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**Licensing Topical Report**

**ESBWR CERTIFICATION PROBABILISTIC RISK  
ASSESSMENT**

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## **1 INTRODUCTION**

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# 1 INTRODUCTION

## 1.1 PURPOSE

The purpose of this analysis is to describe the methodology and the results of the ESBWR probabilistic risk assessment (PRA) and severe accidents.

The PRA has been performed in an iterative manner with the ESBWR design development to evaluate and improve the risk aspects of the ESBWR design.

The overall objectives of the ESBWR PRA are:

- Provide an integrated and systematic assessment of the ESBWR design in response to transient and accident events (including severe accidents),
- Assess the capability of the ESBWR design to meet, with sufficient margin, the NRC safety goals for new plant designs,
- Identify design and analysis areas where further investigation and/or improvement is needed to meet the safety goals,
- Assess the sensitivity of the ESBWR risk profile to human interactions,
- Identify the importance of individual systems and components to the ESBWR risk profile, and
- Develop an analytic tool for use in investigating alternatives in design and operational strategies to optimize ESBWR plant safety.

The specific objectives of the plant-specific PRA and severe accident evaluations are to demonstrate that the ESBWR has been designed with state-of-the-art safety features, incorporating highly reliable and available passive safety functions with significant redundancy and diversity.

The design-specific PRA results and insights are compared against the following goals (note: these are goals and not regulatory requirements) and address how the plant features properly balance severe accident prevention and mitigation:

- Determine how the risk associated with the design compares against the Commission's goals of less than  $1E-4$ /yr for core damage frequency (CDF),
- Determine how the risk associated with the design compares against the Commission's goals of less than  $1E-6$ /yr for large release frequency (LRF),
- A deterministic goal that containment integrity be maintained for approximately 24 hours following the onset of core damage for the more likely severe accident challenges, and
- A probabilistic goal that the conditional containment failure probability (CCFP) is approximately 0.1 for the composite of at-power core damage sequences assessed in the PRA.

The ESBWR design PRA uses the current information available from the ESBWR plant design, Technical Specifications, and procedures. Component failure data and initiating event frequencies are based on generic industry data with consideration of the ESBWR design. Given the state of the ESBWR plant design, the PRA analyses contain conservative elements

(e.g., pre-initiator and post-initiator human error probabilities; maintenance unavailabilities; component failure rates; flood and fire initiation, propagation and effects; ground level release with no evacuation warning assumed in consequence analysis). As such, the actual ESBWR risk profile is judged to be lower than the current quantitative results described in this report.

## **1.2 SCOPE**

The ESBWR PRA is a full scope (Level 1, Level 2, and Level 3) PRA, that covers both internal and external events, full power and shutdown. Where applicable, ASME-RA-Sb-2005 capability category 2 attributes are included in the analysis. Some of these attributes are not achievable at the certification stage of a nuclear power plant. For example, many aspects of assessing human actions cannot be analyzed in absence of a physical, operating plant and operation staff. In these cases, a bounding approach is taken to encompass potential sites, configurations, and operating organizations. In addition, any analyses requiring site-specific characteristics are treated in a bounding manner.

## 1.3 PRA OVERVIEW

### 1.3.1 Internal Events

The PRA quantification modeling methodology used in the ESBWR Level 1 PRA is a linked fault tree approach.

Fault trees have been developed and evaluated for the major ESBWR front line and support systems to determine the unavailability on demand of emergency core cooling and decay heat removal systems. Transient and loss-of-coolant accident events have been consolidated into major accident event sequences that are described by the accident event trees. These event trees are used to calculate the frequency of core damage sequences by directly linking the fault trees and solving for the minimal cutsets.

Outcomes of the event trees are transferred to containment event trees for further treatment to determine frequencies of radioactive releases to the environment.

Results of the containment event tree analyses provide the necessary input to model and assess fission product transport through the drywell and containment; calculate fission product release fractions associated with containment release paths; and determine potential consequences associated with each fission product release category.

The characteristics of the internal events PRA are as follows:

- Initiating Events

Transients, Loss of Preferred Power, Loss of Coolant Accidents, and special initiator categories are identified based on review of industry PRAs and guidance documents. These are modified based on specifics of the ESBWR design and expected operation.

Initiating event frequencies are estimated based on generic industry data for operating BWRs.

- Accident Sequence Analysis

Accident sequence event tree structures and end states are defined for each initiator category based on review of industry PRAs and guidance documents. These are modified based on specifics of the ESBWR design and expected operation.

Event tree nodal inputs are system fault tree logic or nodal point estimates, as appropriate.

Functional success criteria are based on analysis of ESBWR design and expected operation.

- Systems Analysis

System fault trees are developed based on standard industry techniques and reflect the ESBWR system design. Systemic success criteria are based on analysis of the ESBWR design and expected operation.

- Human Reliability Analysis

Pre-initiator and post-initiator human error probabilities are defined based on the ESBWR design and expected operation. The human error probabilities used in the model are screening values based on the time available to perform the various actions.

- Data Analysis

Component failure probabilities are estimated based on generic industry data.

- Containment Performance Analysis

Severe accident phenomena are explicitly addressed and are quantitatively treated. The Risk Oriented Accident Analysis Methodology is used to assess the containment response to severe accident phenomena. A linked fault tree approach is used to address the containment systems and the ability to prevent overpressurization from loss of decay heat removal.

In order to support the consequence analysis, multiple radionuclide release categories are modeled.

- Consequence Analysis

Source terms are defined based on ESBWR thermal hydraulic analysis. Offsite consequence analyses are performed, showing that the ESBWR design meets NRC safety goals with sufficient margin.

### 1.3.2 External Events

The external events portion of the PRA explicitly analyzes core damage accidents initiated during power and shutdown operation for the following hazards:

- Internal floods,
- Internal fires,
- High winds, and
- Seismic events.

The external events analyses are bounding assessments that are meant to show significant design margin for these hazards. The frequencies of initiating events are based on generic industry data, and are applied in a bounding manner. The fault trees and event trees developed for the internal events evaluations are used in the external events analyses to the maximum extent possible, using logic flags that account for the common failures induced by the external hazard events.

The ESBWR seismic assessment is a seismic margins analysis. The analysis demonstrates the ESBWR plant and equipment can withstand an earthquake with a magnitude at least 1.67 times the safe shutdown earthquake.

### 1.3.3 Shutdown Risk

The shutdown and transition risk analysis includes an assessment of the internal event initiated core damage accidents occurring during shutdown operations. Initiator categories and

frequencies are based on a review of industry studies, generic industry data, and consideration of ESBWR design and operation. In addition, a typical refueling outage time line is assumed.

## **1.4 PRA DOCUMENTATION ORGANIZATION**

The ESBWR PRA is documented as follows:

### Introduction

- Introduction (Section 1)

### Level 1 Analysis

- Initiating Events (Section 2)
- Accident Sequence Analysis (Section 3)
- Systems Analysis (Section 4)
- Data Analysis (Section 5)
- Human Reliability Analysis (Section 6)
- Core Damage Frequency Quantification (Section 7)

### Level 2 Analysis

- Containment Performance (Section 8)
- Source Terms (Section 9)

### Level 3 Analysis

- Consequence Analysis (Section 10)

### Uncertainty and Sensitivity

- Uncertainty and Sensitivity Analysis (Section 11)

### External Event Analysis

- Probabilistic Fire Analysis (Section 12)
- Probabilistic Flood Analysis (Section 13)
- High Wind Risk (Section 14)
- Seismic Margins Analysis (Section 15)

### Low Power/Shutdown Analysis

- Shutdown Risk (Section 16)

### Results and Insights

- Results Summary (Section 17)
- PRA Insights Affecting ESBWR Design (Section 18)
- Reliability and Maintainability (Section 19)
- Regulatory Treatment of Non-Safety Systems (Section 20)

### Severe Accident Analysis

- Severe Accident Management (Section 21)

### Changes to the PRA Model

- ESBWR PRA Changes (Section 22)

Section 22 provides a process to document and evaluate changes to PRA parameters that occur after the PRA modeling details are frozen and incorporated into NEDO-33201. New information from technical reviews, operating experience, or other feedback mechanisms is evaluated for its effect on PRA parameters. Subsections correspond to the main report, for example, changes to the flooding PRA would be found in subsection 22.13.

The site-specific PRA model is completed during the construction phase prior to fuel load, and it incorporates the Section 22 changes.



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## 2 INITIATING EVENTS

### 2.1 INTRODUCTION

Event trees are used in a PRA to model discrete accident sequences. An accident sequence is comprised of an initiating event followed by challenges to system successes and failures that lead to either safe, stable plant conditions or to a plant condition that is considered unacceptable. An initiating event is any occurrence that disrupts normal plant operations sufficiently to require a reactor trip by either automatic or manual action. An initiating event may occur due to a random component failure or a human action, thus requiring plant systems to respond to maintain the unit in a safe, stable condition. The initiating event marks the starting point of the accident sequence analysis.

One of the first and basic steps in a PRA is the identification and quantification of the initiating events to be used in the sequence analysis. Initiating events have historically been broadly classified as either “internal” or “external” events. The initiating events discussed in this section are limited to at-power internal initiating events, that is, those initiating events occurring during power operation either as a direct result of equipment failure, or as the result of errors while performing maintenance, testing, or any other operator action. External initiating events (e.g., seismic events, internal floods) and initiating events during shutdown are discussed in other sections.

Initiating event analysis involves the following two major steps:

- (1) Identification and grouping and
- (2) Frequency quantification.

Each of these key steps is discussed below.

## 2.2 INITIATING EVENT IDENTIFICATION AND CATEGORIZATION

To develop a comprehensive accounting of initiating events, a systematic approach is used to identify events that challenge normal plant operation and require successful mitigation to prevent core damage. This includes an evaluation of previously identified initiating events that are also applicable to the ESBWR, and an assessment of the failure modes and effects of systems that are unique to the ESBWR design. In order to identify the list of initiating events to be considered in the analysis, the following steps are taken:

- (1) Identification of the set of initiating events applicable to the ESBWR plant by reviewing NUREG/CR-5750 (Ref. 2.2-1) (Subsections 2.2.1 and 2.2.2) and
- (2) Analysis of the failure of individual ESBWR systems that could result in additional initiating events (Subsection 2.2.3).

Human error induced initiating events are also considered for these analyses.

Individual initiating events that require similar response from front line and auxiliary systems and operators are combined into initiating event categories. Combining initiating events into categories reduces the number of event trees that need to be developed. The general categories of internal initiating events are:

- (1) Transients,
- (2) Loss of coolant accidents (LOCA),
- (3) Interfacing-System LOCA (ISLOCA), and
- (4) Special initiators.

Note that fire initiators are addressed in Chapter 12 and internal flooding initiators are addressed in Chapter 13. The categorization of initiating events within each of these major groups is discussed below.

The postulated initiating events to be addressed in the at-power PRA are derived from a review of nuclear power plant operating experience, as summarized in the NUREG/CR-5750. NUREG/CR-5750 builds upon previous industry studies with similar objectives, such as EPRI Report NP-2230 (Ref. 2.2-2) published in 1982 and NUREG/CR-3862 (Ref. 2.2-3), published in 1985. The NUREG/CR-5750 categories are applicable, in general, to all BWR and PWR plants that are currently in operation. The NUREG/CR-5750 initiating event categories are listed in Table 2.2-1 and are judged to represent the appropriate set of categories for the ESBWR.

Some systems in the ESBWR design differ from those for the operating BWR plants. In addition, the ESBWR design contains several innovative systems; as such, certain NUREG/CR-5750 categories are not directly applicable to the ESBWR. These are indicated in Table 2.2-1.

### 2.2.1 Transients

The transient initiating event categories are developed based on the following considerations:

- Effect of the initiator on feedwater and power conversion system (PCS) availability.
- Effect of the initiator on systems required to prevent core damage or containment failure.
- Successful configuration (e.g., mode of operation, number of pumps in operation) of mitigating systems.
- Effect of the initiator on operator response.

The resulting transient initiating event categories for the ESBWR PRA are as follows:

- General Transient,
- Transient with Power Conversion System (PCS) Unavailable,
- Loss of Feedwater,
- Loss of Preferred Power (LOPP), and
- Inadvertent Opening of SRV (IORV).

The results of this analysis and the NUREG/CR-5750 initiating events grouped into each of the ESBWR PRA initiating event categories are summarized in Table 2.2-2.

### 2.2.2 LOCAs

Loss of Coolant Accident (LOCA) initiator categories are defined based on approaches in previous BWR PRAs, plant specific configuration, and success criteria.

LOCA initiators are classified according to the following main factors:

- (1) Level position: Steam breaks (for pipes above Level 3) or liquid breaks (for pipes below Level 3.) The exceptions are the RWCU/SDC pipe at elevation 17215 mm and the feedwater pipe which is at elevation 18915 mm which are below Level 3 at 19780 mm.

Thermal hydraulic calculation concluded that the RWCU/SDC and feedwater pipe break performed like a steam break.

- (2) Break size: Large, medium, or small classifications are used.
- (3) Pipe function: Emergency Core Cooling System (ECCS) line break or non-ECCS line break (the former affects ECCS operability).
- (4) Location: Inside/outside containment breaks (breaks outside containment can potentially be isolated).
- (5) Pipe class: LOCAs can be postulated for situations in which valves between the reactor coolant pressure boundary (RCPB) and non-RCPB segments fail, propagating high pressure to low pressure design piping.
- (6) Coolability: Coolable LOCAs (all the above categories) or non-coolable LOCAs.

### 2.2.2.1 LOCAs Inside Containment

These initiators are failures of the RCPB that occur inside the containment during power operation. LOCAs inside containment are categorized into the following LOCA sizes:

- Large: RPV depressurizes sufficiently (without the need for additional depressurization methods) to allow GDCS injection prior to uncovering the top of active fuel (TAF).
- Medium (Steam): RPV depressurizes sufficiently (without the need for additional depressurization methods) to allow active low pressure injection prior to uncovering TAF.
- Medium (Liquid): CRD insufficient as a high pressure makeup source because the break flow exceeds CRD injection flow. RPV depressurization is required for low pressure injection.
- Small (Steam or Liquid): CRD is sufficient as a makeup source. RPV depressurization is required for low pressure injection.

The lower limit of LOCAs is defined as a RCPB leak small enough to be managed by normal operation water makeup and containment cooling systems. The Turbine Trip initiating event category considers this level of RCPB leakage.

An analysis is performed to establish the appropriate LOCA classification for each line connected to the Reactor Coolant Pressure Boundary (RCPB). Table 2.2-3 summarizes the number, the diameter, and the nozzle elevation of lines connected to the RCPB. For each line, Table 2.2-3 classifies the breaks into Large, Medium, and Small LOCA sizes according to the pipe cross-section area, and whether it is a liquid or steam break. Criteria for the classifications are:

- Pipes connected to the RPV at elevations above Level 3 are classified as steam breaks (even though a liquid phase is initially discharged through the break).
- Pipes connected to the RPV at elevations below Level 3 are classified as liquid breaks (RWCU/SDC pipe at elevation 17215 mm and feedwater pipe at elevation 18915 mm are considered as steam break).

The generic BWR emergency procedure guidelines direct the operators to maintain reactor vessel level between Level 3 and Level 8 after reactor trip. This action is considered applicable for ESBWR, so any LOCA below Level 3 results in the continual release of water through the break, provided that an injection system into the vessel is available.

As such, the LOCA categories in terms of location and diameter are as follows:

- Large (steam): >305 mm (12") dia. piping above Level 3,
- Large (liquid): >305 mm (12") dia. Piping below Level 3,
- Medium (steam): 264mm (10.4") – 305 mm (12") dia. piping above Level 3,

- Medium (liquid): 25 mm (1") – 305 mm (12") dia. piping below Level 3,
- Small (steam): <264 mm (10.4") dia. piping above Level 3, and
- Small (liquid): <25 mm (1") dia. piping below Level 3.

The diameter of an orifice or a nozzle in a line, when it exists, is considered in the break size classification.

The initiating event categorization for LOCAs inside containment is summarized below and in Table 2.3-3.

#### Large Break LOCA

The large break LOCA is sufficiently large to depressurize the reactor to permit low pressure system injection, without the need for additional depressurization methods. The ESBWR design does not contain any piping with diameters greater than 12" below Level 3, thus, all breaks analyzed are steam break. Inadvertent opening of all DPV/SRVs is also included in this group.

This initiating event category corresponds to the NUREG/CR-5750 category (G7) Large Pipe Break LOCA.

#### Medium Break LOCA

- Steam break case - The medium break steam LOCA is large enough to depressurize the reactor sufficiently to permit low pressure system injection (except GDCS) without the need for additional RPV depressurization methods. Inadvertent opening of a DPV is included in this group. No additional ESBWR lines fall into this category.
- Liquid break case - The flow rate at reactor pressure for a medium break liquid LOCA is greater than the CRD makeup capacity. Depressurization is needed for GDCS injection to be effective. A number of ESBWR lines fall into this category.

This initiating event category corresponds to the NUREG/CR-5750 category (G6) Medium Pipe Break LOCA.

#### Small Break LOCA

- Steam break case - The small break steam LOCA is sufficiently small such that RPV depressurization is needed for effective low pressure injection (including LPCI and FPS). ESBWR instrument lines above Level 3 fall into this category.

The consequences of an inadvertent opening of one SRV (IORV) are similar to the consequences of a small steam LOCA; however, IORV is analyzed separately as a transient because of the steam discharge to the suppression pool versus the drywell.

- Liquid break case - CRD is a viable high pressure injection source, as the flow rate for a small break liquid LOCA is less than the CRD makeup capacity. RPV depressurization is needed for effective low pressure system injection. ESBWR instrument lines below Level 3 fall into this category.



This initiating event category corresponds to the NUREG/CR-5750 category (G3) Small Pipe Break LOCA.

#### Excessive LOCA

An “Excessive LOCA” is defined as a LOCA that cannot be mitigated by any combination of engineered systems. LOCAs, such as vessel rupture have been considered excessive LOCAs in the past; however, the ESBWR design is such that, depending on location, the vessel rupture can be recovered. If the LOCA location is above the bottom of the fuel, the LOCA is recoverable and transfers to the Reactor Vessel Rupture (RVR) Event tree. If the excessive LOCA location is below the bottom of the fuel, no recovery is credited.

#### **2.2.2.2 LOCAs Outside Containment**

LOCAs outside containment are defined as breaks in high pressure systems outside the containment. The break can be isolated by closure of the isolation valves, and this is addressed in the accident sequence analysis.

This initiating event category corresponds to NUREG/CR-5750 categories (K1) Steam Line Break Outside Containment and (K2) Feedwater Line Break.

#### **2.2.2.3 Interfacing System LOCAs**

An interfacing system LOCA occurs at a breach in a system that interfaces with the RCS, where isolation between the breached system and the RCS fails. An ISLOCA is characterized by the over pressurization of a low pressure system when subjected to RCS pressure and can result in a containment bypass. This initiating event category corresponds to NUREG/CR-5750 category (N1) Interfacing System LOCA.

#### **2.2.3 Special Initiators**

Special initiating events refer to plant-specific malfunctions that could lead to a plant trip. A new initiating category is identified when the event is not associated with any of the categories defined before; otherwise, it is grouped into one of the defined categories and the frequency of the existing category is modified to account for the contribution of the systemic malfunction.

In general, systems that can influence scram or isolation signals (either directly or as a consequence) are analyzed. The list of systems analyzed is as follows:

##### Front line systems

- Control Rod Drive System
- Feedwater / Condensate
- Isolation Condenser System
- Depressurization System
- Gravity Driven Cooling System

- Fuel and Auxiliary Pool Cooling System
- Reactor Water Cleanup / Shutdown Cooling System
- Standby Liquid Control System

#### Support Systems

- Reactor Component Cooling Water System
- Turbine Component Cooling Water System
- Plant Service Water System
- Air Systems (High Pressure Nitrogen Supply, Service Air, Instrument Air)
- 13.8 kVAC and 6.9 kVAC bus system
- 250VDC bus system
- Reactor Water Level Instrumentation (RWLI) System
- Drywell Cooling System

For each of these systems, the possibility for the generation of inadvertent scram or isolation signals is investigated. The effects of spurious equipment actuation, human errors, hardware failures and pipe breaks in these systems are also considered.

A qualitative screening analysis is performed to eliminate errors or failures which are not credible or which do not contribute to a scram initiation or isolation function. This analysis is described in the subsections below.

#### **2.2.3.1 Control Rod Drive System**

The CRD system has one pump in operation during normal plant operation. The other pump is in standby and starts automatically upon a reactor water Level 2 signal.

In normal operation the system performs the following functions:

- Charging of hydraulic control units, and
- Supply of purging water to the control rod drives (CRD), RWCU/SDC pumps and reactor water level reference leg instrument lines.

Refer to Subsection 4.3 for a description and simplified diagram of the system.

The following malfunctions are considered:

- (1) Trip of the operating pump: No major effects are expected because at the time of the pump trip the hydraulic control units are charged and the check valve on the charging line prevents their discharge. Also, loss of purge does not impair the Fine Motion Control Rod Drive (FMCRD) function in the short term. If the tripped pump or the standby pump cannot be restarted, a controlled reactor shutdown is pursued.
- (2) Spurious actuation of the standby pump and opening of the injection valve: This malfunction results in additional inventory of cold water entering the reactor pressure

vessel (RPV) from the feedwater line. Because the feedwater system is able to regulate the injection flow (by level control) and the temperature reduction of the total flow entering the vessel is negligible when feedwater is operating, no consequences are expected from this event.

- (3) Injection line breaks downstream of the check valves that isolate CRD from the RWCU line: This line is common to the injection of CRD and RWCU train A; because it belongs to RWCU, the consequences of this event are analyzed within RWCU below.

### **2.2.3.2 Feedwater / Condensate Systems**

The Feedwater and Condensate systems are in operation at all times during normal plant operation. Refer to Subsection 4.9 for a description and simplified diagrams of these systems.

The following malfunctions are considered:

- (1) FW controller malfunction (reactor water level increase): The FW controller is single failure proof. Therefore, the FW controller failure is much less likely to occur in the ESBWR than in current generation reactors.

In addition, there is the added protection of a FW runback, closure signals to the high pressure makeup (CRD) flow control valves on reactor water Level 8, and trip of the FW pumps on reactor water Level 9. A scram occurs on reactor water Level 8; this event is included in the General Transient initiating event category.

In case a high reactor water level trip signal does not operate and the operator does not perform backup action, the following Main Steam Line (MSL) flooding scenarios can be postulated:

- MSL break: this event is similar to a steam LOCA event.
- MSL does not break and ICS does not operate: in this case, the SRV opens and discharges water. A break of the SRV discharge might occur and cause a LOCA inside the drywell. The consequence of this event is bounded by the Small Steam LOCA event.
- No pipe break occurs, the ICS is not operating, and an SRV remains stuck open: The consequence of this event is bounded by the IORV event.

The frequency of all the above failures is estimated to be below any LOCA frequency.

- (2) FW controller malfunctions (reactor water level decrease): A controller malfunction that results in reduced feedwater flow is included in the General Transient initiating event category. A controller malfunction that results in loss of all feedwater flow is included in the Loss of Feedwater initiating event category.

- (3) Partial loss of feedwater: The design of the ESBWR is such that loss of a single train of feedwater or condensate will not cause a reactor trip. Loss of two or three trains is not considered credible because there are four independent power trains supplying the two trains of four condensate and feedwater pumps and it would take a common cause failure of two out of four pumps or three out of four pumps to lead to a partial loss of feedwater for two or three condensate or feedwater pumps. Therefore, malfunctions involving partial loss of the condensate or feedwater systems are not modeled.
- (4) Complete loss of feedwater: Malfunctions that cause complete loss of condensate or complete loss of feedwater are included in the Loss of Feedwater initiating event category.

### **2.2.3.3 Isolation Condensers Systems**

This system is in standby during normal plant operation. It is automatically actuated in case of reactor isolation or high reactor pressure. Refer to Subsection 4.2 for a description and simplified diagram of this system.

The following malfunctions are considered:

- a. Spurious actuation of isolation condensers: The effect on the plant for spurious actuation of from one to four isolation condensers is an insertion of positive reactivity. The likely consequence of the event is a reactor trip. The water level changes are corrected by FW flow control. This event is included as part of the General Transient initiating event category.
- b. Spurious opening of one to twelve of the twelve vent lines venting the IC to the suppression pool:  
The bottom header vent valves are signaled to open by high RPV pressure (above IC actuation value). The spurious opening of just one vent line produces a small LOCA with the steam flowing directly to the suppression pool and eventually leading to a high suppression pool temperature scram. This event is bounded by the IORV.
- c. System pipe breaks upstream of the isolation valves: These breaks are not isolable and they produce LOCA events. This event is considered in the frequency evaluation of LOCAs inside containment (refer to Subsection 2.3).
- d. System pipe breaks downstream from the isolation valves:
  - Significant break inside the containment: Automatic isolation valves are provided on the suction lines; if a break is sensed (by measuring the flow in the line) these valves close rapidly, so that only a limited loss of RPV water occurs, and no transient initiation is possible. Pipe breaks, combined with failure to isolate the line, have a very low frequency. The consequences are similar to a LOCA inside the containment, but the frequency of the event is much lower. Such events are subsumed by the small steam LOCA initiators.
  - IC tube or pipe break outside containment: Automatic or manual break isolation is possible through the multiple leak detection systems, depending on the break size. The IC pipe break outside containment is analyzed as a separate initiating event category.

#### **2.2.3.4 Depressurization and Safety/Relief Valves**

Refer to Subsection 4.1 for a description and simplified diagram of this system.

For this system, only spurious actuation resulting either from operator error or from hardware failure is considered. Breaks of piping between valves and RPV nozzles are taken into account in the LOCA frequency evaluation (see Table 2.2-3).

The spurious actuation of an SRV constitutes an IORV event. An IORV is similar to a small break LOCA, but a specific event tree is used. Its frequency is evaluated in Subsection 2.3.

The spurious actuation of only one DPV is included in the medium steam LOCA initiating event category. Only the valve mechanical failure contributes to this event because the logic failure causes more than one valve to open, and thus, a different event.

The spurious actuation of two or more SRVs and DPVs is accounted for within the large LOCA category because of the large total flow area through the valves. The main causes for this event are discussed and quantified in Subsection 2.3.

#### **2.2.3.5 Gravity Driven Cooling System**

The GDCS is in standby and is automatically started by low reactor water level or by drywell high temperature. Refer to Subsection 4.6 for a description and simplified diagram of this system.

The following malfunctions are considered:

- (1) Spurious actuation of a squib valve due to Instrumentation and Control failures: The spurious actuation of a squib valve due to Instrumentation and Control failures is equivalent to the total frequency of inadvertent opening of one or more DPVs due to Instrumentation and Control failures which was calculated in DCD Rev 5 Section 15A.3.9.3 to be  $5.75\text{E-}04/\text{year}$  and the failure of the in-line check valve to close ( $1.0\text{E-}03/\text{demand}$ ) produce an event similar to a GDCS line break. The probability of occurrence is then  $5.75\text{E-}04 * 1.0\text{E-}03 = 5.75\text{E-}07/\text{year}$ . This is added to the medium liquid LOCA initiating event frequency.
- (2) Spurious actuation of all squib valves: This event can occur for the same reasons as the spurious opening of all DPVs; however, the frequency of this event is lower because, in this case, the check valves on the GDCS lines would need to fail to close. This event is not explicitly considered in the analysis.
- (3) Injection line break between the nozzle and the check valve: This event is a LOCA and its frequency is evaluated in Subsection 2.3.

#### **2.2.3.6 Fuel and Auxiliary Pools Cooling System**

This system is normally in operation with one pump providing spent fuel pool cooling during plant operation. Its reconfiguration into the suppression pool cooling mode is automatic upon a high Suppression Pool temperature signal. The operator initiates the LPCI mode manually. Refer to Subsection 4.7 for a description and simplified diagram of this system.

The following malfunctions are considered:

- (1) Trip of the operating pump: Tripping of the operating pump results in an increase of the spent fuel pool water temperature over the long term; however, the standby pump can be aligned. This will not cause a reactor trip. No effect on plant safety is expected.
- (2) Spurious startup of the standby pump: The startup of the standby pump has no effect on plant safety. If the related suction valves are not open, then the pump could be damaged due to overtemperature. A reactor trip will not be generated. No effect on plant safety is expected.
- (3) Injection line breaks downstream of the check valves (isolating FAPCS from RWCU line): This line is common to the injection of FAPCS and RWCU train B; because it belongs to RWCU, the consequences of this event are analyzed within RWCU below.

#### **2.2.3.7 Reactor Water Clean-Up System**

This system is in operation during normal plant operation with one pump working at a percentage of the rated speed to carry out the reactor water clean-up function. No automatic signals are provided for standby pump actuation or for increase of the operating pump speed. Refer to Subsection 4.8 for a description and simplified diagram of this system.

The following malfunctions are considered:

- (1) Trip of the operating pump: Tripping of the operating pump does not produce an immediate effect on plant safety because only the RWCU function is impaired. The loss of the RWCU system for a long time might result in high water conductivity and require a controlled plant shutdown. However, there is sufficient time available to correct high water conductivity using the standby pump or other functions, and this malfunction is not included as an initiator.
- (2) Spurious startup of the standby pump: No effect on plant safety is expected. No reactor trip will be generated if there is a spurious startup of the standby pump, not included as an initiator.
- (3) Injection line break downstream from the check valves (isolating RWCU from FW line): This event causes loss of FW because of the diverted flow, unavailability of the RWCU trains due to high temperature in the Main Steam Tunnel, loss of the FAPCS in half of the cases (FW line A break), and loss of the CRD injection in half of the cases (FW line B break). The event behaves like a loss of FW with the unavailability of some mitigating systems.
- (4) RWCU line break outside of containment within Reactor Building (other than 3 above): This event causes loss of RWCU/SDC because of the LD&IS isolating signals, RPV Level 2 containment IS isolating signal, and unavailability of both RWCU/SDC trains.

Breaks in the RWCU return line from the RPV lead to LOCA events. The frequency of such an event is evaluated in Subsection 2.3.

### 2.2.3.8 *Standby Liquid Control System*

The system is in standby during normal plant operation and is automatically actuated in response to ATWS signals. Refer to Subsection 4.4 for a description and simplified diagram of this system.

The following malfunctions are considered:

- (1) Spurious system actuation: If one of the redundant squib valves spuriously actuates, boron injection into the RPV occurs. Plant availability is affected, but not plant safety. This event is considered as part of the General Transient initiating event category.
- (2) Injection line break: This event causes a LOCA. Due to the small size of the nozzles (1 inch) and the way that they are routed through the shroud, SLCS LOCA is considered a small liquid LOCA. Its contribution to LOCA frequency is evaluated in Subsection 2.3. For SLCS operation and at 10190 mm elevation (nozzle N16), it initiates at Level 2, which is below Level 3 at 19780 mm.

The SLCS LOCA frequency was calculated based on actual pipe section sizes in Subsection 2.3, but since the injection nozzle size is 1", and its impact is more like a small LOCA, as stated in DCD Subsection 6.3.3.7.6, it was classified as a small liquid LOCA.

DCD Section 6.3.3.7.6, Small Line Breaks Inside Containment, states, "For these cases, the equalization line break, SLC injection line break, the GDCS injection line break and the bottom head drain line break were analyzed. Results show that the GDCS injection line break and the bottom drain line break bound the other small line breaks."

SLC break size is smaller than that of GDCS. TRACG results of SLC injection line LOCA was bounded by GDCS injection line break. PRA treats equalization line break, GDCS injection line break and the bottom head drain line break as medium break per initiating event section definition. However, due to the nozzle size of SLC injection line, it is classified as small LOCA.

### 2.2.3.9 *RCCW System*

The Reactor Component Cooling Water System supplies cooling water to the following systems:

- CRD
- FAPCS
- RWCU/SDC
- Chilled Water System
- Service Air System.

Refer to Section 4.10 for a description and simplified diagram of this system.

The consequences of total failure of RCCW are less severe than total failure of PSWS because BOP systems cooled by TCCW/PSWS remain available for the loss of RCCW event. However,

because the consequences of this event are bounded by the Complete Loss of PSWS initiating event category, loss of RCCW is conservatively grouped together with the Complete Loss of PSWS initiator.

#### ***2.2.3.10 TCCW System***

Refer to Section 4.9 for a description and simplified diagram of this system.

The loss of this system results in loss of balance-of-plant (BOP) systems (i.e., a turbine trip with feedwater and condensate system failure). Given the functional consequences of this event, loss of TCCW is grouped together with the Loss of Feedwater initiating event category.

#### ***2.2.3.11 Plant Service Water System***

Refer to Section 4.11 for a description and simplified diagram of this system.

The loss of this system produces a loss of RCCW and TCCW. The event results in the impairment of several mitigating systems (all non-safety systems, including complete loss of AC power to battery chargers). The consequences are similar to a station blackout event. This event is modeled with a separate initiating event category.

For partial loss of Service Water system, see Note 3 to Table 2.2-1.

#### ***2.2.3.12 Air Systems***

This event consists of the simultaneous loss of HPNSS and both the instrument and service air systems. Refer to Sections 4.12 and 4.13 for descriptions and simplified diagrams of these systems. As a result of complete loss of air, the MSIVs will eventually close because of the discharge of the accumulators due to normal leakage. After the accumulators discharge, the event proceeds like an MSIV closure event. This event is modeled with a separate initiating event category.

#### ***2.2.3.13 Loss of a Single 13.8 kVAC or 6.9 kVAC Safeguards Bus***

Refer to Section 4.14 for a description and simplified diagram of the AC system.

In accordance with DCD chapter 8.1.5.2.2.1, there is no direct Class 1E AC power source required for safety related loads. Because there are no 13.8 kVAC or 6.9 kVAC vital buses they are not included as an initiator at ESBWR. Nonsafety-related Bus loss (QC5) is discussed in general transients and as discussed in Subsection 2.3.1.1 does not cause a reactor scram.

#### ***2.2.3.14 Loss of a Single 250 VDC Bus***

Refer to Section 4.17 for a description and simplified diagram of the 250 DC system.

The Class 1E 250 VDC power distribution system provides four independent and redundant on-site sources of power for operation of DC loads. Because of the N - 2 design of the ESBWR, a single 250 VDC Bus can be taken out of service without shutting down the plant. Therefore,



loss of a single 250 VDC Bus will not cause a plant shutdown and is not considered as a credible initiating event for the ESBWR.

#### ***2.2.3.15 Reactor Water Level Instrumentation Failures***

Failures of the RWLI system can initiate a transient event and at the same time jeopardize the operation of mitigating systems. The failures considered are those involving an erroneous high level signal.

The experience of operating plants shows that an RWLI failure could be caused by leaks in the instrumentation leg or by extreme environmental conditions, such as a high drywell temperature. The following discussion examines the effect of such phenomena, assuming the occurrence of a single leg failure.

- (1) Leaks: Leaks occurring in the instrumentation legs could alter the level, inducing an error in all of the connecting instruments. The ESBWR plant design incorporates one separate leg for each level instrumentation division; this means that if only one leg fails, the RWLI system can still assure correct performance (i.e., one scram signal is not generated and mitigating systems are not prevented from starting).
- (2) Extreme environmental conditions: A high DW temperature could be caused by accidents such as 1) LOCAs, 2) inadvertent opening of one DPV, or 3) loss of the drywell cooling system. However, the instrumentation is assumed to be designed for the maximum temperature attainable in the DW, so no instrumentation effects should occur. A possible local effect could be generated by a LOCA if the break is close to the instrumentation piping. For this case, only one division is expected to be affected, so no significant contribution to core damage frequency is expected. Various level sensors actuate the safety systems (IC, GDCS, SRV).

Given the above, RWLI failures are not included as an initiator for accident sequence quantification.

#### ***2.2.3.16 Drywell Cooling System***

A scram is initiated when the drywell temperature increases above the predetermined limit. No mitigating systems are impaired. The event is similar to a spurious trip and is included in the General Transient initiating event category.

#### ***2.2.3.17 Summary of Special Initiators***

The following are the special initiators that require no further consideration for initiating events:

- Control Rod Drive System
- Feedwater/Condensate
- Isolation Condensers
- Depressurization and Safety/Relief Valves
- Gravity Driven Cooling system

- Fuel and Auxiliary Pools Cooling System
- Reactor Water Clean-up System
- Standby Liquid Control System
- Complete Loss of RCCW
- Complete Loss of TCCW System
- Loss of a Single 13.8 kVAC or 6.9 kVAC Safeguards Bus
- Loss of a Single 250 VDC Bus
- Reactor Water Level Instrumentation Failures
- Loss of Drywell Cooling System.

The following are special initiators that are treated as separate initiating event categories:

- Complete Loss of Plant Service Water System
- Complete Loss of Air Systems.

#### **2.2.4 References**

- 2.2-1 Idaho National Engineering and Environmental Laboratory, “Rates of Initiating Events at U.S. Nuclear Power Plants: 1987-1995”, NUREG/CR-5750, February 1999.
- 2.2-2 Electric Power Research Institute, “EPRI-ALWR Utility Requirements Document”, EPRI ALWR URD, Revision 4, April 1992.
- 2.2-3 Idaho National Engineering Laboratory, “Development of Transient Initiating Event Frequencies for Use in Probabilistic Risk Assessments”, NUREG/CR-3862, May 1985.

**Table 2.2-1**  
**NUREG/CR-5750 Initiating Event Categories**

A	(Reserved) <sup>8</sup>
B	<u>Loss of Offsite Power</u>
	(B1) Loss of Offsite Power (LOSP)
C	<u>Loss of Safety-Related Bus</u>
	(C1) Loss of Vital Medium Voltage AC Bus <sup>2</sup>
	(C2) Loss of Vital Low Voltage AC Bus <sup>2</sup>
	(C3) Loss of Vital DC Bus
D	<u>Loss of Instrument or Control Air</u>
	(D1) Loss of Instrument or Control Air
E	<u>Loss of Safety-Related Cooling Water</u>
	(E1) Total Loss of Service Water
	(E2) Partial Loss of Service Water <sup>3</sup>
F	<u>Steam Generator Tube Rupture</u>
	(F1) Steam Generator Tube Rupture <sup>1</sup>
G	<u>Loss of Coolant Accident (LOCA)/Leak</u>
	(G1) Very Small LOCA/Leak
	(G2) Stuck Open: 1 Safety/Relief Valve
	(G3) Small Pipe Break LOCA
	(G4) Stuck Open: Pressurizer PORV <sup>1</sup>
	(G5) Stuck Open: 2 or More Safety/Relief Valves
	(G6) Medium Pipe Break LOCA
	(G7) Large Pipe Break LOCA
	(G8) Reactor Coolant Pump Seal LOCA: PWR <sup>1</sup>
H	<u>Fire</u>
	(H1) Fire
J	<u>Flood</u>
	(J1) Flood
K	<u>High Energy Line Break</u>

**Table 2.2-1**  
**NUREG/CR-5750 Initiating Event Categories**

	(K1) Steam Line Break Outside Containment
	(K2) Feedwater Line Break
	(K3) Steam Line Break Inside Containment: PWR <sup>1</sup>
L	<u>Total Loss of Condenser Heat Sink</u>
	(L1) Inadvertent Closure of All MSIVs
	(L2) Loss of Condenser Vacuum
	(L3) Turbine Bypass Unavailable
M	(Reserved) <sup>8</sup>
N	<u>Interfacing System LOCA</u>
	(N1) Interfacing System LOCA
P	<u>Total Loss of Feedwater Flow</u>
	(P1) Total Loss of Feedwater Flow
Q	<u>General Transients</u>
	(QC4) Loss of AC Instrumentation and Control Bus
	(QC5) Loss of Non-safety-related Bus
	(QG9) Primary System Leak
	(QG10) Inadvertent Open/Close: 1 Safety/Relief Valve
	(QK4) Steam or Feed Leakage
	(QL4) Loss of Nonsafety-Related Cooling Water
	(QL5) Partial Closure of MSIVs <sup>4</sup>
	(QL6) Condenser Leakage
	(QP2) Partial Loss of Feedwater Flow <sup>5</sup>
	(QP3) Total Loss of Condensate Flow
	(QP4) Partial Loss of Condensate Flow <sup>6</sup>
	(QP5) Excessive Feedwater Flow
	(QR0) RCS High Pressure (RPS Trip)
	(QR1) RCS Low Pressure (RPS Trip): PWR <sup>1</sup>
	(QR2) Loss of Primary Flow (RPS Trip): PWR <sup>1</sup>
	(QR3) Reactivity Control Imbalance
	(QR4) Core Power Excursion (RPS Trip)

**Table 2.2-1**  
**NUREG/CR-5750 Initiating Event Categories**

(QR5) Turbine Trip
(QR6) Manual Reactor Trip
(QR7) Other Reactor Trip (Valid RPS Trip)
(QR8) Spurious Reactor Trip
(QR9) Spurious Engineered Safety Feature Actuation <sup>7</sup>

Notes to Table 2.2-1:

- 1 PWR event. Not applicable to ESBWR.
- 2 These event categories are not applicable to the ESBWR, as the Low and Medium Voltage AC Buses in the ESBWR design are nonsafety-related (with the exception of a portion of the uninterruptible power supply system that is backed up by batteries). Low and Medium voltage AC initiators for the ESBWR are addressed by the NUREG/CR-5750 category QC5 (Loss of Non-safety-Related bus).
- 3 In accordance with DCD, 9.2.1.2 and 9.2.1.5, loss of a single PSWS train does not cause a reactor trip for the ESBWR design.
- 4 In accordance with DCD, 9A.6.4.5 and 15.2.2.6.2, closure of one MSIV does not cause a reactor trip for the ESBWR design.
- 5 In accordance with DCD, 10.4.7.1.2, 10.4.7.2.1, 14.2.8.2.24, Table 6.3-1 and 7.7.5.2.3, loss of a single feedwater pump train does not cause a reactor trip for the ESBWR design.
- 6 In accordance with DCD, 10.4.7.1.2 and 10.4.7.2.1, loss of a single condensate pump train does not cause a reactor trip for the ESBWR design.
- 7 The ESBWR design does not have high pressure standby safety injection systems, and the ESBWR low pressure safety systems cannot inject into the RPV when it is at power. Spurious IC actuation is considered under Special Initiators, and spurious ADS are considered in the LOCA initiator categories.
- 8 “Reserved” is used for this category in NUREG/CR-5750 and does not mean it has been reserved for ESBWR.

**Table 2.2-2**  
**ESBWR Transient Initiating Event Categorization**

<b>ESBWR Transient Initiating Category</b>	<b>Description</b>	<b>NUREG/CR-5750 Categories</b>
General Transient	Scram occurs. FW remains available or is promptly recoverable. Main condenser is available, if the mode switch is positioned in shutdown.	<ul style="list-style-type: none"> <li>a. (QC4) Loss of ac Instrumentation and Control bus</li> <li>b. (QC5) Loss of Nonsafety-related bus</li> <li>c. (QG9) Primary System Leak</li> <li>d. (QK4) Steam or Feed Leakage</li> <li>e. (QL6) Condenser Leakage</li> <li>f. (QP5) Excessive Feedwater Flow</li> <li>g. (QR0) RCS High Pressure (RPS Trip)</li> <li>h. (QR3) Reactivity Control Imbalance</li> <li>i. (QR4) Core Power Excursion (RPS Trip)</li> <li>j. (QR5) Turbine Trip</li> <li>k. (QR6) Manual Reactor Trip</li> <li>l. (QR7) Other Reactor Trip (Valid RPS Trip)</li> <li>m. (QR8) Spurious Reactor Trip</li> </ul>
Transient with PCS Unavailable	Scram occurs. FW remains available for RPV inventory makeup. Main condenser is unavailable.	<ul style="list-style-type: none"> <li>a. (L1) Inadvertent Closure of All MSIVs</li> <li>b. (L2) Loss of Condenser Vacuum</li> <li>c. (L3) Turbine Bypass Unavailable</li> </ul>
Loss of Feedwater	Scram occurs. Feedwater is not available. Main condenser is unavailable due to MSIVs closure on Level 2.	<ul style="list-style-type: none"> <li>a. (P1) Total Loss of Feedwater Flow</li> <li>b. (QL4) Total Loss of TCCW (subset of QL4)</li> <li>c. (QP3) Total Loss of Condensate Flow</li> </ul>
IORV	Scram occurs. FW remains available. One or more safety/relief valves initially stuck open	<ul style="list-style-type: none"> <li>a. (G2) Stuck Open: 1 Safety/Relief Valve</li> <li>b. (QG10) Inadvertent Open/Close: 1 Safety/Relief Valve</li> </ul>

**Table 2.2-3**  
**Lines Connected to Reactor Coolant Pressure Boundary (RCPB)**

Line	Number of lines	mm (inches) diameter	Nozzle Elevation (mm)	Break <sup>7</sup> Type	Notes
Main Steam (MSL) (N3)	4	700 (28) <sup>1</sup>	22840	L	Steam break
DPV/IC (N5)	4	450 (18), 350 (14) <sup>2</sup>	21910	L	Steam break
DPV/MSL <sup>9</sup>	4	N/A <sup>3</sup>	22840	M or L <sup>6</sup>	Steam break
SRV/MSL <sup>9</sup>	18	N/A	22840	M or L <sup>6</sup>	Steam break
FW-12" (N4)	6	300 (12)	18915	L	Steam break
22"	2	550 (22)	—	L	Steam break
RWCU/SDC (N8)	2	300 (12)	17215	L <sup>8</sup>	Steam break
IC return lines	4	200 (8)	13025	M	Liquid break
GDCS (N6)	8	150 (6) <sup>4</sup>	10453	M	Liquid break
Equalizing lines	4	150 (6) <sup>5</sup>	8453	M	Liquid break
RWCU/RPV Drain Lines (N15)	4	50 (2)	0	M	Liquid break
SLCS (N16)	2	50 (2)		S	Liquid break
Instrument lines above L3	4	50 (2)	>L3	S	Steam break
Instrument lines below TAF	4+2	25 (1)	<TAF	S	Liquid break
Instrument lines above TAF and below L3	4	25 (1)	TAF-L3	S	Liquid break

Notes:

- 1 9.75 10-2 m2 (1.05 sq. ft) throat diameter
- 2 450 mm common pipe, 350 mm IC branch pipe
- 3 DPV directly mounted on MSL pipe
- 4 75 mm (3 inches) throat diameter
- 5 50 mm (2 inches) throat diameter
- 6 Break size depends upon whether single or multiple valves spuriously open (single DPV or SRV is Medium; multiple DPVs or SRVs is Large)
- 7 L = Large; M = Medium; S = Small
- 8 In accordance with thermal hydraulic analysis the RWCU/SDC responds like a large steam break
- 9 Use same elevation on main steam lines because penetration is branch off main steam line.



## 2.3 INITIATING EVENTS FREQUENCY QUANTIFICATION

The initiating events are identified and grouped into initiating event categories as discussed in Section 2.2.

This section documents the frequencies calculated for each of the initiating event categories. Loss of coolant accidents (LOCAs) are divided into further subcategories for more effective event tree modeling and quantification.

### 2.3.1 Transients

All transient frequencies are determined based on NUREG/CR-5750 (Ref. 2.3-1) results, which are based on U.S. nuclear power plant operational experience. If the 2005 data in NUREG/CR-5750 is available it is used instead of the Ref. 2.3-1 data. Where NUREG/CR-5750 does not provide information on a particular initiator, the source of the frequency for the initiator is provided in the appropriate section. The resulting frequencies are summarized in Table 2.3-4 and the details of the calculations are presented below.

#### 2.3.1.1 General Transient

The nominal frequency for BWR General Transient is 1.5 /yr. However, several adjustments are required to this number for the ESBWR. In accordance with Table 2.2-1, closure of a single MSIV does not cause a reactor trip for the ESBWR. Loss of two or three MSIVs out of eight in which the failed closed MSIVs are not on the same line is not considered credible since there were 11 events for partial closure of MSIVs, QL5, for BWRs included in the Q events for BWRs. The common cause failure for two or three of four MSIVs would not be credible given there were only 11 partial closures of MSIVs in the database. In accordance with Table 2.2-1, loss of a single feedwater train does not cause a reactor trip for the ESBWR design. There were 45 events for partial loss of feedwater, QP2, for BWRs included in the Q events for BWRs. In accordance with Table 2.2-1, loss of a single train of condensate does not cause a reactor trip for the ESBWR design. There were 13 events for partial loss of condensate, QP4, for BWRs included in the Q events for BWRs. The loss of two or three condensate trains is not considered credible since there are four independent power trains supplying the four condensate pumps and common cause would not be a significant contributor given there were only 13 partial losses of condensate. In accordance with Table 2.2-1, note 7, spurious Engineered Safety Feature Actuation either does not cause a reactor trip or has been included under other initiators and therefore does not get counted as a contributor to Q for the ESBWR PRA. There were 14 events for spurious Engineered Safety Feature Actuation, QR9, for BWRs included in the Q events for BWRs. The partial loss of TCCW would not cause a reactor trip in the ESBWR design since loss of one feedwater train or loss of one condensate train will not cause a reactor trip in the ESBWR design. Loss of two or three trains out of four trains is not considered credible since all feedwater pumps have independent power trains and common cause of two or three out of four given there was only 45 events.

There were 16 events for partial and total loss of non-safety related cooling, QL4. Finally, loss of a nonsafety-related bus, QC5, will not cause a reactor trip in the ESBWR design because loss of one feedwater train, loss of one condensate train, or partial loss of PSW will not trip the unit. To summarize, the following categories will be removed from the Q events:

- Partial closure of MSIVs (QL5) – 11 events,
- Partial loss of feedwater (QP2) – 45 events,
- Partial loss of condensate (QP4) – 13 events,
- Spurious Engineered Safety Feature Actuation (QR9) – 14 events,
- Loss of TCCW (QL4) – 16 events (see Loss of Feedwater also), and
- Loss of Nonsafety-related Bus (QC5) – 5 events.

Additional adjustments required to Q for the ESBWR are removal of the Q contributors that are included in other ESBWR PRA transient initiating event categories. As can be seen from Subsections 2.3.1.3 and 2.3.1.4, these are:

- Total Loss of Condensate Flow (QP3) – 5 events (Loss of Feedwater),
- Total Loss of TCCW (subset of QL4) – 8 events (0.5 \* 16 events) (Loss of Feedwater), and
- Inadvertent Open/Close: 1 Safety/Relief Valve (QG10) – no events (IORV).

Summing all of the Q events for BWRs from Table D-4, pages D-5 and D-6 of Ref. 2.3-1, the total number of Q events for BWRs was 541. The total events to be subtracted from this for the ESBWR design are 117 from above. The calculated value of Q to be used for the ESBWR PRA initiating event is then:

$$Q = (541-117)/(541) * 1.5/\text{yr}$$

$$Q = 1.18/\text{yr}$$

### ***2.3.1.2 Transient With PCS Unavailable***

The frequency for BWR loss of heat sink is 1.97E-1/yr. This is conservatively taken as the frequency of the ESBWR PRA Transient with PCS Unavailable initiating event category.

### ***2.3.1.3 Loss of Feedwater***

As shown in Table 2.2-2, the following NUREG/CR-5750 categories are grouped into the ESBWR PRA Loss of Feedwater initiating event category:

- Total Loss of Feedwater Flow (P1),
- Total Loss of Condensate Flow (QP3), and
- Total Loss of TCCW (subset of QL4).

The frequency of the “Total Loss of Feedwater Flow (P1)” initiating event category is 9.59E-2/yr. Appendix A of NUREG/CR-5750 notes that QP3 events are already included in the

calculation of the “Total Loss of Feedwater Flow (P1)” frequency (as well as separately in the “General Transient (Q)” frequency Summing all of the Q events for BWRs from Table D-4, the total number of Q events for BWRs was 541. Of these, 5 were QP3 (Total Loss of Condensate Flow) events for BWRs. This means the percentage of QP3 events for BWRs, which contribute to Q events for BWRs, is about 1% (5/541). So, the QP3 event initiator for BWRs is  $Q (1.5/\text{yr}) * 0.01 = 1.5\text{E-}02/\text{yr}$ .

NUREG/CR-5750 does not provide a frequency estimate for the QL4 contributor (it is part of the larger NUREG/CR-5750 category “General Transient (Q)”; however, the frequency of QL4 can be estimated from the contribution breakdowns provided in NUREG/CR-5750. QL4 (Loss of nonsafety-related cooling water) events are included in the “General Transient (Q)” frequency. Summing all of the Q events for BWRs from Table D-4, the total number of Q events for BWRs was 541. Of these, 16 were QL4 events for BWRs. The percentage of QL4 events for BWRs that contribute to Q for BWRs is about 3% (16/541). So, the QL4 event initiator for BWRs is  $Q (1.5/\text{yr}) * 0.03 = 4.5\text{E-}02/\text{yr}$ . This is the total contribution of both partial and total losses of non-safety related cooling water. Since only the total loss of TCCW will lead to a scram, only the total loss need be considered for an initiating event. Assuming the ratio of total losses of nonsafety-related cooling water to partial and total losses of cooling water is the same as it is for safety related cooling water, in accordance with NUREG/CR-5750, there are 1 total loss of Service Water and 6 partial losses of service water. The split fraction of total losses to partial and total losses is  $1/(6+1) = 0.14$ . Then multiplying the 0.14 times the total for QL4, which from above is  $4.5\text{E-}2/\text{yr}$ , yields an initiating event frequency for QL4 total losses of  $4.5\text{E-}02/\text{yr} * 0.14 = 6.3\text{E-}03/\text{yr}$ .

Therefore, the frequency of the ESBWR PRA Loss of Feedwater initiating event category is calculated as follows:

$$9.59\text{E-}2/\text{yr} + 1.5\text{E-}2/\text{yr} + 6.3\text{E-}3/\text{yr} = 1.17\text{E-}1/\text{yr}$$

#### **2.3.1.4 IORV**

As shown in Table 2.2-2, the ESBWR PRA IORV initiating event category is comprised of the following contributors:

- Stuck Open: 1 Safety/Relief Valve (G2),
- Inadvertent Open/Close: 1 Safety/Relief Valve (QG10), and
- Spurious opening of two vent valves in series from IC to suppression pool. (This item does not have a NUREG corresponding category, however, its frequency is discussed below and added to the total IORV frequency).

The frequency of "BWR Stuck Open: SRV" initiating event category is  $2.23\text{E-}2/\text{yr}$ .

There were no occurrences of Inadvertent Open/Close: 1 Safety/Relief Valve (QG10) for BWRs. This would make the QG10 frequency contribution a non-significant contributor and will not be evaluated further.

There are three vent lines from each IC to the suppression pool. There are four IC condensers. Each vent line contains two normally closed vent valves in series. Both valves in each line

would have to spuriously open to provide a path from the isolation condenser to the suppression pool. A typical SOV spurious operation rate is  $5.7\text{E-}07/\text{hr}$ . Multiplying by the number of hours in a year, 8760, provides an annual spurious SOV rate of  $5.0\text{E-}03/\text{year}$ . Independent spurious operation of two solenoid valves in series would be a negligible contributor. The common cause failure for two out of two solenoid valves failing would be the failure rate times beta where the beta factor is assumed to be 0.1. The annual common cause failure rate for two out of two of the solenoid vent valves would be  $5.0\text{E-}03/\text{year} * 0.1 = 5.0\text{E-}04/\text{year}$ . There are a total of 12 lines resulting in an annual initiating event frequency for vent line open from IC to suppression pool of  $5.0\text{E-}04/\text{year} * 12 = 6.0\text{E-}03/\text{yr}$ . This will be added to the Stuck Open 1 Safety/Relief Valve frequency of  $2.23\text{E-}02/\text{yr}$  to provide the PRA IORV initiating event frequency of  $2.83\text{E-}02/\text{yr}$ .

Therefore, the frequency of the ESBWR PRA IORV initiating event category is estimated at  $2.83\text{E-}02/\text{yr}$ .

### 2.3.2 Loss of Preferred Power (LOPP)

The frequency of the Loss of Preferred Power (LOPP) initiating event category is based on the "Loss of Offsite Power (B1)" initiating event category. The frequency for Loss of Offsite Power (B1) is  $3.59\text{E-}02/\text{yr}$ . The frequency for Loss of Offsite Power in NUREG/CR-5750 is based on the frequency reported in NUREG/CR-6890 (Ref. 2.3-2). This was further subdivided in NUREG/CR-6890 into the following LOOP categories in the critical operation mode:

- Plant Centered –  $2.07\text{E-}03/\text{rcry}$
- Switchyard Centered –  $1.04\text{E-}02/\text{rcry}$
- Grid Related –  $1.86\text{E-}02/\text{rcry}$
- Weather Related –  $4.83\text{E-}03/\text{rcry}$

Where the frequency units, /rcry, is per reactor critical years.

While NUREG/CR-6890 did address special topics such as seasonal effects on frequencies, consequential LOOPs, and modeling of sites with more than one plant, ESBWR uses the basic categories for Loss of Offsite Power. The following frequencies will be used for the Loss of Preferred Power (LOPP) initiation event subcategories:

- Plant Centered Loss of Preferred Power –  $2.07\text{E-}03/\text{rcry}$
- Switchyard Centered Loss of Preferred Power –  $1.04\text{E-}02/\text{rcry}$
- Grid Related Loss of Preferred Power –  $1.86\text{E-}02/\text{rcry}$
- Weather Related Loss of Preferred Power –  $4.83\text{E-}03/\text{rcry}$

### 2.3.3 LOCAs

The LOCA initiators considered in the ESBWR Probabilistic Risk Assessment are:

- Breaks of the reactor coolant pressure boundary (RCPB) during normal operation,

- Breaks of pipes with design pressure lower than the reactor pressure due to the malfunction of the interfacing valves (interfacing breaks), and
- Vessel rupture.

### 2.3.3.1 LOCAs Inside Containment

The frequencies of LOCAs inside containment are quantified using of the NUREG/CR-5750 mean frequencies (based on BWRs operational experience) for large, medium and small pipe breaks. A very small LOCA (G1) is defined as a pipe break or component failure that results in a loss of primary coolant between 10 to 100 gpm ( $6.3\text{E-}4$  to  $6.3\text{E-}3 \text{ m}^3 \text{ s}^{-1}$ ). It is assumed that the condensate/feedwater makeup capacity is at least 100 gpm ( $6.3\text{E-}3 \text{ m}^3 \text{ s}^{-1}$ ). A reactor trip would not be required for a very small LOCA. For BWRs, a very small LOCA has traditionally been a recirculation pump seal leak. ESBWR does not have recirculation pumps, thus further reducing the probability of a very small LOCA. Therefore, a very small LOCA will not be considered an initiator for ESBWR. For each group of ESBWR lines, the associated NUREG/CR-5750 LOCA frequency is apportioned proportionally using three different methods:

- As a function of line length,
- As a function of the number of lines, and
- As a function of the number of line segments.

The results from the three different methods are averaged to determine the final frequency used in this analysis.

Table 2.3-1 summarizes the break frequency calculations for each group of lines. Table 2.3-1 summarizes for each pipe group: the number of lines, the number of sections (assessed on the basis of layout drawings), the frequency apportionments, and the final averaged frequencies. These data are binned into the LOCA initiator classes, as summarized in Table 2.3-2. Note that contributions from events other than pipe breaks are also included in some of the LOCA categories.

### Additional LOCA Contributions

In addition to pipe breaks, the following additional events contribute to the LOCA frequencies:

	Event	Contribution To	Frequency
a.	Spurious actuation of one DPV	Medium Steam LOCA	6.19E-4
b.	Spurious actuation of two or more SRVs/DPVs	Large LOCA	3.2E-4
c.	Spurious actuation of one GDCS Squib Valve and failure of check valve	Medium Liquid LOCA	5.75E-7

Spurious actuation of a single SRV is addressed as a separate initiating event (IORV). Refer to Subsection 2.3.1.4.

For frequency of spurious actuation of one GDCS Squib valve and check valve see Section 2.2.3.5.

The first two additional LOCA contributors can result from the following causes:

- Valve(s) mechanical failure
- Operator error
- Spurious actuation

Chapter 15A.3.9.2.1.2 of the DCD examined the possibility of an operator error leading to the inadvertent opening of a DPV and concluded that operator errors were an insignificant contributor when compared to the probability of a spurious actuation signal. Operator errors are judged to be a non-significant contribution. The other causes contribute as follows.

(1) Opening of only one DPV:

There are two causes which contribute to this event:

- Spurious opening
- Shear disk rupture

The DPV spurious opening frequency was calculated in DCD Chapter 15A.3.9.3 as  $5.75\text{E-}04/\text{year}$ . The check valve internal rupture (shear disk rupture) failure rate is assumed; considering a verification of the integrity of the nozzle is performed at every refueling, the annual failure rate is  $4.4\text{E-}5$ , based on data in Appendix A of Chapter 1 of the EPRI ALWR URD (Ref. 2.3-3).

Summing these two values results in the frequency of  $6.19\text{E-}4$  events/year for only one of eight DPVs spuriously opening. This is an additional contributor to the medium steam break LOCA (no FW or GDCS line break) initiator category.

(2) Opening of two or more SRVs/DPVs:

Failure of the logic common to the other valves contributes to this event. Mechanical failure of all valves can be postulated, but is statistically a non-significant contributor.

The operational experience of BWRs indicates that no events of more than one SRV stuck open have been observed. NUREG/CR-5750 estimates frequency of  $3.2\text{E-}4$  events/year for this initiating event (NUREG/CR-5750 category G5). This is an additional contributor to the large steam break LOCA (no FW line break) initiator category.

### **2.3.3.2 Breaks Outside Containment**

In addition to loss of coolant accidents inside containment, lines outside containment that are exposed to the high pressure of the reactor coolant pressure boundary could lead to a LOCA if they experience a break. The high pressure lines where this event can occur are:

- Main steam
- Feedwater

- RWCU
- Isolation condenser (outside containment).

The largest pipes are the main steam lines. These lines isolate automatically if a break occurs downstream from the MSIVs. The frequency of a high energy line break (K) is  $1.3\text{E-}02/\text{yr}$ . This is conservative since it includes pipe sizes for which the top event success criteria in the event tree are conservative. The frequency for a feedwater line break is  $3.4\text{E-}03/\text{yr}$ . The frequency for a RWCU break outside containment is assumed to be the same as that for a feedwater line break and is  $3.4\text{E-}03/\text{yr}$ . The frequency of a main steam line break is the frequency of a high energy line break minus the frequencies of feedwater line breaks and RWCU line breaks. The frequency for a steam break/leak outside containment is  $6.2\text{E-}03/\text{yr}$ . This frequency applies to experiencing the steam line break. Isolation of the break is addressed in the accident sequence analysis.

The feedwater pipes isolate automatically if a break occurs upstream from the containment isolation valves, but result in the unavailability of those systems/trains that inject through these lines. The frequency for this initiating event (K2) is  $3.4\text{E-}03/\text{yr}$ . This frequency applies to experiencing the FW line break; isolation of the break is addressed in the accident sequence analysis. The initiating event frequency for a pipe break in the A feedwater train would be half of this or  $1.70\text{E-}03/\text{yr}$ . Likewise, the initiating event frequency for a pipe break in the B feedwater train would be  $1.70\text{E-}03/\text{yr}$ . The RWCU pipes isolate automatically if a break occurs downstream from the containment isolation valves, but result in the unavailability of the train affected by the break. The frequency for this initiating event is assumed to be similar to the frequency of the feedwater lines. The frequency for an RWCU line break outside containment is  $3.40\text{E-}03/\text{yr}$ .

The IC pipes outside the containment isolate automatically if a break occurs downstream from the IC isolation valves, but result in the unavailability of the IC affected by the break. Because a majority of the ICS piping at RPV pressure is inside containment, the percentage of ICS piping outside containment is estimated to be 10%. An estimate of the frequency for this initiating event is 10% of the LOCA frequency apportioned for IC outside the containment in Table 2.3-1 and is 10% of the sum of DPV line/IC ( $7.59\text{E-}06/\text{yr}$ ) and IC return lines ( $7.66\text{E-}06/\text{yr}$ ) or  $1.53\text{E-}06$ . This frequency applies to experiencing the line break; isolation of the break is addressed in the accident sequence analysis.

### ***2.3.3.3 Vessel Rupture***

Pressurized Thermal Shock (PTS) is one possible vessel failure mode of interest and for bounding the possibility of BWR vessel ruptures, PWRs will be used since the operating pressures in BWRs are far lower than in PWRs. The probability of PTS in a pressurized water reactor with a forged vessel with a 60 year life in accordance with NUREG-1806 (Ref. 2.3-3) is between  $10^{-14}$  and  $10^{-10}$  per reactor year.

Two additional observations are necessary. First, the potential of vessel rupture from PTS in a BWR is generally accepted as being substantially less than for a PWR. The fact that BWRs operate at a lower pressure reduces the hoop stress and the design of the vessel allows natural circulation, which reduces thermal stresses during overcooling transients. Second, improved

materials, the absence of nozzles and welds at the core level, and the improved in-service inspection program all justify a lower value for the ESBWR.

Other failure modes might exist such as inadvertent overpressurization, weld failures, multiple control rod mechanism failures, among others. Plant design (e.g., relief valve capacity), periodic vessel inspections and primary system leakage monitoring help ensure that catastrophic failure of the vessel is an extremely unlikely event. Based on the above considerations, the frequency for a vessel rupture is  $1.00\text{E-}10/\text{year}$ .

#### ***2.3.3.4 Interfacing Systems LOCA***

No value is provided for ISLOCA in NUREG/CR-5750. Therefore, an ISLOCA evaluation has been performed which identifies two possible ISLOCA paths. The evaluation uses industry guidance from NUREG/CR-5744 (Ref. 2.3-4) and NUREG/CR-5102 (Ref. 2.3-5). One potential ISLOCA path is the main steam line drains from upstream of the MSIVs inside containment. The evaluation provides a probability of occurrence for this ISLOCA path of  $1.75\text{E-}9/\text{year}$ . Because of the low probability of this event, it is not considered further. The other ISLOCA path that is evaluated is the FAPCS to RWCU/SDC piping. The evaluation provides a probability of occurrence for this event of  $6.42\text{E-}8/\text{year}$ . The location of the FAPCS to RWCU/SDC piping interfacing system LOCA would generate a plant response similar to a Train A feedwater line break outside containment. Because the initiating event frequency for a Train A feedwater line break outside containment is significantly larger than a FAPCS to RWCU/SDC ISLOCA frequency, no adjustment to the Train A feedwater line break outside containment is required.

#### **2.3.4 Special Initiators**

As discussed in Subsection 2.2.3.17, the only systemic malfunctions maintained as separate special initiators are a Complete Loss of PSWS and Complete Loss of Air Systems. All other systemic malfunctions are either included in other existing initiator categories or do not cause a plant trip.

##### Complete Loss of PSWS

The ESBWR Plant Service Water Systems (PSWS) is designed with a high level of redundancy and diversity. Reactor Component Cooling (RCCW), which is grouped within the Complete Loss of PSWS initiator category (refer to Subsection 2.2.3.9), also has a design with a high level of redundancy considering the normal operational requirements (two out of six pumps and heat exchangers).

Given the design of these ESBWR systems, the frequency based on NUREG/CR-5750 is  $9.7\text{E-}04/\text{yr}$ .

##### Complete Loss of Air System

The ESBWR Instrument Air System is designed with a high level of redundancy (two 100% capacity trains in parallel) and is supported by the Service Air System (SAS) compressors, which also consists of two identical trains in parallel. Air receivers and an air receiver/surge tank are provided to maintain air supply pressure if all of the IAS and SAS compressors fail. The High



Pressure Nitrogen Supply System (HPNSS) provides distribution piping from the CIS to the nitrogen loads in containment including the inboard MSIVs. The HPNSS backup consists of two bottle-rack trains in parallel.

Given the design of these ESBWR systems, the frequency for the Complete Loss of Air Systems initiating event category for ESBWR will be 1.02E-02/yr (Ref. 2.3-6).

### **2.3.5 Summary of Initiating Event Frequencies**

Table 2.3-3 summarizes the frequencies of the internal events initiators used in the event tree quantification.

The initiating event frequencies developed in this analysis are based on BWR historical experience. The total initiating event frequency estimated in this analysis is judged conservative because it is greater than the design goal of less than 1 event/year, to be demonstrated in a later stage for the ESBWR by the Reliability Availability Maintenance (RAM) program.

Table 2.3-4 provides a comparison of the ESBWR PRA internal events initiator frequencies to the following industry studies:

- EPRI ALWR Utility Requirements Document (Ref. 2.3-7),
- NUREG/CR-5750 (Ref. 2.3-1), and
- NUREG/CR-6928 (Ref. 2.3-6)

### 2.3.6 References

- 2.3-1 Idaho National Engineering and Environmental Laboratory, “Rates of Initiating Events at U. S. Nuclear Power Plants: 1987-1995”, NUREG/CR-5750, February 1999.
- 2.3-2 Idaho National Laboratory, “Reevaluation of Station Blackout Risk at Nuclear Power Plants Analysis of Loss of Offsite Power Events: 1986-2004”, NUREG/CR-6890, Vol. 1, December 2005.
- 2.3-3 U. S. Nuclear Regulatory Commission, “Technical Basis for Revision Of the Pressurized Thermal Shock (PTS) Screening Limit in the PTS Rule (10 CFR 50.61)”, NUREG/CR-1806, Manuscript Completed May 24, 2006.
- 2.3-4 Idaho National Engineering Laboratory, “Assessment of ISLOCA Risk-Methodology and Application to a Westinghouse Four-Loop Ice Condenser Plant”, NUREG/CR-5744, April 1992.
- 2.3-5 Brookhaven National Laboratory, “Interfacing Systems LOCA: Pressurized Water Reactors”, NUREG/CR-5102, February 1989.
- 2.3-6 Idaho National Laboratory, “Industry-Average Performance for Components and Initiating Events at Commercial Nuclear Power Plants, NUREG/CR-6928, February 2007.
- 2.3-7 Electric Power Research Institute, “EPRI-ALWR Utility Requirements Document”, EPRI ALWR URD, Revision 4, April 1992.
- 2.3-8 S. A. Eide, et.al., “Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants,” NUREG/CR-6928, U.S. Nuclear Regulatory Commission (2007).

**Table 2.3-1****Summary of Lines Connected to RPV And Quantification Of Frequency Apportionment**

ID	Line	Length (m)	No. Lines	No. Sections	Apportionment Method			Final Frequency <sup>4</sup> (events/yr)	Notes
					By Length <sup>1</sup>	By No. Lines <sup>2</sup>	By No. Sections <sup>3</sup>		
a	Main Steam (MSL)	92	4	44	9.32E-6	6.67E-06	6.20E-6	7.40E-6	Large Steam break
b	DPV line/IC	70	4	64	7.09E-6	6.67E-6	9.01E-6	7.59E-6	Large Steam break
c	FW	95	8	74	9.63E-6	1.33E-5	1.04E-5	1.11E-5	Large Steam break
d	RWCU/SDC	39	2	31	3.95E-6	3.33E-6	4.37E-6	3.88E-6	Large Steam break
e	IC return lines	12	4	40	3.78E-6	7.27E06	1.19E-5	7.66E-6	Medium Liquid break
f	GDCS	44	8	32	1.39E-5	1.45E-5	9.55E-6	1.27E-5	Medium Liquid break
fl	Equalizing lines	11	4	12	3.46E-6	7.27E-6	3.58E-6	4.77E-6	Medium Liquid break
g	RWCU/RPV Drain Lines	20	4	20	6.30E-6	7.27E-6	5.97E-6	6.51E-6	Medium Liquid break
h	SLCS	40	2	30	1.26E-5	3.64E-6	8.96E-06	8.40E-6	Small Liquid break
i	Instrument lines above L3	50	4	100	1.43E-4	1.43E-4	1.43E-4	1.43E-4	Small Steam break
i1	Instrument lines below TAF	75	6	150	2.14E-4	2.14E-4	2.14E-4	2.14E-4	Small Liquid break
i2	Instrument lines above TAF and under L3	50	4	100	1.43E-4	1.43E-4	1.43E-4	1.43E-4	Small Liquid break

Notes to Table 2.3-1:

- <sup>1</sup> Calculated as:  $[(\text{length of line}) / (\text{total length of all lines corresponding to LOCA size category})] \times 3\text{E-}5$  per year Large Pipe Break LOCA size category frequency
- <sup>2</sup> Calculated as:  $[(\text{number of individual lines}) / (\text{total number of lines corresponding to LOCA size category})] \times 4\text{E-}5$  per year Medium Pipe Break LOCA size category frequency
- <sup>3</sup> Calculated as:  $[(\text{number of sections}) / (\text{total number of sections corresponding to LOCA size category})] \times 5\text{E-}4$  per year Small Pipe Break LOCA size category frequency
- <sup>4</sup> Final frequency is the average of the three apportionment methods.

**Table 2.3-2**  
**Attributions of Line Frequencies to LOCA Categories**

<b>LOCA Category</b>	<b>Contributors*</b>	<b>Frequency (events/yr)</b>
Large steam LOCA (no FW line break)	a + b + d + (A)	3.39E-4
Large steam LOCA in FW line	c	1.11E-5
Medium liquid LOCA	e + f + fl + (C) + g	3.22E-5
Medium/small steam LOCA	i + (B)	7.62E-4
Small liquid LOCA	il + i2+h	3.65E-4
Main Steam Line Break (Outside Containment)	--	6.200E-3
Feedwater Line Break (Outside Containment)	--	3.40E-3
RWCU Line Break (Outside Containment)	--	3.40E-3
IC Line Break (Outside Containment)	--	1.53E-6
ISLOCA	--	6.42E-8

\*The additional LOCA contributors are as follows:

- (A) Spurious actuation of two or more SRVs and DPVs (3.2E-4/yr)
- (B) Spurious actuation of a single DPV (6.19E-4/yr)
- (C) Spurious actuation of a single GDSC squib valve (5.75E-7/yr)

**Table 2.3-3**  
**Internal Events Initiator Frequencies**

Initiating Event	PRA Basic Event	
	ID	Frequency (events/year)
<u>Transients</u>		
General Transient	%T-GEN	1.18
Transient with PCS Unavailable	%T-PCS	1.97E-1
Loss of Feedwater	%T-FDW	1.17E-1
IORV	%T-IORV	2.83E-2
<u>Loss of Preferred Power (LOPP)</u>		
Plant Centered Loss of Preferred Power	%T-LOPP-PC	2.07E-3
Switchyard Centered Loss of Preferred Power	%T-LOPP-SC	1.04E-2
Grid Related Loss of Preferred Power	%T-LOPP-GR	1.86E-2
Weather Related Loss of Preferred Power	%T-LOPP-WR	4.83E-3
<u>LOCAs Inside Containment</u>		
Large Steam LOCA (no FW line break)	%LL-S	3.39E-4
Large Steam LOCA in FW line	%LL-S-FDWA	5.55E-6
	%LL-S-FDWB	5.55E-6
Medium Liquid LOCA	%ML-L	3.22E-5
Medium/Small Steam LOCA	%SL-S	7.62E-4
Small Liquid LOCA	%SL-L	3.65E-4
Vessel Rupture	%RVR	1.00E-10
<u>LOCAs Outside Containment</u>		
Main Steam Line Break (Outside Containment)	%BOC-MS	6.20E-3
Feedwater Line Break (Outside Containment)	%BOC-FDWA	1.70E-3
	%BOC-FDWB	1.70E-3
RWCU Line Break (Outside Containment)	%BOC-RWCU	3.40E-3
IC Line Break (Outside Containment)	%BOC-IC	1.53E-6
<u>ISLOCA</u>		
	%ISLOCA	6.42E-8
<u>Special Initiators</u>		
<u>Complete Loss of PSWS</u>	%T-SW	9.70E-4
<u>Complete Loss of Air Systems</u>	%T-IA	1.02E-2

**Table 2.3-4**

**Comparison of ESBWR PRA Internal Events Initiating Event Frequencies to Other Studies**

Initiating Event	Frequency (per year)			
	ESBWR PRA	EPRI ALWR URD	NUREG/CR-5750	NUREG/CR-6928
Year Published	n/a	1999	2006	2007
Transients				
General Transient	1.18	2.3	8.3E-1	8.3E-1
Transient with PCS Unavailable	1.97E-1	4.9E-1	1.97E-1	n/a
Loss of Feedwater	1.17E-1	3.7E-1	9.59E-2	9.59E-2
IORV	2.83E-2	n/a	n/a	2.23E-2
Loss of Preferred Power (LOPP)	n/a	3.5E-2	3.59E-2	3.59E-2
Plant Centered Loss of Preferred Power	2.07E-3	n/a	n/a	n/a
Switchyard Centered Loss of Preferred Power	1.04E-2	n/a	n/a	n/a
Grid Related Loss of Preferred Power	1.86E-2	n/a	n/a	n/a
Weather Related Loss of Preferred Power	4.83E-3	n/a	n/a	n/a
LOCAs Inside Containment				
Large Steam LOCA (no FW line break)	3.39E-4	5.8E-4	3.0E-5 <sup>1</sup>	6.78E-6
Large Steam LOCA in FW line	1.11E-5			
Medium Liquid LOCA	3.22E-5	n/a	4.0E-5 <sup>1</sup>	1.04E-4
Medium / Small Steam LOCA	7.62E-4	5.1E-3	5.0E-4 <sup>1</sup>	5.0E-4
Small Liquid LOCA	3.65E-4			
Vessel Rupture	1.00E-10	n/a	n/a	n/a
LOCAs Outside Containment				
Main Steam Line Break (Outside Containment)	6.20E-3	n/a	n/a	n/a
Feedwater Line Break (Outside Containment)	3.40E-3			
RWCU Line Break (Outside Containment)	3.40E-3			
IC Line Break (Outside Containment)	1.53E-6			
ISLOCA	6.42E-8	n/a	n/a	n/a
Special Initiators				
Complete Loss of PSWS	9.70E-4	n/a	9.7E-4 <sup>1</sup>	3.94E-4
Complete Loss of Air Systems	1.02E-2	n/a	1.02E-2	1.02E-2

Notes:

1. From NUREG/CR-5750, published in February, 1999.

**Table 2.3-5**  
**ESBWR PRA Initiating Event Frequencies Uncertainties**

Initiating Event	Estimated Distribution/Error Factor for ESBWR PRA
<b>Transients</b>	
General Transient	G / 1.1 <sup>1</sup>
Transient with PCS Unavailable	L / 3 <sup>2</sup>
Loss of Feedwater	G / 6 <sup>3</sup>
IORV	G / 3 <sup>4</sup>
<b>Loss of Preferred Power (LOPP)</b>	
Plant Centered Loss of Preferred Power	G / 3.2 <sup>5</sup>
Switchyard Centered Loss of Preferred Power	G / 3.2 <sup>5</sup>
Grid Related Loss of Preferred Power	G / 3.2 <sup>5</sup>
Weather Related Loss of Preferred Power	G / 3.2 <sup>5</sup>
<b>LOCAs Inside Containment</b>	
Large Steam LOCA (no FW line break)	G / 10 <sup>6</sup>
Large Steam LOCA in FW line	G / 10 <sup>6</sup>
Medium Liquid LOCA	G / 7 <sup>6</sup>
Medium / Small Steam LOCA	G / 6 <sup>6</sup>
Small Liquid LOCA	G / 6 <sup>6</sup>
Vessel Rupture	L / 30 <sup>7</sup>
<b>LOCAs Outside Containment</b>	
Main Steam Line Break (Outside Containment)	L / 30 <sup>7</sup>
Feedwater Line Break (Outside Containment)	L / 30 <sup>7</sup>
RWCU Line Break (Outside Containment)	L / 30 <sup>7</sup>
IC Line Break (Outside Containment)	L / 30 <sup>7</sup>
ISLOCA	L / 30 <sup>7</sup>
<b>Special Initiators</b>	
Complete Loss of PSWS	G / 8.4 <sup>8</sup>
Complete Loss of Air Systems	G / 2.2 <sup>9</sup>

<sup>1</sup> General Transient

NUREG/CR-6928 [1] states that the initiating event (IE) frequency of general transients for BWR's is distributed as G(149.5,1.802e+2) with Mean=0.83 and EF=1.1.

According to Chapter 2 of NEDO 33201 Rev 3, the IE frequency is 1.18 (mean) based upon 1.5/year and 541-117 = 424 occurrences that leads to G(424,359.3) and EF=1.1.

<sup>2</sup> Transient with PCS Unavailable

NUREG/CR-5750 states that the mean is 1.97E-1, 95th percentile is 3.75E-1 and 5th percentile is 6.25E-2. So, the error factor is  $\sqrt{(3.75E-1/6.25E-2)} = 2.5$ , which is rounded up to 3 to represent the small uncertainty in the calculation of this IE.. In the NUREG/CR-5750, the distribution is stated as lognormal.

For lognormal distributions, because of symmetry, the ratio of 95th percentile to median equals to the ratio of median to the 5th percentile, so in order to calculate the EF, we can use  $\sqrt{(95\text{th percentile}/5\text{th percentile})}$ .



<sup>3</sup> Loss of Feedwater

Engineering judgment based upon NUREG/CR-6928 evaluation (rounded) G(1.2,12) with Mean=0.1 and EF=3.8. EF is assumed to be 6. This is based upon the extra\_uncertainty in the calculation of the mean value of loss of feedwater for ESBWR in Chapter 2 of NEDO 33201 Rev 3.

<sup>4</sup> IORV

Engineering judgment based upon NUREG/CR-6928 evaluation G(6.5,291.7) with Mean=2.23E-2 and EF=1.8. EF is assumed to be 3. This is based upon the extra\_uncertainty in the calculation of the mean value of loss of feedwater for ESBWR in Chapter 2 of NEDO 33201 Rev 3 [4].

<sup>5</sup> Loss of Preferred Power (LOPP)

Based upon NUREG/CR-6928 evaluation G(1.58,44.02) with Mean=3.59E-2 and EF=3.2.

<sup>6</sup> Large/Medium/Small LOCAs

All are based upon NUREG/CR-6928. For large LOCA NUREG/CR-6928 EF = 9.1 is rounded up to 10. For medium LOCA EF = 6.7 is rounded up to 7, and for small LOCA EF = 5.3 is rounded up to 6 to represent the small uncertainty in the calculation of this IE for ESBWR in Chapter 2 of NEDO 33201 Rev 3.

<sup>7</sup> Vessel Rupture and LOCAs outside of the containment

Engineering judgment based upon no specific data and high uncertainties.

<sup>8</sup> Complete Loss of PSWS

NUREG/CR-5750 states that G(1.5,1543.3) with mean 9.72E-4 and EF = 3.3. We used the same frequency with NUREG/CR-5750 in our model. According to

NUREG/CR-6928 the EF is 8.4. So, we chose the greater uncertainty to be conservative.

<sup>9</sup> Complete Loss of Air Systems

Based upon NUREG/CR-6928 with G(3.5,343.3), mean 1.02E-2 and EF = 2.2.

## 2.4 ASSUMPTIONS

- Based on thermal hydraulic analysis, it was assumed that RWCU/SDC pipe break at elevation 17215 mm and feedwater pipe break at elevation 18915 mm behave like steam break, though generally, it was assumed that pipe breaks below level 3 are treated as liquid break.
- Evaluation of special initiators, for the most part, was based on qualitative assumptions for screening. For example, it was assumed that partial loss of feedwater, FAPCS or RWCU will not cause a reactor trip..
- Loss of two or three MSIVs out of eight in which the failed closed MSIVs are not on the same line is not considered as initiator based on industry events data.
- The common cause failure for two or three of four MSIVs is not considered as initiator based on industry events data.
- The loss of two or three condensate trains is not considered as credible initiating events.
- It is assumed that the condensate/feedwater makeup capacity is at least 100 gpm ( $6.3\text{E-}3 \text{ m}^3 \text{ s}^{-1}$ ). A reactor trip would not be required for a very small LOCA. A very small LOCA is not considered an initiator for ESBWR.

## **2.5 INSIGHTS**

Current plant level initiator identification, classification and quantification provide applicable, reasonable and adequate insight to the early stage ESBWR design and decision-making. Section 7 and 11 present risk insights and contributions of initiators to core damage.

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### **3 ACCIDENT SEQUENCE ANALYSIS**

#### **3.1 INTRODUCTION**

The purpose of this section is to document the event trees and accident sequence analysis performed as part of the ESBWR PRA. This section includes the basis for the event trees modeled in the internal event analysis and a description of each event tree heading. These event trees also provide the baseline models for the external events analyses presented in later sections of this report.

The event trees developed for ESBWR are based on the initiating events included in Section 2. The event tree models include the set of systems needed to mitigate each initiating event. Each event tree provides a time independent, system-based response to each initiating event. The objective of these event tree analyses is to show which system combinations result in a safe, stable state, and which ones result in core damage.

The systems modeled, including both safety related and nonsafety-related systems, use the fault tree logic that is presented in Section 4. Support systems and operator actions are modeled explicitly within each system fault tree.

The accident sequence analysis core damage numerical results are presented in Section 7.

The event tree end states are grouped into plant damage states in order to simplify the containment analyses that are presented in Sections 8 and 21.

The event tree logic diagrams are shown at the end of this section in Appendix 3A.

## 3.2 ACCIDENT SEQUENCE METHODOLOGY

### 3.2.1 Acceptance Criteria

The acceptance criteria are the minimum requirements necessary for key safety functions to achieve safe, stable conditions i.e., to protect the fuel and prevent release of radionuclides to the environment. Safe conditions are determined by the ability to meet the following key safety function acceptance criteria. Stable conditions are determined by the ability to maintain each key safety function for long-term operation. For example, conditions may be considered safe during a given event, but not stable unless they can be maintained for at least 72 hours with the existing safety functions. In this case, a core damage end state is assumed. If there is no core damage until more than 72 hours from the initiating event, there is sufficient time to implement recovery actions, including repair of failed equipment.

#### Reactivity Control

The acceptance criterion is to achieve subcriticality and maintain the reactor in a subcritical state. The key functions in the PRA model are: RPS, FMCRD, SLC, FW Control, and ARI.

#### RPV Overpressure Protection

Maintaining pressure below 150 percent of the reactor coolant pressure boundary (Service Level C) pressure is the acceptance criterion for RPV overpressure protection. This limit is used to determine the number of Safety/Relief Valves (SRVs) that are required to operate following any event, including ATWS events. The key functions in the PRA model are actuation of ICS and opening of the SRVs at their pressure relief setpoints.

#### Core Cooling

A peak cladding temperature (PCT) of 2200°F (1477°K) is the criterion for establishing the adequacy of coolant inventory. This criterion defines the onset of core damage. In other words, core damage is defined as the point when a PCT of 2200°F is exceeded.

The key functions in the PRA model are: Feedwater Injection, CRD make-up, GDCS, FAPCS LPCI, and Dedicated LPCI Backup Pump.

#### Containment Heat Removal

For event sequences in which core cooling is successful utilizing passive systems, the containment cooling function acceptance criterion is to maintain the containment pressure below the ultimate containment pressure. If the containment fails under these conditions, the inventory of water available for the passive systems is depleted through the containment breach, and consequently core coverage would be lost without additional make-up from a source that is independent of the containment conditions, such as CRD or Dedicated LPCI Backup pump. The key functions in the PRA model are: PCCS, Vacuum Breakers, ICS, RWCU/SDC, Suppression Pool Cooling, and Containment Venting.

Core damage occurs directly from failure of the Core Cooling key safety function, and indirectly from the failure of Reactivity Control, RPV Overpressure Protection, or Containment Heat Removal.

### 3.2.2 Event Tree Development

Event trees are logical models that represent the postulated combinations of initiating events, mitigating system failures, and human errors that lead to either safe, stable conditions or core damage. They provide a framework for quantification of core damage frequencies. As shown in Table 3.2-1, each initiating event described in Section 2 is quantified by assigning it to an event tree. Credit is taken for safety related and nonsafety-related systems that are capable of responding to the event, as well as significant operator actions that are taken to mitigate the event.

In some cases, the mitigation responses of different initiating events are similar, so the same event tree model is applied to both. The following initiating events are represented in other event trees:

- Loss of PCS,
- Medium Liquid LOCA in RWCU,
- ISLOCA, and
- Loss of Air Systems.

Event trees are constructed for a core damage end state in the level 1 PRA model. Plant damage states, accident phenomena and containment systems responses are used in the level 2 analysis, and are described in Section 8. The initial node of each event tree is the occurrence of an initiating event. The final node is the end state, which is either a safe, stable core condition, or core damage. The other nodes in the tree represent outcomes of expected system or operator responses to the event. The upper branch of any node represents success of the function, and the lower branch represents a failure.

The accident conditions (phenomena) are implicitly addressed in the event tree structure. Most of the equipment in the containment (squib valves etc.) is designed to function during accident conditions (pressure, temperature etc). For instance, sequences include the need of an external low-pressure injection source when containment venting is successful to address potential NPSH issues and also the loss of inventory. However, the event trees conservatively did not credit external sources for low-pressure injection (Dedicated LPCI Backup) when failure of all decay heat removal systems, including containment vent, has occurred.

### 3.2.3 Success Criteria Identification

Success criteria are defined as the minimum numbers of systems, trains, or components that are required to operate in order to meet the acceptance criteria related to key safety functions. For example, the PCCS system has 6 heat exchangers, and its success criterion is the successful operation of four out of six heat exchangers to remove containment heat loads. This criterion is based on thermal-hydraulic analyses, which conclude that four heat exchangers are sufficient, in each potential accident scenario, to satisfy the containment heat removal key safety function. If three or less heat exchangers are available, then the PCCS function is assumed to be lost. Typically, credit is not taken for the benefits of partial functioning of safety functions in the PRA.

The ESBWR PRA success criteria are described in Section 3.3.4 and are summarized in Table 3.3-1. Each criterion is based on either a plant design parameter or a thermal-hydraulic calculation. When a success criterion is used to characterize a range of conditions, the limiting parameters are chosen to represent all cases. In addition, representative thermal-hydraulic analyses are run to validate the appropriateness of the success criteria.

The Modular Accident Analysis Program (MAAP) is used to develop success criteria not covered by design basis and to evaluate the plant response to accident initiation events. MAAP is an integral systems analysis computer code initially developed during the industry sponsored IDCOR Program. MAAP Version 4.0.6 is used in the ESBWR PRA and includes models for the important accident phenomena that might occur within the primary system, in the containment, and in the reactor building. MAAP calculates the progression of the postulated accident sequence, including the disposition of the fission products, from a set of initiating events to either a safe, stable state or to an impaired containment condition (by over-pressure or over-temperature) and the possible release of fission products to the environment.

MAAP also addresses the new and unique features, many of which are passive, included in the ESBWR design. These are:

- Passive heat removal system such as an in-containment isolation condenser,
- Gravity fed water injection systems,
- External heat removal from the containment,
- A generalized nodalization scheme for the containment to accommodate the ESBWR design, and
- The capability to analyze flow through large safety valves.

Since the beginning of the MAAP code development, the codes have represented all of the important safety systems such as emergency core cooling, containment sprays, residual heat removal, etc. MAAP allows operator interventions and incorporates these in a flexible manner, permitting the user to model the operator response and the availability of the various plant systems in a general way.

To establish that the MAAP code is capable of addressing the above purposes and uses, numerous benchmarks have been performed, both with respect to individual models and for the integral response of reactor systems. These benchmarks provide insights into the code performance and confidence in the capabilities of MAAP to represent individual phenomena as well as the integral response of reactor systems, including the influences of operator actions. These are documented in Volume III of the MAAP Users Manual.

The ESBWR MAAP results have been compared to those of TRACG. The comparison is described in EPRI Report 1011712. The comparison of results indicates that MAAP provides adequate and reasonable thermal hydraulic response for ESBWR specific passive containment systems.

### **3.2.4 End States of the Accident Sequences**

The event trees presented in this section identify the potential sequences that can lead to core damage. Many of the sequences have common characteristics with respect to the challenge on

the containment fission product barrier. These sequences are grouped into damage classes that are analyzed in the Level 2 portion of the PRA. The end states of the accident sequences developed for the ESBWR PRA are defined to facilitate the Level 2 Containment Performance Analysis and provide the link between the Level 1 and Level 2 analyses.

The core damage sequences are grouped together based upon the overall challenge to the containment barrier. They are defined as follows:

- OK: The core is successfully cooled and the containment is intact. There is no core damage in these events.
- CD I: The containment is intact when core damage occurs and the RPV is at low pressure.
- CD II: The containment is breached, either due to overpressurization or venting, while the core is successfully cooled. Core damage results because low pressure injection functions fail to maintain core cooling. This end state is divided into 2 classes due to their differing outcomes in the Level 2 analysis.
  - II-a: Containment Failure, Loss of Low Pressure Injection
  - II-b: Containment Vented, Loss of Low Pressure Injection
  - II-c: Containment Failure, Long-term decay heat removal
- CD III: The containment is intact when core damage occurs and there is high RPV pressure at the time of just prior to vessel failure.
- CD IV: Core damage results from an accident sequence with a failure of effective reactivity control (e.g., ATWS without SLCS). This has the potential to affect the containment in a more severe manner than the CD I and CD III because more energy is deposited into the containment prior to RPV failure. The analysis of this end state (Section 8, “Containment Performance”) demonstrates that in fact, all CD IV end states could be treated as CD I or CD III (depending on the RPV pressure) without affecting the results of the containment analysis. This end state has been retained in the Level 1 analysis to more easily allow for sensitivity analyses related to reactivity control.
- CD V: The containment is bypassed at the time of core damage.

The Level 2 analysis requires further discrimination between the end states to determine specific containment challenges. For example, in CD I sequences the water level in the lower drywell is required as input to the Level 2. These sub-classes cannot be determined solely from the sequence path definitions; rather the minimal cutsets must be reviewed for specific failures to determine the applicable plant state. Initial criteria is used to categorize the Level 1 results based on the expected lower drywell level. This information is presented in Section 7, (“PRA Quantification”) along with the results of the Level 1 quantification. Additional criteria is applied in the Level 2 model to provide more detailed results that are used to estimate the conditional containment failure probability.

### 3.2.5 Mission Time

The design of the ESBWR is such that the onsite inventory of cooling water available and plant battery capacity can keep the core covered using passive systems for more than 72 hours. However, the simplifying assumptions made in the PRA analysis are not always applicable for mission times longer than 24 hours. For example, the PRA assumes that once the initiator has occurred, no credit will be given for repair of failed equipment. This is a conservative assumption for a mission time of 24 hours; the results yields misleading insights for a 72 hour mission. Therefore, the mission time for the ESBWR PRA is 24 hours.

In cases where the core remains cooled during the short term (less than 24 hours) but conditions are not stable, a core damage end state will be assigned if there are no effective ways to stabilize the plant in the long term (i.e., from 24 to 72 hours).

### 3.2.6 Key Assumptions and Insights

The event tree model development process involves many assumptions. However, a single key assumption was identified and is used in the event tree models. The PRA assumes that if an automatic isolation failure occurs, then manual isolation of line breaks outside of containment is required for all BOC-RWCU sequences that have initial low pressure injection.

Other notable (non-key) assumptions are listed below:

- (1) The PRA credits, for transient scenarios, continued injection for FW, CRD, or Dedicated LPCI Backup systems if these systems are operating or aligned early in the scenario, without consideration of possible containment failure (decay heat removal or venting not asked). The location of probable containment failures is not near equipment necessary for injection, and the containment fragility profile not likely to change in design phase. However, realignment of a system is not credited if automatic isolation occurs.
- (2) The FAPCS LPCI function is assumed to provide make-up and remove enough decay heat. The heat exchanger is used to prevent containment pressurization and failure resulting in loss of inventory necessary to protect the core – the heat exchangers are included in LPCI fault tree.
- (3) If high pressure injection fails, the operators will attempt to manually depressurize and align low pressure injection prior to depressurization with the DPVs.
- (4) The feedwater system is isolated in LOCA scenarios where high drywell pressure exists. System realignment is not credited for these scenarios.
- (5) The HPCRD system is isolated in LOCA scenarios where both high drywell pressure and high drywell lower water level exists. However, the HPCRD Isolation Bypass can be manually aligned, or it automatically aligns if GDCS injection failure is detected.

The insights are identified based on the potential to impact results. The following insights are identified based on the methods and results used in the event tree development task:

- (1) Passive injection (GDCS) eventually fails due to loss of inventory when the containment fails or is vented. An external injection source must be available after containment venting to ensure RPV water level is maintained. The primary insight involves the need for

operations programs to identify the need, and means to line up external injection when containment is vented or failure is probable.

- (2) The PRA uses conservative assumptions in the modeling for ATWS such as:
  - a. Failure of feedwater runback is assumed to result in core damage.
  - b. Failure to restart feedwater, or use CRD for power/level control is assumed to result in core damage.
  - c. Failure of ADS inhibit is assumed to result in core damage (boron dilution causes failure of reactivity control).
  - d. Failure of SLC is assumed to result in core damage.
- (3) The PRA uses conservative assumptions in the modeling of containment pressure suppression failure. No credit is taken for alignment of any injection sources after failure of the DW/WW vacuum breakers to direct steam flow through suppression pool or to open after blowdown.
- (4) The probability of SRVs failing to reclose is based upon the estimated number of SRVs that would open during a transient with high pressure conditions.

**Table 3.2-1**  
**Initiating Events Assigned to Event Trees**

Initiating Event	Designator	Event Tree
<u>Transients</u>		
General Transient	%T-GEN	T-GEN
Transient with PCS Unavailable	%T-PCS	T-GEN
Loss of Feedwater	%T-FDW	T-FDW
IORV	%T-IORV	T-IORV
Loss of Preferred Power (LOPP)	%T-LOPP-PC %T-LOPP-SC %T-LOPP-GR %T-LOPP-WR	T-LOPP
<u>LOCAs Inside Containment</u>		
Large Steam LOCA	%LL-S	LL-S
Large Steam LOCA in FW Line A	%LL-S-FDWA	LL-S-FDWA
Large Steam LOCA in FW Line B	%LL-S-FDWB	LL-S-FDWB
Medium Liquid LOCA	%ML-L	ML-L
Medium/Small Steam LOCA	%SL-S	SL-S
Small Liquid LOCA	%SL-L	SL-L
Vessel Rupture	%RVR	RVR
<u>LOCAs Outside Containment</u>		
Main Steam Line	%BOC-MS	BOC-MS
Feedwater Line A	%BOC-FDWA	BOC-FDWA
Feedwater Line B	%BOC-FDWB	BOC-FDWB
RWCU Line	%BOC-RWCU	BOC-RWCU
IC Line	%BOC-IC	BOC-IC
ISLOCA	%ISLOCA	BOC-FDWA
<u>Special Initiators</u>		
Complete Loss of PSWS	%T-SW	T-SW
Complete Loss of Air Systems	%T-IA	T-FDW



**Table 3.2-5**  
**Event Tree Transfers**

<b>Figure</b>	<b>Event Tree</b>	<b>Description</b>	<b>Initiators Included</b>	<b>Transfers Out</b>
1	T-GEN	General Transient	%T-GEN, %T-PCS	T-IORV, RVR, AT-T-GEN, T-ICSX1
2	T-FDW	Loss of Feedwater	%T-FDW, %T-IA	T-IORV, RVR, AT-T-FDW, T-ICSX1
3	T-LOPP	Loss of Preferred Power	%T-LOPP-PC %T-LOPP-SC %T-LOPP-GR %T-LOPP-WR	T-IORV, RVR, AT-T-LOPP, T-ICSX1
4	T-SW	Loss of PSWS	%T-SW	T-IORV, RVR, AT-T-SW, T-ICSX1
5	T-IORV	IORV	%T-IORV, %T-GEN, %T-PCS, %T-IA, %BOC-MS, %BOC-IC, %BOC-RWCU, %T-FDW, %T-SW, %T-LOPP-PC, %T-LOPP-SC, %T-LOPP-GR, %T-LOPP-WR	AT-T-IORV, T-ICSX1
6	LL-S	Large Steam LOCA	%LL-S	T-ICSX1
7	LL-S-FDWA	Large Steam LOCA in FW Line A	%LL-S-FDWA	T-ICSX1
8	LL-S-FDWB	Large Steam LOCA in FW Line B	%LL-S-FDWB	T-ICSX1
9	ML-L	Medium Liquid LOCA	%ML-L	T-ICSX1
10	SL-S	Medium/Small Steam LOCA	%SL-S	AT-LOCA, T-ICSX1
11	SL-L	Small Liquid LOCA	%SL-L	AT-LOCA, RVR, T-ICSX1
12	RVR	Vessel Rupture	%RVR	T-ICSX4
13	BOC-MS	Break in Main Steam Line	%BOC-MS	T-GEN, T-ICSX2
14	BOC-FDWA	Break in Feedwater Line A	%BOC-FDWA, %ISLOCA	RVR, AT-T-FDW, T-ICSX1, T-ICSX2
15	BOC-FDWB	Break in Feedwater Line	%BOC-FDWB	RVR, AT-T-FDW, T-ICSX1, T-ICSX2
16	BOC-RWCU	Break in RWCU Line	%BOC-RWCU	T-GEN, T-ICSX5
17	BOC-IC	Break in IC Line	%BOC-IC	T-GEN, T-ICSX2
18	AT-T-GEN	ATWS Transfer T-GEN	%T-GEN, %T-PCS, %T-IA, %BOC-MS, %BOC-IC, %BOC-RWCU	None

**Table 3.2-5**  
**Event Tree Transfers**

<b>Figure</b>	<b>Event Tree</b>	<b>Description</b>	<b>Initiators Included</b>	<b>Transfers Out</b>
19	AT-T-FDW	ATWS Transfer T-FDW	%T-FDW, %BOC-FDWA, %BOC-FDWB	None
20	AT-T-LOPP	ATWS Transfer T-LOPP	%T-LOPP-PC %T-LOPP-SC %T-LOPP-GR %T-LOPP-WR	None
21	AT-T-SW	ATWS Transfer T-SW	%T-SW	None
22	AT-T-IORV	ATWS Transfer T-IORV	%T-IORV, %T-GEN, %T-PCS, %T-IA, %BOC-MS, %BOC-IC, %BOC-RWCU, %T-FDW, %T-SW, %T-LOPP-PC, %T-LOPP-SC, %T-LOPP-GR, %T-LOPP-WR	None
23	AT-LOCA	ATWS Transfer LOCAs	%SL-S, %SL-L	None

### 3.3 FUNCTIONAL LOGIC AND SUCCESS CRITERIA

#### 3.3.1 Introduction

The outcome of each event tree mitigating function (i.e., success or failure) is determined by success criteria. They define the failure modes for each mitigating system and functions that are included in the PRA model. Each event tree node and its respective mitigating function are designated as top events, and are identified as follows:

<b>Event Tree Designator</b>	<b>Mitigating Function</b>
CR	RPS, ARI, FMCRD
CF	FW Runback
CS	SLCS
DL	Vacuum Breakers Reclose
DS	Vacuum Breakers Open
IA	Isolate Feedwater Line A
IB	Isolate Feedwater Line B
IC	Isolate ICS Lines
IS	Isolate MSIV Lines
IR	Isolate RWCU Line
IM	Isolate RWCU Line Manual
MA	Overpressure SRV ATWS
MS	Overpressure SRV
MW	Isolation Condenser
PA	SRV Reclose ATWS
PS	SRV Reclose Transients
PR	Multiple SRV Reclose Transients
QT	TPCS
UF	FW Injection
UD	CRD Injection
VI	GDCS Injection
VE	GDCS Equalize
VL	FAPCS LPCI
VM	Dedicated LPCI Backup
WP	PCCS
WS	Suppression Pool Cooling
WR	RWCU/SDC
WM	Long-Term PCC/IC Pool Make-up
WV	Containment Venting
XD	ADS
XI	ADS Inhibit
XM	Manual Depressurization

### 3.3.2 Functional Logic Affecting Reactivity Control

#### 3.3.2.1 Top Event: (CR) Scram

The Reactor Protection System (RPS) and Control Rod Drive System (CRD) provide for rapid control rod insertion (scram) so that no fuel damage results from any anticipated operational occurrence. The hydraulic power required for scram is provided by high-pressure water stored in the individual hydraulic control units (HCU). The HCUs contain nitrogen-water accumulators, charged to high pressure, and the valves and components needed to scram the Fine-Motion Control Rod Drives (FMCRD).

Upon receipt of an RPS scram signal, the scram solenoid pilot valves de-energize, and the scram valve in the associated HCU opens to apply the hydraulic insert forces to its respective FMCRDs using high pressure water stored within the pre-charged accumulator. Once the hydraulic force is applied, a hollow piston inserts the control rod rapidly. The water displaced from the FMCRD is discharged into the reactor vessel (the need for a scram discharge volume has been eliminated from the ESBWR design.) Indication that the scram has been successfully completed (all rods full-in position) is displayed to the operator.

The alternate rod insertion (ARI) function of the CRD system provides a backup means of actuating a hydraulic scram that is diverse and independent from the RPS logic and components. Following receipt of an actuation signal, solenoid operated valves on the scram air header actuate to depressurize the header, allowing the HCU scram valves to open. The FMCRDs then insert the control rods hydraulically in the same manner as the RPS initiated scram. The same signals that initiate ARI simultaneously actuate the FMCRD motors to insert the control rods electrically.

Success criteria for CR are: RPS or ARI signal, and 3 out of 4 Control Rod Banks Fully Inserted.

Top event gate names: CR-TOPCR.

Dependencies: Failure of CR will transfer the sequence to an ATWS event tree. No operator actions are credited.

Assumptions: No credit is taken for manual RPS actuation by the operators during an initiating event.

#### 3.3.2.2 Top Event: (CF) Feedwater Pump Run Back

A feedwater pump run-back occurs when the feedwater control system sends a zero-flow demand signal to the feed pump adjustable speed drives on identification of an ATWS condition. This is an automatic function that occurs on high RPV pressure and an "SRNM-Not-Downscale" signal. The feedwater pumps are run-back to zero flow to limit power production in the short term following the accident, in order to keep the pressure spike in the RPV within acceptable limits.

Top event gate names: CF-TOPRB

The Success Criterion: Both feedwater pumps run-back to zero-flow to reduce reactor power.

Dependencies: none

Assumptions: This action is automatic, and no manual recovery is credited in the ATWS sequences. Conservatively, the failure of this function is assumed to lead to core damage due to a failure to initially reduce reactor power during an ATWS condition.

### ***3.3.2.3 Top Event: (CS) Standby Liquid Control System***

The SLCS system contains two identical and separate trains. Each train provides 50% injection capacity. For ATWS events, the failure of control rods to insert in response to a valid trip demand is assumed. SLCS automatically initiates by “SRNM-Not-Downscale” and either high reactor dome pressure or low reactor water level persisting for at least 3 minutes.

The success criterion is successful injection of both trains.

Top event gate names: CS-TOP1

Dependencies: Boron dilution -The SLCS design incorporates sufficient margin to discount potential non-uniformities of the boron solution mixing process within the reactor. This result is then increased by an additional margin to discount potential dilution by the RWCU/SDC System in the shutdown cooling mode.

Assumptions: Conservatively, no back up or long term recovery of this function is considered. The failure of this function is assumed to lead to core damage due to failure to successfully control power. RWCU/SDC System Isolation valves are included in the SLC model.

## **3.3.3 Functional Logic Affecting RPV Overpressure Protection**

### ***3.3.3.1 Top Event: (MS) RPV Overpressure Protection***

If the Power Conversion System and Isolation Condenser functions both fail, the pressure in the RPV will reach the pressure setpoints of the SRVs. The design basis is for one SRV to open to prevent exceeding the ASME overpressure limit during transients following successful scram.

Success criteria: One SRV opens to relief pressure

Top event gate names: MS-TOP18

Dependencies: none

Assumptions: Conservatively, an overpressurization of the RPV is assumed to result in a reactor vessel rupture (RVR) and a transfer to the RVR event tree. No credit is taken for operator action to open an SRV.

### ***3.3.3.2 Top Event (MA) RPV Overpressure Protection During ATWS***

During an ATWS, RPV pressure is challenged by the unmitigated reactor power. The success of this function is for 9 SRVs to open automatically.

Top event gate names: MA-TOP10

Dependencies: none

Assumptions: Conservatively, the failure of this function is assumed to lead to core damage due to RPV rupture and re-criticality at low RPV pressure.

### 3.3.3.3 Top Event (MW) Isolation Condensers

The design basis of the isolation condensers (ICs) is to remove post-reactor isolation decay heat with three out of four ICs operating and to reduce reactor pressure and temperature to safe shutdown conditions. Automatic initiation of this function occurs on either low RPV water level, closure of MSIVs, or high RPV pressure. In addition, each ICS train contains a condensate reservoir that provides sufficient water to the RPV following a loss of feedwater to ensure that Level 1 is not reached.

The success criterion of this function is the operation of at least three of four ICs.

Top event gate names: MW-TOPMW

Dependencies: The initiating event BOC-ICS, line break in an ICS line results in the need to isolate one ICS loop. Isolation of the ICS loop makes it unavailable for accident sequence mitigation.

Assumption: The PRA model does not take credit for partial functioning or reduced success criteria that are based on timing. Although MAAP analysis shows that only 2 ICs are needed to control reactor pressure after one hour in a transient initiating event, this is not credited.

### 3.3.4 Functional Logic Affecting Core Cooling

#### 3.3.4.1 Top Events - Isolate Line Breaks Outside Containment:

- (IA) Feedwater Line A
- (IB) Feedwater Line B
- (IC) ICS Line
- (IS)MSIV Line
- (IR) RWCUC Line
- (IM) Manual Isolation of RWCUC Line

This series of top events covers breaks that occur outside of containment that could lead to a loss of primary coolant. In each case, the top event requires the need for an isolation valve to close before RPV Level 1 is reached, so that ADS blowdown is prevented.

Success criterion: Automatic isolation occurs prior to RPV level reaching Level 1.

<u>Top Event</u>	<u>Gate Name</u>	<u>Event Tree</u>
IA	BC-TOPFWLA	BOC-FDWA
IB	BC-TOPFWLB	BOC-FDWB
IC	BC-TOPICS, IC-TOPICSX	BOC-IC, See discussion below
IS	BC-TOPMSL	BOC-MS
IR	BC-TOPRWCUC	BOC-RWCUC
IM	IM-TOPSDC	BOC-RWCUC

Dependencies: Mitigating functions are not credited in BOC event trees if they are dependent on the initiating event. For example, no credit is taken for the failed isolation condenser in the BOC-ICS tree.

Top event IC in the Break Outside of Containment – ICS Line (BOC-IC) event tree is listed above, and it is also used in the transient and LOCA event trees to account for the possibility that one or more of the ICS units could be damaged due to hydrogen detonation if the preventive design features fail to function. When the DPVs are open, hydrogen may accumulate in the isolation condenser lower drums. Design features (valves, logic, power) prevent hydrogen from reaching an adverse concentration by isolating the ICS units, or by providing venting, depending on the specific plant conditions. The IC node follows success branches of XD (DPVs) and DS (vacuum breakers) in transient sequences, and success branch of DS in LOCA sequences where the status of XD is not asked.

Sequence logic for ICS isolation scenarios is treated by using transfer event trees (Figures 3A-17a through 3A-17e) to determine the end state conditions and the accident sequence frequencies. In addition, the event path success and failure paths for these transfers are listed in Tables 3.4-17a through 3.4-17e.

No T-ICSX trees are developed for ATWS transfers although similar issues exist when combustible gases accumulate in the lower drum of ICS heat exchangers after vent line failures. The existing ATWS trees have core damage sequences in class cdiii, cdv and cdv. These core damage classes are not altered with a break in ICS. Some of the cdiii and cdv sequences turn into BYP releases in the Level 2 model due to the failure of ICS isolation or PCCS failure, which are accounted for after core damage. For ATWS sequences not in class cdiii, cdv and cdv, the existing ATWS trees AT-LOCA and AT-T-IORV require active injection systems. The successes of these active injection systems also prevent core damage with a postulated break in ICS.

The class cdii-a sequences (loss of containment heat removal) are in the same class with a postulated break in ICS. The ATWS trees AT-T-FDW, AT-T-GEN, AT-T-LOPP, and AT-T-SW credit top event MW (3/4 ICS) for success. The postulated breaks due to hydrogen detonation in ICS could potentially fail ICS and have significant coolant inventory loss. Therefore, the “ok” sequences in these ATWS event trees could potentially be core damage sequences with a break on ICS. For simplicity and consistency with the existing BOC event trees, new event tree T-ICSX3 includes the top event CR. The failure of CR in T-ICSX3 tree results in core damage and the sequence is assigned to class cdv. With this treatment, no new transfer is required for the ATWS event trees to address hydrogen detonation issues in ICS.

This special treatment of ICS isolation separates the pertinent event sequences from the other event sequences to allow for specific assessments of this phenomenon. After a hydrogen detonation in the lower heat exchanger drum, the ICS unit can still be isolated by closing the steam supply and condensate return isolation valves, which are unaffected by a detonation. Each event tree sequence description in section 3.4 that requires this ICS isolation feature contains a discussion of the event tree transfers to allow for proper quantification of this phenomenon.

**3.3.4.2 Top Event: (PS) SRV Reclose**

Following a transient with loss of PCS and ICS, RPV pressure rises, which causes one or more SRVs to lift at their pressure setpoint. It is necessary for all lifted SRVs to reclose to prevent an inadvertent loss of coolant through a stuck-open relief valve.

Success criterion: All SRVs that opened due to high reactor pressure are required to reclose.

Top event gate names: PS-TOPIORV

Dependencies: This top event is challenged after an MS event occurs.

Assumptions: The probability of SRVs failing to reclose is based upon the estimated number of SRVs that would open during a transient with high pressure conditions.

**3.3.4.3 Top Event: (PR) 9 of 10 SRVs Reclose**

Following a transient with loss of PCS and ICS, RPV pressure rises, which causes one or more SRVs to lift at their pressure setpoint. It is necessary for all lifted SRVs to reclose to prevent an inadvertent loss of coolant through a stuck-open relief valve. Top event PR is a conditional probability to account for more than one SRV failing to reclose.

Success criterion: 9 out of 10 SRVs are required to reclose.

Top event gate names: PS-TOPSLOCA

Dependencies: none

Assumptions: none

**3.3.4.4 Top Event: (PA) SRV Reclose**

During an ATWS with loss of PCS and ICS, RPV pressure rises, which causes one or more SRVs to lift at their pressure setpoint. It is necessary for all lifted SRVs to reclose to prevent an inadvertent loss of coolant through a stuck-open relief valve.

Success criterion: All SRVs that lifted have reclosed.

Top event gate names: PA-TOPCLOSE

Dependencies: This top event is challenged after an MA event occurs.

Assumptions: none

**3.3.4.5 Top Event: (PB) All But 2 SRVs Reclose(Deleted)****3.3.4.6 Top Event: (QT) Power Conversion System**

After a transient with reactivity insertion, the decay heat removal requirements can be accommodated by the minimum set of functions described below. This top event includes functional failures which fail both the steam pathway to the condenser and injection from the condensate and feedwater systems. The power conversion system (PCS) consists of the main condenser, turbine bypass valves, feedwater and condensate, and circulating water. PCS is the preferred method of heat transfer following a transient.

Success Criterion:



- 4 of 12 Turbine Bypass Valves open,
- 1 of 4 Main Steam Lines remain open,
- 1 of 4 Circulating Water Pumps function,
- 1 of 4 FW pumps function, and
- 1 of 4 Condensate pumps function.

Top event gate names: QT-TOPPCS

Dependencies: none

Assumptions: none

#### ***3.3.4.7 Top Event: (UF) FW Injection***

Feedwater injection is successful if one of four Feedwater pumps and one of four Condensate pumps are available to supply water to the RPV during high or low pressure conditions. Suction is taken from the condensate storage tank. If UF fails to maintain RPV level above Level 2, then CRD injection (UD) is automatically initiated.

Success criterion: One of four Feedwater Pumps is successful.

Top event gate names:

- UF-TOP1
- UF-TOPATWS

Dependencies: UF is unavailable in loss of feedwater, loss of preferred power, loss of service water, LOCA, and feedwater line break initiating events. The event trees do not include feedwater injection in LOCA scenarios, since the Feedwater system is isolated when high drywell pressure conditions exist.

Assumptions: Operator actions for monitoring and controlling feedwater and condensate pumps are within the normal process for responding to a feedwater transient. Operator action for feedwater pump restart is necessary after feedwater runback (CF) under top UF-TOPATWS.

#### ***3.3.4.8 Top Event: (UD) CRD Injection***

The CRD pumps supply high pressure makeup water to the reactor when the normal makeup supply (feedwater) is unable to prevent reactor water level from falling below the normal water range. To accomplish this function both CRD pumps are called upon to supply flow. Success is determined based on the initiating event. In the case of an ATWS event, both pumps are required to meet success. In all other transients that result in reactor water level falling below the normal water range, only one CRD pump is required. Regardless of cause, when a Level 2 signal is generated, both CRD pumps start and required flow path to reach the reactor is established with the majority of the other functions normally provided by the CRD system isolated from the flow path. The CRD system is isolated in LOCA scenarios where high drywell pressure, and high lower drywell water level conditions exist. However, the HPCRCD Isolation Bypass logic and valves allow automatic injection by CRD if GDCS injection failure is detected.

Success criteria: 1 of 2 CRD pumps function during transient conditions (UD-TOPINJ), and

2 of 2 CRD pumps function during ATWS (UD-TOPINJ2).

Top event gate names:

- UD-TOPINJ
- UD-TOPINJ2 (ATWS)
- UD-TOPINJ\_X
- UD-TOPINJ\_MAN

Dependencies: UD is unavailable following a loss of preferred power or a loss of service water. UD is automatically initiated on low RPV water level, or GDCS injection signal if the GDCS pool level remains high 11 minutes after the GDCS initiation signal has been generated. Operator actions involve monitoring RPV water level, and manually bypassing HPCRDR isolation if an external makeup source is needed.

Assumptions: For general transient scenarios, CRD injection is unaffected by containment overpressurization failure. This is an important assumption, based on the containment failure analysis, that supports the use of CRD in these sequences.

#### ***3.3.4.9 Top Event: (VI) GDCS Injection***

GDCS provides emergency core cooling after any event that reduces the reactor coolant inventory. Once the reactor has been depressurized the GDCS is capable of injecting large volumes of water into the depressurized RPV to keep the core covered for at least 72 hours following LOCA. The GDCS injection function provides water from all three GDCS pools to the RPV via eight injection lines.

Success criteria: 2 of 8 injection lines and 1 of 3 GDCS pools functional (VI-TOPINJ), 4 of 8 injection lines and 3 of 3 pools (VI-TOPRUP), 8 of 8 injection lines and 3 of 3 pools (VI-TOPRVR).

Top event gate names:

- VI-TOPINJ
- VI-TOPRUP
- VI-TOPRVR

Dependencies: ADS (DPVs must open). GDCS requires PCCS, or SPC with an equalizing line open, to complete the inventory recirculation loop.

Assumptions: none

#### ***3.3.4.10 Top Event: (VE) GDCS Equalize***

If the RPV level decreases to 1 m above the top of the active fuel, squib valves are actuated in each of four GDCS equalizing lines. The open equalizing lines leading from the suppression pool to the RPV make long-term coolant makeup possible. An equalization valve delay time ensures that the GDCS injection function from the GDCS pools has had time to drain to the RPV and that the initial RPV level collapse as a result of the blowdown does not open the equalizing line.

Success criterion: 1 of 4 equalize lines and 1 of 3 GDCS pools functional, or 2 of 3 GDCS pools.

Top event gate names: VE-TOPEQU

Dependencies: ADS (DPVs must open). GDCS requires PCCS, or SPC with an equalizing line open, to complete an inventory recirculation loop.

Assumptions: GDCS is not effective when the containment is vented or the containment has failed. External sources of injection are required to address loss of inventory when the containment is vented, or failed due to overpressure.

#### ***3.3.4.11 Top Event: (VL) LPCI***

This mode may be initiated following an accident after the reactor has been depressurized to provide reactor makeup water for accident recovery. In this mode the FAPCS pump takes suction from the suppression pool, removes decay heat, and pumps it into the reactor vessel via RWCU/SDC loop B and then Feedwater loop A.

After successful RPV depressurization, the FAPCS can accomplish the core cooling function when configured in the RPV injection mode. It is manually actuated and it is necessary to inhibit containment isolation signals if any are present.

Success of this function is the effective operation of at least 1 train of FAPCS operating in RPV injection mode for the duration of the sequence. This function is manually actuated and it is also necessary to inhibit the isolation signals, RPV Level 2 and high drywell pressure that may be present in this case.

Success of this function is the success of at least 1 train of FAPCS operating in the RPV injection mode.

Top event gate names: VL-TOPINJ

Dependencies: RWCU line B and FDW line A. Operator must manually actuate FAPCS, align valves, and inhibit isolation signals.

Assumptions: none

#### ***3.3.4.12 Top Event: (VM) Dedicated LPCI Backup***

Dedicated LPCI Backup provides reactor water inventory control through connection to FAPCS and feedwater injection line A. The motor driven pump and the piping to supply FAPCS are rated Seismic Category I and they remain functional following a safe shutdown earthquake. Dedicated LPCI is used as a backup RPV injection source to FAPCS. This pump is powered by the Ancillary Diesel Generators and takes suction from the Primary Fire Protection Tanks.

Successful Dedicated LPCI Backup requires success of the single motor driven pump and operator action.

Top event gate names: VM-TOPINJ

Dependencies: RWCU line B and FDW line A. Manual alignment, pump start, and level control.

Assumptions: none

**3.3.4.13 Top Event: (XD) ADS**

ADS consists of 10 SRVs and 8 DPVs. The SRVs are mounted on top of the main steamlines in the drywell and discharge through lines routed to quenchers in the suppression pool. Four DPVs are horizontally mounted on horizontal stub tubes connected to the RPV at about the elevation of the main steamlines. The other four DPVs are horizontally mounted on horizontal lines branching from each main steamline. ADS depressurizes the RPV so that gravity-driven flow from GDCS can inject.

Success criterion: 4 of 8 DPVs open

Top event gate names: XD-TOPDPV

Dependencies: Level 1 actuation signal

Assumptions: No credit for pressure reduction is taken for automatic SRVs opening if the DPVs have failed. In general, the model assumes that the DPVs are demanded after initial manual depressurization using SRV.

**3.3.4.14 Top Event: (XI) ADS Inhibit**

The ESBWR ATWS mitigation strategy is to maintain the reactor at high pressure until a controlled depressurization can be performed. To maintain the reactor at pressure, both the SSLC/ESF ADS inhibit signal, and DPS ADS inhibit signal are required. The SSLC/ESF ADS inhibit signal is provided on: (1) high RPV pressure; or, (2) RPV water Level 2 and APRM-not-down-scale signal. The DPS ADS inhibit signal is provided on: (1) high RPV pressure; or, (2) RPV water Level 2 and SRNM-not-down-scale signal raw signal. This avoids the potential consequences of boron dilution associated with reactor depressurization.

Success criterion: ADS is inhibited during ATWS sequences.

Top event gate names: XI-TOPINH

Dependencies: none

Assumptions: Conservatively, the failure of this function is assumed to lead to core damage due to failure to successfully control power.

**3.3.4.15 Top Event: (XM) Manual Depressurization**

If no high pressure injection systems are available, it is necessary to depressurize the RPV by opening SRVs to permit effective FACPS or Dedicated LPCI Backup injection to the RPV. Success of this function is the manually opening of at least five of the ten SRVs that can be opened by the operators. This allows for low-pressure injection using either the FACPS LPCI mode or Dedicated LPCI makeup.

Success criterion: 5 of 10 SRVs open by Operator Action.

Top event gate names: XM-TOPXMAN

Dependencies: Support systems such as DC power, nitrogen and I&C are addressed in the fault trees.

### 3.3.5 Functional Logic Affecting containment Heat Removal

#### 3.3.5.1 Top Event: (DS) Vacuum Breakers Open

The containment steam suppression function uses vacuum breakers that must be initially closed during the LOCA or ADS blowdown to force steam through vertical and horizontal vents and allow steam condensation in the pool. These vacuum breakers must also subsequently open if drywell pressure decreases relative to the wetwell pressure to avoid negative pressure failures. Vacuum breakers are provided between the drywell (DW) and wetwell (WW). The purpose of the DW-to-WW vacuum breaker system is to protect the integrity of the diaphragm floor slab and vent wall between the DW and the WW, and the DW structure and liner, and to prevent back-flooding of the suppression pool water into the DW.

Success criterion: At least one vacuum breaker to open after steam suppression to avoid containment failure due to negative pressure in the drywell.

Top event gate names: DS-TOPVB

Assumptions: Drywell depressurization following a LOCA is expected to produce the most severe negative pressure transient condition in the DW. The results of the Main Steam Line break analysis show that the containment does not reach negative pressure relative to the reactor building, and the maximum WW-DW differential pressure is within the design capability.

#### 3.3.5.2 Top Event: (DL) Vacuum Breakers Reclose

The containment vacuum breakers open in case the pressure in the wetwell is greater than the pressure in the drywell. PCCS effectiveness in containment heat removal requires that a pressure differential exist between the drywell and wetwell. To this end, the vacuum breakers between the DW and WW must be leak tight to maintain this DW to WW pressure differential.

During a LOCA or ADS blowdown, the vacuum breakers open to allow the flow of gas from WW to DW to equalize the WW and DW pressure. Redundant vacuum breakers are provided to protect against a single failure of vacuum breaker, i.e., failure to open. Vacuum breaker isolation valves are provided to protect against failure to close when required.

Success criterion: All the vacuum breakers are closed or re-close following an actuation.

Top event gate name: DL-TOPVB

Dependencies: Support systems such power, and I&C are addressed in the fault trees.

Assumptions: none

#### 3.3.5.3 Top Event: (WP) PCCS

Passive containment heat removal function is performed by PCCS during a LOCA or ADS actuation. It is effective when the drywell pressure is greater than the wetwell pressure, i.e., all of the vacuum breakers are closed and leak-tight. The PCCS loops receive a steam-gas mixture supply directly from the DW. The PCCS loops are initially driven by the pressure difference created between the containment DW and the suppression pool during a LOCA, or ADS actuation (DPVs), and then by gravity drainage of steam condensed in the tubes, so they require no sensing, control, logic or power-actuated devices to function. The PCCS loops are an extension of the safety related containment and do not have isolation valves. The system is

always open to the containment atmosphere and has no valves that require opening. Failure of this function is the loss of effectiveness of the heat exchangers in removing the decay heat from containment atmosphere (e.g., tube plugging, loss of cooling water in pools located in the upper part of containment).

The success criterion for this function is the operation of at least 4 of 6 heat exchangers.

Top event gate name: WP-TOPDHR

Dependencies: Failure of vacuum breakers to reseal (DL) is handled in the event tree structure. In addition, the event trees also address failure to makeup to the PCCS/ICS pools.

Assumptions: none

#### ***3.3.5.4 Top Event: (WS) Suppression Pool Cooling***

One of the FAPCS trains that is not operating in Spent Fuel Pool cooling mode is placed in the suppression pool cooling mode as necessary during normal plant operation. Water drawn from the suppression pool is cooled and cleaned and then returned to the suppression pool in this mode of operation. This mode may be manually initiated following an accident to cool the suppression pool for accident recovery. This mode is automatically initiated in response to a high suppression pool temperature signal.

Success criterion: 1 of 2 FAPCS loops function

Top event gate names: WS-TOPSPC, WS-TOPSPC-A (ATWS)

Dependencies: An equalizing line if PCCS fails, and RPV makeup comes from GDCS. AC power and component cooling are addressed in the fault trees.

Assumptions: none

#### ***3.3.5.5 Top Event: (WR) RWCU/SDC***

The operation of the RWCU/SDC system at high reactor pressure reduces the plant reliance on the main condenser and ICS during normal reactor cooldowns. RWCU/SDC provides decay heat removal in response to transients. After an ATWS, RWCU may be manually restarted to supply shutdown cooling.

Success criterion: 1 of 2 RWCU loops function

Top event gate names: WR-TOPSDC, WR-TOPSDC-A (ATWS)

Dependencies: FDW Lines A and B. Operator actions to restart RWCU after an ATWS.

Assumptions: none

#### ***3.3.5.6 Top Event: (WM) PCC/IC Pool Make Up***

PCCS and the Isolation Condensers can perform the long term containment heat removal function as long as water remains in the pools of the upper part of the containment. There is enough water present during operation to remove decay heat for at least 24 hours. A connection to the refueling well in the upper reactor building will automatically open to extend this inventory to at least 72 hours. This is backed up by the ability to make up water to the pools using various water systems. In the PRA, the source provided by FPS is credited because it is

completely independent, including support systems, of GDCS and the PCCS automatic water makeup. FPS is used to refill the upper containment pools following boil-off of the cooling water during the passive heat removal process. Makeup to the upper containment pools is required in about 72 hours.

Success criterion: Automatic Pool Valves open on low pool level to connect Refuel Well to upper PCCS/ICS pools, or fire water makeup to the pools.

Top event gate names: WM-TOPINV

Dependencies: none

Assumptions: none

### ***3.3.5.7 Top Event: (WV) Containment Venting***

When no containment heat removal system is available, the pressure in the containment will rise. Containment venting is directed by procedure. The actuation of this function is required to avoid the failure of the containment boundary.

The success criterion for the system is manual opening of the vent line.

Top event gate names: WV-TOPVENT

Dependencies: Dedicated LPCI Backup is required after venting when GDCS is used, and PCCS fails. Support systems such instrument air, and local controls, are addressed in the fault trees.

Assumptions: An external low pressure injection source must be available after containment venting to ensure RPV water level is maintained. This dependency is captured within the event trees.

## **3.3.6 ICS Isolation Transfer Event Trees**

As discussed in subsection 3.3.4.1 above, these event sequences are distinguished from the other event sequences to allow for specific assessments of the prevention and mitigation of hydrogen detonation in the ICS condensers. This is accomplished by creating a series of transfer trees that identify the specific accident sequences associated with these types of events.

These transfer trees start from the transfer gates XFR\_ICSX1 through XFR\_ICSX5, which are linked to the transfer sequences from XFR\_ICSX1 through XFR\_ICSX5. The transfer trees are shown in Figures 3A-17a through 3A-17e. The trees are structured as follows.

Both GDCS injection and equalizing are included in the T-ICSX sequences. For conservatism, the VI top event gate VI-TOPRUP (4 of 8 injection lines and 3 of 3 pools) is used for all T-ICSX event trees except T-ICSX4. Event tree T-ICSX4 uses VI top event gate VI-TOPRVR since this event tree models the transfer from the RVR sequences.

It is assumed that GDCS success with PCCS success does not prevent core damage due to inventory loss; however, it can significantly delay core damage. Thus, accident sequences with PCCS success are assigned a new class cdii-c (Long-term Containment Failure). MAAP runs with GDCS and PCCS successes show that core damage would not occur until about 100 hours after the initiation of the accident. However, for the sequences with all active systems failed, it is

conservative to assume that any additional injection sources in these sequences are not restored, although core damage has not occurred at a mission time of 72 hours.

It is assumed that WR (RWCU/SDC) is not be effective due to the potential low RPV water level that could defeat shutdown cooling (conservative). Therefore, WR is not credited in the event trees for decay heat removal.

It is assumed that WS (FAPCS in suppression pool cooling mode) success along with VI and VE successes prevent core damage except for the T-ICSX5 event tree. MAAP runs show that core damage is further delayed in these sequences. It is reasonable to assume that other active injection systems can be restored easily provided that WS is successful (i.e., power supply, DCIS, HVAC, injection sources, and other supporting systems are still available in these sequences).

It is assumed that the success of top events in the existing event trees that credit external injection sources prevent core damage, which includes the tops UD, VL, and VM. For some transferred sequences, these tops may have been failed. They are included for simplicity and consistency, and they do not affect modeling accuracy except for the sequences that cannot take credit for these top events. For example, the UD top already includes %LL-S-FDWB and %BOC-FDWB under its top gate, which will fail UD for FDW-B LOCA sequences. Similarly, the VL and VM tops need to add %LL-S-FDWA and %BOC-FDWA initiating events under their top gates to fail these events for FDW-A break sequences. This logic is handled in the integrated quantification of the model.

To account for specific sequence characteristics, node UD (HPCRD) uses different top events. For sequences with VI success (i.e., HPCRD inject is not automatic), top event UD-TOPINJ\_MAN is used to account for operator action to bypass the isolation. For sequences with VI failure, top event UD-TOPINJ\_X, POST LOCA AUTOMATIC CRD INJECTION FAILS, is used. For sequences with GDCS successes (VI and VE) but without any active injection or containment heat removal system, DL (all VB closed), WP (4/6 PCCS) and WM (Long term PCCS pool inventory) are used. This treatment is similar to other event trees with the exception that core damage is conservatively assumed even with DL, WP and WM successes. This conservatism is added into the event tree to address the fact the containment has been breached due to hydrogen detonation and a loss of inventory is ongoing, which is different from the sequences in other event trees.

The T-ICSX1 sequences with all injection source and GDCS failures are assigned as class cdi. Although the containment is not breached at the time of core damage, the detonation caused by the accumulation of hydrogen and oxygen in the ICS lower drum would result in containment failure after core damage had occurred.

The T-ICSX2 sequences with all injection source and GDCS failures are assigned as class cdv since containment bypass has already occurred in these sequences.

Transfer tree T-ICSX3 considers transients with ICS vent line failures. This transfer is defined in the top logic fault tree for simplicity as transients that demand ICS operation. The logic has gate GENTRANSIENT OR'ed with gate T-GEN, as well as initiators BOC-FDWA & BOC-



FDWB NAND'ed with their associated isolation function failure BC-TOPFWLA or BC-TOPFWLB and the failure of any ICS vent line. In transient sequences, the ICS isolation valves are normally open and the condensate return valves are normally closed. If both the vent lines and condensate return valves are closed, the condensed water in ICS condensate return line will keep the ICS filled. The amount of non-condensable gases introduced into the ICS heat exchangers after steam condensation is expected to be negligible and would not cause hydrogen detonation issues.

The T-ICSX3 tree is similar to the BOC-IC tree, with the following differences:

- a. It starts with node XFR\_ICSX3.
- b. A new node ICS-OPEN is added to remove potential invalid cutsets that are associated with the closing of all ICS loops while the vent lines in one or more ICS loops fail to open. Top event B32-4LOOPSCLOSE considers the case where all 4 ICS loops fail to open.
- c. Failure of CR (reactivity control) results in core damage with class cdv, which is treated similarly in the existing BOC event trees.
- d. The failure of isolation of the break after detonation (top event gate BC-TOPICS) is modeled after node ICS-OPEN. Node IC (top event gate IC-TOPICSX) is not checked after XD because detonation already occurred with IC failure at the beginning of the sequences.
- e. Similar to other T-ICSX event trees, node WS occurs before VI and VE for simplicity of the event tree structure to align active systems together.
- f. Removed node WV for containment venting and the last node on VM. Containment venting is determined to be not necessary in the T-ICSX event trees. The containment (connected to RPV after DPV opening) "venting" is already ongoing, as shown in MAAP runs. Therefore, nodes VL and VM are also checked in sequences with VI and VE successes in this transfer tree.
- g. Sequences T-ICSX3-006 and T0ICSX3-016 are class cdii-c (they are "ok" in BOC-IC tree). Other CDF sequences are assigned to cdii-a (long-term) or cdv (short-term).

The T-ICSX4 event tree is developed following the similar top events in the RVR tree. Only VI top (top event gate VI-TOPRVR) is included in the event tree, which has a success criterion of 8/8 lines and 3/3 GDSC pools. RVR success sequences require both VI and VE successes. While the event tree top event VE is defined as "1/3 GDSC pools and 1/4 equalizing lines or 2/3 GDSC pools", VI success criterion for top event gate VI-TOPRVR actually has covered the success criterion of VE. However, for RVR sequences with a break on ICS, VI success alone (i.e., with all GDSC pool water only) is not assumed to be sufficient for success. MAAP runs show that the opening of one of the equalizing lines is required. Therefore, to model the success criteria properly, VI-TOPRVR includes equalizing line failures. As a result, the final integrated model file for quantification includes gate E50-EQU4OF4-FTI (failure of 4 of 4 equalizing lines into RPV) under gate VI-TOPRVR.

New MAAP runs show that after VI success, HPCRD injection is sufficient in preventing core damage in RVR sequences. Therefore, the top events UD, VL and VM are included in the T-ICSX4 event tree.

The T-ICSX5 event tree is developed following the similar top events in the BOC-RWCU tree. The unique change in the T-ICSX5 event tree is that top event WS (1/2 FAPCS in SP cooling) is no longer credited as success for sequences with VI and VE successes after manual isolation success. MAAP run shows that with the assumed 6 hours to manually isolate the BOC-RWCU break, a significant amount of inventory is lost. The successes of VI, VE and WS only would thus not prevent core damage past 72 hours. Although it is reasonable to assume that operators could isolate the BOC-RWCU break using the manual isolation valves within one or two hours, which would significantly reduce the inventory loss, it is conservative to exclude top event WS in this event tree.

**Table 3.3-1**  
**Summary of Functional Logic and Success Criteria**

<b>EVENT TREE HEADING</b>	<b>FUNCTION</b>	<b>TOP GATE NAME</b>	<b>APPLICABLE TREES</b>	<b>SUCCESS CRITERIA</b>	<b>BASIS</b>
CF	FW Pump Run-back	CR-TOPRB	AT-T-GEN, AT-T-SW, AT-T-IORV, AT-LOCA	Automatic Actuation	Design
CR	Reactor Protection System	CR-TOPCR	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, ML-L, SL-L, BOC-MS, BOC-FDWA, BOC-FDWB, BOC-IC, BOC-RWCU	3/4 CR Banks Insert	Design
CS	Standby Liquid Control System	CS-TOP1	AT-T-GEN, AT-T-FDW, AT-T-SW, AT-T-LOPP, , AT-T-IORV, AT-LOCA	2/2 SLCS Trains	Design
DL	Vapor Suppression System Close	DL-TOPVB	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, ML-L, SL-S, SL-L, RVR, BOC-FDWA, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC	All DW/WW Vacuum Breakers reclose after providing vacuum relief. MDS/ADS	Design
DS	Vapor Suppression System Open	DS-TOPVB	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, ML-L, SL-S, SL-L, RVR, BOC-FDWA, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC	1 of 3 vacuum breakers open to prevent excessive negative DW pressure	TRAC-G
IA	Isolation: FDW Line A	BC-TOPFWLA	BOC-FDWA	Isolation by 1 Valve or 1 check valve	Design
IB	Isolation: FDW Line B	BC-TOPFWLB	BOC-FDWB	Isolation by 1 Valve or 1 check valve	Design
IC	Isolation: IC Steam Line Broken	BC-TOPICS	BOC-IC	Isolation by 1/2 steam valves, and 1/2 condensate valves	Design
IC	Isolation: IC Steam and Condensate Valves	IC-TOPICSX	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, ML-L, SL-S, SL-L, RVR, BOC-FDWA, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC	Isolate 1 of 2 steam supply valves and 1 of 2 condensate return valves.	Design
IS	Isolation: Main Steam Line Broken	BC-TOPMS	BOC-MS	Isolation by 1/2 MSIVs in each main steam line	Design
IR	Isolation: RWCU Line Broken	BC-TOPRWCU	BOC-RWCU	Isolation of both lines in operating train	Design
IM	Manual isolation RWCU	IM-TOPSDC	BOC-RWCU	Manual Selection	Design
MA	Overpressure Protection System	MA-TOP10	AT-T-GEN, AT-T-FDW, AT-T-SW, AT-T-LOPP, AT-T-IORV, AT-LOCA	9/18 SRV ATWS	MAAP
MS	Overpressure Protection System	MS-TOP18	T-GEN, T-FDW, T-SW, T-LOPP, SL-L, BOC-FDWA, BOC-FDWB,	1/18 SRV NO ATWS	Design
MW	Isolation Condensers	MW-TOPMW	T-GEN, T-FDW, T-SW, T-LOPP, AT-T-GEN, AT-T-FDW, AT-T-LOPP, AT-T-SW, SL-L, BOC-FDWA, BOC-FDWB,	3/4 IC Trains	Design
PA	SRV closure	PA-TOPCLOSE	AT-T-GEN, AT-T-FDW, AT-T-SW, AT-T-LOPP	All SRV reclose in ATWS	Design
PR	SRV closure	PS-TOPSLOCA	T-GEN, T-FDW, T-SW, T-LOPP,	9/10 SRVs reclose	Design

**Table 3.3-1**  
**Summary of Functional Logic and Success Criteria**

<b>EVENT TREE HEADING</b>	<b>FUNCTION</b>	<b>TOP GATE NAME</b>	<b>APPLICABLE TREES</b>	<b>SUCCESS CRITERIA</b>	<b>BASIS</b>
PS	SRV closure	PS-TOPIORV	T-GEN, T-FDW, T-SW, T-LOPP	All SRVs reclose	Design
QT	Total Power Conversion System	QT-TOPPCS	T-GEN	4/12 TB Vlv, 1/4 Steam line open, 1/4 Circ Water Pmp, 1/4 FDW Pmp, 1/4 Cond Pmp	Design
UD	CRD for RPV injection	UD-TOPINJ	T-GEN, T-FDW, T-IORV, T-LOPP, LL-S, LL-S-FDWA, SL-S, SL-L, BOC-MS, BOC-FDWA, BOC-IC	1/2 CRD pumps	MAAP
UD	CRD for RPV injection - ATWS	UD-TOPINJ2	AT-T-GEN, AT-T-FDW, AT-T-LOPP, AT-T-IORV, AT-LOCA	2/2 CRD pumps	MAAP
UD	CRD Isolation Bypass for RPV injection	UD-TOPINJ_X	LL-S, LL-S-FDWA, SL-S, SL-L	1/2 CRD pumps	MAAP
UD	Manual CRD Isolation Bypass for RPV injection	UD-TOPINJ_MANN	LL-S-FDWA, SL-S, SL-L	1/2 CRD pumps	MAAP
UF	Feedwater Injection System	UF-TOP1	T-GEN, T-IORV, AT-T-GEN, AT-T-IORV, LL-S, SL-S, ML-L, SL-L, BOC-MS, BOC-IC	1/4 FDW pumps	Design
VE	GDCS Equalize	VE-TOPEQU	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, ML-L, SL-L, RVR, BOC-MS, BOC-FDWA, BOC-FDWB, BOC-IC, BOC-RWCU	1/4 Equalize Lines	MAAP
VI	GDCS Injection	VI-TOPINJ	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, ML-L, SL-L, BOC-MS, BOC-FDWA, BOC-FDWB, BOC-IC	2/8 lines and 1/3 GDCS pools	MAAP
VI	GDCS Injection	VI-TOPRUP	BOC-RWCU	4/8 lines and 3/3 GDCS pools	MAAP
VI	GDCS Injection	VI-TOPRVR	RVR	8/8 lines and 3/3 GDCS pools	MAAP
VL	LPCI	VL-TOPINJ	T-GEN, T-FDW, T-LOPP, T-IORV, LL-S, LL-S-FDWB, SL-S, SL-L, RVR, BOC-MS, BOC-FDWB, BOC-IC, BOC-RWCU	1/2 FAPCS Trains	MAAP
VM	Dedicated LPCI Backup	VM-TOPINJ	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWB, SL-S, ML-L, SL-L, BOC-MS, BOC-FDWB, BOC-IC, BOC-RWCU, RVR	1/1 Dedicated LPCI Backup RPV injection, Valves Open to FDWA line LPCI connection	MAAP
WM	Long-term Upper Pool Make-up	WM-TOPINV	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, AT-T-GEN, AT-T-FDW, AT-T-SW, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, ML-L, SL-L, RVR, BOC-FDWA, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC	PCCS pools connected	MAAP
WP	Passive Containment Cooling System	WP-TOPDHR	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, ML-L, SL-L, RVR, BOC-FDWA, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC	4/6 PCCS Trains	MAAP

**Table 3.3-1**  
**Summary of Functional Logic and Success Criteria**

<b>EVENT TREE HEADING</b>	<b>FUNCTION</b>	<b>TOP GATE NAME</b>	<b>APPLICABLE TREES</b>	<b>SUCCESS CRITERIA</b>	<b>BASIS</b>
WR	RWCU/SDC	WR-TOPSDC	T-GEN, T-FDW, T-LOPP, SL-L	1/2 RWCU/SDC RPV water level must be above Level 3	Design
WR	RWCU/SDC after ATWS	WR-TOPSDC-A	AT-T-GEN, AT-T-FDW, AT-T-LOPP, AT-LOCA	1/2 RWCU/SDC in ATWS	Design
WS	Suppression Pool Cooling	WS-TOPSPC	T-GEN, T-FDW, T-LOPP, T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, ML-L, SL-L, BOC-FDWA, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC, RVR	1/2 FAPCS Suppression Pool cooling	MAAP
WS	Suppression Pool Cooling after ATWS	WS-TOPSPC-A	AT-T-GEN, AT-T-FDW, AT-T-LOPP, AT-T-IORV, AT-LOCA	1/2 FAPCS Suppression Pool cooling	MAAP
WV	Containment Venting	WV-TOPVENT	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, AT-LOCA, AT-T-GEN, AT-T-FDW, AT-T-LOPP, AT-T-IORV, LL-S, LL-S-FDWA, LL-S-FDWB, SL-S, SL-L, RVR, BOC-FDWB, BOC-RWCU, BOC-MS, BOC-IC	Vent path established	MAAP
XD	ADS	XD-TOPDPV	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, ML-L, SL-L, SL-S, BOC-MS, BOC-FDWA, BOC-FDWB, BOC-IC, BOC-RWCU, RVR	4/8 DPVs	MAAP
XI	ADS inhibit	XI-TOPINH	AT-T-GEN, AT-T-FDW, AT-T-LOPP, AT-T-SW, AT-T-IORV, AT-LOCA	Automatic Inhibition Actuation	Design
XM	Manual Depressurization	XM-TOPXMAN	T-GEN, T-FDW, T-SW, T-LOPP, T-IORV, SL-S, SL-L, BOC-MS, BOC-FDWB, BOC-IC	5/10 SRVs	MAAP

### 3.4 EVENT TREE SEQUENCE DESCRIPTIONS

#### 3.4.1 General Transient Event Tree (T-GEN)

##### *3.4.1.1 Sequence Description*

Turbine or reactor trips are the most frequent initiating events at nuclear power plants. In these events, the Feedwater System and the Power Conversion System (PCS) are initially available.

Immediately following the trip, a scram signal is generated to initiate control rod insertion. The failure to insert control rods is transferred to an ATWS event tree.

If the PCS remains available, it provides both the short-term and long-term core cooling functions. In the case of PCS failure, the Isolation Condenser (IC) function is initiated by conditions such as high reactor pressure or low water level in the reactor pressure vessel (RPV). For cases that lead to low reactor water level, Main Steam Line Isolation Valve (MSIV) closure occurs. The IC function is sufficient to perform the short-term and long-term core cooling functions. Cooling water that is supplied by the upper pools for ICS and Passive Containment cooling System (PCCS) must be replenished in about 72 hours due to boil-off from the passive heat exchangers. The event trees assume that long-term makeup to the pools is always required since the time available is slightly less than 72 hours when ICS is used, and slightly greater than 72 hours whenever PCCS is used.

If the IC function fails, the pressure in the reactor rises until one or more Safety Relief Valves (SRV) open on their pressure setpoint. Steam is relieved to the suppression pool and makeup water is required to maintain level in the RPV. At this point in the sequence, the reactor pressure remains high and either Feedwater (FDW) or the Control Rod Drive (CRD) system in high pressure injection mode can provide adequate flow to the core. CRD initiates automatically on low water level. CRD Isolation Bypass initiates automatically if a GDACS actuation signal is received, but GDACS injection failure is detected. If either of these systems is successful, adequate core cooling is assured.

In the case of failure of at least one SRV to open and relieve high RPV pressure, the situation is assumed to be a Reactor Vessel Rupture (RVR), and it is transferred to the RVR event tree.

If the high pressure injection systems fail to maintain adequate water level in the RPV, depressurization of the RPV is required so that low pressure injection systems can operate. This can occur either manually using SRVs as directed by plant procedures, or automatically by the Automatic Depressurization System (ADS).

Manual depressurization is successful if at least 5 SRVs are opened to reduce RPV pressure enough to allow for injection from either the Fuel and Auxiliary Pool Cooling System (FAPCS) in the low pressure coolant injection (LPCI) mode, or the Dedicated LPCI Backup in the injection mode. Both have the capability to successfully perform the coolant makeup function for the short and long term. Condensate pumps could also be used to inject water to the vessel. However, because of their dependence with both PCS and Feedwater, which are already resolved as failed in these sequence paths, the condensate pumps are conservatively not credited as a separate low pressure injection source. If the operators fail to manually depressurize the RPV, it will automatically depressurize (ADS) on a low RPV water level signal.

Then, either Gravity Driven Cooling System (GDSCS), LPCI or Dedicated LPCI Backup can provide inventory to the RPV.

When ADS is actuated, SRVs discharge to the suppression pool and DPVs open to relieve steam to the upper drywell, which is quenched in the suppression pool. The vacuum breakers open to equalize pressure between the wetwell airspace and the upper drywell to prevent containment damage. The vacuum breakers must, in turn, successfully close in order to maintain sufficient differential pressure for the PCCS venting function to occur. Failure of the opened vacuum breakers to reclose results in a failure of PCCS.

If the DPVs are open and the ICS heat exchangers fail to be isolated then hydrogen could accumulate and possibly damage the condensers. Failure to isolate ICS condensers is mitigated by RPV level control.

For the sequences in which LPCI or Dedicated LPCI Backup provide water injection, no further systems or actions are necessary to ensure long-term core cooling; however, long-term containment cooling (decay heat removal) is necessary to assure stable conditions. For the sequences where the water injection function is performed by GDSCS, the core will remain covered for more than 24 hours, however to preserve the state indefinitely without recovery of any of the active systems, containment heat removal is necessary.

The following methods satisfy the containment heat removal function:

- RWCU in shutdown cooling mode,
- PCCS,
- FAPCS in suppression pool cooling mode, and
- Containment venting.

It should be noted that venting the containment breaks the PCCS recirculation loop and continued injection by an external source is required.

### ***3.4.1.2 Event Sequences***

The General Transient event tree produces 21 sequences that end in a core damage end states or transfer to another event tree. Each core damage sequence is described below and is summarized in Table 3.4-1. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.1.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (T-GEN004a, T-GEN020, T- GEN021, T-GEN022, T-GEN051, T-GEN067)**

A transient initiates each of these sequences. After a successful scram, the power conversion system fails either due to loss of the condenser, circulating water, condensate, feedwater, or turbine bypass capability. Vessel level decreases, which causes the MSIVs to close and the ICs to actuate. If ICS is initially successful (T-GEN004a), make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, if CRD fails,

it is conservatively assumed that this sequence results in core damage. In the remaining sequences, the ICs fail to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. High pressure injection using either the Feedwater pumps or Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available. ADS actuates on low RPV level to allow GDCS and LPCI injection.

If ADS is successful, four of these sequences differ by the combinations of GDCS and LPCI failures, and whether manual depressurization was previously successful prior to ADS actuation. Ultimately, each sequence results in a loss of low pressure injection, and core damage.

Sequence T-GEN022 has successful manual depressurization with subsequent failure of LPCI so that vessel level lowers to Level 1, which actuates ADS. However, ADS fails resulting in failure to lower the reactor pressure sufficiently to allow GDCS injection. The failure to inject with GDCS causes the level to decrease and leads to core damage.

#### **3.4.1.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(T-GEN015, T-GEN017, T-GEN019, T-GEN027, T-GEN031, T-GEN035)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The sequences in this sub-class involve the failure of Isolation Condensers, which causes vessel pressure to increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Injection using Feedwater pumps or Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available.

RPV pressure is reduced by successful ADS actuation on Level 1 to allow low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- RWCU/Shutdown cooling,
- PCCS,
- Suppression pool cooling, and
- Containment venting.

It should be noted that RWCU/SDC is considered unavailable whenever the GDCS equalizing lines are open. When the GDCS equalizing lines are open, the RPV level settles below the RWCU/SDC suction line level.

The sequences differ in the timing and manner of low pressure injection, as described in the sub-groupings below:



- (1) GDCS injection and equalizing are successful but injection by LPCI and Dedicated LPCI Backup fail. (T-GEN015, T-GEN017, T-GEN019)
- (2) Manual depressurization fails, but ADS is successful. GDCS injection and equalizing are successful. (T-GEN027, T-GEN031, T-GEN035)

**Class 2-b: Containment Vented with Loss of Low Pressure Injection**

(T-GEN026, T-GEN030, T-GEN034)

Similar to Class 2-a, the power conversion system is unavailable. The Isolation Condensers are demanded on high reactor pressure and they fail, which causes vessel pressure to further increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Injection using Feedwater pumps or Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available.

In sequences T-GEN026, T-GEN030, and T-GEN034, manual depressurization fails, but vessel pressure is reduced by ADS. GDCS injection and equalizing are initially successful in maintaining vessel level. Long-term decay heat removal is lost due to the failure of Suppression Pool Cooling, and PCCS. As noted earlier, RWCU/SDC is unavailable when the GDCS lines are opened. The loss of all DHR requires venting the containment to prevent its failure. The containment is successfully vented; however, GDCS eventually fails due to failure of the recirculation loop, and loss of inventory when the containment is open. Finally, a failure to initiate low pressure injection using Dedicated LPCI Backup results in loss of all low pressure injection and subsequent core damage.

**3.4.1.2.3 High Pressure Core Damage with Containment Intact (Class III) End States: (T-GEN069)**

A transient initiates each of these sequences. After a successful scram, the power conversion system fails either due to loss of the condenser, circulating water, condensate, feedwater, or turbine bypass failure. Vessel level decreases, which causes the MSIVs to close. This actuates the Isolation Condensers, and they fail to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. Injection using Feedwater pumps or Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available.

Sequence T-GEN069 fails manual depressurization and ADS. The vessel level decreases due to loss of all injection, leading to core damage.

**3.4.1.2.4 Core Damage with Containment Bypass (Class V) End State: (T-GEN068)**

Sequence T-GEN068 results in a containment over-pressure failure. In this sequence, there is a loss of all high pressure injection, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is conservatively assumed to lead to core damage. The PRA model conservatively assumes that aligning or initiating injection after containment failure is not successful. However, if injection has been established prior to containment failure, injection is able to prevent core damage.

#### **3.4.1.2.5 ICS Isolation Transfers**

T-GEN021a and T-GEN067a transfer to T-ICSX1.

#### **3.4.1.2.6 Initiating Event Transfers**

Inadvertent Opening of a Relief Valve (IORV): (T-GEN070), T-GEN071

A transient-initiated sequence that challenges one, or more, SRVs with a failure to reseal. The behavior of these sequences follows the IORV event tree.

Reactor Vessel Rupture (RVR): (T-GEN072)

A transient-initiated sequence that requires over-pressure relief, but has a failure to open at least one SRV. This is assumed to lead the reactor vessel failure. The behavior of this sequence follows the RVR event tree.

Anticipated Transient Without Scram (ATWS): (T-GEN073)

A transient-initiated sequence that fails to scram, and is transferred to the AT-T-GEN event tree.

### **3.4.2 Loss of Feedwater Transient (T-FDW)**

#### ***3.4.2.1 Sequence Description***

A loss of Feedwater flow could occur from pump failures, operator errors, loss of instrument air or reactor system variables such as a high vessel water level trip signal. When Feedwater flow terminates, subcooling decreases, causing a reduction in core power level and pressure. As the core power level is reduced, the turbine steam flow starts to drop off because of the action of the pressure regulator in attempting to maintain pressure. Water level continues to drop, and the vessel level scram trip setpoint is reached. The reactor may have been scrammed previously if the initiating event involved a loss of the power generation buses. The vessel water level continues to drop to Level 2. At that time, ICS, CRD high pressure injection and closure of all MSIVs are actuated. In the case that CRD is unavailable for level control, the level can be maintained above the top of active fuel with the ICS as the primary success path.

The ICS design incorporates condensate reservoirs in each train. Upon ICS actuation, the reservoirs provide sufficient inventory to prevent RPV water level from reaching the ADS actuation setpoint after a loss of Feedwater.

If the water level is restored, the event tree proceeds in a similar manner to the general transient, except that PCS and FDW are not available. PCS is not available because the MSIVs close on water Level 2.

If ICS fails, then the ICS condensate reservoirs are not injected into the vessel, and the RPV water level reaches the ADS actuation setpoint.

If ADS successfully actuates, and the DW/WW vacuum breakers fail, the containment fails. However, CRD is able to keep the core covered since it was initiated prior to containment failure. If CRD fails, then core damage with containment bypass is assumed. If the DW/WW vacuum breakers are successful after ADS, and GDCS is successfully initiated the sequence proceeds the same as the general transient branch in which ADS is successful. If GDCS is not

successfully initiated, CRD, FAPCS in LPCI, and Dedicated LPCI Backup can be used to provide low pressure injection.

If the DPVs are open and the ICS heat exchangers fail to be isolated then hydrogen could accumulate and possibly damage the condensers. Failure to isolate ICS condensers is mitigated by RPV level control.

If ADS does not successfully actuate, after ICS failure CRD is able to keep the core covered. FAPCS in LPCI mode or Dedicated LPCI Backup can provide core cooling if manual depressurization using SRVs is successful in reducing reactor pressure.

The major differences between loss of feedwater and general transient accident sequences are:

- No PCS,
- No Feedwater injection, and
- ADS occurs earlier if ICS fails.

Each core damage sequence is described below and is summarized in Table 3.4-2. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

### ***3.4.2.2 Event Sequences***

The Loss of Feedwater event tree produces 16 sequences that end in core damage end states or transfers to other event trees. Each end state is described below.

#### **3.4.2.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (T-FDW003a, T-FDW033, T-FDW050, T-FDW060)**

A total and immediate loss of feedwater transient initiates each of these sequences. After a successful scram, the power conversion system is assumed to be failed due to the loss of feedwater. Vessel level decreases, which causes the MSIVs to close on Level 2. This actuates the Isolation Condensers. If ICS is initially successful (T-FDW003a), make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, if CRD fails, it is conservatively assumed that this sequence results in core damage. In the remaining sequences ICS fails to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. Injection using Control Rod Drive pumps is unavailable, and the RPV reaches Level 1.

In sequences T-FDW033 and T-FDW050, ADS actuates on Level 1 to allow low pressure injection. In sequence T-FDW060, ADS fails to actuate, but manual depressurization is successful. At this point, these three sequences involve combinations of FAPCS LPCI and Dedicated LPCI Backup failures that result in a loss of low pressure injection, and core damage.

#### **3.4.2.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection  
(T-FDW008, T-FDW012, T-FDW016)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDACS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The remaining sequences in this sub-class involve the failure of Isolation Condensers, which causes vessel pressure to increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Although injection using Control Rod Drive pumps may be available, it is assumed that CRD injection flow rate is insufficient to prevent reaching Level 1.

The other 3 sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow successful GDACS injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- (3) RWCU/Shutdown cooling,
- (4) PCCS,
- (5) Suppression pool cooling, and
- (6) Containment venting.

It should be noted that RWCU/SDC is considered unavailable whenever the GDACS equalizing lines are open. When the GDACS equalizing lines are open, the RPV level settles below the RWCU/SDC suction line level.

#### Class 2-b: Containment Vented with Loss of Low Pressure Injection

(T-FDW007, T-FDW011, T-FDW015)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage.

Similar to Class 2-a, the power conversion system is unavailable. The Isolation Condensers are demanded on high reactor pressure and they fail, which causes vessel pressure to further increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Although injection using Control Rod Drive pumps may be available, it is assumed that CRD injection flow rate is insufficient to prevent reaching Level 1.

In sequences T-FDW007, T-FDW011, and T-FDW015, GDACS is successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDACS because it maintains water level below the upper RWCU suction line elevation. The additional loss of suppression pool cooling and active low pressure injection when containment vent is successful leads to core damage.

#### **3.4.2.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (T-FDW061)**

A total and immediate loss of feedwater transient initiates this sequence. After a successful scram, the power conversion system is assumed to be failed due to the loss of feedwater. Vessel level decreases, which causes the MSIVs to close on Level 2. This actuates the Isolation Condensers, and they fail to operate, which causes vessel pressure to further increase. The SRVs

lift at their pressure setpoints to prevent vessel overpressure. ADS and manual depressurization fail to reduce pressure. The vessel level decreases due to loss of all injection, leading to core damage.

#### **3.4.2.2.4 Core Damage with Containment Bypass (Class V) End State: (T-FDW052)**

Sequence T-FDW052 results in a containment over-pressure failure. In this sequence, there is a loss of all high pressure injection, and the vacuum breakers fail after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage.

#### **3.4.2.2.5 ICS Isolation Transfers**

T-FDW050a transfers to T-ICSX1.

#### **3.4.2.2.6 Initiating Event Transfers**

Inadvertent Opening of a Relief Valve (IORV): (T-FDW062, T-FDW063)

A loss of feedwater transient-initiated sequence that challenges one, or more, SRVs with a failure to reseal. The behavior of these sequences follow the IORV event tree.

Reactor Vessel Rupture (RVR): (T-FDW064)

A loss of feedwater transient-initiated sequence that requires over-pressure relief, but has a failure to open at least one SRV. This is assumed to lead the reactor vessel failure. The behavior of this sequence follows the RVR event tree.

Anticipated Transient Without Scram (ATWS): (T-FDW065)

A loss of feedwater transient-initiated sequence that fails to scram, and is transferred to the AT-T-FDW event tree.

### **3.4.3 Loss of Preferred Power Transient (T-LOPP)**

#### ***3.4.3.1 Sequence Description***

The loss of the preferred power (T-LOPP) sequence of events is similar to the loss of feedwater. The discussion provided above relative to the loss of feedwater response remains applicable to the T-LOPP event tree. The modeling of the diesel generator is included in the AC power fault tree.

The event tree developed for the loss of feedwater is also valid for the loss of preferred power. After the initiating event, the sequences for T-LOPP are identical to the T-FDW sequences.

Each core damage sequence is described below and is summarized in Table 3.4-3. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.3.1.1 Station Blackout Events**

Loss of preferred offsite power and diesel generators are modeled in detail under the AC Power fault tree. The postulated station blackout (SBO) scenario involves a total loss of offsite power (both normal and alternate) and the failure of both diesel generators.

The ESBWR has 72-hour safety related batteries. Under the SBO scenario, the safety related batteries still supply DC power to perform safety related functions. This is different from the existing BWR plant designs, which typically have concerns on battery depletion in SBO scenarios. The ESBWR nonsafety-related batteries are sized for two hours. The functions supported by the nonsafety-related batteries do not require continued DC power supply. These functions typically occur right at the beginning of the SBO scenario (e.g., circuit breakers transfer to their alternate alignment.)

The ESBWR passive design is significantly different from the previous BWR designs in that the reactor core is not uncovered in transients due to the additional inventory of coolant above the core. Therefore, even under the unlikely scenario that all the passive systems have failed, the time to core uncover and time to core damage would be much longer than the traditional reactor designs. In addition, the 72-hour safety related batteries and the redundant passive systems would prevent the core uncover.

### ***3.4.3.2 Event Sequences***

The Loss of Preferred Power event tree produces 16 sequences that end in a core damage end state or a transfer to another event tree. Each end state is described below.

#### **3.4.3.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (T-LOPP003a, T-LOPP033, T-LOPP050, T-LOPP060)**

A loss of preferred power initiates each of these sequences. The motor-driven feedwater pumps trip on loss of AC power. After a successful scram, the power conversion system is assumed to be failed due to the loss of feedwater. Vessel level decreases, which causes the MSIVs to close on Level 2. This actuates the Isolation Condensers. If ICS is initially successful (T-LOPP003a), make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, if CRD fails, it is conservatively assumed that this sequence results in core damage. In the remaining sequences ICS fails to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. Injection using Control Rod Drive pumps is unavailable, and the RPV reaches Level 1.

In sequences T-LOPP033 and T-LOPP050, ADS actuates on Level 1 to allow low pressure injection. In sequence T-LOPP060, ADS fails to actuate, but manual depressurization is successful. At this point, these three sequences involve combinations of FAPCS LPCI and Dedicated LPCI Backup failures that result in a loss of low pressure injection, and core damage.

#### **3.4.3.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(T-LOPP008, T-LOPP012, T-LOPP016)

Similar to Class 1, feedwater and the power conversion system are unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only

GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The remaining sequences in this sub-class involve the failure of Isolation Condensers, which causes vessel pressure to increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Although injection using Control Rod Drive pumps may be available, it is assumed that CRD injection flow rate is insufficient to prevent reaching Level 1.

The other 3 sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow successful GDCS injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- RWCU/Shutdown cooling,
- PCCS,
- Suppression pool cooling, and
- Containment venting.

It should be noted that RWCU/SDC is considered unavailable whenever the GDCS equalizing lines are open. When the GDCS equalizing lines are open, the RPV level settles below the RWCU/SDC suction line level.

#### Class 2-b: Containment Vented with Loss of Low Pressure Injection

(T-LOPP007, T-LOPP011, T-LOPP015)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage.

Similar to Class 2-a, feedwater and the power conversion system are unavailable. The Isolation Condensers are demanded on high reactor pressure and they fail, which causes vessel pressure to further increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Although injection using Control Rod Drive pumps may be available, it is assumed that CRD injection flow rate is insufficient to prevent reaching Level 1.

In sequences T-LOPP007, T-LOPP011, T-LOPP015, GDCS is successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDCS because it maintains water level below the upper RWCU suction line elevation. The additional loss of suppression pool cooling and active low pressure injection when containment vent is successful leads to core damage.

#### **3.4.3.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (T-LOPP061)**

A loss of preferred power initiates this sequence. The motor-driven feedwater pumps trip on loss of AC power. After a successful scram, the power conversion system is assumed to be failed due to the loss of feedwater. Vessel level decreases, which causes the MSIVs to close on Level 2. This actuates the Isolation Condensers, and they fail to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. ADS

and manual depressurization fail to reduce pressure. The vessel level decreases due to loss of all injection, leading to core damage.

#### **3.4.3.2.4 Core Damage with Containment Bypass (Class V) End State: (T-LOPP052)**

Sequence T-LOPP052 results in a containment over-pressure failure. In this sequence, there is a loss of all high pressure injection, and the vacuum breakers fail after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage.

#### **3.4.3.2.5 ICS Isolation Transfers**

T-LOPP050a transfers to T-ICSX1.

#### **3.4.3.2.6 Initiating Event Transfers**

Inadvertent Opening of a Relief Valve (IORV): (T-LOPP062, T-LOPP063)

A loss of preferred power transient-initiated sequence that challenges one, or more, SRVs with a failure to reseal. The behaviors of these sequences follow the IORV event tree.

Reactor Vessel Rupture (RVR): (T-LOPP064)

A loss of preferred power transient-initiated sequence that requires over-pressure relief, but has a failure to open at least one SRV. This is assumed to lead the reactor vessel failure. The behavior of this sequence follows the RVR event tree.

Anticipated Transient Without Scram (ATWS): (T-LOPP065)

A loss of preferred power transient-initiated sequence that fails to scram. This sequence is transferred to the AT-T-LOPP event tree.

### **3.4.4 Loss of Service Water (T-SW)**

#### ***3.4.4.1 Sequence Description***

This initiating event produces the failure of the Reactor Closed Cooling Water System (RCCWS) and Turbine Building Closed Cooling Water (TCCW) systems. The event is similar to a loss of the Feedwater system, except:

- The timing of the loss of RCCWS and TCCWS is not immediate because of the residual heat absorption available in these two systems.
- Feedwater is not lost immediately.
- Additional systems that fail following a loss of all service water are RWCU/SDC, FAPCS (LPCI and Suppression Pool Cooling), and CRD.

Each core damage sequence is described below and is summarized in Table 3.4-4. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### ***3.4.4.2 Event Sequences***

The Loss of Service Water Transient event tree produces 21 sequences that end in a core damage end state, or transfer to another event tree. Each end state is described below.



#### **3.4.4.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States (T-SW009, T-SW010, T-SW011, T-SW029, T-SW037)**

A loss of Plant Service Water results in a transient due to loss of component cooling in the power conversion system. After a successful scram, vessel level decreases, which causes the MSIVs to close on Level 2. This actuates the Isolation Condensers, and they fail to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. Feedwater pumps and Control Rod Drive pumps are not available for high pressure injection due to loss of cooling. The vessel is at high pressure and is losing inventory through the SRVs. ADS actuates on Level 1 to allow low pressure injection.

In sequences T-SW009 and T-SW010, reactor pressure is initially reduced by manual depressurization; however, the Dedicated LPCI Backup system fails and, ADS actuates when vessel level reaches Level 1. In this reduced pressure condition, a failure of the vacuum breakers to open would not result in containment failure. Finally, failure of either GDCS injection or GDCS equalization leads to core damage.

Sequence T-SW011 has successful manual depressurization with subsequent failure of the Dedicated LPCI Backup system so that vessel level lowers to Level 1, which actuates ADS. However, ADS fails and the vessel level decreases due to loss of all injection, leading to core damage.

In sequences T-SW029 and T-SW037, manual depressurization with SRV fails and, ADS actuates when vessel level reaches Level 1. Similar to the sequences above, failure of either GDCS injection or GDCS equalization, and failure of Dedicated LPCI Backup injection lead to core damage.

#### **3.4.4.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(T-SW002, T-SW006, T-SW007, T-SW008, T-SW015, T-SW018, T-SW021)

This sub-class involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

Similar to Class 1, a loss of Plant Service Water results in a transient due to loss of component cooling in the power conversion system. After a successful scram, vessel level decreases, which causes the MSIVs to close on Level 2.

Sequence T-SW002 has successful Isolation Condenser operation, with subsequent failure of PCCS due to loss of pool cooling makeup. Shutdown and suppression pool cooling are unavailable to remove long-term decay heat, which leads to core damage.

The remaining sequences in this sub-class involve the failure of Isolation Condensers, which causes vessel pressure to increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Feedwater pumps and Control Rod Drive pumps are not available for injection due to loss of cooling. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available.

In sequences T-SW006, T-SW007, and T-SW008, manual depressurization is successful; however, Dedicated LPCI Backup injection fails, causing RPV water level to decrease to the ADS setpoint. After successful ADS, GDCS injection and equalize modes are successful. Long-term containment heat removal fails, leading to core damage.

In sequences T-SW015, T-SW018, and T-SW021 RPV pressure is reduced by successful ADS actuation to allow low pressure injection. GDCS injection and equalizing are initially successful in maintaining vessel level. Loss of service water causes failure of long-term decay heat removal Suppression Pool Cooling. RWCU/SDC is not available when the GDCS lines are opened, or when service water is lost. Finally, each of these sequences includes loss of decay heat removal by failure of PCCS and Containment venting. The complete loss of all DHR causes containment failure. GDCS eventually fails due to failure of the recirculation loop, and loss of inventory when the containment fails and core damage. The PRA model conservatively assumes that aligning or initiating injection after containment failure is not successful.

#### Class 2-b: Containment Vented with Loss of Low Pressure Injection

(T-SW014, T-SW017, T-SW020)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage.

Similar to Class 2-a, feedwater, CRD and the power conversion system are unavailable. The Isolation Condensers are demanded on high reactor pressure and they fail, which causes vessel pressure to further increase and the SRVs to lift at their pressure setpoints to prevent vessel overpressure. Since high pressure injection sources are not available, the RPV level drops and reaches Level 1.

In sequences T-SW014, T-SW017, T-SW020, manual depressurization with the SRV fails, but GDCS is initially successful after ADS; however, shutdown cooling is unavailable when the GDCS equalizing lines open. RWCU and suppression pool cooling are inoperable due to loss of component cooling. The loss of all DHR requires venting the containment to prevent its failure. The containment is successfully vented; however, GDCS eventually fails due to failure of the recirculation loop, and loss of inventory when the containment is open. The additional loss of active low pressure injection (Dedicated LPCI Backup) when containment vent is successful leads core damage.

#### 3.4.4.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (T-SW-039)

A loss of service water initiates each of this sequence. The motor-driven feedwater pumps, and the CRD pumps, trip on loss of pump cooling. After a successful scram, the power conversion system is assumed to be failed due to the loss of feedwater. Vessel level decreases, which causes the MSIVs to close on Level 2. This actuates the Isolation Condensers, and they fail to operate, which causes vessel pressure to further increase. The SRVs lift at their pressure setpoints to prevent vessel overpressure. ADS and manual depressurization fail to reduce pressure. The vessel level decreases due to loss of all injection, leading to core damage.

#### 3.4.4.2.4 Core Damage with Containment Bypass (Class V) End State: (T-SW038)

After a successful scram, the power conversion system is unavailable. The Isolation Condensers have failed. The Control Rod Drive pumps are unavailable due to loss of component cooling.

The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available. In this sequence, failure of the vacuum breakers to open following ADS is assumed to lead to core damage with a containment bypass.

#### **3.4.4.2.5 ICS Isolation Transfers**

T-SW010a and T-SW037a transfer to T-ICSX1.

#### **3.4.4.2.6 Initiating Event Transfers:**

Inadvertent Opening of a Relief Valve (IORV): (T-SW040, T-SW041)

A loss of service water transient-initiated sequence that challenges one, or more, SRVs with a failure to reseal. The behavior of these sequences follow the IORV event tree.

Reactor Vessel Rupture (RVR): (T-SW042)

A loss of service water transient-initiated sequence that requires over-pressure relief, but has a failure to open at least one SRV. This is assumed to lead the reactor vessel failure. The behavior of this sequence follows the RVR event tree.

Anticipated Transient Without Scram (ATWS): (T-SW043)

A loss of service water transient-initiated sequence that fails to scram. This sequence is transferred to the AT-T-SW event tree.

### **3.4.5 Inadvertent Opening of a Relief Valve Transient (T-IORV)**

#### ***3.4.5.1 Sequence Description***

The inadvertent opening of a relief valve at power produces the need for a reactor trip when the temperature in the suppression pool increases above the allowed limit. For this initiating event, the Power Conversion System (QT) and Isolation Condenser (MW) functions are unavailable and the MS function (SRV lift to prevent RPV overpressure) is not required.

The functions required to mitigate the events included in this group are the same as those following the General Transient, except that the QT, MW and MS top gates are removed from the event tree. Additionally, the XM heading (manual depressurization) only requires 4 SRVs in this case. For simplification, the same success criterion of 5 SRVs, as described in T-GEN, is used.

#### ***3.4.5.2 Event Sequences***

The T-IORV event tree produces 17 sequences that end in a core damage end state or transfer to another event tree. Each core damage sequence is described below and is summarized in Table 3.4-5. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

##### **3.4.5.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (T-IORV016, T-IORV017, T-IORV018, T-IORV047, T-IORV063, T-IORV065)**

An inadvertent opening of a relief valve transient initiates each of these sequences. After a successful scram, the power conversion system is assumed to be unavailable. Vessel level

decreases, which causes the MSIVs to close. In these sequences, it is assumed that the ICs fail to operate, which causes vessel pressure to further increase. High pressure injection using either the Feedwater pumps or Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available.

In sequences T-IORV016 and T-IORV017, manual depressurization is successful, but low pressure injection (FAPCS and Dedicated LPCI Backup) fails. ADS actuates on low RPV level to reduce pressure to allow low pressure injection by GDCS. However, GDCS early or late low pressure injection fails to provide adequate inventory, leading to core damage.

Sequence T-IORV018 has successful manual depressurization with subsequent failure of LPCI so that vessel level lowers to Level 1, which actuates ADS. However, ADS fails and the vessel level decreases due to loss of all injection, leading to core damage.

In sequences T-IORV047 and T-IORV063, ADS actuates on low RPV level because manual depressurization had previously failed. In combination with failure of all low pressure injection, the core eventually uncovers and leads to core damage.

An inadvertent opening of a relief valve transient initiates sequence T-IORV065. After a successful scram, the power conversion system and ICS are unavailable. Vessel level decreases, which causes the MSIVs to close. The SRVs lift at their pressure setpoints to prevent vessel overpressure. Injection using Feedwater pumps or Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the SRVs with no high pressure make-up available. Failure to depressurize the RPV by manual or automatic means leads to high pressure core damage. However, the RPV pressure is low at the time of vessel rupture as a result of the inadvertent opened relief valve.

#### **3.4.5.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(T-IORV011, T-IORV013, T-IORV015, T-IORV023, T-IORV027, T-IORV031,)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The first 6 sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- RWCU/Shutdown cooling,
- PCCS,
- Suppression pool cooling, and
- Containment venting with low pressure make-up source (e.g., Dedicated LPCI Backup).

It should be noted that RWCU/SDC is considered unavailable whenever the GDCS equalizing lines are open. When the GDCS equalizing lines are open, the RPV level settles below the RWCU/SDC suction line level.

The sequences differ in the timing and manner of low pressure injection, as described in the sub-groupings below:

- (5) GDCS injection and equalizing are successful. Because the Dedicated LPCI Backup system has failed in these sequences, containment venting is not demanded. (T-IORV011, T-IORV013, T-IORV015)
- (6) GDCS injection and equalizing are successful. While Dedicated LPCI Backup may be available in these sequences, core damage is assumed since decay heat removal including containment venting fails when demanded. T-IORV023, T-IORV027, T-IORV031)

These differences in the timing and amount of make-up inventory affect the timing of containment overpressurization and also the timing of core uncover.

**Class 2-b: Containment Vented with Loss of Low Pressure Injection**

(T-IORV022, T-IORV026, T-IORV030)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage.

Similar to Class 2-a, the power conversion system is unavailable. Vessel pressure increases and the SRVs lift at their pressure setpoints to prevent vessel overpressure.

In sequences T-IORV022, T-IORV026, and T-IORV030, GDCS injection and equalize modes are successful after ADS; however, the additional loss of suppression pool cooling and active low pressure injection when containment vent is successful leads to core damage.

#### **3.4.5.2.3 Core Damage with Containment Bypass (Class V) End State: (T-IORV064)**

Sequence T-IORV064 also, results in a containment overpressure failure. In this sequence, there is a loss of all high pressure injection similar to the above sequences, and the vacuum breakers fail after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage.

#### **3.4.5.2.4 ICS Isolation Transfers**

T-IORV017a and T-IORV063a transfer to T-ICSX1.

#### **3.4.5.2.5 Initiating Event Transfers**

Anticipated Transient Without Scram (ATWS): (T-IORV066)

A transient, initiated by an inadvertent opening of a relief valve, with a failure to scram. This sequence is transferred to the AT-T-IORV event tree.

### 3.4.6 Large Steam LOCA (LL-S)

#### 3.4.6.1 Sequence Description

A large steam LOCA is an event leading to a rapid loss of coolant, resulting in a rapid consequential depressurization, such that no emergency depressurization is required in order to permit the low pressure injection systems, including GDCS, to inject.

Immediately following the break, there is a drop in the RPV water level. The FDW system attempts to maintain the water level in the vessel, but the system automatically isolates on high drywell pressure. CRD automatically injects at RPV Level 2, but it isolates on high drywell pressure combined with high lower drywell water level. The GDCS automatically initiates on low RPV level with the vessel depressurized, and GDCS and the equalizing lines are sufficient to provide core cooling. If GDCS injection fails, the CRD Isolation Bypass logic automatically opens the bypass valves, and CRD can maintain the RPV level. If the CRD Isolation Bypass is unavailable, FAPCS or Dedicated LPCI Backup injection can be manually actuated after defeating automatic isolation. If the RPV is depressurized and the ICS heat exchangers fail to be isolated then hydrogen could accumulate and possibly damage the condensers. Failure to isolate ICS condensers is mitigated by RPV level control.

Because the RPV is at low pressure, operability of the injection system components is not impaired, given the pump head and containment ultimate capability. When the core is cooled with GDCS, core cooling requires that the LOCA blowdown energy be dissipated by the condensation of the steam that passes through the vents to the suppression pool. If the vapor suppression function is successful, the decay heat removal is accomplished by PCCS, by natural convection and steam condensation. One FAPCS system train can also accomplish the long-term heat removal. Finally, if all other heat removal systems fail, the containment vent can be initiated to reduce the pressure in the containment. The Dedicated LPCI Backup system is required for makeup after venting when GDCS is used.

#### 3.4.6.2 Event Sequences

The LL-S event tree produces 10 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-6. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

##### 3.4.6.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (LL-S016, LL-S020)

A large LOCA initiates each of these sequences. The steam is quenched in the suppression pool, which requires the drywell to wetwell vacuum breakers to open and equalize pressure.

In sequence LL-S016, GDCS injection is successful, but GDCS equalizing, LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

In sequence LL-S020, GDCS injection fails, HPCRDI Isolation Bypass, LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

Containment Failure prior to Late Core Damage (Class II) End States

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(LL-S005, LL-S009, LL-S013)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDACS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

GDACS injection and equalize modes are successful; however, each of these sequences includes loss of decay heat removal by failure of long term suppression pool cooling and containment venting.

Class 2-b: Containment Vented with Loss of Low Pressure Injection

( LL-S004, LL-S008, LL-S012)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. In sequences LL-S004, LL-S008, and LL-S012, GDACS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDACS because it maintains water level below the upper RWCU suction line elevation. In these sequences either the vacuum breakers fail to maintain a pressure differential between the drywell and wetwell or short or long term PCCS failures occur. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to core damage.

#### **3.4.6.2.2 Core Damage Due to ATWS Sequences (Class IV) End State: (LL-S022)**

Sequence LL-S022 involves a LOCA and a failure to scram. This sequence is assumed to lead to core damage.

#### **3.4.6.2.3 Core Damage with Containment Bypass (Class V) End State: (LL-S021)**

Sequence LL-S021 results in a containment overpressure failure. In this sequence, there is a large steam LOCA, a successful scram, but the vacuum breakers fail. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage.

#### **3.4.6.2.4 ICS Isolation Transfers**

LL-S020a transfers to T-ICSX1.

### **3.4.7 Large Steam LOCA in FDW Line A (LL-S-FDWA)**

#### ***3.4.7.1 Sequence Description***

The sequence of events subsequent to the initiating event is the similar as those described in large steam LOCAs (LL-S). Therefore, the event tree developed for large steam LOCAs is also valid for this initiating event, except that the functions that use the FAPCS line to FDW line A, i.e., Dedicated LPCI Backup (VM), LPCI (VL), and RWCU/SDC (WR) are removed due to the failure of FDW line A and manual CRD isolation bypass is used as an external makeup source

for sequences where venting is successful. The FDW is assumed failed and/or isolated for a large break in either FDW line.

### **3.4.7.2 Event Sequences**

The LL-S-FDWA event tree produces 10 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-7. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.7.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (LL-S-FDWA015, LL-S-FDWA017)**

A large LOCA in feedwater line A initiates each of these sequences. The steam is quenched in the suppression pool, which requires the drywell to wetwell vacuum breakers to open and equalize pressure.

In sequence LL-FDWA015, GDCS injection is successful, but GDCS equalizing, and manual HPCRD Isolation Bypass fail to maintain RPV water level, leading to core damage.

In sequence LL-FDWA017, GDCS injection fails, and automatic HPCRD Isolation Bypass, fail to maintain RPV water level, leading to core damage.

#### **3.4.7.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(LL-S-FDWA005, LL-S-FDWA009, LL-S-FDWA013)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. Although the Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures, it can not be credited since the break occurs in FDW Line A. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

GDCS injection and equalizing are successful; however, each of these sequences includes loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting.

Class 2-b: Containment Vented with Loss of Low Pressure Injection

(LL-S-FDWA004, LL-S-FDWA008, LL-S-FDWA 012)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. In sequences LL-S-FDWA004, LL-S-FDWA008, and LL-S-FDWA 012, GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDCS because it maintains water level below the upper RWCU suction



line elevation. In these sequences either the vacuum breakers fail to maintain a pressure differential between the drywell and wetwell or short or long term PCCS failures occur. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to core damage.

#### **3.4.7.2.3 Core Damage Due to ATWS Sequences (Class IV) End State: (LL-S-FDWA019)**

Sequence LL-S-FDWA019 involves a LOCA and a failure to scram. This sequence is assumed to lead directly to core damage.

#### **3.4.7.2.4 Core Damage with Containment Bypass (Class V) End State: (LL-S-FDWA018)**

Sequence LL-S-FDWA018 results in a containment overpressure failure. In this sequence, there is a large steam LOCA in feedwater line A, a successful scram, but the vacuum breakers and CRD injection fail. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage.

#### **3.4.7.2.5 ICS Isolation Transfers**

LL-S-FDWA017a transfers to T-ICSX1.

### **3.4.8 Large Steam LOCA in FDW Line B (LL-S-FDWB)**

#### ***3.4.8.1 Sequence Description***

The sequence of events after the initiating event is the same as described in large steam LOCAs (LL-S). Therefore, the event tree developed for large steam LOCAs is also valid for this initiating event, except that the UD headings are not applicable due to the failure of the line B of the FDW and the failure of CRD injection, which injects into FDW line B. The FDW is assumed failed and/or isolated for a large break in either FDW line.

#### ***3.4.8.2 Event Sequences***

The LL-S-FDWB event tree produces 10 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-8. The table includes a listing of failed and successful top events to help illustrate each sequence of events

##### **3.4.8.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (LL-S-FDWB029, LL-S-FDWB045)**

A large LOCA initiates each of these sequences. The steam is quenched in the suppression pool, which requires the drywell to wetwell vacuum breakers to open and equalize pressure.

In sequences LL-S-FDWB029 and LL-S-FDWB045, GDCS, FAPCS LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

##### **3.4.8.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection  
(LL-S-FDWB005, LL-S-FDWB009, LL-S-FDWB013)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDACS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

GDACS injection and equalize modes are successful; however, each of these sequences includes loss of decay heat removal by failure of PCCS, suppression pool cooling, and containment venting.

Class 2-b: Containment Vented with Loss of Low Pressure Injection

(LL-S-FDWB004, LL-S-FDWB008, LL-S-FDWB012)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage.

In sequences LL-S-FDWB004, LL-S-FDWB008, and LL-S-FDWB012, GDACS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDACS because it maintains water level below the upper RWCU suction line elevation. In these sequences either the vacuum breakers fail to maintain a pressure differential between the drywell and wetwell or short or long term PCCS failures occur. The additional loss of suppression pool cooling and active low pressure injection when containment vent is successful, leads to core damage.

#### **3.4.8.2.3 Core Damage Due to ATWS Sequences (Class IV) End State: (LL-S-FDWB047)**

Sequence LL-S-FDWB047 involves a LOCA and a failure to scram. This sequence is assumed to lead directly to core damage.

#### **3.4.8.2.4 Core Damage with Containment Bypass (Class V) End State: (LL-S-FDWB046)**

Sequence LL-S-FDWB046 results in a containment overpressure failure. In this sequence, there is a large steam LOCA in feedwater line B, a successful scram, but the vacuum breakers fail. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage.

#### **3.4.8.2.5 ICS Isolation Transfers**

LL-S-FWB045a transfers to T-ICSX1.

### **3.4.9 Medium Liquid LOCA (ML-L)**

#### ***3.4.9.1 Sequence Description***

The flow rate at reactor pressure for a medium break liquid LOCA is greater than the CRD makeup capacity, and FDW is isolated due to high drywell pressure. Depressurization is needed for GDACS injection to prevent core uncover. It is assumed that FAPCS in the LPCI injection mode, which takes suction from the suppression pool, is lost on suppression pool low water level, before the level of water outside the vessel can maintain the core covered. Therefore, FAPCS in the suppression pool cooling mode is not available in those cases. Due to water level

in the vessel being below Level 3, the upper suction line to RWCU/SDC is not available. Therefore, it is assumed that shutdown cooling is not available.

### **3.4.9.2 Event Sequences**

The ML-L event tree produces 12 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-9. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.9.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: ( ML-L015, ML-L017, ML-L019)**

A medium liquid LOCA initiates each of these sequences. The steam is quenched in the suppression pool, which requires the drywell to wetwell vacuum breakers to open and equalize pressure. In sequences ML-L015 and ML-L017, ADS is successful; however, failure of GDACS and Dedicated LPCI Backup injection leads to core damage. In sequence ML-L019, automatic depressurization with the DPVs fails, manual depressurization using the SRVs is successful, but failure of the Dedicated LPCI Backup system leads to core damage.

#### **3.4.9.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(ML-L005, ML-L009, ML-L013)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDACS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

GDACS injection and equalizing are successful; however, each of these sequences includes loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting

Class 2-b: Containment Vented with Loss of Low Pressure Injection

(ML-L004, ML-L008, ML-L012)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage.

In sequences ML-L004, ML-L008, and ML-L012, GDACS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDACS because it maintains water level below the upper RWCU suction line elevation. In these sequences either the vacuum breakers fail to maintain a pressure differential between the drywell and wetwell or short or long term

PCCS failures occur. The additional loss of suppression pool cooling and active low pressure injection when containment vent is successful, leads to core damage.

#### **3.4.9.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: ( ML-L020)**

In this sequence, feedwater is isolated on high drywell pressure signal, CRD is isolated and not capable to makeup the inventory losses and the ADS setpoint is reached. ADS fails to actuate or the DPVs fail to open and manual depressurization using the SRV fails, so there low pressure injection is not available and core damage follows.

#### **3.4.9.2.4 Core Damage Due to ATWS Sequences (Class IV) End State: (ML-L022)**

Sequence ML-L022 involves a medium LOCA and a failure to scram. This sequence is assumed to lead directly to core damage.

#### **3.4.9.2.5 Core Damage with Containment Bypass (Class V) End State: ( ML-L021)**

After a successful scram, the vessel is at high pressure and is losing inventory through the break. In this sequence, failure of the vacuum breakers to open is assumed to lead to core damage with a containment bypass.

#### **3.4.9.2.6 ICS Isolation Transfers**

ML-L017a transfers to T-ICSX1.

### **3.4.10 Small Steam LOCA (SL-S)**

#### ***3.4.10.1 Sequence Description***

A small steam LOCA is an event where RPV water level is decreasing while RPV pressure is reducing, but at a slower rate, such that depressurization is required in order to permit the low pressure injection systems to inject. This group includes both the medium and small LOCA group included in Section 2, “Initiating Events”. These are combined because the mitigating responses are the same for both and can be managed in the same event tree.

#### ***3.4.10.2 Event Sequences***

The SL-S event tree produces 12 sequences that end with a core damage end state. One end state requires a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-10. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.10.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: ( SL-S019, SL-S023, SL-S028)**

A small break LOCA in a line above Level 3 initiates each of these sequences. After a successful scram, the power conversion system is assumed to be unavailable. Vessel level decreases, drywell pressure increases, and the MSIVs close. In these sequences, it is assumed that the ICs fail to operate. The Feedwater system isolates on high drywell pressure, CRD is unable to turn the RPV level before reaching the ADS setpoint.

In the following three sequences where ICS is assumed to be unavailable and not required to mitigate the pressure transient, but makeup is needed due to the small break LOCA. A low RPV level, or high drywell pressure condition is present, and either the DPVs open to reduce reactor pressure and allow low pressure injection by GDCS, or manual operation of the SRVs is required to allow injection by LPCI and Dedicated LPCI Backup.

In sequence SL-S019, GDCS injection is successful, but GDCS equalizing, LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

In sequence SL-S023, GDCS injection fails, HPCRDI Isolation Bypass, LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

In Sequence SL-S028, ADS fails resulting in failure to lower the reactor pressure sufficiently to allow GDCS injection. Manual depressurization using the SRVs is successful, but HPCRDI Isolation Bypass, LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

#### **3.4.10.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection  
(SL-S006, SL-S011, SL-S016)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- RWCU/Shutdown cooling,
- PCCS,
- Suppression pool cooling, and
- Containment venting

(7) It should be noted that RWCU/SDC is considered unavailable whenever the GDCS equalizing lines are open. When the GDCS equalizing lines are open, the RPV level settles below the RWCU/SDC suction line level.

Class 2-b: Containment Vented with Loss of Low Pressure Injection  
(SL-S005, SL-S010, SL-S015)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. Similar to Class 2-a, the power conversion system is unavailable.

In sequences SL-S005, SL-S010, and SL-S015, GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when

RPV water level is controlled by the equalize mode of GDSCS because it maintains water level below the upper RWCU suction line elevation. In these sequences either the vacuum breakers fail to maintain a pressure differential between the drywell and wetwell or short or long term PCCS failures occur. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to core damage

#### **3.4.10.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: ( SL-S030)**

A small break LOCA in a line above Level 3 initiates each of these sequences. After a successful scram, the power conversion system is assumed to be unavailable. Vessel level decreases, drywell pressure increases, and the MSIVs close. The Feedwater system isolates on high drywell pressure, and CRD is assumed to isolate after reaching the ADS setpoint.. The vessel is at high pressure and is losing inventory through the break with no high pressure make-up available. Failure to depressurize the RPV by manual or automatic means and failure of HPCRD Isolation Bypass after a GDSCS signal leads to high pressure core damage.

#### **3.4.10.2.4 Core Damage with Containment Bypass (Class V) End State: ( SL-S024)**

After a successful scram, the vessel is at high pressure and is losing inventory through the break. The Feedwater system isolates on high drywell pressure, and CRD is assumed to isolate after reaching the ADS setpoint. ADS is successful and the DPVs open. Failure of the vacuum breakers to open after ADS leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage with containment bypass.

#### **3.4.10.2.5 ICS Isolation Transfers**

SL-S023a transfers to T-ICSX1.

#### **3.4.10.2.6 Initiating Event Transfers**

Anticipated Transient Without Scram (ATWS): ( SL-S031)

A small steam LOCA, with a failure to scram transfers to the AT-T-LOCA event tree.

### **3.4.11 Small Liquid LOCA (SL-L)**

#### ***3.4.11.1 Sequence Description***

A small liquid LOCA is an event where RPV water level is decreasing while RPV pressure is reducing, but at a slower rate, such that depressurization is required in order to permit the low pressure injection systems to inject. In some cases, RPV pressure may still increase such that SRVs lift to prevent vessel overpressurization. All of the functions required to mitigate the events included in this group, except for the power conversion system, are the same as those following the General Transient. Because PCS is initially failed, top event QT is removed from the event tree. The small liquid LOCA results in isolation of Feedwater and CRD so RPV depressurization is required even if ICS mitigates the pressure transient and adds its limited inventory to the vessel.

### **3.4.11.2 Event Sequences**

The SL-L event tree produces 24 sequences that end with a core damage end state. Two end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-11. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.11.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: ( SL-L020, SL-L024, SL-L029, SL-L051, SL-L055, SL-L060)**

A small break LOCA in a line below Level 3 initiates each of these sequences. After a successful scram, the power conversion system is assumed to be unavailable. Vessel level decreases, drywell pressure increases, and the MSIVs close. The small liquid LOCA results in isolation of Feedwater and CRD so RPV depressurization is required even if ICS mitigates the pressure transient and adds its limited inventory to the vessel. The vessel is at high pressure and is losing inventory through the break with no high-pressure make-up available.

In the following three sequences where ICS mitigates the pressure transient, but makeup is needed due to the small break LOCA. A low RPV level, or high drywell pressure condition is present, and either the DPVs open to reduce reactor pressure and allow low pressure injection by GDCS, or manual operation of the SRVs is required to allow injection by LPCI and Dedicated LPCI Backup.

In sequence SL-L020, GDCS injection is successful, but GDCS equalizing, FAPCS LPCI, Dedicated LPCI Backup, and Manual CRD Isolation Bypass fail to maintain RPV water level, leading to core damage.

In sequence SL-L024, GDCS injection fails, HPCRD Isolation Bypass, FAPCS LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

In Sequence SL-S029, ADS fails resulting in failure to lower the reactor pressure sufficiently to allow GDCS injection. Manual depressurization using the SRVs is successful, but HPCRD Isolation Bypass, FAPCS LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

In the following three sequences where ICS fails, but the SRVs are successful in controlling the pressure transient and makeup is needed due to the small break LOCA. A low RPV level, or high drywell pressure condition is present, and either the DPVs open to reduce reactor pressure and allow low pressure injection by GDCS, or manual operation of the SRVs is required to allow injection by LPCI and Dedicated LPCI Backup.

In sequence SL-L051, GDCS injection is successful, but GDCS equalizing, FAPCS LPCI, Dedicated LPCI Backup, and Manual CRD Isolation Bypass fail to maintain RPV water level, leading to core damage.

In sequence SL-L055, GDCS injection fails, HPCRD Isolation Bypass, FAPCS LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

In Sequence SL-L060, ADS fails resulting in failure to lower the reactor pressure sufficiently to allow GDCS injection. Manual depressurization using the SRVs is successful, but HPCRD Isolation Bypass, FAPCS LPCI and Dedicated LPCI Backup fail to maintain RPV water level, leading to core damage.

### 3.4.11.2.2 Containment Failure prior to Late Core Damage (Class II) End States

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(SL-L006, SL-L011, SL-L016, SL-L037, SL-L042, SL-L047)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The 6 sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- RWCU/Shutdown cooling,
- PCCS,
- Suppression pool cooling, and
- Containment venting.

It should be noted that RWCU/SDC is considered unavailable whenever the GDCS equalizing lines are open. When the GDCS equalizing lines are open, the RPV level settles below the RWCU/SDC suction line level.

Class 2-b: Containment Vented with Loss of Low Pressure Injection

( SL-L005, SL-L010, SL-L015, SL-L036, SL-L041, SL-L046)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. Similar to Class 2-a, the power conversion system is unavailable.

In these sequences, GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDCS because it maintains water level below the upper RWCU suction line elevation. In these sequences either the vacuum breakers fail to maintain a pressure differential between the drywell and wetwell or short or long term PCCS failures occur. The additional loss of suppression pool cooling and active low pressure injection, or manual HPCRDI Isolation Bypass, when containment vent is successful, leads to core damage.

### 3.4.11.2.3 *High Pressure Core Damage with Containment Intact (Class III) End State: ( SL-L031, SL-L062)*

After a successful scram, the power conversion system is assumed to be unavailable. Vessel level decreases, drywell pressure increases, and the MSIVs close. The Feedwater system isolates on high drywell pressure, and CRD isolates on high drywell pressure combined with high lower drywell water level. The vessel is at high pressure and is losing inventory through the break with no high pressure make-up available. Failure to depressurize the RPV by manual or automatic means and failure of HPCRDI Isolation Bypass after a GDCS signal leads to high pressure core damage.



#### **3.4.11.2.4 Core Damage with Containment Bypass (Class V) End State: ( SL-L025, SL-L056)**

After a successful scram, the vessel is at high pressure and is losing inventory through the break. The Feedwater system isolates on high drywell pressure, and CRD isolates on high drywell pressure combined with high lower drywell water level. After reaching the ADS setpoint. ADS is successful and the DPVs open. Failure of the vacuum breakers to open after ADS leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. These sequences are assumed to lead to core damage with containment bypass.

#### **3.4.11.2.5 ICS Isolation Transfers**

SL-L024a and SL-L055a transfer to T-ICSX1.

#### **3.4.11.2.6 Initiating Event Transfers**

Anticipated Transient Without Scram (ATWS): ( SL-L064)

A small steam LOCA with a failure to scram transfers to the AT-T-LOCA event tree.

Reactor Vessel Rupture (RVR): ( SL-L063)

A small liquid LOCA sequence that requires over-pressure relief, but has a failure to open at least one SRV is assumed to lead the reactor vessel failure. The behavior of this sequence follows the RVR event tree.

### **3.4.12 Reactor Vessel Rupture (RVR)**

#### **3.4.12.1 Sequence Description**

A Reactor Vessel Rupture (RVR) is postulated as an event leading to a rapid depressurization and a loss of coolant through a large break in the RPV.

For this initiating event, it is considered that no active high pressure or low pressure system is able to compensate for the inventory lost through the break and maintain the level in the reactor above RPV Level 1 before core damage. Only injection by the GDSCS injection and equalize modes together can provide an amount of water quickly and with enough volume to allow the level of water outside the vessel to maintain the core covered. If the RPV is depressurized and the ICS heat exchangers fail to be isolated then hydrogen could accumulate and possibly damage the condensers. Failure to isolate ICS condensers is mitigated by RPV level control.

#### **3.4.12.2 Event Sequences**

The RVR event tree produces 10 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-12. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

##### **3.4.12.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (RVR-014, RVR-015)**

A reactor vessel rupture initiates these sequences. The steam is quenched in the suppression pool, which requires the drywell to wetwell vacuum breakers to open and equalize pressure. In both sequences there is insufficient GDSCS available to prevent core damage.

#### **3.4.12.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection  
(RVR005, RVR009, RVR013)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDACS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

GDACS injection and equalizing are successful; however, each of these sequences includes loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting.

Class 2-b: Containment Vented with Loss of Low Pressure Injection  
(RVR-004, RVR-008, RVR-012)

This sub-class involves successful venting of the containment with insufficient low pressure injection, and subsequent core damage.

#### **3.4.12.2.3 Core Damage with Containment Bypass (Class V) End States: (RVR-016, RVR-017)**

In sequence RVR-016, RPV rupture occurs, and the drywell to wetwell vacuum breakers fail to suppress containment pressure. This sequence is assumed to result in core damage with containment bypass.

In sequence RVR-017, RPV rupture occurs, and the control rods fail to insert. This sequence is assumed to result in core damage with containment bypass.

#### **3.4.12.2.4 ICS Isolation Transfers**

RVR-014a transfers to T-ICSX4.

### **3.4.13 Break Outside Containment in Main Steam Line (BOC-MS)**

#### ***3.4.13.1 Sequence Description***

Immediately following a break in a Main Steam line, there is a drop in the RPV pressure and an isolation signal is sent to the MSIVs to close. In the case of successful isolation, the scenario develops into a general transient (T-GEN). If the isolation fails, this event behaves similar to an inadvertent opening of a relief valve, except that short-term core damage sequences are Class V, (containment bypass) sequences. Top event "I ML" is included for isolating the break, before the CR heading.

### **3.4.13.2 Event Sequences**

The BOC-MS event tree produces 18 sequences that end in a core damage end state or a transfer to another event tree. Each core damage sequence is described below and is summarized in Table 3.4-13. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.13.2.1 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(BOC-MS011, BOC-MS014, BOC-MS017, BOC-MS026, BOC-MS030, BOC-MS034)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of long-term decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The 6 sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting with low pressure make-up source (e.g., Dedicated LPCI Backup).

The sequences differ in the timing and manner of low pressure injection, as described in the sub-groupings below:

- (8) GDCS injection and equalizing are successful. Because Dedicated LPCI Backup is unavailable in these sequences, containment venting is not demanded. (BOC-MS011, BOC-MS014, BOC-MS017)
- (9) GDCS injection and equalizing are successful. While Dedicated LPCI Backup may be available in these sequences, core damage is assumed since decay heat removal including containment venting fails when demanded. (BOC-MS026, BOC-MS030, BOC-MS034)

Class 2-b: Containment Vented with Loss of Low Pressure Injection

(BOC-MS025, BOC-MS029, BOC-MS033)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. Similar to Class 2-a, the power conversion system is unavailable.

In sequences BOC-MS025, BOC-MS029, and BOC-MS033, GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDCS because it maintains water level below the upper RWCU suction line elevation. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to core damage.

#### **3.4.13.2.2 Core Damage with Containment Bypass (Class V) End State: (BOC-MS067)**

Sequence BOC-MS067 involves a failure to isolate the break and a failure of the control rods to insert. The combination of an ATWS with an unisolated break is assumed to lead to core damage. This sequence is classified as containment bypass since this scenario leads to unmitigated releases.

#### **3.4.13.2.3 Core Damage with Containment Bypass (Class V) End State: (BOC-MS019, BOC-MS020, BOC-MS021, BOC-MS049, BOC-MS064, BOC-MS065, BOC-MS066)**

Sequences BOC-MS019, BOC-MS020 and BOC-MS021 involve failure of high pressure injection, with successful depressurization. Core damage occurs due to failure of low pressure injection from GDCS, LPCI and Dedicated LPCI Backup. Failure to isolate the break results in containment bypass sequences.

In sequences BOC-MS049 and BOC-MS064, ADS actuates on low RPV level to reduce pressure to allow low pressure injection. However, low pressure injection fails to provide adequate inventory, leading to core damage. The break is not isolated, therefore, these are containment bypass sequences.

Sequence BOC-MS065 results in a containment overpressure failure. In this sequence, there is a loss of all high pressure injection, and the vacuum breakers fail after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage with a containment bypass.

In sequence BOC-MS066 there is a loss of high pressure injection and a failure to depressurize. Loss of RPV level leads to core damage at high pressure, with containment bypass.

#### **3.4.13.2.4 ICS Isolation Transfers**

BOC-MS020a transfers to T-ICSX2.

#### **3.4.13.2.5 Initiating Event Transfers**

Transfer to General Transient (T-GEN): (BOC-MS001)

Upon successful MSIV closure, a transient induced by a Main Steam Line break outside of containment behaves like a generic transient.

### **3.4.14 Break Outside Containment in FDW Line A (BOC-FDWA)**

#### ***3.4.14.1 Sequence Description***

A line break outside containment in FDW Line A, or interfacing system LOCA could affect the functioning of RWCU and FAPCS lines that connect to the line. Therefore, it is assumed that RWCU shutdown cooling, FAPCS LPCI, and Dedicated LPCI Backup injection are not available. In addition, containment venting is assumed to be ineffective because low pressure injection from LPCI or Dedicated LPCI Backup are unavailable to maintain RPV water level. Short-term core damage sequences with isolation failure are considered to be Class V, (containment bypass) sequences. Top event "IA" is included for isolating the break, before the CR heading.

### **3.4.14.2 Event Sequences**

The BOC-FDWA event tree produces 17 sequences that end in a core damage end state or a transfer to another event tree. Each core damage sequence is described below and is summarized in Table 3.4-14. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.14.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (BOC-FDWA020, BOC-FDWA027)**

A Feedwater A Line break initiates each of these sequences. After a successful scram, and feedwater line isolation, the power conversion system is assumed to be unavailable. Vessel level decreases, drywell pressure increases, and the MSIVs close. In these sequences the ICs fail to operate. High pressure injection using Control Rod Drive pumps is also unsuccessful. The vessel is at high pressure and is losing inventory through the break with no high pressure make-up available.

In sequences BOC-FDWA020 and BOC-FDWA027, ADS actuates on low RPV level to reduce pressure to allow low pressure injection. However, low pressure injection fails to provide adequate inventory by GDCS, leading to core damage.

#### **3.4.14.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(BOC-FDWA015, BOC-FDWA017, BOC-FDWA019, BOC-FDWA035, BOC-FDWA037, BOC-FDWA039, and BOC-FDWA001a)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. . If only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The 6 sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of PCCS and suppression pool cooling.

The sequences differ in the timing and manner of low pressure injection, as described in the sub-groupings below:

- (10) FDW Line A is isolated and GDCS injection and equalizing are successful. Because Dedicated LPCI Backup is unavailable, containment venting is not demanded. (BOC-FDWA015, BOC-FDWA017, BOC-FDWA019)
- (11) FDW Line A is not automatically isolated and GDCS injection and equalizing are successful. Because Dedicated LPCI Backup is unavailable, containment venting is not demanded. (BOC-FDWA035, BOC-FDWA037, BOC-FDWA039)

These differences in the timing and amount of make-up inventory affect the timing of containment overpressurization and also the timing of core uncover.

In addition to the 6 sequences in this sub-class, BOC-FDWA001a is conservatively treated as Class IIa sequence. The break outside containment in the feedwater line is successfully isolated. ICS is initially successful, but make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, this sequence is not a dominant contributor to risk and CRD is not credited as a late injection recovery, and it is conservatively assumed that this sequence results in core damage.

#### **3.4.14.2.3 High RPV Pressure at the time of Core Damage (Class III) End State: (BOC-FDWA029)**

In this sequence, ICS and CRD injection fail. Although the line break is isolated, the failure of ADS to depressurize leads high pressure to core damage.

#### **3.4.14.2.4 Core Damage with Containment Bypass (Class V) End State: (BOC-FDWA028, BOC-FDWA040, BOC-FDWA047, BOC-FDWA048, BOC-FDWA049, BOC-FDWA050)**

In sequence BOC-FDWA028 the Feedwater line break is successfully isolated; however CRD injection is assumed to be unavailable. Upon successful ADS, the vacuum breakers fail to open, which leads to core damage with containment failure.

Sequences BOC-FDWA040 and BOC-FDWA047 involve failure of high pressure injection, with successful depressurization. Core damage occurs due to failure of low pressure injection from GDSCS. Failure to isolate the break results in containment bypass sequences.

Sequence BOC-FDWA048 results in a containment overpressure failure. In this sequence, the line break is not isolated. There is a loss of all high pressure injection, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage with a containment bypass.

In sequence BOC-FDWA049 the line break is not isolated. There is a loss of high pressure injection and a failure to depressurize. Loss of RPV level leads to core damage at high pressure, with containment bypass.

Sequence BOC-FDWA050 involves a failure to isolate the break and a failure of the control rods to insert. The combination of an ATWS with an unisolated break is assumed to lead to core damage.

#### **3.4.14.2.5 ICS Isolation Transfers**

BOC-FDWA027a and BOC-FDWA047a transfer to T-ICSX1 and T-ICSX2, respectively.

#### **3.4.14.2.6 Initiating Event Transfers**

Transfer Reactor Vessel Rupture (RVR): (BOC-FDWA030)

In this sequence, the line break is isolated. Failure of ICS and failure of at least one SRV to lift lead to RPV overpressurization.

Transfer to ATWS (AT-T-FDW): (BOC-FDWA031)

A transient initiated by line break that is successfully isolated leads to an ATWS due to failure of control rods to insert.

### **3.4.15 Break Outside Containment in FDW Line B (BOC-FDWB)**

#### ***3.4.15.1 Sequence Description***

A line break in FDW Line B is assumed to disable all FDW injection, and it also affects the functioning of CRD injection line that connects to the line. Therefore, it is assumed that CRD injection is not available. RWCU shutdown cooling is assumed to be unavailable due to the possibility that a steam break outside containment could cause an RWCU isolation. Short-term core damage sequences with isolation failure are considered to be Class V, (containment bypass) sequences. Top event “IB” is included for isolating the break, before the CR heading.

#### ***3.4.15.2 Event Sequences***

The BOC-FDWB event tree produces 26 sequences that end with a core damage end state. Two end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-15. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

##### **3.4.15.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (BOC-FDWB019, BOC-FDWB021, BOC-FDWB020, BOC-FDWB036, BOC-FDWB053)**

A break in feedwater line B initiates these sequences. After a successful scram, and feedwater line isolation, the power conversion system is assumed to be unavailable. The line break is successfully isolated. Vessel level decreases, drywell pressure increases, and the MSIVs close. In these sequences, the ICs fail to operate. There is no high pressure injection using the Control Rod Drive pumps in these sequences. The vessel is at high pressure and is losing inventory through the break. If ADS is successful, it actuates on low RPV level to reduce pressure to allow low pressure injection. However, in these sequences low pressure injection fails to provide adequate inventory, leading to core damage.

Sequence BOC-FDWB021 has successful manual depressurization with subsequent failure of LPCI so that vessel level lowers to Level 1, which actuates ADS. However, ADS fails resulting in failure to lower the reactor pressure sufficiently to allow GDCS injection. The failure to inject with GDCS causes the level to decrease and leads to core damage.

##### **3.4.15.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(BOC-FDWB012, BOC-FDWB014, BOC-FDWB017, BOC-FDWB026, BOC-FDWB030, BOC-FDWB034, BOC-FDWB061, BOC-FDWB065, BOC-FDWB069 and BOC-FDWB001a)

Similar to Class 1, the power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The 9 sequences in this sub-class reduce pressure by successful ADS actuation to allow low pressure injection by GDCS, and loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting.

The sequences differ in the timing and manner of low pressure injection, as described in the sub-groupings below:

- (12) The line break is successfully isolated, but FAPCS LPCI and Dedicated LPCI Backup fail. However, GDCS injection and equalizing are successful. Because Dedicated LPCI Backup is unavailable in these sequences, containment venting is not demanded. (BOC-FDWB012, BOC-FDWB014, BOC-FDWB017)
- (13) The line break is successfully isolated, but SRV manual depressurization fails. However, GDCS injection and equalizing are successful. (BOC-FDWB026, BOC-FDWB030, BOC-FDWB034)
- (14) The line break is not isolated, GDCS injection and equalizing are successful. (BOC-FDWB061, BOC-FDWB065, BOC-FDWB069)

These differences in the timing and amount of make-up inventory affect the timing of containment overpressurization and also the timing of core uncover.

In addition to the 9 sequences in this sub-class, BOC-FDWB001a is conservatively treated as Class IIa sequence. The break outside containment in the feedwater line is successfully isolated. ICS is initially successful, but make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, this sequence is not a dominant contributor to risk and CRD is not credited as a late injection recovery, and it is conservatively assumed that this sequence results in core damage.

#### Class 2-b: Containment Vented with Loss of Low Pressure Injection

(BOC-FDWB025, BOC-FDWB029, BOC-FDWB033, BOC-FDWB060, BOC-FDWB064, BOC-FDWB068)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. Similar to Class 2-a, the power conversion system is unavailable.

In sequences BOC-FDWB025, BOC-FDWB029, and BOC-FDWB033, the break is isolated, and GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDCS because it maintains water level below the upper RWCU suction line elevation. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to core damage.

In sequences BOC-FDWB060, BOC-FDWB064, and BOC-FDWB068, the break is not isolated. GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is



unavailable. RWCU is inoperable when RPV water level is controlled by the equalize mode of GDSCS because it maintains water level below the upper RWCU suction line elevation. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to core damage.

#### **3.4.15.2.3 High RPV Pressure at the time of Core Damage (Class III) End State: (BOC-FDWB054)**

The break is successfully isolated in this sequence. However, failure of ICS and depressurization leads to high pressure core damage.

#### **3.4.15.2.4 Core Damage with Containment Bypass (Class V) End State: (BOC-FDW053a, BOC-FDWB086, BOC-FDWB103, BOC-FDWB104, BOC-FDWB105, BOC-FDWB106)**

In sequence BOC-FDWB053a, the break is isolated. The RPV is depressurized; however, the vacuum breakers fail to reclose, which leads to containment failure and assumed core damage.

In sequence BOC-FDWB086 and BOC-FDWB103, the break is not isolated. Depressurization is successful; however, failure of adequate low pressure injection leads to core damage with a containment bypass.

In sequence BOC-FDWB104, the break is not isolated. The RPV is depressurized; however, the vacuum breakers fail to reclose, which leads to containment failure and assumed core damage.

In sequence BOC-FDWB105, RPV depressurization fails, which leads to core damage with containment bypass.

Sequence BOC-FDWB106 involves a failure to isolate the break and a failure of the control rods to insert. The combination of an ATWS with an unisolated break is assumed to lead to core damage.

#### **3.4.15.2.5 ICS Isolation Transfers**

BOC-FDWB020a and BOC-FDWB053x transfer to T-ICSX1, and BOC-FDWB103a transfers to T-ICSX2.

#### **3.4.15.2.6 Initiating Event Transfers**

Transfer Reactor Vessel Rupture (RVR): (BOC-FDWB055)

In this sequence, the line break is isolated. Failure of ICS and failure of at least one SRV to lift lead to RPV overpressurization.

Transfer to ATWS (AT-T-FDW): (BOC-FDWB056)

A transient initiated by line break that is successfully isolated leads to an ATWS due to failure of control rods to insert.

### **3.4.16 Break Outside Containment in RWCU/SDC Line (BOC-RWCU)**

#### ***3.4.16.1 Sequence Description***

An isolation signal is sent to the RWCU/SDC valves to close, immediately following the line break. In the case of successful automatic isolation, this scenario develops to a General Transient with the WR function failed. Top event "IR" is included for automatic isolation of the

break, before the CR heading, and top event IM is included for manual isolation of the break. In the cases when automatic isolation fails, depressurization is still required to allow for low pressure injection. Decay heat removal is still required to maintain containment integrity and prevent core damage. It is also assumed, that manual isolation is required for all sequences that have initial low pressure injection.

### **3.4.16.2 Event Sequences**

The BOC-RWCU event tree produces 17 sequences that end in a core damage end state or a transfer to another event tree. Each core damage sequence is described below and is summarized in Table 3.4-16. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.16.2.1 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(BOC-RWCU 006, BOC-RWCU 010, BOC-RWCU 014)

Sub-class 2-a involves loss of long-term decay heat removal, with subsequent core damage. The RWCU line fails to automatically isolate, but is successfully isolated manually. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDSCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

The sequences in this sub-class reduce pressure by successful ADS actuation on Level 1 to allow successful GDSCS injection and equalize modes. Finally, each of these sequences includes loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting.

Class 2-b: Containment Vented with Loss of Low Pressure Injection

(BOC-RWCU005, BOC-RWCU009, BOC-RWCU013)

This sub-class involves successful venting of the containment with loss of low pressure injection, and subsequent core damage. The RWCU line fails to automatically isolate but, is successfully isolated manually. In sequences BOC-RWCU005, BOC-RWCU009, and BOC-RWCU013, GDSCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, leads to long-term containment failure.

#### **3.4.16.2.2 Core Damage with Containment Bypass (Class V) End State: (BOC-RWCU015, BOC-RWCU029, BOC-RWCU031, BOC-RWCU032, BOC-RWCU046, BOC-RWCU048, BOC-RWCU049, BOC-RWCU050, BOC-RWCU051, BOC-RWCU 052)**

Sequences BOC-RWCU015, BOC-RWCU029 and BOC-RWCU031 assume failure of high pressure injection, with successful depressurization. Low pressure injection is initially available.

However, failure to isolate the break manually results in core damage and containment bypass sequences.

In sequence BOC-RWCU032, the line is not isolated and GDCS injection is successful after depressurization. However, subsequent failure of GDCS equalize, LPCI, and Dedicated LPCI Backup lead to core damage with a bypassed containment.

In sequences BOC-RWCU046, and BOC-RWCU048, ADS actuates on low RPV level to reduce pressure to allow low pressure injection. GDCS low pressure injection fails, but LPCI or Dedicated LPCI Backup is initially available to provide adequate inventory. However, failure to manually isolate the break is assumed to lead to core damage and containment bypass.

In sequence BOC-RWCU049, the line is not isolated and GDCS injection fails after depressurization. Subsequent failure LPCI, and Dedicated LPCI Backup lead to core damage with a bypassed containment.

Sequence BOC-RWCU050 results in a containment overpressure failure. In this sequence, there is a loss of all high pressure injection, and the vacuum breakers fail after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is assumed to lead to core damage with a containment bypass.

In sequence BOC-RWCU051 there is a loss of high pressure injection and a failure to depressurize. Loss of RPV level leads to core damage at high pressure, with containment bypass.

Sequence BOC-RWCU052 involves a failure to isolate the break and a failure of the control rods to insert. The combination of an ATWS with an unisolated break is assumed to lead to core damage.

#### **3.4.16.2.3 ICS Isolation Transfers**

BOC-RWCU049a transfers to T-ICSX5.

#### **3.4.16.2.4 Initiating Event Transfers**

Transfer to General Transient (T-GEN): (BOC-RWCU001)

Upon successful isolation valve closure, a transient induced by an RWCU line break outside of containment behaves like a generic transient.

### **3.4.17 Break Outside Containment in IC Line (BOC-IC)**

#### **3.4.17.1 Sequence Description**

RPV pressure drops immediately following the break and an isolation signal is sent to the IC valves to close. In the case of successful isolation of the affected line, the scenario develops to a general transient with one IC train unavailable. If the isolation function fails, the containment is open and the sequence of events following this initiating event is similar to Main Steam line break sequences.

### **3.4.17.2 Event Sequences**

The BOC-IC event tree produces 17 sequences that end with a core damage end state. One end state requires a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-17. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.17.2.1 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(BOC-IC012, BOC-IC014, BOC-IC016, BOC-IC024, BOC-IC028, BOC-IC032)

The power conversion system is unavailable in all Class 2 sequences. Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. The Dedicated LPCI Backup system has been designed to allow injection at higher containment pressures to prevent core damage. However, if only GDCS is available DHR (PCCS or SPC) is also required. If all the decay heat removal systems fail, the containment pressure increases until the containment fails, and core damage is assumed to occur.

In these sequences, the line break fails to automatically isolate, and high pressure injection is unavailable. Successful ADS actuation on Level 1 allows low pressure injection. Finally, each of these sequences includes loss of decay heat removal by failure of:

- PCCS,
- Suppression pool cooling, and
- Containment venting.

The sequences differ in the timing and manner of low pressure injection, as described in the sub-groupings below:

- (15) GDCS injection and equalizing are successful. Because Dedicated LPCI Backup is unavailable in these sequences, containment venting is not demanded. (BOC-IC012, BOC-IC014, BOC-IC016)
- (16) GDCS injection and equalizing are successful. While Dedicated LPCI Backup may be available in these sequences, core damage is assumed since decay heat removal including containment venting fails when demanded. (BOC-IC024, BOC-IC028, BOC-IC032)

These differences in the timing and amount of make-up inventory affect the timing of containment overpressurization and also the timing of core uncover.

Class 2-b: Containment Vented with Loss of Low Pressure Injection

(BOC-IC023, BOC-IC027, BOC-IC031)

In sequences BOC-IC023, BOC-IC027, and BOC-IC031, GDCS injection and equalize modes are successful after ADS; however, shutdown cooling is unavailable. The additional loss of suppression pool cooling and active low pressure injection, when containment vent is successful, core damage.

#### **3.4.17.2.2 Core Damage with Containment Bypass (Class V) End State: (BOC-IC017, BOC-IC018, BOC-IC019, BOC-IC047, BOC-IC062, BOC-IC063, BOC-IC064, BOC-IC065)**

In sequences BOC-IC017 and BOC-IC018, the break is not isolated and high pressure injection fails. Depressurization is successful; however, failure of adequate low pressure injection leads to core damage with a containment bypass.

In sequences BOC-IC047 and BOC-IC062, the break is not isolated and high pressure injection fails. Manual depressurization fails, however, ADS is successful. Failure of adequate low pressure injection leads to core damage with a containment bypass.

In sequence BOC-IC063, the break is not isolated. The RPV is depressurized; however, either the vacuum breakers leak initially during blowdown or subsequently fail to open for vacuum relief, which leads to containment failure and assumed core damage.

In sequence BOC-IC019 and BOC-IC064, RPV depressurization fails, which leads to core damage with containment bypass.

Sequence BOC-IC065 involves a failure to isolate the break and a failure of the control rods to insert. The combination of an ATWS with an unisolated break is assumed to lead to core damage.

#### **3.4.17.2.3 ICS Isolation Transfers**

BOC-IC018a and BOC-IC062a transfer to T-ICSX2.

#### **3.4.17.2.4 Initiating Event Transfers**

Transfer General Transient (T-GEN): (BOC-IC001)

A break in an ICS line outside of containment that successfully isolates is treated like a general transient.

### **3.4.18 ATWS Event Tree (AT-T-GEN)**

#### ***3.4.18.1 Sequence Description***

ATWS sequences are initiated by an event in which there is a failure of either the hydraulic or electrical control rod insertion functions. To mitigate an ATWS condition, sodium pentaborate, in sufficient quantity to achieve subcriticality, is injected into the reactor core region by the Standby Liquid Control System (SLCS). SLCS is activated automatically on high RPV pressure or an RPV Level 2 signal in combination with a Source Range Neutron Monitoring permissive (SRNM) not downscale signal lasting for 3 minutes.

In addition to SLCS injection, Feedwater runback and ADS inhibit functions are used to control reactivity. FDW runback reduces the power by affecting natural circulation. ADS inhibit allows adequate reactor pressure to maintain RPV water level control. The ADS inhibit signal is sealed in. Under these conditions, power generation is reduced within the cooling capability of IC and/or CRD until SLCS injection is completed.

ADS inhibit also prevents uncontrolled reactor depressurization and the subsequent GDSCS injection which could lead to boron washing out of the RPV. It is assumed that without ADS inhibit the resulting boron dilution causes recriticality.

Following an ATWS with the PCS remaining available, RPV overpressure protection is provided by the actuation of three possible systems: SRV, turbine bypass (Power Conversion System), or ICS.

With successful SLCS injection, core cooling can be performed: (1) by ICS if all the valves that are open also close correctly, (2) by the FDW or CRD with the heat removal by the FAPCS in the cooling mode; or, (3) by RWCU/SDC if isolation signals are inhibited and the filters are bypassed. In case of failure of high pressure systems, core damage is assumed because the reactor is depressurized, and reactivity control is not credited in preventing core damage because of the potential for boron dilution.

The long term heat removal function is similar to that for transients except that no credit is taken for PCCS, because ATWS mitigation is not carried out at low pressure, as discussed earlier. The preferred source for residual heat removal is FAPCS, because in ATWS situations the RWCU/SDC is automatically isolated. Nevertheless, if FAPCS fails, the isolation signal can be overridden and the filters bypassed to provide shutdown cooling.

It should be noted that in the transient event trees, successful injection with a high pressure makeup system is considered a stable safe state. For ATWS scenarios the PRA model assumes that high pressure injection is necessary to prevent core damage. However, since ATWS scenarios involve higher initial energies that may threaten containment integrity, the model assumes that decay heat removal systems, excluding PCCS, are required when high pressure injection is successful.

### ***3.4.18.2 Event Sequences***

The AT-T-GEN event tree produces 11 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-18. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.18.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (AT-T-GEN003a, AT-T-GEN021)**

A transient initiates each of these sequences. Reactor scram fails but feedwater runback and SLC, and ADS inhibit are successful. Vessel level decreases, which causes the MSIVs to close and the ICs to actuate. If ICS is initially successful (AT-T-GEN003a), make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, if CRD fails, it is conservatively assumed that this sequence results in core damage.

In sequence AT-T-GEN021, feedwater and CRD injection fail. There is no high pressure injection available for power/level control and core damage follows. However, since this sequence involves failure to reclose a SRV, the reactor pressure decreases significantly prior to RPV failure.

#### **3.4.18.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(AT-T-GEN007, AT-T-GEN011, AT-T-GEN016, AT-T-GEN020)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. Feedwater runback is successful in reducing core power level. ADS is successfully inhibited, and SLCS injection is successful. As discussed earlier, a high pressure system, and a decay heat removal system are required for ATWS scenarios.

Each of these sequences includes loss of decay heat removal by failure of:

- RWCU Shutdown cooling,
- Suppression pool cooling, and
- Containment venting.

The sequences differ in the timing and manner of RPV water level control by ICS, Feedwater, and CRD injection.

#### **3.4.18.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (AT-T-GEN012)**

In this sequence, feedwater and CRD injection fail. There is no high pressure injection available for power/level control and core damage follows.

#### **3.4.18.2.4 Core Damage Due to ATWS Sequences (Class IV) End State: (AT-T-GEN023, AT-T-GEN024, AT-T-GEN025, AT-T-GEN026)**

Sequence AT-T-GEN023 involves failure of SLCS. This sequence is assumed to lead to core damage.

Sequence AT-T-GEN024 involves a failure to inhibit ADS. It is assumed that the RPV is depressurized by ADS when ADS inhibit fails, and the vacuum breakers are successful. This sequence is assumed to lead to core damage.

Sequence AT-T-GEN025 involves an RPV overpressurization due to an insufficient number of SRVs lifting. This sequence is assumed to lead to core damage.

Sequence AT-T-GEN026 involves failure of the Feedwater runback function. This sequence is assumed to lead to core damage.

#### **3.4.18.2.5 Core Damage with Containment Bypass (Class V)End State: (AT-T-GEN024a)**

Sequence AT-T-GEN024a results in a containment over-pressure failure. In this sequence, there is failure to inhibit ADS, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is conservatively assumed to lead to core damage with containment bypass.

### **3.4.19 ATWS Transfer from Loss of FDW Transient Event Tree (AT-T-FDW)**

#### ***3.4.19.1 Sequence Description***

ATWS sequences are initiated by an event in which there is a failure of either the hydraulic or electrical control rod insertion functions. To mitigate an ATWS condition, sodium pentaborate,

in sufficient quantity to achieve subcriticality, is injected into the reactor core region by the Standby Liquid Control System (SLCS). SLCS is activated automatically on high RPV pressure or an RPV Level 2 signal in combination with a Source Range Neutron Monitoring permissive (SRNM) not downscale signal lasting for 3 minutes.

In addition to SLCS injection, Feedwater runback and ADS inhibit functions are used to control reactivity. However, in a loss of feedwater transient, automatic FDW runback is not necessary. ADS inhibit allows adequate reactor pressure to maintain RPV water level control. The ADS inhibit signal is sealed in. Under these conditions, power generation is reduced within the cooling capability of IC and/or CRD until SLCS injection is completed.

It should be noted that in the transient event trees, successful injection with a high pressure makeup system is considered a stable safe state. For ATWS scenarios the PRA model assumes that high pressure injection is necessary to prevent core damage. However, since ATWS scenarios involve higher initial energies that may threaten containment integrity, the model assumes that decay heat removal systems, excluding PCCS, are required when high pressure injection is successful.

### ***3.4.19.2 Event Sequences***

The AT-T-FDW event tree produces 8 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-19. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.19.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (AT-T-FDW003a, AT-T-FDW013)**

A loss of feedwater transient initiates each of these sequences. Reactor scram fails, but SLC and ADS inhibit are successful. Vessel level decreases, which causes the MSIVs to close and the ICs to actuate. If ICS is initially successful (AT-T-FDW003a), make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, if CRD fails, it is conservatively assumed that this sequence results in core damage.

In sequence AT-T-FDW013, CRD injection fails. There is no high pressure injection available for power/level control and core damage follows. However, since this sequence involves failure to reclose a SRV, the reactor pressure decreases significantly prior to RPV failure.

#### **3.4.19.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection

(AT-T-FDW007, AT-T-FDW012)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. ADS is successfully inhibited, and SLCS injection is successful. As discussed earlier, a high pressure system, and a decay heat removal system are required for ATWS scenarios.



Each of these sequences includes loss of decay heat removal by failure of:

- RWCU Shutdown cooling,
- Suppression pool cooling, and
- Containment venting.

The sequences differ in the timing and manner of RPV water level control by ICS and CRD injection.

#### **3.4.19.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (AT-T-FDW008)**

In this sequence CRD injection fails. There is no injection available and core damage follows.

#### **3.4.19.2.4 Core Damage Due to ATWS Sequences (Class IV) End State: (AT-T-FDW015, AT-T-FDW016, AT-T-FDW017)**

Sequence AT-T-FDW015 involves failure of SLCS. This sequence is assumed to lead to core damage.

Sequence AT-T-FDW016 involves a failure to inhibit ADS. It is assumed that the RPV is depressurized by ADS when ADS inhibit fails, and the vacuum breakers are successful. This sequence is assumed to lead to core damage.

Sequence AT-T-FDW017 involves an RPV overpressurization due to an insufficient number of SRVs lifting. This sequence is assumed to lead to core damage.

#### **3.4.19.2.5 Core Damage with Containment Bypass (Class V) End State: (AT-T-FDW016a)**

Sequence AT-T-FDW016a results in a containment over-pressure failure. In this sequence, there is failure to inhibit ADS, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is conservatively assumed to lead to core damage with containment bypass.

### **3.4.20 ATWS Transfer from Loss of Preferred Power Event Tree (AT-T-LOPP)**

#### ***3.4.20.1 Sequence Description***

ATWS sequences are initiated by an event in which there is a failure of either the hydraulic or electrical control rod insertion functions. To mitigate an ATWS condition, sodium pentaborate, in sufficient quantity to achieve subcriticality, is injected into the reactor core region by the Standby Liquid Control System (SLCS). SLCS is activated automatically on high RPV pressure or an RPV Level 2 signal in combination with a Source Range Neutron Monitoring permissive (SRNM) not downscale signal lasting for 3 minutes.

In addition to SLCS injection, Feedwater runback and ADS inhibit functions are used to control reactivity. However, in a loss of preferred power transient, feedwater pumps trip, and thus, automatic FDW runback is not necessary. ADS inhibit allows adequate reactor pressure to maintain RPV water level control. The ADS inhibit signal is sealed in. Under these conditions,

power generation is reduced within the cooling capability of IC and/or CRD until SLCS injection is completed.

It should be noted that in the transient event trees, successful injection with a high pressure makeup system is considered a stable safe state. For ATWS scenarios the PRA model assumes that high pressure injection is necessary to prevent core damage. However, since ATWS scenarios involve higher initial energies that may threaten containment integrity, the model assumes that decay heat removal systems, excluding PCCS, are required when high pressure injection is successful.

### ***3.4.20.2 Event Sequences***

The AT-T-LOPP event tree produces 8 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-20. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.20.2.1 Low Pressure Core Damage with Containment Intact (Class I) End States: (AT-T-LOPP003a, AT-T-LOPP013)**

A loss of preferred power transient initiates each of these sequences. Reactor scram fails, but SLC and ADS inhibit are successful. Vessel level decreases, which causes the MSIVs to close and the ICs to actuate. If ICS is initially successful (AT-T-LOPP003a), make-up to the ICS/PCCS pools or other long-term decay removal system is needed. If the long-term decay heat removal fails, containment fails an external source of injection is required. There is substantial time and systems available to mitigate core damage in this sequence, so CRD may be used to maintain RPV level after the failure of ICS long-term heat removal has occurred. However, if CRD fails, it is conservatively assumed that this sequence results in core damage.

In sequence AT-T-LOPP013, CRD injection fails. There is no high pressure injection available for power/level control and core damage follows. However, since this sequence involves failure to reclose a SRV, the reactor pressure decreases significantly prior to RPV failure.

#### **3.4.20.2.2 Containment Failure prior to Late Core Damage (Class II) End States Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection (AT-T-LOPP003, AT-T-LOPP007, AT-T-LOPP012)**

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. ADS is successfully inhibited, and SLCS injection is successful. As discussed earlier, a high pressure system, and a decay heat removal system are required for ATWS scenarios.

Each of these sequences includes loss of decay heat removal by failure of:

- RWCU Shutdown cooling,
- Suppression pool cooling, and
- Containment venting.

The sequences differ in the timing and manner of RPV water level control by ICS and CRD injection.

#### **3.4.20.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (AT-T-LOPP008)**

In this sequence CRD injection fails. There is no injection available and core damage follows.

#### **3.4.20.2.4 Core Damage Due to ATWS Sequences (Class IV) End State: (AT-T-LOPP015, AT-T-LOPP016, AT-T-LOPP017)**

Sequence AT-T-LOPP015 involves failure of SLCS. This sequence is assumed to lead to core damage.

Sequence AT-T-LOPP016 involves a failure to inhibit ADS. It is assumed that RPV is depressurized by ADS when ADS inhibit fails, and the vacuum breakers are successful. This sequence is assumed to lead to core damage.

Sequence AT-T-LOPP017 involves an RPV overpressurization due to an insufficient number of SRVs lifting. This sequence is assumed to lead to core damage.

#### **3.4.20.2.5 Core Damage with Containment Bypass (Class V) End State: (AT-T-LOPP016a)**

Sequence AT-T-LOPP016a results in a containment over-pressure failure. In this sequence, there is failure to inhibit ADS, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is conservatively assumed to lead to core damage with containment bypass.

### **3.4.21 ATWS Transfer from Loss of Service Water Event Tree (AT-T-SW)**

#### ***3.4.21.1 Sequence Description***

ATWS sequences are initiated by an event in which there is a failure of either the hydraulic or electrical control rod insertion functions. To mitigate an ATWS condition, sodium pentaborate, in sufficient quantity to achieve subcriticality, is injected into the reactor core region by the Standby Liquid Control System (SLCS). SLCS is activated automatically on high RPV pressure or an RPV Level 2 signal in combination with a Source Range Neutron Monitoring permissive (SRNM) not downscale signal lasting for 3 minutes.

In addition to SLCS injection, Feedwater runback and ADS inhibit functions are used to control reactivity. However, in a loss of service water transient, the feedwater pumps trip and thus, automatic FDW runback is not necessary. ADS inhibit allows adequate reactor pressure to maintain RPV water level control. The ADS inhibit signal is sealed in. Under these conditions, power generation is reduced within the cooling capability of IC and/or CRD until SLCS injection is completed. For loss of SW ATWS scenarios, only IC is modeled for makeup and heat removal since feedwater, CRD, and decay heat removal systems are assumed to fail due to loss of component cooling.

It should be noted that in the transient event trees, successful injection with a high pressure makeup system is considered a stable safe state. For ATWS scenarios the PRA model assumes that high pressure injection is necessary to prevent core damage. However, since ATWS scenarios involve higher initial energies that may threaten containment integrity, the model

assumes that decay heat removal systems, excluding PCCS, are required when high pressure injection is successful.

### ***3.4.21.2 Event Sequences***

The AT-T-SW event tree produces 8 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-21. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

#### **3.4.21.2.1 Low Pressure Core Damage with Containment Intact (Class I) End State: (AT-T-SW004)**

In this sequence, SLCS is successful; however, SRVs that had lifted to relieve RPV pressure have failed to reseal, leading to core damage.

#### **3.4.21.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection (AT-T-SW002)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. In this sequence, SLCS is successful. Containment heat removal fails due to failure to provide long-term makeup to the PCCS pools.

#### **3.4.21.2.3 High Pressure Core Damage with Containment Intact (Class III) End State: (AT-T-SW003)**

In this sequence SLCS is successful; however, ICS fails, and core damage follows.

#### **3.4.21.2.4 Core Damage Due to ATWS Sequences (Class IV) End State: (AT-T-SW006, AT-T-SW007, AT-T-SW008, AT-T-SW009)**

Sequence AT-T-SW006 involves failure of SLCS. This sequence is assumed to lead to core damage.

Sequence AT-T-SW007 involves a failure to inhibit ADS. It assumed that the RPV is depressurized by ADS when ADS inhibit fails, and the vacuum breakers are successful. This sequence is assumed to lead to core damage.

Sequence AT-T-SW008 involves an RPV overpressurization due to an insufficient number of SRVs lifting. This sequence is assumed to lead to core damage.

Sequence AT-T-SW009 involves failure of the Feedwater runback function. This sequence is assumed to lead to core damage. It should be noted that feedwater is eventually loss due to component cooling. However, the Feedwater runback function is assumed to be required at the beginning of the accident scenario.

#### **3.4.21.2.5 Core Damage with Containment Bypass (Class V) End State: (AT-T-SW007a)**

Sequence AT-T-SW007a results in a containment over-pressure failure. In this sequence, there is failure to inhibit ADS, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell

airspace. This sequence is conservatively assumed to lead to core damage with containment bypass.

### **3.4.22 ATWS Transfer from Inadvertent Opening of a Relief Valve (AT-T-IORV)**

#### ***3.4.22.1 Sequence Description***

ATWS sequences are initiated by an event in which there is a failure of either the hydraulic or electrical control rod insertion functions. To mitigate an ATWS condition, sodium pentaborate, in sufficient quantity to achieve subcriticality, is injected into the reactor core region by the Standby Liquid Control System (SLCS). These sequences involve a failure to scram and originate as an IORV transient. Feedwater and CRD are available for high pressure injection to maintain RPV water level. Failure to control water level is assumed to lead to core damage. For IORV ATWS scenarios, the IC system is not credited for makeup or decay heat removal.

It should be noted that in the transient event trees, successful injection with a high pressure makeup system is considered a stable safe state. For ATWS scenarios the PRA model assumes that high pressure injection is necessary to prevent core damage. However, since ATWS scenarios involve higher energies that may threaten containment integrity, the model also requires the availability of a decay heat removal systems, excluding PCCS, when high pressure injection is successful.

#### ***3.4.22.2 Event Sequences***

The AT-T-IORV event tree produces 8 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-22. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

##### **3.4.22.2.1 Low Pressure Core Damage with Containment Intact (Class I) End State: (AT-T-IORV009)**

In this sequence, ADS inhibit and SLCS injection are successful. However, failure of feedwater and CRD injection results in failure to control RPV water level. This is assumed to lead to core damage.

##### **3.4.22.2.2 Containment Failure prior to Late Core Damage (Class II) End States**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection (AT-T-IORV004, AT-T-IORV008)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. In these sequences, SLCS and ADS inhibit, and feedwater or CRD are successful. Containment heat removal fails due to loss of suppression pool cooling, shutdown cooling, and failure to vent.

##### **3.4.22.2.3 Core Damage Due to ATWS Sequences (Class IV) End State: (AT-T-IORV011, AT-T-IORV012, AT-T-IORV013, AT-T-IORV014)**

Sequence AT-T-IORV011 involves failure of SLCS. This sequence is assumed to lead to core damage.

Sequence AT-T-IORV012 involves a failure to inhibit ADS, which results in failure to control RPV water level. It is assumed that RPV is depressurized by ADS when ADS inhibit fails, and the vacuum breakers are successful. This sequence is assumed to lead to core damage.

Sequence AT-T-IORV013 involves an RPV overpressurization due to an insufficient number of SRVs lifting. This sequence is assumed to lead to core damage.

Sequence AT-T-IOR014 involves failure of the Feedwater runback function. This sequence is assumed to lead to core damage.

#### **3.4.22.2.4 Core Damage with Containment Bypass (Class V) End State: (AT-T-IORV012a)**

Sequence AT-T-IORV012a results in a containment over-pressure failure. In this sequence, there is failure to inhibit ADS, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is conservatively assumed to lead to core damage with containment bypass.

### **3.4.23 ATWS Transfer from LOCA Event Tree (AT-LOCA)**

#### ***3.4.23.1 Sequence Description***

ATWS sequences are initiated by an event in which there is a failure of either the hydraulic or electrical control rod insertion functions. To mitigate an ATWS condition, sodium pentaborate, in sufficient quantity to achieve subcriticality, is injected into the reactor core region by the Standby Liquid Control System (SLCS). These sequences involve a failure to scram following a LOCA. Feedwater and CRD are available for high pressure injection to maintain RPV water level. Failure to control water level is assumed to lead to core damage.

It should be noted that in the transient event trees, successful injection with a high pressure makeup system is considered a stable safe state. For ATWS scenarios the PRA model assumes that high pressure injection is necessary to prevent core damage. However, since ATWS scenarios involve higher energies that may threaten containment integrity, the model also requires the availability of a decay heat removal systems, excluding PCCS, when high pressure injection is successful.

#### ***3.4.23.2 Event Sequences***

The AT-LOCA event tree produces 8 sequences that end with a core damage end state. No end states require a transfer to another event tree. Each core damage sequence is described below and summarized in Table 3.4-23. The table includes a listing of failed and successful top events to help illustrate each sequence of events.

##### **3.4.23.2.1 Containment Failure prior to Late Core Damage (Class II) End State:**

Class 2-a: Loss of Decay Heat Removal with Failure of Low Pressure Injection (AT-LOCA001d, AT -LOCA004)

Sub-class 2-a involves pressurization of the containment due to loss of decay heat removal, with subsequent core damage. In these sequences, SLCS, ADS inhibit, and either Feedwater or CRD

injection are successful. However, long-term containment heat removal fails, which leads to containment failure and core damage.

**3.4.23.2.2 High Pressure Core Damage with Containment Intact (Class III) End State: (AT-LOCA005)**

In this sequence, SLCS and ADS inhibit are successful; however, loss of Feedwater and CRD injection results in failure to control water level, leading to core damage.

**3.4.23.2.3 Core Damage Due to ATWS Sequences (Class IV) End State: (AT -LOCA012, AT-LOCA013, AT -LOCA014, AT -LOCA015)**

Sequence AT -LOCA012 involves failure of SLCS. This sequence is assumed to lead to core damage.

Sequence AT -LOCA013 involves a failure to inhibit ADS, which results in failure to control RPV water level. It is assumed that the RPV is depressurized by ADS when ADS inhibit fails, and the vacuum breakers are successful. This sequence is assumed to lead to core damage.

Sequence AT -LOCA014 involves an RPV overpressurization due to an insufficient number of SRVs lifting. This sequence is assumed to lead to core damage.

Sequence AT -LOCA015 involves failure of the Feedwater runback function. This sequence is assumed to lead to core damage.

**3.4.23.2.4 Core Damage with Containment Bypass (Class V) End State: (AT- LOCA013a)**

Sequence AT-T-LOCA013a results in a containment over-pressure failure. In this sequence, there is failure to inhibit ADS, and the vacuum breakers fail to open after ADS. This leads to containment failure due to excessive pressure differential between the drywell and the wetwell airspace. This sequence is conservatively assumed to lead to core damage with containment bypass.

**Table 3.4-1**  
**General Transient Event Paths**

Sequence	Class	Failures	Successes
T-GEN004A	cdi	T-GEN, QT, WR, WM, UD	CR, MW
T-GEN015	cdii-a	T-GEN, QT, MW, UF, UD, VL, VM, WM, WS	CR, MS, PS, XM, XD, VI, VE, DL, WP
T-GEN017	cdii-a	T-GEN, QT, MW, UF, UD, VL, VM, WP, WS	CR, MS, PS, XM, XD, VI, VE, DL
T-GEN019	cdii-a	T-GEN, QT, MW, UF, UD, VL, VM, DL, WS	CR, MS, PS, XM, XD, VI, VE
T-GEN020	cdi	T-GEN, QT, MW, UF, UD, VL, VM, VE	CR, MS, PS, XM, XD, VI
T-GEN021	cdi	T-GEN, QT, MW, UF, UD, VL, VM, VI	CR, MS, PS, XM, XD
T-GEN021a	T-ICSX1	T-GEN, QT, MW, UF, UD, VL, VM, IC	CR, MS, PS, XM, XD
T-GEN022	cdi	T-GEN, QT, MW, UF, UD, VL, VM, XD	CR, MS, PS, XM
T-GEN026	cdii-b	T-GEN, QT, MW, UF, UD, XM, WM, WS, VM	CR, MS, PS, XD, DS, VI, VE, DL, WP, WV
T-GEN027	cdii-a	T-GEN, QT, MW, UF, UD, XM, WM, WS, WV	CR, MS, PS, XD, DS, VI, VE, DL, WP
T-GEN030	cdii-b	T-GEN, QT, MW, UF, UD, XM, WP, WS, VM	CR, MS, PS, XD, DS, VI, VE, DL, WV
T-GEN031	cdii-a	T-GEN, QT, MW, UF, UD, XM, WP, WS, WV	CR, MS, PS, XD, DS, VI, VE, DL
T-GEN034	cdii-b	T-GEN, QT, MW, UF, UD, XM, DL, WS, VM	CR, MS, PS, XD, DS, VI, VE, WV
T-GEN035	cdii-a	T-GEN, QT, MW, UF, UD, XM, DL, WS, WV	CR, MS, PS, XD, DS, VI, VE
T-GEN051	cdi	T-GEN, QT, MW, UF, UD, XM, VE, VL, VM	CR, MS, PS, XD, DS, VI
T-GEN067	cdi	T-GEN, QT, MW, UF, UD, XM, VI, VL, VM	CR, MS, PS, XD, DS
T-GEN067a	T-ICSX1	T-GEN, QT, MW, UF, UD, XM, IC	CR, MS, PS, XD, DS
T-GEN068	cdv	T-GEN, QT, MW, UF, UD, XM, DS	CR, MS, PS, XD
T-GEN069	cdiii	T-GEN, QT, MW, UF, UD, XM, XD	CR, MS, PS
T-GEN070	IORV	T-GEN, QT, MW, PS	CR, MS, PR
T-GEN071	IORV	T-GEN, QT, MW, PS, PR	CR, MS
T-GEN072	RVR	T-GEN, QT, MW, MS	CR
T-GEN073	ATWS	T-GEN, CR	



**Table 3.4-2**  
**Loss of Feedwater Transient Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-FDW003A	cdi	T-FDW, WR, WM, UD	CR, MW
T-FDW007	cdii-b	T-FDW, MW, WM, WS, VM	CR, MS, PS, XD, DS, VI, VE, DL, WP, WV
T-FDW008	cdii-a	T-FDW, MW, WM, WS, WV	CR, MS, PS, XD, DS, VI, VE, DL, WP
T-FDW011	cdii-b	T-FDW, MW, WP, WS, VM	CR, MS, PS, XD, DS, VI, VE, DL, WV
T-FDW012	cdii-a	T-FDW, MW, WP, WS, WV	CR, MS, PS, XD, DS, VI, VE, DL
T-FDW015	cdii-b	T-FDW, MW, DL, WS, VM	CR, MS, PS, XD, DS, VI, VE, WV
T-FDW016	cdii-a	T-FDW, MW, DL, WS, WV	CR, MS, PS, XD, DS, VI, VE
T-FDW033	cdi	T-FDW, MW, VE, UD, VL, VM	CR, MS, PS, XD, DS, VI
T-FDW050	cdi	T-FDW, MW, VI, UD, VL, VM	CR, MS, PS, XD, DS
T-FDW50a	T-ICSX1	T-FDW, MW, IC	CR, MS, PS, XD, DS
T-FDW052	cdv	T-FDW, MW, DS, UD	CR, MS, PS, XD
T-FDW060	cdi	T-FDW, MW, XD, UD, VL, VM	CR, MS, PS, XM
T-FDW061	cdiii	T-FDW, MW, XD, UD, XM	CR, MS, PS
T-FDW062	IORV	T-FDW, MW, PS	CR, MS, PR
T-FDW063	IORV	T-FDW, MW, PS, PR	CR, MS
T-FDW064	RVR	T-FDW, MW, MS	CR
T-FDW065	ATWS	T-FDW, CR	

**Table 3.4-3****Loss of Preferred Power Transient Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-LOPP003A	cdi	T-LOPP, WR, WM, UD	CR, MW
T-LOPP007	cdii-b	T-LOPP, MW, WM, WS, VM	CR, MS, PS, XD, DS, VI, VE, DL, WP, WV
T-LOPP008	cdii-a	T-LOPP, MW, WM, WS, WV	CR, MS, PS, XD, DS, VI, VE, DL, WP
T-LOPP011	cdii-b	T-LOPP, MW, WP, WS, VM	CR, MS, PS, XD, DS, VI, VE, DL, WV
T-LOPP012	cdii-a	T-LOPP, MW, WP, WS, WV	CR, MS, PS, XD, DS, VI, VE, DL
T-LOPP015	cdii-b	T-LOPP, MW, DL, WS, VM	CR, MS, PS, XD, DS, VI, VE, WV
T-LOPP016	cdii-a	T-LOPP, MW, DL, WS, WV	CR, MS, PS, XD, DS, VI, VE
T-LOPP033	cdi	T-LOPP, MW, VE, UD, VL, VM	CR, MS, PS, XD, DS, VI
T-LOPP050	cdi	T-LOPP, MW, VI, UD, VL, VM	CR, MS, PS, XD, DS
T-LOPP50a	T-ICSX1	T-LOPP, MW, IC	CR, MS, PS, XD, DS
T-LOPP052	cdv	T-LOPP, MW, DS, UD	CR, MS, PS, XD
T-LOPP060	cdi	T-LOPP, MW, XD, UD, VL, VM	CR, MS, PS, XM
T-LOPP061	cdiii	T-LOPP, MW, XD, UD, XM	CR, MS, PS
T-LOPP062	IORV	T-LOPP, MW, PS	CR, MS, PR
T-LOPP063	IORV	T-LOPP, MW, PS, PR	CR, MS
T-LOPP064	RVR	T-LOPP, MW, MS	CR
T-LOPP065	ATWS	T-LOPP, CR	

**Table 3.4-4**  
**Loss of Service Water Transient Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-SW002	cdii-a	T-SW, WM	CR, MW
T-SW006	cdii-a	T-SW, MW, VM, WM	CR, MS, PS, XM, XD, VI, VE, DL, WP
T-SW007	cdii-a	T-SW, MW, VM, WP	CR, MS, PS, XM, XD, VI, VE, DL
T-SW008	cdii-a	T-SW, MW, VM, DL	CR, MS, PS, XM, XD, VI, VE
T-SW009	cdi	T-SW, MW, VM, VE	CR, MS, PS, XM, XD, VI
T-SW010	cdi	T-SW, MW, VM, VI	CR, MS, PS, XM, XD
T-SW010a	T-ICSX1	T-SW, MW, VM, IC	CR, MS, PS, XM, XD
T-SW011	Cdi	T-SW, MW, VM, XD	CR, MS, PS, XM
T-SW014	cdii-b	T-SW, MW, XM, WM, VM	CR, MS, PS, XD, DS, VI, VE, DL, WP, WV
T-SW015	cdii-a	T-SW, MW, XM, WM, WV	CR, MS, PS, XD, DS, VI, VE, DL, WP
T-SW017	cdii-b	T-SW, MW, XM, WP, VM	CR, MS, PS, XD, DS, VI, VE, DL, WV
T-SW018	cdii-a	T-SW, MW, XM, WP, WV	CR, MS, PS, XD, DS, VI, VE, DL
T-SW020	cdii-b	T-SW, MW, XM, DL, VM	CR, MS, PS, XD, DS, VI, VE, WV
T-SW021	cdii-a	T-SW, MW, XM, DL, WV	CR, MS, PS, XD, DS, VI, VE
T-SW029	Cdi	T-SW, MW, XM, VE, VM	CR, MS, PS, XD, DS, VI
T-SW037	Cdi	T-SW, MW, XM, VI, VM	CR, MS, PS, XD, DS
T-SW037a	T-ICSX1	T-SW, MW, XM, IC	CR, MS, PS, XD, DS
T-SW038	Cdv	T-SW, MW, XM, DS	CR, MS, PS, XD
T-SW039	cdiii	T-SW, MW, XM, XD	CR, MS, PS
T-SW040	IORV	T-SW, MW, PS	CR, MS, PR
T-SW041	IORV	T-SW, MW, PS, PR	CR, MS
T-SW042	RVR	T-SW, MW, MS	CR
T-SW043	ATWS	T-SW, CR	

**Table 3.4-5**  
**Inadvertent Opening of Relief Valve Transient Event Paths**

Sequence	Class	Failures	Successes
T-IORV011	cdii-a	MS-T-IORV, UF, UD, VL, VM, WM, WS	CR, XM, XD, VI, VE, DL, WP
T-IORV013	cdii-a	MS-T-IORV, UF, UD, VL, VM, WP, WS	CR, XM, XD, VI, VE, DL
T-IORV015	cdii-a	MS-T-IORV, UF, UD, VL, VM, DL, WS	CR, XM, XD, VI, VE
T-IORV016	cdi	MS-T-IORV, UF, UD, VL, VM, VE	CR, XM, XD, VI
T-IORV017	cdi	MS-T-IORV, UF, UD, VL, VM, VI	CR, XM, XD
T-IORV017a	T-ICSX1	MS-T-IORV, UF, UD, VL, VM, IC	CR, XM, XD
T-IORV018	cdi	MS-T-IORV, UF, UD, VL, VM, XD	CR, XM
T-IORV022	cdii-b	MS-T-IORV, UF, UD, XM, WM, WS, VM	CR, XD, DS, VI, VE, DL, WP, WV
T-IORV023	cdii-a	MS-T-IORV, UF, UD, XM, WM, WS, WV	CR, XD, DS, VI, VE, DL, WP
T-IORV026	cdii-b	MS-T-IORV, UF, UD, XM, WP, WS, VM	CR, XD, DS, VI, VE, DL, WV
T-IORV027	cdii-a	MS-T-IORV, UF, UD, XM, WP, WS, WV	CR, XD, DS, VI, VE, DL
T-IORV030	cdii-b	MS-T-IORV, UF, UD, XM, DL, WS, VM	CR, XD, DS, VI, VE, WV
T-IORV031	cdii-a	MS-T-IORV, UF, UD, XM, DL, WS, WV	CR, XD, DS, VI, VE
T-IORV047	cdi	MS-T-IORV, UF, UD, XM, VE, VL, VM	CR, XD, DS, VI
T-IORV063	cdi	MS-T-IORV, UF, UD, XM, VI, VL, VM	CR, XD, DS
T-IORV063a	T-ICSX1	MS-T-IORV, UF, UD, XM, IC	CR, XD, DS
T-IORV064	cdv	MS-T-IORV, UF, UD, XM, DS	CR, XD
T-IORV065	cdi	MS-T-IORV, UF, UD, XM, XD	CR
T-IORV066	ATWS	MS-T-IORV, CR	

**Table 3.4-6**  
**Large Steam LOCA Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
LL-S004	cdii-b	LL-S, WM, WS, VM	CR, DS, VI, VE, DL, WP, WV
LL-S005	cdii-a	LL-S, WM, WS, WV	CR, DS, VI, VE, DL, WP
LL-S008	cdii-b	LL-S, WP, WS, VM	CR, DS, VI, VE, DL, WV
LL-S009	cdii-a	LL-S, WP, WS, WV	CR, DS, VI, VE, DL
LL-S012	cdii-b	LL-S, DL, WS, VM	CR, DS, VI, VE, WV
LL-S013	cdii-a	LL-S, DL, WS, WV	CR, DS, VI, VE
LL-S016	cdi	LL-S, VE, VL, VM	CR, DS, VI
LL-S020	cdi	LL-S, UD, VI, VL, VM	CR, DS
LL-S020a	T-ICSX1	LL-S, IC	CR, DS
LL-S021	cdv	LL-S, DS	CR
LL-S022	cdiv	LL-S, CR	

**Table 3.4-7**  
**LOCA in FDW Line A Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
LL-S-FDWA004	cdii-b	LL-S-FDWA, WM, WS, UD	CR, DS, VI, VE, DL, WP, WV
LL-S-FDWA005	cdii-a	LL-S-FDWA, WM, WS, WV	CR, DS, VI, VE, DL, WP
LL-S-FDWA008	cdii-b	LL-S-FDWA, WP, WS, UD	CR, DS, VI, VE, DL, WV
LL-S-FDWA009	cdii-a	LL-S-FDWA, WP, WS, WV	CR, DS, VI, VE, DL
LL-S-FDWA012	cdii-b	LL-S-FDWA, DL, WS, UD	CR, DS, VI, VE, WV
LL-S-FDWA013	cdii-a	LL-S-FDWA, DL, WS, WV	CR, DS, VI, VE
LL-S-FDWA015	cdi	LL-S-FDWA, VE, UD	CR, DS, VI
LL-S-FDWA017	cdi	LL-S-FDWA, VI, UD	CR, DS
LL-S-FDWA017a	T-ICSX1	LL-S-FDWA, IC	CR, DS
LL-S-FDWA018	cdv	LL-S-FDWA, DS	CR
LL-S-FDWA019	cdiv	LL-S-FDWA, CR	

**Table 3.4-8**  
**LOCA in FDW Line B Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
LL-S-FDWB004	cdii-b	LL-S-FDWB, WM, WS, VM	CR, DS, VI, VE, DL, WP, WV
LL-S-FDWB005	cdii-a	LL-S-FDWB, WM, WS, WV	CR, DS, VI, VE, DL, WP
LL-S-FDWB008	cdii-b	LL-S-FDWB, WP, WS, VM	CR, DS, VI, VE, DL, WV
LL-S-FDWB009	cdii-a	LL-S-FDWB, WP, WS, WV	CR, DS, VI, VE, DL
LL-S-FDWB012	cdii-b	LL-S-FDWB, DL, WS, VM	CR, DS, VI, VE, WV
LL-S-FDWB013	cdii-a	LL-S-FDWB, DL, WS, WV	CR, DS, VI, VE
LL-S-FDWB029	cdi	LL-S-FDWB, VE, VL, VM	CR, DS, VI
LL-S-FDWB045	cdi	LL-S-FDWB, VI, VL, VM	CR, DS
LL-S-FDWB045a	T-ICSX1	LL-S-FDWB, IC	CR, DS
LL-S-FDWB046	Cdv	LL-S-FDWB, DS	CR
LL-S-FDWB047	cdiv	LL-S-FDWB, CR	

**Table 3.4-9**  
**Medium Liquid LOCA Event Paths Event Paths**

Sequence	Class	Failures	Successes
ML-L004	cdii-b	ML-L, WM, WS, VM	CR, DS, XD, VI, VE, DL, WP, WV
ML-L005	cdii-a	ML-L, WM, WS, WV	CR, DS, XD, VI, VE, DL, WP
ML-L008	cdii-b	ML-L, WP, WS, VM	CR, DS, XD, VI, VE, DL, WV
ML-L009	cdii-a	ML-L, WP, WS, WV	CR, DS, XD, VI, VE, DL
ML-L012	cdii-b	ML-L, DL, WS, VM	CR, DS, XD, VI, VE, WV
ML-L013	cdii-a	ML-L, DL, WS, WV	CR, DS, XD, VI, VE
ML-L015	cdi	ML-L, VE, VM	CR, DS, XD, VI
ML-L017	cdi	ML-L, VI, VM	CR, DS, XD
ML-L017a	T-ICSX1	ML-L, IC	CR, DS, XD
ML-L019	cdi	ML-L, XD, VM	CR, DS, XM
ML-L020	cdiii	ML-L, XD, XM	CR, DS
ML-L021	cdv	ML-L, DS	CR
ML-L022	cdiv	ML-L, CR	



**Table 3.4-10**  
**Small Steam LOCA Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
SL-S005	cdii-b	SL-S, WM, WS, VM, UD	CR, XD, DS, VI, VE, DL, WP, WV
SL-S006	cdii-a	SL-S, WM, WS, WV	CR, XD, DS, VI, VE, DL, WP
SL-S010	cdii-b	SL-S, WP, WS, VM, UD	CR, XD, DS, VI, VE, DL, WV
SL-S011	cdii-a	SL-S, WP, WS, WV	CR, XD, DS, VI, VE, DL
SL-S015	cdii-b	SL-S, DL, WS, VM, UD	CR, XD, DS, VI, VE, WV
SL-S016	cdii-a	SL-S, DL, WS, WV	CR, XD, DS, VI, VE
SL-S019	cdi	SL-S, VE, VL, VM	CR, XD, DS, VI
SL-S023	cdi	SL-S, VI, UD, VL, VM	CR, XD, DS
SL-S023a	T-ICSX1	SL-S, IC	CR, XD, DS
SL-S024	cdv	SL-S, DS	CR, XD
SL-S028	cdi	SL-S, XD, UD, VL, VM	CR, XM
SL-S030	cdiii	SL-S, XD, XM, UD	CR
SL-S031	ATWS	SL-S, CR	

**Table 3.4-11**  
**Small Liquid LOCA Event Paths**

Sequence	Class	Failures	Successes
SL-L005	cdii-b	SL-L, WM, WS, VM, UD	CR, MW, XD, DS, VI, VE, DL, WP, WV
SL-L006	cdii-a	SL-L, WM, WS, WV	CR, MW, XD, DS, VI, VE, DL, WP
SL-L010	cdii-b	SL-L, WP, WS, VM, UD	CR, MW, XD, DS, VI, VE, DL, WV
SL-L011	cdii-a	SL-L, WP, WS, WV	CR, MW, XD, DS, VI, VE, DL
SL-L015	cdii-b	SL-L, DL, WS, VM, UD	CR, MW, XD, DS, VI, VE, WV
SL-L016	cdii-a	SL-L, DL, WS, WV	CR, MW, XD, DS, VI, VE
SL-L020	cdi	SL-L, VE, VL, VM, UD	CR, MW, XD, DS, VI
SL-L024	cdi	SL-L, VI, UD, VL, VM	CR, MW, XD, DS
SL-L024a	T-ICSX1	SL-L, IC	CR, MW, XD, DS
SL-L025	cdv	SL-L, DS	CR, MW, XD
SL-L029	cdi	SL-L, XD, UD, VL, VM	CR, MW, XM
SL-L031	cdiii	SL-L, XD, XM, UD	CR, MW
SL-L036	cdii-b	SL-L, MW, WM, WS, VM, UD	CR, MS, XD, DS, VI, VE, DL, WP, WV
SL-L037	cdii-a	SL-L, MW, WM, WS, WV	CR, MS, XD, DS, VI, VE, DL, WP
SL-L041	cdii-b	SL-L, MW, WP, WS, VM, UD	CR, MS, XD, DS, VI, VE, DL, WV
SL-L042	cdii-a	SL-L, MW, WP, WS, WV	CR, MS, XD, DS, VI, VE, DL
SL-L046	cdii-b	SL-L, MW, DL, WS, VM, UD	CR, MS, XD, DS, VI, VE, WV
SL-L047	cdii-a	SL-L, MW, DL, WS, WV	CR, MS, XD, DS, VI, VE
SL-L051	cdi	SL-L, MW, VE, VL, VM, UD	CR, MS, XD, DS, VI
SL-L055	cdi	SL-L, MW, VI, UD, VL, VM	CR, MS, XD, DS
SL-L055a	T-ICSX1	SL-L, MW, IC	CR, MS, XD, DS
SL-L056	cdv	SL-L, MW, DS	CR, MS, XD
SL-L060	cdi	SL-L, MW, XD, UD, VL, VM	CR, MS, XM
SL-L062	cdiii	SL-L, MW, XD, XM, UD	CR, MS
SL-L063	RVR	SL-L, MW, MS	CR
SL-L064	ATWS	SL-L, CR	

**Table 3.4-12**  
**Reactor Vessel Rupture Event Paths**

Sequence	Class	Failures	Successes
RVR-004	cdii-b	T-RVR, WM, WS, VM	CR, DS, XD, VI, DL, WP, WV
RVR-005	cdii-a	T-RVR, WM, WS, WV	CR, DS, XD, VI, DL, WP
RVR-008	cdii-b	T-RVR, WP, WS, VM	CR, DS, XD, VI, DL, WV
RVR-009	cdii-a	T-RVR, WP, WS, WV	CR, DS, XD, VI, DL
RVR-012	cdii-b	T-RVR, DL, WS, VM	CR, DS, XD, VI, WV
RVR-013	cdii-a	T-RVR, DL, WS, WV	CR, DS, XD, VI
RVR-014	cdi	T-RVR, VI	CR, DS, XD
RVR-014a	T-ICSX4	T-RVR, IC	CR, DS, XD
RVR-015	cdi	T-RVR, XD	CR, DS
RVR-016	cdv	T-RVR, DS	CR
RVR-017	cdv	T-RVR, CR	

**Table 3.4-13**  
**Break Outside Containment in MS Line Event Paths**

Sequence	Class	Failures	Successes
BOC-MS001	T-GEN	BOC-MS	IS
BOC-MS011	cdii-a	BOC-MS, IS, UF, UD, VL, VM, WM, WS	CR, XM, XD, VI, VE, DL, WP
BOC-MS014	cdii-a	BOC-MS, IS, UF, UD, VL, VM, WP, WS	CR, XM, XD, VI, VE, DL
BOC-MS017	cdii-a	BOC-MS, IS, UF, UD, VL, VM, DL, WS	CR, XM, XD, VI, VE
BOC-MS019	cdv	BOC-MS, IS, UF, UD, VL, VM, VE	CR, XM, XD, VI
BOC-MS020	cdv	BOC-MS, IS, UF, UD, VL, VM, VI	CR, XM, XD
BOC-MS020a	T-ICSX2	BOC-MS, IS, UF, UD, VL, VM, IC	CR, XM, XD
BOC-MS021	Cdv	BOC-MS, IS, UF, UD, VL, VM, XD	CR, XM
BOC-MS025	cdii-b	BOC-MS, IS, UF, UD, XM, WM, WS, VM	CR, XD, DS, VI, VE, DL, WP, WV
BOC-MS026	cdii-a	BOC-MS, IS, UF, UD, XM, WM, WS, WV	CR, XD, DS, VI, VE, DL, WP
BOC-MS029	cdii-b	BOC-MS, IS, UF, UD, XM, WP, WS, VM	CR, XD, DS, VI, VE, DL, WV
BOC-MS030	cdii-a	BOC-MS, IS, UF, UD, XM, WP, WS, WV	CR, XD, DS, VI, VE, DL
BOC-MS033	cdii-b	BOC-MS, IS, UF, UD, XM, DL, WS, VM	CR, XD, DS, VI, VE, WV
BOC-MS034	cdii-a	BOC-MS, IS, UF, UD, XM, DL, WS, WV	CR, XD, DS, VI, VE
BOC-MS049	Cdv	BOC-MS, IS, UF, UD, XM, VE, VL, VM	CR, XD, DS, VI
BOC-MS064	Cdv	BOC-MS, IS, UF, UD, XM, VI, VL, VM	CR, XD, DS
BOC-MS064a	T-ICSX2	BOC-MS, IS, UF, UD, XM, IC	CR, XD, DS
BOC-MS065	Cdv	BOC-MS, IS, UF, UD, XM, DS	CR, XD
BOC-MS066	Cdv	BOC-MS, IS, UF, UD, XM, XD	CR
BOC-MS067	cdv	BOC-MS, IS, CR	

**Table 3.4-14**  
**Break Outside Containment in FDW Line A Event Paths**

Sequence	Class	Failures	Successes
BOC-FDWA001A	cdii-a	BOC-FDWA, WM	IA, CR, MW
BOC-FDWA015	cdii-a	BOC-FDWA, MW, UD, WM, WS	IA, CR, MS, XD, DS, VI, VE, DL, WP
BOC-FDWA017	cdii-a	BOC-FDWA, MW, UD, WP, WS	IA, CR, MS, XD, DS, VI, VE, DL
BOC-FDWA019	cdii-a	BOC-FDWA, MW, UD, DL, WS	IA, CR, MS, XD, DS, VI, VE
BOC-FDWA020	cdi	BOC-FDWA, MW, UD, VE	IA, CR, MS, XD, DS, VI
BOC-FDWA027	cdi	BOC-FDWA, MW, UD, VI	IA, CR, MS, XD, DS
BOC-FDWA027a	T-ICSX1	BOC-FDWA, MW, UD, IC	IA, CR, MS, XD, DS
BOC-FDWA028	Cdv	BOC-FDWA, MW, UD, DS	IA, CR, MS, XD
BOC-FDWA029	Cdiii	BOC-FDWA, MW, UD, XD	IA, CR, MS
BOC-FDWA030	RVR	BOC-FDWA, MW, MS	IA, CR
BOC-FDWA031	ATWS	BOC-FDWA, CR	IA
BOC-FDWA035	cdii-a	BOC-FDWA, IA, UD, WM, WS	CR, XD, DS, VI, VE, DL, WP
BOC-FDWA037	cdii-a	BOC-FDWA, IA, UD, WP, WS	CR, XD, DS, VI, VE, DL
BOC-FDWA039	cdii-a	BOC-FDWA, IA, UD, DL, WS	CR, XD, DS, VI, VE
BOC-FDWA040	Cdv	BOC-FDWA, IA, UD, VE	CR, XD, DS, VI
BOC-FDWA047	Cdv	BOC-FDWA, IA, UD, VI	CR, XD, DS
BOC-FDWA047a	T-ICSX2	BOC-FDWA, IA, UD, IC	CR, XD, DS
BOC-FDWA048	Cdv	BOC-FDWA, IA, UD, DS	CR, XD
BOC-FDWA049	cdv	BOC-FDWA, IA, UD, XD	CR
BOC-FDWA050	cdv	BOC-FDWA, IA, CR	

**Table 3.4-15**  
**Break Outside Containment in FDW Line B Event Paths**

Sequence	Class	Failures	Successes
BOC-FDWB001A	cdii-a	BOC-FDWB, WM	IB, CR, MW
BOC-FDWB012	cdii-a	BOC-FDWB, MW, VL, VM, WM, WS	IB, CR, MS, XM, XD, VI, VE, DL, WP
BOC-FDWB014	cdii-a	BOC-FDWB, MW, VL, VM, WP, WS	IB, CR, MS, XM, XD, VI, VE, DL
BOC-FDWB017	cdii-a	BOC-FDWB, MW, VL, VM, DL, WS	IB, CR, MS, XM, XD, VI, VE
BOC-FDWB019	cdi	BOC-FDWB, MW, VL, VM, VE	IB, CR, MS, XM, XD, VI
BOC-FDWB020	cdi	BOC-FDWB, MW, VL, VM, VI	IB, CR, MS, XM, XD
BOC-FDWB020a	T-ICSX1	BOC-FDWB, MW, VL, VM, IC	IB, CR, MS, XM, XD
BOC-FDWB021	Cdi	BOC-FDWB, MW, VL, VM, XD	IB, CR, MS, XM
BOC-FDWB025	cdii-b	BOC-FDWB, MW, XM, WM, WS, VM	IB, CR, MS, XD, DS, VI, VE, DL, WP, WV
BOC-FDWB026	cdii-a	BOC-FDWB, MW, XM, WM, WS, WV	IB, CR, MS, XD, DS, VI, VE, DL, WP
BOC-FDWB029	cdii-b	BOC-FDWB, MW, XM, WP, WS, VM	IB, CR, MS, XD, DS, VI, VE, DL, WV
BOC-FDWB030	cdii-a	BOC-FDWB, MW, XM, WP, WS, WV	IB, CR, MS, XD, DS, VI, VE, DL
BOC-FDWB033	cdii-b	BOC-FDWB, MW, XM, DL, WS, VM	IB, CR, MS, XD, DS, VI, VE, WV
BOC-FDWB034	cdii-a	BOC-FDWB, MW, XM, DL, WS, WV	IB, CR, MS, XD, DS, VI, VE
BOC-FDWB036	Cdi	BOC-FDWB, MW, XM, VE, VL, VM	IB, CR, MS, XD, DS, VI
BOC-FDWB053	Cdi	BOC-FDWB, MW, XM, VI, VL, VM	IB, CR, MS, XD, DS
BOC-FDWB053x	T-ICSX1	BOC-FDWB, MW, XM, IC	IB, CR, MS, XD, DS
BOC-FDWB053A	Cdv	BOC-FDWB, MW, XM, DS	IB, CR, MS, XD
BOC-FDWB054	Cdiii	BOC-FDWB, MW, XM, XD	IB, CR, MS
BOC-FDWB055	RVR	BOC-FDWB, MW, MS	IB, CR
BOC-FDWB056	ATWS	BOC-FDWB, CR	IB
BOC-FDWB060	cdii-b	BOC-FDWB, IB, WM, WS, VM	CR, XD, DS, VI, VE, DL, WP, WV
BOC-FDWB061	cdii-a	BOC-FDWB, IB, WM, WS, WV	CR, XD, DS, VI, VE, DL, WP
BOC-FDWB064	cdii-b	BOC-FDWB, IB, WP, WS, VM	CR, XD, DS, VI, VE, DL, WV
BOC-FDWB065	cdii-a	BOC-FDWB, IB, WP, WS, WV	CR, XD, DS, VI, VE, DL
BOC-FDWB068	cdii-b	BOC-FDWB, IB, DL, WS, VM	CR, XD, DS, VI, VE, WV

**Table 3.4-15****Break Outside Containment in FDW Line B Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
BOC-FDWB069	cdii-a	BOC-FDWB, IB, DL, WS, WV	CR, XD, DS, VI, VE
BOC-FDWB086	cdv	BOC-FDWB, IB, VE, VL, VM	CR, XD, DS, VI
BOC-FDWB103	cdv	BOC-FDWB, IB, VI, VL, VM	CR, XD, DS
BOC-FDWB103a	T-ICSX2	BOC-FDWB, IB, IC	CR, XD, DS
BOC-FDWB104	cdv	BOC-FDWB, IB, DS	CR, XD
BOC-FDWB105	cdv	BOC-FDWB, IB, XD	CR
BOC-FDWB106	cdv	BOC-FDWB, IB, CR	

**Table 3.4-16**  
**Break Outside Containment in RWCU/SDC Line**

Sequence	Class	Failures	Successes
BOC-RWCU001	T-GEN	BOC-RWCU	IR
BOC-RWCU005	cdii-b	BOC-RWCU, IR, WM, WS, VM	CR, XD, DS, VI, VE, IM, DL, WP, WV
BOC-RWCU006	cdii-a	BOC-RWCU, IR, WM, WS, WV	CR, XD, DS, VI, VE, IM, DL, WP
BOC-RWCU009	cdii-b	BOC-RWCU, IR, WP, WS, VM	CR, XD, DS, VI, VE, IM, DL, WV
BOC-RWCU010	cdii-a	BOC-RWCU, IR, WP, WS, WV	CR, XD, DS, VI, VE, IM, DL
BOC-RWCU013	cdii-b	BOC-RWCU, IR, DL, WS, VM	CR, XD, DS, VI, VE, IM, WV
BOC-RWCU014	cdii-a	BOC-RWCU, IR, DL, WS, WV	CR, XD, DS, VI, VE, IM
BOC-RWCU015	cdv	BOC-RWCU, IR, IM	CR, XD, DS, VI, VE
BOC-RWCU029	cdv	BOC-RWCU, IR, VE, IM	CR, XD, DS, VI, VL
BOC-RWCU031	cdv	BOC-RWCU, IR, VE, VL, IM	CR, XD, DS, VI, VM
BOC-RWCU032	cdv	BOC-RWCU, IR, VE, VL, VM	CR, XD, DS, VI
BOC-RWCU046	cdv	BOC-RWCU, IR, VI, IM	CR, XD, DS, VL
BOC-RWCU048	cdv	BOC-RWCU, IR, VI, VL, IM	CR, XD, DS, VM
BOC-RWCU049	cdv	BOC-RWCU, IR, VI, VL, VM	CR, XD, DS
BOC-RWCU049a	T-ICSX5	BOC-RWCU, IR, IC	CR, XD, DS
BOC-RWCU050	Cdv	BOC-RWCU, IR, DS	CR, XD
BOC-RWCU051	cdv	BOC-RWCU, IR, XD	CR
BOC-RWCU052	cdv	BOC-RWCU, IR, CR	



**Table 3.4-17**  
**Break Outside Containment in ICS Event Paths**

Sequence	Class	Failures	Successes
BOC-IC001	T-GEN	BOC-IC	IC
BOC-IC012	cdii-a	BOC-IC, IC, UF, UD, VL, VM, WM, WS	CR, XM, XD, VI, VE, DL, WP
BOC-IC014	cdii-a	BOC-IC, IC, UF, UD, VL, VM, WP, WS	CR, XM, XD, VI, VE, DL
BOC-IC016	cdii-a	BOC-IC, IC, UF, UD, VL, VM, DL, WS	CR, XM, XD, VI, VE
BOC-IC017	cdv	BOC-IC, IC, UF, UD, VL, VM, VE	CR, XM, XD, VI
BOC-IC018	cdv	BOC-IC, IC, UF, UD, VL, VM, VI	CR, XM, XD
BOC-IC018a	T-ICSX2	BOC-IC, IC, UF, UD, VL, VM, IC	CR, XM, XD
BOC-IC019	Cdv	BOC-IC, IC, UF, UD, VL, VM, XD	CR, XM
BOC-IC023	cdii-b	BOC-IC, IC, UF, UD, XM, WM, WS, VM	CR, XD, DS, VI, VE, DL, WP, WV
BOC-IC024	cdii-a	BOC-IC, IC, UF, UD, XM, WM, WS, WV	CR, XD, DS, VI, VE, DL, WP
BOC-IC027	cdii-b	BOC-IC, IC, UF, UD, XM, WP, WS, VM	CR, XD, DS, VI, VE, DL, WV
BOC-IC028	cdii-a	BOC-IC, IC, UF, UD, XM, WP, WS, WV	CR, XD, DS, VI, VE, DL
BOC-IC031	cdii-b	BOC-IC, IC, UF, UD, XM, DL, WS, VM	CR, XD, DS, VI, VE, WV
BOC-IC032	cdii-a	BOC-IC, IC, UF, UD, XM, DL, WS, WV	CR, XD, DS, VI, VE
BOC-IC047	Cdv	BOC-IC, IC, UF, UD, XM, VE, VL, VM	CR, XD, DS, VI
BOC-IC062	Cdv	BOC-IC, IC, UF, UD, XM, VI, VL, VM	CR, XD, DS
BOC-IC062a	T-ICSX2	BOC-IC, IC, UF, UD, XM, IC	CR, XD, DS
BOC-IC063	Cdv	BOC-IC, IC, UF, UD, XM, DS	CR, XD
BOC-IC064	cdv	BOC-IC, IC, UF, UD, XM, XD	CR
BOC-IC065	cdv	BOC-IC, IC, CR	

**Table 3.4-17a**  
**Transfer Tree T-ICSX1 Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-ICSX1-005	cdii-c	T-ICSX1, WS, UD, VL, VM	VI, VE, DL, WP, WM
T-ICSX1-006	cdii-a	T-ICSX1, WS, UD, VL, VM, WM	VI, VE, DL, WP
T-ICSX1-007	cdii-a	T-ICSX1, WS, UD, VL, VM, WP	VI, VE, DL
T-ICSX1-008	cdii-a	T-ICSX1, WS, UD, VL, VM, DL	VI, VE
T-ICSX1-012	cdi	T-ICSX1, VE, UD, VL, VM	VI
T-ICSX1-016	cdi	T-ICSX1, VI, UD, VL, VM	None

**Table 3.4-17b**  
**Transfer Tree T-ICSX2 Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-ICSX2-005	cdii-c	T-ICSX2, WS, UD, VL, VM	VI, VE, DL, WP, WM
T-ICSX2-006	cdii-a	T-ICSX2, WS, UD, VL, VM, WM	VI, VE, DL, WP
T-ICSX2-007	cdii-a	T-ICSX2, WS, UD, VL, VM, WP	VI, VE, DL
T-ICSX2-008	cdii-a	T-ICSX2, WS, UD, VL, VM, DL	VI, VE
T-ICSX2-012	cdv	T-ICSX2, VE, UD, VL, VM	VI
T-ICSX2-016	cdv	T-ICSX2, VI, UD, VL, VM	None

**Table 3.4-17c**  
**Transfer Tree T-ICSX3 Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-ICSX3-006	cdii-c	T-ICSX3, IC, UF, UD, VL, VM, WS	CR, XM, XD, VI, VE, DL, WP, WM
T-ICSX3-007	cdii-a	T-ICSX3, IC, UF, UD, VL, VM, WS, WM	CR, XM, XD, VI, VE, DL, WP
T-ICSX3-008	cdii-a	T-ICSX3, IC, UF, UD, VL, VM, WS, WP	CR, XM, XD, VI, VE, DL
T-ICSX3-009	cdii-a	T-ICSX3, IC, UF, UD, VL, VM, WS, DL	CR, XM, XD, VI, VE
T-ICSX3-010	cdv	T-ICSX3, IC, UF, UD, VL, VM, VE	CR, XM, XD, VI
T-ICSX3-011	cdv	T-ICSX3, IC, UF, UD, VL, VM, VI	CR, XM, XD
T-ICSX3-012	cdv	T-ICSX3, IC, UF, UD, VL, VM, XD	CR, XM
T-ICSX3-016	cdii-c	T-ICSX3, IC, UF, UD, XM, VL, VM, WS	CR, XM, XD, DS, VI, VE, DL, WP, WM
T-ICSX3-017	cdii-a	T-ICSX3, IC, UF, UD, XM, VL, VM, WS, WM	CR, XM, XD, DS, VI, VE, DL, WP
T-ICSX3-018	cdii-a	T-ICSX3, IC, UF, UD, XM, VL, VM, WS, WP	CR, XD, DS, VI, VE, DL
T-ICSX3-019	cdii-a	T-ICSX3, IC, UF, UD, XM, VL, VM, WS, DL	CR, XD, DS, VI, VE
T-ICSX3-022	cdv	T-ICSX3, IC, UF, UD, XM, VL, VM, VE	CR, XD, DS, VI
T-ICSX3-025	cdv	T-ICSX3, IC, UF, UD, XM, VL, VM, VI	CR, XD, DS
T-ICSX3-026	cdv	T-ICSX3, IC, UF, UD, XM, DS	CR, XD
T-ICSX3-027	cdv	T-ICSX3, IC, UF, UD, XM, XD	CR
T-ICSX3-028	cdv	T-ICSX3, IC, CR	

**Table 3.4-17d**  
**Transfer Tree T-ICSX4 Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-ICSX4-005	cdii-c	T-ICSX4, WS, UD, VL, VM	VI, DL, WP, WM
T-ICSX4-006	cdii-a	T-ICSX4, WS, UD, VL, VM, WM	VI, DL, WP
T-ICSX4-007	cdii-a	T-ICSX4, WS, UD, VL, VM, WP	VI, DL
T-ICSX4-008	cdi	T-ICSX4, WS, UD, VL, VM, DL	VI
T-ICSX4-009	cdi	T-ICSX4, VI	None

**Table 3.4-17e**  
**Transfer Tree T-ICSX5 Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
T-ICSX5-003	cdii-c	T-ICSX5, VL, VM	IM, VI, VE, DL, WP, WM
T-ICSX5-004	cdii-a	T-ICSX5, VL, VM, WM	IM, VI, VE, DL, WP
T-ICSX5-005	cdii-a	T-ICSX5, VL, VM, WP	IM, VI, VE, DL
T-ICSX5-006	cdii-a	T-ICSX5, VL, VM, DL	IM, VI, VE
T-ICSX5-009	cdv	T-ICSX5, VE, VL, VM	IM, VI
T-ICSX5-012	cdv	T-ICSX5, VI, VL, VM	IM
T-ICSX5-013	cdv	T-ICSX5, IM	None

**Table 3.4-18**  
**ATWS Transfer from T-GEN Event Paths**

Sequence	Class	Failures	Successes
AT-T-GEN003A	cdi	AT-T-GEN, WR, WM, UD	CF, MA, XI, CS, PA, MW
AT-T-GEN007	cdii-a	AT-T-GEN, MW, WS, WR, WV	CF, MA, XI, CS, PA, UF
AT-T-GEN011	cdii-a	AT-T-GEN, MW, UF, WS, WR, WV	CF, MA, XI, CS, PA, UD
AT-T-GEN012	cdiii	AT-T-GEN, MW, UF, UD	CF, MA, XI, CS, PA
AT-T-GEN016	cdii-a	AT-T-GEN, PA, WS, WR, WV	CF, MA, XI, CS, UF
AT-T-GEN020	cdii-a	AT-T-GEN, PA, UF, WS, WR, WV	CF, MA, XI, CS, UD
AT-T-GEN021	cdi	AT-T-GEN, PA, UF, UD	CF, MA, XI, CS
AT-T-GEN023	cdiv	AT-T-GEN, CS	CF, MA, XI
AT-T-GEN024	cdiv	AT-T-GEN, XI	CF, MA, DS
AT-T-GEN024A	cdv	AT-T-GEN, XI, DS	CF, MA
AT-T-GEN025	cdiv	AT-T-GEN, MA	CF
AT-T-GEN026	cdiv	AT-T-GEN, CF	

**Table 3.4-19**  
**ATWS Transfer from T-FDW Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
AT-T-FDW003A	cdi	AT-T-FDW, WR, WM, UD	MA, XI, CS, PA, MW
AT-T-FDW007	cdii-a	AT-T-FDW, MW, WS, WR, WV	MA, XI, CS, PA, UD
AT-T-FDW008	cdiii	AT-T-FDW, MW, UD	MA, XI, CS, PA
AT-T-FDW012	cdii-a	AT-T-FDW, PA, WS, WR, WV	MA, XI, CS, UD
AT-T-FDW013	cdi	AT-T-FDW, PA, UD	MA, XI, CS
AT-T-FDW015	cdiv	AT-T-FDW, CS	MA, XI
AT-T-FDW016	cdiv	AT-T-FDW, XI	MA, DS
AT-T-FDW016A	cdv	AT-T-FDW, XI, DS	MA
AT-T-FDW017	cdiv	AT-T-FDW, MA	



**Table 3.4-20**  
**ATWS Transfer from T-LOPP Event Paths**

Sequence	Class	Failures	Successes
AT-T-LOPP003A	cdi	AT-T-LOPP, WR, WM, UD	MA, XI, CS, PA, MW
AT-T-LOPP007	cdii-a	AT-T-LOPP, MW, WS, WR, WV	MA, XI, CS, PA, UD
AT-T-LOPP008	cdiii	AT-T-LOPP, MW, UD	MA, XI, CS, PA
AT-T-LOPP012	cdii-a	AT-T-LOPP, PA, WS, WR, WV	MA, XI, CS, UD
AT-T-LOPP013	cdi	AT-T-LOPP, PA, UD	MA, XI, CS
AT-T-LOPP015	cdiv	AT-T-LOPP, CS	MA, XI
AT-T-LOPP016	cdiv	AT-T-LOPP, XI	MA, DS
AT-T-LOPP016A	cdv	AT-T-LOPP, XI, DS	MA
AT-T-LOPP017	cdiv	AT-T-LOPP, MA	

**Table 3.4-21**  
**ATWS Transfer from T-SW Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
AT-T-SW002	cdii-a	AT-T-SW, WM	CF, MA, XI, CS, PA, MW
AT-T-SW003	cdiii	AT-T-SW, MW	CF, MA, XI, CS, PA
AT-T-SW004	cdi	AT-T-SW, PA	CF, MA, XI, CS
AT-T-SW006	cdiv	AT-T-SW, CS	CF, MA, XI
AT-T-SW007	cdiv	AT-T-SW, XI	CF, MA, DS
AT-T-SW007A	cdv	AT-T-SW, XI, DS	CF, MA
AT-T-SW008	cdiv	AT-T-SW, MA	CF
AT-T-SW009	cdiv	AT-T-SW, CF	

**Table 3.4-22**  
**ATWS Transfer from T-IORV Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
AT-T-IORV004	cdii-a	AT-T-IORV, WS, WR, WV	CF, MA, XI, CS, UF
AT-T-IORV008	cdii-a	AT-T-IORV, UF, WS, WR, WV	CF, MA, XI, CS, UD
AT-T-IORV009	cdi	AT-T-IORV, UF, UD	CF, MA, XI, CS
AT-T-IORV011	cdiv	AT-T-IORV, CS	CF, MA, XI
AT-T-IORV012	cdiv	AT-T-IORV, XI	CF, MA, DS
AT-T-IORV012A	cdv	AT-T-IORV, XI, DS	CF, MA
AT-T-IORV013	cdiv	AT-T-IORV, MA	CF
AT-T-IORV014	cdiv	AT-T-IORV, CF	

**Table 3.4-23**  
**ATWS Transfer from T-LOCA Event Paths**

<b>Sequence</b>	<b>Class</b>	<b>Failures</b>	<b>Successes</b>
AT-LOCA001D	cdii-a	AT-LOCA, WS, WR, WV	CF, MA, XI, CS, UF
AT-LOCA004	cdii-a	AT-LOCA, UF, WS, WR, WV	CF, MA, XI, CS, UD
AT-LOCA005	cdiii	AT-LOCA, UF, UD	CF, MA, XI, CS
AT-LOCA012	cdiv	AT-LOCA, CS	CF, MA, XI
AT-LOCA013	cdiv	AT-LOCA, XI	CF, MA, DS
AT-LOCA013A	cdv	AT-LOCA, XI, DS	CF, MA
AT-LOCA014	cdiv	AT-LOCA, MA	CF
AT-LOCA015	cdiv	AT-LOCA, CF	

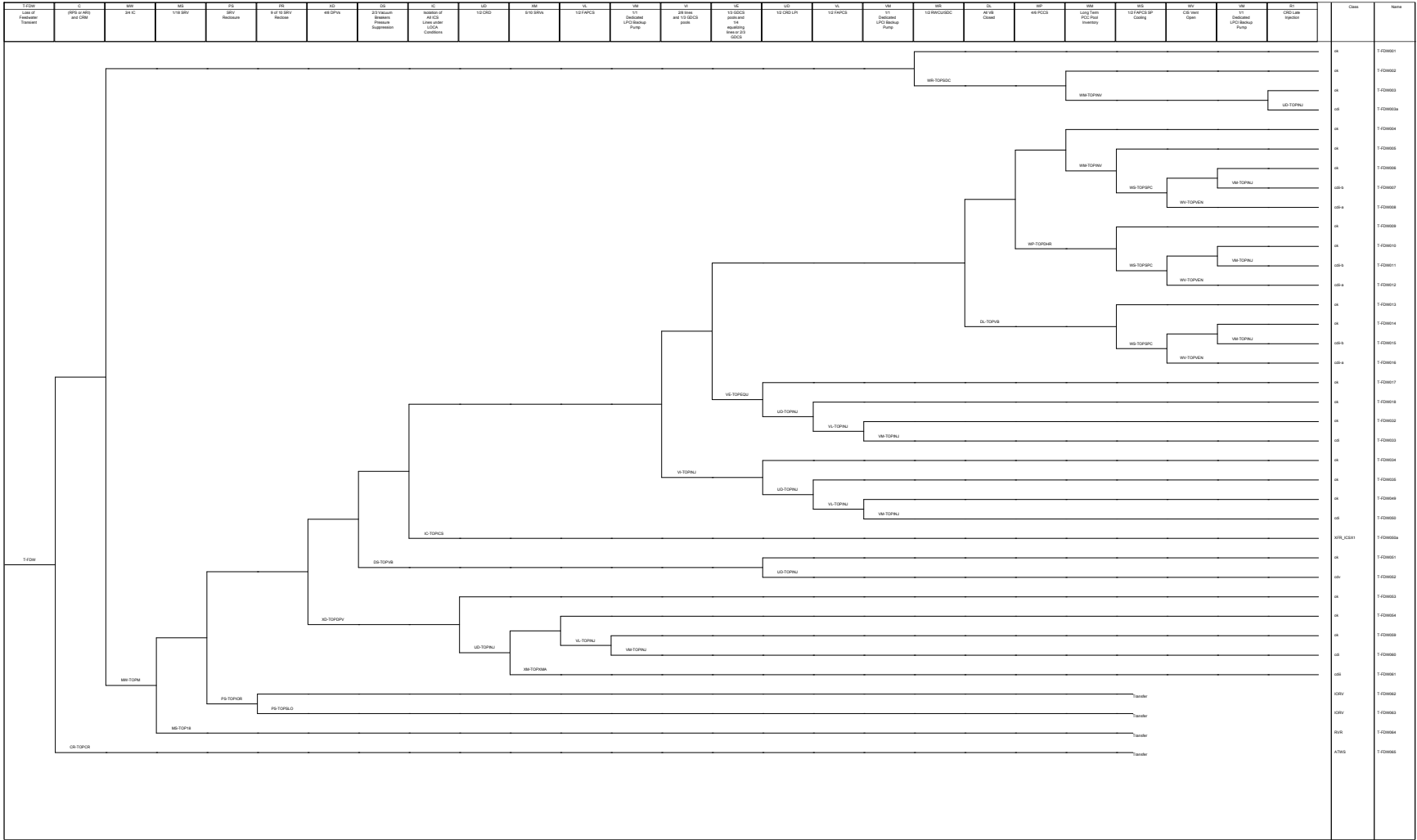
### 3.5 REFERENCES

- 3-1 ESBWR DCD Tier 2, Chapter 6, Engineering Safety Features, 26A6642AT
- 3-2 ESBWR DCD Tier 2, Chapter 15, Safety Analysis, 26A6642BP
- 3.3 MAAP 4.0.6 ESBWR Application and Comparison to TRACG Benchmarks; *MAAP Support of ESBWR Design Certification Document*, EPRI, Palo Alto, CA and General Electric Co.; 2005 1011712

## APPENDIX 3A FIGURES

3A-1	General Transient
3A-2	Loss of Feedwater Transient
3A-3	Loss of Preferred Power Transient (T-LOPP)
3A-4	Loss of Service Water System (T SW)
3A-5	Inadvertent Opening of a Relief Valve (IORV)
3A-6	Large Steam LOCA
3A-7	Large Steam LOCA in FW Line A
3A-8	Large Steam LOCA in FW Line B
3A-9	Medium Liquid LOCA
3A-10	Small and Medium Liquid LOCA
3A-11	Small Liquid LOCA
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3A-13	Break Outside of Containment - Main Steam Line
3A-14	Break Outside of Containment – FDW Line A
3A-15	Break Outside of Containment -FDW Line B
3A-16	Break Outside of Containment – RWCU Line
3A-17	Break Outside of Containment – Isolation Condenser Line
3A-17a	ICS Transfer 1
3A-17b	ICS Transfer 2
3A-17c	ICS Transfer 3
3A-17d	ICS Transfer 4
3A-17e	ICS Transfer 5
3A-18	ATWS Transfer from General Transient
3A-19	ATWS Transfer from Loss of Feedwater
3A-20	ATWS Transfer from Loss of Preferred Power
3A-21	ATWS Transfer from Loss of Service Water
3A-22	ATWS Transfer from Inadvertent Opening of a Relief Valve
3A-23	ATWS Transfer LOCAs









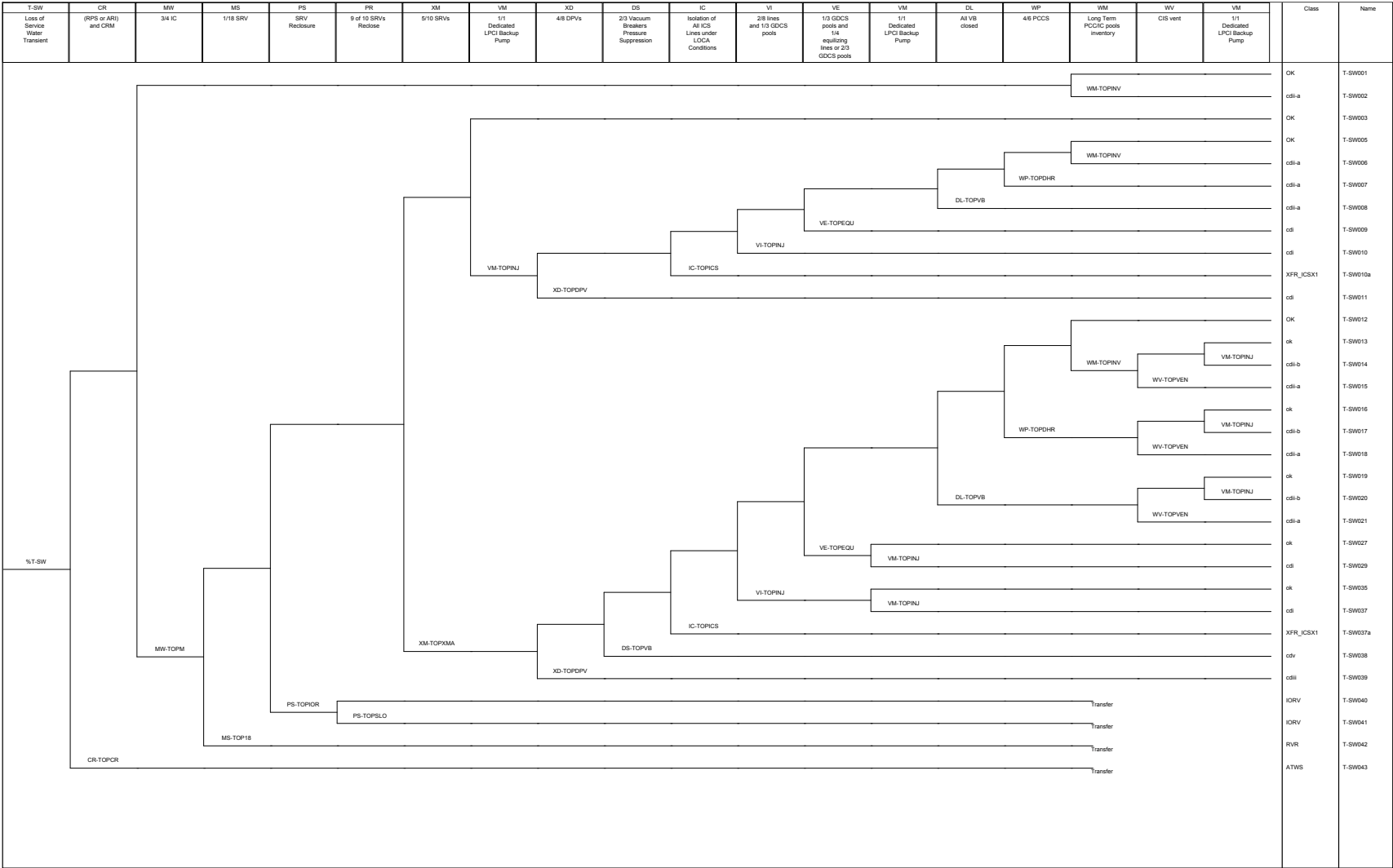


Figure 3A-4. Loss of Plant Service Water Event Tree

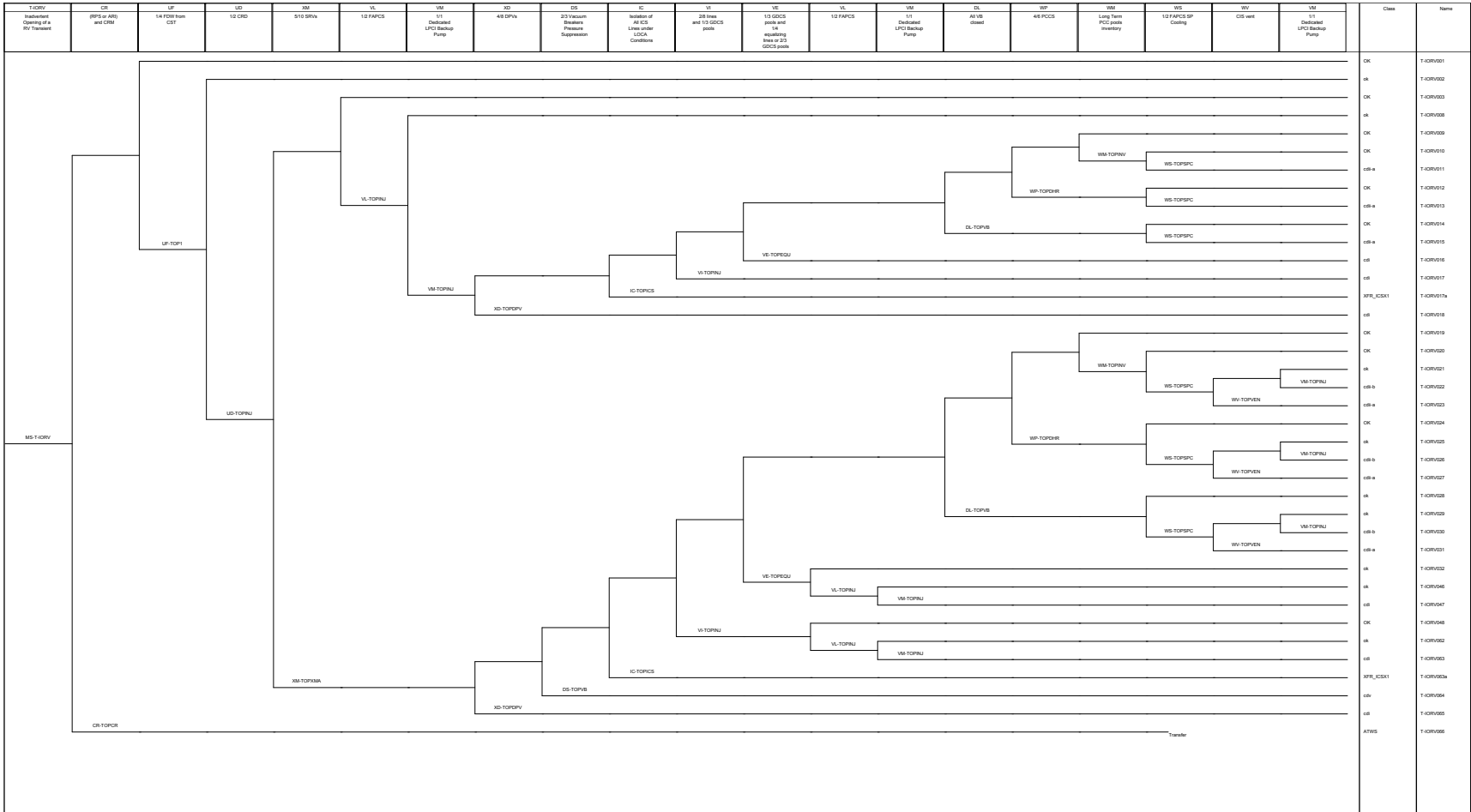


Figure 3A-5. Inadvertent Opening of Relief Valve Event Tree

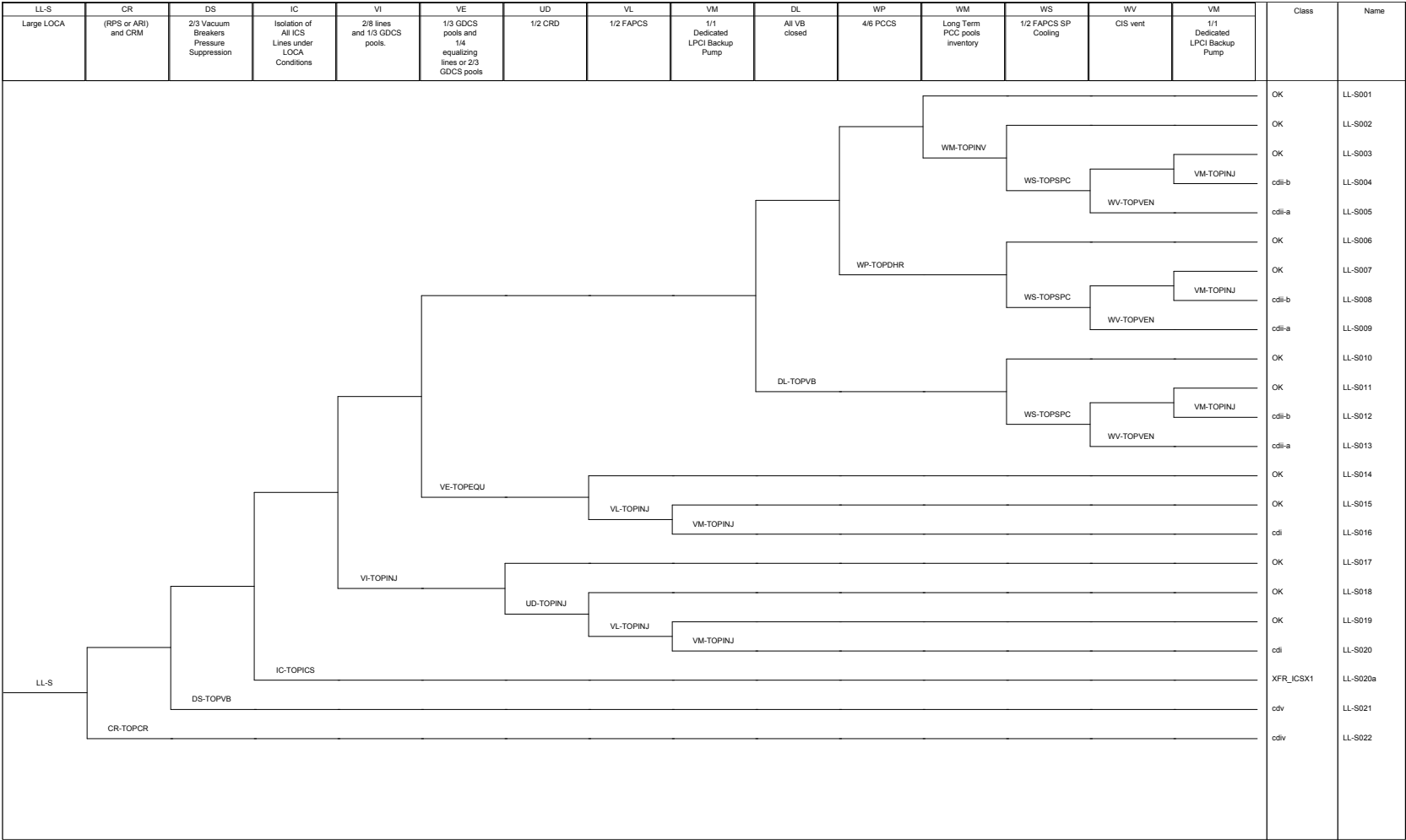


Figure 3A-6. Large Steam LOCA Event Tree

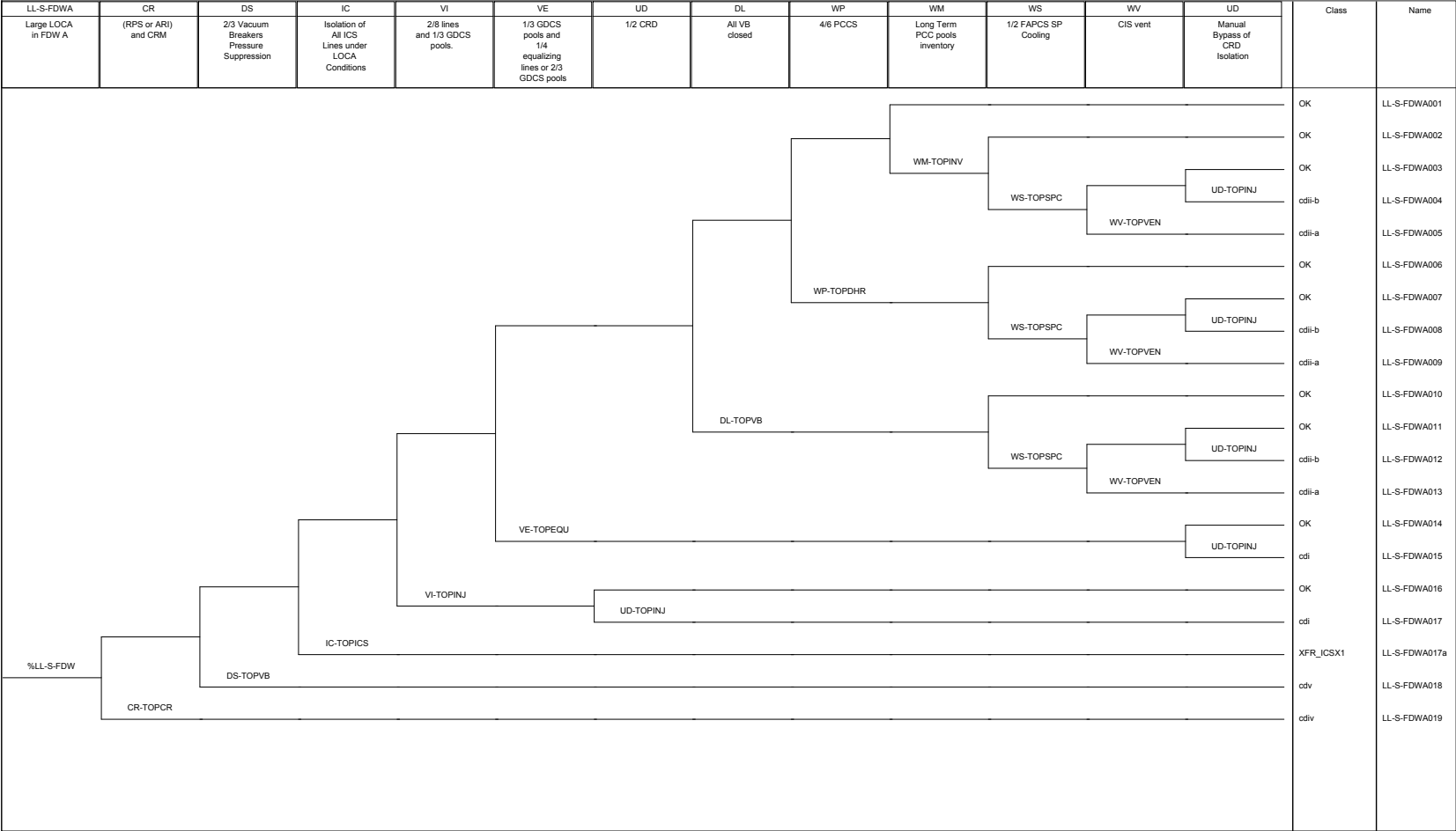


Figure 3A-7. Large Steam LOCA in Feedwater Line A Event Tree



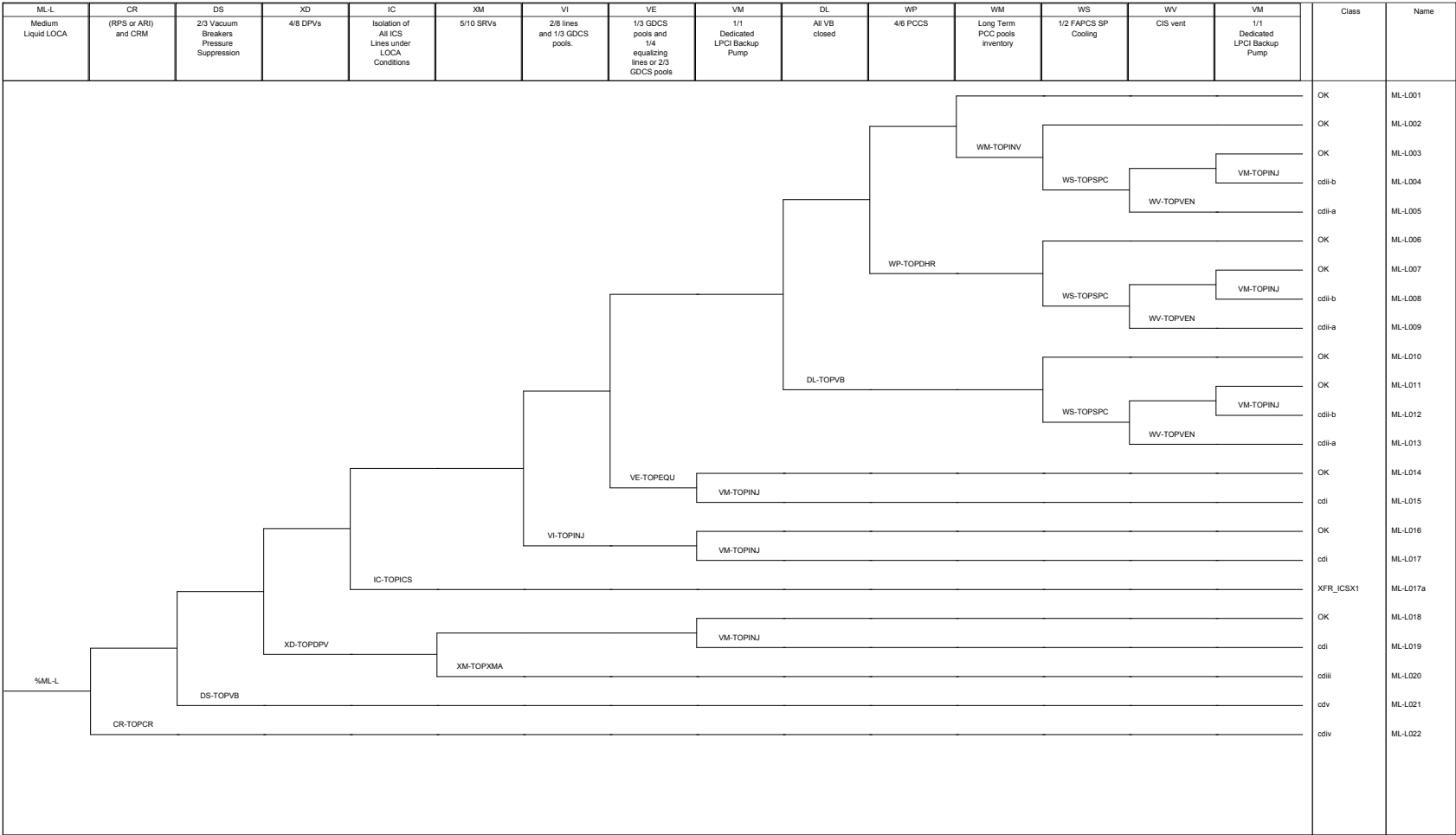


Figure 3A-9. Medium Liquid LOCA Event Tree

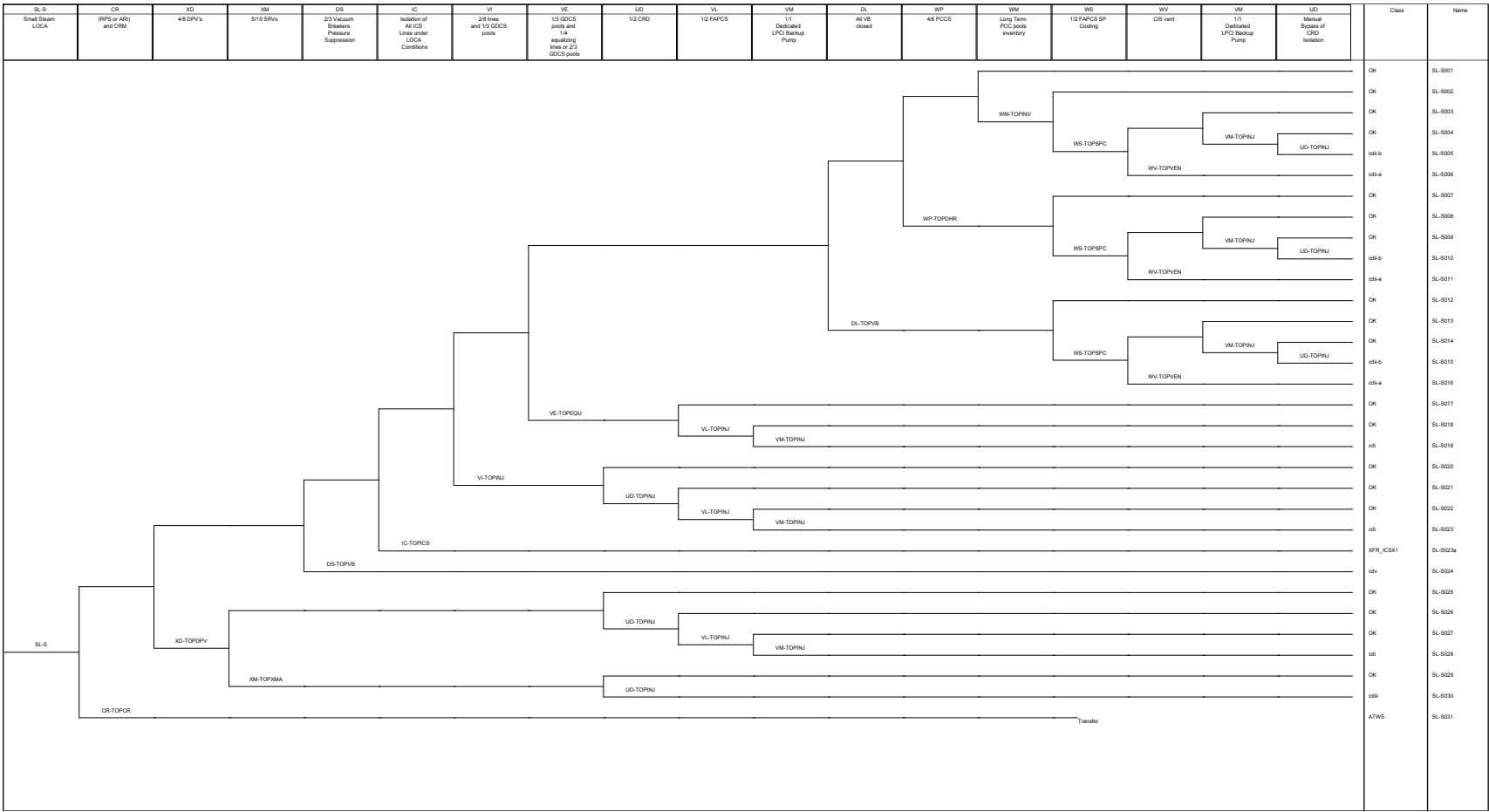


Figure 3A-10. Small Steam LOCA Event Tree





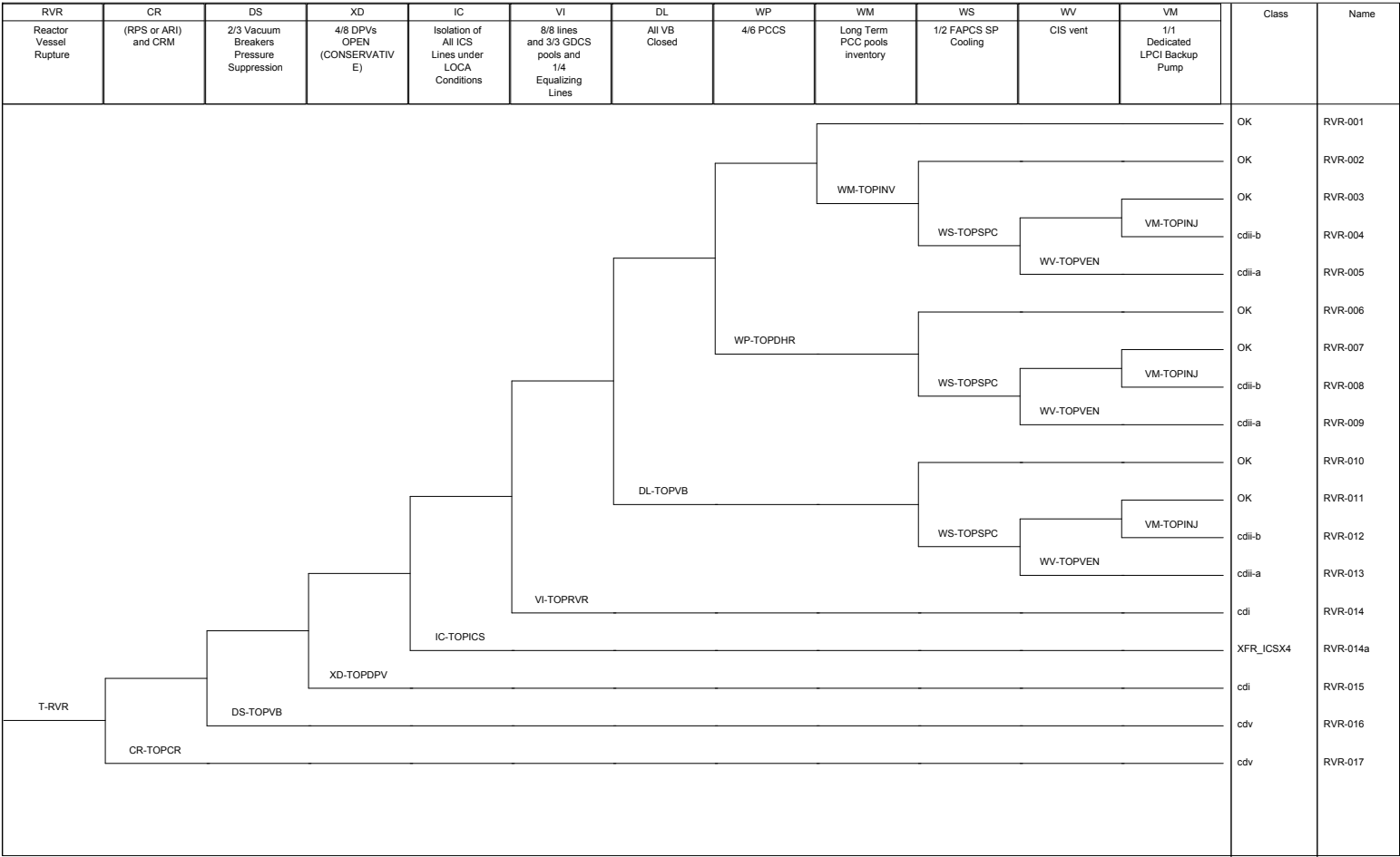


Figure 3A-12. Reactor Vessel Rupture Event Tree







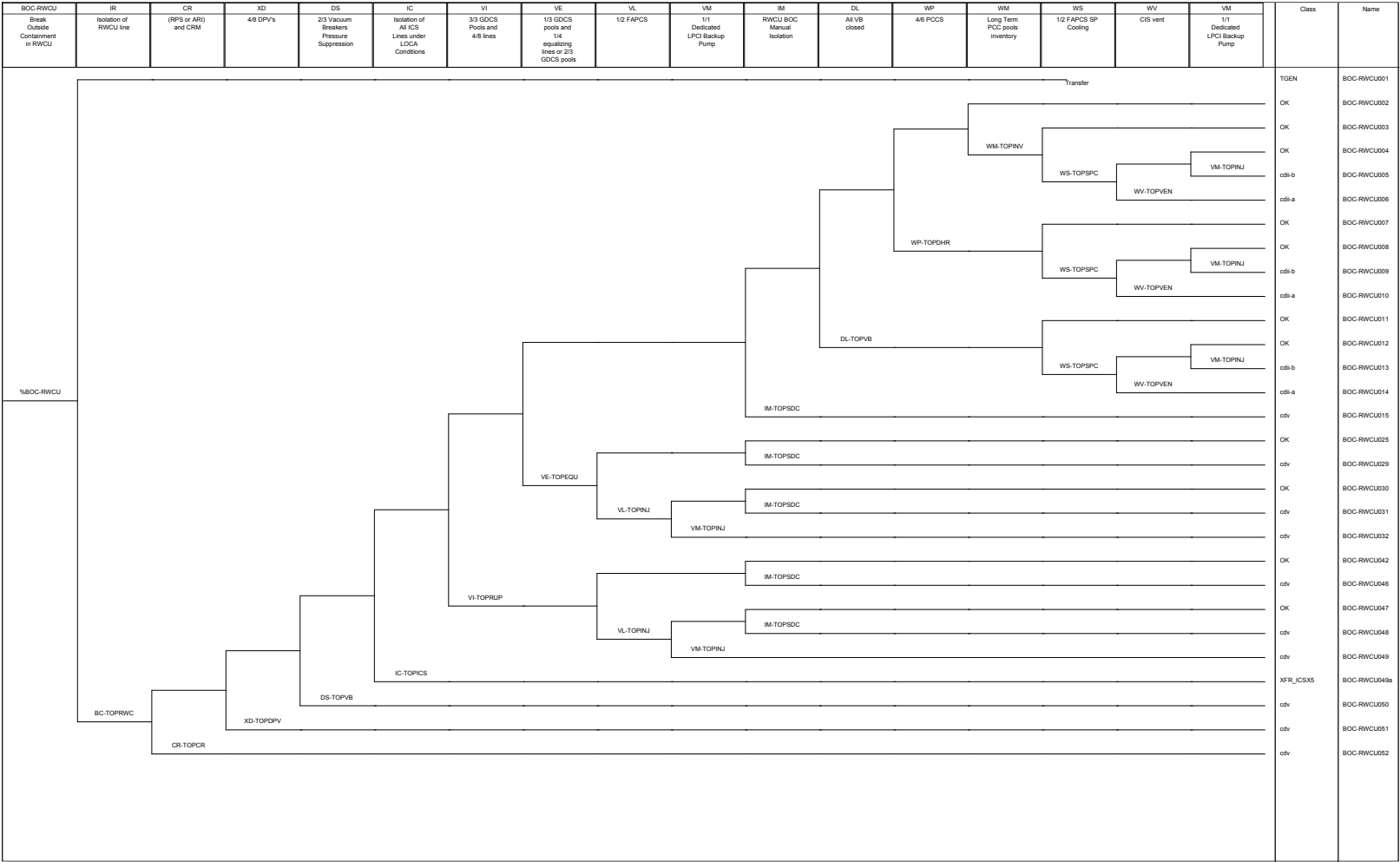


Figure 3A-16. Break Outside Containment in RWCU Event Tree

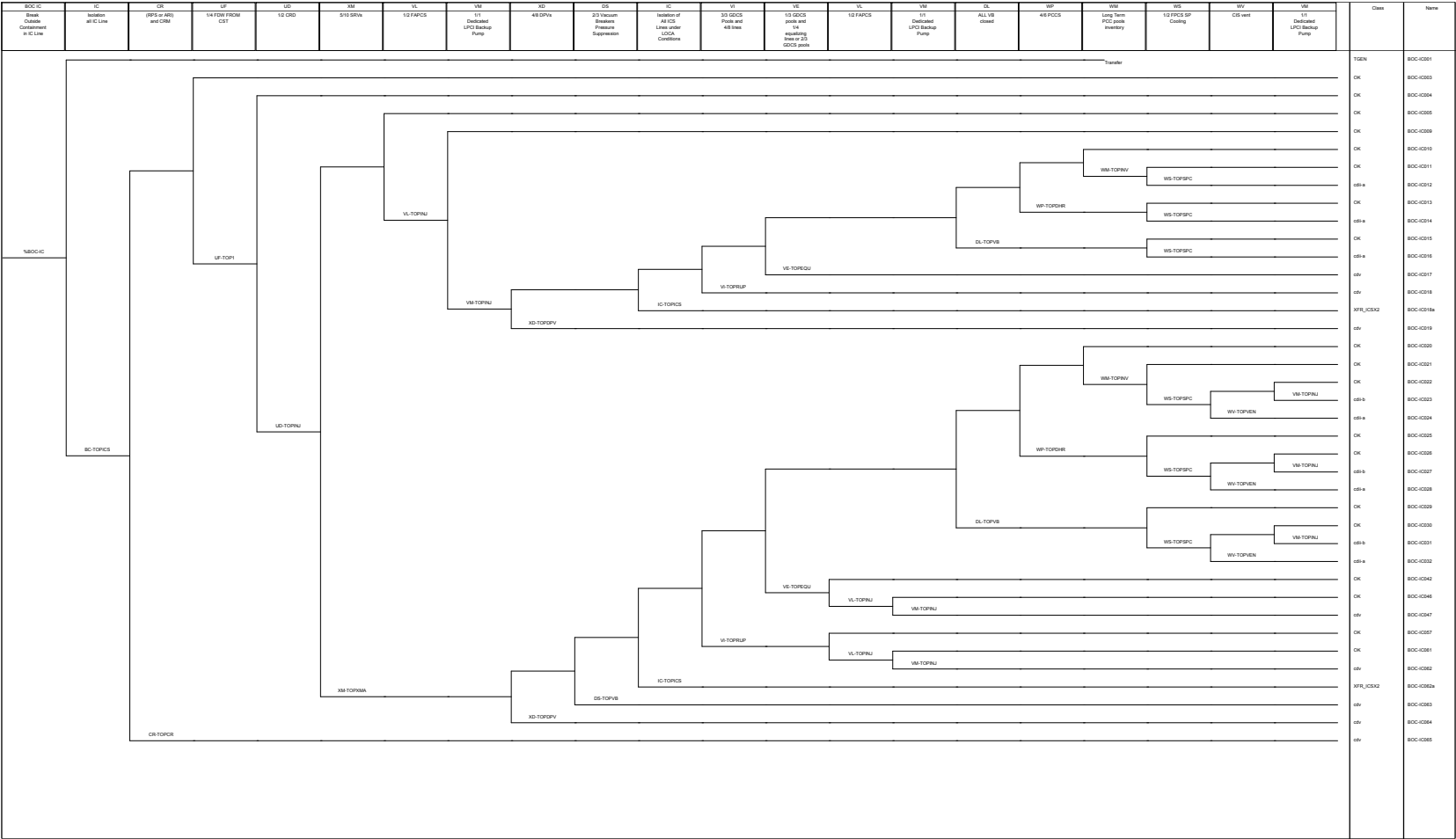


Figure 3A-17. Break Outside Containment in ICS Event Tree

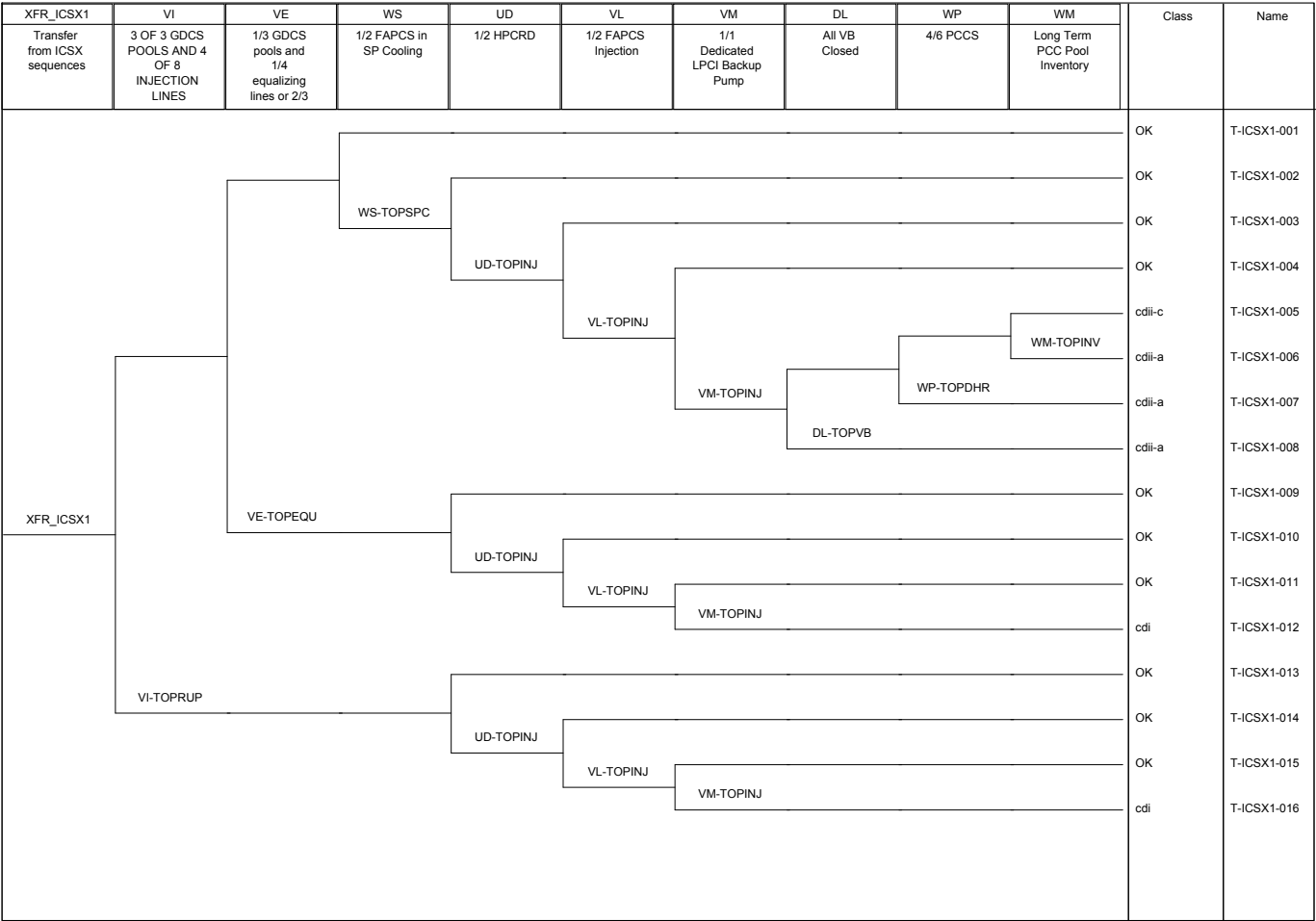


Figure 3A-17a. ICS Transfer 1 Event Tree



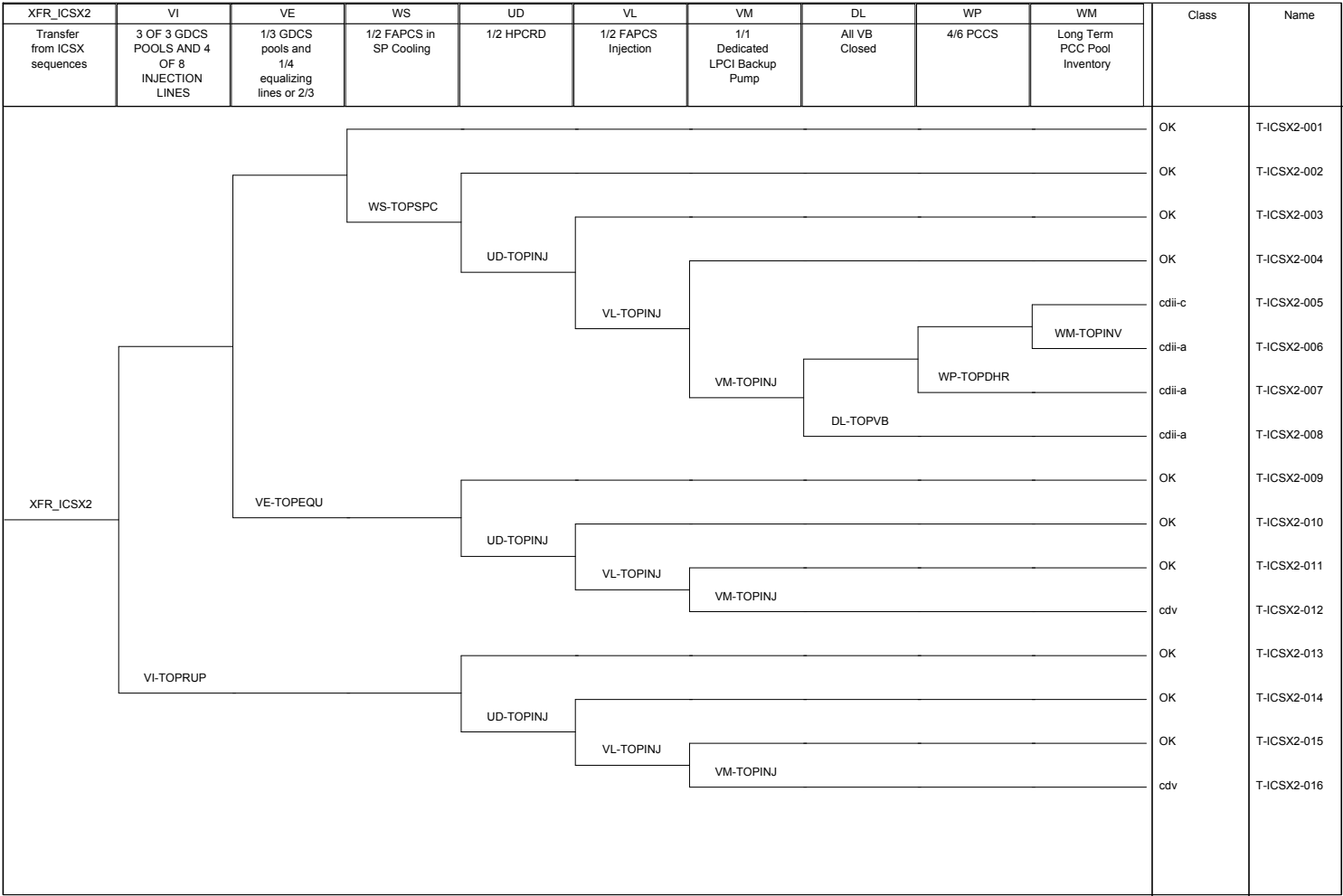


Figure 3A-17b. ICS Transfer 2 Event Tree



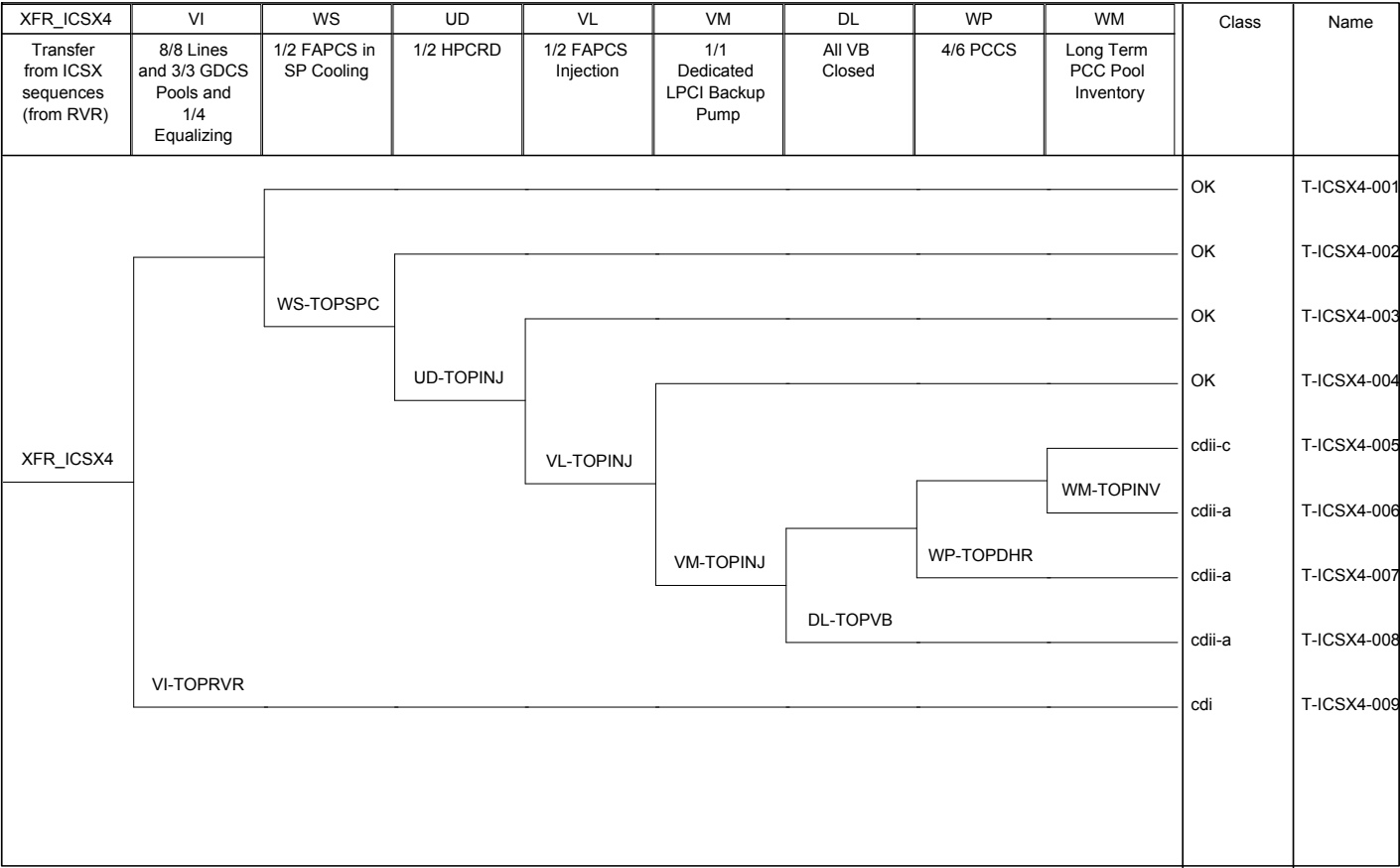


Figure 3A-17d. ICS Transfer 4 Event Tree

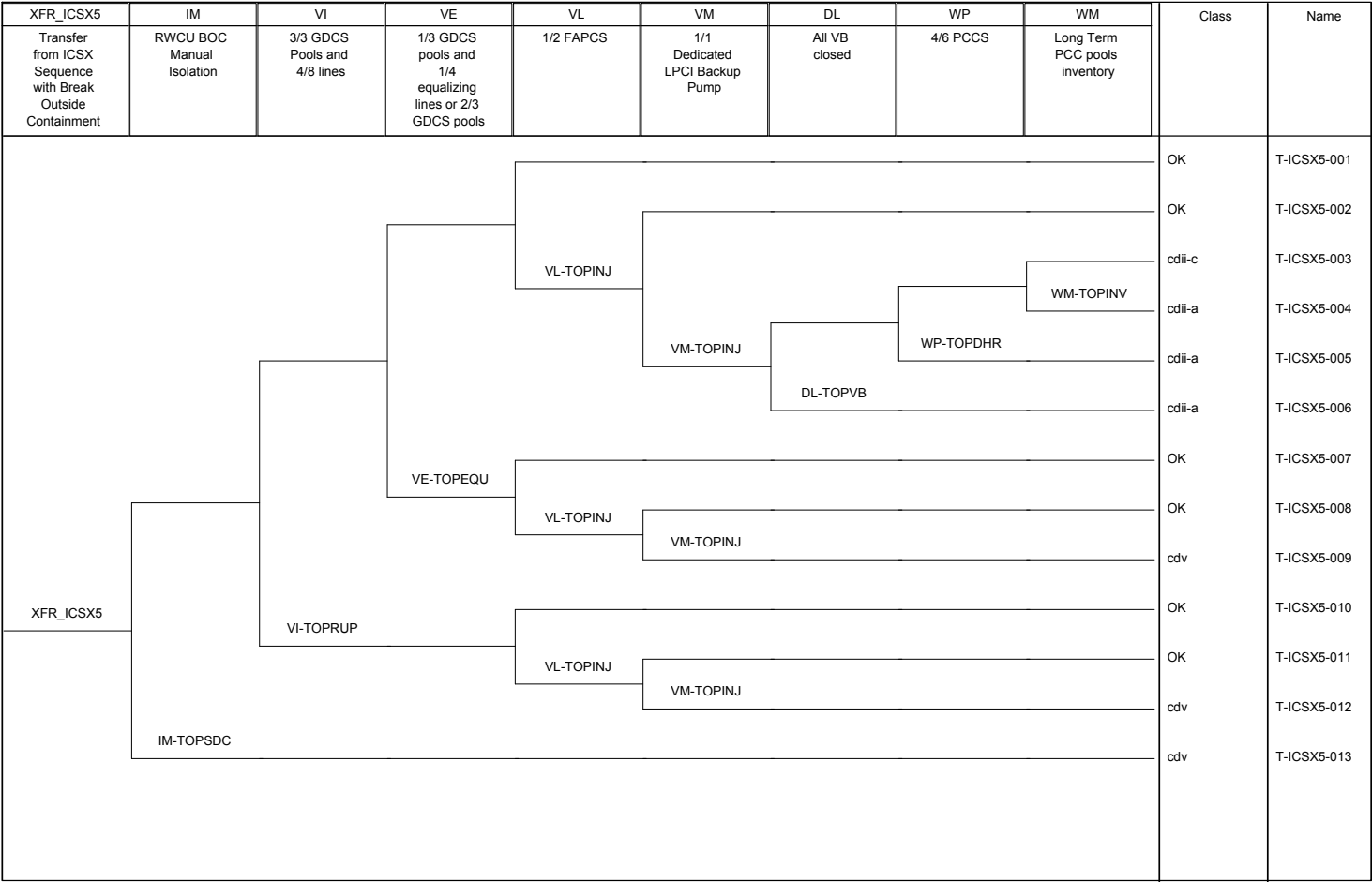


Figure 3A-17e. ICS Transfer 5 Event Tree

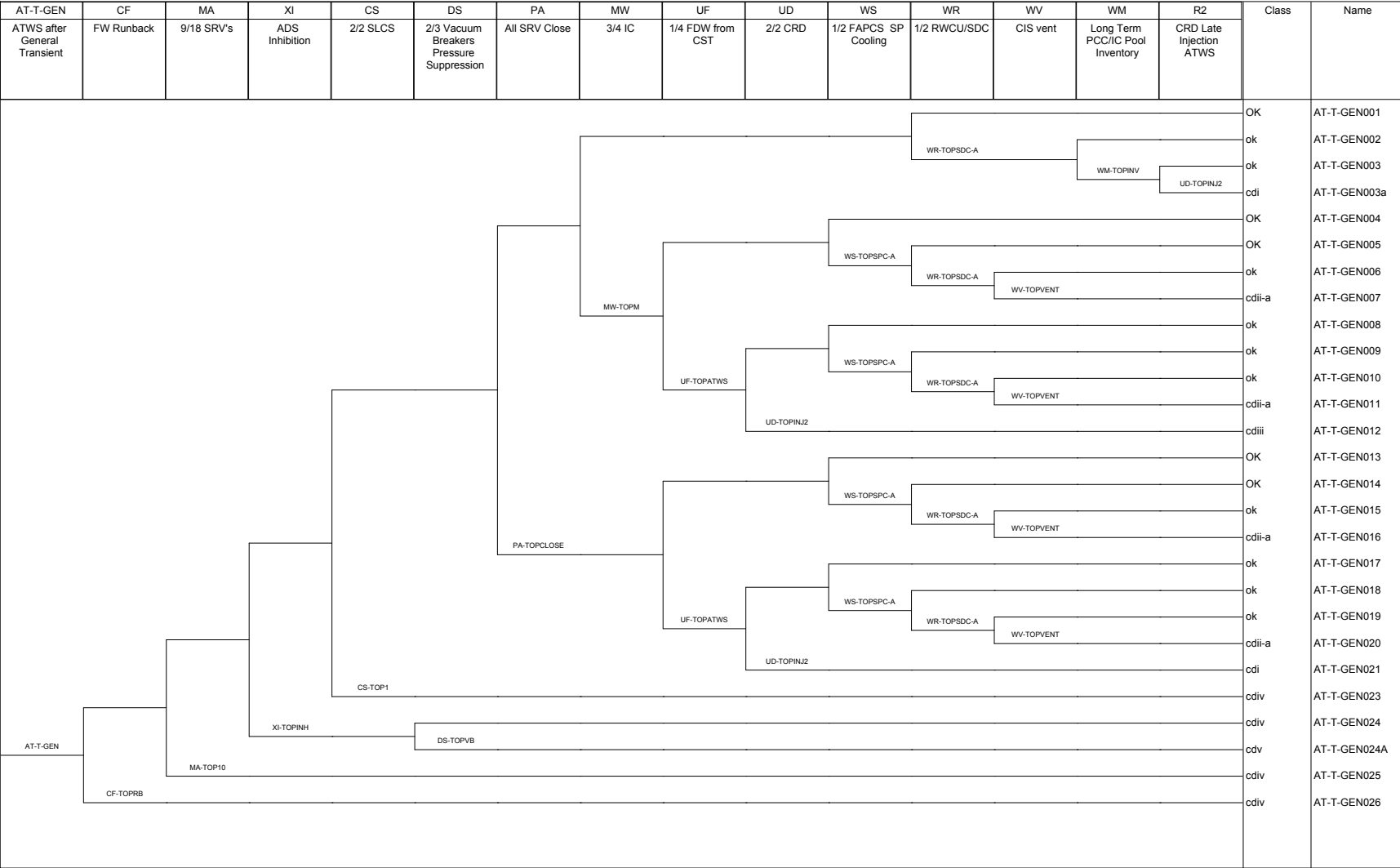


Figure 3A-18. General Transient ATWS Event Tree

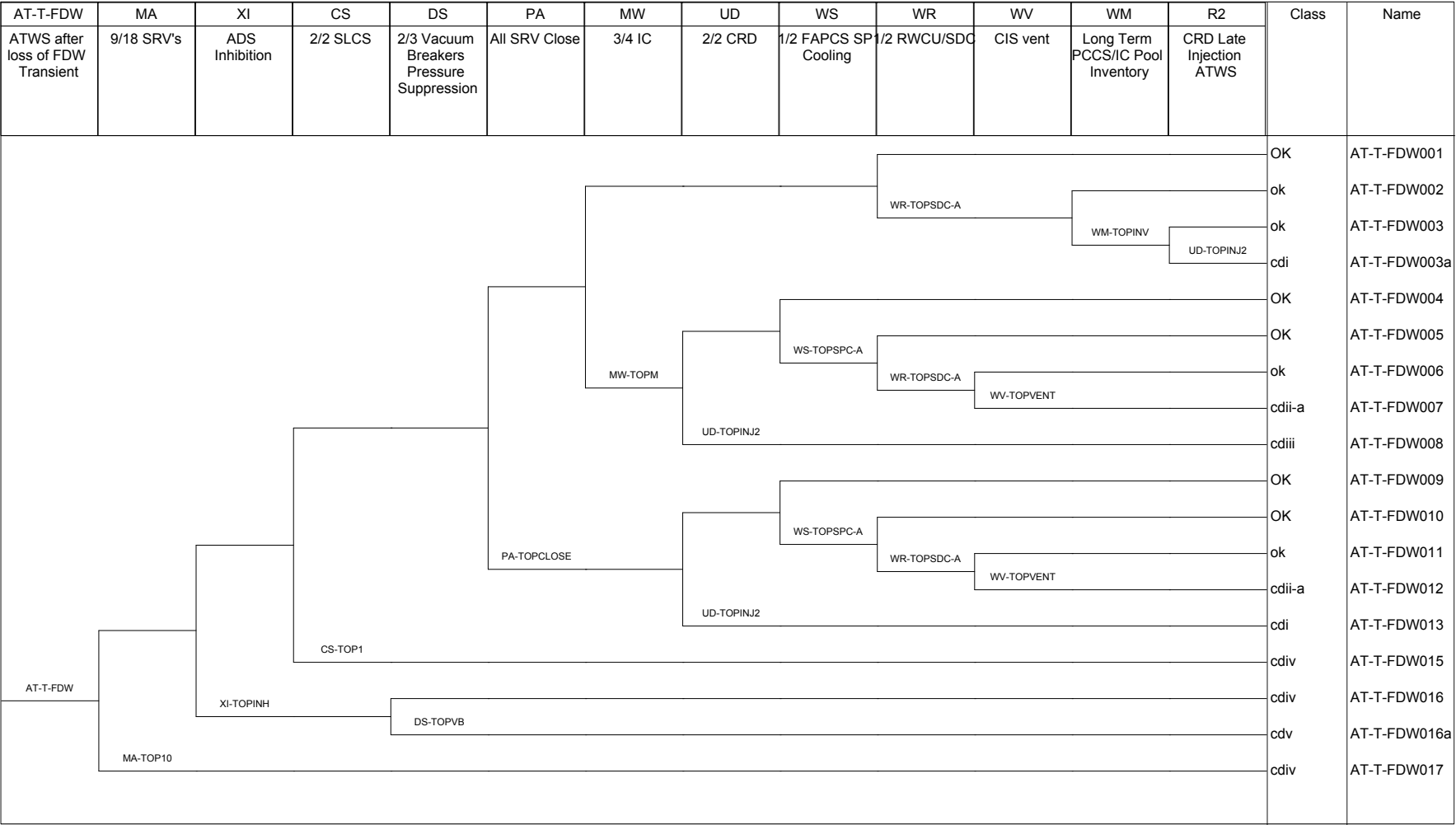
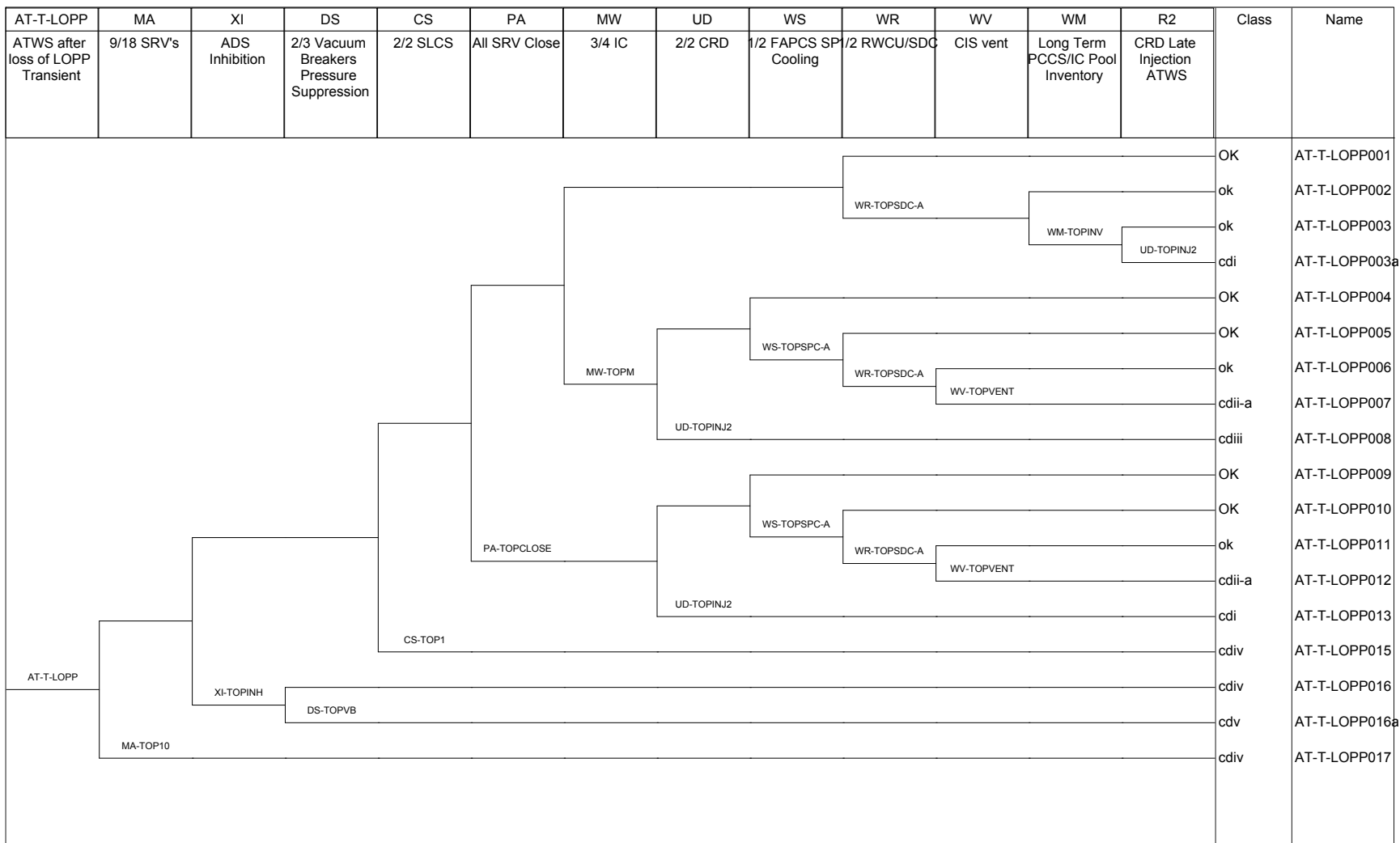


Figure 3A-19. Loss of Feedwater ATWS Event Tree



**Figure 3A-20. Loss of Preferred Power ATWS Event Tree**

AT-T-SW	CF	MA	XI	DS	CS	PA	MW	WM	Class	Name
ATWS after Loss of Service Water Transient	FDW Runback	9/18 SRV's	ADS Inhibition	2/3 Vacuum Breakers Pressure Suppression	2/2 SLCS	All SRV Close	3/4 IC	Long Term PCC/IC Pool Inventory		
<pre>graph LR     A[AT-T-SW] --&gt; B[CF-TOPRB]     A --&gt; C[MA-TOP10]     B --&gt; D[XI-TOPINH]     B --&gt; E[DS-TOPVB]     C --&gt; F[CS-TOP1]     C --&gt; G[PA-TOPCLOSE]     D --&gt; H[MW-TOPM]     D --&gt; I[WM-TOPINV]     E --&gt; J[OK]     E --&gt; K[cdii-a]     F --&gt; L[cdiii]     F --&gt; M[cdi]     G --&gt; N[cdiv]     G --&gt; O[cdiv]     H --&gt; P[cdv]     H --&gt; Q[cdi]     I --&gt; R[cdv]     I --&gt; S[cdi]</pre>	OK	AT-T-SW001								
	WM-TOPINV	cdii-a	AT-T-SW002							
	MW-TOPM	cdiii	AT-T-SW003							
	PA-TOPCLOSE	cdi	AT-T-SW004							
	CS-TOP1	cdiv	AT-T-SW006							
	XI-TOPINH	cdiv	AT-T-SW007							
	DS-TOPVB	cdv	AT-T-SW007a							
	MA-TOP10	cdiv	AT-T-SW008							
	CF-TOPRB	cdiv	AT-T-SW009							

Figure 3A-21. Loss of Plant Service Water ATWS Event Tree



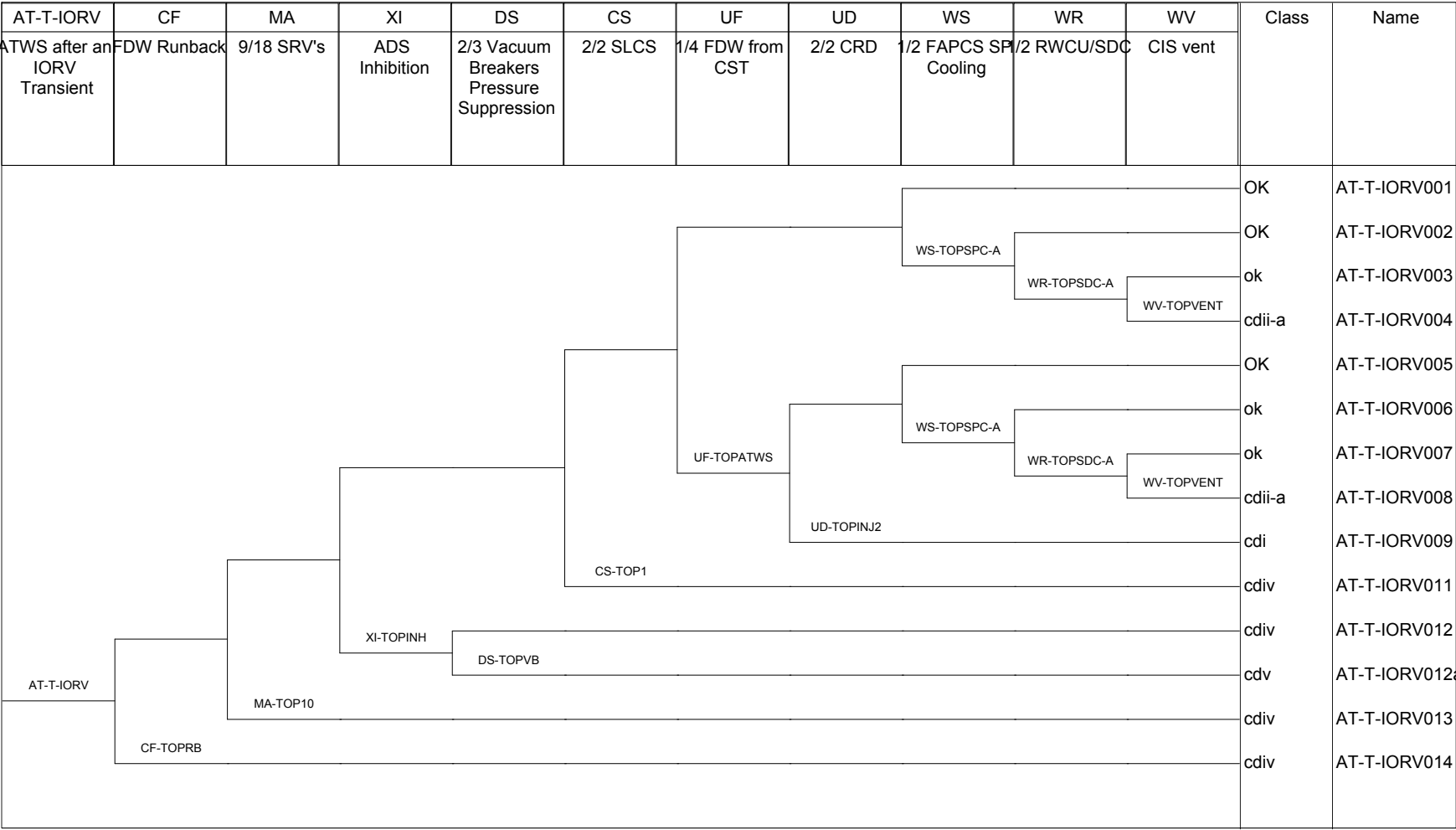
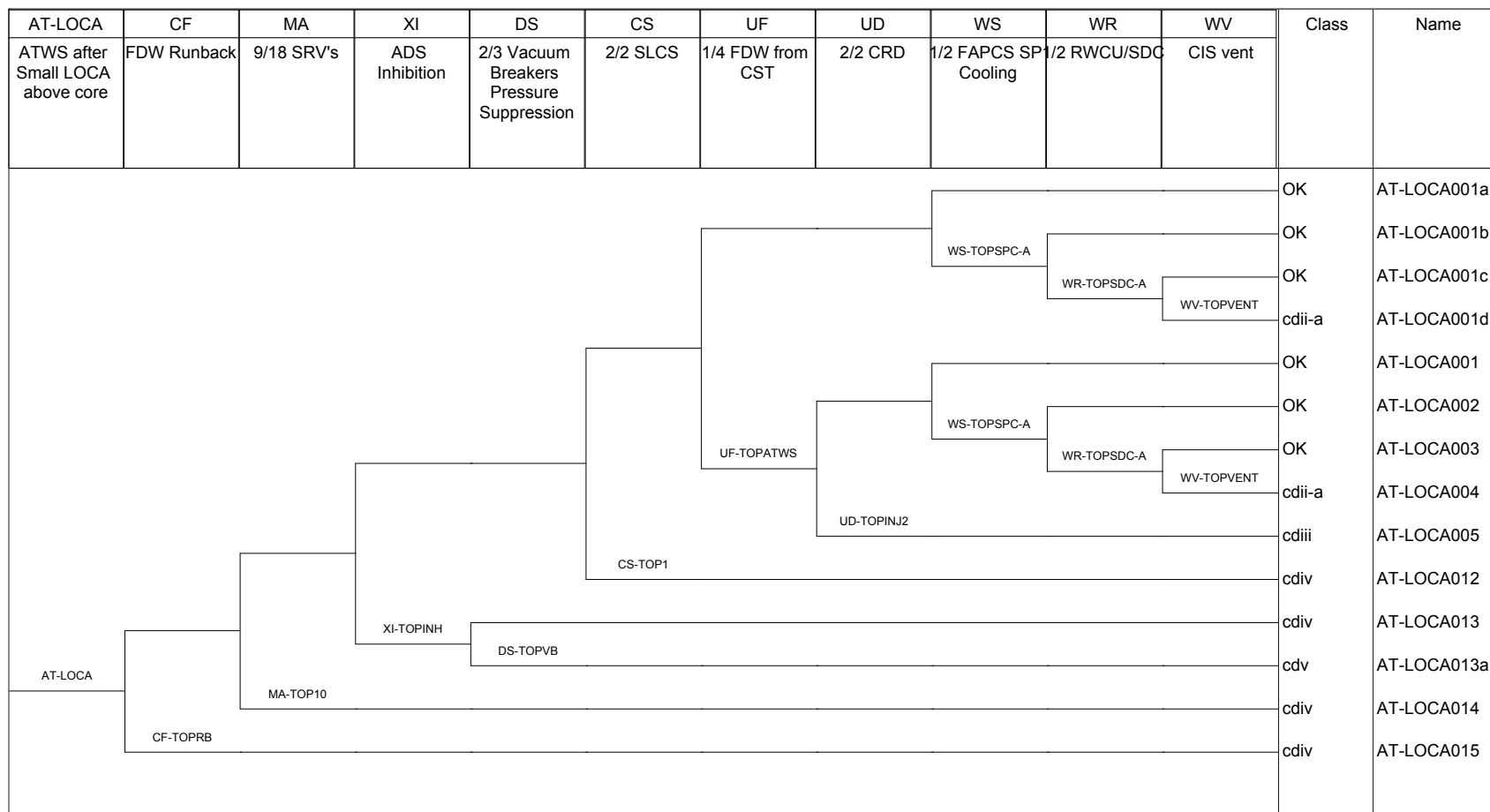


Figure 3A-22. Inadvertent Opening of Relief Valve ATWS Event Tree



**Figure 3A-23. Small LOCA ATWS Event Tree**

## 4 SYSTEM ANALYSIS

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## **4.0 INTRODUCTION**

### **4.0.1 System Analysis Purpose**

The purpose of ESBWR system analysis is to document the systems modeled in the ESBWR PRA. The systems correspond to the functional headings described in Chapter 3 plus any support systems needed to accomplish those functions. Each of Subsections 4.1 through 4.19 contains the following items:

- Functional Description
- Assumptions
- System Description
- Automatic and Manual Control
- System Interfaces
- System Testing
- System Maintenance
- Common Cause Failures
- Fault Tree Analysis
- Results of Fault Tree Analysis
- PRA Insights

The documentation of the system analysis is constructed to facilitate certification of the ESBWR design. It describes the processes used for modeling and quantification. It also includes the generic modeling assumptions. It is constructed with consideration of future updates to the ESBWR PRA and for risk informed applications involving the ESBWR.

Table 4.0-1 contains a list of the systems and the associated functions that are modeled in the ESBWR PRA.

### **4.0.2 Fault Trees**

There is at least one fault tree file for each system function included in the PRA model. If multiple trains can perform the function, then each train is modeled. All of the logic for a particular system can be contained in a single fault tree file. In fact, this is the preferred method for the ESBWR PRA.

The fault trees are constructed using the gate and basic event naming conventions described in Subsection 4.0.4. The fault tree database is stored in the CAFTA Database file format.

#### 4.0.3 General Assumptions and Modeling Ground Rules

The following general assumptions are applied to all ESBWR PRA system model development:

- (1) The Revision 4 ESBWR PRA system models are based on ESBWR DCD Revision 6. The late changes in DCD Revision 6, if any, are evaluated in Section 22 with corresponding subsections (e.g., Subsection 4.1, “AUTOMATIC DEPRESSURIZATION SYSTEM - (B21)”, has its corresponding Subsection 22.4.1).
- (2) The PRA system models include the supporting systems assuming train separation when applicable (i.e., powered from their divisional AC, DC, and/or UPS power, and cooled from their divisional component cooling water train). However, it should be noted that sometime the term “train” in the PRA documentation may be a segment of a system only, which is referred to as a train for modeling convenience.
- (3) In order to be consistent with the methods that the component failure data are collected, the feeder breakers and local instrumentation and control devices are not modeled separately for a component (e.g., a pump or valve).
- (4) System or train failures due to flow diversion are not modeled if one of the following justifications exists:
  - a. There are two or more normally closed valves on the postulated flow diversion paths.
  - b. The smallest pipe diameter (or the orifice opening diameter if included in the design) on the postulated flow diversion path is less than one fourth of the pipe diameter of the main flow path.
  - c. Loss of flow due to pipe breaks or open drain valves is not included in this analysis due to the low probability of occurrence compared to other modeled failures.
  - d. Loss of flow through relief valves is not judged to be a significant flow diversion.
- (5) Vent lines, drain lines, instrument lines and test lines have not been included in the system model. Because these lines are small in diameter, may have manual isolation valves and/or are rotated into service on a periodic basis that would identify mispositioning errors, they are not included in the system model.
- (6) For conservatism, a limited number of post-initiator operator actions are modeled with screening values.
- (7) For standby systems, trains, and components that are not normally aligned during normal plant operation, restoration errors are typically modeled.
- (8) The catastrophic pool failures for the passive systems are not modeled. The postulated failures are not credible because these pools have a stainless steel liner with the 3-4 feet concrete walls. The water levels in these pools are monitored during plant operation. Periodic inspections of these pools will also be performed during plant operation and refueling outages. Therefore, any leakage should have been identified and fixed.
- (9) In previous revisions of system models, house events XHOSLOSP and XHOSLOPP were used for different quantification settings associated with the loss of offsite power. These

house events are not used as quantification flags but are kept in the system models. In the integration process of all system models, these house events are set to be equal to the gate INI-LOPP, which is defined in the AC Electric Power System. Gate INI-LOPP is an OR gate of all loss of offsite power initiators and the consequential loss of offsite power after a plant trip. Another house event XHOS72H was used in previous revisions to indicate the sequences with long-term failures (at or after 72 hours after the accident), which is kept in the current revision. This event is set to TRUE (probability of 1) and is not used in the quantification.

- (10) System models follow the methodologies and guidelines described in Sections 5 and 6 for component failure rates, CCF groups, and operator actions. Transfers among the system models are modeled as special events with a screen value of 1E-3. Because the system models were developed first, Sections 2, 5 and 6 include the approved input data that are used in the model integration and quantification process, which is documented in Sections 7 and 8. During the model integration and quantification process, further verifications are performed to check the accuracy of all the model inputs. Any discrepancies between the inputs used in the final quantification and the ones documented in other sections are documented in the quantification packages.

#### **4.0.4 System Model Naming Conventions**

##### ***4.0.4.1 Initiating Event Naming Convention***

Basic events that represent initiating events shall be formatted as follows:

%AAAAAA

Where AAAAA is a descriptive identifier of up to 31 characters.

##### ***4.0.4.2 Basic Event Naming Convention***

Basic events that represent individual components shall be named as follows:

XXX-YYY-ZZ-AAAAA

Where the fields are defined as:

XXX      System ID

YYY      Component Type Code

ZZ        Failure Mode

AAAAA    Information to identify the specific component. This should match the identifier on the system sketch, excluding the component code. Use as many digits as necessary up to a total of 21 for this field. The maximum number of characters for the basic event is 32.

Common cause basic events use a similar convention, except that field AAAAA contains the combination of equipment in the CCF group. For example, CCF of 3 of 6 GDCS valves F002A, F002B, and F002D would be:

E50-SQV-CC\_1\_2\_4

Human error basic events also follow similar convention except the following changes:

- For pre-initiating event human actions, field ZZ is designated as “RE.” For example, the basic event for operator failure to restore RCCWS Train 1A pump would be:

P21-TRN-RE-PUMP1A.

- For post-initiating event human actions, field YYY and ZZ are designated as “XHE” and “FO.” For example, the basic event for operator failure to align and actuate FAPCS in low pressure injection mode would be:

G21-XHE-FO-LPCI

- For some post-initiating event human actions that affect multiple systems, field XXX is designated as “XXX.” For example, the basic event for operator failure to recognize the need of depressurization would be:

XXX-XHE-FO-DEPRESS

Some systems and recoveries may be modeled as undeveloped events. These are named using the same convention, with the following codes:

XXX      System ID.

YYY      Use the code “SYS.”

ZZ        For an undeveloped system, use “FF”.

For a recovery action use “NR”.

AAAAA   For an undeveloped system, provide a short description of the system.

#### ***4.0.4.3 System Top and Gate Naming Convention***

System fault tree gates should be named starting with the 3-character system designator, then a hyphen ( - ), then a unique identifier. This identifier can be descriptive.

The naming of the system tops should follow one of the following two conventions:

(1)   AAA-XXXX

where AAA is the system identifier, and XXXX is an abbreviation of the function (use more characters if necessary). This applies to tops that are expected to be used by more than one system.

(2)   AAA-BBB-XXXXX-ZZZZ

where AAA is the system identifier for the system providing the support, BBB is the identifier of the system needing the support, XXXXX is the component identifier needing the support, and ZZZZ is an abbreviation of the support function needed.

Example:

C63-B32-F005-OPEN (open signal provided by C63 to B32-F005).



**Table 4.0-1**  
**Subsection Number and Fault Trees of Key ESBWR Systems**

Subsection #	System ID	System Name	Functions Modeled
4.1	B21	Nuclear Boiler System (NBS)	Depressurization (SRV or DPV) Overpressure Protection
4.2	B32	Isolation Condenser System (ICS)	Reactor Heat Removal SRV Leakage DPV Leakage
4.3	C12	Control Rod Drive System (CRD)	RPV Injection at High Pressure
4.4	C41	Standby Liquid Control (SLC) System	Boron Injection
4.5	C62 C63 C71 C72 C74	Nonsafety-Related DCIS Safety-Related DCIS Reactor Protection System (RPS) Diverse Instrumentation and Control System Safety System Logic and Control (SSLC)	Safety-related equipment actuation and control. Nonsafety-Related equipment actuation and control. Instrumentation (Sensors) Reactor Protection System Signals - SCRAM - Alternate Rod Insertion - Feedwater Runback - Manual Rod Insertion - ADS Inhibit
4.6	E50	Gravity- Driven Cooling System (GDCCS)	RPV Injection at Low Pressure
4.7	G21	Fuel and Auxiliary Pools Cooling System (FAPCS)	Suppression Pool Cooling Low Pressure Coolant Injection Post-accident Reactor Inventory Makeup via the Dedicated FAPCS Pump ICS Pool Makeup GDCCS Pool Makeup
4.8	G31	Reactor Water Cleanup / Shutdown Cooling (RWCU/SDC) System	Shutdown Cooling
4.9	N21	Condensate and Feedwater System (C&FS)	RPV Injection at High Pressure RPV Injection at Low Pressure
	N71	Circulating Water System (CIRC)	

**Table 4.0-1**

**Subsection Number and Fault Trees of Key ESBWR Systems**

<b>Subsection #</b>	<b>System ID</b>	<b>System Name</b>	<b>Functions Modeled</b>
	P22	Turbine Component Cooling Water System (TCCWS)	
4.10	P21	Reactor Component Cooling Water System (RCCWS)	Component Cooling
4.11	P41	Plant Service Water System (PSWS)	Component Cooling
4.12	P52 P51	Instrument Air System (IAS) Service Air System (SAS)	Valve Motive Power
4.13	P54	High Pressure Nitrogen Supply System (HPNSS)	Valve Motive Power
4.14	R10 R11 R12 R21	Electrical Power Distribution System (EPDS) Medium Voltage Distribution System (MVDS) Low Voltage Distribution System (LVDS) Standby AC Power Supply	AC Power
4.15	R13	Uninterruptible AC Power Supply (UPS)	AC Power
4.16	U43	Fire Protection System	PCCS Pool Makeup IC Pool Make up
4.17	R16	Direct Current Power Supply	DC Power
4.18	T10	Containment System	Containment Isolation Vapor Suppression
4.19	T15	Passive Containment Cooling System (PCCS)	Containment Atmosphere Cooling

## **4.1 AUTOMATIC DEPRESSURIZATION SYSTEM - (B21)**

### **4.1.1 Functional Description**

In response to emergency conditions, the Automatic Depressurization System (ADS) portion of the Nuclear Boiler System (NBS) provides automatic, effectively permanent depressurization of the reactor under a timely blowdown schedule. Once the depressurization is complete, passive re-supply of coolant to the reactor is provided by the Gravity Driven Cooling System (GDCS). The ADS uses eight (8) depressurization valves (DPVs) together with ten (10) safety-relief valves (SRVs) to achieve reactor depressurization. This function continues until the vessel pressure and temperature are nominally stabilized. For the long term, the DPVs provide a flow path for the steam to the drywell and from there to the Passive Containment Cooling System (PCCS). The SRVs involved in the ADS actuation are each piped separately to their respective quenchers located in the suppression pool to permit condensation of the discharged steam. There are eight (8) safety valves (SVs) used to provide RCS Overpressure Protection (OP) for the postulated anticipated transient without scram (ATWS) event. Overpressure protection is also required if the Isolation Condenser System (ICS) fails after reactor isolation.

The NBS also contains the feedwater containment isolation valves through which all active, external injection must flow to the RPV. To allow injection by either the feedwater system, control rod drive system, fuel and auxiliary pools cooling system, or the reactor water cleanup / shutdown cooling system, these check valves must open (if previously closed) and remain open for the mission time.

### **4.1.2 Assumptions**

The following assumptions with respect to the design are made:

- (1) The SVs and SRVs will be significantly different enough in design and testing programs that they can be considered as separate CCF groups for OP.
- (2) The nitrogen accumulators on the SRVs are sufficient to provide one extended-duration cycle of their respective SRV. This extended duration cycle of depressurization is sufficient to permit active low-pressure make-up in the event of a loss of the high-pressure nitrogen supply system (HPNSS).
- (3) The discharge line vacuum breakers are not modeled for two reasons. One, the potential water hammer that results from the DW pipe re-flood after SRV actuation would not prevent the SRVs from successfully performing their depressurization function. Also, the PRA assumes one actuation of the SRVs, so the model would not expose the discharge pipe to the potential for condensation-related pressure instabilities.
- (4) To bound nitrogen accumulator performance given a loss of HPNSS, the single accumulator check valve is assumed to start in the open position and is required to close for success. Common cause failures of the accumulator check valves to close is modeled between all SRV accumulators.
- (5) Although the ADS utilizes both SRVs and DPVs for the automatic function, the PRA only models the DPVs for the automatic actuation. The SRVs are only credited for manual depressurization, and manual actuation of the ADS sequence is not modeled. This

simplifying assumption also bounds drywell (DW) pressure response because all RPV energy is released directly to the DW during automatic depressurization instead of first being directed to the suppression pool (SP).

- (6) All ten SRVs, which are set at the same OP setpoint (lower than the SVs) are assumed to open during a general transient. Only one valve is required to open for success, but to bound uncertainty in system response, all ten are assumed to open for the purpose of re-seat failures. Similarly, only 9 are required to open for ATWS OP, but all 18 are assumed to open to bound uncertainty regarding re-seat failures.

### 4.1.3 System Description

#### 4.1.3.1 Hardware Configuration

The automatic depressurization system is composed of ten SRVs and eight depressurization valves (DPVs), together with their related instrumentation and control logic. The ten SRVs are distributed for each main steam line (3-2-2-3) and are spring-loaded and nitrogen operated. The eight SVs are distributed evenly between the four main steam lines. The SRVs have the capability of actuating in ADS mode or overpressure protection mode; the SVs, however, can only actuate in the overpressure protection mode.

Each SRV has an individual discharge line routed to the suppression pool, ending with a submerged steam quencher. This discharge line incorporates redundant vacuum breakers within the drywell pipe run in order to limit re-flood of the line after SRV reclosure, which could result from condensation of residual steam after valve operation.

Hardware failures considered for the SRVs include failure to open in manual actuation mode, fail to open in overpressure protection mode, and failure to re-seat after opening. For ADS mode, the SRV boundary includes the four solenoids and associated failure modes. For hardware failures associated with the DPVs, the initiators and booster are included in the valve boundary; for both SRVs and DPVs, the load driver configurations are included in the support systems (Q-DCIS and DPS).

The DPVs are straight through, squib-actuated, non-reclosing type valves, with a metal diaphragm (seal) that acts as a valve disk. The diaphragm is sheared off by four initiators (squibs) that either individually or jointly are capable of actuating the booster and, subsequently, opening the valve.

There are two feedwater containment isolation valves. One air-testable check valve (B21-F111A/B) is on the “alternate injection flowpath” close to where the non-feedwater injection systems connect to their respective feedwater line. The second check valve (B21-F102A/B) is located inside the drywell. All of the non-feedwater injection systems flow through both check valves, feedwater does not flow through the B21-F111A/B valves.

Figure 4.1-1 shows a simplified diagram of the system.

#### 4.1.3.2 System Operation

Considerable margins exist between the SRV/SV spring setpoint pressures and the reactor operating pressure. The Isolation Condenser System (ICS) is able to keep reactor pressure vessel (RPV) pressure below the SRV spring setpoint during transient events. The automatic

depressurization function is requested when the RPV water Level 1 is reached for a short time delay.

Opening the SRVs and the DPVs performs the automatic depressurization function.

In order to depressurize to a point where the GDCS is allowed to operate, one of the following minimal combinations of SRVs and/or DPVs must be successful:

- 6 SRVs must open
- 4 SRVs and 2 DPVs must open
- 4 DPVs must open

However, the PRA model currently only credits the last of these alternatives because long term cooling with the GDCS equalizing lines requires the successful operation of 4 DPVs.

The SRV/SVs are also called into operation during an ATWS event to prevent over pressurization of the RPV and a possible subsequent break. The success criterion for the pressure relief during ATWS is that nine of eighteen SRV/SVs must open in overpressure protection mode. In addition, during this ATWS event, the automatic initiation of ADS (SRVs and DPVs) is inhibited, automatic or manually.

The feedwater check valves are used in various other systems as a support for RPV injection and/or cooling functions. The valves must open (if previously closed) and remain open for the modeled mission time.

#### ***4.1.3.3 Component Location***

The SRV/SVs are installed on the main steam lines. All eight DPVs are on short stub pipes that extend from the RPV at approximately (slightly below) the elevation of the main steam lines. All components and associated power and control cables are located in the DW, and as such are designed for operation in the post-LOCA DW environment. As a result, no special considerations are necessary to account for harsh operating conditions.

The air-testable feedwater containment isolation valve B21-F111A/B is located close to where the lines from CRD, FAPCS, and RWCU/SDC connect to the feedwater lines outside containment. The inboard feedwater containment isolation valve B21-F102A/B is located inside the drywell.

#### **4.1.4 Automatic and Manual Control**

The driving concept of the ADS is the ability to actuate SRVs and DPVs even if two electrical or signal divisions are lost.

The feedwater check valves are passively process-actuated valves. The B21-F111A/B valves are air-testable, but do not have enough closure pressure (if inadvertently actuated) to prevent any of the injection or cooling systems from performing their modeled functions.

A list of all the related control room instrumentation and alarms is reported in Table 4.1-1.

#### ***4.1.4.1 Automatic Actuation***

The ADS logic is automatically initiated when a low reactor water level signal (Level 1) is present. If the RPV low water level signal is present concurrently with a high drywell pressure signal, both the main ADS timer and the high drywell pressure bypass timer are initiated. If the RPV low water level signal is present without a concurrent high drywell pressure signal, only the ADS high drywell pressure bypass timer is initiated. Upon the time-out of the ADS high drywell pressure bypass timer and concurrent with a RPV low water level signal, the main ADS timer is initiated, if not already initiated. The main ADS timer continues to completion and times out only in the continued presence of an RPV low water level signal. When the main ADS timer times out, the ADS function is initiated. The depressurization rate is limited by time-delayed actuation of groups of SRVs and DPVs. Group one is the first five SRVs, group two is the second five SRVs, group three is three DPVs, groups four and five are 2 DPVs each, and group six is the one remaining DPV. The timer-controlled depressurization rate is used to prevent reactor coolant inventory level swells in amounts sufficient to produce liquid carry-over along with steam in the blowdown exhaust flow.

#### ***4.1.4.2 Manual Actuation***

The ten (10) SRVs also have the capability of being opened manually from the control room. Manual actuation can be done either by actuating individual valves or by manually initiating ADS as a system. The operator can open an SRV through a pushbutton switch; valves remain open for as long as the pushbutton switch is depressed. With this feature, the operator is able to control normal isolation transients even if, according to the design, no need should arise for such an operation.

The operator can also manually initiate the ADS function from the main control room; this function is not modeled in the PRA.

#### ***4.1.4.3 Safety Actuation***

All 10 SRVs and 8 SVs open in the overpressure protection mode (that is, actuated on high RPV pressure) when reactor pressure reaches the spring setpoint value.

#### **4.1.5 System Interfaces**

The ADS shares all of the components related to the actuating signals with other safety-related systems. These include RPV water level (Level 1) and ATWS inhibit signals. ADS shares four level sensors with the systems actuated on a Level 2 signal.

The SRVs need pressurized nitrogen supply to open and to remain open. This is achieved through accumulators connected to the high pressure nitrogen supply system (HPNSS). The nitrogen supply in the accumulators is adequate to keep the SRVs open for sufficient time intervals to depressurize even if HPNSS supply is not available. The long-term nitrogen supply for the SRVs is bottled nitrogen in the HPNSS.

The B21-F102A/B and B21-F111A/B check valves interface with various RPV injection and cooling systems. The “A” train valves interface with FAPCS and train “B” of RWCU/SDC. The “B” train valves interface with CRD and train “A” of RWCU/SDC. The B21-F102A/B valves also interface with the corresponding trains of the feedwater system.

Table 4.1-2a summarizes dependencies on the support systems by division. Table 4.1-2b lists the transfer gates to the ADS support systems.

#### **4.1.6 System Testing**

Testing of SRVs is possible during plant operation. It is assumed that SRV tests are scheduled at 18-months intervals on a staggered tests basis. The SRV/SV safety function setpoints are verified at 24-months intervals for half of the eighteen valves. Each DPV contains four initiators and one booster. During plant operation, the integrity of the electrical circuits of the initiators is continuously monitored by a low current flowing through the wires.

#### **4.1.7 System Maintenance**

All of the main components are within the drywell, therefore no maintenance is planned during plant operation. Maintenance work on SRV/SVs is anticipated during alternate refueling outages, or every four years. During refueling, a small sample of squib valve booster and initiators are replaced and test fired; also, an inspection is expected to verify the integrity of the mechanical parts of the DPVs.

#### **4.1.8 Common Cause Failures**

A high degree of redundancy is incorporated in the system design. For that reason, common cause failures (CCFs) turn out to be a potential contributor to system unavailability. The CCFs that have been identified in the system are listed in Table 4.1-4.

#### **4.1.9 Fault Tree Analysis**

The ADS fault tree has been evaluated to determine the system unavailability and to identify the components that contribute significantly to system unavailability.

##### ***4.1.9.1 Top Event Definitions***

- Gate MA-TOP10 represents the failure of 10/18 SRVs to open in overpressure protection during ATWS.
- Gate MS-TOP18 represents the failure of all 18/18 SRVs to open in overpressure protection during a general transient.
- Gate PA-TOPCLOSE represents the failure of exactly one SRV to re-seat during ATWS.
- Gate PB-TOPCLOSE represents the failure of two or more SRVs to re-seat during ATWS.
- Gate PS-TOPIORV represents the failure of exactly one SRV to re-seat during a general transient.
- Gate PS-TOPLSLOCA represents the failure of two or more SRVs to re-seat during a general transient.
- Gate XD-TOPDPV represents the failure of 5/8 DPVs to open automatically for ADS.
- Gate XM-TOPXMAN represents the failure of 6/10 ADS SRVs to open manually for depressurization.

- Gate B21-FDW-A-CC represents the failure of feedwater line A containment isolation valves to open to allow alternate active injection once feedwater has tripped. This is a support to the active injection systems that inject through feedwater line A (RWCU/SDC train B and CRD).
- Gate B21-FDW-A-OC represents the failure of feedwater line A containment isolation valves to remain open. This is a support to the active injection systems that inject through feedwater line A (RWCU/SDC train B and CRD).
- Gate B21-FDW-B-CC represents the failure of feedwater line B containment isolation valves to open to allow alternate active injection once feedwater has tripped. This is a support to the active injection systems that inject through feedwater line B (RWCU/SDC train A and FAPCS).
- Gate B21-FDW-B-OC represents the failure of feedwater line B containment isolation valves to remain open. This is a support to the active injection systems that inject through feedwater line B (RWCU/SDC train A and FAPCS).

The top events list defined for the system is given in Table 4.1-6.

#### ***4.1.9.2 Fault Tree Description***

The fault trees are shown in Figure 4.1-2.

#### ***4.1.9.3 Human Interaction***

There are two operator actions modeled for manual depressurization with the ADS SRVs. The event XXX-XHE-FO-DEPRESS represents operator failure to recognize the need for depressurization. Additionally, the event B21-XHE-FO-6OPEN represents operator failure to open at least six of ten SRVs. No other manual actions, such as manual recovery of automatic ADS actuation, are credited in the system model. Human error events are summarized in Table 4.1-5.

#### ***4.1.9.4 Special Events***

There are two special events in the ADS PRA model; both of them are conditional probabilities involving failure to re-seat of SRVs after the valves open in overpressure protection.

PB-TOPCLOSE is a conditional probability that, during ATWS, a total of two or more SRVs fail to re-seat given that one SRV is already stuck open. That is, that one or more additional SRVs stick open after exactly one SRV has already stuck open.

PS-TOPLSLOCA is a conditional probability that, during a general transient, a total of two or more SRVs fail to reseat given that one SRV is already stuck open. That is, that one or more additional SRVs stick open after exactly one SRV has already stuck open.

#### **4.1.10 Results of Fault Tree Analysis**

The definition of each basic event is reported in Table 4.1-7.

The quantification of core damage sequences implicitly includes the contribution of basic events for this system. This quantification process enables checking the global consistency of the system fault trees and their relationship with the rest of the systems modeled in the PRA.



The importance measurements obtained from core damage frequency equations allow identification of the most relevant basic events and system component failures in an integrated context, as well as the determination of their relative importance with respect to the basic events and component failures of the other systems modeled.

#### **4.1.11 PRA Insights**

The ADS features extensive redundancy in both the SRV and DPV sub-systems, which leads to system cutsets that are dominated by common cause events. The exception is manual depressurization with the SRVs, which is led by the two human error events.

There is one key insight or assumption associated with the B21 PRA system analysis:

- (1) The nitrogen accumulators are assumed to support component (SRV) function coincident with a loss of HPNSS.

**Table 4.1-1**  
**ADS - Control Room Instrumentation and Alarms**

<b>Controls</b>
Manual actuation of individual SRVs
<b>Displays</b>
Reactor vessel pressure
Reactor vessel water level
Main steam line pressure
Main condenser vacuum
Main steam line flow
Main steam line radiation (from PRMS)
SRV position
MSIV position
DPV position
Main steam line drain valve position
Position of feedwater motor operated valves within Reactor Building
Feedwater outboard isolation check valve position
Position of feedwater maintenance manual isolation valve
RPV head seal leak detection
Main steam line drain temperature
<b>Alarms</b>
RPV head closure seal leakage
Low reactor water level (L1, L2 and L3)
High reactor water level (L8)
High reactor water level (L9)
High SRV discharge line temperature
SRV – Open
MSIV – Closure
DPV – Open
ADS Inhibited/Auto Out of Service
ADS Logic Initiated
Valve travel failure (all feedwater motor-operated valves)
Loss of continuity in SRV actuation circuits
Loss of continuity in DPV firing circuits

**Table 4.1-2a**  
**ADS - System Dependencies**

Component	Type	Air Supply	Powered Control Signal	
F004A	DPV	-	C63 (Div 1, 2, 3)	C72 (DPS)
F004B	DPV	-	C63 (Div 1, 2, 4)	
F004C	DPV	-	C63 (Div 1, 2, 3)	
F004D	DPV	-	C63 (Div 1, 2, 4)	
F004E	DPV	-	C63 (Div 1, 2, 3)	
F004F	DPV	-	C63 (Div 1, 2, 4)	
F004G	DPV	-	C63 (Div 1, 2, 3)	
F004H	DPV	-	C63 (Div 1, 2, 4)	
F006A	SRV	P54 (HPNSS)	C63 (Div 1, 2, 3)	C72 (DPS)
F006B	SRV	P54 (HPNSS)	C63 (Div 1, 2, 4)	
F006C	SRV	P54 (HPNSS)	C63 (Div 1, 2, 3)	
F006D	SRV	P54 (HPNSS)	C63 (Div 1, 2, 4)	
F006E	SRV	P54 (HPNSS)	C63 (Div 1, 2, 3)	
F006F	SRV	P54 (HPNSS)	C63 (Div 1, 2, 4)	
F006G	SRV	P54 (HPNSS)	C63 (Div 1, 2, 3)	
F006H	SRV	P54 (HPNSS)	C63 (Div 1, 2, 4)	
F006J	SRV	P54 (HPNSS)	C63 (Div 1, 2, 3)	
F006K	SRV	P54 (HPNSS)	C63 (Div 1, 2, 4)	

**Table 4.1-2b**  
**ADS - Transfers**

<b>Transfer</b>	<b>Description</b>
C63-B21-F004A-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004A-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004A-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004B-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004B-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004B-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004C-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004C-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004C-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004D-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004D-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004D-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004E-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004E-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004E-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004F-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004F-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004F-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004G-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004G-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004G-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004H-A	Q-DCIS DIV. A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004H-B	Q-DCIS DIV. B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F004H-C	Q-DCIS DIV. C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006A-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006A-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006A-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006B-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006B-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006B-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006C-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006C-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE

**Table 4.1-2b**  
**ADS - Transfers**

<b>Transfer</b>	<b>Description</b>
C63-B21-F006C-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006D-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006D-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006D-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006E-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006E-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006E-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006F-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006F-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006F-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006G-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006G-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006G-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006H-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006H-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006H-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006J-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006J-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006J-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006K-A	Q-DCIS DIVISION A (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006K-B	Q-DCIS DIVISION B (1 OF 4) TRANSMISSION FAILURE
C63-B21-F006K-C	Q-DCIS DIVISION C (1 OF 4) TRANSMISSION FAILURE
C72-B21-F004A-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004B-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004C-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004D-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004E-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004F-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004G-DPS	DPS TRANSMISSION FAILURE
C72-B21-F004H-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006A-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006B-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006C-DPS	DPS TRANSMISSION FAILURE

**Table 4.1-2b**  
**ADS - Transfers**

<b>Transfer</b>	<b>Description</b>
C72-B21-F006D-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006E-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006F-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006G-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006H-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006J-DPS	DPS TRANSMISSION FAILURE
C72-B21-F006K-DPS	DPS TRANSMISSION FAILURE
P54-B21-HIGHPN2LOSS	LOSS OF HIGH PRESSURE NITROGEN SUPPLY

**Table 4.1-3**  
**ADS – Component Test and Maintenance**

<b>Component</b>	<b>Type</b>	<b>Expected Test Interval</b>
SRV and DPV actuation circuit continuity test	SRV / DPV	Continuous, does not affect function
SRVs safety function setpoints	SRV	24-month intervals for half of the SRVs
SRV tests	SRV	18-month intervals on a staggered tests basis
Signal chain	DPV	Quarterly
Actuating logic devices	DPV	Monthly
Initiators and boosters	DPV	24-months

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
B21-SQV-CC_1_2_3	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004C
B21-SQV-CC_1_2_4	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004D
B21-SQV-CC_1_2_5	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004E
B21-SQV-CC_1_2_6	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004F
B21-SQV-CC_1_2_7	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004G
B21-SQV-CC_1_2_8	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004H
B21-SQV-CC_1_3	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004C
B21-SQV-CC_1_3_4	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004D
B21-SQV-CC_1_3_5	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004E
B21-SQV-CC_1_3_6	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004F
B21-SQV-CC_1_3_7	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004G
B21-SQV-CC_1_3_8	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004H
B21-SQV-CC_1_4	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004D
B21-SQV-CC_1_4_5	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004D & B21-SQV-CC-F004E
B21-SQV-CC_1_4_6	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004D & B21-SQV-CC-F004F
B21-SQV-CC_1_4_7	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004D & B21-SQV-CC-F004G
B21-SQV-CC_1_4_8	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004D & B21-SQV-CC-F004H
B21-SQV-CC_1_5	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004E
B21-SQV-CC_1_5_6	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004E & B21-SQV-CC-F004F
B21-SQV-CC_1_5_7	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004E & B21-SQV-CC-F004G



**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SQV-CC_1_5_8	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004E & B21-SQV-CC-F004H
B21-SQV-CC_1_6	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004F
B21-SQV-CC_1_6_7	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004F & B21-SQV-CC-F004G
B21-SQV-CC_1_6_8	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004F & B21-SQV-CC-F004H
B21-SQV-CC_1_7	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004G
B21-SQV-CC_1_7_8	7.94E-07	CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_1_8	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004H
B21-SQV-CC_2_3	2.38E-05	CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004C
B21-SQV-CC_2_3_4	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004D
B21-SQV-CC_2_3_5	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004E
B21-SQV-CC_2_3_6	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004F
B21-SQV-CC_2_3_7	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004G
B21-SQV-CC_2_3_8	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004H
B21-SQV-CC_2_4	2.38E-05	CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004D
B21-SQV-CC_2_4_5	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004D & B21-SQV-CC-F004E
B21-SQV-CC_2_4_6	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004D & B21-SQV-CC-F004F
B21-SQV-CC_2_4_7	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004D & B21-SQV-CC-F004G
B21-SQV-CC_2_4_8	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004D & B21-SQV-CC-F004H
B21-SQV-CC_2_5	2.38E-05	CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004E
B21-SQV-CC_2_5_6	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004E & B21-SQV-CC-F004F
B21-SQV-CC_2_5_7	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004E & B21-SQV-CC-F004G
B21-SQV-CC_2_5_8	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004E & B21-SQV-CC-F004H
B21-SQV-CC_2_6	2.38E-05	CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004F

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SQV-CC_2_6_7	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004F & B21-SQV-CC-F004G
B21-SQV-CC_2_6_8	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004F & B21-SQV-CC-F004H
B21-SQV-CC_2_7	2.38E-05	CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004G
B21-SQV-CC_2_7_8	7.94E-07	CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_2_8	2.38E-05	CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004H
B21-SQV-CC_3_4	2.38E-05	CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004D
B21-SQV-CC_3_4_5	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004E
B21-SQV-CC_3_4_6	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004F
B21-SQV-CC_3_4_7	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004G
B21-SQV-CC_3_4_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004H
B21-SQV-CC_3_5	2.38E-05	CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004E
B21-SQV-CC_3_5_6	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004F
B21-SQV-CC_3_5_7	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004G
B21-SQV-CC_3_5_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004H
B21-SQV-CC_3_6	2.38E-05	CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004F
B21-SQV-CC_3_6_7	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004F & B21-SQV-CC-F004G
B21-SQV-CC_3_6_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004F & B21-SQV-CC-F004H
B21-SQV-CC_3_7	2.38E-05	CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004G
B21-SQV-CC_3_7_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_3_8	2.38E-05	CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004H
B21-SQV-CC_4_5	2.38E-05	CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004E
B21-SQV-CC_4_5_6	7.94E-07	CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004E & B21-SQV-CC-F004F
B21-SQV-CC_4_5_7	7.94E-07	CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004E & B21-SQV-CC-F004G

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SQV-CC_4_5_8	7.94E-07	CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004E & B21-SQV-CC-F004H
B21-SQV-CC_4_6	2.38E-05	CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004F
B21-SQV-CC_4_6_7	7.94E-07	CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004F & B21-SQV-CC-F004G
B21-SQV-CC_4_6_8	7.94E-07	CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004F & B21-SQV-CC-F004H
B21-SQV-CC_4_7	2.38E-05	CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004G
B21-SQV-CC_4_7_8	7.94E-07	CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_4_8	2.38E-05	CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004H
B21-SQV-CC_5_6	2.38E-05	CCF of two components: B21-SQV-CC-F004E & B21-SQV-CC-F004F
B21-SQV-CC_5_6_7	7.94E-07	CCF of three components: B21-SQV-CC-F004E & B21-SQV-CC-F004F & B21-SQV-CC-F004G
B21-SQV-CC_5_6_8	7.94E-07	CCF of three components: B21-SQV-CC-F004E & B21-SQV-CC-F004F & B21-SQV-CC-F004H
B21-SQV-CC_5_7	2.38E-05	CCF of two components: B21-SQV-CC-F004E & B21-SQV-CC-F004G
B21-SQV-CC_5_7_8	7.94E-07	CCF of three components: B21-SQV-CC-F004E & B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_5_8	2.38E-05	CCF of two components: B21-SQV-CC-F004E & B21-SQV-CC-F004H
B21-SQV-CC_6_7	2.38E-05	CCF of two components: B21-SQV-CC-F004F & B21-SQV-CC-F004G
B21-SQV-CC_6_7_8	7.94E-07	CCF of three components: B21-SQV-CC-F004F & B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_6_8	2.38E-05	CCF of two components: B21-SQV-CC-F004F & B21-SQV-CC-F004H
B21-SQV-CC_7_8	2.38E-05	CCF of two components: B21-SQV-CC-F004G & B21-SQV-CC-F004H
B21-SQV-CC_ALL	1.50E-04	CCF of all components in group 'B21-SQV-CC'
B21-SRV-CC_1_10	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006K
B21-SRV-CC_1_2	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006B
B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
B21-SRV-CC_1_2_3	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006C
B21-SRV-CC_1_2_4	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006D
B21-SRV-CC_1_2_5	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006B & B21-SRV-CC-F006E
B21-SRV-CC_1_2_6	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006F
B21-SRV-CC_1_2_7	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006G
B21-SRV-CC_1_2_8	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006H
B21-SRV-CC_1_2_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006J
B21-SRV-CC_1_3	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006C
B21-SRV-CC_1_3_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006K
B21-SRV-CC_1_3_4	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006D
B21-SRV-CC_1_3_5	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006E
B21-SRV-CC_1_3_6	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006F
B21-SRV-CC_1_3_7	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006G
B21-SRV-CC_1_3_8	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006H
B21-SRV-CC_1_3_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006C & B21-SRV-CC-F006J
B21-SRV-CC_1_4	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006D
B21-SRV-CC_1_4_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006D & B21-SRV-CC-F006K
B21-SRV-CC_1_4_5	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006D & B21-SRV-CC-F006E
B21-SRV-CC_1_4_6	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006D & B21-SRV-CC-F006F
B21-SRV-CC_1_4_7	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006D & B21-SRV-CC-F006G
B21-SRV-CC_1_4_8	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006D & B21-SRV-CC-F006H
B21-SRV-CC_1_4_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006D & B21-SRV-CC-F006J
B21-SRV-CC_1_5	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006E
B21-SRV-CC_1_5_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006E & B21-SRV-CC-F006K
B21-SRV-CC_1_5_6	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006E & B21-SRV-CC-F006F
B21-SRV-CC_1_5_7	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006E & B21-SRV-CC-F006G
B21-SRV-CC_1_5_8	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006E & B21-SRV-CC-F006H
B21-SRV-CC_1_5_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006E & B21-SRV-CC-F006J
B21-SRV-CC_1_6	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006F
B21-SRV-CC_1_6_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006F & B21-SRV-CC-F006K
B21-SRV-CC_1_6_7	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006F & B21-SRV-CC-F006G
B21-SRV-CC_1_6_8	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006F & B21-SRV-CC-F006H
B21-SRV-CC_1_6_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006F & B21-SRV-CC-F006J
B21-SRV-CC_1_7	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006G
B21-SRV-CC_1_7_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_1_7_8	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006G & B21-SRV-CC-F006H
B21-SRV-CC_1_7_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_1_8	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006H
B21-SRV-CC_1_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_1_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_1_9	3.66E-05	CCF of two components: B21-SRV-CC-F006A & B21-SRV-CC-F006J
B21-SRV-CC_1_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_2_10	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006K
B21-SRV-CC_2_3	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006C
B21-SRV-CC_2_3_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006C & B21-SRV-CC-F006K
B21-SRV-CC_2_3_4	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006C & B21-SRV-CC-F006D
B21-SRV-CC_2_3_5	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006C & B21-SRV-CC-F006E
B21-SRV-CC_2_3_6	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006C & B21-SRV-CC-F006F
B21-SRV-CC_2_3_7	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006C & B21-SRV-CC-F006G
B21-SRV-CC_2_3_8	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006C & B21-SRV-CC-F006H
B21-SRV-CC_2_3_9	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006C & B21-SRV-CC-F006J
B21-SRV-CC_2_4	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006D
B21-SRV-CC_2_4_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006D & B21-SRV-CC-F006K
B21-SRV-CC_2_4_5	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006D & B21-SRV-CC-F006E
B21-SRV-CC_2_4_6	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006D & B21-SRV-CC-F006F
B21-SRV-CC_2_4_7	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006D & B21-SRV-CC-F006G
B21-SRV-CC_2_4_8	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006D & B21-SRV-CC-F006H
B21-SRV-CC_2_4_9	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006D & B21-SRV-CC-F006J
B21-SRV-CC_2_5	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006E
B21-SRV-CC_2_5_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006E & B21-SRV-CC-F006K
B21-SRV-CC_2_5_6	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006E & B21-SRV-CC-F006F
B21-SRV-CC_2_5_7	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006E & B21-SRV-CC-F006G
B21-SRV-CC_2_5_8	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006E & B21-SRV-CC-F006H
B21-SRV-CC_2_5_9	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006E & B21-SRV-CC-F006J
B21-SRV-CC_2_6	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006F
B21-SRV-CC_2_6_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006F & B21-SRV-CC-F006K
B21-SRV-CC_2_6_7	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006F & B21-SRV-CC-F006G
B21-SRV-CC_2_6_8	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006F & B21-SRV-CC-F006H
B21-SRV-CC_2_6_9	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006F & B21-SRV-CC-F006J
B21-SRV-CC_2_7	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006G
B21-SRV-CC_2_7_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_2_7_8	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006G & B21-SRV-CC-F006H
B21-SRV-CC_2_7_9	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_2_8	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006H
B21-SRV-CC_2_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_2_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_2_9	3.66E-05	CCF of two components: B21-SRV-CC-F006B & B21-SRV-CC-F006J
B21-SRV-CC_2_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006B & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_3_10	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006K
B21-SRV-CC_3_4	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006D
B21-SRV-CC_3_4_10	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006K
B21-SRV-CC_3_4_5	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006E
B21-SRV-CC_3_4_6	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006F
B21-SRV-CC_3_4_7	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006G
B21-SRV-CC_3_4_8	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006H
B21-SRV-CC_3_4_9	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006J
B21-SRV-CC_3_5	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006E
B21-SRV-CC_3_5_10	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006E & B21-SRV-CC-F006K
B21-SRV-CC_3_5_6	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006E & B21-SRV-CC-F006F
B21-SRV-CC_3_5_7	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006E & B21-SRV-CC-F006G
B21-SRV-CC_3_5_8	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006E & B21-SRV-CC-F006H
B21-SRV-CC_3_5_9	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006E & B21-SRV-CC-F006J
B21-SRV-CC_3_6	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006F
B21-SRV-CC_3_6_10	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006F & B21-SRV-CC-F006K
B21-SRV-CC_3_6_7	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006F & B21-SRV-CC-F006G
B21-SRV-CC_3_6_8	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006F & B21-SRV-CC-F006H
B21-SRV-CC_3_6_9	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006F & B21-SRV-CC-F006J
B21-SRV-CC_3_7	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006G
B21-SRV-CC_3_7_10	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_3_7_8	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006G & B21-SRV-CC-F006H
B21-SRV-CC_3_7_9	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_3_8	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006H
B21-SRV-CC_3_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_3_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_3_9	3.66E-05	CCF of two components: B21-SRV-CC-F006C & B21-SRV-CC-F006J
B21-SRV-CC_3_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_4_10	3.66E-05	CCF of two components: B21-SRV-CC-F006D & B21-SRV-CC-F006K
B21-SRV-CC_4_5	3.66E-05	CCF of two components: B21-SRV-CC-F006D & B21-SRV-CC-F006E
B21-SRV-CC_4_5_10	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006E & B21-SRV-CC-F006K
B21-SRV-CC_4_5_6	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006E & B21-SRV-CC-F006F
B21-SRV-CC_4_5_7	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006E & B21-SRV-CC-F006G
B21-SRV-CC_4_5_8	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006E & B21-SRV-CC-F006H
B21-SRV-CC_4_5_9	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006E & B21-SRV-CC-F006J
B21-SRV-CC_4_6	3.66E-05	CCF of two components: B21-SRV-CC-F006D & B21-SRV-CC-F006F
B21-SRV-CC_4_6_10	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006F & B21-SRV-CC-F006K
B21-SRV-CC_4_6_7	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006F & B21-SRV-CC-F006G
B21-SRV-CC_4_6_8	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006F & B21-SRV-CC-F006H
B21-SRV-CC_4_6_9	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-



**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006F & B21-SRV-CC-F006J
B21-SRV-CC_4_7	3.66E-05	CCF of two components: B21-SRV-CC-F006D & B21-SRV-CC-F006G
B21-SRV-CC_4_7_10	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_4_7_8	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006G & B21-SRV-CC-F006H
B21-SRV-CC_4_7_9	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_4_8	3.66E-05	CCF of two components: B21-SRV-CC-F006D & B21-SRV-CC-F006H
B21-SRV-CC_4_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_4_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_4_9	3.66E-05	CCF of two components: B21-SRV-CC-F006D & B21-SRV-CC-F006J
B21-SRV-CC_4_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006D & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_5_10	3.66E-05	CCF of two components: B21-SRV-CC-F006E & B21-SRV-CC-F006K
B21-SRV-CC_5_6	3.66E-05	CCF of two components: B21-SRV-CC-F006E & B21-SRV-CC-F006F
B21-SRV-CC_5_6_10	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006F & B21-SRV-CC-F006K
B21-SRV-CC_5_6_7	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006F & B21-SRV-CC-F006G
B21-SRV-CC_5_6_8	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006F & B21-SRV-CC-F006H
B21-SRV-CC_5_6_9	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006F & B21-SRV-CC-F006J
B21-SRV-CC_5_7	3.66E-05	CCF of two components: B21-SRV-CC-F006E & B21-SRV-CC-F006G
B21-SRV-CC_5_7_10	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_5_7_8	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006G & B21-SRV-CC-F006H
B21-SRV-CC_5_7_9	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_5_8	3.66E-05	CCF of two components: B21-SRV-CC-F006E & B21-SRV-CC-F006H
B21-SRV-CC_5_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_5_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_5_9	3.66E-05	CCF of two components: B21-SRV-CC-F006E & B21-SRV-CC-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006J
B21-SRV-CC_5_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006E & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_6_10	3.66E-05	CCF of two components: B21-SRV-CC-F006F & B21-SRV-CC-F006K
B21-SRV-CC_6_7	3.66E-05	CCF of two components: B21-SRV-CC-F006F & B21-SRV-CC-F006G
B21-SRV-CC_6_7_10	1.44E-05	CCF of three components: B21-SRV-CC-F006F & B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_6_7_8	1.44E-05	CCF of three components: B21-SRV-CC-F006F & B21-SRV-CC-F006G & B21-SRV-CC-F006H
B21-SRV-CC_6_7_9	1.44E-05	CCF of three components: B21-SRV-CC-F006F & B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_6_8	3.66E-05	CCF of two components: B21-SRV-CC-F006F & B21-SRV-CC-F006H
B21-SRV-CC_6_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006F & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_6_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006F & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_6_9	3.66E-05	CCF of two components: B21-SRV-CC-F006F & B21-SRV-CC-F006J
B21-SRV-CC_6_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006F & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_7_10	3.66E-05	CCF of two components: B21-SRV-CC-F006G & B21-SRV-CC-F006K
B21-SRV-CC_7_8	3.66E-05	CCF of two components: B21-SRV-CC-F006G & B21-SRV-CC-F006H
B21-SRV-CC_7_8_10	1.44E-05	CCF of three components: B21-SRV-CC-F006G & B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_7_8_9	1.44E-05	CCF of three components: B21-SRV-CC-F006G & B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_7_9	3.66E-05	CCF of two components: B21-SRV-CC-F006G & B21-SRV-CC-F006J
B21-SRV-CC_7_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006G & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_8_10	3.66E-05	CCF of two components: B21-SRV-CC-F006H & B21-SRV-CC-F006K
B21-SRV-CC_8_9	3.66E-05	CCF of two components: B21-SRV-CC-F006H & B21-SRV-CC-F006J
B21-SRV-CC_8_9_10	1.44E-05	CCF of three components: B21-SRV-CC-F006H & B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_9_10	3.66E-05	CCF of two components: B21-SRV-CC-F006J & B21-SRV-CC-F006K
B21-SRV-CC_ALL	5.85E-04	CCF of all components in group 'B21-SRV-CC'
B21-SRV-RO-F003_1_2	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003B

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SRV-RO-F003_1_2_3	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003B & B21-SRV-RO-F003C
B21-SRV-RO-F003_1_2_4	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003B & B21-SRV-RO-F003D
B21-SRV-RO-F003_1_2_5	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003B & B21-SRV-RO-F003E
B21-SRV-RO-F003_1_2_6	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003B & B21-SRV-RO-F003F
B21-SRV-RO-F003_1_2_7	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003B & B21-SRV-RO-F003G
B21-SRV-RO-F003_1_2_8	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003B & B21-SRV-RO-F003H
B21-SRV-RO-F003_1_3	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003C
B21-SRV-RO-F003_1_3_4	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003C & B21-SRV-RO-F003D
B21-SRV-RO-F003_1_3_5	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003C & B21-SRV-RO-F003E
B21-SRV-RO-F003_1_3_6	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003C & B21-SRV-RO-F003F
B21-SRV-RO-F003_1_3_7	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003C & B21-SRV-RO-F003G
B21-SRV-RO-F003_1_3_8	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003C & B21-SRV-RO-F003H
B21-SRV-RO-F003_1_4	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003D
B21-SRV-RO-F003_1_4_5	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003D & B21-SRV-RO-F003E
B21-SRV-RO-F003_1_4_6	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003D & B21-SRV-RO-F003F
B21-SRV-RO-F003_1_4_7	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003D & B21-SRV-RO-F003G
B21-SRV-RO-F003_1_4_8	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003D & B21-SRV-RO-F003H
B21-SRV-RO-F003_1_5	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003E
B21-SRV-RO-F003_1_5_6	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003E & B21-SRV-RO-F003F
B21-SRV-RO-F003_1_5_7	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003E & B21-SRV-RO-F003G
B21-SRV-RO-F003_1_5_8	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003E & B21-SRV-RO-F003H
B21-SRV-RO-F003_1_6	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003F
B21-SRV-RO-F003_1_6_7	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003F & B21-SRV-RO-F003G

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SRV-RO-F003_1_6_8	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003F & B21-SRV-RO-F003H
B21-SRV-RO-F003_1_7	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003G
B21-SRV-RO-F003_1_7_8	2.51E-09	CCF of three components: B21-SRV-RO-F003A & B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_1_8	7.52E-08	CCF of two components: B21-SRV-RO-F003A & B21-SRV-RO-F003H
B21-SRV-RO-F003_2_3	7.52E-08	CCF of two components: B21-SRV-RO-F003B & B21-SRV-RO-F003C
B21-SRV-RO-F003_2_3_4	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003C & B21-SRV-RO-F003D
B21-SRV-RO-F003_2_3_5	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003C & B21-SRV-RO-F003E
B21-SRV-RO-F003_2_3_6	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003C & B21-SRV-RO-F003F
B21-SRV-RO-F003_2_3_7	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003C & B21-SRV-RO-F003G
B21-SRV-RO-F003_2_3_8	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003C & B21-SRV-RO-F003H
B21-SRV-RO-F003_2_4	7.52E-08	CCF of two components: B21-SRV-RO-F003B & B21-SRV-RO-F003D
B21-SRV-RO-F003_2_4_5	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003D & B21-SRV-RO-F003E
B21-SRV-RO-F003_2_4_6	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003D & B21-SRV-RO-F003F
B21-SRV-RO-F003_2_4_7	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003D & B21-SRV-RO-F003G
B21-SRV-RO-F003_2_4_8	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003D & B21-SRV-RO-F003H
B21-SRV-RO-F003_2_5	7.52E-08	CCF of two components: B21-SRV-RO-F003B & B21-SRV-RO-F003E
B21-SRV-RO-F003_2_5_6	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003E & B21-SRV-RO-F003F
B21-SRV-RO-F003_2_5_7	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003E & B21-SRV-RO-F003G
B21-SRV-RO-F003_2_5_8	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003E & B21-SRV-RO-F003H
B21-SRV-RO-F003_2_6	7.52E-08	CCF of two components: B21-SRV-RO-F003B & B21-SRV-RO-F003F
B21-SRV-RO-F003_2_6_7	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003F & B21-SRV-RO-F003G
B21-SRV-RO-F003_2_6_8	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003F & B21-SRV-RO-F003H
B21-SRV-RO-F003_2_7	7.52E-08	CCF of two components: B21-SRV-RO-F003B & B21-SRV-RO-F003G

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SRV-RO-F003_2_7_8	2.51E-09	CCF of three components: B21-SRV-RO-F003B & B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_2_8	7.52E-08	CCF of two components: B21-SRV-RO-F003B & B21-SRV-RO-F003H
B21-SRV-RO-F003_3_4	7.52E-08	CCF of two components: B21-SRV-RO-F003C & B21-SRV-RO-F003D
B21-SRV-RO-F003_3_4_5	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003D & B21-SRV-RO-F003E
B21-SRV-RO-F003_3_4_6	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003D & B21-SRV-RO-F003F
B21-SRV-RO-F003_3_4_7	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003D & B21-SRV-RO-F003G
B21-SRV-RO-F003_3_4_8	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003D & B21-SRV-RO-F003H
B21-SRV-RO-F003_3_5	7.52E-08	CCF of two components: B21-SRV-RO-F003C & B21-SRV-RO-F003E
B21-SRV-RO-F003_3_5_6	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003E & B21-SRV-RO-F003F
B21-SRV-RO-F003_3_5_7	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003E & B21-SRV-RO-F003G
B21-SRV-RO-F003_3_5_8	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003E & B21-SRV-RO-F003H
B21-SRV-RO-F003_3_6	7.52E-08	CCF of two components: B21-SRV-RO-F003C & B21-SRV-RO-F003F
B21-SRV-RO-F003_3_6_7	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003F & B21-SRV-RO-F003G
B21-SRV-RO-F003_3_6_8	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003F & B21-SRV-RO-F003H
B21-SRV-RO-F003_3_7	7.52E-08	CCF of two components: B21-SRV-RO-F003C & B21-SRV-RO-F003G
B21-SRV-RO-F003_3_7_8	2.51E-09	CCF of three components: B21-SRV-RO-F003C & B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_3_8	7.52E-08	CCF of two components: B21-SRV-RO-F003C & B21-SRV-RO-F003H
B21-SRV-RO-F003_4_5	7.52E-08	CCF of two components: B21-SRV-RO-F003D & B21-SRV-RO-F003E
B21-SRV-RO-F003_4_5_6	2.51E-09	CCF of three components: B21-SRV-RO-F003D & B21-SRV-RO-F003E & B21-SRV-RO-F003F
B21-SRV-RO-F003_4_5_7	2.51E-09	CCF of three components: B21-SRV-RO-F003D & B21-SRV-RO-F003E & B21-SRV-RO-F003G
B21-SRV-RO-F003_4_5_8	2.51E-09	CCF of three components: B21-SRV-RO-F003D & B21-SRV-RO-F003E & B21-SRV-RO-F003H
B21-SRV-RO-F003_4_6	7.52E-08	CCF of two components: B21-SRV-RO-F003D & B21-SRV-RO-F003F
B21-SRV-RO-F003_4_6_7	2.51E-09	CCF of three components: B21-SRV-RO-F003D & B21-SRV-RO-F003F & B21-SRV-RO-F003G

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-SRV-RO-F003_4_6_8	2.51E-09	CCF of three components: B21-SRV-RO-F003D & B21-SRV-RO-F003F & B21-SRV-RO-F003H
B21-SRV-RO-F003_4_7	7.52E-08	CCF of two components: B21-SRV-RO-F003D & B21-SRV-RO-F003G
B21-SRV-RO-F003_4_7_8	2.51E-09	CCF of three components: B21-SRV-RO-F003D & B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_4_8	7.52E-08	CCF of two components: B21-SRV-RO-F003D & B21-SRV-RO-F003H
B21-SRV-RO-F003_5_6	7.52E-08	CCF of two components: B21-SRV-RO-F003E & B21-SRV-RO-F003F
B21-SRV-RO-F003_5_6_7	2.51E-09	CCF of three components: B21-SRV-RO-F003E & B21-SRV-RO-F003F & B21-SRV-RO-F003G
B21-SRV-RO-F003_5_6_8	2.51E-09	CCF of three components: B21-SRV-RO-F003E & B21-SRV-RO-F003F & B21-SRV-RO-F003H
B21-SRV-RO-F003_5_7	7.52E-08	CCF of two components: B21-SRV-RO-F003E & B21-SRV-RO-F003G
B21-SRV-RO-F003_5_7_8	2.51E-09	CCF of three components: B21-SRV-RO-F003E & B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_5_8	7.52E-08	CCF of two components: B21-SRV-RO-F003E & B21-SRV-RO-F003H
B21-SRV-RO-F003_6_7	7.52E-08	CCF of two components: B21-SRV-RO-F003F & B21-SRV-RO-F003G
B21-SRV-RO-F003_6_7_8	2.51E-09	CCF of three components: B21-SRV-RO-F003F & B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_6_8	7.52E-08	CCF of two components: B21-SRV-RO-F003F & B21-SRV-RO-F003H
B21-SRV-RO-F003_7_8	7.52E-08	CCF of two components: B21-SRV-RO-F003G & B21-SRV-RO-F003H
B21-SRV-RO-F003_ALL	4.74E-07	CCF of all components in group 'B21-SRV-RO-F003'
B21-SRV-RO-F006_1_10	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_2	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006B
B21-SRV-RO-F006_1_2_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_2_3	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006C
B21-SRV-RO-F006_1_2_4	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006D
B21-SRV-RO-F006_1_2_5	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006E
B21-SRV-RO-F006_1_2_6	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006F
B21-SRV-RO-F006_1_2_7	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006G
B21-SRV-RO-F006_1_2_8	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006B & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_2_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006B & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_3	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006C
B21-SRV-RO-F006_1_3_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_3_4	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006D
B21-SRV-RO-F006_1_3_5	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006E
B21-SRV-RO-F006_1_3_6	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006F
B21-SRV-RO-F006_1_3_7	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006G
B21-SRV-RO-F006_1_3_8	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_3_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006C & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_4	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006D
B21-SRV-RO-F006_1_4_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006D & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_4_5	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006D & B21-SRV-RO-F006E
B21-SRV-RO-F006_1_4_6	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006D & B21-SRV-RO-F006F
B21-SRV-RO-F006_1_4_7	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006D & B21-SRV-RO-F006G
B21-SRV-RO-F006_1_4_8	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006D & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_4_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006D & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_5	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006E
B21-SRV-RO-F006_1_5_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006E & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_5_6	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006E & B21-SRV-RO-F006F
B21-SRV-RO-F006_1_5_7	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006E & B21-SRV-RO-F006G
B21-SRV-RO-F006_1_5_8	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006E & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_5_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006E & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_6	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006F
B21-SRV-RO-F006_1_6_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006F & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_6_7	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006F & B21-SRV-RO-F006G
B21-SRV-RO-F006_1_6_8	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006F & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_6_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006F & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_7	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006G
B21-SRV-RO-F006_1_7_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_7_8	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_7_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_8	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006H
B21-SRV-RO-F006_1_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_1_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_9	5.85E-08	CCF of two components: B21-SRV-RO-F006A & B21-SRV-RO-F006J
B21-SRV-RO-F006_1_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006A & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_10	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_3	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006C
B21-SRV-RO-F006_2_3_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_3_4	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006D
B21-SRV-RO-F006_2_3_5	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006E
B21-SRV-RO-F006_2_3_6	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006F
B21-SRV-RO-F006_2_3_7	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006G
B21-SRV-RO-F006_2_3_8	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006H
B21-SRV-RO-F006_2_3_9	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006C & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_4	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-



**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006D
B21-SRV-RO-F006_2_4_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006D & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_4_5	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006D & B21-SRV-RO-F006E
B21-SRV-RO-F006_2_4_6	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006D & B21-SRV-RO-F006F
B21-SRV-RO-F006_2_4_7	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006D & B21-SRV-RO-F006G
B21-SRV-RO-F006_2_4_8	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006D & B21-SRV-RO-F006H
B21-SRV-RO-F006_2_4_9	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006D & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_5	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006E
B21-SRV-RO-F006_2_5_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006E & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_5_6	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006E & B21-SRV-RO-F006F
B21-SRV-RO-F006_2_5_7	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006E & B21-SRV-RO-F006G
B21-SRV-RO-F006_2_5_8	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006E & B21-SRV-RO-F006H
B21-SRV-RO-F006_2_5_9	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006E & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_6	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006F
B21-SRV-RO-F006_2_6_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006F & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_6_7	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006F & B21-SRV-RO-F006G
B21-SRV-RO-F006_2_6_8	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006F & B21-SRV-RO-F006H
B21-SRV-RO-F006_2_6_9	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006F & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_7	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006G
B21-SRV-RO-F006_2_7_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_7_8	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_2_7_9	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_8	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006H
B21-SRV-RO-F006_2_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_2_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_9	5.85E-08	CCF of two components: B21-SRV-RO-F006B & B21-SRV-RO-F006J
B21-SRV-RO-F006_2_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006B & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_10	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_4	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-F006D
B21-SRV-RO-F006_3_4_10	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006D & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_4_5	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006D & B21-SRV-RO-F006E
B21-SRV-RO-F006_3_4_6	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006D & B21-SRV-RO-F006F
B21-SRV-RO-F006_3_4_7	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006D & B21-SRV-RO-F006G
B21-SRV-RO-F006_3_4_8	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006D & B21-SRV-RO-F006H
B21-SRV-RO-F006_3_4_9	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006D & B21-SRV-RO-F006J
B21-SRV-RO-F006_3_5	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-F006E
B21-SRV-RO-F006_3_5_10	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006E & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_5_6	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006E & B21-SRV-RO-F006F
B21-SRV-RO-F006_3_5_7	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006E & B21-SRV-RO-F006G
B21-SRV-RO-F006_3_5_8	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006E & B21-SRV-RO-F006H
B21-SRV-RO-F006_3_5_9	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006E & B21-SRV-RO-F006J
B21-SRV-RO-F006_3_6	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-F006F
B21-SRV-RO-F006_3_6_10	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006F & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_6_7	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006F & B21-SRV-RO-F006G
B21-SRV-RO-F006_3_6_8	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006F & B21-SRV-RO-F006H
B21-SRV-RO-F006_3_6_9	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006F & B21-SRV-RO-F006J
B21-SRV-RO-F006_3_7	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006G
B21-SRV-RO-F006_3_7_10	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_7_8	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_3_7_9	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_3_8	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-F006H
B21-SRV-RO-F006_3_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_3_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_3_9	5.85E-08	CCF of two components: B21-SRV-RO-F006C & B21-SRV-RO-F006J
B21-SRV-RO-F006_3_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006C & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_4_10	5.85E-08	CCF of two components: B21-SRV-RO-F006D & B21-SRV-RO-F006K
B21-SRV-RO-F006_4_5	5.85E-08	CCF of two components: B21-SRV-RO-F006D & B21-SRV-RO-F006E
B21-SRV-RO-F006_4_5_10	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006E & B21-SRV-RO-F006K
B21-SRV-RO-F006_4_5_6	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006E & B21-SRV-RO-F006F
B21-SRV-RO-F006_4_5_7	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006E & B21-SRV-RO-F006G
B21-SRV-RO-F006_4_5_8	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006E & B21-SRV-RO-F006H
B21-SRV-RO-F006_4_5_9	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006E & B21-SRV-RO-F006J
B21-SRV-RO-F006_4_6	5.85E-08	CCF of two components: B21-SRV-RO-F006D & B21-SRV-RO-F006F
B21-SRV-RO-F006_4_6_10	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006F & B21-SRV-RO-F006K
B21-SRV-RO-F006_4_6_7	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006F & B21-SRV-RO-F006G
B21-SRV-RO-F006_4_6_8	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006F & B21-SRV-RO-F006H
B21-SRV-RO-F006_4_6_9	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006F & B21-SRV-RO-F006J
B21-SRV-RO-F006_4_7	5.85E-08	CCF of two components: B21-SRV-RO-F006D & B21-SRV-RO-F006G
B21-SRV-RO-F006_4_7_10	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_4_7_8	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_4_7_9	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_4_8	5.85E-08	CCF of two components: B21-SRV-RO-F006D & B21-SRV-RO-F006H
B21-SRV-RO-F006_4_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_4_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_4_9	5.85E-08	CCF of two components: B21-SRV-RO-F006D & B21-SRV-RO-F006J
B21-SRV-RO-F006_4_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006D & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_5_10	5.85E-08	CCF of two components: B21-SRV-RO-F006E & B21-SRV-RO-F006K
B21-SRV-RO-F006_5_6	5.85E-08	CCF of two components: B21-SRV-RO-F006E & B21-SRV-RO-F006F
B21-SRV-RO-F006_5_6_10	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006F & B21-SRV-RO-F006K
B21-SRV-RO-F006_5_6_7	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006F & B21-SRV-RO-F006G
B21-SRV-RO-F006_5_6_8	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006F & B21-SRV-RO-F006H
B21-SRV-RO-F006_5_6_9	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006F & B21-SRV-RO-F006J
B21-SRV-RO-F006_5_7	5.85E-08	CCF of two components: B21-SRV-RO-F006E & B21-SRV-RO-F006G
B21-SRV-RO-F006_5_7_10	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_5_7_8	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_5_7_9	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_5_8	5.85E-08	CCF of two components: B21-SRV-RO-F006E & B21-SRV-RO-F006H
B21-SRV-RO-F006_5_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_5_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_5_9	5.85E-08	CCF of two components: B21-SRV-RO-F006E & B21-SRV-RO-F006J
B21-SRV-RO-F006_5_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006E & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_6_10	5.85E-08	CCF of two components: B21-SRV-RO-F006F & B21-SRV-RO-F006K
B21-SRV-RO-F006_6_7	5.85E-08	CCF of two components: B21-SRV-RO-F006F & B21-SRV-RO-

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
		F006G
B21-SRV-RO-F006_6_7_10	1.46E-09	CCF of three components: B21-SRV-RO-F006F & B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_6_7_8	1.46E-09	CCF of three components: B21-SRV-RO-F006F & B21-SRV-RO-F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_6_7_9	1.46E-09	CCF of three components: B21-SRV-RO-F006F & B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_6_8	5.85E-08	CCF of two components: B21-SRV-RO-F006F & B21-SRV-RO-F006H
B21-SRV-RO-F006_6_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006F & B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_6_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006F & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_6_9	5.85E-08	CCF of two components: B21-SRV-RO-F006F & B21-SRV-RO-F006J
B21-SRV-RO-F006_6_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006F & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_7_10	5.85E-08	CCF of two components: B21-SRV-RO-F006G & B21-SRV-RO-F006K
B21-SRV-RO-F006_7_8	5.85E-08	CCF of two components: B21-SRV-RO-F006G & B21-SRV-RO-F006H
B21-SRV-RO-F006_7_8_10	1.46E-09	CCF of three components: B21-SRV-RO-F006G & B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_7_8_9	1.46E-09	CCF of three components: B21-SRV-RO-F006G & B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_7_9	5.85E-08	CCF of two components: B21-SRV-RO-F006G & B21-SRV-RO-F006J
B21-SRV-RO-F006_7_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006G & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_8_10	5.85E-08	CCF of two components: B21-SRV-RO-F006H & B21-SRV-RO-F006K
B21-SRV-RO-F006_8_9	5.85E-08	CCF of two components: B21-SRV-RO-F006H & B21-SRV-RO-F006J
B21-SRV-RO-F006_8_9_10	1.46E-09	CCF of three components: B21-SRV-RO-F006H & B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_9_10	5.85E-08	CCF of two components: B21-SRV-RO-F006J & B21-SRV-RO-F006K
B21-SRV-RO-F006_ALL	4.74E-07	CCF of all components in group 'B21-SRV-RO-F006'
B21-UV_-CC-F102_1_2	2.99E-06	CCF of two components: B21-UV_-CC-F102A & B21-UV_-CC-F102B
B21-UV_-CC-F111_1_2	2.99E-06	CCF of two components: B21-UV_-CC-F111A & B21-UV_-CC-F111B
B21-UV_-OO_1_10	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035K
B21-UV_-OO_1_2	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035B

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_1_2_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035K
B21-UV_-OO_1_2_3	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035C
B21-UV_-OO_1_2_4	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035D
B21-UV_-OO_1_2_5	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035E
B21-UV_-OO_1_2_6	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035F
B21-UV_-OO_1_2_7	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035G
B21-UV_-OO_1_2_8	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035H
B21-UV_-OO_1_2_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035B & B21-UV_-OO-F035J
B21-UV_-OO_1_3	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035C
B21-UV_-OO_1_3_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035K
B21-UV_-OO_1_3_4	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035D
B21-UV_-OO_1_3_5	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035E
B21-UV_-OO_1_3_6	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035F
B21-UV_-OO_1_3_7	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035G
B21-UV_-OO_1_3_8	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035H
B21-UV_-OO_1_3_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035C & B21-UV_-OO-F035J
B21-UV_-OO_1_4	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035D
B21-UV_-OO_1_4_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035D & B21-UV_-OO-F035K
B21-UV_-OO_1_4_5	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035D & B21-UV_-OO-F035E
B21-UV_-OO_1_4_6	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035D & B21-UV_-OO-F035F
B21-UV_-OO_1_4_7	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035D & B21-UV_-OO-F035G
B21-UV_-OO_1_4_8	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035D & B21-UV_-OO-F035H
B21-UV_-OO_1_4_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035D & B21-UV_-OO-F035J

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_1_5	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035E
B21-UV_-OO_1_5_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035E & B21-UV_-OO-F035K
B21-UV_-OO_1_5_6	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035E & B21-UV_-OO-F035F
B21-UV_-OO_1_5_7	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035E & B21-UV_-OO-F035G
B21-UV_-OO_1_5_8	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035E & B21-UV_-OO-F035H
B21-UV_-OO_1_5_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035E & B21-UV_-OO-F035J
B21-UV_-OO_1_6	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035F
B21-UV_-OO_1_6_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035F & B21-UV_-OO-F035K
B21-UV_-OO_1_6_7	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035F & B21-UV_-OO-F035G
B21-UV_-OO_1_6_8	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035F & B21-UV_-OO-F035H
B21-UV_-OO_1_6_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035F & B21-UV_-OO-F035J
B21-UV_-OO_1_7	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035G
B21-UV_-OO_1_7_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_1_7_8	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_1_7_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035G & B21-UV_-OO-F035J
B21-UV_-OO_1_8	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035H
B21-UV_-OO_1_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_1_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_1_9	1.19E-07	CCF of two components: B21-UV_-OO-F035A & B21-UV_-OO-F035J
B21-UV_-OO_1_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035A & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_2_10	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035K
B21-UV_-OO_2_3	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035C
B21-UV_-OO_2_3_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035K

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_2_3_4	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035D
B21-UV_-OO_2_3_5	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035E
B21-UV_-OO_2_3_6	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035F
B21-UV_-OO_2_3_7	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035G
B21-UV_-OO_2_3_8	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035H
B21-UV_-OO_2_3_9	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035C & B21-UV_-OO-F035J
B21-UV_-OO_2_4	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035D
B21-UV_-OO_2_4_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035D & B21-UV_-OO-F035K
B21-UV_-OO_2_4_5	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035D & B21-UV_-OO-F035E
B21-UV_-OO_2_4_6	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035D & B21-UV_-OO-F035F
B21-UV_-OO_2_4_7	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035D & B21-UV_-OO-F035G
B21-UV_-OO_2_4_8	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035D & B21-UV_-OO-F035H
B21-UV_-OO_2_4_9	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035D & B21-UV_-OO-F035J
B21-UV_-OO_2_5	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035E
B21-UV_-OO_2_5_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035E & B21-UV_-OO-F035K
B21-UV_-OO_2_5_6	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035E & B21-UV_-OO-F035F
B21-UV_-OO_2_5_7	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035E & B21-UV_-OO-F035G
B21-UV_-OO_2_5_8	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035E & B21-UV_-OO-F035H
B21-UV_-OO_2_5_9	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035E & B21-UV_-OO-F035J
B21-UV_-OO_2_6	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035F
B21-UV_-OO_2_6_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035F & B21-UV_-OO-F035K
B21-UV_-OO_2_6_7	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035F & B21-UV_-OO-F035G
B21-UV_-OO_2_6_8	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035F & B21-UV_-OO-F035H



**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_2_6_9	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035F & B21-UV_-OO-F035J
B21-UV_-OO_2_7	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035G
B21-UV_-OO_2_7_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_2_7_8	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_2_7_9	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035G & B21-UV_-OO-F035J
B21-UV_-OO_2_8	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035H
B21-UV_-OO_2_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_2_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_2_9	1.19E-07	CCF of two components: B21-UV_-OO-F035B & B21-UV_-OO-F035J
B21-UV_-OO_2_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035B & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_3_10	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035K
B21-UV_-OO_3_4	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035D
B21-UV_-OO_3_4_10	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035D & B21-UV_-OO-F035K
B21-UV_-OO_3_4_5	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035D & B21-UV_-OO-F035E
B21-UV_-OO_3_4_6	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035D & B21-UV_-OO-F035F
B21-UV_-OO_3_4_7	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035D & B21-UV_-OO-F035G
B21-UV_-OO_3_4_8	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035D & B21-UV_-OO-F035H
B21-UV_-OO_3_4_9	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035D & B21-UV_-OO-F035J
B21-UV_-OO_3_5	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035E
B21-UV_-OO_3_5_10	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035E & B21-UV_-OO-F035K
B21-UV_-OO_3_5_6	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035E & B21-UV_-OO-F035F
B21-UV_-OO_3_5_7	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035E & B21-UV_-OO-F035G
B21-UV_-OO_3_5_8	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035E & B21-UV_-OO-F035H

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_3_5_9	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035E & B21-UV_-OO-F035J
B21-UV_-OO_3_6	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035F
B21-UV_-OO_3_6_10	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035F & B21-UV_-OO-F035K
B21-UV_-OO_3_6_7	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035F & B21-UV_-OO-F035G
B21-UV_-OO_3_6_8	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035F & B21-UV_-OO-F035H
B21-UV_-OO_3_6_9	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035F & B21-UV_-OO-F035J
B21-UV_-OO_3_7	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035G
B21-UV_-OO_3_7_10	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_3_7_8	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_3_7_9	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035G & B21-UV_-OO-F035J
B21-UV_-OO_3_8	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035H
B21-UV_-OO_3_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_3_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_3_9	1.19E-07	CCF of two components: B21-UV_-OO-F035C & B21-UV_-OO-F035J
B21-UV_-OO_3_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035C & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_4_10	1.19E-07	CCF of two components: B21-UV_-OO-F035D & B21-UV_-OO-F035K
B21-UV_-OO_4_5	1.19E-07	CCF of two components: B21-UV_-OO-F035D & B21-UV_-OO-F035E
B21-UV_-OO_4_5_10	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035E & B21-UV_-OO-F035K
B21-UV_-OO_4_5_6	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035E & B21-UV_-OO-F035F
B21-UV_-OO_4_5_7	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035E & B21-UV_-OO-F035G
B21-UV_-OO_4_5_8	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035E & B21-UV_-OO-F035H
B21-UV_-OO_4_5_9	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035E & B21-UV_-OO-F035J
B21-UV_-OO_4_6	1.19E-07	CCF of two components: B21-UV_-OO-F035D & B21-UV_-OO-F035F

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_4_6_10	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035F & B21-UV_-OO-F035K
B21-UV_-OO_4_6_7	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035F & B21-UV_-OO-F035G
B21-UV_-OO_4_6_8	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035F & B21-UV_-OO-F035H
B21-UV_-OO_4_6_9	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035F & B21-UV_-OO-F035J
B21-UV_-OO_4_7	1.19E-07	CCF of two components: B21-UV_-OO-F035D & B21-UV_-OO-F035G
B21-UV_-OO_4_7_10	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_4_7_8	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_4_7_9	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035G & B21-UV_-OO-F035J
B21-UV_-OO_4_8	1.19E-07	CCF of two components: B21-UV_-OO-F035D & B21-UV_-OO-F035H
B21-UV_-OO_4_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_4_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_4_9	1.19E-07	CCF of two components: B21-UV_-OO-F035D & B21-UV_-OO-F035J
B21-UV_-OO_4_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035D & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_5_10	1.19E-07	CCF of two components: B21-UV_-OO-F035E & B21-UV_-OO-F035K
B21-UV_-OO_5_6	1.19E-07	CCF of two components: B21-UV_-OO-F035E & B21-UV_-OO-F035F
B21-UV_-OO_5_6_10	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035F & B21-UV_-OO-F035K
B21-UV_-OO_5_6_7	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035F & B21-UV_-OO-F035G
B21-UV_-OO_5_6_8	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035F & B21-UV_-OO-F035H
B21-UV_-OO_5_6_9	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035F & B21-UV_-OO-F035J
B21-UV_-OO_5_7	1.19E-07	CCF of two components: B21-UV_-OO-F035E & B21-UV_-OO-F035G
B21-UV_-OO_5_7_10	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_5_7_8	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_5_7_9	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035G & B21-UV_-OO-F035J

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_5_8	1.19E-07	CCF of two components: B21-UV_-OO-F035E & B21-UV_-OO-F035H
B21-UV_-OO_5_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_5_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_5_9	1.19E-07	CCF of two components: B21-UV_-OO-F035E & B21-UV_-OO-F035J
B21-UV_-OO_5_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035E & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_6_10	1.19E-07	CCF of two components: B21-UV_-OO-F035F & B21-UV_-OO-F035K
B21-UV_-OO_6_7	1.19E-07	CCF of two components: B21-UV_-OO-F035F & B21-UV_-OO-F035G
B21-UV_-OO_6_7_10	2.35E-07	CCF of three components: B21-UV_-OO-F035F & B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_6_7_8	2.35E-07	CCF of three components: B21-UV_-OO-F035F & B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_6_7_9	2.35E-07	CCF of three components: B21-UV_-OO-F035F & B21-UV_-OO-F035G & B21-UV_-OO-F035J
B21-UV_-OO_6_8	1.19E-07	CCF of two components: B21-UV_-OO-F035F & B21-UV_-OO-F035H
B21-UV_-OO_6_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035F & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_6_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035F & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_6_9	1.19E-07	CCF of two components: B21-UV_-OO-F035F & B21-UV_-OO-F035J
B21-UV_-OO_6_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035F & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_7_10	1.19E-07	CCF of two components: B21-UV_-OO-F035G & B21-UV_-OO-F035K
B21-UV_-OO_7_8	1.19E-07	CCF of two components: B21-UV_-OO-F035G & B21-UV_-OO-F035H
B21-UV_-OO_7_8_10	2.35E-07	CCF of three components: B21-UV_-OO-F035G & B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_7_8_9	2.35E-07	CCF of three components: B21-UV_-OO-F035G & B21-UV_-OO-F035H & B21-UV_-OO-F035J
B21-UV_-OO_7_9	1.19E-07	CCF of two components: B21-UV_-OO-F035G & B21-UV_-OO-F035J
B21-UV_-OO_7_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035G & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_8_10	1.19E-07	CCF of two components: B21-UV_-OO-F035H & B21-UV_-OO-F035K
B21-UV_-OO_8_9	1.19E-07	CCF of two components: B21-UV_-OO-F035H & B21-UV_-OO-F035J

**Table 4.1-4**  
**ADS - Common Cause Failures**

Basic Event	Prob	Description
B21-UV_-OO_8_9_10	2.35E-07	CCF of three components: B21-UV_-OO-F035H & B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_9_10	1.19E-07	CCF of two components: B21-UV_-OO-F035J & B21-UV_-OO-F035K
B21-UV_-OO_ALL	1.72E-05	CCF of all components in group 'B21-UV_-OO'

**Table 4.1-5**  
**ADS - Human Error Events**

<b>Basic Event</b>	<b>Description</b>
XXX-XHE-FO-DEPRESS	OPERATOR FAILS TO RECOGNIZE NEED OF DEPRESSURIZATION
B21-XHE-FO-6OPEN	OPERATOR FAILS TO OPEN 6/10 SRVs

**Table 4.1-6**  
**ADS - Top Events**

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
B21-FDW-A-CC	Feedwater line A check valves fail to open	2
B21-FDW-A-OC	Feedwater line A check valves fail remain open	5
B21-FDW-B-CC	Feedwater line B check valves fail to open	3
B21-FDW-B-OC	Feedwater line B check valves fail remain open	4
MA-TOP10	10/18 SRVs fail to open in relief mode	1
MS-TOP18	18/18 SRVs fail to open in relief mode	11
PA-TOPCLOSE	One SRV fails to close (re-seat) during ATWS	8
PB-TOPCLOSE	At least 2 SRVs fail to close (re-seat) during ATWS	7
PS-TOPIORV	One SRV opens in relief mode during general transient and fails to close	10
PS-TOPLSLOCA	2 or more SRVs fail to re-seat after general transient (F006 valves)	6
XD-TOPDPV	5/8 DPVs fail to open	276
XM-TOPXMAN	6 out of 10 SRVs fail to open manually in actuation mode	124

**Table 4.1-7**  
**ADS - Basic Events**

Basic Event	Prob	Description
B21-ACV-OC-F111A	2.40E-05	AIR-TESTABLE CHECK VALVE F111A FAILS TO REMAIN OPEN
B21-ACV-OC-F111B	2.40E-05	AIR-TESTABLE CHECK VALVE F111B FAILS TO REMAIN OPEN
B21-CONDPROB-PB	1.25E-01	CONDITIONAL PROBABILITY OF PB PA
B21-PS_COND	9.66E-02	CONDITIONAL PROBABILITY OF TOPLSLOCA TOPIORV
B21-SQV-CC-F004A	3.00E-03	EXPLOSIVE VALVE DPV F004A FAILS TO OPERATE
B21-SQV-CC-F004B	3.00E-03	EXPLOSIVE VALVE DPV B FAILS TO OPERATE
B21-SQV-CC-F004C	3.00E-03	EXPLOSIVE VALVE DPV C FAILS TO OPERATE
B21-SQV-CC-F004D	3.00E-03	EXPLOSIVE VALVE DPV D FAILS TO OPERATE
B21-SQV-CC-F004E	3.00E-03	EXPLOSIVE VALVE DPV E FAILS TO OPERATE
B21-SQV-CC-F004F	3.00E-03	EXPLOSIVE VALVE DPV F FAILS TO OPERATE
B21-SQV-CC-F004G	3.00E-03	EXPLOSIVE VALVE DPV G FAILS TO OPERATE
B21-SQV-CC-F004H	3.00E-03	EXPLOSIVE VALVE DPV H FAILS TO OPERATE
B21-SRV-ANY2CCF-F006	5.85E-06	COMMON CAUSE OF ANY TWO F006 SRVs
B21-SRV-CC-F006A	7.00E-03	SRV F006A FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006B	7.00E-03	SRV F006B FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006C	7.00E-03	SRV F006C FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006D	7.00E-03	SRV F006D FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006E	7.00E-03	SRV F006E FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006F	7.00E-03	SRV F006F FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006G	7.00E-03	SRV F006G FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006H	7.00E-03	SRV F006H FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006J	7.00E-03	SRV F006J FAILS TO OPEN ON DEMAND
B21-SRV-CC-F006K	7.00E-03	SRV F006K FAILS TO OPEN ON DEMAND
B21-SRV-OO-ANYSRV1	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV10	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV11	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV12	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV13	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV14	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV15	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV16	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE



**Table 4.1-7**  
**ADS - Basic Events**

B21-SRV-OO-ANYSRV17	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV18	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV2	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV3	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV4	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV5	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV6	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV7	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV8	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-ANYSRV9	6.00E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
B21-SRV-OO-F006A	6.00E-03	SAFETY/RELIEF VALVE F006A FAILS TO RE-CLOSE
B21-SRV-OO-F006B	6.00E-03	SAFETY/RELIEF VALVE F006B FAILS TO RE-CLOSE
B21-SRV-OO-F006C	6.00E-03	SAFETY/RELIEF VALVE F006C FAILS TO RE-CLOSE
B21-SRV-OO-F006D	6.00E-03	SAFETY/RELIEF VALVE F006D FAILS TO RE-CLOSE
B21-SRV-OO-F006E	6.00E-03	SAFETY/RELIEF VALVE F006E FAILS TO RE-CLOSE
B21-SRV-OO-F006F	6.00E-03	SAFETY/RELIEF VALVE F006F FAILS TO RE-CLOSE
B21-SRV-OO-F006G	6.00E-03	SAFETY/RELIEF VALVE F006G FAILS TO RE-CLOSE
B21-SRV-OO-F006H	6.00E-03	SAFETY/RELIEF VALVE F006H FAILS TO RE-CLOSE
B21-SRV-OO-F006J	6.00E-03	SAFETY/RELIEF VALVE F006J FAILS TO RE-CLOSE
B21-SRV-OO-F006K	6.00E-03	SAFETY/RELIEF VALVE F006K FAILS TO RE-CLOSE
B21-SRV-RO-ANY2F006	4.00E-06	ANY TWO F006 SRVS FAIL TO OPEN INDEPENDENTLY
B21-SRV-RO-F003A	2.00E-05	F003A FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003B	2.00E-05	F003B FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003C	2.00E-05	F003C FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003D	2.00E-05	F003D FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003E	2.00E-05	F003E FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003F	2.00E-05	F003F FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003G	2.00E-05	F003G FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F003H	2.00E-05	F003H FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006A	2.00E-05	F006A FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006B	2.00E-05	F006B FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006C	2.00E-05	F006C FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006D	2.00E-05	F006D FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006E	2.00E-05	F006E FAILS TO OPEN IN RELIEF MODE

**Table 4.1-7**  
**ADS - Basic Events**

B21-SRV-RO-F006F	2.00E-05	F006F FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006G	2.00E-05	F006G FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006H	2.00E-05	F006H FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006J	2.00E-05	F006J FAILS TO OPEN IN RELIEF MODE
B21-SRV-RO-F006K	2.00E-05	F006K FAILS TO OPEN IN RELIEF MODE
B21-TNK-RP-A003A	2.40E-06	NITROGEN ACCUMULATOR A003A RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003B	2.40E-06	NITROGEN ACCUMULATOR A003B RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003C	2.40E-06	NITROGEN ACCUMULATOR A003C RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003D	2.40E-06	NITROGEN ACCUMULATOR A003D RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003E	2.40E-06	NITROGEN ACCUMULATOR A003E RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003F	2.40E-06	NITROGEN ACCUMULATOR A003F RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003G	2.40E-06	NITROGEN ACCUMULATOR A003G RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003H	2.40E-06	NITROGEN ACCUMULATOR A003H RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003J	2.40E-06	NITROGEN ACCUMULATOR A003J RUPTURES CATASTROPHICALLY
B21-TNK-RP-A003K	2.40E-06	NITROGEN ACCUMULATOR A003K RUPTURES CATASTROPHICALLY
B21-UV_-CC-F102A	1.00E-04	CHECK VALVE F102A FAILS TO OPEN
B21-UV_-CC-F102B	1.00E-04	CHECK VALVE F102B FAILS TO OPEN
B21-UV_-CC-F111A	1.00E-04	CHECK VALVE F111A FAILS TO OPEN
B21-UV_-CC-F111B	1.00E-04	CHECK VALVE F111B FAILS TO OPEN
B21-UV_-OC-F102A	4.80E-06	CHECK VALVE F102A FAILS TO REMAIN OPEN
B21-UV_-OC-F102B	4.80E-06	CHECK VALVE F102B FAILS TO REMAIN OPEN
B21-UV_-OO-F035A	1.00E-03	CHECK VALVE F035A FAILS TO CLOSE
B21-UV_-OO-F035B	1.00E-03	CHECK VALVE F035B FAILS TO CLOSE
B21-UV_-OO-F035C	1.00E-03	CHECK VALVE F035C FAILS TO CLOSE
B21-UV_-OO-F035D	1.00E-03	CHECK VALVE F035D FAILS TO CLOSE
B21-UV_-OO-F035E	1.00E-03	CHECK VALVE F035E FAILS TO CLOSE
B21-UV_-OO-F035F	1.00E-03	CHECK VALVE F035F FAILS TO CLOSE
B21-UV_-OO-F035G	1.00E-03	CHECK VALVE F035G FAILS TO CLOSE
B21-UV_-OO-F035H	1.00E-03	CHECK VALVE F035H FAILS TO CLOSE
B21-UV_-OO-F035J	1.00E-03	CHECK VALVE F035J FAILS TO CLOSE
B21-UV_-OO-F035K	1.00E-03	CHECK VALVE F035K FAILS TO CLOSE
B21-UV_-RL-F035A	2.40E-05	CHECK VALVE F035A EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035B	2.40E-05	CHECK VALVE F035B EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035C	2.40E-05	CHECK VALVE F035C EXPERIENCESE REVERSE LEAKAGE
B21-UV_-RL-F035D	2.40E-05	CHECK VALVE F035D EXPERIENCES REVERSE LEAKAGE

**Table 4.1-7**

**ADS - Basic Events**

B21-UV_-RL-F035E	2.40E-05	CHECK VALVE F035E EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035F	2.40E-05	CHECK VALVE F035F EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035G	2.40E-05	CHECK VALVE F035G EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035H	2.40E-05	CHECK VALVE F035H EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035J	2.40E-05	CHECK VALVE F035J EXPERIENCES REVERSE LEAKAGE
B21-UV_-RL-F035K	2.40E-05	CHECK VALVE F035K EXPERIENCES REVERSE LEAKAGE

**Table 4.1-8****ADS - Cutsets**

For each system top event, the dominant cutsets are shown below.

**B21-FDW-A-CC FDW LINE A CHECK VALVES FAIL TO OPEN**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.E-04	48.6	B21-UV_-CC-F102A	1.E-04	CHECK VALVE F102A FAILS TO OPEN
1.E-04	48.6	B21-UV_-CC-F111A	1.E-04	CHECK VALVE F111A FAILS TO OPEN
2.99E-06	1.5	B21-UV_-CC-F102_1_2	2.99E-06	CCF of two components: B21-UV_-CC-F102A & B21-UV_-CC-F102B
2.99E-06	1.5	B21-UV_-CC-F111_1_2	2.99E-06	CCF of two components: B21-UV_-CC-F111A & B21-UV_-CC-F111B

**B21-FDW-A-OC FDW LINE A CHECK VALVES FAIL TO REMAIN OPEN**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
2.4E-05	83.3	B21-ACV-OC-F111A	2.4E-05	AIR-TESTABLE CHECK VALVE F111A FAILS TO REMAIN OPEN
4.8E-06	16.7	B21-UV_-OC-F102A	4.8E-06	CHECK VALVE F102A FAILS TO REMAIN OPEN

**B21-FDW-B-CC FDW LINE B CHECK VALVES FAIL TO OPEN**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.E-04	48.6	B21-UV_-CC-F102B	1.E-04	CHECK VALVE F102B FAILS TO OPEN
1.E-04	48.6	B21-UV_-CC-F111B	1.E-04	CHECK VALVE F111B FAILS TO OPEN
2.99E-06	1.5	B21-UV_-CC-F102_1_2	2.99E-06	CCF of two components: B21-UV_-CC-F102A & B21-UV_-CC-F102B
2.99E-06	1.5	B21-UV_-CC-F111_1_2	2.99E-06	CCF of two components: B21-UV_-CC-F111A & B21-UV_-CC-F111B

**B21-FDW-B-OC FDW LINE B CHECK VALVES FAIL TO REMAIN OPEN**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
2.4E-05	83.3	B21-ACV-OC-F111B	2.4E-05	AIR-TESTABLE CHECK VALVE F111B FAILS TO REMAIN OPEN
4.8E-06	16.7	B21-UV_-OC-F102B	4.8E-06	CHECK VALVE F102B FAILS TO REMAIN OPEN

**MA-TOP10 10/18 SRVs FAIL TO OPEN IN RELIEF MODE**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
4.74E-07	100.0	B21-SRV-RO-F006_ALL	4.74E-07	CCF of all components in group 'B21-SRV-RO-F006'
2.77E-12	0.0	B21-SRV-ANY2CCF-F006	5.85E-06	COMMON CAUSE OF ANY TWO F006 SRVs
		B21-SRV-RO-F003_ALL	4.74E-07	CCF of all components in group 'B21-SRV-RO-F003'
1.89E-12	0.0	B21-SRV-RO-ANY2F006	4.E-06	ANY TWO F006 SRVS FAIL TO OPEN INDEPENDENTLY
		B21-SRV-RO-F003_ALL	4.74E-07	CCF of all components in group 'B21-SRV-RO-F003'

## MS-TOP18 18/18 SRVs FAIL TO OPEN IN RELIEF MODE

Probability	% of Top	Event	Probability	Description
There are no top event cutsets at a truncation of 1E-12				

## PA-TOPCLOSE ONE SRV FAILS TO CLOSE (RE-SEAT) DURING ATWS

Probability	% of Top	Event	Probability	Description
6.E-03	5.8	B21-SRV-OO-ANYSRV1	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV10	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV11	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV12	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV13	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV14	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV15	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV16	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV17	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV18	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV2	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV3	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV4	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV5	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV6	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE
6.E-03	5.8	B21-SRV-OO-ANYSRV7	6.E-03	SAFETY/RELIEF VALVE FAILS TO RE-CLOSE

## PB-TOPCLOSE AT LEAST 2 SRVS FAIL TO CLOSE (RE-SEAT) DURING ATWS

Probability	% of Top	Event	Probability	Description
1.25E-01	100.0	B21-CONDPROB-PB	1.25E-01	CONDITIONAL PROBABILITY OF PB PA

## PS-TOPIORV ONE SRV OPENS IN RELIEF DURING GENERAL TRANSIENT AND FAILS TO CLOSE

Probability	% of Top	Event	Probability	Description
6.E-03	10.3	B21-SRV-OO-F006A	6.E-03	SAFETY/RELIEF VALVE F006A FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006B	6.E-03	SAFETY/RELIEF VALVE F006B FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006C	6.E-03	SAFETY/RELIEF VALVE F006C FAILS TO RE-

Probability	% of Top	Event	Probability	Description
				CLOSE
6.E-03	10.3	B21-SRV-OO-F006D	6.E-03	SAFETY/RELIEF VALVE F006D FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006E	6.E-03	SAFETY/RELIEF VALVE F006E FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006F	6.E-03	SAFETY/RELIEF VALVE F006F FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006G	6.E-03	SAFETY/RELIEF VALVE F006G FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006H	6.E-03	SAFETY/RELIEF VALVE F006H FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006J	6.E-03	SAFETY/RELIEF VALVE F006J FAILS TO RE-CLOSE
6.E-03	10.3	B21-SRV-OO-F006K	6.E-03	SAFETY/RELIEF VALVE F006K FAILS TO RE-CLOSE

## PS-TOPLSLOCA 2 OR MORE SRVs FAIL TO RE-SEAT AFTER GEN TRANSIENT (F006 VALVES)

Probability	% of Top	Event	Probability	Description
9.66E-02	100.0	B21-PS_COND	9.66E-02	CONDITIONAL PROBABILITY OF TOPLSLOCA TOPIORV

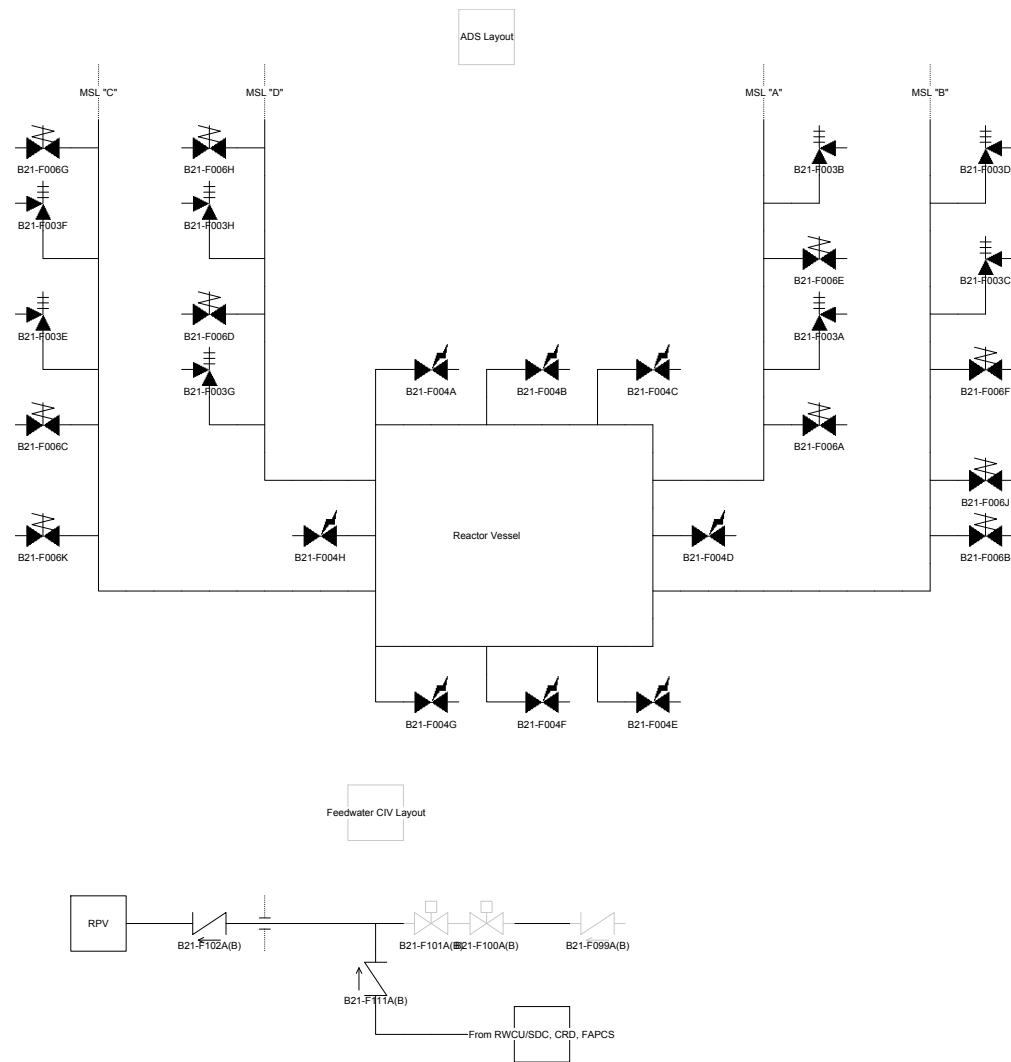
## XD-TOPDPV 5/8 DPVs FAIL TO OPEN

Probability	% of Top	Event	Probability	Description
1.5E-04	100.0	B21-SQV-CC_ALL	1.5E-04	CCF of all components in group 'B21-SQV-CC'
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_4_5	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004E
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_4_6	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004F
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_4_7	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004G
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_4_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004H
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_5_6	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004F
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_5_7	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004G
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B

Probability	% of Top	Event	Probability	Description
		B21-SQV-CC_3_5_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004H
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_6_7	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004F & B21-SQV-CC-F004G
1.89E-11	0.0	B21-SQV-CC_1_2	2.38E-05	CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004B
		B21-SQV-CC_3_6_8	7.94E-07	CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004F & B21-SQV-CC-F004H

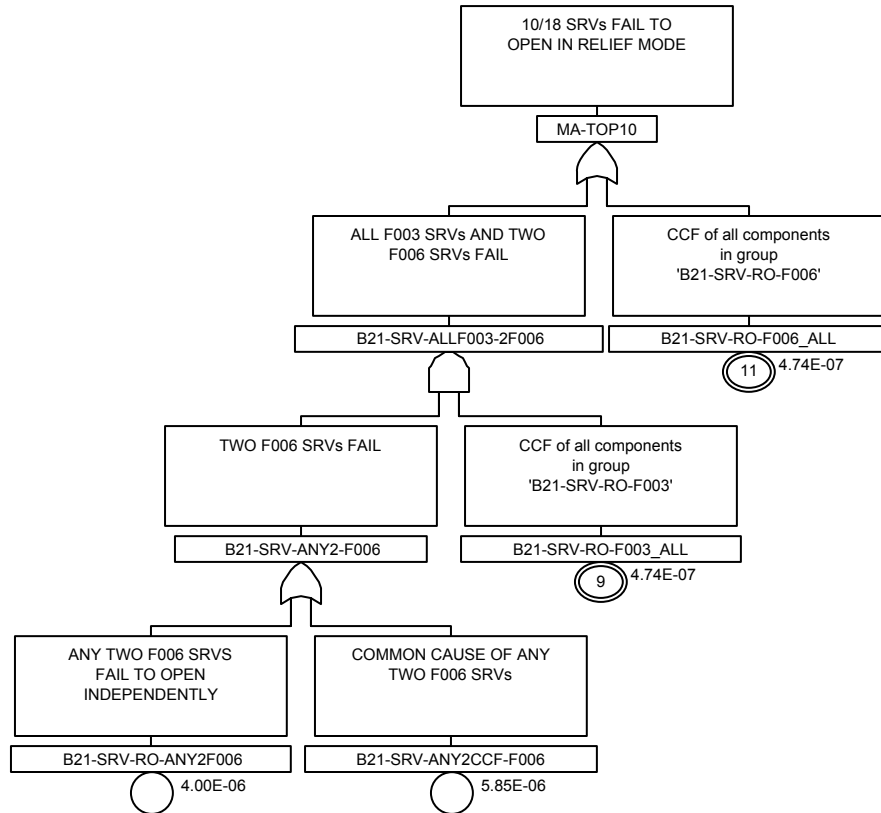
## XM-TOPXMAN 6 OUT OF 10 SRV FAIL TO OPEN MANULLY IN ACTUATION MODE

Probability	% of Top	Event	Probability	Description
1.61E-01	98.9	XXX-XHE-FO-DEPRESS	1.61E-01	OPERATOR FAILS TO RECOGNIZE NEED OF DEPRESSURIZATION
1.61E-03	1.0	B21-XHE-FO-6OPEN	1.61E-03	OPERATOR FAILS TO OPEN 6/10 SRVs
5.85E-04	0.4	B21-SRV-CC_ALL	5.85E-04	CCF of all components in group 'B21-SRV-CC'
1.72E-08	0.0	B21-UV_-OO_ALL	1.72E-05	CCF of all components in group 'B21-UV_-OO'
		P54-B21-HIGHPN2LOSS	1.E-03	LOSS OF HIGH PRESSURE NITROGEN SUPPLY
2.08E-10	0.0	B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
		B21-SRV-CC_3_4_5	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006E
2.08E-10	0.0	B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
		B21-SRV-CC_3_4_6	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006F
2.08E-10	0.0	B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
		B21-SRV-CC_3_4_7	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006G
2.08E-10	0.0	B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
		B21-SRV-CC_3_4_8	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006H
2.08E-10	0.0	B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
		B21-SRV-CC_3_4_9	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006D & B21-SRV-CC-F006J
2.08E-10	0.0	B21-SRV-CC_1_2_10	1.44E-05	CCF of three components: B21-SRV-CC-F006A & B21-SRV-CC-F006B & B21-SRV-CC-F006K
		B21-SRV-CC_3_5_6	1.44E-05	CCF of three components: B21-SRV-CC-F006C & B21-SRV-CC-F006E & B21-SRV-CC-F006F



**Figure 4.1-1. Simplified Diagram of Nuclear Boiler System**





**Figure 4.1-2 Nuclear Boiler System Fault Tree**

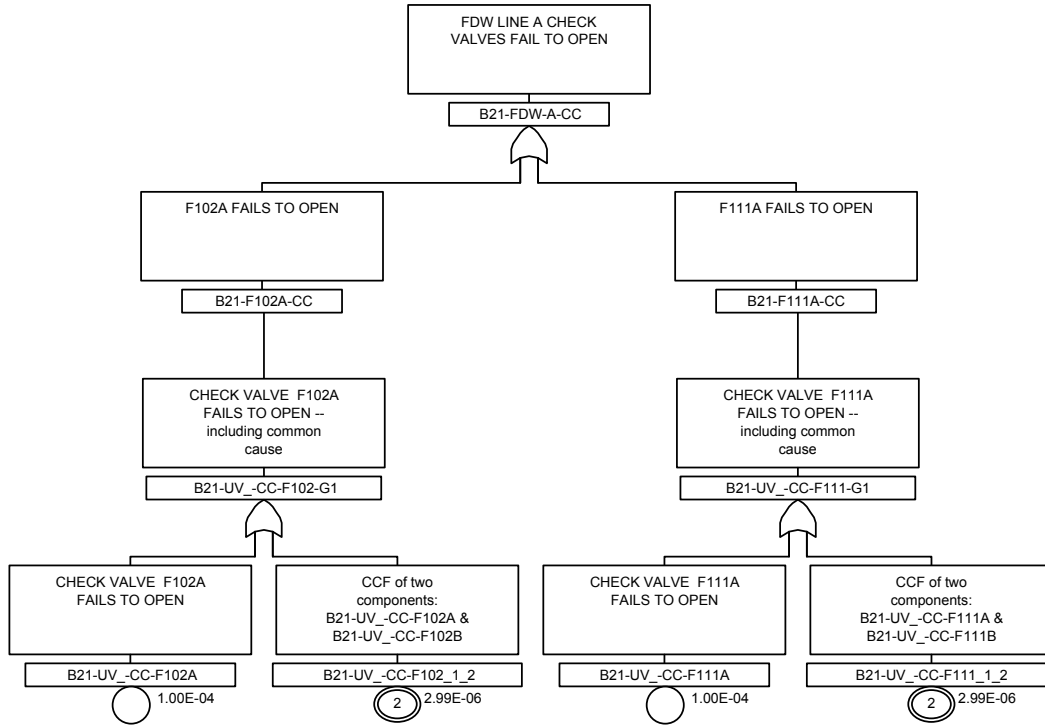


Figure 4.1-2. Sheet 2 Nuclear Boiler System

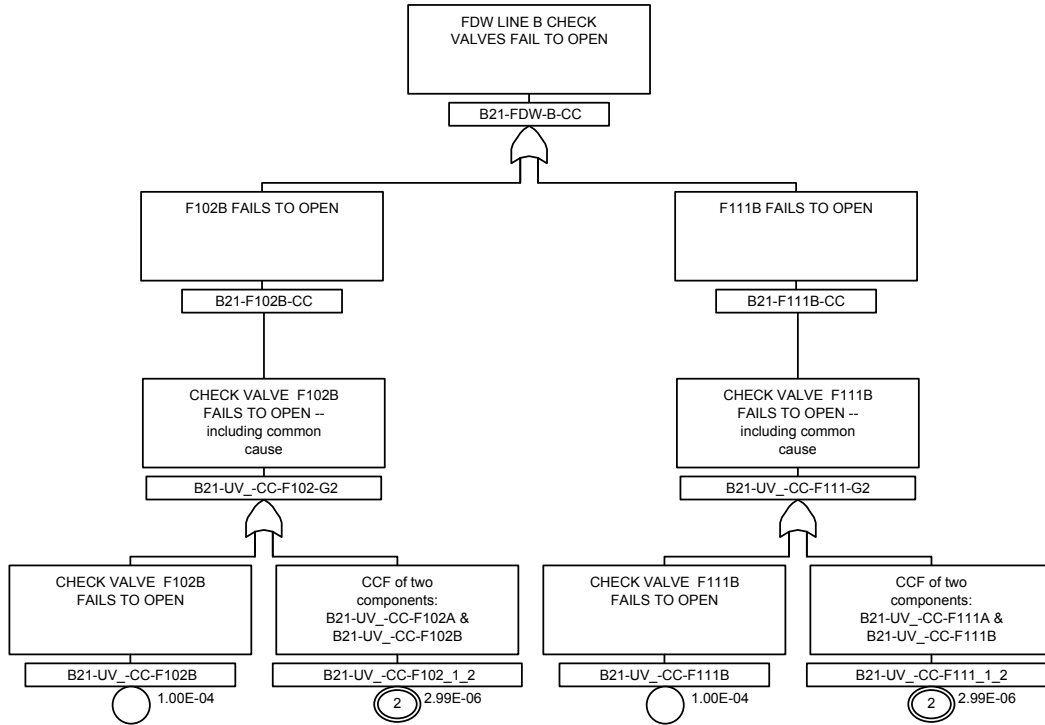


Figure 4.1-2. Sheet 3 Nuclear Boiler System

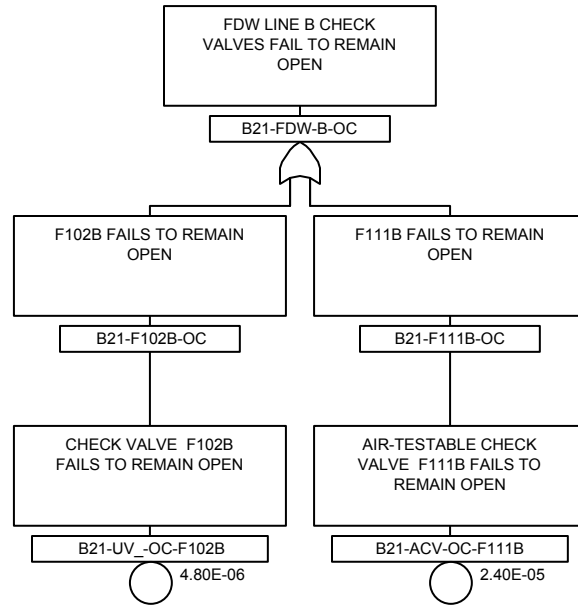


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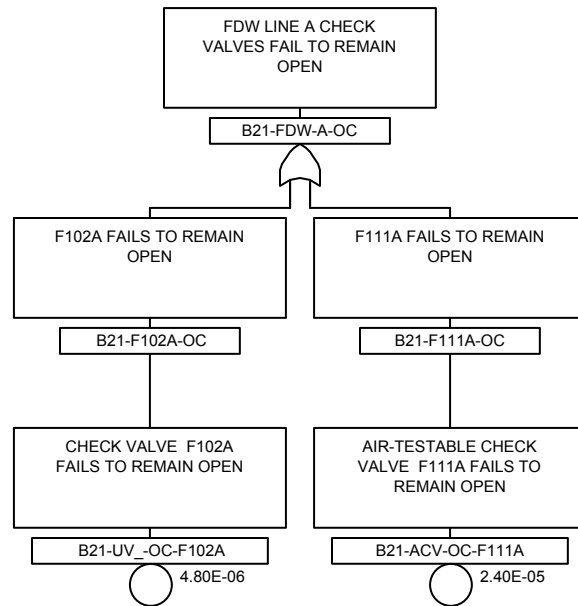


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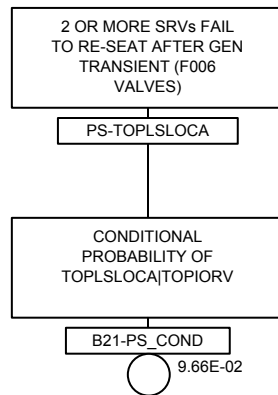


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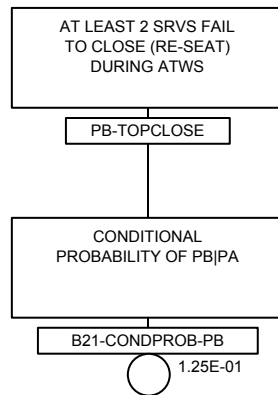


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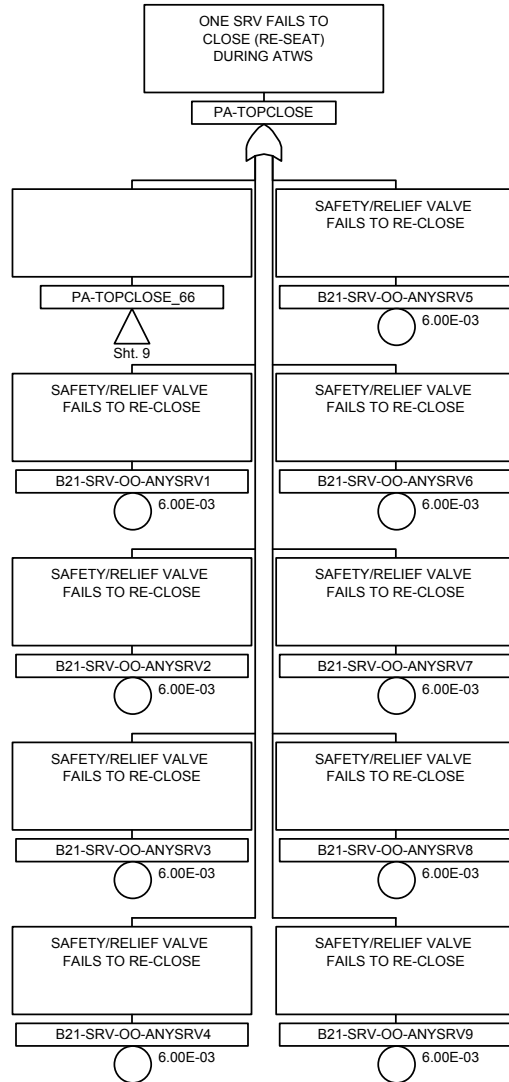


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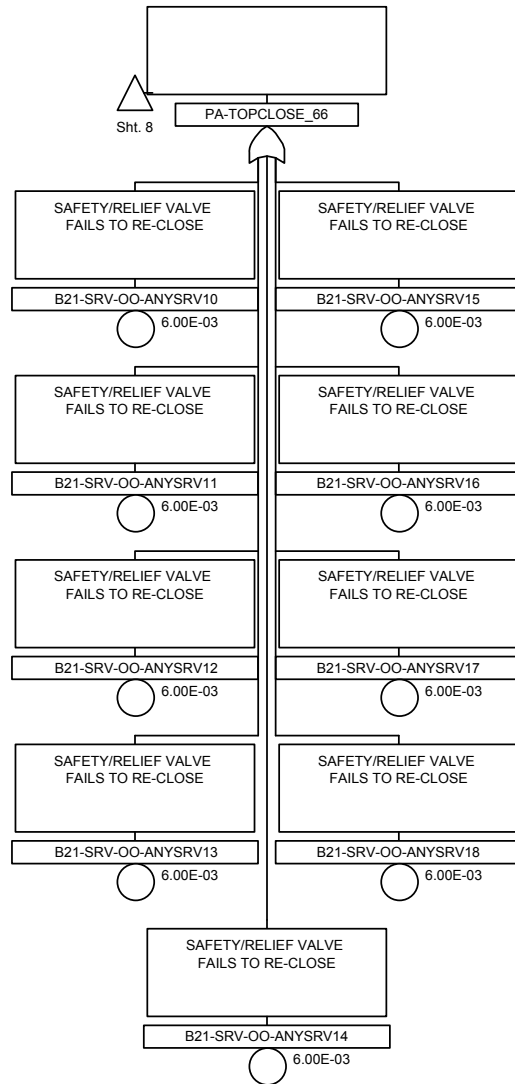


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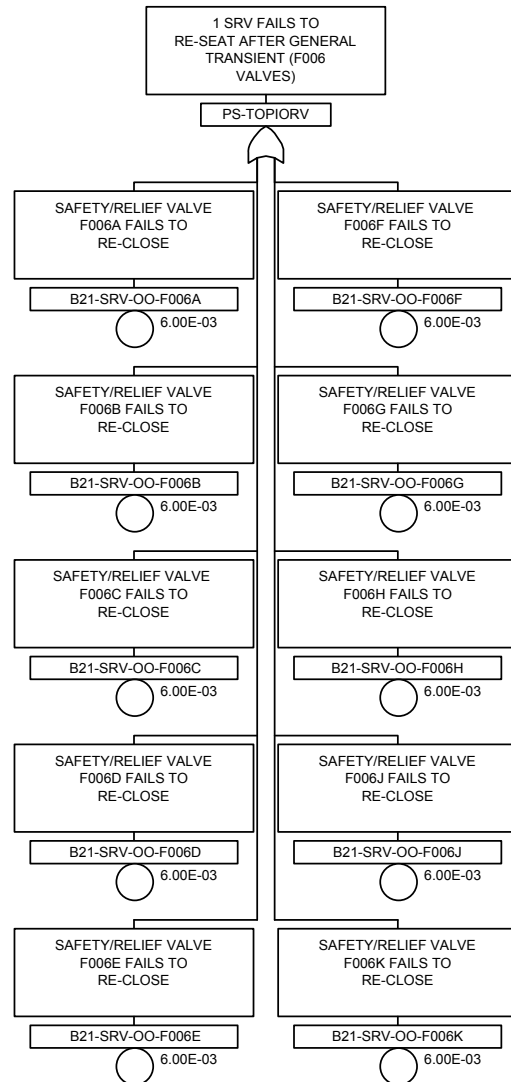


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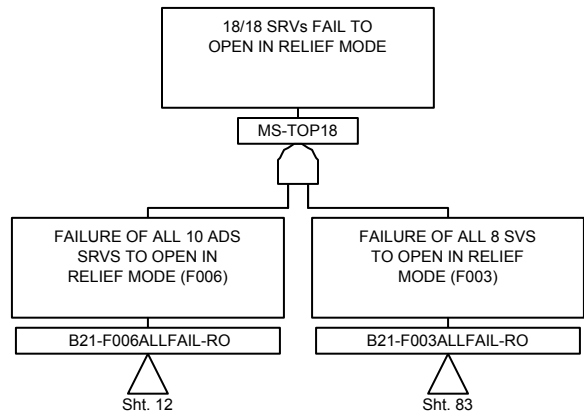


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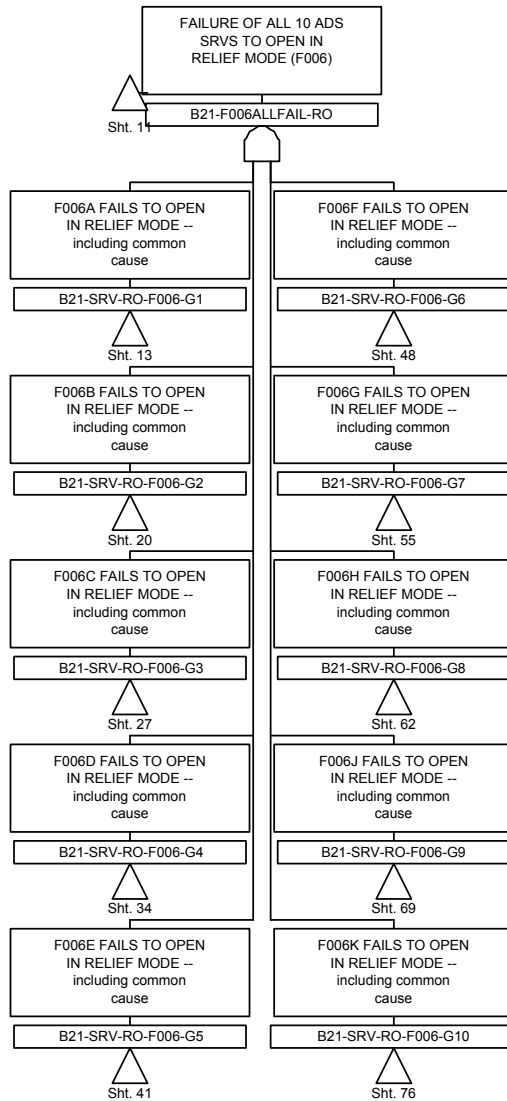


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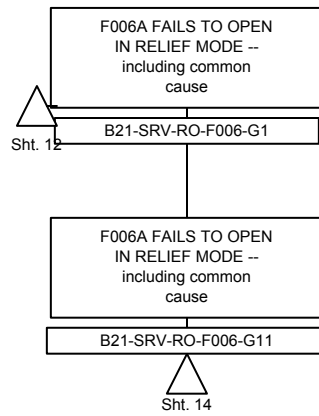


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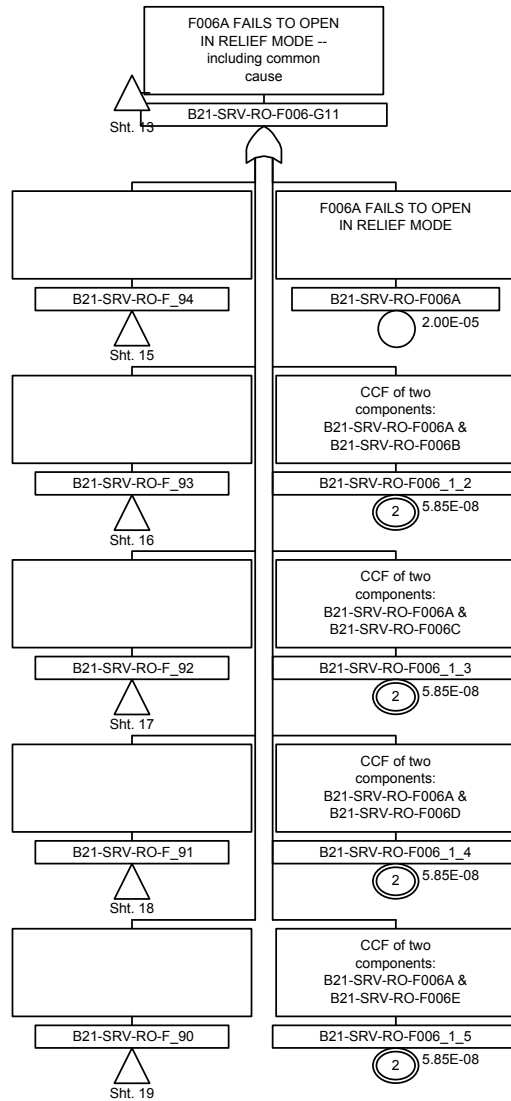


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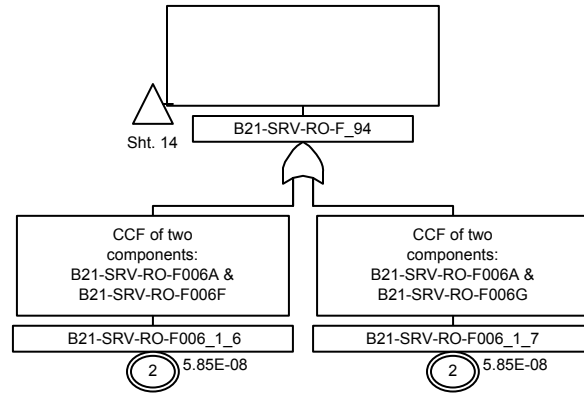


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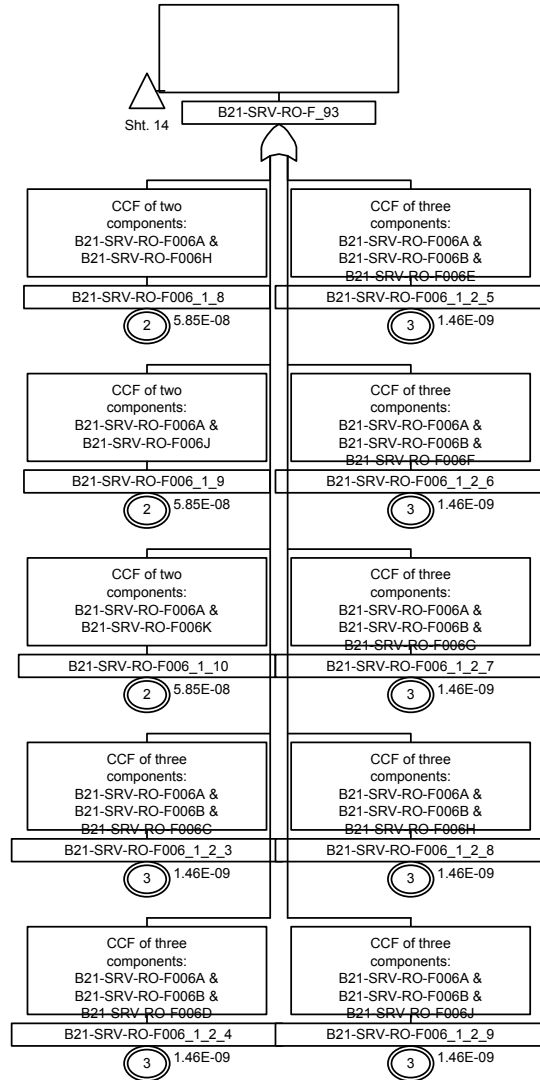


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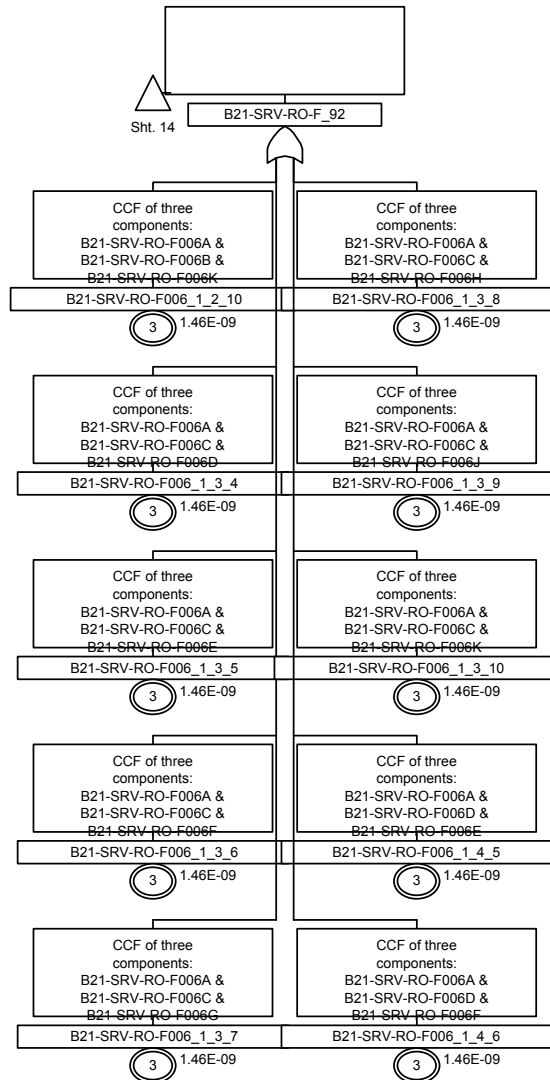


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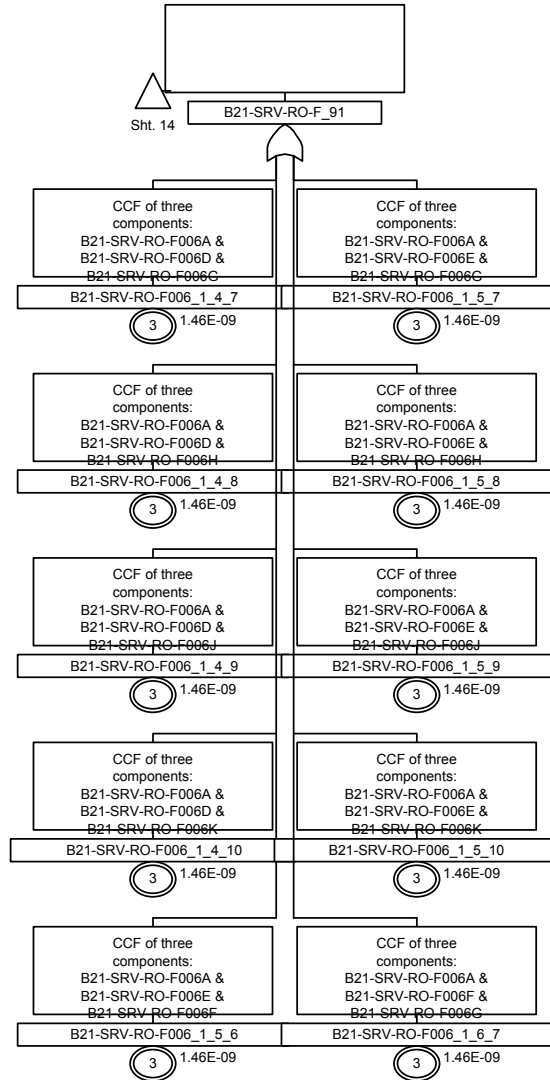


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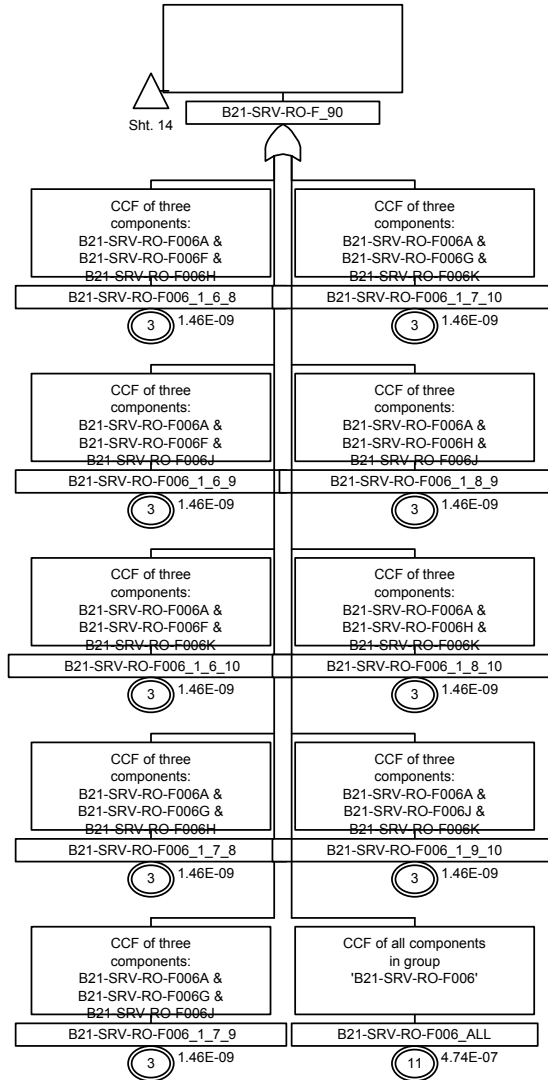


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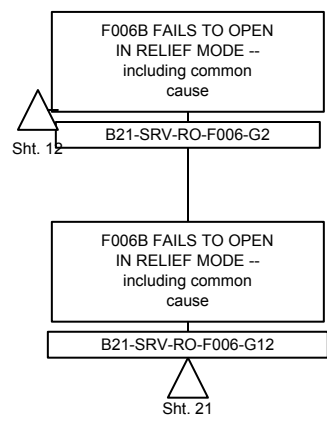


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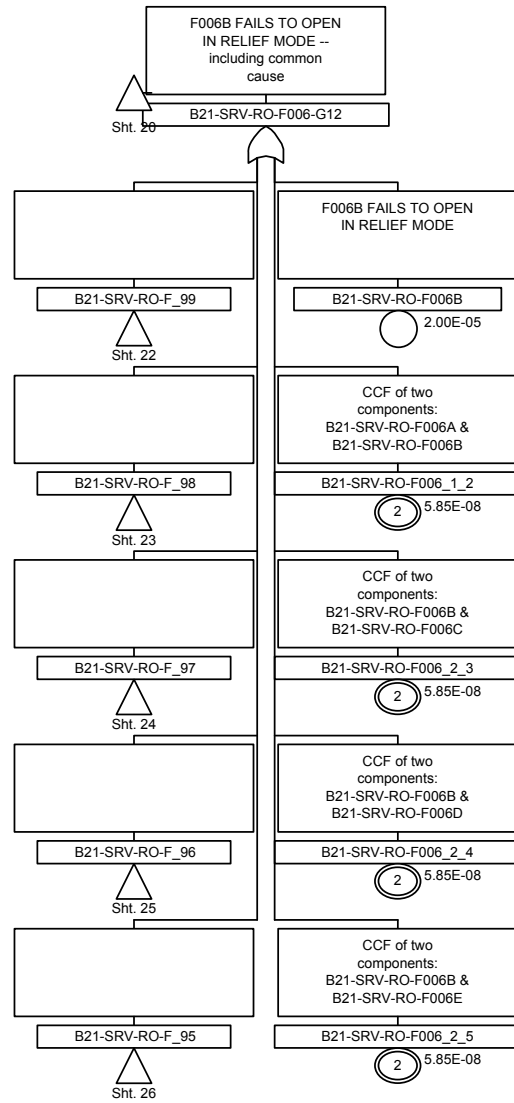


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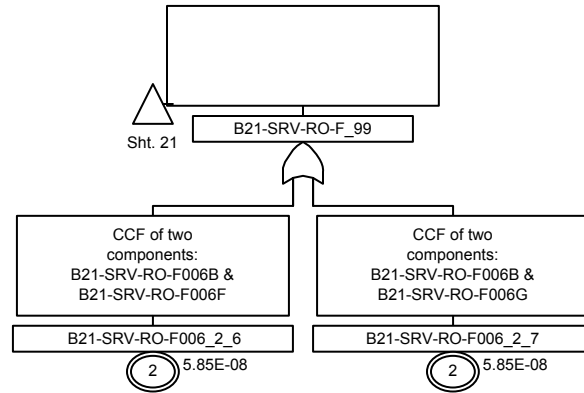


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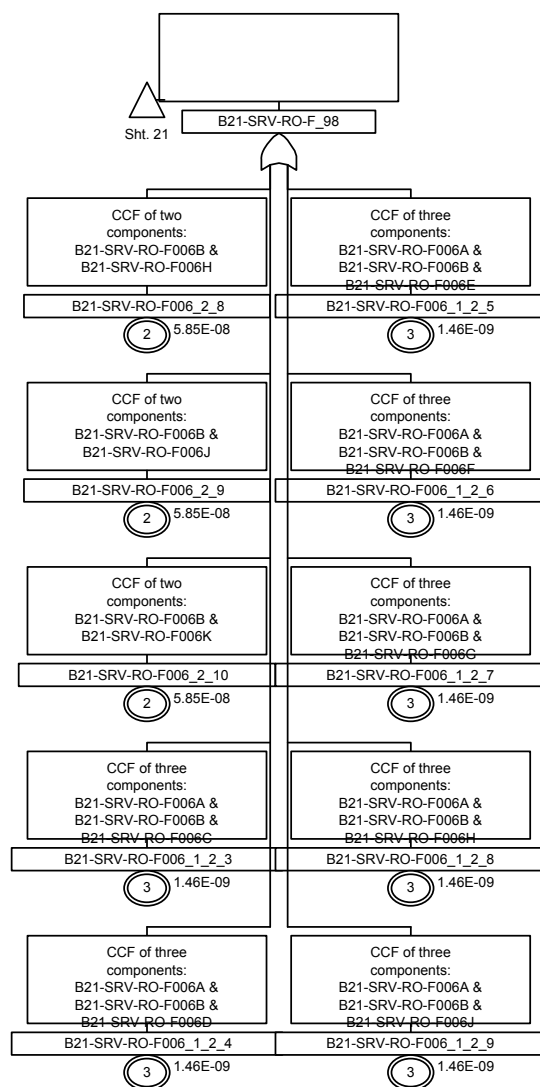


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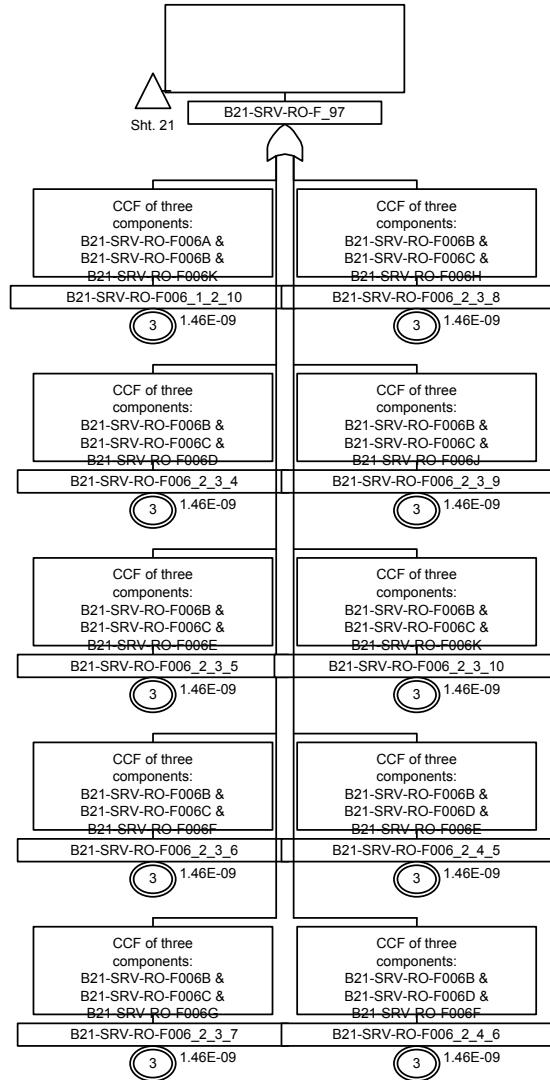


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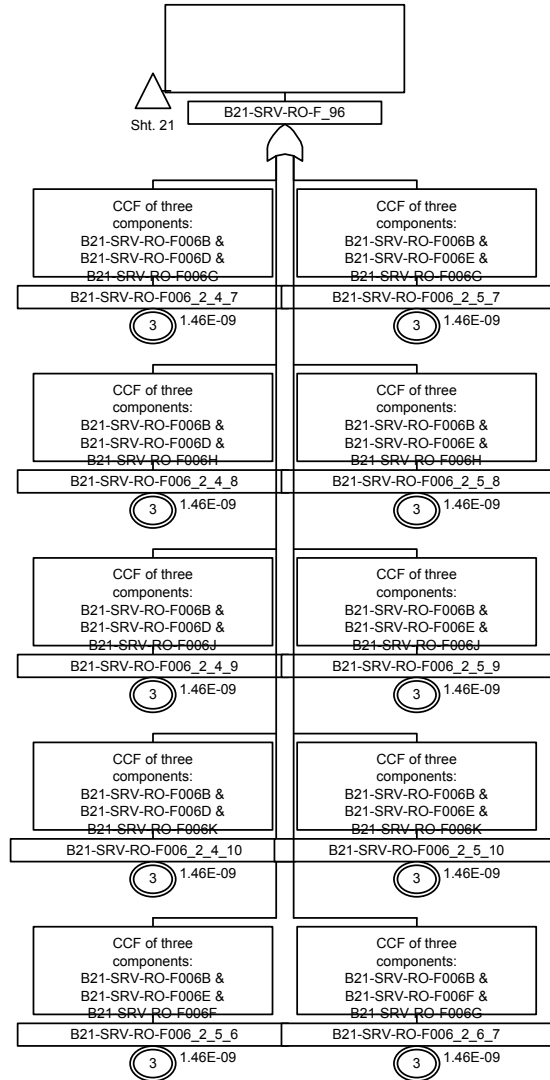


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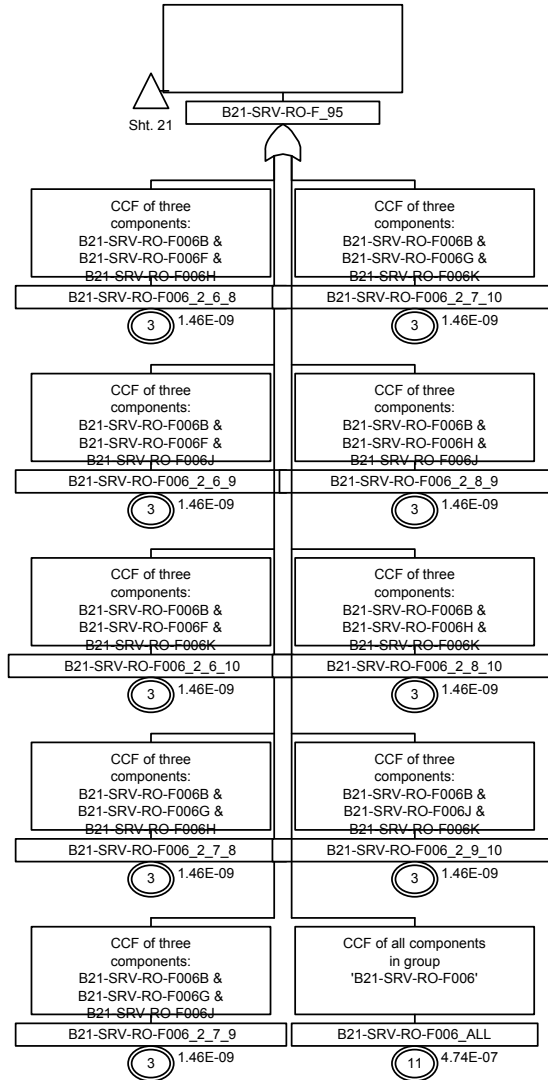


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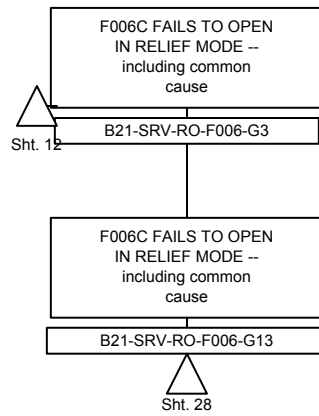


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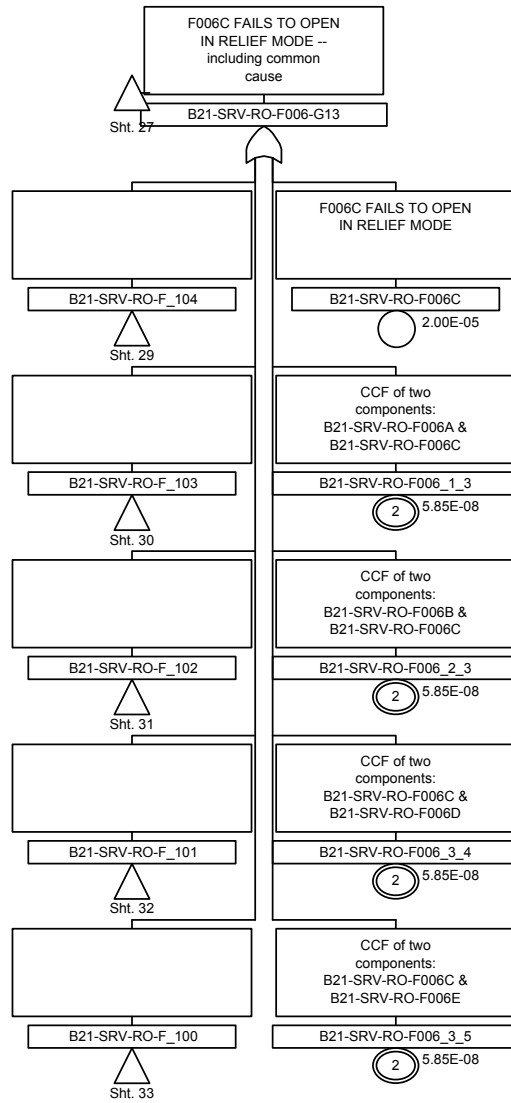


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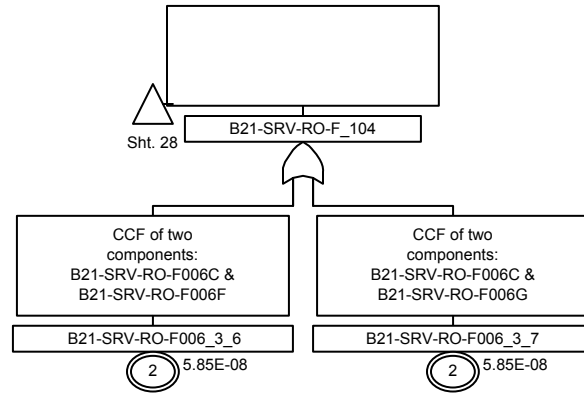


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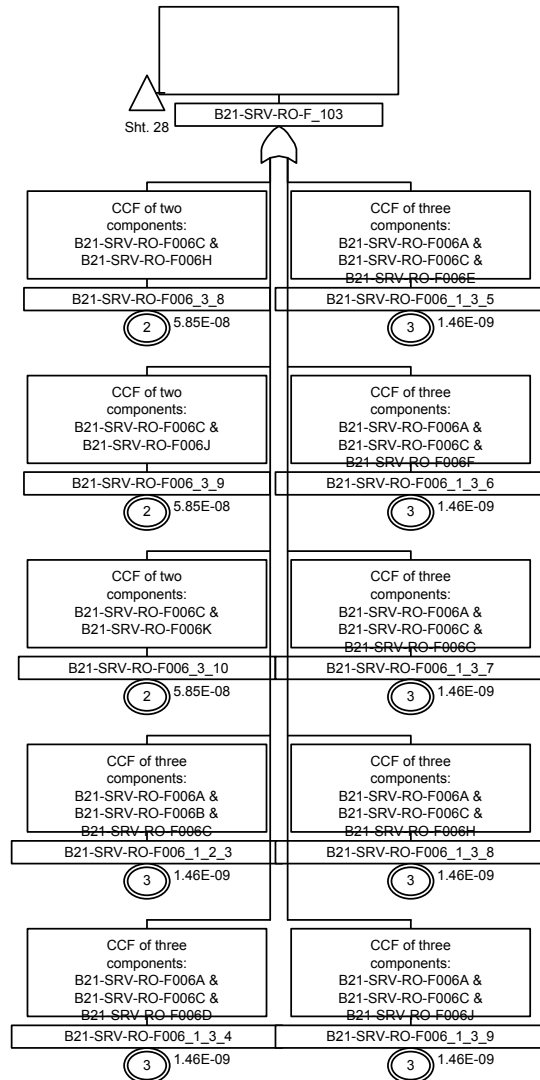


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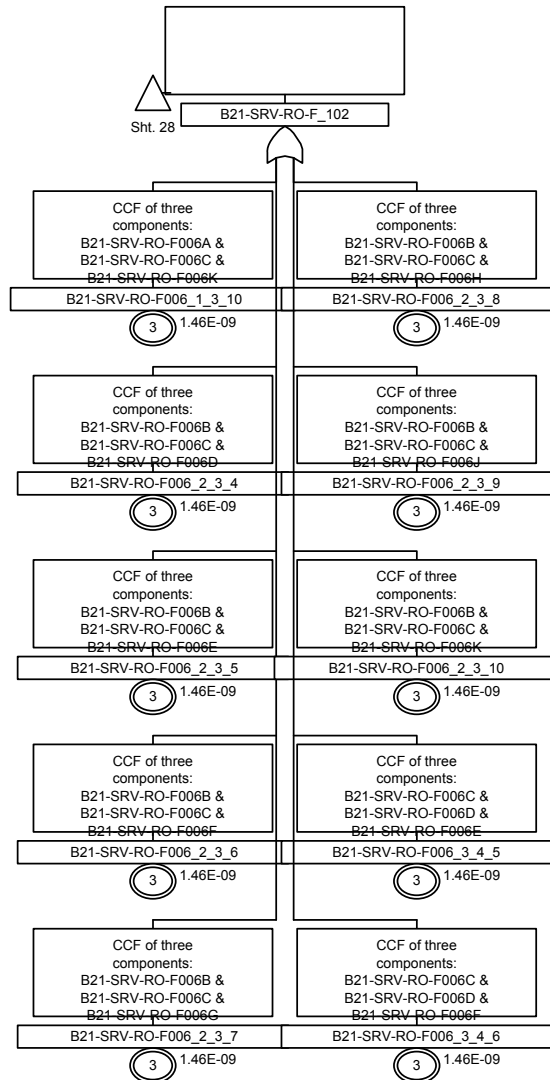


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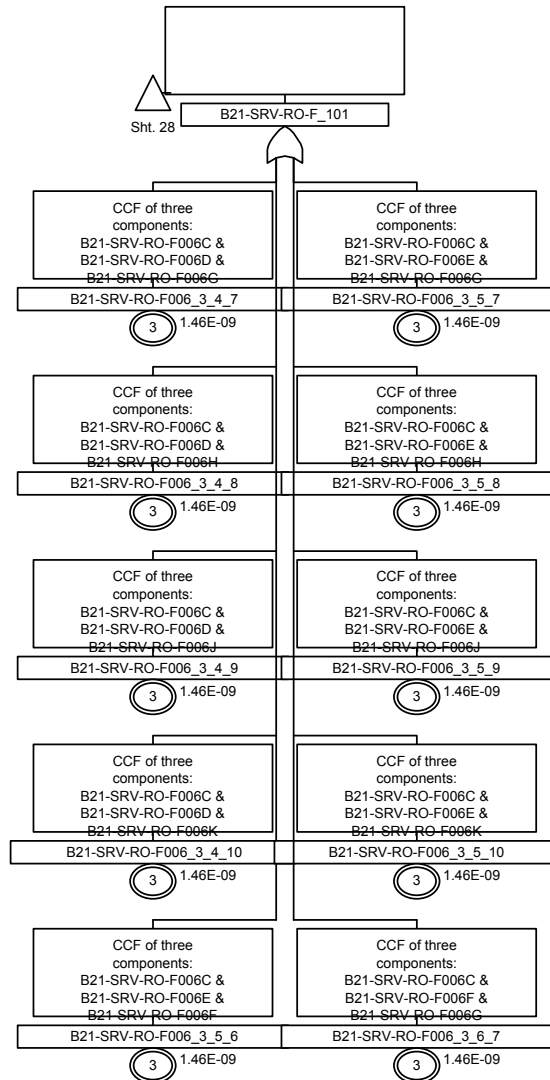


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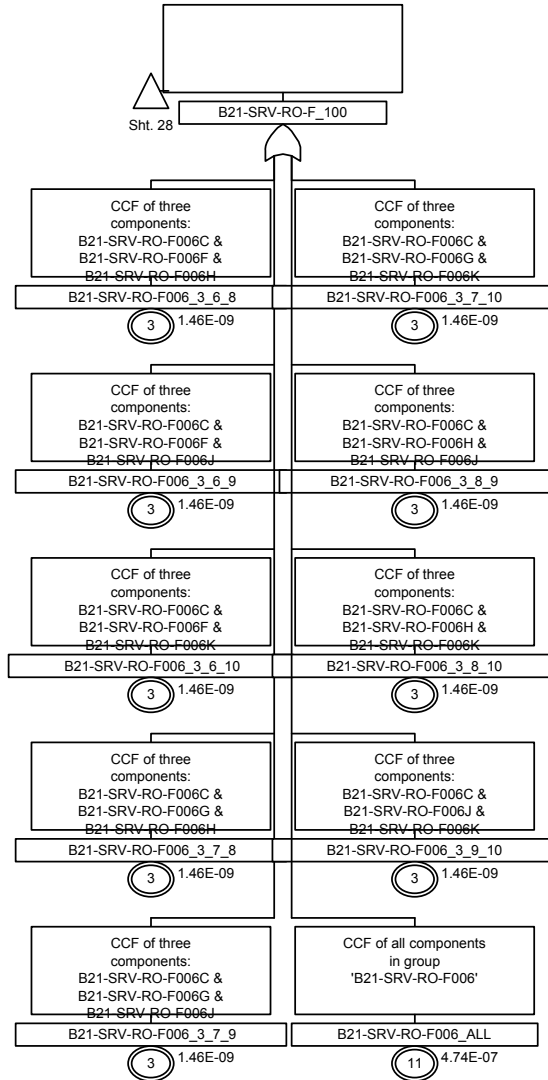


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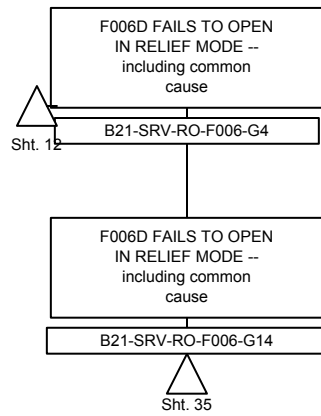


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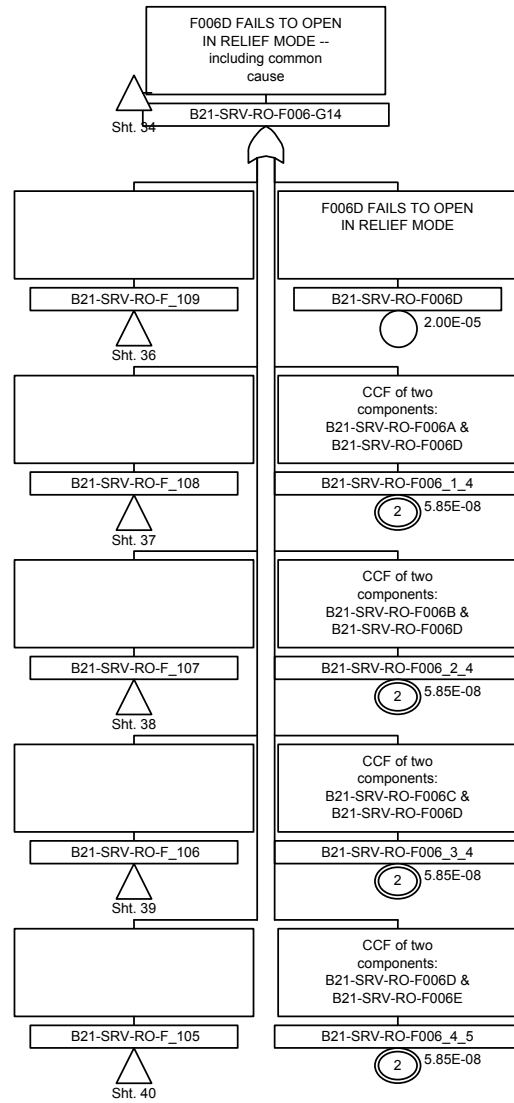


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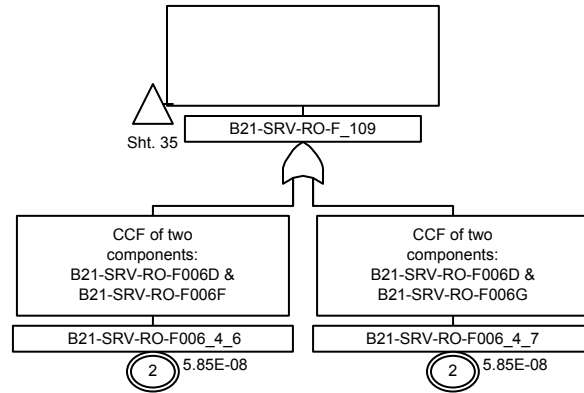


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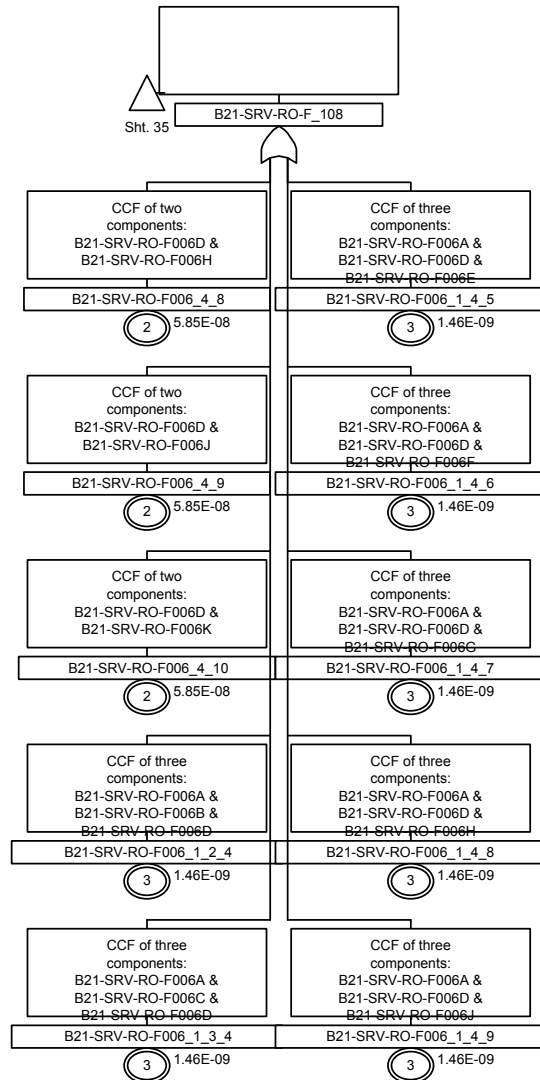


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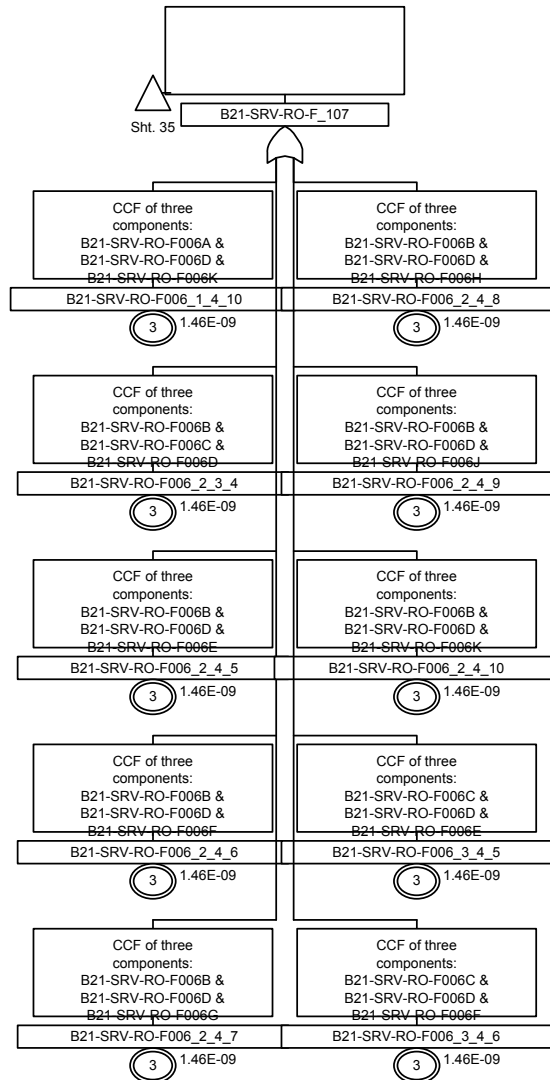


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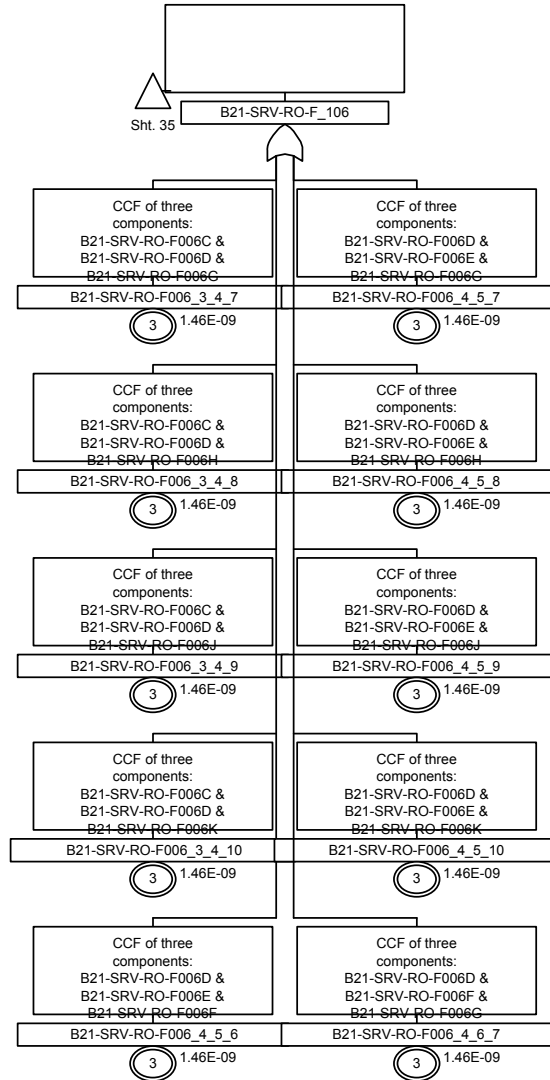


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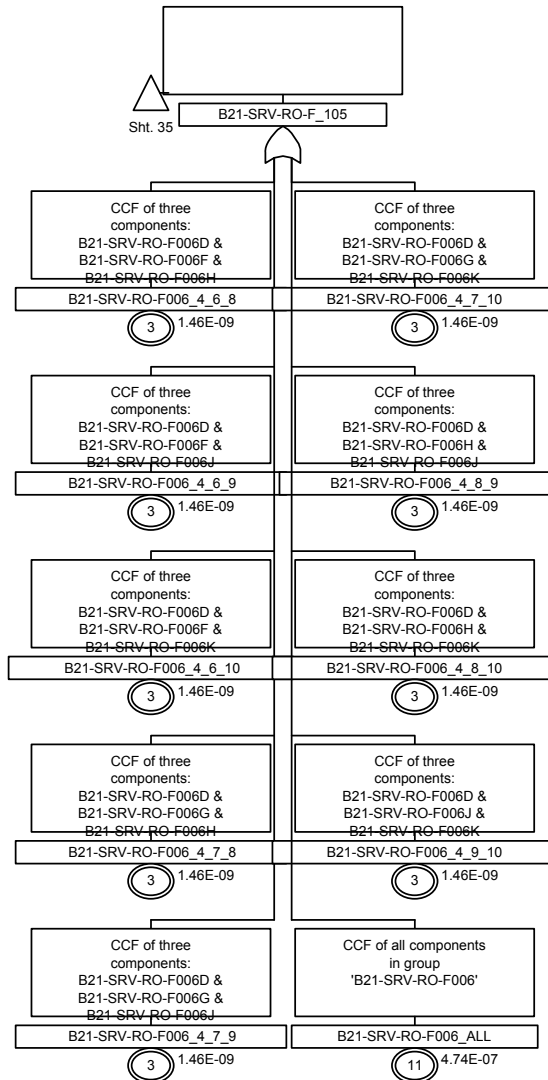


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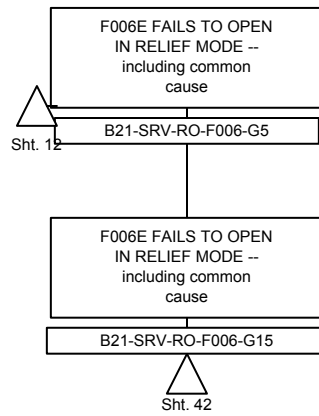


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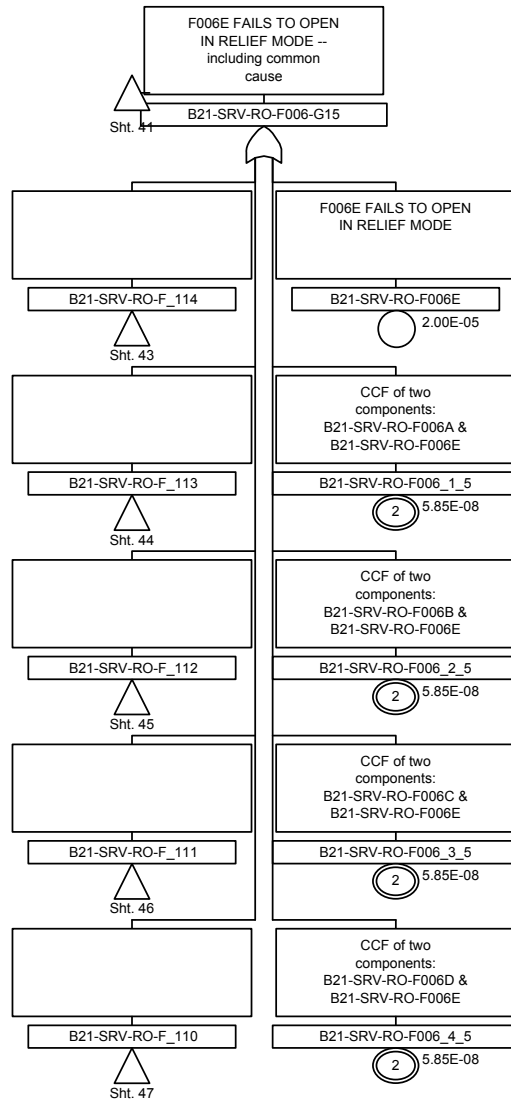


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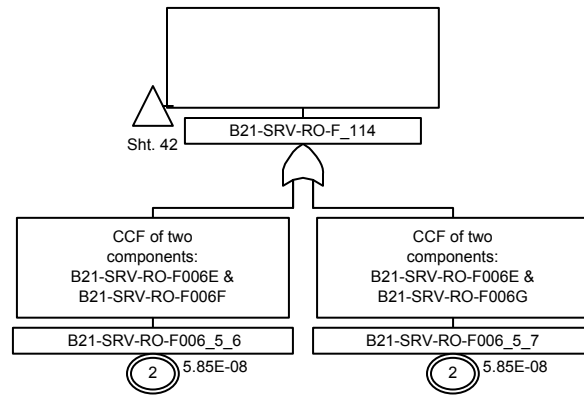


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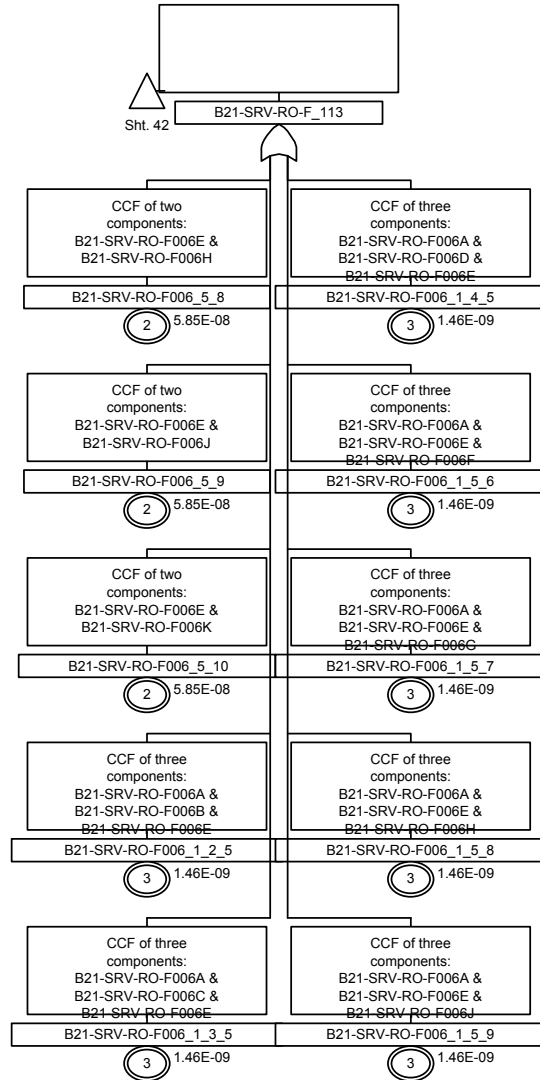


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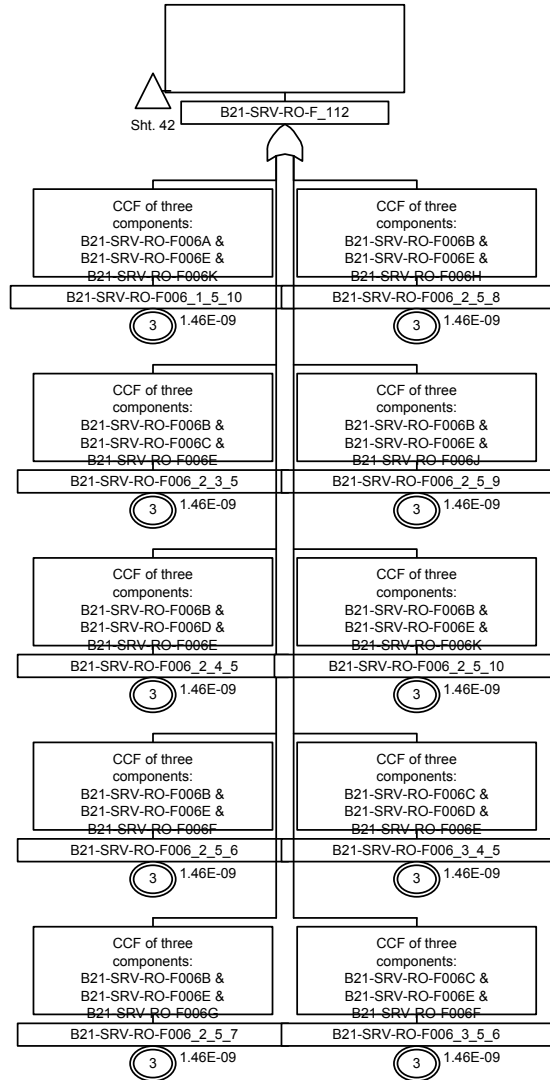


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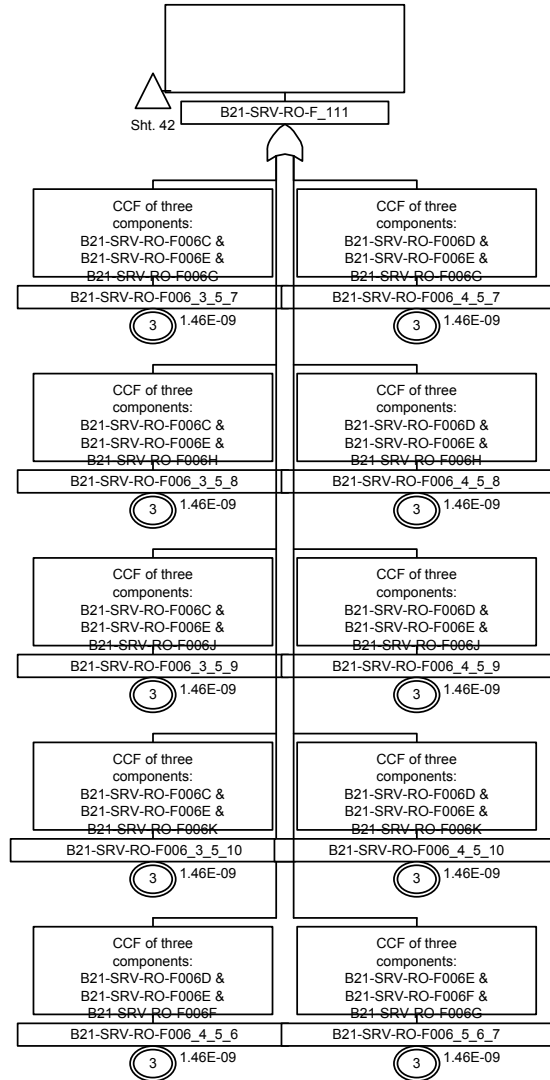


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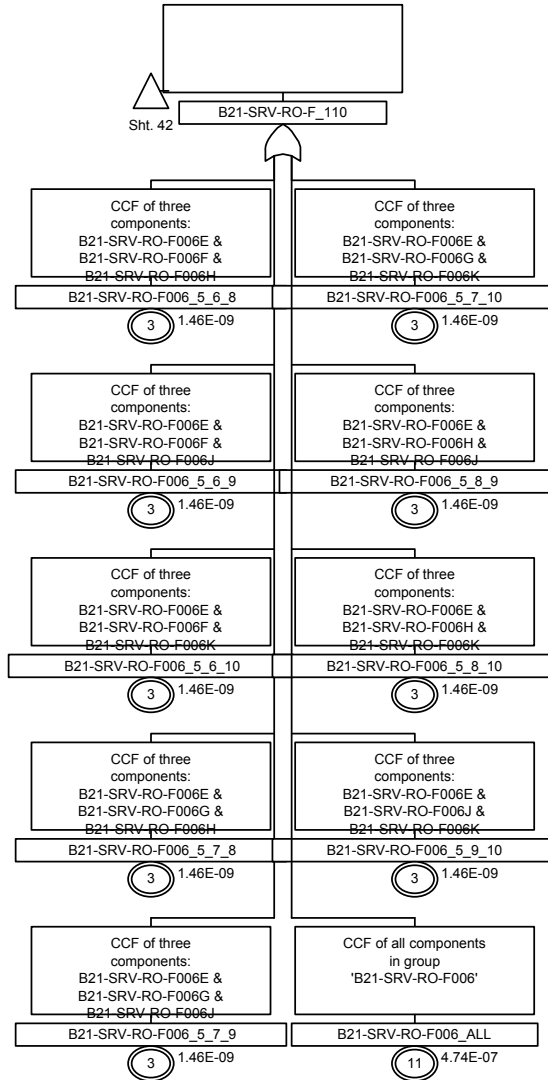


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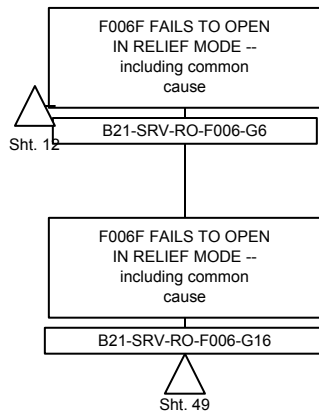


Figure 4.1-2. Sheet 48 Nuclear Boiler System



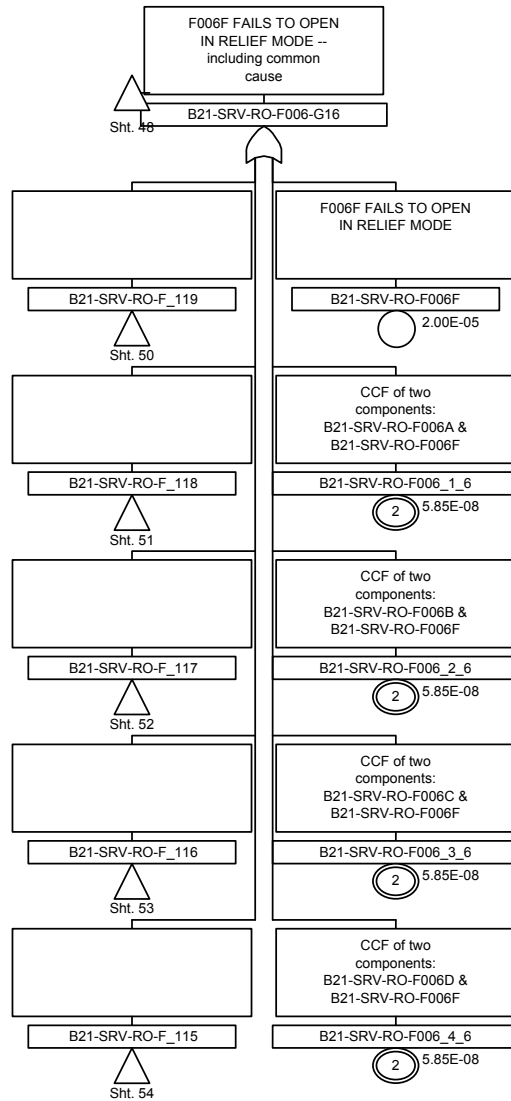


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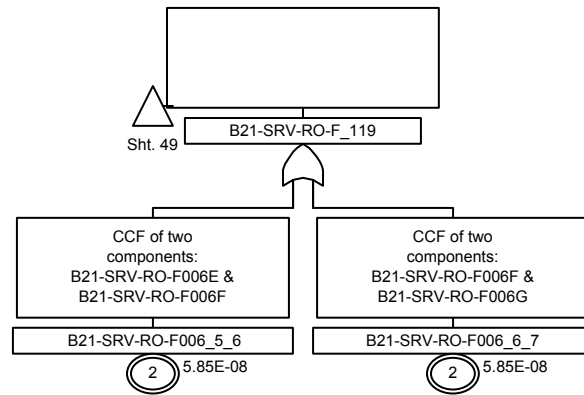


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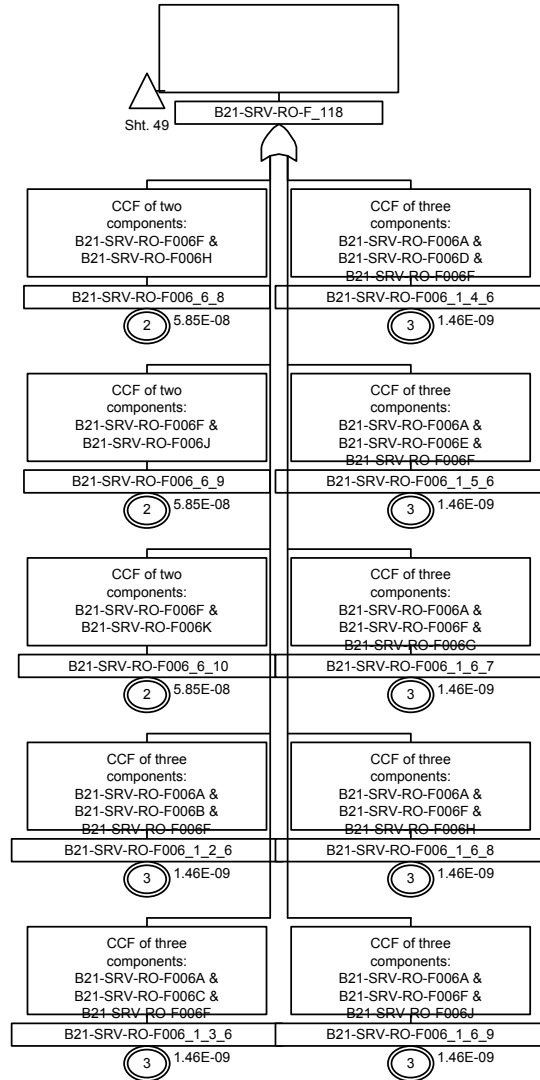


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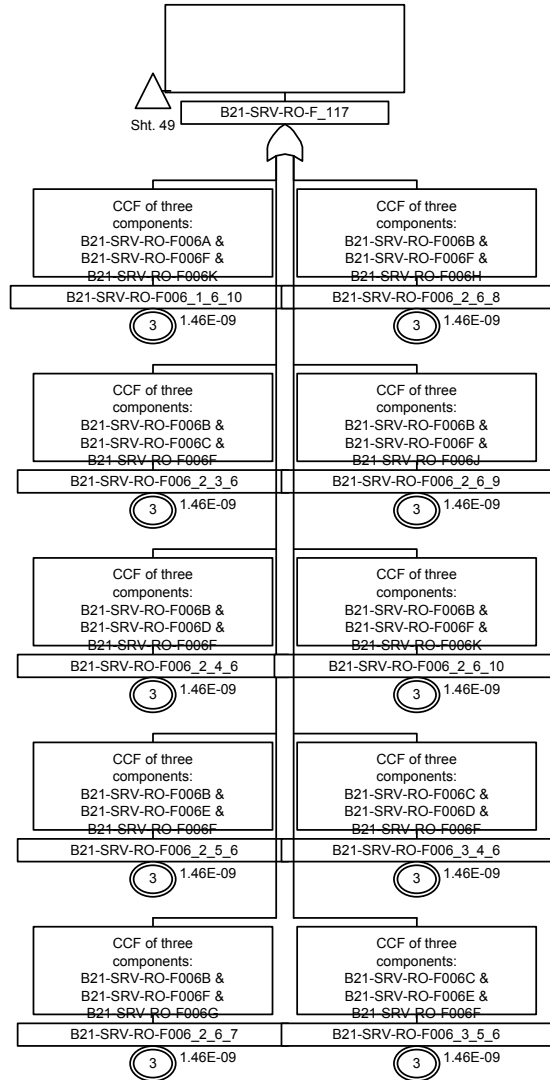


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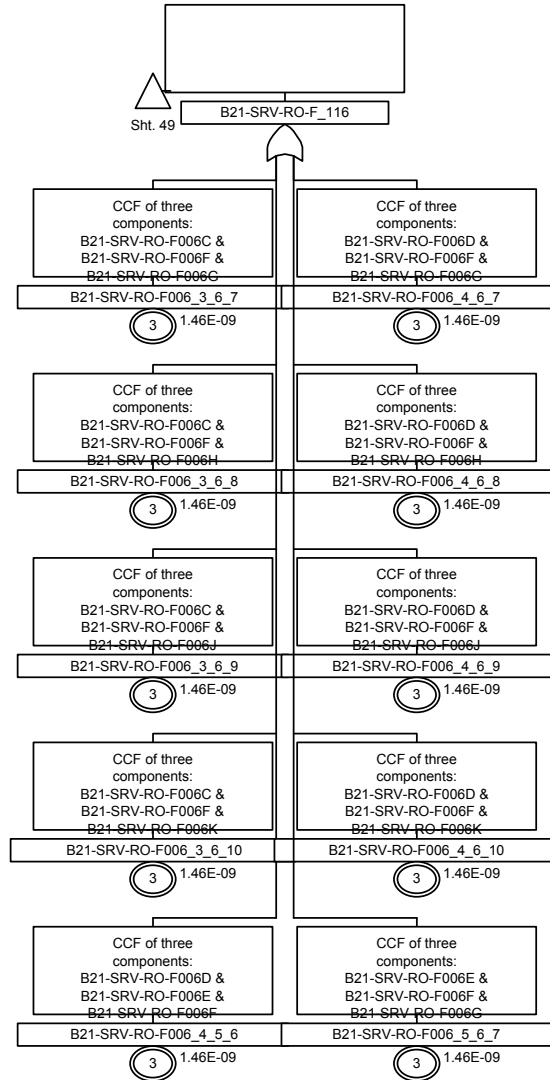


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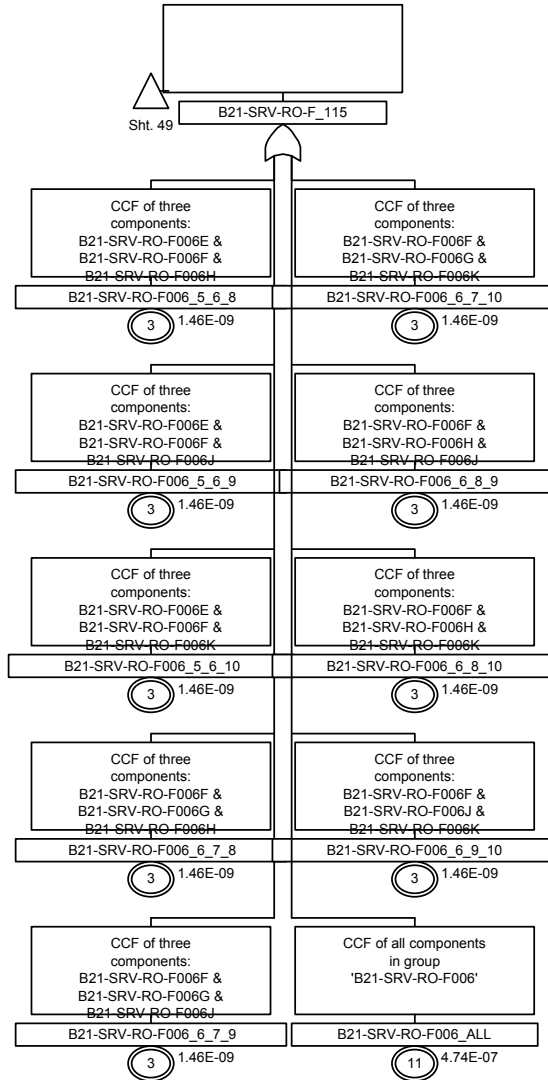


Figure 4.1-2. Sheet 54 Nuclear Boiler System

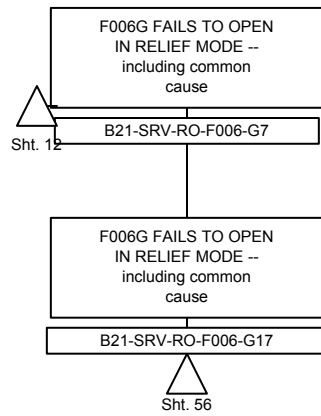


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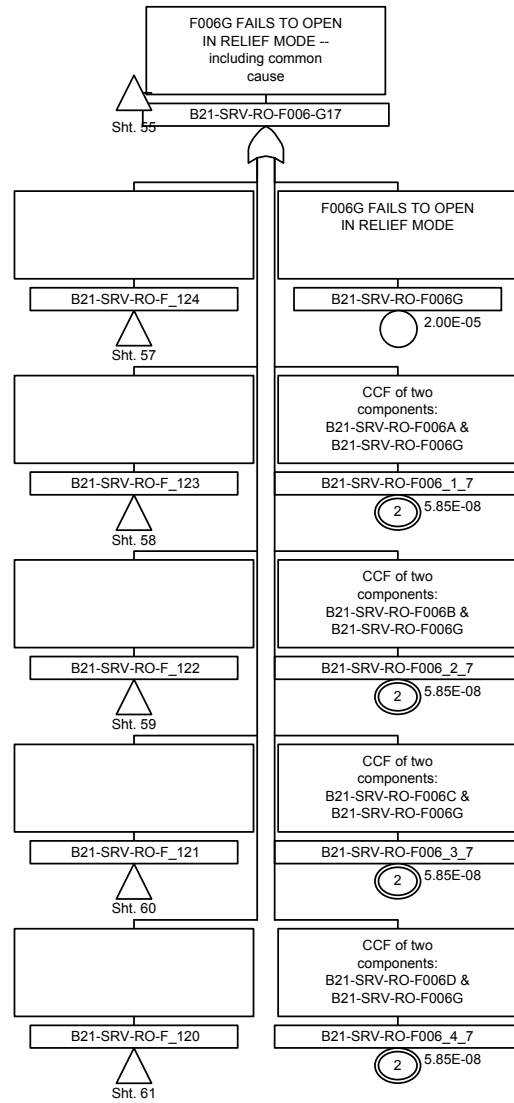


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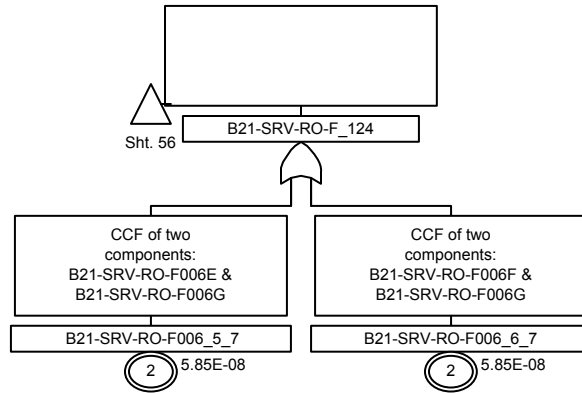


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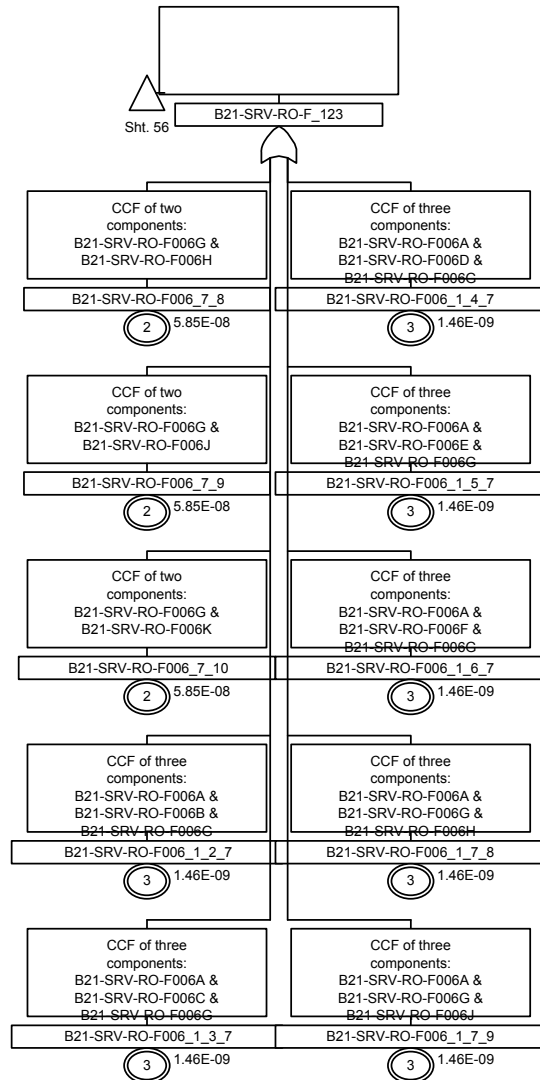


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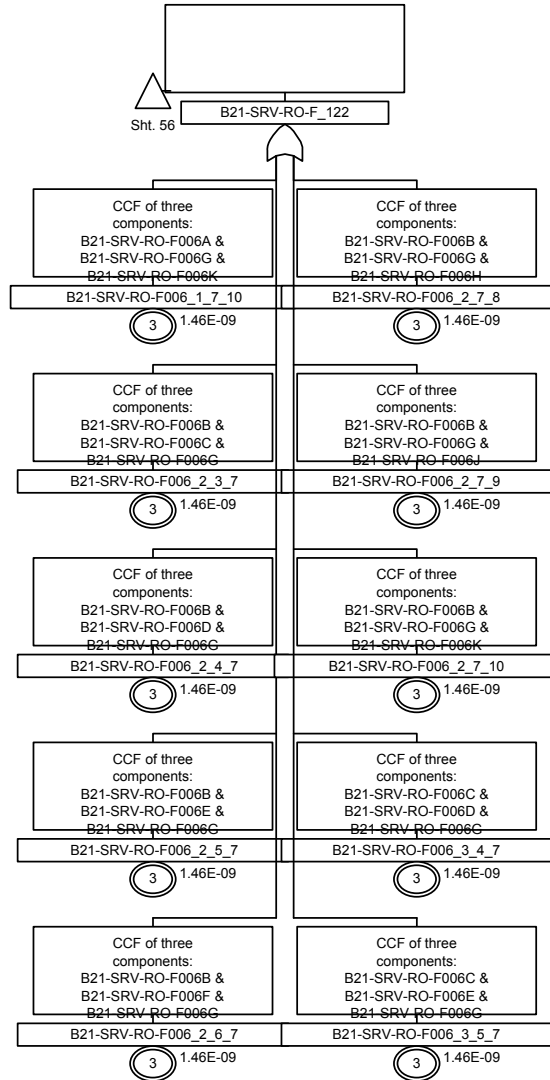


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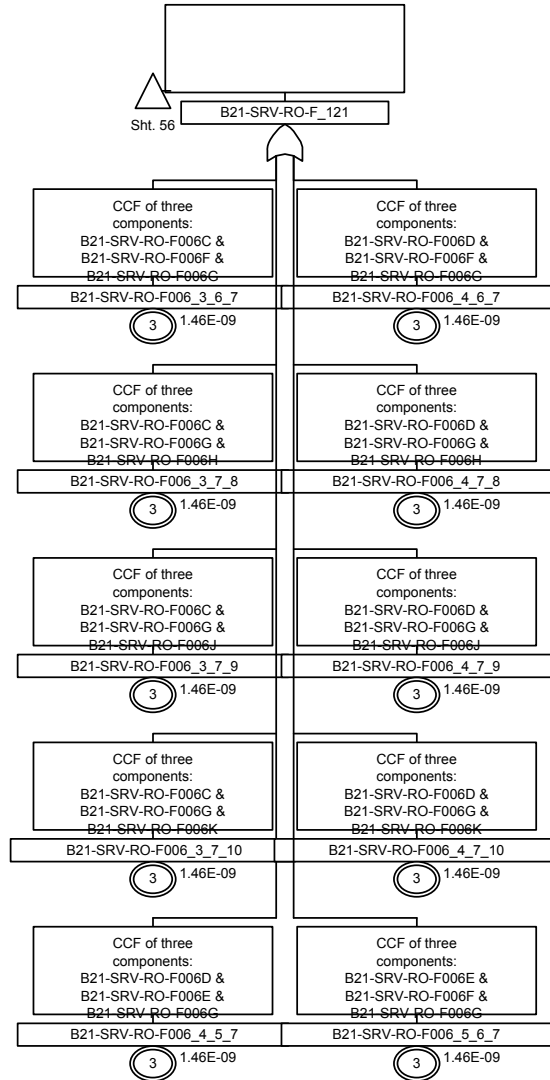


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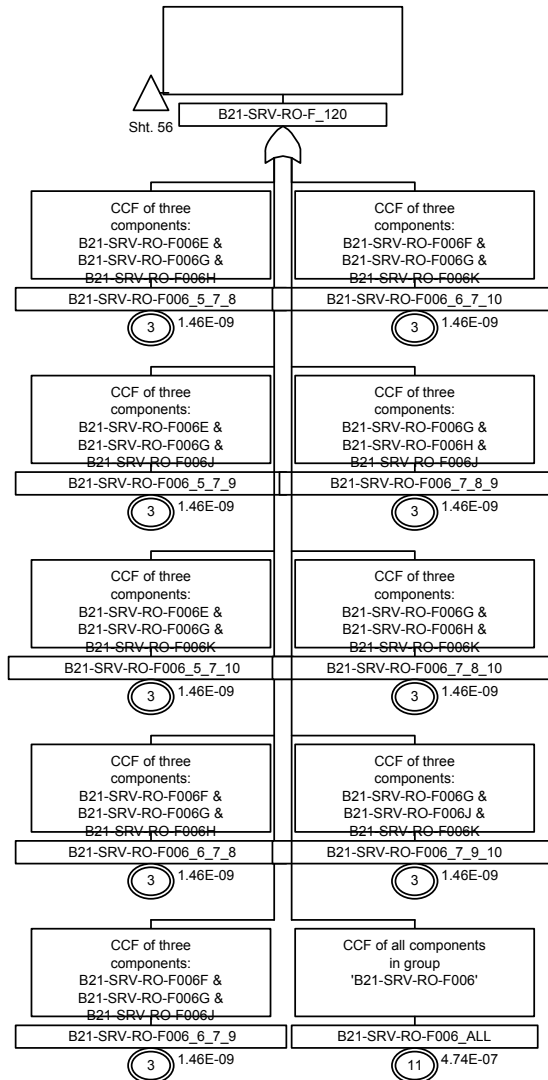


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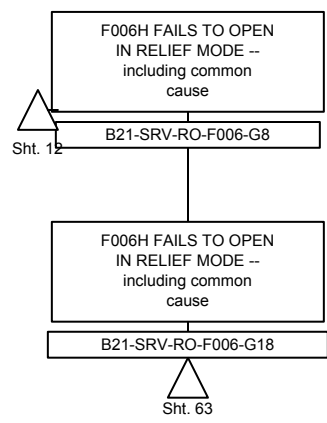


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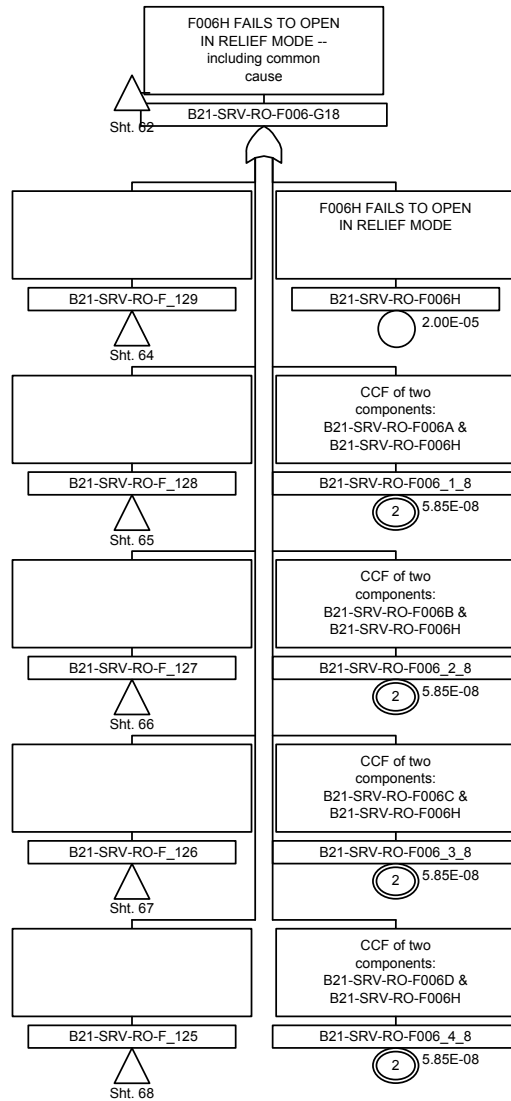


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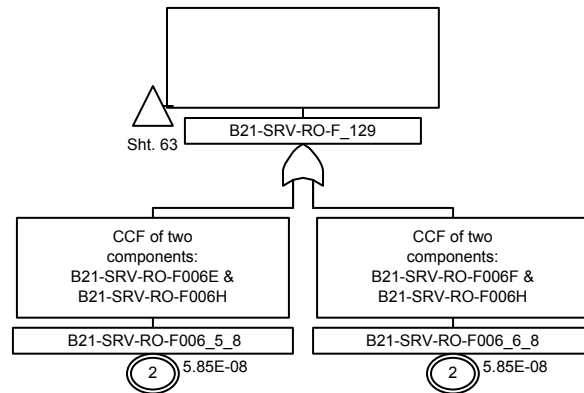


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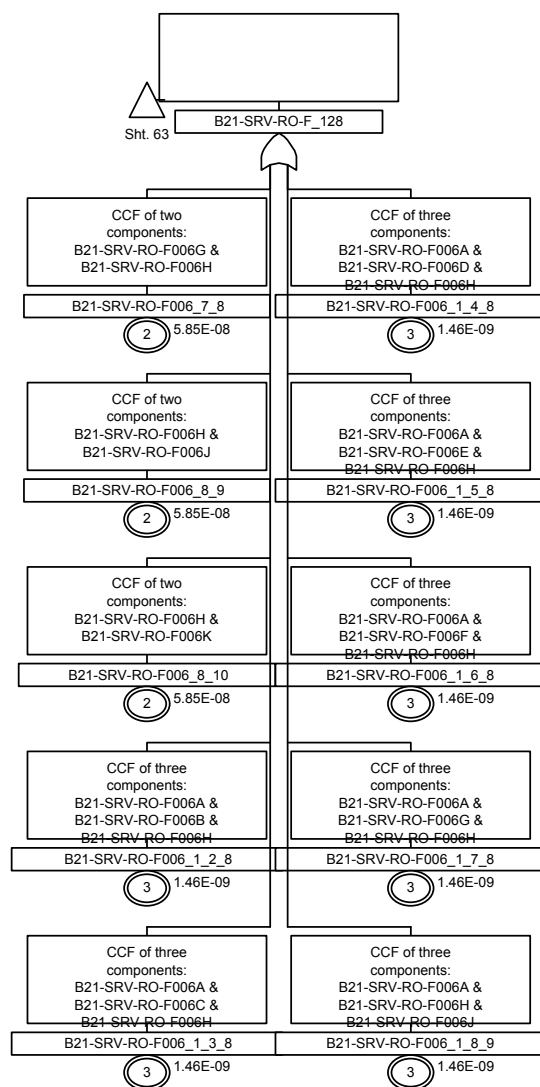
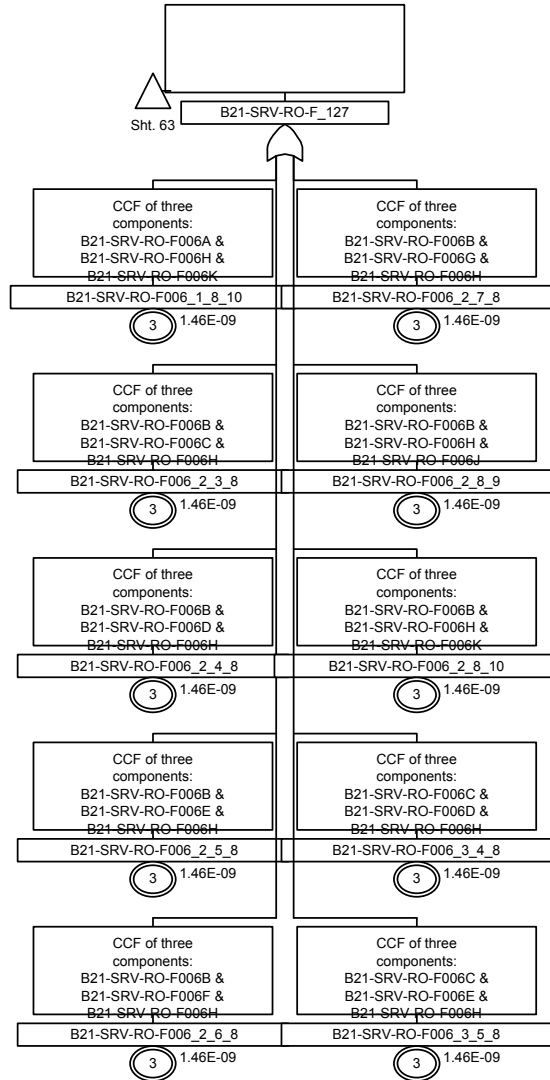


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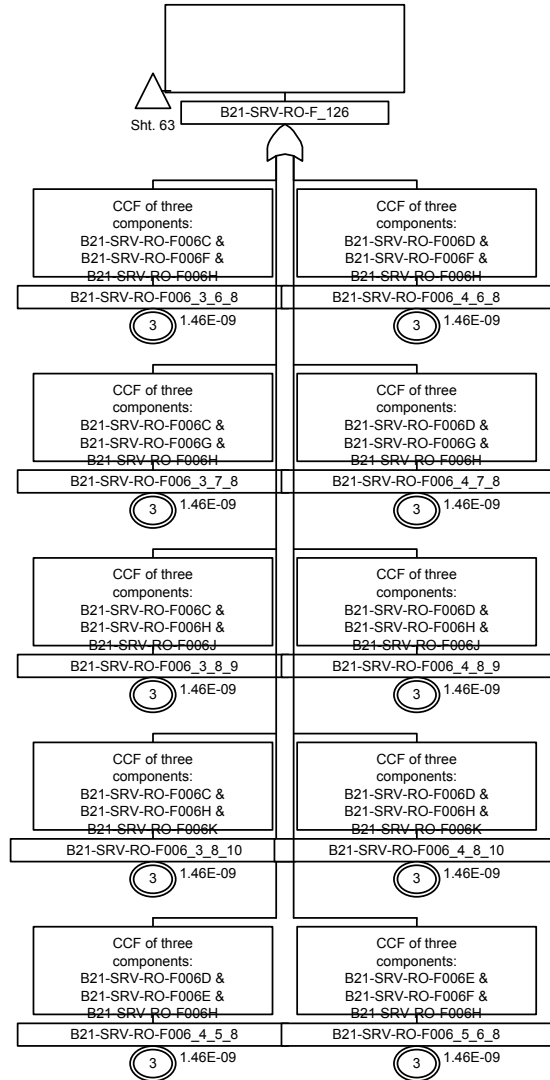


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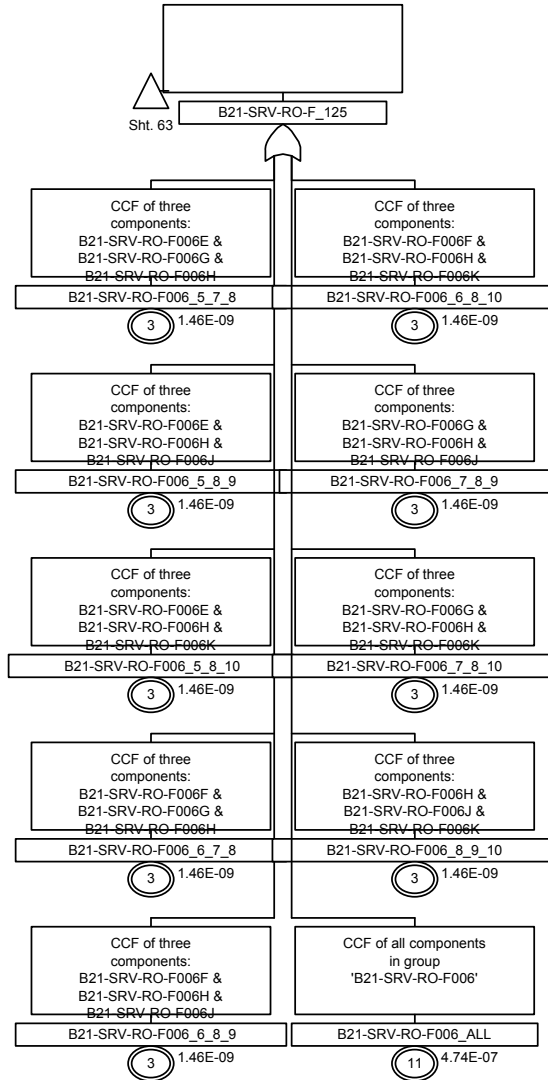


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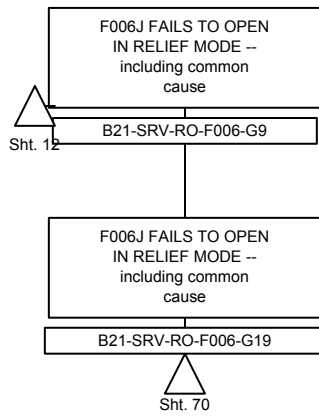


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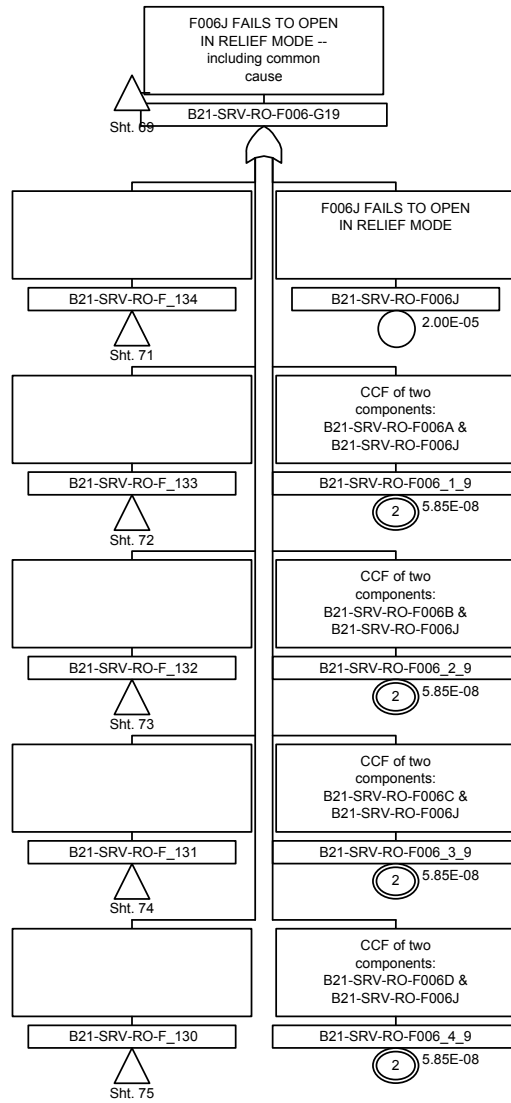


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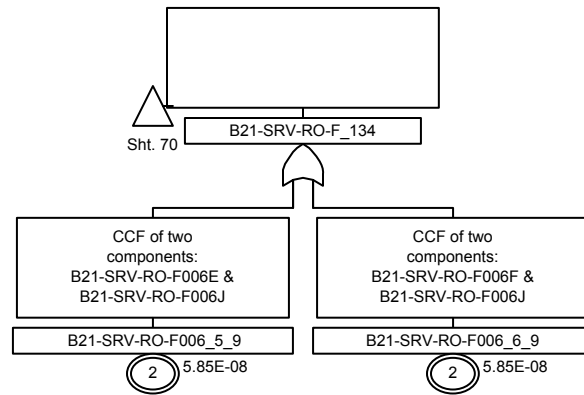


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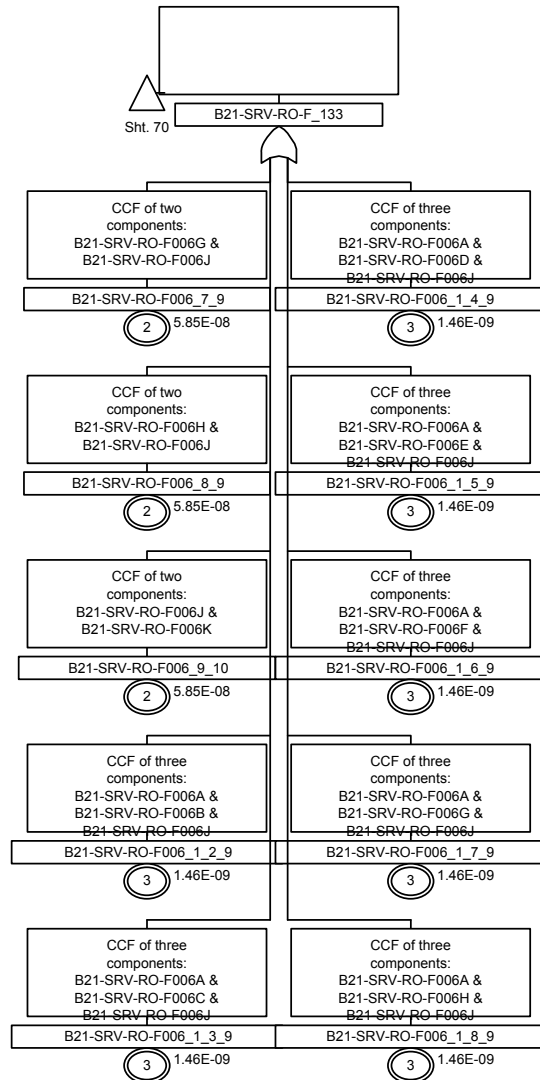


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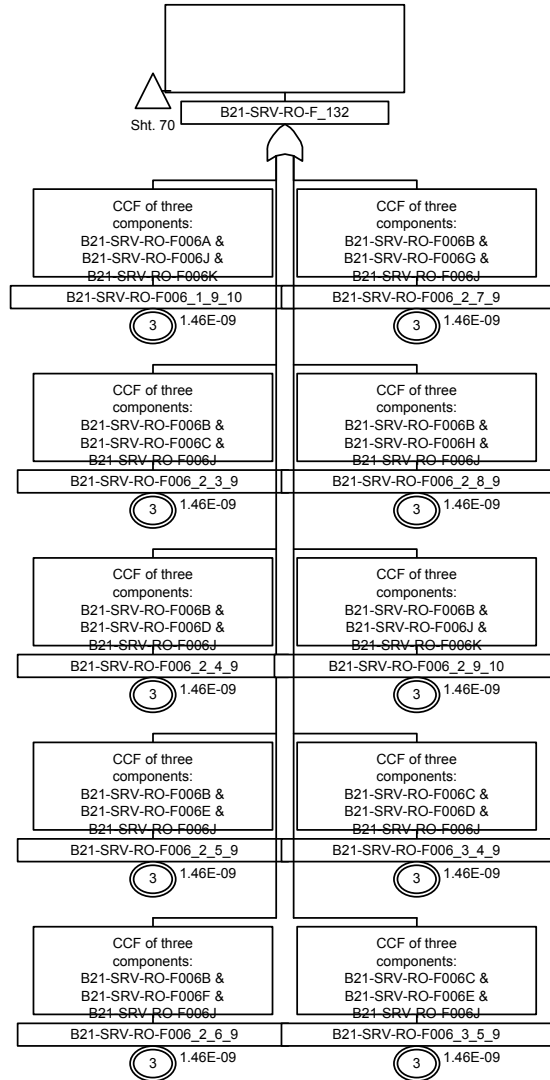


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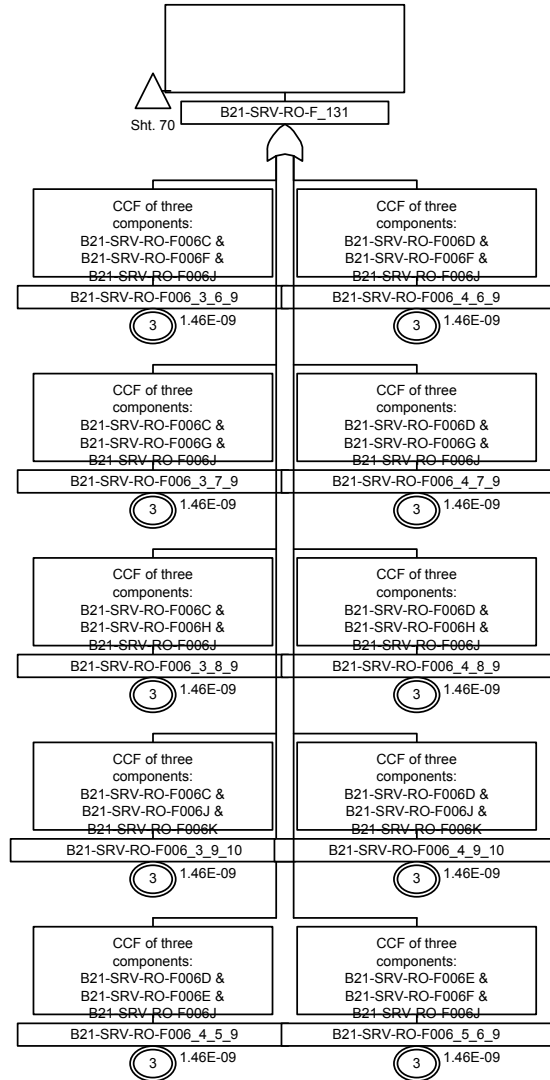


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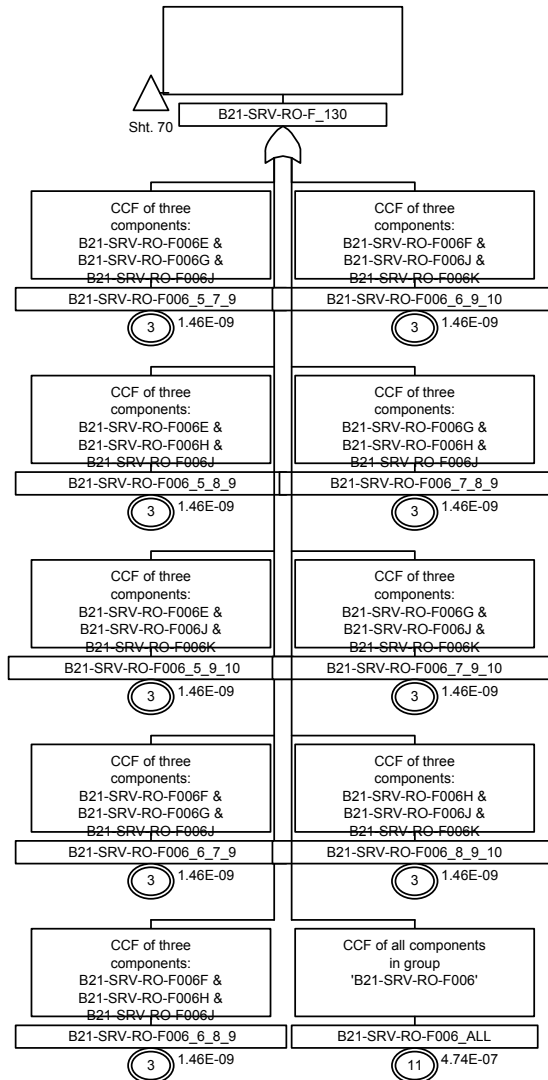


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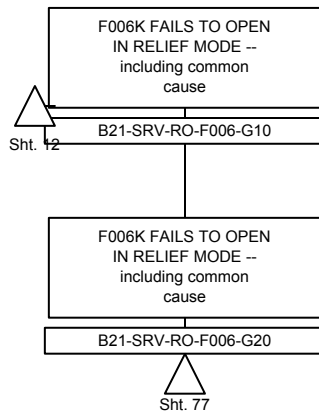


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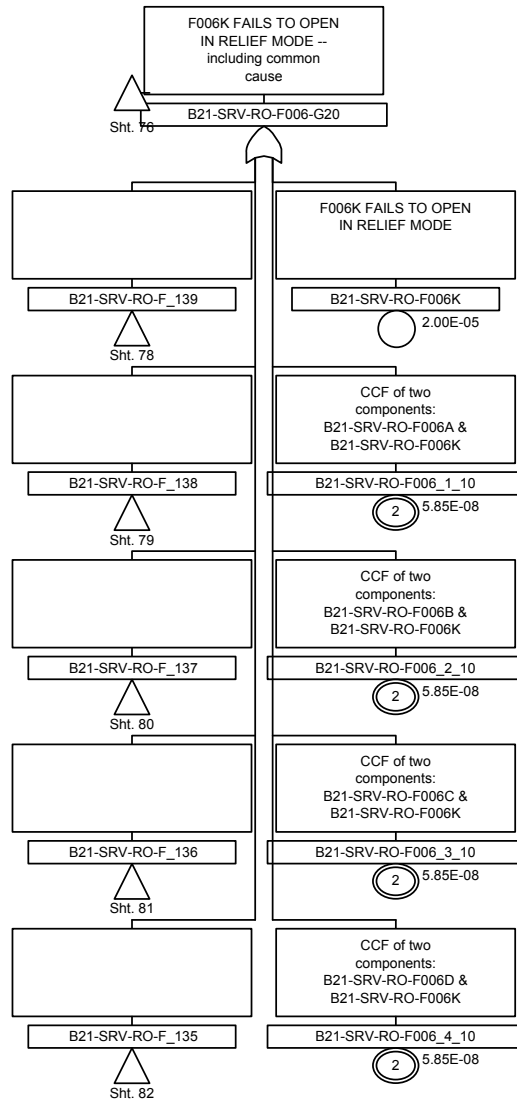


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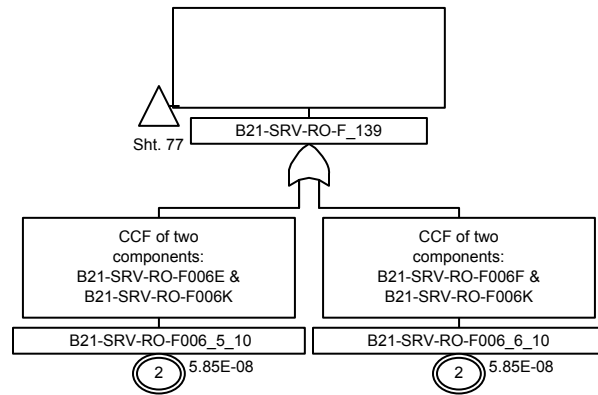


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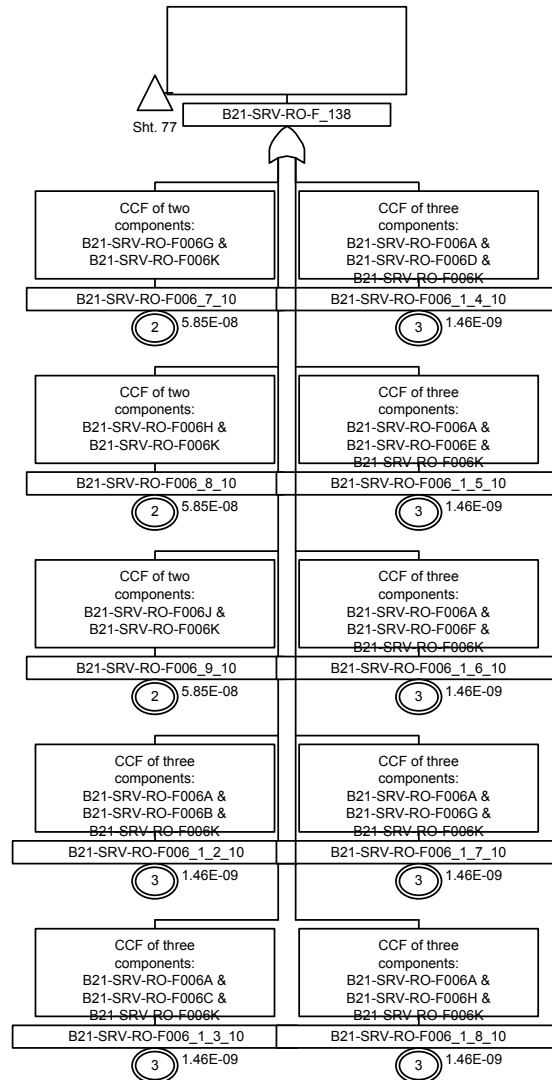


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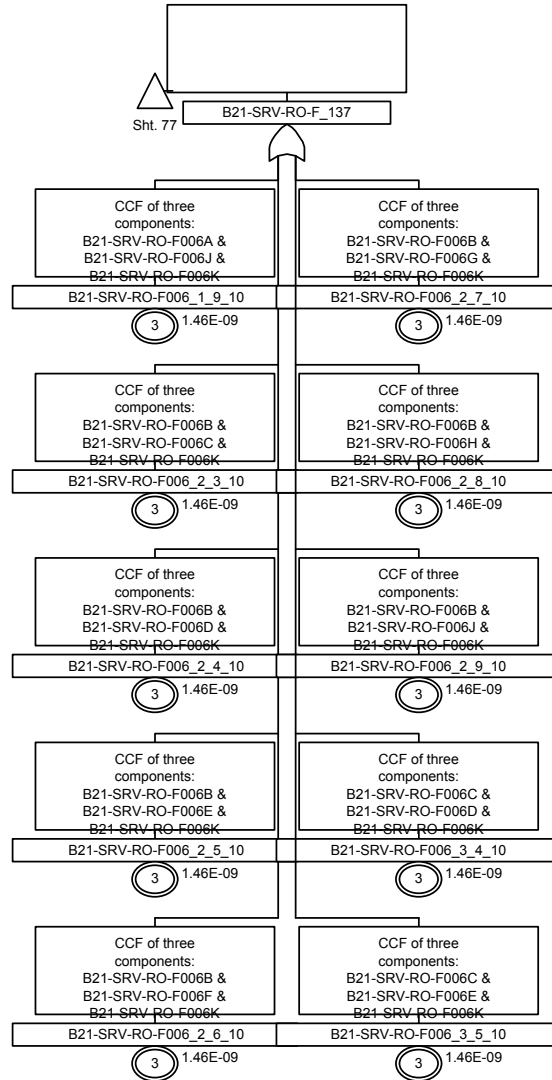


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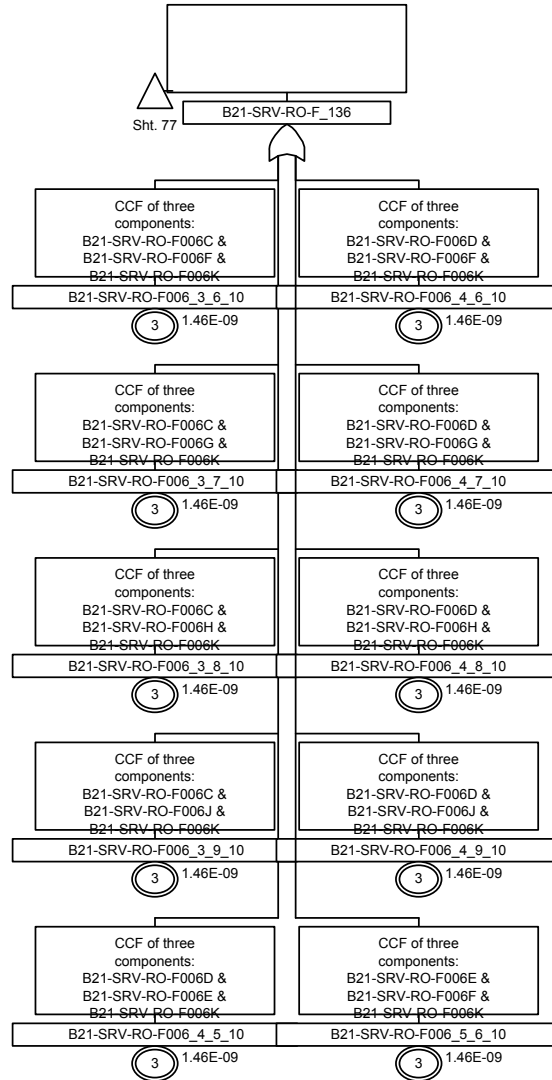


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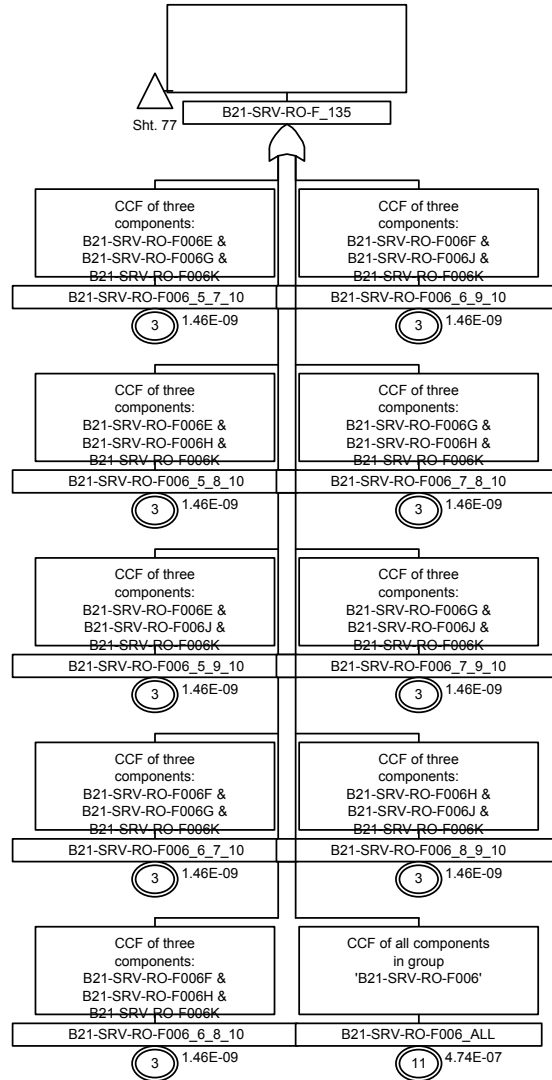


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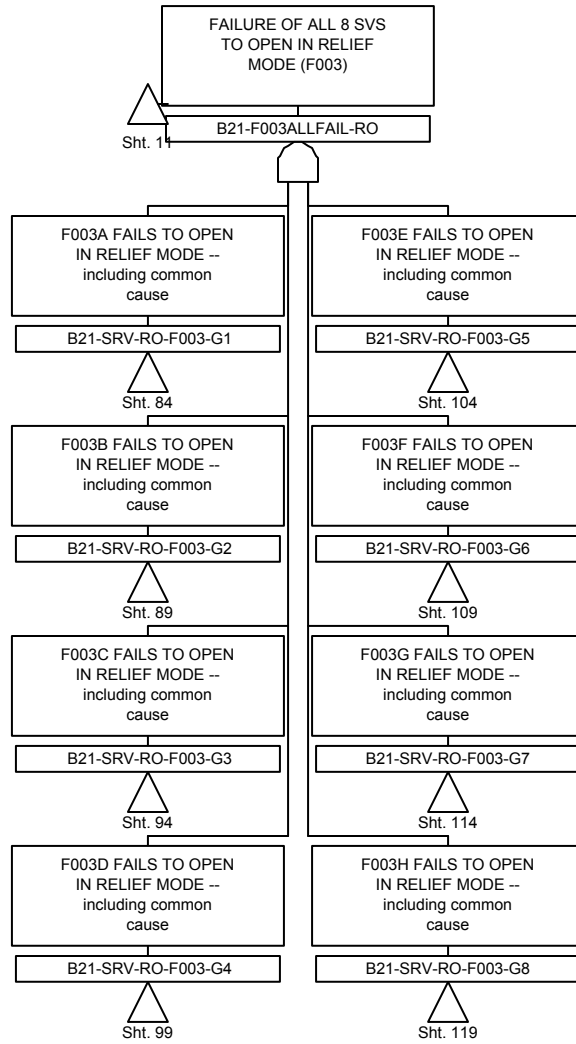


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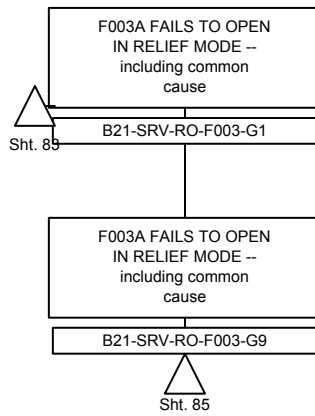


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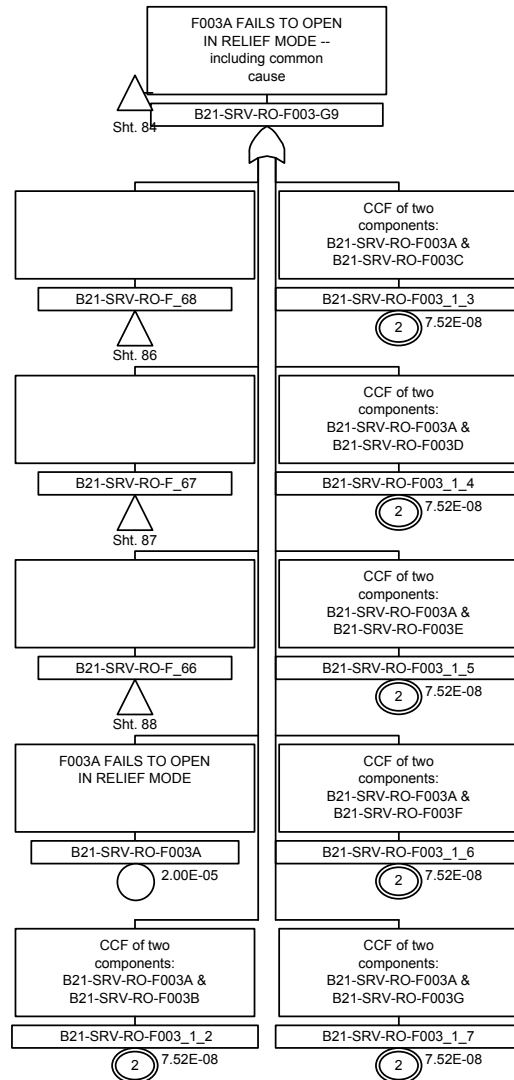


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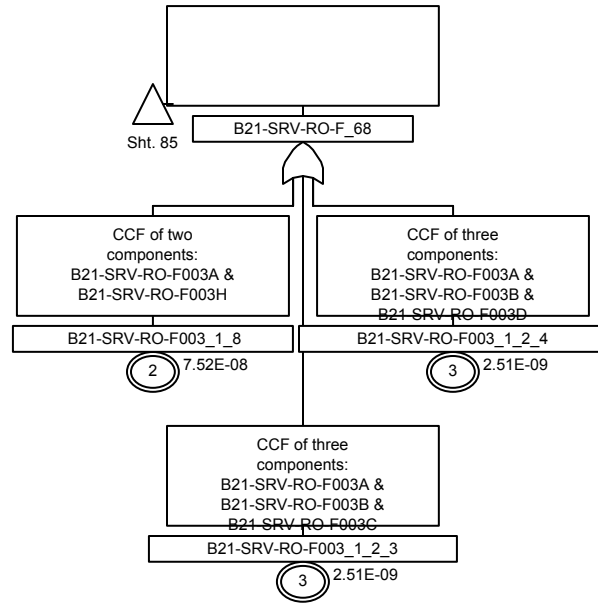


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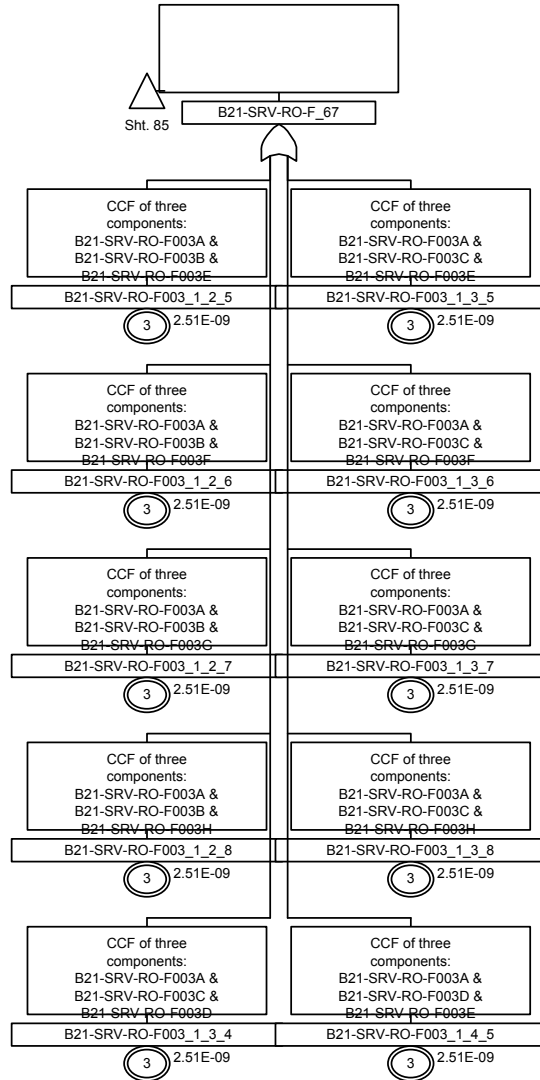


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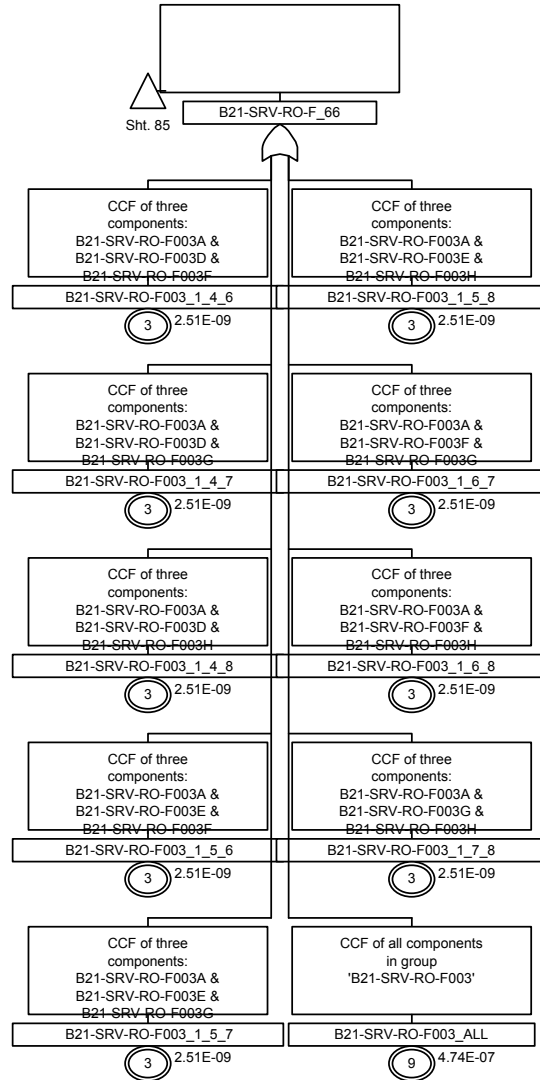


Figure 4.1-2. Sheet 88 Nuclear Boiler System



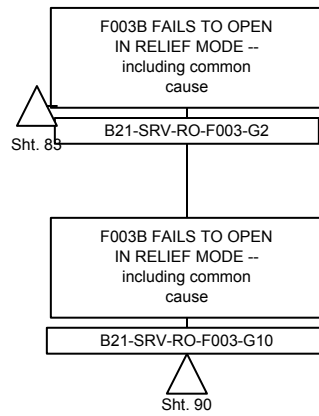


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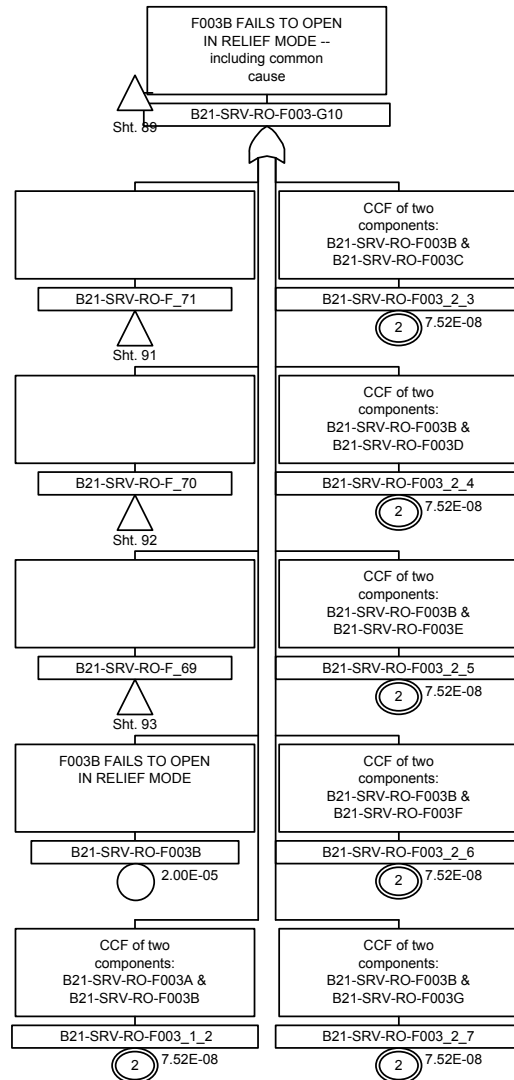


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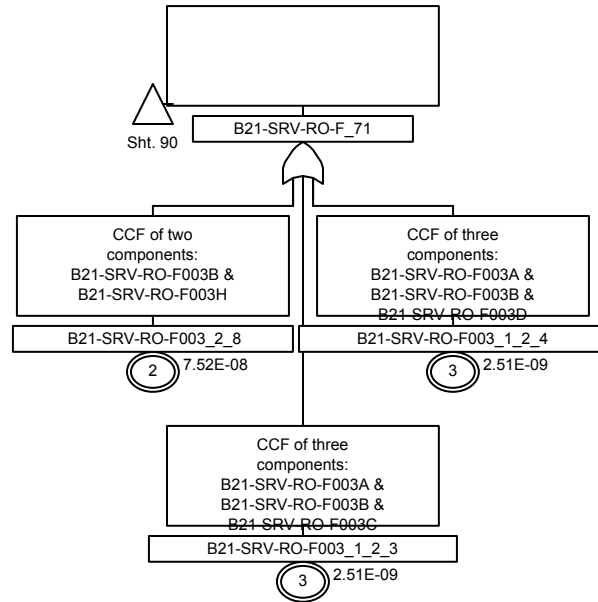


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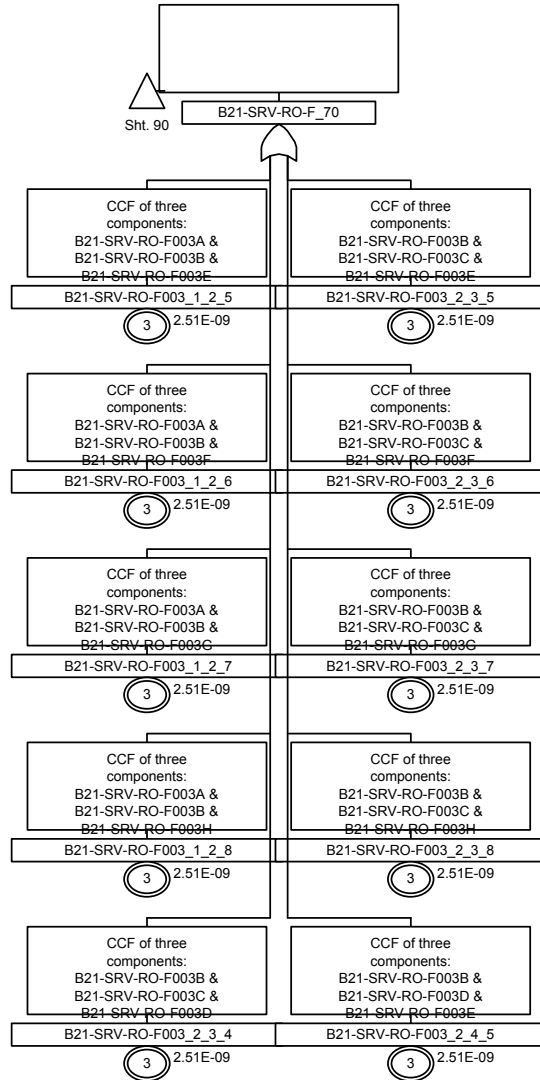


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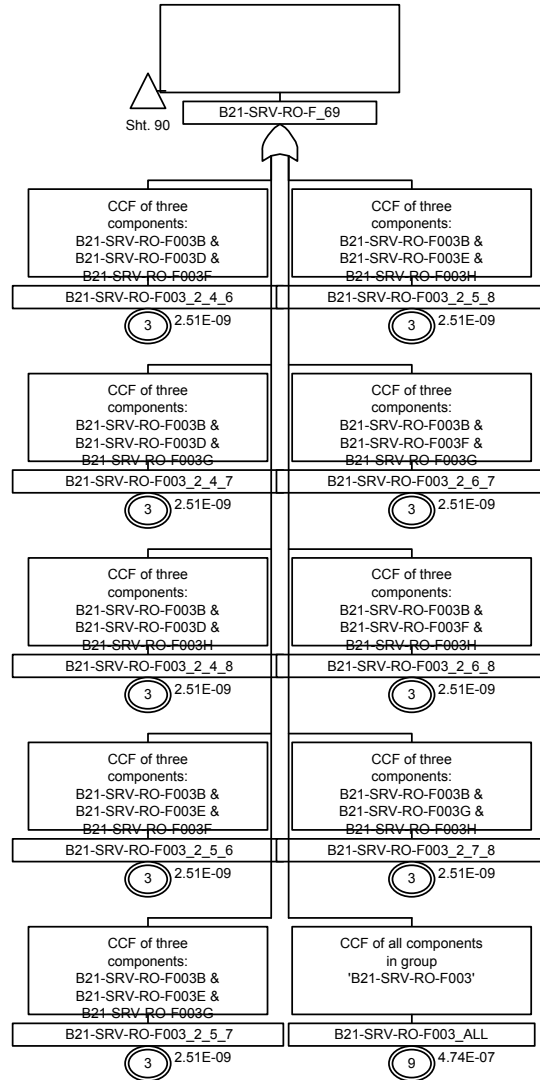


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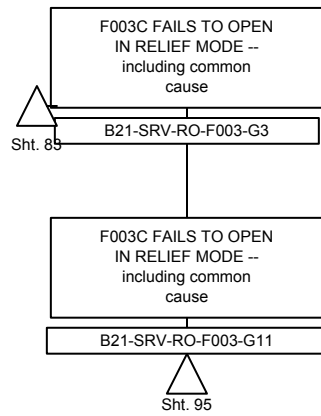


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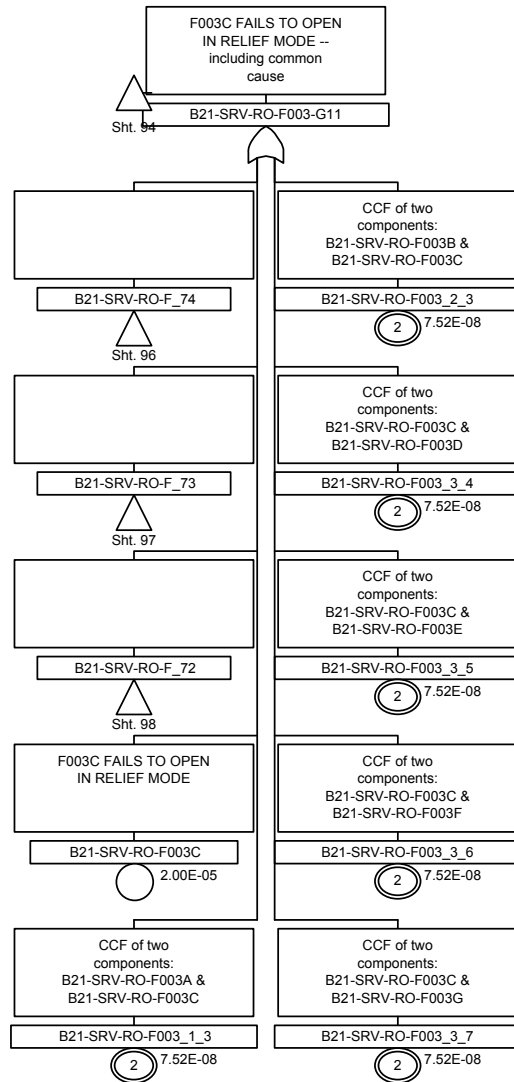


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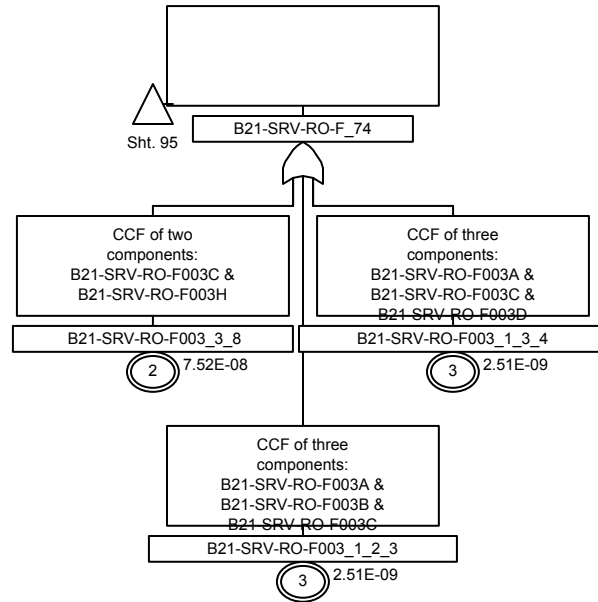


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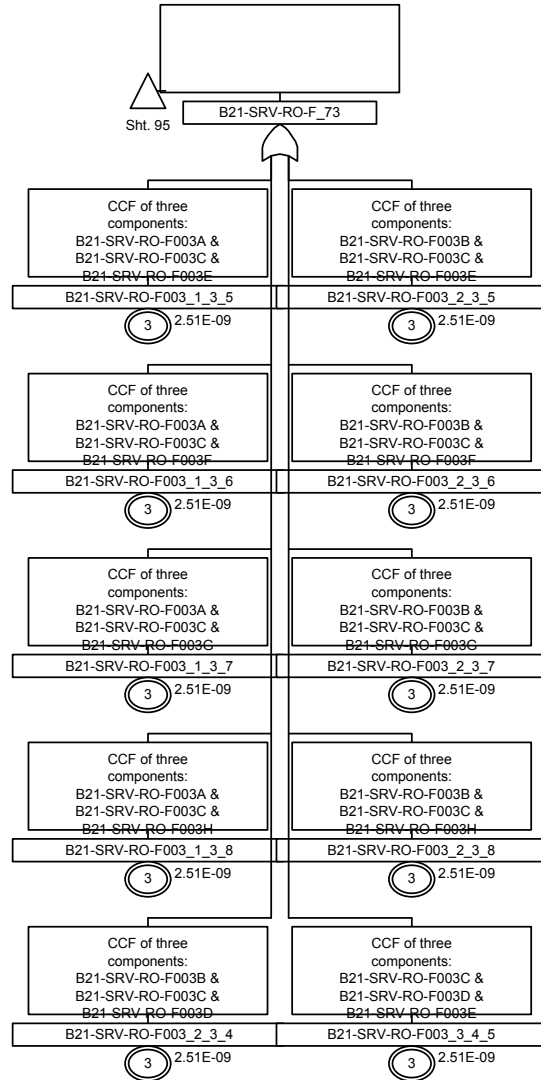


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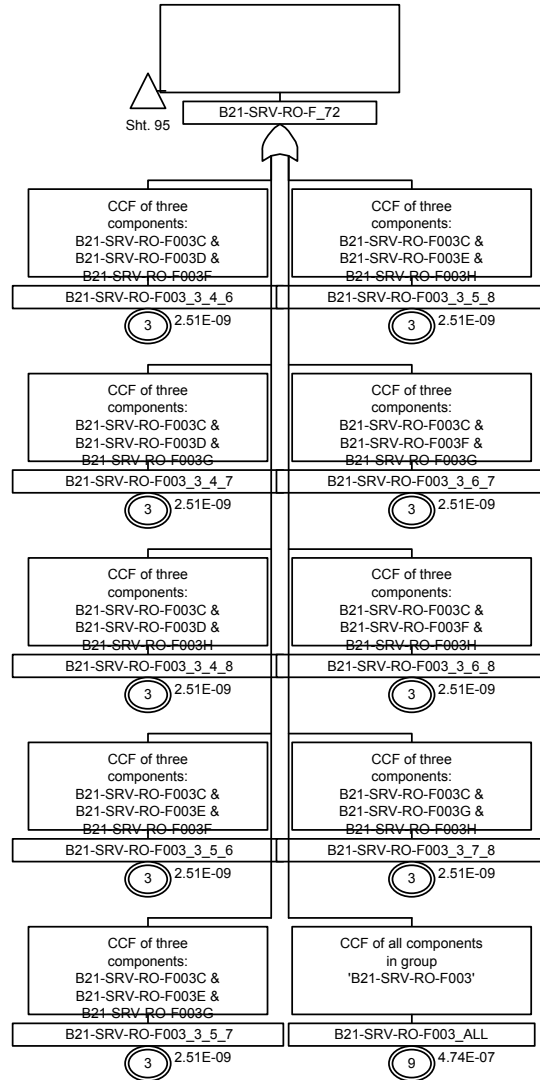


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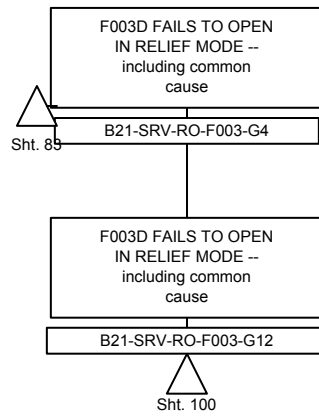


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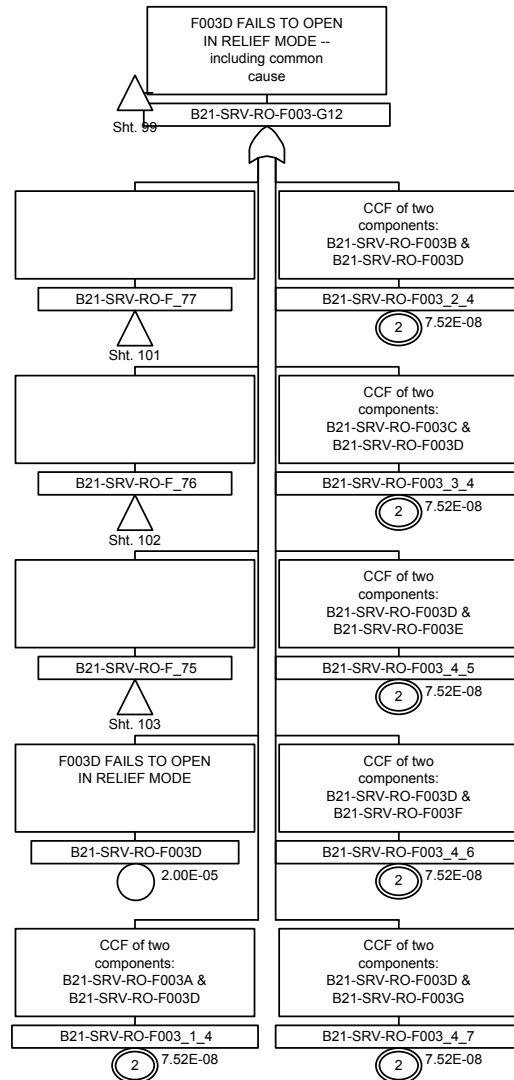


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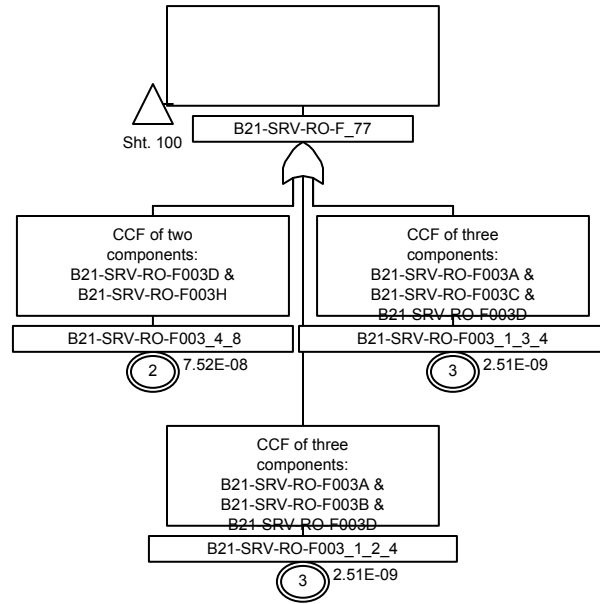


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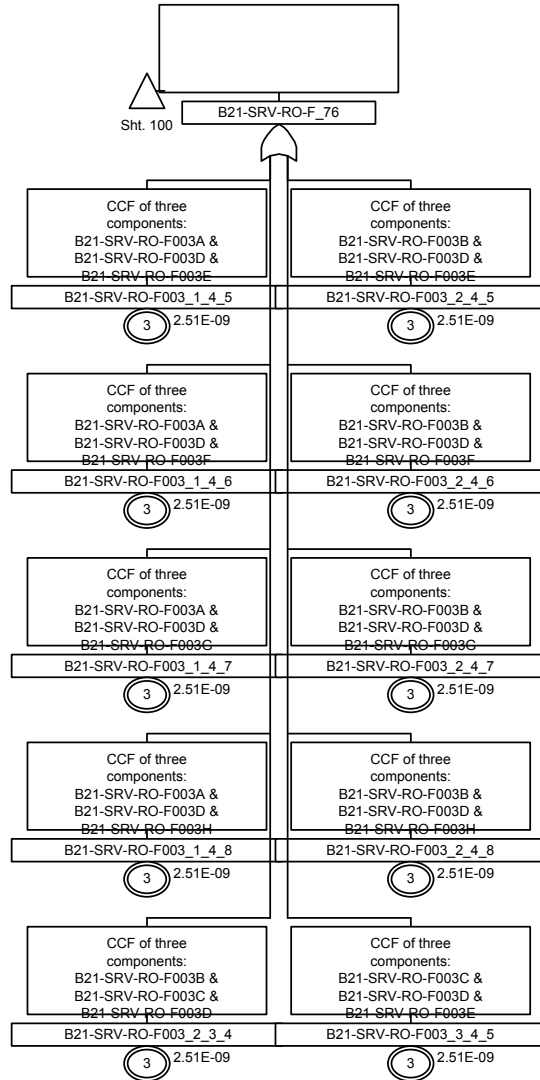


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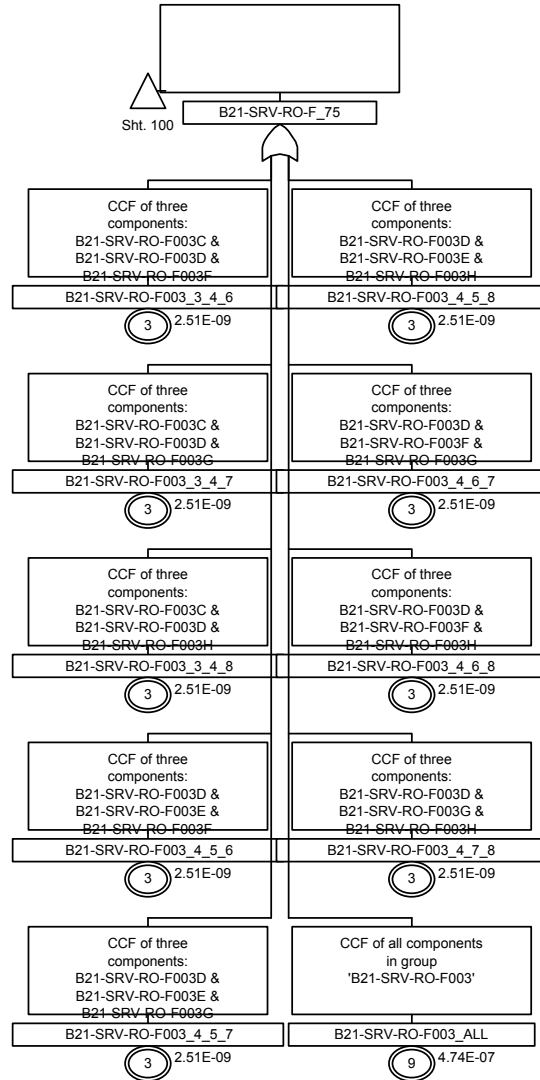


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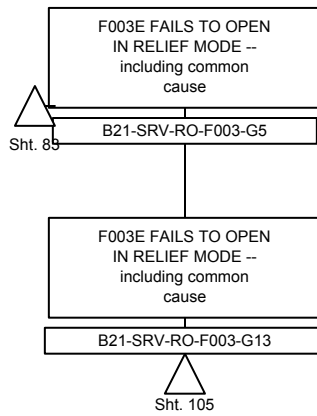


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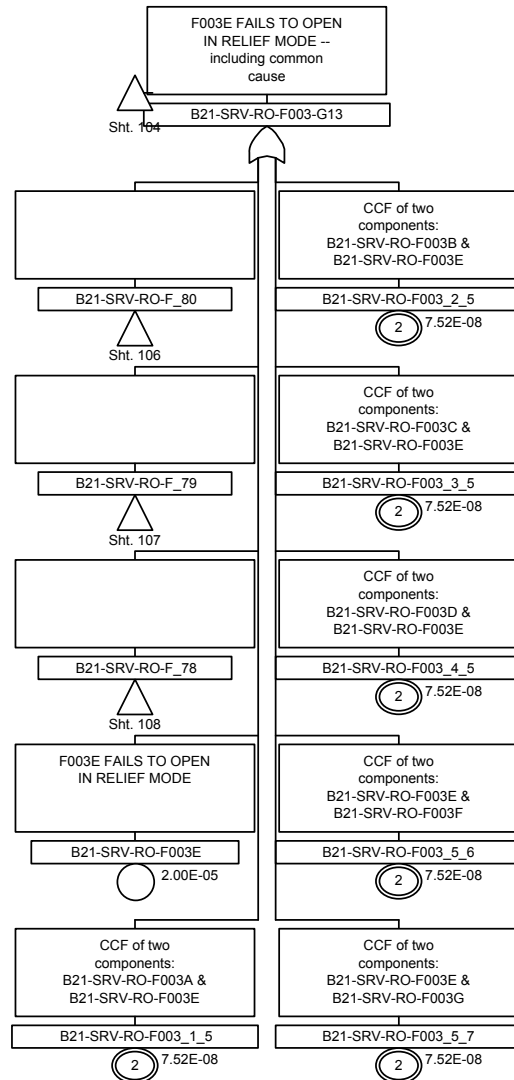


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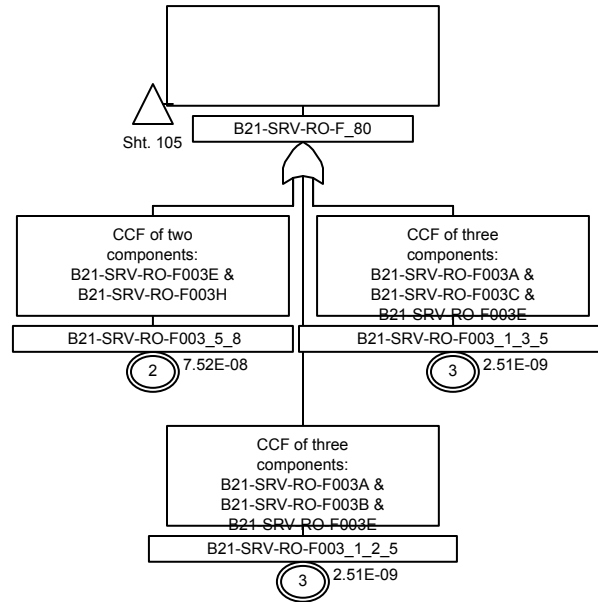


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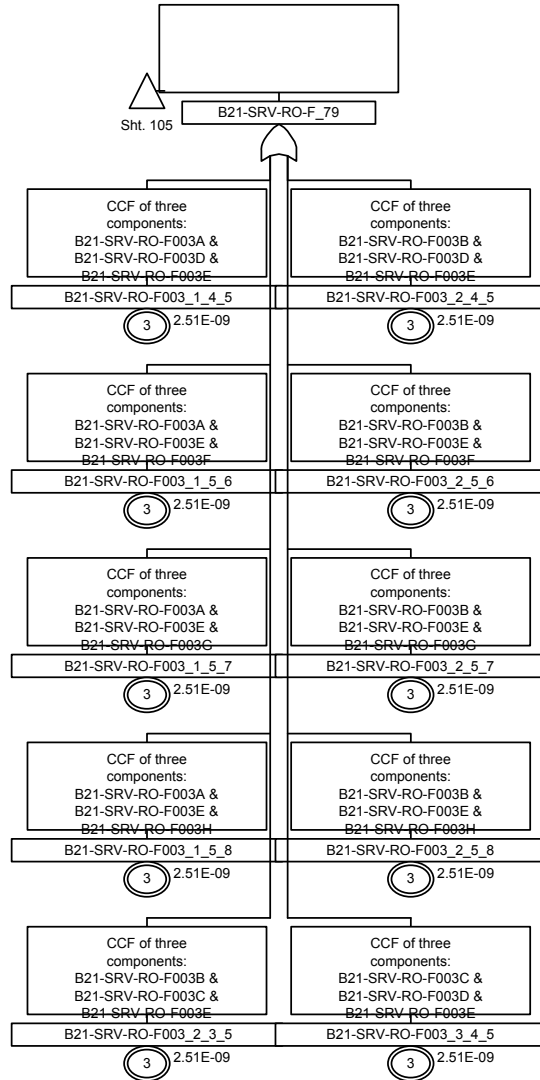


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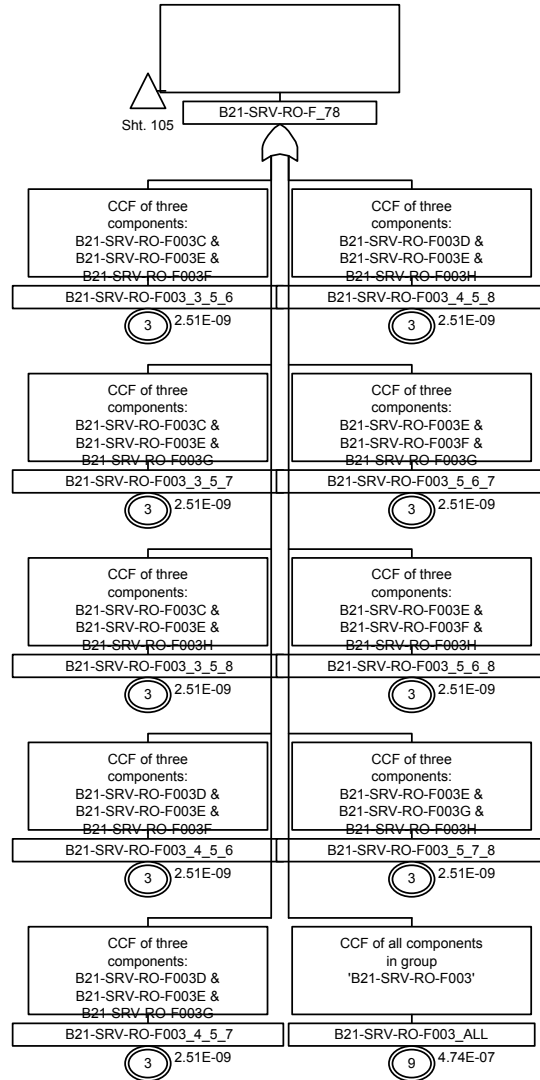


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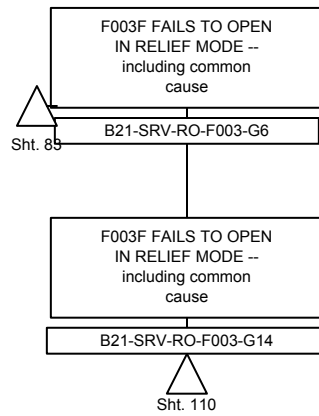


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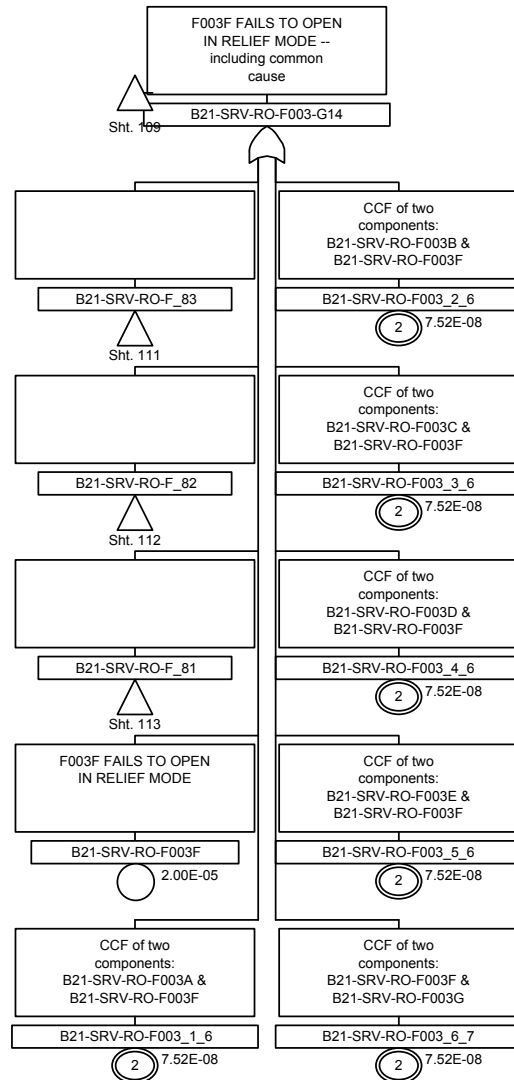


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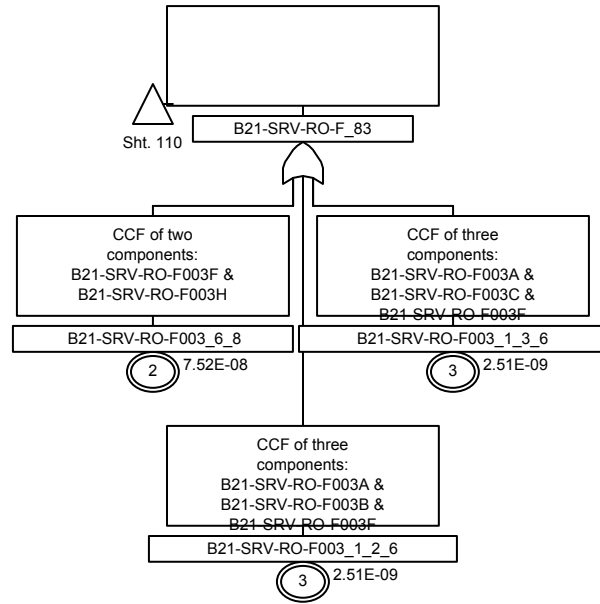


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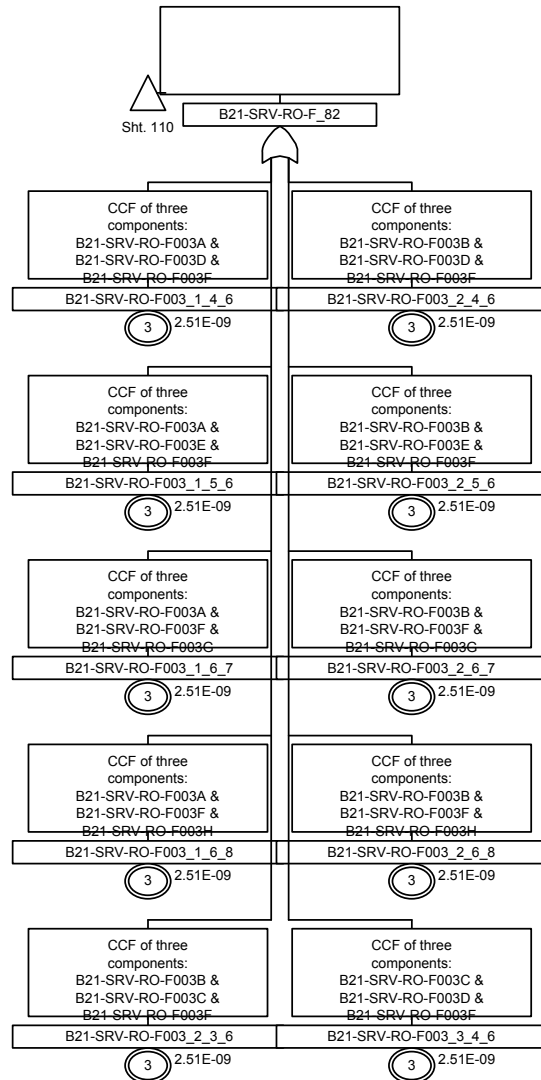


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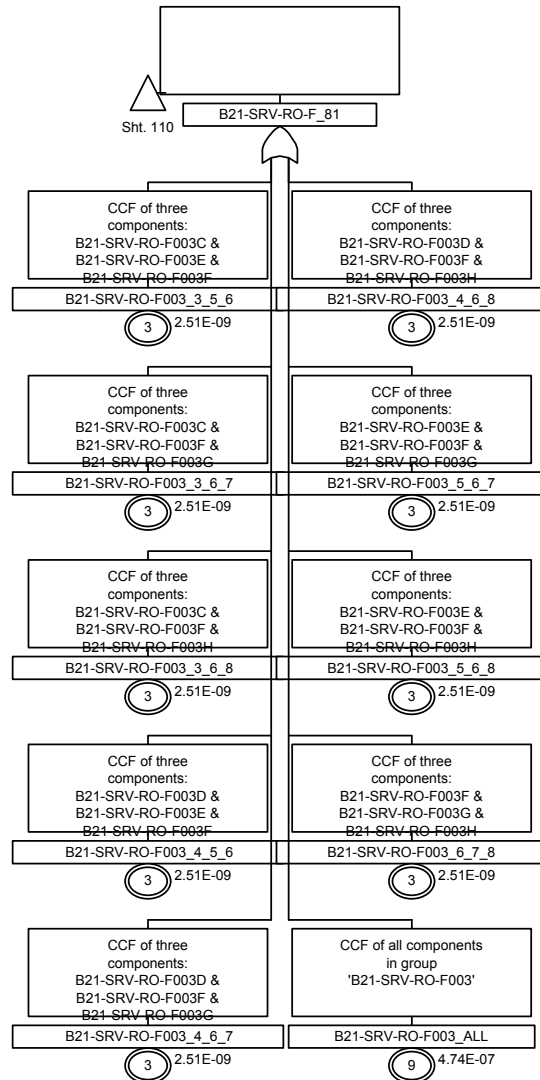


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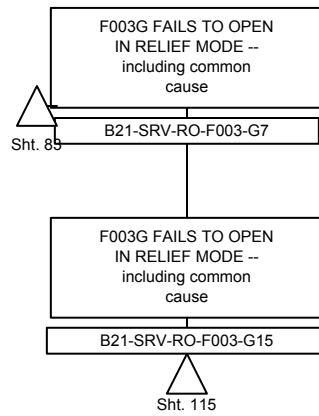


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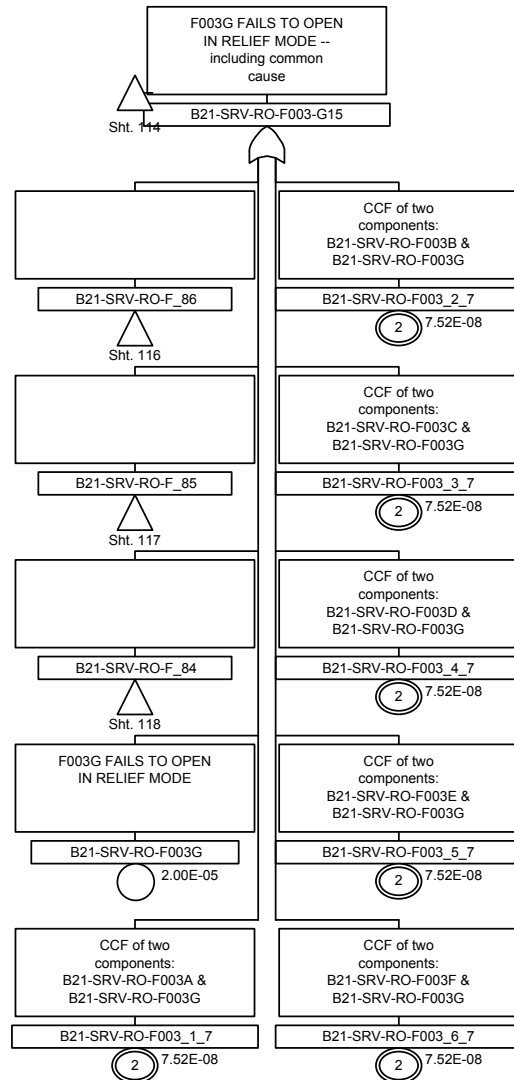


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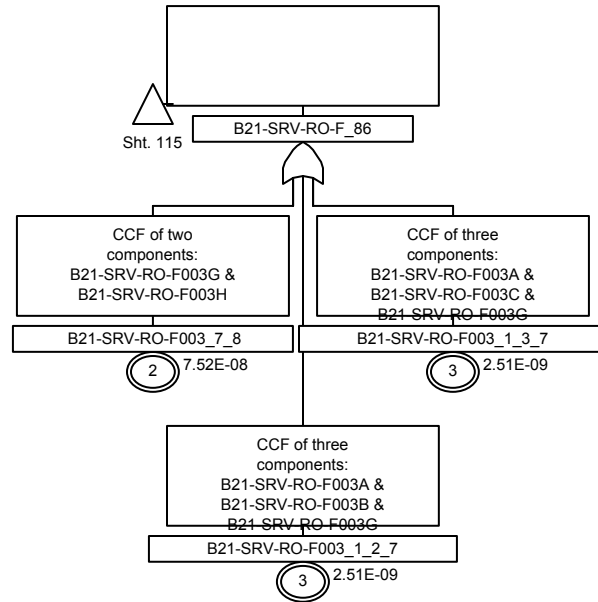


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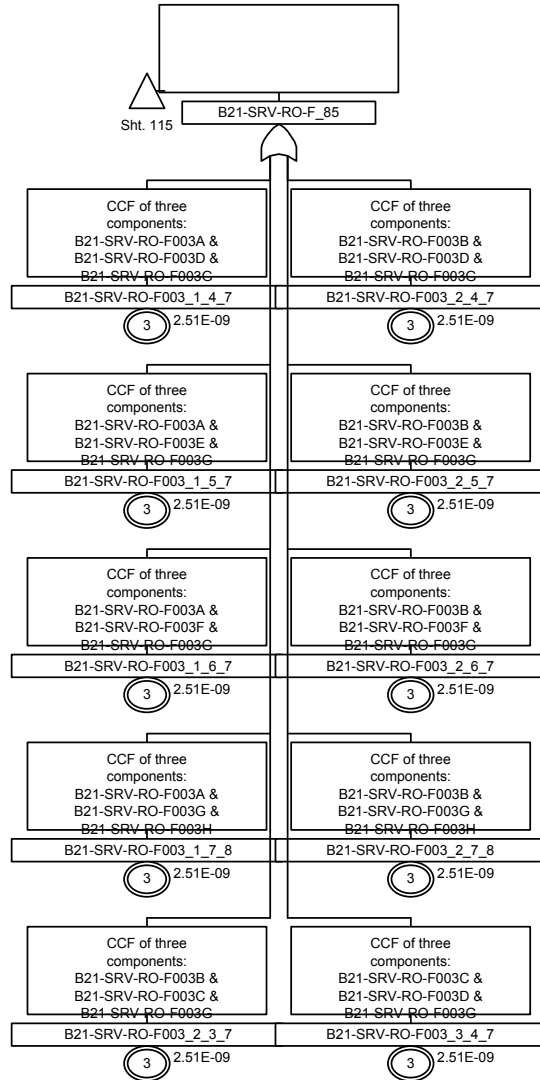


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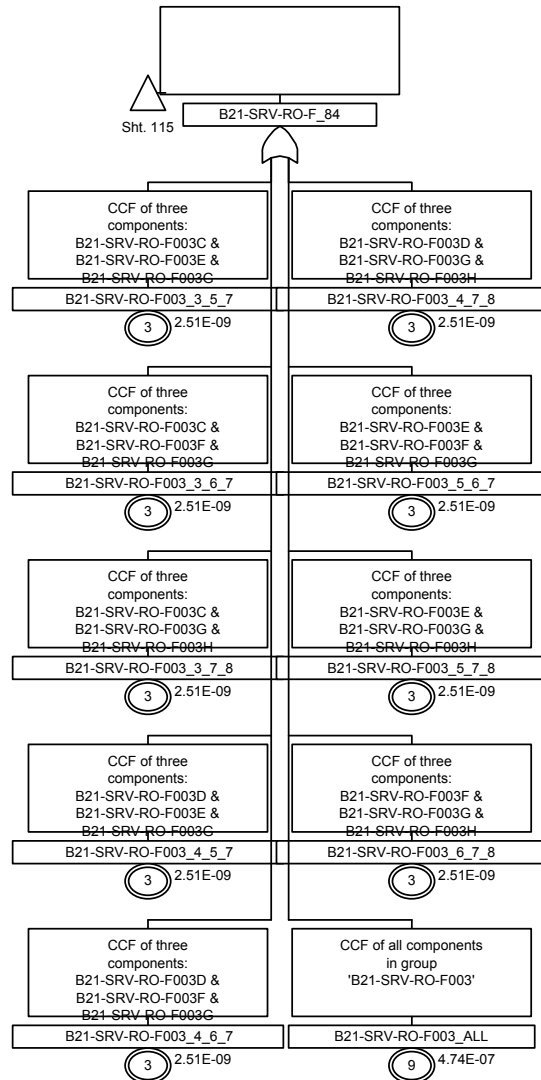


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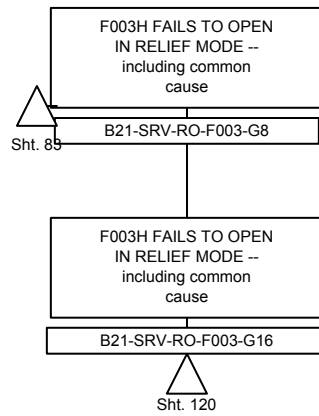


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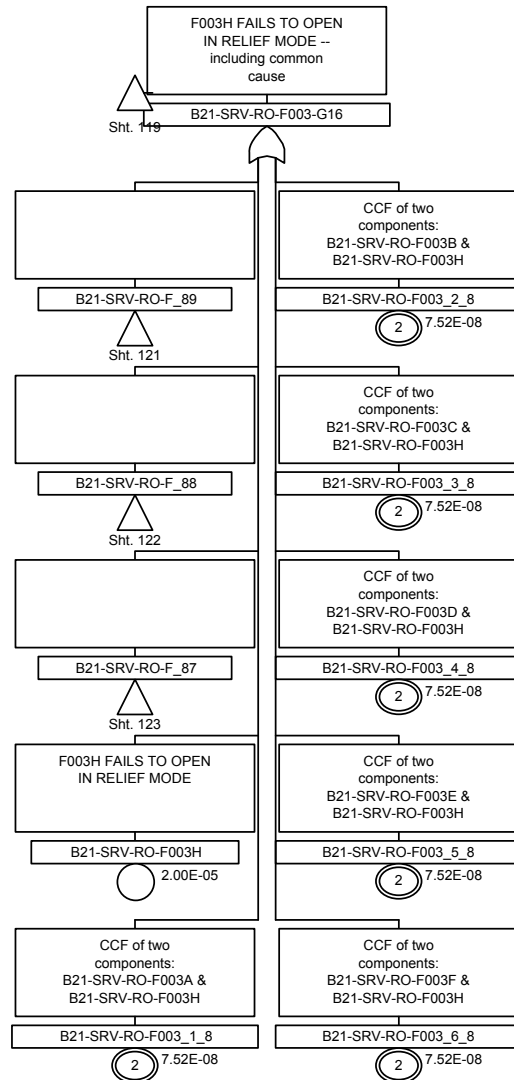


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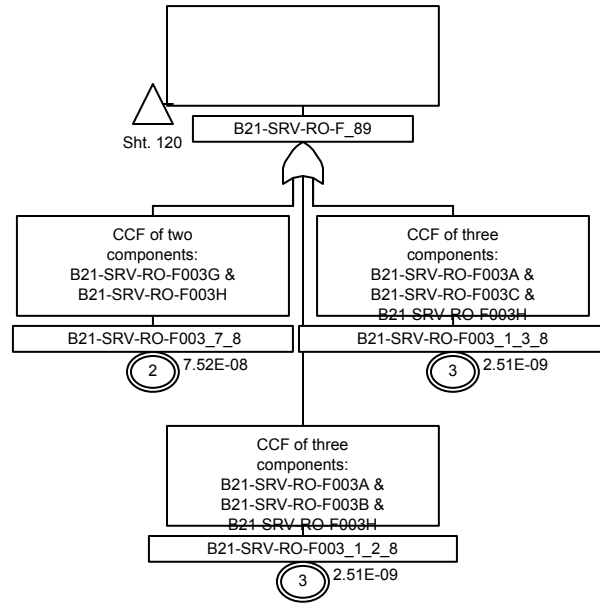


Figure 4.1-2. Sheet 121 Nuclear Boiler System

4.1-176

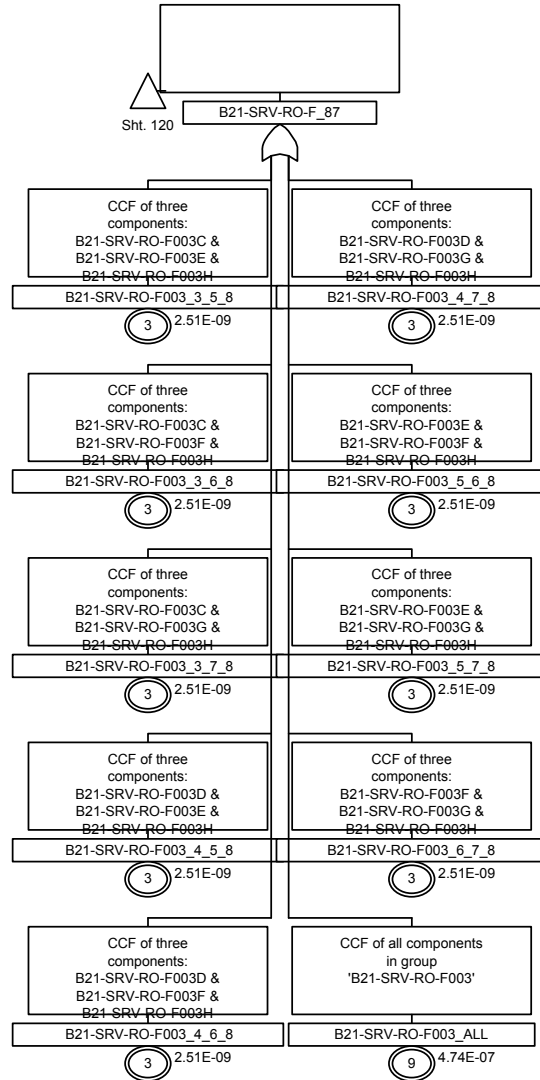


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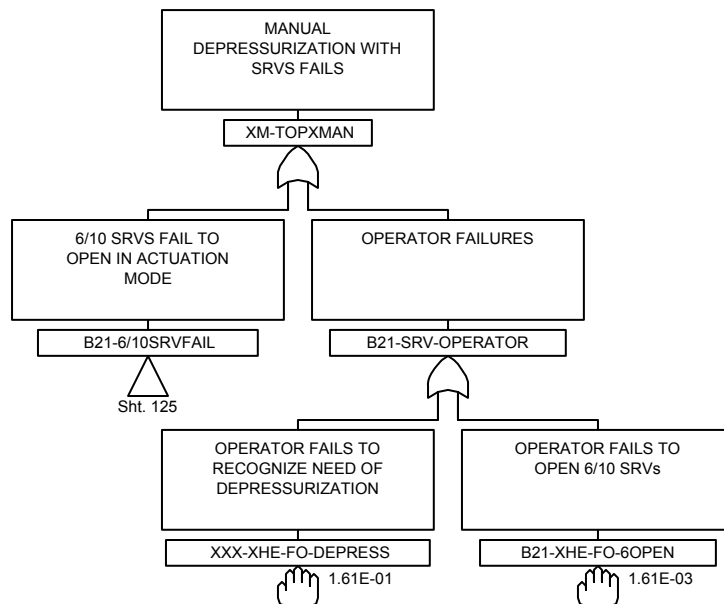


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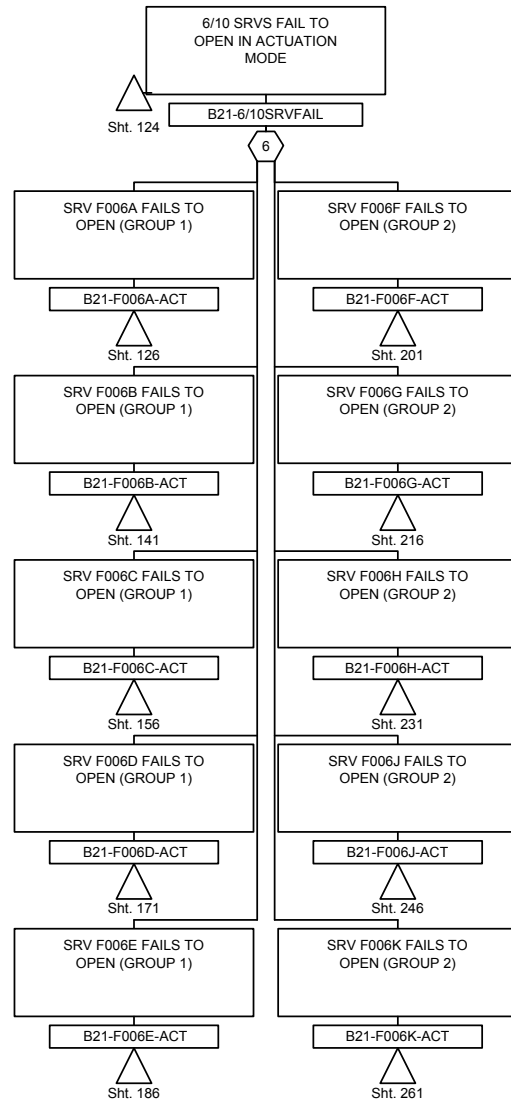


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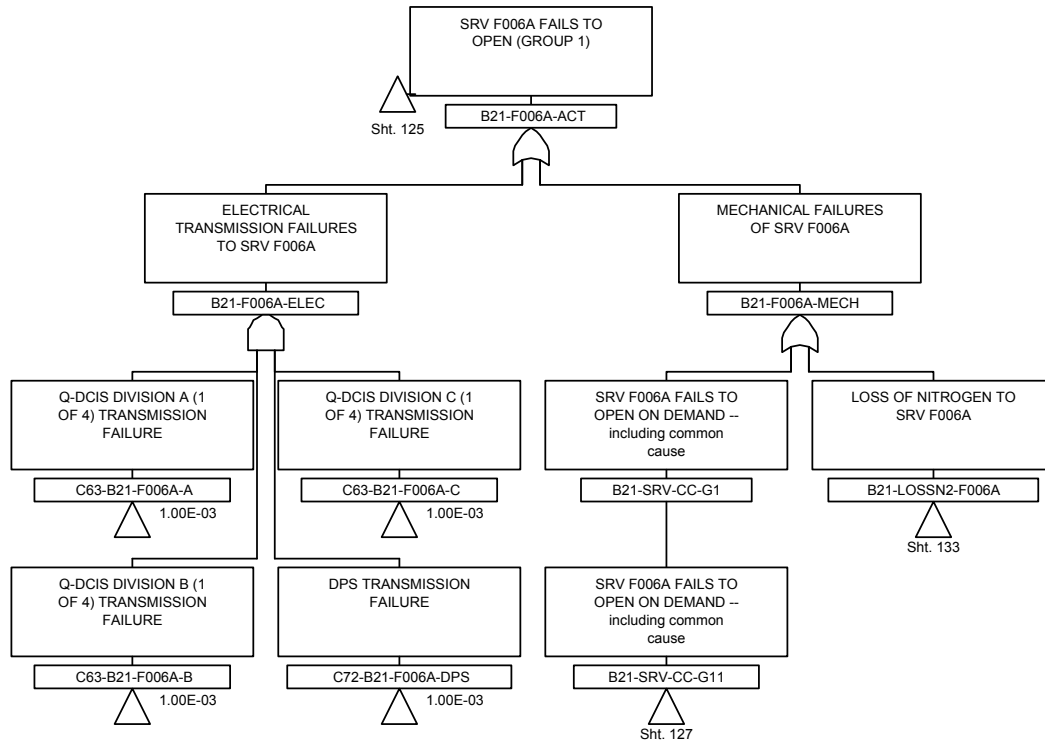


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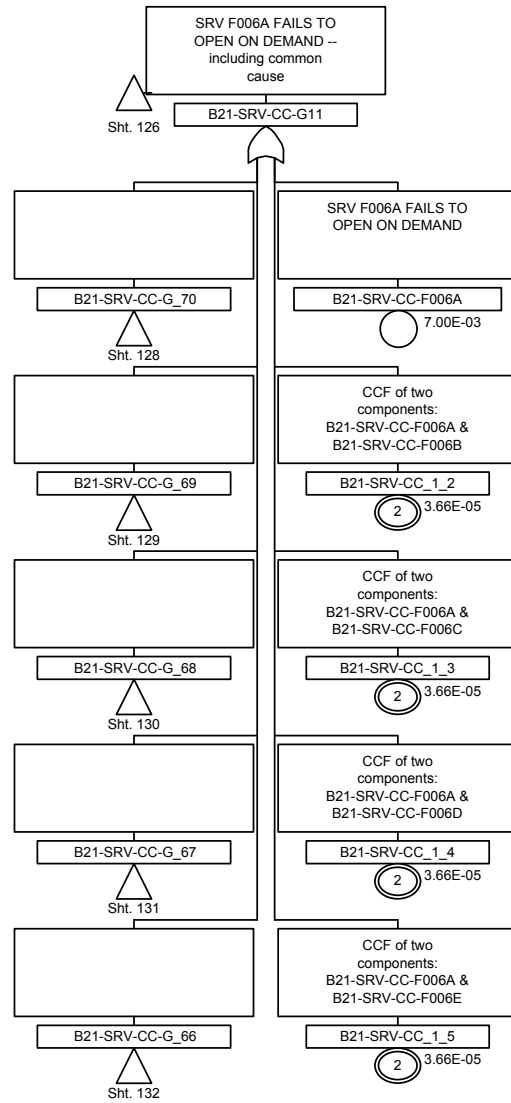


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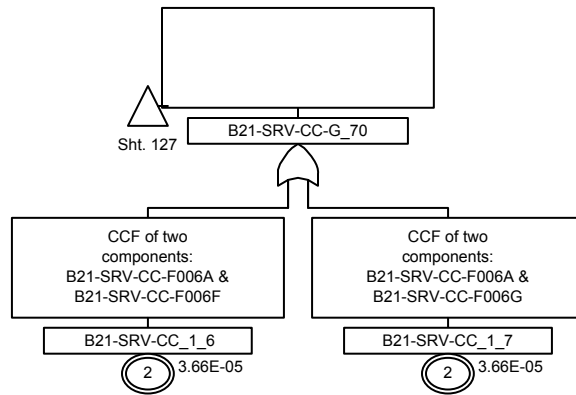


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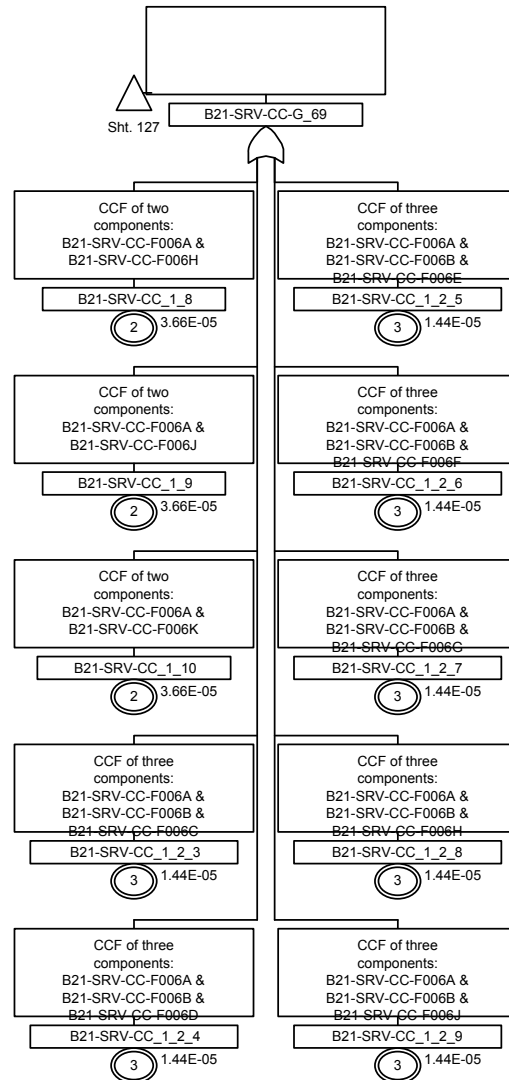


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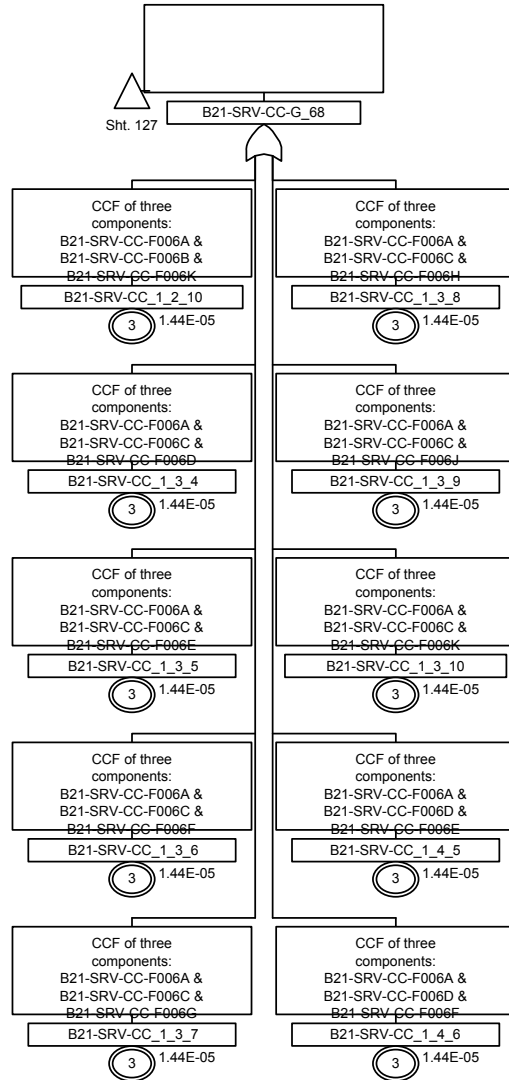


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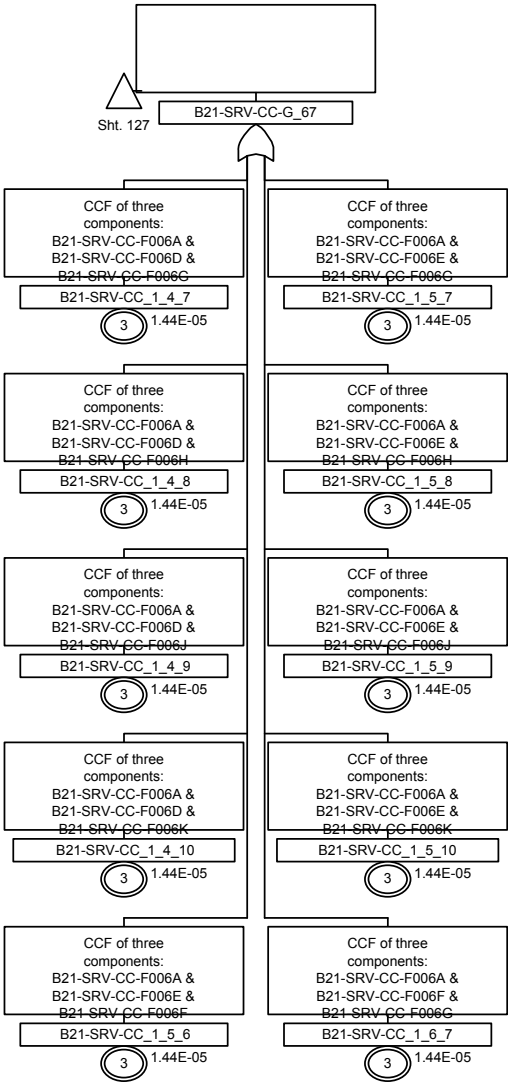


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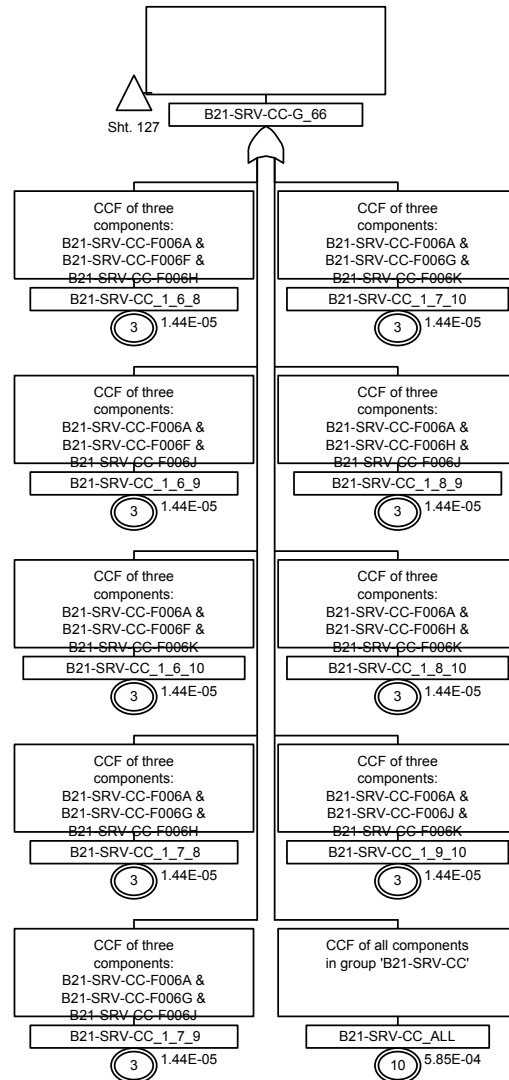


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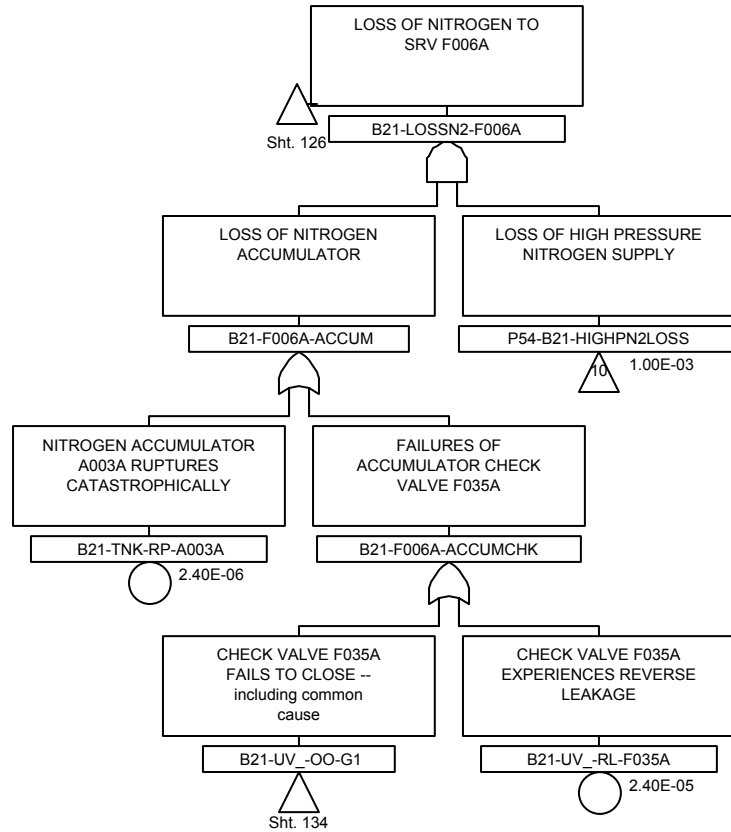


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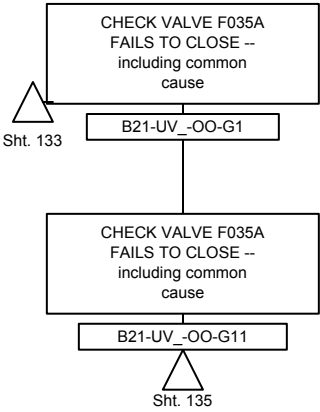


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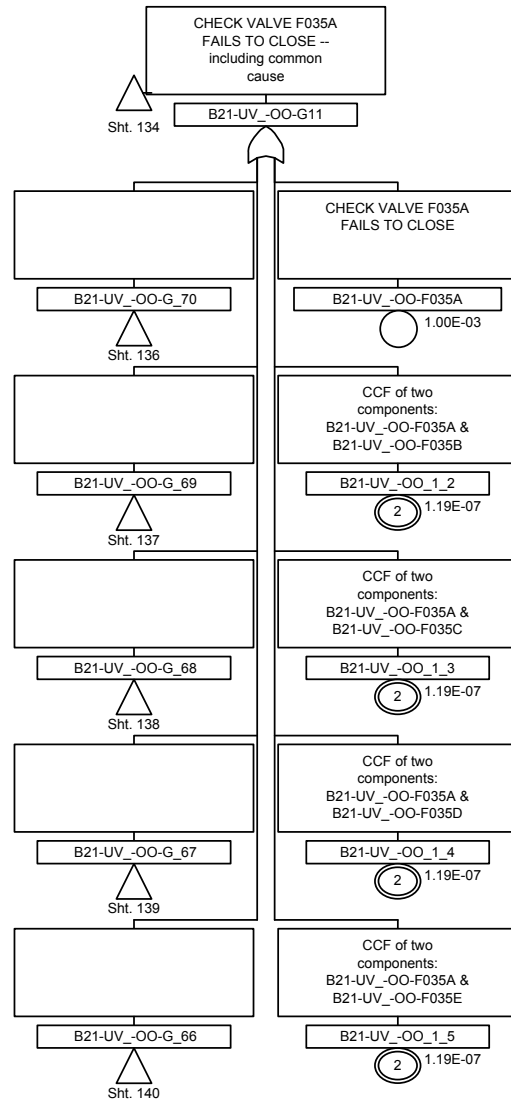


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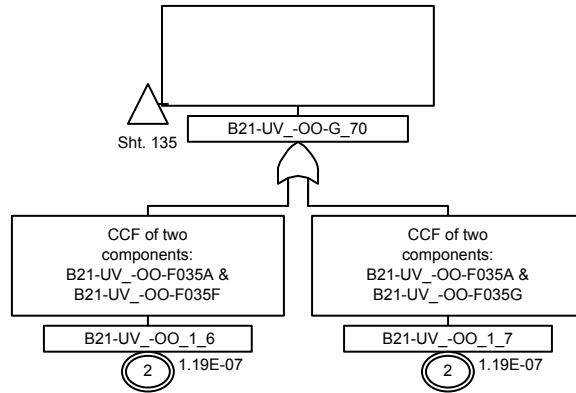


Figure 4.1-2. Sheet 136 Nuclear Boiler System



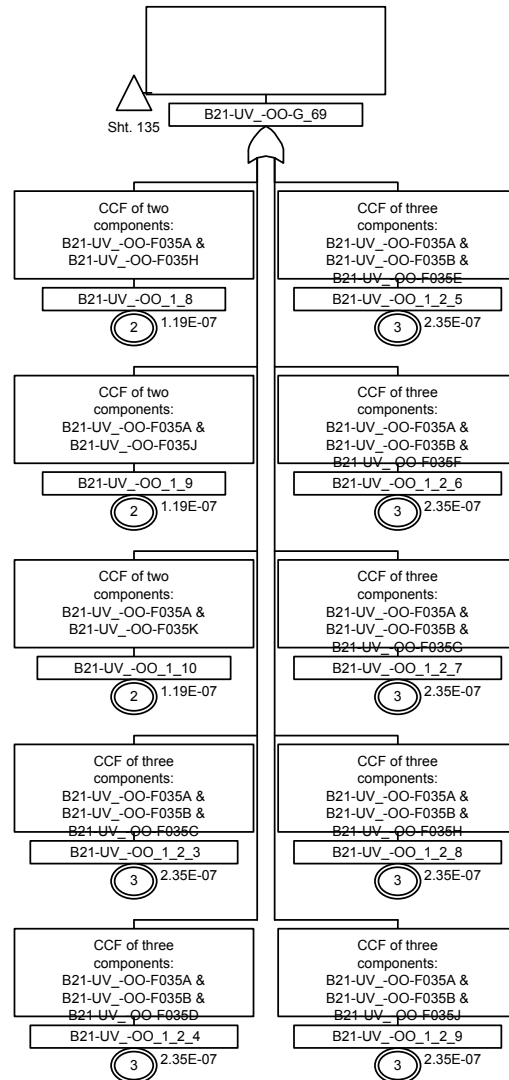


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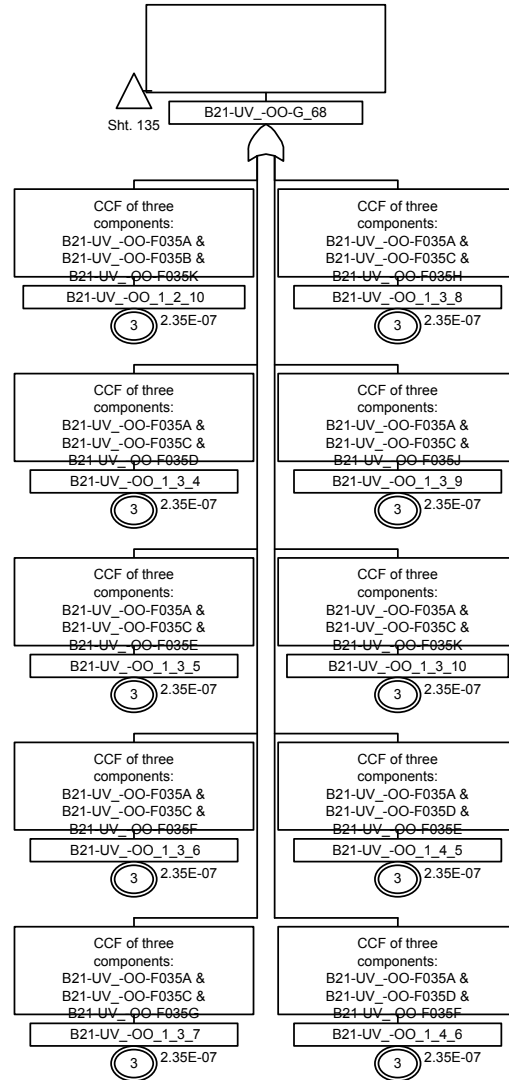


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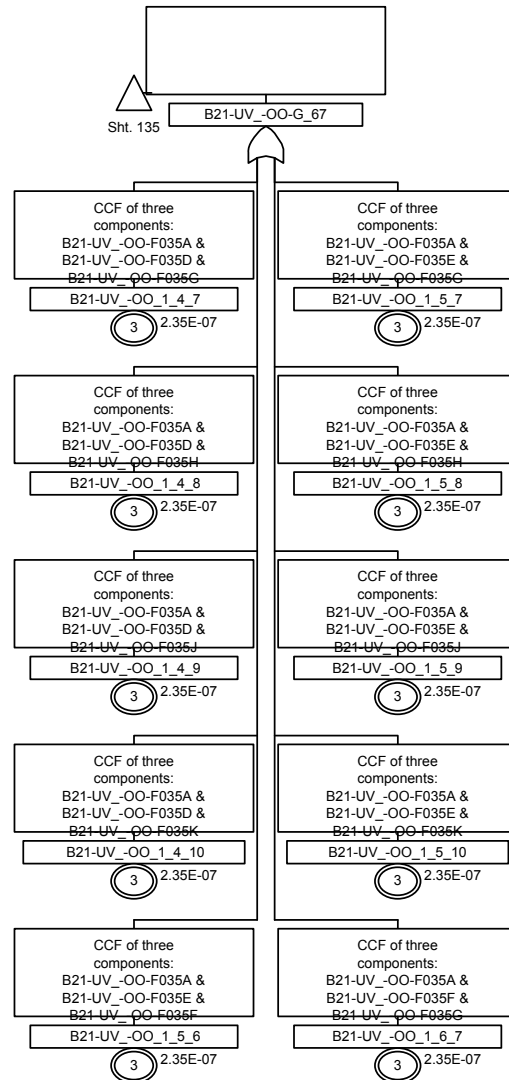


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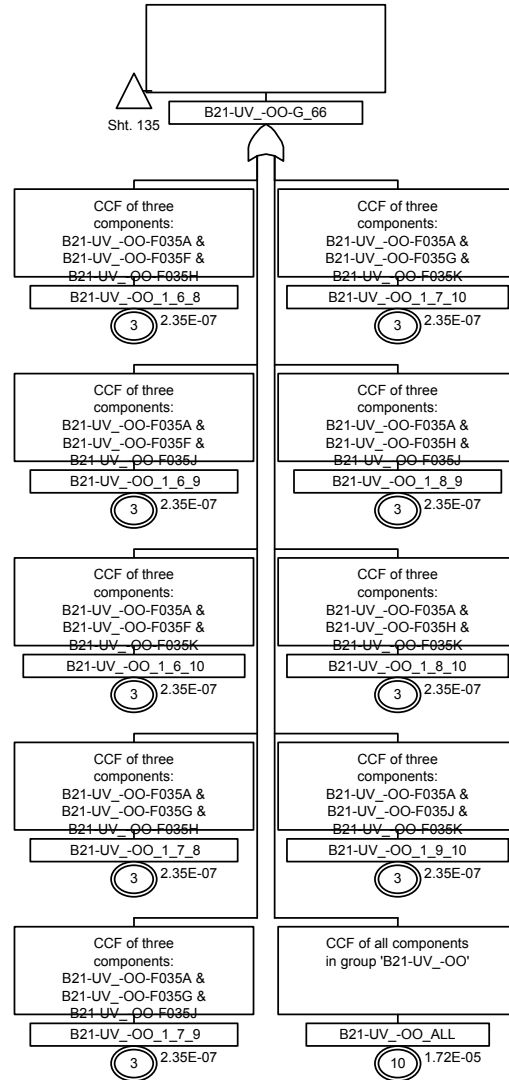


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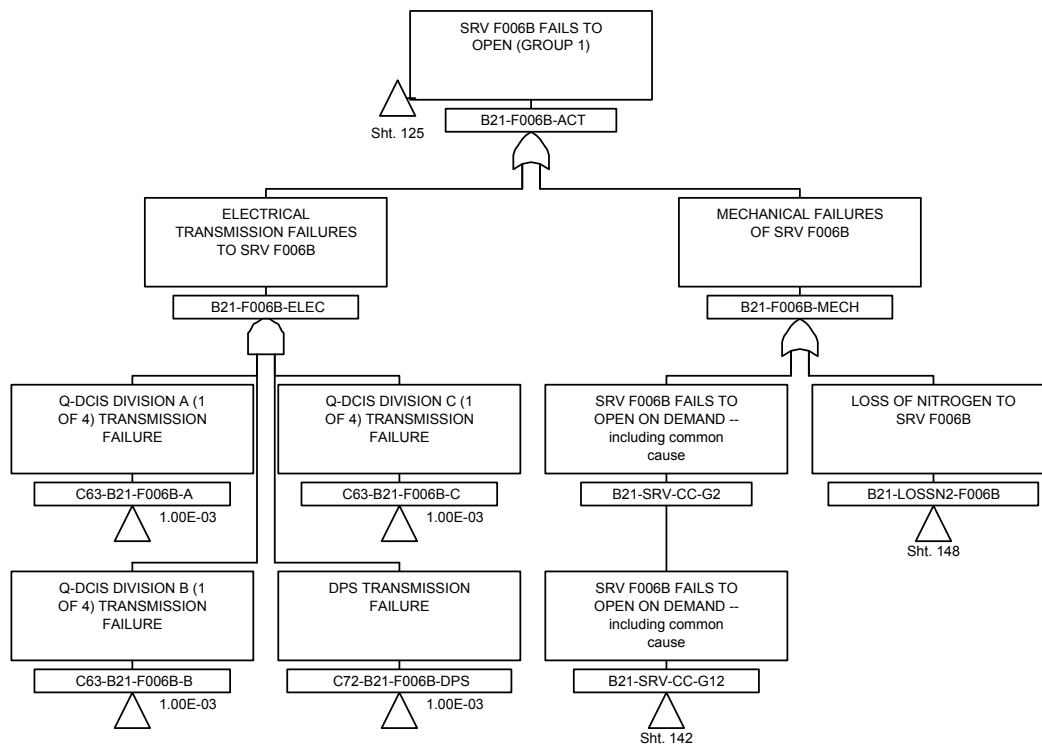


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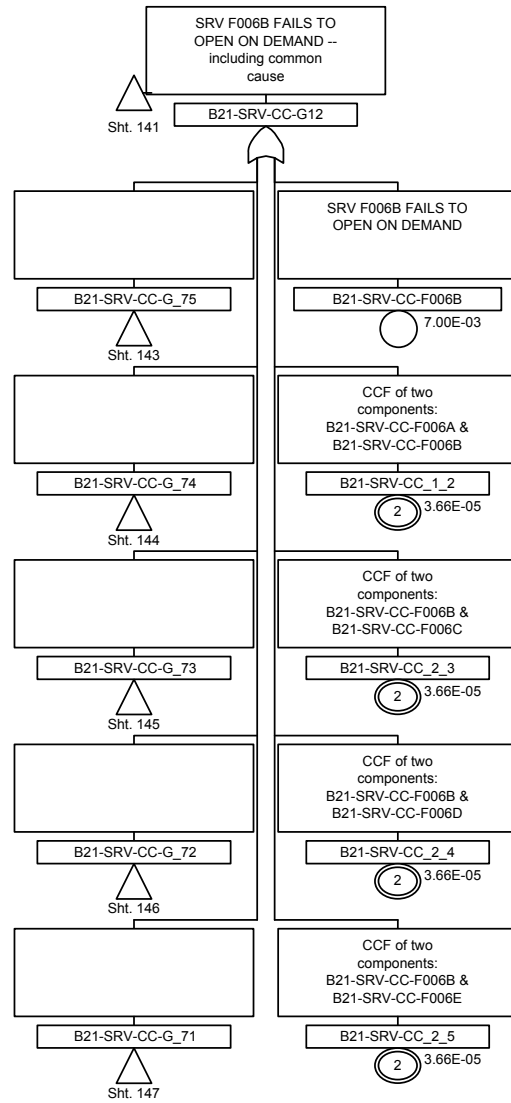


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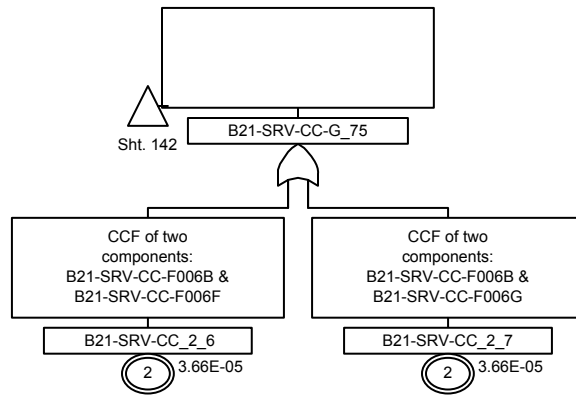


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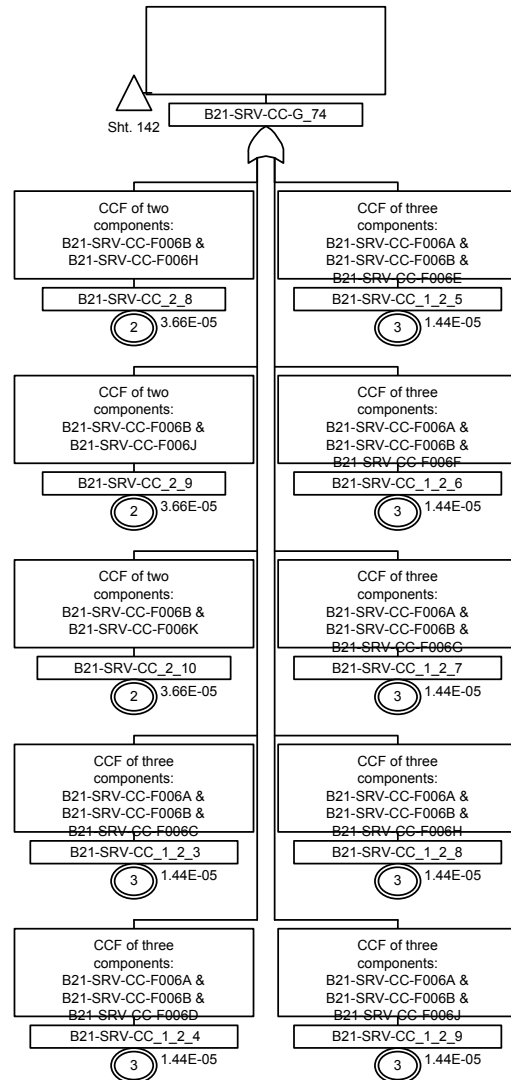


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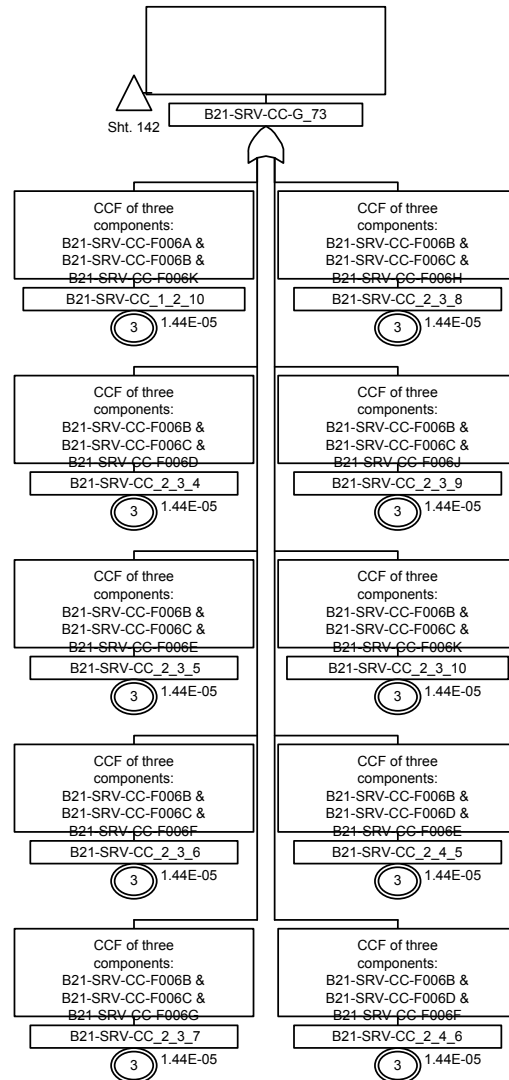


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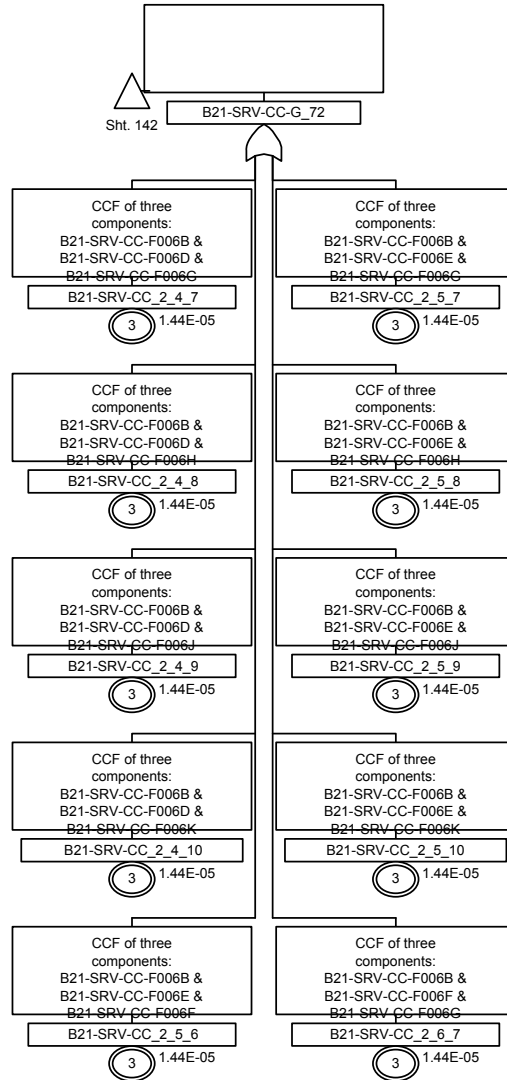


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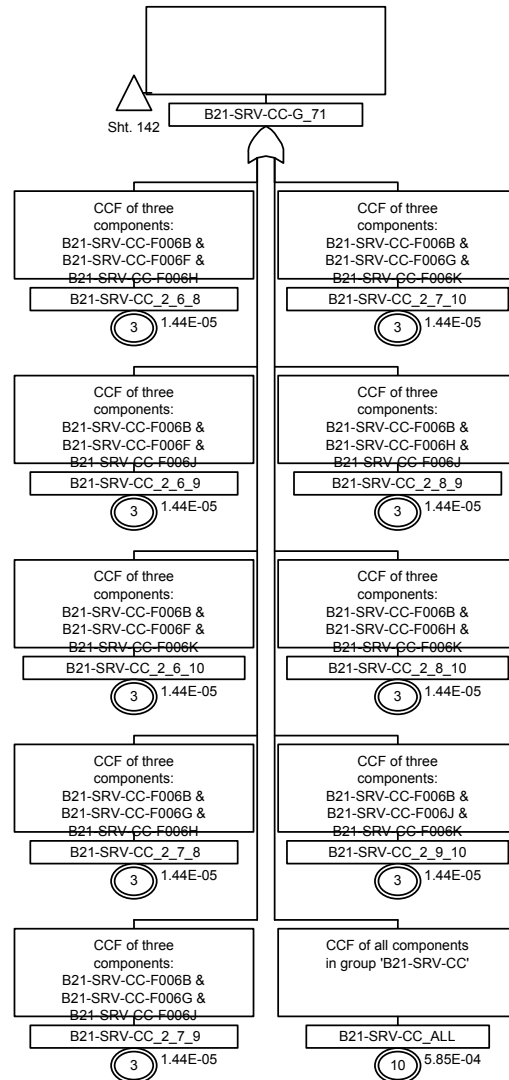


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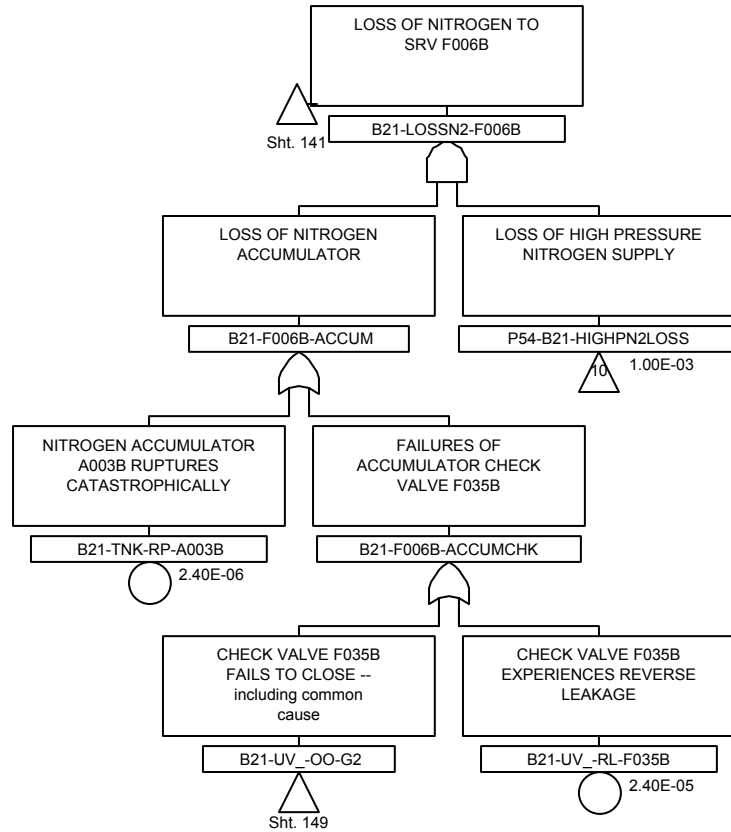


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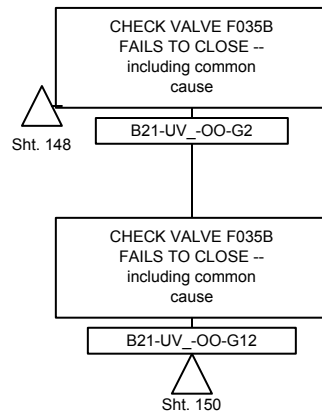


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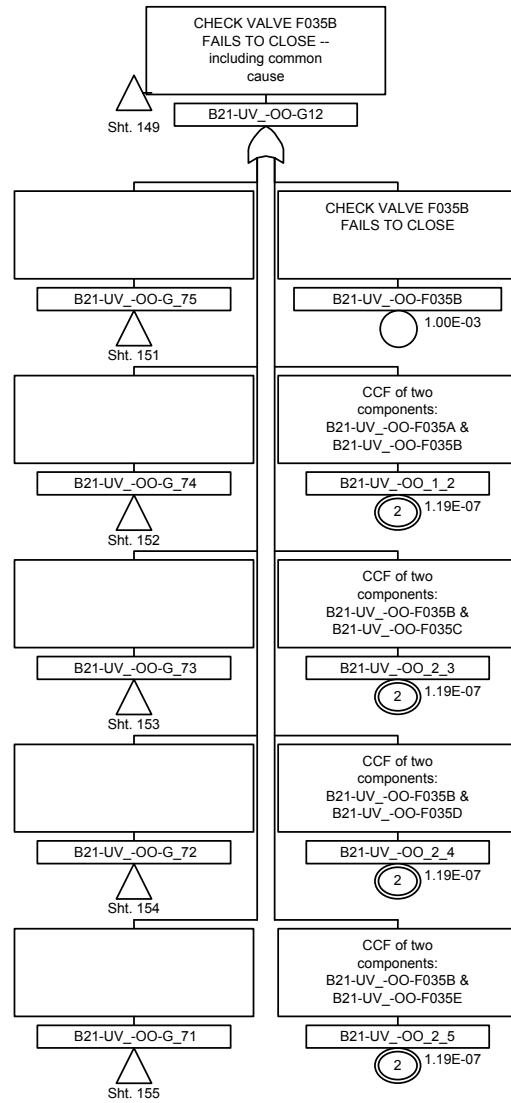


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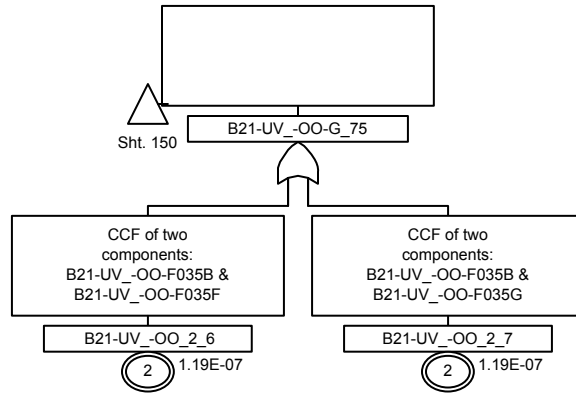


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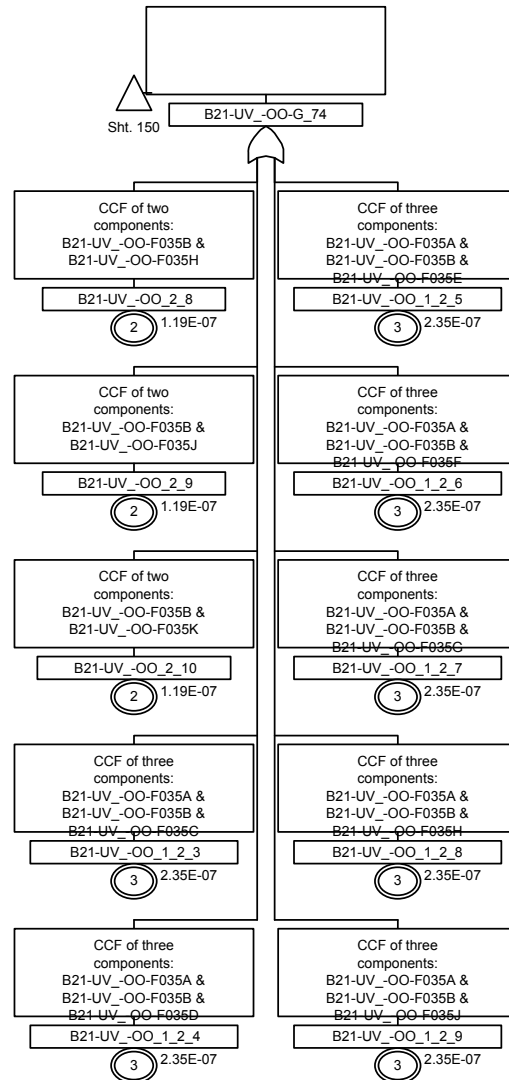


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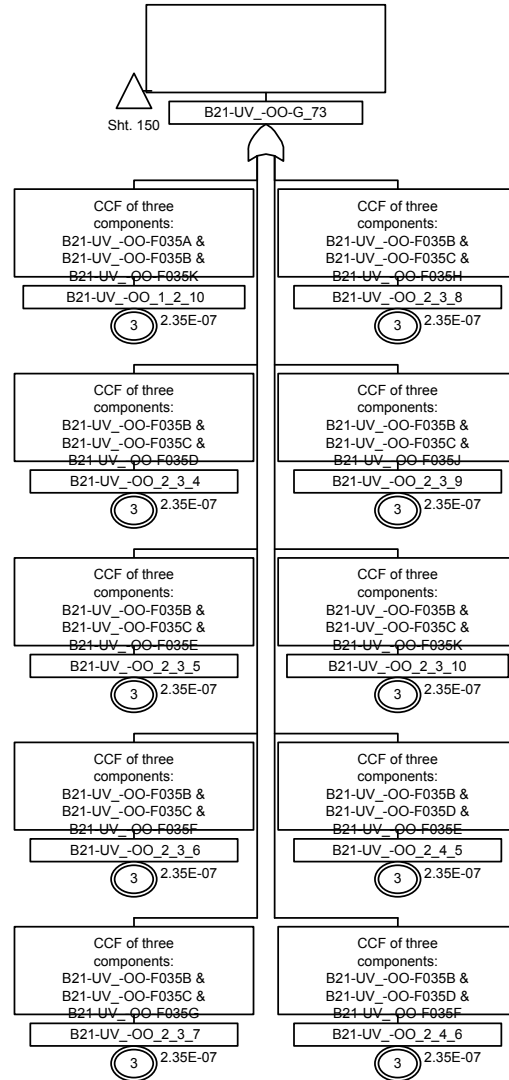


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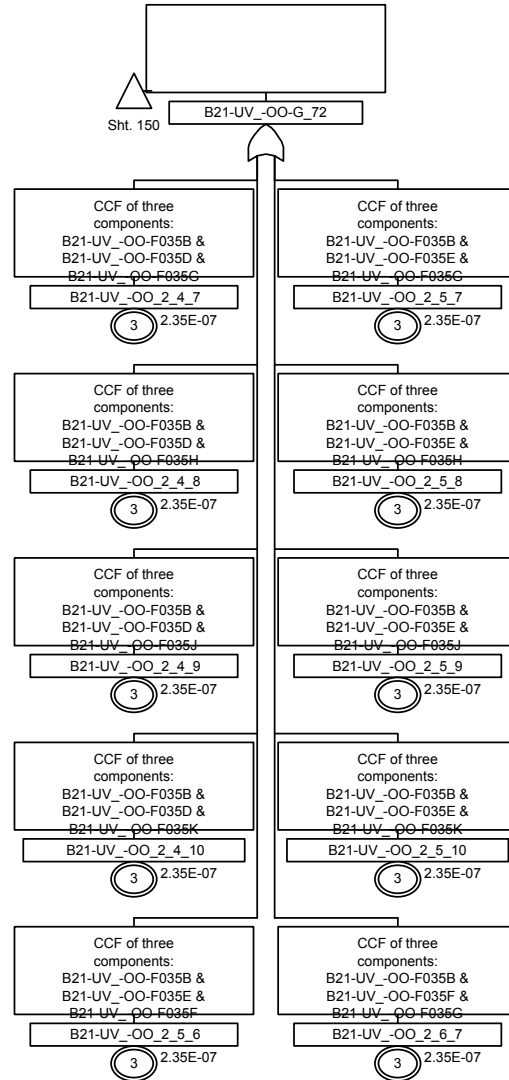


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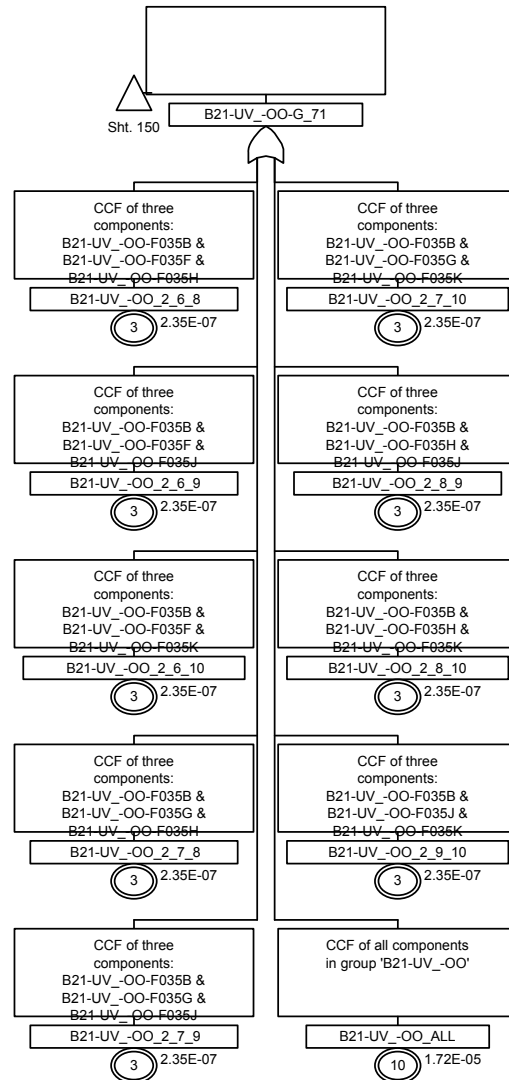


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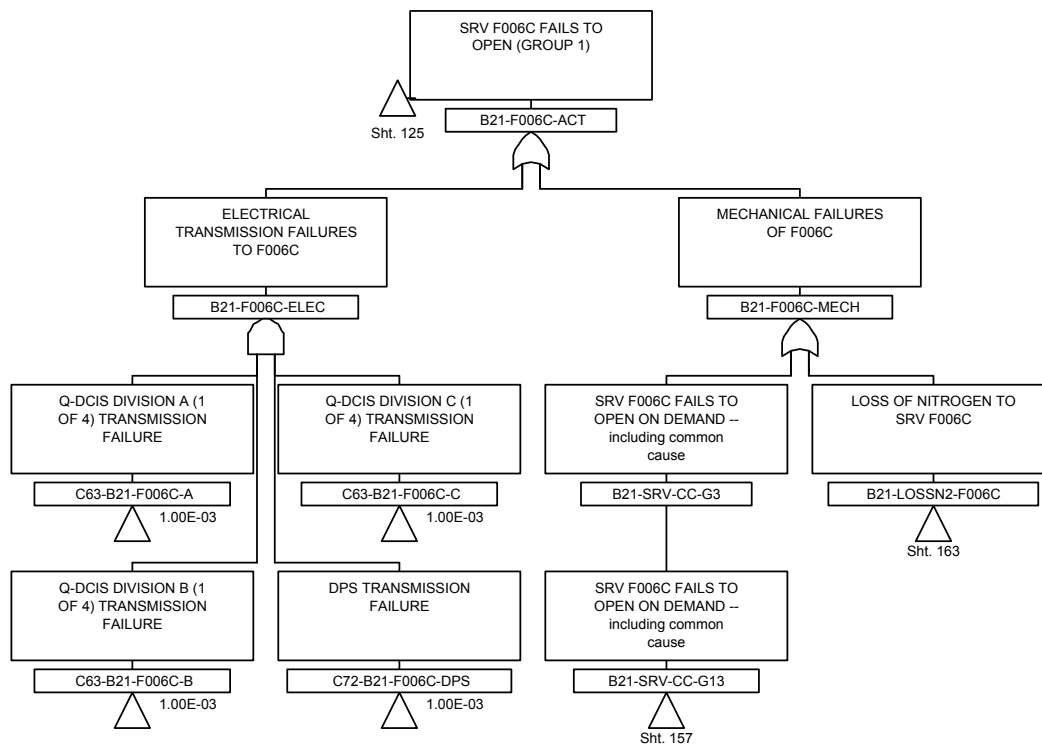


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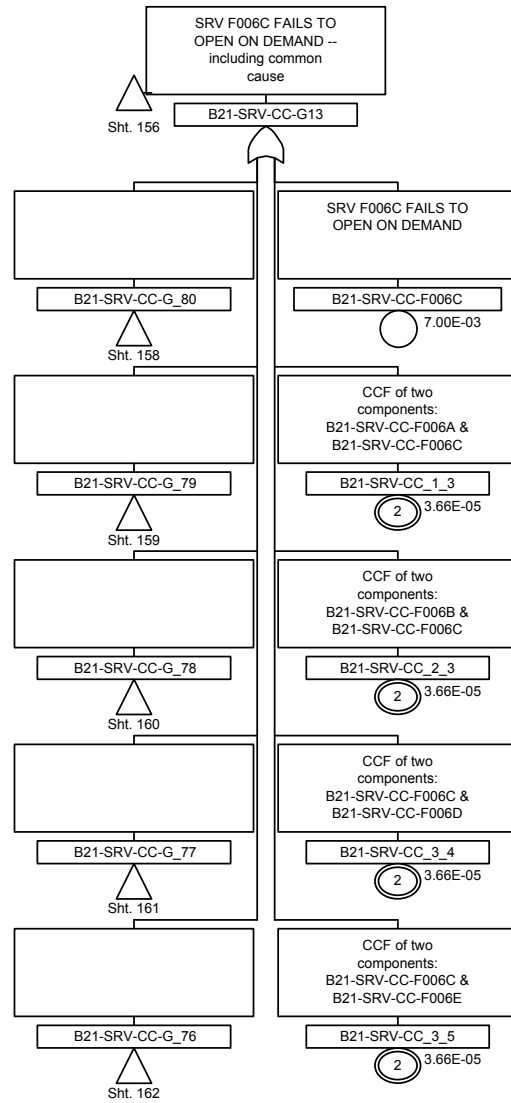


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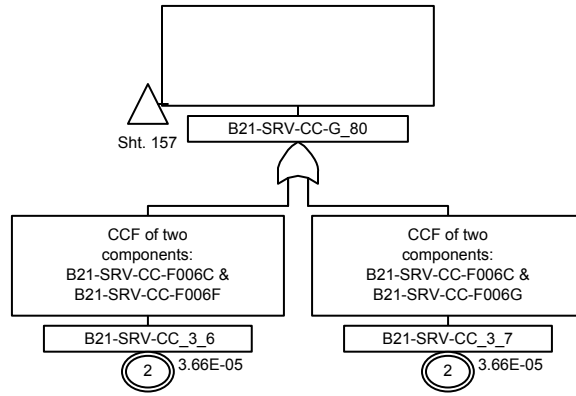


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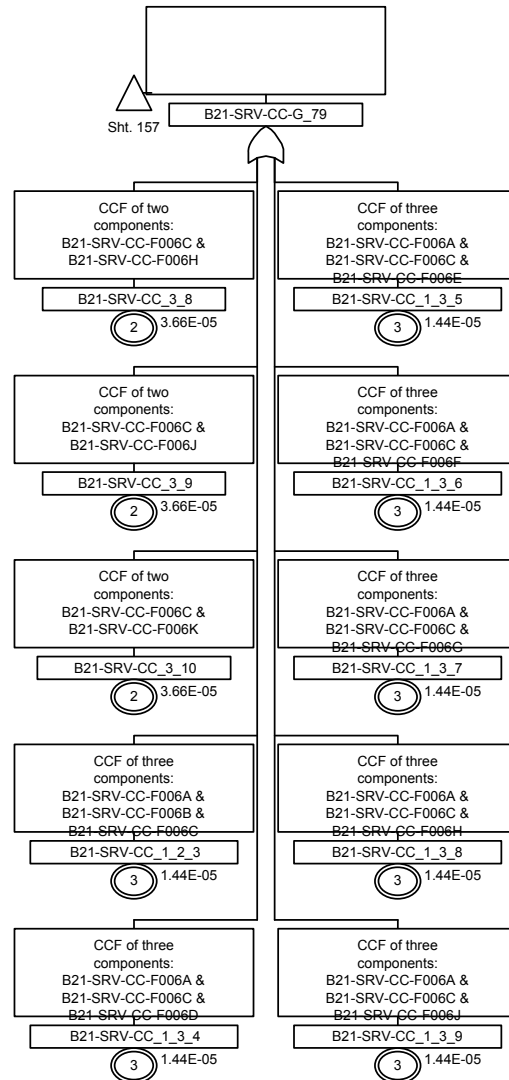


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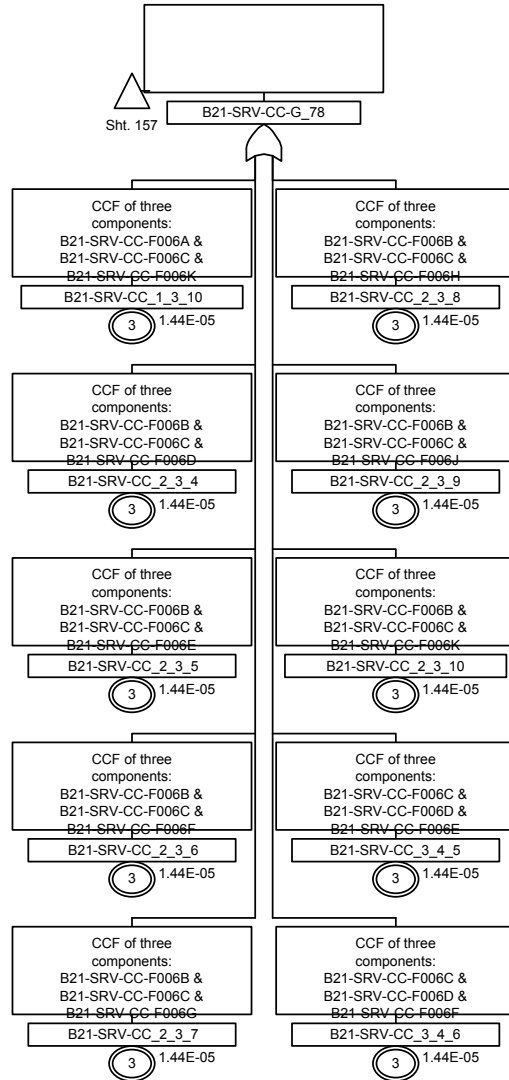


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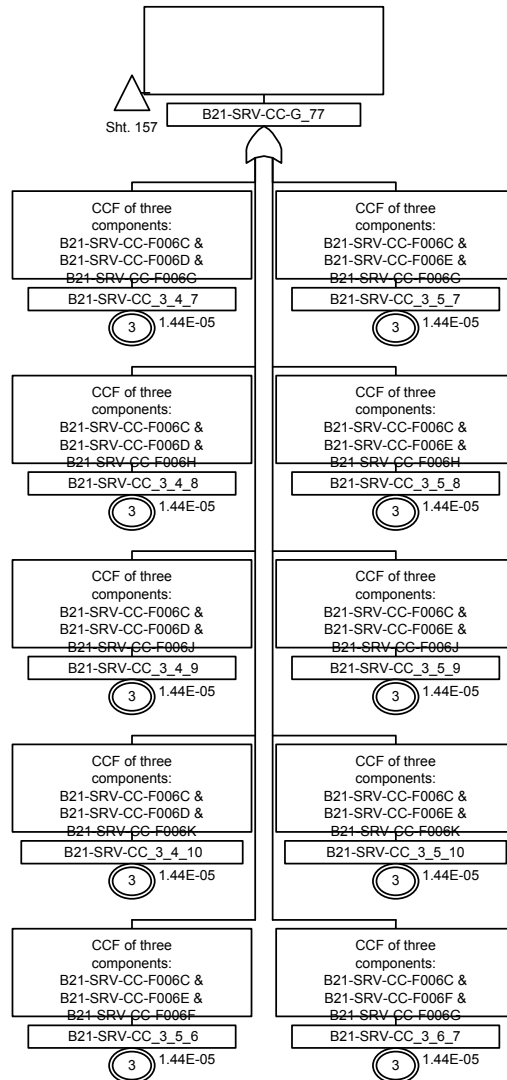


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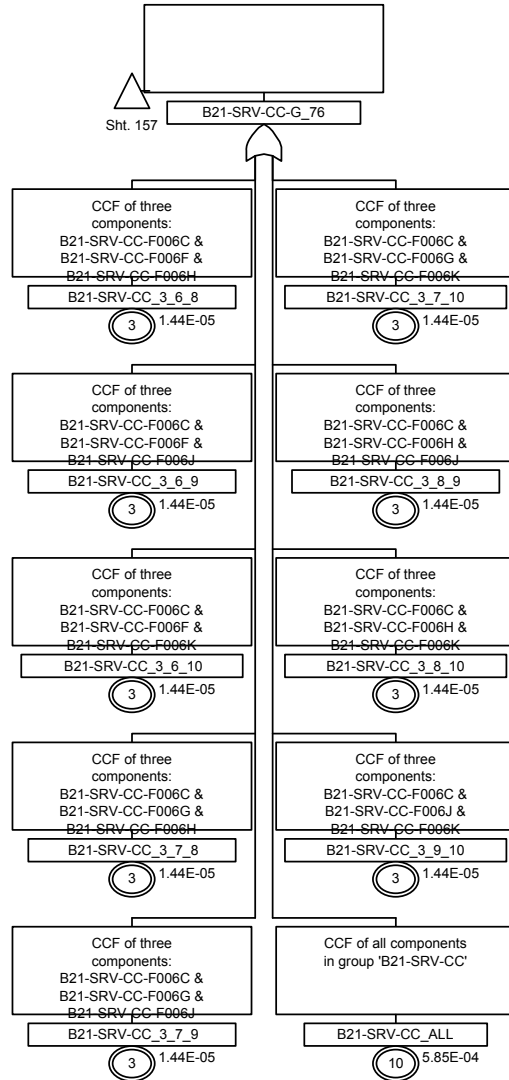


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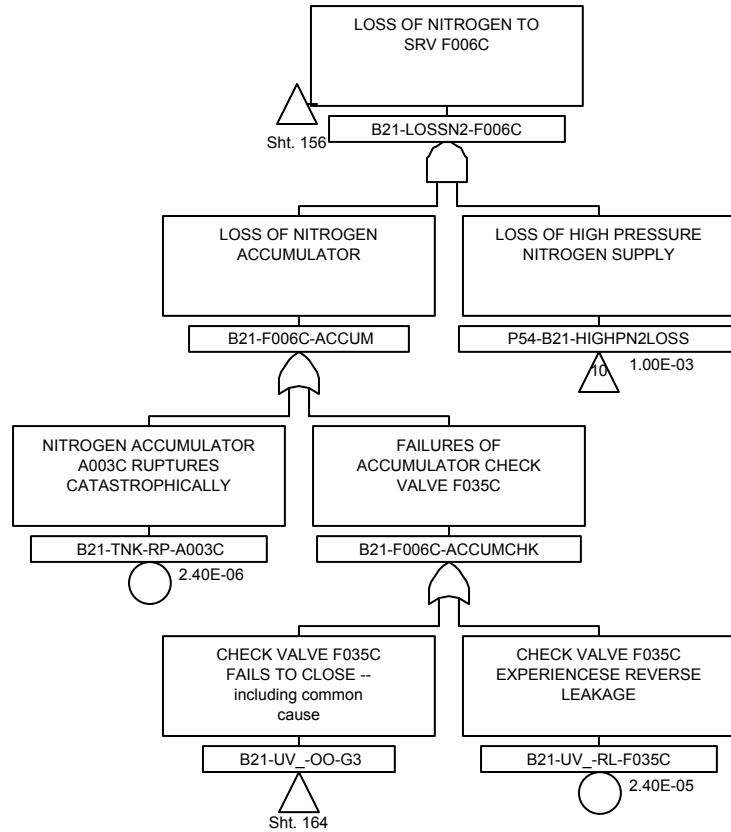


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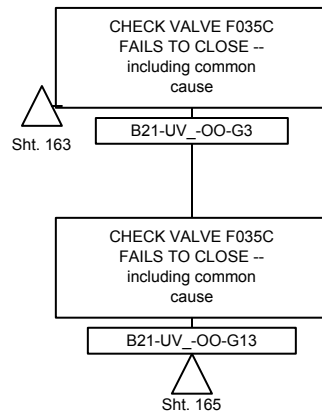


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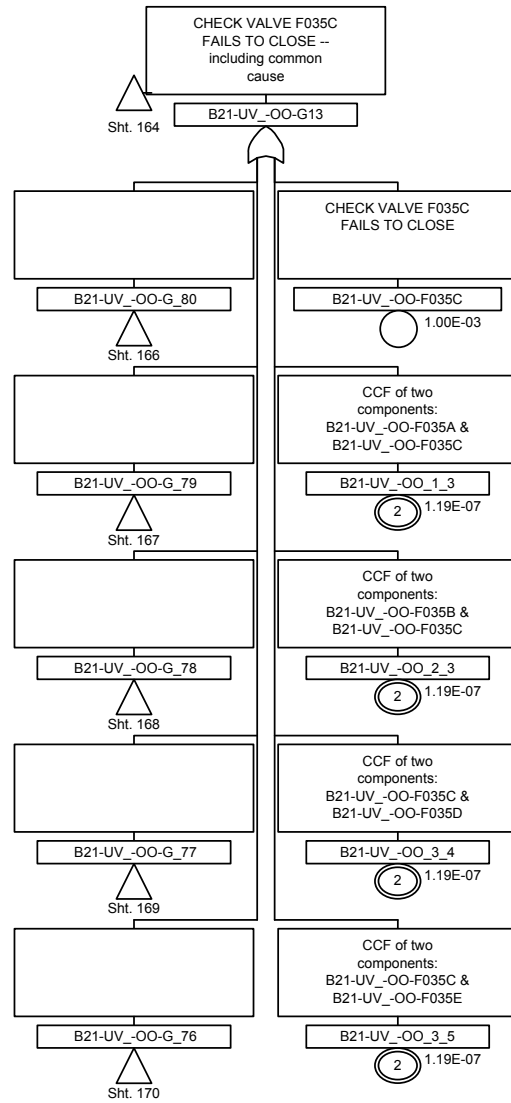


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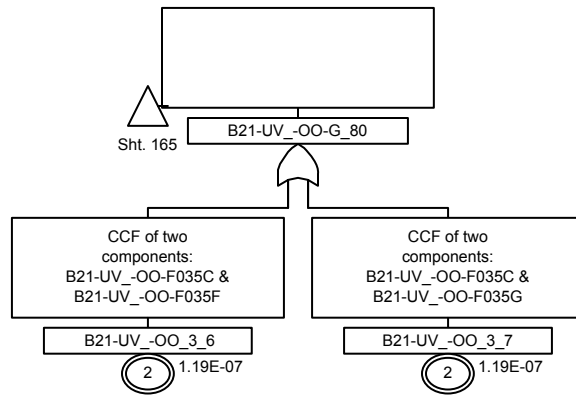


Figure 4.1-2. Sheet 166 Nuclear Boiler System

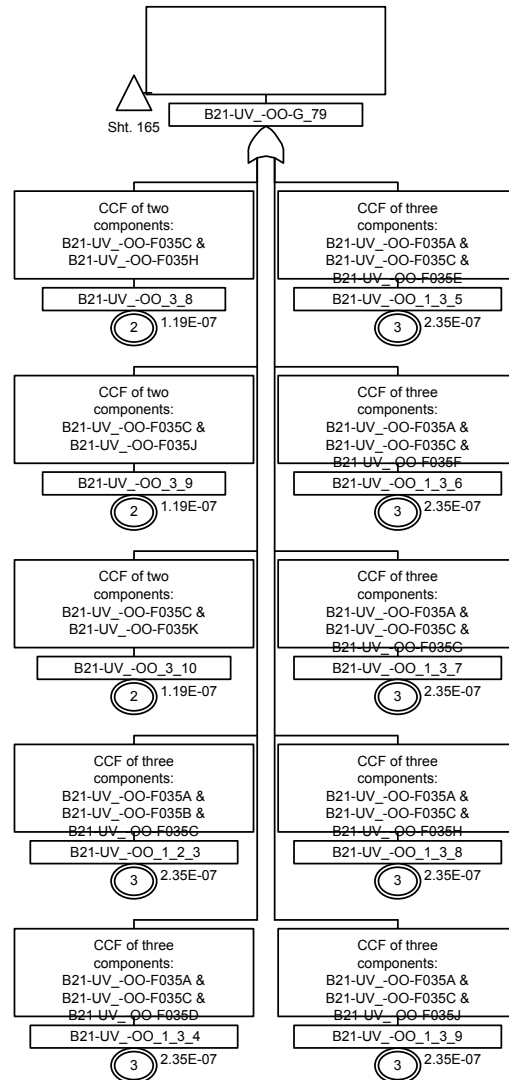


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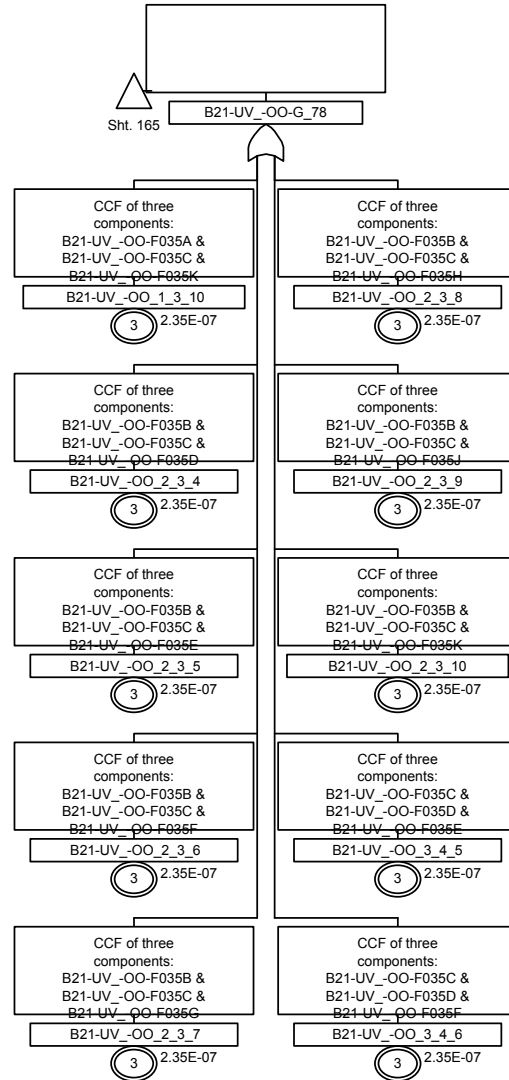


Figure 4.1-2. Sheet 168 Nuclear Boiler System



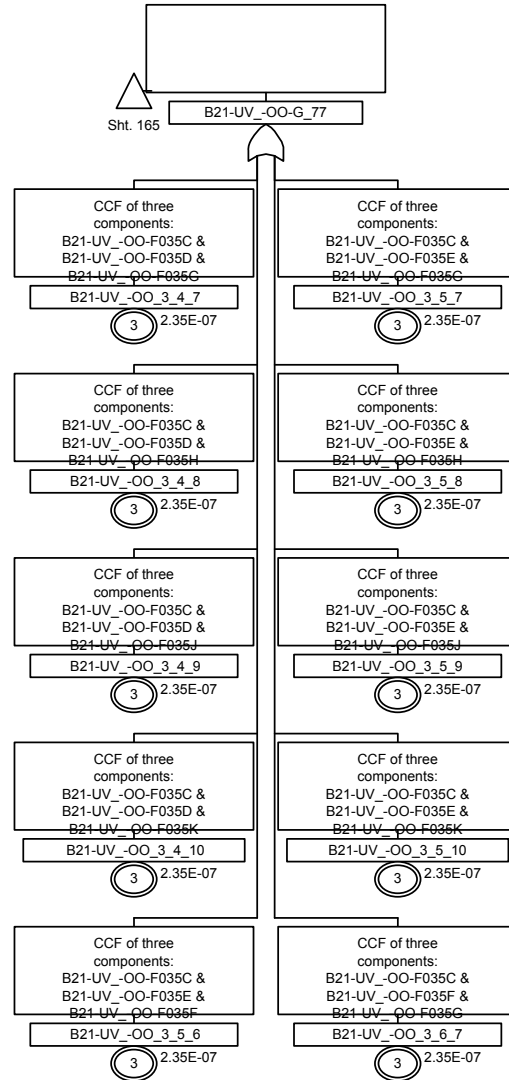


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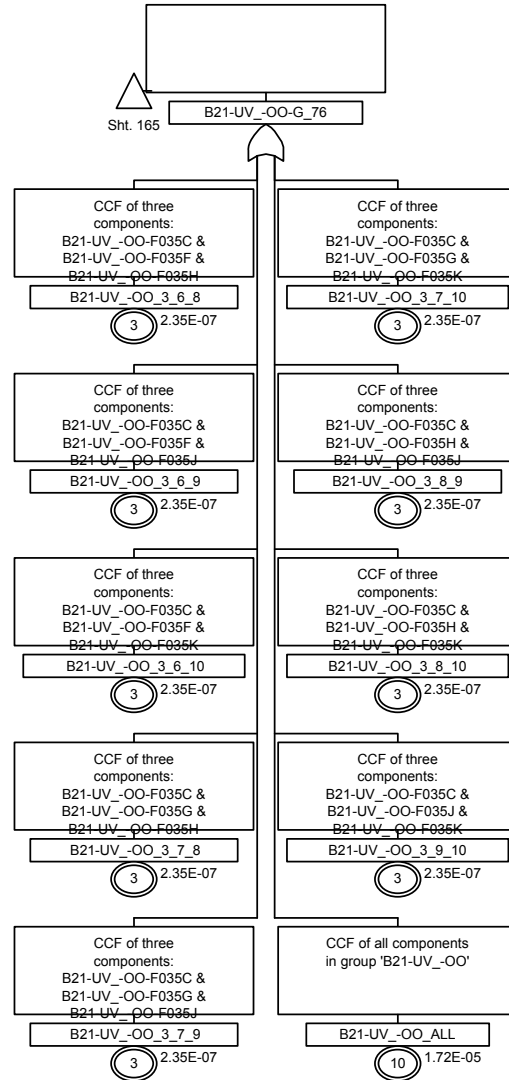


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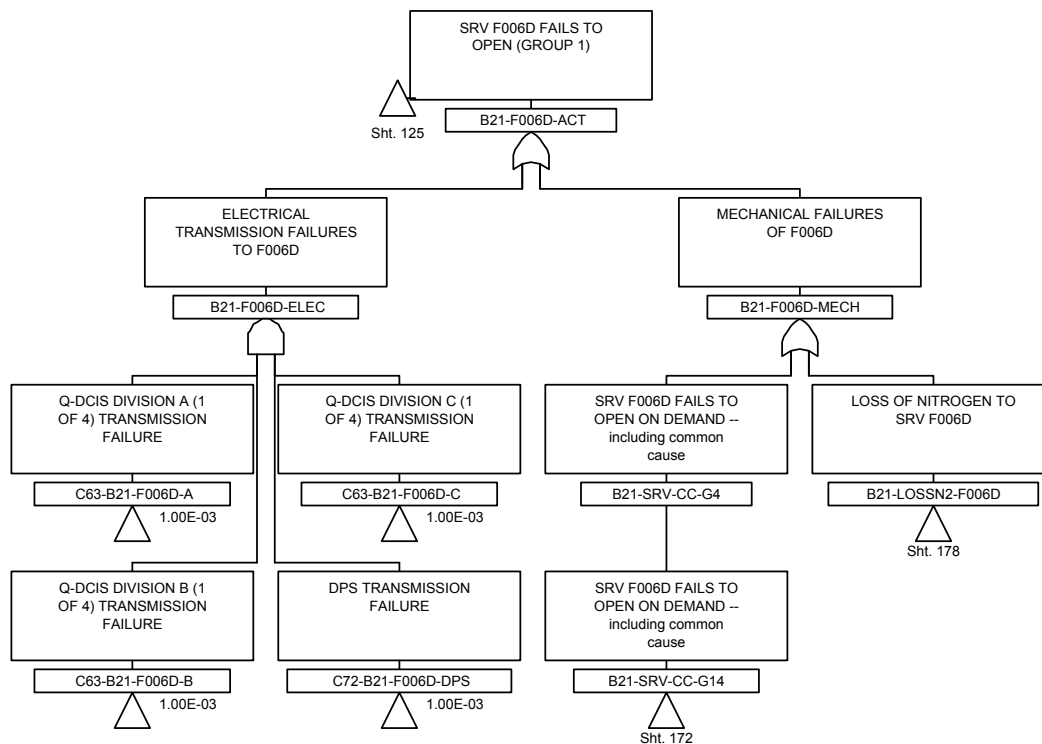


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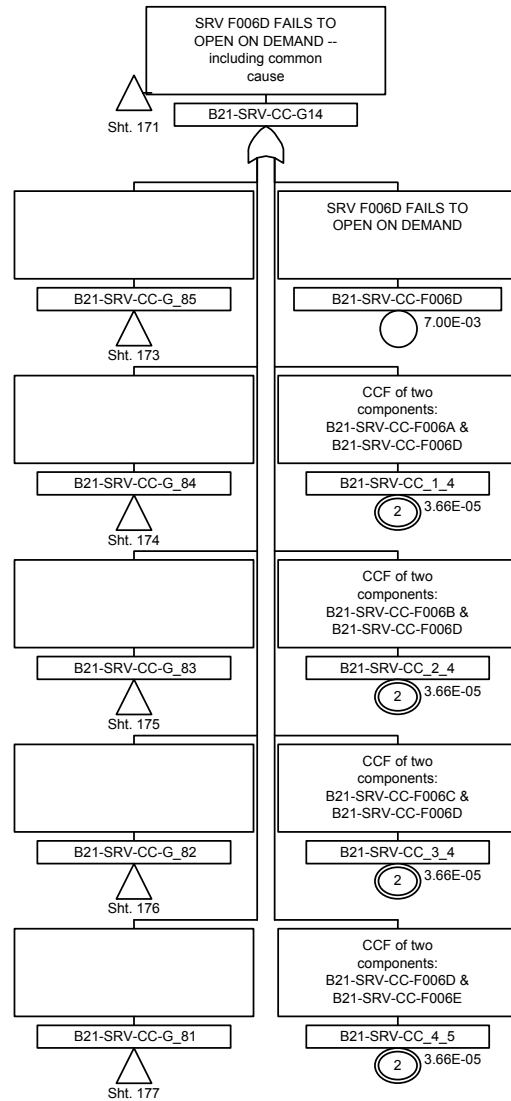


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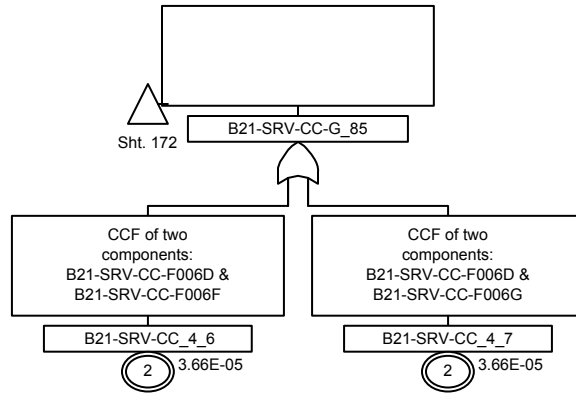


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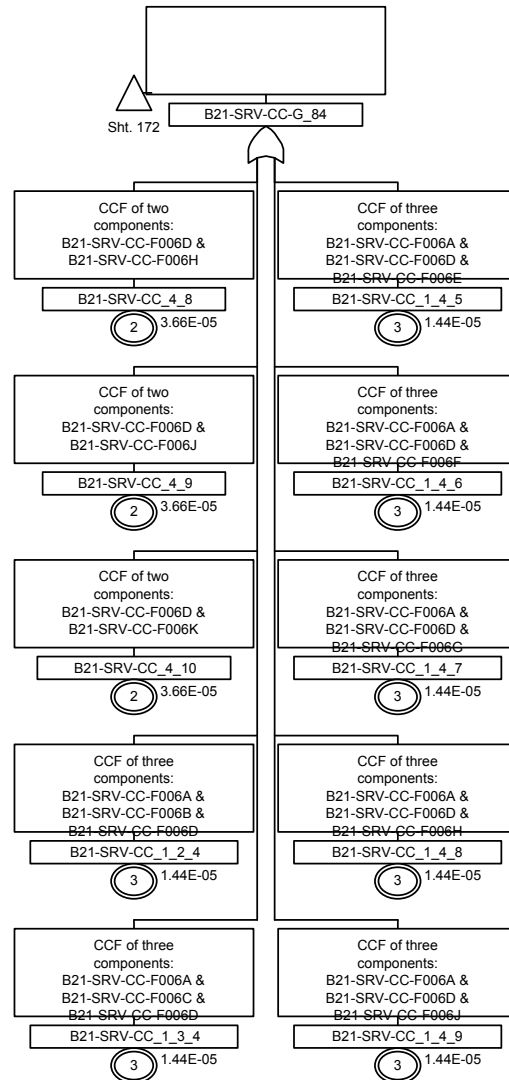


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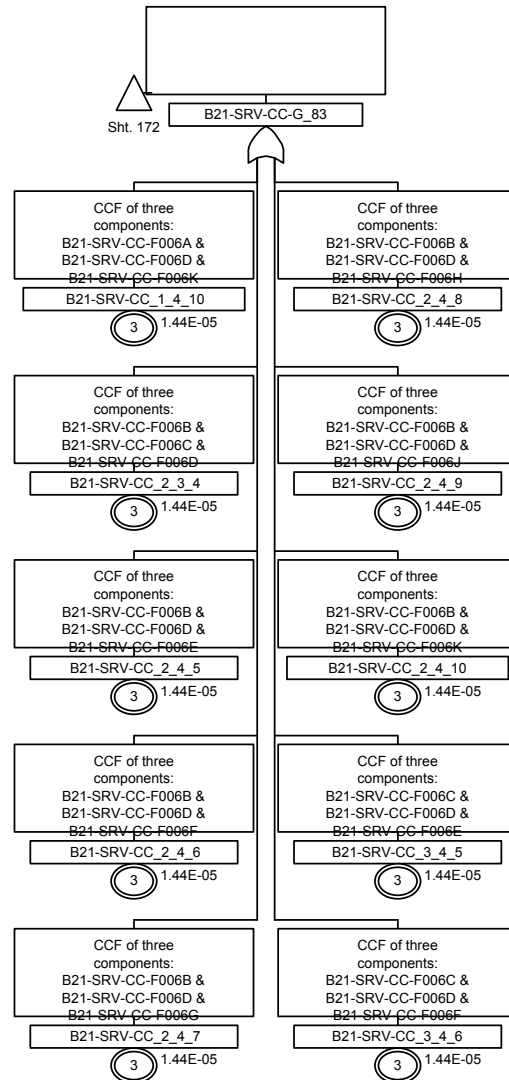


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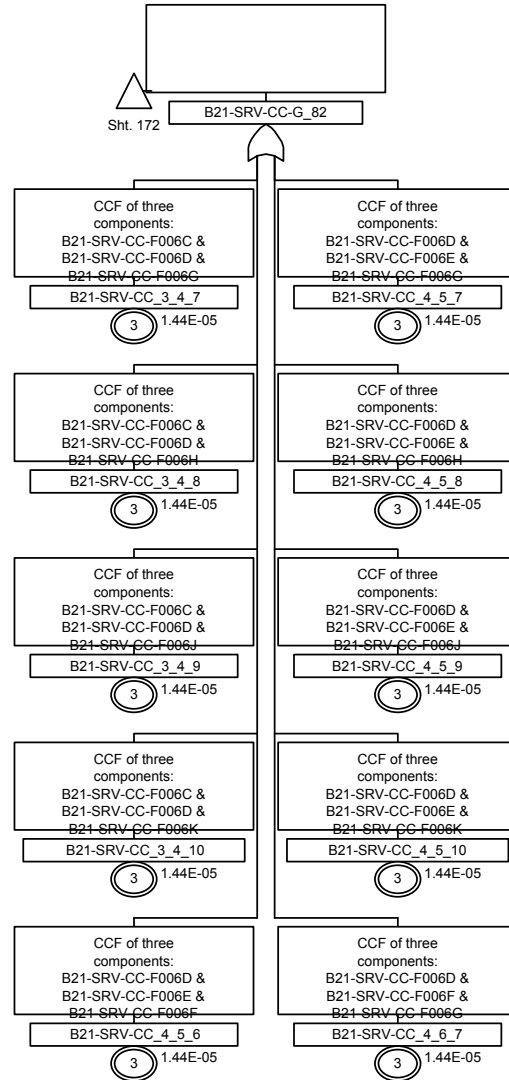


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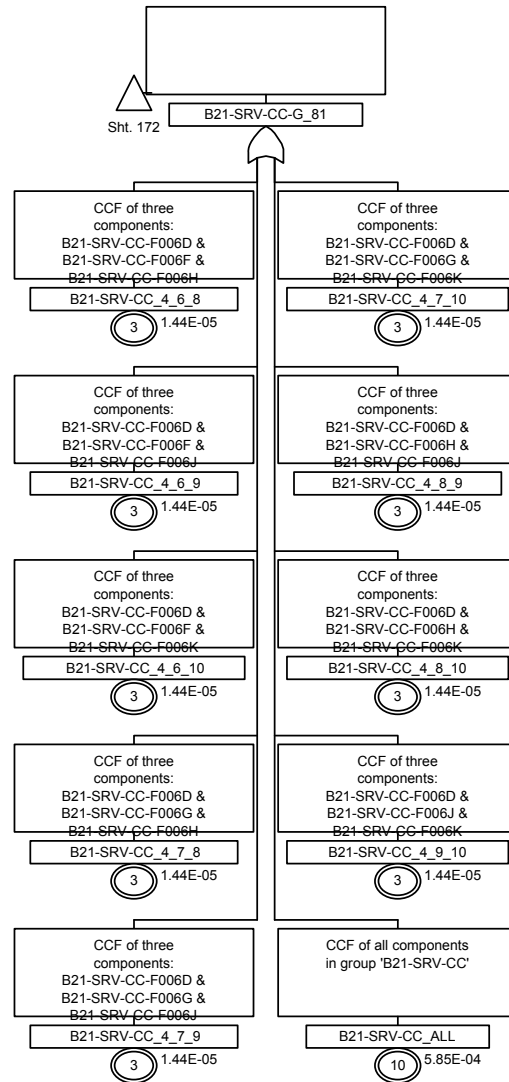


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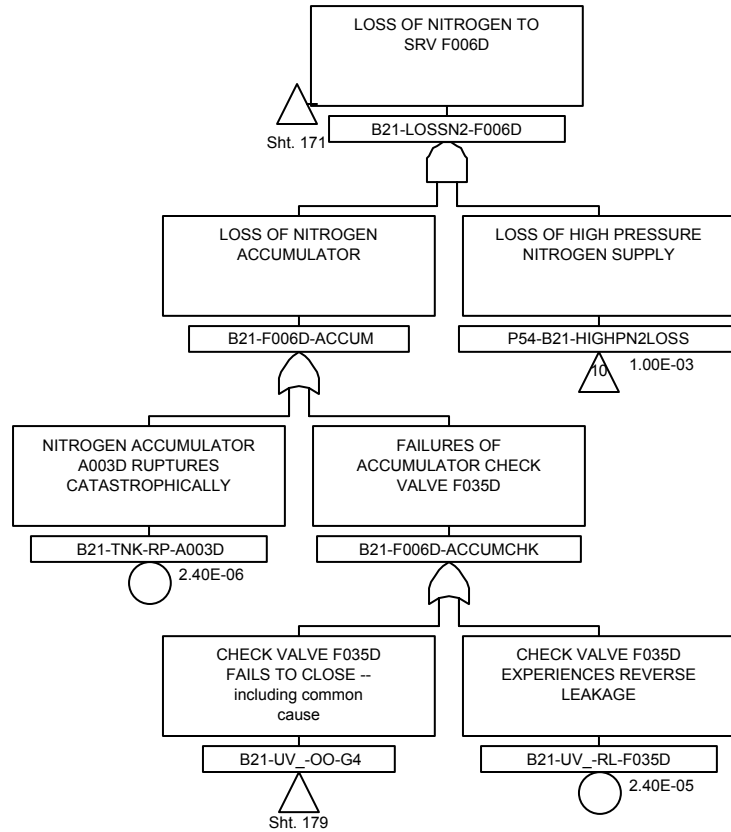


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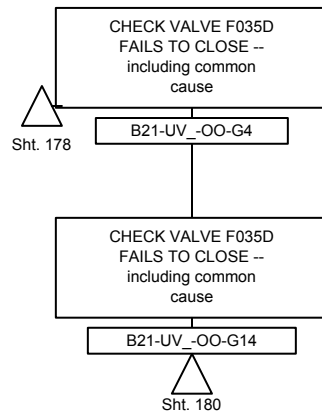


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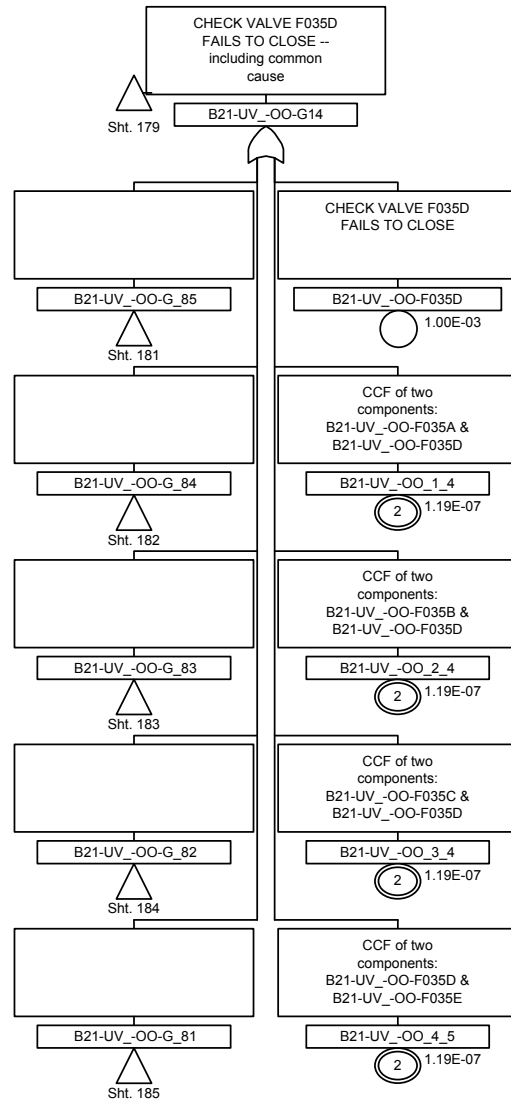


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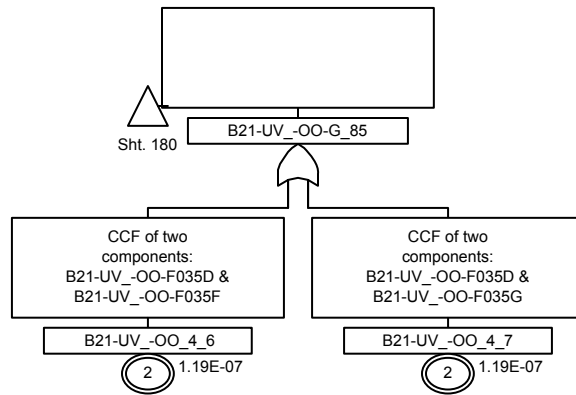


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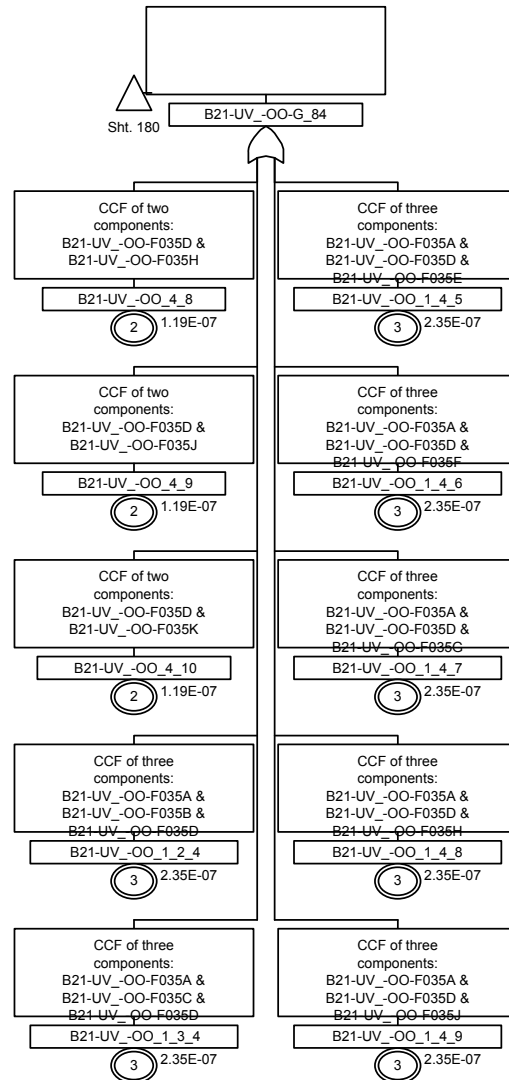


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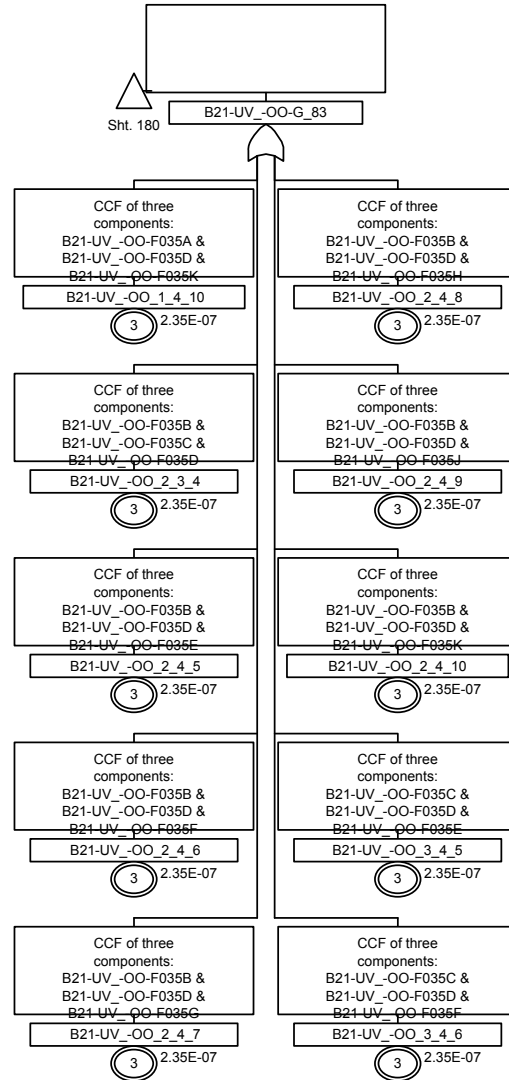


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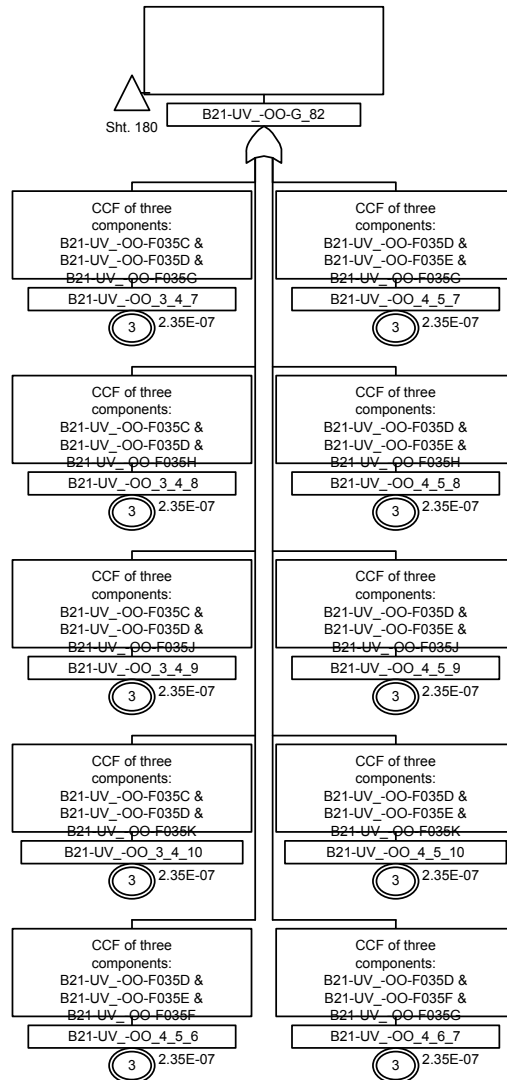


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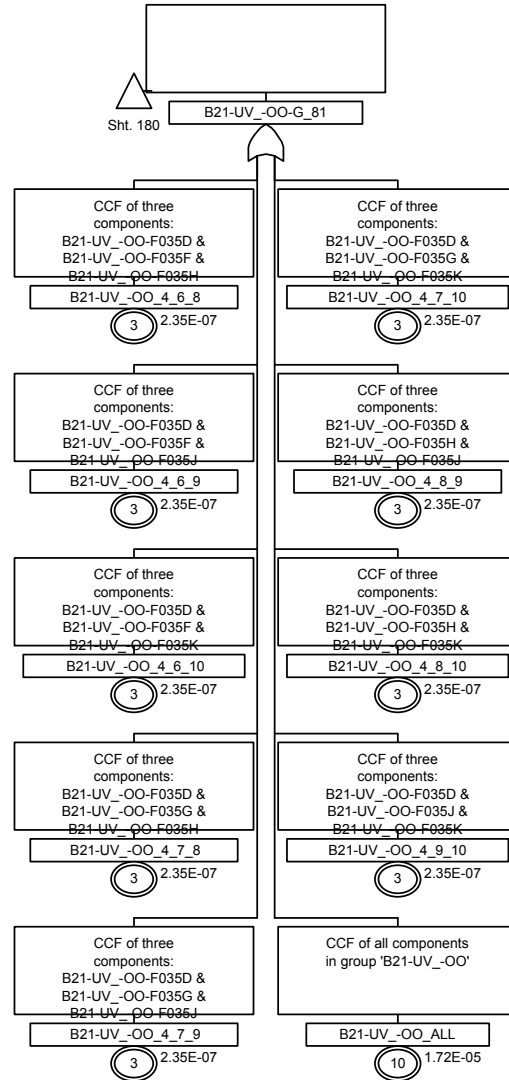


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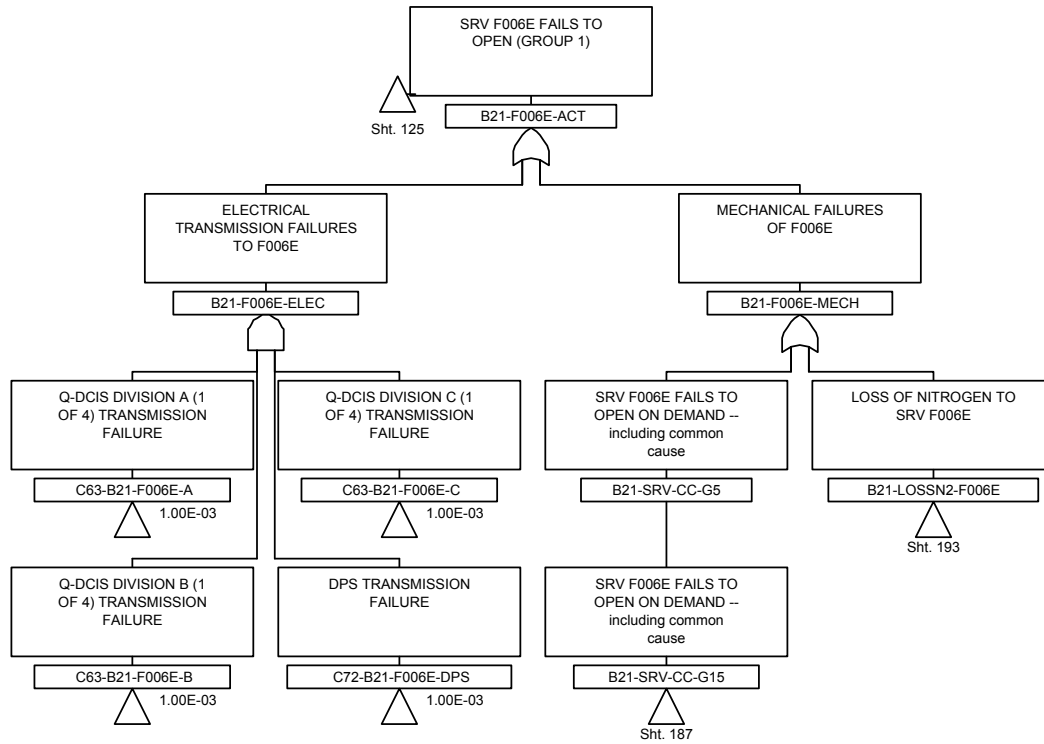


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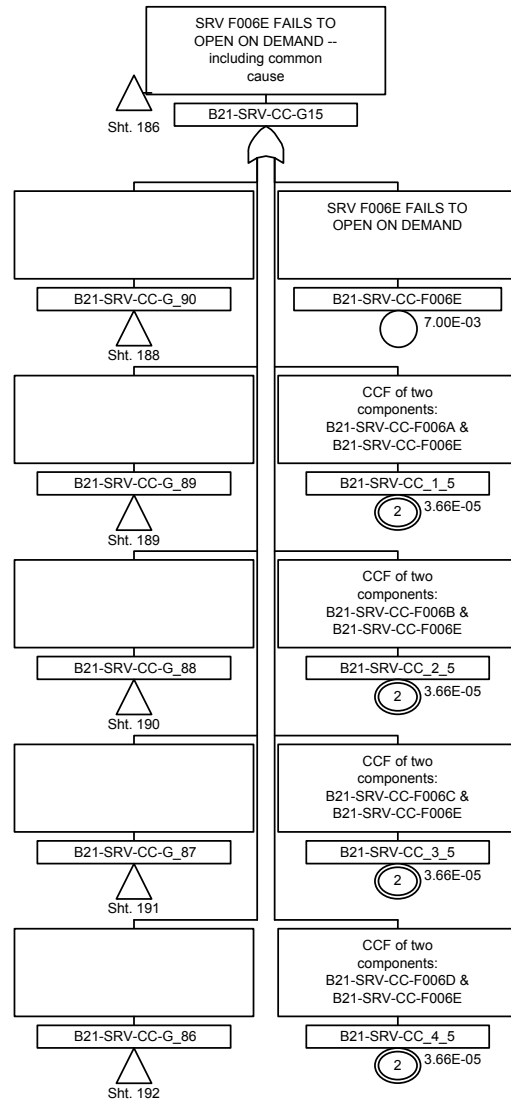


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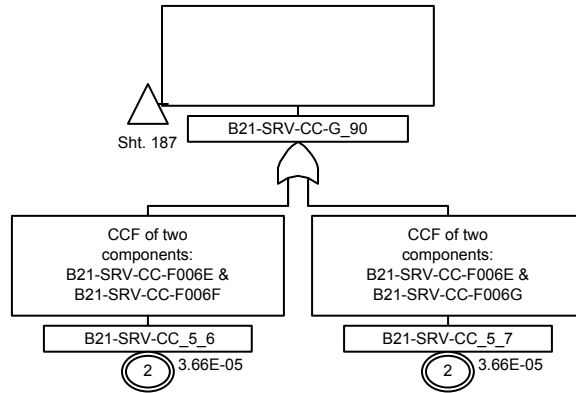


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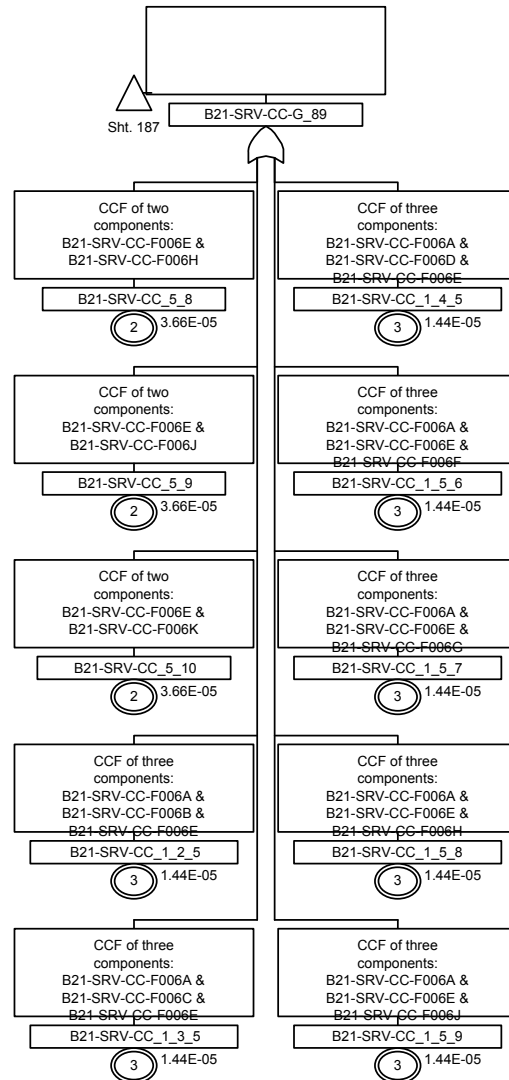


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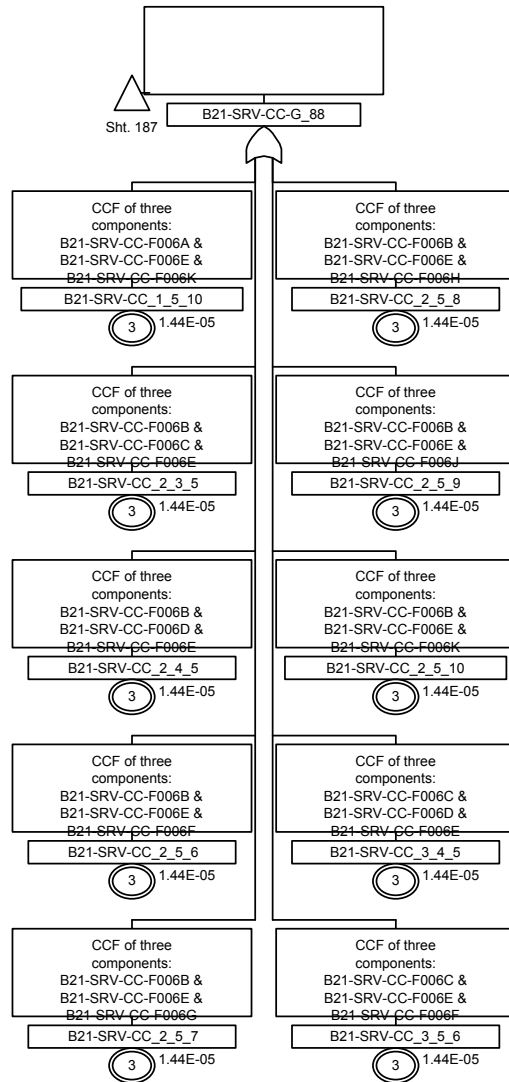


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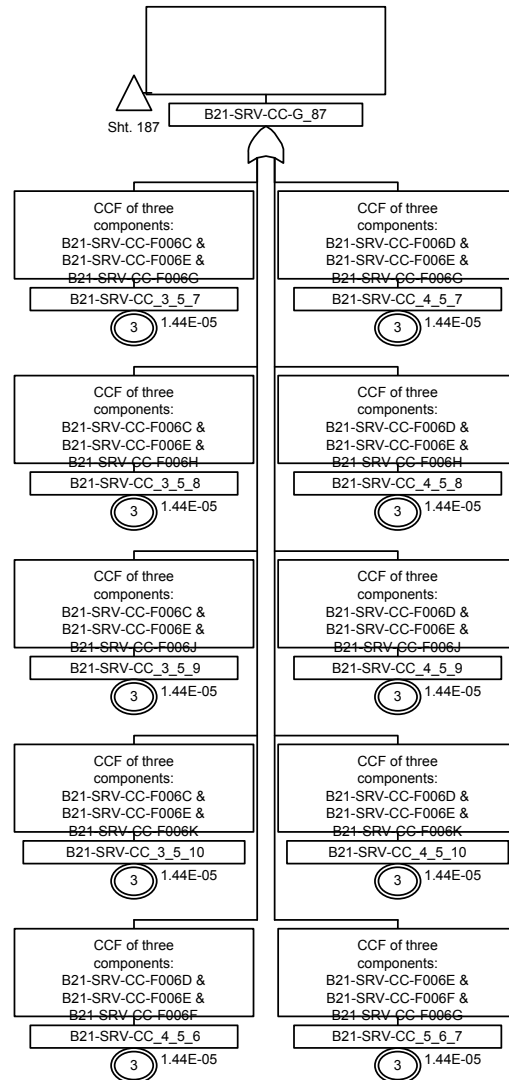


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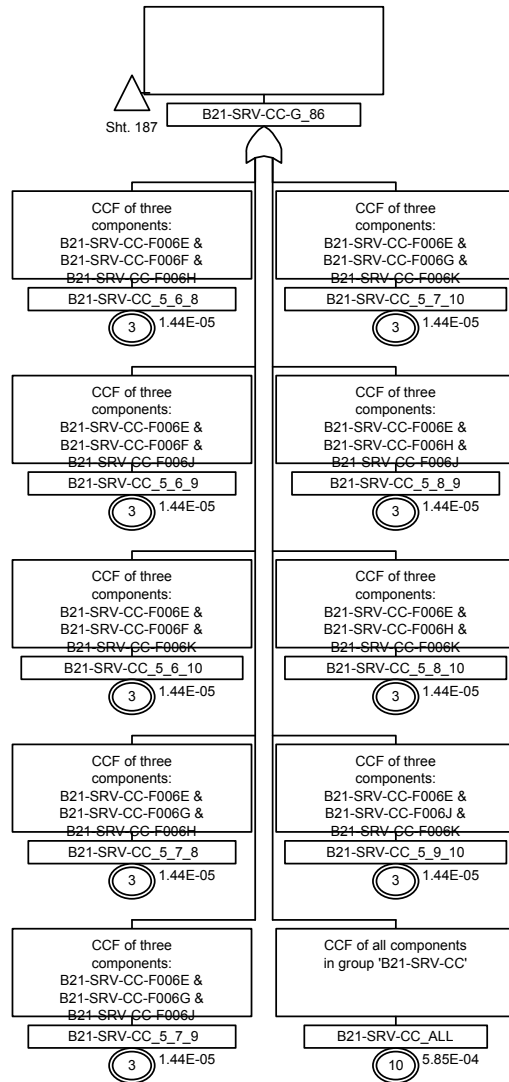


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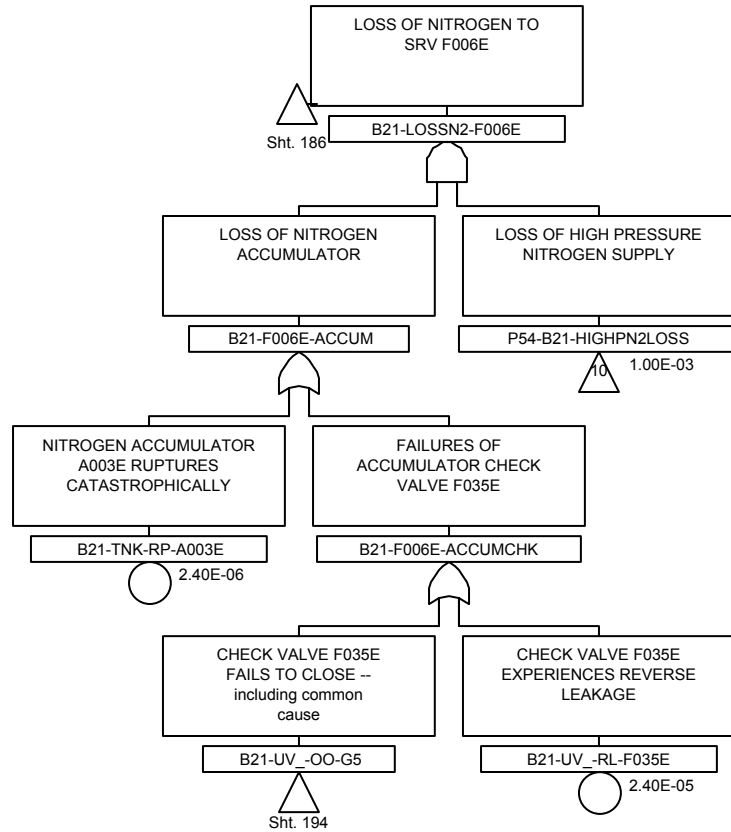


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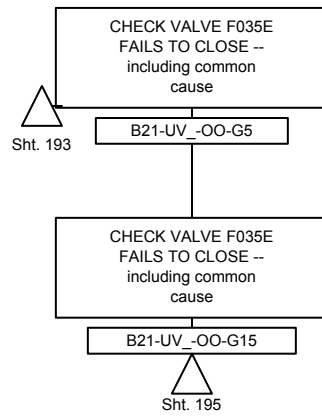


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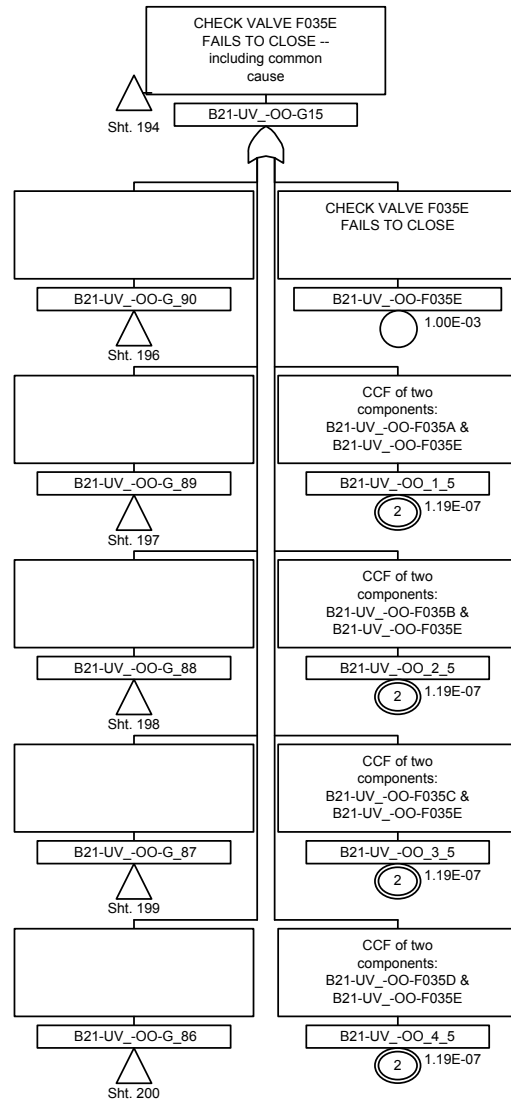


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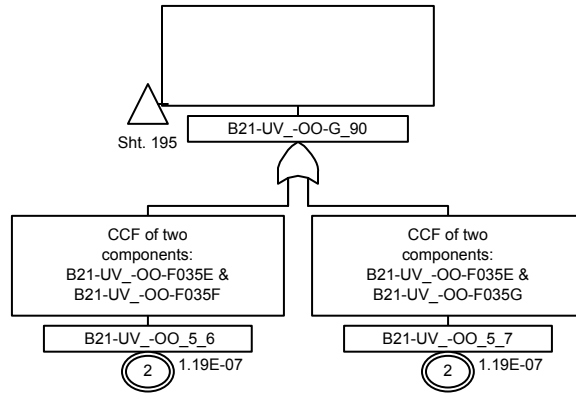


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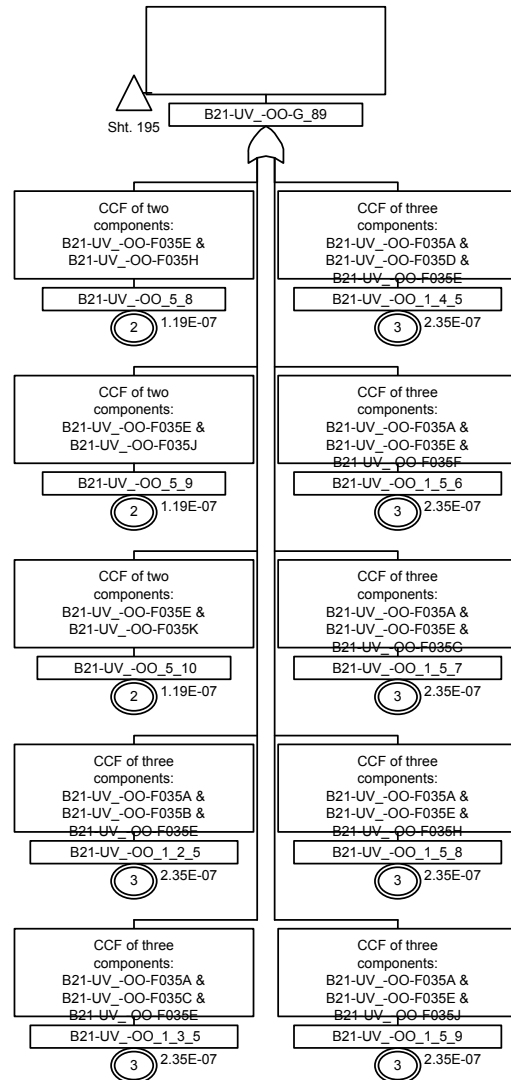
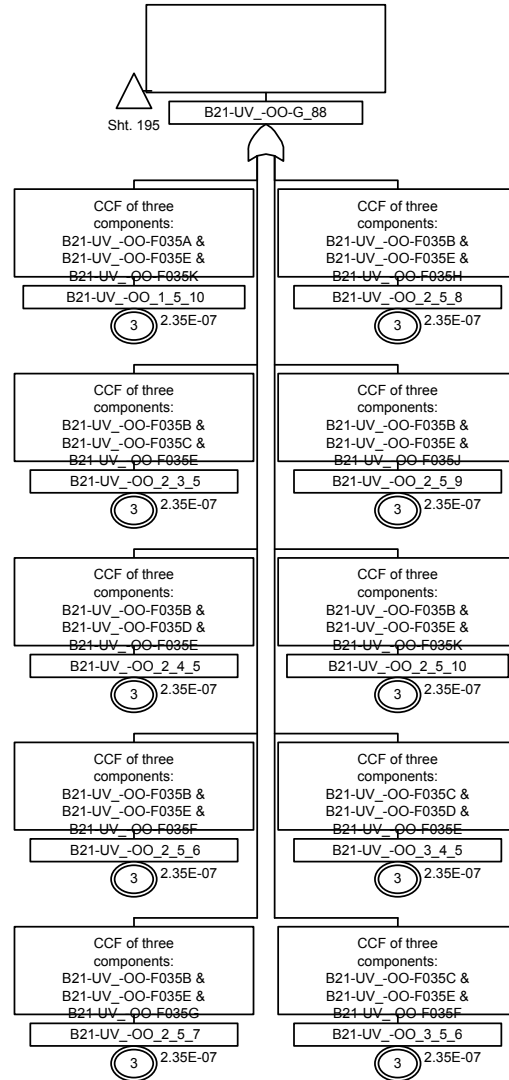


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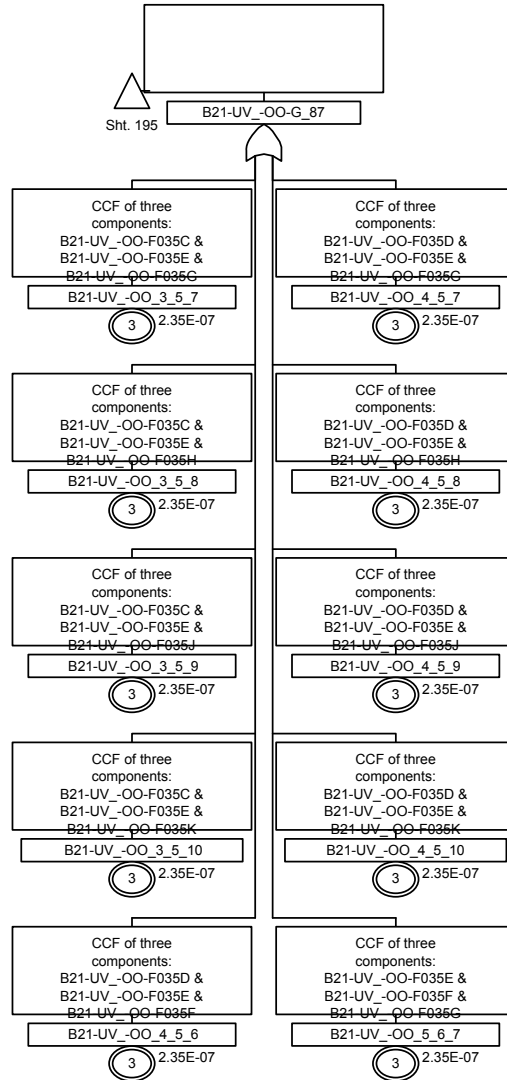


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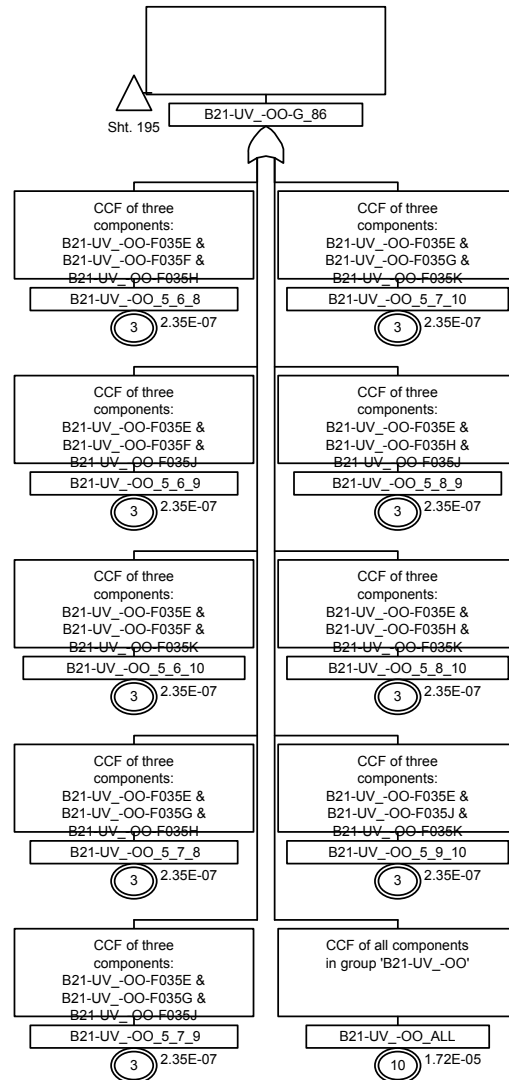


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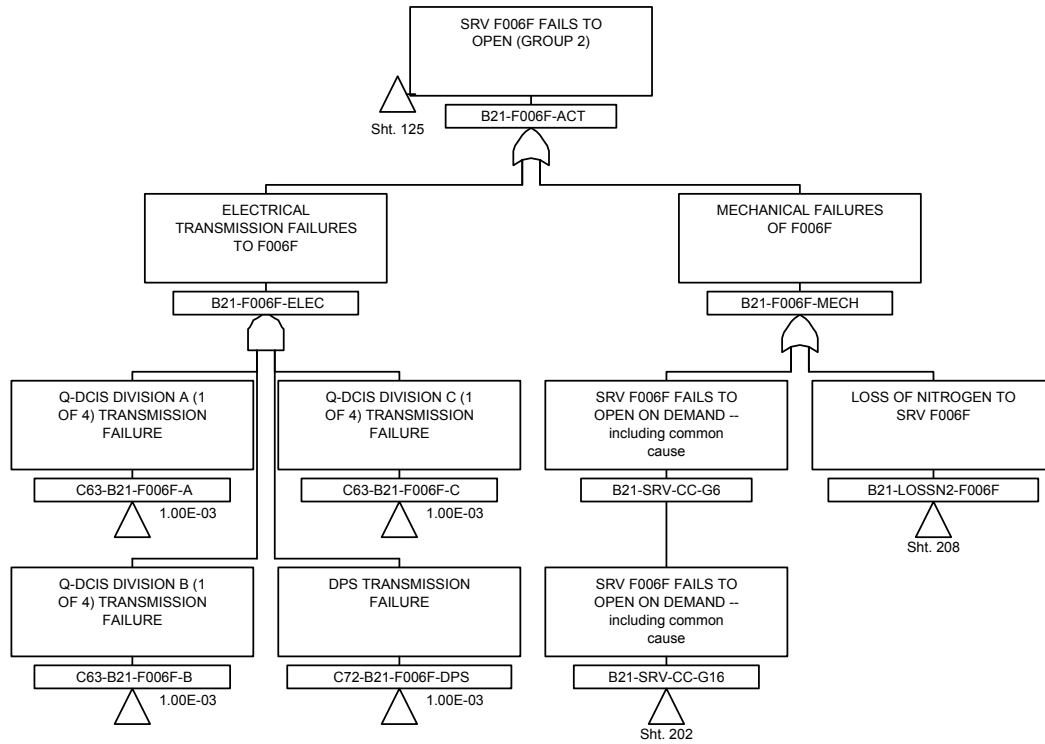


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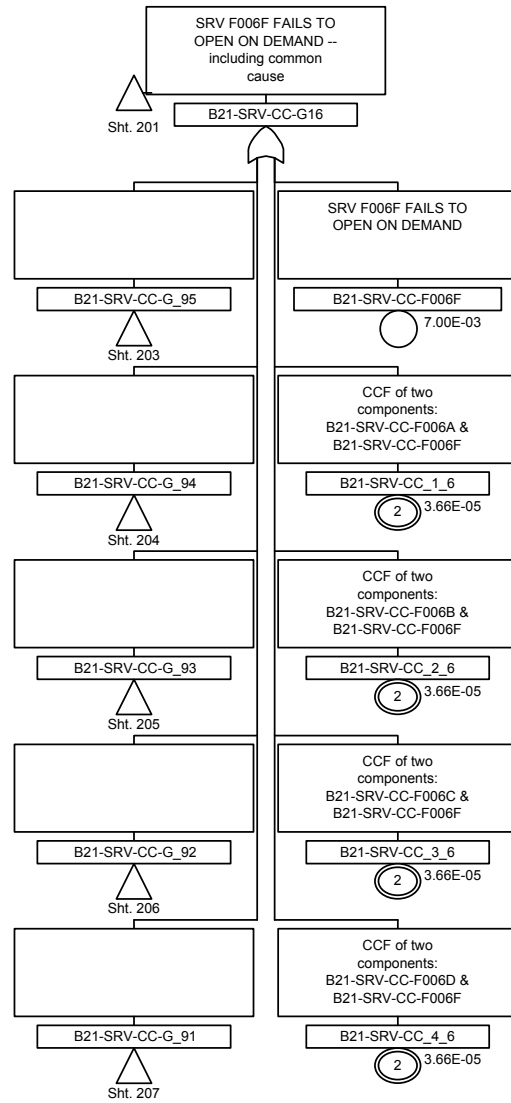


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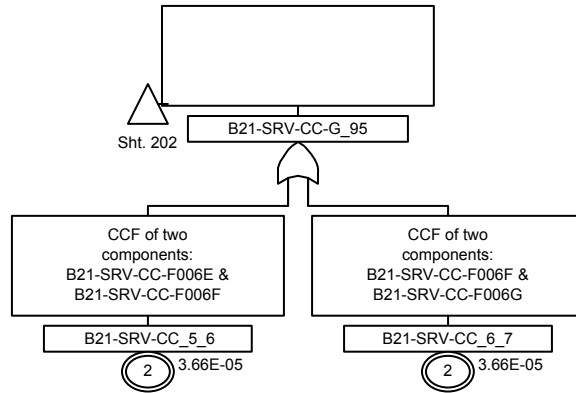


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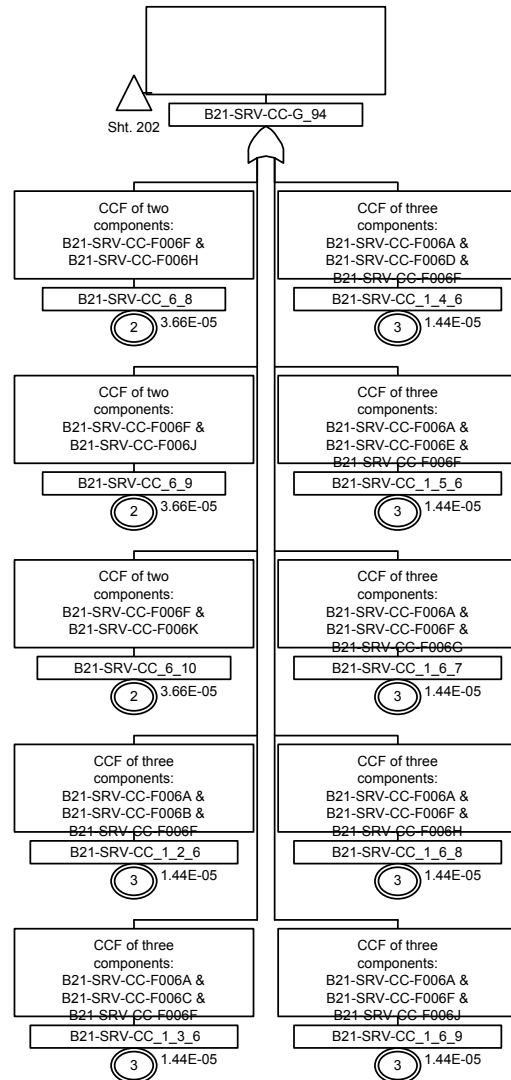


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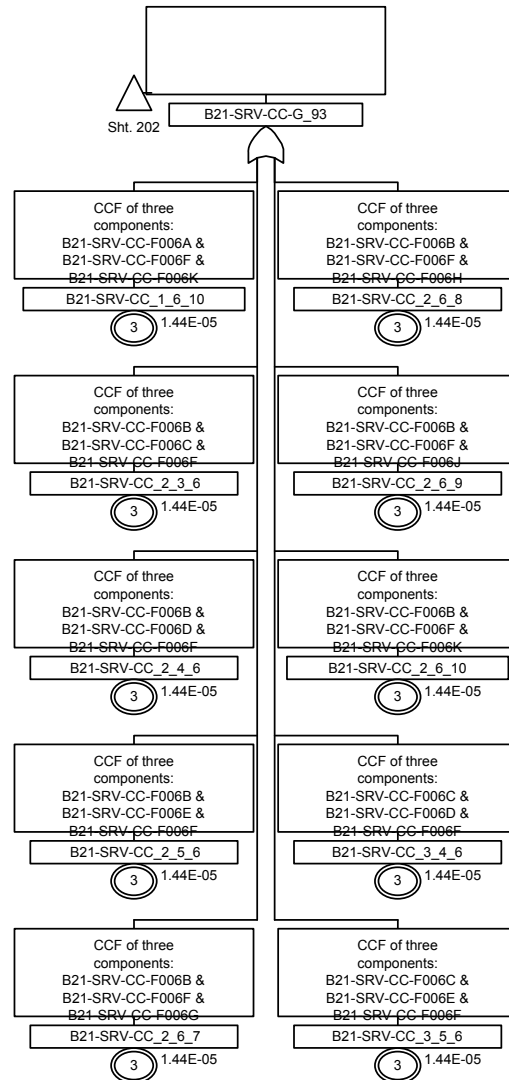


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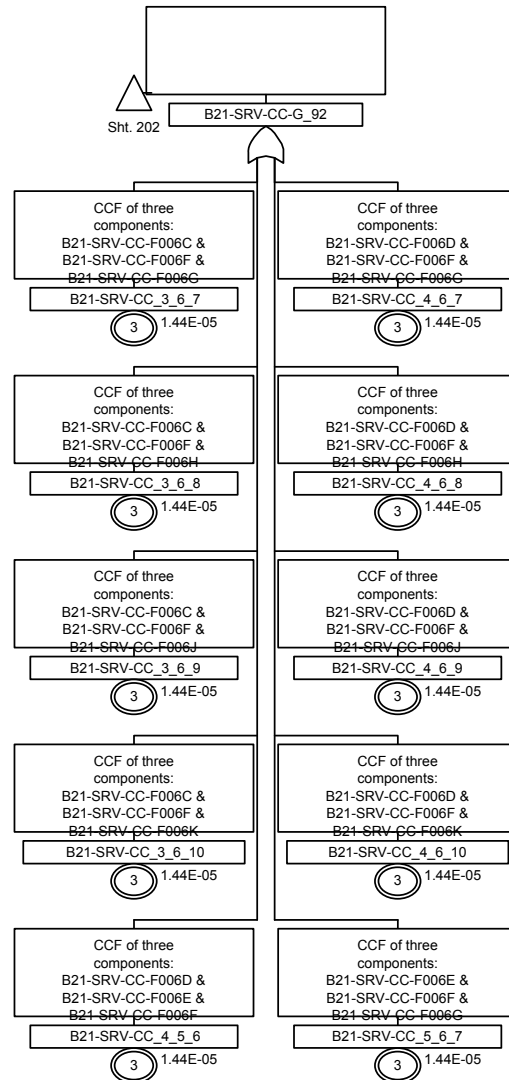


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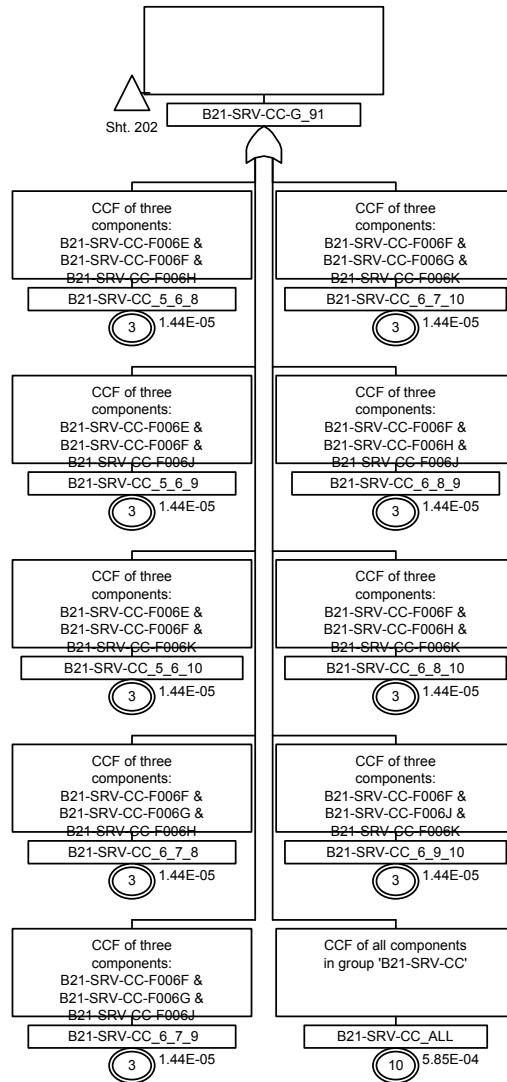


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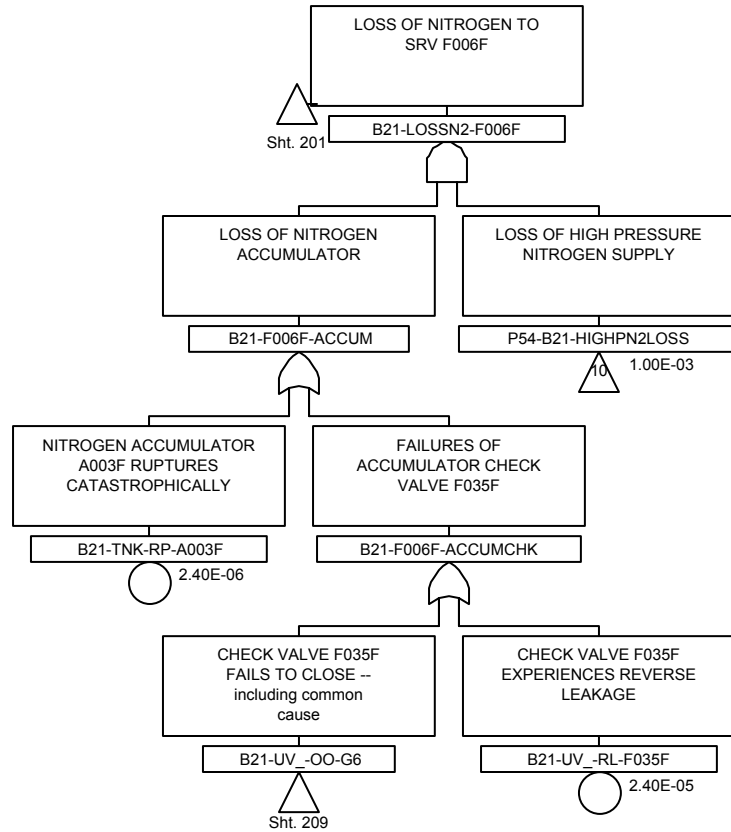


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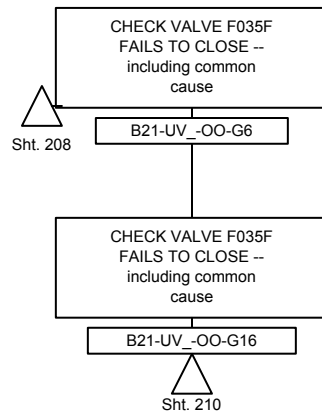


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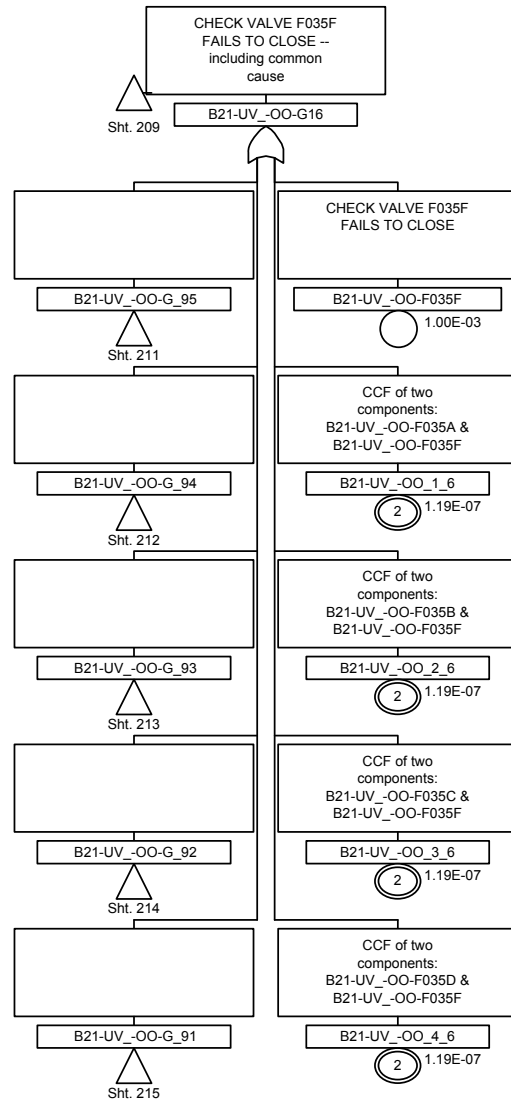


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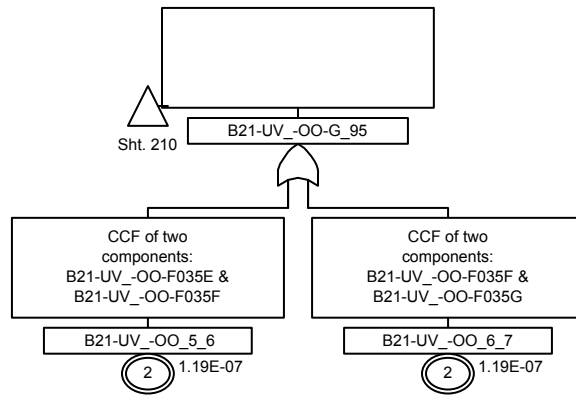


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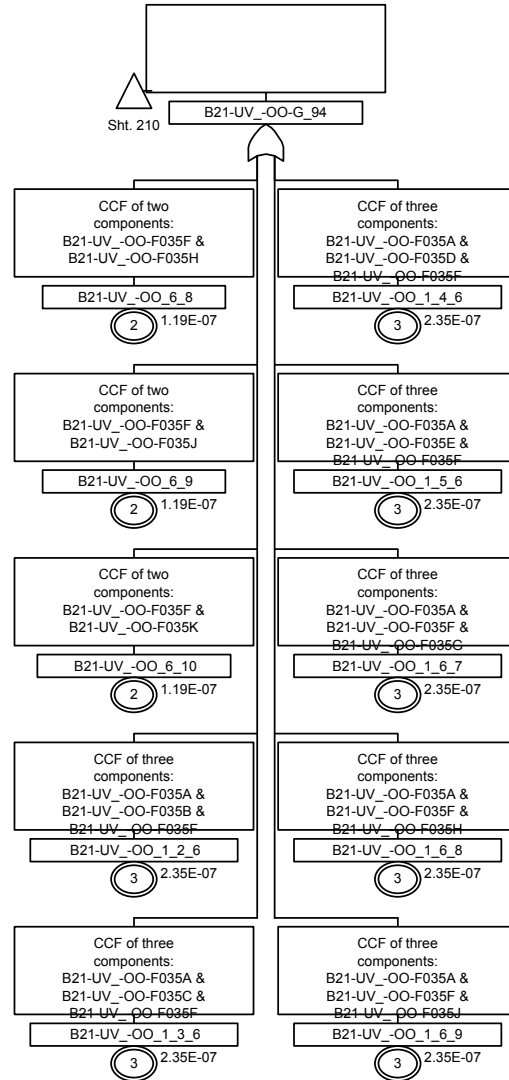


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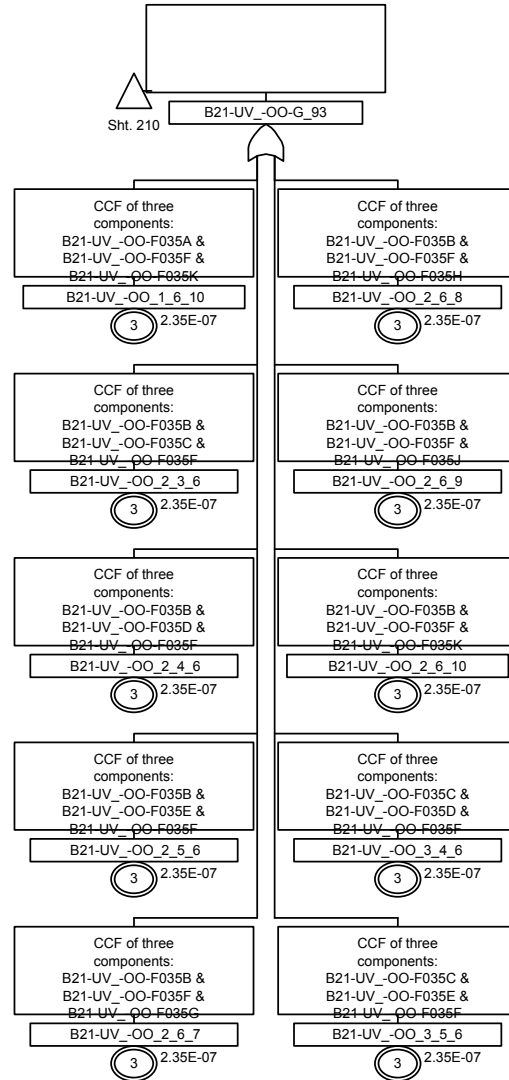


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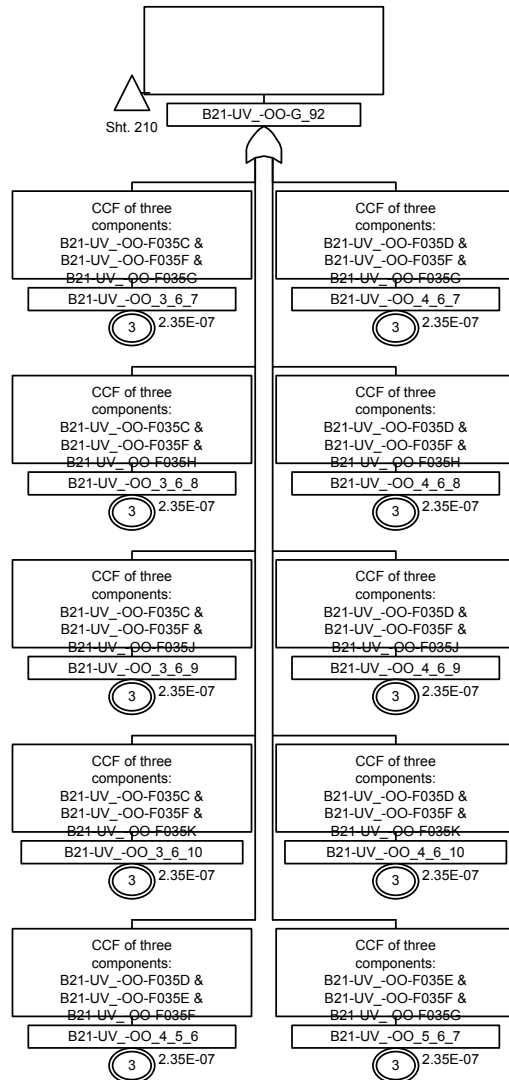


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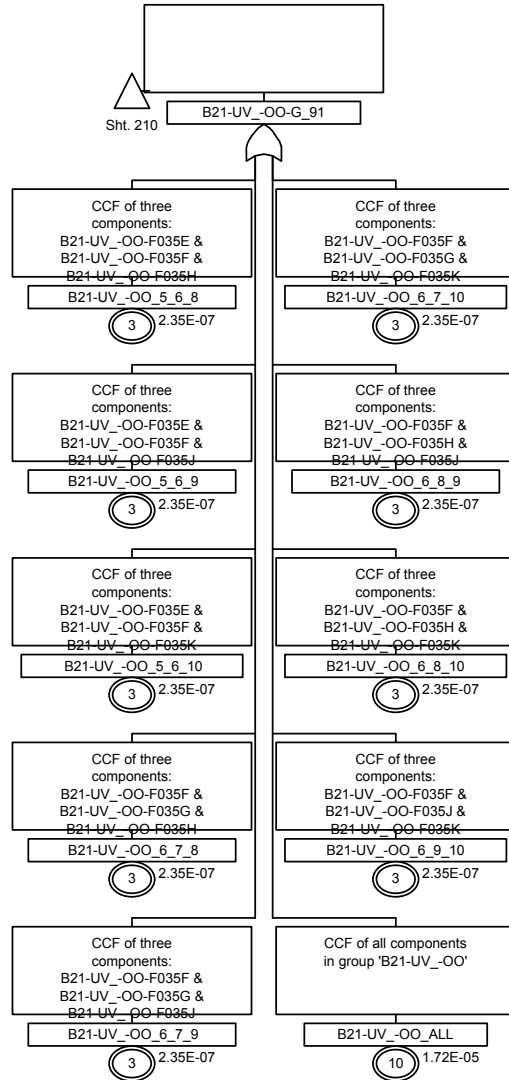


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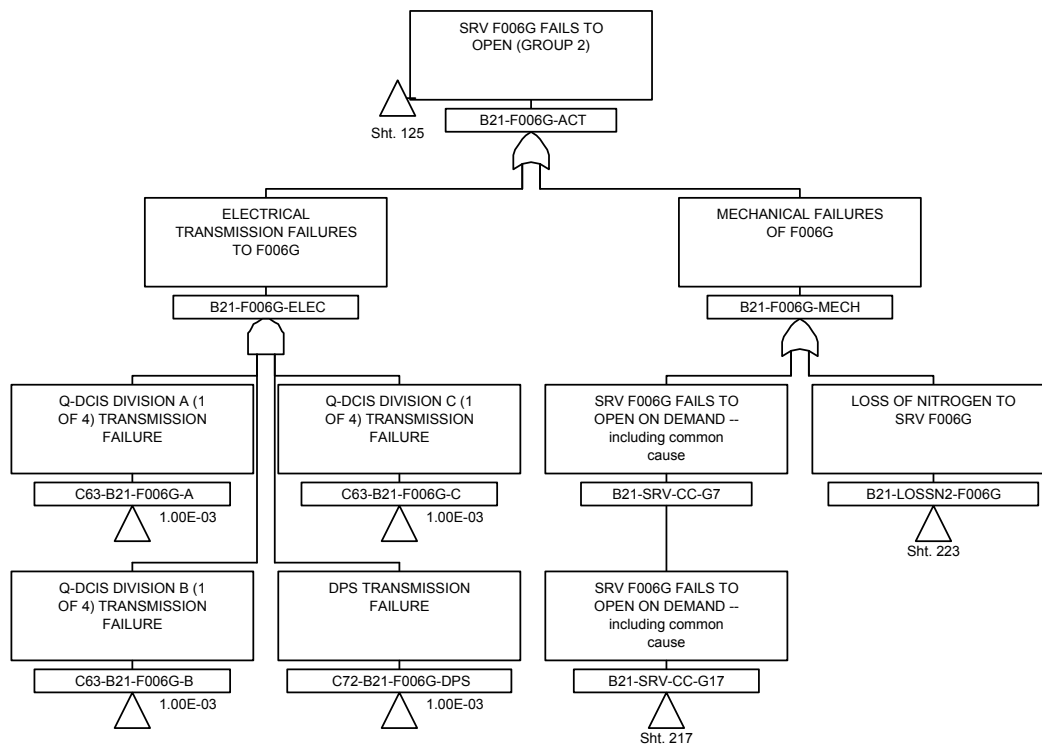


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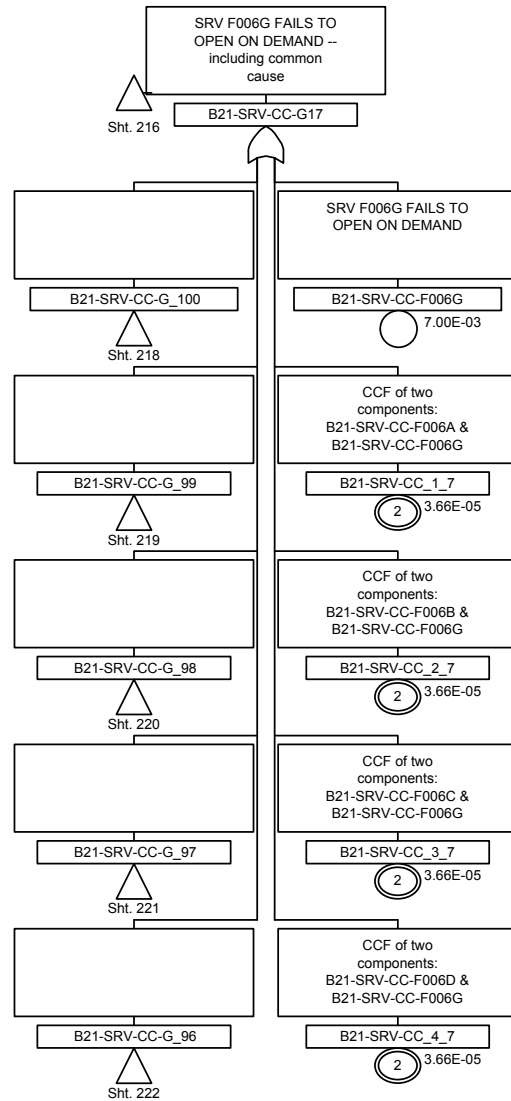


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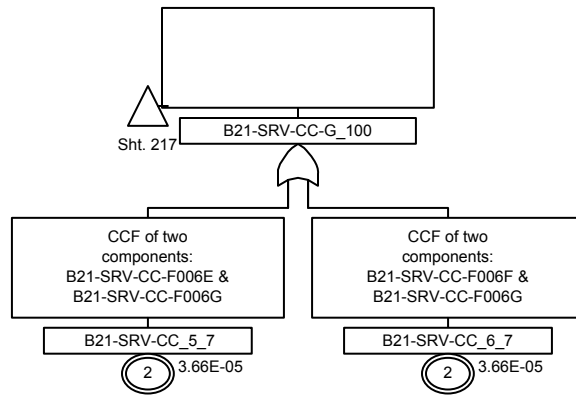


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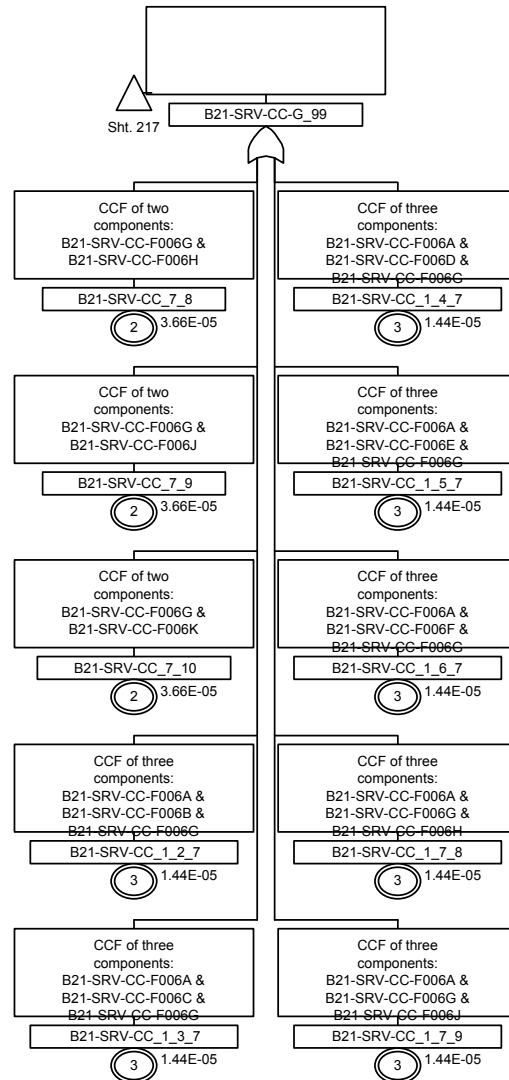


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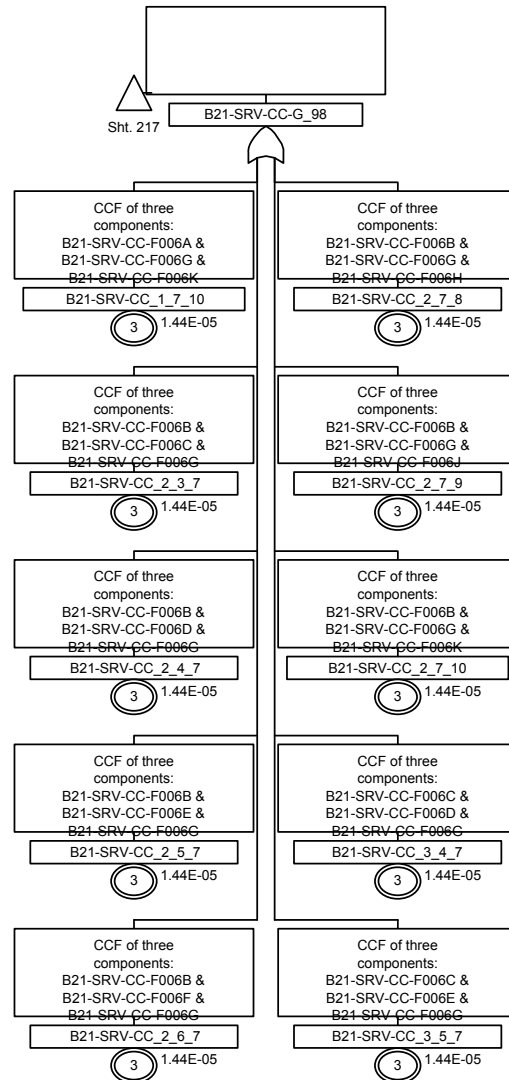


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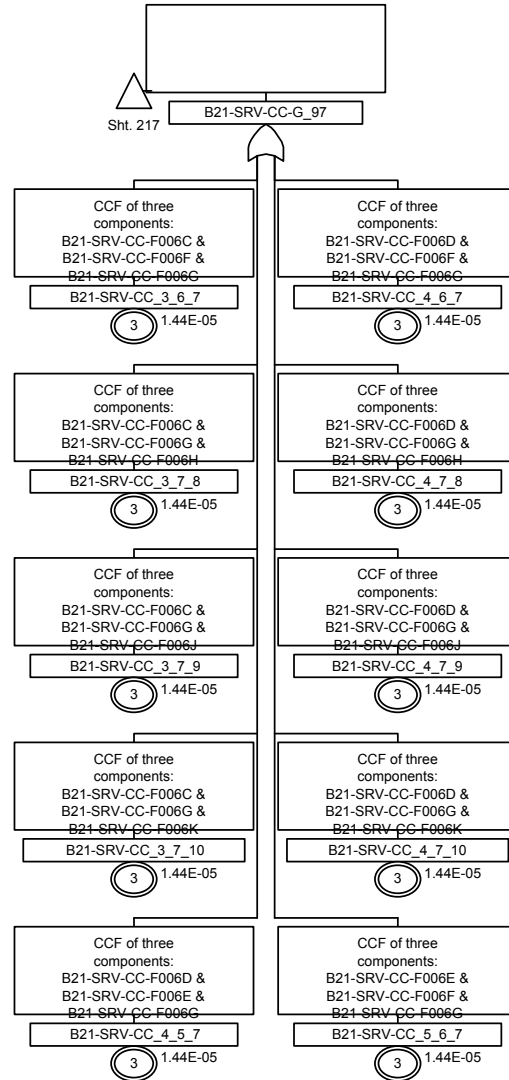


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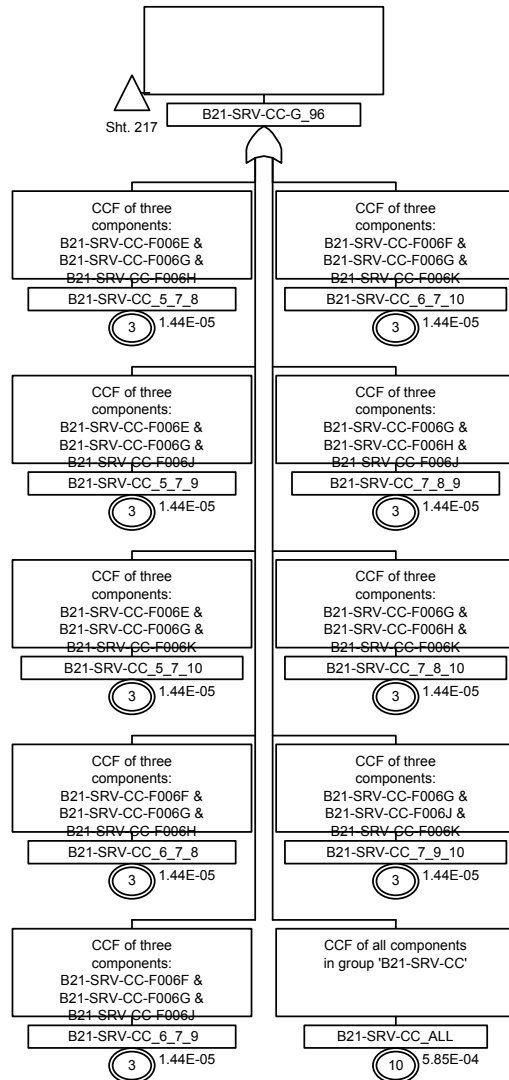


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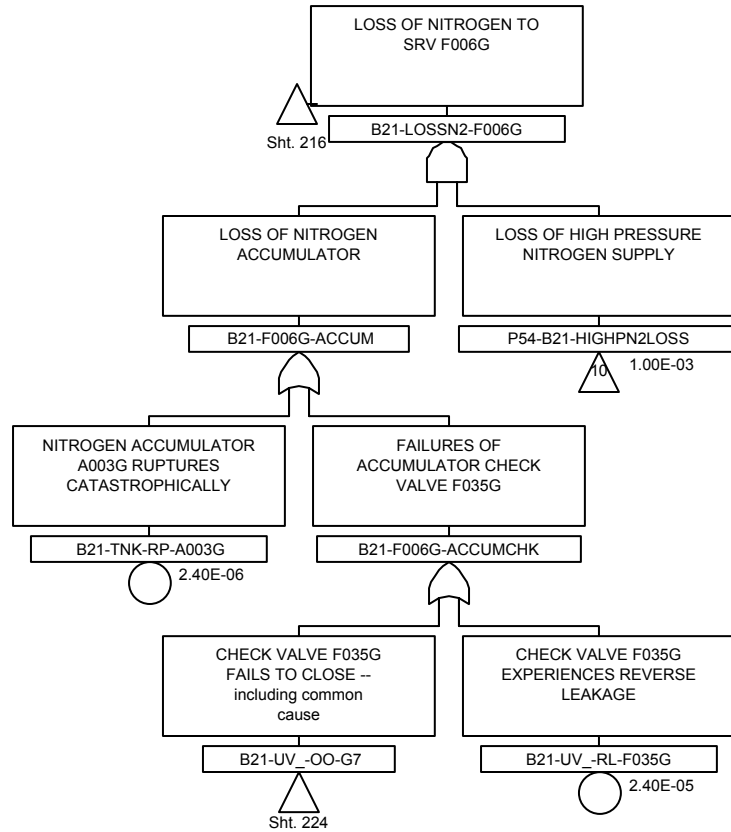


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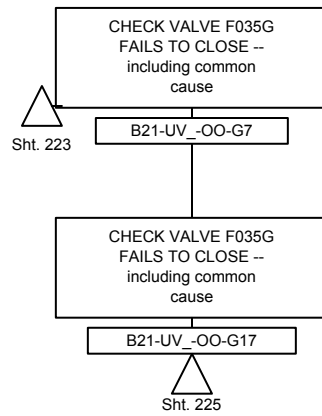


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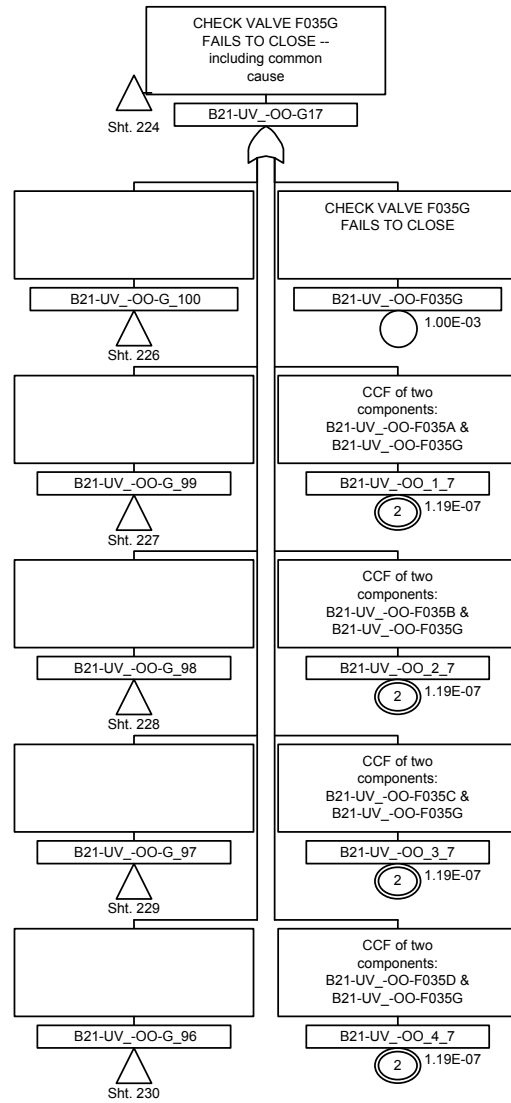


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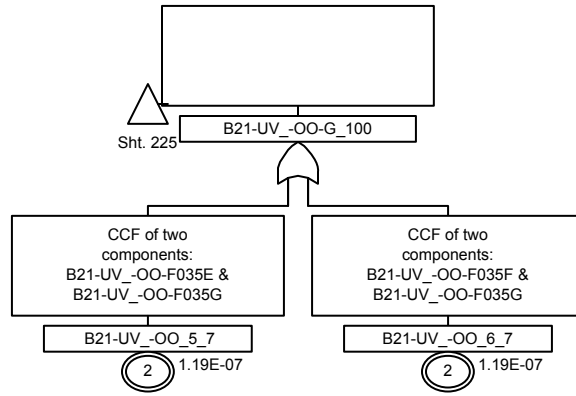


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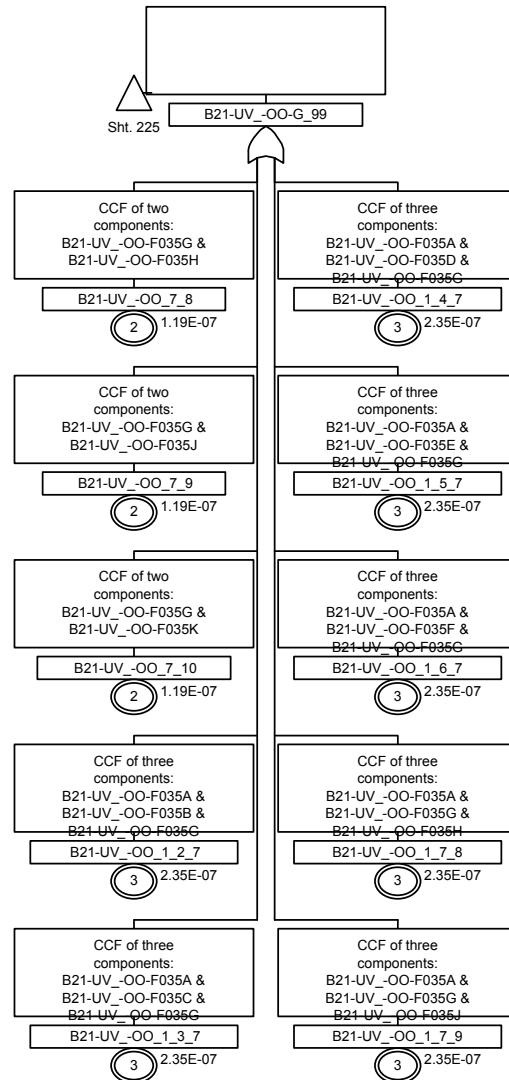


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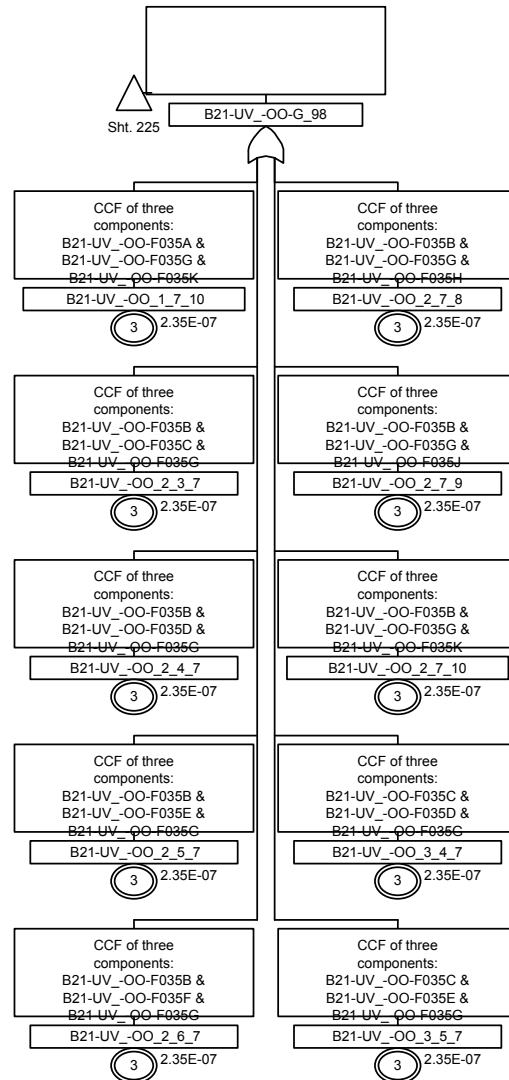


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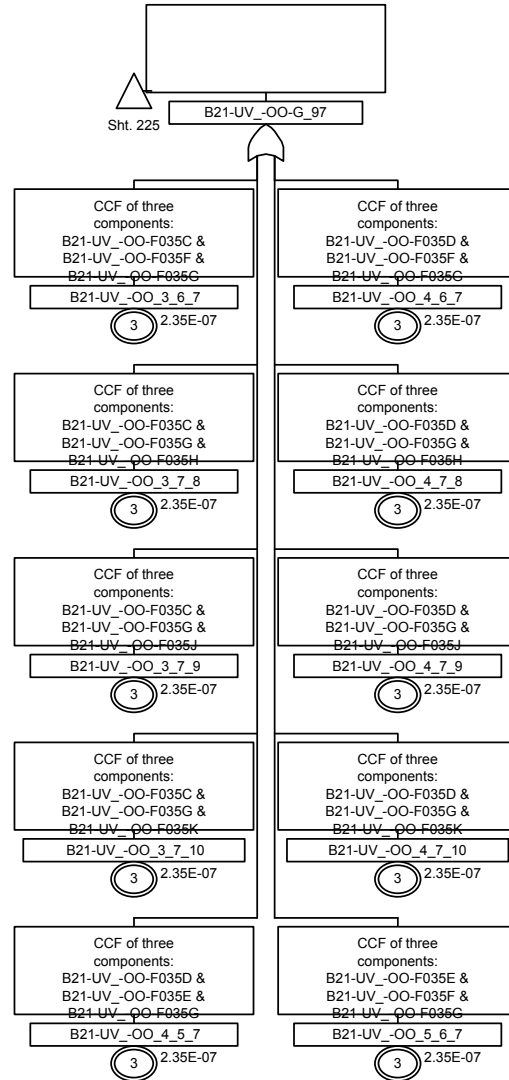


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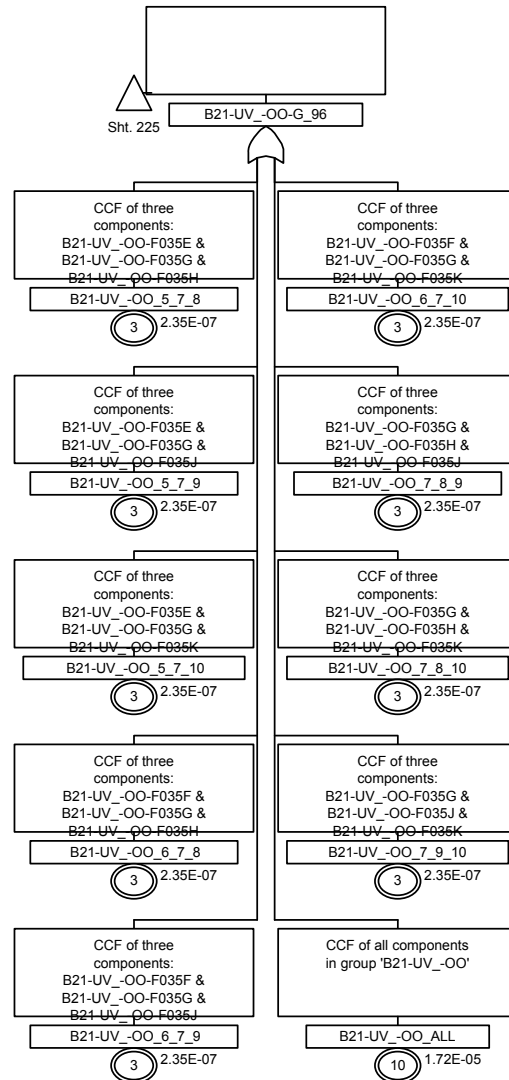


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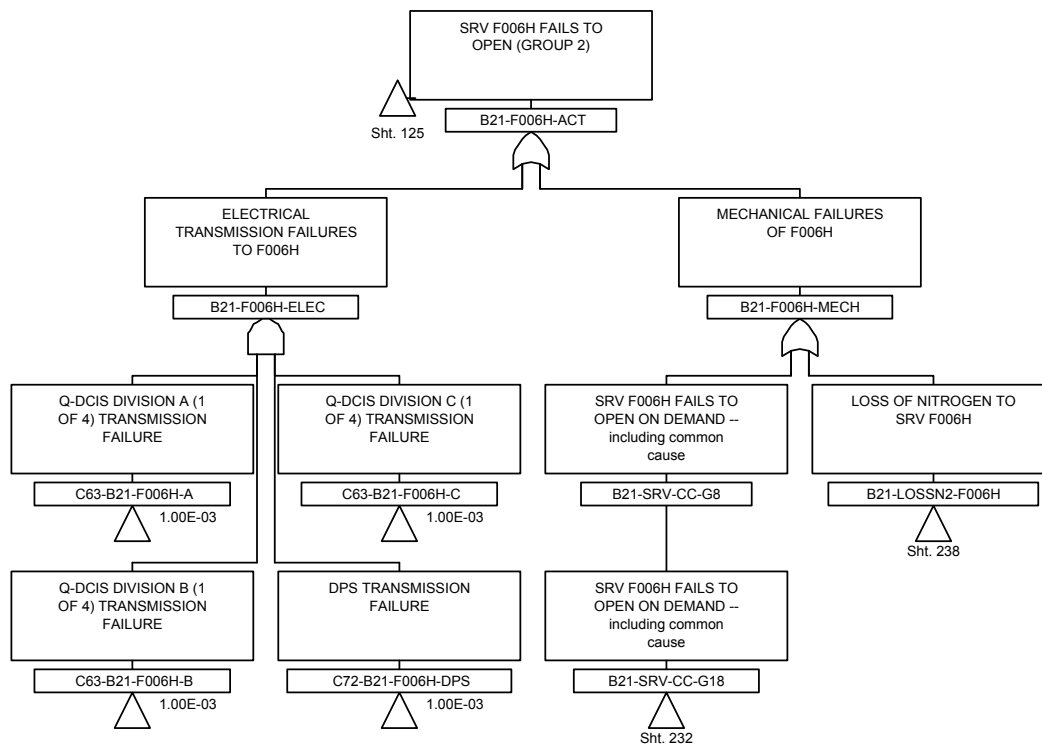


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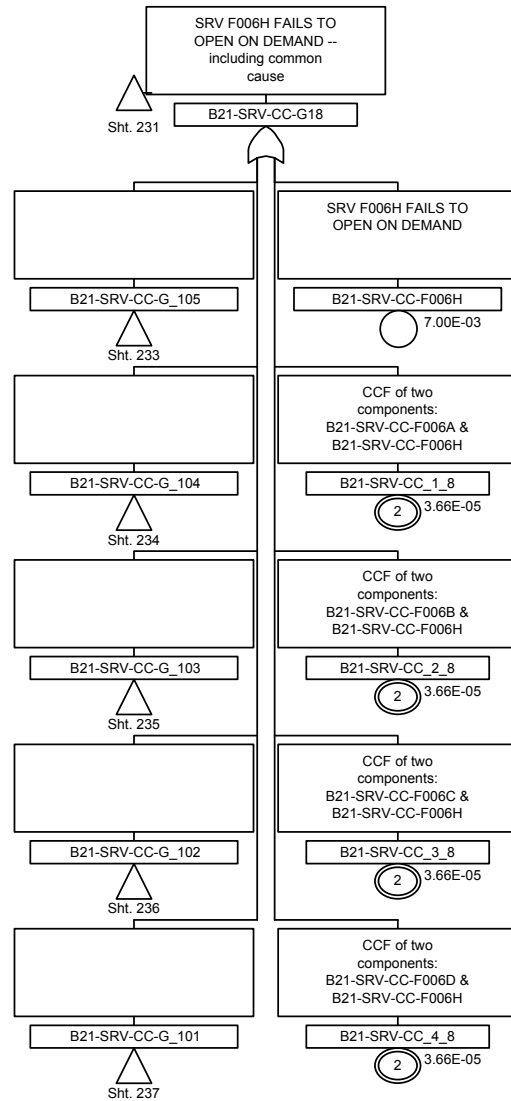


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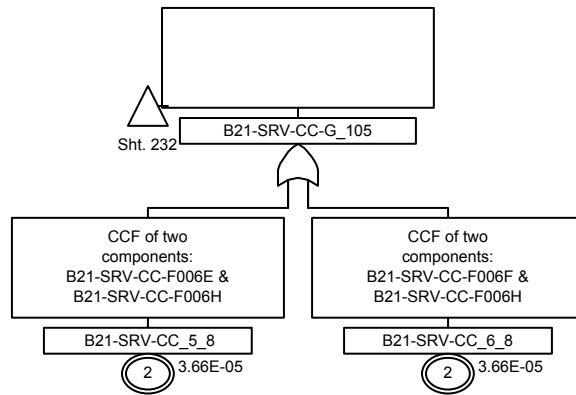


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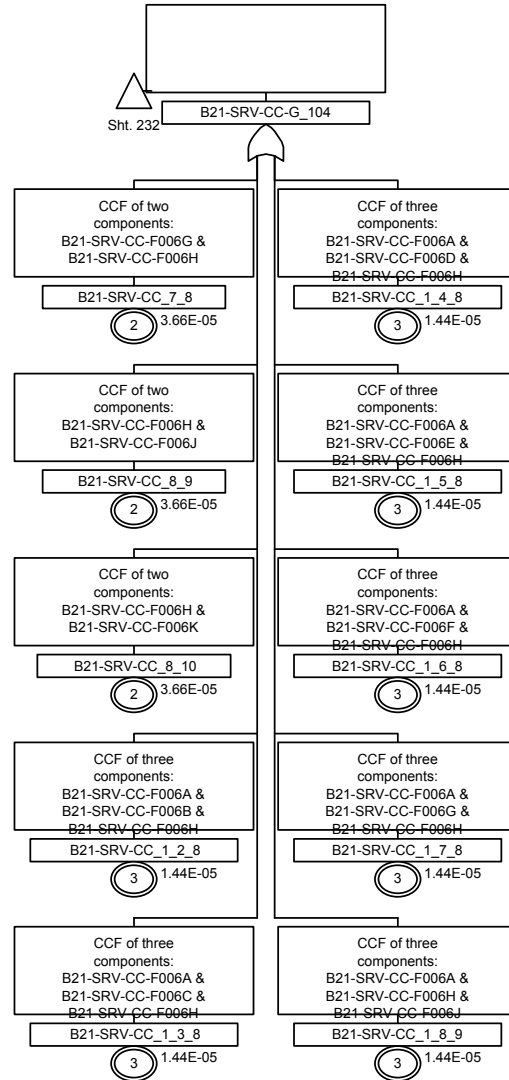


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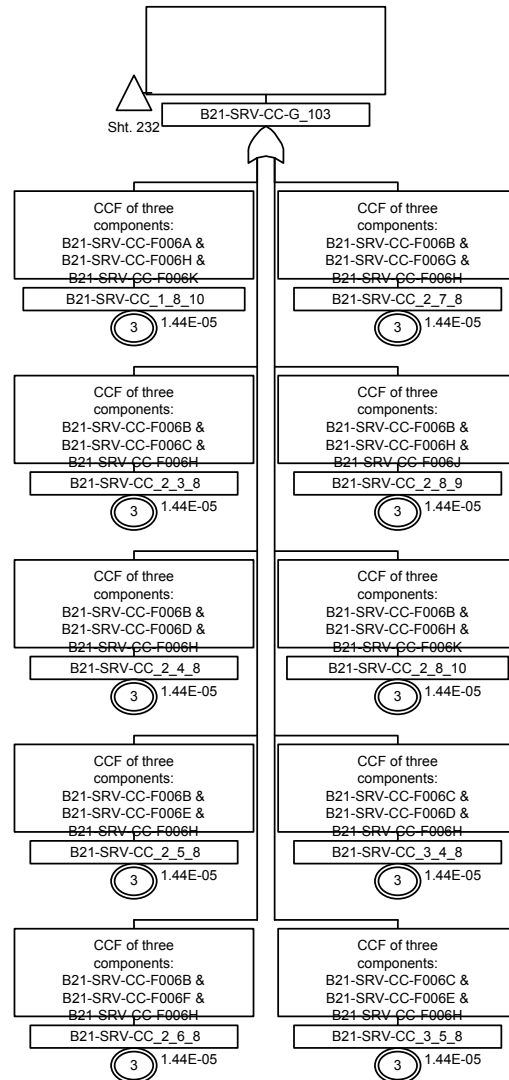


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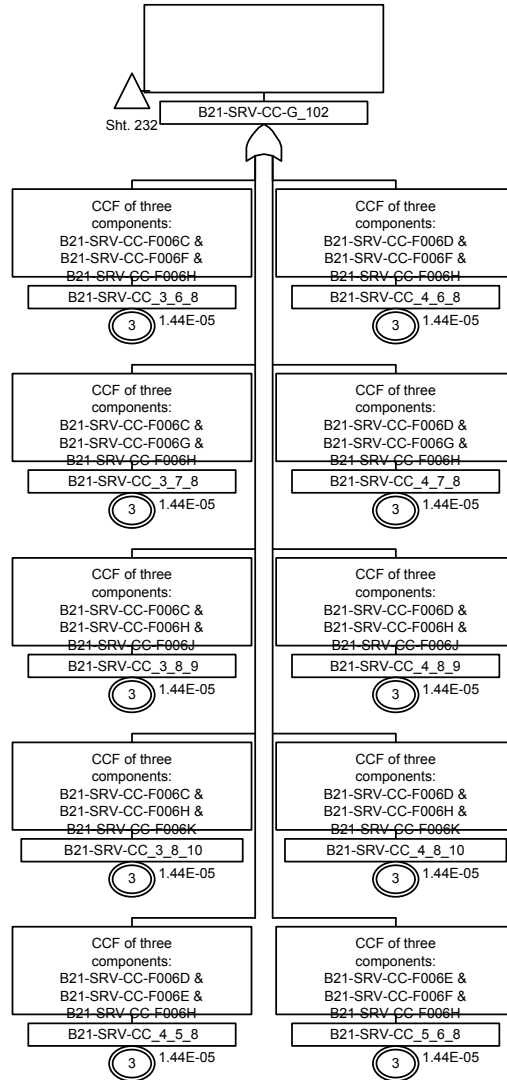


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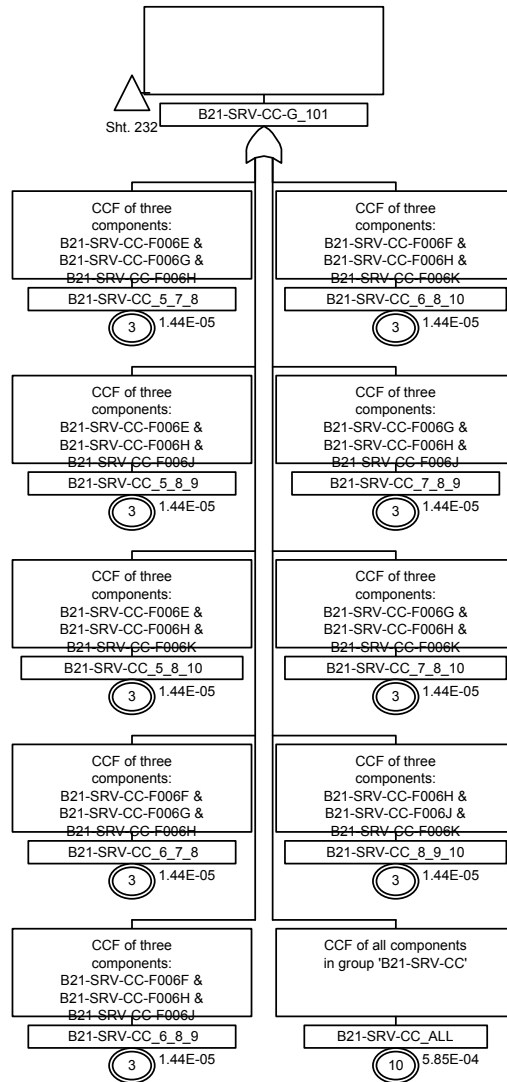


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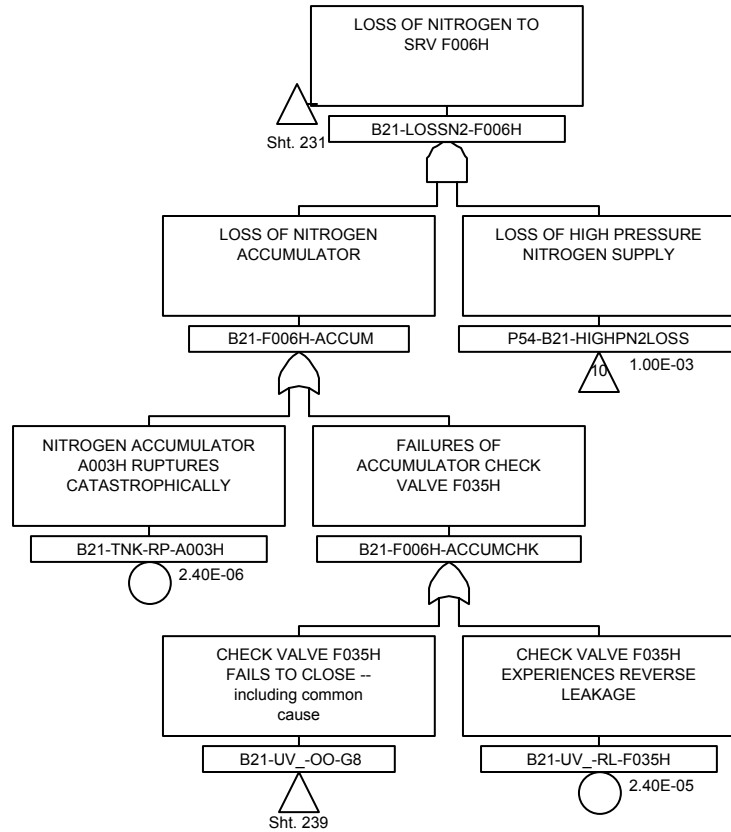


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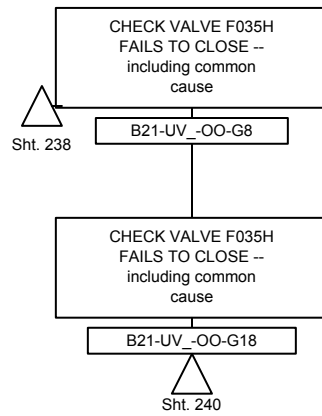


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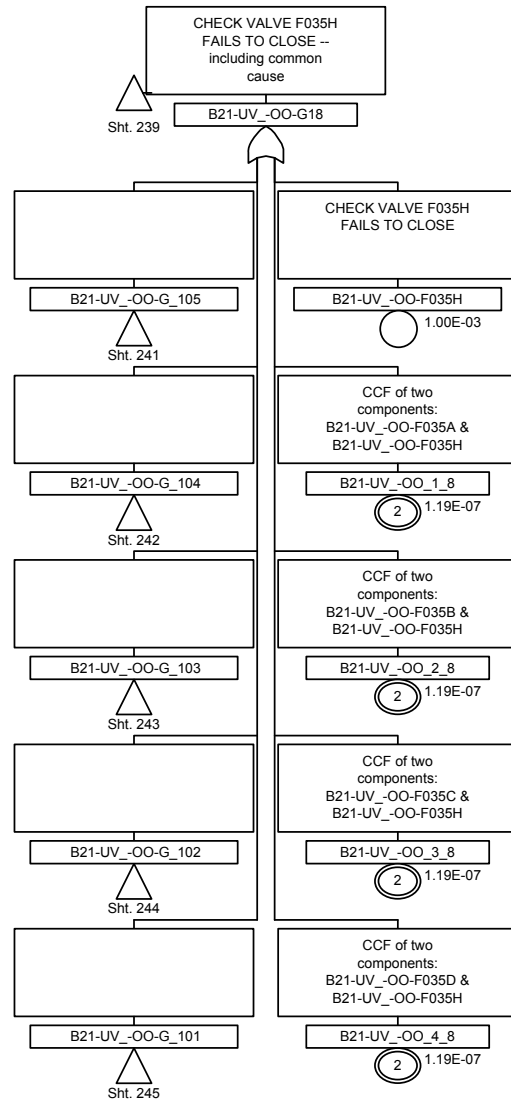


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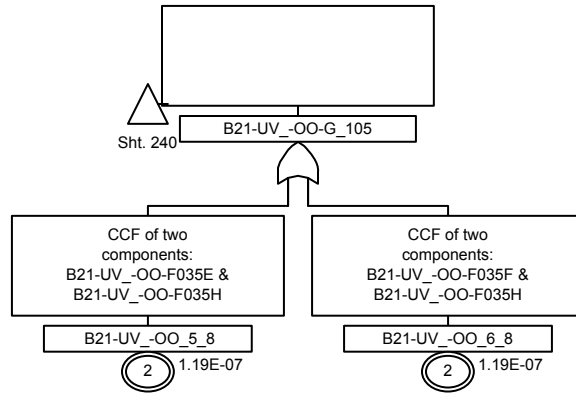


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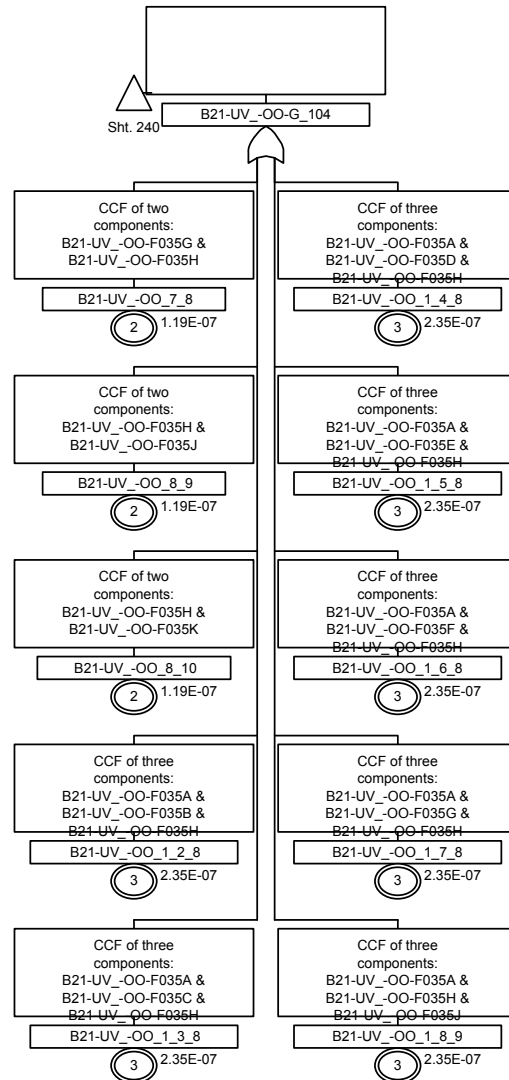
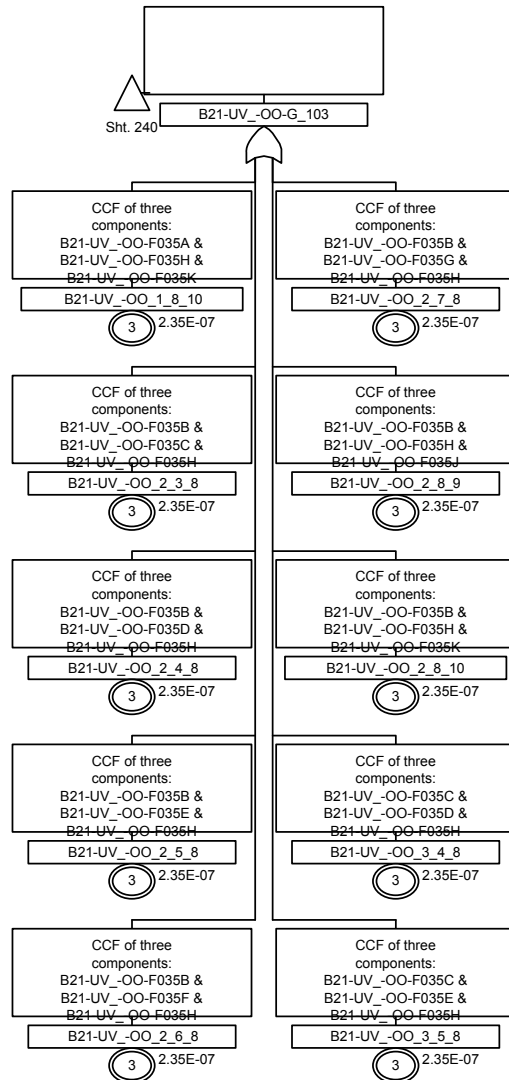


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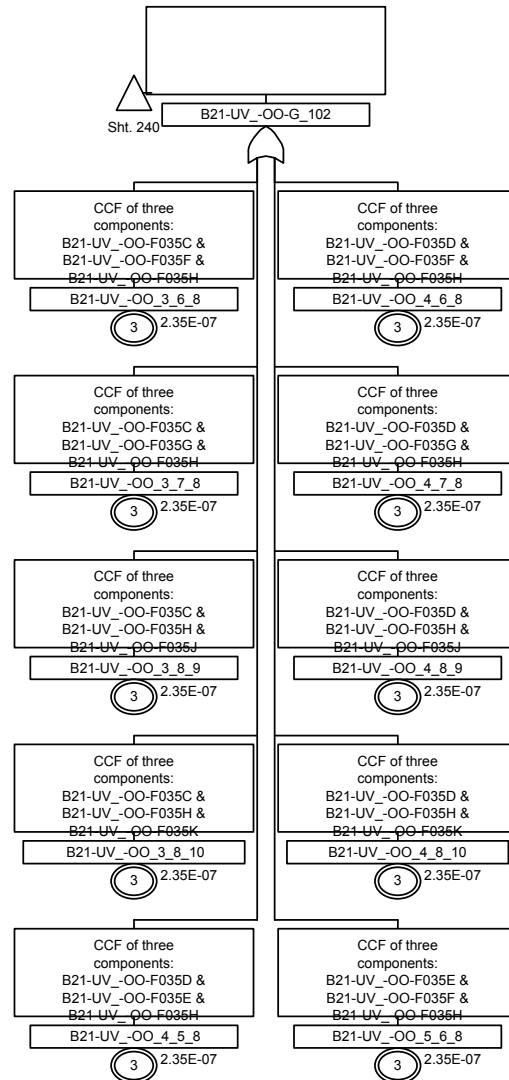


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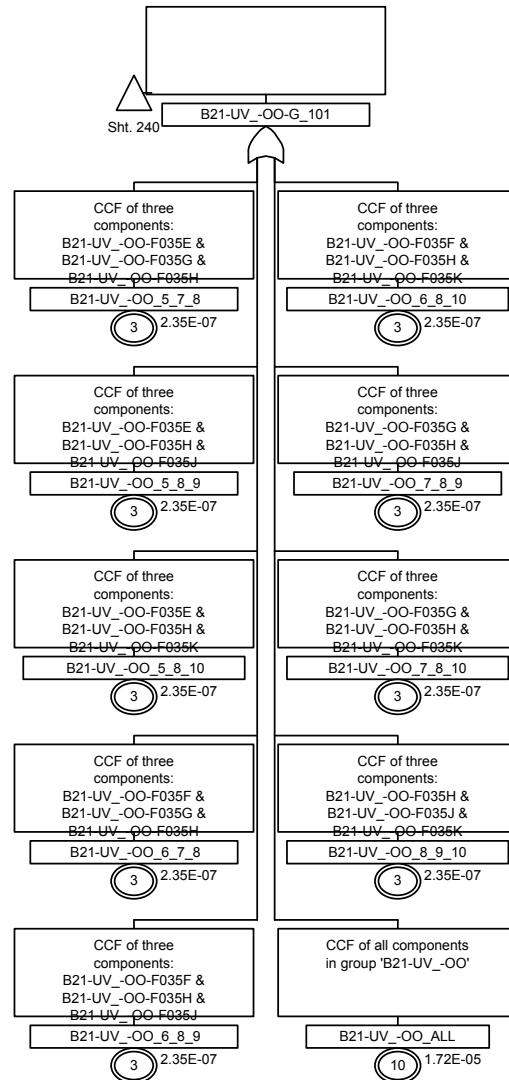


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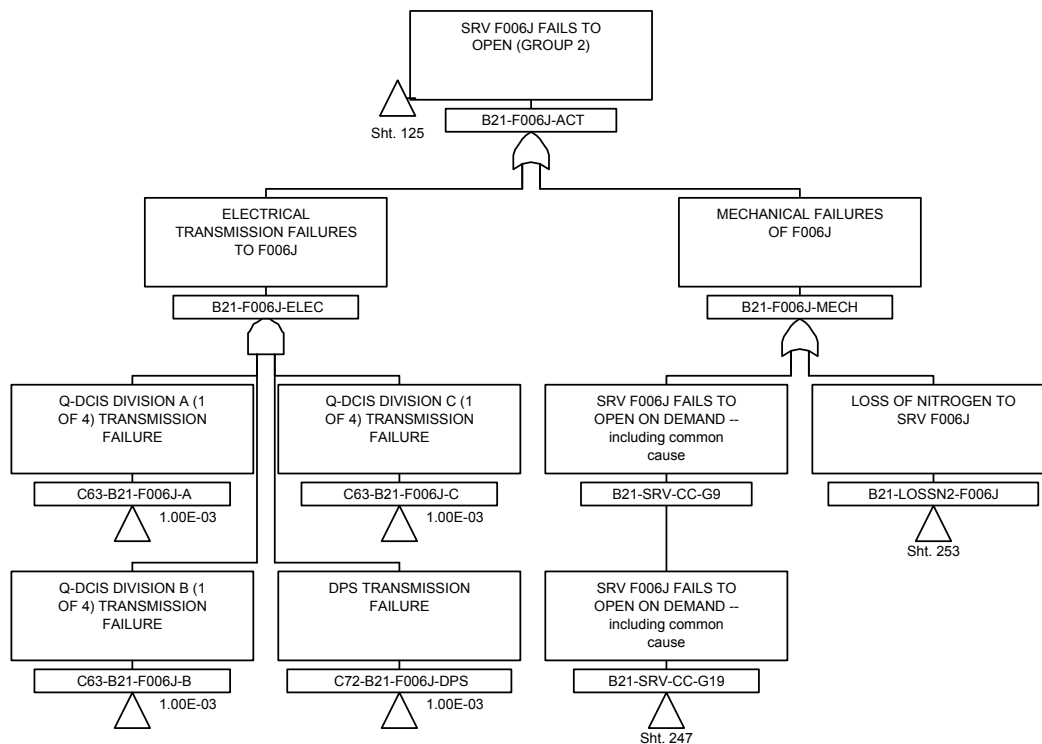


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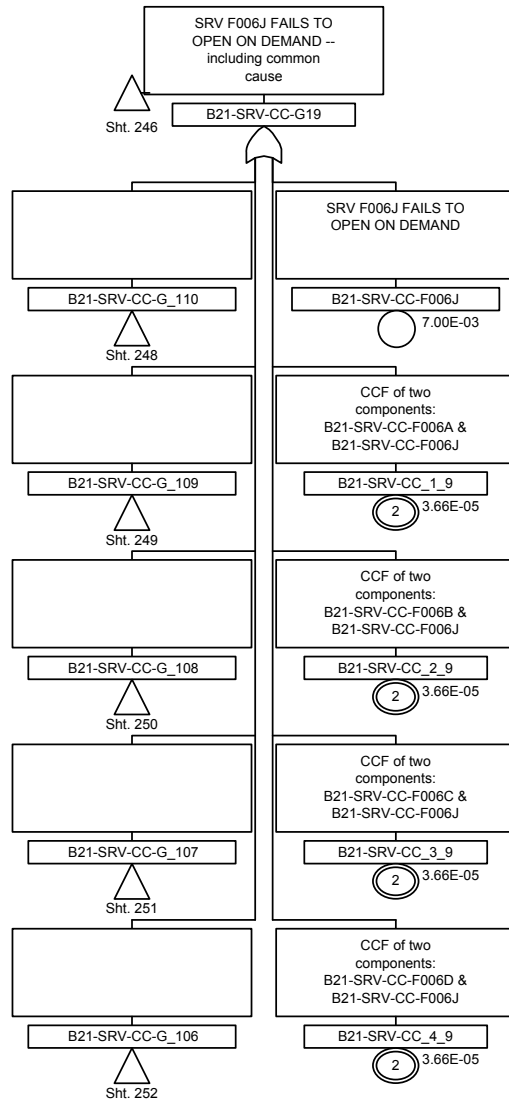


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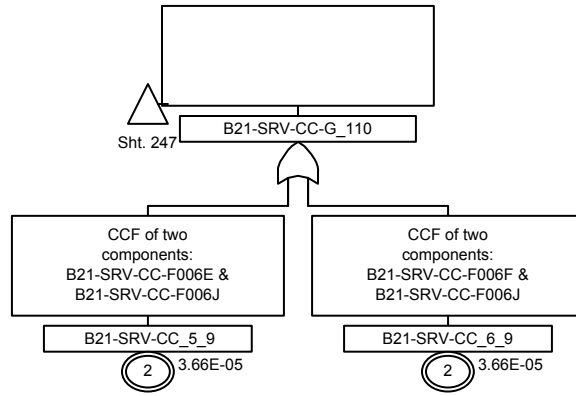
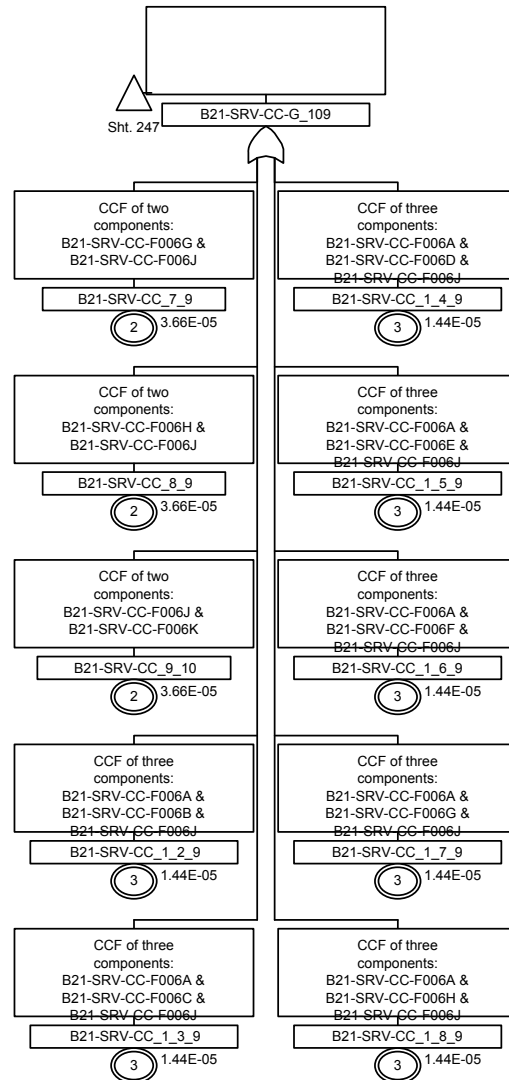


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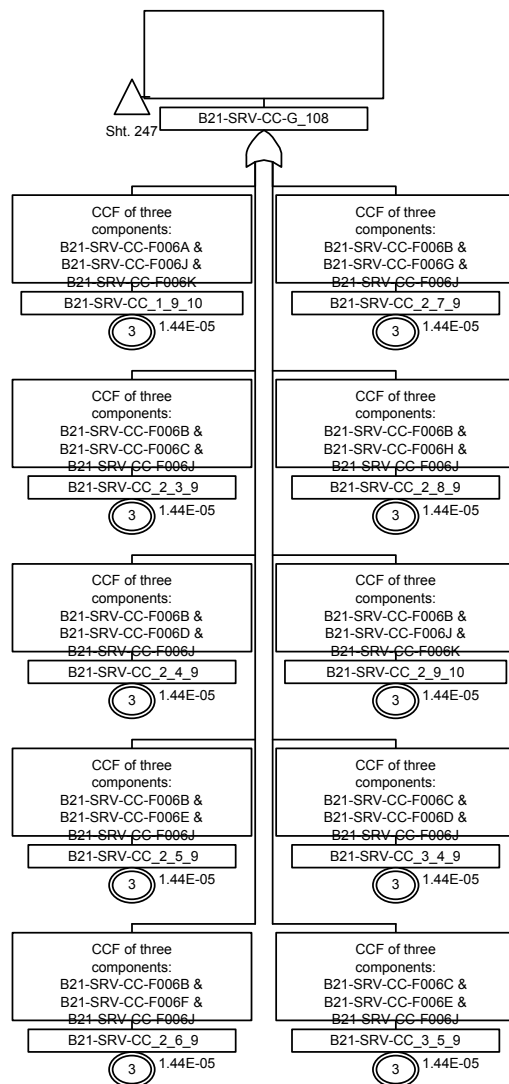


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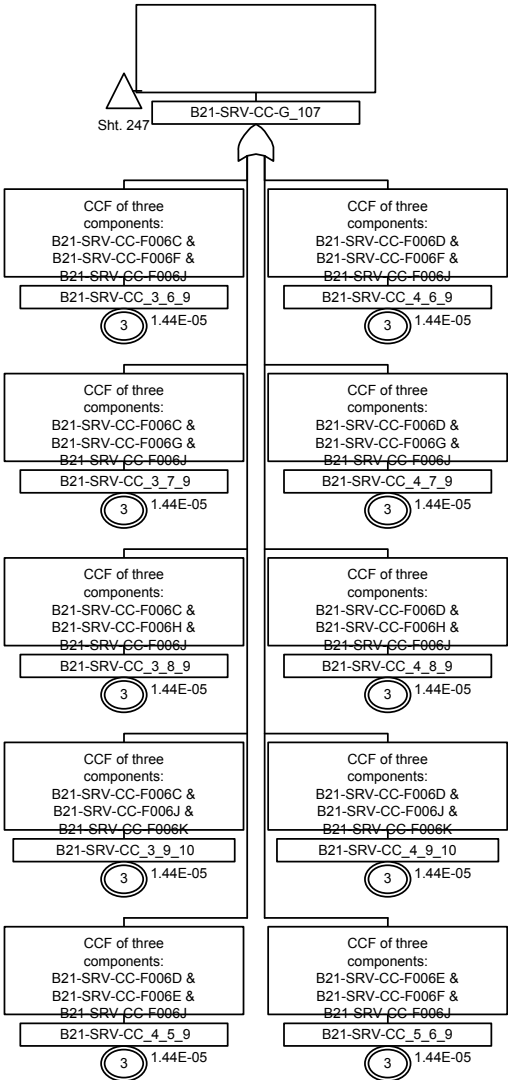


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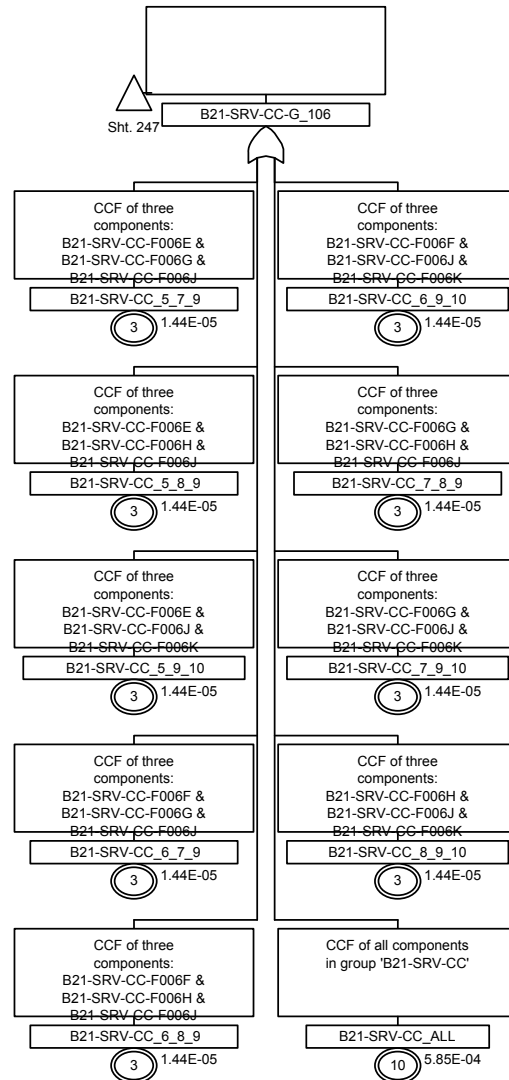


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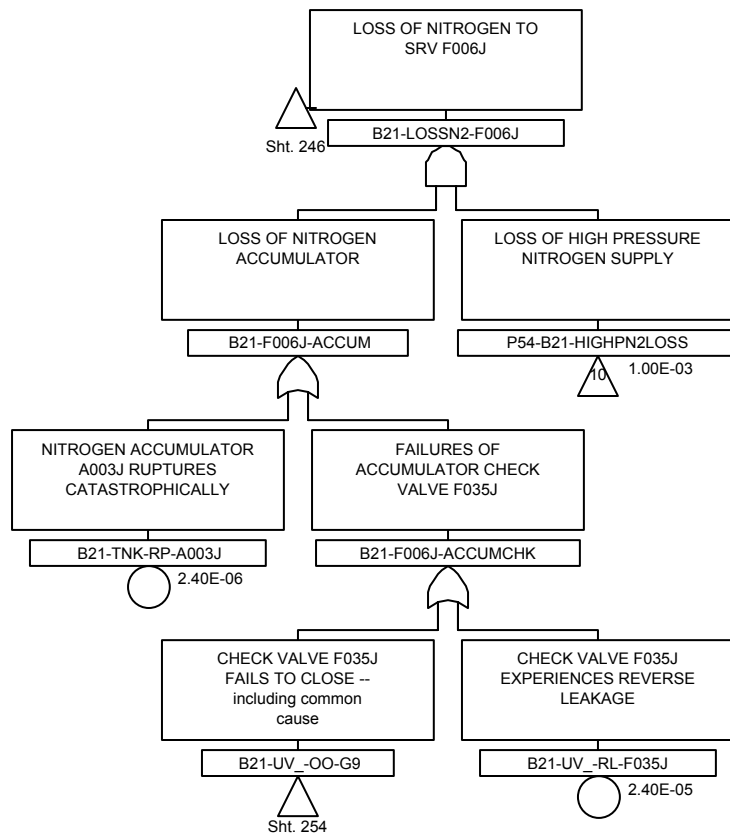


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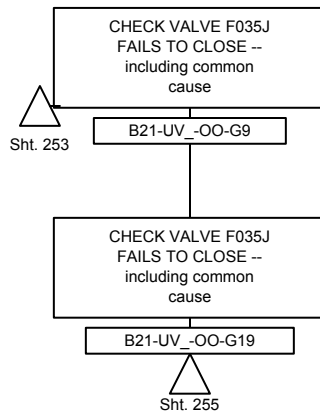


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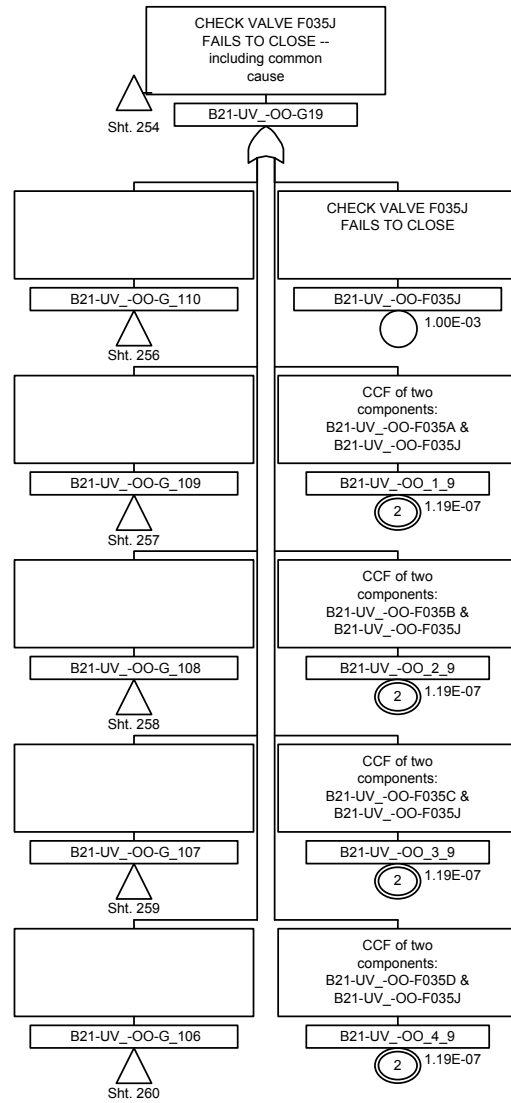


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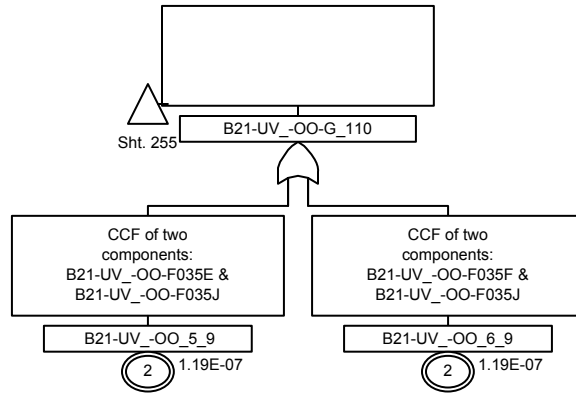


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4.1-311

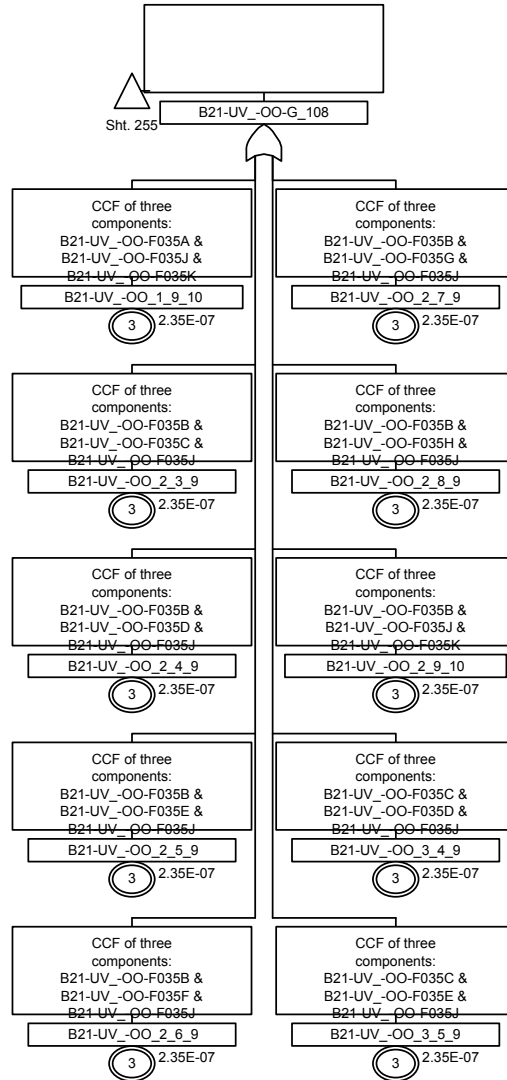


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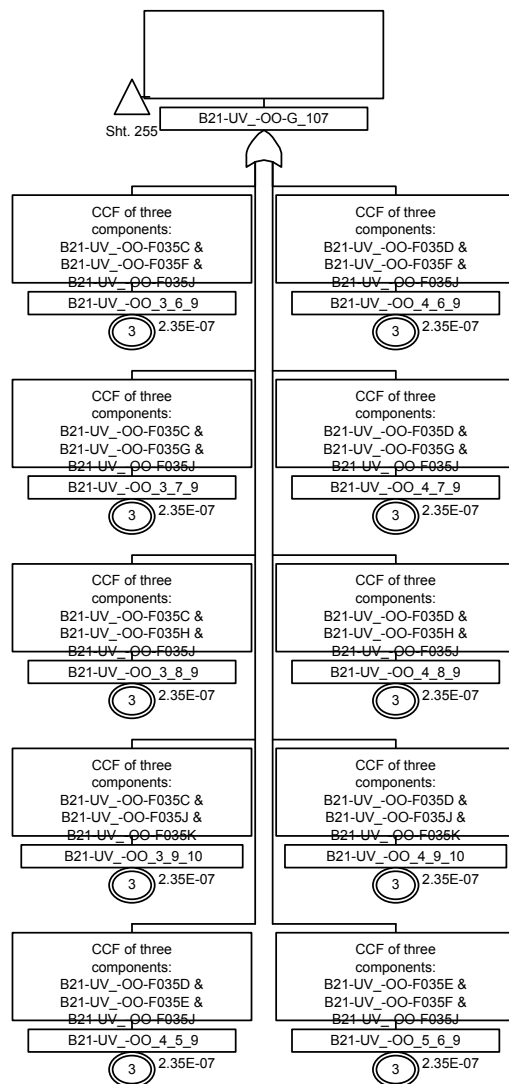


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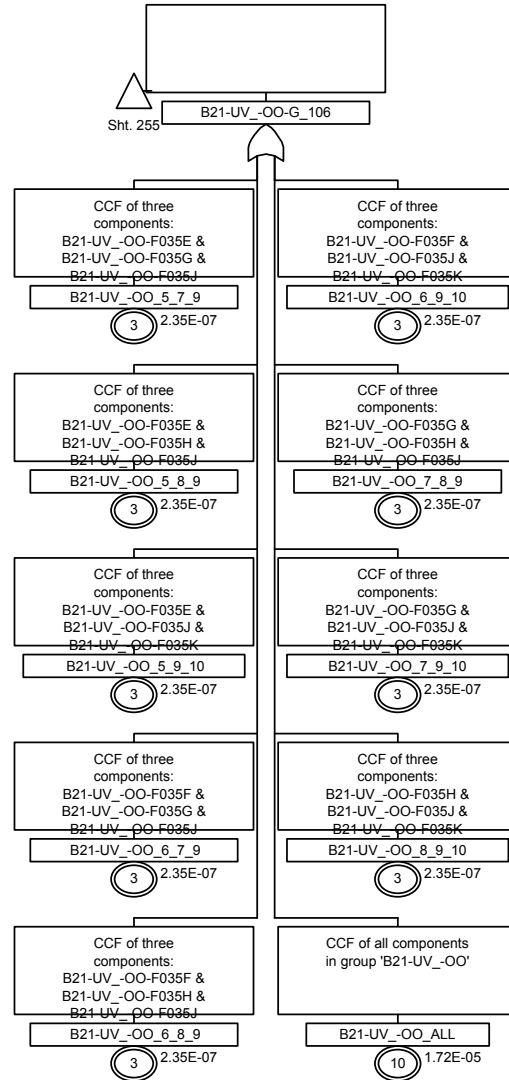


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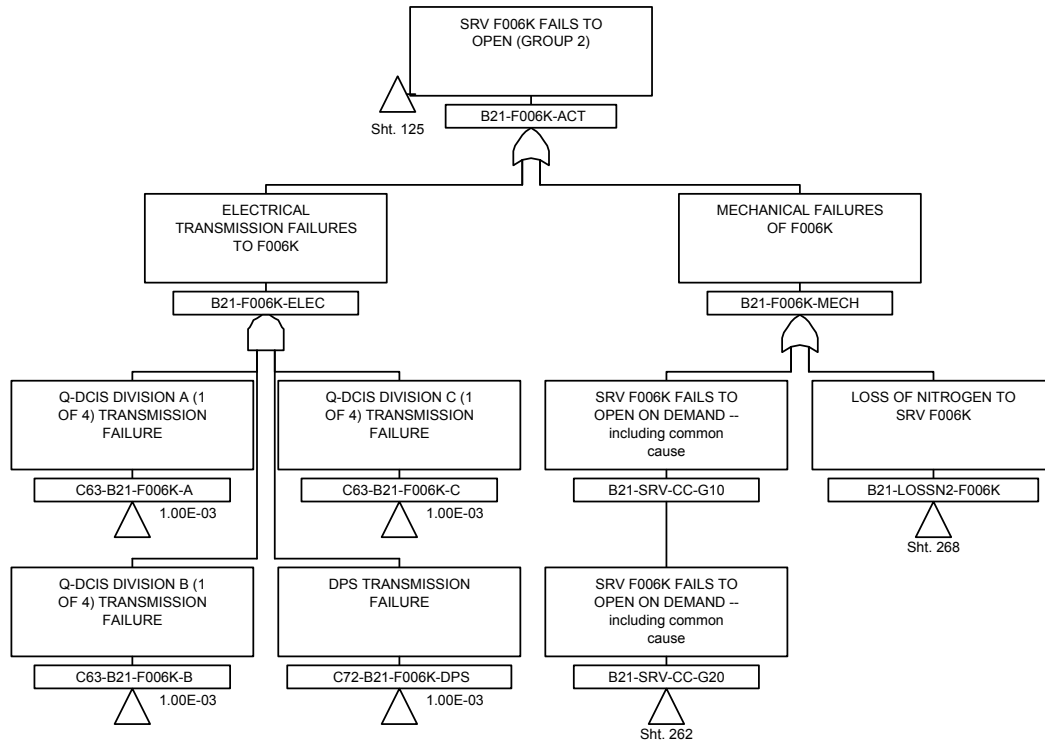


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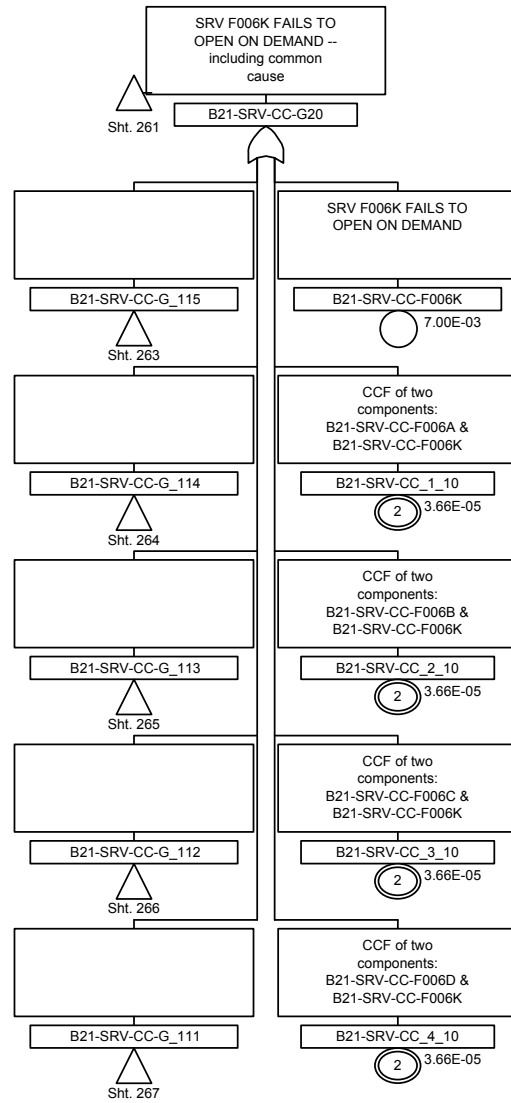


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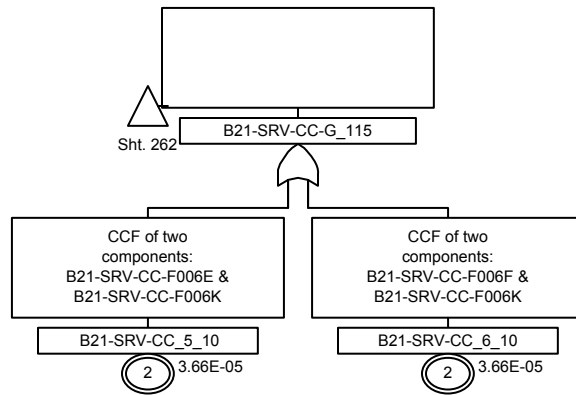


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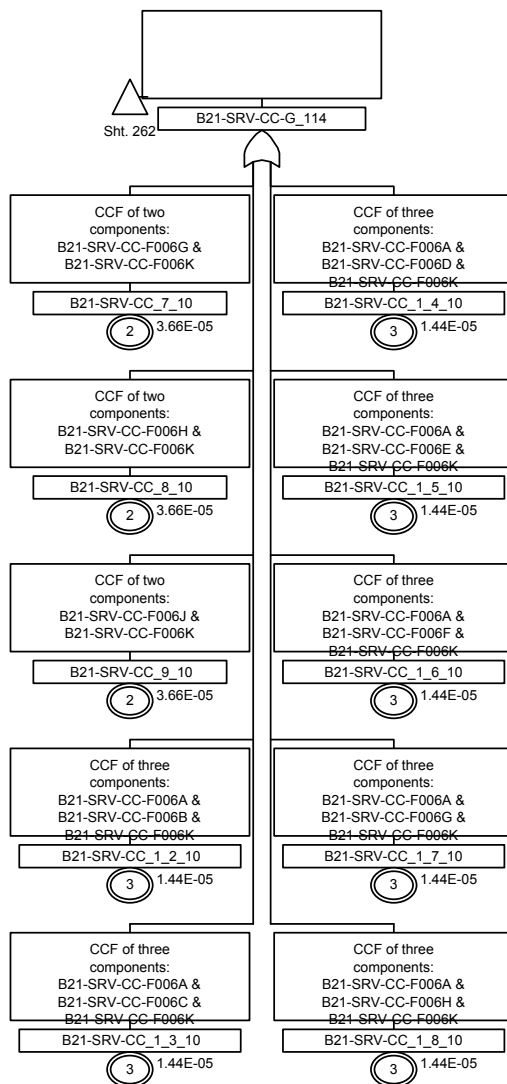


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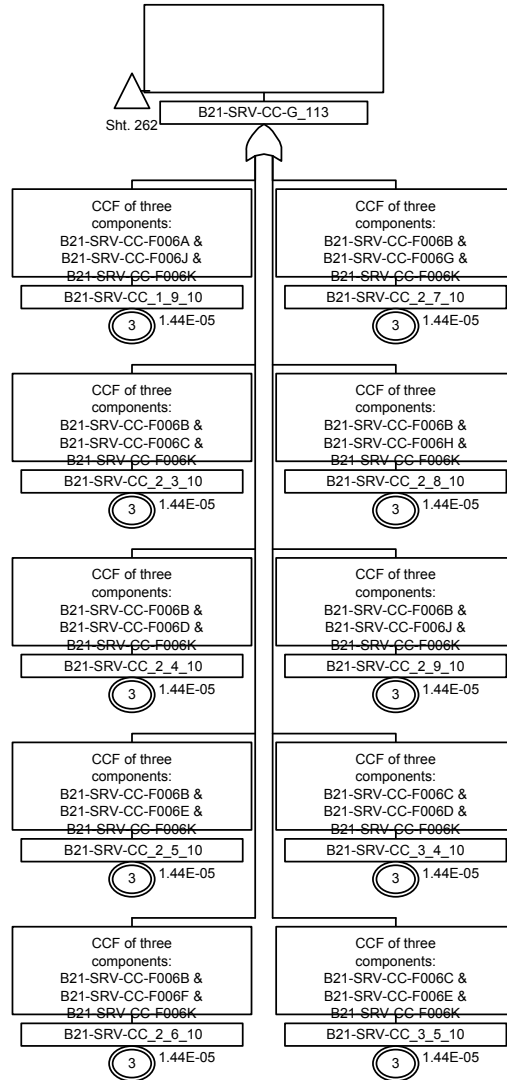
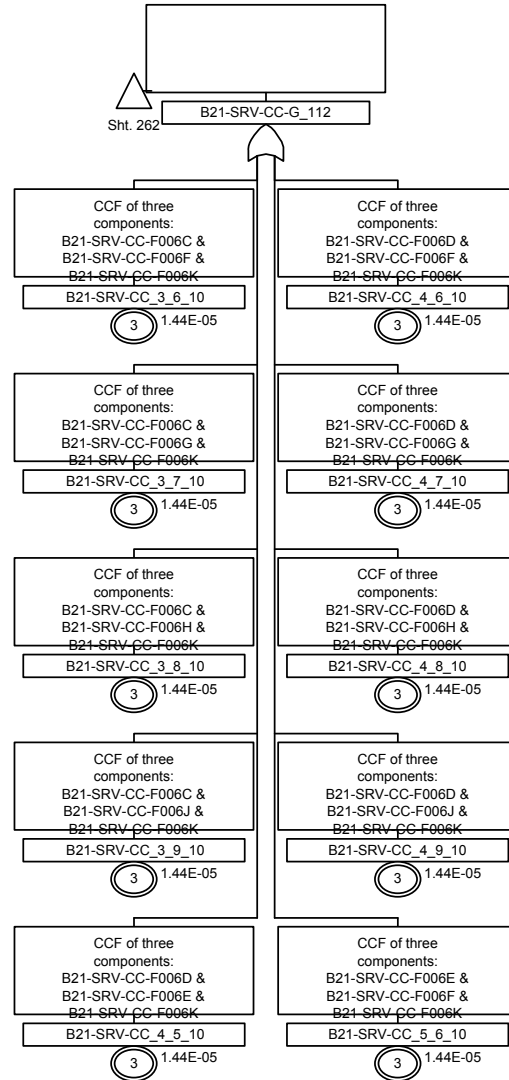


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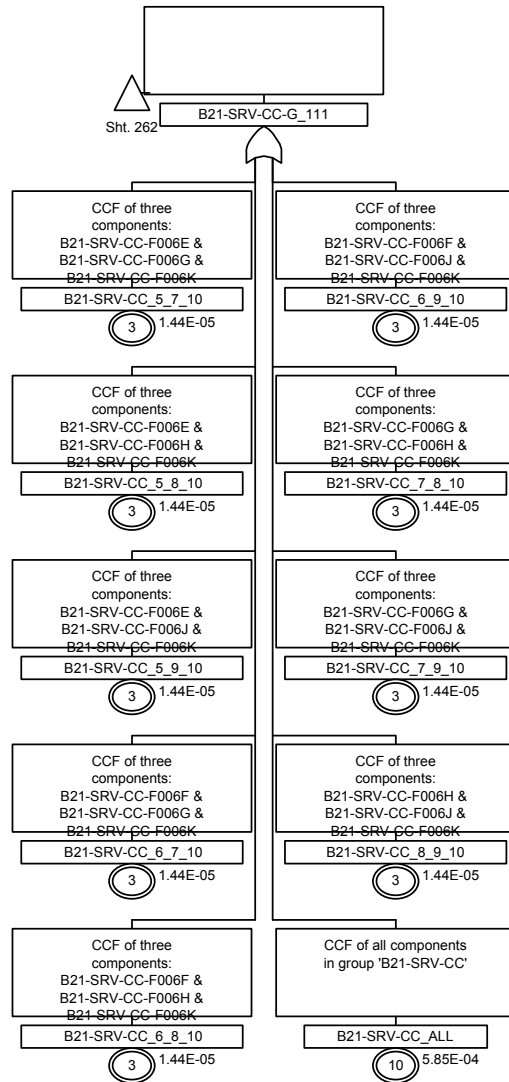


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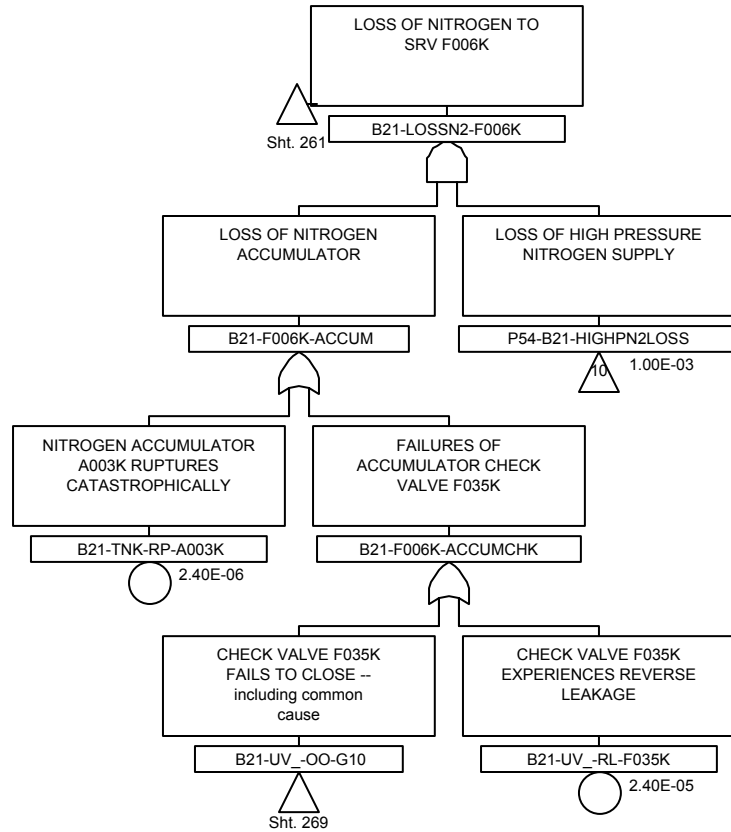


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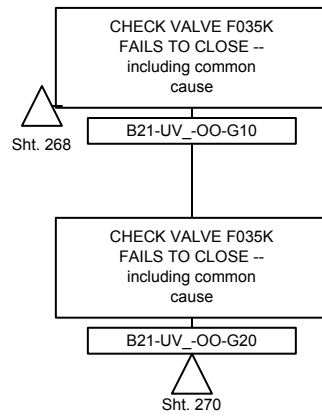


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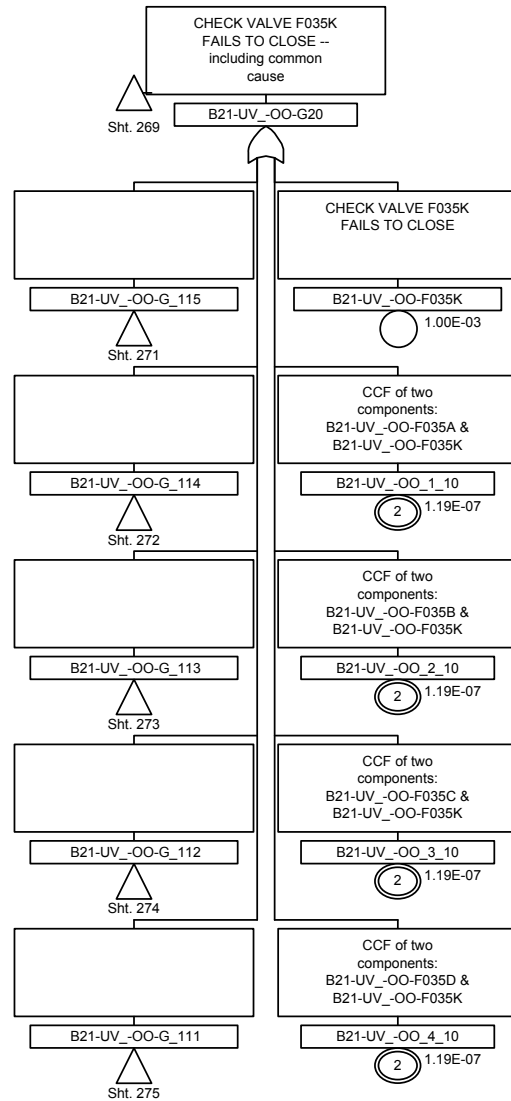


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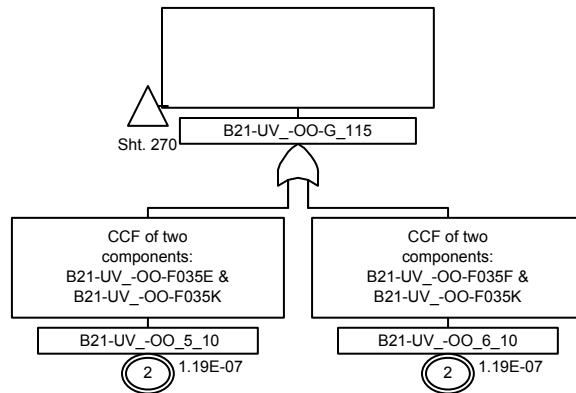


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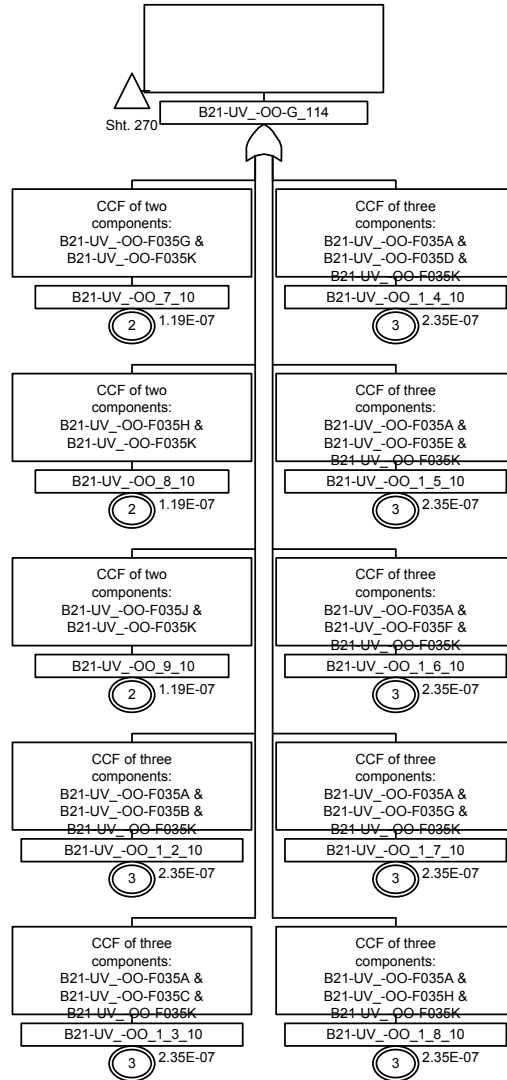


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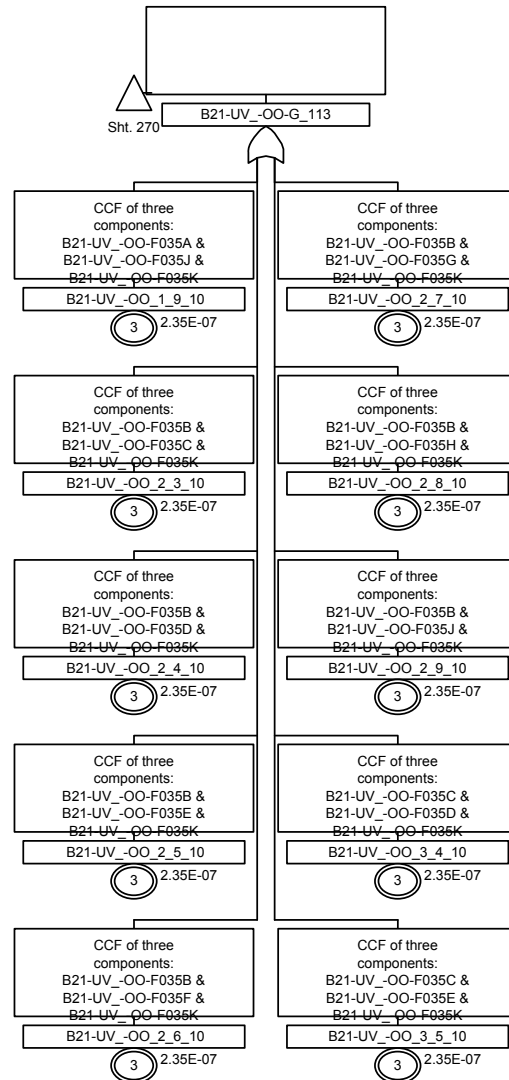


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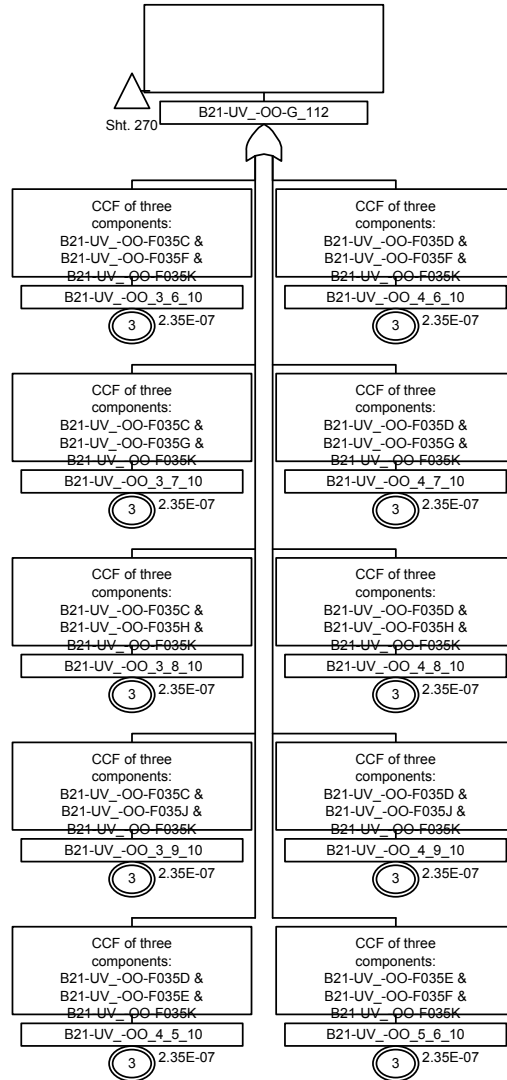


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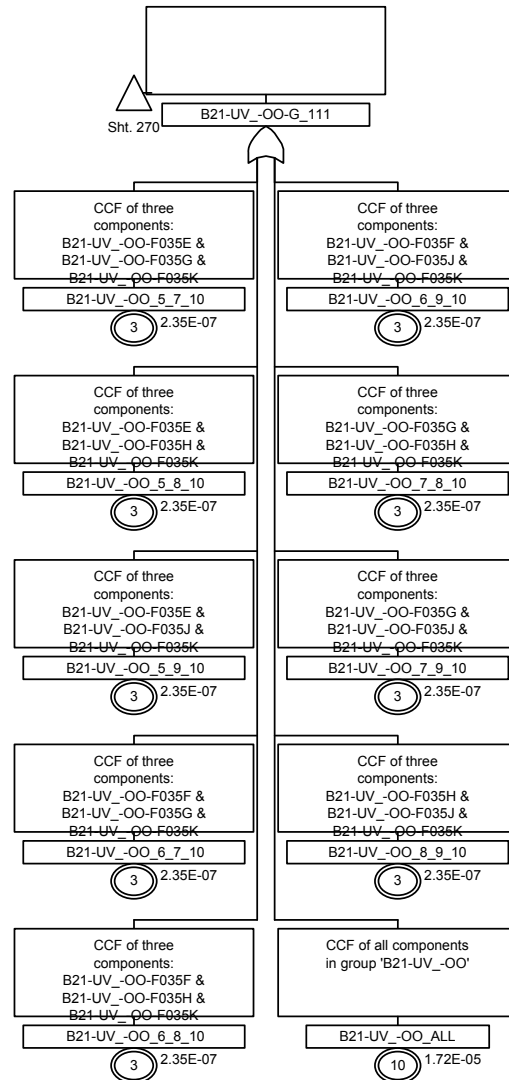


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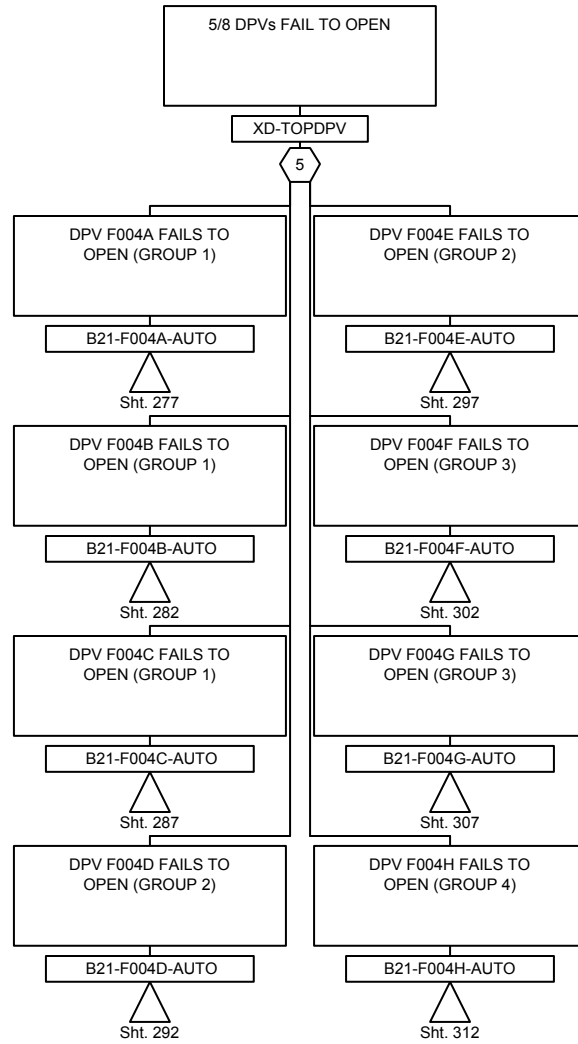


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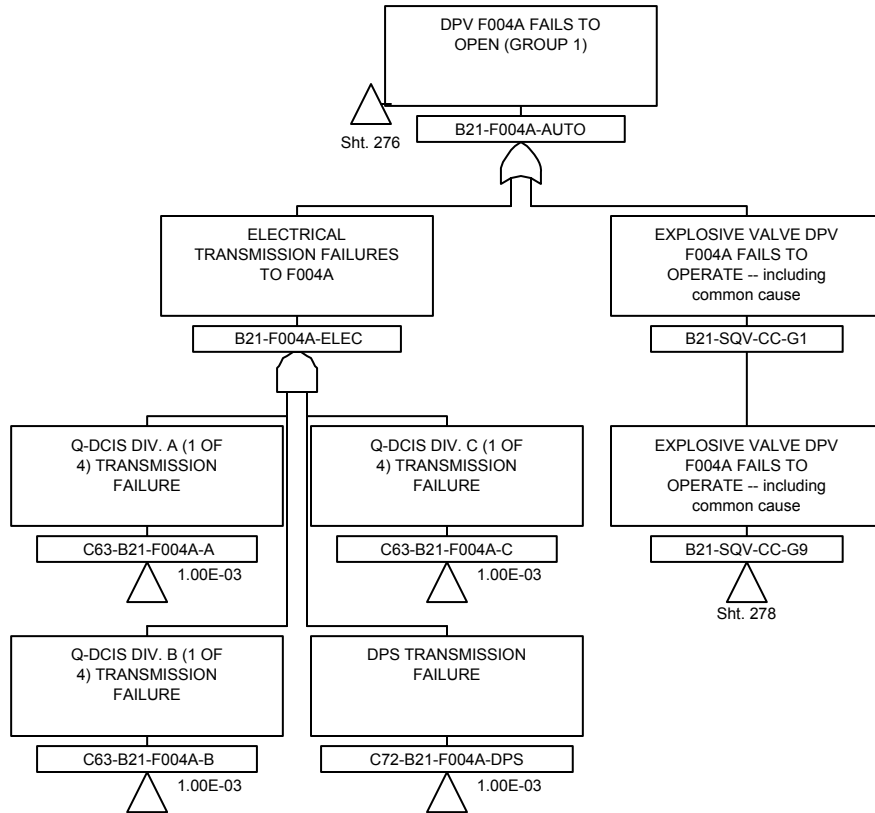


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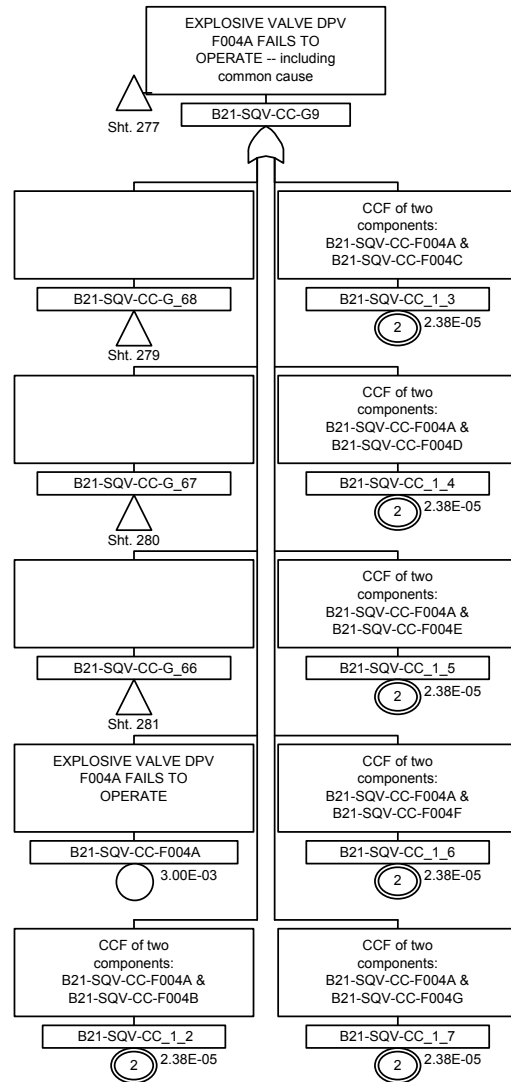


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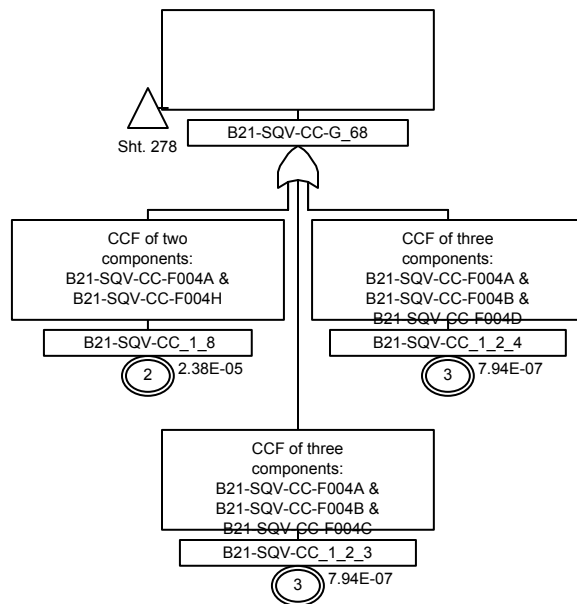


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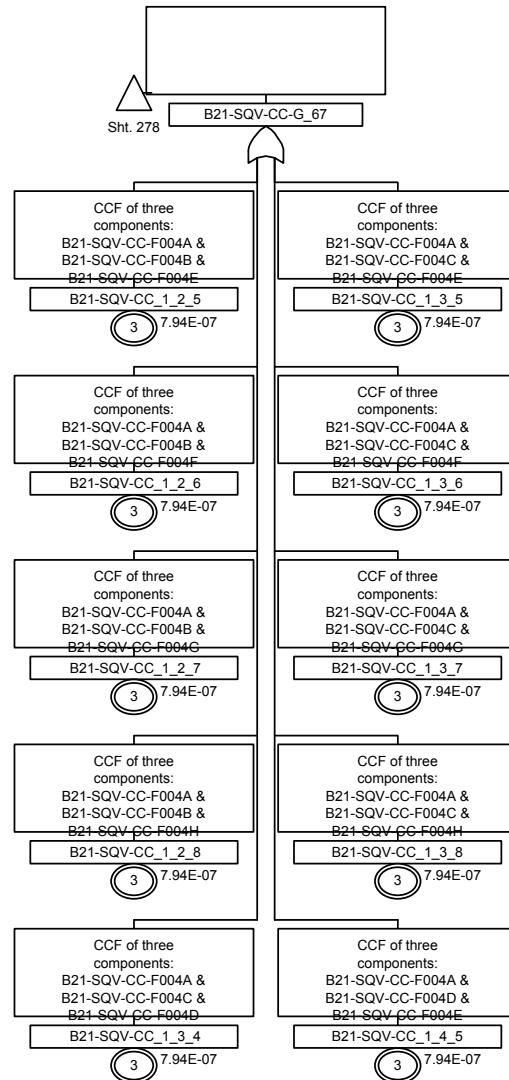


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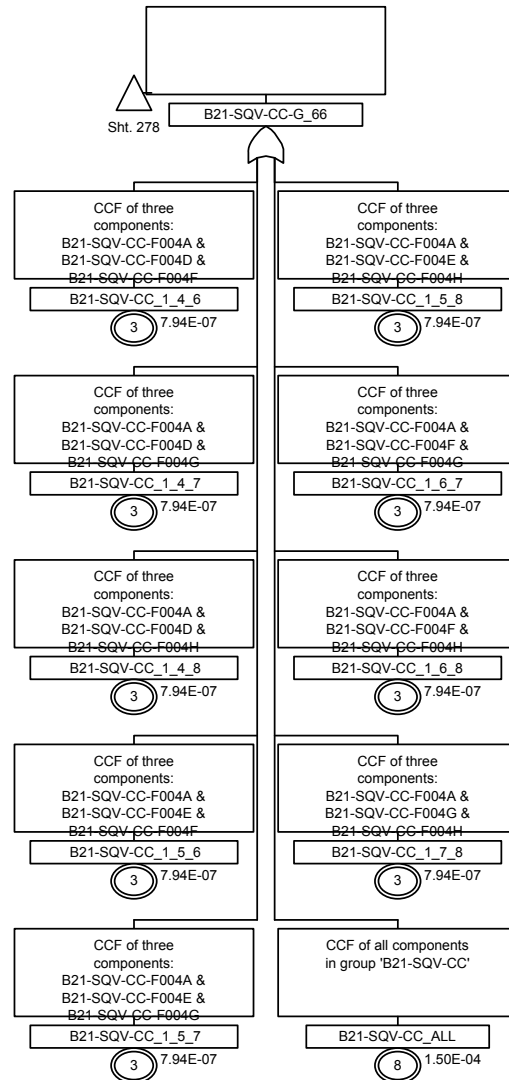


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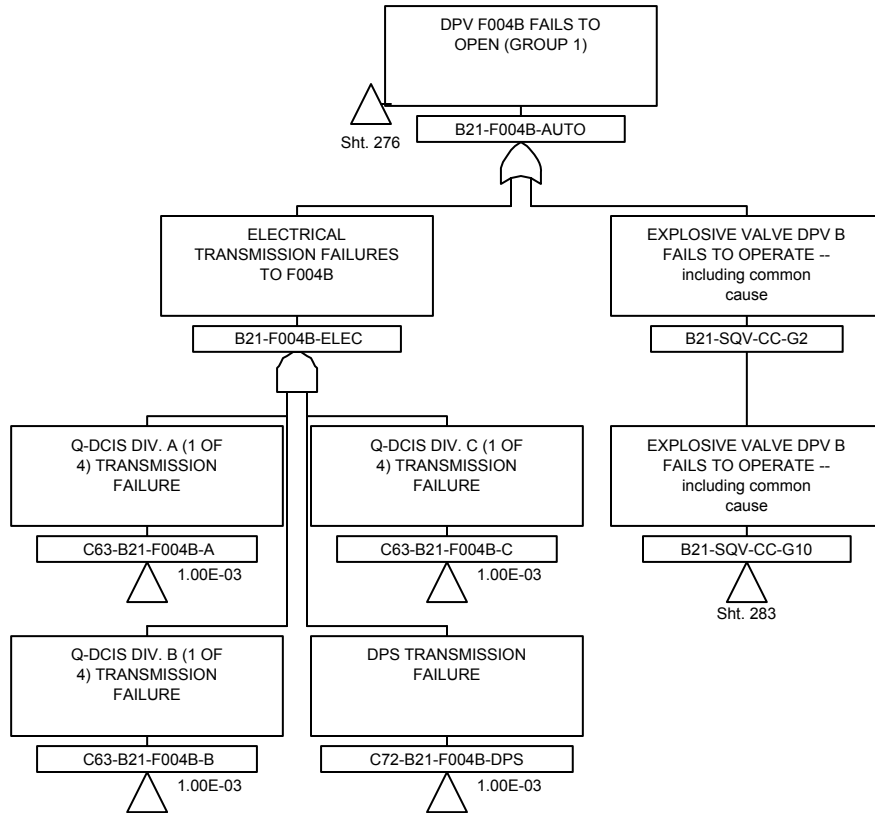


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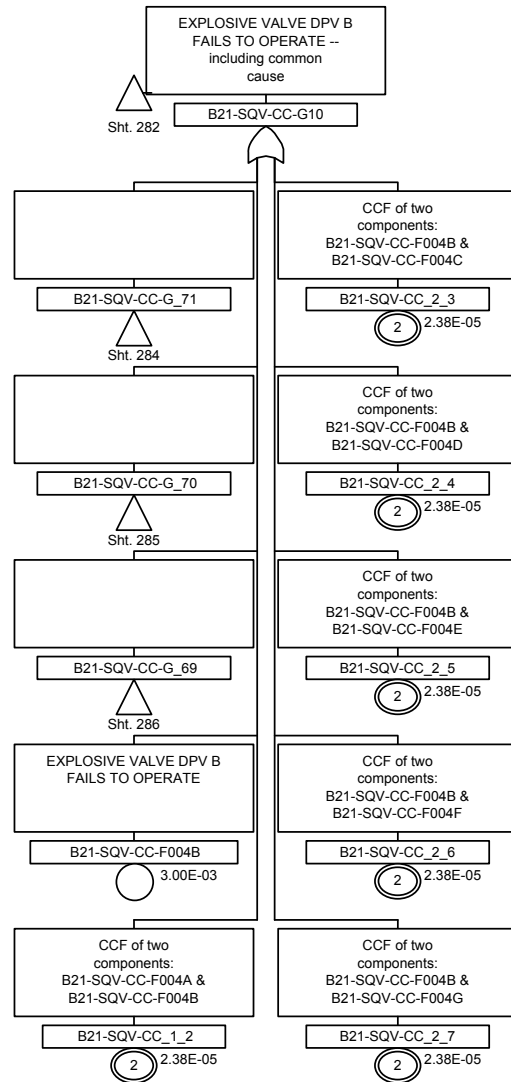


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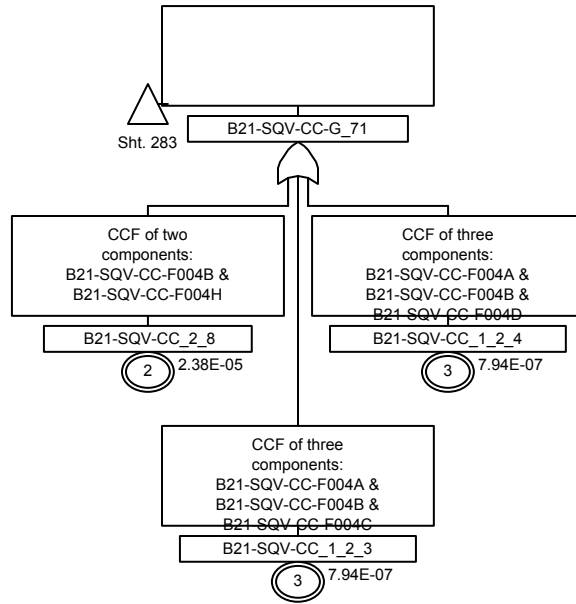


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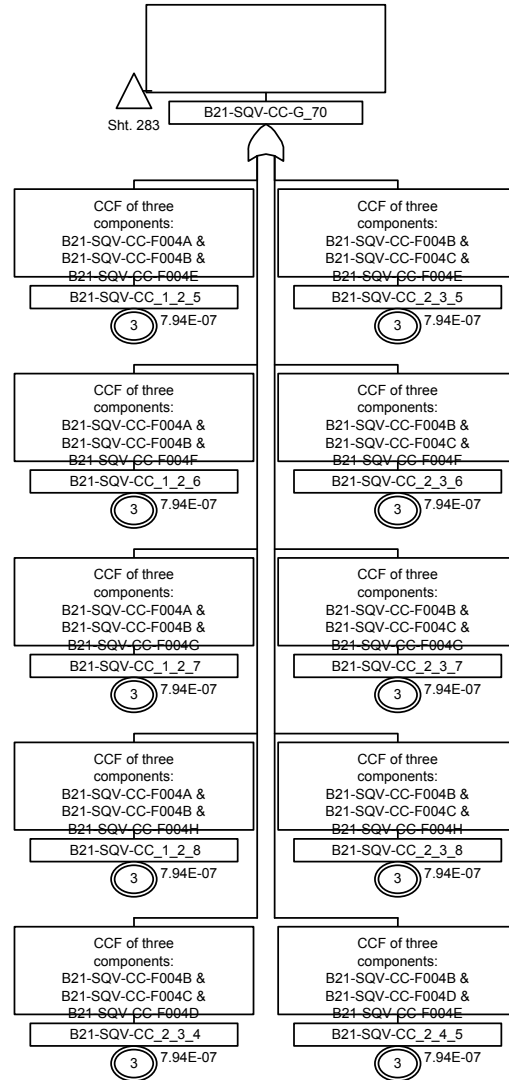


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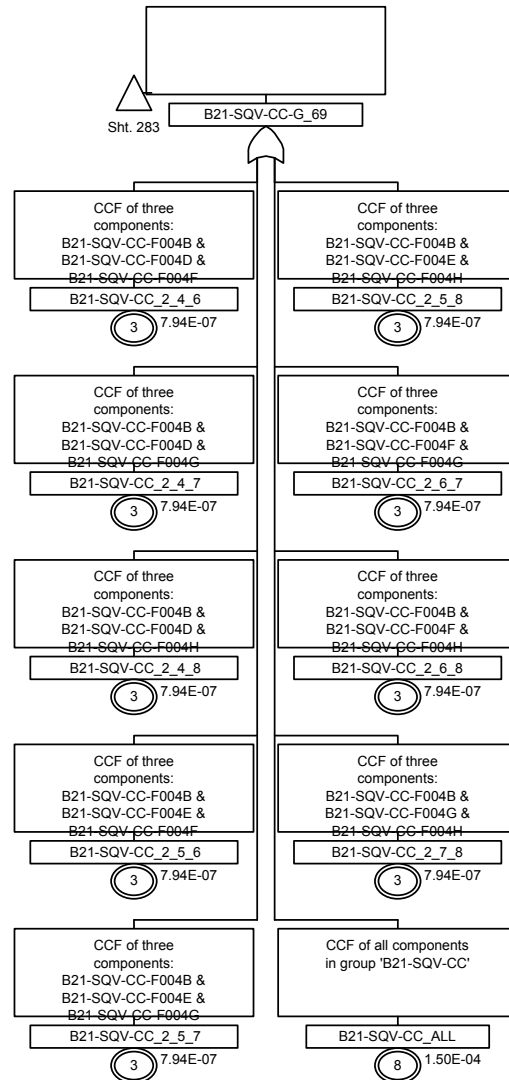


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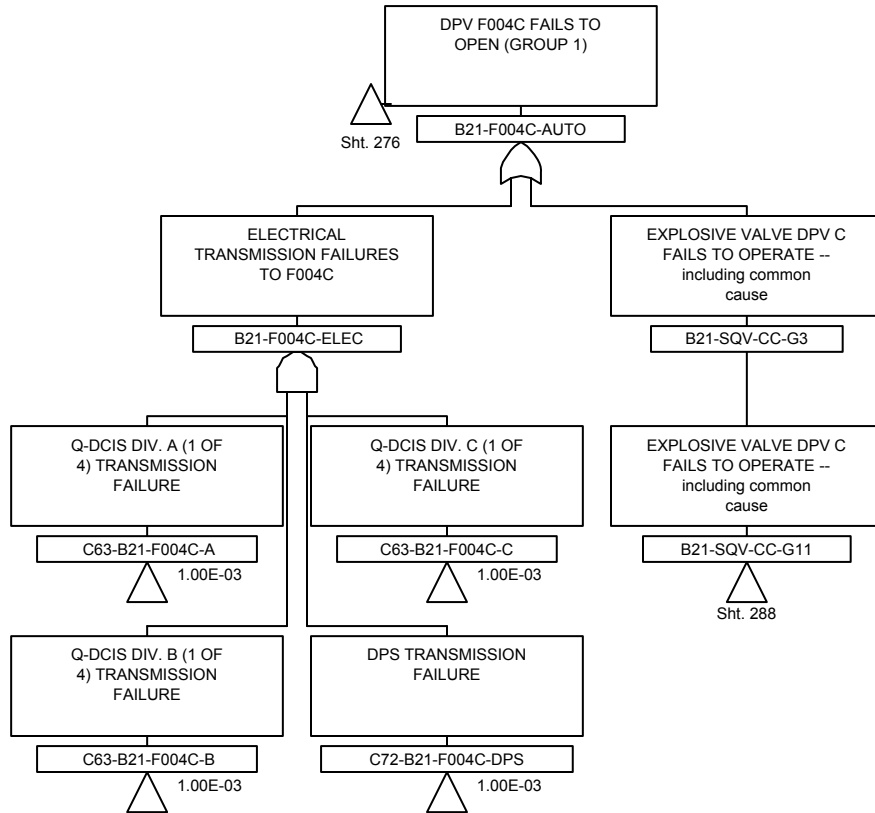


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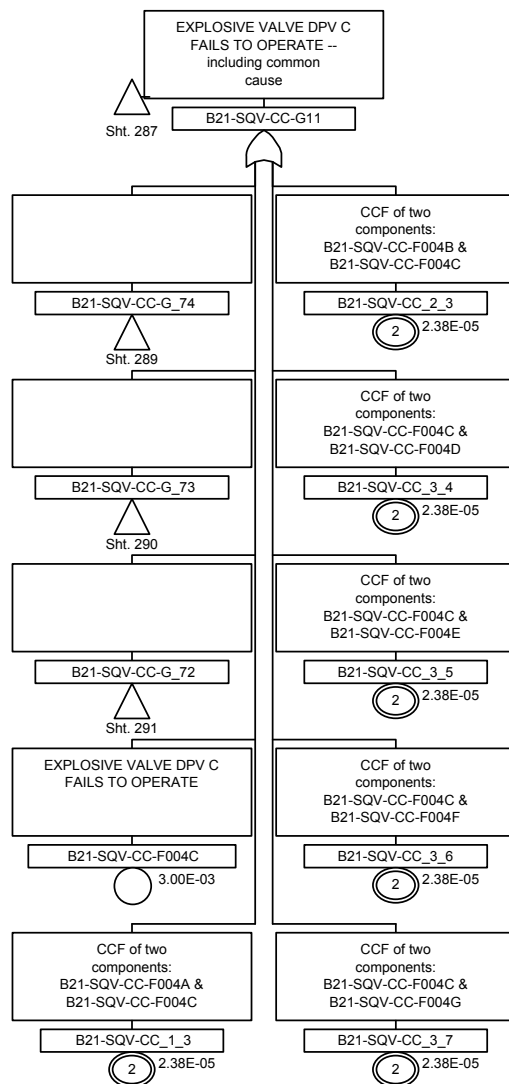


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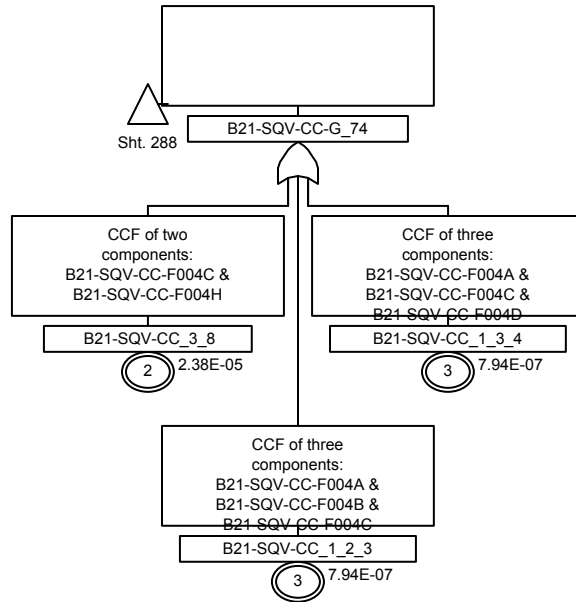


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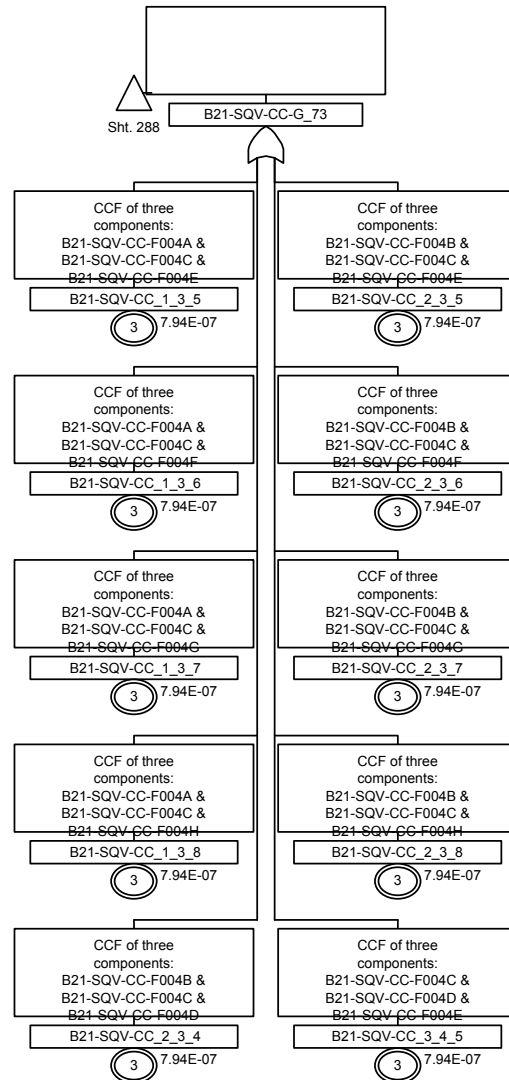


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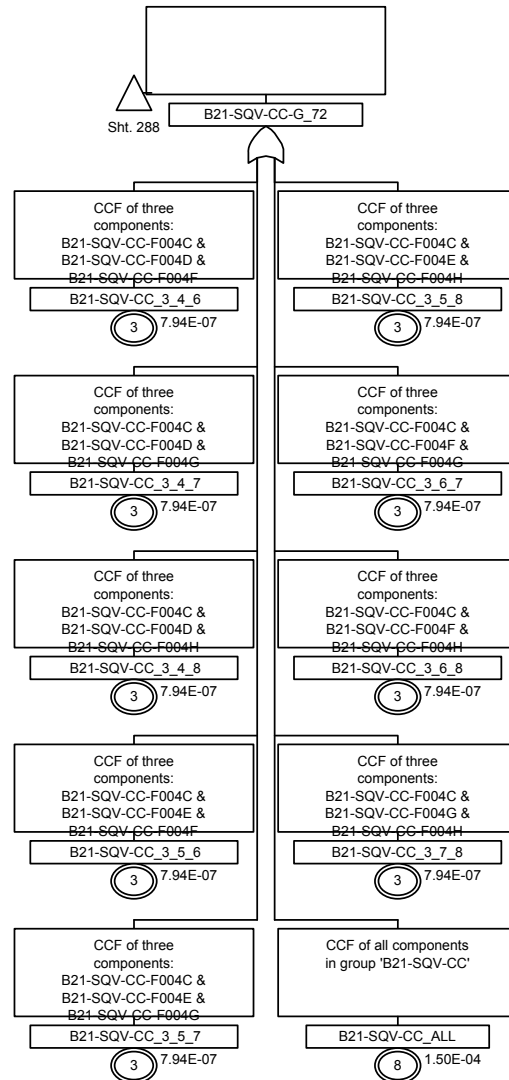


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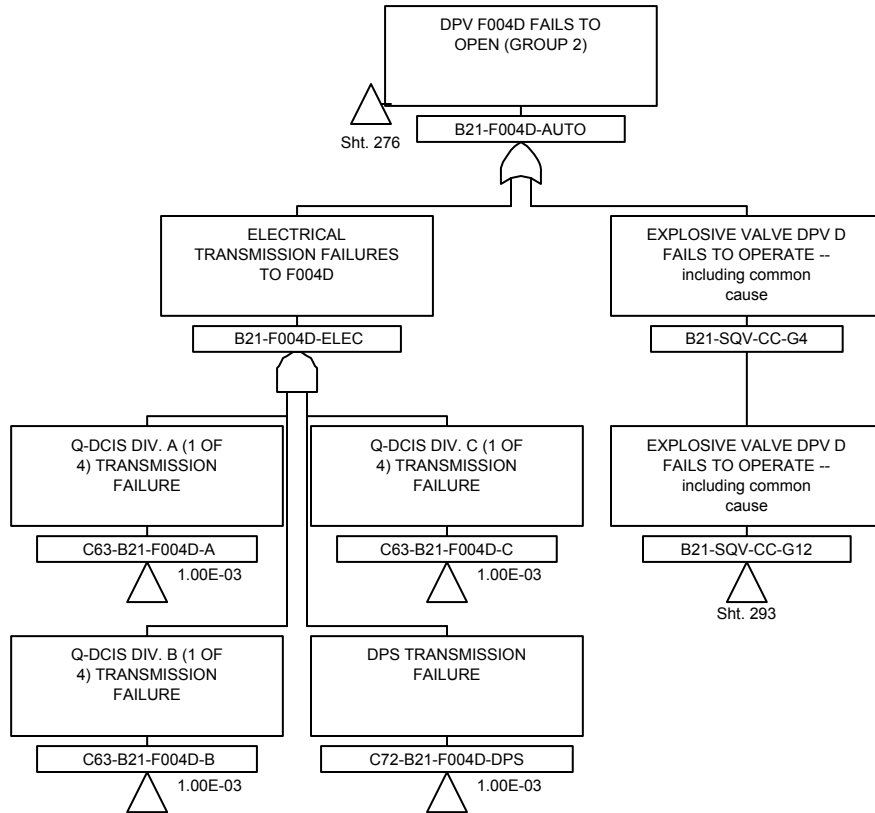


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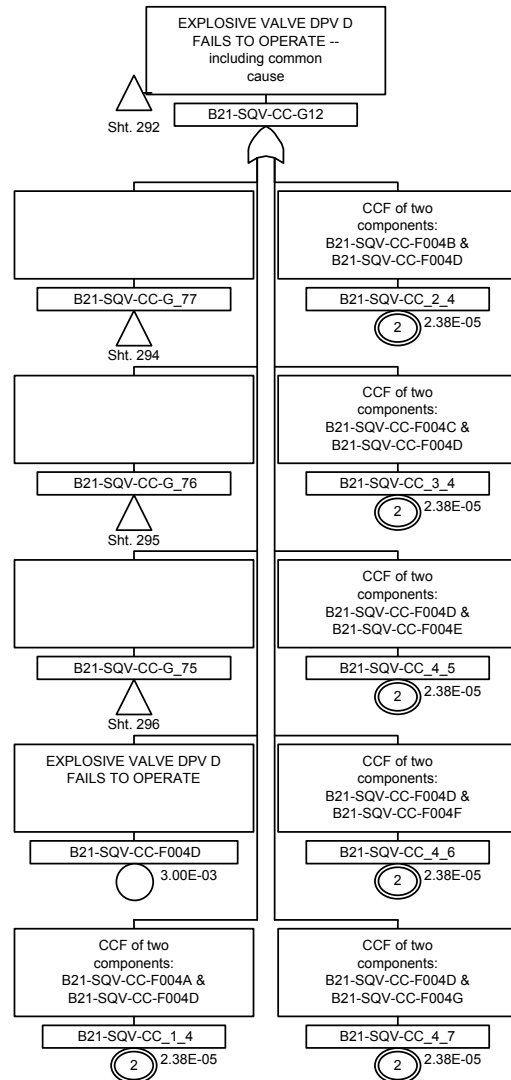


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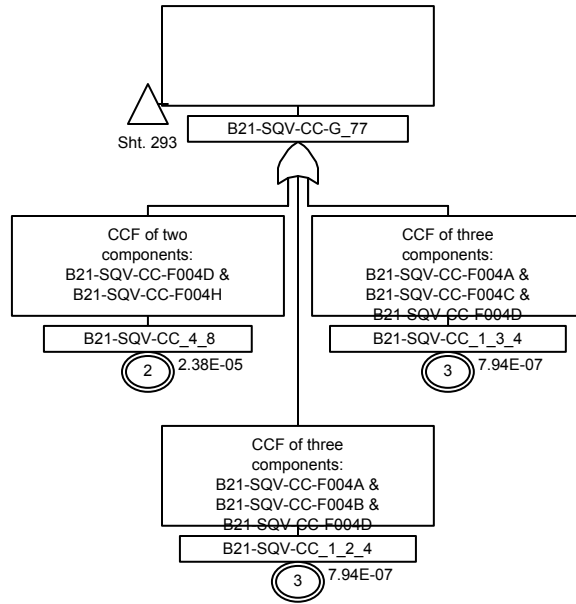


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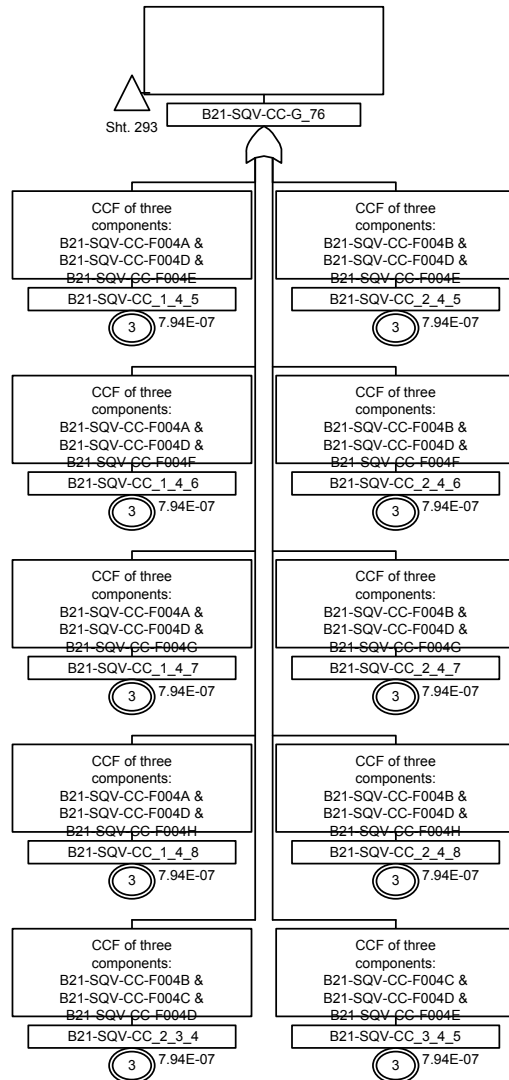


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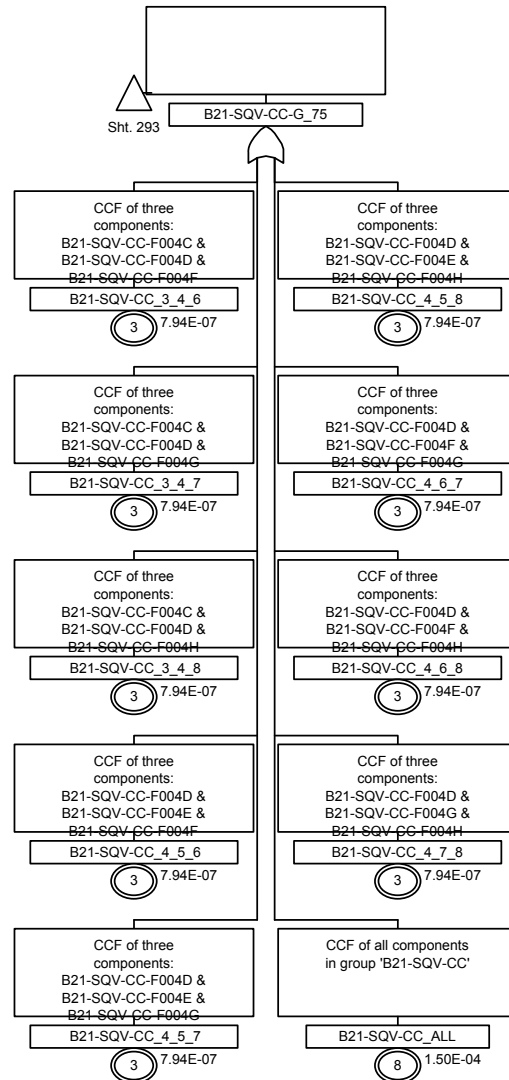


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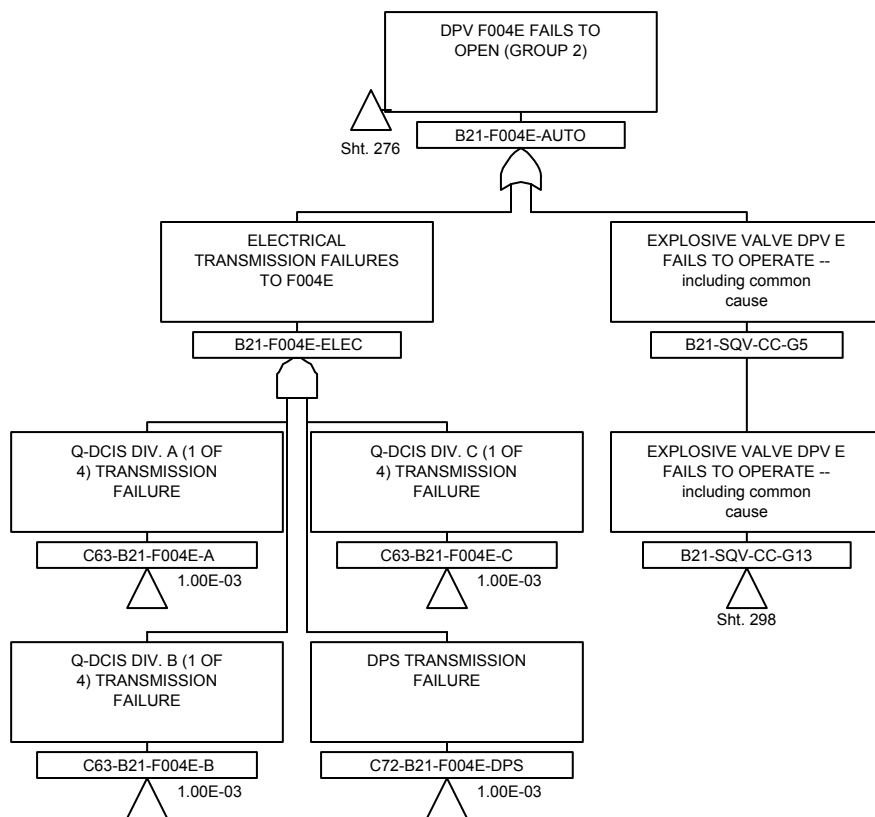


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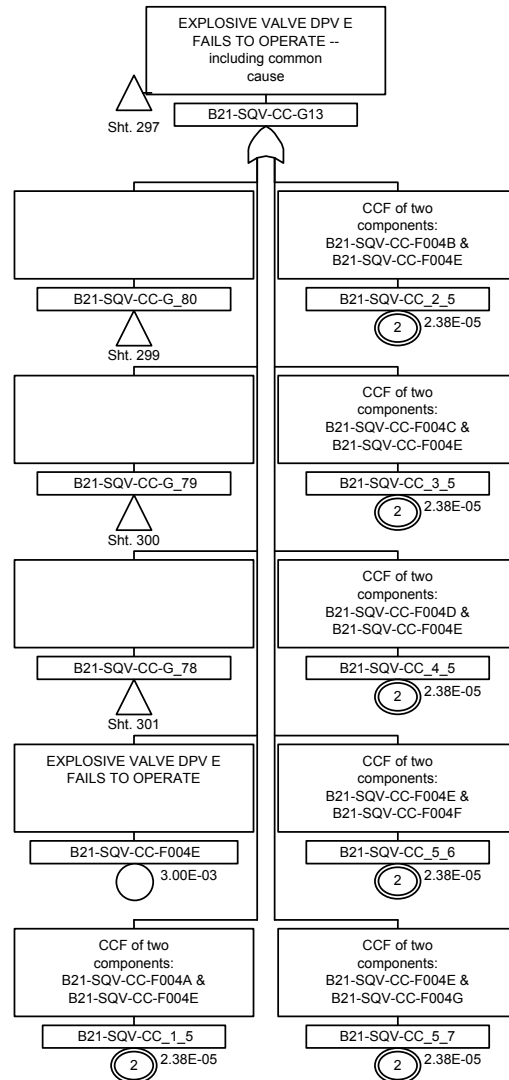


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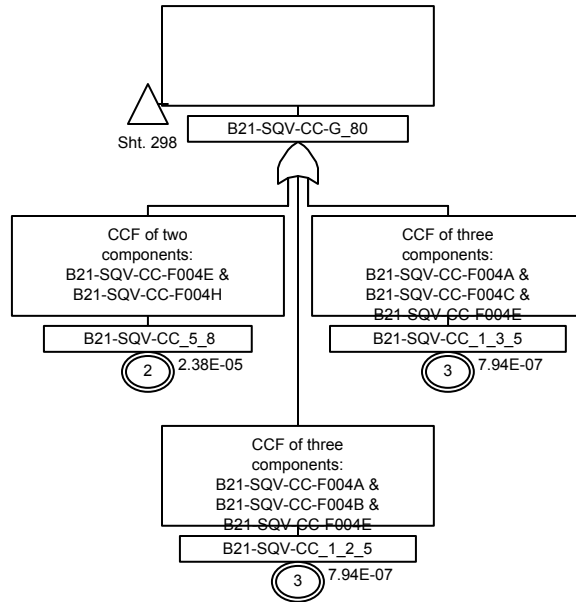


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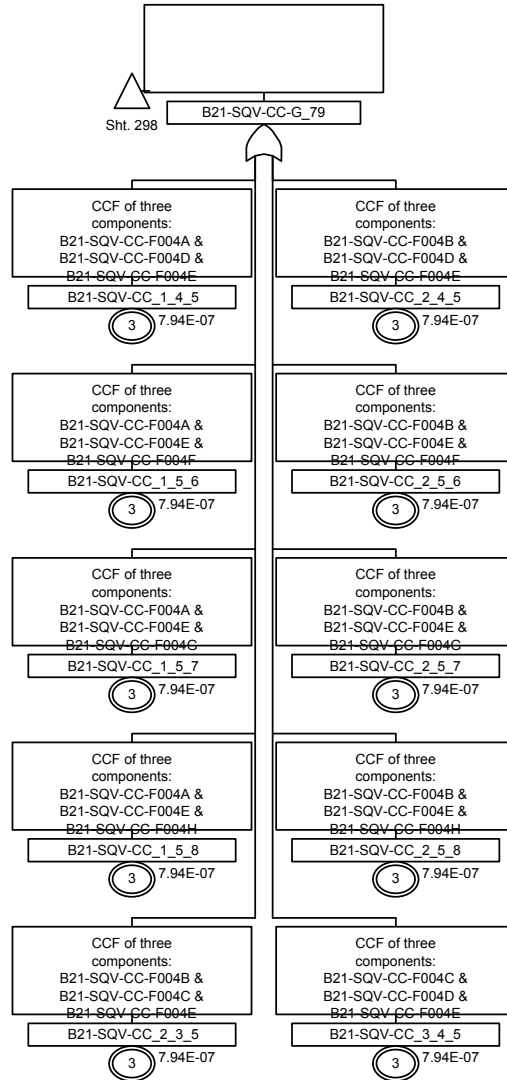


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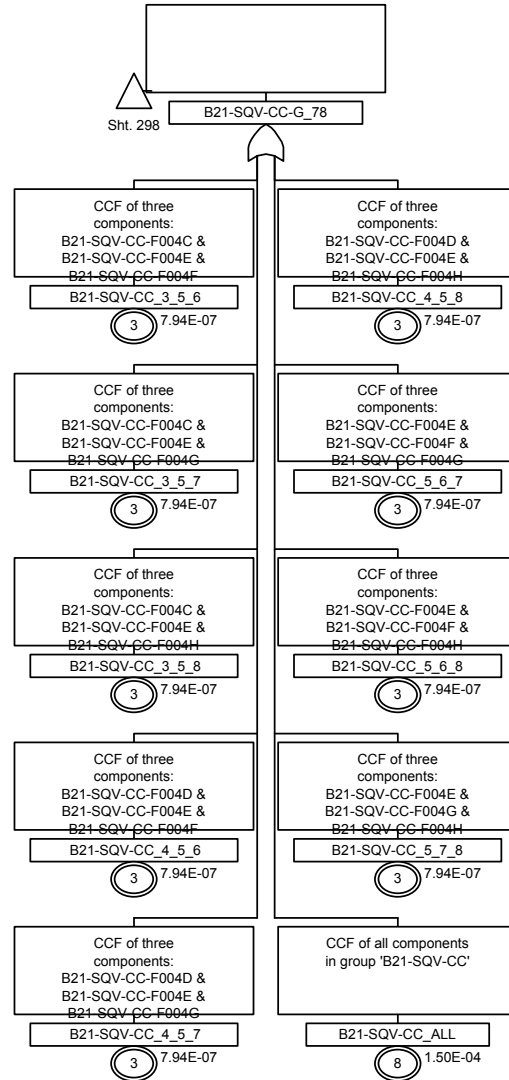


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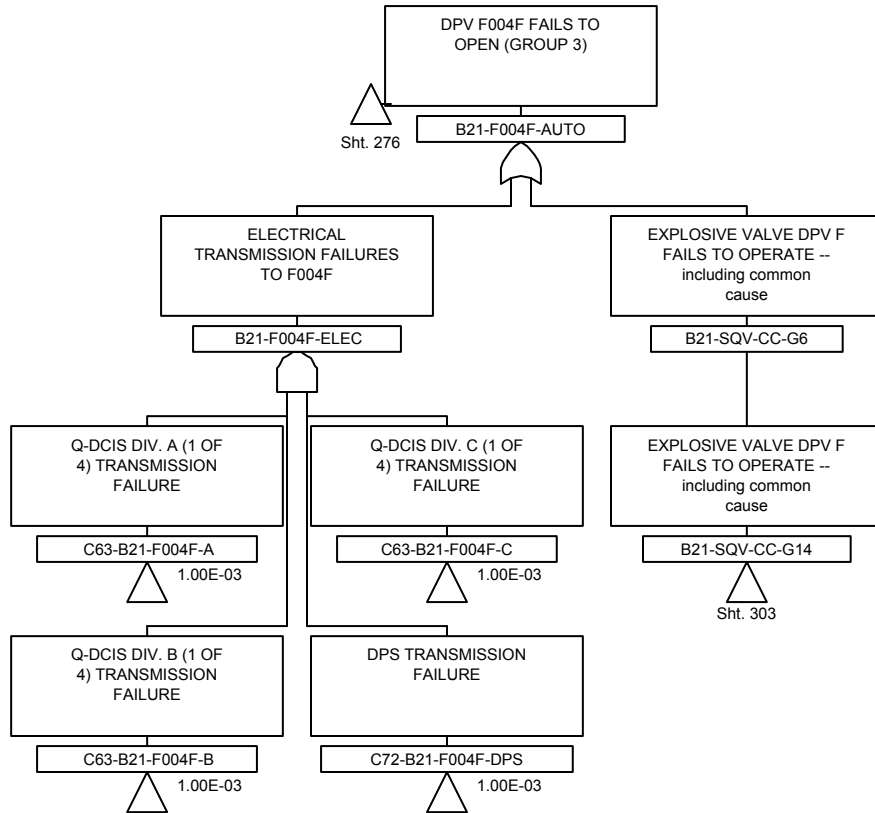


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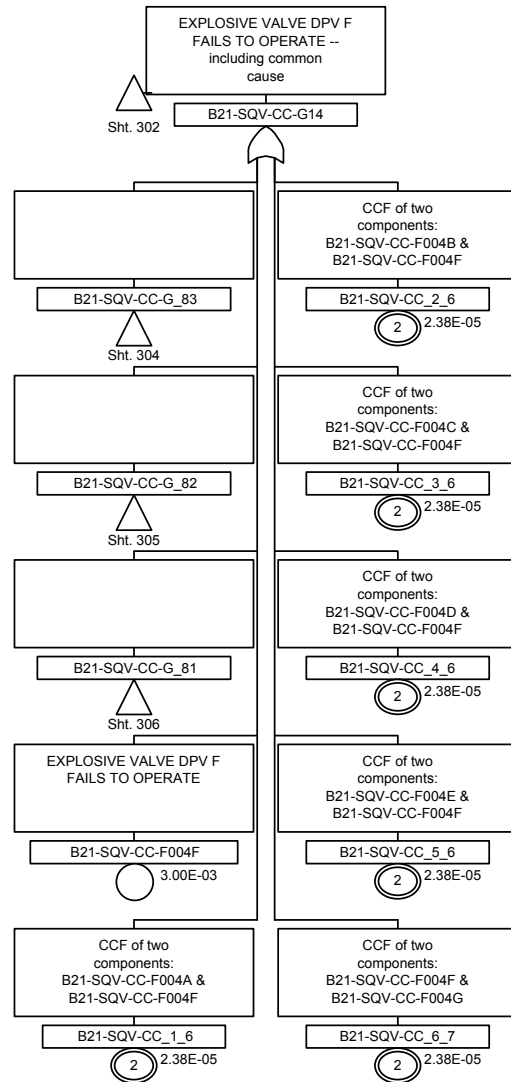


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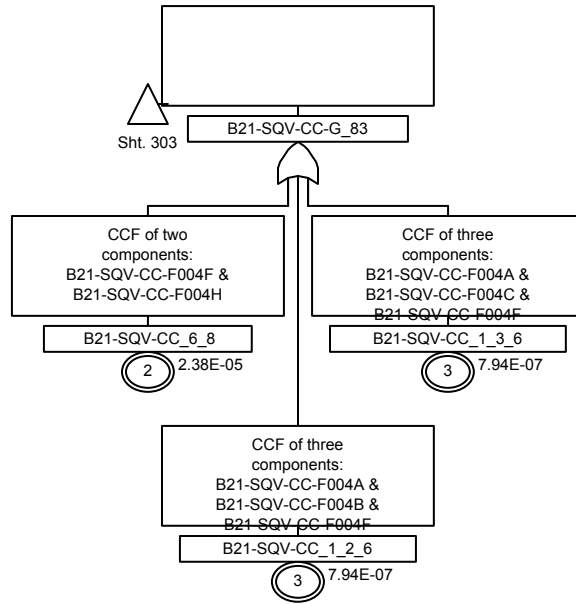


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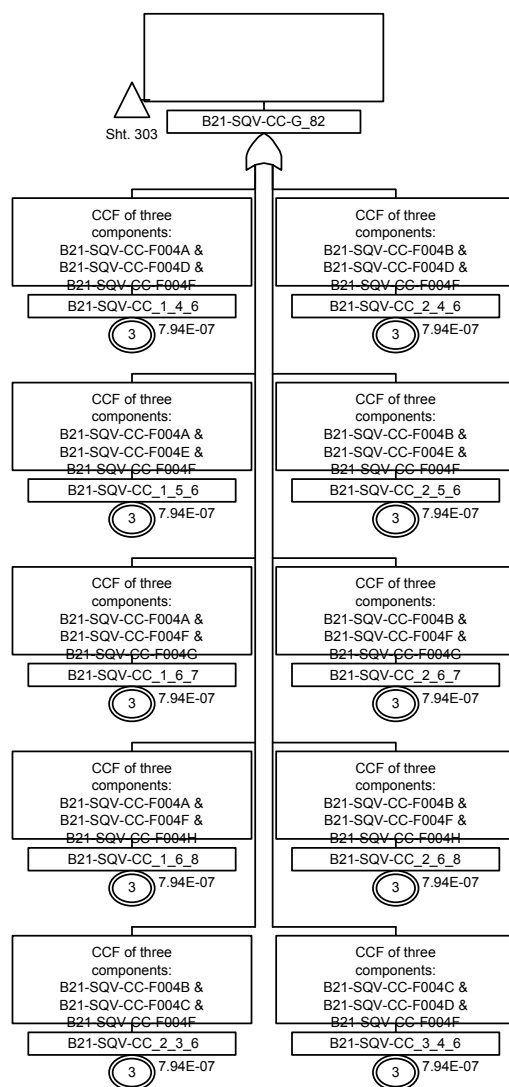


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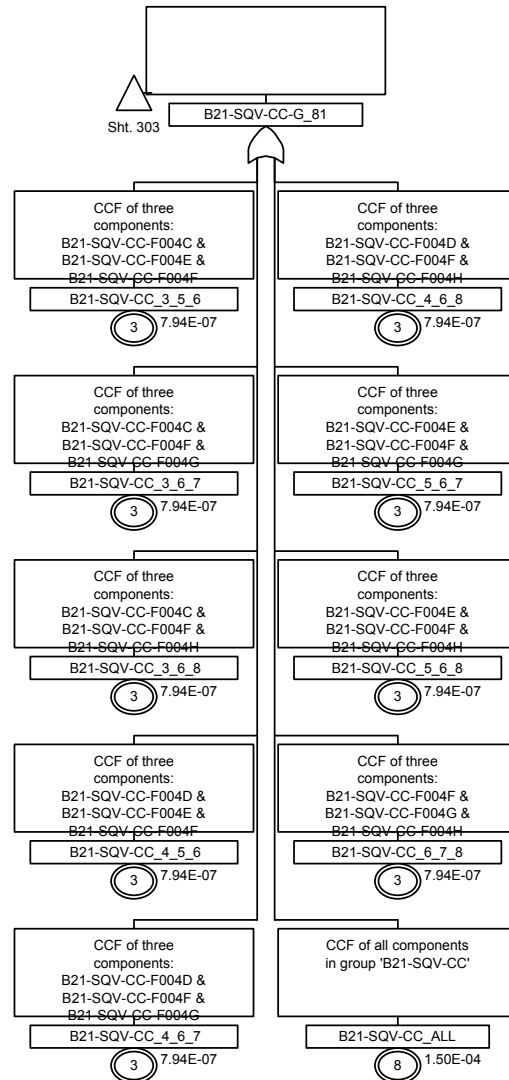


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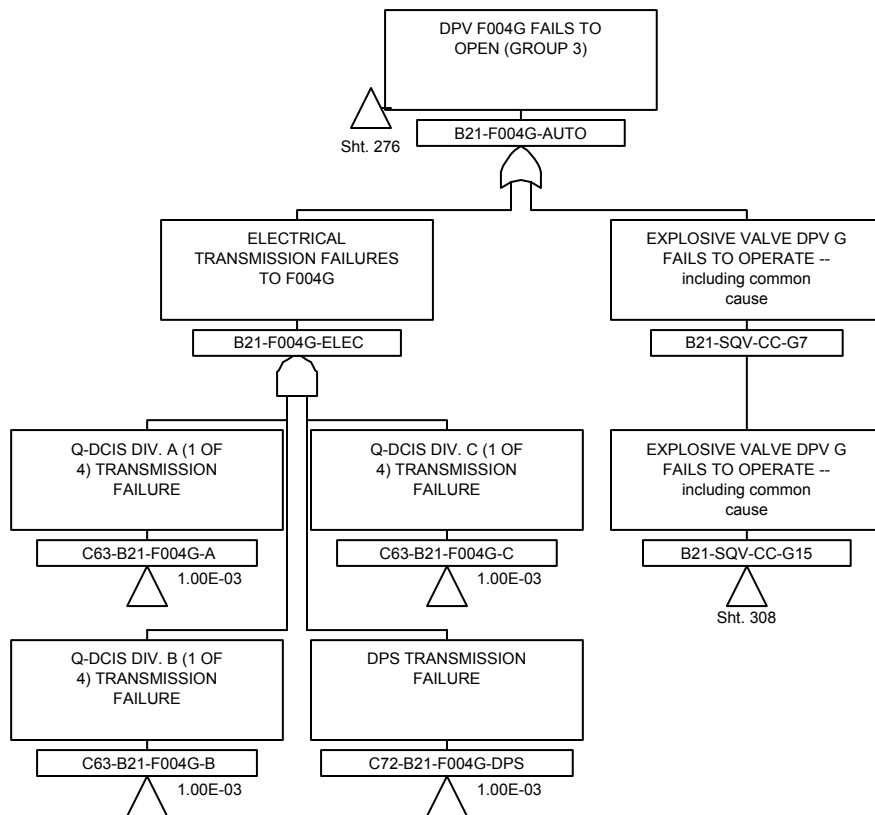


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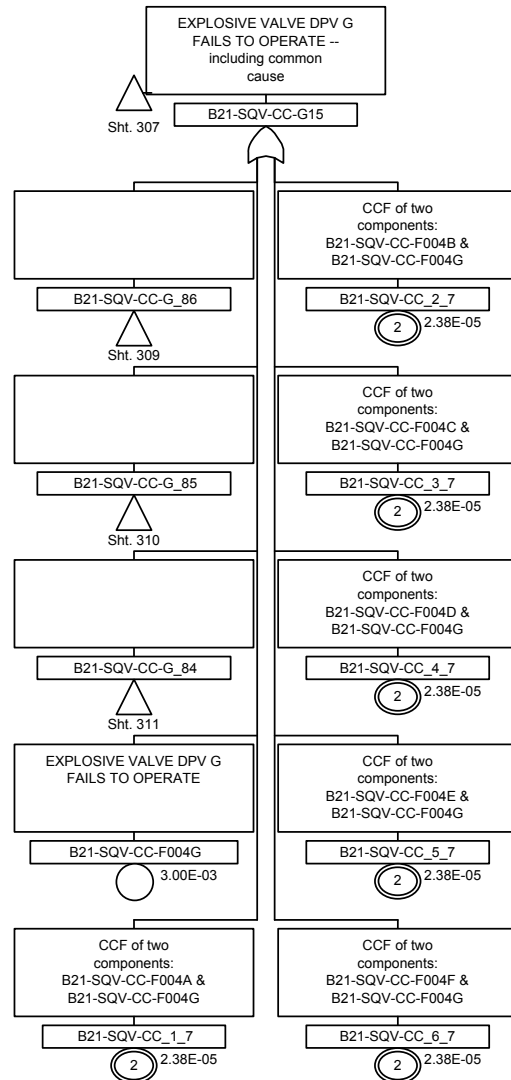


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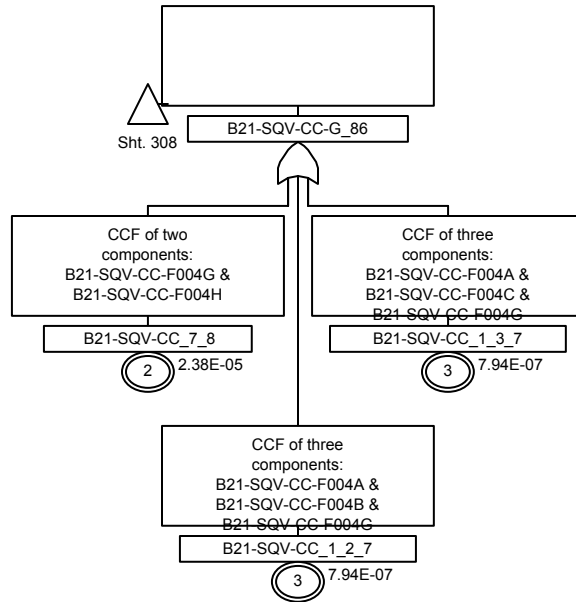


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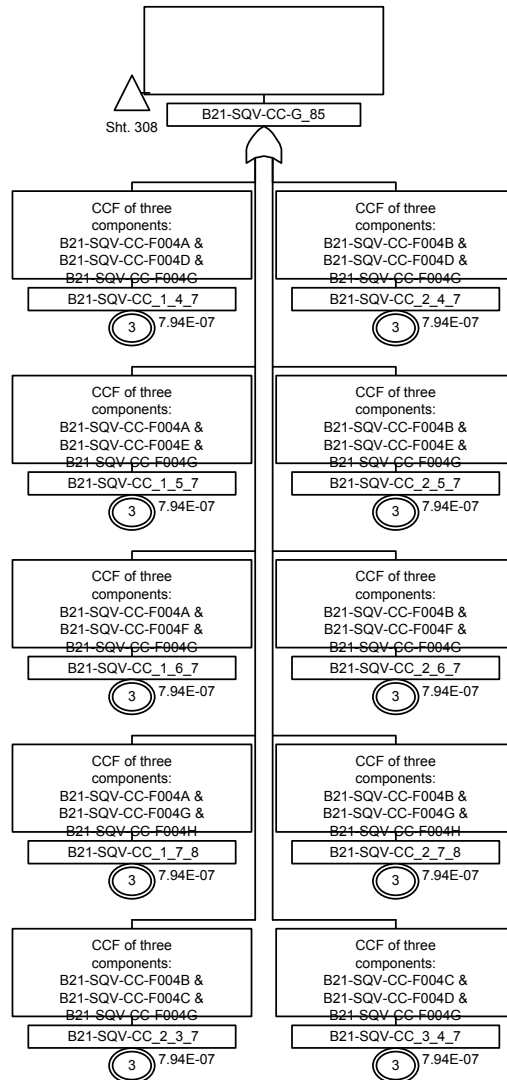


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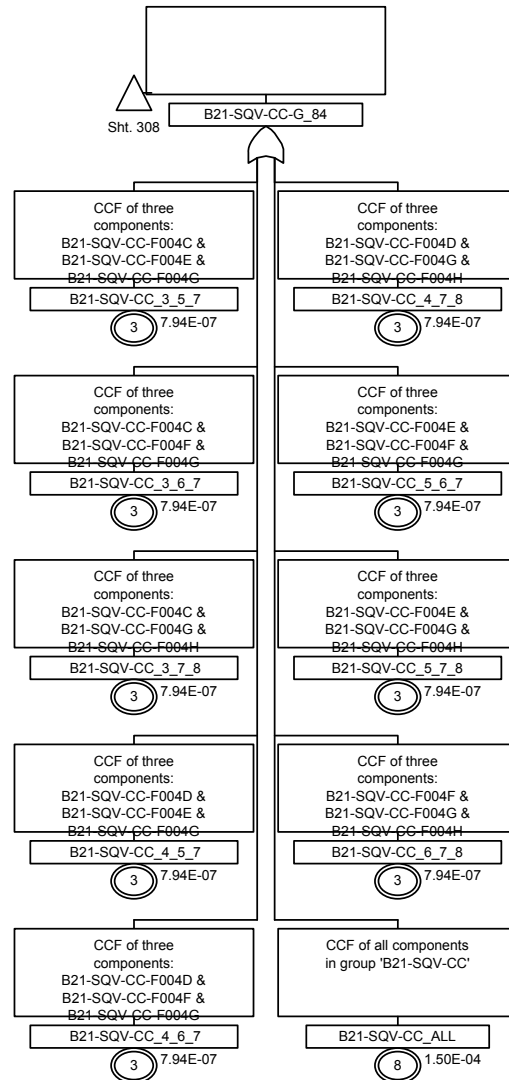


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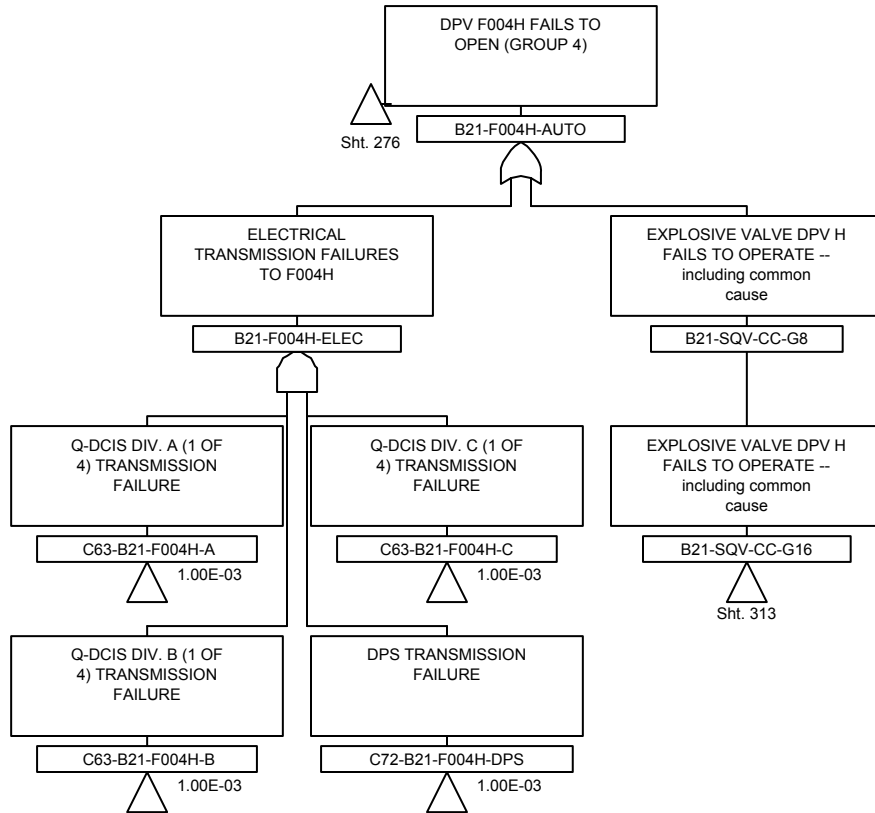


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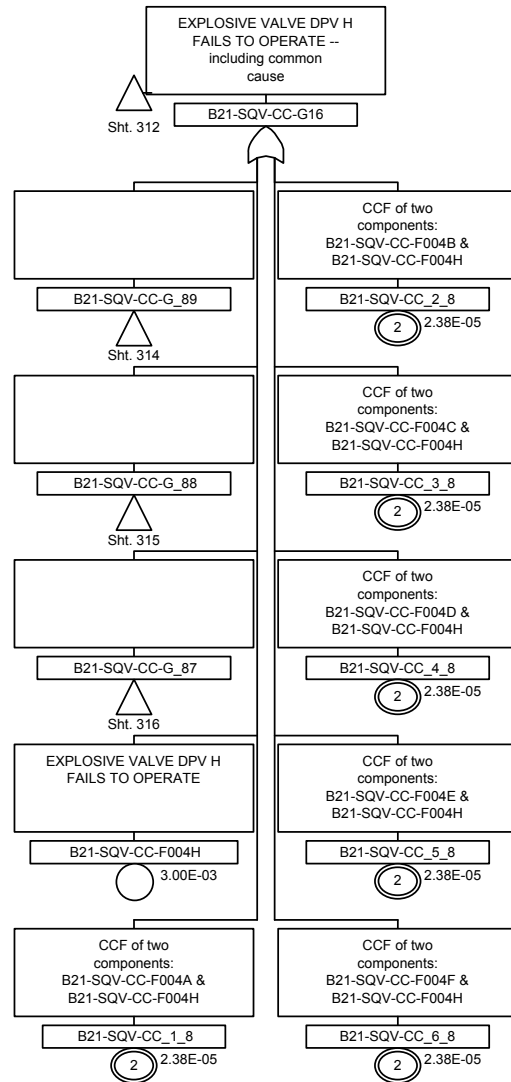


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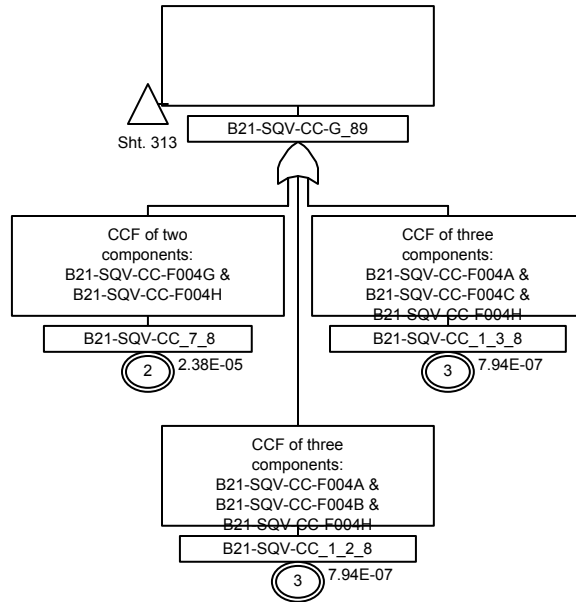


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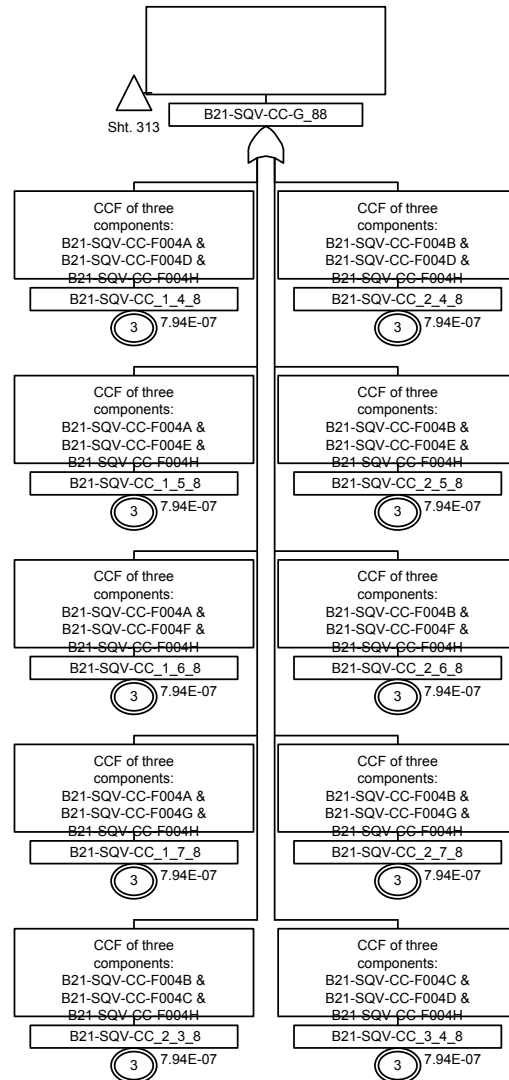


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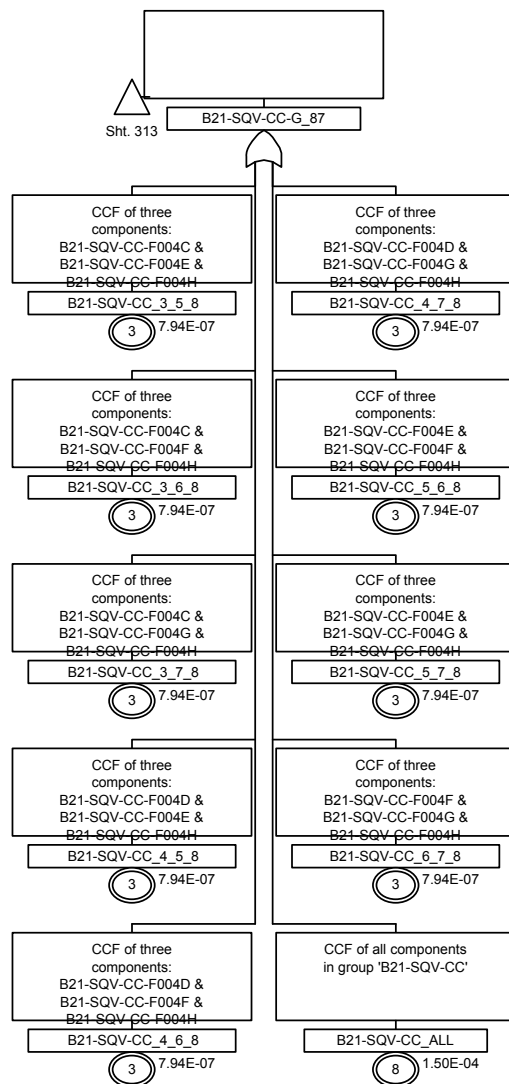


Figure 4.1-2. Sheet 316 Nuclear Boiler System

## 4.2 ISOLATION CONDENSER SYSTEM – (B32)

### 4.2.1 Functional Description

The Isolation Condenser System (ICS) limits reactor pressure and temperature within an acceptable range so that safety/relief valve operation is avoided and automatic reactor depressurization will not occur when the reactor becomes isolated during power operations. The ICS is used to transfer decay and residual heat from the reactor after the reactor is shut down and isolated. This function can also be performed by the other Engineered Safety Features (ESFs) of Automatic Depressurization System (ADS) and Gravity Driven Cooling System (GDCS). ICS functions to avoid unnecessary use of these other ESFs for residual heat removal and ICS provides additional liquid inventory upon opening of the condensate return valves to initiate the system. The IC system also provides the means for initial depressurization of the reactor before ADS initiation from a low reactor water level.

The Isolation Condenser System consists of four, high pressure, independent loops, each containing a heat exchanger that condenses steam on the tube side and transfers heat to water in a large Isolation Condenser/Passive Containment Cooling pool (ICS/PCCS pool) that is vented to the atmosphere.

The units are located in the ICS/PCCS pool positioned above, and outside, the containment (drywell). The condenser, connected by piping to the reactor pressure vessel, is placed at an elevation above the source of steam (reactor vessel) and, when the steam is condensed, condensate is returned to the vessel via a condensate return pipe.

The steam side connection between the vessel and the IC is normally open and the condensate line is normally closed. This allows the isolation condenser and drain piping to fill with condensate that is maintained at a sub-cooled temperature by the ICS/PCCS pool water during normal reactor operation.

The isolation condenser is started into operation by draining the condensate to the reactor, thus causing steam from the reactor to fill the tubes that transfer heat to the cooler pool water.

### 4.2.2 Assumptions

The following assumptions with respect to the design are made:

- (1) Two limit switches per Main Steam Line are used to generate the MSIV closure signal. Two limit switches, each one belonging to a different MSIV (inboard and outboard) on the same Main Steam Line (MSL), serve as inputs to generate the opening signals to electro-hydraulic F005 valves, when one MSIV in at least two of four MSLs is closing.
- (2) A diverse initiating signal for electro-hydraulic F005 valves is generated by a high RPV pressure  $> 7.447$  MPa-gauge (1080 psig) for 10 seconds.
- (3) One nitrogen-operated condensate return bypass valve (F006) is present in each return condensate line. Each F006 valve is spring-to-open and is maintained closed by means of the nitrogen pressure through three normally energized solenoid valves. Two solenoids are powered from different divisions of safety-related power through Q-DCIS, one is powered by nonsafety-related power through DPS; upon loss of all normally-supplied

power the valve will open. Upon loss of the high-pressure nitrogen supply system (HPNSS) and the valve's associated accumulator, the valve will open.

- (4) Automatic initiation of the ICS F006 valves is provided by the same signals that actuate the F005 valves.
- (5) The system has a built-in auxiliary flowpath that takes steam from the heat exchanger inlet and returns it to the main steam line. The purpose is to ensure that the supply line to the heat exchanger is always purged. It is assumed that this line and F013, are not required for system functionality.
- (6) %BOC-IC is the initiating event Break Outside Containment - Isolation Condenser. The break is assumed to be on loop 1(A).
- (7) No latent error has been modeled for the pool subcompartment isolation valves. These valves are controlled by tech specs and surveillances. It is assumed that there will be sufficient controls and/or remote position indication to warrant not modeling latent misposition.
- (8) Assume that all valves that require nitrogen to change state for system operation are provisioned with accumulators. The accumulators are sized to accommodate the requisite number of valve strokes and account for expected leakage.
- (9) The testing described in the SDS does not render the system inoperable. The components that are aligned during the test automatically realign to their normal position on actuation of the system.
- (10) The system has provisions for venting of non-condensable gases from the heat exchanger. These are required only if gases accumulate; it is assumed that they will.
- (11) The failure of the common ICS/PCCS pools due to catastrophic rupture is not considered in the model. The only plausible failure mechanism is due to external events, such as a safe-shutdown earthquake (SSE). These external events will be considered in the external events PRA - there are no credible failure modes for the pools in the design PRA.
- (12) The PANTHER report shows that gas accumulation at the top does not contribute to loss of heat removal capability. It also demonstrates that the top vents are not effective at removing gases (the removal of gases doesn't change overall heat removal capability). Therefore, the upper header vents will not be modeled.
- (13) The equipment pool cross-connect valves (F104A/B and F105A/B) are assumed to be controlled by two divisions of Q-DCIS each and DPS. Valves in parallel are assumed to get diverse divisions of Q-DCIS. The F105A/B valves are assumed to be equipped with air accumulators to support their safety-related function. The cross-connect valves are normally closed such that a misposition error would leave them open. Since the safety position is open, this misposition error is not modeled.
- (14) Unavailability of the ICS trains is modeled based on Tech Spec allowable outage times documented in LCO 3.5.4 conditions A and B. Mutually exclusive rules are used to control combinations of events that are not allowable. One ICS train may be out for up to 14 days, two or more ICS trains may be out of service at once for up to 12 hours.

- (15) Unavailability of the cross-connect flowpaths from the equipment storage pool to the ICS/PCCS expansion pools, controlled by LCO 3.7.1, is not modeled. The cross-connect flowpath is only needed to refill the expansion pools at least 24 hours after an initiating event. Thermal hydraulic calculations indicate that make up to the expansion pools is actually required beyond 50 hours for most sequences. It is assumed that the cross-connect flowpaths can be restored to operable within this timeframe, and the potential unavailability at initiating event does not affect plant response.
- (16) The pilot solenoids for ICS isolation valves B32-F002 and F003 are configured to allow both Q-DCIS and Independent Control Platform (ICP) signals to close these valves. This configuration adds complexity to the valve designs; however, the same failure rate is used by assuming that the failure rate is not significantly affected by the design. The solenoids are considered within the component boundary of the nitrogen-piston operated (NO) valves. Therefore, the solenoids are not modeled separately.
- (17) Relief valve B32-F011 is modeled as a power-operated relief valve (PORV) to allow operator manual actions to provide a continuous lower header vent path via valves B32-F011 and F012 for the non-condensable gases.

### 4.2.3 System Description

A simplified P&ID is shown in Figure 4.2-1.

#### 4.2.3.1 Hardware Configuration

##### Isolation Condenser System (ICS)

The ICS consists of four high pressure, independent loops, each containing a condenser that condenses steam on the tube side and transfers heat to water in a large pool (ICS/PCCS pool) positioned above and outside the primary containment. The surface of the pool is vented to the atmosphere through a plant stack.

Each ICS condenser is connected by piping to the reactor pressure vessel and is placed at an elevation above the source of steam (RPV). When the steam is condensed, it returns to the vessel via a condensate return pipe. The ICS piping is part of the reactor coolant pressure boundary (RCPB).

The steam side connection between the vessel and the ICS condenser is normally open and the condensate line is normally closed. This allows the isolation condenser and drain piping to fill with condensate, which is maintained at a subcooled temperature by the pool water during normal reactor operation.

Portions of the ICS system outside the containment are located in a subcompartment of the safety-related ICS/PCCS pool to provide protection from missiles, tornadoes and winds. The IC steam supply pipes include flow restrictors and the IC condensate drain pipes diameter is sized such that if an IC piping or tube rupture occurs in the safety-related ICS/PCCS pool, flow-induced dynamic loads and pressure buildup in the ICS/PCCS pool would be limited by these design features.

The steam supply line is vertical and feeds two horizontal headers through four pipes. The steam line is properly insulated and enclosed in a guard pipe, which penetrates the containment roof

slab, up to the distribution branching point. Guard pipes and special transition fittings are used at the locations where the IC steam supply and condensate return pipes enter the pool at the containment pressure boundary.

Two fail-as-is isolation valves in series (electro-hydraulically operated F001 and nitrogen-operated F002) are located in the run of steam supply line piping inboard of the containment boundary. They are used to isolate that part of the ICS that is located outside the containment. Two different valve actuator types are used to assure flow path closure.

Steam is condensed inside vertical tubes and is collected in two lower headers. Two pipes, one from each lower header, take the condensate to the common drain line, which vertically penetrates the containment roof slab.

On the condensate return piping, two fail-as-is isolation valves in series (nitrogen -operated F003 and electro-hydraulically operated F004) are provided, both located inboard of the containment boundary. They are also used to isolate parts of the ICS outside the containment. Two different valve actuator types are used to assure flow path closure.

A loop seal and two condensate return valves (nitrogen-operated, fail-open F006, and electro-hydraulically operated, fail-as-is F005) are located on the condensate return piping just upstream from the reactor vessel. These valves are closed during normal plant power operations. Because the steam supply line valves are normally open, condensate forms in the ICS condenser and fills up to the steam distributor, above the upper headers.

Isolation condenser operation is initiated by draining the condensate to the reactor, thus causing steam from the reactor to fill the tubes, which transfers heat to the water of the ICS pools. The condensate return valves (F005 and F006) are opened to initiate ICS operation and drain the condensate into the reactor. The steam-water interface in the condenser tube bundle moves downward, below the lower headers, to a point within the main condensate return line.

A vent line to the suppression pool is provided for both the upper and lower headers in order to remove the non-condensable gases during ICS operation.

Venting is controlled as follows: two normally closed, fail open, solenoid-operated valves (F009 and F010) are located in the vent line from the lower headers. They can be actuated both automatically and manually; automatically, when RPV pressure is high and either of the condensate return valves is open, and manually, by the control room operator. In order to prevent the accumulation of combustible levels of hydrogen and oxygen, the lower header vent line is designed to automatically open on ICS initiation with a 6-hour time delay.

If the normal vent path (F009 and F010) fails there is a parallel bypass vent path with relief valve F011 and solenoid valve F012. Once ICS pressure exceeds the setpoint of F011, which is indicative of failure to automatically vent through F009 and F010, the operator may manually open vent valves F011 and F012 to reduce system pressure.

A vent line from the upper headers equipped with two normally closed, fail closed, solenoid-operated valves (F007 and F008) allows the operator to vent non-condensable gases, if necessary. As stated in assumption #12 in Section 4.2.2, the upper header vent path is not modeled.

During normal plant operation, non-condensable gases may accumulate in the ICS condenser due to hydrogen buildup from water chemistry control additions and air entrained in the feedwater.



A normally-open purge line to the Main Steam line is provided to assure that the tubes are not blanketed with non-condensable gases when the system is first actuated.

### **ICS Pool**

The isolation condensers (IC) and the passive containment cooling (PCCS) condensers are located in the same large water pool, positioned above the drywell. The large ICS pool is partitioned, but both the ICS and PCCS are able to draw water from the entire pool. The air and steam spaces are also common.

The pool subcompartment interconnections are as follows: the ICS and PCCS pool subcompartments are connected to the other pools below the water level by locked open valves, one for each subcompartment. These valves can be closed to isolate and drain the individual partitioned ICS pool for maintenance of the unit. All pool subcompartments are interconnected below the pool water level.

The remote handwheels on the locked open valves extend above the water level to locations accessible to the operator.

The walls containing the airspace flow path extend above the normal water level. This enhances the flow stability and heat removal capability of the condensers by establishing a flow path for the makeup water through the lower pipes.

See Figure 4.19-2 for a simplified diagram of the ICS/PCCS pool layout.

#### ***4.2.3.2 System Operation***

During normal plant operation, the ICS cooling loop is on ready standby. Both steam supply isolation valves and both isolation valves on the condensate return line are in a normally open position with the condensate level in the ICS condenser extending above the upper headers. The condensate return valves are both closed, and the small vent lines from the ICS condenser top and bottom headers to the suppression pool are also closed.

Steam flow is induced from the steam distributor through the purge line by the pressure differential caused by main steam line flow. The valve status, failure mode, actuator type, pipe size, valve type, and line location are as follows:

Valve number	Status	Failure mode	Actuator type	Pipe Size mm (inches)	Valve type	Location
F001	NO	AI	EH	350 (14)	Gate	Steam line
F002	NO	AI	NO	350 (14)	Gate	Steam line
F003	NO	AI	NO	200 (8)	Gate	Condensate to RPV
F004	NO	AI	EH	200 (8)	Gate	Condensate to RPV
F005	NC	AI	EH	200 (8)	Gate	Condensate to RPV
F006	NC	FO	NO	200 (8)	Globe	Condensate to RPV
F007	NC	FC	SO	25 (1)	Globe	Vent line to SP
F008	NC	FC	SO	25 (1)	Globe	Vent line to SP
F009	NC	FO	SO	25 (1)	Globe	Vent line to SP
F010	NC	FO	SO	25 (1)	Globe	Vent line to SP
F011	NC	AI	SA	25 (1)	Relief Valve	Vent line to SP
F012	NC	FO	SO	25 (1)	Globe	Vent line to SP
F013	NO	AI	NO	20(3/4)	Globe	Purge line to MSL
F104	NC	AI	SQ	-	Squib	Equipment pool cross-connect valves
F105	NC	AI	NO	-	Gate	

Legend	NO	= normally open
	NC	= normally closed
	AI	= as is
	FO	= fail open
	FC	= fail closed
	EH	= electro-hydraulic operated
	NO	= nitrogen piston operated
	SO	= solenoid operated
	SQ	= squib operated
	SA	= self actuated (note valve F011 is modeled as a PORV to allow manual operation)

During refueling, the ICS condenser is isolated from the reactor; all isolation valves (F001 through F004) and all vent valves (F007 through F012) are closed.

During plant operation, when one of the ICS initiation signals (as described in Section 4.2.4) opens condensate return valve F005 or F006, operation of the ICS starts.

If, during ICS operation and after the initial transient, the RPV pressure increases above 7.516 Mpa (1090 psi)-gauge, the bottom vent valves, F009 and F010, automatically open. When the RPV pressure decreases below 7.447 Mpa (1080 psi)-gauge (reset value), and after a time delay these two valves close. As discussed in Section 4.2.3.1, there is a bottom vent bypass flowpath that provides a manual back-up to the primary automatic venting via valves F011 and F012. In order to prevent the accumulation of combustible levels of hydrogen and oxygen, the lower header vent line is designed to automatically open on ICS initiation with a 6-hour time delay.

When ICS and/or PCCS operation causes the water level in the common expansion pools to reach a set low level, the F104 and F105 valves receive an automatic open signal to provide

make-up water to the ICS/PCCS condensers. These valves can also be controlled manually from the main control room.

#### **4.2.3.3 Component Location**

The ICS condensers are located in a large pool positioned above, and outside, the ESBWR primary containment.

The large pool is partitioned between the ICS and PCCS condensers, but each is able to draw water from the entire pool; the air and steam space is also open to both. The cross-connect valves F104 and F105 are located between the equipment storage pool and the two inner expansion pools.

The ICS condensers are extensions of the reactor coolant pressure boundary and are isolable from it.

The condenser flowpath piping and valves are all within the drywell. The vent valves (F007 through F012) are located in a vertical pipe run near the top of the drywell.

Radiation monitors are installed in each IC pool exhaust passage to the atmosphere to detect IC leakage.

#### **4.2.4 Automatic and Manual Control**

##### **4.2.4.1 Automatic Actuation**

The initiation signals actuate all four ICS loops at the same time by opening the F005 and F006 valves (A, B, C and D). The initiation signals are described as follows:

- (1) The "Reactor Mode Switch is in run" and at least one of the inboard or outboard MSIVs position switches indicate that the valves are less than 92% open on at least two of the four Main Steam Lines.
- (2) RPV pressure (with logic two-out-of-four) > 7.447 Mpa (1080 psi)-gauge for 10 seconds or more.
- (3) Reactor water level below Level 2 with a 30 second time delay.
- (4) Reactor water below Level 1.
- (5) Loss of Feed Water (loss of power to 2-out-of-4 feed water pumps) in Reactor Run Mode.

The condensate return valve (F006) opens automatically upon a loss of its respective electrical power divisions, or on the loss of nitrogen supply and associated accumulator.

Initiation of the ICS automatically generates a confirmatory open signal to normally open containment isolation valves F001 through F004 (A, B, C, and D).

The automatic valves interconnecting the upper containment pools have a manual backup. The signal is from the water level in the common expansion pools. This gives the operators a chance to makeup with demineralized water and thus prevent opening of the valves.

Automatic actuation for the vent valves (F009 and F010) is provided by a high RPV pressure (above system actuation value) and either of the condensate return valves not fully closed (with a time delay to avoid the vents opening during the initial transient). The valves close to prevent

excess loss of inventory when the RPV pressure decreases below the 7.447 Mpa (1080 psi)-gauge reset value. In order to prevent the accumulation of combustible levels of hydrogen and oxygen, the lower header vent line is designed to automatically open on ICS initiation with a 6-hour time delay.

The Leak Detection and Isolation System (LD&IS) isolates each IC loop individually on high pool radiation or on high flow (as measured by high differential pressure) in the steam supply line or the condensate return line.

- Four radiation sensors are installed in each IC-HX pool exhaust passages that vent air and coolant vapor to the environment. Detection of a low-level leak (radiation level above background, logic two-out-of-four) initiates an alarm. Detection of a high radiation level (exceeding site boundary limits, logic two-out-of-four) isolates the leaking isolation condenser automatically (closure of isolation valves F001 through F004). The high radiation may be due to a leak from any condenser tube and a subsequent release of noble gas to the air above the pool.
- Four redundant sets of differential Pressure Transmitters (dPT) on the steam line and another four sets on the condensate return line are used to detect a possible LOCA. A high dPT signal coming from two-out-of-four dPTs on the same line (steam or condensate) results in alarms to the operator and automatic closure of all isolation valves, rendering the affected IC inoperable.

Closure of the isolation valves (F001 through F004) and an alarm is automatic on the following signals coming from their own loop (logic two-out-of-four):

- High mass flow in the ICS steam supply line or
- High mass flow in the ICS condensate return line or
- High radiation in the IC-HX pool steam flow path

The operator cannot override the high radiation signals from the IC atmospheric vents and high flow IC isolation signals.

Another isolation signal has been introduced to prevent combustible gases from concentrating in the ICS condenser during a LOCA scenario in which ICS heat removal is not required. Upon receiving indication that two or more DPVs are in an open position, the ICS containment isolation valves are closed automatically. Each DPV is equipped with four divisional position switches, and 2/4 indication in at least two DPVs is required to trigger the isolation signal in all four ICS trains.

A temperature element is provided downstream from the valves in each vent line to confirm vent-valve function and in the condensate return line, downstream from isolation valve F004.

The cross-connect valves open automatically on low water level in the inner expansion pools.

The instrument and alarm signals reported in the control room are given in Table 4.2-1.

#### **4.2.4.2 Manual Actuation**

The ICS can be actuated manually, should automatic actuation fail. Additionally, the ICS vent valves and cross-connect valves can be manually opened in the event of automatic failure.

#### 4.2.4.3 Safety Actuation

The actuation signals described in the Automatic Actuation signals section describes the safety-related actuation signals.

#### 4.2.5 System Interfaces

The ICS actuation valves (F005 and F006) each receive two divisions of Q-DCIS such that all four divisions can independently actuate each ICS loop. The DPS can also actuate ICS by providing an actuation signal to the F006 valve.

Containment isolation valves (F001, F002, F003, F004) each receive two divisions of Q-DCIS, either of which can operate the valve. Valves F002 and F003 are also equipped with two additional pilot solenoids operated via an ICP, which will perform the required action in the event of a Q-DCIS common cause failure.

The condensate return valve (F005) is electro-hydraulically operated and designed to fail as-is upon loss of safety-related 250 V DC power.

The condensate bypass return valve (F006) is nitrogen-operated and fails open on loss of HPNSS and its accumulator. The F006 valves also fail open if all of the provided 250 V DC power fails.

The electro-hydraulic containment isolation valves (F001 and F004) are supplied by safety-related 250 V DC power.

The nitrogen-operated containment isolation valves (F002 and F003) are supplied by safety-related 250 V DC power. These valves also receive nitrogen from the HPNSS; accumulators are provided to allow for valve actuation coincident with a loss of the HPNSS.

Non-condensable vent valves are controlled by Q-DCIS and DPS. The ICS/PCCS pool cross-connect valves are supplied with Q-DCIS and DPS; the nitrogen-operated cross-connect valves (F105A/B) also receive HPNSS and accumulators. Both safety-related and nonsafety-related 250 V DC are provided.

The Fire Protection System is able to provide makeup water to the ICS/PCCS pool in the long term and is included in the model under event tree heading WM-TOPINV.

Table 4.2-2 reports the System Dependency Matrix for ICS components.

#### 4.2.6 System Testing

During normal plant operations, a quarterly surveillance test of the normally closed actuation valves (F005 and F006) on the ICS condensate line to the RPV is performed. The test procedure of the condensate return valve starts after the condensate return line isolation valves, F003 and F004, are closed. This avoids subjecting the condenser to unnecessary thermal heat-up and cooldown cycles. Isolation valves on the steam supply line (that is, F001 and F002) remain open. The control room operator via remote manual switches that actuate the isolation valves and the condensate return valves performs the test. Their status light verifies the opening and closure of the valves. The procedure is as follows:

- Close valves F003 and F004
- Open fully and then close valves F005/F006

- Re-open isolation valves F003 and F004 to put the ICS in normal stand-by condition

The isolation valves (F001, F002, F003, and F004) are tested quarterly, one at a time. If an automatic system actuation signal occurs during the test, all the valves are aligned automatically to permit the ICS to start operation.

Each vent valve (F007 through F012) is tested quarterly. These valves, in series, are opened one at a time during normal plant operation. A permissive allows the operator to open one vent valve if the other one in series is closed.

Purge line root valve F013 is tested quarterly.

Table 4.2-3 shows the test program for the system; no testing renders the system inoperable, so no testing unavailability is modeled in the PRA.

#### **4.2.7 System Maintenance**

Preventive maintenance actions are not anticipated during normal plant operation for the ICS.

Corrective maintenance for tube plugging following the detection of a tube leak is expected to be performed during refueling. After closing the isolation valves to or from the condenser, plugging of the leaking tube is performed by personnel operating from the refueling floor. Maintenance is performed from the upper and lower ends of the condensers after removal of the header covers. A remotely operated tool is used.

To account for unplanned unavailability allowed by Tech Specs, each loop is modeled with two different T&M unavailability terms. One ICS loop is allowed to be unavailable for up to 14 days; two or more ICS loops may be unavailable for up to 12 hours. Although maintenance is not expected to be performed during power operation, these terms are included to capture the impact of the potential for ICS loop(s) out of service.

The pool water in the isolation condenser subcompartment is removable without emptying the entire ICS/PCCS pool. The individual partitioned ICS pool is isolated by closing the locked open valve interconnecting it to the other pools and emptying the compartment using a portable pump. This water is discharged into the common pool. To replenish the pool, the normally locked open valve is reopened and the water refills the pool.

Table 4.2-3 shows the test and maintenance program for the system.

#### **4.2.8 Common Cause Failures**

Common cause failures within the ICS are summarized in Table 4.2-4.

#### **4.2.9 Fault Tree Analysis**

The ICS fault trees are evaluated to determine the system unavailability and to identify the components that contribute significantly.

#### **4.2.9.1 Top Event Definitions**

The ICS is modeled to remove heat from and provide water to the RPV, as well as replenish the upper pool water supply.

- Gate B32-2LOOPFAIL represents the failure of two ICS loops to remove heat and provide condensate back to the reactor.
- Gate B32-4LOOPSCLOSE represents the failure of all ICS loops to open.
- Gate B32-CROSSCONNAB represents the failure of long-term make-up to the “AB” inner expansion pool by the ICS cross-connect valves.
- Gate B32-CROSSCONNCD represents the failure of long-term make-up to the “CD” inner expansion pool by the ICS cross-connect valves.

Table 4.2-6 reports the list of ICS top events.

#### **4.2.9.2 Fault Tree Description**

The fault tree is illustrated in Figure 4.2-2.

#### **4.2.9.3 Human Interactions**

Table 4.2-5 summarizes the human errors considered in the present analysis.

#### **4.2.9.4 Special Events**

B32-NONCONDENSE represents the special event that indicates that non-condensable gases have formed in the ICS sufficiently to require venting. This event is set to a probability of 1.0 to bound phenomenological uncertainty.

### **4.2.10 Results of Fault Tree Analysis**

The fault tree results provide quantitative values of systems unavailability and the importance of specific components to that total.

The definition of each basic event is reported in Table 4.2-7.

The quantification of top events for ICS includes the contribution of basic events for this system. This quantification process enables checking the global consistency of the system fault trees and their relationship with the rest of the systems modeled in the PRA.

The importance measures obtained from core damage frequency equations allow identification of the most relevant basic events and system component failures in an integrated context, as well as the determination of their relative importance with respect to the basic events and component failures of the other systems modeled.

### **4.2.11 PRA Insights**

The IC pools provide sufficient cooling water for 24 hours. To maintain the pool cooling function beyond 24 hours, it is necessary to interconnect ICS/PCCS and Reactor Well pools through the provided valves (F104A/B and F105A/B). This is an automatic action initiated on

low pool level. Alternatively, the lost water can be made up via a manual cross tie from the Fire Protection Systems.

There is one key insight or assumption associated with the B32 PRA system analysis:

- (1) The diverse protection system (DPS) can actuate the ICS/PCCS pool cross-connect make-up valves (F104A/B and F105A/B).



**Table 4.2-1**  
**ICS - Control Room Instrumentation and Alarms**

<b>Controls</b>
Vent valves F009/F010/F011/F012
Actuation valves F005/F006
Containment isolation valves F001/F002/F003/F004
ICS/PCCS expansion pool cross-connect valves F104/F105
<b>Displays</b>
Remote operable valves status lights
A vent line element temperature downstream of the valves to confirm vent function.
ICS/PCCS expansion pool water level
<b>Alarms</b>
High mass flow (dPT) in steam mass supply
High mass flow (dPT) in condensate return line to RPV
High radiation in the pool vents
Remote operable valves computer alarms

**Table 4.2-2a**  
**ICS - System Dependencies**

<b>Component</b>	<b>Type</b>	<b>Air Supply</b>	<b>Powered Control Signal</b>	
F001 (A/B/C/D)	EH	-	C63 (Div 1, 3)	-
F002 (A/B/C/D)	NO	HPNSS	C63 (Div 2, 4)	ICP (Div 2, 4)
F003 (A/B/C/D)	NO	HPNSS	C63 (Div 2, 4)	ICP (Div 2, 4)
F004 (A/B/C/D)	EH	-	C63 (Div 1, 3)	-
F005 (A/B/C/D)	EH	-	C63 (Div 2, 4)	-
F006 (A/B/C/D)	NO	HPNSS	C63 (Div 1, 3)	C72 (DPS)
F009 (A/C)	SO	-	C63 (Div 2, 4)	-
F009 (B/D)	SO	-	C63 (Div 1, 3)	-
F010 (A/C)	SO	-	-	C72 (DPS)
F010 (B/D)	SO	-	-	C72 (DPS)
F011A	SA	-	C63 (Div 1)	-
F011B	SA	-	C63 (Div 2)	-
F011C	SA	-	C63 (Div 3)	-
F011D	SA	-	C63 (Div 4)	-
F012A	SO	-	C63 (Div 1)	-
F012B	SO	-	C63 (Div 2)	-
F012C	SO	-	C63 (Div 3)	-
F012D	SO	-	C63 (Div 4)	-
F104 (A/B)	SQ	-	C63 (Div 1, 3)	C72 (DPS)
F105 (A/B)	NO	HPNSS	C63 (Div 2, 4)	C72 (DPS)

**Table 4.2-2b**  
**ICS - Transfers**

<b>Transfer</b>	<b>Description</b>
C63-B32-F001-SPUR-A	Spurious closure signal to B32-F001A
C63-B32-F001-SPUR-B	Spurious closure signal to B32-F001B
C63-B32-F001-SPUR-C	Spurious closure signal to B32-F001C
C63-B32-F001-SPUR-D	Spurious closure signal to B32-F001D
C63-B32-F002-SPUR-A	Spurious closure signal to B32-F002A
C63-B32-F002-SPUR-B	Spurious closure signal to B32-F002B
C63-B32-F002-SPUR-C	Spurious closure signal to B32-F002C
C63-B32-F002-SPUR-D	Spurious closure signal to B32-F002D
C63-B32-F003-SPUR-A	Spurious closure signal to B32-F003A
C63-B32-F003-SPUR-B	Spurious closure signal to B32-F003B
C63-B32-F003-SPUR-C	Spurious closure signal to B32-F003C
C63-B32-F003-SPUR-D	Spurious closure signal to B32-F003D
C63-B32-F004-SPUR-A	Spurious closure signal to B32-F004A
C63-B32-F004-SPUR-B	Spurious closure signal to B32-F004B
C63-B32-F004-SPUR-C	Spurious closure signal to B32-F004C
C63-B32-F004-SPUR-D	Spurious closure signal to B32-F004D
C63-B32-F005A-DIV2	Failure of open signal to B32-F005A
C63-B32-F005A-DIV4	Failure of open signal to B32-F005A
C63-B32-F005B-DIV1	Failure of open signal to B32-F005B
C63-B32-F005B-DIV3	Failure of open signal to B32-F005B
C63-B32-F005C-DIV2	Failure of open signal to B32-F005C
C63-B32-F005C-DIV4	Failure of open signal to B32-F005C
C63-B32-F005D-DIV1	Failure of open signal to B32-F005D
C63-B32-F005D-DIV3	Failure of open signal to B32-F005D
C63-B32-F006A-DIV1	Failure of open signal to B32-F006A
C63-B32-F006A-DIV3	Failure of open signal to B32-F006A
C63-B32-F006B-DIV2	Failure of open signal to B32-F006B
C63-B32-F006B-DIV4	Failure of open signal to B32-F006B
C63-B32-F006C-DIV1	Failure of open signal to B32-F006C
C63-B32-F006C-DIV3	Failure of open signal to B32-F006C
C63-B32-F006D-DIV2	Failure of open signal to B32-F006D
C63-B32-F006D-DIV4	Failure of open signal to B32-F006D
C63-B32-F009A-DIV2(NP)	No signal from Q-DCIS Div 2 for valve B32-F009A to de-energize
C63-B32-F009A-DIV4(NP)	No signal from Q-DCIS Div 4 for valve B32-F009A to de-energize
C63-B32-F009B-DIV1(NP)	No signal from Q-DCIS Div 1 for valve B32-F009B to de-energize
C63-B32-F009B-DIV3(NP)	No signal from Q-DCIS Div 3 for valve B32-F009B to de-energize
C63-B32-F009C-DIV2(NP)	No signal from Q-DCIS Div 2 for valve B32-F009C to de-energize
C63-B32-F009C-DIV4(NP)	No signal from Q-DCIS Div 4 for valve B32-F009C to de-energize
C63-B32-F009D-DIV1(NP)	No signal from Q-DCIS Div 1 for valve B32-F009D to de-energize

**Table 4.2-2b**  
**ICS - Transfers**

<b>Transfer</b>	<b>Description</b>
C63-B32-F009D-DIV3(NP)	No signal from Q-DCIS Div 3 for valve B32-F009D to de-energize
C63-B32-F012A-DIV1-MAN	Signal failure to B32-F012A
C63-B32-F012B-DIV2-MAN	Manual signal failure to B32-F012B
C63-B32-F012C-DIV3-MAN	Manual signal failure to B32-F012C
C63-B32-F012D-DIV4-MAN	Manual signal failure to B32-F012D
C63-B32-F104A-DIV1	Q-DCIS DIV 1 FAILURE
C63-B32-F104A-DIV1-MAN	Manual Q-DCIS DIV 1 FAILURE
C63-B32-F104A-DIV3	Q-DCIS DIV 3 FAILURE
C63-B32-F104A-DIV3-MAN	Manual Q-DCIS DIV 3 FAILURE
C63-B32-F104B-DIV1	Q-DCIS DIV 1 FAILURE
C63-B32-F104B-DIV1-MAN	Manual Q-DCIS DIV 1 FAILURE
C63-B32-F104B-DIV3	Q-DCIS DIV 3 FAILURE
C63-B32-F104B-DIV3-MAN	Manual Q-DCIS DIV 3 FAILURE
C63-B32-F105A-DIV2	Q-DCIS DIV 2 FAILURE
C63-B32-F105A-DIV2-MAN	Manual Q-DCIS DIV 2 FAILURE
C63-B32-F105A-DIV4	Q-DCIS DIV 4 FAILURE
C63-B32-F105A-DIV4-MAN	Manual Q-DCIS DIV 4 FAILURE
C63-B32-F105B-DIV2	Q-DCIS DIV 2 FAILURE
C63-B32-F105B-DIV2-MAN	Manual Q-DCIS DIV 2 FAILURE
C63-B32-F105B-DIV4	Q-DCIS DIV 4 FAILURE
C63-B32-F105B-DIV4-MAN	Manual Q-DCIS DIV 4 FAILURE
C72-B32-F006A-DPS	Failure of DPS open signal to B32-F006A
C72-B32-F006B-DPS	Failure of DPS open signal to B32-F006B
C72-B32-F006C-DPS	Failure of DPS open signal to B32-F006C
C72-B32-F006D-DPS	Failure of DPS open signal to B32-F006D
C72-B32-F010A-DPS(NP)	No signal from DPS for valve B32-F010A to de-energize
C72-B32-F010B-DPS(NP)	No signal from DPS for valve B32-F010B to de-energize
C72-B32-F010C-DPS(NP)	No signal from DPS for valve B32-F010C to de-energize
C72-B32-F010D-DPS(NP)	No signal from DPS for valve B32-F010D to de-energize
C72-B32-F104A-DPS	Failure of DPS signal to F104A
C72-B32-F104A-DPS-MAN	Failure of manual DPS signal to F104A
C72-B32-F104B-DPS	Failure of DPS signal to F104B
C72-B32-F104B-DPS-MAN	Failure of manual DPS signal to F104B
C72-B32-F105A-DPS	Failure of DPS signal to F104D
C72-B32-F105A-DPS-MAN	Failure of manual DPS signal to F104D
C72-B32-F105B-DPS	Failure of DPS signal to F105B
C72-B32-F105B-DPS-MAN	Failure of manual DPS signal to F105B
P54-0001-_1	LOSS OF HPNSS
R13-11-RB	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG
R13-12-RB	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG
R13-21-RB	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG
R13-22-RB	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG

**Table 4.2-2b**  
**ICS - Transfers**

<b>Transfer</b>	<b>Description</b>
R13-31-RB	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG
R13-32-RB	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG
R13-41-RB	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG
R13-42-RB	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG

**Table 4.2-3**  
**ICS – Component Test and Maintenance**

<b>Component</b>	<b>Type</b>	<b>Expected test interval</b>	<b>Components aligned away from emergency position without automatic return logic</b>
F005A/B/C/D	EH	Quarterly	None
F006A/B/C/D	NO	Quarterly	None
F001A/B/C/D	EH	Quarterly	None
F002A/B/C/D	NO	Quarterly	None
F003A/B/C/D	NO	Quarterly	None
F004A/B/C/D	EH	Quarterly	None

**Table 4.2-4**  
**ICS - Common Cause Failures**

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
B32-HOV-FO-COND_1_2	3.70E-05	CCF of two components: B32-HOV-FO-F005A & B32-HOV-FO-F005B
B32-HOV-FO-COND_1_2_3	3.70E-06	CCF of three components: B32-HOV-FO-F005A & B32-HOV-FO-F005B & B32-HOV-FO-F005C
B32-HOV-FO-COND_1_2_4	3.70E-06	CCF of three components: B32-HOV-FO-F005A & B32-HOV-FO-F005B & B32-HOV-FO-F005D
B32-HOV-FO-COND_1_3	3.70E-05	CCF of two components: B32-HOV-FO-F005A & B32-HOV-FO-F005C
B32-HOV-FO-COND_1_3_4	3.70E-06	CCF of three components: B32-HOV-FO-F005A & B32-HOV-FO-F005C & B32-HOV-FO-F005D
B32-HOV-FO-COND_1_4	3.70E-05	CCF of two components: B32-HOV-FO-F005A & B32-HOV-FO-F005D
B32-HOV-FO-COND_2_3	3.70E-05	CCF of two components: B32-HOV-FO-F005B & B32-HOV-FO-F005C
B32-HOV-FO-COND_2_3_4	3.70E-06	CCF of three components: B32-HOV-FO-F005B & B32-HOV-FO-F005C & B32-HOV-FO-F005D
B32-HOV-FO-COND_2_4	3.70E-05	CCF of two components: B32-HOV-FO-F005B & B32-HOV-FO-F005D
B32-HOV-FO-COND_3_4	3.70E-05	CCF of two components: B32-HOV-FO-F005C & B32-HOV-FO-F005D
B32-HOV-FO-COND_ALL	1.00E-04	CCF of all components in group 'B32-HOV-FO-COND'
B32-HX_-PG_1_2	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B
B32-HX_-PG_1_2_3	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00
B32-HX_-PG_1_2_4	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00
B32-HX_-PG_1_2_5	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00
B32-HX_-PG_1_2_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00
B32-HX_-PG_1_2_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00
B32-HX_-PG_1_2_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00
B32-HX_-PG_1_3	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C
B32-HX_-PG_1_3_4	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_1_3_5	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_1_3_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_1_3_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_1_3_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_1_4	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D
B32-HX_-PG_1_4_5	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_1_4_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_1_4_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_1_4_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_1_5	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A
B32-HX_-PG_1_5_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_1_5_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_1_5_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_1_6	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002B
B32-HX_-PG_1_6_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_1_6_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_1_7	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002C
B32-HX_-PG_1_7_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002C & B32-HX_-PG-HX00
B32-HX_-PG_1_8	9.02E-08	CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002D
B32-HX_-PG_2_3	9.02E-08	CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C
B32-HX_-PG_2_3_4	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_2_3_5	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_2_3_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_2_3_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_2_3_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001B &



**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-HX_-PG-HX001C & B32-HX_-PG-HX00
B32-HX_-PG_2_4	9.02E-08	CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D
B32-HX_-PG_2_4_5	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_2_4_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_2_4_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_2_4_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_2_5	9.02E-08	CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A
B32-HX_-PG_2_5_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_2_5_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_2_5_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_2_6	9.02E-08	CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002B
B32-HX_-PG_2_6_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_2_6_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_2_7	9.02E-08	CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002C
B32-HX_-PG_2_7_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002C & B32-HX_-PG-HX00
B32-HX_-PG_2_8	9.02E-08	CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002D
B32-HX_-PG_3_4	9.02E-08	CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D
B32-HX_-PG_3_4_5	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_3_4_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_3_4_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_3_4_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00
B32-HX_-PG_3_5	9.02E-08	CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A
B32-HX_-PG_3_5_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_3_5_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001C &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_3_5_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_3_6	9.02E-08	CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002B
B32-HX_-PG_3_6_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_3_6_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_3_7	9.02E-08	CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002C
B32-HX_-PG_3_7_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002C & B32-HX_-PG-HX00
B32-HX_-PG_3_8	9.02E-08	CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002D
B32-HX_-PG_4_5	9.02E-08	CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A
B32-HX_-PG_4_5_6	3.01E-09	CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_4_5_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_4_5_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A & B32-HX_-PG-HX00
B32-HX_-PG_4_6	9.02E-08	CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002B
B32-HX_-PG_4_6_7	3.01E-09	CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_4_6_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_4_7	9.02E-08	CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002C
B32-HX_-PG_4_7_8	3.01E-09	CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002C & B32-HX_-PG-HX00
B32-HX_-PG_4_8	9.02E-08	CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002D
B32-HX_-PG_5_6	9.02E-08	CCF of two components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002B
B32-HX_-PG_5_6_7	3.01E-09	CCF of three components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_5_6_8	3.01E-09	CCF of three components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00
B32-HX_-PG_5_7	9.02E-08	CCF of two components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002C
B32-HX_-PG_5_7_8	3.01E-09	CCF of three components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002C & B32-HX_-PG-HX00
B32-HX_-PG_5_8	9.02E-08	CCF of two components: B32-HX_-PG-HX002A &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-HX_-PG-HX002D
B32-HX_-PG_6_7	9.02E-08	CCF of two components: B32-HX_-PG-HX002B & B32-HX_-PG-HX002C
B32-HX_-PG_6_7_8	3.01E-09	CCF of three components: B32-HX_-PG-HX002B & B32-HX_-PG-HX002C & B32-HX_-PG-HX00
B32-HX_-PG_6_8	9.02E-08	CCF of two components: B32-HX_-PG-HX002B & B32-HX_-PG-HX002D
B32-HX_-PG_7_8	9.02E-08	CCF of two components: B32-HX_-PG-HX002C & B32-HX_-PG-HX002D
B32-HX_-PG_ALL	5.68E-07	CCF of all components in group 'B32-HX_-PG'
B32-NPO-CC-XCONN_1_2	9.65E-06	CCF of two components: B32-NPO-CC-F105A & B32-NPO-CC-F105B
B32-NPO-CC_1_2	1.85E-06	CCF of two components: B32-NPO-CC-F006A & B32-NPO-CC-F006B
B32-NPO-CC_1_2_3	1.85E-07	CCF of three components: B32-NPO-CC-F006A & B32-NPO-CC-F006B & B32-NPO-CC-F006C
B32-NPO-CC_1_2_4	1.85E-07	CCF of three components: B32-NPO-CC-F006A & B32-NPO-CC-F006B & B32-NPO-CC-F006D
B32-NPO-CC_1_3	1.85E-06	CCF of two components: B32-NPO-CC-F006A & B32-NPO-CC-F006C
B32-NPO-CC_1_3_4	1.85E-07	CCF of three components: B32-NPO-CC-F006A & B32-NPO-CC-F006C & B32-NPO-CC-F006D
B32-NPO-CC_1_4	1.85E-06	CCF of two components: B32-NPO-CC-F006A & B32-NPO-CC-F006D
B32-NPO-CC_2_3	1.85E-06	CCF of two components: B32-NPO-CC-F006B & B32-NPO-CC-F006C
B32-NPO-CC_2_3_4	1.85E-07	CCF of three components: B32-NPO-CC-F006B & B32-NPO-CC-F006C & B32-NPO-CC-F006D
B32-NPO-CC_2_4	1.85E-06	CCF of two components: B32-NPO-CC-F006B & B32-NPO-CC-F006D
B32-NPO-CC_3_4	1.85E-06	CCF of two components: B32-NPO-CC-F006C & B32-NPO-CC-F006D
B32-NPO-CC_ALL	5.00E-06	CCF of all components in group 'B32-NPO-CC'
B32-OR_-PG-VENT_1_2	5.75E-06	CCF of two components: B32-OR_-PG-R001A & B32-OR_-PG-R001B
B32-OR_-PG-VENT_1_2_3	5.75E-07	CCF of three components: B32-OR_-PG-R001A & B32-OR_-PG-R001B & B32-OR_-PG-R001C
B32-OR_-PG-VENT_1_2_4	5.75E-07	CCF of three components: B32-OR_-PG-R001A & B32-OR_-PG-R001B & B32-OR_-PG-R001D
B32-OR_-PG-VENT_1_3	5.75E-06	CCF of two components: B32-OR_-PG-R001A & B32-OR_-PG-R001C
B32-OR_-PG-VENT_1_3_4	5.75E-07	CCF of three components: B32-OR_-PG-R001A & B32-OR_-PG-R001C & B32-OR_-PG-R001D
B32-OR_-PG-VENT_1_4	5.75E-06	CCF of two components: B32-OR_-PG-R001A & B32-OR_-PG-R001D
B32-OR_-PG-VENT_2_3	5.75E-06	CCF of two components: B32-OR_-PG-R001B &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-OR_-PG-R001C
B32-OR_-PG-VENT_2_3_4	5.75E-07	CCF of three components: B32-OR_-PG-R001B & B32-OR_-PG-R001C & B32-OR_-PG-R001D
B32-OR_-PG-VENT_2_4	5.75E-06	CCF of two components: B32-OR_-PG-R001B & B32-OR_-PG-R001D
B32-OR_-PG-VENT_3_4	5.75E-06	CCF of two components: B32-OR_-PG-R001C & B32-OR_-PG-R001D
B32-OR_-PG-VENT_ALL	1.55E-05	CCF of all components in group 'B32-OR_-PG-VENT'
B32-SOV-FD-F09/10/12_10_11	5.05E-06	CCF of two components: B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_10_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F012B & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_10_12	5.05E-06	CCF of two components: B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_11_12	5.05E-06	CCF of two components: B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_10	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_11	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_12	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_2	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F009B
B32-SOV-FD-F09/10/12_1_2_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_2_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_2_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_2_3	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F009C
B32-SOV-FD-F09/10/12_1_2_4	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F009D
B32-SOV-FD-F09/10/12_1_2_5	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_1_2_6	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_1_2_7	1.01E-07	CCF of three components: B32-SOV-FD-F009A &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F009B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_1_2_8	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_2_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_3	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F009C
B32-SOV-FD-F09/10/12_1_3_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_3_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_3_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_3_4	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F009D
B32-SOV-FD-F09/10/12_1_3_5	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_1_3_6	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_1_3_7	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_1_3_8	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_3_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_4	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F009D
B32-SOV-FD-F09/10/12_1_4_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_4_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_4_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_4_5	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_1_4_6	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_1_4_7	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_1_4_8	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_4_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F009D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_5	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_1_5_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_5_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_5_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_5_6	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010A & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_1_5_7	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010A & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_1_5_8	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010A & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_5_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010A & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_6	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_1_6_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_6_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_6_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_6_7	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_1_6_8	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_6_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_7	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_1_7_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_7_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_7_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_7_8	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_7_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_8	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_1_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_1_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_9	5.05E-06	CCF of two components: B32-SOV-FD-F009A & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_1_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_1_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_1_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F009A & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_10	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_11	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_12	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_3	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F009C
B32-SOV-FD-F09/10/12_2_3_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_3_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_3_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_3_4	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F009D
B32-SOV-FD-F09/10/12_2_3_5	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_2_3_6	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_2_3_7	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_2_3_8	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_2_3_9	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_4	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F009D
B32-SOV-FD-F09/10/12_2_4_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F009D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_4_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_4_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_4_5	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_2_4_6	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_2_4_7	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_2_4_8	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_2_4_9	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F009D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_5	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_2_5_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_5_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_5_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_5_6	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_2_5_7	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_2_5_8	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_2_5_9	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010A & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_6	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_2_6_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_6_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_6_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_6_7	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_2_6_8	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_2_6_9	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_7	5.05E-06	CCF of two components: B32-SOV-FD-F009B &



**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_2_7_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_7_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_7_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_7_8	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_2_7_9	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_8	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_2_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_2_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_9	5.05E-06	CCF of two components: B32-SOV-FD-F009B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_2_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_2_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_2_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F009B & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_10	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_11	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_12	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_4	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F009D
B32-SOV-FD-F09/10/12_3_4_10	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_4_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F009D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_4_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_4_5	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_3_4_6	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_3_4_7	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_3_4_8	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_3_4_9	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F009D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_3_5	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_3_5_10	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_5_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_5_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_5_6	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_3_5_7	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_3_5_8	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_3_5_9	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010A & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_3_6	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_3_6_10	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_6_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_6_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_6_7	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_3_6_8	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_3_6_9	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_3_7	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_3_7_10	1.01E-07	CCF of three components: B32-SOV-FD-F009C &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_7_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_7_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_7_8	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_3_7_9	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_3_8	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_3_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_3_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_3_9	5.05E-06	CCF of two components: B32-SOV-FD-F009C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_3_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_3_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_3_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F009C & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_10	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_4_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_11	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_12	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_5	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F010A
B32-SOV-FD-F09/10/12_4_5_10	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_4_5_11	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_5_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_5_6	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010A & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_4_5_7	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010A & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_4_5_8	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010A & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_4_5_9	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010A & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_4_6	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_4_6_10	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_4_6_11	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_6_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_6_7	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_4_6_8	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_4_6_9	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_4_7	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_4_7_10	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_4_7_11	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_7_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_7_8	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_4_7_9	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_4_8	5.05E-06	CCF of two components: B32-SOV-FD-F009D & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_4_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_4_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_4_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_4_9	5.05E-06	CCF of two components: B32-SOV-FD-F009D &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_4_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_4_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_4_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F009D & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_10	5.05E-06	CCF of two components: B32-SOV-FD-F010A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_5_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_5_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_11	5.05E-06	CCF of two components: B32-SOV-FD-F010A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_5_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_12	5.05E-06	CCF of two components: B32-SOV-FD-F010A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_6	5.05E-06	CCF of two components: B32-SOV-FD-F010A & B32-SOV-FD-F010B
B32-SOV-FD-F09/10/12_5_6_10	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_5_6_11	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_5_6_12	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_6_7	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_5_6_8	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_5_6_9	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_5_7	5.05E-06	CCF of two components: B32-SOV-FD-F010A & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_5_7_10	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_5_7_11	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_5_7_12	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_7_8	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_5_7_9	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_5_8	5.05E-06	CCF of two components: B32-SOV-FD-F010A &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_5_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_5_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_5_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_5_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_5_9	5.05E-06	CCF of two components: B32-SOV-FD-F010A & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_5_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_5_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_5_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F010A & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_6_10	5.05E-06	CCF of two components: B32-SOV-FD-F010B & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_6_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_6_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_6_11	5.05E-06	CCF of two components: B32-SOV-FD-F010B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_6_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_6_12	5.05E-06	CCF of two components: B32-SOV-FD-F010B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_6_7	5.05E-06	CCF of two components: B32-SOV-FD-F010B & B32-SOV-FD-F010C
B32-SOV-FD-F09/10/12_6_7_10	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_6_7_11	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_6_7_12	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_6_7_8	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_6_7_9	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_6_8	5.05E-06	CCF of two components: B32-SOV-FD-F010B & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_6_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_6_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F010B &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_6_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_6_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_6_9	5.05E-06	CCF of two components: B32-SOV-FD-F010B & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_6_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_6_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_6_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F010B & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_7_10	5.05E-06	CCF of two components: B32-SOV-FD-F010C & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_7_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_7_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_7_11	5.05E-06	CCF of two components: B32-SOV-FD-F010C & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_7_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_7_12	5.05E-06	CCF of two components: B32-SOV-FD-F010C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_7_8	5.05E-06	CCF of two components: B32-SOV-FD-F010C & B32-SOV-FD-F010D
B32-SOV-FD-F09/10/12_7_8_10	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_7_8_11	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_7_8_12	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_7_8_9	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_7_9	5.05E-06	CCF of two components: B32-SOV-FD-F010C & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_7_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_7_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_7_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F010C & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_8_10	5.05E-06	CCF of two components: B32-SOV-FD-F010D & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_8_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F010D &

**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_8_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F010D & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_8_11	5.05E-06	CCF of two components: B32-SOV-FD-F010D & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_8_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F010D & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_8_12	5.05E-06	CCF of two components: B32-SOV-FD-F010D & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_8_9	5.05E-06	CCF of two components: B32-SOV-FD-F010D & B32-SOV-FD-F012A
B32-SOV-FD-F09/10/12_8_9_10	1.01E-07	CCF of three components: B32-SOV-FD-F010D & B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_8_9_11	1.01E-07	CCF of three components: B32-SOV-FD-F010D & B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_8_9_12	1.01E-07	CCF of three components: B32-SOV-FD-F010D & B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_9_10	5.05E-06	CCF of two components: B32-SOV-FD-F012A & B32-SOV-FD-F012B
B32-SOV-FD-F09/10/12_9_10_11	1.01E-07	CCF of three components: B32-SOV-FD-F012A & B32-SOV-FD-F012B & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_9_10_12	1.01E-07	CCF of three components: B32-SOV-FD-F012A & B32-SOV-FD-F012B & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_9_11	5.05E-06	CCF of two components: B32-SOV-FD-F012A & B32-SOV-FD-F012C
B32-SOV-FD-F09/10/12_9_11_12	1.01E-07	CCF of three components: B32-SOV-FD-F012A & B32-SOV-FD-F012C & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_9_12	5.05E-06	CCF of two components: B32-SOV-FD-F012A & B32-SOV-FD-F012D
B32-SOV-FD-F09/10/12_ALL	5.00E-05	CCF of all components in group 'B32-SOV-FD-F09/10/12'
B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
B32-SRV-CC-F011_1_2	1.30E-04	CCF of two components: B32-SRV-CC-F011A & B32-SRV-CC-F011B
B32-SRV-CC-F011_1_2_3	1.30E-05	CCF of three components: B32-SRV-CC-F011A & B32-SRV-CC-F011B & B32-SRV-CC-F011C
B32-SRV-CC-F011_1_2_4	1.30E-05	CCF of three components: B32-SRV-CC-F011A & B32-SRV-CC-F011B & B32-SRV-CC-F011D
B32-SRV-CC-F011_1_3	1.30E-04	CCF of two components: B32-SRV-CC-F011A & B32-SRV-CC-F011C
B32-SRV-CC-F011_1_3_4	1.30E-05	CCF of three components: B32-SRV-CC-F011A & B32-SRV-CC-F011C & B32-SRV-CC-F011D
B32-SRV-CC-F011_1_4	1.30E-04	CCF of two components: B32-SRV-CC-F011A & B32-SRV-CC-F011D
B32-SRV-CC-F011_2_3	1.30E-04	CCF of two components: B32-SRV-CC-F011B &



**Table 4.2-4**  
**ICS - Common Cause Failures**

Basic Event	Prob	Description
		B32-SRV-CC-F011C
B32-SRV-CC-F011_2_3_4	1.30E-05	CCF of three components: B32-SRV-CC-F011B & B32-SRV-CC-F011C & B32-SRV-CC-F011D
B32-SRV-CC-F011_2_4	1.30E-04	CCF of two components: B32-SRV-CC-F011B & B32-SRV-CC-F011D
B32-SRV-CC-F011_3_4	1.30E-04	CCF of two components: B32-SRV-CC-F011C & B32-SRV-CC-F011D
B32-SRV-CC-F011_ALL	3.50E-04	CCF of all components in group 'B32-SRV-CC-F011'
B32-UV_-OO-XCONN-ACC_1_2	2.67E-05	CCF of two components: B32-UV_-OO-F105A & B32-UV_-OO-F105B

**Table 4.2-5**  
**ICS - Human Error Events**

<b>BE</b>	<b>Description</b>
B32-XHE-FO-VENT	Operator fails to open vent
XXX-XHE-FO-ICPCCS	Operator fails to recognize the need to makeup ICS

**Table 4.2-6**  
**ICS – Top Events**

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
B32-2LOOPSFALL	Failure of two ICS loops to remove heat and provide condensate back to the reactor	26
B32-4LOOPSCLOSE	One or more ICP loops are open	1
B32-CROSSCONNAB	Failure of long-term make-up to the “AB” inner expansion pool by the ICS cross-connect valves	20
B32-CROSSCONNCD	Failure of long-term make-up to the “CD” inner expansion pool by the ICS cross-connect valves	14

**Table 4.2-7**  
**ICS - Basic Events**

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
%BOC-IC	1.53E-06	Break in ICS Piping outside containment
B32-ACC-FO-A105A	2.40E-06	Nitrogen or Air Accumulator Fails
B32-ACC-FO-A105B	2.40E-06	Nitrogen or Air Accumulator Fails
B32-HOV-FO-F005A	2.00E-03	ELECTRO-HYDRAULIC VALVE FAILS TO OPERATE
B32-HOV-FO-F005B	2.00E-03	ELECTRO-HYDRAULIC VALVE FAILS TO OPERATE
B32-HOV-FO-F005C	2.00E-03	ELECTRO-HYDRAULIC VALVE FAILS TO OPERATE
B32-HOV-FO-F005D	2.00E-03	ELECTRO-HYDRAULIC VALVE FAILS TO OPERATE
B32-HOV-OC-F001A	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F001B	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F001C	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F001D	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F004A	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F004B	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F004C	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F004D	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F005A	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F005B	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F005C	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HOV-OC-F005D	2.40E-06	ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN
B32-HX_-PG-HX001A	2.40E-05	Heat Exchanger HX001A Plugs
B32-HX_-PG-HX001B	2.40E-05	Heat Exchanger HX001B Plugs
B32-HX_-PG-HX001C	2.40E-05	Heat Exchanger HX001C Plugs
B32-HX_-PG-HX001D	2.40E-05	Heat Exchanger HX001D Plugs
B32-HX_-PG-HX002A	2.40E-05	Heat Exchanger HX002A Plugs
B32-HX_-PG-HX002B	2.40E-05	Heat Exchanger HX002B Plugs
B32-HX_-PG-HX002C	2.40E-05	Heat Exchanger HX002A Plugs
B32-HX_-PG-HX002D	2.40E-05	Heat Exchanger HX002D Plugs
B32-NONCONDENSE	1.00E+00	Non condensable gasses form in ICS sufficiently to require venting
B32-NPO-CC-F006A	1.00E-04	Condensate return F006A fails to Open
B32-NPO-CC-F006B	1.00E-04	Condensate return F006B fails to Open
B32-NPO-CC-F006C	1.00E-04	Condensate return F006C fails to Open
B32-NPO-CC-F006D	1.00E-04	Condensate return F006D fails to Open
B32-NPO-CC-F105A	1.00E-04	F105A Fails to Open
B32-NPO-CC-F105B	1.00E-04	F105B fails to open
B32-NPO-OC-F002A	2.40E-06	F002A Spuriously closes
B32-NPO-OC-F002B	2.40E-06	F002B Spuriously closes
B32-NPO-OC-F002C	2.40E-06	F002C Spuriously closes
B32-NPO-OC-F002D	2.40E-06	F002D Spuriously closes
B32-NPO-OC-F003A	2.40E-06	F003A Spuriously closes

**Table 4.2-7**  
**ICS - Basic Events**

Basic Event	Prob	Description
B32-NPO-OC-F003B	2.40E-06	F003B Spuriously closes
B32-NPO-OC-F003C	2.40E-06	F003C Spuriously closes
B32-NPO-OC-F003D	2.40E-06	F003D Spuriously closes
B32-NPO-OC-F006A	2.40E-06	Condensate return valve spuriously closes
B32-NPO-OC-F006B	2.40E-06	Condensate return valve spuriously closes
B32-NPO-OC-F006C	2.40E-06	Condensate return valve spuriously closes
B32-NPO-OC-F006D	2.40E-06	Condensate return valve spuriously closes
B32-OR_-PG-R001A	6.55E-04	ORIFICE (PLUGGED)
B32-OR_-PG-R001B	6.55E-04	ORIFICE (PLUGGED)
B32-OR_-PG-R001C	6.55E-04	ORIFICE (PLUGGED)
B32-OR_-PG-R001D	6.55E-04	ORIFICE (PLUGGED)
B32-SOV-FD-F009A	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F009B	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F009C	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F009D	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F010A	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F010B	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F010C	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F010D	1.00E-03	SOLENOID VALVE (FAILURE TO DEENERGIZE)
B32-SOV-FD-F012A	1.00E-03	F012A fails to open on demand
B32-SOV-FD-F012B	1.00E-03	SOLENOID VALVE (FAILURE TO DE-ENERGIZE)
B32-SOV-FD-F012C	1.00E-03	SOLENOID VALVE (FAILURE TO DE-ENERGIZE)
B32-SOV-FD-F012D	1.00E-03	SOLENOID VALVE (FAILURE TO DE-ENERGIZE)
B32-SQV-CC-F104A	3.00E-03	F104A FAILS TO OPEN
B32-SQV-CC-F104B	3.00E-03	F104B FAILS TO OPEN
B32-SRV-CC-F011A	7.00E-03	SAFETY/RELIEF VALVE FAILS TO OPEN (ACTUATION MODE)
B32-SRV-CC-F011B	7.00E-03	SAFETY/RELIEF VALVE FAILS TO OPEN (ACTUATION MODE)
B32-SRV-CC-F011C	7.00E-03	SAFETY/RELIEF VALVE FAILS TO OPEN (ACTUATION MODE)
B32-SRV-CC-F011D	7.00E-03	SAFETY/RELIEF VALVE FAILS TO OPEN (ACTUATION MODE)
B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
B32-TM-LOOPA-MULT	1.37E-03	ICS LOOP A IN TEST OR MAINTENANCE, MULTIPLE LOOPS
B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
B32-TM-LOOPB-MULT	1.37E-03	ICS LOOP B IN TEST OR MAINTENANCE, MULTIPLE LOOPS
B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
B32-TM-LOOPC-MULT	1.37E-03	ICS LOOP C IN TEST OR MAINTENANCE, MULTIPLE LOOPS
B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
B32-TM-LOOPD-MULT	1.37E-03	ICS LOOP D IN TEST OR MAINTENANCE, MULTIPLE LOOPS
B32-UV_-OO-F105A	1.00E-03	CHECK VALVE FAILS TO CLOSE
B32-UV_-OO-F105B	1.00E-03	CHECK VALVE FAILS TO CLOSE

**Table 4.2-7**  
**ICS - Basic Events**

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
B32-UV_-RL-F105A	2.40E-05	CHECK VALVE REVERSE LEAKAGE
B32-UV_-RL-F105B	2.40E-05	CHECK VALVE REVERSE LEAKAGE

**Table 4.2-8**  
**ICS - Cutsets**

For each system top event, the dominant cutsets are shown below.

(Note: The cutsets reported for each system function include at least the top ten cutsets. Additional cutsets are reported until the total probability of the reported cutset reaches 90% of the total probability of all cutsets.)

<b>B32-2LOOPSFAIL</b>				
<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
5.E-05	2.3	B32-SOV-FD-F09/10/12_ALL	5.E-05	CCF of all components in group 'B32-SOV-FD-F09/10/12'
		B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
3.84E-05	1.8	B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
3.84E-05	1.8	B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
3.84E-05	1.8	B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
3.84E-05	1.8	B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F003-SPUR-B	1.E-03	Spurious closure signal to B32-F003B
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A

**B32-2LOOPSFAIL**

Probability	% of Top	Event	Probability	Description
3.84E-05	1.8	B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F002-SPUR-C	1.E-03	Spurious closure signal to B32-F002C
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F003-SPUR-B	1.E-03	Spurious closure signal to B32-F003B
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F003-SPUR-C	1.E-03	Spurious closure signal to B32-F003C
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
3.84E-05	1.8	B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		C63-B32-F004-SPUR-C	1.E-03	Spurious closure signal to B32-F004C
3.84E-05	1.8	C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C



**B32-2LOOPSFAIL**

Probability	% of Top	Event	Probability	Description
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F002-SPUR-C	1.E-03	Spurious closure signal to B32-F002C
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F002-SPUR-C	1.E-03	Spurious closure signal to B32-F002C
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F003-SPUR-B	1.E-03	Spurious closure signal to B32-F003B
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F003-SPUR-C	1.E-03	Spurious closure signal to B32-F003C
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F003-SPUR-C	1.E-03	Spurious closure signal to B32-F003C
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F003-SPUR-D	1.E-03	Spurious closure signal to B32-F003D
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F003-SPUR-D	1.E-03	Spurious closure signal to B32-F003D
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F003-SPUR-D	1.E-03	Spurious closure signal to B32-F003D

**B32-2LOOPSFAIL**

Probability	% of Top	Event	Probability	Description
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F004-SPUR-C	1.E-03	Spurious closure signal to B32-F004C
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F004-SPUR-C	1.E-03	Spurious closure signal to B32-F004C
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F004-SPUR-D	1.E-03	Spurious closure signal to B32-F004D
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F004-SPUR-D	1.E-03	Spurious closure signal to B32-F004D
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
3.84E-05	1.8	C63-B32-F004-SPUR-D	1.E-03	Spurious closure signal to B32-F004D
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-OR_-PG-R001D	6.55E-04	ORIFICE (PLUGGED)
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001B	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPA-IND	3.84E-02	ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001C	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001A	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting

**B32-2LOOPSFAIL**

Probability	% of Top	Event	Probability	Description
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001C	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPB-IND	3.84E-02	ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001D	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001A	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001B	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPC-IND	3.84E-02	ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001D	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001A	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001B	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
4.43E-06	0.2	B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-TM-LOOPD-IND	3.84E-02	ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF
		B32-OR_-PG-R001C	6.55E-04	ORIFICE (PLUGGED)
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent

**B32-2LOOPSFAIL**

Probability	% of Top	Event	Probability	Description
2.73E-06	0.1	B32-OR_-PG-VENT_ALL	1.55E-05	CCF of all components in group 'B32-OR_-PG-VENT'
		B32-NONCONDENSE	1.E+00	Non condensable gasses form in ICS sufficiently to require venting
		B32-XHE-FO-VENT	1.76E-01	Operator fails to open vent
1.88E-06	0.1	B32-TM-LOOPB-MULT	1.37E-03	ICS LOOP B IN TEST OR MAINTENANCE, MULTIPLE LOOPS
		B32-TM-LOOPA-MULT	1.37E-03	ICS LOOP A IN TEST OR MAINTENANCE, MULTIPLE LOOPS
1.88E-06	0.1	B32-TM-LOOPC-MULT	1.37E-03	ICS LOOP C IN TEST OR MAINTENANCE, MULTIPLE LOOPS
		B32-TM-LOOPA-MULT	1.37E-03	ICS LOOP A IN TEST OR MAINTENANCE, MULTIPLE LOOPS
1.88E-06	0.1	B32-TM-LOOPC-MULT	1.37E-03	ICS LOOP C IN TEST OR MAINTENANCE, MULTIPLE LOOPS
		B32-TM-LOOPB-MULT	1.37E-03	ICS LOOP B IN TEST OR MAINTENANCE, MULTIPLE LOOPS
1.88E-06	0.1	B32-TM-LOOPD-MULT	1.37E-03	ICS LOOP D IN TEST OR MAINTENANCE, MULTIPLE LOOPS
		B32-TM-LOOPA-MULT	1.37E-03	ICS LOOP A IN TEST OR MAINTENANCE, MULTIPLE LOOPS

**B32-4LOOPSCLOSE**

Probability	% of Top	Event	Probability	Description
5.E-10	66.1	B32-NPO-CC_ALL	5.E-06	CCF of all components in group 'B32-NPO-CC'
		B32-HOV-FO-COND_ALL	1.E-04	CCF of all components in group 'B32-HOV-FO-COND'
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D

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**B32-4LOOPSCLOSE**

Probability	% of Top	Event	Probability	Description
1.E-12	0.1	C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
		C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F004-SPUR-C	1.E-03	Spurious closure signal to B32-F004C
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F004-SPUR-C	1.E-03	Spurious closure signal to B32-F004C
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
1.E-12	0.1	C63-B32-F001-SPUR-D	1.E-03	Spurious closure signal to B32-F001D
		C63-B32-F004-SPUR-C	1.E-03	Spurious closure signal to B32-F004C
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F001-SPUR-C	1.E-03	Spurious closure signal to B32-F001C
		C63-B32-F002-SPUR-B	1.E-03	Spurious closure signal to B32-F002B

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**B32-4LOOPSCLOSE**

Probability	% of Top	Event	Probability	Description
		C63-B32-F002-SPUR-C	1.E-03	Spurious closure signal to B32-F002C
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F002-SPUR-C	1.E-03	Spurious closure signal to B32-F002C
		C63-B32-F004-SPUR-B	1.E-03	Spurious closure signal to B32-F004B
		C63-B32-F004-SPUR-A	1.E-03	Spurious closure signal to B32-F004A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F003-SPUR-C	1.E-03	Spurious closure signal to B32-F003C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F001-SPUR-A	1.E-03	Spurious closure signal to B32-F001A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F003-SPUR-C	1.E-03	Spurious closure signal to B32-F003C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F002-SPUR-A	1.E-03	Spurious closure signal to B32-F002A
1.E-12	0.1	C63-B32-F002-SPUR-D	1.E-03	Spurious closure signal to B32-F002D
		C63-B32-F003-SPUR-C	1.E-03	Spurious closure signal to B32-F003C
		C63-B32-F001-SPUR-B	1.E-03	Spurious closure signal to B32-F001B
		C63-B32-F003-SPUR-A	1.E-03	Spurious closure signal to B32-F003A

**B32-CROSSCONNAB**

Probability	% of Top	Event	Probability	Description
3.E-07	81.3	B32-NPO-CC-F105A	1.E-04	F105A Fails to Open
		B32-SQV-CC-F104A	3.E-03	F104A FAILS TO OPEN
3.33E-08	9.0	B32-NPO-CC-F105A	1.E-04	F105A Fails to Open
		B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
2.89E-08	7.8	B32-NPO-CC-XCONN_1_2	9.65E-06	CCF of two components: B32-NPO-CC-F105A & B32-NPO-CC-F105B
		B32-SQV-CC-F104A	3.E-03	F104A FAILS TO OPEN
3.22E-09	0.9	B32-NPO-CC-XCONN_1_2	9.65E-06	CCF of two components: B32-NPO-CC-F105A & B32-NPO-CC-F105B
		B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
3.E-09	0.8	B32-SQV-CC-F104A	3.E-03	F104A FAILS TO OPEN
		B32-UV_-OO-F105A	1.E-03	CHECK VALVE FAILS TO CLOSE
		P54-0001-_1	1.E-03	LOSS OF HPNSS
3.33E-10	0.1	B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
		B32-UV_-OO-F105A	1.E-03	CHECK VALVE FAILS TO CLOSE
		P54-0001-_1	1.E-03	LOSS OF HPNSS

**B32-CROSSCONNAB**

Probability	% of Top	Event	Probability	Description
8.01E-11	0.0	B32-SQV-CC-F104A	3.E-03	F104A FAILS TO OPEN
		B32-UV_-OO-XCONN-ACC_1_2	2.67E-05	CCF of two components: B32-UV_-OO-F105A & B32-UV_-OO-F105B
		P54-0001-_1	1.E-03	LOSS OF HPNSS
7.2E-11	0.0	B32-SQV-CC-F104A	3.E-03	F104A FAILS TO OPEN
		B32-UV_-RL-F105A	2.4E-05	CHECK VALVE REVERSE LEAKAGE
		P54-0001-_1	1.E-03	LOSS OF HPNSS
8.9E-12	0.0	B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
		B32-UV_-OO-XCONN-ACC_1_2	2.67E-05	CCF of two components: B32-UV_-OO-F105A & B32-UV_-OO-F105B
		P54-0001-_1	1.E-03	LOSS OF HPNSS
8.E-12	0.0	B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
		B32-UV_-RL-F105A	2.4E-05	CHECK VALVE REVERSE LEAKAGE
		P54-0001-_1	1.E-03	LOSS OF HPNSS

**B32-CROSSCONNCD**

Probability	% of Top	Event	Probability	Description
3.E-07	81.3	B32-NPO-CC-F105B	1.E-04	F105B fails to open
		B32-SQV-CC-F104B	3.E-03	F104B FAILS TO OPEN
3.33E-08	9.0	B32-NPO-CC-F105B	1.E-04	F105B fails to open
		B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
2.89E-08	7.8	B32-NPO-CC-XCONN_1_2	9.65E-06	CCF of two components: B32-NPO-CC-F105A & B32-NPO-CC-F105B
		B32-SQV-CC-F104B	3.E-03	F104B FAILS TO OPEN
3.22E-09	0.9	B32-NPO-CC-XCONN_1_2	9.65E-06	CCF of two components: B32-NPO-CC-F105A & B32-NPO-CC-F105B
		B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
3.E-09	0.8	B32-SQV-CC-F104B	3.E-03	F104B FAILS TO OPEN
		B32-UV_-OO-F105B	1.E-03	CHECK VALVE FAILS TO CLOSE
		P54-0001-_1	1.E-03	LOSS OF HPNSS
3.33E-10	0.1	B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B

**B32-CROSSCONNCD**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
		B32-UV_-OO-F105B	1.E-03	CHECK VALVE FAILS TO CLOSE
		P54-0001-_1	1.E-03	LOSS OF HPNSS
8.01E-11	0.0	B32-SQV-CC-F104B	3.E-03	F104B FAILS TO OPEN
		B32-UV_-OO-XCONN-ACC_1_2	2.67E-05	CCF of two components: B32-UV_-OO-F105A & B32-UV_-OO-F105B
		P54-0001-_1	1.E-03	LOSS OF HPNSS
7.2E-11	0.0	B32-SQV-CC-F104B	3.E-03	F104B FAILS TO OPEN
		B32-UV_-RL-F105B	2.4E-05	CHECK VALVE REVERSE LEAKAGE
		P54-0001-_1	1.E-03	LOSS OF HPNSS
8.9E-12	0.0	B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
		B32-UV_-OO-XCONN-ACC_1_2	2.67E-05	CCF of two components: B32-UV_-OO-F105A & B32-UV_-OO-F105B
		P54-0001-_1	1.E-03	LOSS OF HPNSS
8.E-12	0.0	B32-SQV-CC-XCONN_1_2	3.33E-04	CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B
		B32-UV_-RL-F105B	2.4E-05	CHECK VALVE REVERSE LEAKAGE
		P54-0001-_1	1.E-03	LOSS OF HPNSS

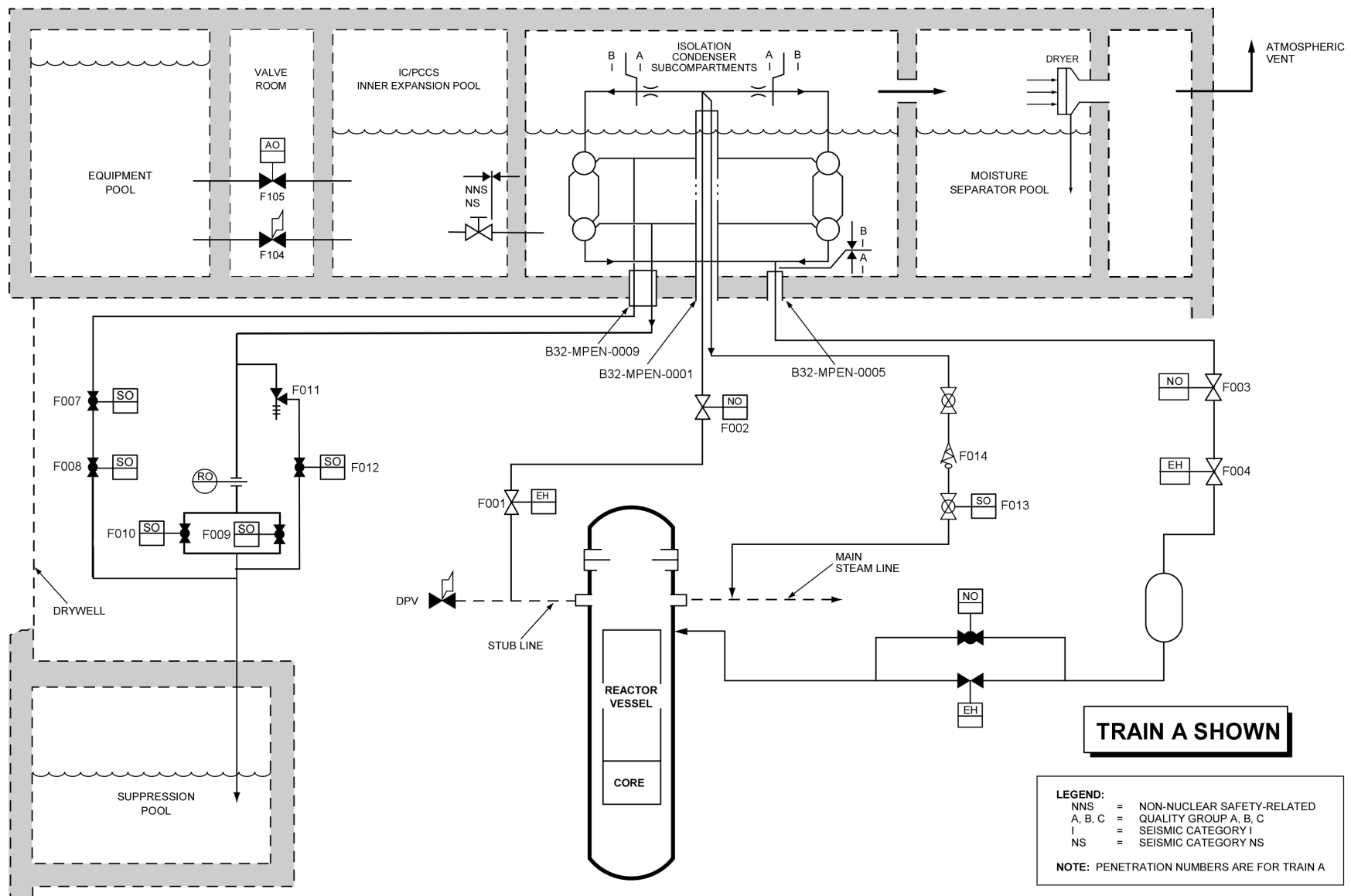
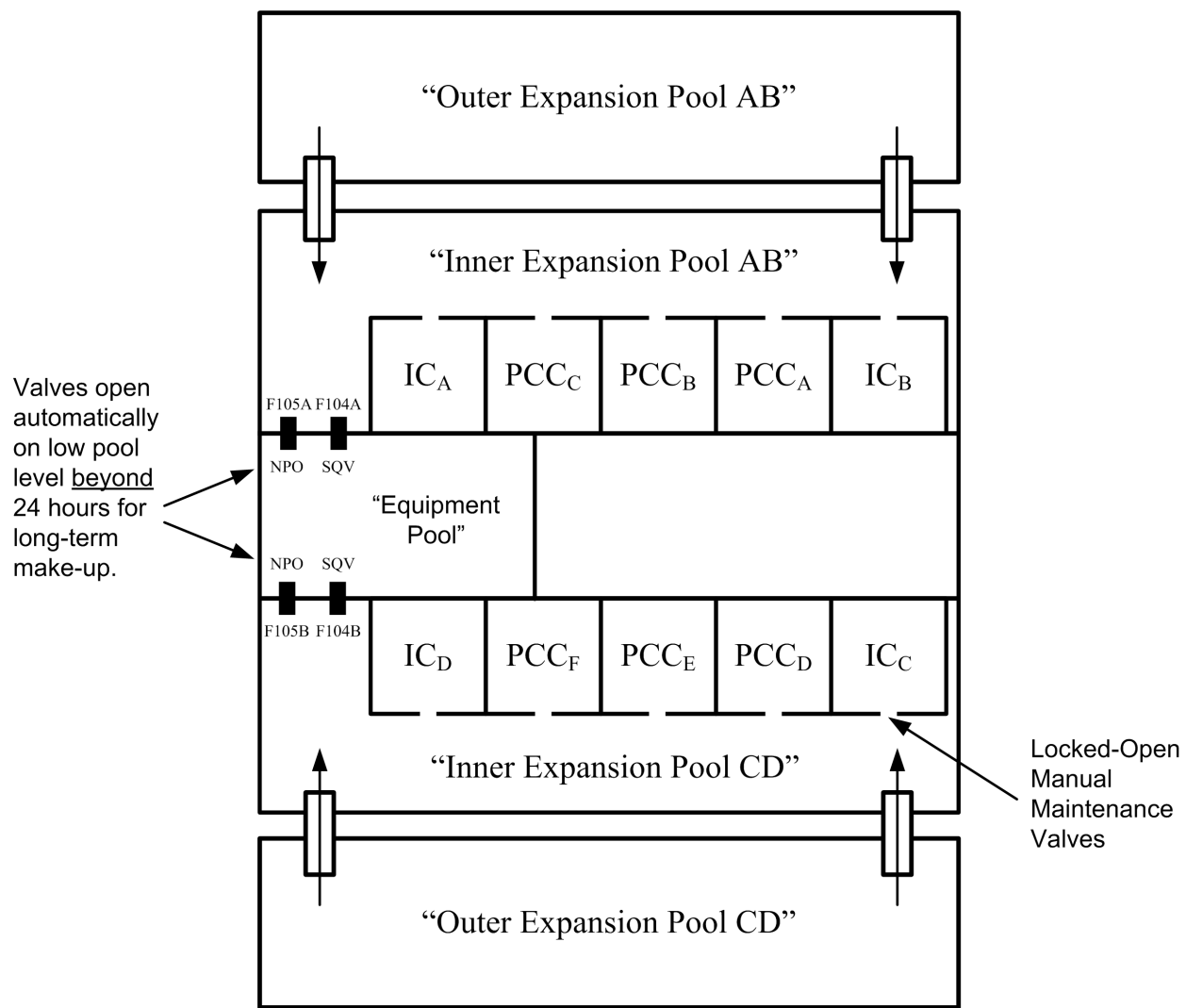
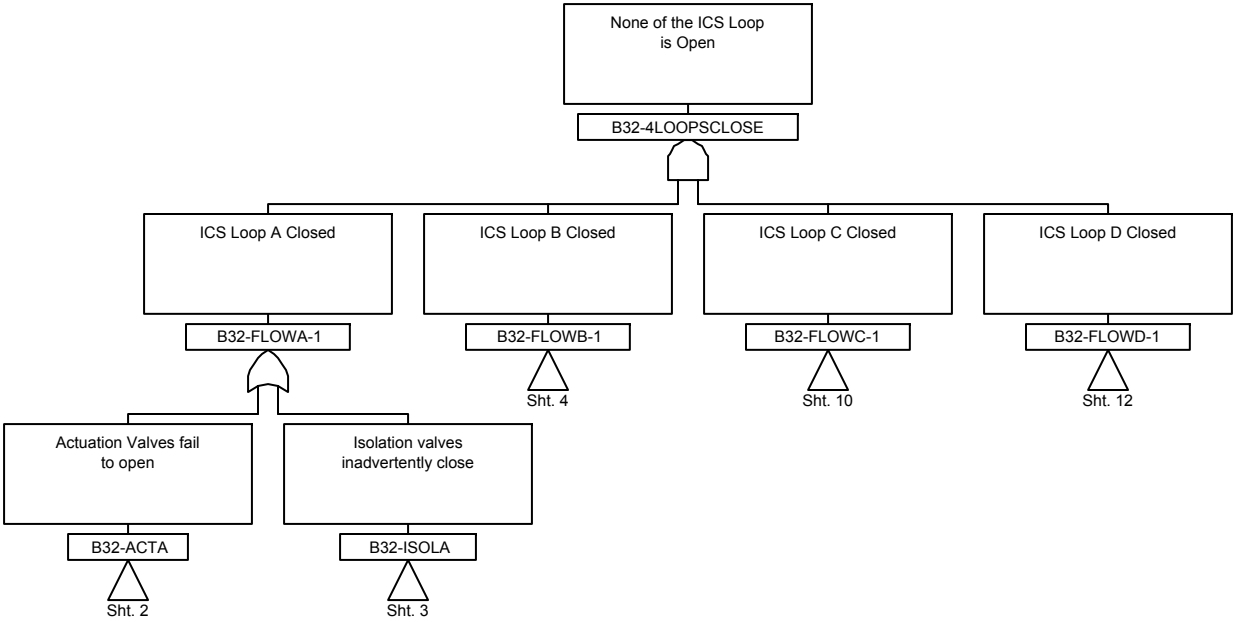


Figure 4.2-1. Simplified Diagram of Isolation Condenser System





**Figure 4.2-2. Schematic of the ICS/PCCS Pools and Interconnections**



**Figure 4.2-3 Isolation Condenser System Fault Tree**  
Sheet 1

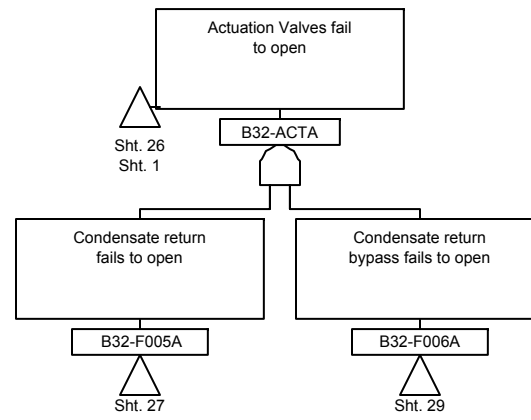


Figure 4.2-3. Sheet 2 Isolation Condenser System

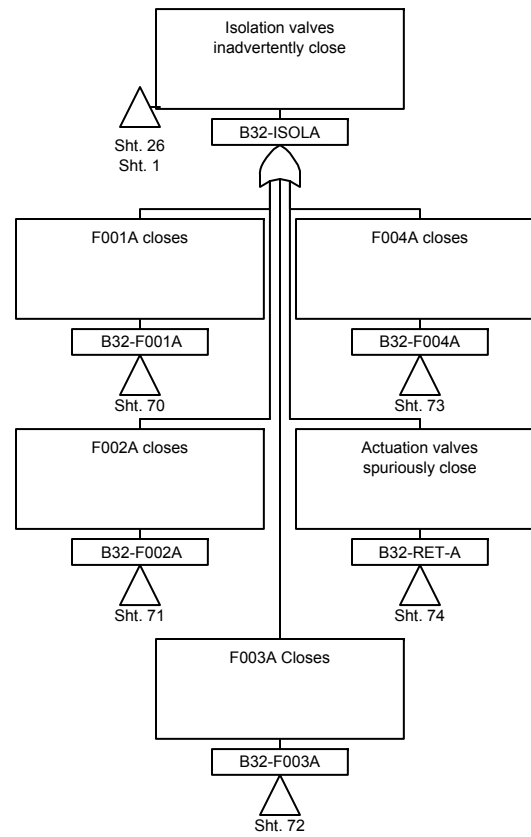


Figure 4.2-3. Sheet 3 Isolation Condenser System

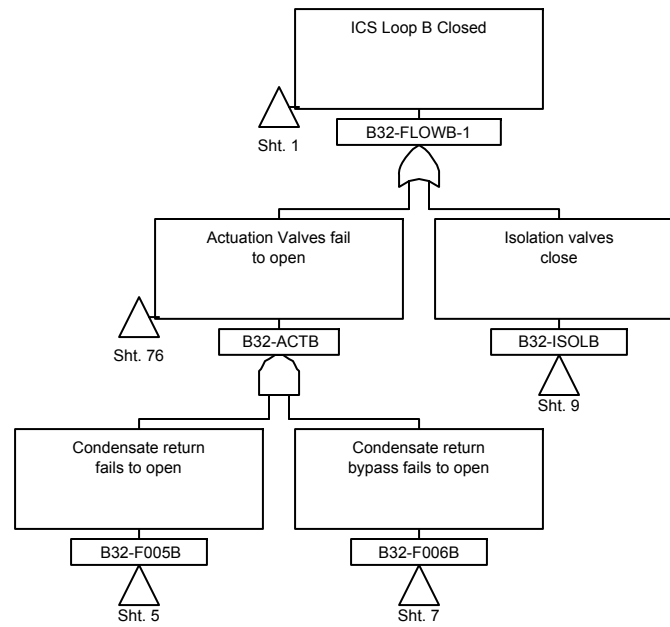


Figure 4.2-3. Sheet 4 Isolation Condenser System

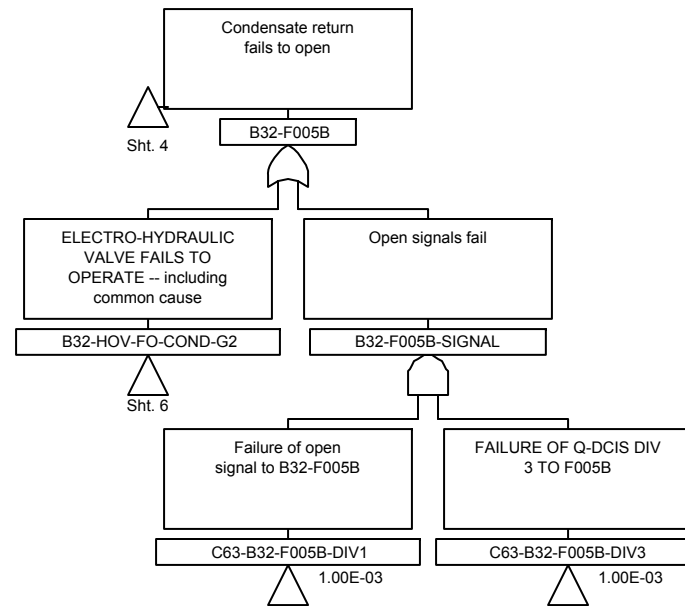


Figure 4.2-3. Sheet 5 Isolation Condenser System



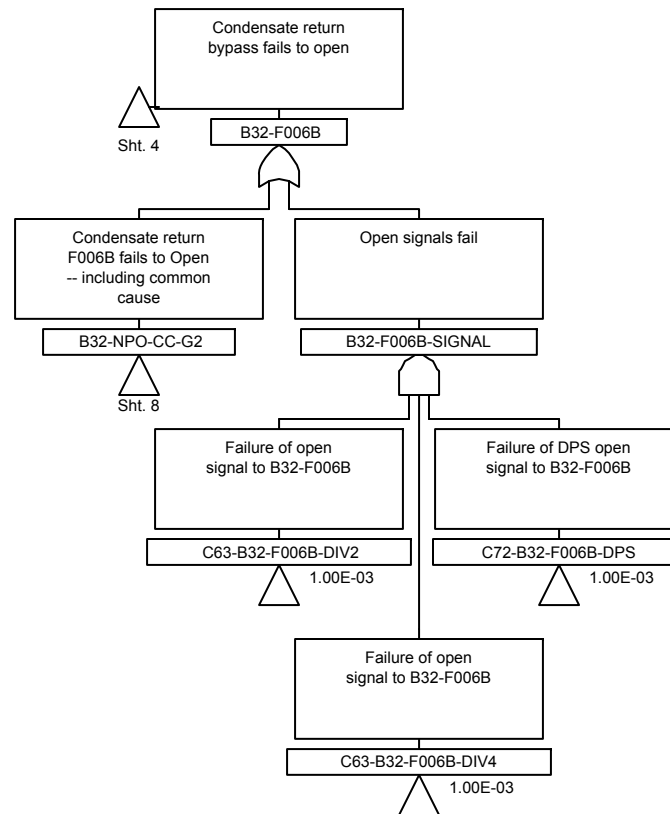


Figure 4.2-3. Sheet 7 Isolation Condenser System



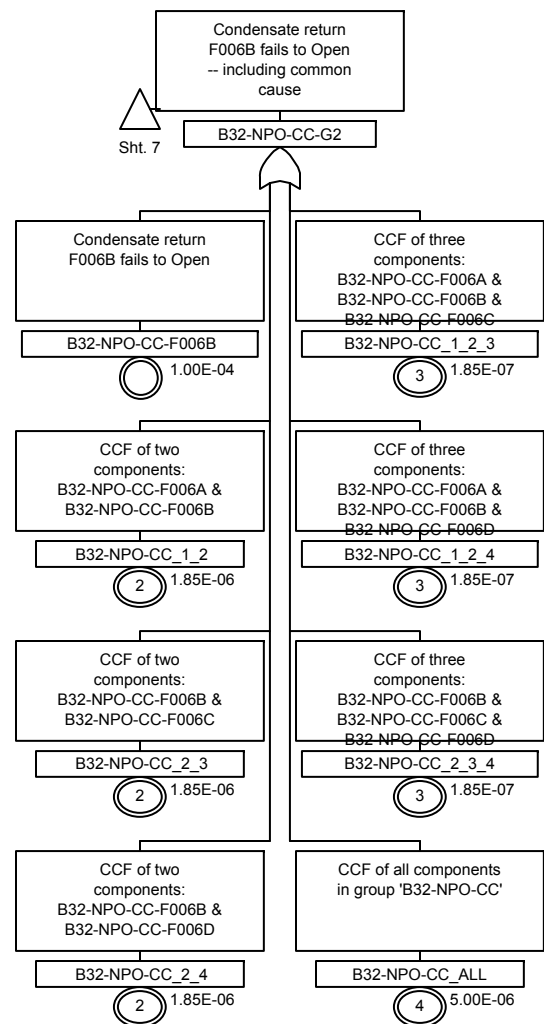


Figure 4.2-3. Sheet 8 Isolation Condenser System

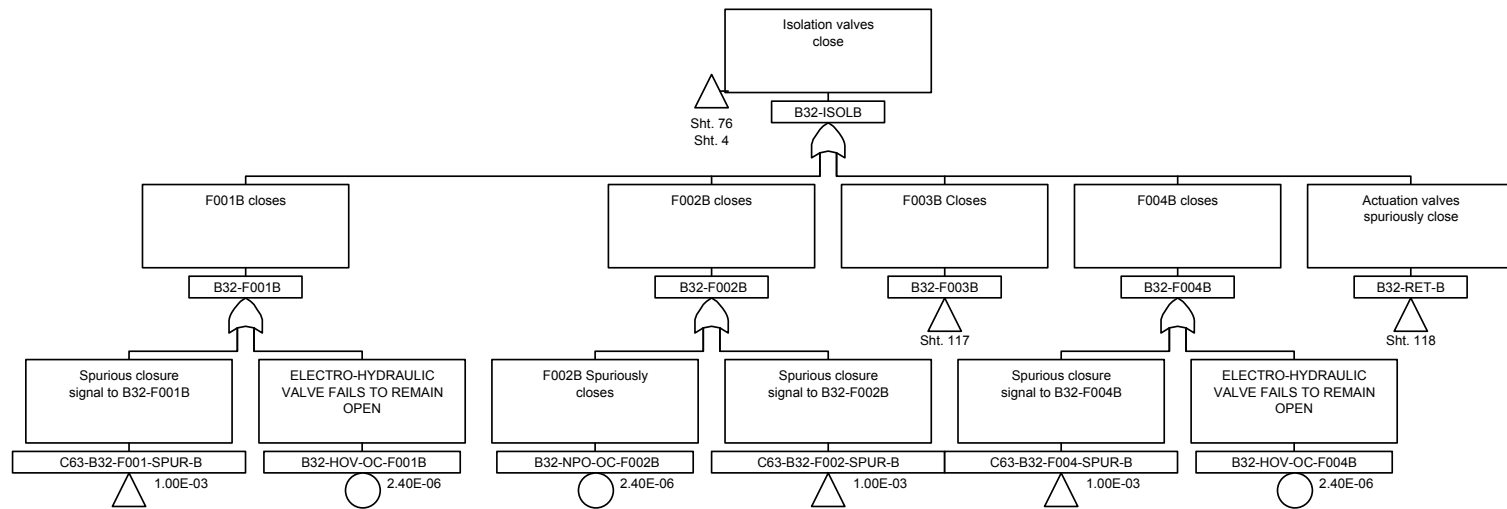


Figure 4.2-3. Sheet 9 Isolation Condenser System

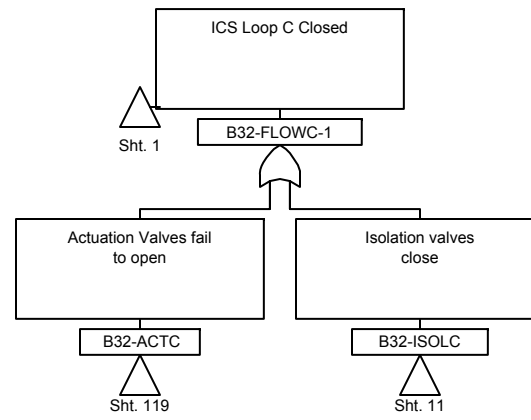


Figure 4.2-3. Sheet 10 Isolation Condenser System

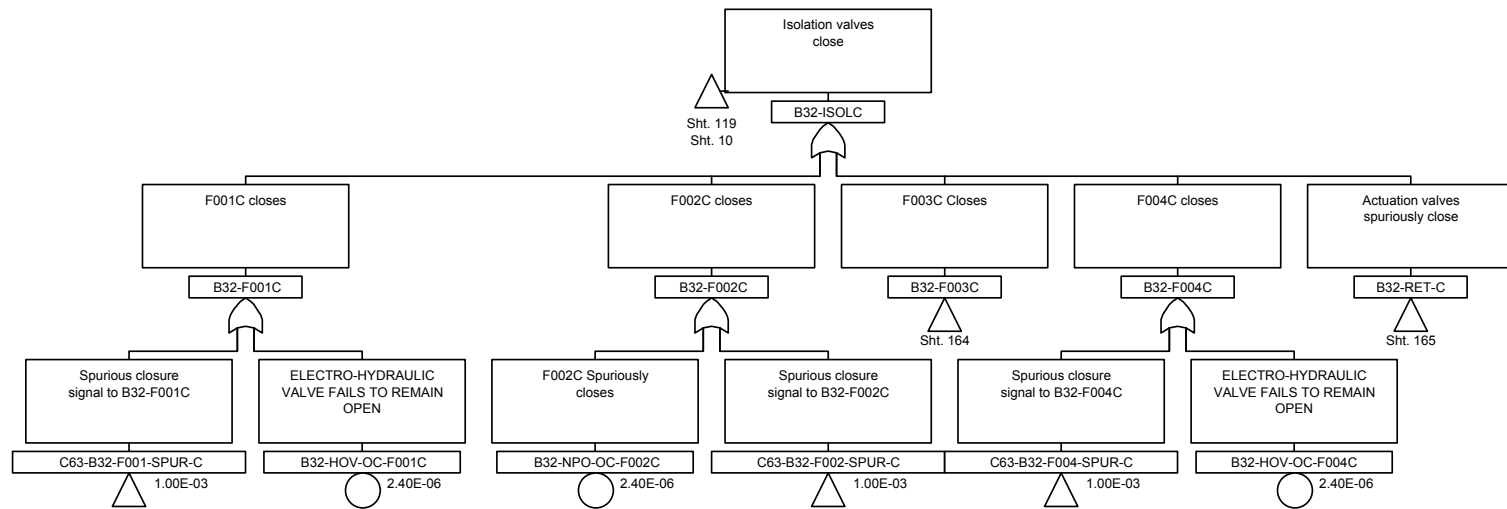


Figure 4.2-3. Sheet 11 Isolation Condenser System

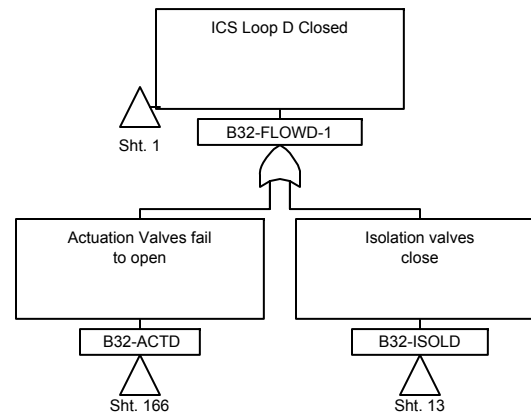


Figure 4.2-3. Sheet 12 Isolation Condenser System

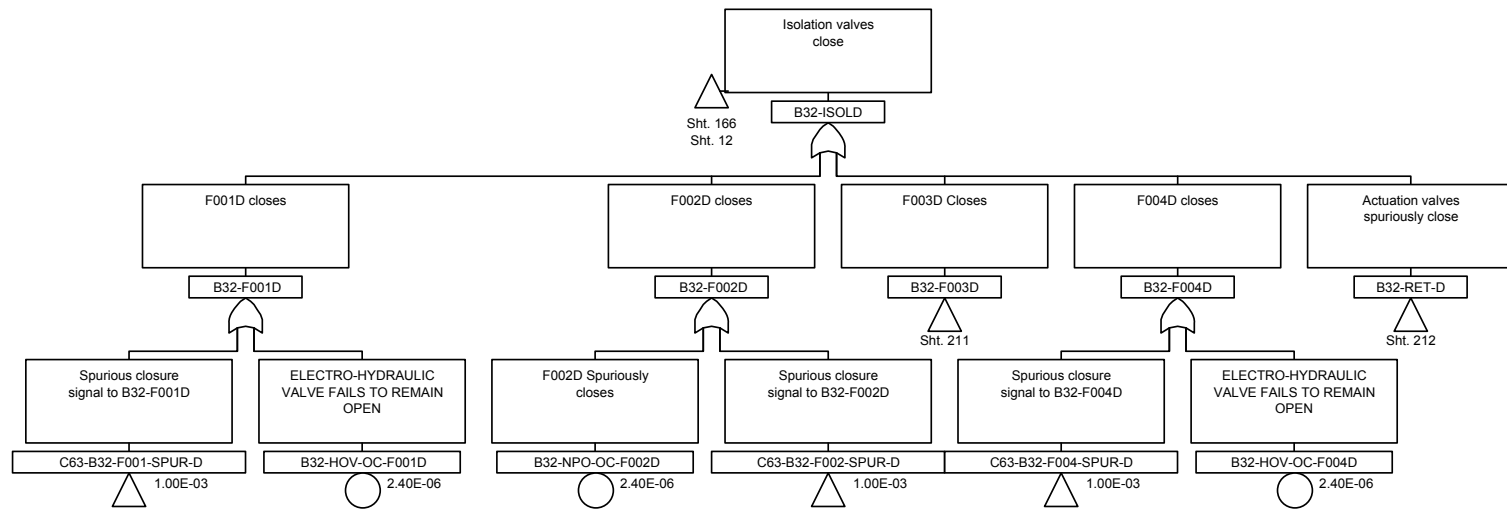


Figure 4.2-3. Sheet 13 Isolation Condenser System

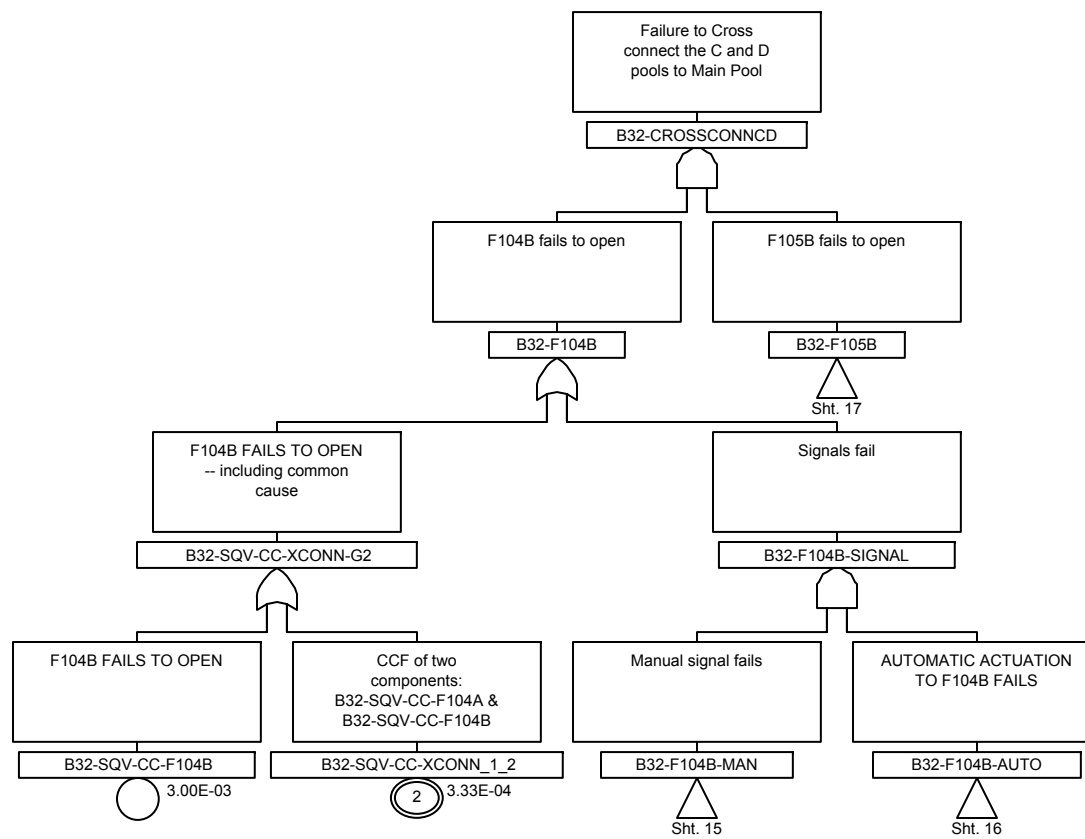


Figure 4.2-3. Sheet 14 Isolation Condenser System

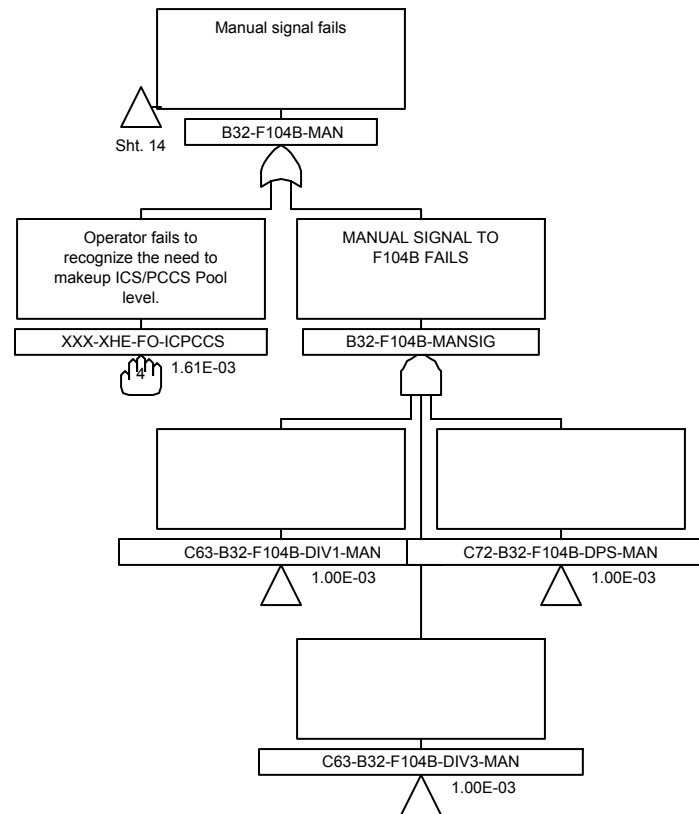


Figure 4.2-3. Sheet 15 Isolation Condenser System



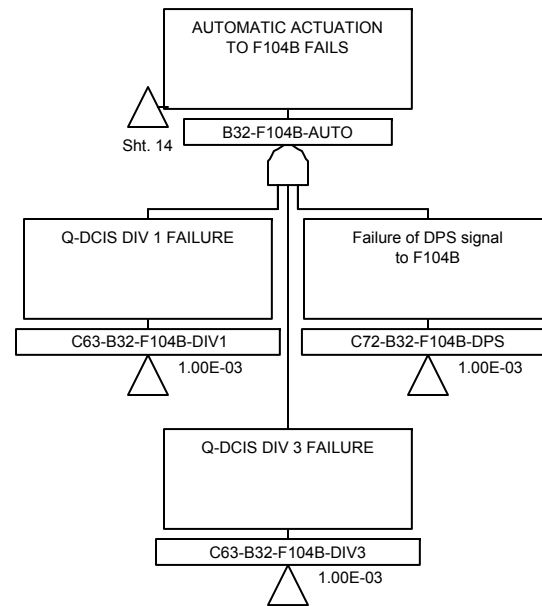


Figure 4.2-3. Sheet 16 Isolation Condenser System

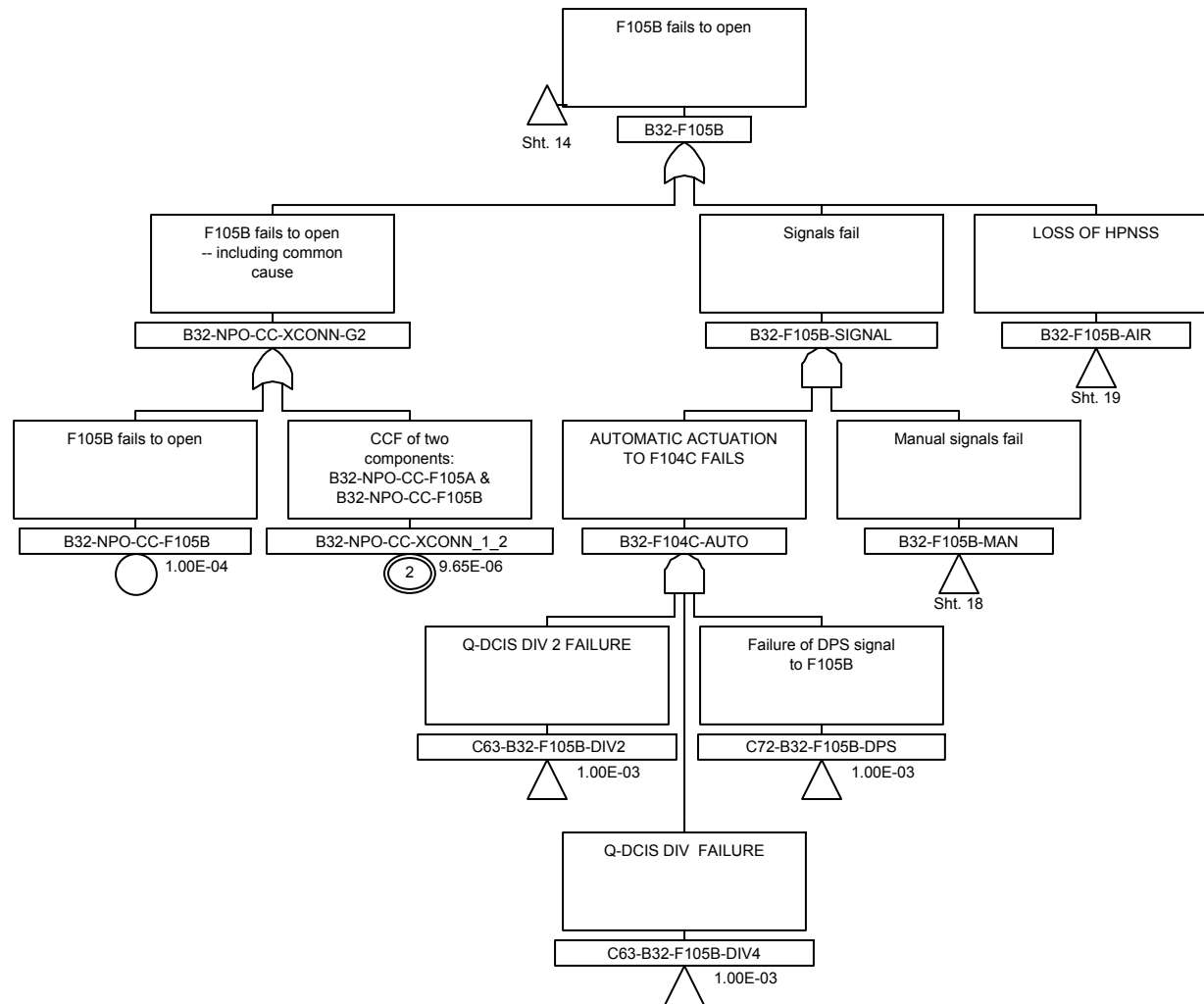


Figure 4.2-3. Sheet 17 Isolation Condenser System

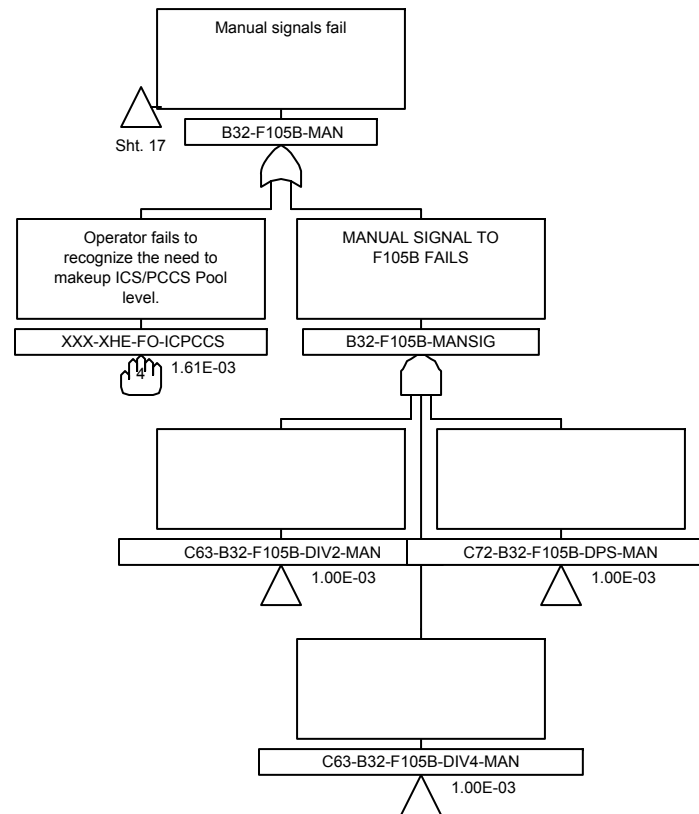


Figure 4.2-3. Sheet 18 Isolation Condenser System

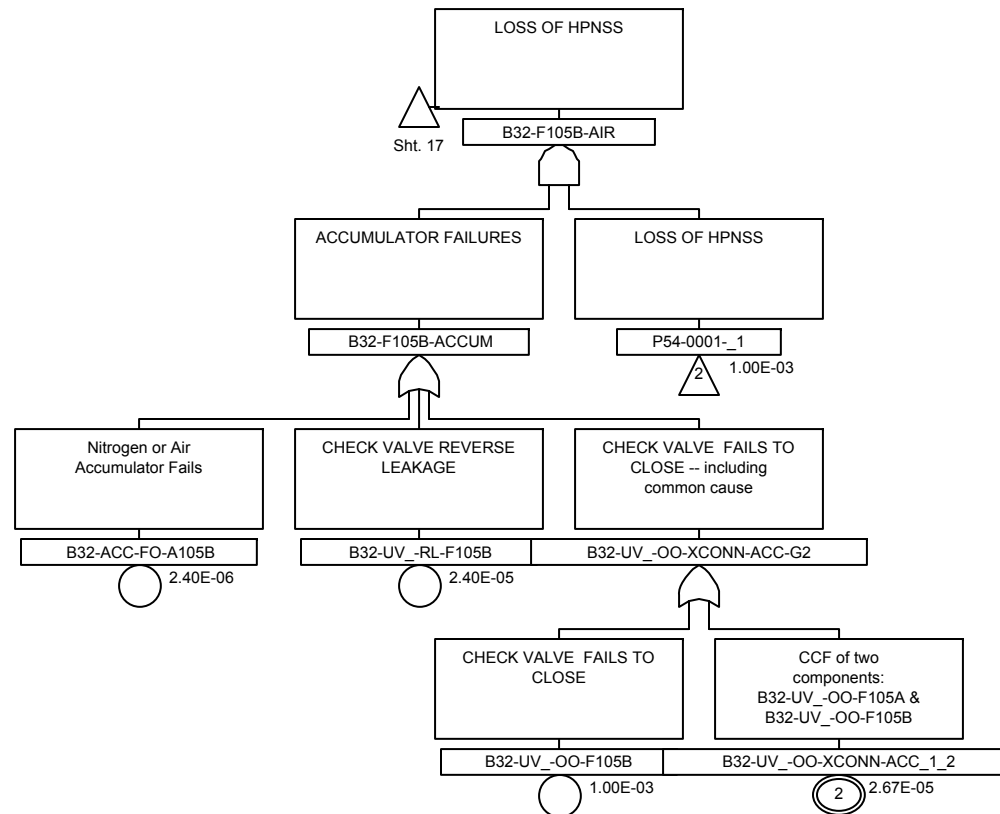


Figure 4.2-3. Sheet 19 Isolation Condenser System

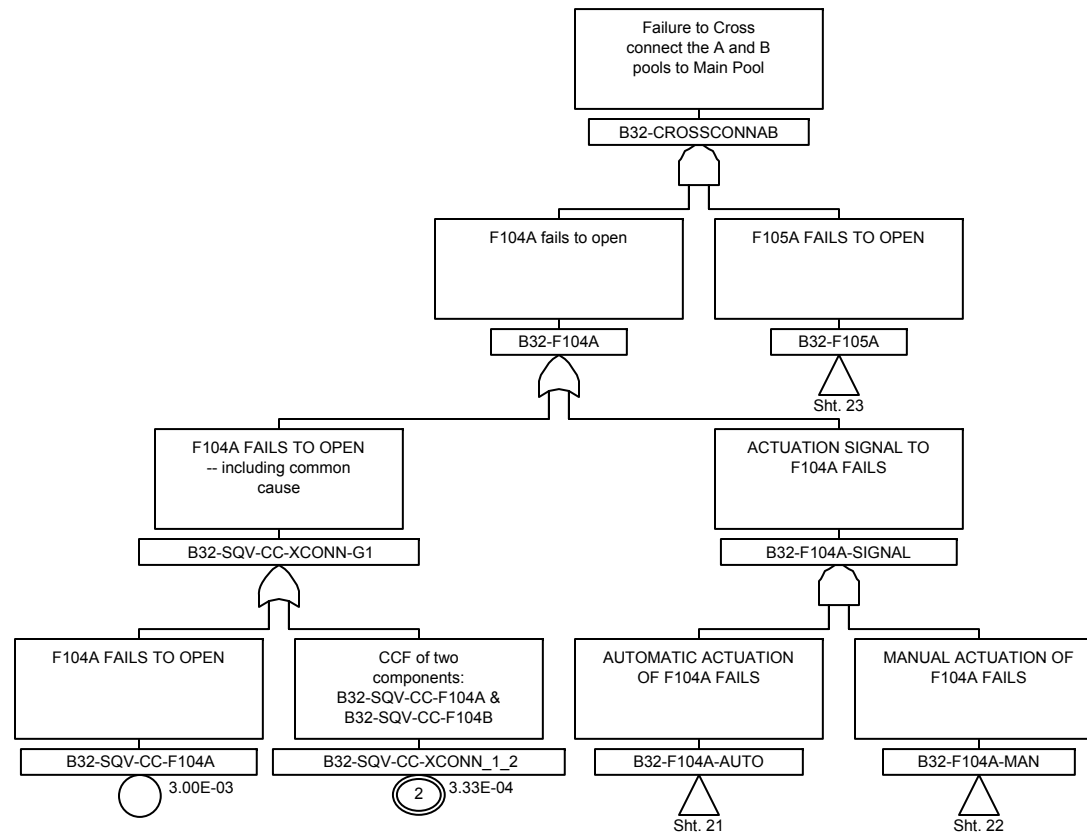


Figure 4.2-3. Sheet 20 Isolation Condenser System

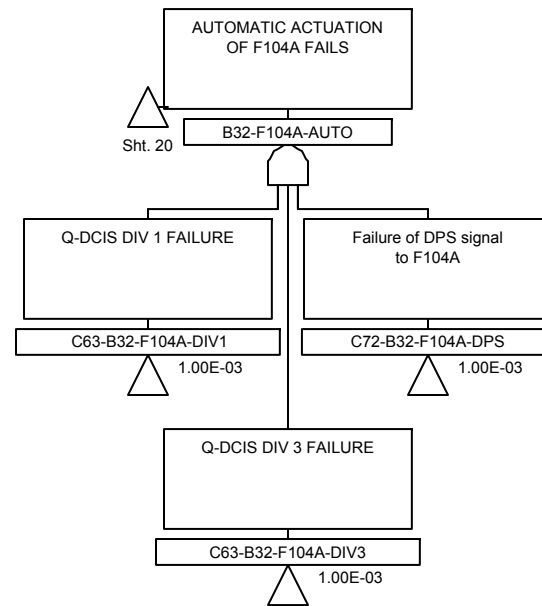


Figure 4.2-3. Sheet 21 Isolation Condenser System

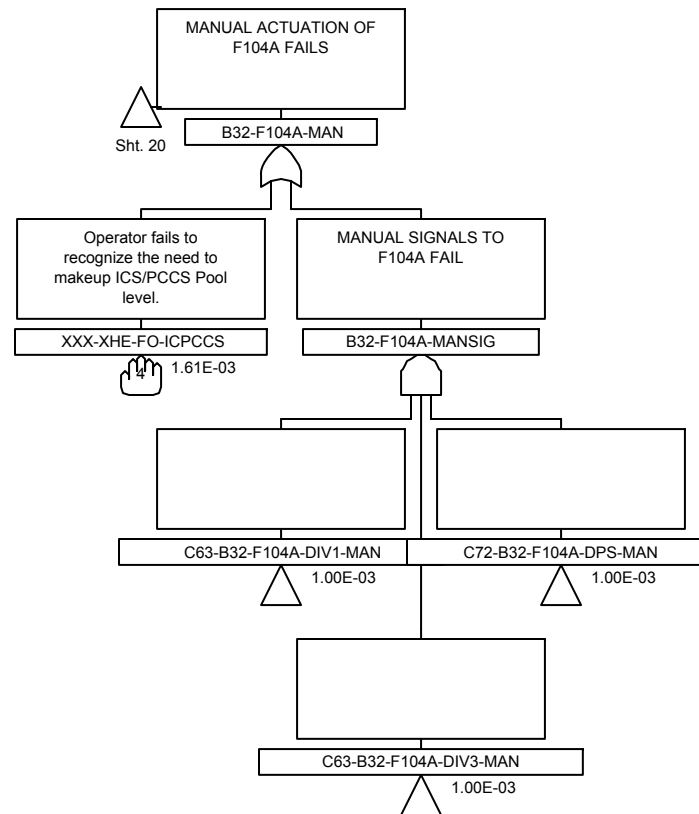


Figure 4.2-3. Sheet 22 Isolation Condenser System

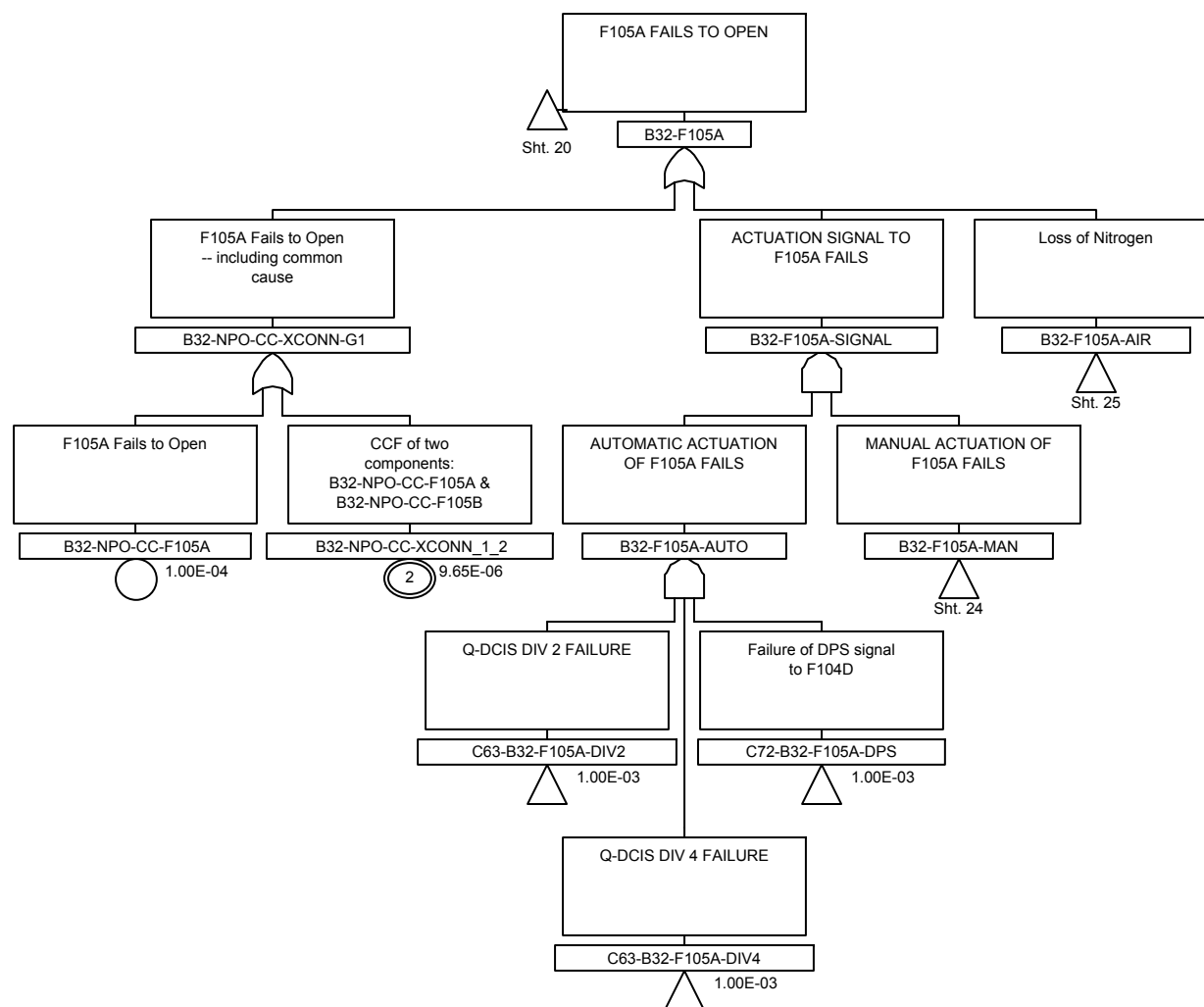


Figure 4.2-3. Sheet 23 Isolation Condenser System



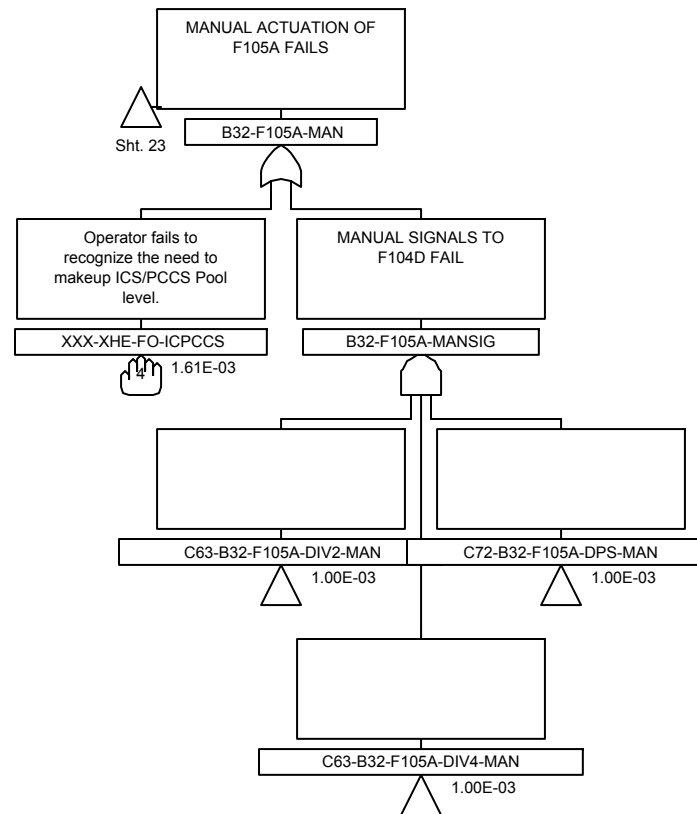


Figure 4.2-3. Sheet 24 Isolation Condenser System

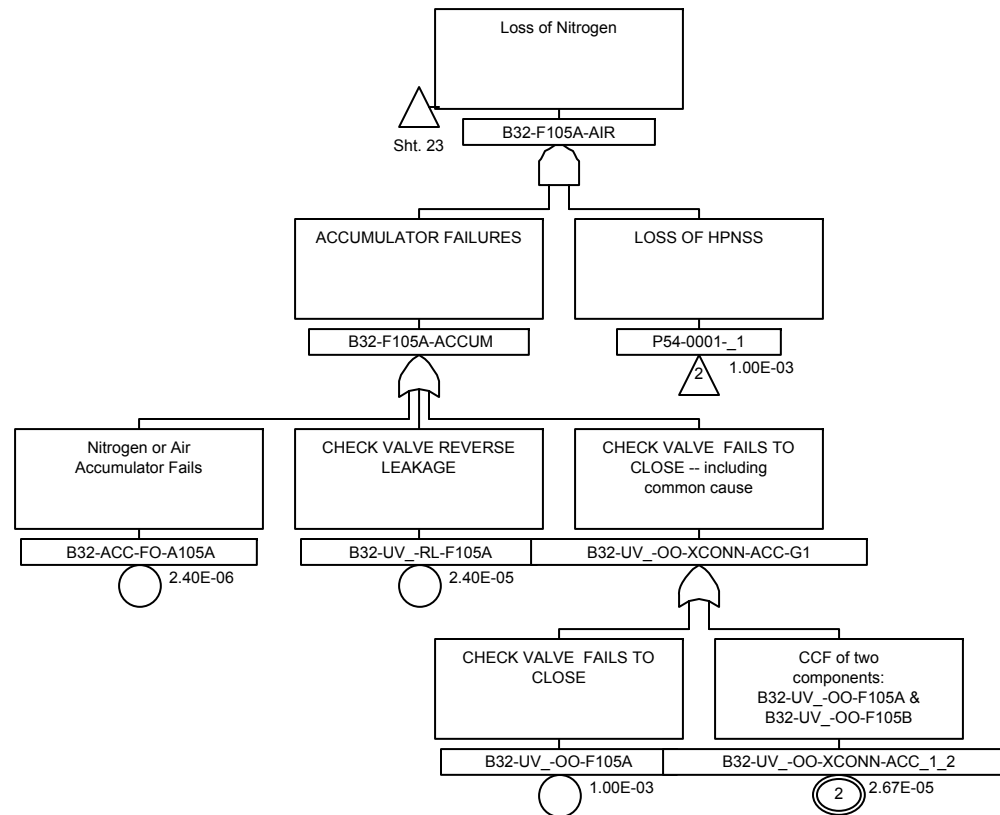


Figure 4.2-3. Sheet 25 Isolation Condenser System

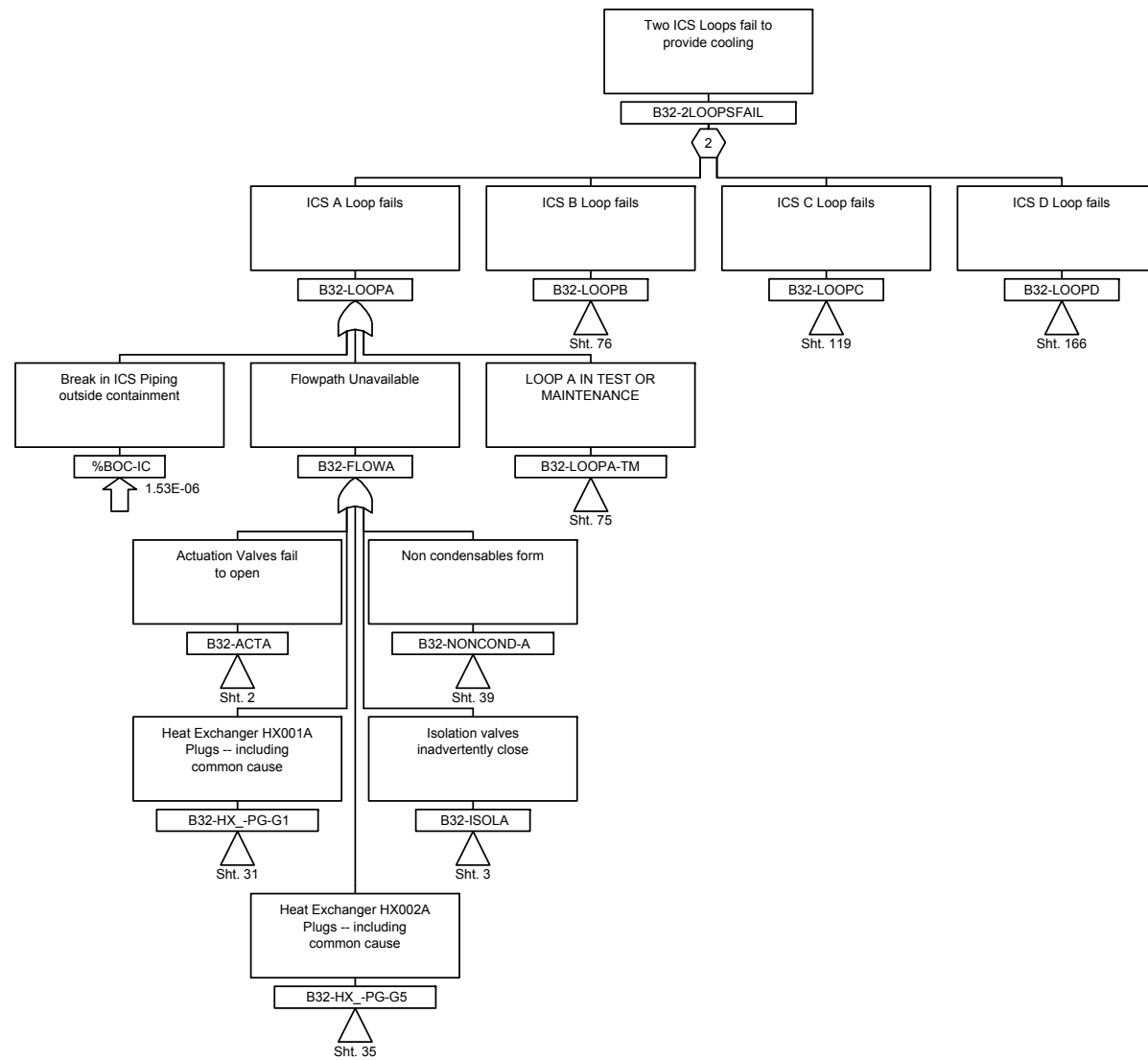


Figure 4.2-3. Sheet 26 Isolation Condenser System

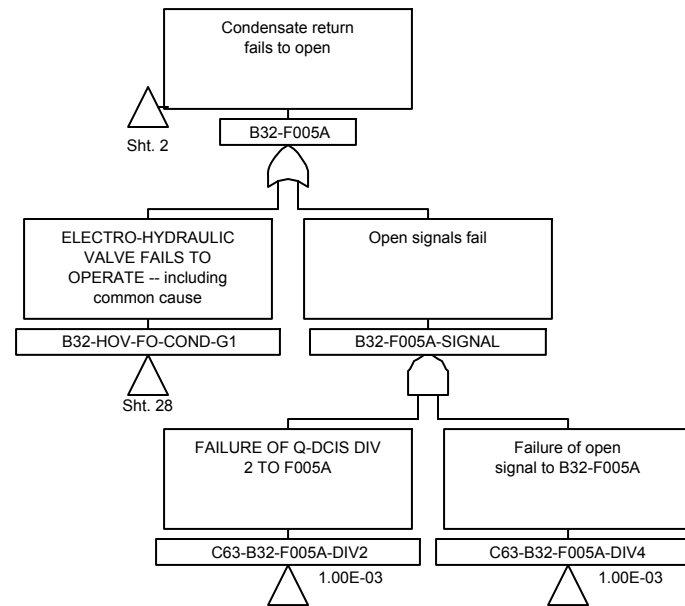


Figure 4.2-3. Sheet 27 Isolation Condenser System

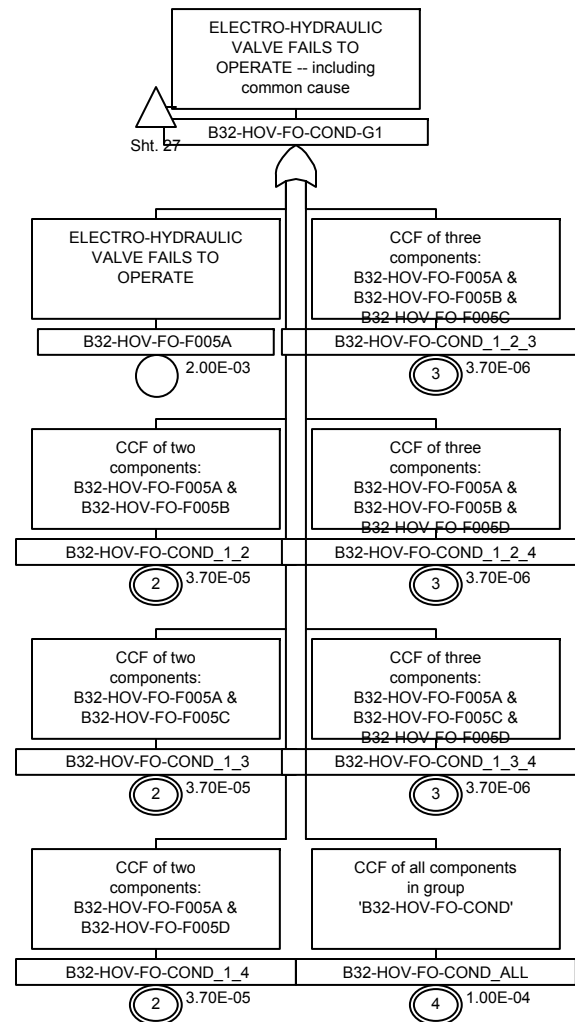


Figure 4.2-3. Sheet 28 Isolation Condenser System

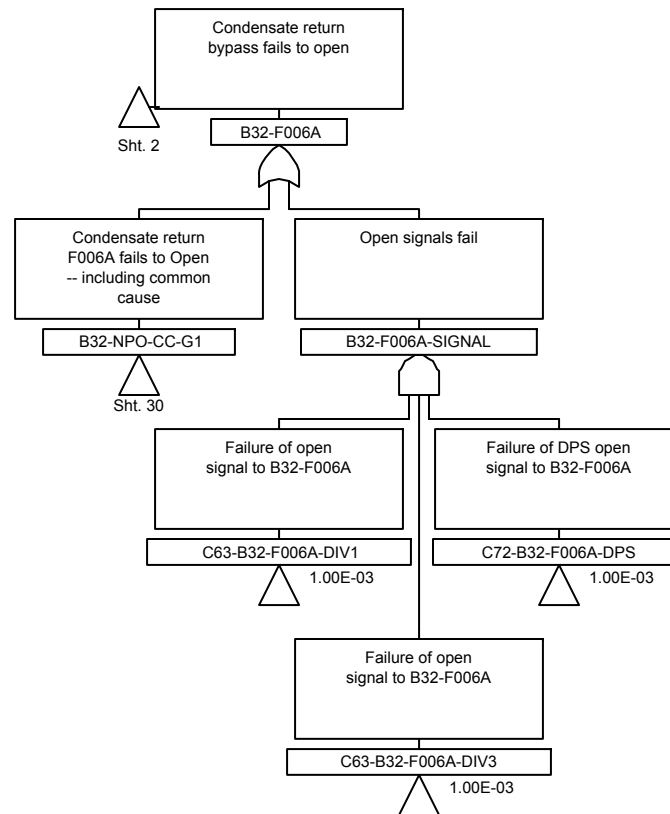


Figure 4.2-3. Sheet 29 Isolation Condenser System

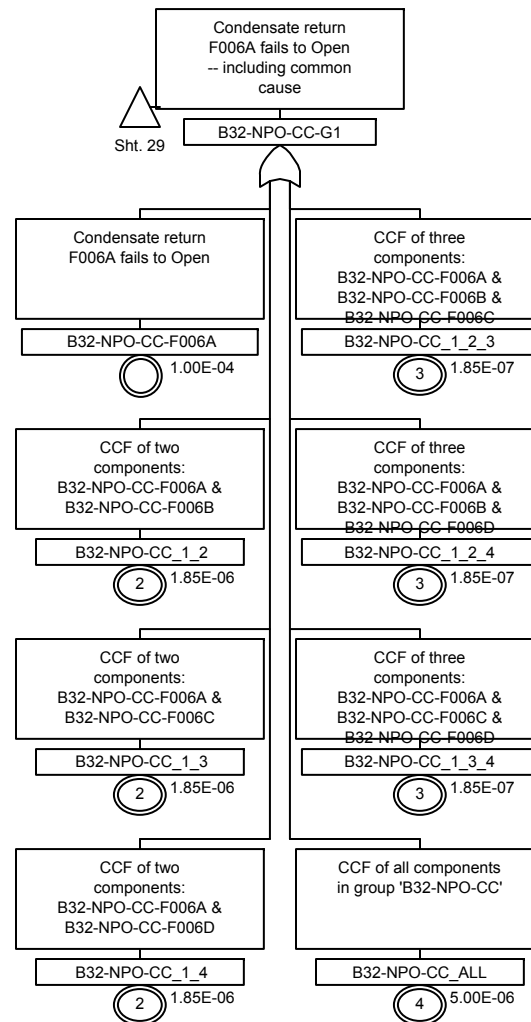


Figure 4.2-3. Sheet 30 Isolation Condenser System

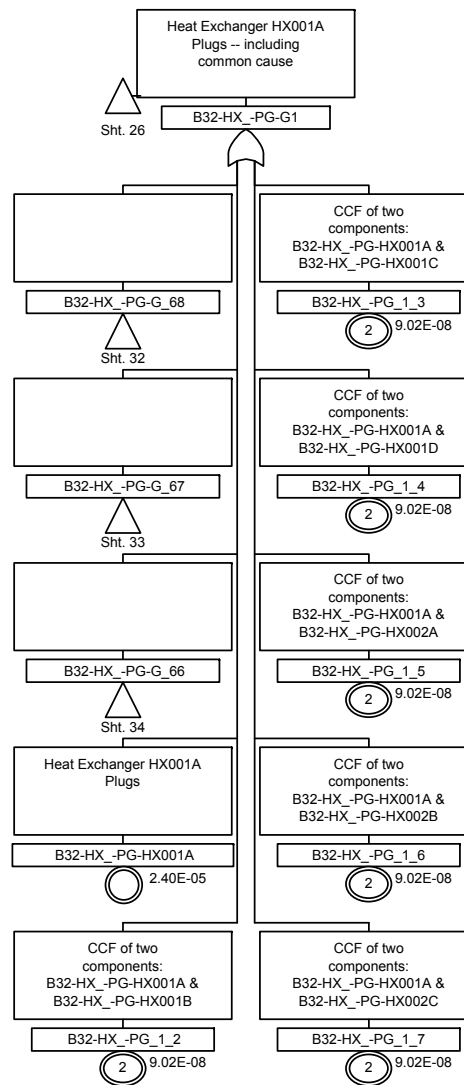


Figure 4.2-3. Sheet 31 Isolation Condenser System



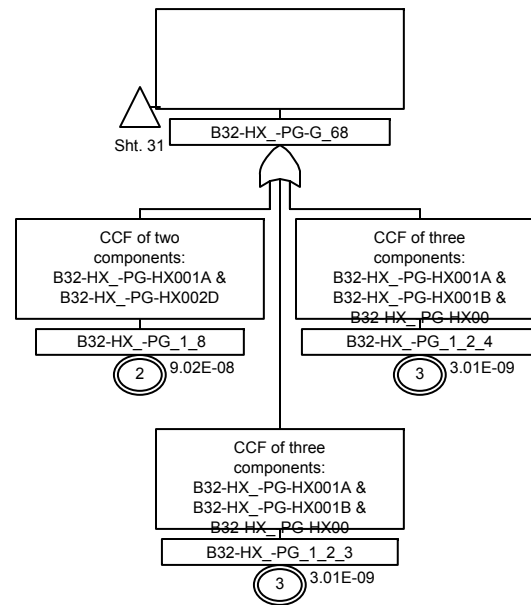


Figure 4.2-3. Sheet 32 Isolation Condenser System

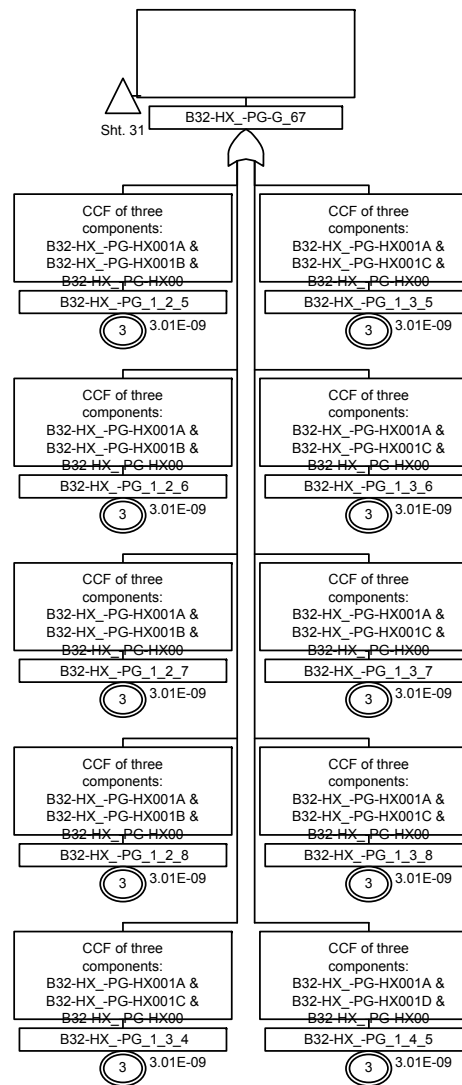


Figure 4.2-3. Sheet 33 Isolation Condenser System

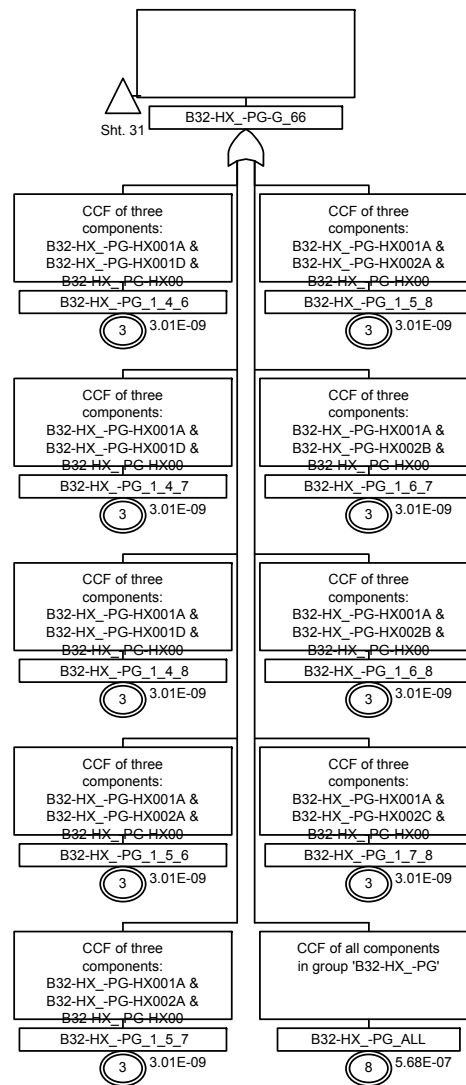


Figure 4.2-3. Sheet 34 Isolation Condenser System

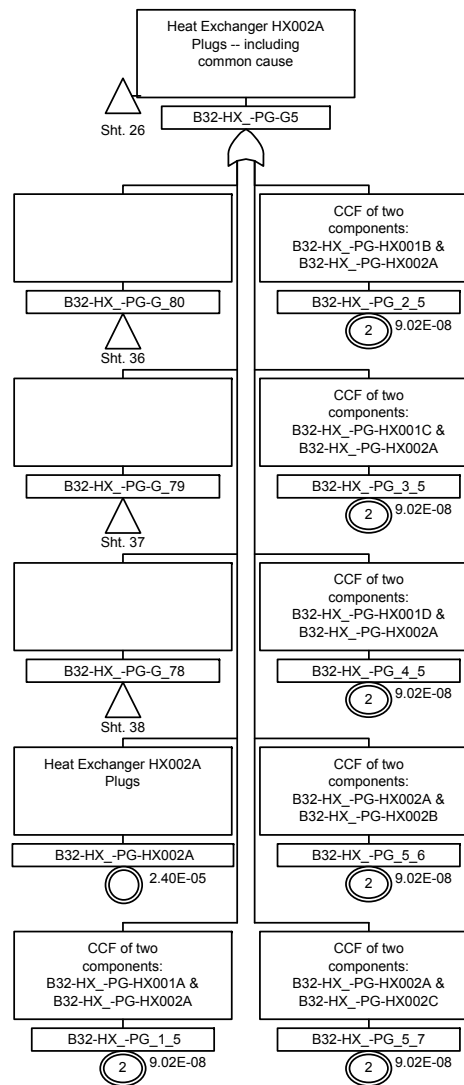


Figure 4.2-3. Sheet 35 Isolation Condenser System

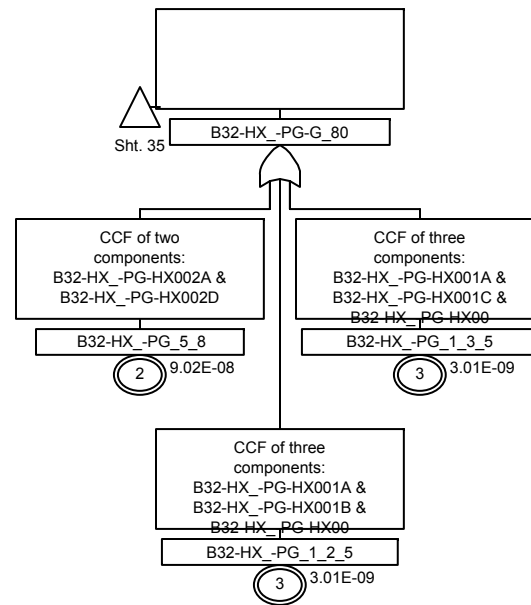


Figure 4.2-3. Sheet 36 Isolation Condenser System

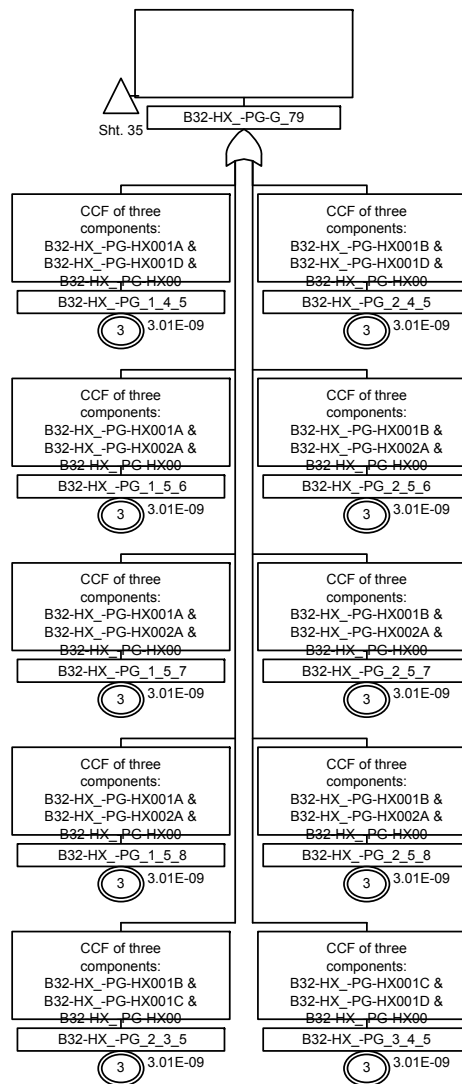


Figure 4.2-3. Sheet 37 Isolation Condenser System

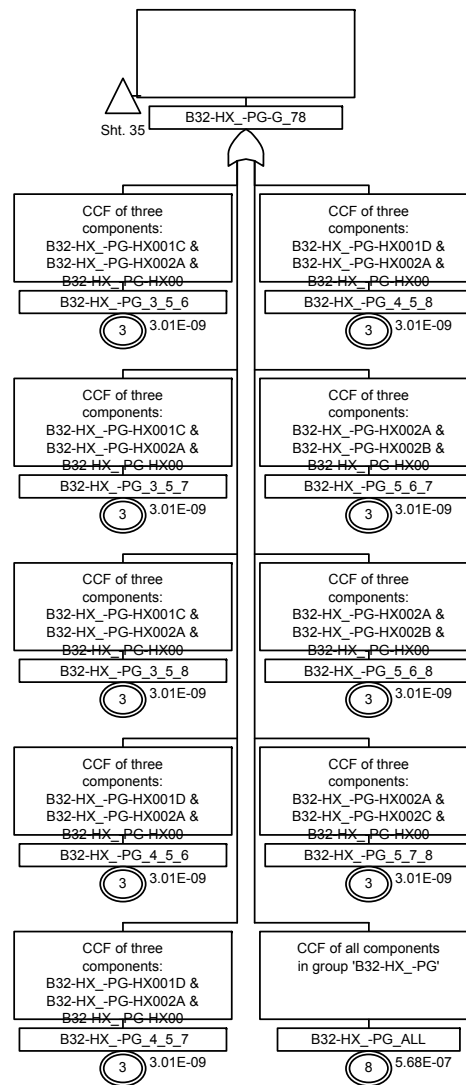


Figure 4.2-3. Sheet 38 Isolation Condenser System

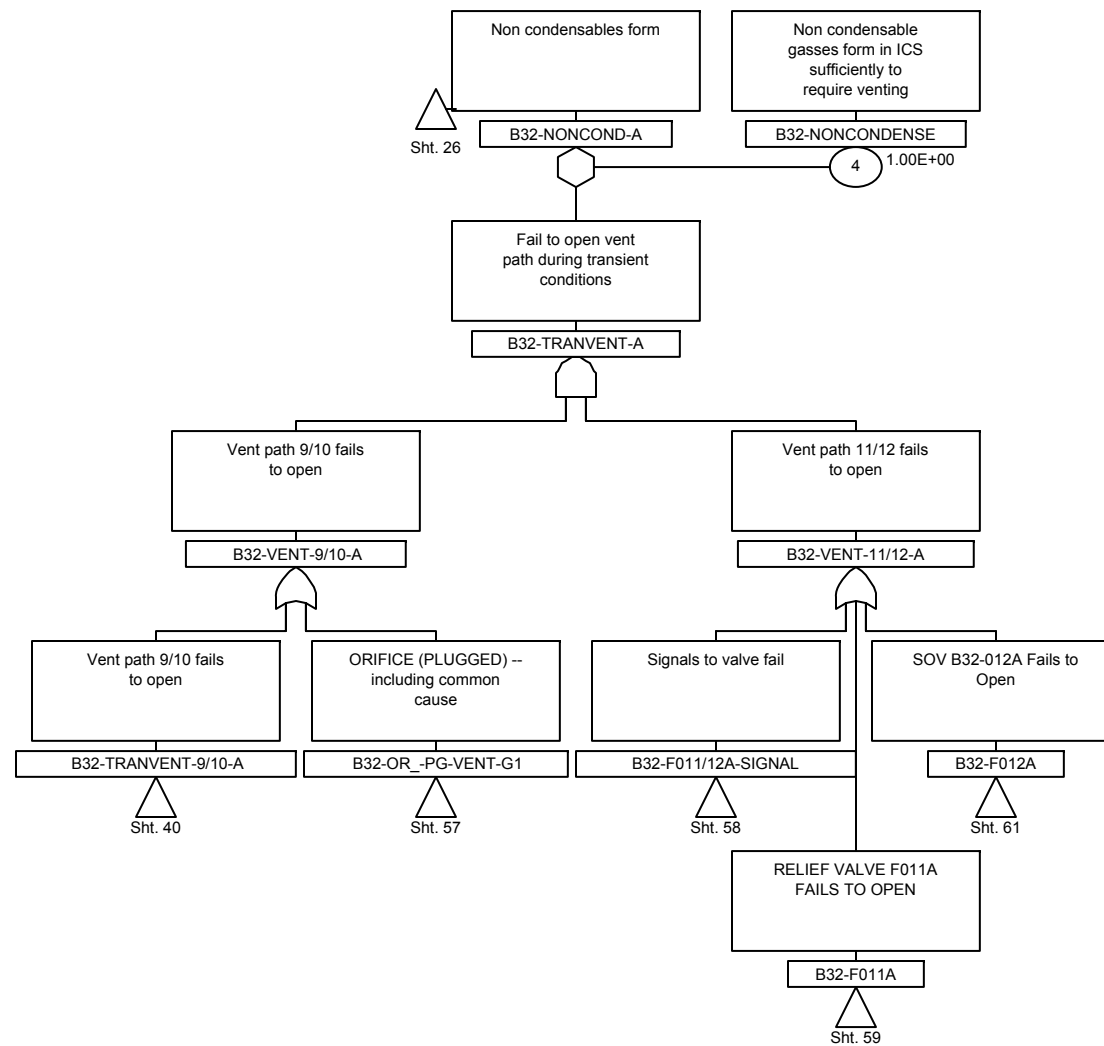


Figure 4.2-3. Sheet 39 Isolation Condenser System



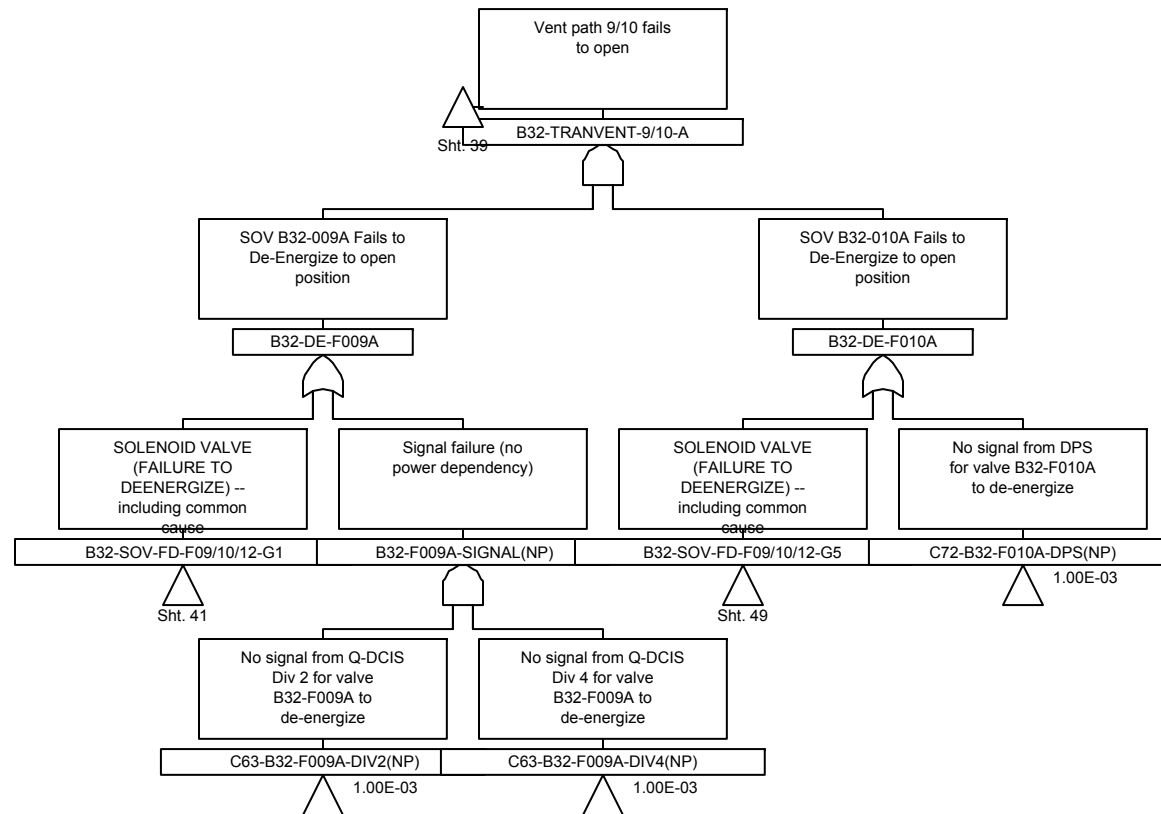


Figure 4.2-3. Sheet 40 Isolation Condenser System

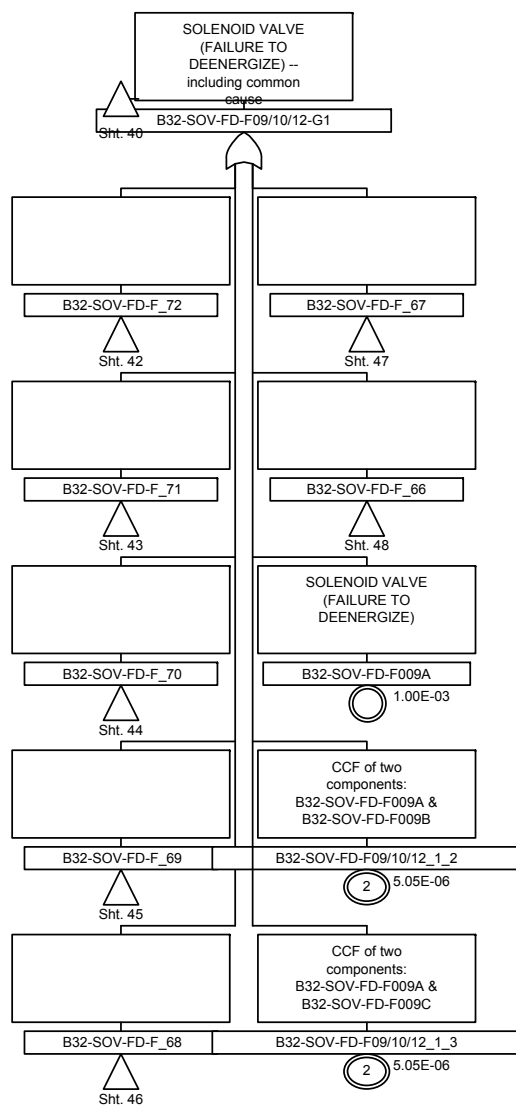


Figure 4.2-3. Sheet 41 Isolation Condenser System

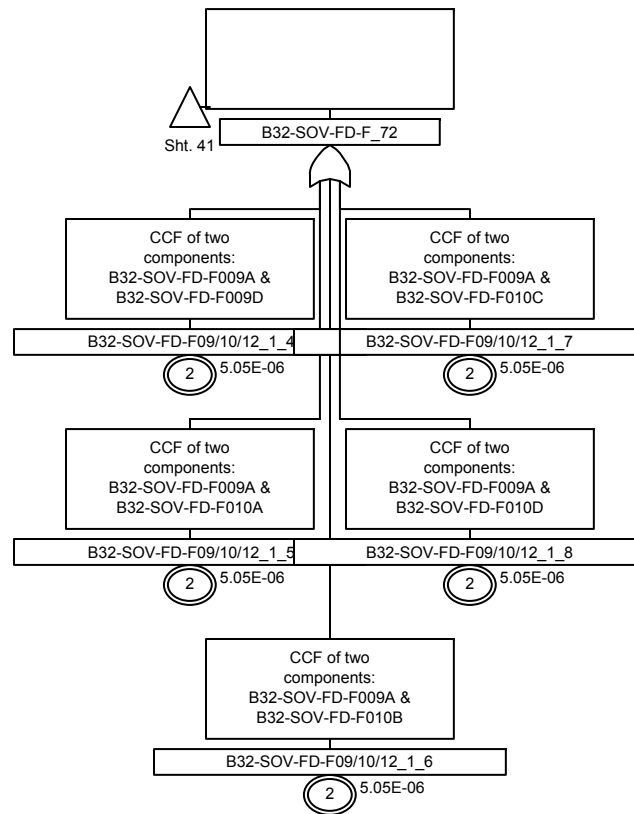


Figure 4.2-3. Sheet 42 Isolation Condenser System

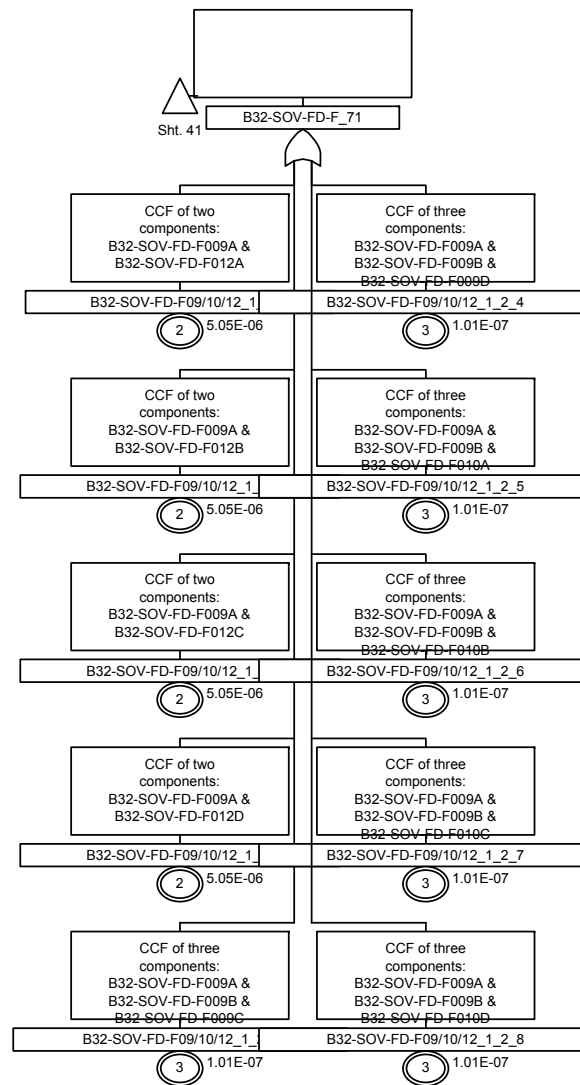


Figure 4.2-3. Sheet 43 Isolation Condenser System



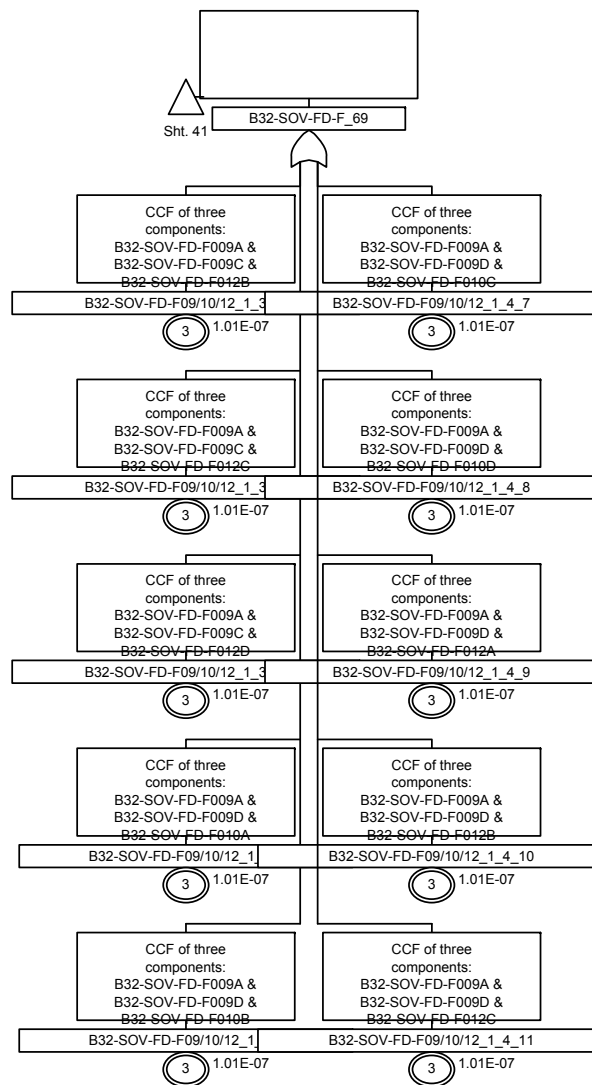


Figure 4.2-3. Sheet 45 Isolation Condenser System

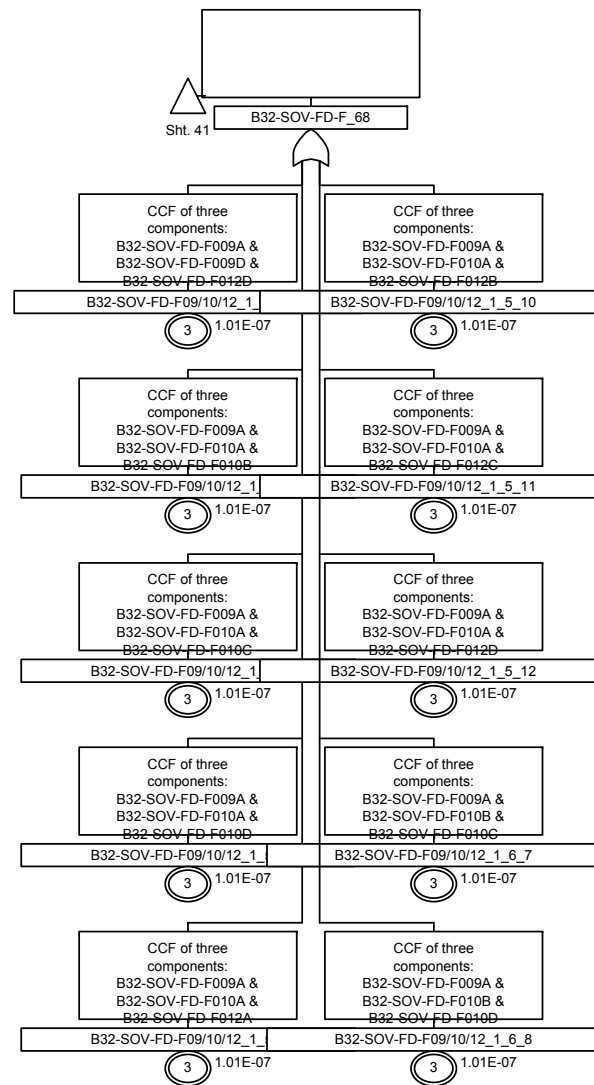


Figure 4.2-3. Sheet 46 Isolation Condenser System

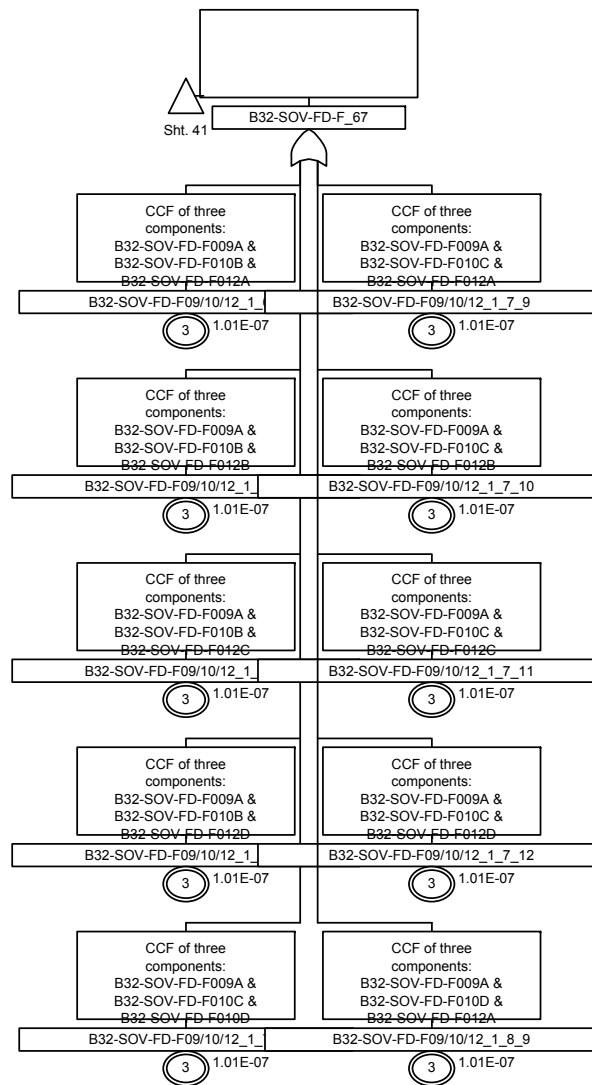


Figure 4.2-3. Sheet 47 Isolation Condenser System



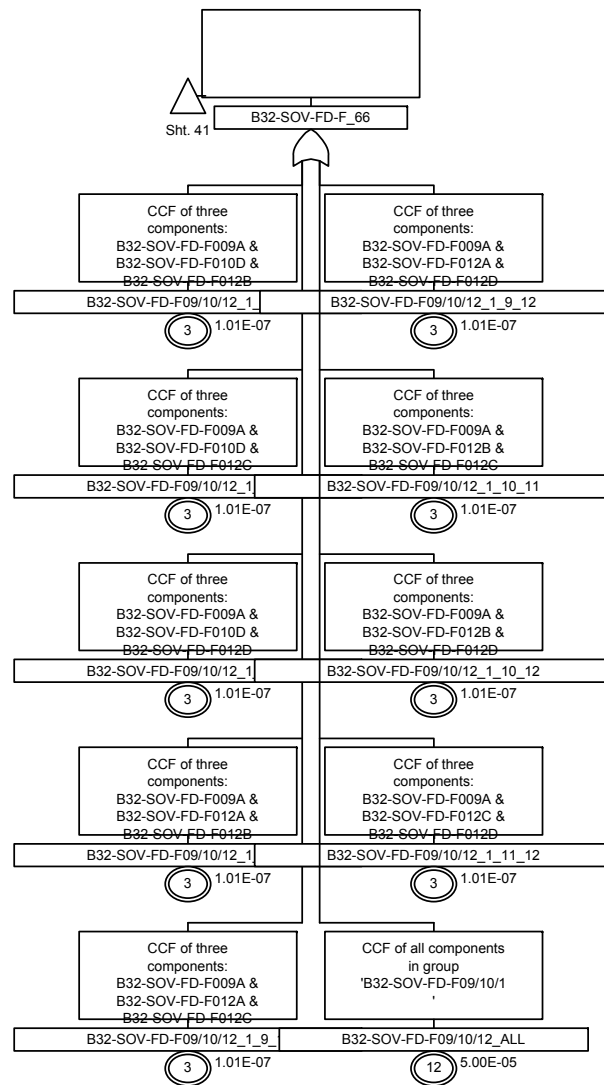


Figure 4.2-3. Sheet 48 Isolation Condenser System

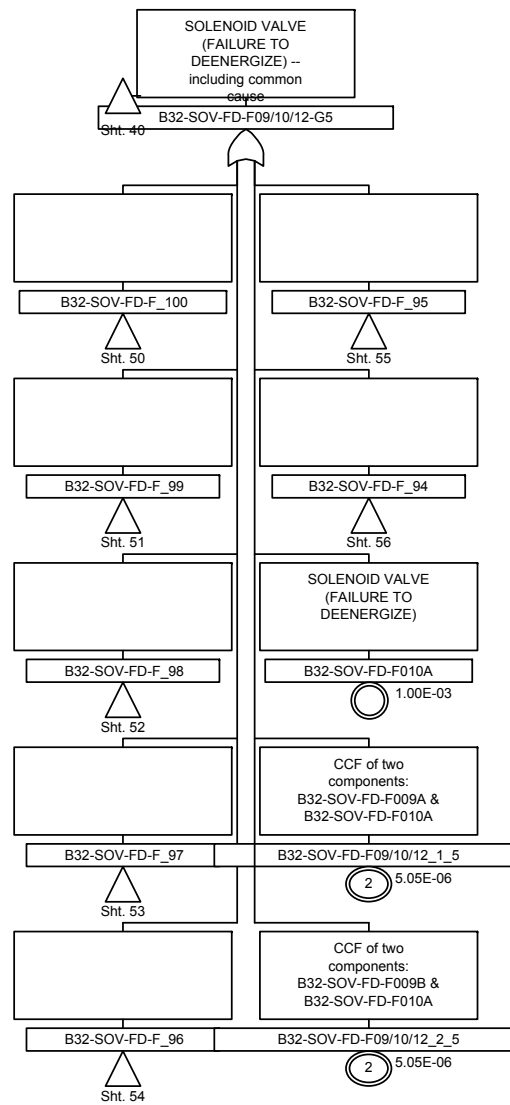


Figure 4.2-3. Sheet 49 Isolation Condenser System

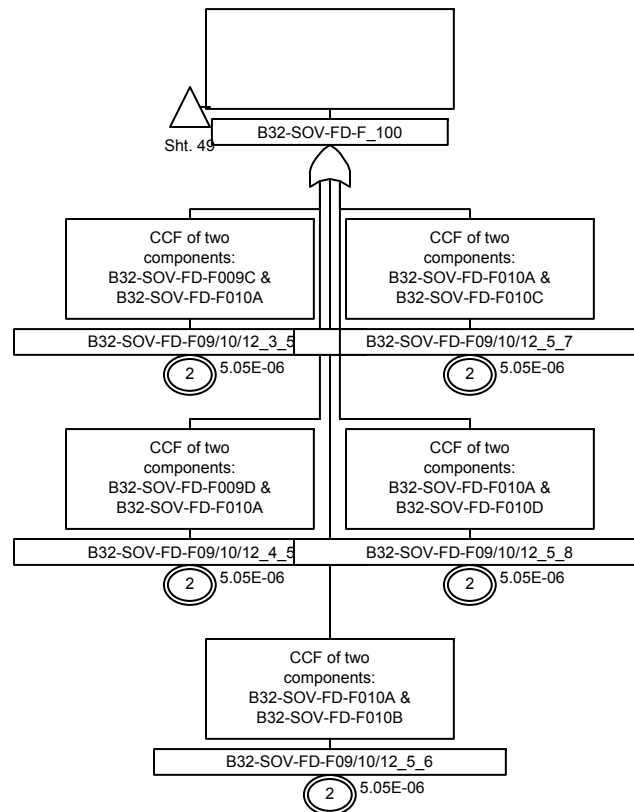


Figure 4.2-3. Sheet 50 Isolation Condenser System

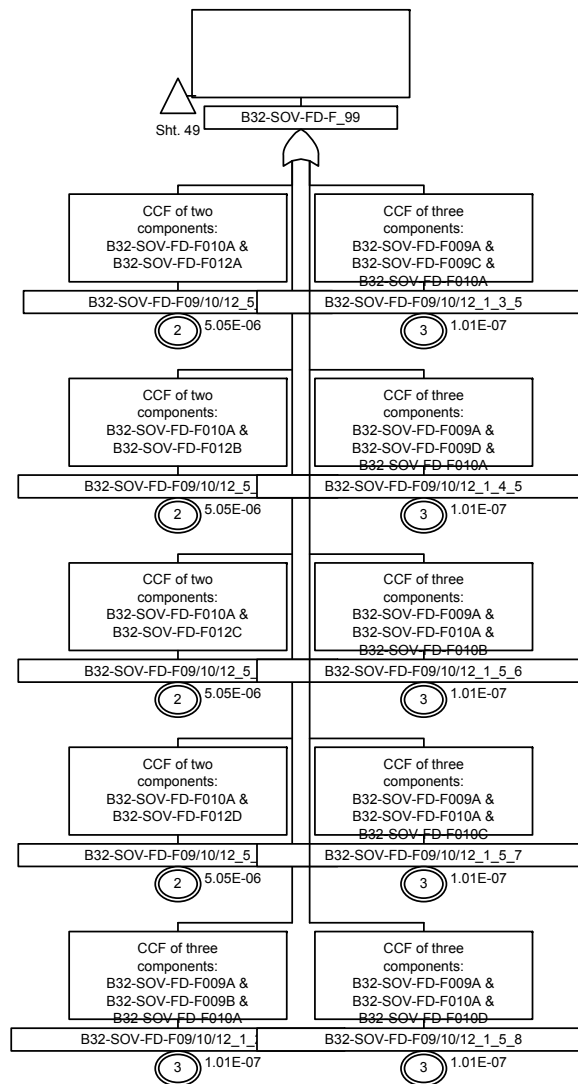


Figure 4.2-3. Sheet 51 Isolation Condenser System

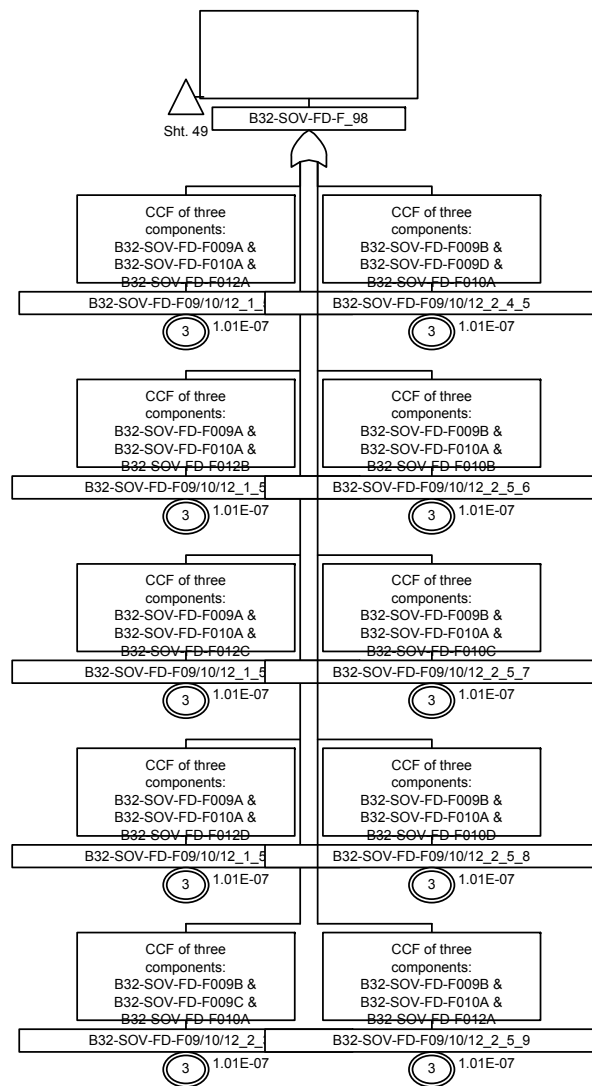


Figure 4.2-3. Sheet 52 Isolation Condenser System

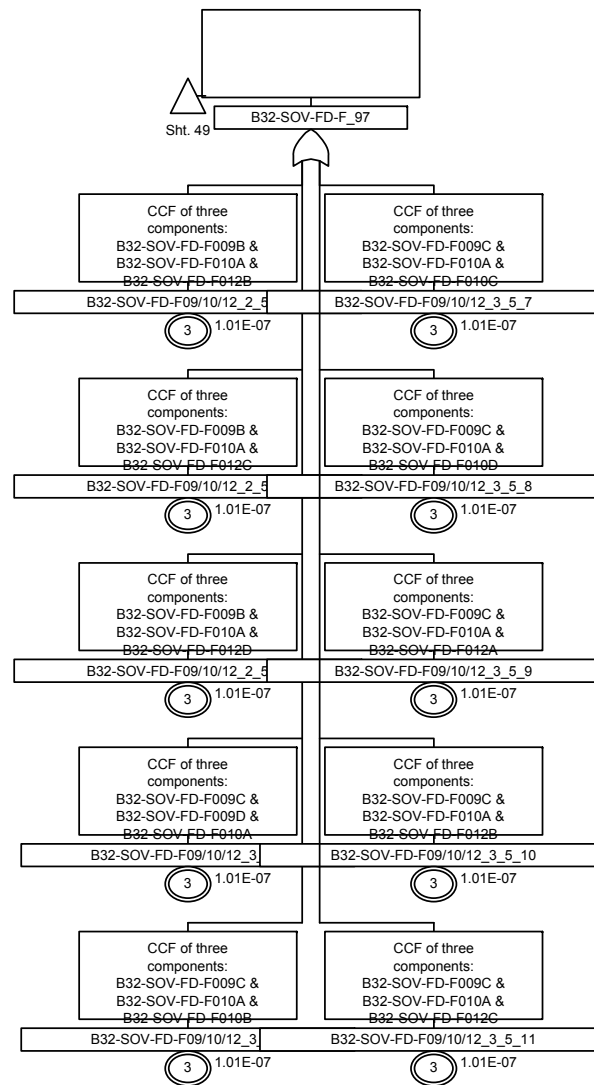


Figure 4.2-3. Sheet 53 Isolation Condenser System

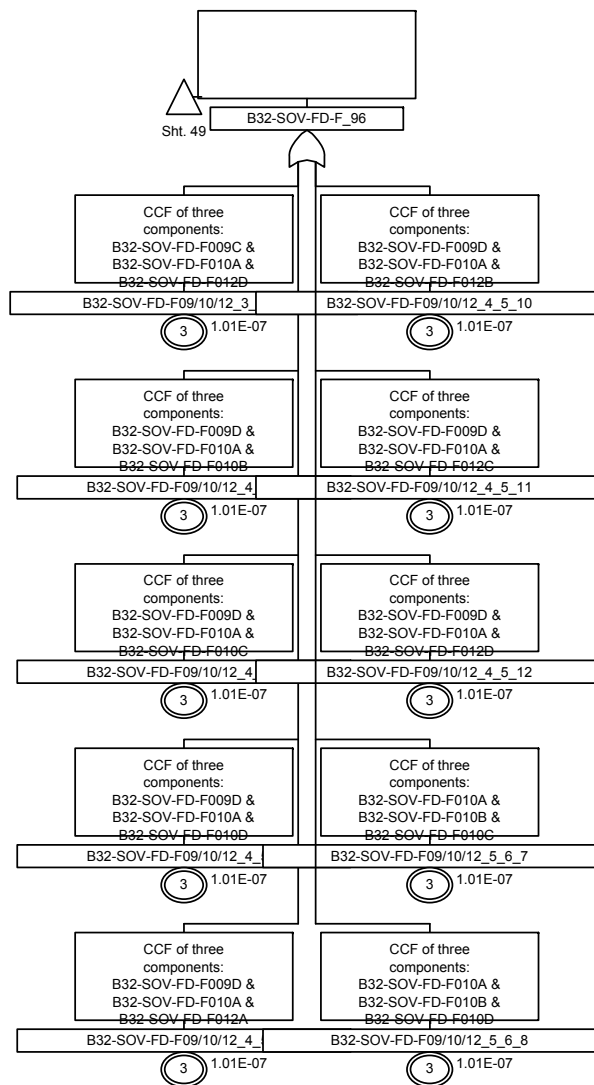


Figure 4.2-3. Sheet 54 Isolation Condenser System

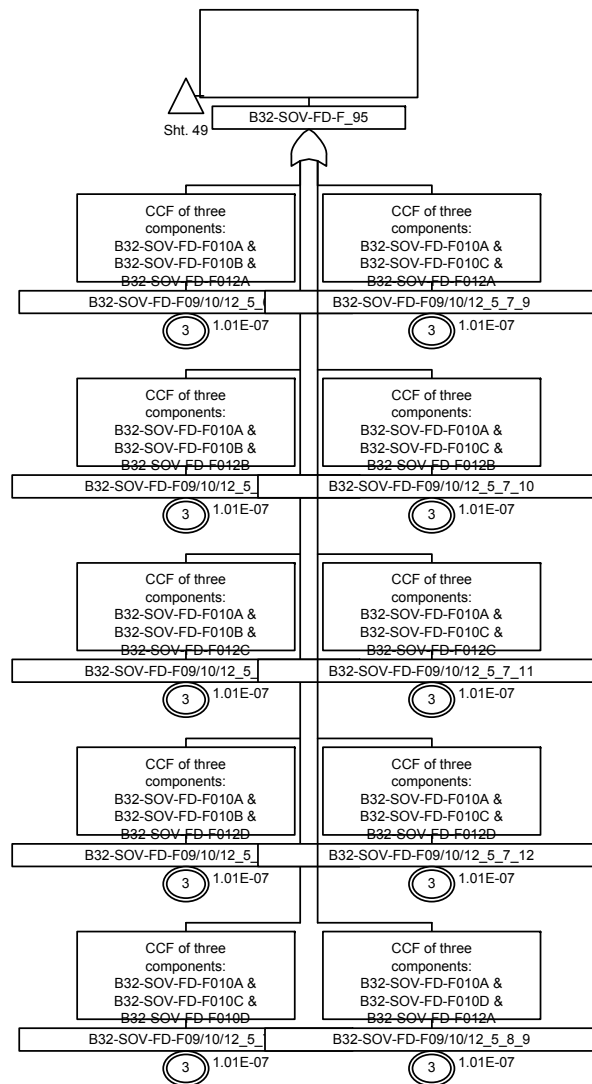


Figure 4.2-3. Sheet 55 Isolation Condenser System





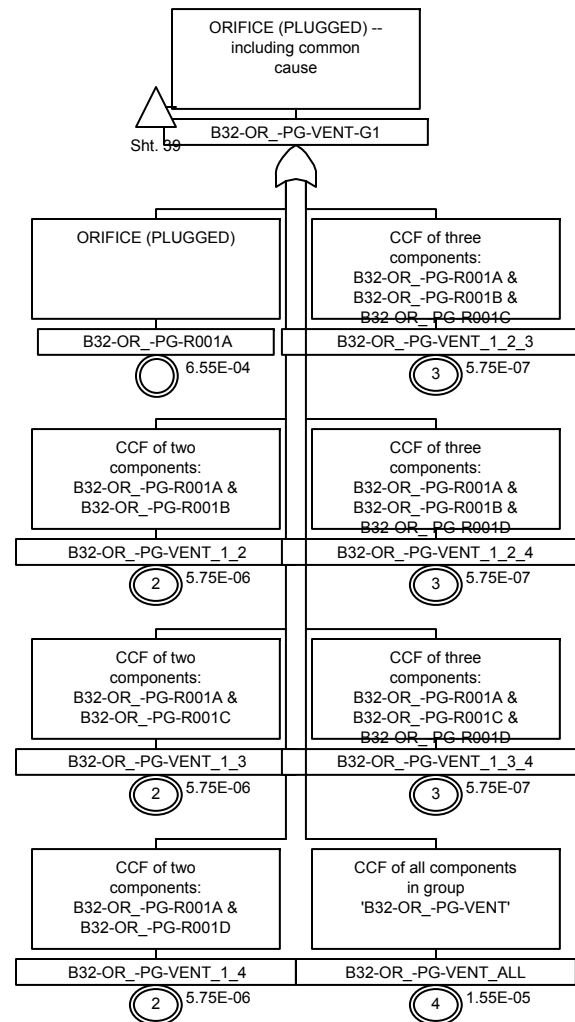


Figure 4.2-3. Sheet 57 Isolation Condenser System

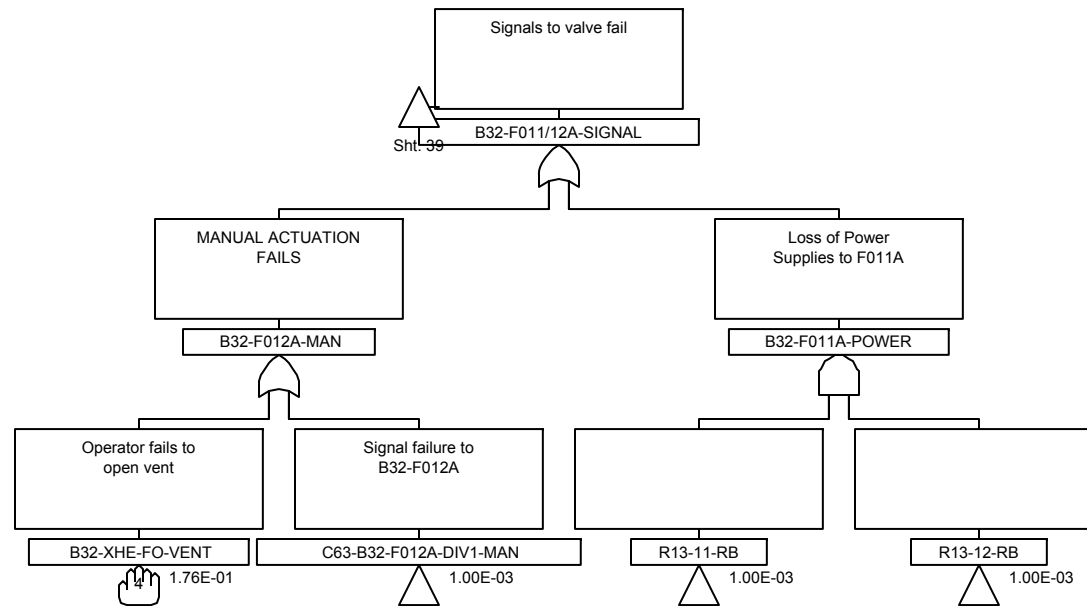


Figure 4.2-3. Sheet 58 Isolation Condenser System

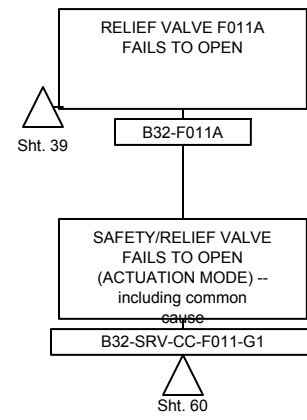


Figure 4.2-3. Sheet 59 Isolation Condenser System

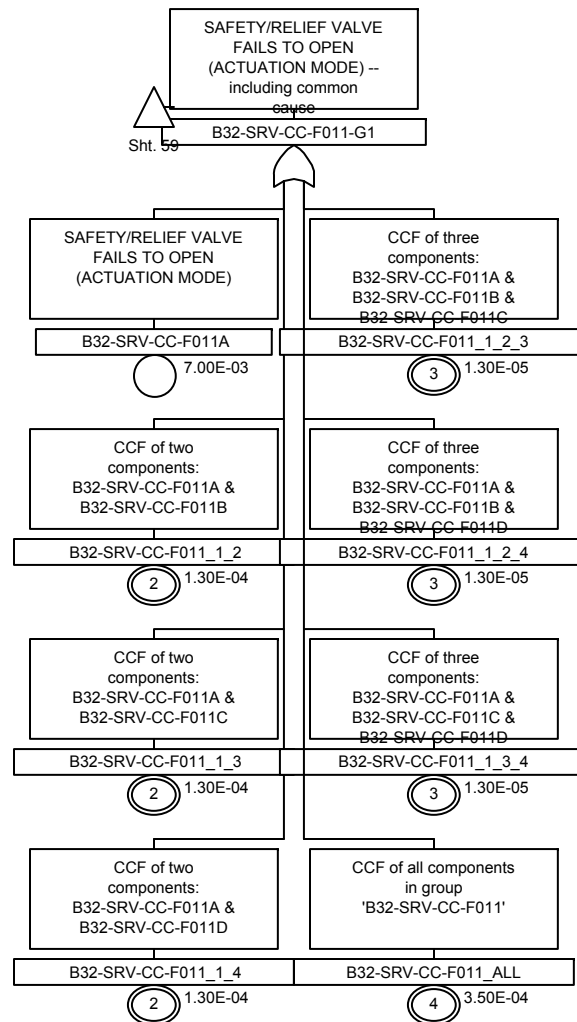


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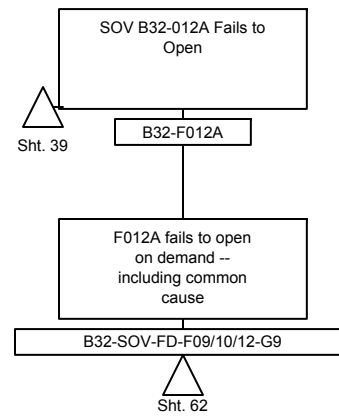


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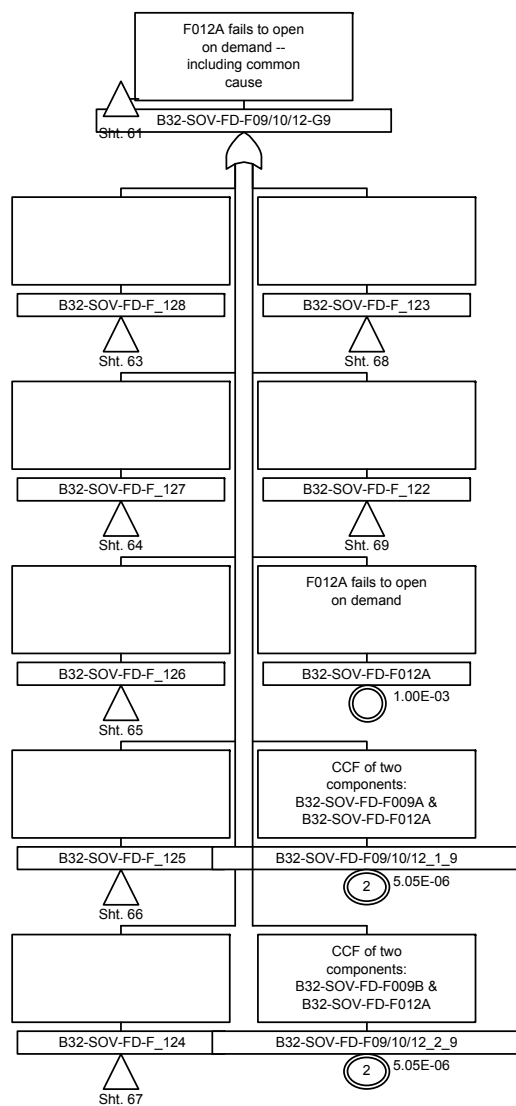


Figure 4.2-3. Sheet 62 Isolation Condenser System

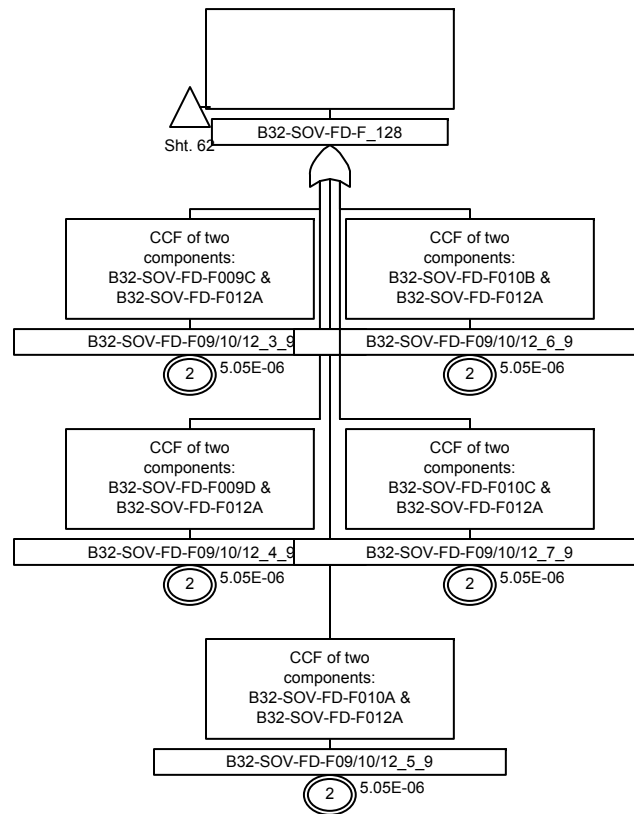


Figure 4.2-3. Sheet 63 Isolation Condenser System



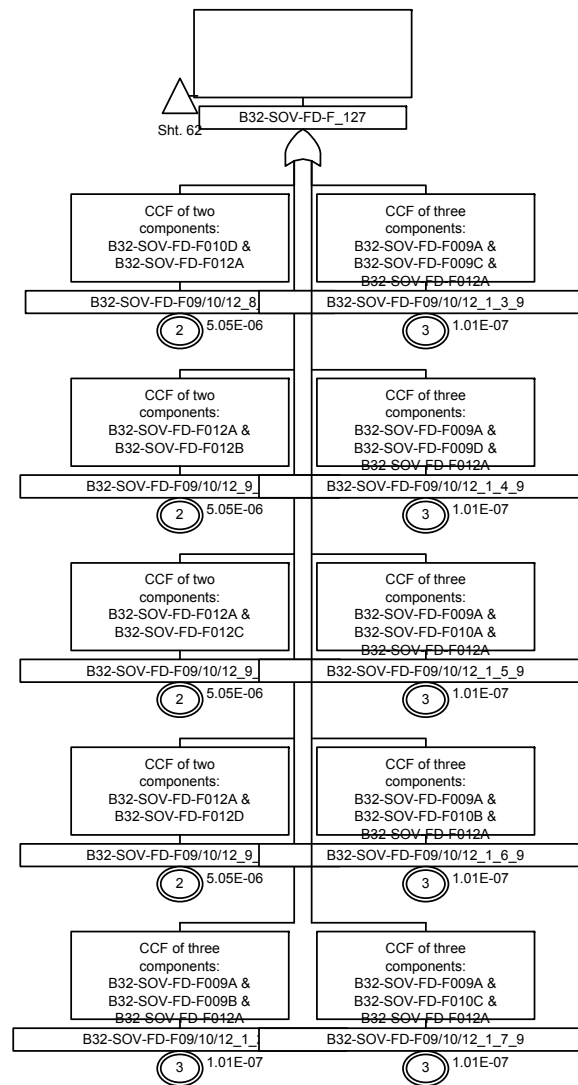


Figure 4.2-3. Sheet 64 Isolation Condenser System



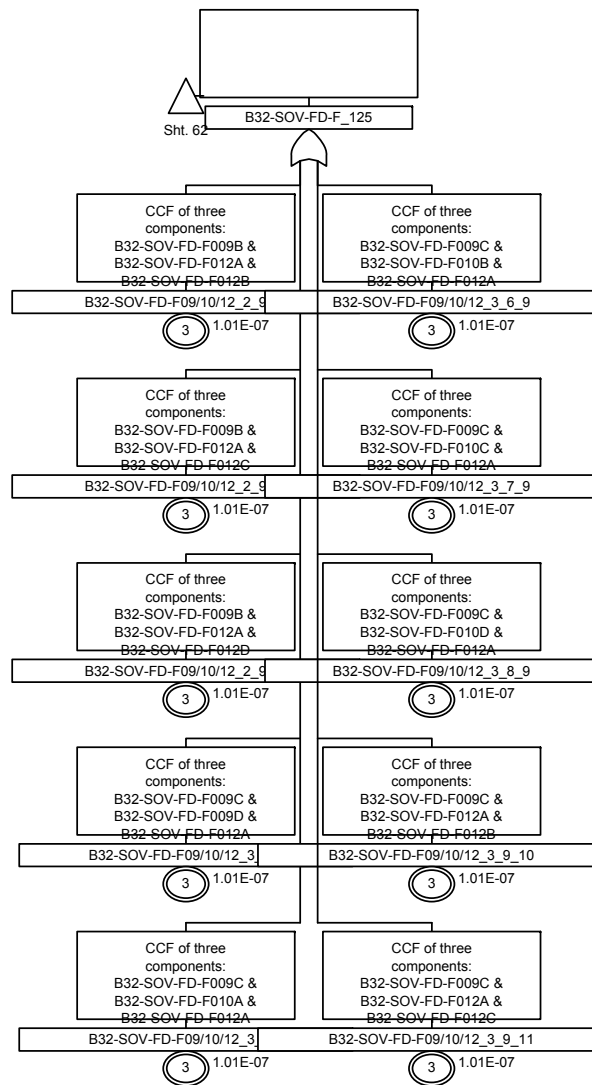


Figure 4.2-3. Sheet 66 Isolation Condenser System



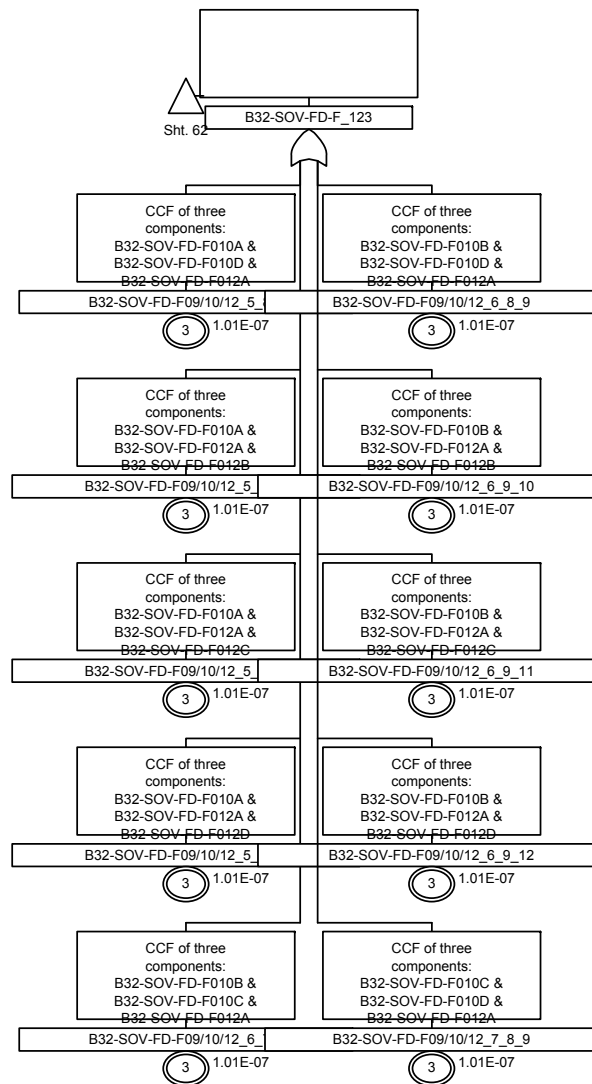


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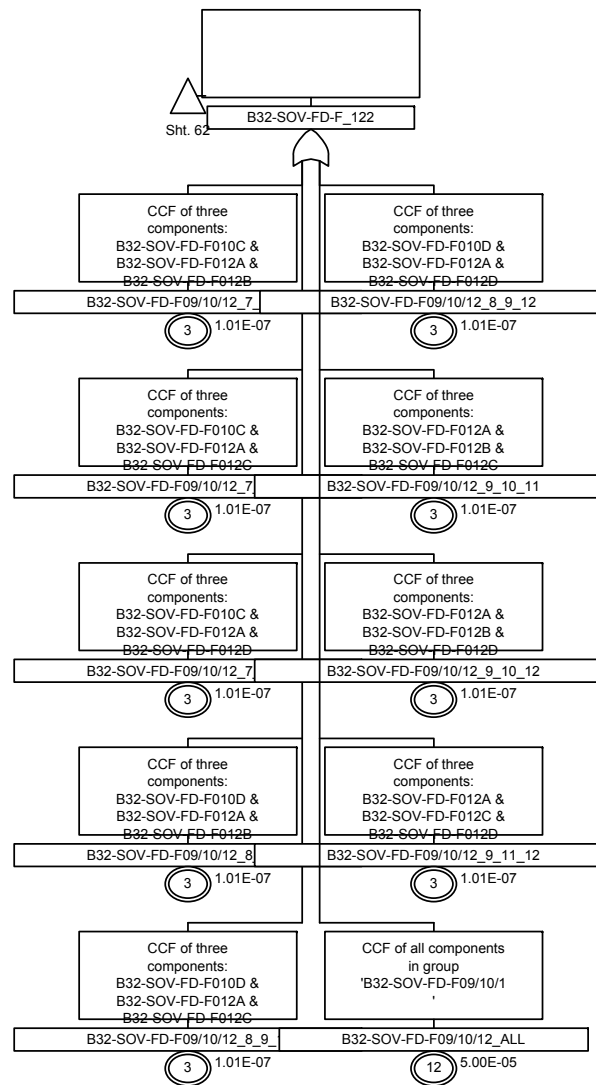


Figure 4.2-3. Sheet 69 Isolation Condenser System

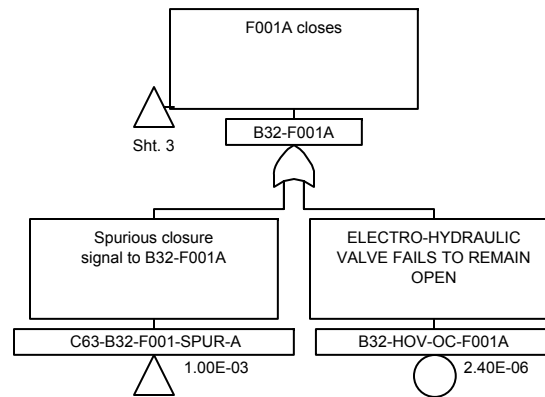


Figure 4.2-3. Sheet 70 Isolation Condenser System

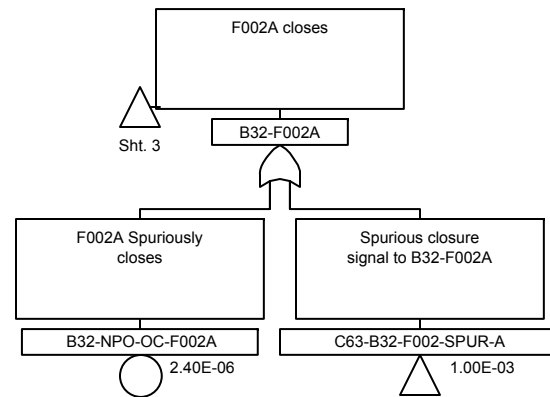


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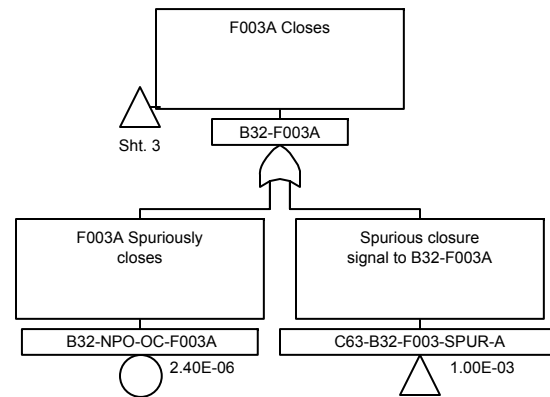


Figure 4.2-3. Sheet 72 Isolation Condenser System

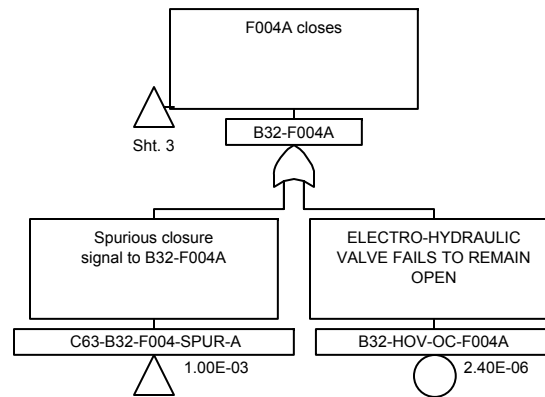


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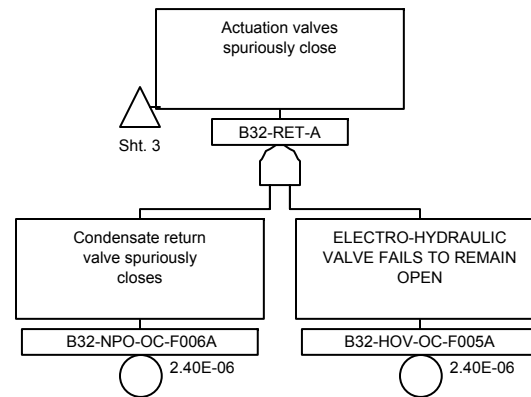


Figure 4.2-3. Sheet 74 Isolation Condenser System

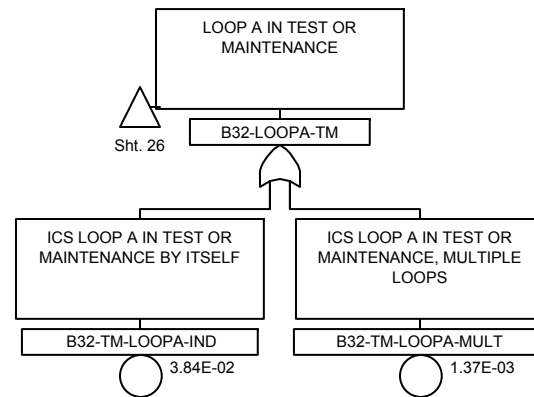


Figure 4.2-3. Sheet 75 Isolation Condenser System

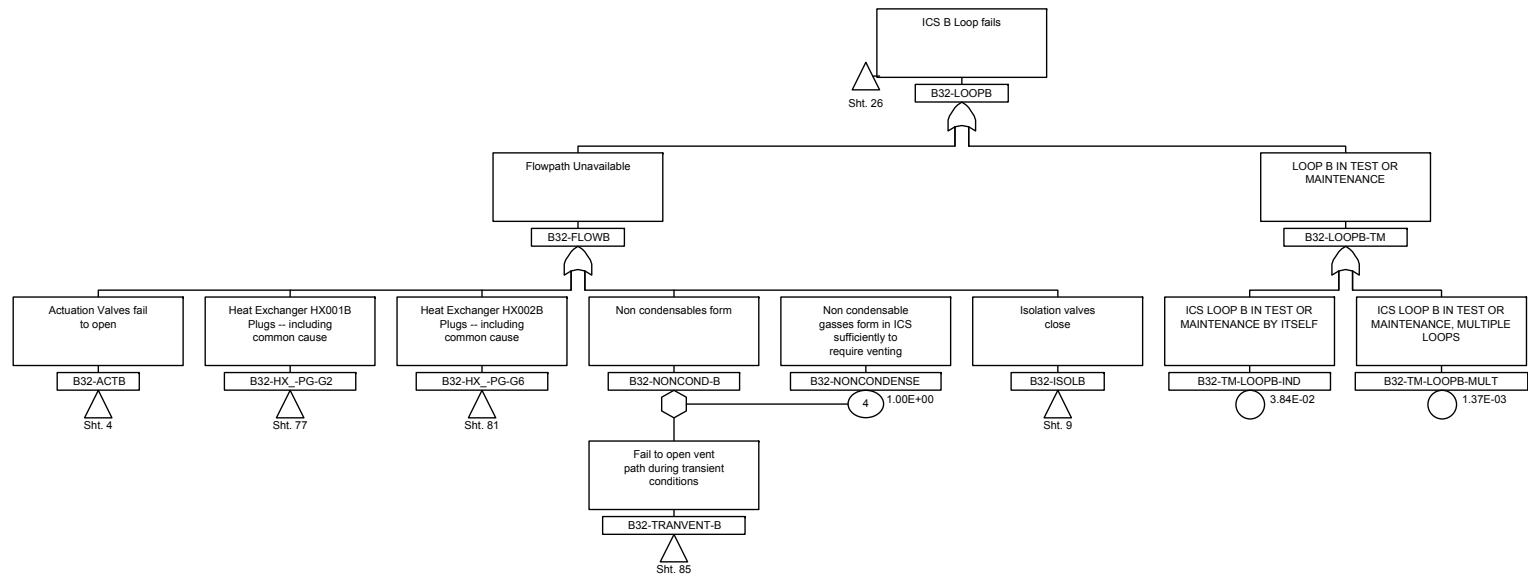


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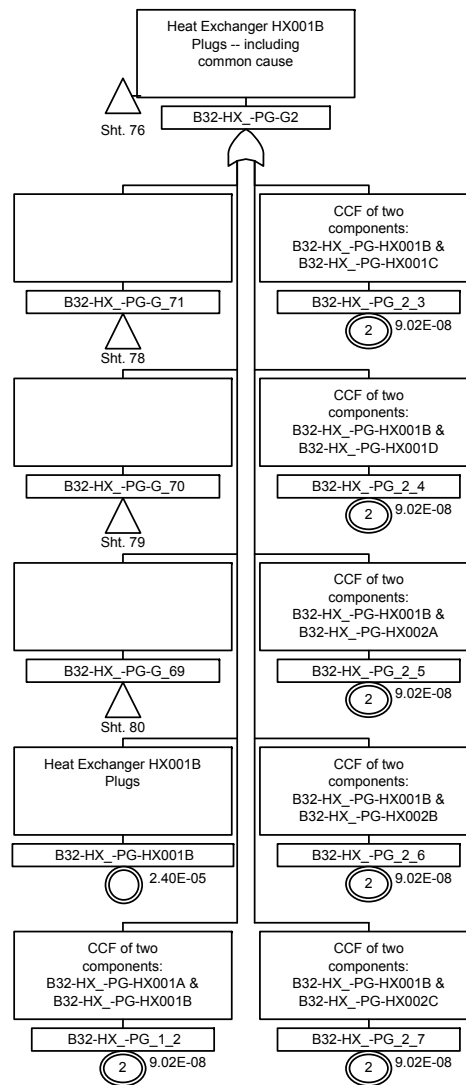


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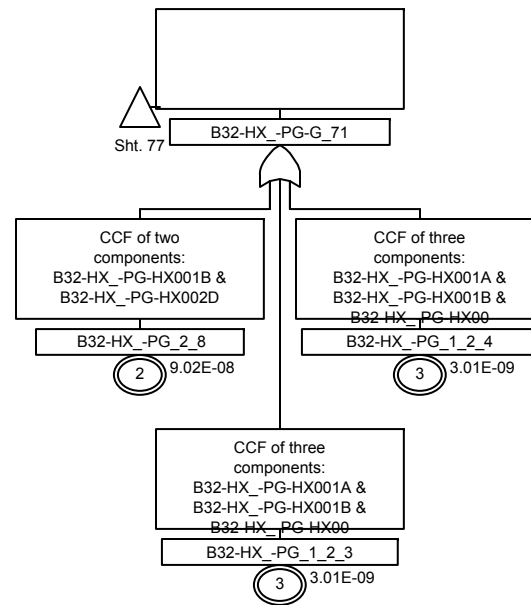


Figure 4.2-3. Sheet 78 Isolation Condenser System

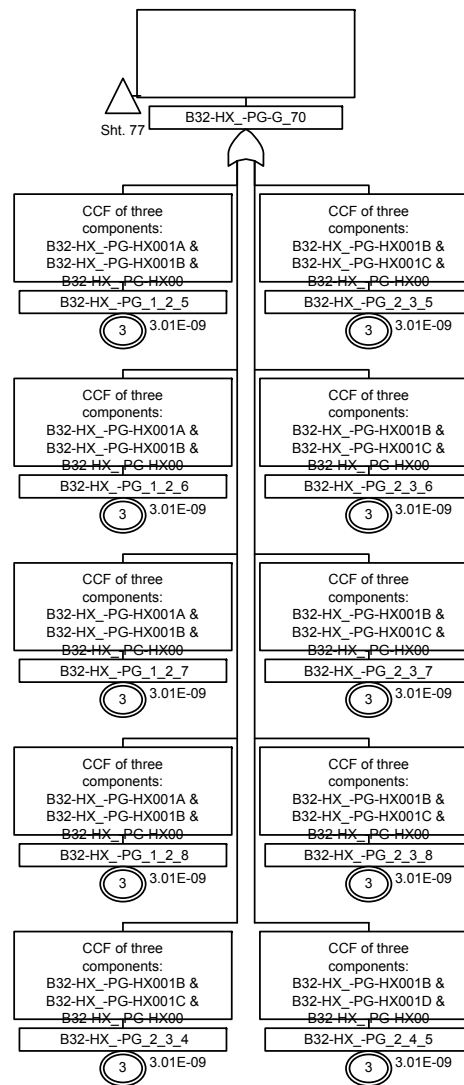


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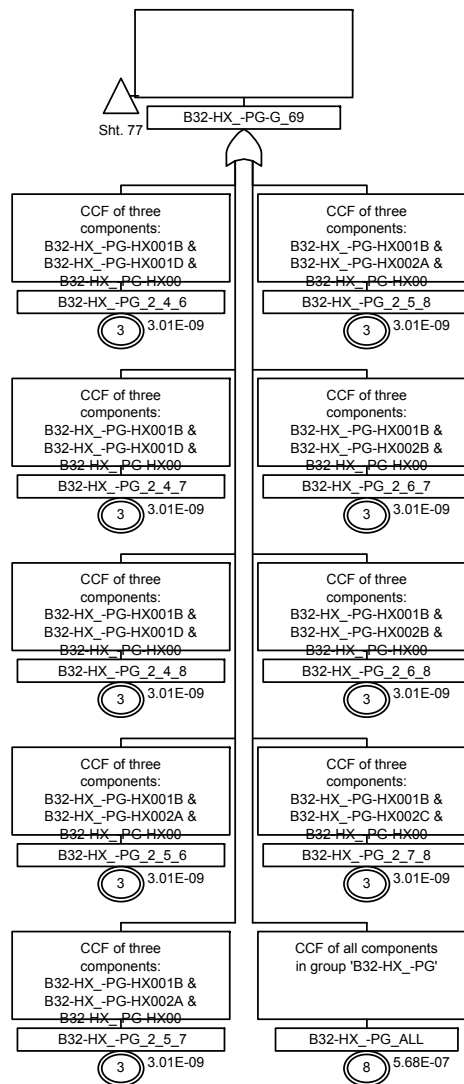


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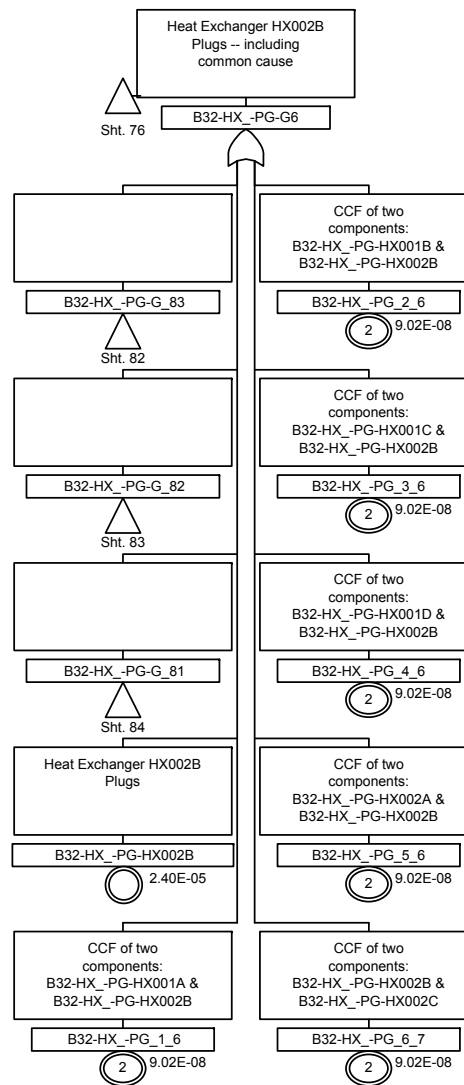


Figure 4.2-3. Sheet 81 Isolation Condenser System

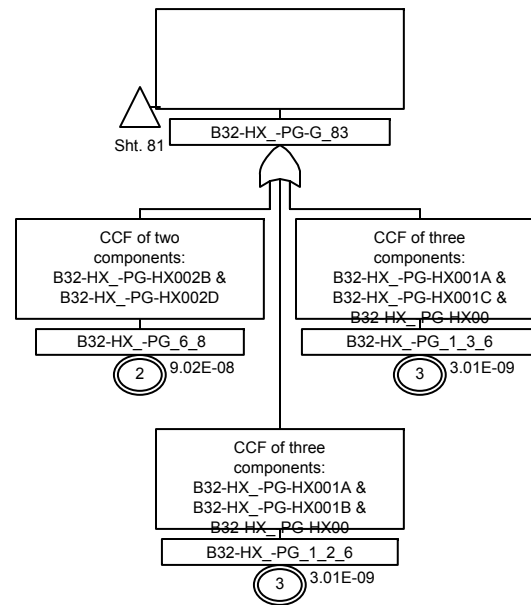


Figure 4.2-3. Sheet 82 Isolation Condenser System

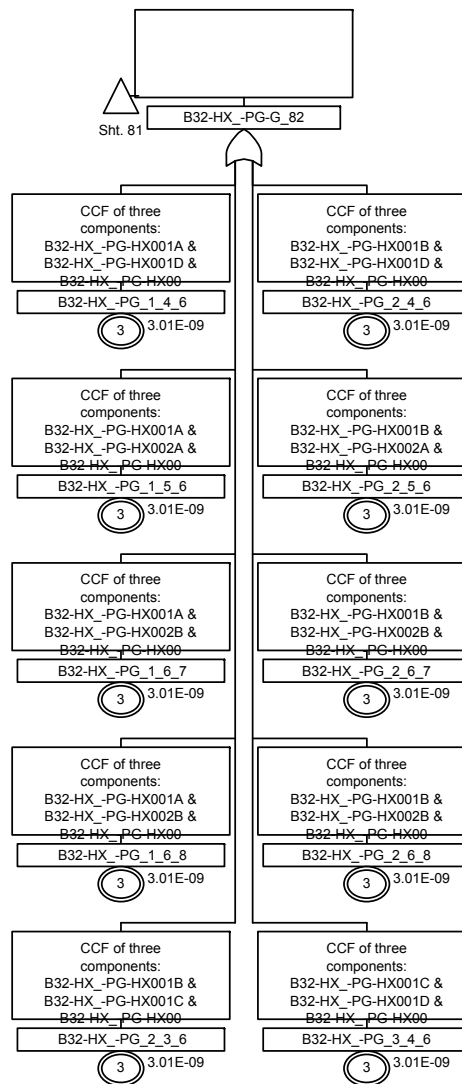


Figure 4.2-3. Sheet 83 Isolation Condenser System

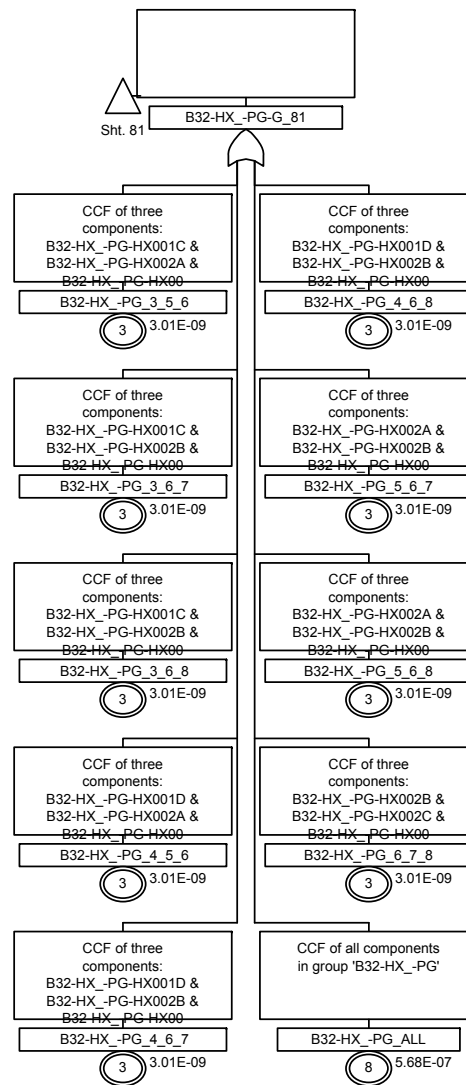


Figure 4.2-3. Sheet 84 Isolation Condenser System

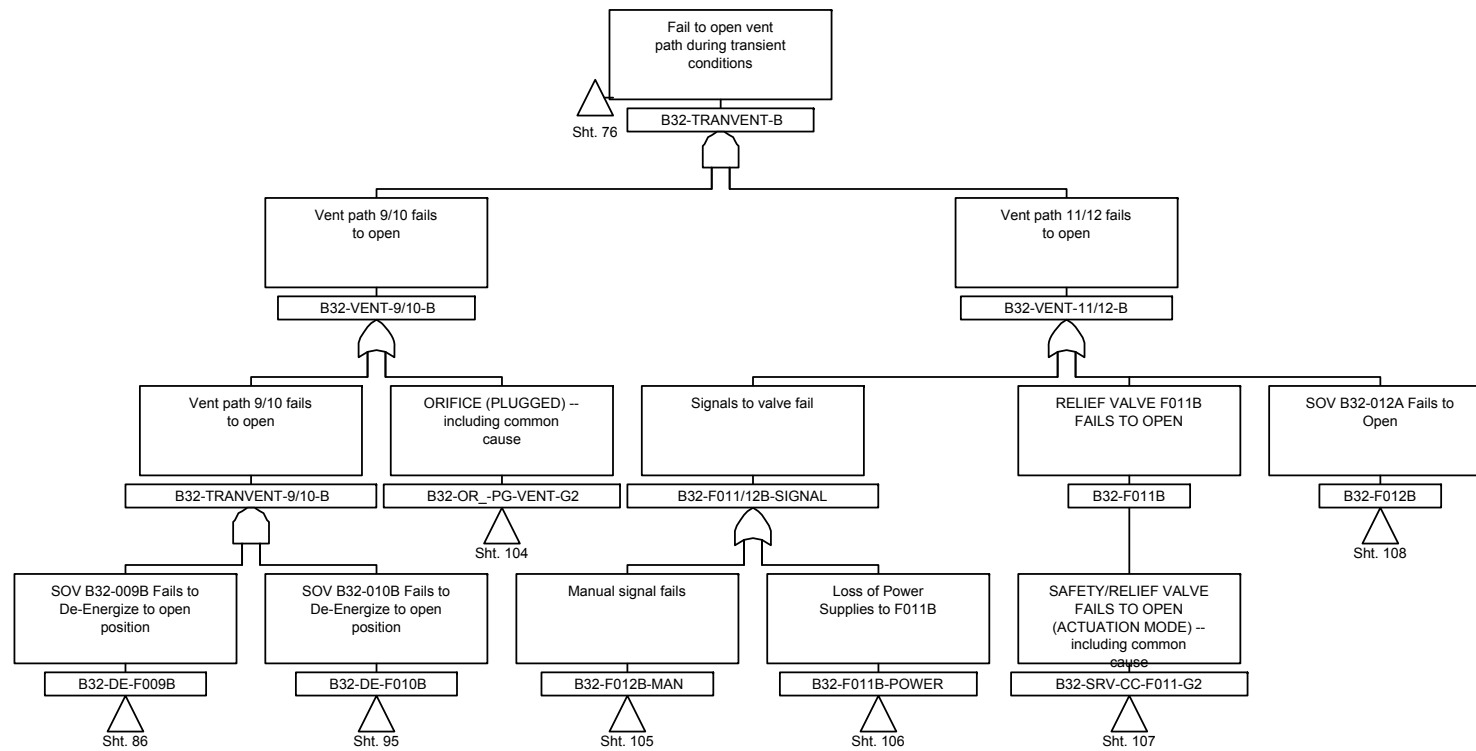


Figure 4.2-3. Sheet 85 Isolation Condenser System

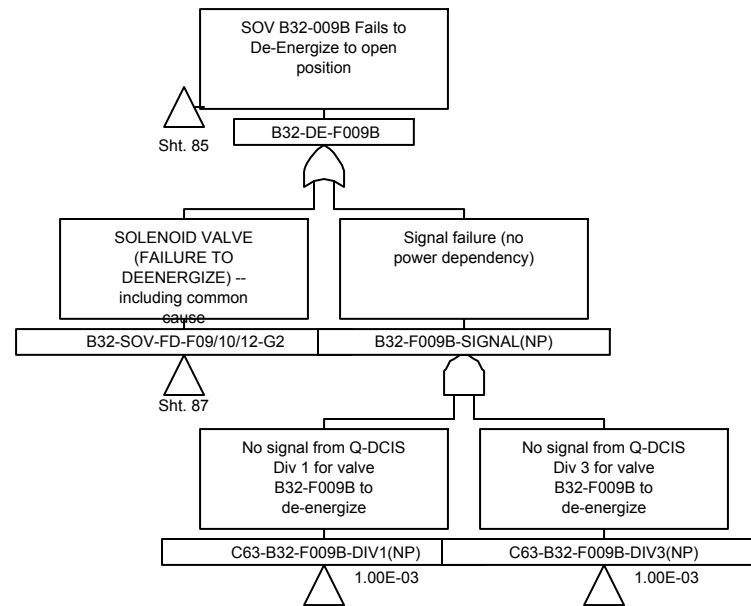


Figure 4.2-3. Sheet 86 Isolation Condenser System

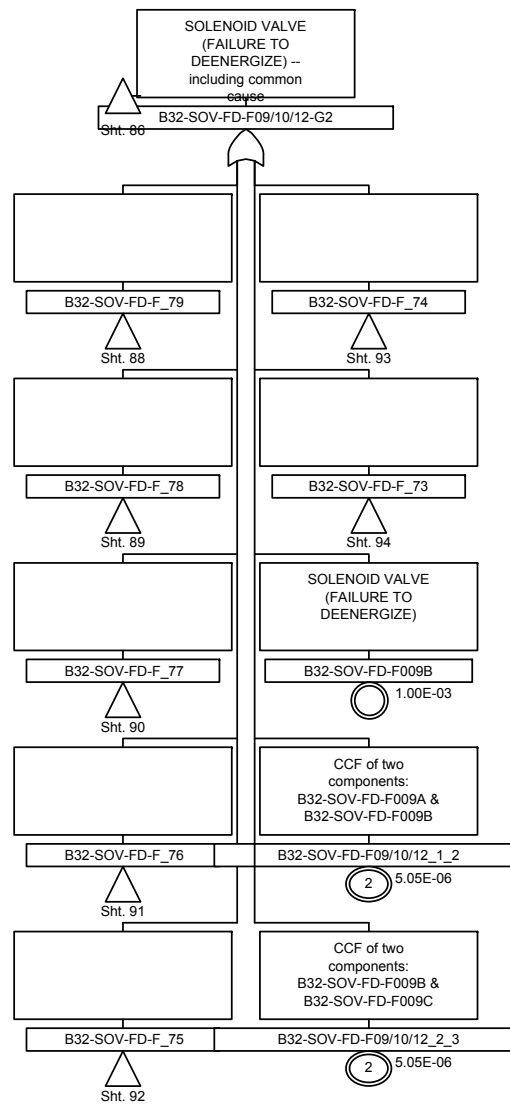


Figure 4.2-3. Sheet 87 Isolation Condenser System



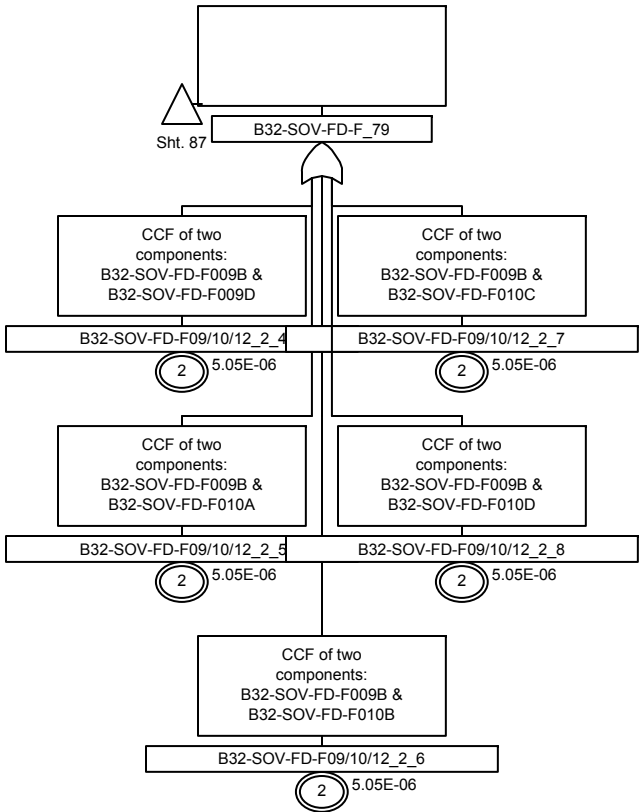


Figure 4.2-3. Sheet 88 Isolation Condenser System

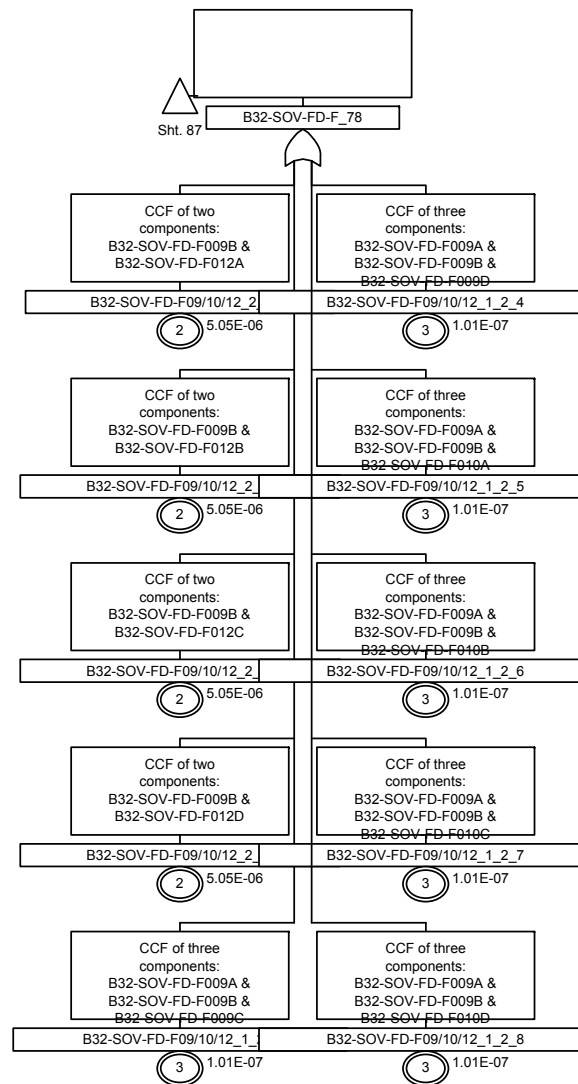


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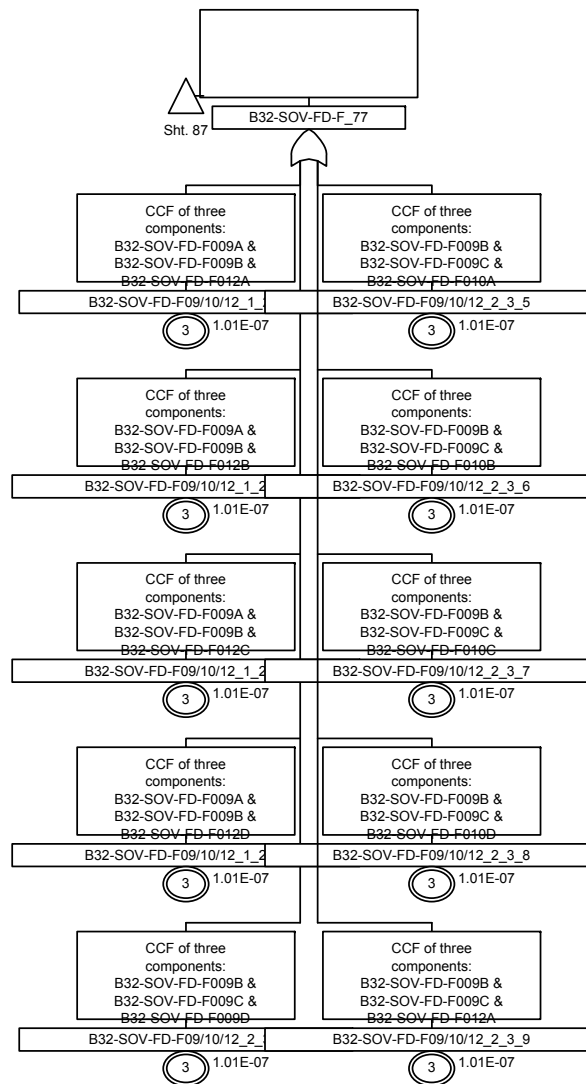


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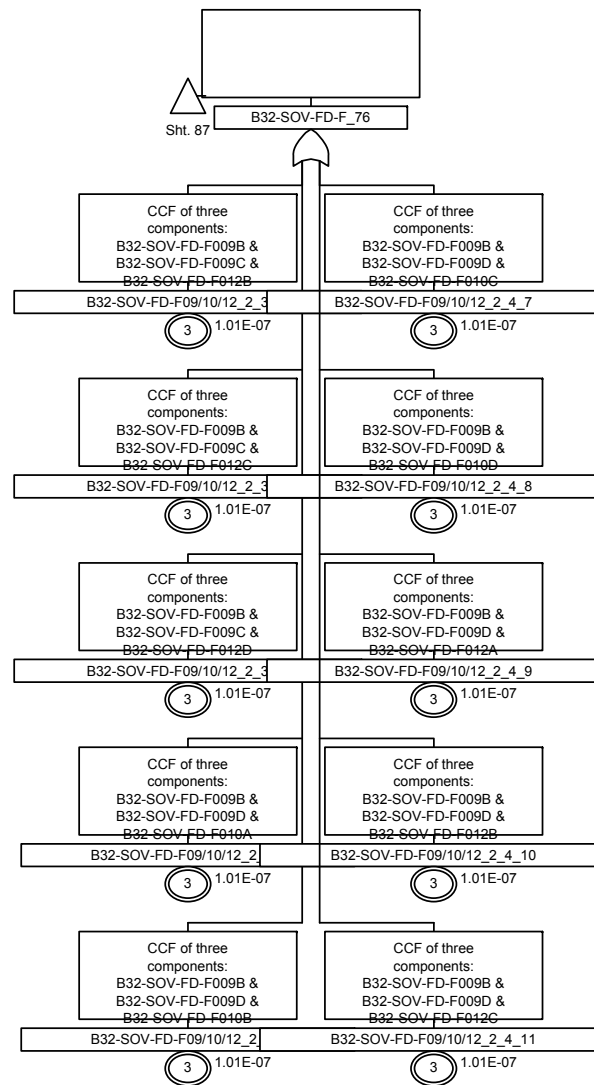


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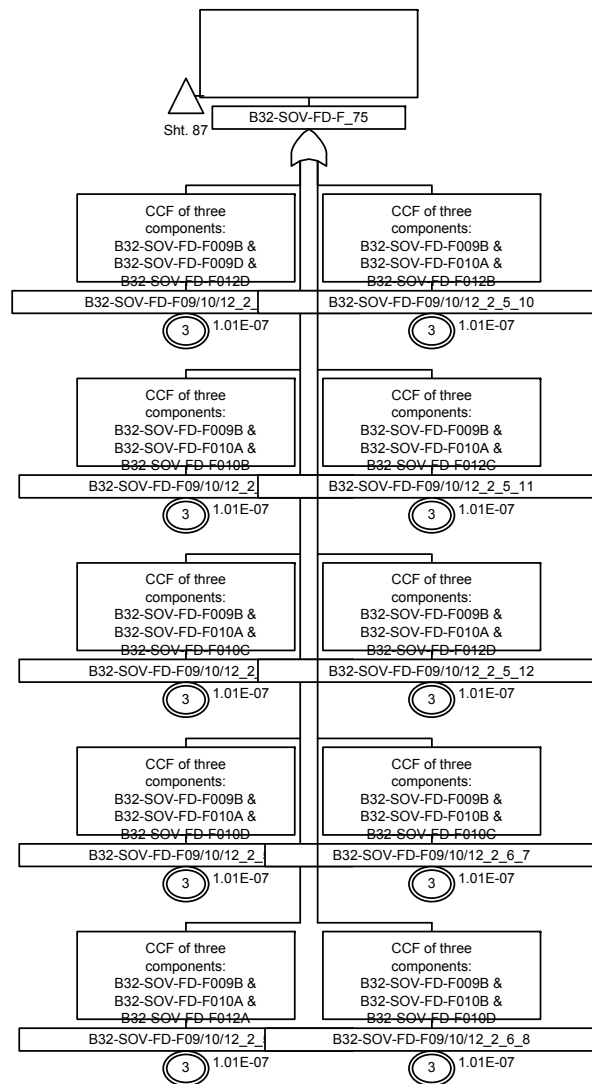


Figure 4.2-3. Sheet 92 Isolation Condenser System

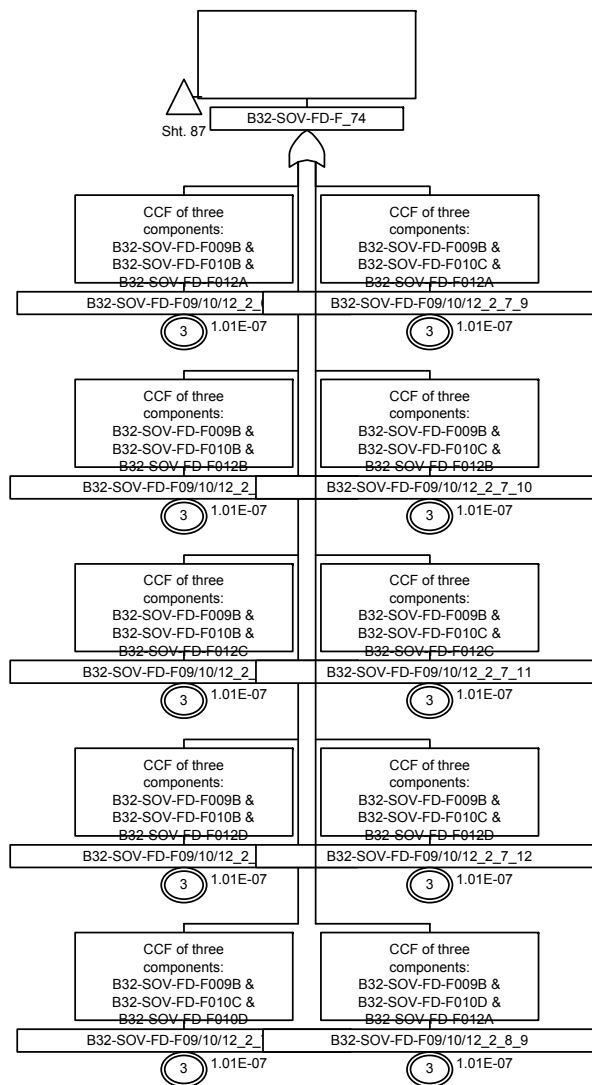


Figure 4.2-3. Sheet 93 Isolation Condenser System

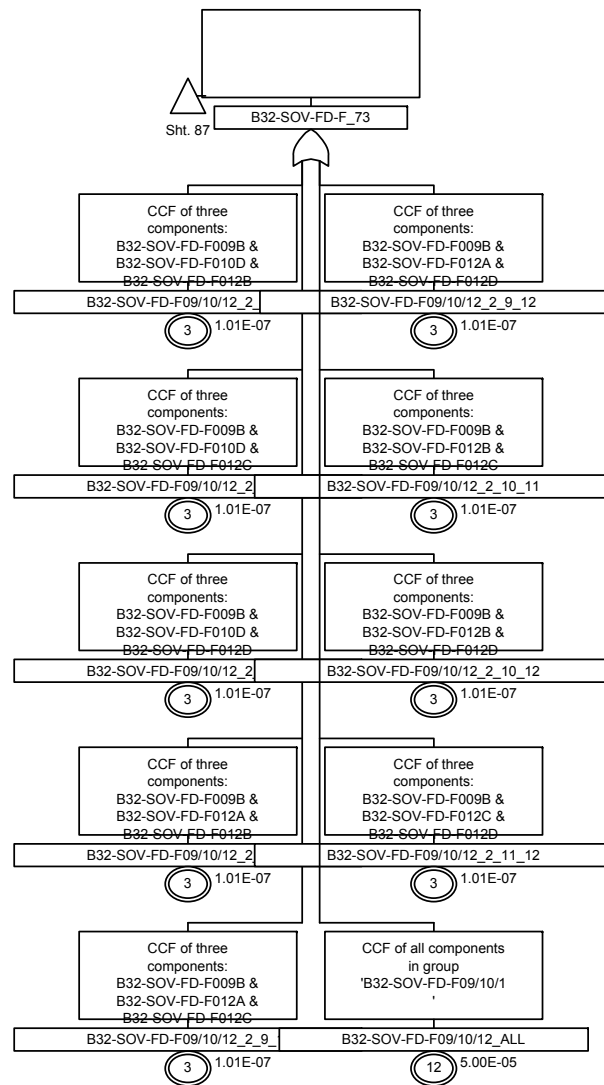


Figure 4.2-3. Sheet 94 Isolation Condenser System

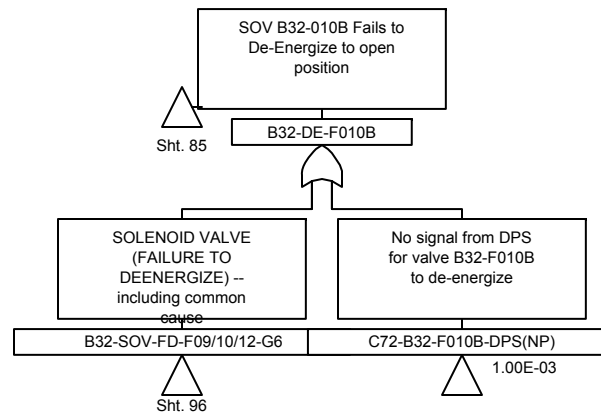


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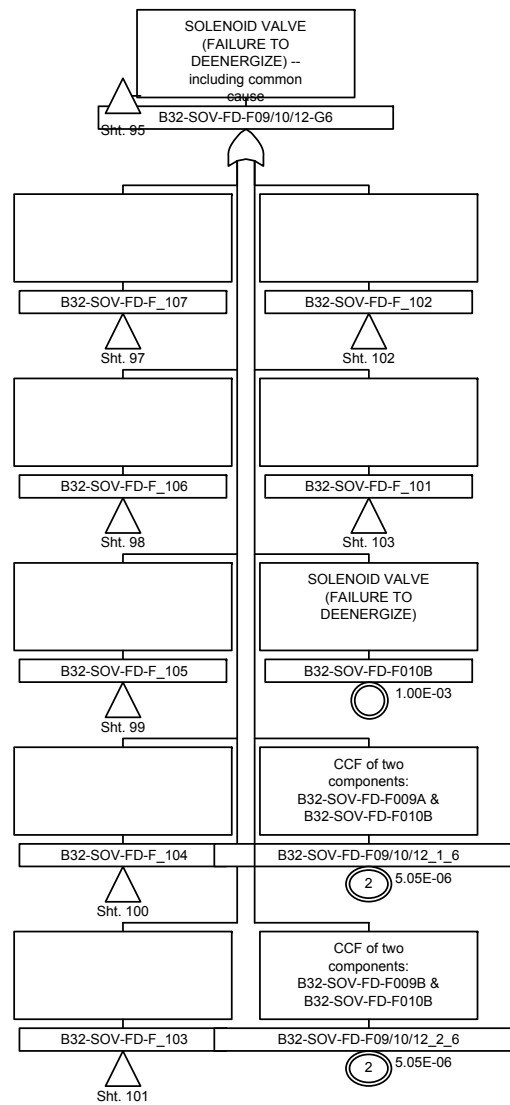


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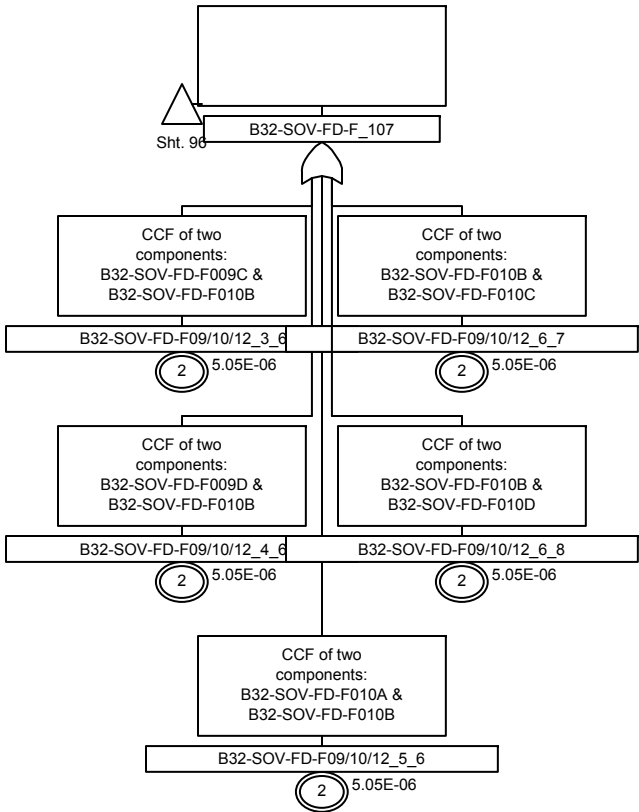


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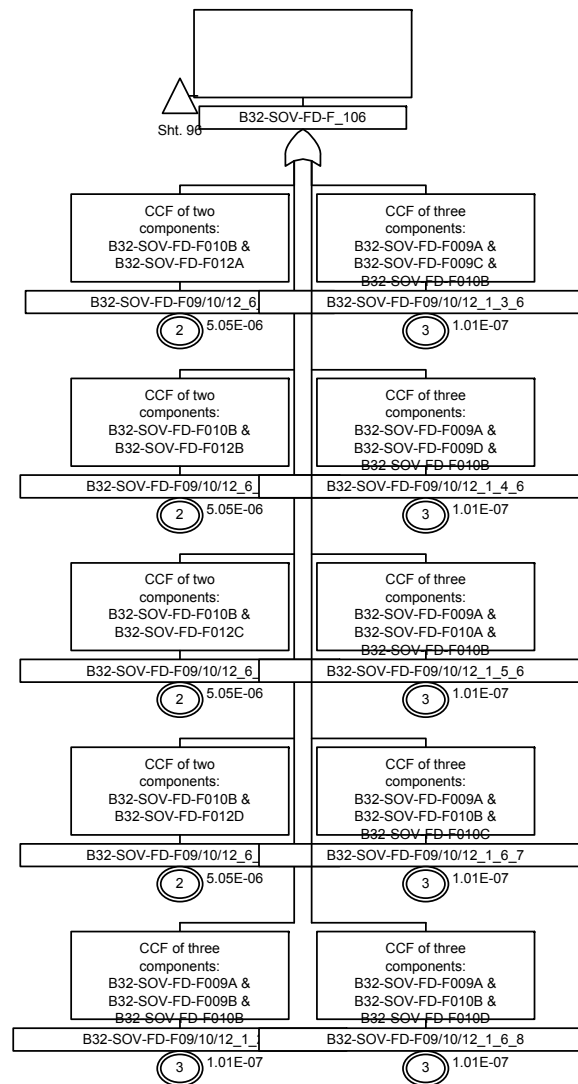


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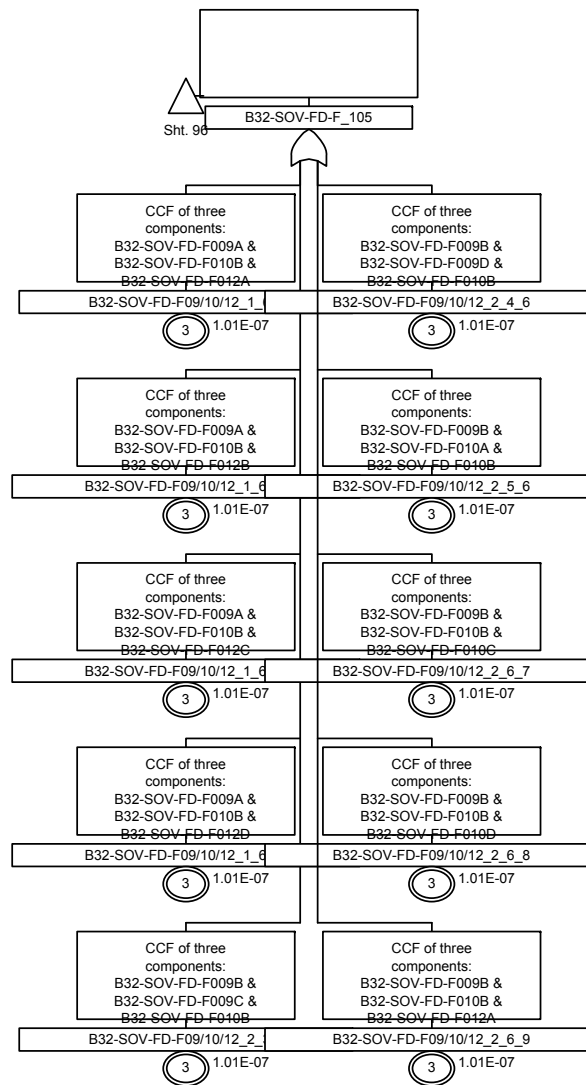


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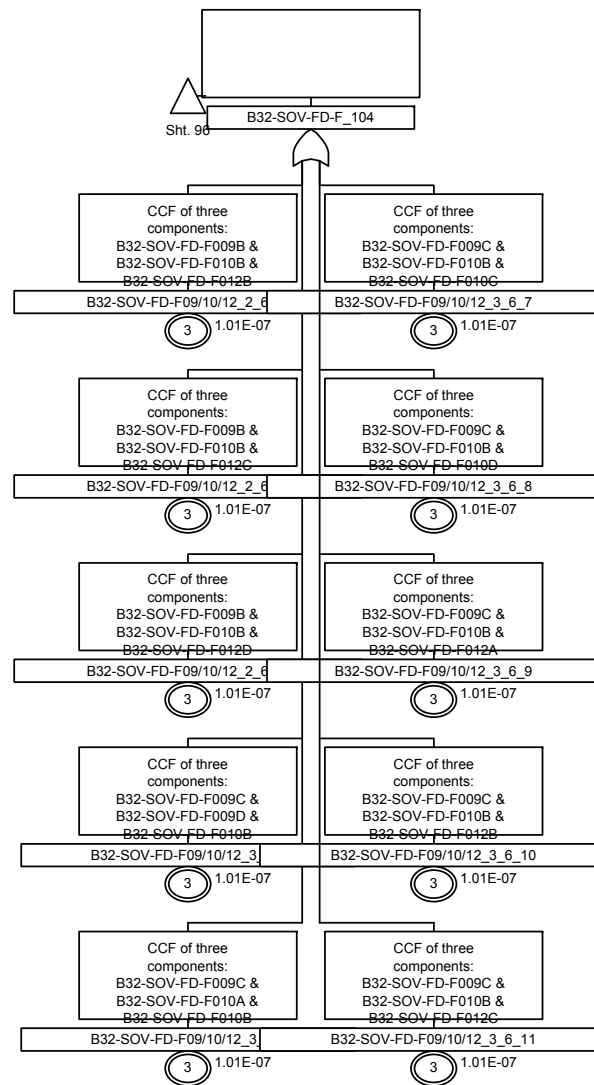


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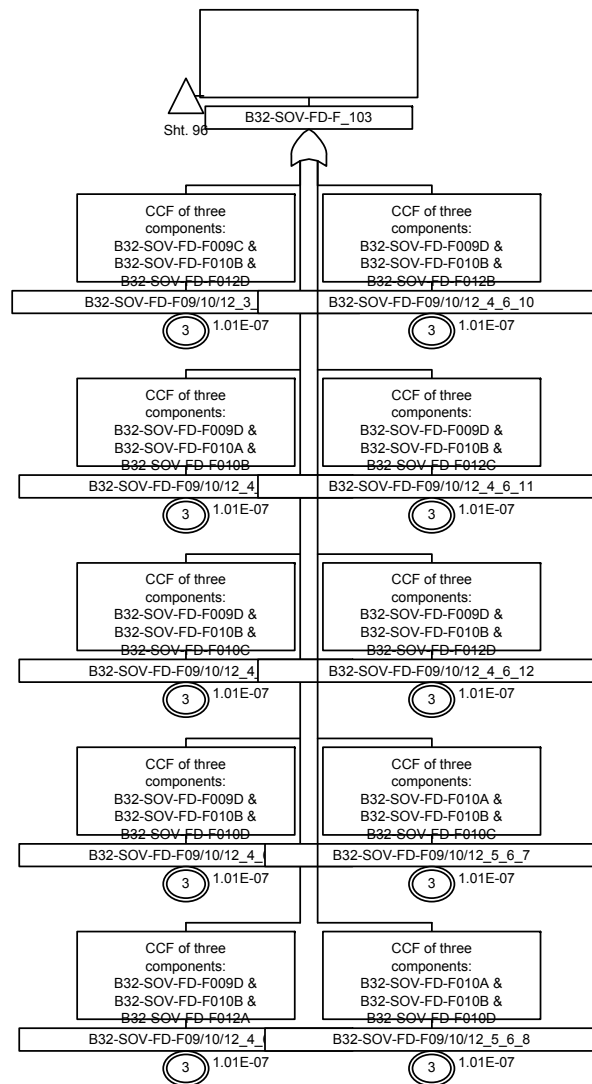


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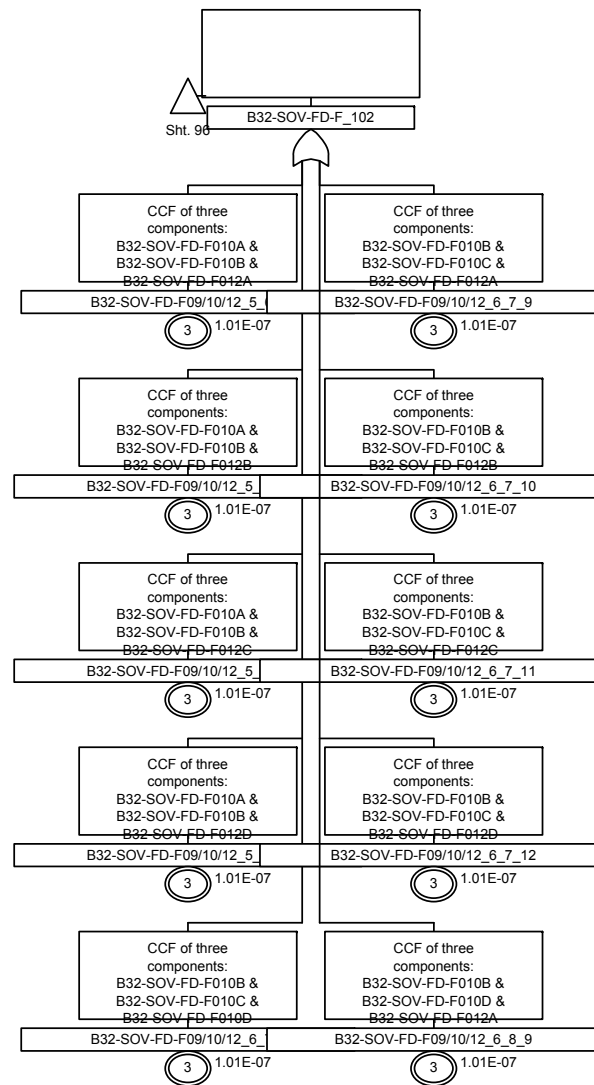


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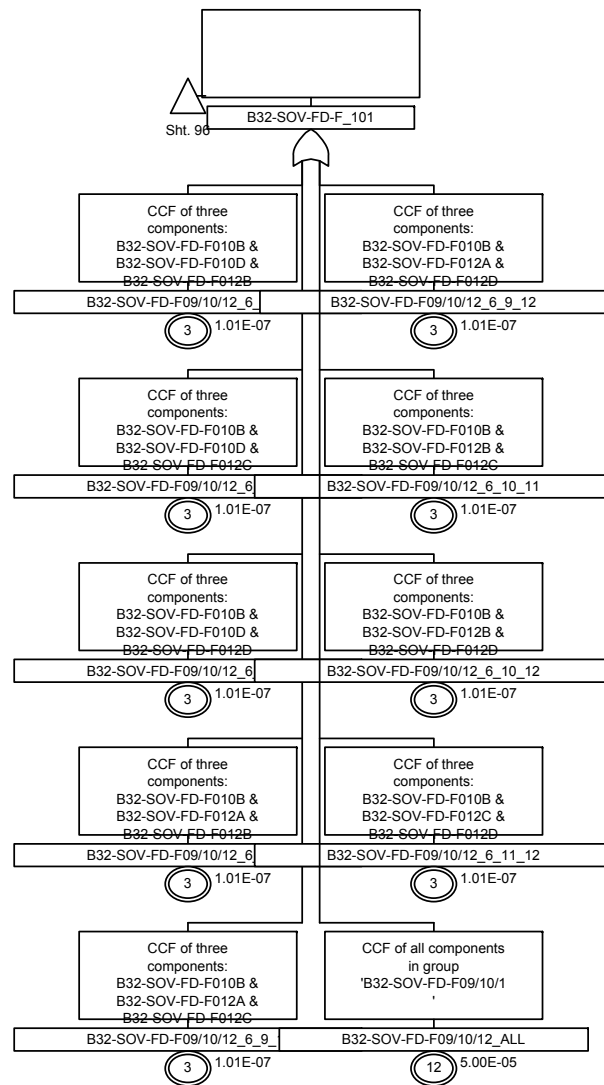


Figure 4.2-3. Sheet 103 Isolation Condenser System



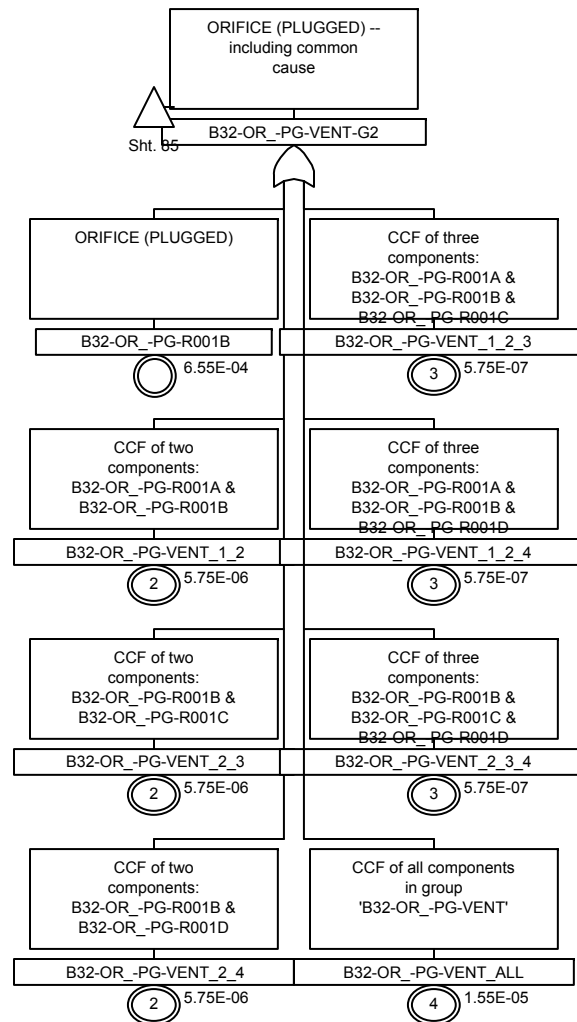


Figure 4.2-3. Sheet 104 Isolation Condenser System

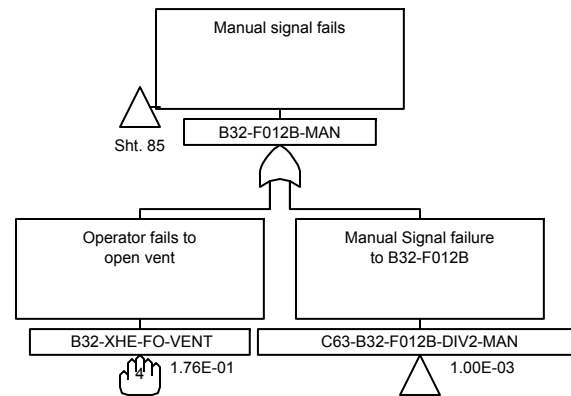


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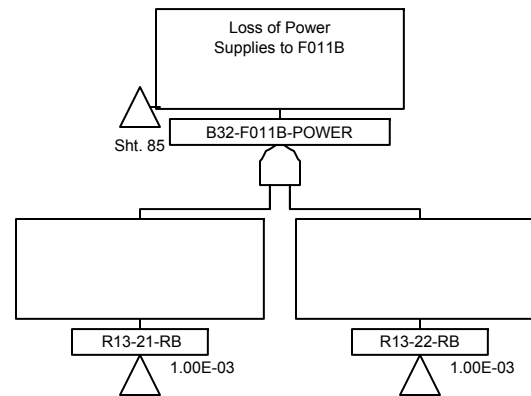


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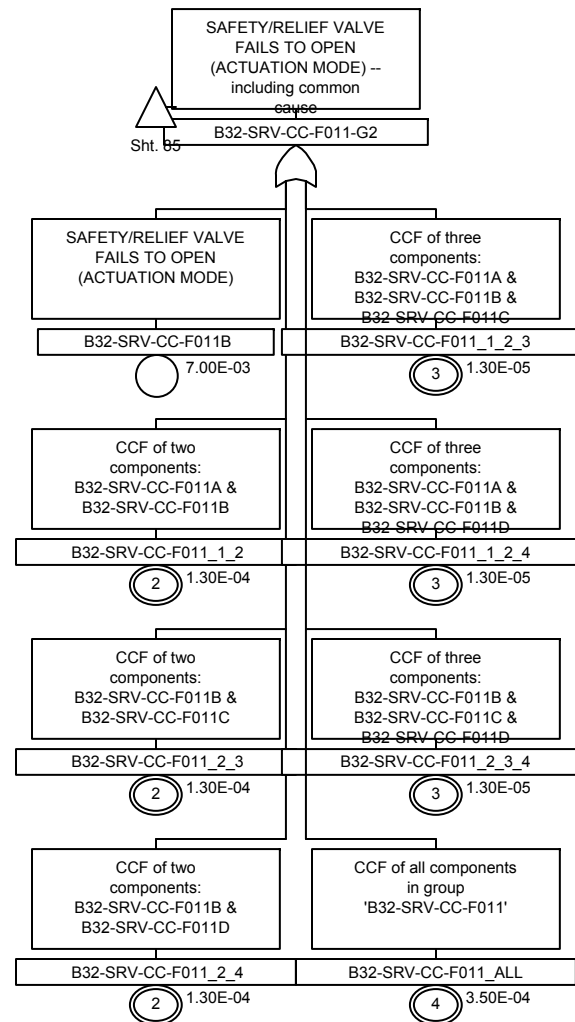


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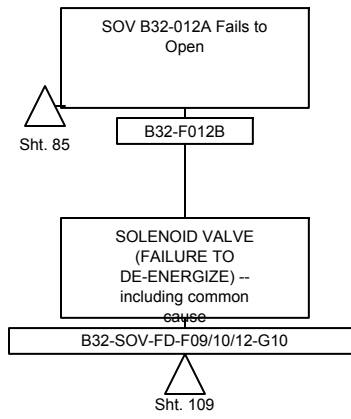


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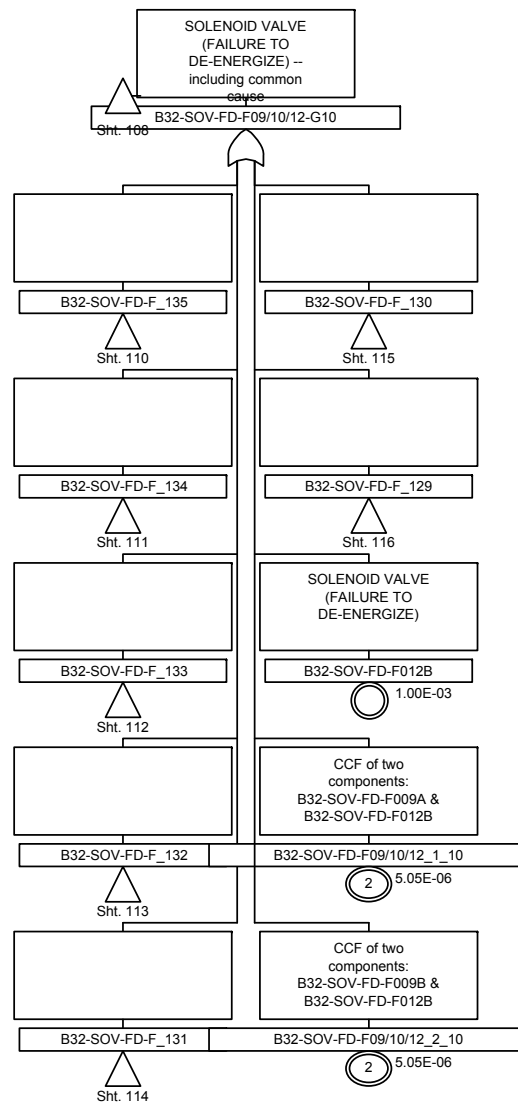


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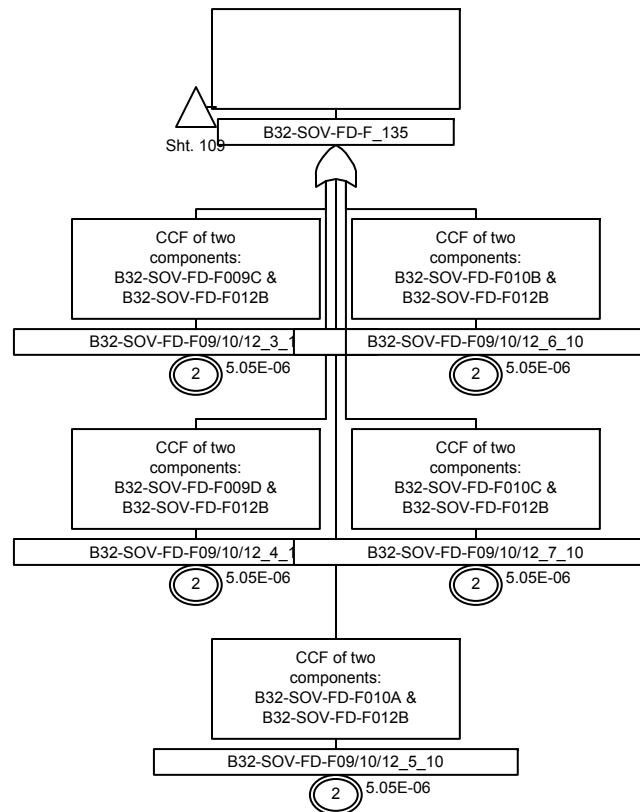


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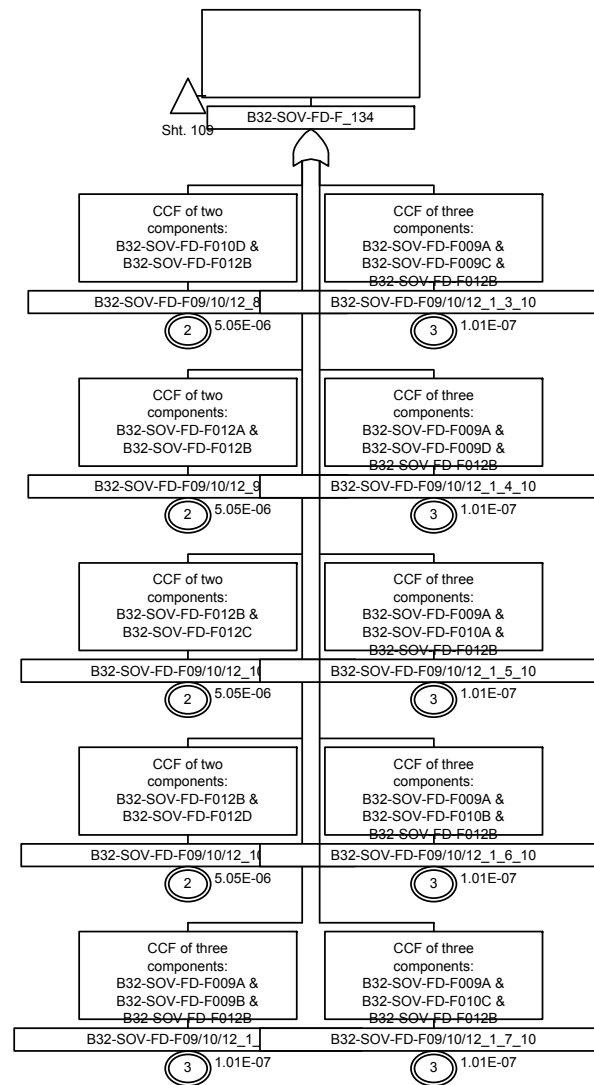


Figure 4.2-3. Sheet 111 Isolation Condenser System



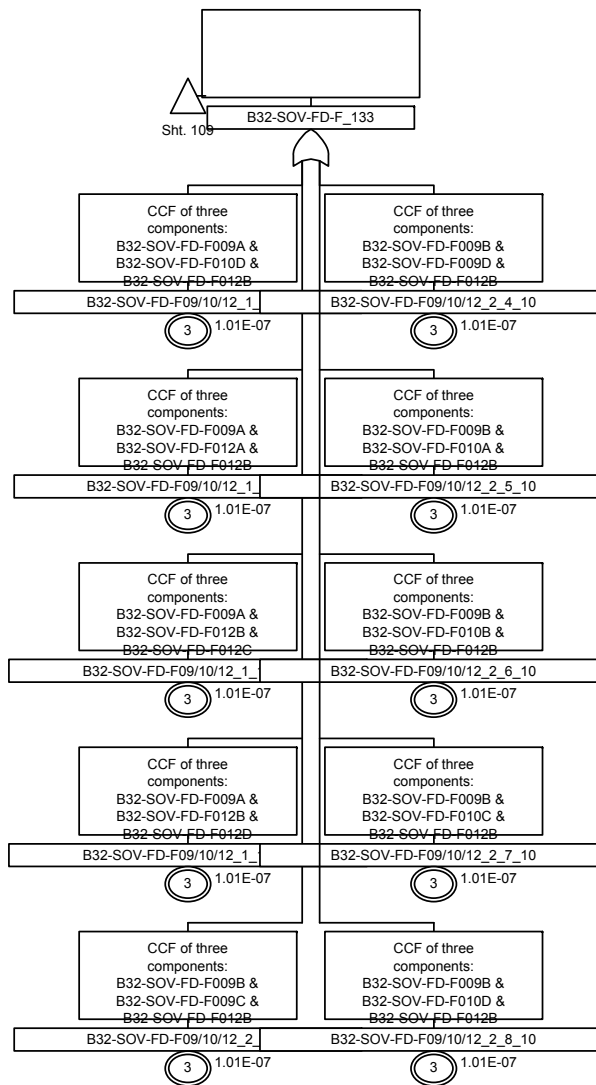


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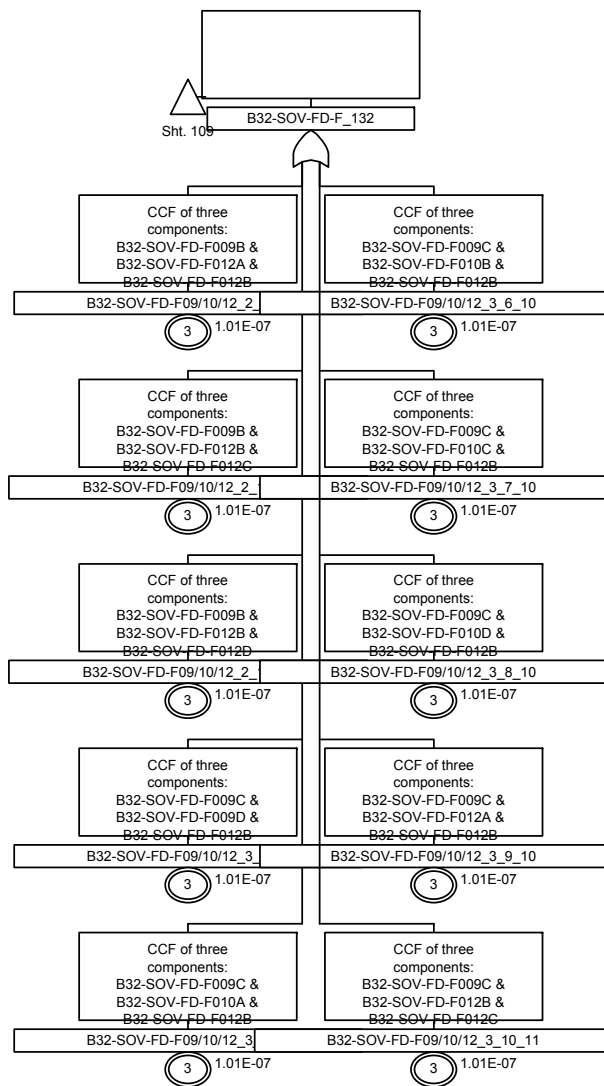


Figure 4.2-3. Sheet 113 Isolation Condenser System

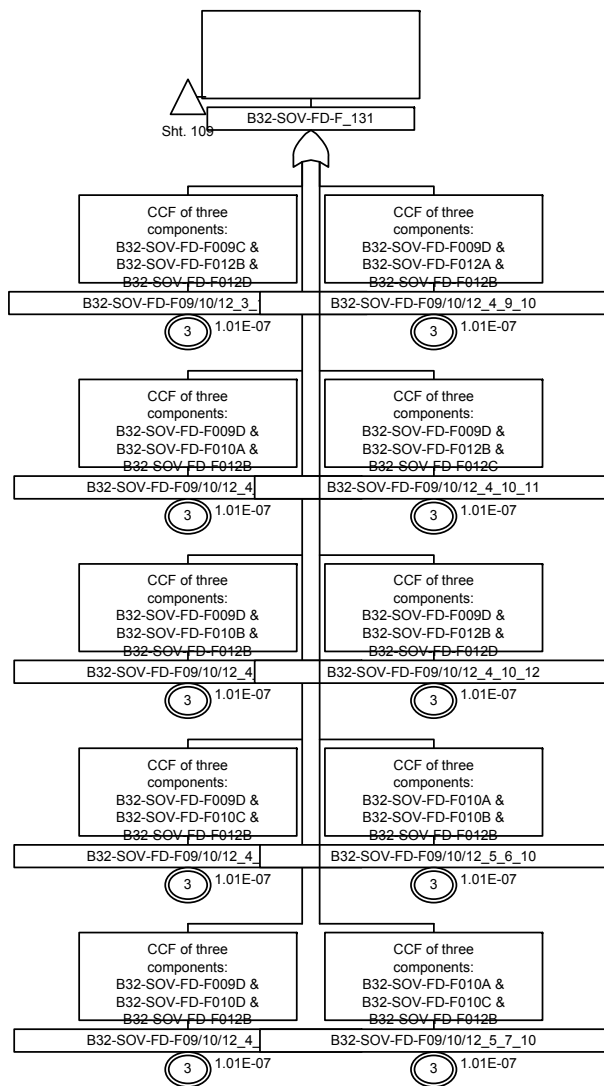


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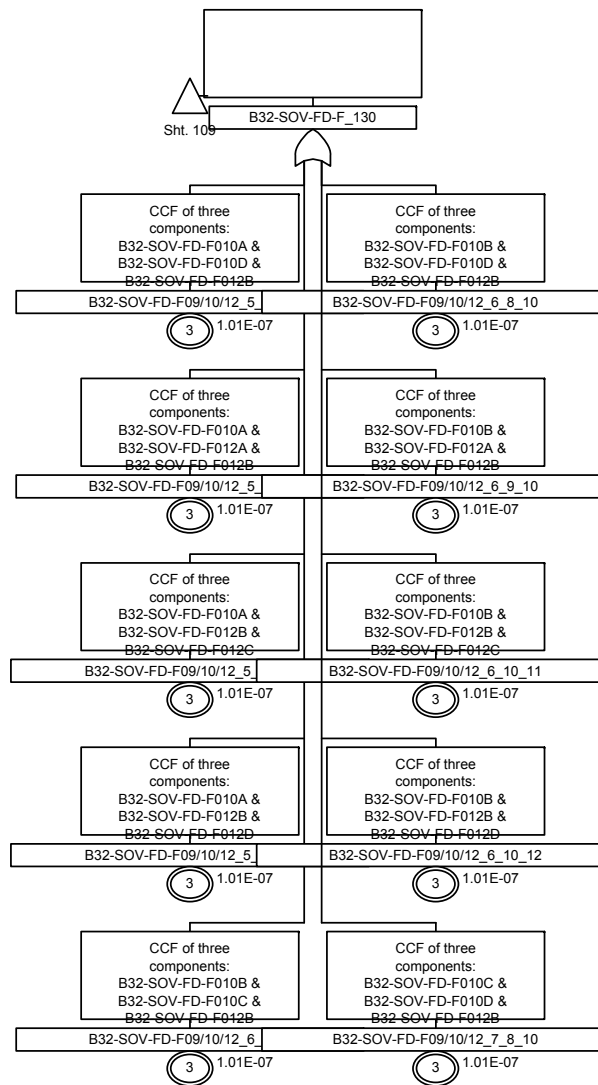


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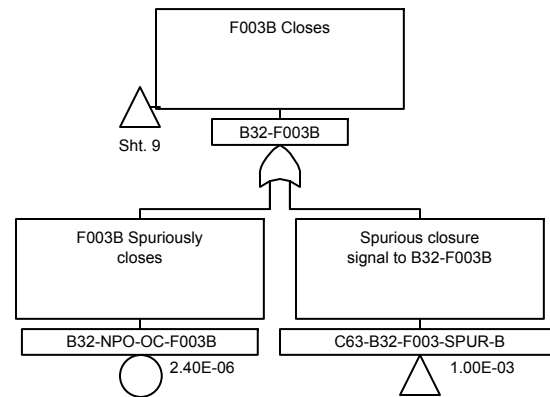


Figure 4.2-3. Sheet 117 Isolation Condenser System

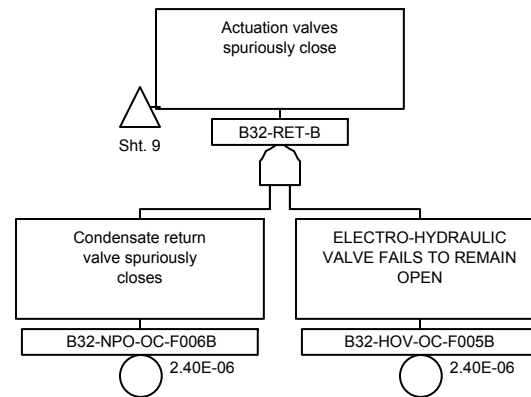


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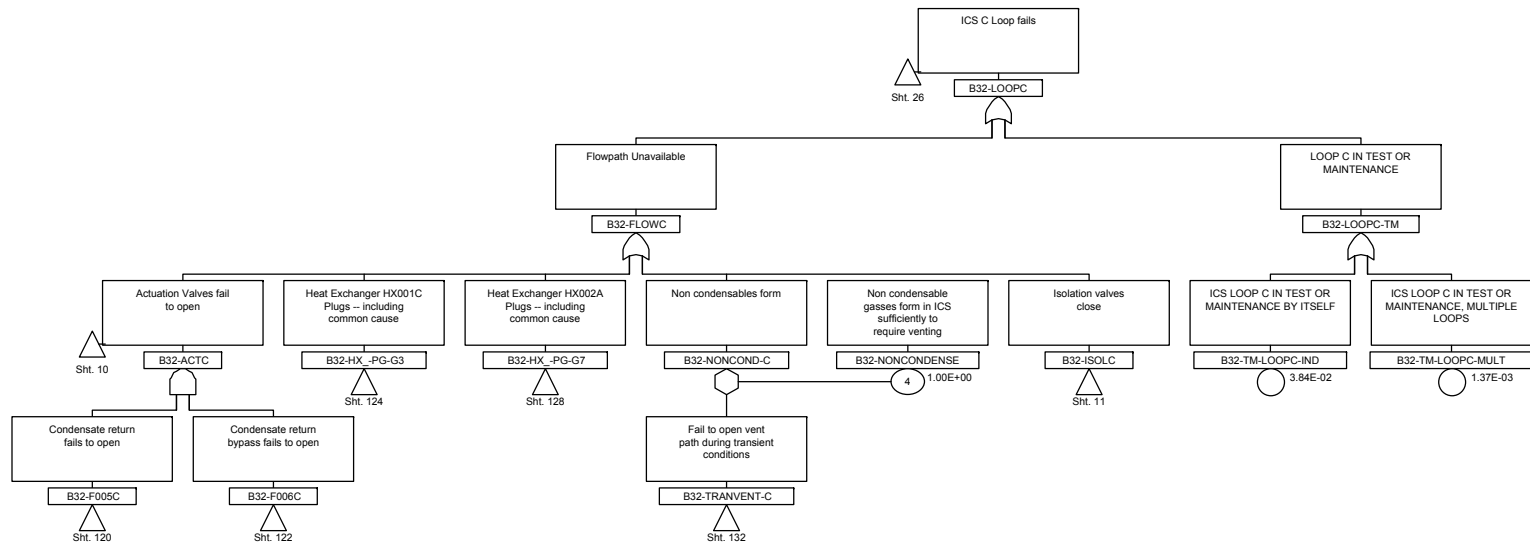


Figure 4.2-3. Sheet 119 Isolation Condenser System



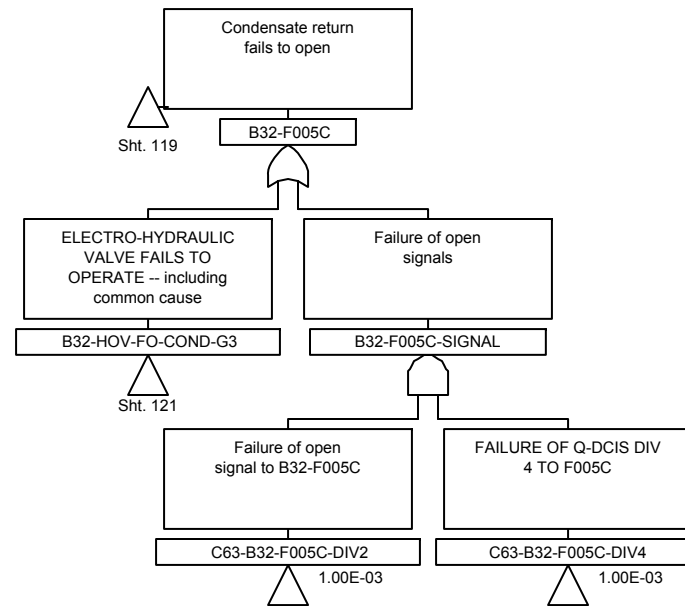


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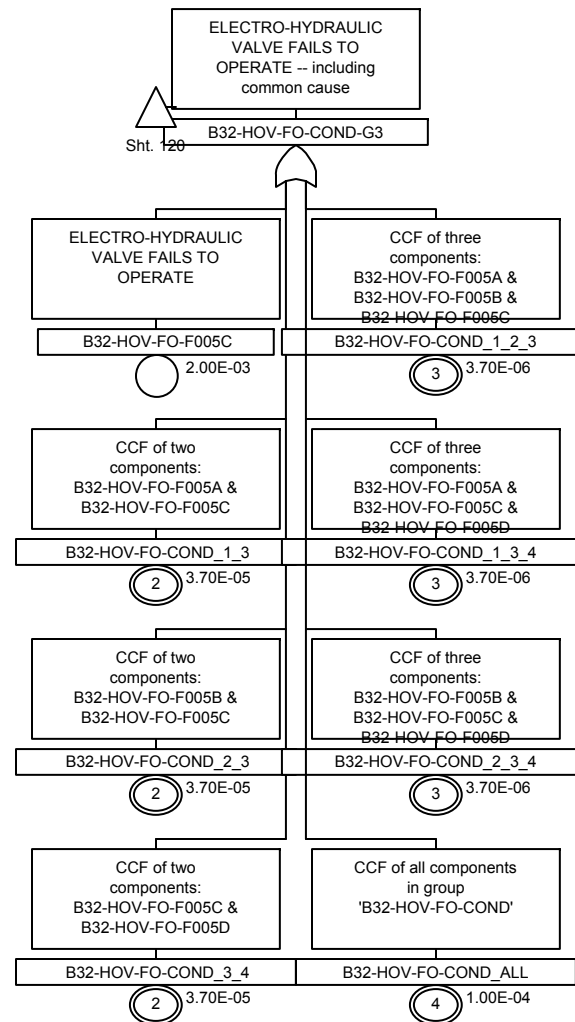


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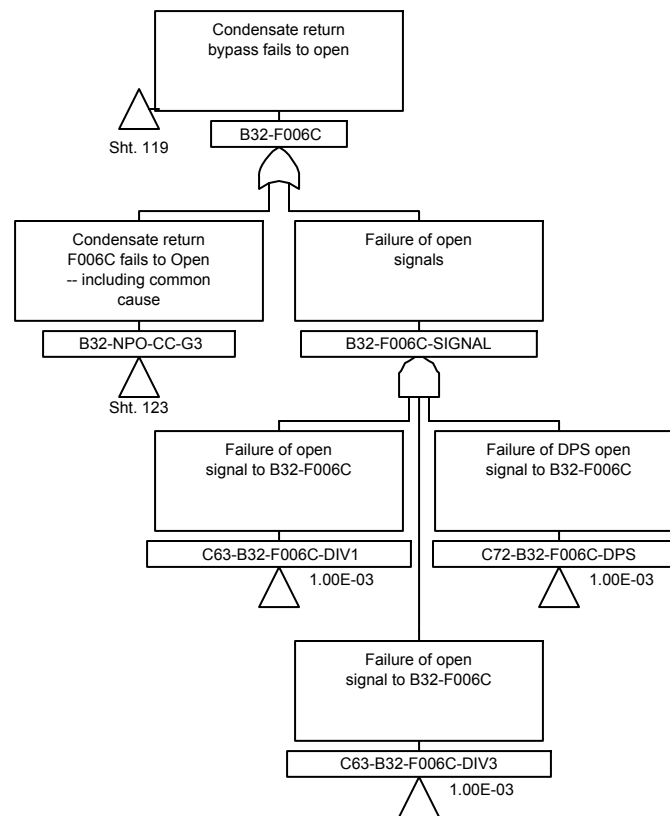


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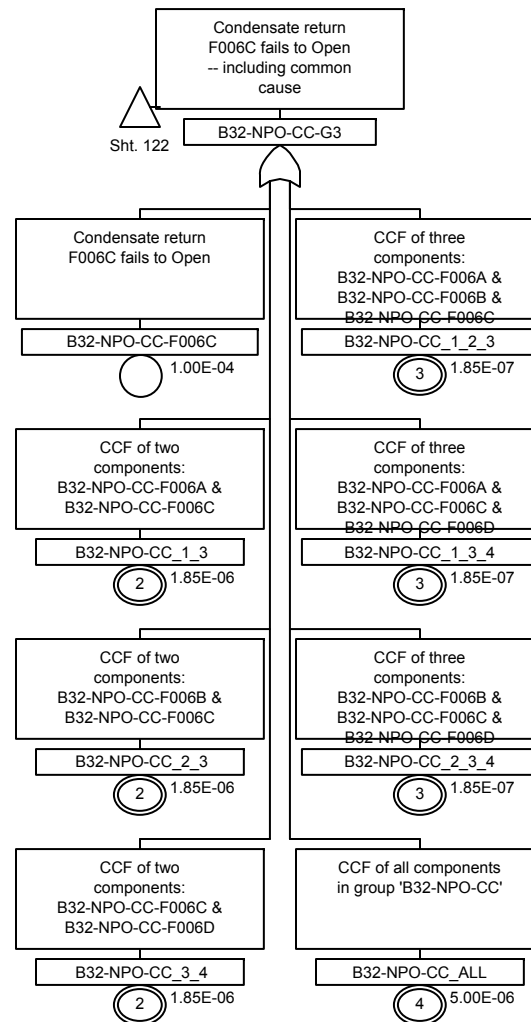


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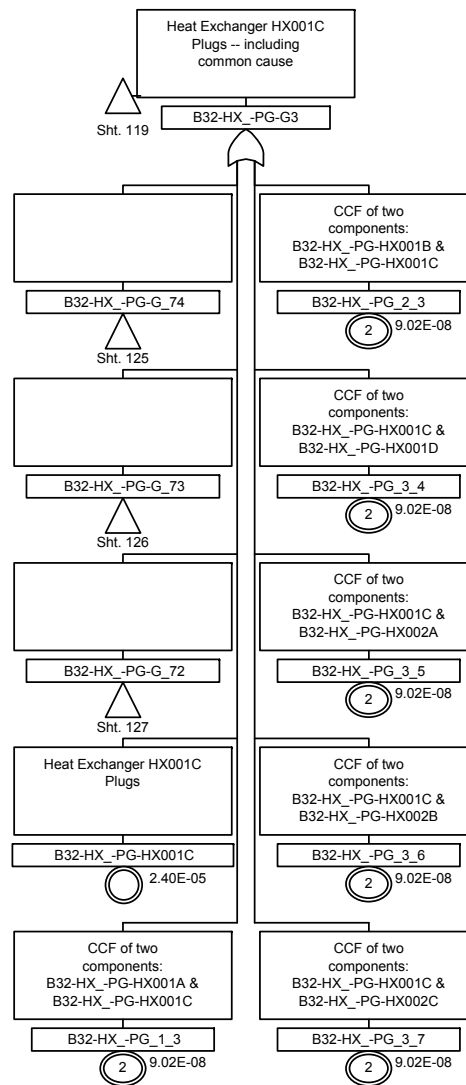


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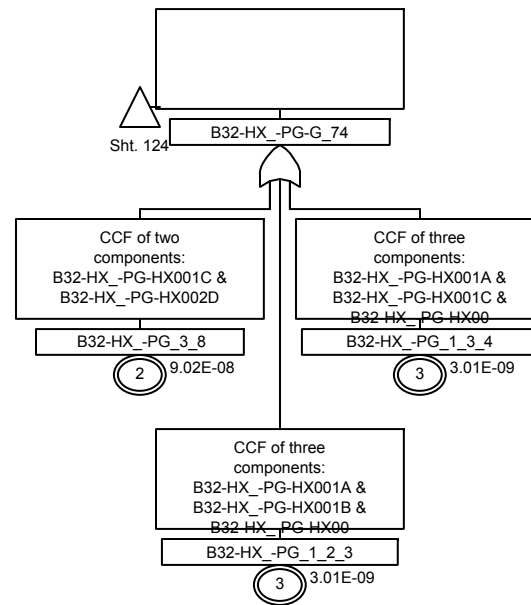


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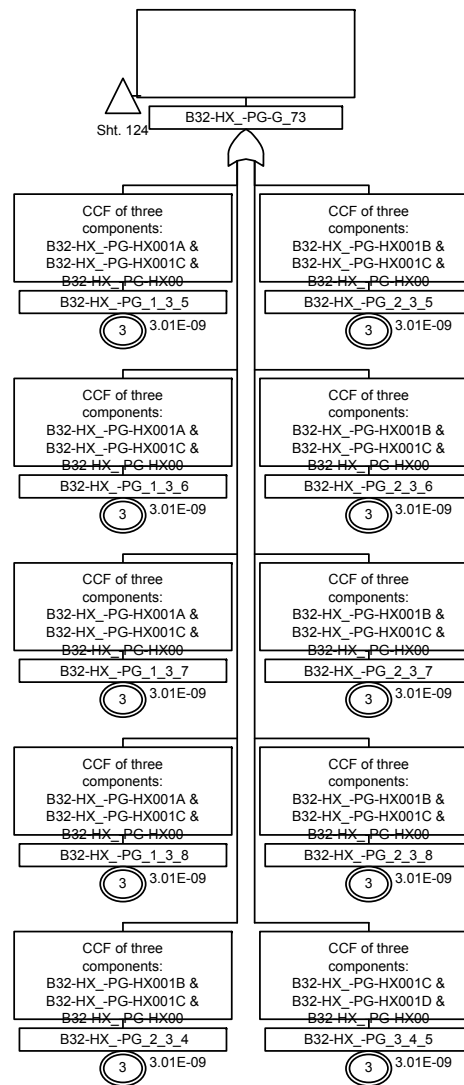


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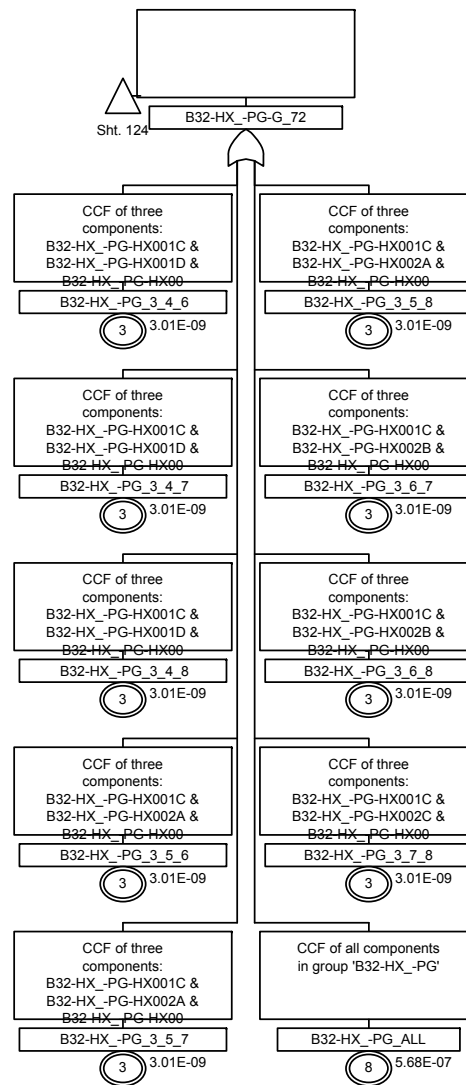


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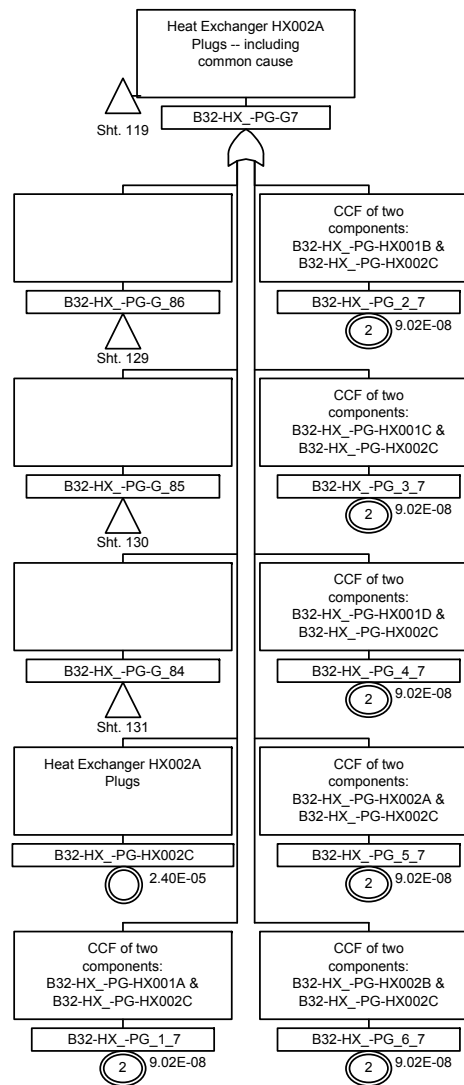


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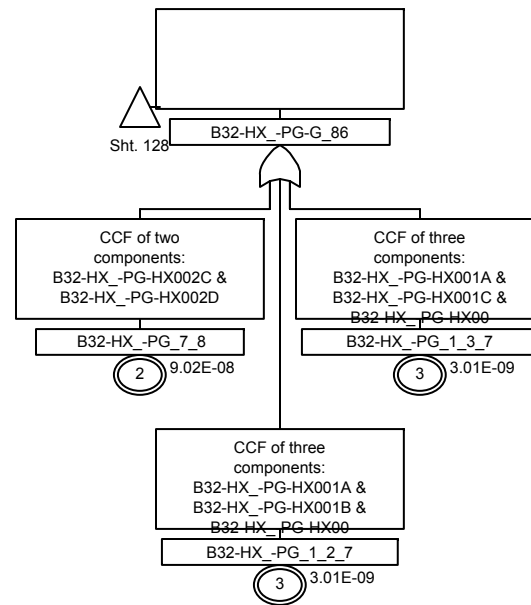


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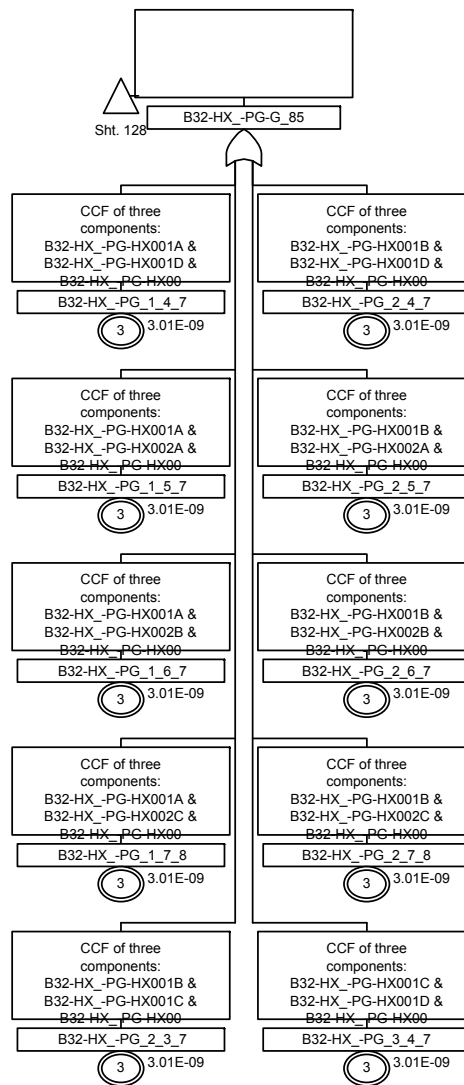


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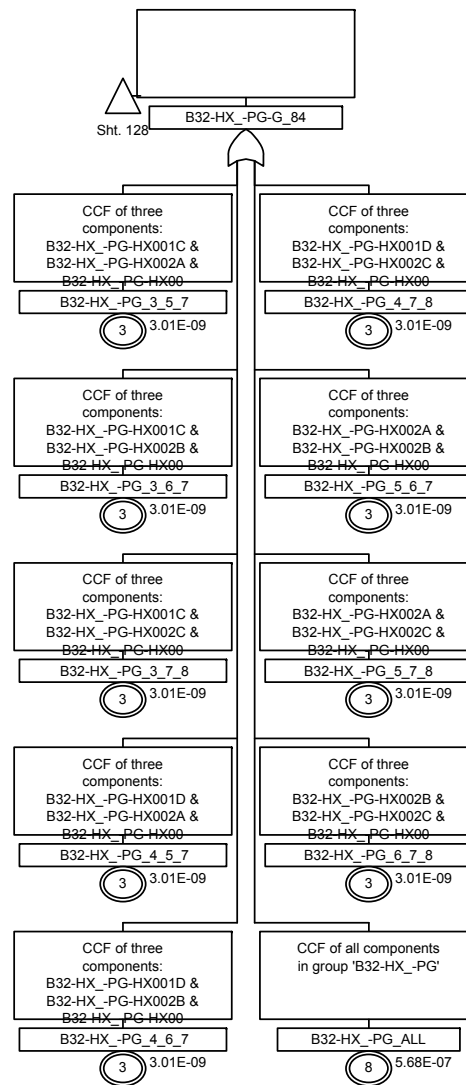


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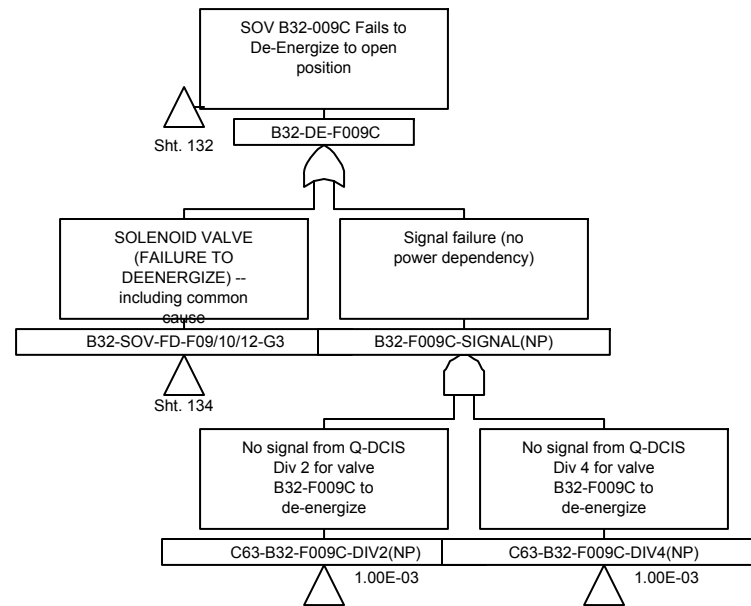


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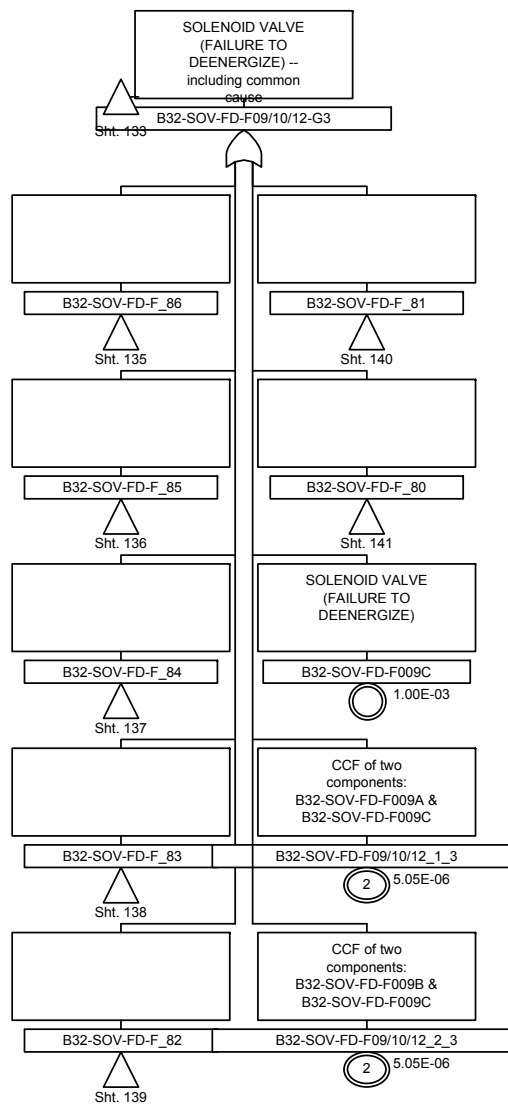


Figure 4.2-3. Sheet 134 Isolation Condenser System

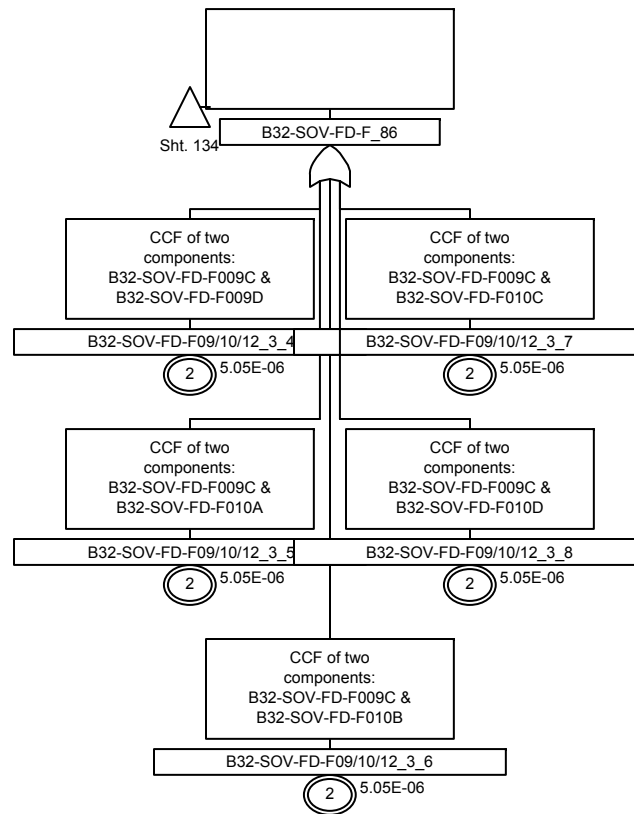


Figure 4.2-3. Sheet 135 Isolation Condenser System



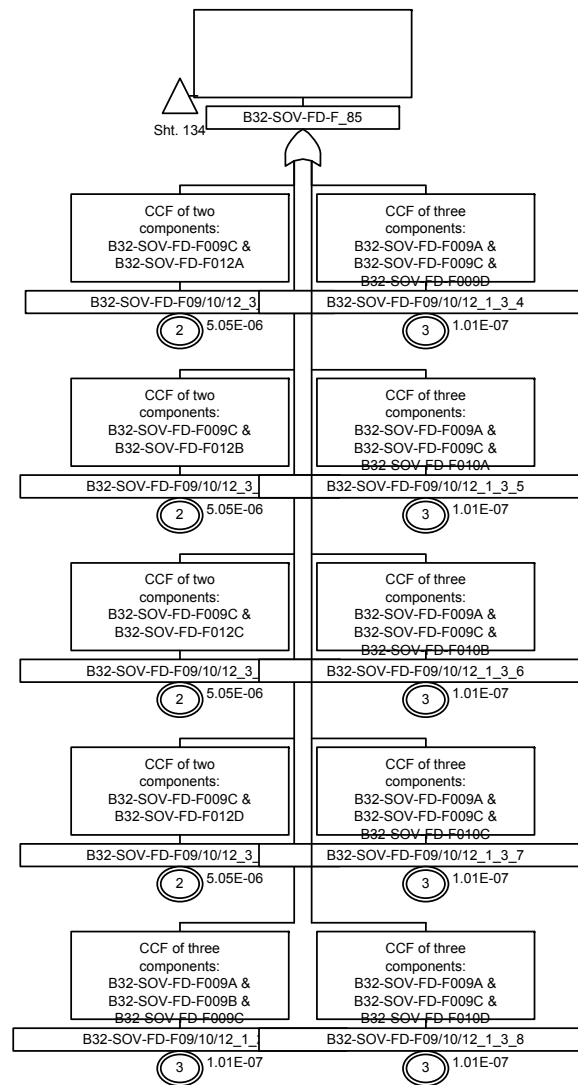


Figure 4.2-3. Sheet 136 Isolation Condenser System

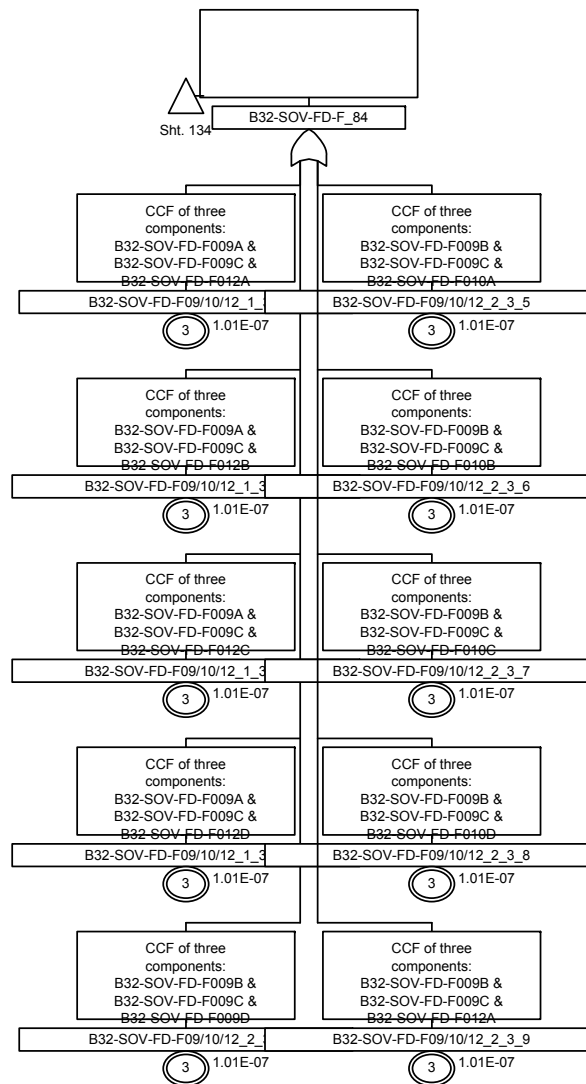


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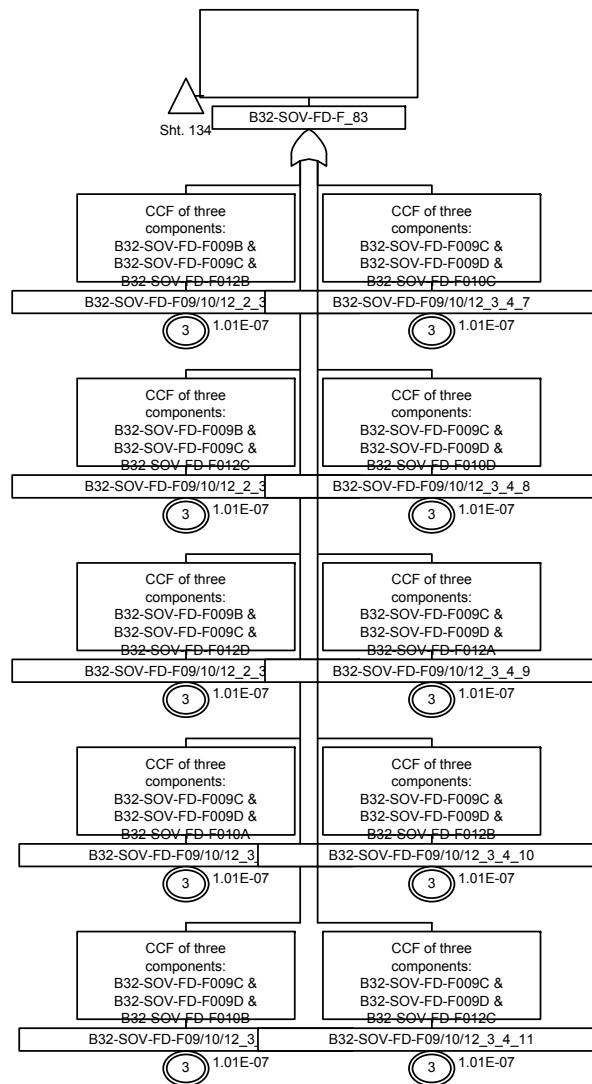


Figure 4.2-3. Sheet 138 Isolation Condenser System

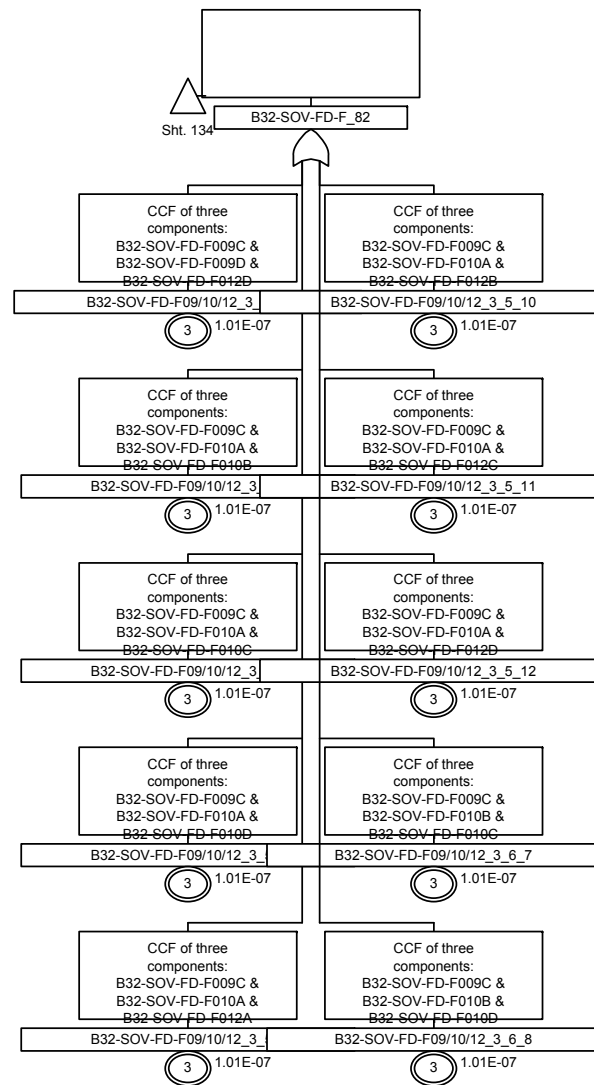


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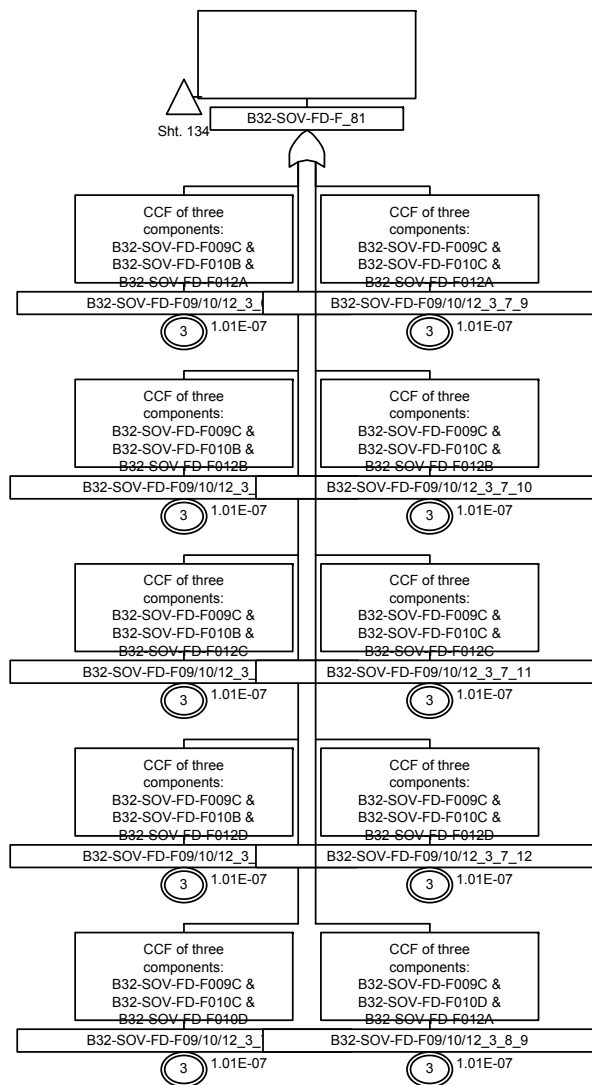


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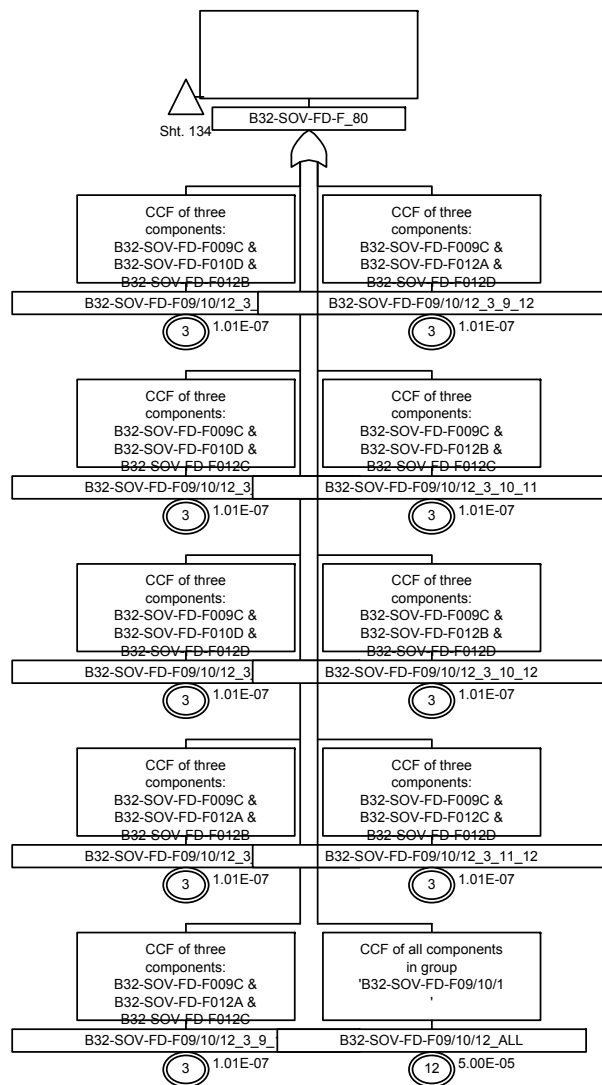


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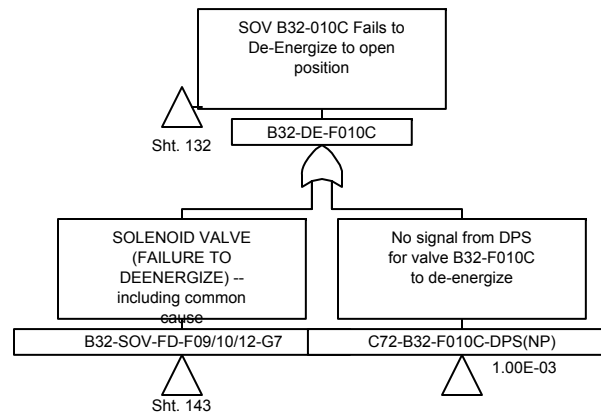


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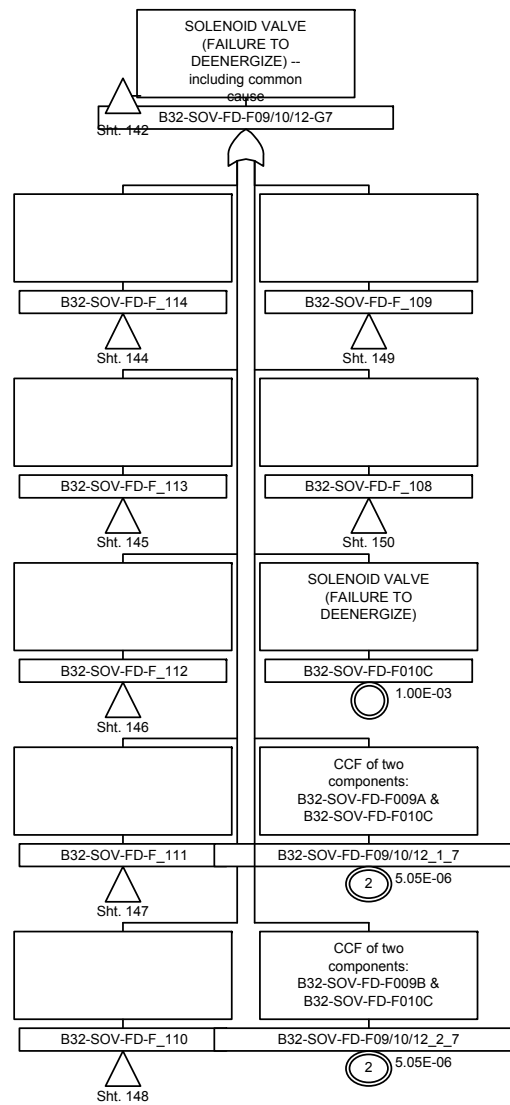


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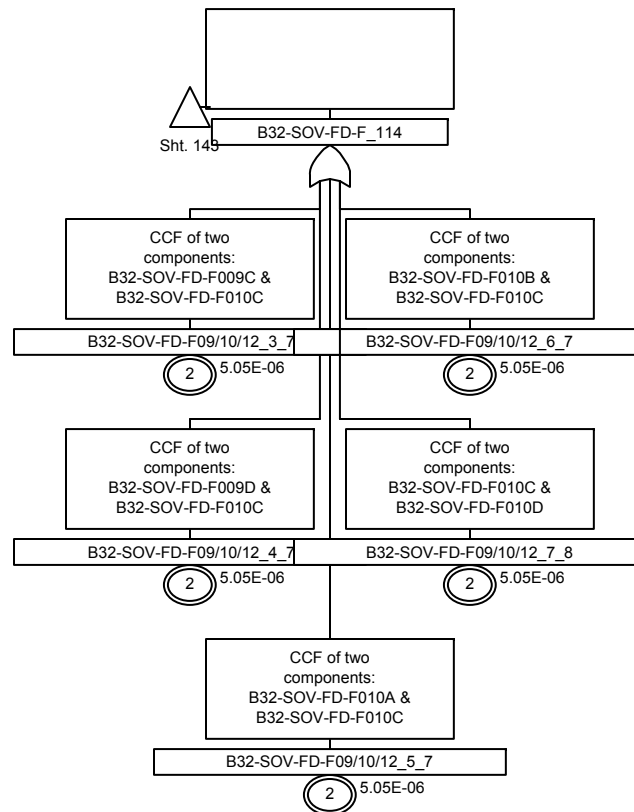


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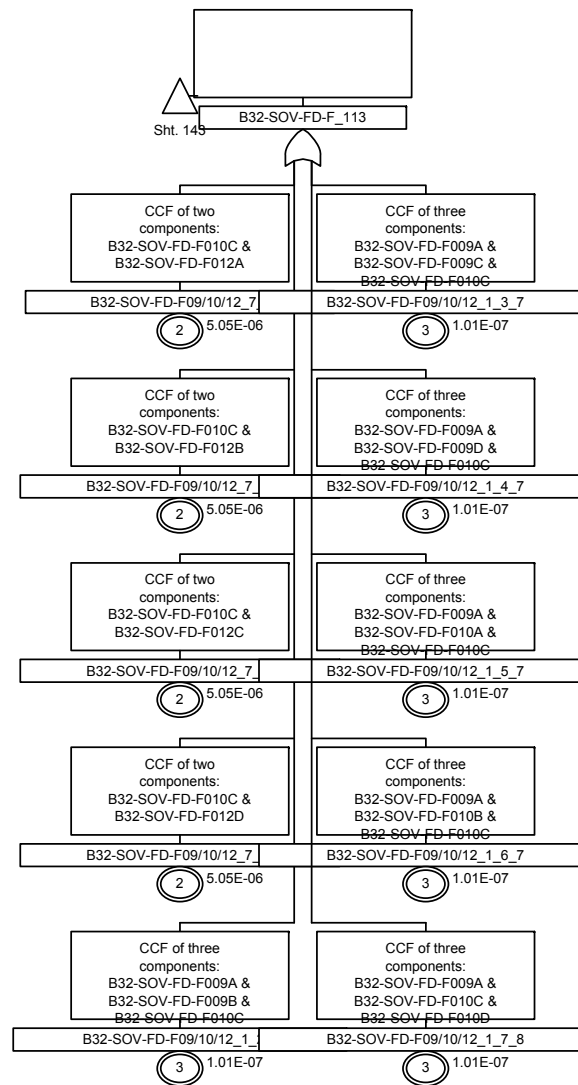


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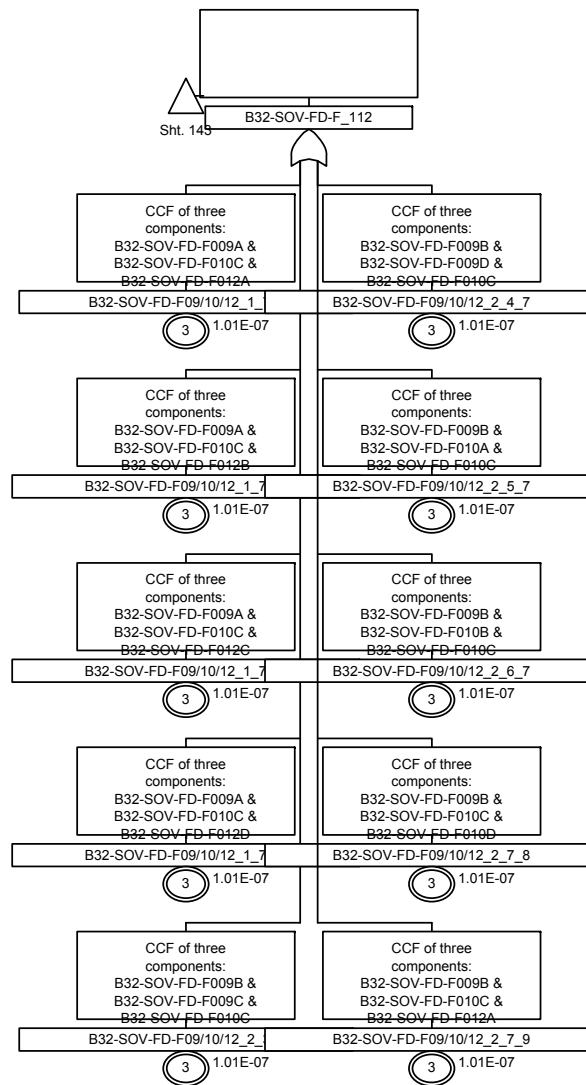


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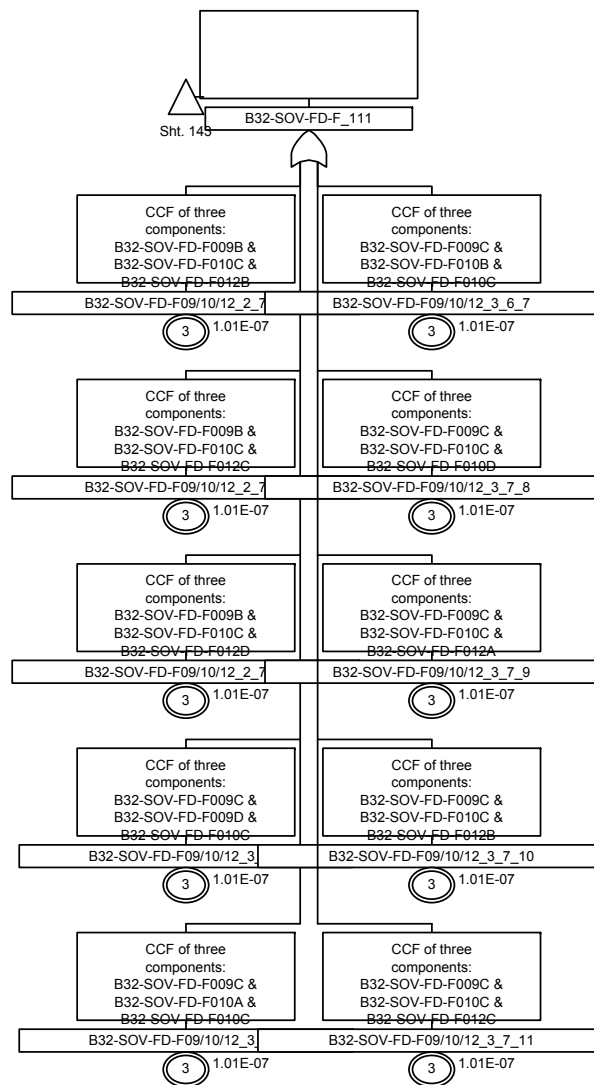


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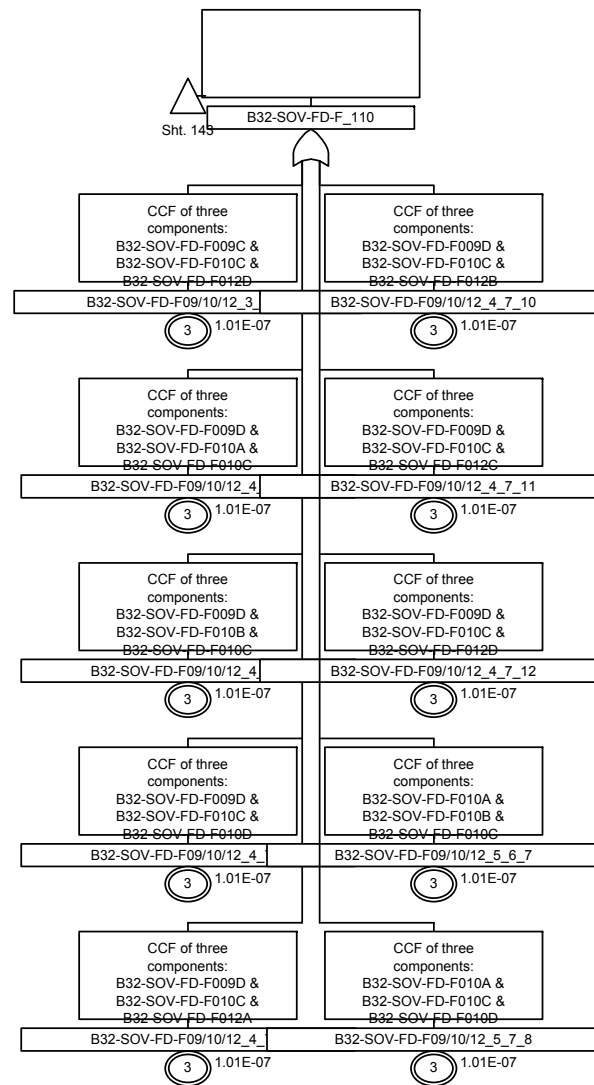


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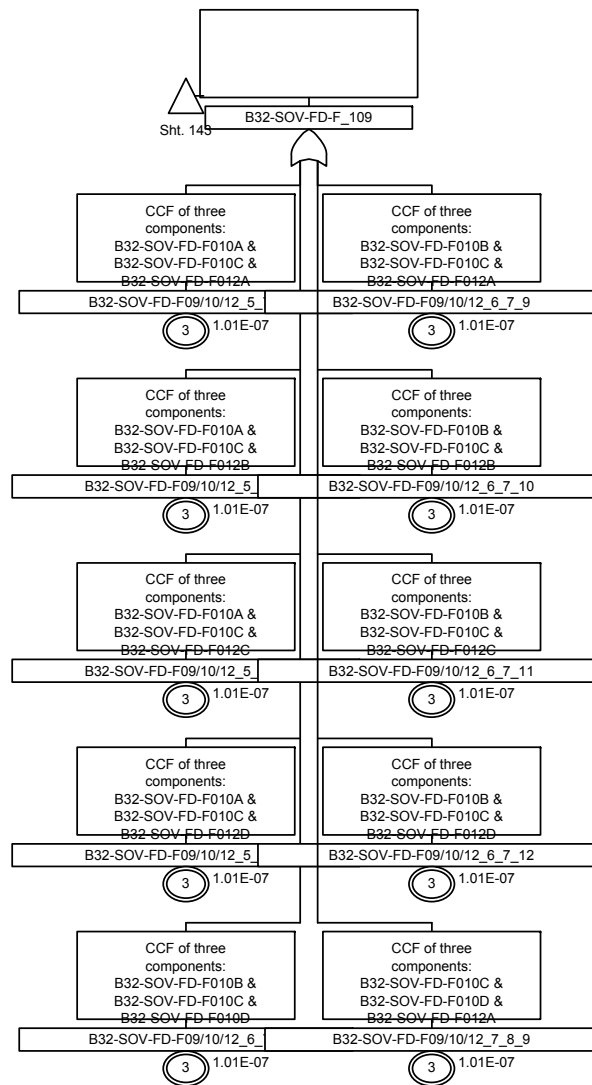


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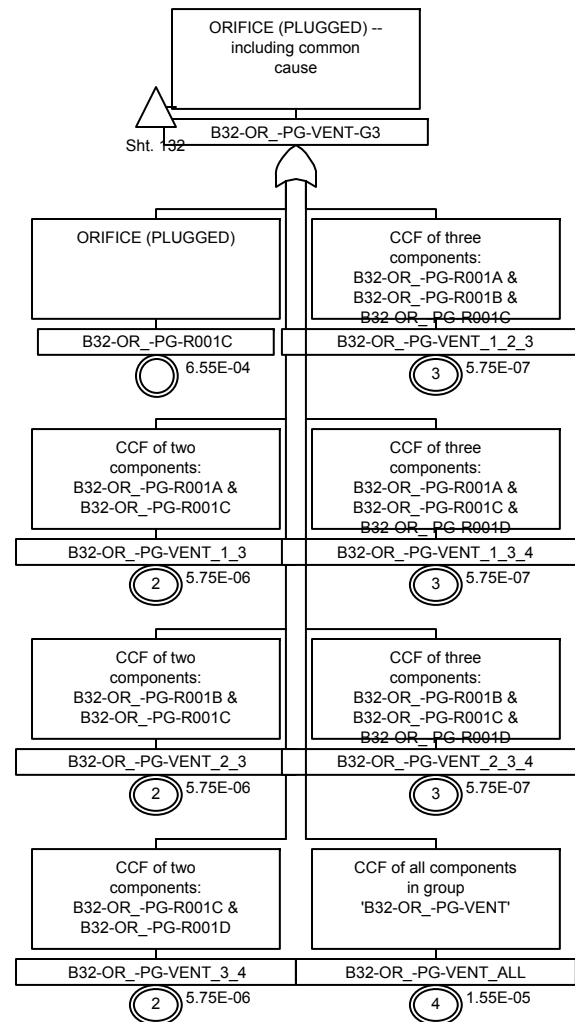


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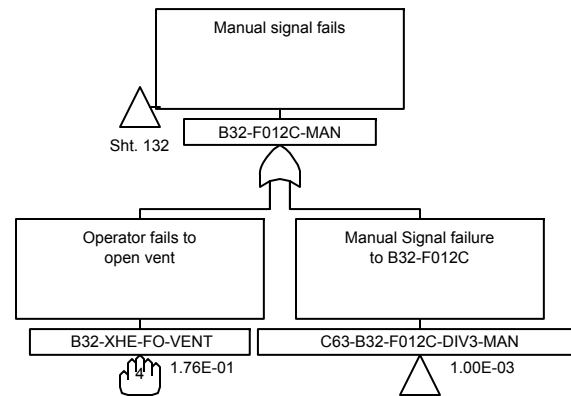


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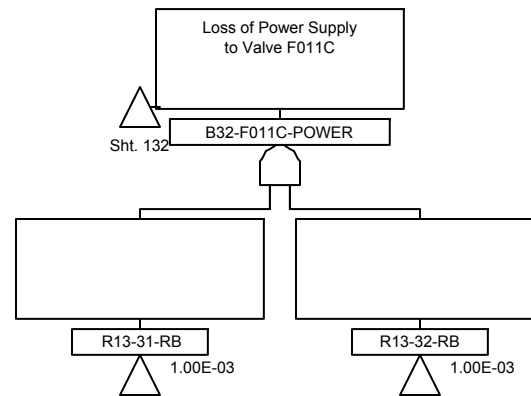


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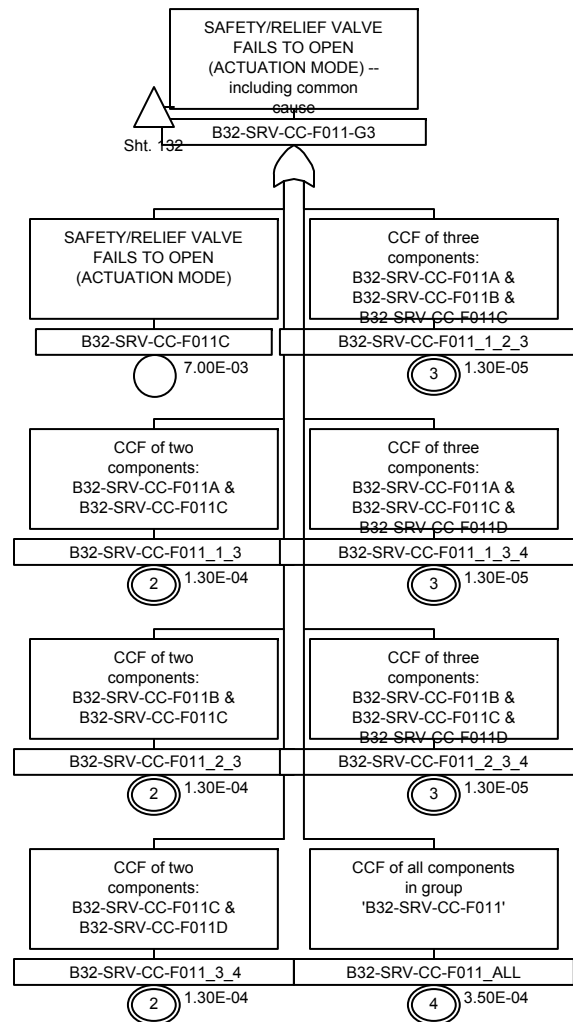


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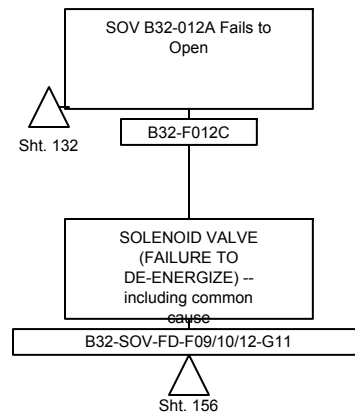


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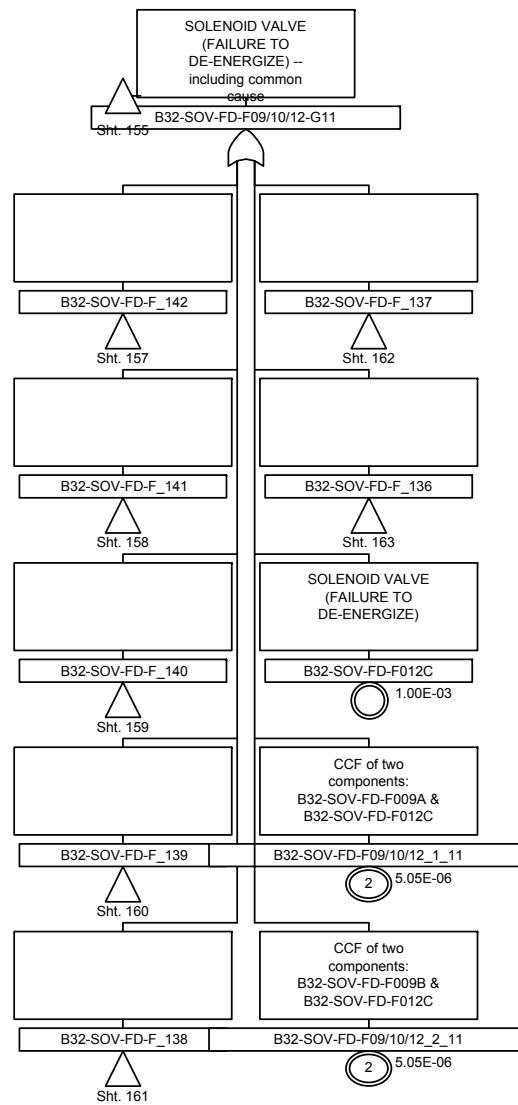


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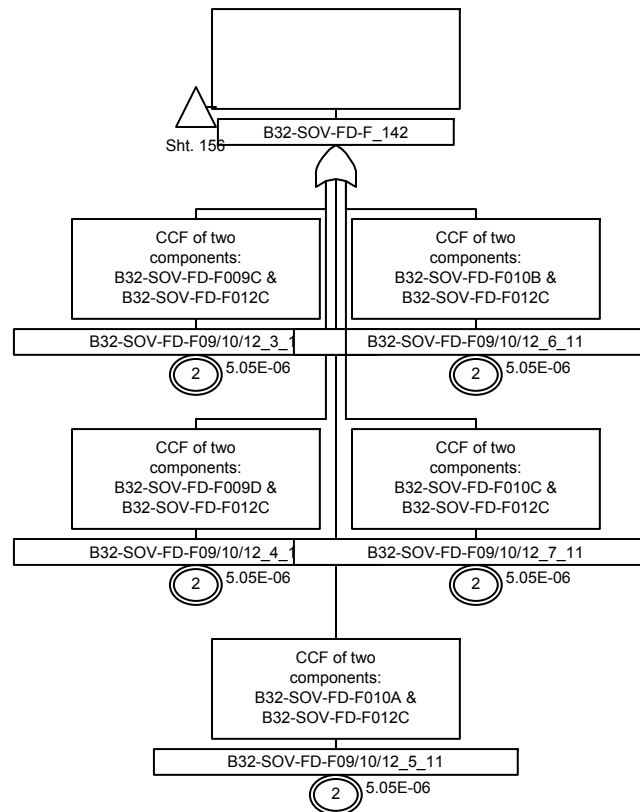


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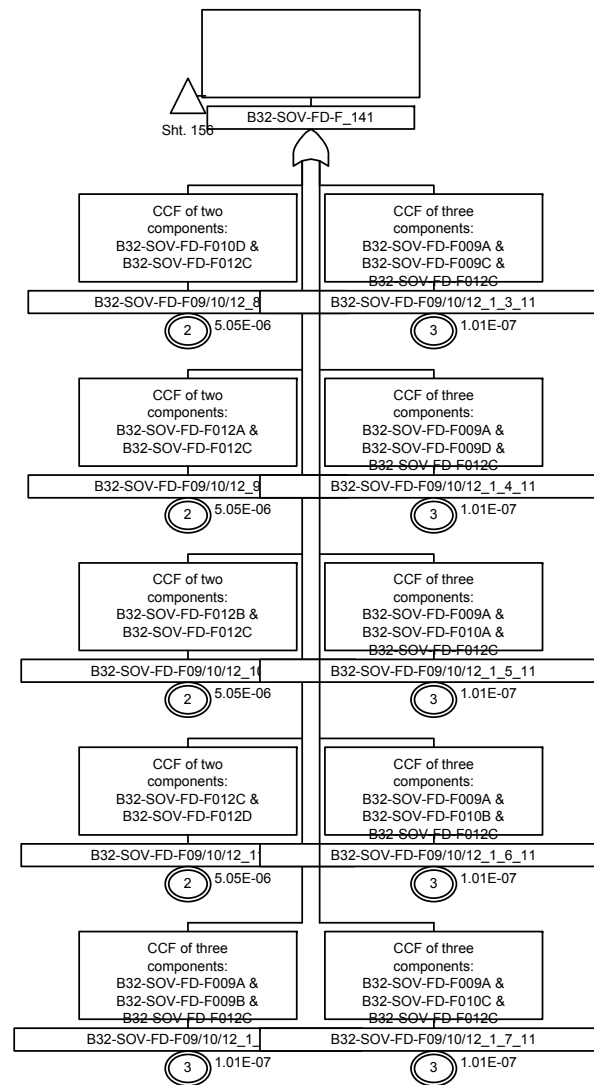


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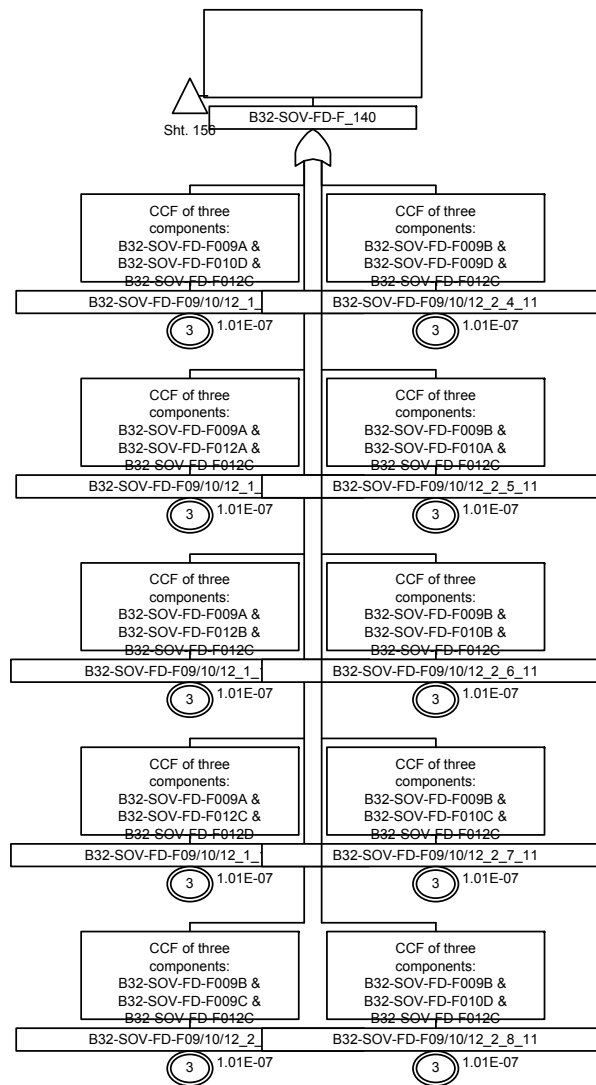


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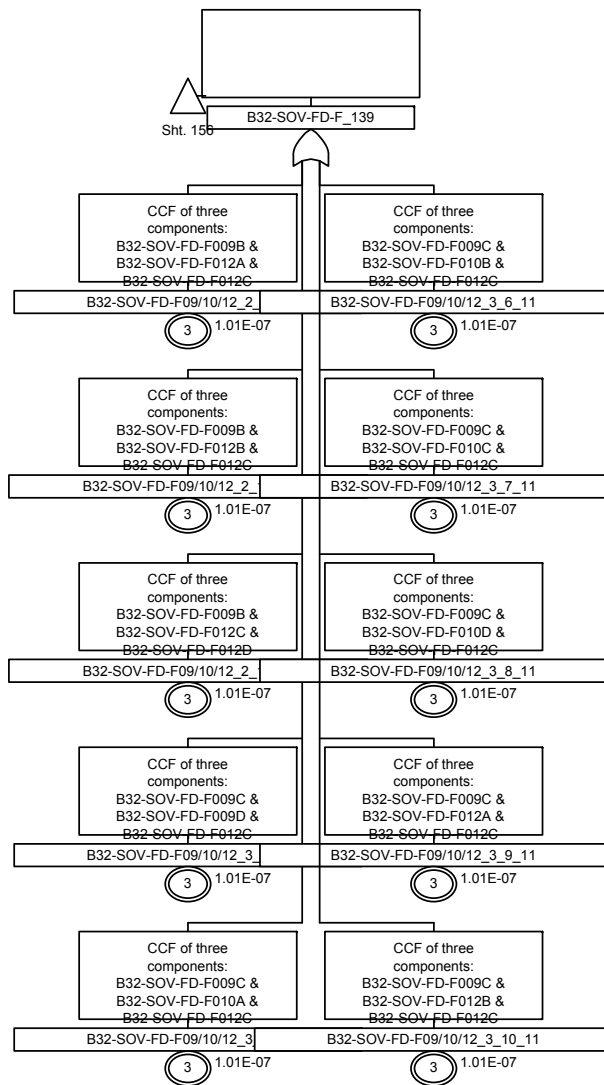


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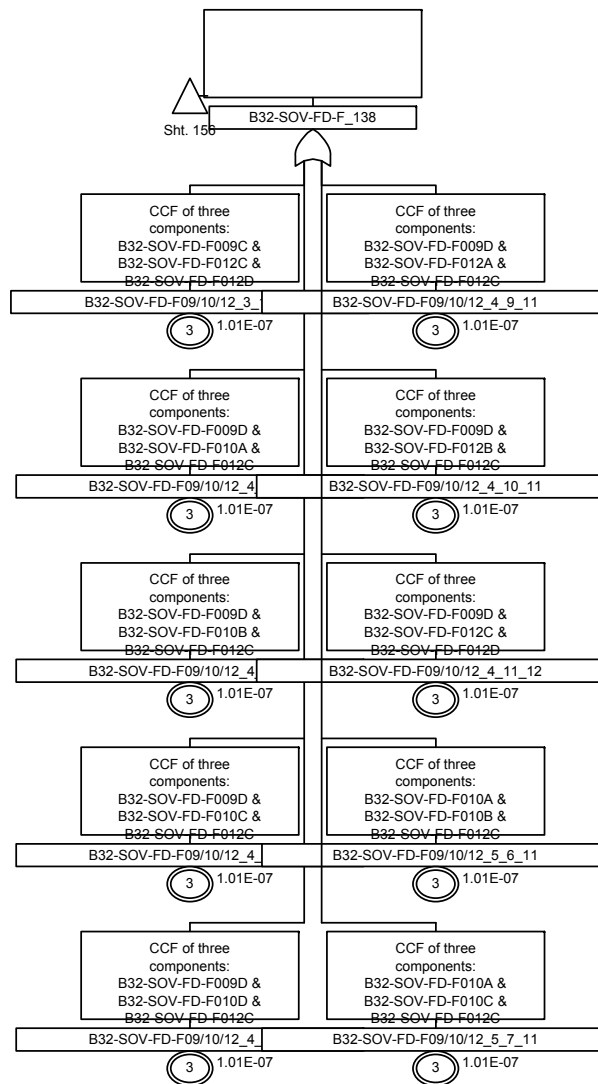


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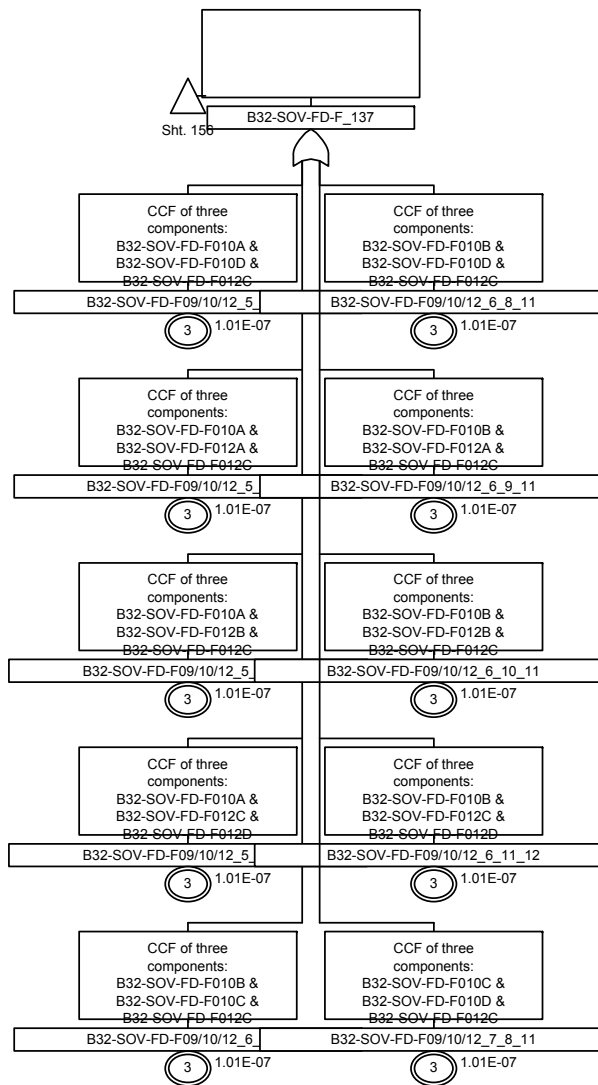


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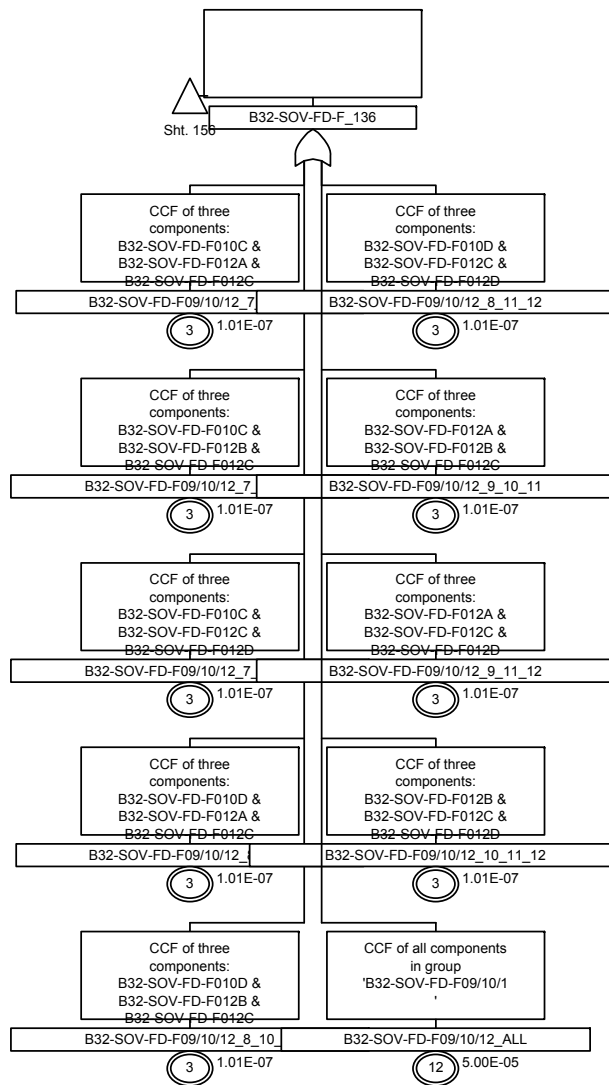


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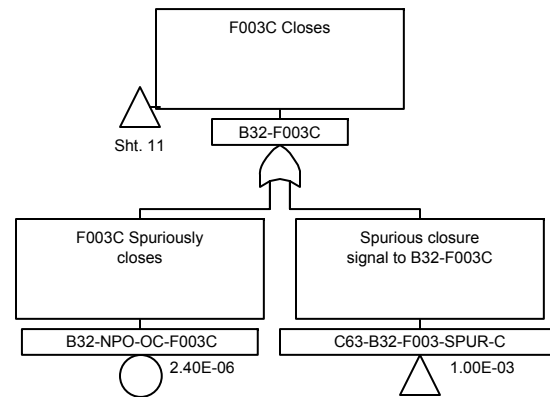


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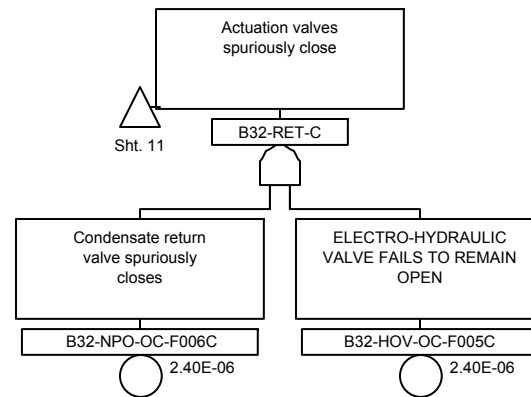


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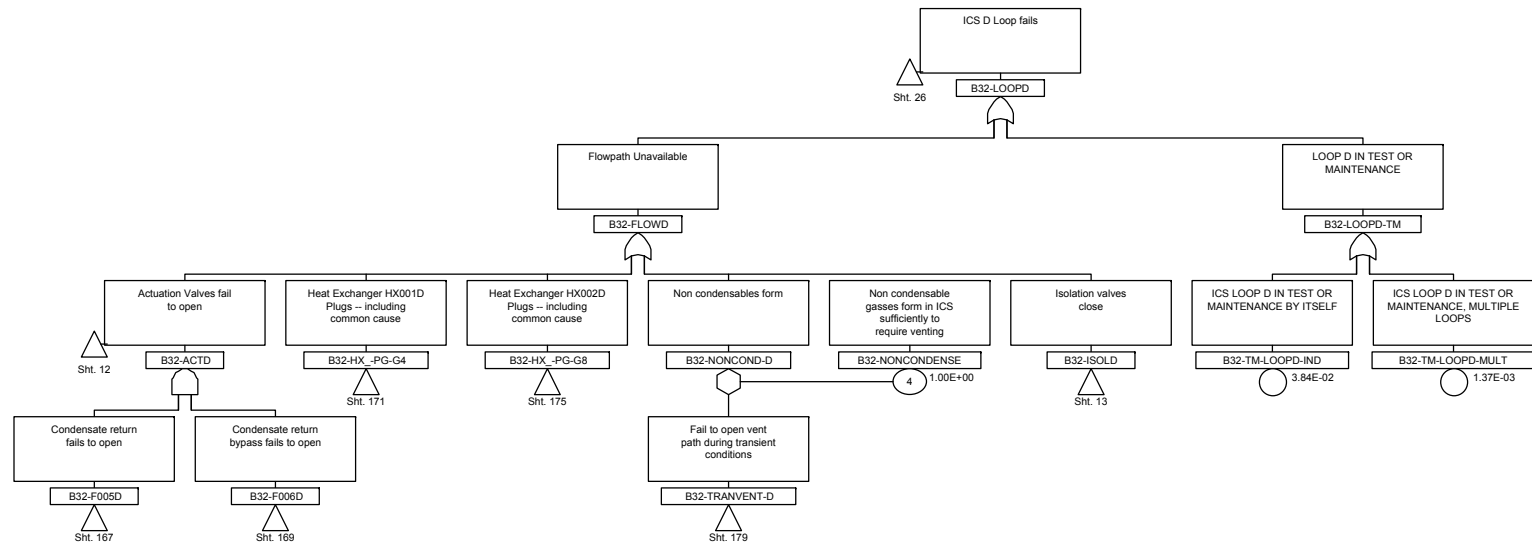


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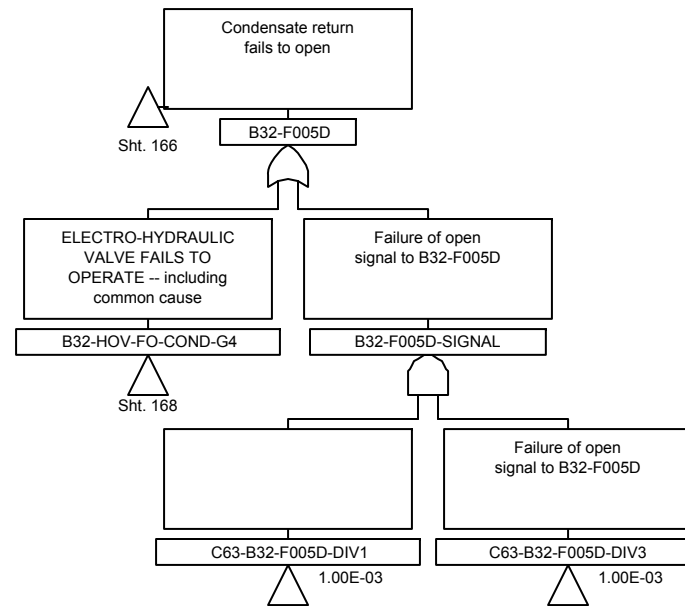


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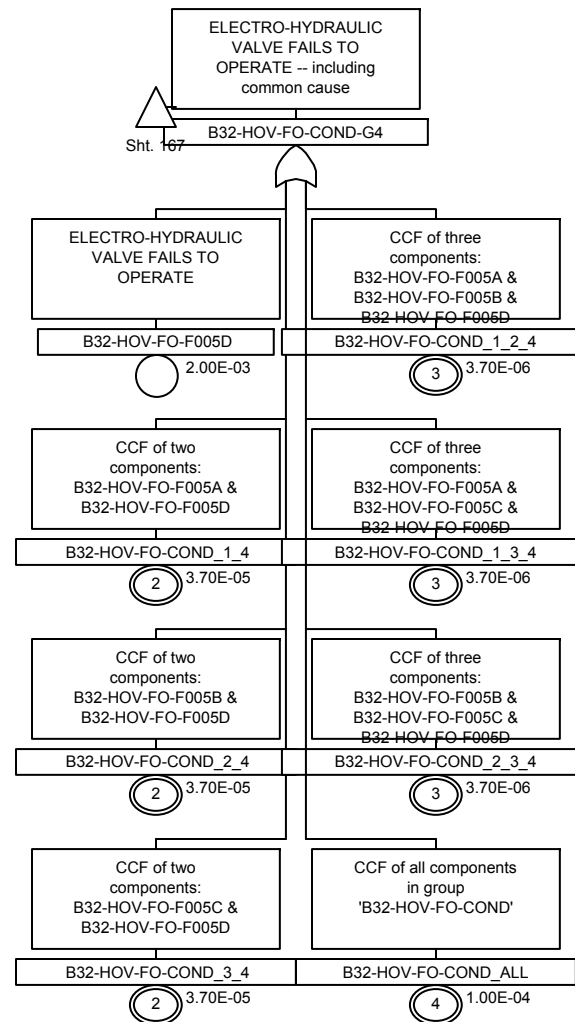


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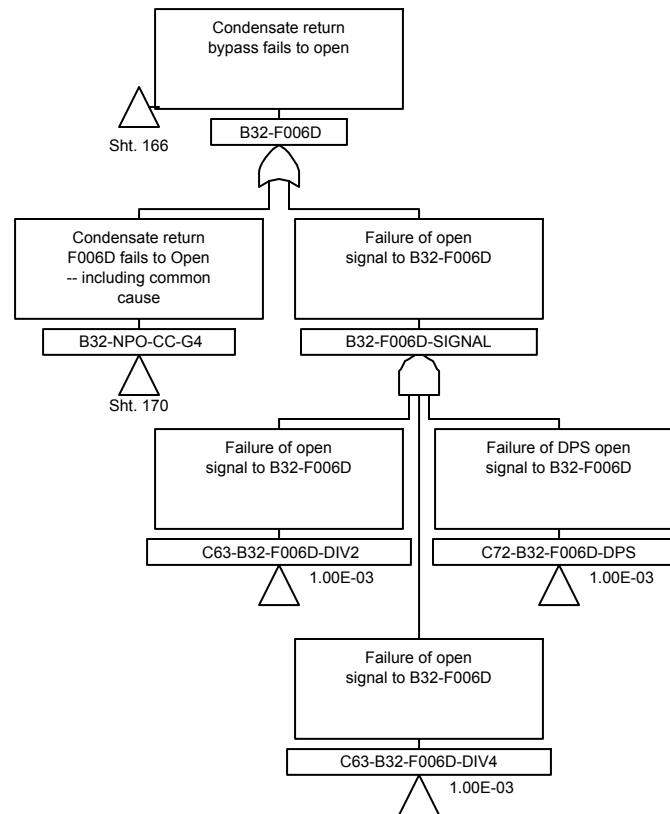


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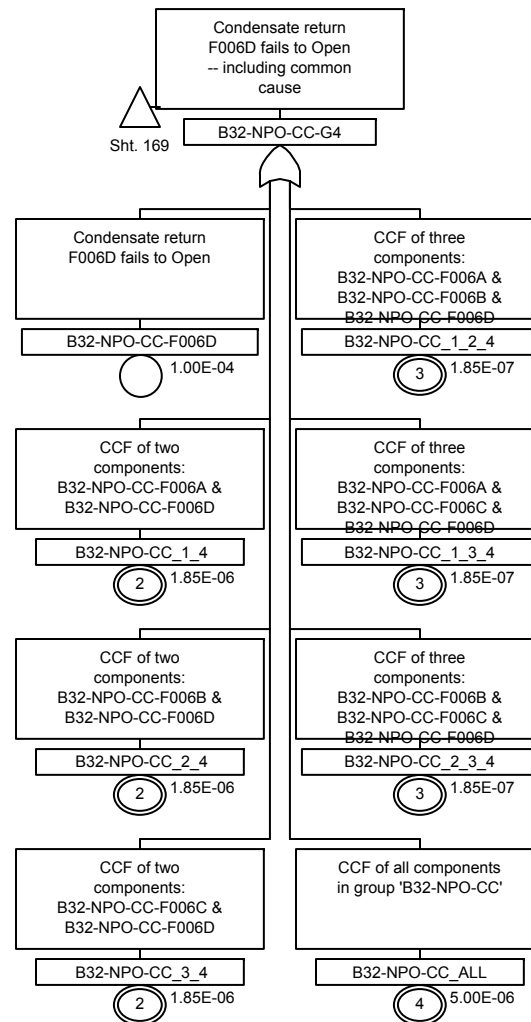


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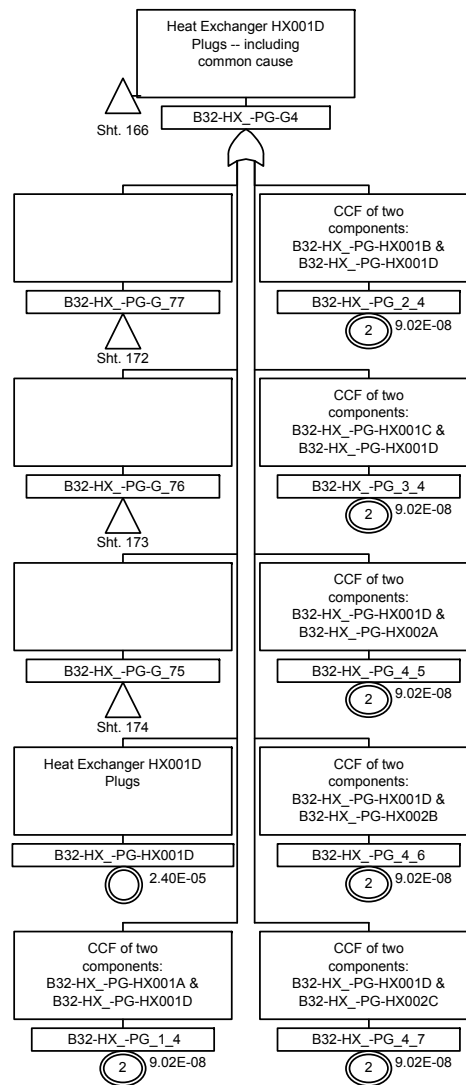


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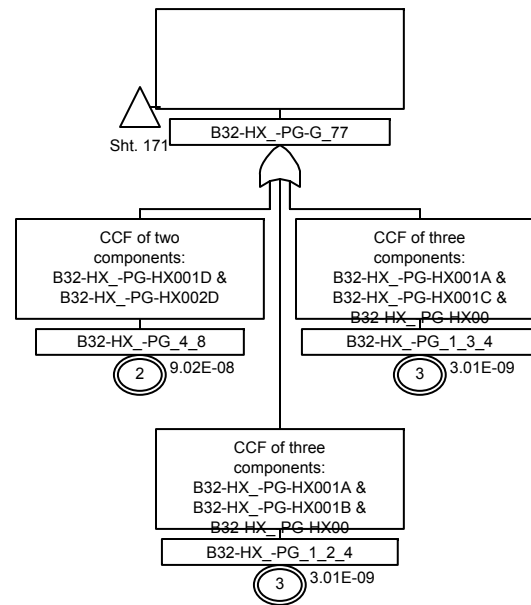


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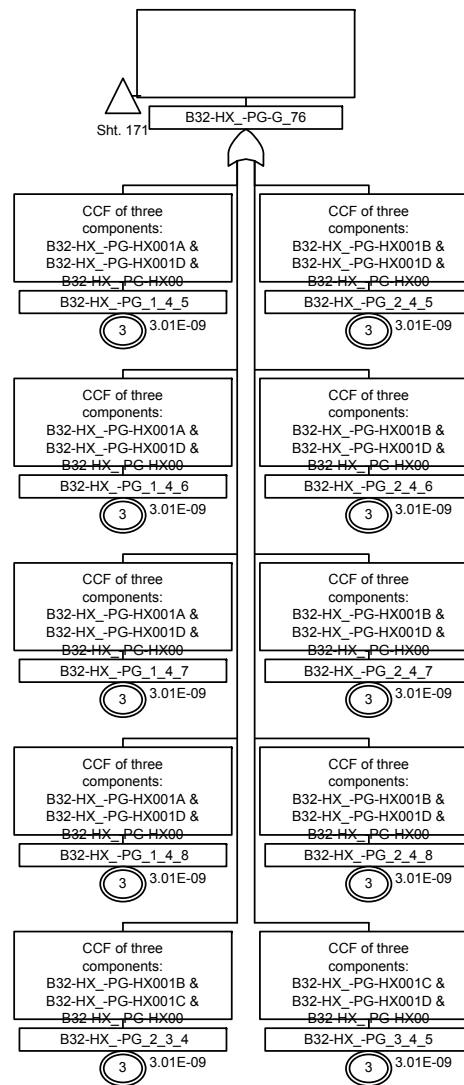


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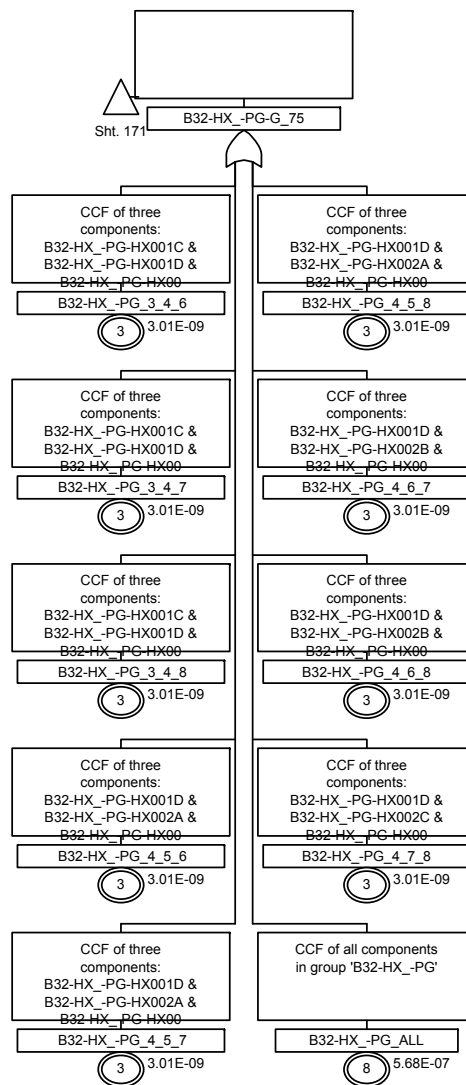


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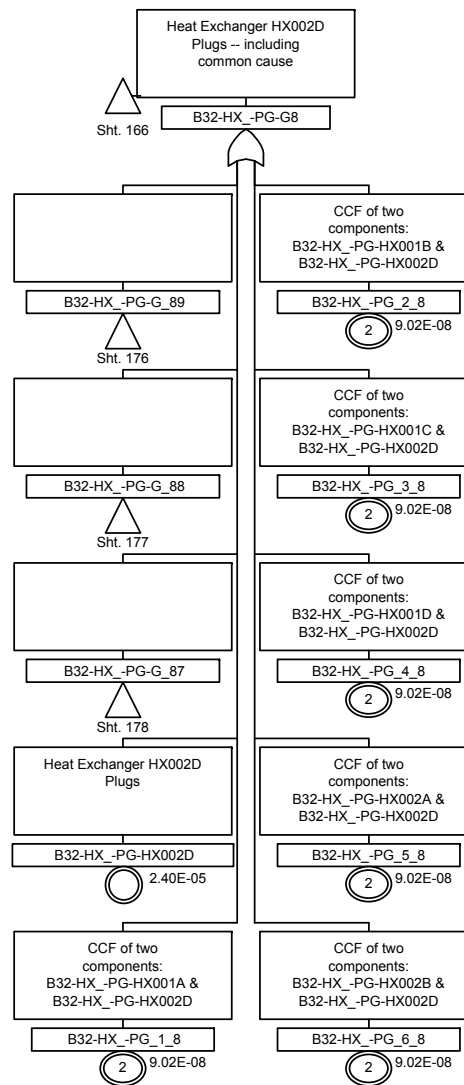


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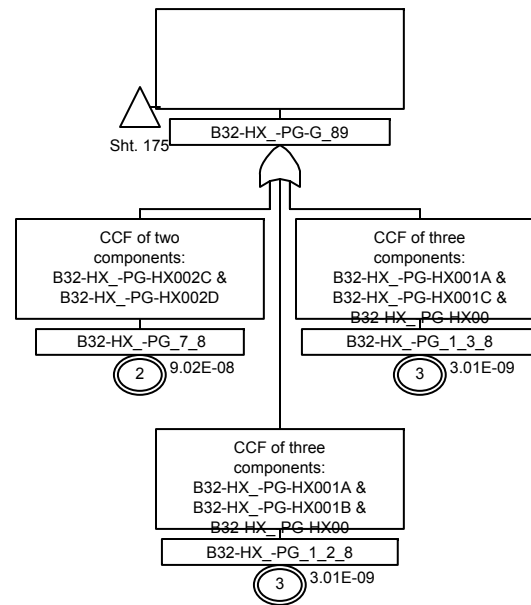


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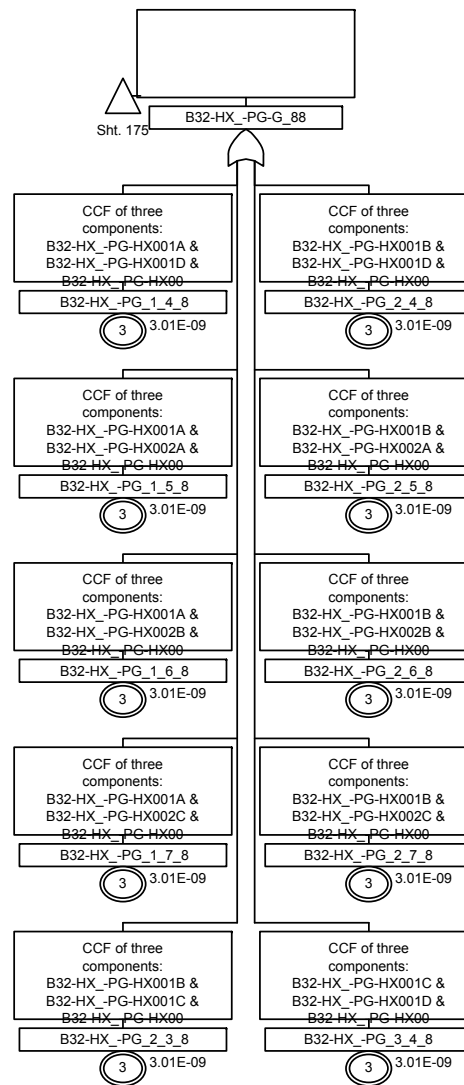


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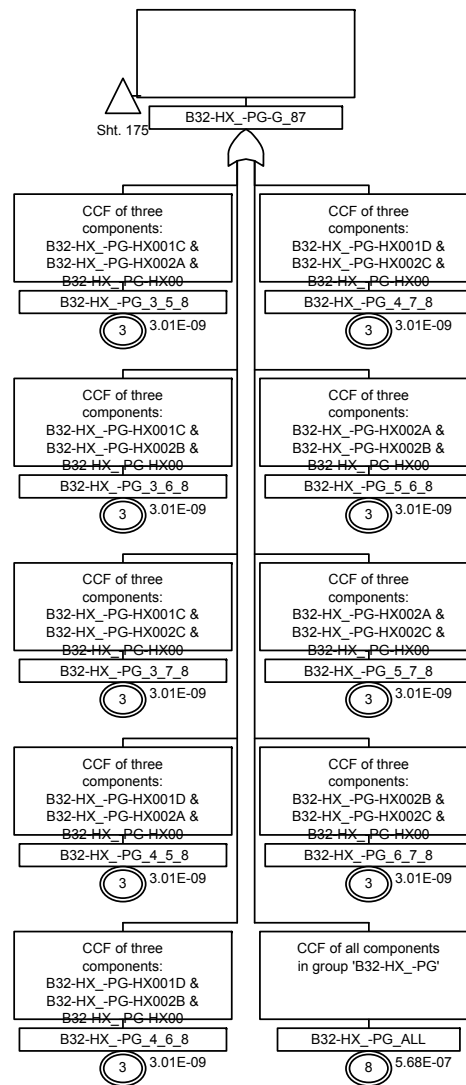


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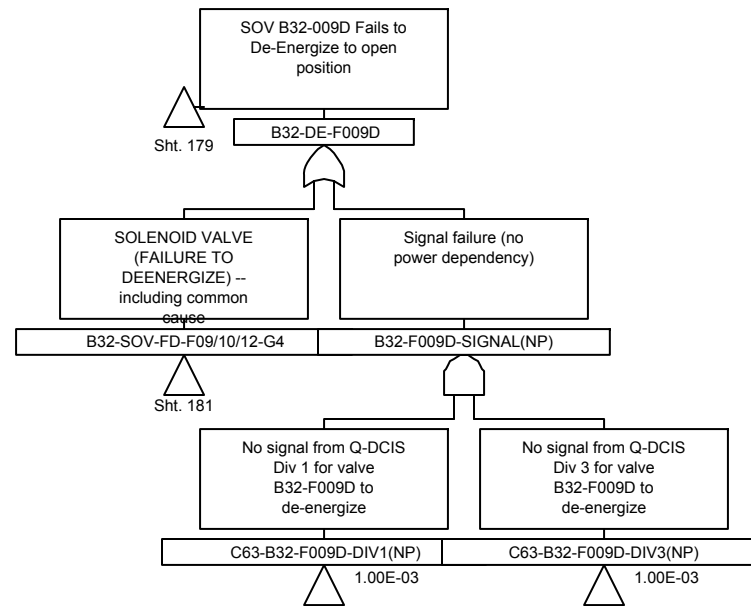


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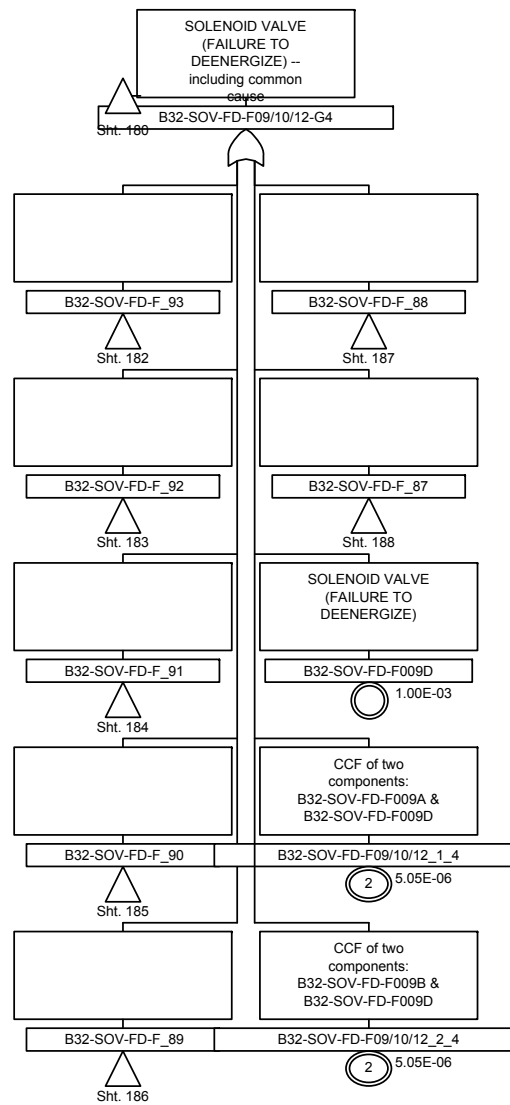


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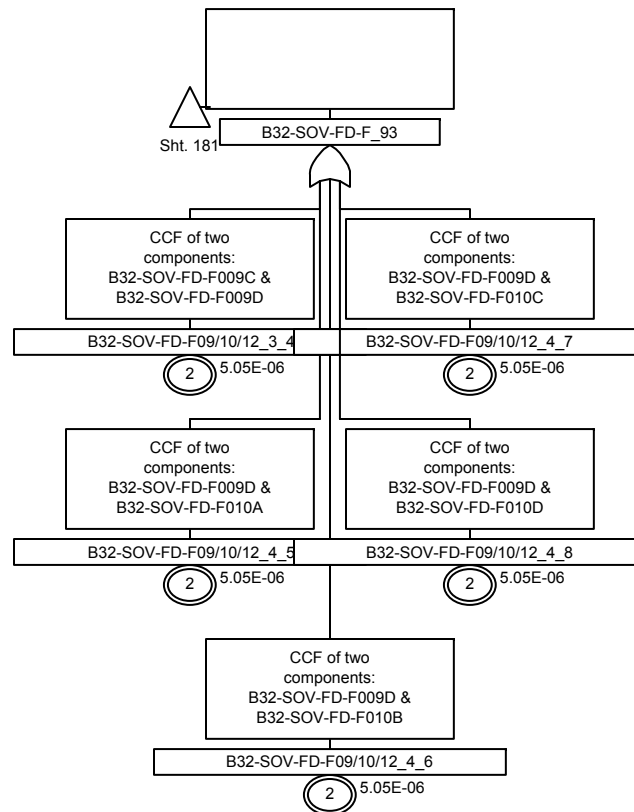


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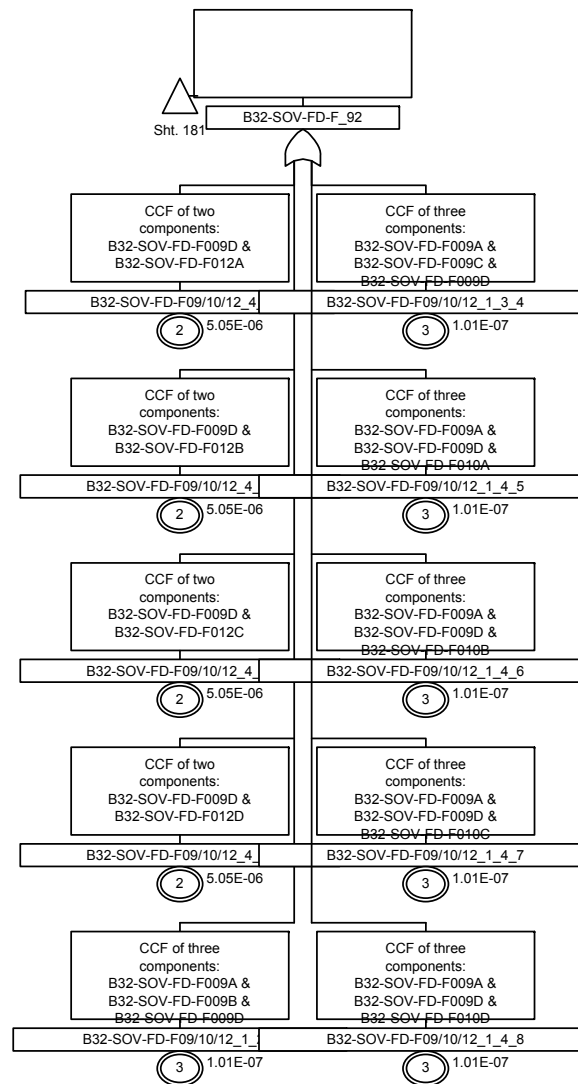


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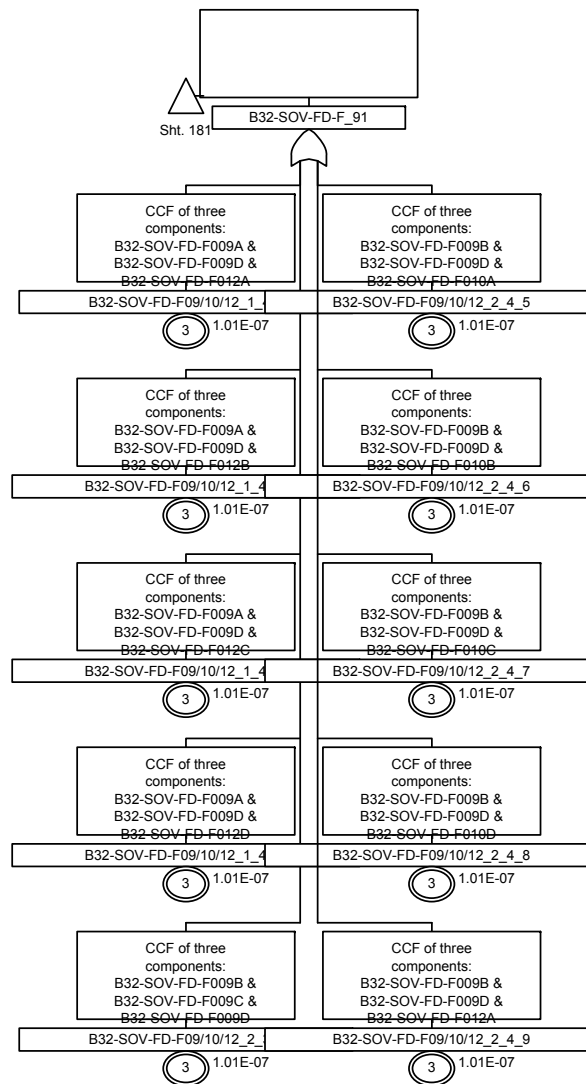


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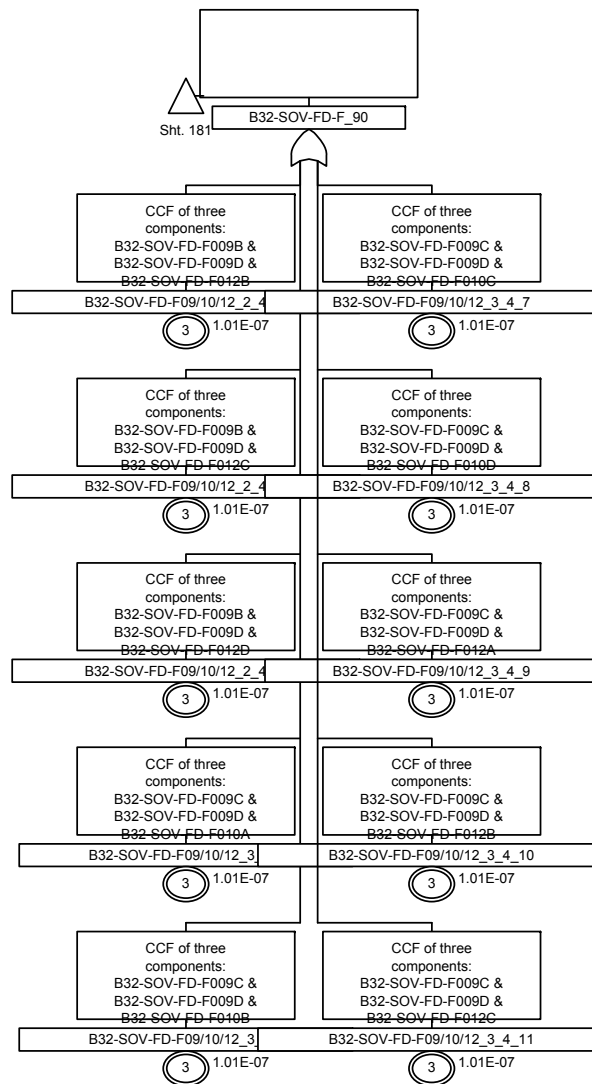


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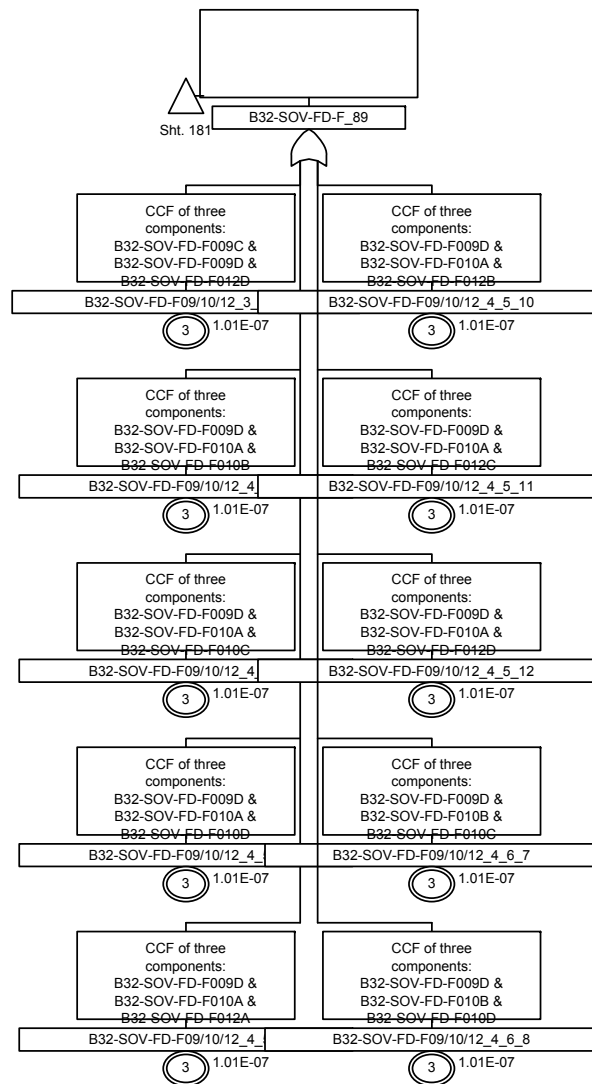


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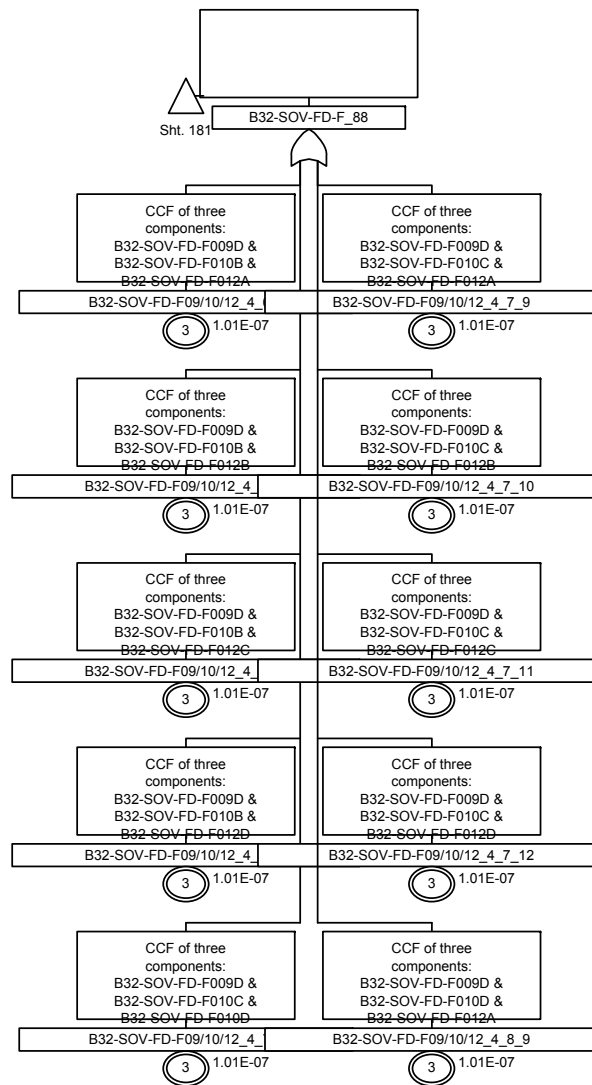


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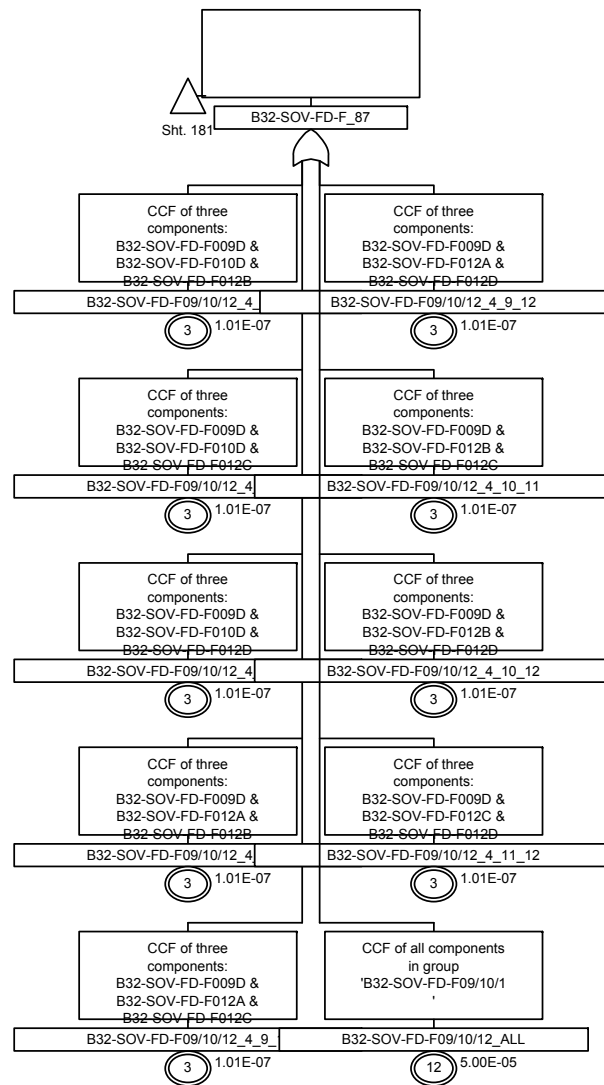


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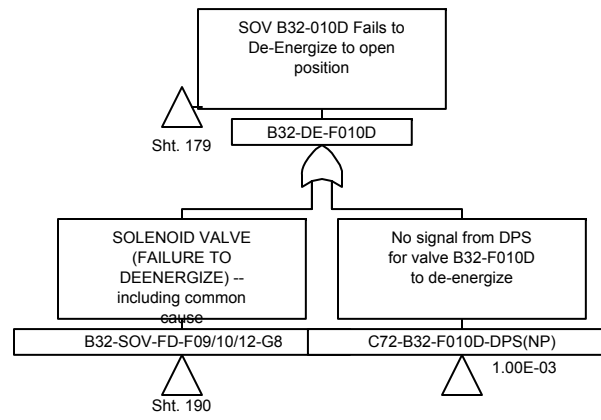


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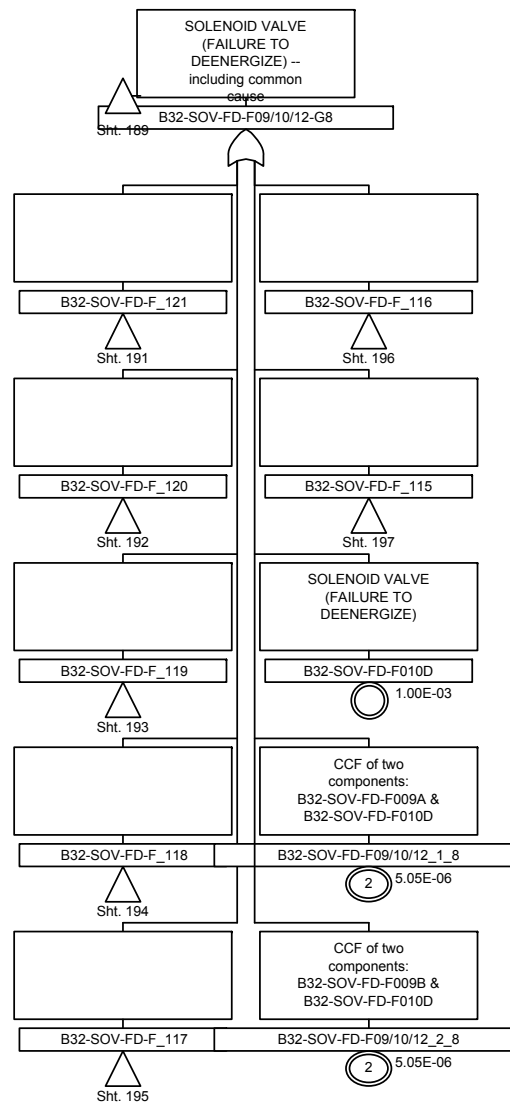


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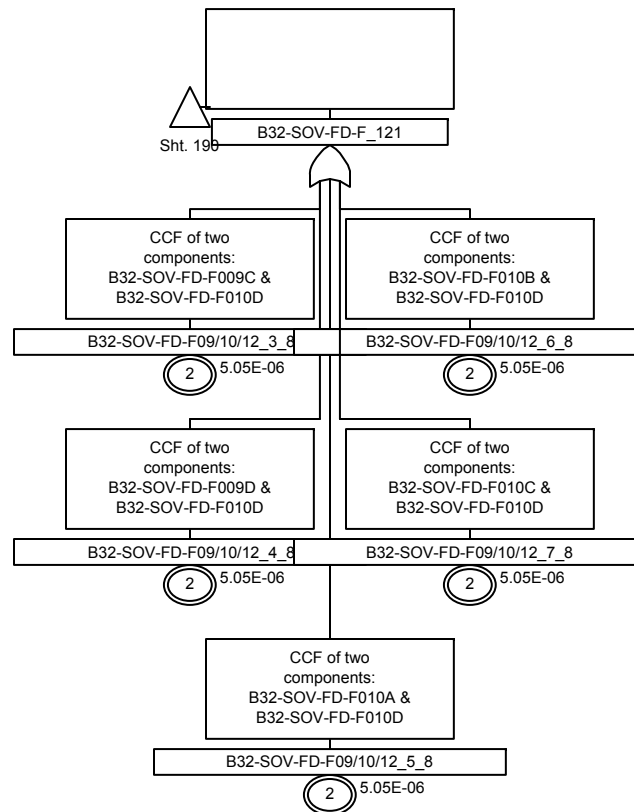


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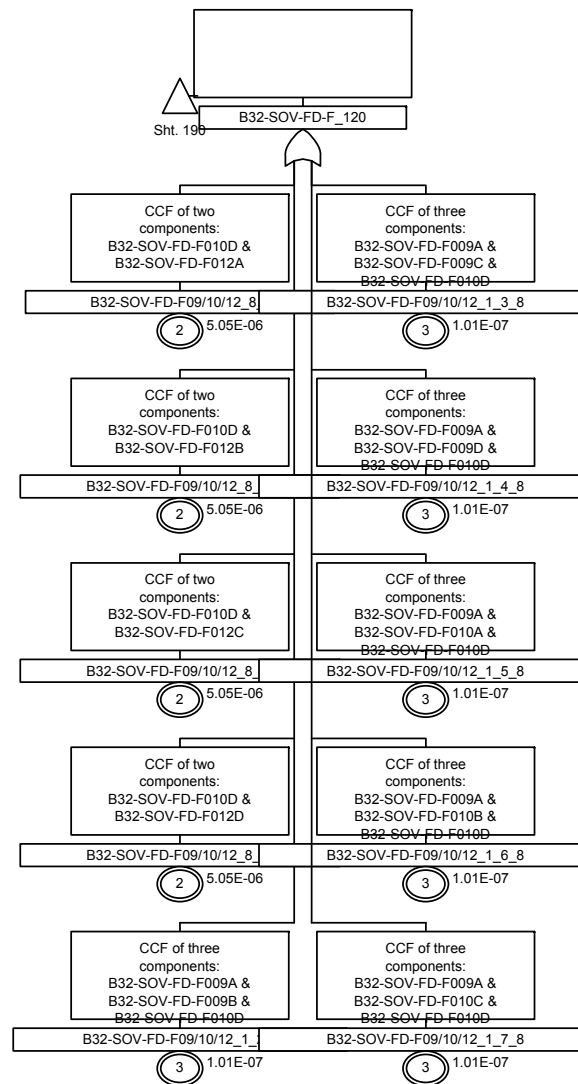


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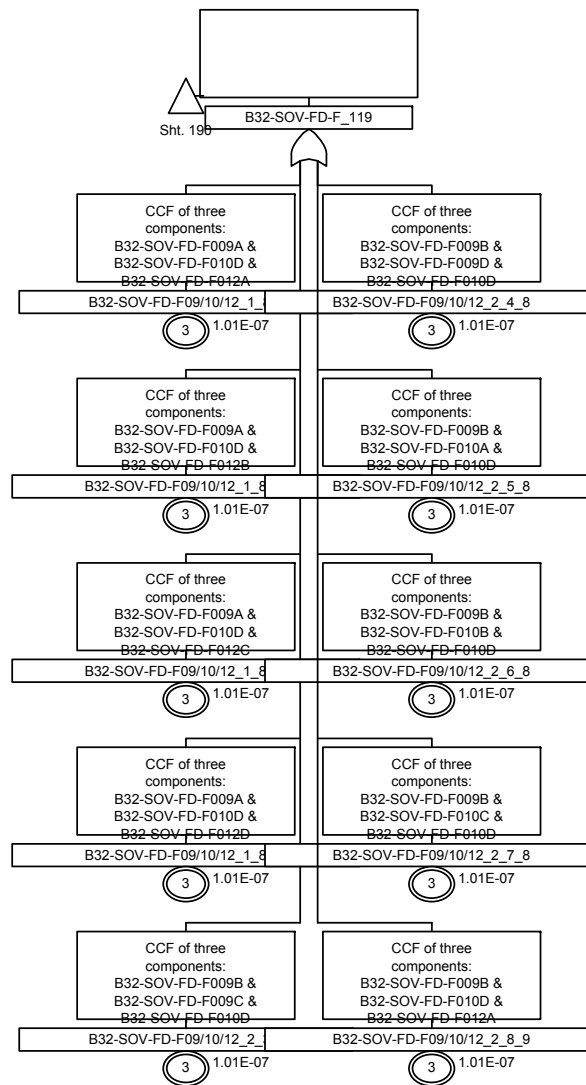


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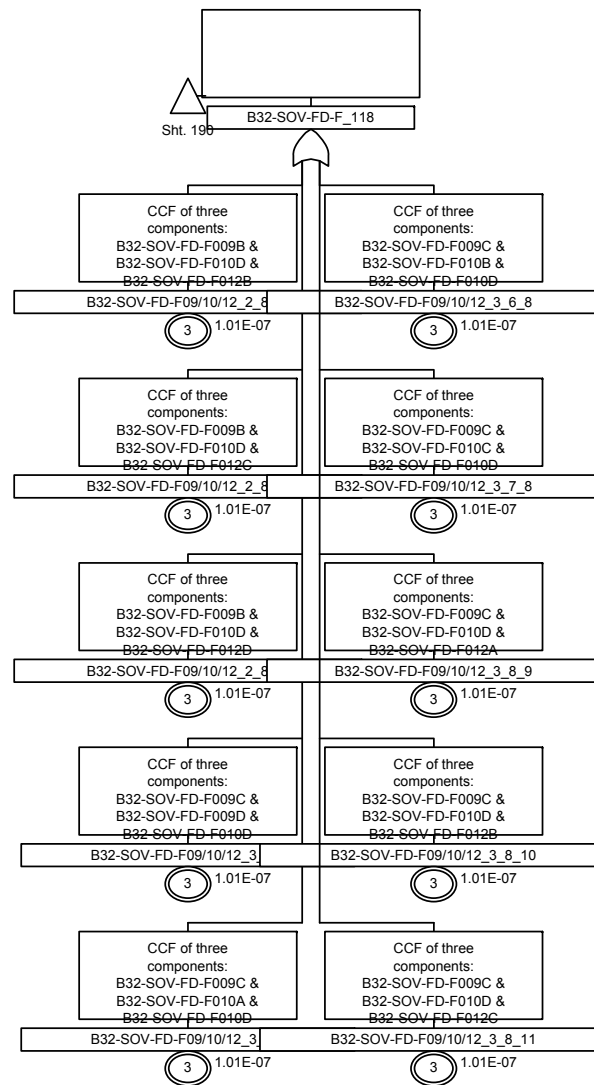


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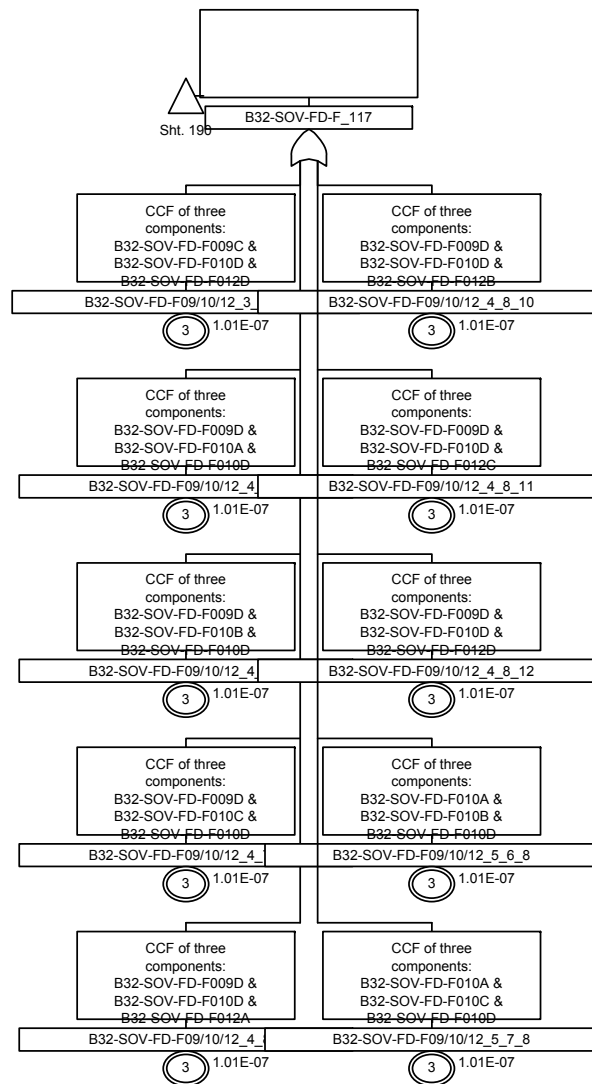


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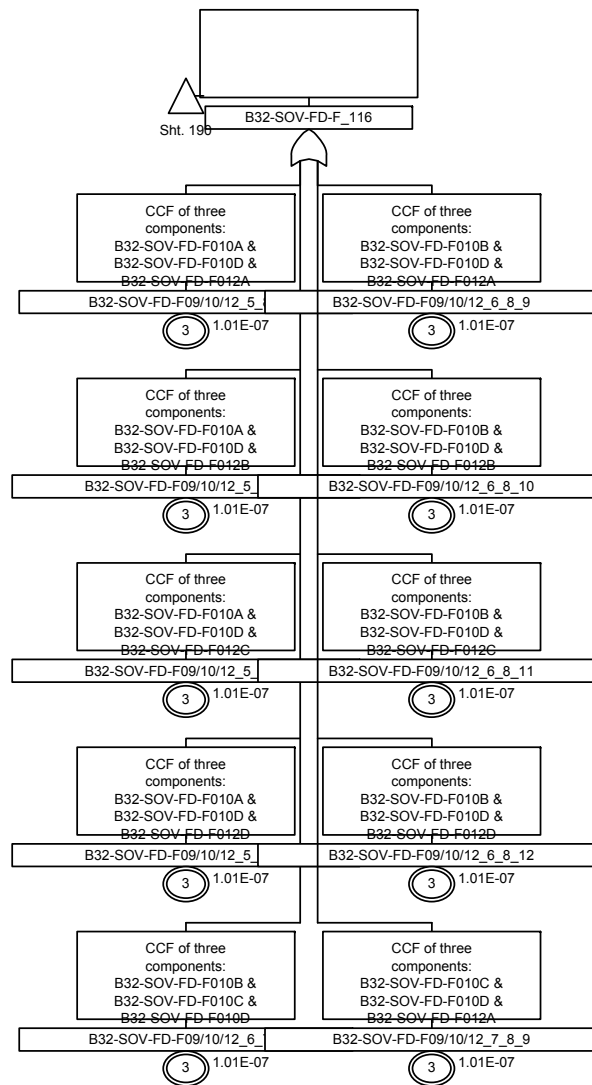


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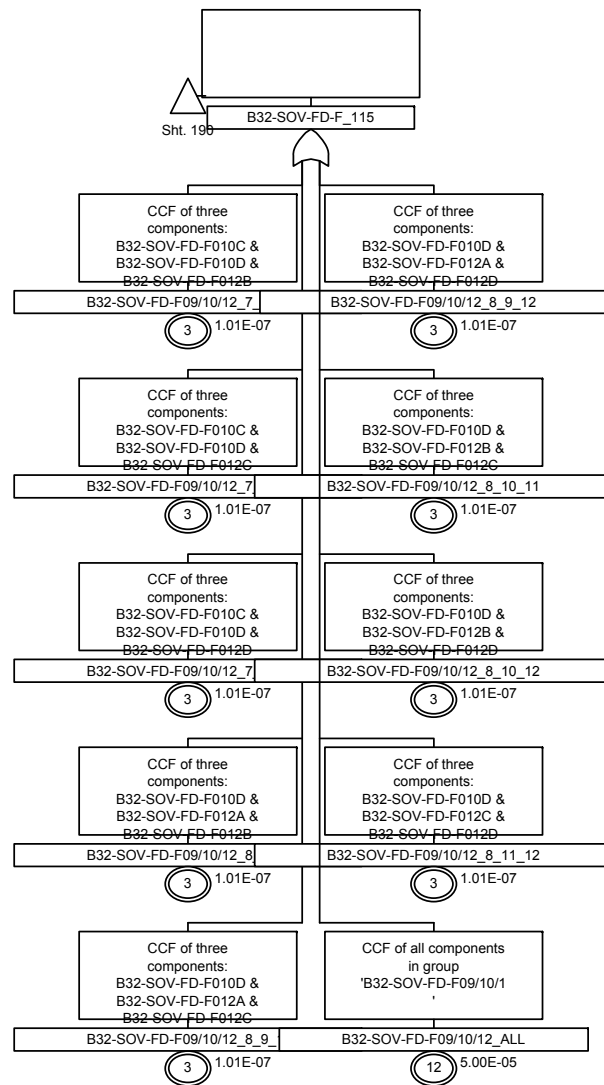


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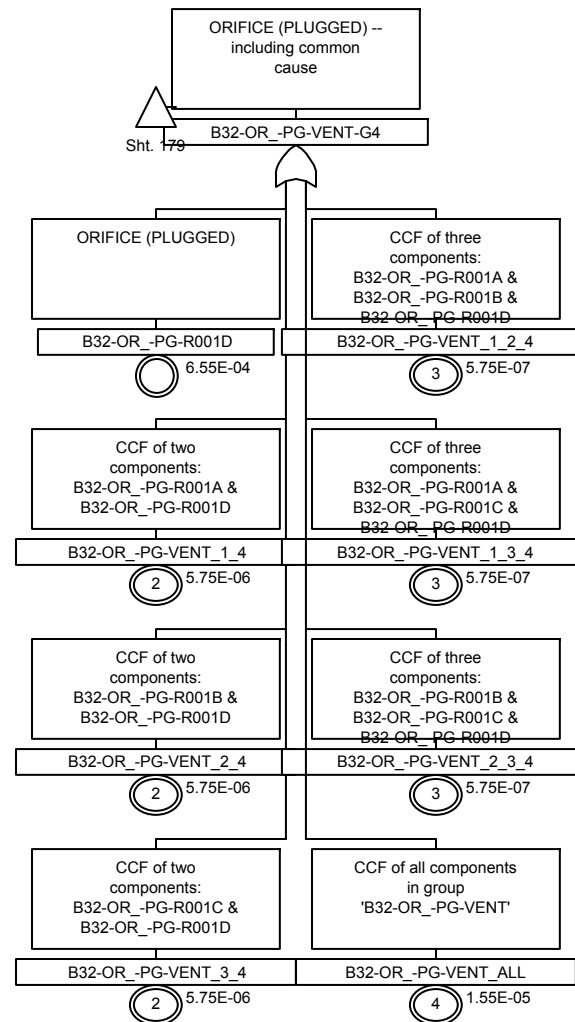


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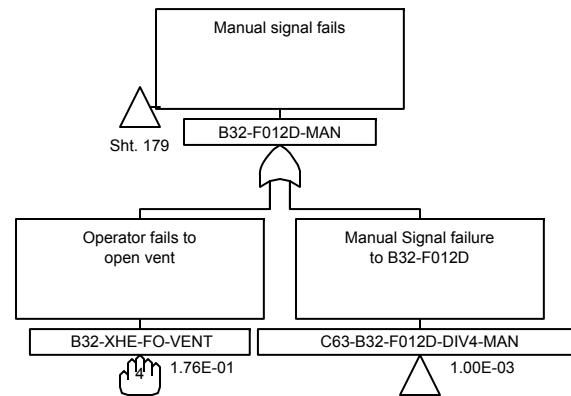


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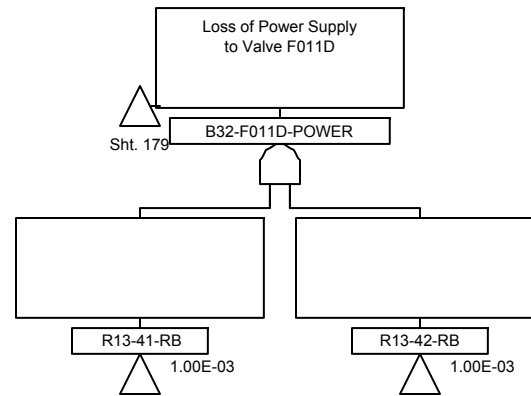


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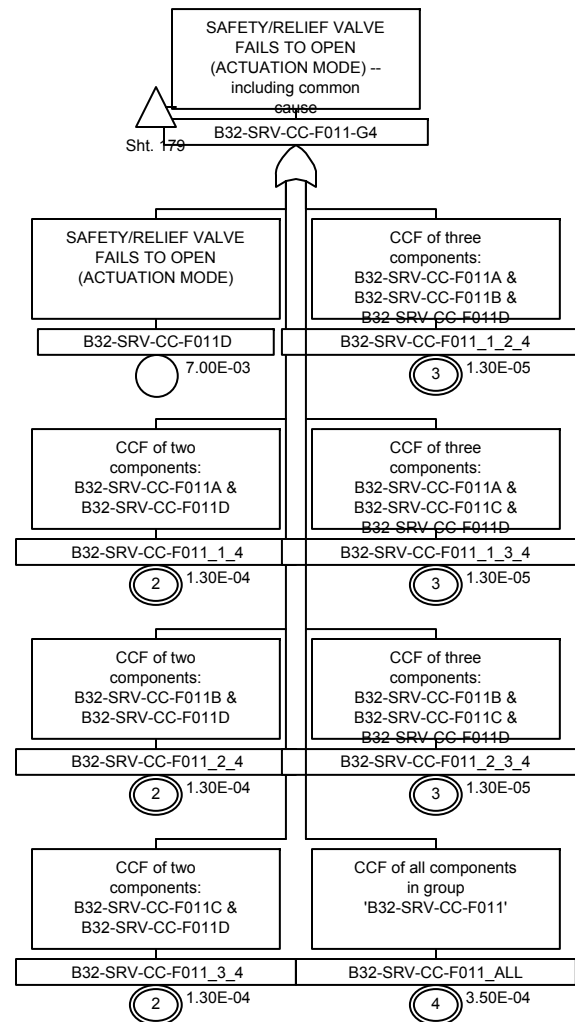


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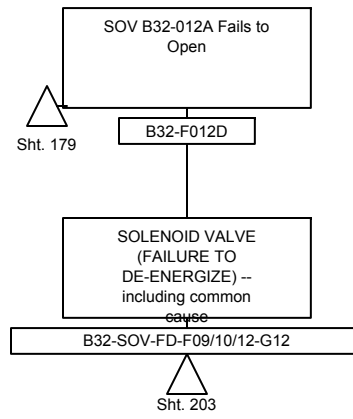


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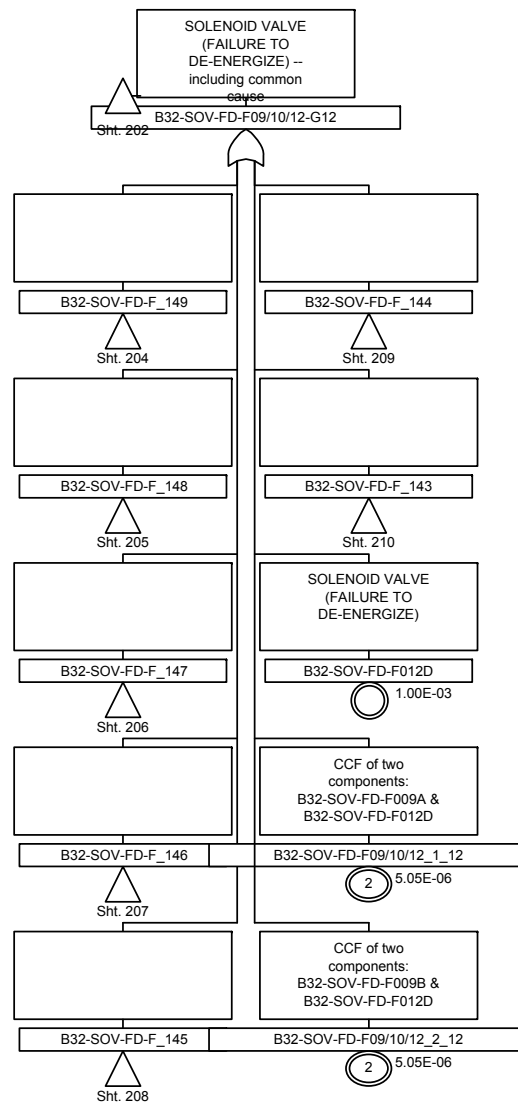


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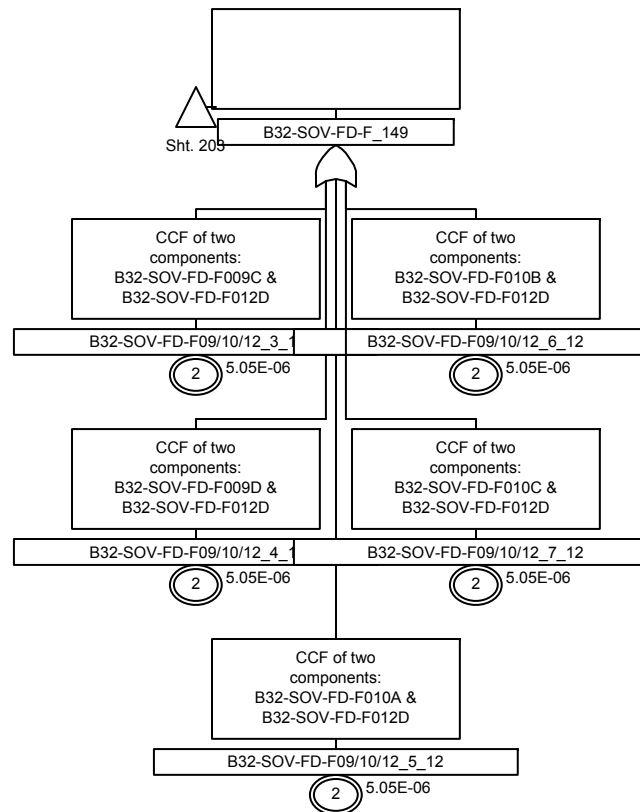


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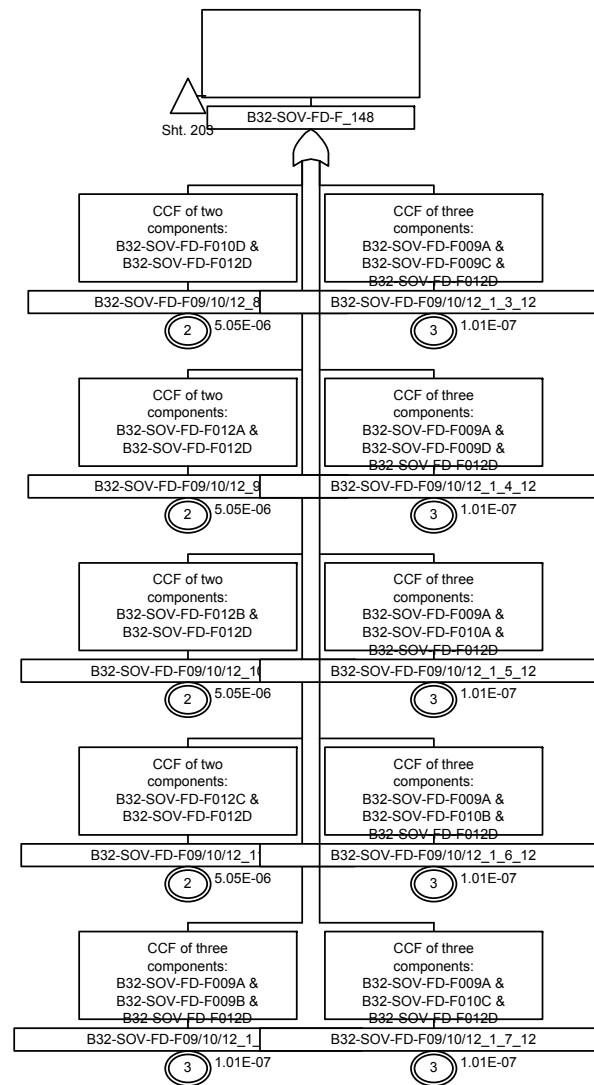


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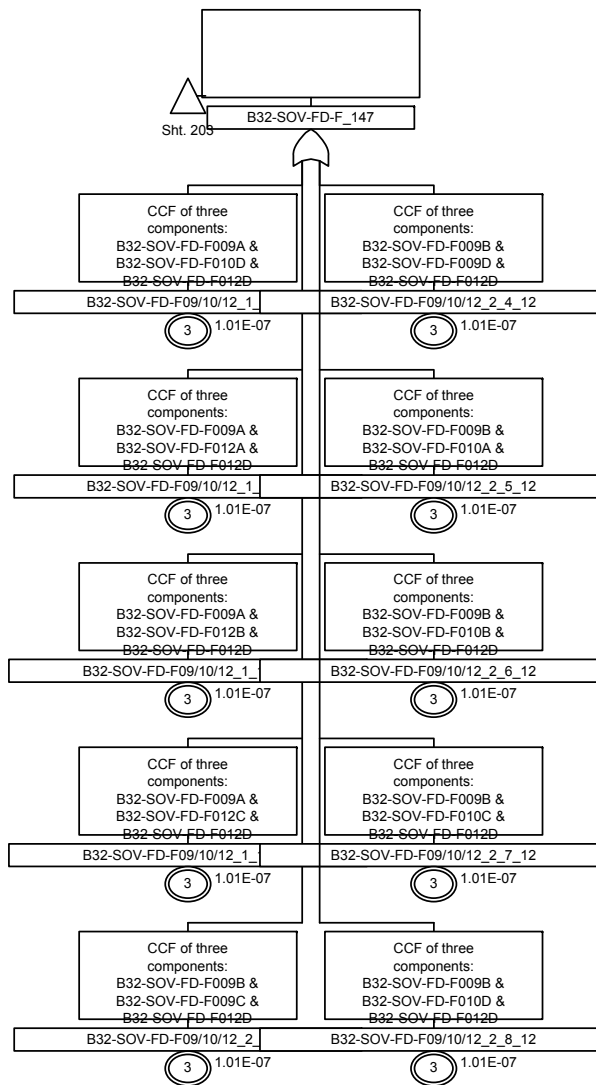


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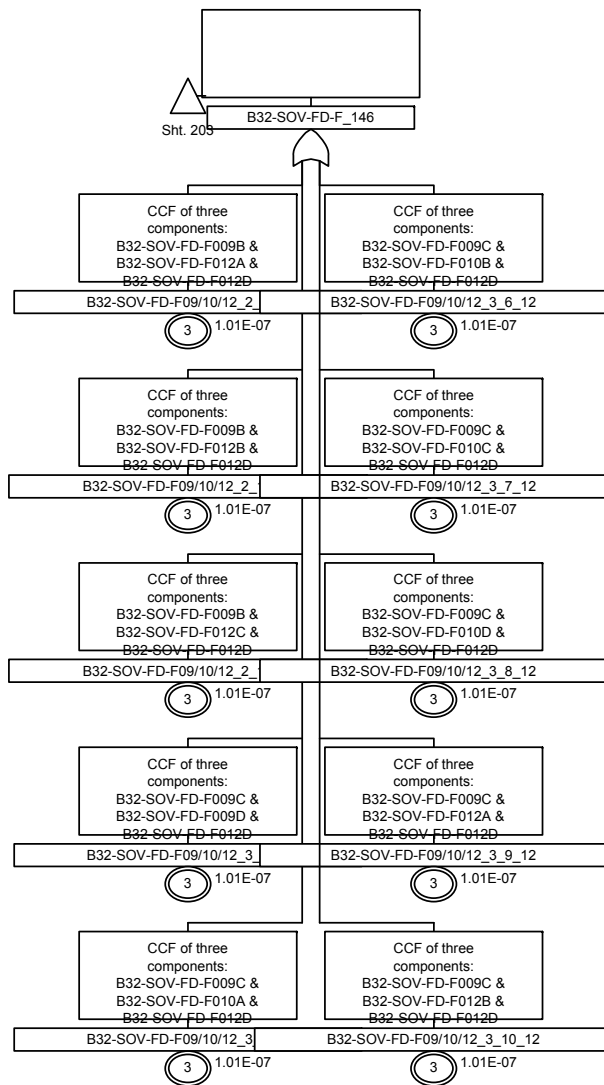


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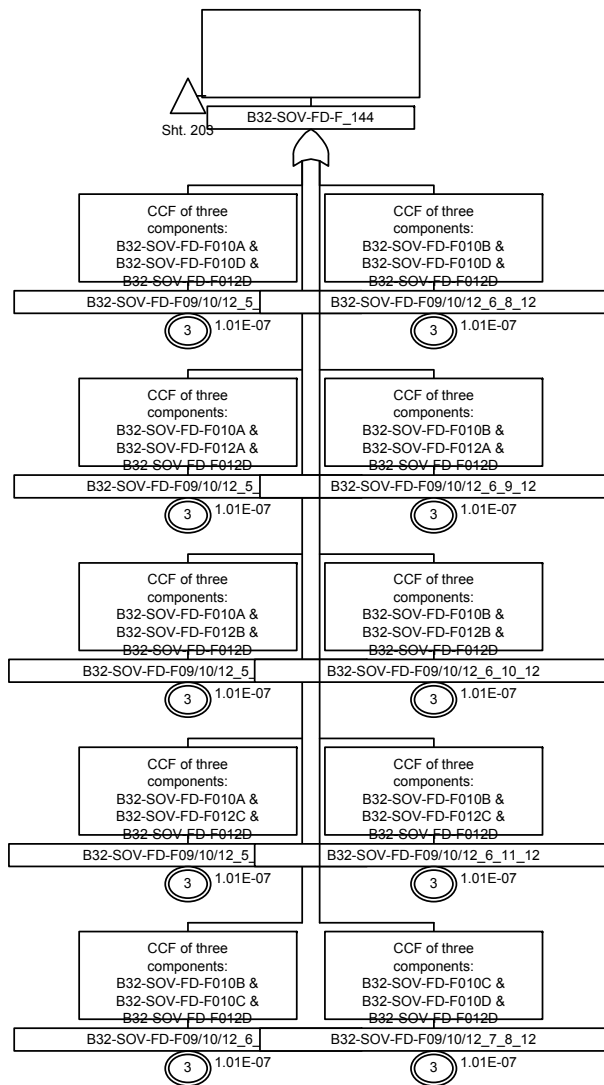


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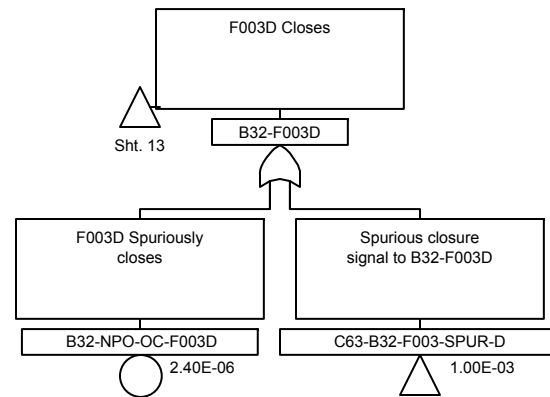


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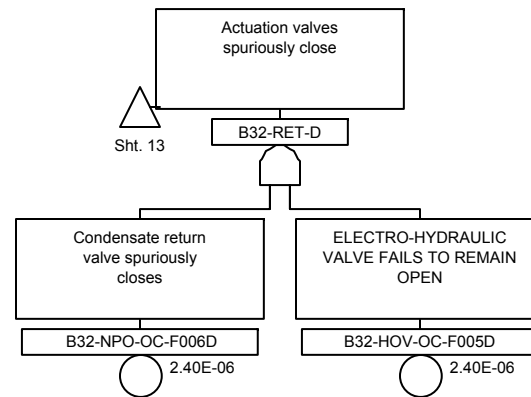


Figure 4.2-3. Sheet 212 Isolation Condenser System

### 4.3 CONTROL ROD DRIVE SYSTEM - (C12)

#### 4.3.1 Functional Description

The Control Rod Drive (CRD) System provides both safety and non-safety related functions. This section only pertains to the non-safety related CRD high pressure (HP) injection function. The safety-related scram function is covered under the C71 system presented in Section 4.5.

In the C12 system HP reactor pressure vessel (RPV) injection mode (mode D), for sequences where normal makeup supply system (feedwater) is unable to maintain water level is modeled. The HP injection mode of operation initiates on receipt of a low reactor water Level 2 signal (Reference 4-9).

CRD HP injection is automatically inhibited using AO isolation valves, in LOCA sequences where GDCS operates. There is a post-LOCA injection feature that will automatically start CRD HP injection, using a bypass around the isolation valves, if GDCS does not operate.

#### 4.3.2 Assumptions

The following assumptions are used for the CRD HP injection model:

- (1) The general assumptions provided in Section 4.0.3 apply.
- (2) The data and methods described in Sections 5 and 6 are used in the construction of the fault trees.
- (3) A single CRD pump will inject 518 gpm (117.6 m<sup>3</sup>/hr) to the RPV during postulated accident conditions. This value is used for success criteria analysis.
- (4) Two CRD pumps will inject 1036 gpm (235.2 m<sup>3</sup>/hr) to the RPV during postulated accident conditions. This value is used for success criteria analysis.
- (5) The CRD pump oil subsystems are cooled by the Reactor Component Cooling Water System (RCCWS). Failure of the RCCWS results in the failure of the CRD HP injection function.
- (6) For modeling purposes, during normal operating conditions it is assumed that CRD Pump A is running and pump B is in standby condition. The HP injection is inhibited by closed valves F020A and F020B.
- (7) CRD pump oil pressure and temperature are indicated in the Main Control Room (MCR). The main oil pump on the inservice CRD pump A is running. The auxiliary oil pump on the CRD pump B is also running while pump B is in standby condition. Cooling water valve mispositions are not modeled, because isolated cooling water would be detected by high oil temperature alarm in the MCR.
- (8) A large steam LOCA on the feedwater injection line B into which CRD injects, or a break outside of the containment on the feedwater line B is assumed to fail the HP injection function.
- (9) Either of the two 200 mm suction piping paths is sufficient to supply two-pump injection.

- (10) No flow is assumed in the stagnant areas between F018A and B, F024 and F022 during normal CRD operation. Therefore, component failures or mispositioning within that boundary are single failures that could go undetected and lead to failure in sequences requiring 1036 gpm (235.2 m<sup>3</sup>/hr).
- (11) Electrical power is supplied from AC busses R11-1000A3 and R12-A2-02A for train A, and R11-1000B3 and R12-B2-02B for train B. These busses are capable of being powered by the non-safety related diesel generators.
- (12) Mission time is assumed to be 24 hours.
- (13) Lack of scram reset does not prevent the required CRD HP injection flow to the RPV. Therefore, this was not modeled as a potential diversion path.
- (14) CRD manual valve positions are not required to be indicated in the MCR.
- (15) Lack of water supply to CRD pumps will trip pumps on low suction pressure.
- (16) CRD HP injection capability is tested quarterly.
- (17) CRD pumps are tripped on RPV water Level 9 signal from the C62 system and injection is isolated on low GDCS pool level signal from the C63 system or high drywell pressure coincident with high water level in the lower drywell.
- (18) On receipt of a RPV water Level 8 signal, motor operated valve F020 closes and F062A and B open. This signal does not actuate F023, F024, F012 and F030. Operator shall manually actuate these valves for normal operation mode.
- (19) The manual valves F064 and F065 cannot be mispositioned closed at the same time without being detected during normal operation.
- (20) The air operated valves F012 and F030 close automatically with loss of power. So that, the failure of their power supplies are not modeled for CRD HP injection mode of operation.
- (21) CRD pump suction relief valves F004A and F004B cannot divert flow from CRD pumps.
- (22) Motor operated valves F023 and F024 are assumed to be connected to the R12-A2-02A power train.
- (23) Valves F062A and F062B are assumed to be powered from R12-A2-02A and R12-B2-02B, respectively. Failure of either valve to close is assumed to result in diverted HP injection and failure of the associated top event. No assumptions are made for normal cycling of valves on CRD flow, as there is no basis for the number of times this might occur.
- (24) Loss of preferred power (LOPP) causes loss of both CRD and auxiliary oil pumps.
- (25) Common cause failures (CCF) are modeled for:
  - Motor operated valves of the same size, in the same operating environment,
  - Air operated valves of the same size, in the same operating environment,
  - Check valves of the same size, in the same operating environment, and
  - Motor operated pumps of the same size, in the same operating environment.

### 4.3.3 System Description

The CRD System is composed of three major elements: (1) the electro-hydraulic fine motion control rod drive (FMCRD) mechanisms, (2) the hydraulic control units (HCU), and (3) the control rod drive hydraulic system (CRDHS). Figure 4.3-1 provides a simplified diagram of the CRD System.

The CRDHS portion of CRD supplies clean, demineralized water that is regulated and distributed to provide charging of the HCU scram accumulators and purge water flow to the FMCRDs during normal operation. The CRDHS is also the source of pressurized water for purging the Reactor Water Cleanup/Shutdown Cooling (RWCU/SDC) System pumps and the Nuclear Boiler System (NBS) reactor water level reference leg instrument lines. Additionally, the CRDHS provides high pressure makeup water to the reactor during events in which the feedwater system is unable to maintain normal reactor water level. This makeup water is supplied to the reactor via a bypass line off the CRD pump discharge header that connects to the feedwater inlet piping via the RWCU/SDC return piping (Reference 4-9).

Upon receipt of a reactor water Level 2 signal, the normal operation mode changes to the HP RPV injection mode.

#### 4.3.3.1 Hardware Configuration

Either the condensate storage tank (CST) or the Condensate and Feedwater System (C&FS) is capable of supplying the suction header of the CRD HP injection system. During normal plant operation, the CRD operates in the purging and HCU-charging mode using water filtered through one of the pump-suction filters, D001A or B. Upon receipt of an RPV water Level 2 signal, valves F014A and B in the redundant suction CRDS header open to provide water directly to the suction of pumps C001A and B. The CRD can draw water directly from the CST through normally locked open manual valve F065 or the C&FS through normally open manual valve F064 and check valve F063. The CRD system is arranged so that water is supplied from the source of higher pressure. During loss of offsite power (when condensate pumps are unavailable), the water source is the CST.

High-pressure water is discharged from both CRD pumps into a discharge header during the injection mode. The discharge header supplies water to the RPV through the normally closed valves F020A and B, via the RWCU/SDC A and feedwater loop B piping and valves.

The two CRD pumps are motor-driven, multi-stage, high-pressure, centrifugal pumps. The pump motors are powered by 6.9 kV AC, and the RCCWS water cools the pumps' oil coolers. Motor-operated valves are powered by 480 V AC power.

#### 4.3.3.2 System Operation

During normal plant operation, the CRD is aligned with one of the two pumps continuously operating to pressurize the system with water from the C&FS and/or CST, supplying purge water flow to the control rod drives, the RWCU/SDC pumps, and the reactor water level instrument lines. The other CRD pump is in standby condition.



#### **4.3.3.3 Component Location**

The CRD equipment, with the exception of piping from the condensate system and to the RWCU/SDC system, is located in the reactor building adjacent to the HCUs.

#### **4.3.4 Automatic and Manual Control**

##### **4.3.4.1 Automatic Actuation**

The HP water injection mode of operation is initiated by a low reactor water Level 2 signal. On receipt of this signal, the following actions occur (Reference 4-9):

- (1) The CRD pump suction filter bypass valves F014A and B are opened,
- (2) The flow control valves F020A and B are opened,
- (3) The standby CRD pump start is started,
- (4) The charging water header isolation valve F030 and purge water header isolation valve F012 are closed,
- (5) Test valve F023 opens, if it is closed at the start of the event, and test valve F024 closes, if it is open at the start of the event, and
- (6) The pump minimum flow bypass line isolation valves F062A and B are closed.

The RPV water Level 2 initiating signal is supplied by the Distributed Control and Instrumentation System (DCIS) logic.

A high RPV water Level 8 signal closes the flow control valves F020A and B to stop the flow to the reactor in order to prevent flooding of the main steam lines. The pump minimum flow bypass line isolation valves F062A and B should open on low flow, and both pumps continue to operate in a low flow condition by directing their flow back to the CST through the pump minimum flow lines. The case where the CRD HP isolation valves were to close would have a similar result. The control valves reopen and the pump minimum flow bypass isolation valve closes to restart high-pressure makeup flow if a subsequent Level 2 signal should occur.

The CRD pumps trip upon receipt of a low suction pressure condition, low pump lube oil pressure or reactor water Level 9 signal. For accident sequences with loss of offsite power:

- The running CRD pump(s) stops,
- Circuit breakers must reclose to allow restart of the pumps,
- Auxiliary oil pumps start, and
- All needed power is supplied by the on-site diesel generators.

CRD HP injection is inhibited using AO isolation valves F071 and F072 in LOCA sequences where GDCS operates. This isolation is actuated by safety-related logic (C63) in order to prevent overpressurizing containment during those sequences. Another independent platform, which is nonsafety-related, provides for an automatic initiation bypass of the isolation function for LOCA sequences in which GDCS does not operate. In the latter case, there are redundant isolation bypass MOVs (F070A and F070B) that provide the isolation bypass flowpath(s).

#### 4.3.4.2 *Manual Actuation*

As a backup to automatic initiation, the operator has the capability to manually initiate the CRD HP injection. In addition, the operator will have capability to manually bypass a CRD HP injection isolation in the unlikely event that conditions would warrant this action.

#### 4.3.4.3 *Safety Actuation*

The high pressure makeup mode of operation is automatically stopped by closure of F071 and F072 on low level indication in two of the three GDCS pools. This action prevents a reduction of the containment air space volume and increased containment pressurization that could be caused by injecting water from outside containment during accident conditions.

**Instrumentation and Alarms.** The instrumentation and alarm signals provided in the main control room for CRD HP injection are listed in Table 4.3-1.

#### 4.3.5 *System Interfaces*

**Support Systems.** The CRD HP injection function depends on several support systems, including control signals, AC power and the RCCW. The reactor water Level 2 actuation and Level 8 and 9 trip signals are provided by the N-DCIS (C62) system. The low GDCS pool level isolation or LOCA isolation is provided by the Q-DCIS (C63) system. The CRD pump motors are driven by 6.9 kV AC power, and the motor operated valves are operated by 480 V AC power. The CRD pump oil coolers are cooled by the RCCW water.

Instrument air is required to support injection by maintaining the in-series injection isolation AOVs (F071 and F072) open. Loss of instrument causes these valves to fail closed. High drywell pressure and high water level in the lower drywell close the injection isolation AOVs using a safety-related signal from C63.

These specific dependency relationships are shown in Table 4.3-2a and the transfer gates for these support systems are listed in Table 4.3-2b.

**Shared Components.** The CRD HP injection function uses the same pumps (C001A and B) and water source as the purging and HCU-charging function. Also, RPV water level and GDCS pool level signals, instrumentation and logic are shared with other systems. The CRD injects HP water into the RWCU/SDC system discharge line, which connects to the feedwater line B by sharing several check valves and isolation valves.

#### 4.3.6 *System Testing*

The high pressure makeup mode of operation is tested every refueling outage to verify the automatic response of the system to a simulated or actual initiation signal. Every quarter each CRD pump, each F020 valve, and F024 are tested to verify that it can develop the required flow rate for HP makeup against a system head corresponding to the required reactor pressure. This test uses the system test return line to the CST (Reference 4-9). The component testing and maintenance requirements are listed in Table 4.3-3.

#### 4.3.7 *System Maintenance*

Components of the CRD HP injection function can be maintained while the plant is in normal operation. Normally open manual isolation valves whose misposition could go undetected by

control room position indication /or alarm are subject to being left in the closed position following maintenance.

#### **4.3.8 Common Cause Failures**

Common cause failures within the CRD system are summarized in Table 4.3-4.

#### **4.3.9 Fault Tree Analysis**

Fault trees have been developed for the CRD high pressure injection function. The success criteria are shown in Table 4.3-6.

##### ***4.3.9.1 Top Event Definitions***

Four top events are modeled for the CRDS fault tree analysis:

- UD-TOPINJ                      TRANSIENT CRD INJECTION FAILS
- UD-TOPINJ2                    ATWS CRD INJECTION FAILS
- UD-TOPINJ\_X                 POST LOCA AUTOMATIC CRD INJECTION FAILS
- UD-TOPINJ\_MAN              POST LOCA MANUAL CRD INJECTION FAILS

##### ***4.3.9.2 Fault Tree Description***

The fault tree for UD-TOPINJ2 represents the probability that both two trains of CRD HP injection will be unavailable if called upon during ATWS event sequences. The fault tree for UD-TOPINJ represents the probability that neither of the trains will be available if called upon during transient sequences.

The fault tree for UD-TOPINJ\_X represents the probability that a CRD HP injection train will be unavailable if called upon to automatically operate in post-LOCA sequences. The fault tree for UD-TOPINJ\_MAN provides the probability that the operator will fail to manually inject with a CRD pump in post-LOCA sequences where GDCS fails to provide core cooling.

##### ***4.3.9.3 Human Interactions***

Human errors have been considered in developing the fault trees:

- (1) Manual valve mispositioning (closed) and pre-initiating event conditions are referred to as Type A Human Errors.
- (2) Human error in recovery following failure to receive an automatic initiation signal on RPV water Level 2. For this situation, the operator should manually initiate the CRD HP injection function. This is a post-initiating event referred to as Type C Human Error.
- (3) Human error in actuating the injection bypass valves in post-LOCA sequences. This is also a Type C human error.

The human errors are listed in Table 4.3-5.

##### ***4.3.9.4 Special Events***

There are no special events in the CRD HP injection system model.

#### **4.3.10 Results of Fault Tree Analysis**

The quantification of the core damage sequences implicitly includes the contribution of basic events for this system. This quantification process enables checking the global consistency of the system fault trees and their relationship with the rest of the systems modeled in the PRA.

A summary of the basic events included in the system fault trees are reported in Table 4.3-7, and the dominant cutsets from quantification of the CRDS top events are provided in Table 4.3-8.

Due to a combination of design changes and a number of modeling refinements, a revised fault tree was developed for Revision 4.

#### **4.3.11 PRA Insights**

Failure of instrument air, single failure of MOVs, and human error events dominate the cutsets. Relatively high screening values for valve mispositions (closed) tend to increase system unavailability. These misposition errors may be removed with proper procedures, valve lineups and other operational programs as the ESBWR design progresses.

**Table 4.3-1**  
**CRDS - Control Room Instrumentation and Alarms**

<b>Displays</b>
CRD pump operational status (run/stop)
CRD oil pump operational status (run/stop)
Flow control valve position
Pump suction pressure
Pump discharge pressure
System flow rate
Charging water header pressure
Reactor/purge water header differential pressure
<b>Alarms</b>
Low pump lube oil pressure
Low pump suction pressure
High pump suction filter differential pressure
High drive water filter differential pressure
Low charging header pressure

**Table 4.3-2a**  
**CRDS – System Dependencies**

Component	Type	Power Supply				RCCWS		Control Signal	
		R12 480 V AC		R11 6.9 KV AC		DIV A	DIV B	N-DCIS	Q-DCIS
		DIV A	DIV B	DIV A	DIV B				
F014A	MO	X						X	
F014B	MO		X					X	
F020A	MO	X						X	
F020B	MO		X					X	
F023	MO	X						X	
F024	MO	X						X	
F062A	MO	X						X	
F062B	MO		X					X	
F070A	MO	X						X	
F070B	MO		X					X	
F012	AO							X	
F030	AO							X	
F071	AO								X
F072	AO								X
C001A	Pump			X				X	
C001B	Pump				X			X	
C001A	Oil Pump	X				X		X	
C001B	Oil Pump		X				X	X	

**Table 4.3-2b**  
**CRDS - Transfers**

<b>Transfer</b>	<b>Description</b>
B21-FDW-B-CC	CHECK VALVES ON FDW LINE B FAIL TO OPEN
B21-FDW-B-OC	CHECK VALVES ON FDW LINE B FAIL TO REMAIN OPEN
C62-C12-C001A	START SIGNAL AT REACTOR WATER LEVEL 2 FAILS - A
C62-C12-C001A-MAN	MANUAL FAILURE TO PROVIDE START SIGNAL A
C62-C12-C001A-SPUR	SPURIOUS STOP SIGNAL BEFORE REACHING REACTOR WATER LEVEL 9
C62-C12-C001B	START SIGNAL AT REACTOR WATER LEVEL 2 FAILS - B
C62-C12-C001B-MAN	MANUAL FAILURE TO PROVIDE START SIGNAL B
C62-C12-C001B-SPUR	SPURIOUS STOP SIGNAL BEFORE REACHING REACTOR WATER LEVEL 9
C62-C12-CCFSOFTWARE_S	SPURIOUS COMMON CAUSE SOFTWARE EVENT
C62-C12-F020A-SPUR	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 A
C62-C12-F020B-SPUR	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 B
C63-C12-C001B-SPUR	SPURIOUS ISOLATION SIGNAL ON LOW GDACS LEVEL
C63-C12-CCFSOFTWARE_S	SPURIOUS COMMON CAUSE SOFTWARE EVENT
C63-C12-GDACS-LEVEL-SPUR	SPURIOUS 2/3 GDACS POOLS LOW LEVEL SIGNAL
C63-C12-HDWL-SPUR	SPURIOUS HIGH DRYWELL LEVEL
C63-C12-HDWP-SPUR	SPURIOUS HIGH-HIGH DRYWELL PRESSURE
C63-C12-LL-SIG-AUTO	AUTOMATIC INJECTION SIGNAL FAILS
C63-C12-LL-SIG-MAN	MANUAL SIGNALS FAIL
E50-POL-RP-POOLA	GDACS POOLS A LEAKS CATASTROPHICALLY
E50-POL-RP-POOLB/C	GDACS POOL B/C LEAKS CATASTROPHICALLY
E50-POL-RP-POOLD	GDACS POOL D LEAKS CATASTROPHICALLY
INI-LOPP	INITIATING EVENT - LOSP
N21-0002-_4	CONDENSATE PUMPS FAIL TO RUN
P21-0001-_1A	RCCWS TO C001A FAILS
P21-0001-_1B	RCCWS TO C001B FAILS
R11-1000A3	LOSS OF 6.9 KV AC FROM BUS R11-A3
R11-1000B3	LOSS OF 6.9 KV AC FROM BUS R11-B3
R12-A2-02A	LOSS OF 480 V AC FROM BUS R12-A2-02A
R12-B2-02B	LOSS OF 480 V AC FROM BUS R12-B2-02B

**Table 4.3-3**  
**CRDS – Component Test and Maintenance**

This table will be updated when the design reliability assurance program is complete.

<b>Component</b>	<b>Type</b>	<b>Expected Test Interval</b>
C001A/B	MP	Quarterly
Train A/B	Train	Every Refueling Outage
F020A/B, F024	Valve	Quarterly



**Table 4.3-4**  
**CRDS - Common Cause Failures**

Basic Event	Prob	Description
C12-ACV-CO-F012-F030_1_2	3.79E-08	CCF of two components: C12-ACV-CO-F012 & C12-ACV-CO-F030
C12-ACV-OO-F012-F030_1_2	1.93E-04	CCF of two components: C12-ACV-OO-F012 & C12-ACV-OO-F030
C12-MOV-CC-F014_1_2	2.11E-04	CCF of two components: C12-MOV-CC-F014A & C12-MOV-CC-F014B
C12-MOV-CC-F020_1_2	2.11E-04	CCF of two components: C12-MOV-CC-F020A & C12-MOV-CC-F020B
C12-MOV-CC-F070_1_2	2.11E-04	CCF of two components: C12-MOV-CC-F070A & C12-MOV-CC-F070B
C12-MOV-OC-F014_1_2	2.80E-07	CCF of two components: C12-MOV-OC-F014A & C12-MOV-OC-F014B
C12-MOV-OC-F020_1_2	2.80E-07	CCF of two components: C12-MOV-OC-F020A & C12-MOV-OC-F020B
C12-MP_-FR-C001OIL_1_2	1.41E-05	CCF of two components: C12-MP_-FR-C001AOIL & C12-MP_-FR-C001BOIL
C12-MP_-FR-C001_1_2	3.97E-05	CCF of two components: C12-MP_-FR-C001A & C12-MP_-FR-C001B
C12-UV_-CC-F019_1_2	2.99E-06	CCF of two components: C12-UV_-CC-F019A & C12-UV_-CC-F019B
C12-UV_-OC-F019_1_2	2.53E-07	CCF of two components: C12-UV_-OC-F019A & C12-UV_-OC-F019B
G31-UV_-OO_1_2	5.26E-05	CCF of two components: G31-UV_-OO-F023A & G31-UV_-OO-F024A

**Table 4.3-5**  
**CRDS - Human Error Events**

	<b>Prob</b>	<b>Description</b>
C12-BV_-RE-F003B	1.21E-02	MISPOSITION OF PUMP SUCTION VALVE F003B
C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
C12-BV_-RE-F018A	1.21E-02	MISPOSITION OF VALVE F018A
C12-BV_-RE-F018B	1.21E-02	MISPOSITION OF VALVE FO18B
C12-BV_-RE-F021A	1.21E-02	MISPOSITION OF VALVE F021A
C12-BV_-RE-F021B	1.21E-02	MISPOSITION OF VALVE F021B
C12-BV_-RE-F064	4.84E-02	MISPOSITION OF OPEN VALVE F064
C12-BV_-RE-F065	4.84E-02	MISPOSITION OF LOCKED OPEN VALVE F065
C12-XHE-FO-LEVEL2	3.22E-02	OPERATOR FAILS TO BACK-UP CRD ACTUATION
C12-XHE-FO-LL-INJ	3.21E-02	OPERATOR FAILS TO ACTUATE INJECTION BYPASS

**Table 4.3-6**  
**CRDS - Top Events**


<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
UD-TOPINJ	At least one CRD pump provides HP injection during transient event sequences.	54
UD-TOPINJ_MAN	At least one CRD pump provides manual injection (isolation bypass) in LOCA event sequences.	1
UD-TOPINJ_X	At least one CRD pump provides automatic HP injection (isolation bypass) in LOCA event sequences.	16
UD-TOPINJ2	Two CRD pumps provide HP injection during ATWS event sequences.	18

**Table 4.3-7**  
**CRDS Basic Events**

Basic Event	Prob	Description
%BOC-FDWB	1.70E-03	FEEDWATER LINE BREAK OUTSIDE CONTAINMENT
%LL-S-FDWB	5.55E-06	LARGE STEAM LOCA IN FW LINE B
%ML-L	7.55E-05	MEDIUM LIQUID LOCA
%RVR	1.00E-10	REACTOR VESSEL RUPTURE
%SL-L	1.43E-04	SMALL LIQUID LOCA
C12-ACV-CO-F012	7.20E-07	AIR OPERATED VALVE F012 FAILS TO REMAIN CLOSED
C12-ACV-CO-F030	7.20E-07	AIR OPERATED VALVE F030 FAILS TO REMAIN CLOSED
C12-ACV-OO-F012	2.00E-03	AIR OPERATED VALVE F012 FAILS TO CLOSE
C12-ACV-OO-F030	2.00E-03	AIR OPERATED VALVE F030 FAILS TO CLOSE
C12-ACV_OC-F071	2.40E-05	F071 FAILS TO REMAIN OPEN
C12-ACV_OC-F072	2.40E-05	F072 FAILS TO REMAIN OPEN
C12-BV_-OC-F003A	7.20E-07	MANUAL VALVE F003A PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F003B	7.20E-07	MANUAL VALVE F003B PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F013A	7.20E-07	MANUAL VALVE F013A PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F013B	7.20E-07	MANUAL VALVE F013B PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F015A	7.20E-07	MANUAL VALVE F015A PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F015B	7.20E-07	MANUAL VALVE F015B PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F018A	7.20E-07	MANUAL VALVE F018A PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F018B	7.20E-07	MANUAL VALVE F018B PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F021A	7.20E-07	MANUAL VALVE F021A PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F021B	7.20E-07	MANUAL VALVE F021B PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F064	7.20E-07	MANUAL VALVE F064 PLUGS/TRANSFERS CLOSED
C12-BV_-OC-F065	7.20E-07	MANUAL VALVE F065 PLUGS/TRANSFERS CLOSED
C12-HX_-LK-C001AHX	2.40E-05	CRD HX LEAKS OR RUPTURES
C12-HX_-LK-C001BHX	2.40E-05	HEAT EXCHANGER (LEAK OR RUPTURE)
C12-HX_-PG-C001AHX	2.40E-05	CRD HEAT EXCHANGER (PLUGGED)
C12-HX_-PG-C001BHX	2.40E-05	CRD HEAT EXCHANGER PLUGS
C12-MOV-CC-F014A	4.00E-03	MOTOR OPER. VALVE F014A FAILS TO OPEN
C12-MOV-CC-F014B	4.00E-03	MOTOR OPER. VALVE F014B FAILS TO OPEN
C12-MOV-CC-F020A	4.00E-03	MOTOR OPER. VALVE F020A FAILS TO OPEN
C12-MOV-CC-F020B	4.00E-03	MOTOR OPER. VALVE F020B FAILS TO OPEN
C12-MOV-CC-F023	4.00E-03	MOTOR OPERATED VALVE F023 FAILS TO OPEN
C12-MOV-CC-F070A	4.00E-03	F070A FAILS TO OPEN
C12-MOV-CC-F070B	4.00E-03	F070B FAILS TO OPEN
C12-MOV-CO-F024	1.20E-05	MOTOR OPERATED VALVE F024 FAILS TO REMAIN CLOSED
C12-MOV-CO-F062A	1.20E-05	MOTOR OPERATED VALVE F062A FAILS TO REMAIN CLOSE
C12-MOV-CO-F062B	1.20E-05	MOTOR OPERATED VALVE F062B FAILS TO REMAIN CLOSED
C12-MOV-OC-F014A	3.36E-06	MOTOR OPER. VALVE F014A FAILS TO REMAIN OPEN

**Table 4.3-7**  
**CRDS Basic Events**

Basic Event	Prob	Description
C12-MOV-OC-F014B	3.36E-06	MOTOR OPER. VALVE F014B FAILS TO REMAIN OPEN
C12-MOV-OC-F020A	3.36E-06	MOTOR OPER. VALVE F020A FAILS TO REMAIN OPEN
C12-MOV-OC-F020B	3.36E-06	MOTOR OPER. VALVE F020B FAILS TO REMAIN OPEN
C12-MOV-OC-F023	3.36E-06	MOTOR OPERATED VALVE F023 FAILS TO REMAIN OPEN
C12-MOV-OO-F024	4.00E-03	MOTOR OPERATED VALVE F024 FAILS TO CLOSE
C12-MOV-OO-F062A	4.00E-03	MOTOR OPERATED VALVE F062A FAILS TO CLOSE
C12-MOV-OO-F062B	4.00E-03	MOTOR OPERATED VALVE F062B FAILS TO CLOSE
C12-MP_-FR-C001A	6.00E-04	MOTOR-DRIVEN PUMP C001A FAILS TO RUN
C12-MP_-FR-C001AOIL	6.00E-04	MOTOR-DRIVEN AUX. OIL PUMP FOR C001A FAILS TO RUN
C12-MP_-FR-C001B	6.00E-04	MOTOR-DRIVEN PUMP C001B FAILS TO RUN
C12-MP_-FR-C001BOIL	6.00E-04	MOTOR-DRIVEN AUX. OIL PUMP FOR C001B FAILS TO RUN
C12-MP_-FS-C001A	2.00E-03	MOTOR-DRIVEN PUMP C001A FAILS TO START
C12-MP_-FS-C001AOIL	2.00E-03	MOTOR-DRIVEN AUX. OIL PUMP FOR C001A FAILS TO RESTART
C12-MP_-FS-C001B	2.00E-03	MOTOR-DRIVEN PUMP C001B FAILS TO START
C12-MP_-FS-C001BOIL	2.00E-03	MOTOR-DRIVEN AUX. OIL PUMP FOR C001B FAILS TO START
C12-OR_-PG-D007A	1.44E-05	ORIFICE D007A FAILS TO REMAIN OPEN (PLUG)
C12-OR_-PG-D007B	1.44E-05	ORIFICE D007B FAILS TO REMAIN OPEN (PLUG)
C12-OR_-RP-D007A	7.20E-07	ORIFICE D007A RUPTURE
C12-OR_-RP-D007B	7.20E-07	ORIFICE D007B RUPTURE
C12-PT_-HL-N004A	6.48E-06	PRESSURE TRANSMITTER FAILS TO ZERO OR MAXIMUM
C12-PT_-HL-N004B	6.48E-06	PRESSURE TRANSMITTER FAILS TO ZERO OR MAXIMUM
C12-SYS-TM-TRAINB	3.00E-03	TRAIN B IN MAINTENANCE
C12-UV_-CC-F019A	1.00E-04	CHECK VALVE F019A FAILS TO OPEN
C12-UV_-CC-F019B	1.00E-04	CHECK VALVE F019B FAILS TO OPEN
C12-UV_-CC-F022	1.00E-04	CHECK VALVE F022 FAILS TO OPEN
C12-UV_-OC-F019A	4.80E-06	CHECK VALVE F019A FAILS TO REMAIN OPEN
C12-UV_-OC-F019B	4.80E-06	CHECK VALVE F019B FAILS TO REMAIN OPEN
C12-UV_-OC-F022	4.80E-06	CHECK VALVE F022 FAILS TO REMAIN OPEN
C12-UV_-OC-F063	4.80E-06	CHECK VALVE F063 FAILS TO REMAIN OPEN
G31-UV_-OO-F023A	1.00E-03	CHECK VALVE F023A FAILS TO PREVENT BACKFLOW INTO RWCU/SDC
G31-UV_-OO-F024A	1.00E-03	CHECK VALVE F024A FAILS TO PREVENT BACKFLOW INTO RWCU/SDC
P30-TNK-RP-A001	2.40E-06	CONDENSATE STORAGE TANK LEAKS CATASTROPHICALLY
P52-0001_1	1.02E-02	LOSS OF INSTRUMENT AIR SUPPLY

**Table 4.3-8**  
**CRDS – Cutsets**

<b>TopGate</b>	<b>Probability</b>	<b>Without CCF</b>	<b>Discussion</b>
UD-TOPINJ	5.24E-02	5.17E-02	Failure of this TOP is dominated by loss of instrument air and MOV failures.
UD-TOPINJ_MAN	4.16E-02	4.09E-02	Failure of this TOP is dominated by MOV failures and manual valve misposition.
UD-TOPINJ_X	4.16E-02	4.09E-02	Failure of this TOP is dominated by MOV failures and manual valve misposition.
UD-TOPINJ2	1.29E-01	1.28E-01	Failure of this TOP is dominated by MOV failures and manual valve misposition.

For each system top event, the dominant cutsets are shown below.

UD-TOPINJ TRANSIENT CRD INJECTION FAILS

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.02E-02	19.5	P52-0001_1	1.02E-02	LOSS OF INSTRUMENT AIR SUPPLY
4.E-03	7.6	C12-MOV-CC-F023	4.E-03	MOTOR OPERATED VALVE F023 FAILS TO OPEN
4.E-03	7.6	C12-MOV-OO-F024	4.E-03	MOTOR OPERATED VALVE F024 FAILS TO CLOSE
4.E-03	7.6	C12-MOV-OO-F062A	4.E-03	MOTOR OPERATED VALVE F062A FAILS TO CLOSE
4.E-03	7.6	C12-MOV-OO-F062B	4.E-03	MOTOR OPERATED VALVE F062B FAILS TO CLOSE
2.34E-03	4.5	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
2.34E-03	4.5	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.34E-03	4.5	C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
		C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
2.34E-03	4.5	C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.E-03	3.8	C12-ACV-OO-F012	2.E-03	AIR OPERATED VALVE F012 FAILS TO CLOSE
2.E-03	3.8	C12-ACV-OO-F030	2.E-03	AIR OPERATED VALVE F030 FAILS TO CLOSE
1.7E-03	3.2	%BOC-FDWB	1.7E-03	FEEDWATER LINE BREAK OUTSIDE CONTAINMENT
1.E-03	1.9	B21-FDW-B-CC	1.E-03	CHECK VALVES ON FDW LINE B FAIL TO OPEN
1.E-03	1.9	B21-FDW-B-OC	1.E-03	CHECK VALVES ON FDW LINE B FAIL TO REMAIN OPEN
1.E-03	1.9	C62-C12-F020A-SPUR	1.E-03	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE

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Probability	% of Top	Event	Probability	Description
				REACHING REACTOR WATER LEVEL 8 A
1.E-03	1.9	C62-C12-F020B-SPUR	1.E-03	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 B
1.E-03	1.9	C62-CCFSOFTWARE_S	1.E-03	COMMON CAUSE SOFTWARE FAILURE
1.E-03	1.9	C63-C12-GDCS-LEVEL-SPUR	1.E-03	SPURIOUS 2/3 GDCS POOLS LOW LEVEL SIGNAL

UD-TOPINJ MAN POST LOCA MANUAL CRD INJECTION FAILS

Probability	% of Top	Event	Probability	Description
4.E-03	9.6	C12-MOV-CC-F023	4.E-03	MOTOR OPERATED VALVE F023 FAILS TO OPEN
4.E-03	9.6	C12-MOV-OO-F024	4.E-03	MOTOR OPERATED VALVE F024 FAILS TO CLOSE
4.E-03	9.6	C12-MOV-OO-F062A	4.E-03	MOTOR OPERATED VALVE F062A FAILS TO CLOSE
4.E-03	9.6	C12-MOV-OO-F062B	4.E-03	MOTOR OPERATED VALVE F062B FAILS TO CLOSE
2.34E-03	5.6	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
2.34E-03	5.6	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.34E-03	5.6	C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
		C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
2.34E-03	5.6	C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.E-03	4.8	C12-ACV-OO-F012	2.E-03	AIR OPERATED VALVE F012 FAILS TO CLOSE
2.E-03	4.8	C12-ACV-OO-F030	2.E-03	AIR OPERATED VALVE F030 FAILS TO CLOSE
1.7E-03	4.1	%BOC-FDWB	1.7E-03	FEEDWATER LINE BREAK OUTSIDE CONTAINMENT
1.E-03	2.4	B21-FDW-B-CC	1.E-03	CHECK VALVES ON FDW LINE B FAIL TO OPEN
1.E-03	2.4	B21-FDW-B-OC	1.E-03	CHECK VALVES ON FDW LINE B FAIL TO REMAIN OPEN
1.E-03	2.4	C62-C12-F020A-SPUR	1.E-03	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 A
1.E-03	2.4	C62-C12-F020B-SPUR	1.E-03	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 B
1.E-03	2.4	C62-CCFSOFTWARE_S	1.E-03	COMMON CAUSE SOFTWARE FAILURE
1.E-03	2.4	C63-CCFSOFTWARE_S	1.E-03	COMMON CAUSE SOFTWARE FAILURE
1.E-03	2.4	R12-A2-02A	1.E-03	LOSS OF 480 V AC FROM BUS R12-A2-02A

UD-TOPINJ X POST LOCA AUTOMATIC CRD INJECTION FAILS

Probability	% of Top	Event	Probability	Description
4.E-03	9.6	C12-MOV-CC-F023	4.E-03	MOTOR OPERATED VALVE F023 FAILS TO

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Probability	% of Top	Event	Probability	Description
				OPEN
4.E-03	9.6	C12-MOV-OO-F024	4.E-03	MOTOR OPERATED VALVE F024 FAILS TO CLOSE
4.E-03	9.6	C12-MOV-OO-F062A	4.E-03	MOTOR OPERATED VALVE F062A FAILS TO CLOSE
4.E-03	9.6	C12-MOV-OO-F062B	4.E-03	MOTOR OPERATED VALVE F062B FAILS TO CLOSE
2.34E-03	5.6	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
2.34E-03	5.6	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.34E-03	5.6	C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
		C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
2.34E-03	5.6	C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.E-03	4.8	C12-ACV-OO-F012	2.E-03	AIR OPERATED VALVE F012 FAILS TO CLOSE
2.E-03	4.8	C12-ACV-OO-F030	2.E-03	AIR OPERATED VALVE F030 FAILS TO CLOSE
1.7E-03	4.1	%BOC-FDWB	1.7E-03	FEEDWATER LINE BREAK OUTSIDE CONTAINMENT
1.E-03	2.4	B21-FDW-B-CC	1.E-03	CHECK VALVES ON FDW LINE B FAIL TO OPEN
1.E-03	2.4	B21-FDW-B-OC	1.E-03	CHECK VALVES ON FDW LINE B FAIL TO REMAIN OPEN
1.E-03	2.4	C62-C12-F020A-SPUR	1.E-03	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 A
1.E-03	2.4	C62-C12-F020B-SPUR	1.E-03	SPURIOUS MOV OPEN - CLOSE SIGNAL BEFORE REACHING REACTOR WATER LEVEL 8 B
1.E-03	2.4	C62-CCFSOFTWARE_S	1.E-03	COMMON CAUSE SOFTWARE FAILURE
1.E-03	2.4	C63-C12-LL-SIG-AUTO	1.E-03	AUTOMATIC INJECTION SIGNAL FAILS
1.E-03	2.4	R12-A2-02A	1.E-03	LOSS OF 480 V AC FROM BUS R12-A2-02A

UD-TOPINJ2 ATWS CRD INJECTION FAILS

Probability	% of Top	Event	Probability	Description
1.21E-02	9.4	C12-BV_-RE-F003B	1.21E-02	MISPOSITION OF PUMP SUCTION VALVE F003B
1.21E-02	9.4	C12-BV_-RE-F018A	1.21E-02	MISPOSITION OF VALVE F018A
1.21E-02	9.4	C12-BV_-RE-F018B	1.21E-02	MISPOSITION OF VALVE F018B
1.21E-02	9.4	C12-BV_-RE-F021A	1.21E-02	MISPOSITION OF VALVE F021A
1.21E-02	9.4	C12-BV_-RE-F021B	1.21E-02	MISPOSITION OF VALVE F021B
1.02E-02	7.9	P52-0001_1	1.02E-02	LOSS OF INSTRUMENT AIR SUPPLY
4.E-03	3.1	C12-MOV-CC-F020A	4.E-03	MOTOR OPER. VALVE F020A FAILS TO OPEN
4.E-03	3.1	C12-MOV-CC-F020B	4.E-03	MOTOR OPER. VALVE F020B FAILS TO OPEN



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Probability	% of Top	Event	Probability	Description
4.E-03	3.1	C12-MOV-CC-F023	4.E-03	MOTOR OPERATED VALVE F023 FAILS TO OPEN
4.E-03	3.1	C12-MOV-OO-F024	4.E-03	MOTOR OPERATED VALVE F024 FAILS TO CLOSE
4.E-03	3.1	C12-MOV-OO-F062A	4.E-03	MOTOR OPERATED VALVE F062A FAILS TO CLOSE
4.E-03	3.1	C12-MOV-OO-F062B	4.E-03	MOTOR OPERATED VALVE F062B FAILS TO CLOSE
3.E-03	2.3	C12-SYS-TM-TRAINB	3.E-03	TRAIN B IN MAINTENANCE
2.34E-03	1.8	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
2.34E-03	1.8	C12-BV_-RE-F013A	4.84E-02	MISPOSITION OF VALVE F013A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.34E-03	1.8	C12-BV_-RE-F013B	4.84E-02	MISPOSITION OF VALVE F013B
		C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
2.34E-03	1.8	C12-BV_-RE-F015A	4.84E-02	MISPOSITION OF VALVE F015A
		C12-BV_-RE-F015B	4.84E-02	MISPOSITION OF VALVE F015B
2.E-03	1.6	C12-ACV-OO-F012	2.E-03	AIR OPERATED VALVE F012 FAILS TO CLOSE
2.E-03	1.6	C12-ACV-OO-F030	2.E-03	AIR OPERATED VALVE F030 FAILS TO CLOSE
2.E-03	1.6	C12-MP_-FS-C001B	2.E-03	MOTOR-DRIVEN PUMP C001B FAILS TO START
2.E-03	1.6	C12-MP_-FS-C001BOIL	2.E-03	MOTOR-DRIVEN AUX. OIL PUMP FOR C001B FAILS TO START
1.7E-03	1.3	%BOC-FDWB	1.7E-03	FEEDWATER LINE BREAK OUTSIDE CONTAINMENT

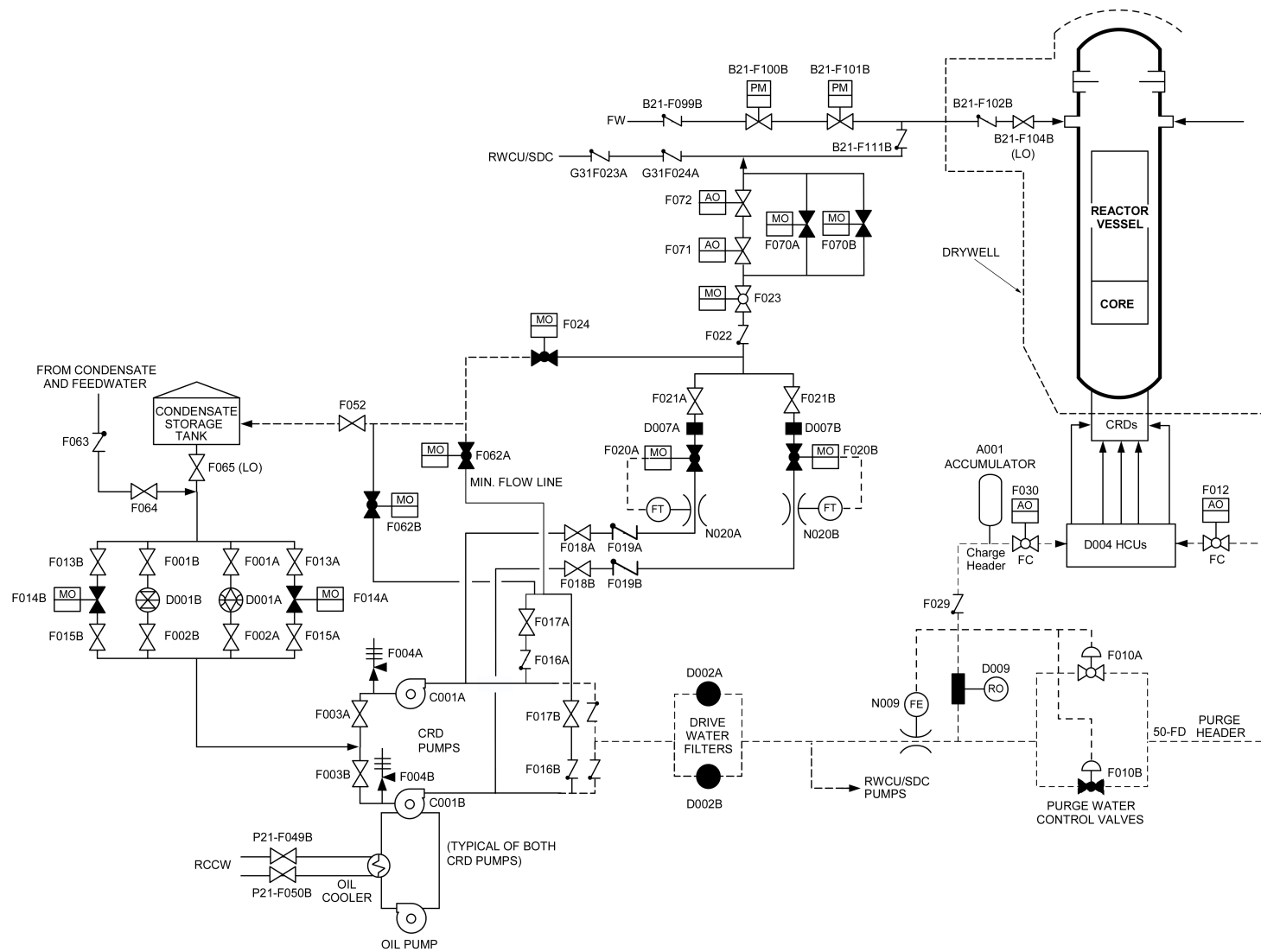
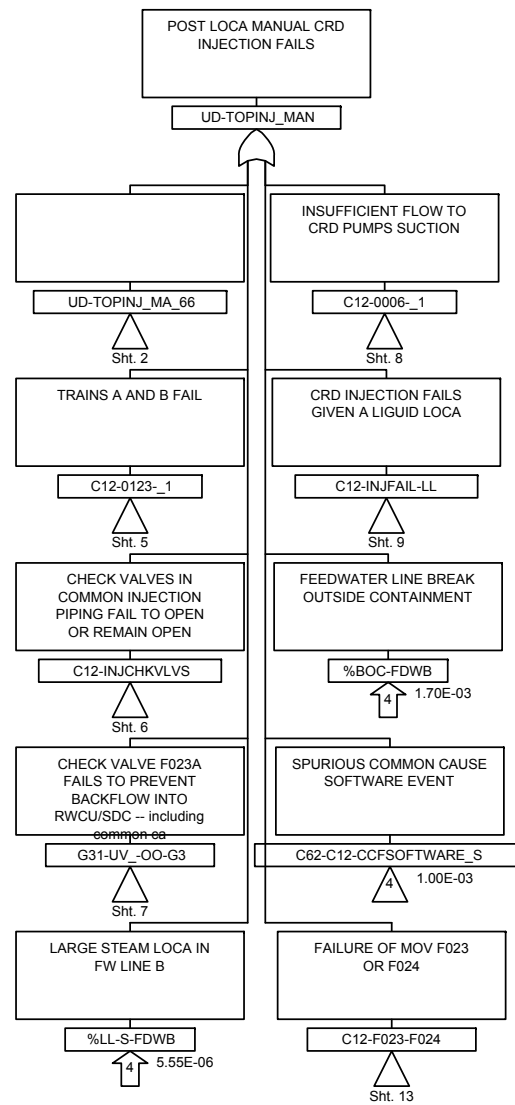


Figure 4.3-1. Simplified Diagram of Control Rod Drive System



**Figure 4.3-2. Control Rod Drive**  
**Sheet 1**

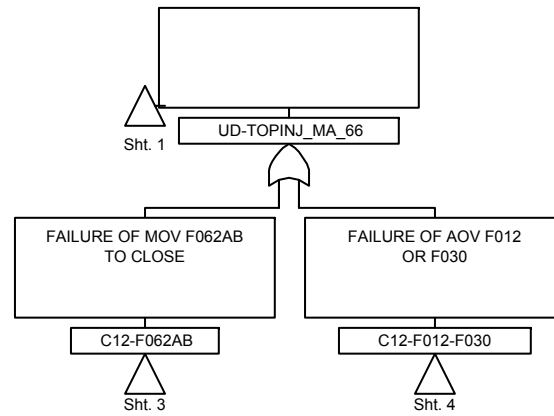


Figure 4.3-2. Sheet 2 Control Rod Drive

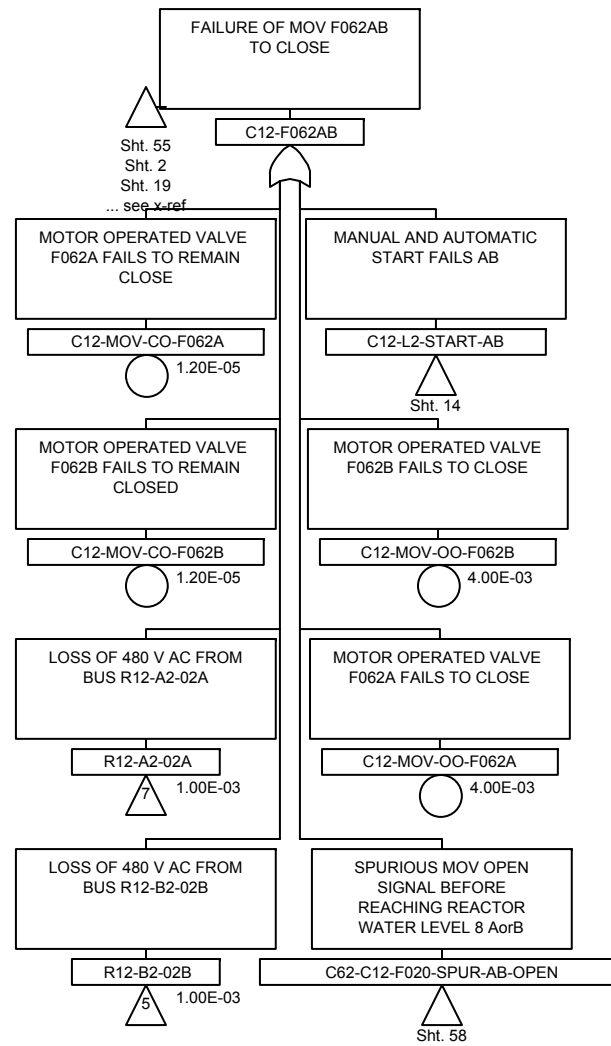


Figure 4.3-2. Sheet 3 Control Rod Drive

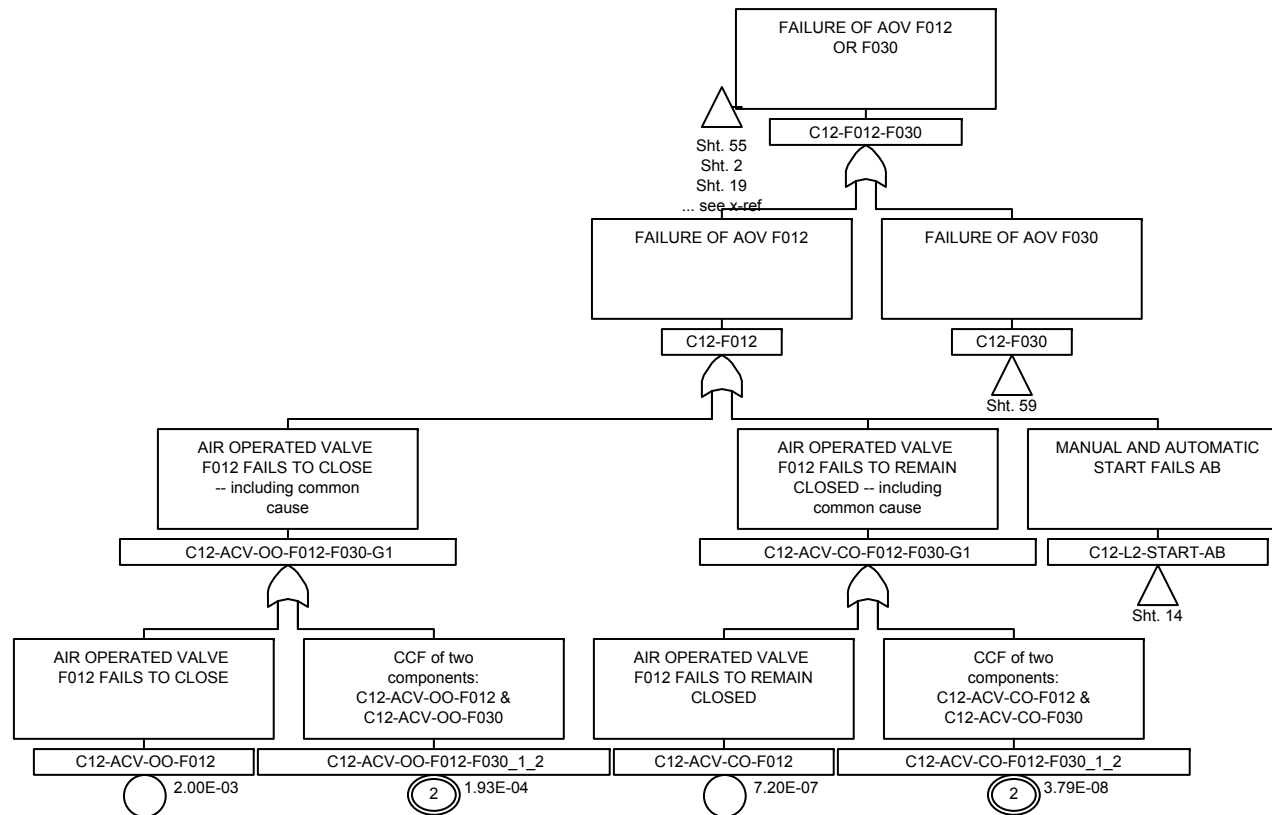


Figure 4.3-2. Sheet 4 Control Rod Drive

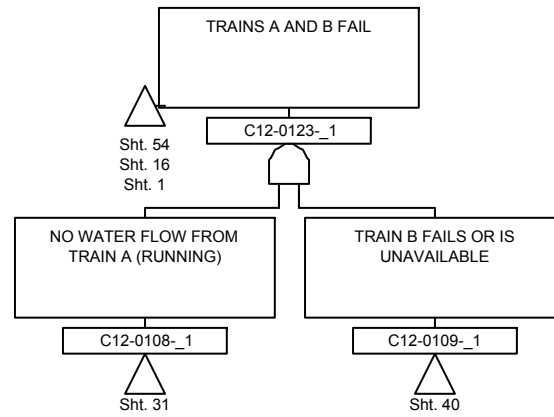


Figure 4.3-2. Sheet 5 Control Rod Drive

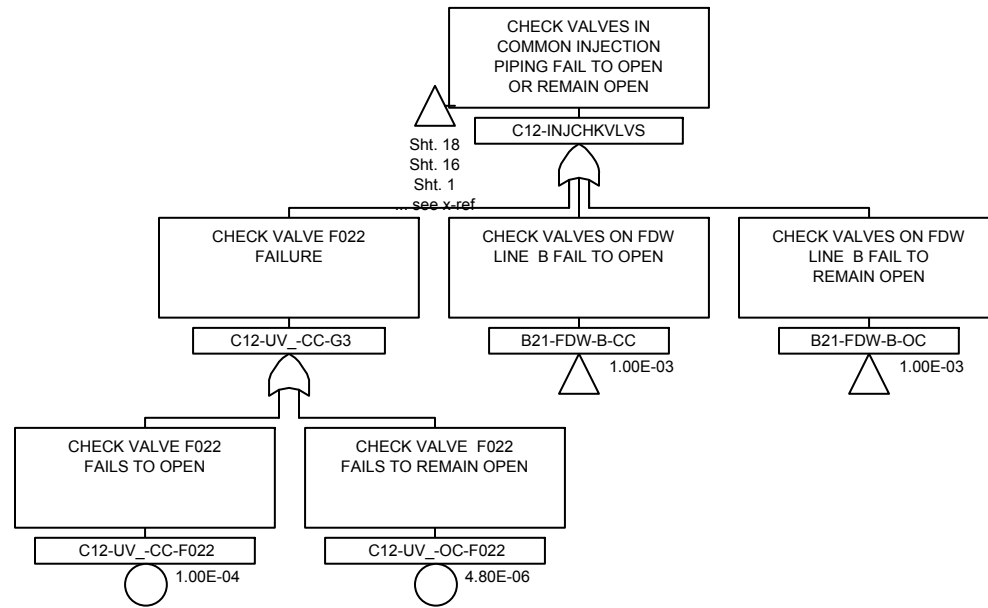


Figure 4.3-2. Sheet 6 Control Rod Drive



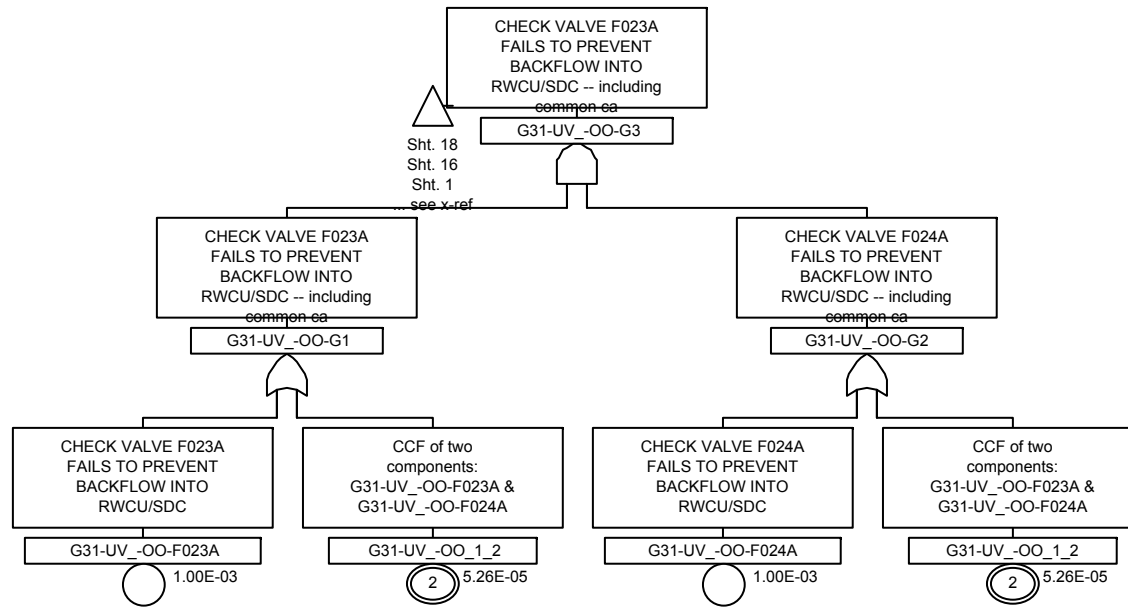


Figure 4.3-2. Sheet 7 Control Rod Drive

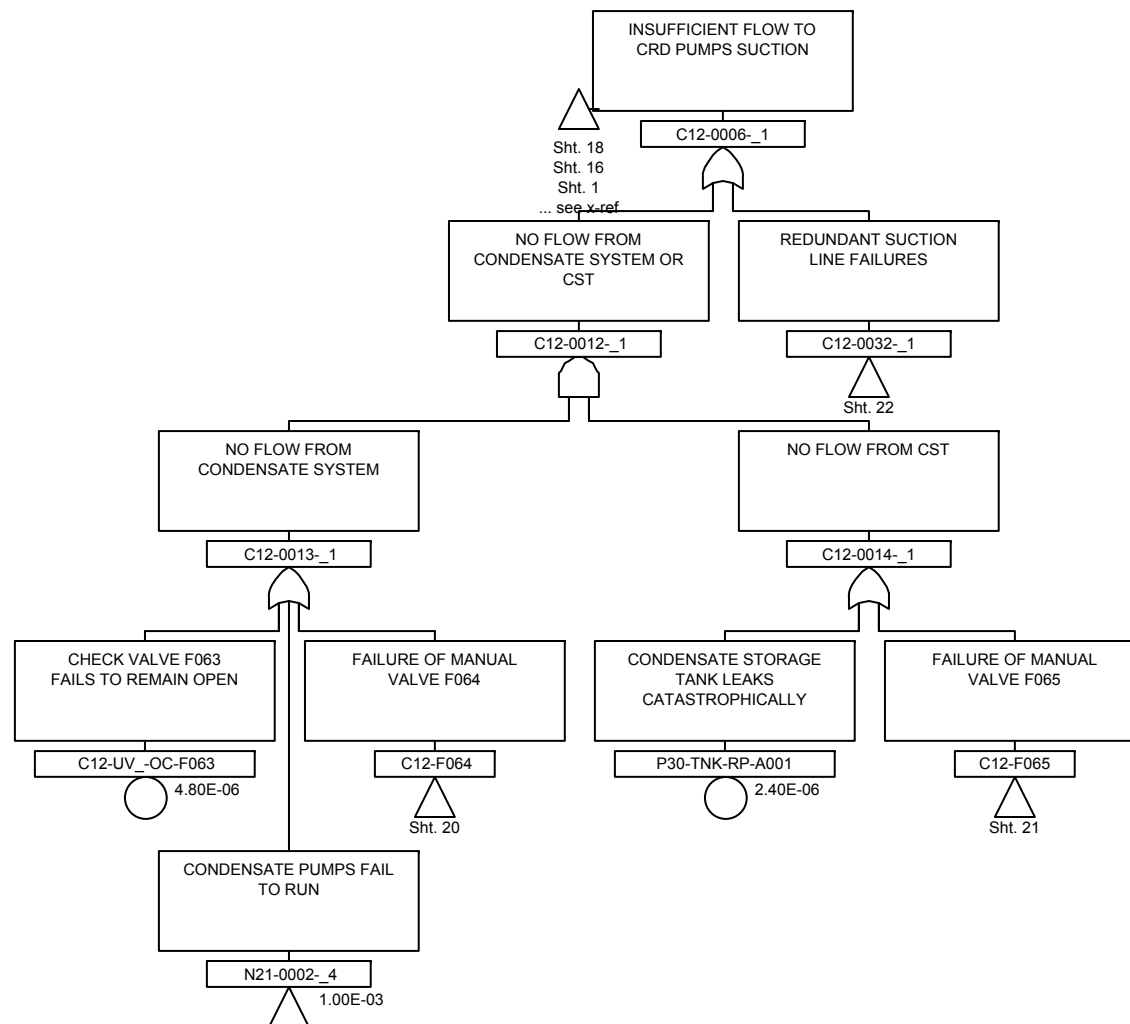


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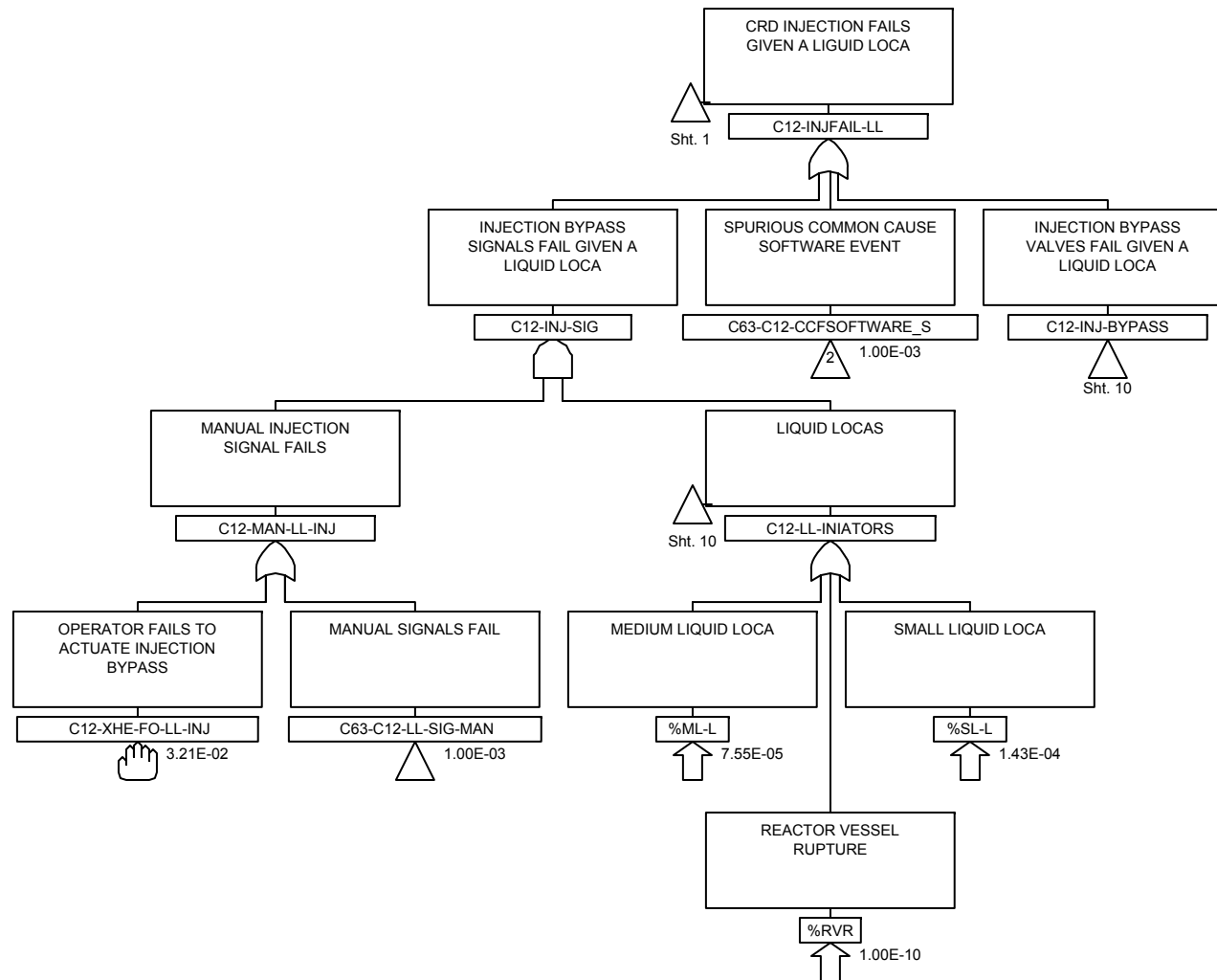


Figure 4.3-2. Sheet 9 Control Rod Drive

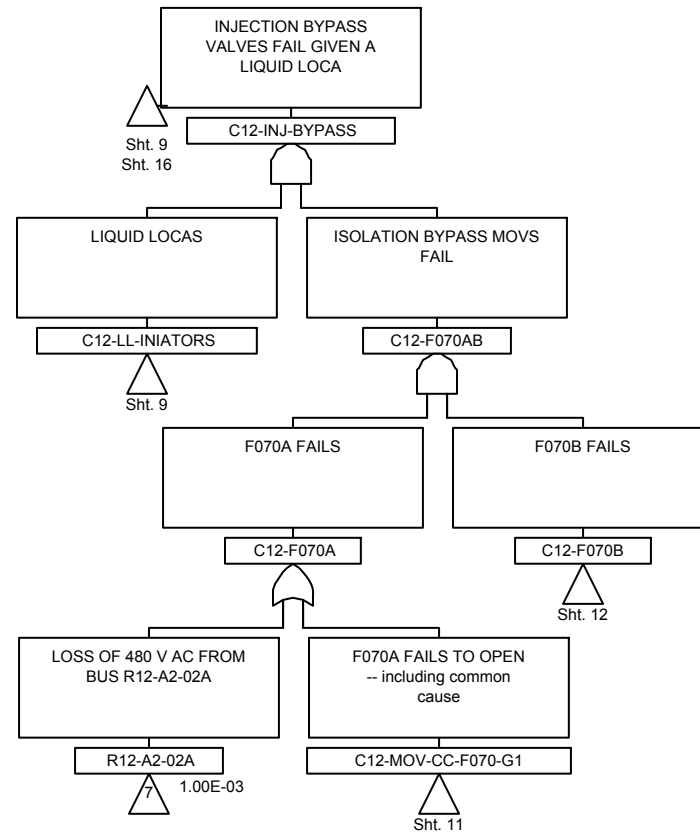


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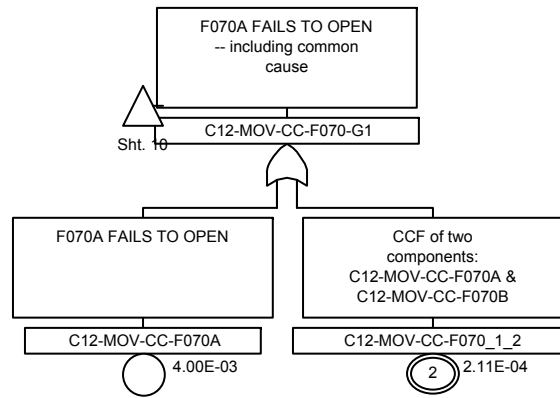


Figure 4.3-2. Sheet 11 Control Rod Drive

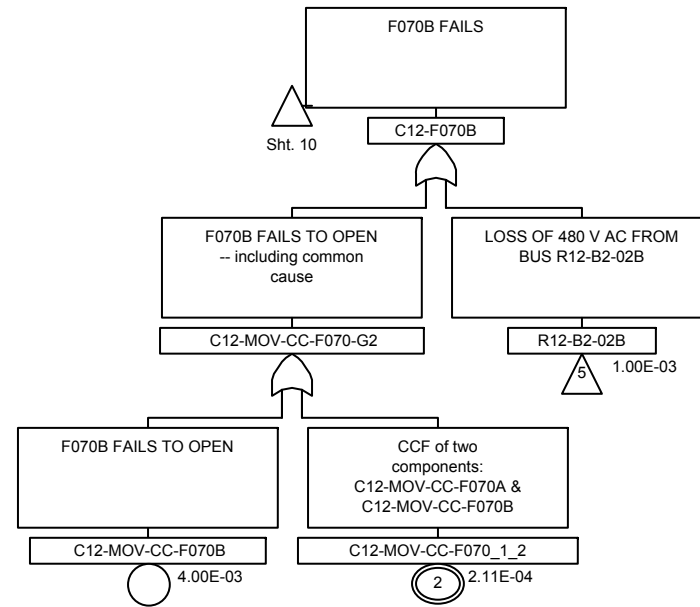


Figure 4.3-2. Sheet 12 Control Rod Drive

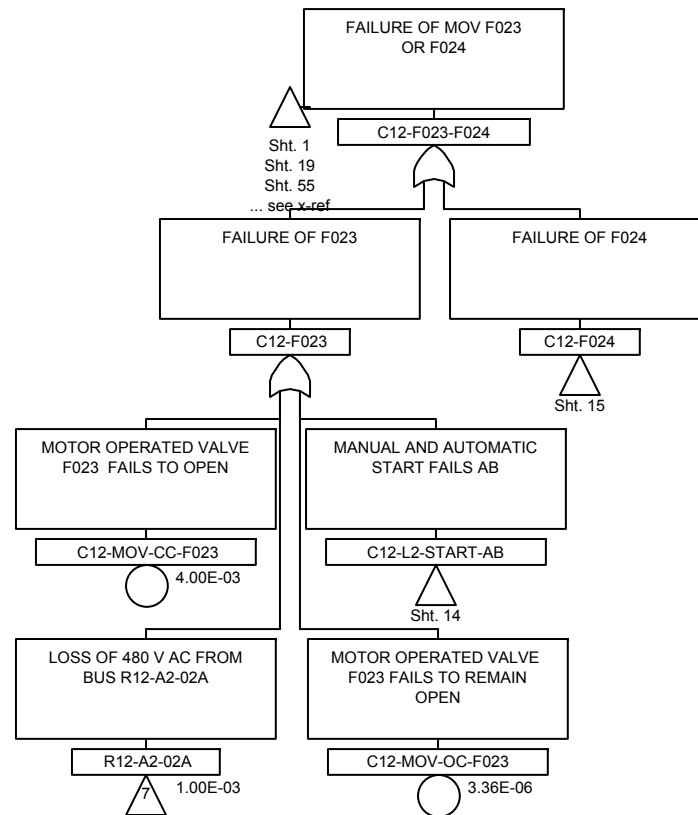


Figure 4.3-2. Sheet 13 Control Rod Drive

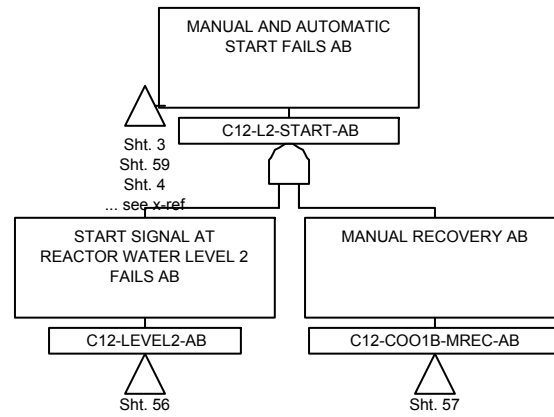


Figure 4.3-2. Sheet 14 Control Rod Drive



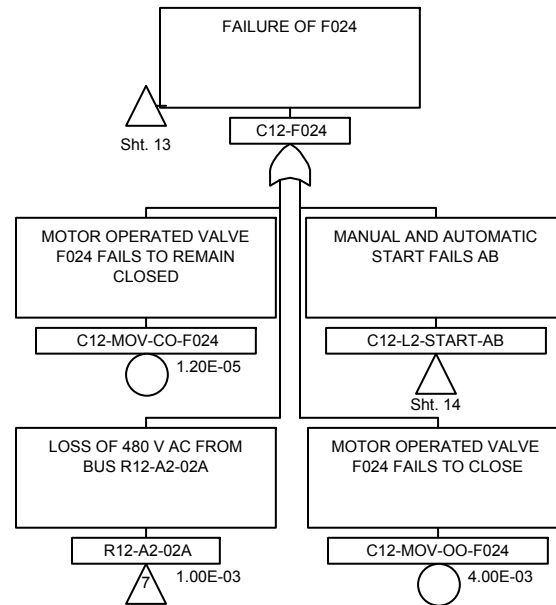


Figure 4.3-2. Sheet 15 Control Rod Drive

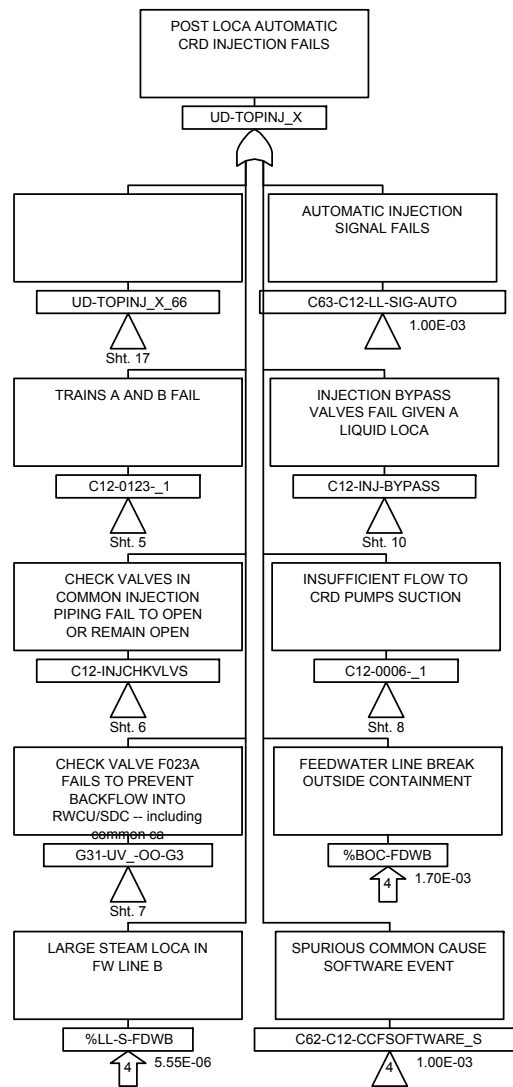


Figure 4.3-2. Sheet 16 Control Rod Drive

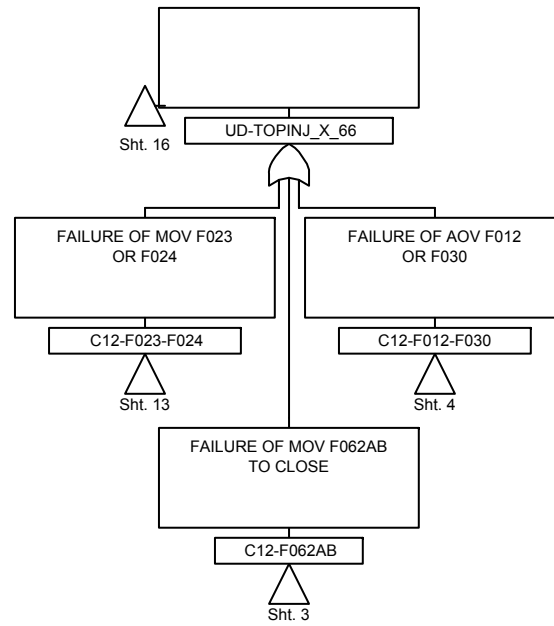


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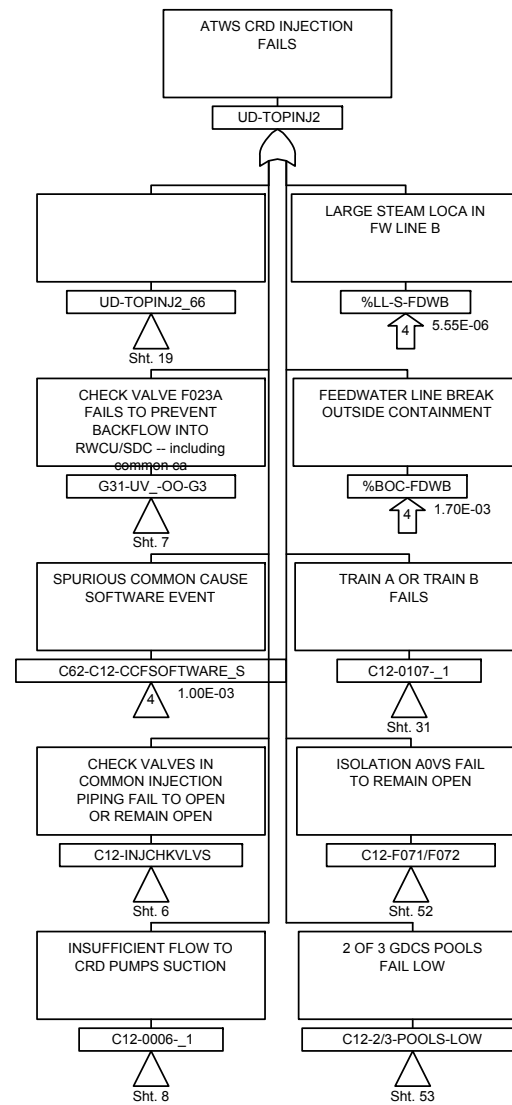


Figure 4.3-2. Sheet 18 Control Rod Drive

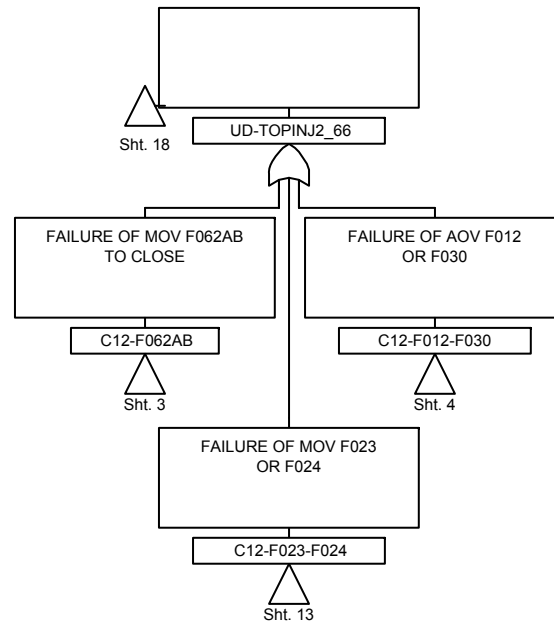


Figure 4.3-2. Sheet 19 Control Rod Drive

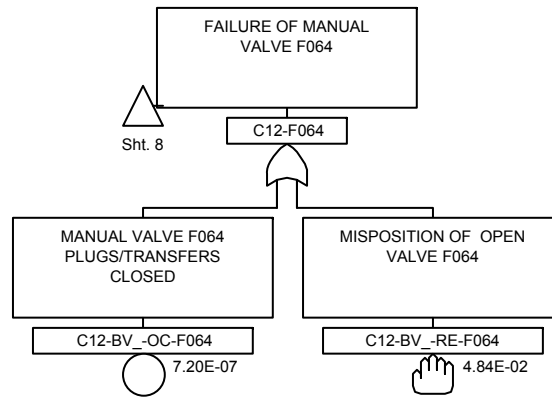


Figure 4.3-2. Sheet 20 Control Rod Drive

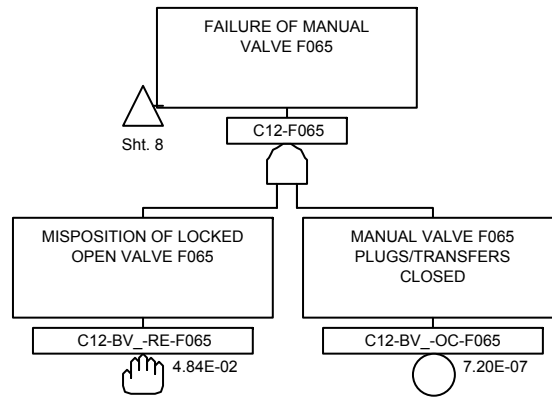


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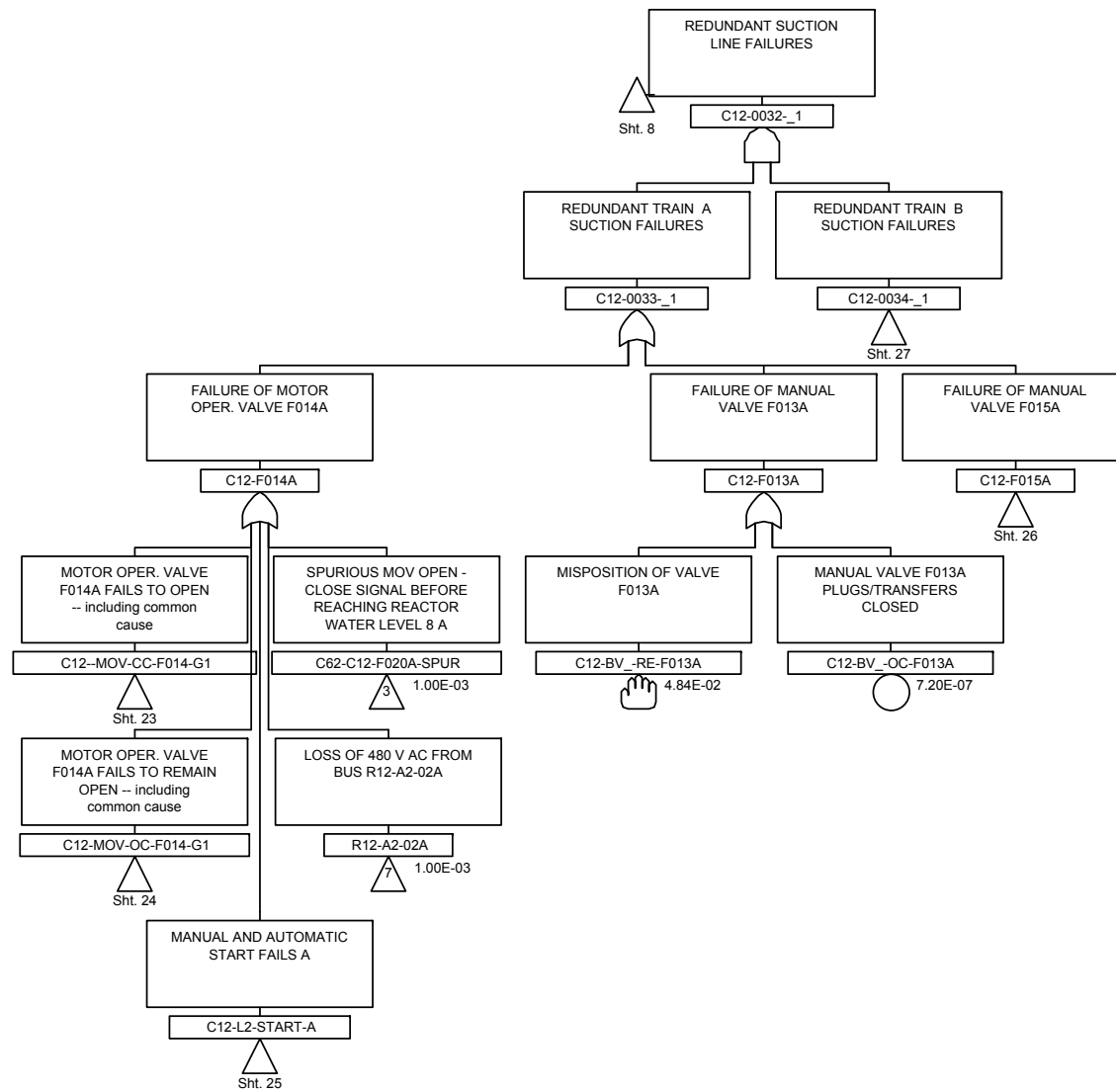


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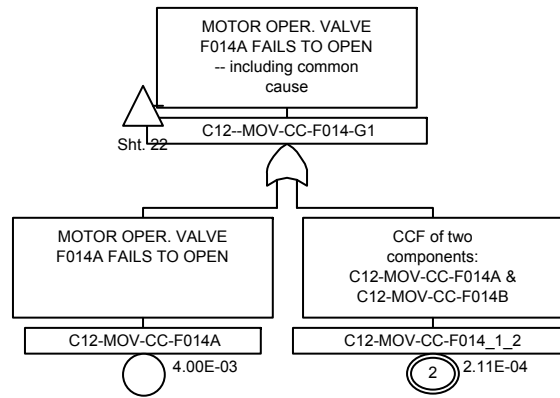


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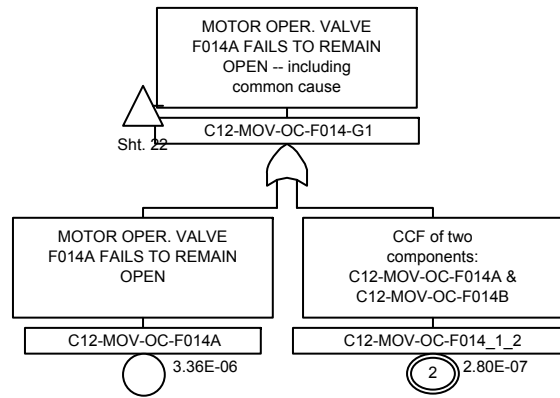


Figure 4.3-2. Sheet 24 Control Rod Drive

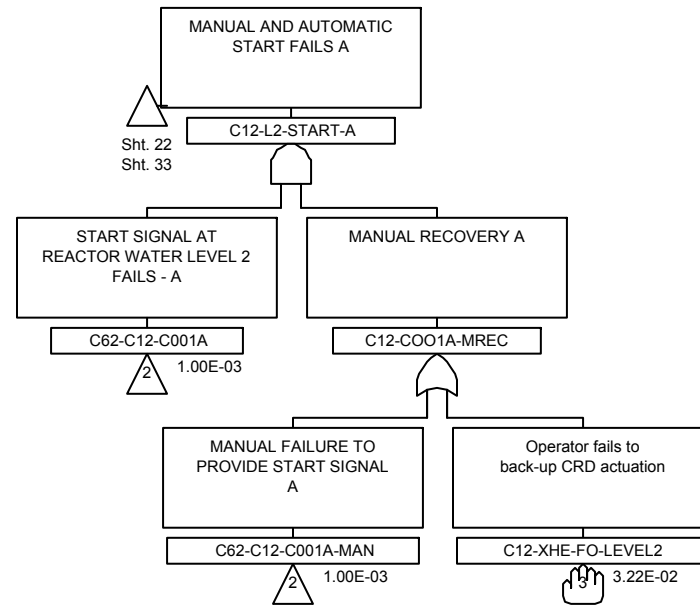


Figure 4.3-2. Sheet 25 Control Rod Drive

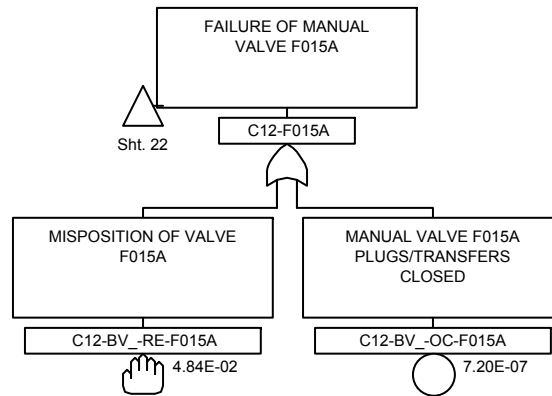


Figure 4.3-2. Sheet 26 Control Rod Drive

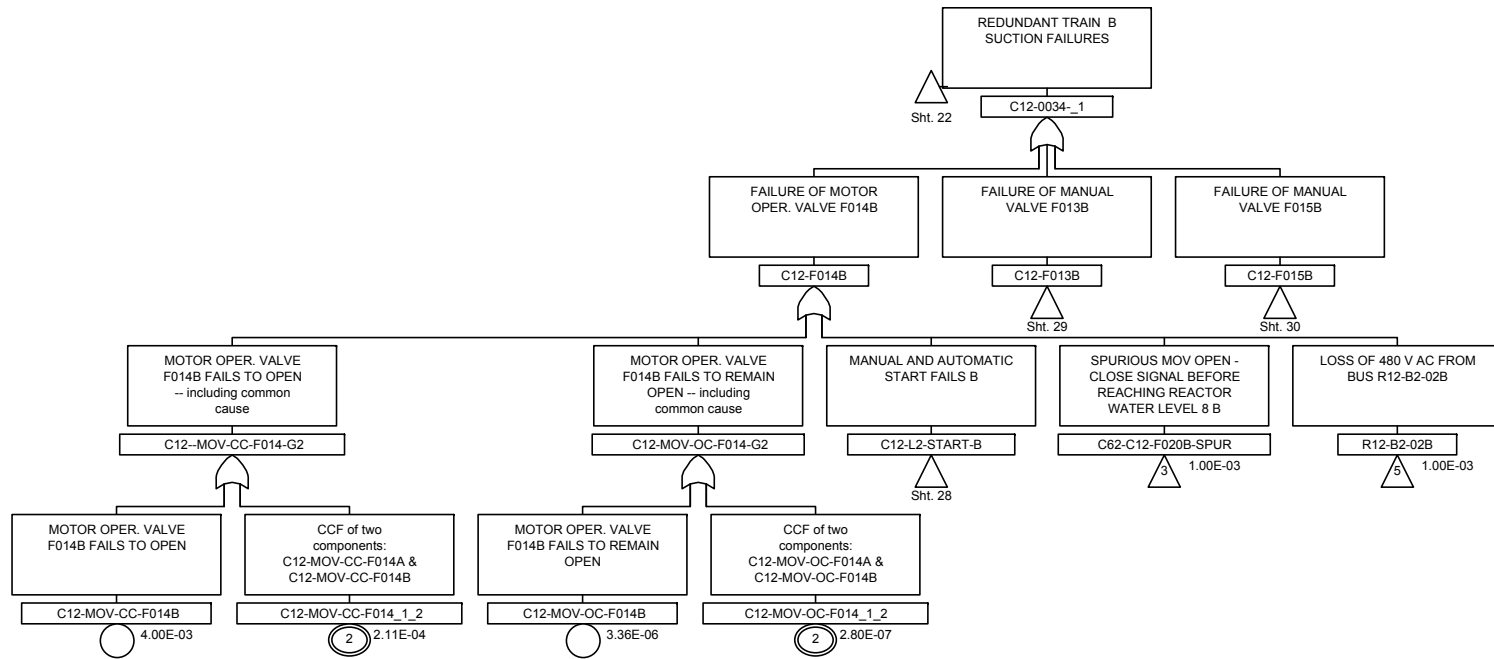


Figure 4.3-2. Sheet 27 Control Rod Drive

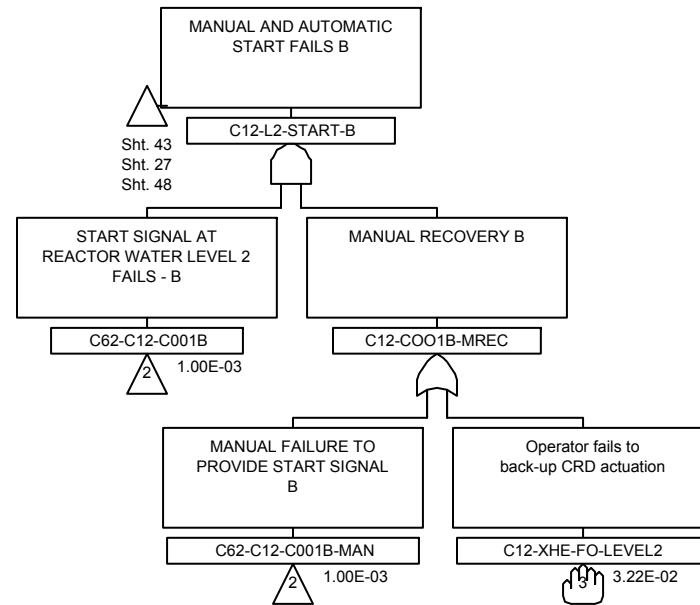


Figure 4.3-2. Sheet 28 Control Rod Drive

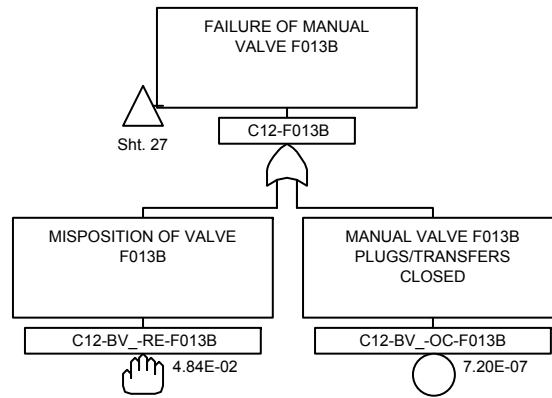


Figure 4.3-2. Sheet 29 Control Rod Drive

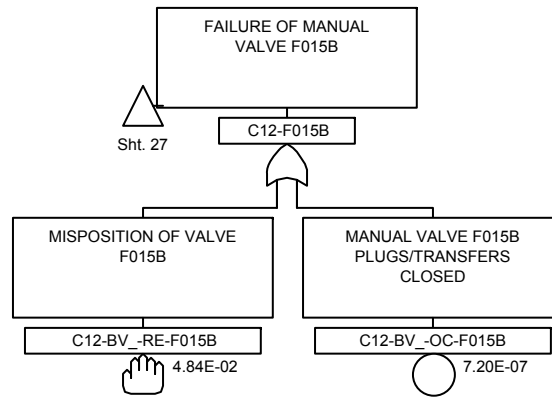


Figure 4.3-2. Sheet 30 Control Rod Drive



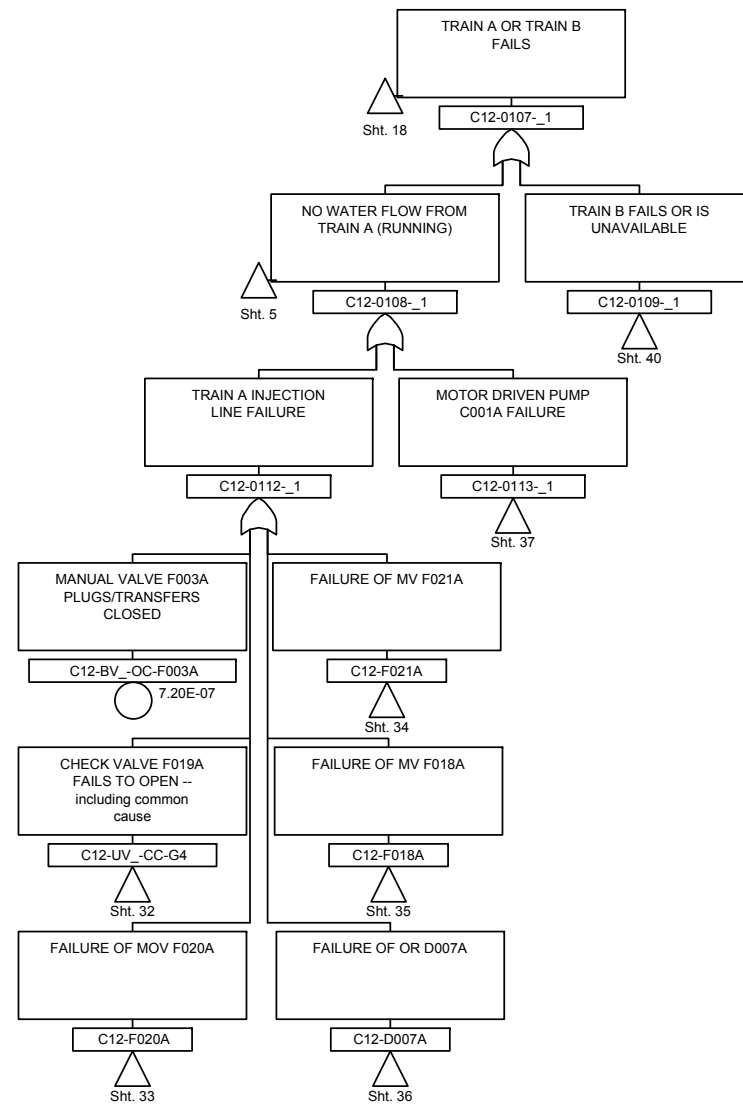


Figure 4.3-2. Sheet 31 Control Rod Drive

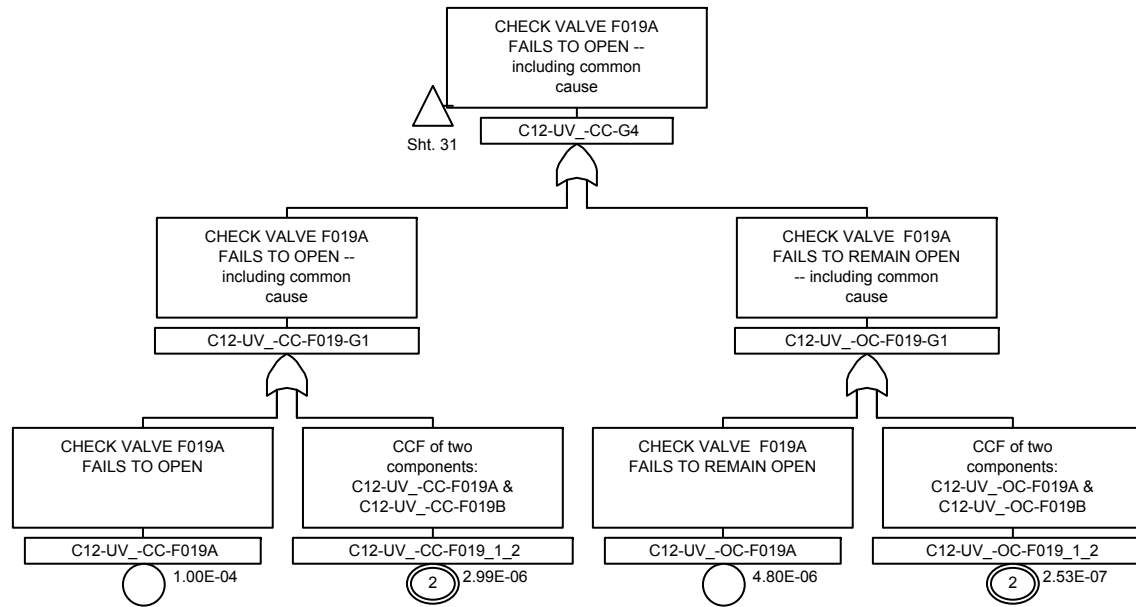


Figure 4.3-2. Sheet 32 Control Rod Drive

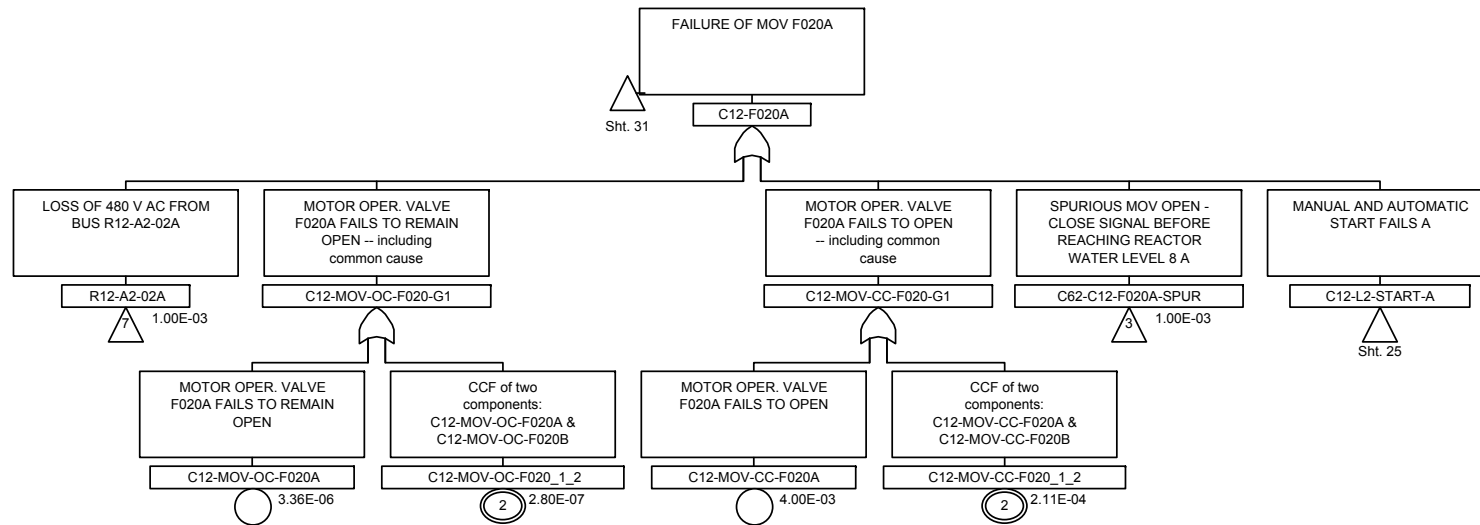


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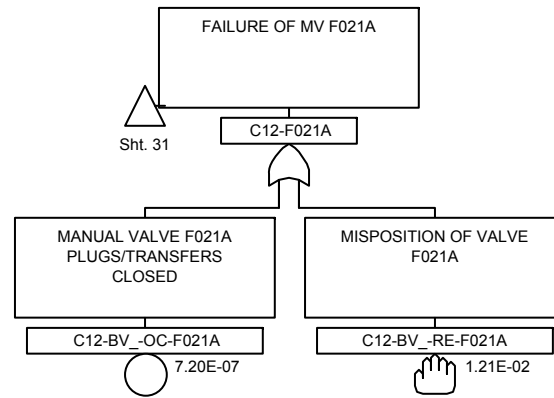


Figure 4.3-2. Sheet 34 Control Rod Drive

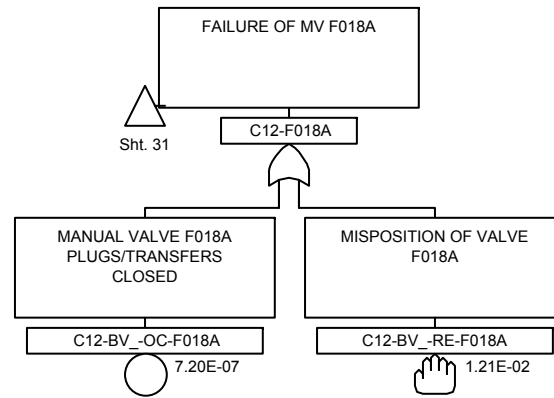


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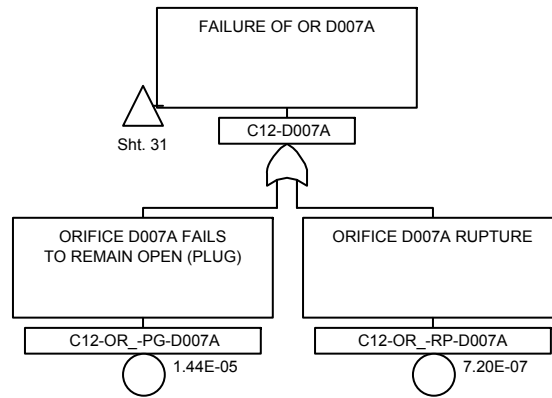


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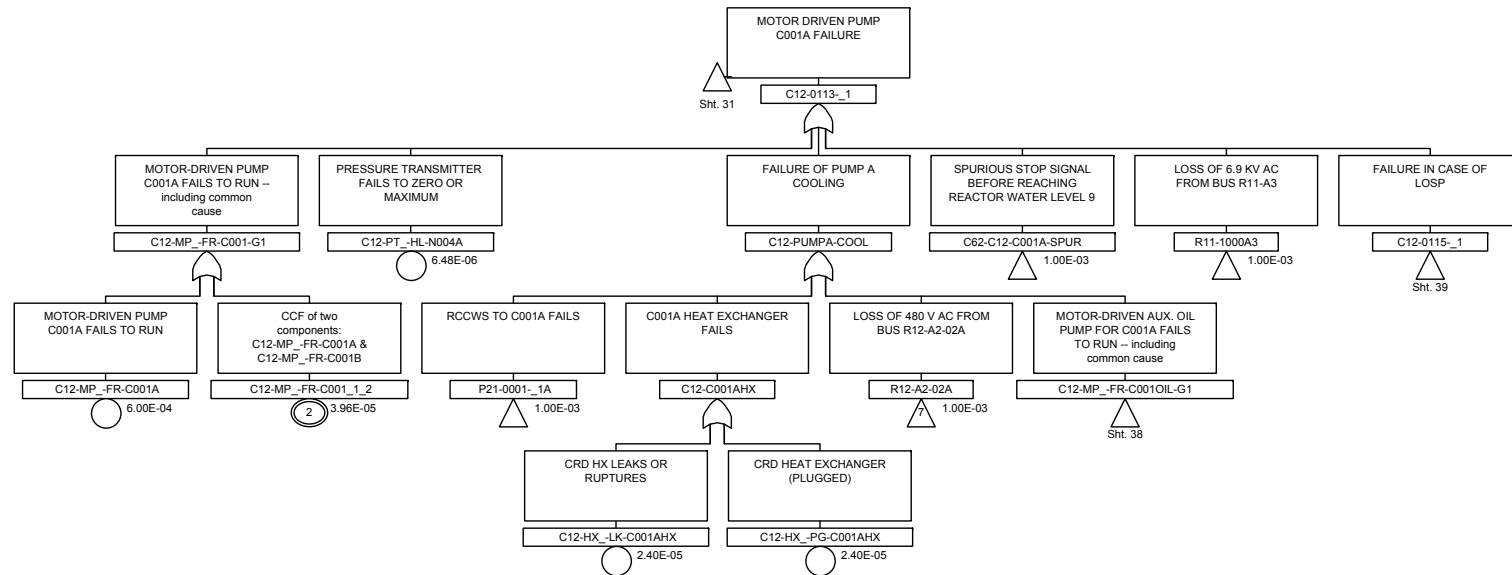


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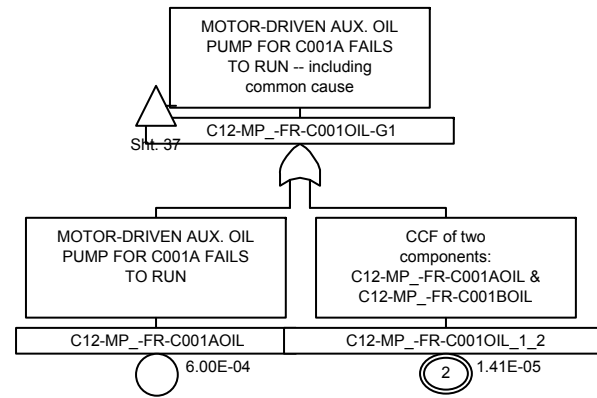


Figure 4.3-2. Sheet 38 Control Rod Drive



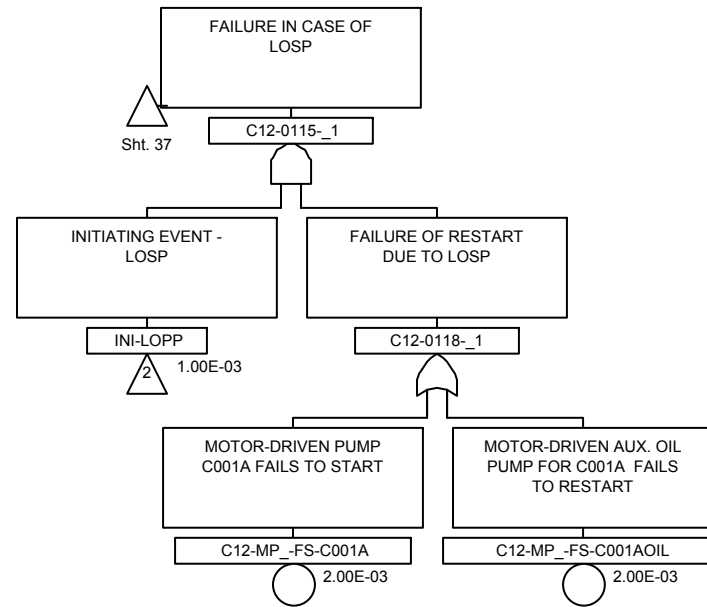


Figure 4.3-2. Sheet 39 Control Rod Drive

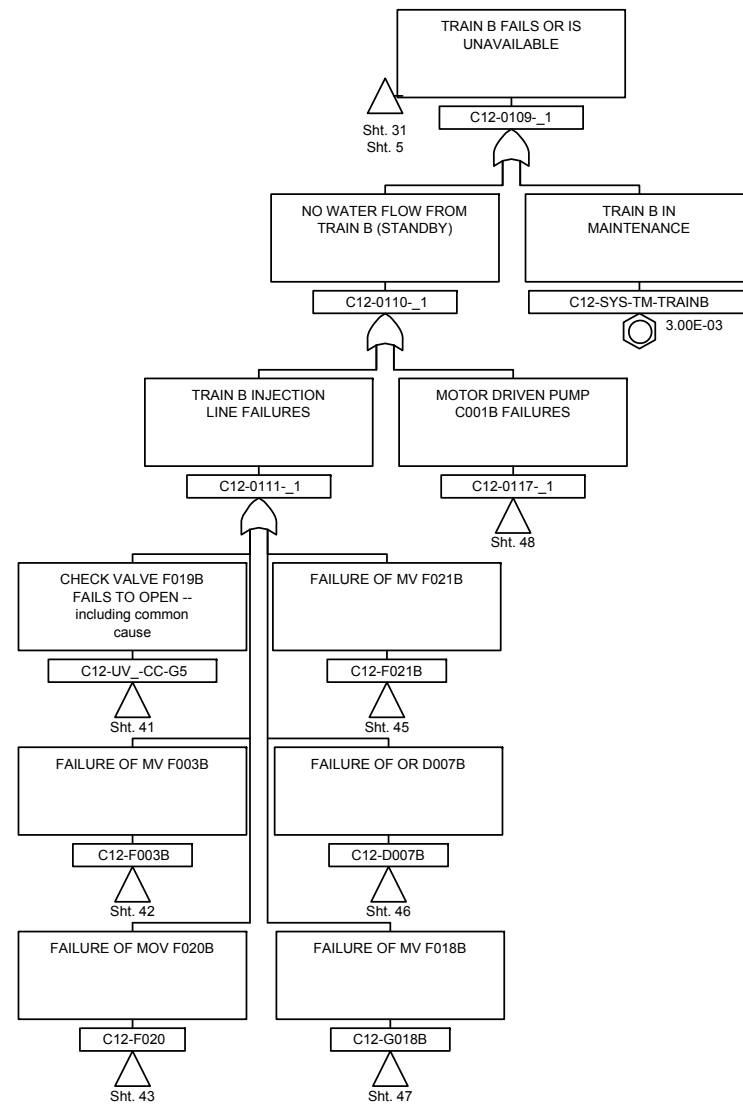


Figure 4.3-2. Sheet 40 Control Rod Drive

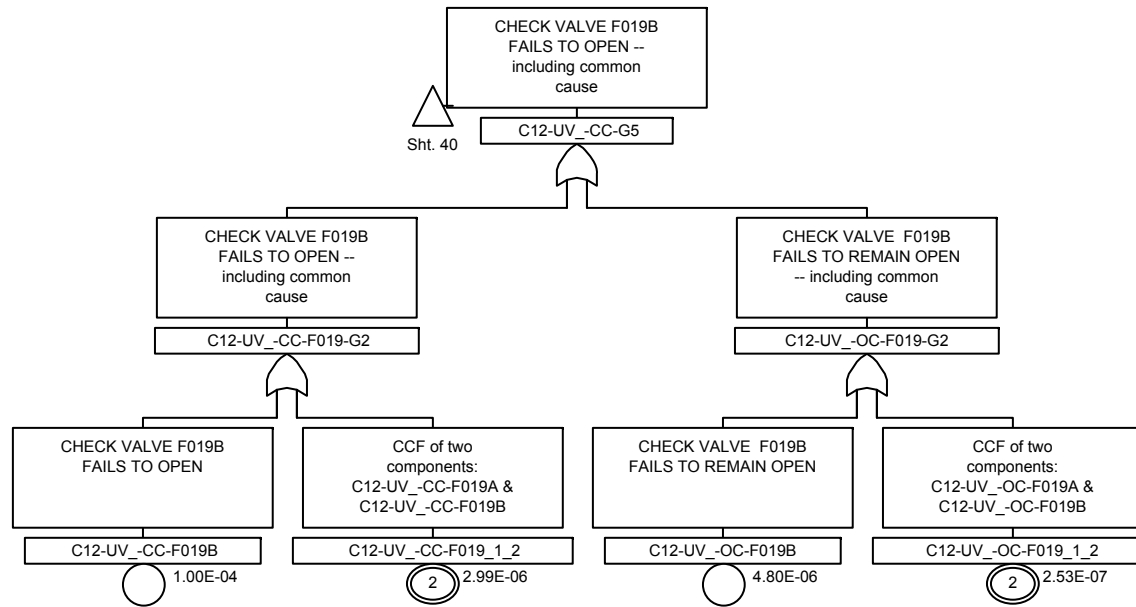


Figure 4.3-2. Sheet 41 Control Rod Drive

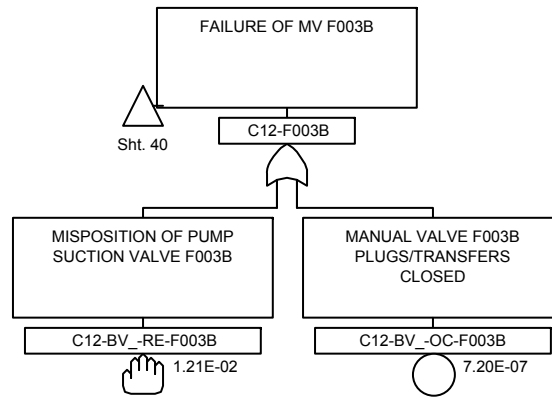


Figure 4.3-2. Sheet 42 Control Rod Drive

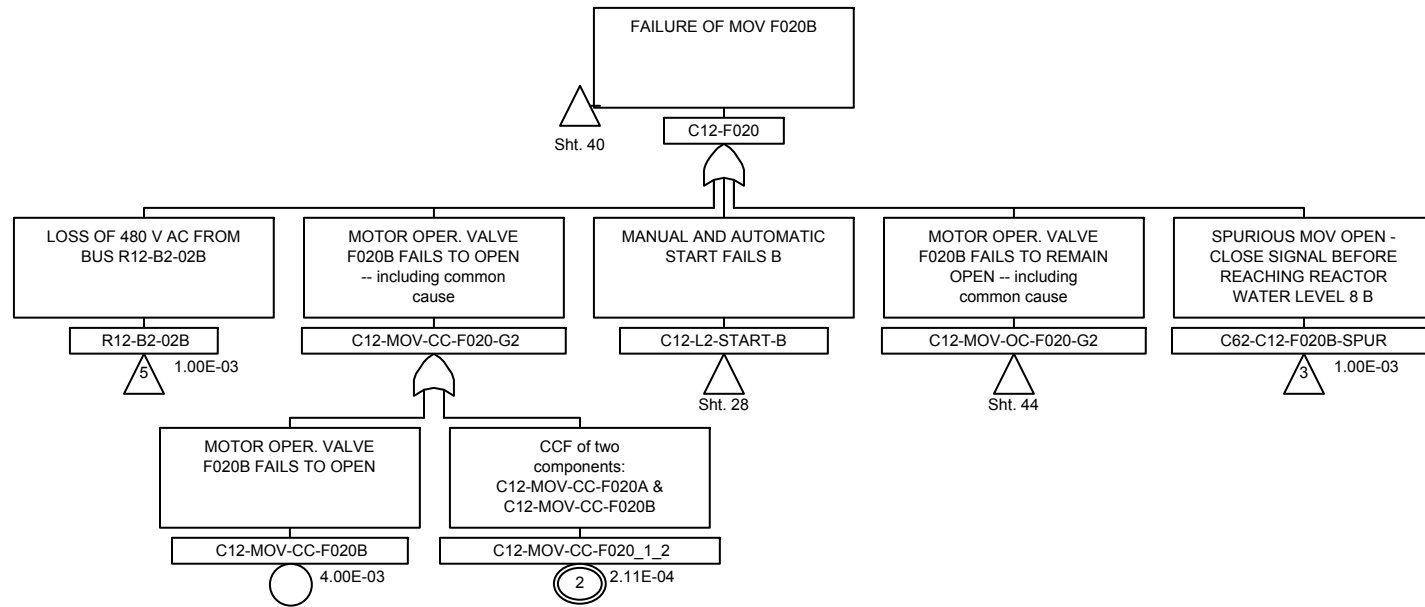


Figure 4.3-2. Sheet 43 Control Rod Drive

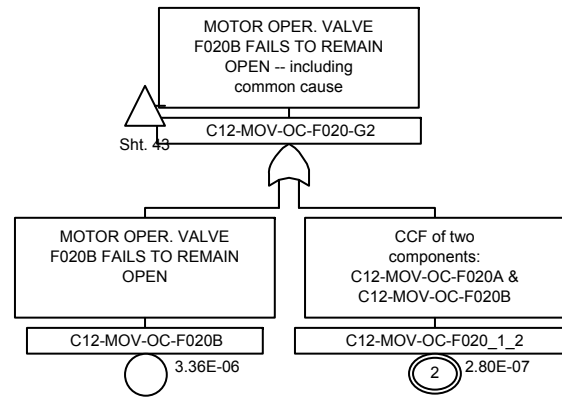


Figure 4.3-2. Sheet 44 Control Rod Drive

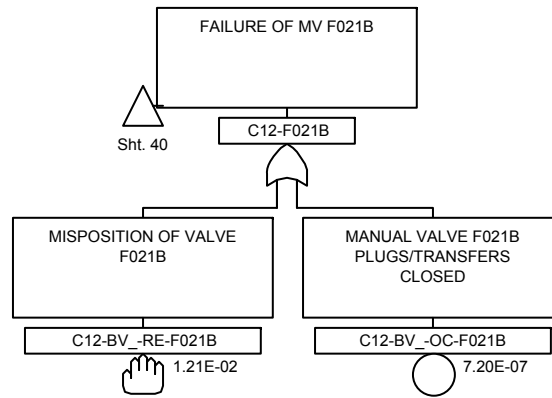


Figure 4.3-2. Sheet 45 Control Rod Drive

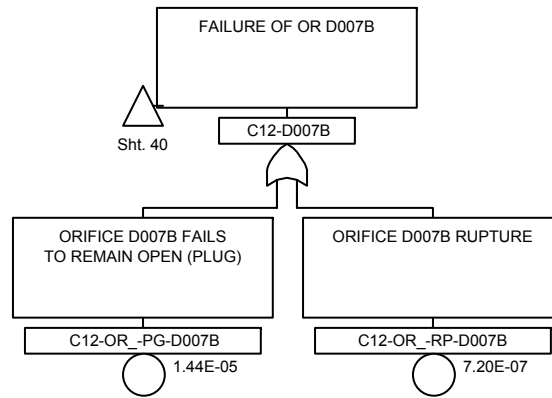


Figure 4.3-2. Sheet 46 Control Rod Drive



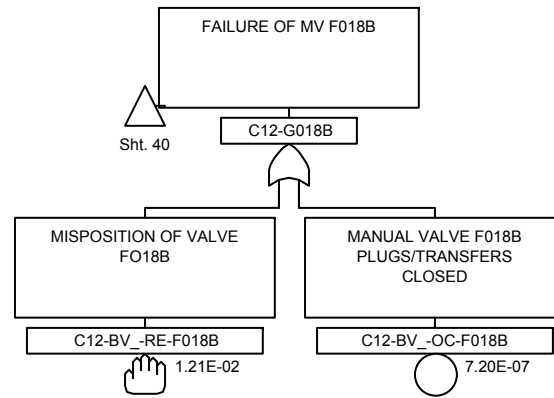


Figure 4.3-2. Sheet 47 Control Rod Drive

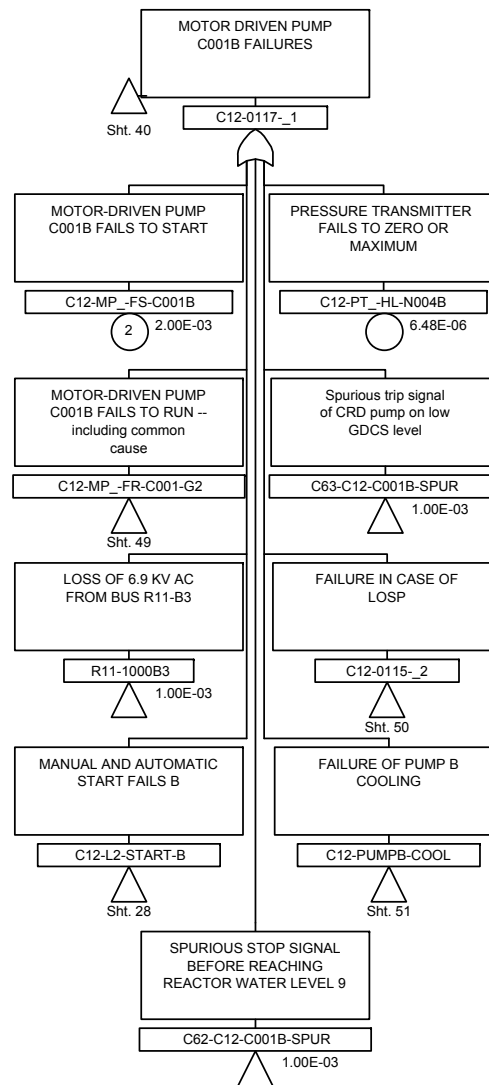


Figure 4.3-2. Sheet 48 Control Rod Drive

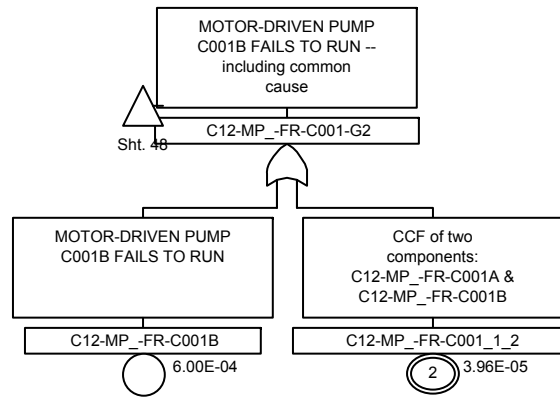


Figure 4.3-2. Sheet 49 Control Rod Drive

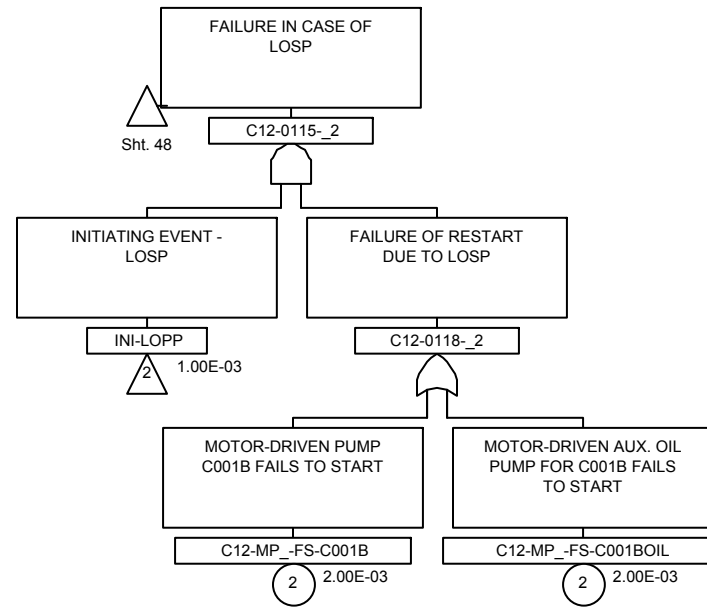


Figure 4.3-2. Sheet 50 Control Rod Drive

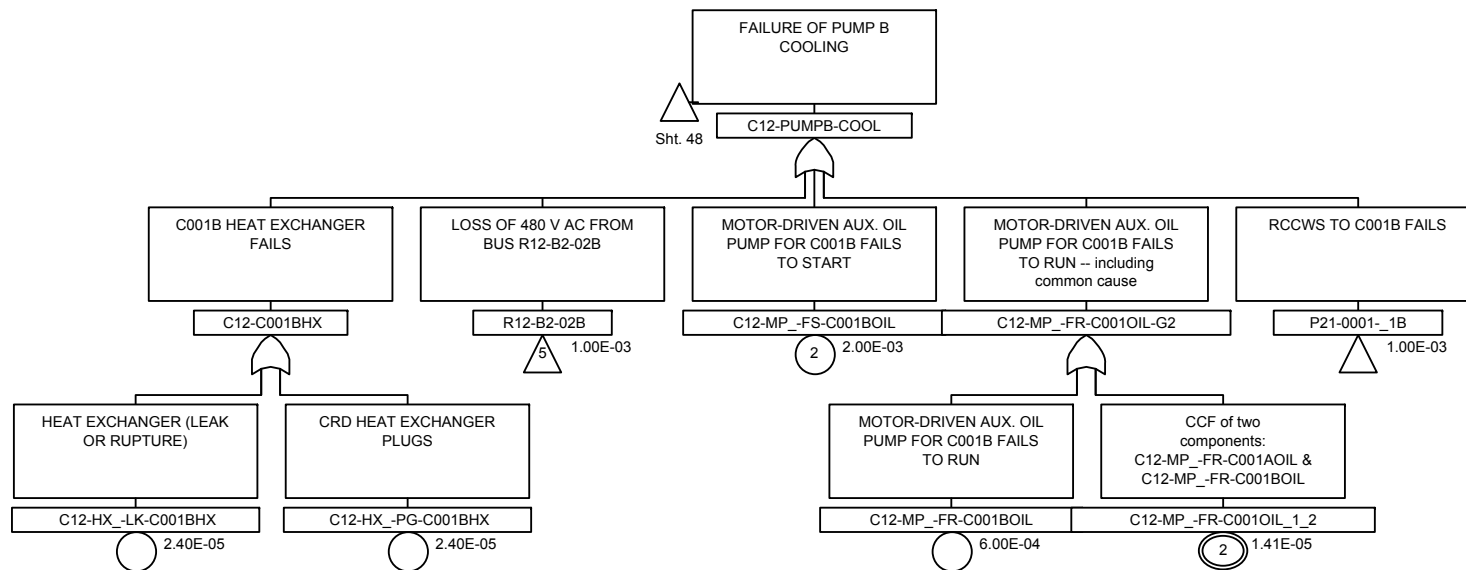


Figure 4.3-2. Sheet 51 Control Rod Drive

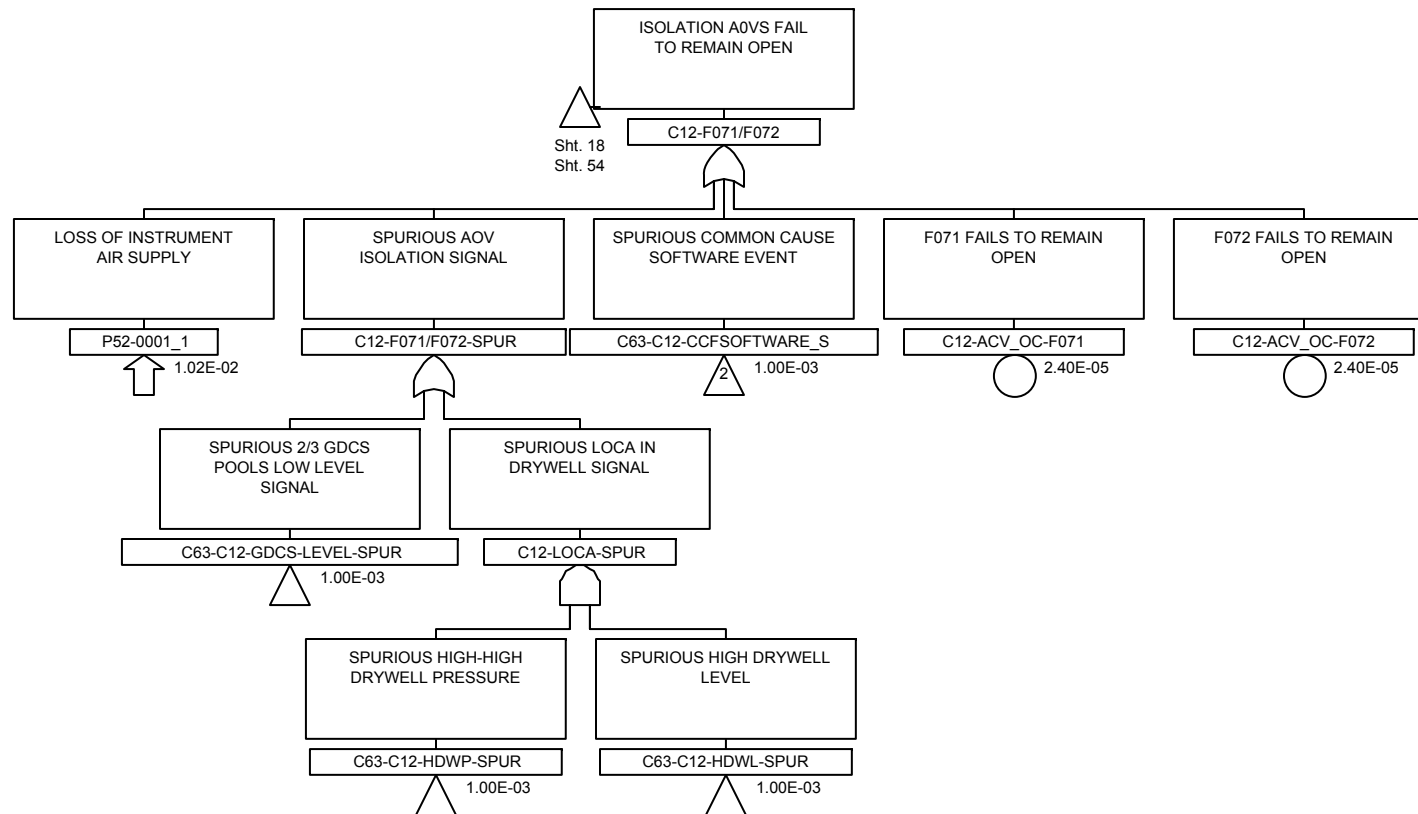


Figure 4.3-2. Sheet 52 Control Rod Drive

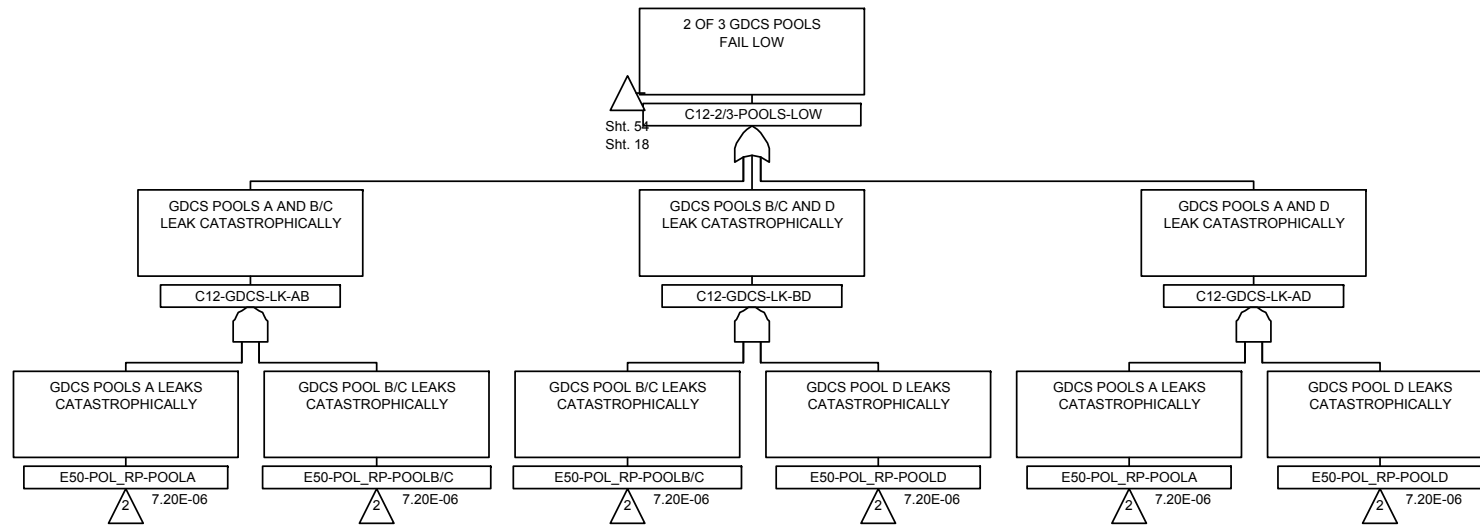


Figure 4.3-2. Sheet 53 Control Rod Drive

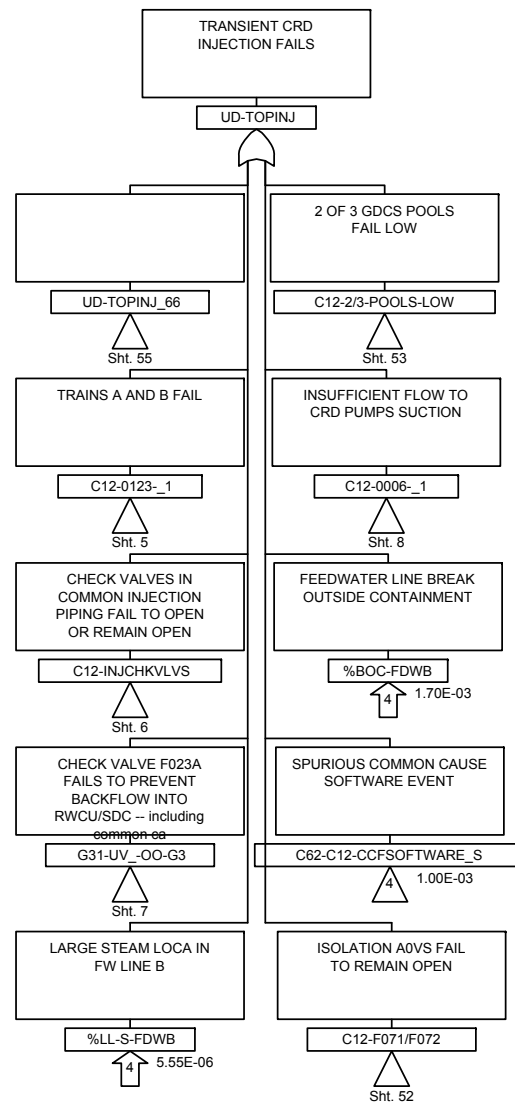


Figure 4.3-2. Sheet 54 Control Rod Drive



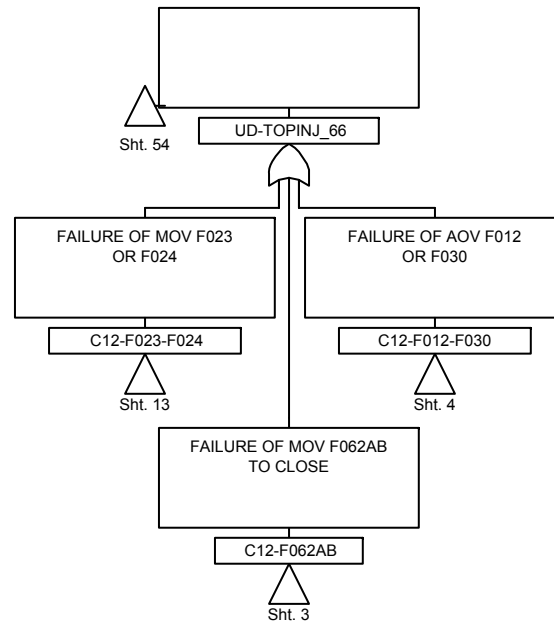


Figure 4.3-2. Sheet 55 Control Rod Drive

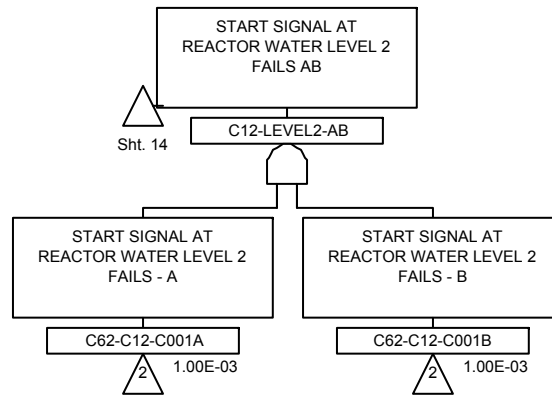


Figure 4.3-2. Sheet 56 Control Rod Drive

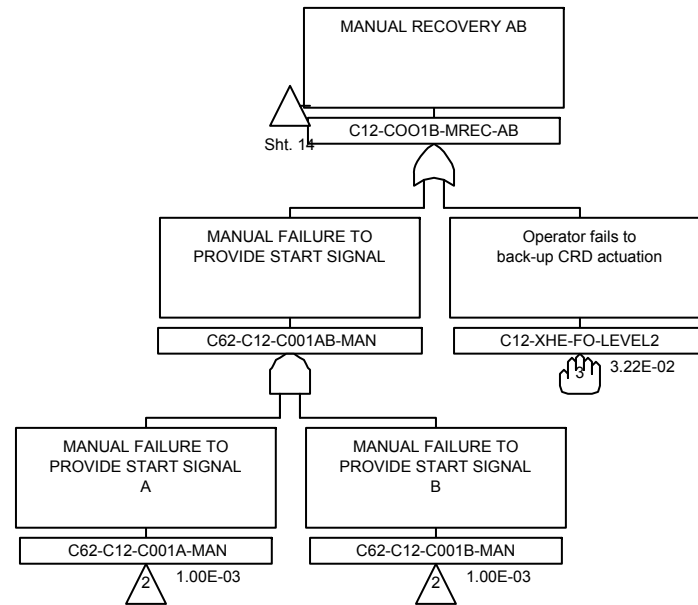


Figure 4.3-2. Sheet 57 Control Rod Drive

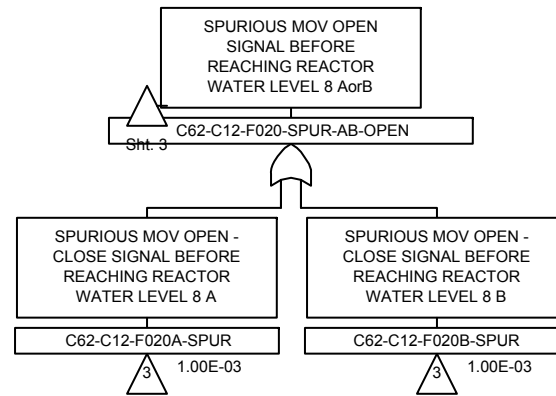


Figure 4.3-2. Sheet 58 Control Rod Drive

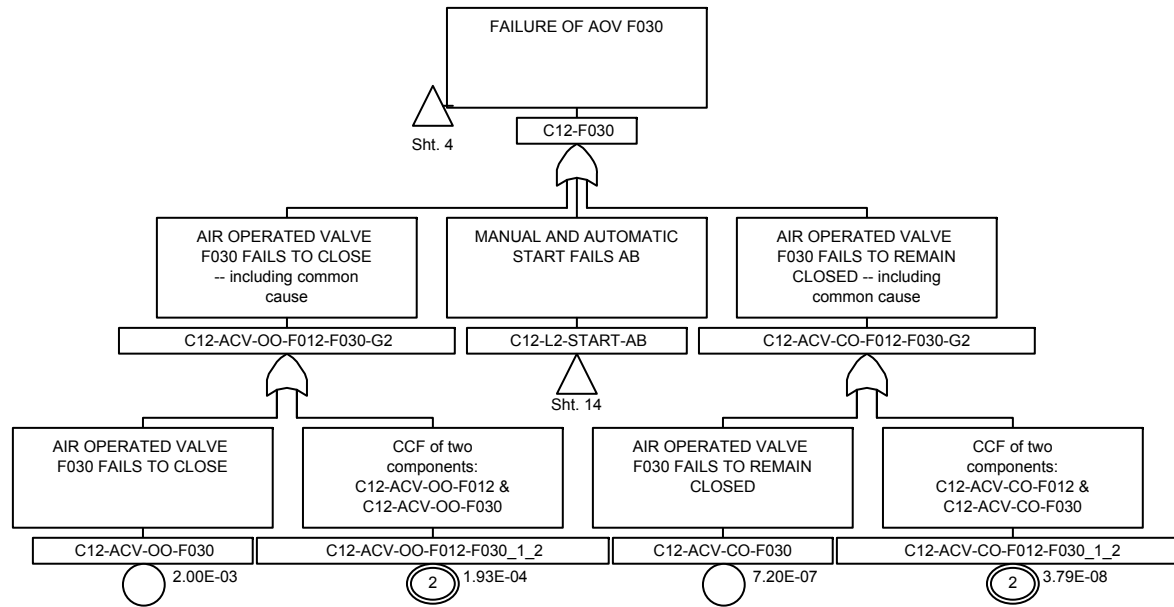


Figure 4.3-2. Sheet 59 Control Rod Drive

## **4.4 STANDBY LIQUID CONTROL SYSTEM - (C41)**

### **4.4.1 Functional Description**

The purpose of the Standby Liquid Control System (SLCS) is to provide a backup function to the Control Rod Drives for reactivity control to assure automatic reactor shutdown from full power given an anticipated transient without scram (ATWS). The SLCS is also used to mitigate loss of coolant accidents LOCA by providing makeup to the Reactor Pressure Vessel (RPV) inventory. The volume of water introduced via SLCS is small and, as a result, the function of SLCS during LOCAs was not considered in the PRA.

Reactor shutdown is achieved by injection of a neutron absorber solution of sodium pentaborate (SPBS) inside the RPV, where it rapidly becomes mixed with the primary reactor coolant. No control rod movement is required. ATWS mitigation logic is provided to initiate SLCS if the startup range neutron monitor (SRNM) power permissive exists (setpoint greater or equal to 6%) and one of the following conditions persists for at least three minutes: High reactor dome gauge pressure of greater or equal to 7.76 MPa; and Low reactor vessel water level (smaller or equal to Level 2). The operator from the control room may also initiate it manually.

### **4.4.2 Assumptions**

The following assumptions with respect to the design are made:

- (1) Conditions in the rooms housing the SLCS accumulators and associated piping necessary for injection of SPBS are controlled to prevent precipitation. Neither heat tracing in the discharge lines nor ventilation dependencies are necessary.
- (2) The PRA success criterion applied to the SLCS is that both trains are required to fulfill the safety function related to control of reactivity to prevent core damage. While the boron from a single accumulator is sufficient to bring the plant to hot shutdown, cold shutdown conditions associated with the largest total water mass in which the particular shutdown concentration must be established and therefore, this condition determines the total mass of boron solution from both accumulator to be injected.
- (3) No maintenance is expected to occur during power operation that makes either train of the SLCS unavailable.
- (4) Initially, each train of the SLCS is in standby mode, with the squib injection valves closed.
- (5) For purposes of the PRA model, the SLCS system is considered to be injection ready upon actuation and does not include the configurations required for preparation and makeup of the SPBS, pressurization of the accumulator or regulation of air supply to the valves.

### **4.4.3 System Description**

The SLCS consists of two trains, each one consisting of a high-pressure accumulator tank containing an enriched SPBS, a main discharge line containing a pair of parallel squib-actuated injection valves; an in-RPV supply header that connects to several sparger tubes, each located inside the core bypass region; a system connection to a high-pressure nitrogen gas supply, and associated valves, piping, local instrumentation, and control.

#### **4.4.3.1 Hardware Configuration**

A simplified diagram of the SLCS is shown on Figure 4.4-1. The SPBS is stored in the accumulator tanks, A001A and A001B. The discharge is through an 80 mm (3 inch nominal) line containing a locked-open isolation valve, F001A and B. Downstream of the isolation valve, two normally open, air operated valves (F002A and C for Train A and F002B and D for Train B) close on a low-level signal from the accumulator to prevent nitrogen injection into the RPV following depletion of the SPBS. Downstream of the air operated valves, F002A & C and F002B & D, the injection line divides into two parallel lines, each of which contains a normally closed squib valve (F003A & C for Train A and F003B & D for Train B). These valves receive an actuation signal to open given the ATWS logic is satisfied. The injection through the squib valves is routed to the RPV via a series of check valves (F004A & F005A in Train A and F004B & F005B in Train B) and a locked-open isolation valve, F006A and B, inside the drywell.

An initial charge of compressed nitrogen to the accumulators ensures full injection of SPBS at a reactor pressure of 6.9 MPa (1000 psia). Pressure makeup to the accumulators in each train of SLCS is supplied through motor-operated valves (F029A and B), and check valves (F028A and B) from the liquid nitrogen tank through a heated nitrogen vaporizer. These charging valves (F029A and B) are operated manually, but automatically close upon actuation of SLCS. Accumulator tank pressure is monitored in the control room and pressure makeup can be initiated manually.

A keylock switch is provided in the control room, which operates two series high-pressure air-operated diaphragm valves (F507A and B and F508A and B) to vent the accumulator tank. These depressurization valves are actuated manually and automatically to prevent nitrogen from getting into the RPV following the injection of the SPBS in the accumulators.

#### **4.4.3 2 System Operation**

During normal plant operation, the system is in standby with the SPBS in the accumulator tanks and the tanks pressure maintained greater than 14.72 MPa gauge (2135 psig) and a volume equal to or greater than 7.8 m<sup>3</sup> (2060 gallons). All valves in the tank discharge line are open except the four squib valves and check valves.

In the event of an ATWS, the four squib valves are fired open given an initiation signal when ATWS logic is satisfied. The SLCS system is automatically initiated with one of the following conditions:

- High reactor vessel dome pressure and SRNM ATWS permissive (setpoint  $\geq$  6% persisting for at least three minutes), or
- Low reactor vessel water level (Level 2) and SRNM ATWS permissive persisting for at least three minutes.

The squib valves can also be fired from the control room by depressing dual, key-lock control switches simultaneously.

Following firing of the squib valves, the SPBS is injected into the RPV. When each tank reaches a set low level setpoint, local instrumentation closes the respective air-operated valves, F002A & C on Train A and F002B & D on Train B, to prevent the injection of nitrogen into the RPV. The same signal that closes valves F002A & C and F002B & D also opens the diverse accumulator

depressurization valves, F507A & F508A on accumulator A001A and F507B & F508B on accumulator A001B, after a delay.

For successful operation of the system to prevent core damage, the injection of the contents of both accumulators in Train A and B through at least one of the two squib valves in each of the trains is required.

Power for the safety functions of the SLCS is supplied from safety-related 120 VAC Uninterruptible Power Station (UPS).

#### ***4.4.3.3 Component Location***

Each train of SLCS equipment is located in a separate room located outside the drywell in the Reactor Building. The high pressure nitrogen processing and supply portion of SLCS is in the Reactor Building

### **4.4.4 Automatic and Manual Control**

#### ***4.4.4.1 Automatic Actuation***

The SLCS is automatically initiated for SPBS injection upon receipt of an ATWS signal. The ATWS signal is supplied by the Distributed Control and Instrumentation System (DCIS).

When the SPBS level in the accumulator tanks have reached the low level setpoint, DCIS provides a signal that closes the shutoff valves F002A & C for accumulator A001A and F002B & D for accumulator A001B. To provide a diverse means of preventing nitrogen injection into the RPV following depletion of SPBS, the nitrogen depressurization valves F507A & B, and F508A & B, are also actuated by the same DCIS signal after a delay.

#### ***4.4.4.2 Manual Actuation***

As a backup to automatic actuation, the operator has the capability to manually initiate the boron injection from the main control room by simultaneously depressing dual, key-locked control switches to actuate the squib valves F003A/B/C/D.

#### ***4.4.4.3 Safety Actuation***

The actuation described in the Automatic and Manual Actuation sections describes the safety-related actuation of the SLCS.

**Instrumentation and Alarms.** The instrumentation and alarm signals provided in the main control room for the SLCS safety-related functions are listed in Table 4.4-1.

### **4.4.5 System Interfaces**

**Support Systems.** The support systems for the SLCS to actuate and isolate injection are either the Distributed Control and Instrumentation System (DCIS) or the Diverse Protection System (DPS). SLCS dependencies are included in the dependency matrix given in Table 4.4-2a. The transfer gates required for SLCS are listed in Table 4.4-2b.



#### **4.4.6 System Testing**

The SLCS is designed with passive and redundant features such that minimum in-service testing is required. Assurance that SLCS design conditions are maintained during plant operation is accomplished by critical parameter alarms and periodic surveillances.

During plant operation, the integrity of the electrical circuits of the squib initiators are continuously monitored by a small current circuit to verify circuit continuity.

The SLCS is tested during plant refueling shutdowns. The system fault tree analysis is based on a test interval of once every two years for all SLCS equipment.

#### **4.4.7 System Maintenance**

No specific maintenance activities are planned or anticipated on the SLCS during normal plant operation. If necessary, all components of the SLCS can be maintained while the plant is in normal operation, subject to Technical Specification requirements and limitations.

Component tests for SLCS are summarized in Table 4.4-3.

#### **4.4.8 Common Cause Failures**

The common-cause failures in the SLCS equipment were identified as the common-cause failure of the redundant squib valves F003A/B/C/D and check valves F004A&B and F005A&B to operate within each train. These failures are included in the PRA analysis. A list of the basic events for common cause failures is contained in Table 4.4-4, SLCS - Common Cause Failures.

#### **4.4.9 Fault Tree Analysis**

The fault tree developed for the SLCS is for a transient initiating event with failure to scram, namely ATWS. Instrumentation and logic for SLCS initiation provided as transfers from DCIS and DPS and are presented herein as separate fault trees, for each squib valve initiation. Beyond the squib valves individually firing, more important is the function of the entire train; each of the two trains are presented as fault trees, both of which are necessary to meet success criteria.

##### ***4.4.9.1 Top Event Definitions***

One top event is developed for the SLCS fault tree analysis:

- C41-CS-TOP1 – 2 OF 2 SLC FAILURE TO INJECT BORON

The top events list defined for SLCS is given in Table 4.4-6.

##### ***4.4.9.2 Fault Tree Description***

The fault tree for C41-CS-TOP1 is presented in Figure 4.4-2.

##### ***4.4.9.3 Human Interactions***

Human errors considered in developing the fault trees include:

- Human error in failing to provide manual initiation of SLCS in the event of failure of automatic initiation, C41-XHE-FO-EQU.

This human error is listed in Table 4.4-5.

#### **4.4.9.4 *Special Events***

There are no special events in SLCS.

#### **4.4.10 Results of Fault Tree Analysis**

A summary of the basic events in the system fault trees are reported in Table 4.4-7 and the dominant cutsets from quantification of the SLCS top event are provided in Table 4.4-8.

The quantification of core damage sequences implicitly includes the contribution of basic events for this system. This quantification process enables the checking of the global consistency of the system fault trees and their relationship with the rest of the systems modeled in the PRA.

The importance measures obtained from core damage frequency equations and large release frequency cutset files allow the identification of the most relevant basic events and system component failures in an integrated context, as well as the determination of their relative importance with respect to the basic events and component failures of the other systems modeled.

#### **4.4.11 PRA Insights**

The SLCS model is dominated by failure of the check valves which prevent injection of a single train. Other risks are primarily common cause failures associated with the failure of the squib valves in the injection path. Additional details are provided in Subsection 5.3 of Data Analysis discussing the CCF of SLCS components.

Sensitivities were performed to evaluate the success criteria for the two trains of SLCS and the uncertainty of the failure data for the squib valves. The results for these sensitivities are discussed in Section 11.

Additional insights for SLCS were generated and are provided in Section 12 for the fire analysis and Section 13 for the flooding analysis.

**Table 4.4-1**  
**SLCS - Control Room Instrumentation and Alarms**

<b>Controls</b>
Air-operated isolation valves F002A/B/C/D open/close
Squib valves F003A/B/C/D open
Accumulator depressurization valves F507A&B and F508 A&B open/close
Temperature and humidity control of SLCS equipment rooms
<b>Displays</b>
Accumulator level
Accumulator pressure
Accumulator temperature
Continuity of electrical signals to squib valves F003A/B/C/D
Valve position for squib valves F003A/B/C/D open/close, penetration check valves F004A&B and F005A&B
Valve position for air-operated isolation valves F002A/B/C/D open/close
Valve position for accumulator depressurization valves F029A/B open/close
Valve position for penetration check valves F004A/B and F005A/B open/close
Temperature indication of the SLCS system rooms (MCR panels)
<b>Alarms</b>
Accumulator level alarms
Accumulator pressure alarms

**Table 4.4-2a**  
**SLCS - System Dependencies**

		Support System	
		Power Control Signal	
Component	Type	C63	C72
F002A	AOV	X	X
F002B	AOV	X	X
F002C	AOV	X	X
F002D	AOV	X	X
F003A	SQV	X	X
F003B	SQV	X	X
F003C	SQV	X	X
F003D	SQV	X	X

**Table 4.4-2b**  
**SLCS - Transfer**

Name	Probability	Description
C63-C41-F002A-A	1.00E-03	ACCUMULATOR 1A LEVEL SIGNAL A FAILURE TO AOV F002A
C63-C41-F002A-B	1.00E-03	ACCUMULATOR 1A LEVEL SIGNAL B FAILURE TO AOV F002A
C63-C41-F002B-A	1.00E-03	ACCUMULATOR 1B LEVEL SIGNAL A FAILURE TO AOV F002B
C63-C41-F002B-B	1.00E-03	ACCUMULATOR 1B LEVEL SIGNAL B FAILURE TO AOV F002B
C63-C41-F002C-A	1.00E-03	ACCUMULATOR 1A LEVEL SIGNAL A FAILURE TO AOV F002C
C63-C41-F002C-B	1.00E-03	ACCUMULATOR 1A LEVEL SIGNAL B FAILURE TO AOV F002C
C63-C41-F002D-A	1.00E-03	ACCUMULATOR 1B LEVEL SIGNAL A FAILURE TO AOV F002D
C63-C41-F002D-B	1.00E-03	ACCUMULATOR 1B LEVEL SIGNAL B FAILURE TO AOV F002D
C63-C41-F003A-A	1.00E-03	DCIS DIVISION A TRANSMISSION FAILURE
C63-C41-F003A-B	1.00E-03	DCIS DIVISION B TRANSMISSION FAILURE
C63-C41-F003A-C	1.00E-03	DCIS DIVISION C TRANSMISSION FAILURE
C63-C41-F003B-A	1.00E-03	DCIS DIVISION A TRANSMISSION FAILURE
C63-C41-F003B-B	1.00E-03	DCIS DIVISION B TRANSMISSION FAILURE
C63-C41-F003B-C	1.00E-03	DCIS DIVISION C TRANSMISSION FAILURE
C63-C41-F003C-A	1.00E-03	DCIS DIVISION A TRANSMISSION FAILURE
C63-C41-F003C-B	1.00E-03	DCIS DIVISION B TRANSMISSION FAILURE
C63-C41-F003C-C	1.00E-03	DCIS DIVISION C TRANSMISSION FAILURE
C63-C41-F003D-A	1.00E-03	DCIS DIVISION A TRANSMISSION FAILURE
C63-C41-F003D-B	1.00E-03	DCIS DIVISION B TRANSMISSION FAILURE
C63-C41-F003D-C	1.00E-03	DCIS DIVISION C TRANSMISSION FAILURE
C72-C41-F003A-DPS	1.00E-03	DPS TRANSMISSION FAILURE
C72-C41-F003B-DPS	1.00E-03	DPS TRANSMISSION FAILURE
C72-C41-F003C-DPS	1.00E-03	DPS TRANSMISSION FAILURE
C72-C41-F003D-DPS	1.00E-03	DPS TRANSMISSION FAILURE
T10-C41-RWCU-ISO-F002A	1.00E-03	FAILURE OF RWCU VALVE F002A TO ISOLATE
T10-C41-RWCU-ISO-F002B	1.00E-03	FAILURE OF RWCU VALVE F002B TO ISOLATE
T10-C41-RWCU-ISO-F003A	1.00E-03	FAILURE OF RWCU VALVE F003A TO ISOLATE

**Table 4.4-2b**  
**SLCS - Transfer**

<b>Name</b>	<b>Probability</b>	<b>Description</b>
T10-C41-RWCU-ISO-F003B	1.00E-03	FAILURE OF RWCU VALVE F003B TO ISOLATE
T10-C41-RWCU-ISO-F007A	1.00E-03	FAILURE OF RWCU VALVE F007A TO ISOLATE
T10-C41-RWCU-ISO-F007B	1.00E-03	FAILURE OF RWCU VALVE F007B TO ISOLATE
T10-C41-RWCU-ISO-F008A	1.00E-03	FAILURE OF RWCU VALVE F008A TO ISOLATE
T10-C41-RWCU-ISO-F008B	1.00E-03	FAILURE OF RWCU VALVE F008B TO ISOLATE

**Table 4.4-3**  
**SLCS - Component Test and Maintenance**

Component	Type	Expected Test Interval
F003A/B/C/D	SQV	31 Days (1)
F002A/B/C/D	AOV	Monthly (2)
F004A/B	UV	During plant outages
F005A/B	UV	During plant outages

(1) A small, current circuit shall be used to verify circuit continuity for receiving squib firing signals. Technical Specifications requires this every 31 days.

(2) Technical Specifications require “each SLC System manual, power-operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position” every 31 days.

**Table 4.4-4**  
**SLCS - Common Cause Failures**

Name	Probability	Description
SQV-CC_1_2	5.56E-05	CCF of two components: C41-SQV-CC-F003A & C41-SQV-CC-F003B
SQV-CC_1_2_3	5.56E-06	CCF of three components: C41-SQV-CC-F003A & C41-SQV-CC-F003B & C41-SQV-CC-F003C
SQV-CC_1_2_4	5.56E-06	CCF of three components: C41-SQV-CC-F003A & C41-SQV-CC-F003B & C41-SQV-CC-F003D
SQV-CC_1_3	5.56E-05	CCF of two components: C41-SQV-CC-F003A & C41-SQV-CC-F003C
SQV-CC_1_3_4	5.56E-06	CCF of three components: C41-SQV-CC-F003A & C41-SQV-CC-F003C & C41-SQV-CC-F003D
SQV-CC_1_4	5.56E-05	CCF of two components: C41-SQV-CC-F003A & C41-SQV-CC-F003D
SQV-CC_2_3	5.56E-05	CCF of two components: C41-SQV-CC-F003B & C41-SQV-CC-F003C
SQV-CC_2_3_4	5.56E-06	CCF of three components: C41-SQV-CC-F003B & C41-SQV-CC-F003C & C41-SQV-CC-F003D
SQV-CC_2_4	5.56E-05	CCF of two components: C41-SQV-CC-F003B & C41-SQV-CC-F003D
SQV-CC_3_4	5.56E-05	CCF of two components: C41-SQV-CC-F003C & C41-SQV-CC-F003D
SQV-CC_ALL	1.50E-04	CCF of all components in group 'SQV-CC'
UV_-CC_1_2	2.84E-07	CCF of two components: C41-UV_-CC-F004A & C41-UV_-CC-F004B
UV_-CC_1_2_3	2.25E-06	CCF of three components: C41-UV_-CC-F004A & C41-UV_-CC-F004B & C41-UV_-CC-F005A
UV_-CC_1_2_4	2.25E-06	CCF of three components: C41-UV_-CC-F004A & C41-UV_-CC-F004B & C41-UV_-CC-F005B
UV_-CC_1_3	2.84E-07	CCF of two components: C41-UV_-CC-F004A & C41-UV_-CC-F005A
UV_-CC_1_3_4	2.25E-06	CCF of three components: C41-UV_-CC-F004A & C41-UV_-CC-F005A & C41-UV_-CC-F005B
UV_-CC_1_4	2.84E-07	CCF of two components: C41-UV_-CC-F004A & C41-UV_-CC-F005B
UV_-CC_2_3	2.84E-07	CCF of two components: C41-UV_-CC-F004B & C41-UV_-CC-F005A
UV_-CC_2_3_4	2.25E-06	CCF of three components: C41-UV_-CC-F004B & C41-UV_-CC-F005A & C41-UV_-CC-F005B
UV_-CC_2_4	2.84E-07	CCF of two components: C41-UV_-CC-F004B & C41-UV_-CC-F005B
UV_-CC_3_4	2.84E-07	CCF of two components: C41-UV_-CC-F005A & C41-UV_-CC-F005B
UV_-CC_ALL	1.37E-05	CCF of all components in group 'UV_CC'



**Table 4.4-5**  
**SLCS - Human Error Events**

<b>Name</b>	<b>Probability</b>	<b>Description</b>
C41-XHE-FO-EQU	1.61E-03	OPERATOR FAILS TO ACTUATE SLCS

**Table 4.4-6**  
**SLCS – Top Event**

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C41-CS-TOP1	2 of 2 SLC Failure to Inject Boron	1

**Table 4.4-7**  
**SLCS - Basic Events**

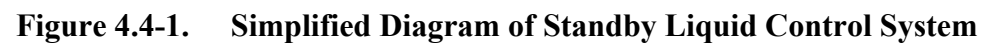
<b>Name</b>	<b>Probability</b>	<b>Description</b>
C41-ACV-OC-F002A	3.72E-05	AIR OPERATED VALVE F002A FAILS TO REMAIN OPEN
C41-ACV-OC-F002B	3.72E-05	AIR OPERATED VALVE F002B FAILS TO REMAIN OPEN
C41-ACV-OC-F002C	3.72E-05	AIR OPERATED VALVE F002C FAILS TO REMAIN OPEN
C41-ACV-OC-F002D	3.72E-05	AIR OPERATED VALVE F002D FAILS TO REMAIN OPEN
C41-BV_-OC-F001A	2.63E-04	MAINTENANCE VALVE F001A PLUGS/TRANSFERS CLOSED
C41-BV_-OC-F001B	2.63E-04	MAINTENANCE VALVE F001B PLUGS/TRANSFERS CLOSED
C41-BV_-OC-F006A	2.63E-04	MAINTENANCE VALVE F006A PLUGS/TRANSFERS CLOSED
C41-BV_-OC-F006B	2.63E-04	MAINTENANCE VALVE F006B PLUGS/TRANSFERS CLOSED
C41-SLLINJFACTOR	2.30E-02	FACTORS APPORTIONING SSL-LOCA BREAKS SLCS INJECTION LINE BREAK
C41-SQV-CC-F003A	3.00E-03	EXPLOSIVE VALVE F003A FAILS TO OPERATE
C41-SQV-CC-F003B	3.00E-03	EXPLOSIVE VALVE F003B FAILS TO OPERATE
C41-SQV-CC-F003C	3.00E-03	EXPLOSIVE VALVE F003C FAILS TO OPERATE
C41-SQV-CC-F003D	3.00E-03	EXPLOSIVE VALVE F003D FAILS TO OPERATE
C41-TNK-RP-A001A	2.40E-06	ACCUMULATOR A001A FAILS CATASTROPHICALLY
C41-TNK-RP-A001B	2.40E-06	ACCUMULATOR A001B FAILS CATASTROPHICALLY
C41-UV_-CC-F004A	8.00E-04	CHECK VALVE F004A FAILS TO OPEN
C41-UV_-CC-F004B	8.00E-04	CHECK VALVE F004B FAILS TO OPEN
C41-UV_-CC-F005A	8.00E-04	CHECK VALVE F005A FAILS TO OPEN
C41-UV_-CC-F005B	8.00E-04	CHECK VALVE F005B FAILS TO OPEN

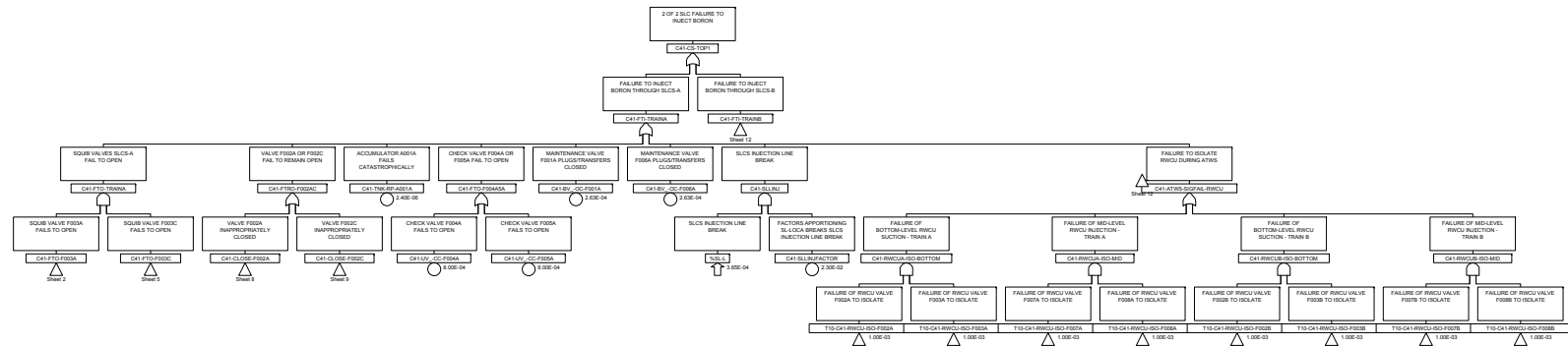
**Table 4.4-8**  
**SLCS - Cutsets**

For each system top event, the dominant cutsets are shown below.

**C41-CS-TOP1 2 OF 2 SLC FAILURE TO INJECT BORON**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
8E-04	13.2	C41-UV_-CC-F004A	8E-04	CHECK VALVE F004A FAILS TO OPEN
8E-04	13.2	C41-UV_-CC-F004B	8E-04	CHECK VALVE F004B FAILS TO OPEN
8E-04	13.2	C41-UV_-CC-F004C	8E-04	CHECK VALVE F005A FAILS TO OPEN
8E-04	13.2	C41-UV_-CC-F004D	8E-04	CHECK VALVE F005B FAILS TO OPEN
3.72E-04	6.1	C41-ACV-OC-F002A	3.72E-04	AIR OPERATED VALVE F002A FAILS TO REMAIN OPEN
3.72E-04	6.1	C41-ACV-OC-F002B	3.72E-04	AIR OPERATED VALVE F002B FAILS TO REMAIN OPEN
3.72E-04	6.1	C41-ACV-OC-F002C	3.72E-04	AIR OPERATED VALVE F002C FAILS TO REMAIN OPEN
3.72E-04	6.1	C41-ACV-OC-F002D	3.72E-04	AIR OPERATED VALVE F002D FAILS TO REMAIN OPEN
2.63E-04	4.3	C41-BV_-OC-F001A	2.63E-04	MAINTENANCE VALVE F001A PLUGS/TRANSFERS CLOSED
2.63E-04	4.3	C41-BV_-OC-F001B	2.63E-04	MAINTENANCE VALVE F001B PLUGS/TRANSFERS CLOSED
2.63E-04	4.3	C41-BV_-OC-F006A	2.63E-04	MAINTENANCE VALVE F006A PLUGS/TRANSFERS CLOSED
2.63E-04	4.3	C41-BV_-OC-F006B	2.63E-04	MAINTENANCE VALVE F006B PLUGS/TRANSFERS CLOSED





**Figure 4.4-2. Standby Liquid Control System Fault Tree**

Sheet 1

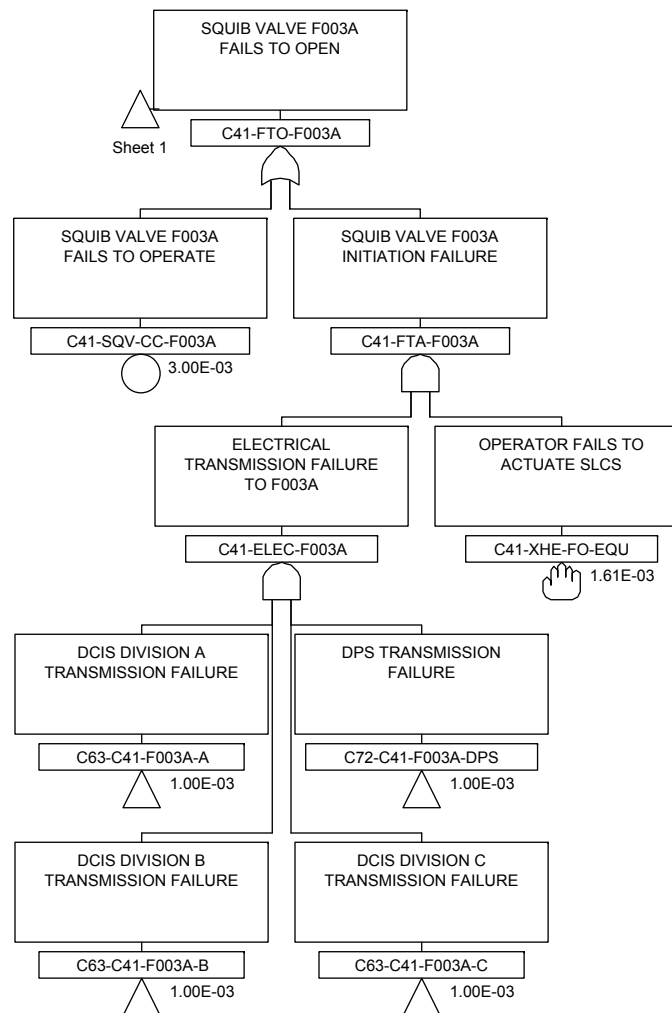


Figure 4.4-2. Sheet 2 Standby Liquid Control System Fault Tree

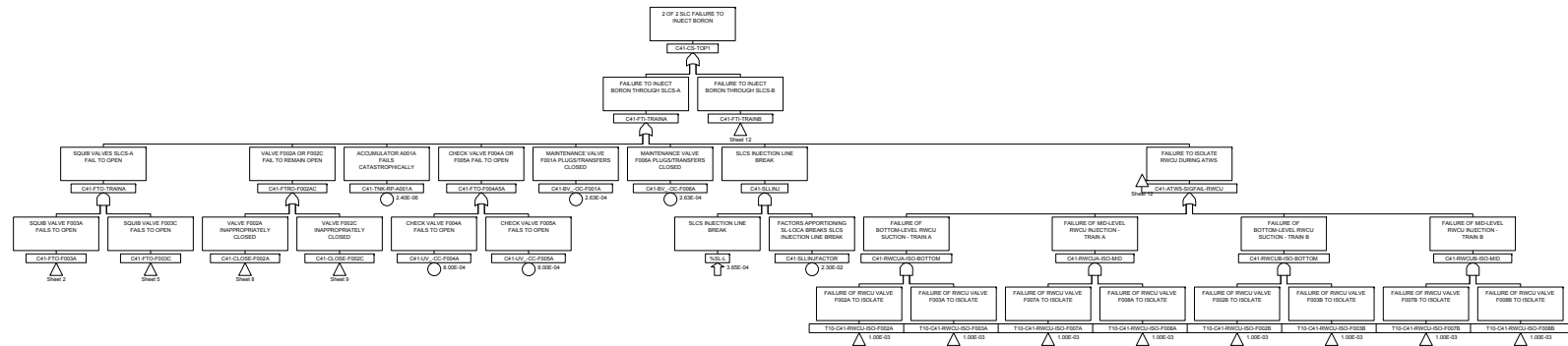


Figure 4.4-2. Sheet 3 Standby Liquid Control System Fault Tree



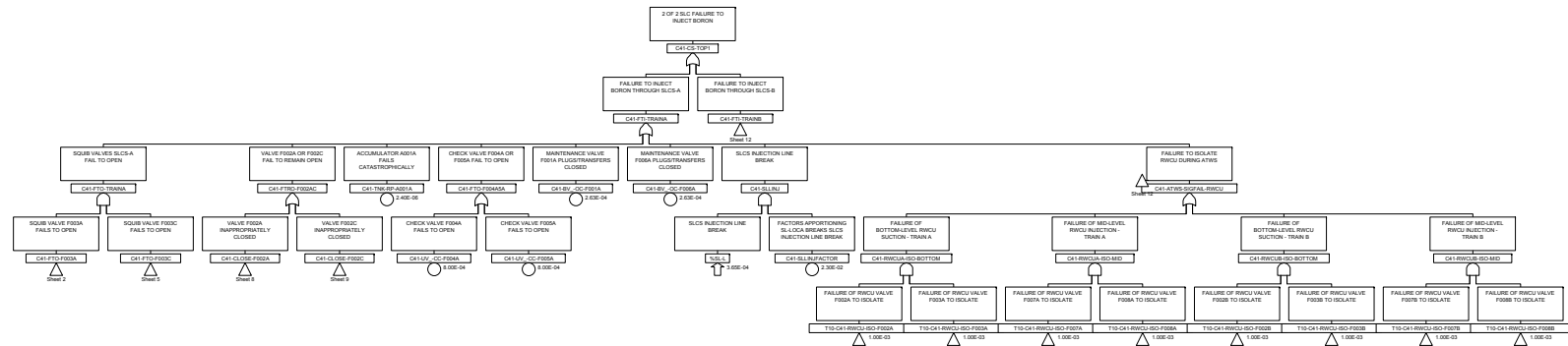


Figure 4.4-2. Sheet 4 Standby Liquid Control System Fault Tree

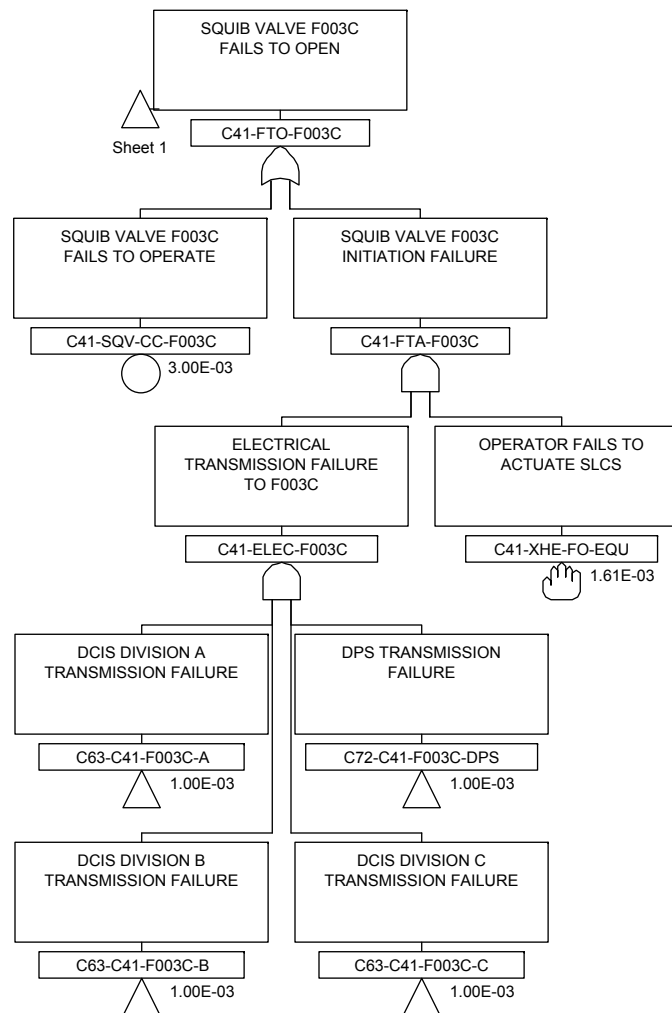


Figure 4.4-2. Sheet 5 Standby Liquid Control System Fault Tree

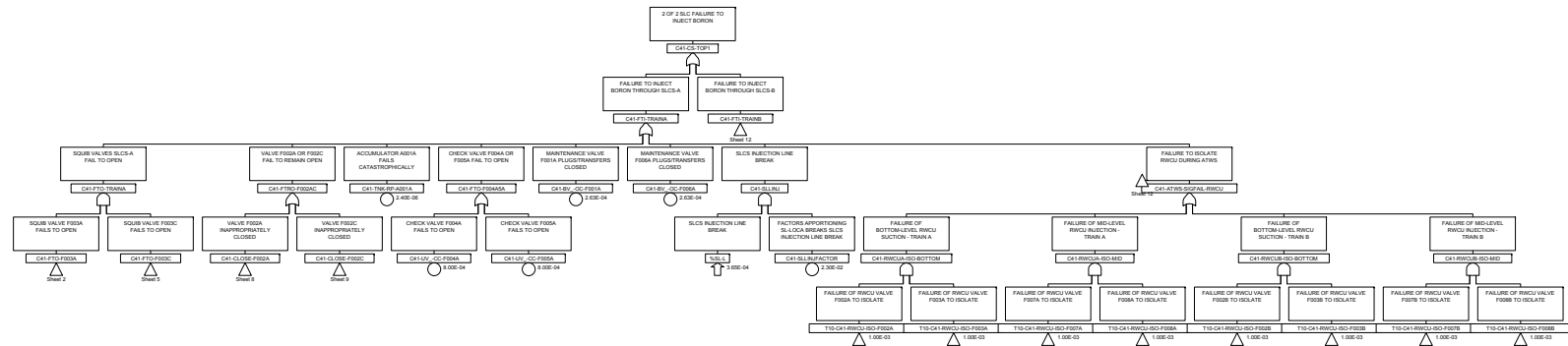


Figure 4.4-2. Sheet 6 Standby Liquid Control System Fault Tree

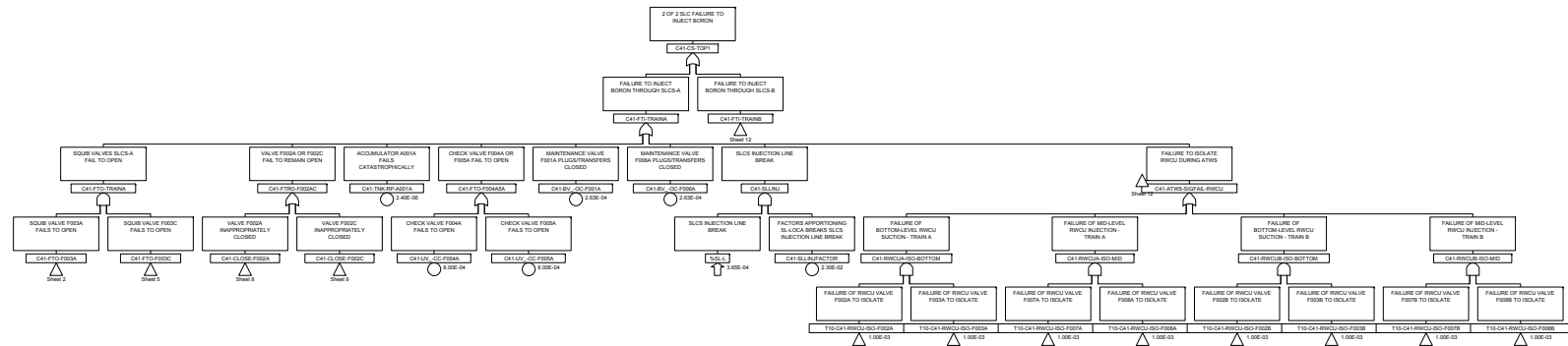


Figure 4.4-2. Sheet 7 Standby Liquid Control System Fault Tree

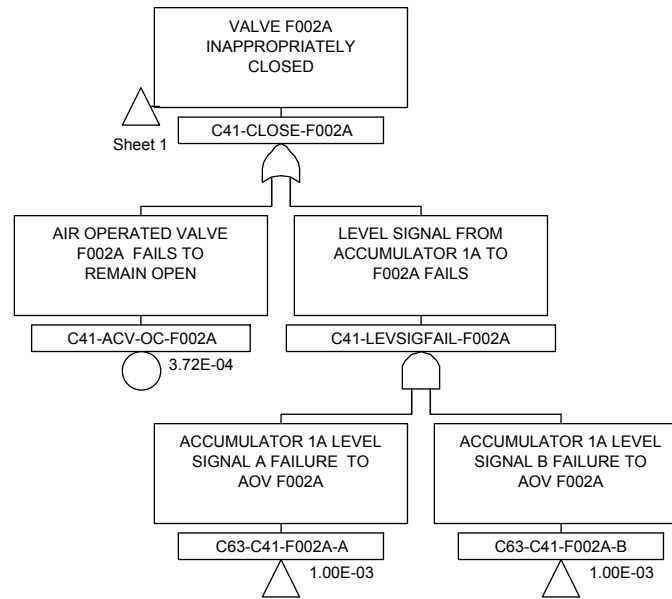


Figure 4.4-2. Sheet 8 Standby Liquid Control System Fault Tree

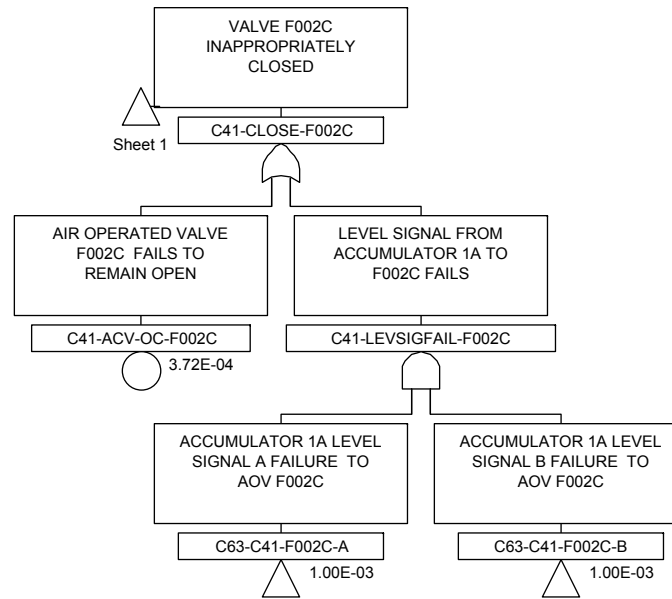


Figure 4.4-2. Sheet 9 Standby Liquid Control System Fault Tree

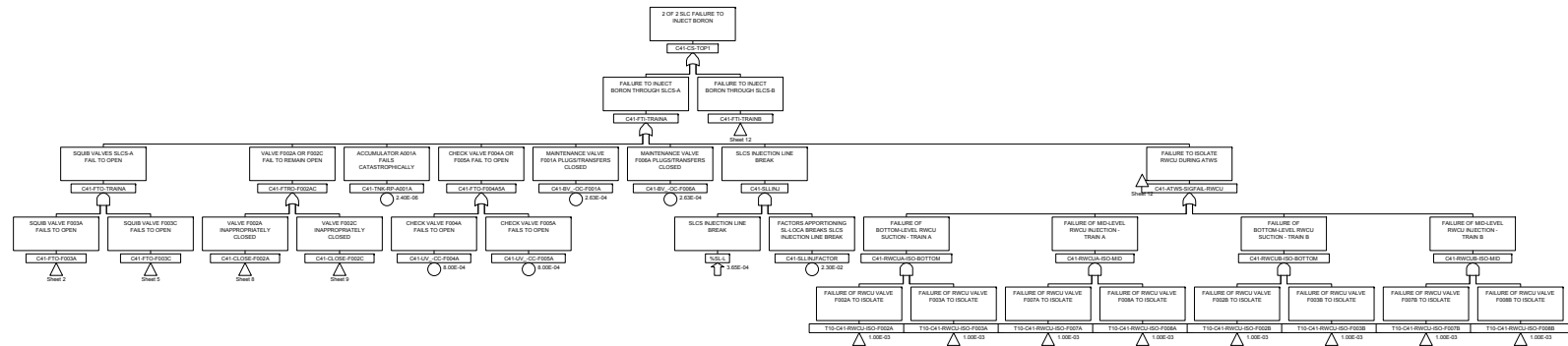


Figure 4.4-2. Sheet 10 Standby Liquid Control System Fault Tree

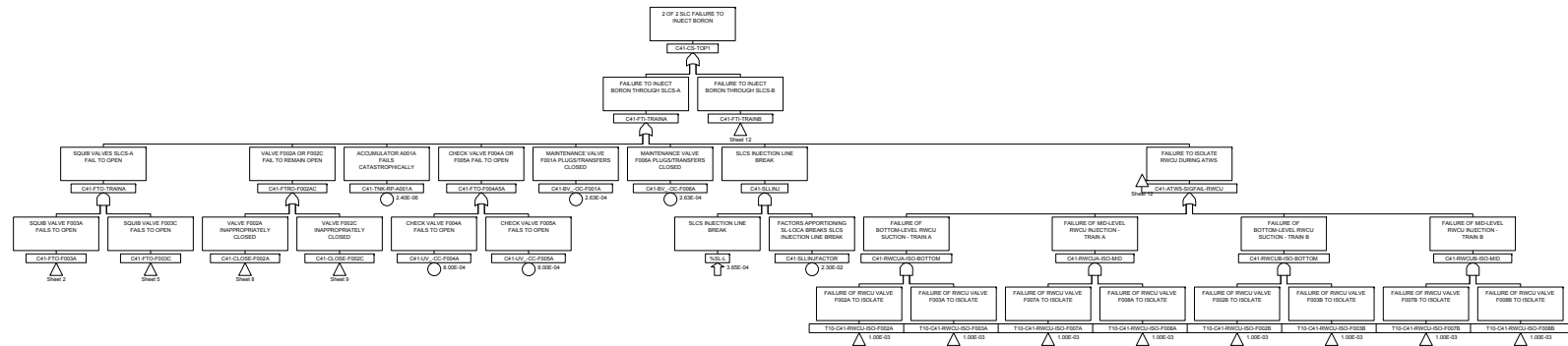


Figure 4.4-2. Sheet 11 Standby Liquid Control System Fault Tree



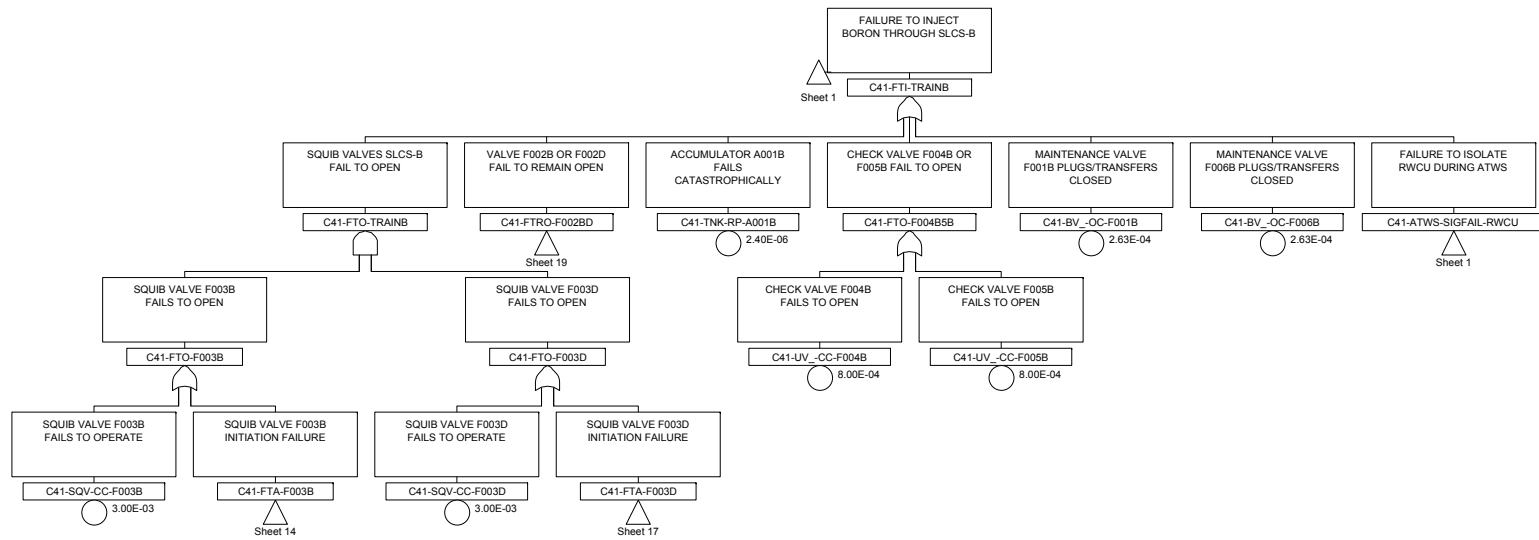


Figure 4.4-2. Sheet 12 Standby Liquid Control System Fault Tree

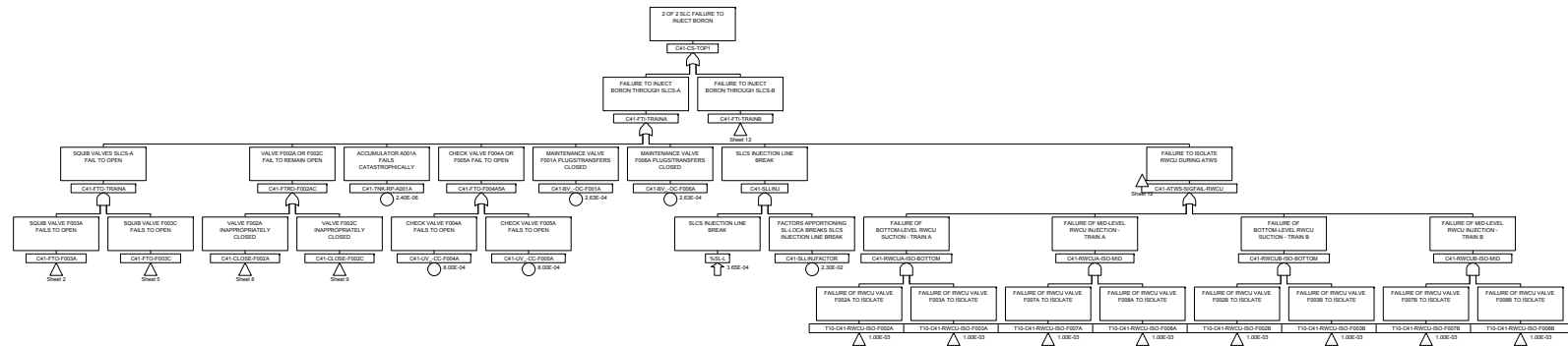


Figure 4.4-2. Sheet 13 Standby Liquid Control System Fault Tree

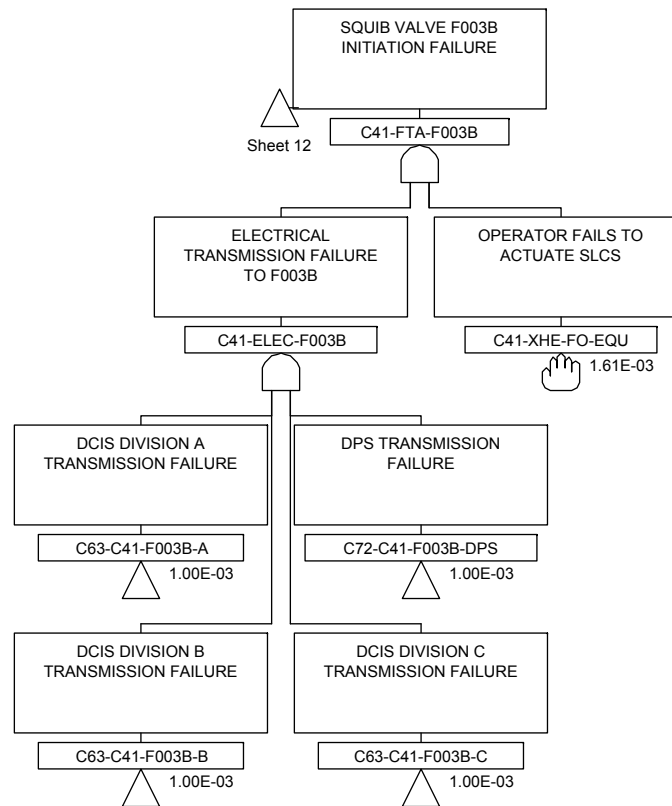


Figure 4.4-2. Sheet 14 Standby Liquid Control System Fault Tree

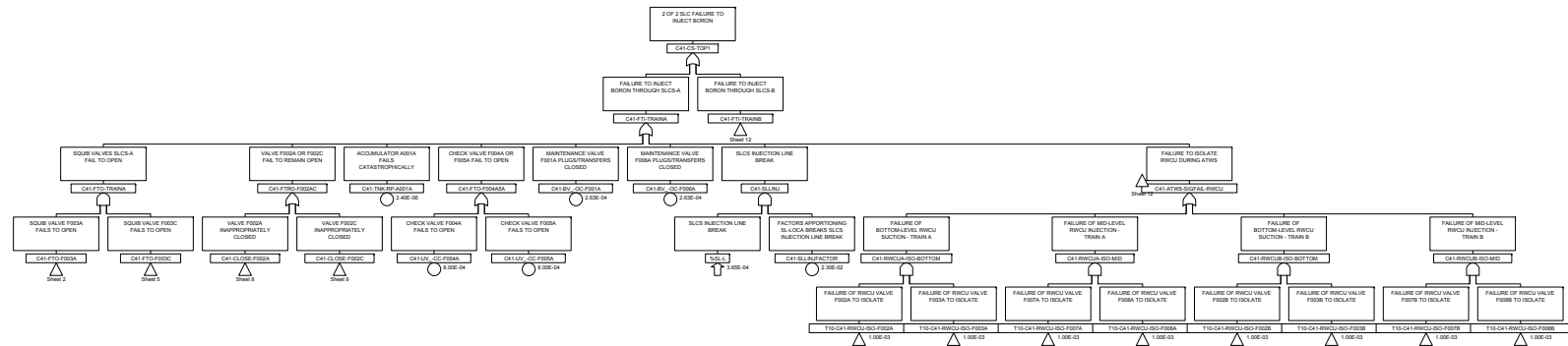


Figure 4.4-2. Sheet 15 Standby Liquid Control System Fault Tree

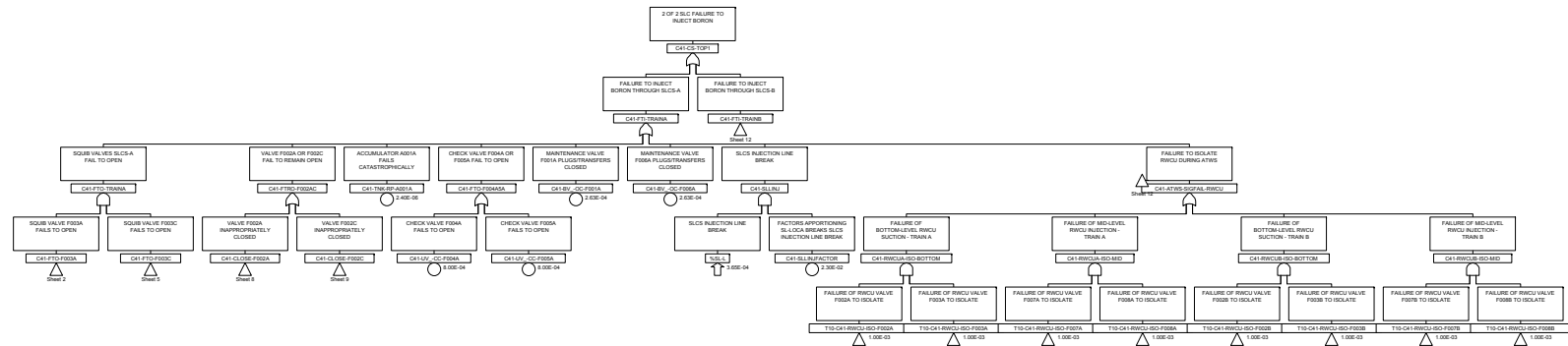


Figure 4.4-2. Sheet 16 Standby Liquid Control System Fault Tree

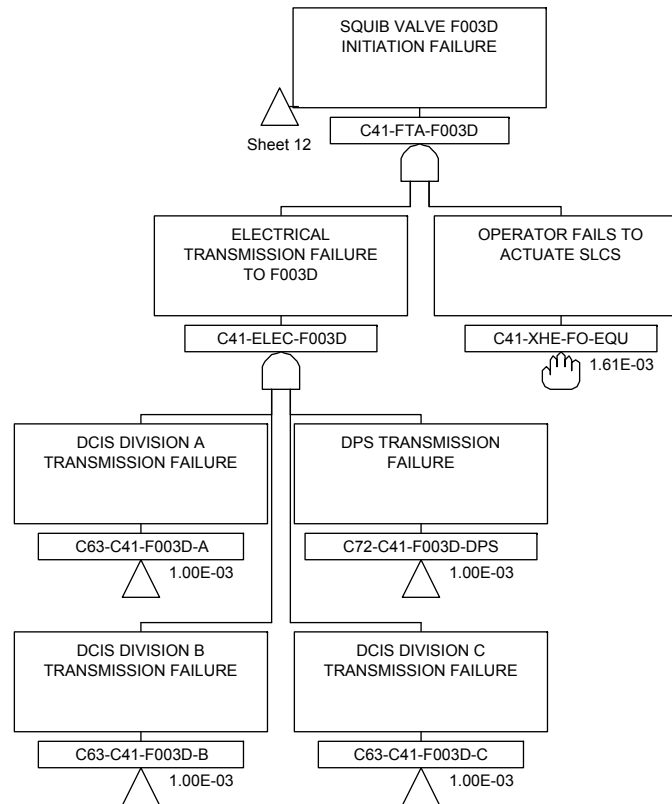


Figure 4.4-2. Sheet 17 Standby Liquid Control System Fault Tree

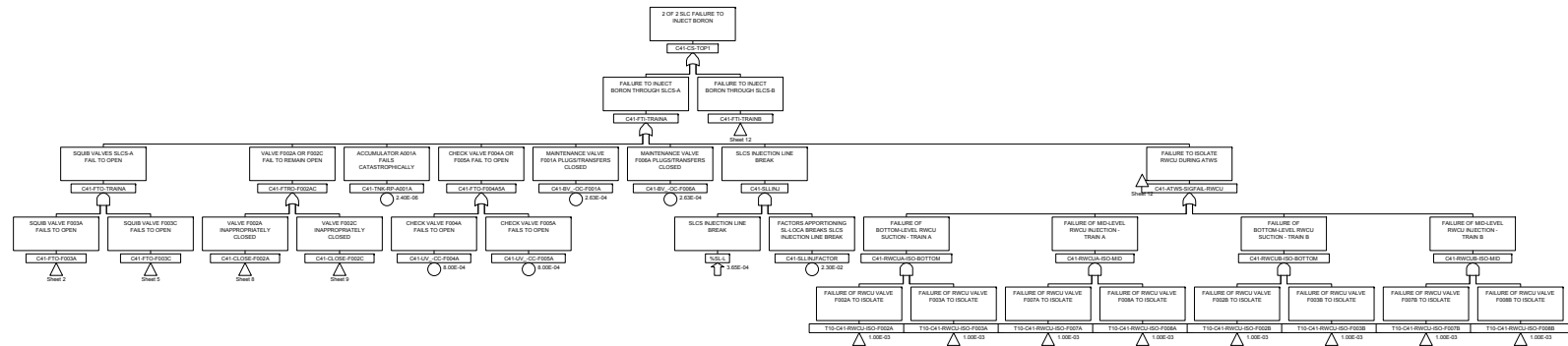


Figure 4.4-2. Sheet 18 Standby Liquid Control System Fault Tree

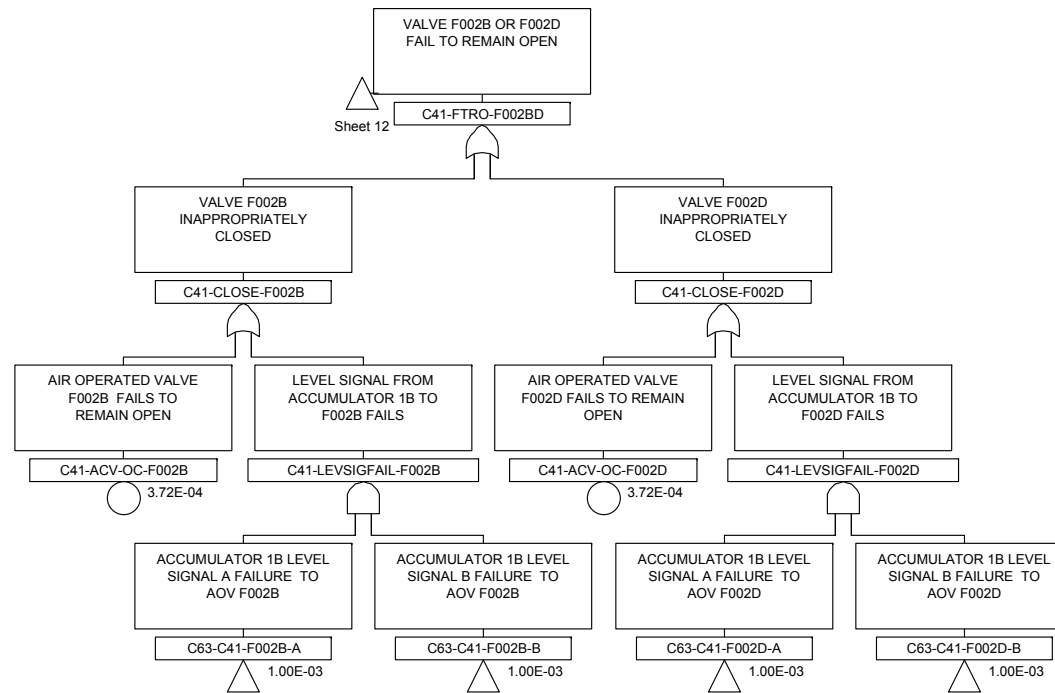


Figure 4.4-2. Sheet 19 Standby Liquid Control System Fault Tree



## 4.5 INSTRUMENTATION, LOGIC AND CONTROL SYSTEM – (C62, C63, C71, C72 AND C74)

### 4.5.1 Functional Description

The ESBWR Instrumentation, Logic and Control (I&C) System provides a centralized set of equipment for implementing safety and nonsafety-related logic functions.

The ESBWR Instrumentation, Logic and Control (I&C) System is made up of the safety related Distributed Control and Information System (Q-DCIS), and the Nonsafety-Related Distributed Control and Information System (N-DCIS). The I&C subsystems and primary functions included in the Probabilistic Risk Assessment are shown below:

- (1) Q-DCIS subsystem (Safety-related)
  - a. RTIF provides the following functions
    - i. Reactor Protection System (RPS)
    - ii. Main Steam Isolation Valve (MSIV) closure signal (LD&IS)
  - b. Independent Control Platforms
    - i. ATWS/SLC
    - ii. VBIF – Vacuum Breaker Isolation Function
    - iii. Independent Control Platform for HP CRD Isolation Bypass
    - iv. ICS DPV Isolation Function
  - c. Neutron Monitoring System
  - d. SSLC/ESF provides signals for ECCS systems
    - i. ECCS actuation functions
    - ii. LD&IS isolation functions
- (2) N-DCIS subsystem (nonsafety-related)
  - a. Diverse Protection System (DPS)
  - b. Plant Investment Protection Systems (PIP-A and PIP-B)
  - c. BOP Control

The Q-DCIS subsystem processes signals for the Reactor Trip and Isolation Functions (RTIF), Neutron Monitoring System (NMS), Independent Control Platform, and SSLC/ESF Systems as noted below:

The Reactor Protection System (RPS) processes the automatic and manual signals that act on system Control Rod Drive (primary and backup control rod scram).

The RTIF Leak Detection & Isolation System provides a MSIV closure signal (MSIV isolation).

The Independent Control Platforms include:

- The ATWS/SLC system processes the automatic and manual signals that act on SLCS, as well as the feedwater runback and ADS inhibits signals.
- The VBIF processes the automatic and manual signals that act on the drywell to wetwell vacuum breakers to allow isolation for pressure suppression and continued operation of PCCS. This model is discussed separately under Section 4.18.
- Independent Control Platform for HP CRD Isolation Bypass function automatically bypasses the HP CRD injection isolation (intended to prevent the over-pressurization of the containment and therefore loss of long-term containment integrity) to compensate for a failure of the GDCS to inject. The automatic and manual signals open the HP CRD Bypass valves when a GDCS signal is replicated, but the level in the GDCS pools has not changed.
- The ICS DPV isolation function ensures that, upon detection of DPV open position, there is no loss of long-term containment integrity.

The Neutron Monitoring System provides signals from the SRNM and PRNM (APRM function systems to ATWS/SLC logic.

The SSLC/ESF systems processes the automatic and manual signals that act on the following systems: Isolation Condenser System, Gravity Driven Cooling System, High Pressure Nitrogen Supply System, Nuclear Boiler System (ADS signal) and Containment System (LD&IS for ICS, SLC, Feedwater, High Pressure Nitrogen and RWCU).

The N-DCIS subsystem processes signals for the Diverse Protection System, Plant Investment Protection Systems, and BOP control systems as noted below:

- The DPS system processes the automatic and manual signals that act on the following systems: Control Rod Drive (DPS RPS signal, ARI actuation signal and FMCRD Run-In signal), Nuclear Boiler System (Manual SRV actuation, ADS signal, MSIV isolation, and DPS ADS Inhibit signal), Gravity Driven Cooling System, Isolation Condenser System (actuation, isolation signals and IC pool cross-connect signal), Feedwater (Runback signal and Feedwater isolation signal), and RWCU (RWCU/SDC isolation signal).
- The PIP Control systems process the automatic and manual signals that act on the following systems: Control Rod Drive, Fuel and Auxiliary Pools Cooling System, Reactor Water Cleanup/Shutdown Cooling System, Reactor Component Cooling Water System, Plant Service Water System, Instrument Air System, High Pressure Nitrogen Supply System, Service Air System, and Dedicated LPCI Backup System.
- The BOP Control system processes the automatic and manual signals that act on the following systems: Condensate and Feedwater System, Turbine Component Cooling Water System, Condensate Storage and Transfer System.

Each of these subsystems is comprised of the corresponding part of the Q-DCIS or N-DCIS that provides distributed control and instrumentation data communications networks. The networks support the monitoring and control of interfacing plant systems and the logic (firmware or microprocessor-based, software-controlled, processing modules) located in the control building cabinets and VDUs in the Main Control Room area.

The Q-DCIS systems, RPS, LD&IS, ATWS/SLC, ICP for HP CRD Isolation Bypass, NMS, and SSLC/ESF are composed of four independent and separated instrumentation divisions I, II, III, and IV (logic channels), while the N-DCIS systems DPS, two PIP control systems (PIP-A, and PIP-B), and BOP Control systems are made up of dual or triple redundant processors.

#### 4.5.2 Assumptions

The following assumptions with respect to the design are made:

- (1) Power supplies are not included in the modeling of Reactor Protection System since the de-energizing the circuits leads to success.
- (2) DPS is assumed to acquire its signals from N-DCIS (sensors/transmitters, transducers). Except for these modeled dependencies, it is assumed that there are no common cause failures between N-DCIS and DPS components or software. This assumption is based on differences in expected usage, testing and maintenance requirements for systems required for plant operation vs. requirements for DPS standby functions.
- (3) DPS power supplies to loads and processors are assumed to be non-safety uninterruptible power.
- (4) For most solenoid valves, it is assumed that there are two load drivers in series needed to actuate the valve (isolation, actuation solenoids). It is assumed that three load drivers in series are needed to actuate squib valves.
- (5) DPS includes RPS signal. . The DPS RPS scram initiation logic is “energize-to-actuate” with the trip signal applied at the return side of the 120 VAC circuit for the CRD hydraulic control unit (HCU) scram pilot valve solenoids.
- (6) Q-DCIS and N-DCIS hardware is assumed to be bounded by the modeled design. This consists of sensors/transmitters, transducers, and RMUs or instrument panels in the field with dual power supplies. The field RMUs feed logic cabinets that consist of dual or triple redundant main processors, and dual power supplies. The PRA does not explicitly model additional output RMUs, but represents them with load drivers.
- (7) Common cause failure of software is provided on a platform level. For example, the C63-CCFSOFTWARE basic event represents the failure of the entire Q-DCIS platform to actuate all supported functions, including manual actuations.
- (8) Diverse platforms do not share any common cause failure modes, including software failures.
- (9) Common cause failure of software to actuate is assumed to be diverse from common cause failure of software that introduces spurious isolations. These are considered to be extreme failure conditions of the same system, and are therefore different from each other. They are not allowed to occur simultaneously, but are modeled as different failure modes.
- (10) External HVAC dependency is not included for any Q-DCIS cabinet since the generated heat is removed passively (except possibly by small chassis mounted fans). HVAC dependencies for N-DCIS are not modeled because the effects associated with HVAC failures have already been covered by the modeled dependencies such as power supplies and cooling water, etc. Finally, HVAC is not modeled for DPS because most of the DPS

functions are demanded in the early stages of the accident scenario (ARI, FMCRD, Feedwater runback, ICS actuation, DPV and GDCS squib valves). The few remaining loads (GDCS equalizing squib valves) are not needed until much later in the accident scenarios and the models include long term power failures.

- (11) The PRA uses a simplified model for NMS. The PRA models treat the NMS signals as sensor/transmitters and TLUs that send a trip signal to the TLUs for RPS/MSIV and ATWS/SLC logic. Power supplies are not included in the modeling of Reactor Protection System since the de-energizing the circuits lead to success. However, it is assumed that NMS uses the same divisional power as the ATWS/SLC processors.
- (12) A common cause software failure probability of  $1.0\text{E-}04$  is assumed in the PRA. This is a screening value that has been determined to be appropriate for ESBWR design certification purposes. This value reasonably bounds the uncertainties associated with the digital DCIS systems. It also generates meaningful risk insights and identifies potential DCIS system vulnerabilities for ESBWR design certification without masking the PRA results. .
- (13) A spurious common cause software probability of  $1.0\text{E-}04$  is assumed in the PRA. This is a screening value that has been determined to be appropriate for ESBWR design certification purposes. This value reasonably bounds the uncertainties associated with the digital DCIS systems. It also generates meaningful risk insights and identifies potential DCIS system vulnerabilities for ESBWR design certification without masking the PRA results.
- (14) The Independent Control Platform (ICP) designed for ICS DPV isolation function is not susceptible to common cause failure of software across divisions.

#### 4.5.3 System Description

The Instrumentation Logic and Control (I&C) System analysis described here refers to the system configuration shown in Figures 4.5-1 and 4.5-2. This system is defined based upon acceptance criteria that describe the bounding functionality and design to which the system must conform. The I&C system DCD is being reviewed based on Design Acceptance Criteria (DAC). Under this process, the NRC does not require the system design to approve the application. As such, detailed design information and the final physical implementation are not yet available.

The PRA models for RPS/MSIV, SSLC/ESF, DPS, ATWS/SLC, HP CRD Bypass, ICS DPV isolation, PIP, and BOP include corresponding sensors/transmitters, transducers, power supplies, power dependencies, analog or digital trip modules, load rivers, main processors and applicable platform common cause software failure. However, these models exclude HVAC. The PRA models treat the NMS signals as sensor/transmitters and TLUs that send a trip signal to the TLUs for RPS/MSIV and ATWS/SLC logic.

The I&C system is designed to accomplish both safety-related and nonsafety-related functions.

The safety-related functions are those designed for the following:

- To lead to an automatic reactor scram when plant conditions reach safety limits,
- To provide automatic and manual actuation of safety-related systems, thus limiting the consequences of accidents, and

- To collect plant data and alert the operator to any abnormal plant conditions so that corrective action can be initiated to prevent a reactor scram.

The nonsafety-related functions are designed for the following:

- To provide the automatic or manual control of the Balance of Plant (BOP) systems from the control room,
- To provide backup manual and automatic actuation of safety-related functions. DPS provides diverse reactor scram functions, diverse emergency core cooling actuation, and performs selected containment isolation functions, and
- To provide manual and automatic actuation of all non-safety systems.

Some basic characteristics of ESBWR I&C are reported in Reference 4-4.

#### ***4.5.3.1 Hardware Configuration***

Q-DCIS logic cabinets reside in four independent and separated instrumentation divisions. Q-DCIS integrates the control logic in each division into firmware or microprocessor-based, software-controlled, processing modules located in divisional rooms in the basement of the Control building.

Each division performs functionally identical logical operations on the processed sensor signals to initiate protective action. Q-DCIS provides the interface function for RPS, NMS and SSLC/ESF protection systems.

Q-DCIS uses fiber optic cables to provide distributed control and instrumentation data communication networks to support the monitoring and control of interfacing plant systems.

Q-DCIS has independent and separated data multiplexing divisions. Each Q-DCIS division contains a redundant fiber optic network that comprises of RMUs, fiber optic signal transmission path, and isolated digital interfaces. The network connects RMUs with: divisional Safety-related VDUs, RPS and NMS Digital Trip Modules, SSLC/ESF CIMs, RPS, NMS and SSLC/ESF Cabinets, and Test Cabinets, located in each of the Q-DCIS safety related equipment rooms in the control and reactor buildings. The network also interfaces with N-DCIS through isolated digital gateways/datalinks. Q-DCIS acquires, formats, and transmits plant sensor data and control commands within the time response requirements of the safety-related systems with which it interfaces.

N-DCIS logic cabinets reside in two divisionally separated rooms, on the floor above the control room. DPS resides in a compartment in the control building separate of the N-DCIS rooms.

N-DCIS uses fiber optic cables to provide distributed control and instrumentation data communication networks to support the monitoring and control of interfacing plant systems.

N-DCIS has independent and separated data multiplexing divisions. Each N-DCIS segment contains a redundant fiber optic network that comprises of RMUs, fiber optic signal transmission path, and isolated digital interfaces. The network connects nonsafety-related VDUs, and several RMUs located in each of the equipment rooms in different buildings. N-DCIS acquires, formats, and transmits plant sensor data and control commands within the time response requirements of the safety-related systems with which it interfaces.

The main equipment, or software equivalent function, in each division considered in the PRA model development and the functions performed are described below. However, it should be noted that the PRA does not include every component. The PRA uses simplified representative models that capture the most significant components (e.g. sensors, processors, load drivers), functions (2 out of 4 logic), and dependencies (power).

#### RPS or MSIV LD&IS

- Digital Trip Module (DTM) - Sensor channel trip decisions (comparison of input variables to programmed setpoints).
- Trip Logic Unit (TLU) - The TLU Logic trains in each division are redundant but not independent modules. Each divisional TLUs receives the trip status from the DTMs in all four divisions and performs 2-out-of-4 logic to determine the actuation status for each system function. The TLUs are located in the logic cabinet (per division).
- Bypass Unit (BPU) - Division-of-sensors bypass and division maintenance bypass functions that permit on-line calibration, test, and repair without causing a trip or MSIV isolation.
- Output Logic Unit (OLU) – The OLUs perform division trip, seal-in, reset and trip test functions. Each OLU receives bypass inputs from the RPS BPU, trip inputs from the TLU of the same division, and various manual inputs from switches within the same division. Each OLU provides trip outputs to the trip actuators.
- Load Drivers - The load drivers/discrete outputs are solid-state power switches, directing appropriate currents to devices such as the scram pilot valve solenoids, air operated valves, and explosive-actuated squib valves. The output of each divisional OLU is sent to two different load drivers. Each load driver belongs to one of two load drivers groups (arranged in a series/parallel/series load driver group). The output of each load drivers group feeds one of the solenoids. The combined arrangements of the two groups of load drivers yields an equivalent second 2-out-of-4 signal processing used for de-energizing for the RPS or MSIV solenoids.
- Cabinets - RPS logic cabinets are located in the divisional, safety-related rooms in the basement of the Control building.

#### ATWS/SLC

- Analog Trip Modules - Sensor channel trip decisions (comparison of input variables to setpoint).
- ATWS logic processors - The ATWS Logic trains in each division are redundant but not independent modules. Each of the ATWS logic processors receives the trip status from the ATMs in all four divisions and performs 2-out-of-4 logic to determine the actuation status for each system function. The ATWS logic processors are located in the RTIF logic cabinet (per division). The trip signals are sent to load drivers, or to DPS for further processing (Feedwater Runback function).
- Load Drivers - The load drivers/discrete outputs are solid-state power switches, directing appropriate currents to devices such as the scram pilot valve solenoids, air operated

valves, and explosive-actuated squib valves. Output of the ATWS/SLC logic processor is sent to SLC squib valve load drivers.

- Cabinets – ATWS/SLC logic resides on the RTIF cabinet and is part of Q-DCIS. However, the ATWS logic processors are separate and diverse from RPS circuitry.

#### NMS

- NMS Digital Trip Module – Sensor channel trip decisions from SRNM or PRNM-APRM function (comparison of input variables to setpoint).
- NMS Trip Logic Unit - The NMS Trip Logic Unit in each division receives the trip status from the NMS Digital Trip Module in all four divisions and performs 2-out-of-4 logic to determine the actuation status for each system function.
- Bypass Unit (BPU) - Division-of-sensors bypass and division maintenance bypass functions that permit on-line calibration, test, and repair without trips signals for RPS or ATWS/SLC logic.
- Output signal – Trip status to RTIF TLU, and ATWS/SLC. NMS Trip Logic Unit sends a NMS-isolated digital trip signal (voted two-out-of-four in the NMS TLU) to each division of the RPS/MSIV trip logic unit.
- Cabinets – The NMS VLU functions reside in the corresponding divisional logic cabinet.

#### SSLC/ESF

- Digital Trip Module (DTM) function- Sensor channel trip decisions (comparison of input variables to programmed setpoints).
- Voter Logic Unit (VLU) function- The Voter Logic functional trains in each division are redundant but not independent. The VLU functional trains receive the trip status from the DTMs in all four divisions.. The VLU functions are implemented in the SSLC/ESF triply redundant logic and processors and the results of the two-out-of-four vote is sent to the two or three separate load drivers/discrete outputs in the RMUs. Each load driver/discrete output is individually addressed and all two (solenoid) or three (squib initiator) load drivers/discrete outputs must close to operate the solenoid/squib initiator.
- Load Drivers VLU Output Logic Confirmation - The load drivers/discrete outputs are solid-state power switches, directing appropriate currents to devices such as the scram pilot valve solenoids, air operated valves, and explosive-actuated squib valves. The vote logic trip signals, from each VLU functional train, are transmitted to the RMU, where a two-out-of-two (or three-out-of-three) confirmation is performed. The redundant trains within a division are necessary to prevent single failures within a division from causing an actuation; as a result, each VLU logic functional train is required to operate to get an output.
- Bypass Unit (BPU) - Division-of-sensors bypass and division maintenance bypass functions that permit on-line calibration, test, and repair without causing containment isolation, or degrade ECCS or other ESF operation. Located in the Test Cabinet.
- Cabinets – The SSLC/ESF processors reside in the corresponding divisional logic cabinet.

### N-DCIS (DPS/ PIP/BOP)

- Gateways, datalinks, signal isolators and I/O modules – allow one-way translation and distribution of data from Q-DCIS to N-DCIS.
- Fiber optic and hardwired network cables and switches – switches allow various the various controllers, data acquisition and displays associated with a segment to communicate with each other.
- Digital Trip Modules (DTMs) - Sensor channel trip decisions (comparison of input variables to programmed setpoints).
- Dual or triple redundant processors perform 2-out-of-4 logic to determine the actuation status for each system function.
- Load Drivers - The load drivers/discrete outputs are solid-state power switches, directing appropriate currents to devices such as the scram pilot valve solenoids, air operated valves, and explosive-actuated squib valves. Load driver are used by DPS to provide a diverse backup actuation to selected safety-related loads.
- Cabinets –N-DCIS logic cabinets reside in two divisionally separated rooms, on the floor above the control room. DPS resides in a separate compartment from the N-DCIS rooms. It uses a set of input sensors diverse to the safety related sensors, to derive its signals, and sends actuation signals to a set of components (solenoids, or squibs) diverse to its safety-related counterpart. Selected signals from the nonsafety-related instrumentation are transmitted to the N-DCIS input cabinets through dedicated hardwired connections.

Remote Multiplexing Units are used to acquire data for the N-DCIS and Q-DCIS systems. The description of the RMU is common to all these systems and it is shown below:

- RMUs - An assembly of divisional Input/Output (I/O) equipment, power supplies and possibly some logic housed in one cabinet. It excludes, field sensors and wiring. The field sensors and process transmitters are hardwired to the local RMUs through plant building. At the input module of the field RMUs, the analog data is delivered to the analog input modules and discrete data is delivered to the digital input modules. Analog signal conditioning, A/D conversion, and digital signal conditioning such as filtering and voltage level conversion is performed at the input modules. Each field RMU formats and transmits input signals as data messages to the dual network. The RMU function performs both I/O signal-processing functions. The RMU then provides output signals to the final actuating devices.

#### ***4.5.3.2 System Operation***

The I&C evaluates safety system trip conditions continuously in all modes of plant operation; that is, Run, Startup, Hot Shutdown, Cold Shutdown, and Refueling and itself operates in two modes that affect all safety systems simultaneously: Normal and Bypass.

During normal operation, the systems supported by the I&C are maintained in a standby condition and are ready to function on demand if an accident or transient event should occur. The following tasks are performed repetitively in all plant modes on data received during each scan of Q-DCIS or from other sensor data sources.



### RPS and LD&IS (MSIV)

- The signals are acquired per division by the RMUs of the same division, or are hardwired to the RPS/MSIV logic. The RMU data is sent via fiber optic cables to the RTIF cabinet located in the corresponding divisional I&C equipment room in the Control Building (CB).
- The first stage of RPS/MSIV logic operation is the comparison of the measured parameters to their setpoints. Digital or digitized input signals from RPS or MSIV logic provide the value or status of critical plant process parameters to the DTMs/Setpoint comparison contained in each division cabinets.
- The TLU sends the trip signal to the OLU within its own division. The OLU performs division trip.
- For RPS and MSIV, equipment within a division of trip actuators includes load drivers and controllers for functions such as automatic scram and air header dump initiation. The RPS includes two physically separate and electrically independent divisions of trip actuators that receive inputs from the four Divisions of Trip Logic. The load driver outputs are arranged in the scram logic circuitry, which is between the scram solenoids and scram solenoid 120 VAC power source. When in a tripped state, the load drivers within a division interconnect with the OLU of all other divisions to form an arrangement (connected in series and in parallel in two separate groups) that results in two-out-of-four scram logic. If load drivers associated with any two or more divisions receive trip signals from the OLUs de-energizing of the scram solenoids occurs.
- De-energizing the solenoids for RPS results in opening solenoids valves to vent the air header and insert the rods. Similarly, de-energizing the solenoids for the MSIVs results in MSIV closure.

### ATWS/SLC

- The signals are acquired per division by the RMUs of the same division, or are hardwired to the ATWS/SLC logic. The RMU data is sent via fiber optic cables to the RTIF cabinet located in the corresponding divisional I&C equipment room in the Control Building (CB).
- The first stage of ATWS/SLC logic operation is the comparison of the measured parameters to their setpoints. Analog Trip Modules (ATM), instead of Digital Trip Modules (DTM), perform setpoint comparisons for the automatic trip parameters in each division.
- Hardware-based discrete digital logic substitutes for software-based trip logic to perform two-out-of-four voting.
- The system is designed to produce a safety-related permissive signal to the ATWS/SLC system logic to actuate SLC, and generate a feedwater runback signal to DPS for additional processing.

### NMS

- The signals are acquired per division by RMUs (SRNMs or PRNMs-APRM) of the same division. The data is sent via fiber optic cables to the NMS Digital Trip Modules in the

NMS cabinets located in the corresponding divisional I&C equipment rooms in the Control Building (CB).

- The first stage of SRNM or APRM logic operation is the comparison of the measured parameters to their setpoints. Digital or digitized input signals from NMS SRNM or PRNM provide the value or status of critical plant process parameters to the NMS Digital Trip Module for setpoint comparison contained in each division cabinets. The output signal is sent to the NMS Trip Logic Unit.
- For each parameter that exceeds the setpoint limit, the unit declares a sensor channel trip. The trip signals are sent to divisional NMS TLUs (or software equivalent within their own division), by isolated fiber optic cables, and also sent to the other subsystem divisions.
- Each division therefore has a separate trip logic that can independently perform a two-out-of-four vote on the sensor trips. The trip status is sent to RPS/MSIV trip logic unit, or to ATWS/SLC processors.

#### SSLC/ESF

- The signals are acquired per division by RMUs of the same division. The data is sent via fiber optic cables to the SSLC/ESF cabinets located in the corresponding divisional I&C equipment rooms in the Control Building (CB).
- The first stage of I&C operation is the comparison of the measured parameters to their setpoints. Digital or digitized input signals from Q-DCIS provide the value or status of critical plant process parameters to the DTMs/Setpoint comparison function contained in each division cabinets.
- The input signals for each division are acquired from separate and independent sensor channels. At these, the value of each monitored parameter is compared to a reference setpoint stored in digital memory. For each parameter that exceeds the setpoint limit, the unit declares a sensor channel trip.
- For each parameter that exceeds the setpoint limit, the unit declares a sensor channel trip. The trips are sent through the communication interface to coincident VLU functional trains within their own division and to the other subsystem divisions.
- Each division has separate trip logics that can independently perform a two-out-of-four vote on the sensor trips. The VLU functional trains receive the trip status from the DTMs in all four divisions.. The VLU functions are implemented in the SSLC/ESF triply redundant logic and processors and the results of the two-out-of-four vote is sent to the two or three separate load drivers/discrete outputs in the RMUs. Each load driver/discrete output is individually addressed and all two (solenoid) or three (squib initiator) load drivers/discrete outputs must close to operate the solenoid/squib initiator..
- Trip outputs from each VLU trains are serially multiplexed on separate communication links of Q-DCIS to the discrete output logic in the RMUs, where a two-out-of-two or three-out-of-three voter determines if there is agreement between the channels. Disagreement between the channels inhibits the control output. Agreement results in processing of control and interlock signals in the identical logic which communicate across the card file backplane. Correct performance results in output of control signals

for equipment initiation or nuclear system isolation as required. Control signals to component actuators are hardwired from contact closures in the RMUs of Q-DCIS to the appropriate motor control centers, switchgear, or solenoids.

#### N-DCIS (DPS /PIP-A or PIP-B/ BOP)

- The signals are acquired per division by RMUs.
- Dual or Triple redundant logic processors receive the trip status from the ATMs/DTMs in all four divisions and performs 2-out-of-4 logic to determine the actuation status for each system function.
- A trip signal from the processors is sent to the RMU load drivers (discrete outputs). The PRA assumes that a common 2-out-of-3 signal is sent to the load drivers.
- The load drivers process the signal and results in output of control signals for equipment initiation or nuclear system isolation as required. Control signals to component actuators are hardwired from contact closures in the N-DCIS RMUs to the appropriate motor control centers, switchgear, or solenoids.

This arrangement prevents inadvertent equipment initiation or primary containment vessel isolation due to hardware or software failure in a single discrete output. The output logic trains provide device interlock logic and formulate the protective action initiation commands that are transmitted to the local area equipment actuators.

#### **4.5.3.3 Components Location**

The SSLC/ESF Q-DCIS cabinets are located in the basement of the Control Building.

The N-DCIS cabinets are located on the floor above the Control Room.

The ATWS/SLC Q-DCIS independent divisional hardware housed in RTIF cabinets are located in the basement of the Control Building.

The DPS cabinet is located in a compartment separate of N-DCIS areas in the Control Building.

The RPS Q-DCIS logic hardware housed in RTIF cabinets are located in the basement of the Control Building.

The NMS Q-DCIS cabinets are located in the basement of the Control Building.

RMUs for the I&C systems are located in the areas of the equipment being actuated, or instruments being read.

### **4.5.4 Automatic and Manual Control**

#### **4.5.4.1 Automatic Actuation**

The DCIS uses diverse and separate sets of instrumentation and transmitters for each of the following primary systems:

- RPS (RTIF)
- ATWS/SLC
- HP CRD Bypass

- VBIF (see Section 4.18)
- ICS DPV Isolation
- SSLC/ESF
- N-DCIS (DPS/PIP/BOP)

The following automatic signals processed through the I&C systems are considered in the PRA models:

#### **Isolation Condenser System (ICS)**

The valves B32-F005A/B/C/D and B32-F006A/B/C/D open automatically by the following signals:

- High reactor pressure sensed by pressure transmitters (if the high pressure remains for more than 10 seconds).

OR

- Reactor water level 2 sensed by level transmitters.

OR

- MSIV closure, that is, closure of Main Steam Lines (MSL), sensed by two or more position limit switches indicating <92% open, in separate MSLs, with reactor Mode Switch in "RUN".

The valves B32-F104A/B and B32-F105A/B, providing cross connection of the ICS and PCCS pools to allow 72 hours of cooling by the ICS and PCCS heat exchangers, open automatically on the following signals:

- Low level in the pool A sensed by level transmitters (valves B32-F104A and B32-F105A).

OR

- Low level in the pool B sensed by level transmitters (valves B32-F104B and B32-F105B).

The valves B32-F001A/B/C/D through F004A/B/C/D close automatically upon the following signals:

- DPV position signals representing two or more open DPVs are detected.

The corresponding signals are processed through the SSLC/ESF and DPS or ICP subsystems.

#### **Automatic Depressurization System (ADS)**

The DPVs and SRVs are actuated by the following signal:

- Reactor water level 1 as sensed by water level transmitters.
- High Drywell Pressure.

The corresponding signals are processed through the SSLC/ESF and DPS subsystems. For the SRVs, manual actuation through SSLC/ESF and DPS is modeled. Operator failure to manually

depressurized is modeled under system B21 since the human error is assumed to be common to both SSLC/ESF and DPS (i.e. operator diagnosis and execution actions are highly dependent).

### **Gravity Driven Cooling System (GDCS)**

The GDCS is actuated by the following signal:

- Reactor water level 1 as sensed by water level transmitters.
- High Drywell pressure, sustained for 60-minutes.

The corresponding signal is processed through the SSLC/ESF and DPS subsystems.

### **High Pressure Nitrogen Supply System (HPNSS)**

The nonsafety-related nitrogen bottles are aligned by the following signal:

- Low pressure of nitrogen sensed by pressure transmitters.

This signal is processed through the N-DCIS PIP subsystems.

### **Main Steam Isolation Valve (MSIV)**

The MSIV are closed by the following signals:

- Reactor water level 2 sensed by level transmitters.

The corresponding signals are processed through the SSLC/RTIF RPS and DPS subsystems.

These isolation are included in the L1 main steam line break outside containment and Level 2 event trees.

### **Leak Detection and Isolation System (LD&IS)**

The LD&IS is employed to isolate either the entire containment or a single system according to the signal received.

ICS isolation in case of LOCA outside containment. In this case, the line break is isolated by the following signals:

- High differential pressure between steam supply line and condensate return line of the corresponding loop sensed by pressure differential transmitters.

OR

- High radiation in the corresponding pool exhaust sensed by radiation monitors.

RWCU isolation in case of LOCA outside containment. In this case, the line break is isolated by the following signals:

- Reactor water level 2 sensed by level transmitters.

OR

- High flow in the corresponding RWCU train sensed by flow transmitters.

OR

- High temperature in the steam tunnel sensed by temperature transmitters.

Feedwater isolation in case of LOCA inside containment. In this case, the line break is isolated by the following signals:

- Feedwater lines differential pressure high coincident with high drywell pressure,
- High drywell water level coincident with high drywell pressure,
- RPV water Level 0.5 with time delay, and
- RPV water Level 8.
- Drywell pressure high-high.

The corresponding signals are processed through the SSLC/ESF, and N-DCIS DPS subsystems.

These isolation areas included in the L1 feedwater line break outside containment, and Level 2 event trees.

### **Standby Liquid Control System (SLCS)**

The SLCS is actuated by the following signals:

- High reactor pressure sensed by RPV pressure transmitters  
OR
- Reactor water level 2 sensed by level transmitters  
AND
- ATWS Permissive signal sensed by SRNM flux detectors

These signals are processed through the ATWS/SLC subsystem.

### **ADS Inhibit**

The SSLC/ESF ADS Inhibit that precludes DPV opening is actuated by the following signals:

- High reactor pressure sensed by pressure transmitters  
OR
- Reactor water level 2 sensed by level transmitters  
AND
- ATWS Permissive signal sensed by APRM flux detectors

The DPS ADS Inhibit that precludes DPV opening is actuated by the following signals:

- High reactor pressure sensed by pressure transmitters  
OR
- Reactor water level 2 sensed by level transmitters  
AND
- ATWS Permissive signal sensed by SRNM flux detectors (raw signal)

The corresponding signals are processed through the ATWS/SLC and DPS subsystems. Both the SSLC/ESF ADS Inhibit signal and the DPS ADS Inhibit signals are required to inhibit ADS.

**Feedwater Runback (FWRB)**

The FWRB is actuated by the following signals:

- High reactor pressure sensed pressure transmitters
- AND
- ATWS Permissive signal sensed by the SRNM flux detectors.

These signals are processed through the ATWS /SLC and DPS subsystems.

**Control Rod Drive System (CRDS)**

The CRDS is initiated in its injection mode by the following signal:

- Reactor water level 2 sensed by level transmitters.

This signal is generated in Safety-related sensor channels and processed through the N-DCIS subsystem.

**Fuel and Auxiliary Pools Cooling System (FAPCS)**

The FAPCS is initiated in its suppression pool-cooling mode by the following signal:

- High temperature in the suppression pool sensed by temperature transmitters.

This signal is processed through the N-DCIS subsystem.

**Standby On-Site AC Power Supply**

The SDGs are started by the following signal:

- Low voltage in bus A3 sensed by the undervoltage relay.
- Low voltage in bus B3 sensed by the undervoltage relay.

The startup of any one of the diesel generators leads to the automatic startup of the corresponding pumps of Reactor Component Cooling Water System and Plant Service Water System that provide cooling to their respective diesel generators. The PRA also includes ADGs, which are totally independent from SDGs and require no support.

The bus undervoltage relays are included in the appropriate AC power supply models. The PRA models conservatively exclude any potential redundant auto starts from the corresponding instrumentation and control system.

**4.5.4.2 Manual Actuation**

Manual signals from the control room are processed through the I&C system. However, the PRA only considers a limited set of the operator actions involving system actuation or isolations (e.g. manual depressurization, SLC actuation etc.). In all these cases, the signal is propagated using most of the same hardware that the automatic signals use. This hardware dependency is accounted for in the model. A complete list of the operator actions can be found in Section 6.

**4.5.4.3 Safety Actuation**

The system provides safety actuation (initiation, isolation, or trip) in support of other systems.

#### 4.5.5 System Interfaces

The I&C system dependencies and transfers are included in the dependency matrix given in Table 4.5-2a, and Tables 4.5-2b1-through 4.5-2b5.

#### 4.5.6 System Testing

The continuous self-diagnostics of Q-DCIS and N-DCIS automatically detect most data transmission errors and hardware failures at the component level. A comprehensive, off-line, network performance test confirms that the data transmission capability is as intended. The test provides confidence that data error rates are within specified limits, signal quality is within specifications, and the network is capable of handling the required throughput.

In general, I&C equipment testing includes the following:

- Preoperational, startup and refueling/outage inspection testing; and
- In-service and operational surveillance testing.

In-service testing is performed periodically to verify operability of a system during normal plant operation and to ensure that each tested channel can perform its intended design function. The surveillance tests include: (a) instrument channel checks, (b) functional tests, (c) verification of proper sensor and channel calibration, (d) verification of applicable functions in the division of trip logic and division of actuators, and (e) response time tests.

The surveillance requirements, for the different safety-related systems, can be found in DCD Chapter 16. A brief overview of the test is included below:

- **Sensor Channel (Instrument Channel) Check** - This check is a visual comparison, on the MCR main control console, of the parameter indicated in one sensor channel to a similar parameter in a different sensor channel. Since redundant sets of sensors measure the same process, the indications should be reasonably close.
- **Divisional Functional Test** - The test is performed by replacing the process signal with a test signal generated by the Surveillance Test Controller located within each divisional Test cabinet. The test signal, which can simulate the full range of an analog or digital process signal, is injected at the RMU input of Q-DCIS or N-DCIS to test the DTMs. The as-found trip setpoints are confirmed to be within their allowable values. However, VLU function logic is not tested, since inputs from multiple divisions would be required. Keylock switches allow the load driver/discrete output checks to be done online (one at a time) without causing valve operation, opening the firing circuit with the keylock switch allows the continuity monitor to be tested, and allows online surveillance and maintenance activities to be done, with the assurance that a valve is not opened inadvertently. This test supplements the continuous self-diagnostic checks within each controller.
- **Comprehensive Functional Test** - This test, which is performed during an outage, verifies overall system function, computer component function, software and hardware interactions, response times, and error handling in four divisions. Successful completion of these tests establishes operability of sensor channels (instrument channels), logic channels (trip logic), and output channels (trip actuators). This end-to-end test injects test



signals simultaneously in the four divisions at the RMU inputs and thus checks the voting logic units (VLU) functions.

- **Sensor Channel Calibration** - A sensor channel calibration or channel calibration is a complete check of the channel from the sensor output through any intervening devices and to the trip output (for example, RMU or other signal conditioner, multiplexing network, DTM). This test verifies that a channel responds to the measured parameter within the necessary range and accuracy. This calibration is performed during outages.

#### 4.5.7 System Maintenance

No regular maintenance is required for Q-DCIS or N-DCIS logic components. Continuous self-diagnostics in each component monitor the state of the system and each module. Fault conditions that result in detected failures are alarmed in the MCR and are traceable to the lowest replaceable module. Component self-testing reconfigures the system to the approved safe state upon detection of uncorrectable errors. An individual division can be disconnected for maintenance and calibration through the use of bypasses within the safety-related logic division without compromising the operations of the other divisions.

The four-division RTIF, NMS, and SSLC/ESF, and independent control platform logic provides at least two valid divisions for crosschecking of monitored variables. The third division also has the capability to be available for crosschecking, depending on the maintenance bypass status. When one division is placed into maintenance bypass mode, the condition is alarmed in the MCR and the division logic automatically becomes a two-out-of-three voting scheme. Most sensors and actuators are provisioned for actual testing and calibration during power operation.

Therefore, no maintenance unavailability is considered.

#### 4.5.8 Common Cause Failures

The common cause failures have been grouped in Tables 4.5-4a through 4.5-4e.

#### 4.5.9 Fault Tree Analysis

In relation to the functions that the I&C has to carry out, various fault trees have been developed that allow determining the system unavailability and identifying components that contribute significantly to system unavailability.

The fault trees for these systems were built using a bounding approach. Specifically, subsystems C63 and C62 were built assuming a particular basic design. This is perceived to bound all of the candidate vendor designs. The design of this system is shown in Figures 4.5-1 and 4.5-2. In addition, the following DCD Chapter 7 functional block diagrams are used as guidance in the model development: Figure 7.2-1 (RPS/MSIV), Figure 7.3-4 (SSLC/ESF), Figure 7.8-2 (ARI/FMCRD), and Figure 7.8-3 (ATWS/SLC). These fault trees are documented below in Figures 4.5-3a through Figure 4.5-3e.

##### 4.5.9.1 Top Event Definitions

The top events list defined for the system is given in Tables 4.5-6a through 4.5-6e.

#### ***4.5.9.2 Fault Tree Description***

The Q-DCIS and N-DCIS system fault trees were built assuming a standardized approach to the configuration of the RMUs and logic cabinets. The instrumentation is included in the models, but sensitivity analyses demonstrates that these components are not significant contributors to the baseline at power risk.

#### ***4.5.9.3 Human Actions***

The operator actions associated with manual actuation of a particular component are modeled in the specific system. A listing of control room alarms and displays can be found in Table 4.5-1. However, it should be noted that both safety-related, and nonsafety-related video display units are available for the operators to monitor plant and equipment conditions.

Section 6 provides list and analyses for operator actions such as manual depressurization, and alignment of low pressure injection.

**4.5.9.4 Special Events**

THE FOLLOWING SPECIAL EVENTS ARE DEFINED AND USED IN THE FAULT TREE:

BE	Description	Probability	Basis
C62-CCFSOFTWARE	N-DCIS COMMON CAUSE SOFTWARE FAILURE	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C62-CCFSOFTWARE_S	N-DCIS COMMON CAUSE SOFTWARE FAILURE	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C62-LDD-FC-LOADS	COMMON CAUSE FAILURE OF REMAINING N-DCIS LOAD DRIVERS	1.86E-06	23A6100, Rev 4, 1993 ABWR SAFETY ANALYSIS REPORT
C63-CCFSOFTWARE	Common cause failure of the software on the Logic computers	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C63-CCFSOFTWARE_S	Spurious software failure leading to inadvertent actuation	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C63-LDD-FC-ESFLOADS	CCF OF ALL ESF LOAD DRIVERS	1.86E-06	23A6100, Rev 4, 1993 ABWR SAFETY ANALYSIS REPORT
C51-CCFSOFTWARE	NMS COMMON CAUSE SOFTWARE FAILURE	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C71-CCFSOFTWARE	RPS COMMON CAUSE SOFTWARE FAILURE	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C71-LDD-FC-2OF4G	CCF LOAD DRIVER (2 of 4 GROUPS)	1.86E-06	23A6100, Rev 4, 1993 ABWR STANDARD SAFETY ANALYSIS REPORT
C12-ROD-CF-SCRAM	CCF OF CONTROL RODS TO INSERT	2.50E-07	NUREG CR-5500, Vol. 3, 1999
C12-ACV-CC-SCRV126	CCF TO OPEN OF AIR OPERATED SCRAM VALVE AOV-126	6.90E-09	NUREG-CR-5500, Vol. 3, 1999
C12-SOV-FD-SCRV139	CCF TO OPEN (VENT) OF SCRAM PILOT SOLENOID VALVES SOV-139	1.70E-06	NUREG CR-5500, Vol. 3, 1999
C72-CCFSOFTWARE	COMMON CAUSE SOFTWARE FAILURE OF DPS	1.00E-04	Section 4.5.2 assumptions #12 and #13.
C72-LDD-FC-LOADS	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS	1.86E-06	23A6100, Rev 4, 1993 ABWR SAFETY ANALYSIS REPORT
C12-MOT-FR-CFFMCRD	COMMON CAUSE FAILURE OF FMCRD MOTORS TO RUN	1.00E-06	Assumed CCF screening value based on AC motor failure to run.

BE	Description	Probability	Basis
C12-MOT-FS-CFFMCRD	COMMON CAUSE FAILURE OF FMCRD MOTORS TO START	1.50E-06	Assumed CCF screening value based on AC motor failure to start.

#### 4.5.10 Results of Fault Tree Analysis

The fault tree results provide quantitative values of system unavailability and of the importance of specific components to that total for each system top. The basic events for each I&C system are included in Tables 4.5-7a through 4.5-7e. In addition, the results for each system tops are shown in Tables 4.5-8a through 4.5-8e.

The quantification of core damage sequences in Section 7, or large release sequences in Section 8, implicitly includes the contribution of basic events for these systems. The quantification process enables checking the global consistency of the system fault trees and their relationship with the rest of the systems modeled in the PRA.

The importance measures obtained from core damage frequency or large release frequency, allow identification of the most relevant basic events and system component failures in an integrated context, as well as the determination of their relative importance with respect to the basic events and component failures of the other systems modeled.

#### 4.5.11 PRA Insights

There is only one key insight associated with the I&C system:

- (1) The I&C system is comprised of redundant, robust hardware. From a design perspective, it is very reliable. Q-DCIS and N-DCIS are, at their heart, computer based systems, running high quality software, or firmware. As such, the only weakness of the system is uncertainty in failure modes of the software.

The integrated model results can be found in Section 7. The results are used to derive insights for the risk contribution of the integrated modeled systems and event trees. A detailed evaluation of the results, including sensitivities, system importance, and uncertainties can be found in Section 11.

**Table 4.5-1**  
**I& C System - Control Room Instrumentation and Alarms**

<b>Controls</b>
The data transmission and processing functions require no operator intervention are provided
<b>Displays</b>
Division I of sensors in bypass
Division II of sensors in bypass
Division III of sensors in bypass
Division IV of sensors in bypass
ESF loop 1 in bypass
ESF loop 2 in bypass
ESF loop 3 in bypass
ESF loop 4 in bypass
SSLC Division I controller inoperative (DTM, VLU or SLU)
SSLC Division II controller inoperative (DTM, VLU or SLU)
SSLC Division III controller inoperative (DTM, VLU or SLU)
SSLC Division IV controller inoperative (DTM, VLU or SLU)
NIM, CIM or BTM Division I inoperative
NIM, CIM or BTM Division II inoperative
NIM, CIM or BTM Division III inoperative
NIM, CIM or BTM Division IV inoperative
Q-DCIS Division I diagnostic displays
Q-DCIS Division II diagnostic displays
Q-DCIS Division III diagnostic displays
Q-DCIS Division IV diagnostic displays
N-DCIS diagnostic displays
<b>Alarms</b>
SSLC/ESF in bypass
SSLC/ESF system trouble
Q-DCIS Division I trouble
Q-DCIS Division II trouble
Q-DCIS Division III trouble
Q-DCIS Division IV trouble
N-DCIS alarms

**Table 4.5-2a**  
**I&C System - System Dependencies**

<b>COMPONENT</b>	<b>R13 (Safety-related)</b>	<b>R13 (Nonsafety-related)</b>
Q-DCIS (RPS, MSIV, NMS, SSLC/ESF) Division I	DIV 1	
Q-DCIS (RPS, MSIV, NMS, SSLC/ESF) Division II	DIV 2	
Q-DCIS (RPS, MSIV, NMS, SSLC/ESF) Division III	DIV 3	
Q-DCIS (RPS, MSIV, NMS, SSLC/ESF) Division IV	DIV 4	
ICP (ATWS/SLC, HP CRD Isolation Bypass, VBIF, and ICS DPV Isolation) Division I	DIV 1	
ICP (ATWS/SLC, HP CRD Isolation Bypass, VBIF, and ICS DPV Isolation) Division II	DIV 2	
ICP (ATWS/SLC, HP CRD Isolation Bypass, VBIF, and ICS DPV Isolation) Division III	DIV 3	
ICP (ATWS/SLC, HP CRD Isolation Bypass, VBIF, and ICS DPV Isolation) Division IV	DIV 4	
DPS triple redundant controller		Train A, B, C
N-DCIS dual or triple redundant controllers		Train A, B, C

Note: Functions such as RPS and MSIV LD&IS, or NMS use de-energized-to-trip fail-safe logic. Therefore, a loss of power will not fail the RPS and MSIV LD&IS functions.

**Table 4.5-2b1**  
**I&C System – Transfers (C62)**

The following transfers are used in the C62 fault tree:

<b>Transfer</b>	<b>Description</b>
R13-NSR-CBA	Loss of Power from R13-NSR-CBA
R13-NSR-CBB	Loss of Power from R13-NSR-CBB
R13-NSR-CBC	Loss of Power from R13-NSR-CBC
R13-NSR-RBA	Loss of Power from R13-NSR-RBA
R13-NSR-RBA-ST	FAILURE OF NON-SAFETY UPS RB LOAD GROUP A
R13-NSR-RBB	Loss of Power from R13-NSR-RBB
R13-NSR-RBB-ST	FAILURE OF NON-SAFETY UPS RB LOAD GROUP B
R13-NSR-RBC	Loss of Power from R13-NSR-RBC
R13-NSR-RBC-ST	FAILURE OF NON-SAFETY UPS RB LOAD GROUP C
R13-NSR-TBA	Loss of Power from R13-NSR-TBA
R13-NSR-TBB	Loss of Power from R13-NSR-TBB
R13-NSR-TBC	Loss of Power from R13-NSR-TBC

**Table 4.5-2b2**  
**I&C System – Transfers (C63)**

The following transfers are used in the C63 fault tree:

<b>Transfer</b>	<b>Description</b>
R13-11-CB	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR CONTROL BLDG
R13-11-RB	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG
R13-11-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
R13-12-CB	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR CONTROL BLDG
R13-12-RB	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG
R13-12-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
R13-21-CB	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CONTROL BLDG
R13-21-RB	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG
R13-21-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
R13-22-CB	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CONTROL BLDG
R13-22-RB	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG
R13-22-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
R13-31-CB	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR CONTROL BLDG
R13-31-RB	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG
R13-31-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
R13-32-CB	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR CONTROL BLDG
R13-32-RB	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG
R13-32-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
R13-41-CB	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CONTROL BLDG
R13-41-RB	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG
R13-41-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
R13-42-CB	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CONTROL BLDG
R13-42-RB	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG
R13-42-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)



**Table 4.5-2b3**  
**I&C System – Transfers (C71)**

The following transfers are used in the C71 fault tree

<b>Transfer</b>	<b>Description</b>
C12-C71-FMCRD	FAILURE OF FMCRD SCRAM FOLLOW UP FUNCTION
C63-C71-D1DTM-CV	FAILURE TO GENERATE HIGH CONDENSER VACUUM SIGNAL FOR RPS DIV I DTM
C63-C71-D1DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV I DTM
C63-C71-D1DTM-LV	FAILURE TO GENERATE RPV LOW LEVEL SIGNAL FOR RPS DIV I DTM
C63-C71-D1DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV I DTM
C63-C71-D2DTM-CV	FAILURE TO GENERATE HIGH CONDENSER VACUUM SIGNAL FOR RPS DIV II DTM
C63-C71-D2DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV II DTM
C63-C71-D2DTM-LV	FAILURE TO GENERATE RPV LOW LEVEL SIGNAL FOR RPS DIV II DTM
C63-C71-D2DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV II DTM
C63-C71-D3DTM-CV	FAILURE TO GENERATE HIGH CONDENSER VACUUM SIGNAL FOR RPS DIV III DTM
C63-C71-D3DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV III DTM
C63-C71-D3DTM-LV	FAILURE TO GENERATE RPV LOW LEVEL SIGNAL FOR RPS DIV III DTM
C63-C71-D3DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV III DTM
C63-C71-D4DTM-CV	FAILURE TO GENERATE HIGH CONDENSER VACUUM SIGNAL FOR RPS DIV IV DTM
C63-C71-D4DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV IV DTM
C63-C71-D4DTM-LV	FAILURE TO GENERATE RPV LOW LEVEL SIGNAL FOR RPS DIV IV DTM
C63-C71-D4DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV IV DTM
C72-C71-ARI	ARI VALVE FAIL TO OPEN OR DPS FAILS TO GENERATE ACTUATION SIGNAL
C72-RPS	DPS FAILURE TO SCRAM
R13-11-RB-ST	FAILURE OF DIV I 120V AC UPS
R13-21-RB-ST	FAILURE OF DIV II 120V AC UPS

**Table 4.5-2b4**  
**I&C System – Transfers (C72)**

The following transfers are used in the C72 fault tree:

<b>Transfer</b>	<b>Description</b>
C62-C72-ARIDPSD1LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV I (L2)
C62-C72-ARIDPSD1LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV I (L2)
C62-C72-ARIDPSD1LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV I (L2)
C62-C72-ARIDPSD1LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV I (L2)
C62-C72-ARIDPSD1PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV I
C62-C72-ARIDPSD1PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV I
C62-C72-ARIDPSD1PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV I
C62-C72-ARIDPSD1PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV I
C62-C72-ARIDPSD2LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV II
C62-C72-ARIDPSD2PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV II
C62-C72-ARIDPSD3LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV III
C62-C72-ARIDPSD3PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV III

**Table 4.5-2b4**  
**I&C System – Transfers (C72)**

The following transfers are used in the C72 fault tree:

<b>Transfer</b>	<b>Description</b>
C62-C72-DPSCNTLPSA-FIX	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
C62-C72-DPSCNTLPSB-FIX	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
C62-C72-DPSRMUASDFLINGA	SDC IN FLOW SIGNAL A FAILS
C62-C72-DPSRMUASDFLINGC	SDC IN FLOW SIGNAL C FAILS
C62-C72-DPSRMUASDFLOUTGA	SDC OUT FLOW SIGNAL A FAILS
C62-C72-DPSRMUASDFLOUTGC	SDC OUT FLOW SIGNAL C FAILS
C62-C72-DPSRMUBSDFLINGB	SDC IN FLOW SIGNAL B FAILS
C62-C72-DPSRMUBSDFLINGD	SDC IN FLOW SIGNAL D FAILS
C62-C72-DPSRMUBSDFLOUTGB	SDC OUT FLOW SIGNAL B FAILS
C62-C72-DPSRMUBSDFLOUTGD	SDC OUT FLOW SIGNAL D FAILS
C62-C72-ICSPOOL1	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 1
C62-C72-ICSPOOL2	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 2
C62-C72-ISO-DPRA	NDCIS FEEDWATER DIFFERENTIAL PRESSURE SIGNAL A FAILURE
C62-C72-ISO-DPRB	NDCIS FEEDWATER DIFFERENTIAL PRESSURE SIGNAL B FAILURE
C62-C72-ISO-DPRC	NDCIS FEEDWATER DIFFERENTIAL PRESSURE SIGNAL C FAILURE
C62-C72-ISO-DPRD	NDCIS FEEDWATER DIFFERENTIAL PRESSURE SIGNAL D FAILURE
C62-C72-L1D1LLA	FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV I
C62-C72-L1D1LLB	FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV I
C62-C72-L1D1LLC	FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV I
C62-C72-L1D1LLD	FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV I
C62-C72-L1D2LLA	FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV II
C62-C72-L1D2LLB	FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV II
C62-C72-L1D2LLC	FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV II
C62-C72-L1D2LLD	FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV II
C62-C72-L1D3LLA	FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV III
C62-C72-L1D3LLB	FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV III
C62-C72-L1D3LLC	FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV III

**Table 4.5-2b4**  
**I&C System – Transfers (C72)**

The following transfers are used in the C72 fault tree:

<b>Transfer</b>	<b>Description</b>
C62-C72-L1D3LLD	FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV III
C62-C72-RPSDPSD1LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV I
C62-C72-RPSDPSD1PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV I
C62-C72-RPSDPSD2LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV II
C62-C72-RPSDPSD2LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV II
C62-C72-RPSDPSD2LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV II
C62-C72-RPSDPSD2LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV II
C62-C72-RPSDPSD2PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV I
C62-C72-RPSDPSD2PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV II
C62-C72-RPSDPSD2PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV II
C62-C72-RPSDPSD2PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV II
C62-C72-RPSDPSD3LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV III
C62-C72-RPSDPSD3PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV III
C62-DPSRMUADWPRSGA	DPS DRYWELL PRESSURE SIGNAL A FAILS
C62-DPSRMUADWPRSGC	DPS DRYWELL PRESSURE SIGNAL C FAILS

**Table 4.5-2b4**  
**I&C System – Transfers (C72)**

The following transfers are used in the C72 fault tree:

<b>Transfer</b>	<b>Description</b>
C62-DPSRMUBDWPRSGB	DPS DRYWELL PRESSURE SIGNAL B FAILS
C62-DPSRMUBDWPRSGD	DPS DRYWELL PRESSURE SIGNAL D FAILS
C63-C74-D1ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV I LOGIC (L2)
C63-C74-D1ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC
C63-C74-D1ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV I LOGIC (L2)
C63-C74-D1ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC
C63-C74-D1ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV I LOGIC (L2)
C63-C74-D1ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC
C63-C74-D1ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV I LOGIC (L2)
C63-C74-D1ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC
C63-C74-D2ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV II LOGIC (L2)
C63-C74-D2ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC
C63-C74-D2ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV II LOGIC (L2)
C63-C74-D2ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC
C63-C74-D2ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV II LOGIC (L2)
C63-C74-D2ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC
C63-C74-D2ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV II LOGIC (L2)
C63-C74-D2ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC
C63-C74-D3ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV III LOGIC (L2)
C63-C74-D3ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC
C63-C74-D3ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV III LOGIC (L2)
C63-C74-D3ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC
C63-C74-D3ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV III LOGIC (L2)
C63-C74-D3ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC
C63-C74-D3ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV III LOGIC (L2)
C63-C74-D3ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC
C63-C74-D4ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV IV LOGIC (L2)
C63-C74-D4ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC
C63-C74-D4ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV IV LOGIC (L2)
C63-C74-D4ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC

**Table 4.5-2b4**  
**I&C System – Transfers (C72)**

The following transfers are used in the C72 fault tree:

<b>Transfer</b>	<b>Description</b>
C63-C74-D4ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV IV LOGIC (L2)
C63-C74-D4ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC
C63-C74-D4ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV IV LOGIC (L2)
C63-C74-D4ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC
C71-D1APRM	DIV I APRM FAILS TO GENERATE TRIP SIGNAL
C71-D2APRM	DIV II APRM FAILS TO GENERATE TRIP SIGNAL
C71-D3APRM	DIV III APRM FAILS TO GENERATE TRIP SIGNAL
C71-D4APRM	DIV IV APRM FAILS TO GENERATE TRIP SIGNAL
R12-FMCRD1	LOSS OF POWER TO FMCRD ELECTRICAL GROUP 1
R12-FMCRD2	LOSS OF POWER TO FMCRD ELECTRICAL GROUP 1
R12-FMCRD3	LOSS OF POWER TO FMCRD ELECTRICAL GROUP 1
R13-11-CB-ST	DIV I 120 VAC CB UPS
R13-21-CB-ST	DIV II 120 VAC CB UPS
R13-31-CB-ST	DIV III 120 VAC CB UPS
R13-41-CB-ST	DIV IV 120 VAC CB UPS
R13-NSR-CBA	POWER FAILURE TO DPS DIV I
R13-NSR-CBA-ST	POWER FAILURE TO DPS DIV I
R13-NSR-CBB	POWER FAILURE TO DPS DIV II
R13-NSR-CBB-ST	POWER FAILURE TO DPS DIV II
R13-NSR-CBC	POWERFAILURE TO DPS DIV III
R13-NSR-CBC-ST	POWERFAILURE TO DPS DIV III
R13-NSR-RBA-ST	FAILURE OF NON-SAFETY UPS RB LOAD GROUP A
R13-NSR-RBB-ST	FAILURE OF NON-SAFETY UPS RB LOAD GROUP B
R13-NSR-RBC-ST	FAILURE OF NON-SAFETY UPS RB LOAD GROUP C
R13-NSR-TBA-ST	POWER FAILURE OF NON SAFETY RELATED UPS TURBINE BUILDING GROUP A
R13-NSR-TBB-ST	POWER FAILURE OF NON SAFETY RELATED UPS TURBINE BUILDING GROUP B
R13-NSR-TBC-ST	POWER FAILURE OF NON SAFETY RELATED UPS TURBINE BUILDING GROUP C

**Table 4.5-2b5**

**I&C System – Transfers (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV  
ISOLATION)**

The following transfers are used in the fault tree:

<b>Transfer</b>	<b>Description</b>
R13-11-CB	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR CONTROL BLDG
R13-11-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
R13-12-CB	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR CONTROL BLDG
R13-12-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
R13-21-CB	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CONTROL BLDG
R13-21-RB	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG
R13-21-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
R13-22-CB	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CONTROL BLDG
R13-22-RB	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG
R13-22-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
R13-31-CB	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR CONTROL BLDG
R13-31-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
R13-32-CB	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR CONTROL BLDG
R13-32-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
R13-41-CB	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CONTROL BLDG
R13-41-RB	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG
R13-41-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
R13-42-CB	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CONTROL BLDG
R13-42-RB	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG
R13-42-RB-ST	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)

**Table 4.5-3**  
**I&C System - Component Tests and Maintenance**  
(See Subsection 4.5.6 System Testing)



**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
C62-FT_-NO-PIPSD_1_2	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB
C62-FT_-NO-PIPSD_1_2_3	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_2_4	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_2_5	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_2_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_2_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_2_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINB & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_3	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINC
C62-FT_-NO-PIPSD_1_3_4	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_3_5	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_3_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_3_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_3_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_4	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLIND
C62-FT_-NO-PIPSD_1_4_5	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_4_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_4_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_4_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_1_5	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTA
C62-FT_-NO-PIPSD_1_5_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_1_5_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-FT_-NO-PIPSD_1_5_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_1_6	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTB
C62-FT_-NO-PIPSD_1_6_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_1_6_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_1_7	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTC
C62-FT_-NO-PIPSD_1_7_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTC & C62-FT_-NO-S
C62-FT_-NO-PIPSD_1_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINA & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_2_3	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLINC
C62-FT_-NO-PIPSD_2_3_4	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_3_5	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_3_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_3_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_3_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLINC & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_4	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND
C62-FT_-NO-PIPSD_2_4_5	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_4_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_4_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_4_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_2_5	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA
C62-FT_-NO-PIPSD_2_5_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_2_5_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_2_5_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-FT_-NO-PIPSD_2_6	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTB
C62-FT_-NO-PIPSD_2_6_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_2_6_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_2_7	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTC
C62-FT_-NO-PIPSD_2_7_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTC & C62-FT_-NO-S
C62-FT_-NO-PIPSD_2_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_3_4	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND
C62-FT_-NO-PIPSD_3_4_5	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_3_4_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_3_4_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_3_4_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLIND & C62-FT_-NO-SD
C62-FT_-NO-PIPSD_3_5	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA
C62-FT_-NO-PIPSD_3_5_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_3_5_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_3_5_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_3_6	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTB
C62-FT_-NO-PIPSD_3_6_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_3_6_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_3_7	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTC
C62-FT_-NO-PIPSD_3_7_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTC & C62-FT_-NO-S
C62-FT_-NO-PIPSD_3_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_4_5	2.63E-07	CCF of two components: C62-FT_-NO-SDFLINB & C62-FT_-NO-SDFLOUTA

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-FT_-NO-PIPSD_4_5_6	8.76E-09	CCF of three components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_4_5_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_4_5_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTA & C62-FT_-NO-S
C62-FT_-NO-PIPSD_4_6	2.63E-07	CCF of two components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTB
C62-FT_-NO-PIPSD_4_6_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_4_6_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-S
C62-FT_-NO-PIPSD_4_7	2.63E-07	CCF of two components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTC
C62-FT_-NO-PIPSD_4_7_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTC & C62-FT_-NO-S
C62-FT_-NO-PIPSD_4_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLIND & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_5_6	2.63E-07	CCF of two components: C62-FT_-NO-SDFLOUTA & C62-FT_-NO-SDFLOUTB
C62-FT_-NO-PIPSD_5_6_7	8.76E-09	CCF of three components: C62-FT_-NO-SDFLOUTA & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-
C62-FT_-NO-PIPSD_5_6_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLOUTA & C62-FT_-NO-SDFLOUTB & C62-FT_-NO-
C62-FT_-NO-PIPSD_5_7	2.63E-07	CCF of two components: C62-FT_-NO-SDFLOUTA & C62-FT_-NO-SDFLOUTC
C62-FT_-NO-PIPSD_5_7_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLOUTA & C62-FT_-NO-SDFLOUTC & C62-FT_-NO-
C62-FT_-NO-PIPSD_5_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLOUTA & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_6_7	2.63E-07	CCF of two components: C62-FT_-NO-SDFLOUTB & C62-FT_-NO-SDFLOUTC
C62-FT_-NO-PIPSD_6_7_8	8.76E-09	CCF of three components: C62-FT_-NO-SDFLOUTB & C62-FT_-NO-SDFLOUTC & C62-FT_-NO-
C62-FT_-NO-PIPSD_6_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLOUTB & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_7_8	2.63E-07	CCF of two components: C62-FT_-NO-SDFLOUTC & C62-FT_-NO-SDFLOUTD
C62-FT_-NO-PIPSD_ALL	1.66E-06	CCF of all components in group 'C62-FT_-NO-PIPSD'
C62-LOG-FC-BOPMP_1_2	4.00E-05	CCF of two components: C62-LOG-FC-BOP1 & C62-LOG-FC-BOP2
C62-LOG-FC-CFSMP_1_2	1.00E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
C62-LOG-FC-CFSMP_1_2_3	2.00E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-LOG-FC-CFSMP_1_3	1.00E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
C62-LOG-FC-CFSMP_2_3	1.00E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
C62-LOG-FC-PIPMP_1_3	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1
C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
C62-LOG-FC-PIPMP_1_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB2
C62-LOG-FC-PIPMP_2_3	6.67E-06	CCF of two components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
C62-LOG-FC-PIPMP_2_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
C62-LOG-FC-PIPMP_ALL	1.80E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
C62-LT_-NO-BOPQQ_1_2	1.33E-06	CCF of two components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB
C62-LT_-NO-BOPQQ_1_2_3	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLC
C62-LT_-NO-BOPQQ_1_2_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLD
C62-LT_-NO-BOPQQ_1_3	1.33E-06	CCF of two components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLC
C62-LT_-NO-BOPQQ_1_3_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLC & C62-LT_-NO-QLVLD
C62-LT_-NO-BOPQQ_1_4	1.33E-06	CCF of two components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLD
C62-LT_-NO-BOPQQ_2_3	1.33E-06	CCF of two components: C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLC
C62-LT_-NO-BOPQQ_2_3_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLC & C62-LT_-NO-QLVLD
C62-LT_-NO-BOPQQ_2_4	1.33E-06	CCF of two components: C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLD
C62-LT_-NO-BOPQQ_3_4	1.33E-06	CCF of two components: C62-LT_-NO-QLVLC & C62-LT_-NO-QLVLD

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-LT_-NO-BOPQQ_ALL	3.60E-06	CCF of all components in group 'C62-LT_-NO-BOPQQ'
C62-LT_-NO-DPSPX_1_2	1.33E-06	CCF of two components: C62-LT_-NO-PLLVLA & C62-LT_-NO-PLLVLB
C62-LT_-NO-DPSPX_1_2_3	1.33E-07	CCF of three components: C62-LT_-NO-PLLVLA & C62-LT_-NO-PLLVLB & C62-LT_-NO-PLLV
C62-LT_-NO-DPSPX_1_2_4	1.33E-07	CCF of three components: C62-LT_-NO-PLLVLA & C62-LT_-NO-PLLVLB & C62-LT_-NO-PLLV
C62-LT_-NO-DPSPX_1_3	1.33E-06	CCF of two components: C62-LT_-NO-PLLVLA & C62-LT_-NO-PLLVLC
C62-LT_-NO-DPSPX_1_3_4	1.33E-07	CCF of three components: C62-LT_-NO-PLLVLA & C62-LT_-NO-PLLVLC & C62-LT_-NO-PLLV
C62-LT_-NO-DPSPX_1_4	1.33E-06	CCF of two components: C62-LT_-NO-PLLVLA & C62-LT_-NO-PLLVLD
C62-LT_-NO-DPSPX_2_3	1.33E-06	CCF of two components: C62-LT_-NO-PLLVLB & C62-LT_-NO-PLLVLC
C62-LT_-NO-DPSPX_2_3_4	1.33E-07	CCF of three components: C62-LT_-NO-PLLVLB & C62-LT_-NO-PLLVLC & C62-LT_-NO-PLLV
C62-LT_-NO-DPSPX_2_4	1.33E-06	CCF of two components: C62-LT_-NO-PLLVLB & C62-LT_-NO-PLLVLD
C62-LT_-NO-DPSPX_3_4	1.33E-06	CCF of two components: C62-LT_-NO-PLLVLC & C62-LT_-NO-PLLVLD
C62-LT_-NO-DPSPX_ALL	3.60E-06	CCF of all components in group 'C62-LT_-NO-DPSPX'
C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
C62-LT_-NO-NDCRX_1_2_3	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_2_4	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_2_5	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_2_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_2_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_2_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
C62-LT_-NO-NDCRX_1_3_4	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_3_5	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_3_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-LT_-NO-NDCRX_1_3_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_3_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
C62-LT_-NO-NDCRX_1_4_5	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_4_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_4_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_4_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE
C62-LT_-NO-NDCRX_1_5_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_5_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_5_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLF
C62-LT_-NO-NDCRX_1_6_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_6_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_7	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLG
C62-LT_-NO-NDCRX_1_7_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_1_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
C62-LT_-NO-NDCRX_2_3_4	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_3_5	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_3_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_3_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-LT_-NO-NDCRX_2_3_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
C62-LT_-NO-NDCRX_2_4_5	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_4_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_4_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_4_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE
C62-LT_-NO-NDCRX_2_5_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_5_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_5_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLF
C62-LT_-NO-NDCRX_2_6_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_6_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_7	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLG
C62-LT_-NO-NDCRX_2_7_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_2_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
C62-LT_-NO-NDCRX_3_4_5	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_4_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_4_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_4_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE



**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-LT_-NO-NDCRX_3_5_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_5_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_5_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLF
C62-LT_-NO-NDCRX_3_6_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_6_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_7	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLG
C62-LT_-NO-NDCRX_3_7_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_3_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE
C62-LT_-NO-NDCRX_4_5_6	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_4_5_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_4_5_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_4_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLF
C62-LT_-NO-NDCRX_4_6_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_4_6_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_4_7	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLG
C62-LT_-NO-NDCRX_4_7_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_4_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_5_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLVLF
C62-LT_-NO-NDCRX_5_6_7	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_5_6_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLV

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-LT_-NO-NDCRX_5_7	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLVLG
C62-LT_-NO-NDCRX_5_7_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_5_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLE & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_6_7	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLVLG
C62-LT_-NO-NDCRX_6_7_8	1.91E-08	CCF of three components: C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLV
C62-LT_-NO-NDCRX_6_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLF & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_7_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLG & C62-LT_-NO-RXLVLH
C62-LT_-NO-NDCRX_ALL	3.60E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
C62-PSP-FO-BOPEP_1_2	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPPSB
C62-PSP-FO-BOPEP_1_2_3	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPR
C62-PSP-FO-BOPEP_1_2_4	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPR
C62-PSP-FO-BOPEP_1_2_5	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPR
C62-PSP-FO-BOPEP_1_2_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPR
C62-PSP-FO-BOPEP_1_3	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSA
C62-PSP-FO-BOPEP_1_3_4	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_1_3_5	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_1_3_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_1_4	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSB
C62-PSP-FO-BOPEP_1_4_5	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_1_4_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_1_5	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRBPSA
C62-PSP-FO-BOPEP_1_5_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRBPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_1_6	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSA & C62-PSP-FO-BOPRBPSB

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-BOPEP_2_3	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSA
C62-PSP-FO-BOPEP_2_3_4	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_2_3_5	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_2_3_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_2_4	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSB
C62-PSP-FO-BOPEP_2_4_5	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_2_4_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_2_5	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRBPSA
C62-PSP-FO-BOPEP_2_5_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRBPSA & C62-PSP-FO-BO
C62-PSP-FO-BOPEP_2_6	8.00E-08	CCF of two components: C62-PSP-FO-BOPPSB & C62-PSP-FO-BOPRBPSB
C62-PSP-FO-BOPEP_3_4	8.00E-08	CCF of two components: C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BOPRAPSB
C62-PSP-FO-BOPEP_3_4_5	4.00E-09	CCF of three components: C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BOPRAPSB & C62-PSP-FO-
C62-PSP-FO-BOPEP_3_4_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BOPRAPSB & C62-PSP-FO-
C62-PSP-FO-BOPEP_3_5	8.00E-08	CCF of two components: C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BOPRBPSA
C62-PSP-FO-BOPEP_3_5_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BOPRBPSA & C62-PSP-FO-
C62-PSP-FO-BOPEP_3_6	8.00E-08	CCF of two components: C62-PSP-FO-BOPRAPSA & C62-PSP-FO-BOPRBPSB
C62-PSP-FO-BOPEP_4_5	8.00E-08	CCF of two components: C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BOPRBPSA
C62-PSP-FO-BOPEP_4_5_6	4.00E-09	CCF of three components: C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BOPRBPSA & C62-PSP-FO-
C62-PSP-FO-BOPEP_4_6	8.00E-08	CCF of two components: C62-PSP-FO-BOPRAPSB & C62-PSP-FO-BOPRBPSB
C62-PSP-FO-BOPEP_5_6	8.00E-08	CCF of two components: C62-PSP-FO-BOPRBPSA & C62-PSP-FO-BOPRBPSB
C62-PSP-FO-BOPEP_ALL	3.60E-07	CCF of all components in group 'C62-PSP-FO-BOPEP'
C62-PSP-FO-CFSEP_1_2	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSAPSB
C62-PSP-FO-CFSEP_1_2_3	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSAPSB & C62-PSP-FO-CF

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-CFSEP_1_2_4	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSAPSB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_2_5	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSAPSB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_2_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSAPSB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_3	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPA
C62-PSP-FO-CFSEP_1_3_4	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_3_5	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_3_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_4	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPB
C62-PSP-FO-CFSEP_1_4_5	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_4_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_1_5	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSPSA
C62-PSP-FO-CFSEP_1_5_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSPSA & C62-PSP-FO-CFS
C62-PSP-FO-CFSEP_1_6	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSA & C62-PSP-FO-CFSPSB
C62-PSP-FO-CFSEP_2_3	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPA
C62-PSP-FO-CFSEP_2_3_4	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_2_3_5	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_2_3_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_2_4	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPB
C62-PSP-FO-CFSEP_2_4_5	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_2_4_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_2_5	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSPSA
C62-PSP-FO-CFSEP_2_5_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSPSA & C62-PSP-FO-CFS

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-CFSEP_2_6	8.00E-08	CCF of two components: C62-PSP-FO-CFSAPSB & C62-PSP-FO-CFSPSB
C62-PSP-FO-CFSEP_3_4	8.00E-08	CCF of two components: C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CFSBPSPB
C62-PSP-FO-CFSEP_3_4_5	4.00E-09	CCF of three components: C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_3_4_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CF
C62-PSP-FO-CFSEP_3_5	8.00E-08	CCF of two components: C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CFSPSPA
C62-PSP-FO-CFSEP_3_5_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CFSPSPA & C62-PSP-FO-CFS
C62-PSP-FO-CFSEP_3_6	8.00E-08	CCF of two components: C62-PSP-FO-CFSBPSPA & C62-PSP-FO-CFSPSB
C62-PSP-FO-CFSEP_4_5	8.00E-08	CCF of two components: C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CFSPSPA
C62-PSP-FO-CFSEP_4_5_6	4.00E-09	CCF of three components: C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CFSPSPA & C62-PSP-FO-CFS
C62-PSP-FO-CFSEP_4_6	8.00E-08	CCF of two components: C62-PSP-FO-CFSBPSPB & C62-PSP-FO-CFSPSB
C62-PSP-FO-CFSEP_5_6	8.00E-08	CCF of two components: C62-PSP-FO-CFSPSPA & C62-PSP-FO-CFSPSB
C62-PSP-FO-CFSEP_ALL	3.60E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
C62-PSP-FO-DPSEP_1_2	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSAPSPB
C62-PSP-FO-DPSEP_1_2_3	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSAPSPB & C62-PSP-FO-DP
C62-PSP-FO-DPSEP_1_2_4	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSAPSPB & C62-PSP-FO-DP
C62-PSP-FO-DPSEP_1_2_5	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSAPSPB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_1_2_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSAPSPB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_1_3	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSBPSPA
C62-PSP-FO-DPSEP_1_3_4	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSBPSPA & C62-PSP-FO-DP
C62-PSP-FO-DPSEP_1_3_5	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_1_3_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_1_4	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSBPSPB
C62-PSP-FO-DPSEP_1_4_5	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSPA & C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-DPSEP_1_4_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSBPSB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_1_5	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C72-PSP-FO-DPSCNTPSA
C62-PSP-FO-DPSEP_1_5_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-
C62-PSP-FO-DPSEP_1_6	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C72-PSP-FO-DPSCNTPSB
C62-PSP-FO-DPSEP_2_3	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPA
C62-PSP-FO-DPSEP_2_3_4	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPA & C62-PSP-FO-DP
C62-PSP-FO-DPSEP_2_3_5	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_2_3_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_2_4	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPB
C62-PSP-FO-DPSEP_2_4_5	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_2_4_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSB & C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_2_5	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSB & C72-PSP-FO-DPSCNTPSA
C62-PSP-FO-DPSEP_2_5_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSAPSB & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-
C62-PSP-FO-DPSEP_2_6	8.00E-08	CCF of two components: C62-PSP-FO-DPSAPSB & C72-PSP-FO-DPSCNTPSB
C62-PSP-FO-DPSEP_3_4	8.00E-08	CCF of two components: C62-PSP-FO-DPSBPSPA & C62-PSP-FO-DPSBPSPB
C62-PSP-FO-DPSEP_3_4_5	4.00E-09	CCF of three components: C62-PSP-FO-DPSBPSPA & C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_3_4_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSBPSPA & C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DP
C62-PSP-FO-DPSEP_3_5	8.00E-08	CCF of two components: C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DPSCNTPSA
C62-PSP-FO-DPSEP_3_5_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-
C62-PSP-FO-DPSEP_3_6	8.00E-08	CCF of two components: C62-PSP-FO-DPSBPSPA & C72-PSP-FO-DPSCNTPSB
C62-PSP-FO-DPSEP_4_5	8.00E-08	CCF of two components: C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DPSCNTPSA
C62-PSP-FO-DPSEP_4_5_6	4.00E-09	CCF of three components: C62-PSP-FO-DPSBPSPB & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-DPSEP_4_6	8.00E-08	CCF of two components: C62-PSP-FO-DPSBPSB & C72-PSP-FO-DPSCNTPSB
C62-PSP-FO-DPSEP_5_6	8.00E-08	CCF of two components: C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-DPSCNTPSB
C62-PSP-FO-DPSEP_ALL	3.60E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
C62-PSP-FO-PIPEP_10_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSA
C62-PSP-FO-PIPEP_10_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_10_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_10_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_10_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_10_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_10_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSB
C62-PSP-FO-PIPEP_10_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_10_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_10_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_10_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_10_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_10_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_10_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_10_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_10_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_10_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_10_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_10_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUYPSA
C62-PSP-FO-PIPEP_10_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUYPSA & C62-PSP

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_10_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSB & C62-PSP-FO-PIPRMUYPBSB
C62-PSP-FO-PIPEP_11_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUFPBSB
C62-PSP-FO-PIPEP_11_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUFPBSB & C62-PSP
C62-PSP-FO-PIPEP_11_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUFPBSB & C62-PSP
C62-PSP-FO-PIPEP_11_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUFPBSB & C62-PSP
C62-PSP-FO-PIPEP_11_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUFPBSB & C62-PSP
C62-PSP-FO-PIPEP_11_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_11_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_11_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_11_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_11_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_11_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_11_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_11_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUYPSPA
C62-PSP-FO-PIPEP_11_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUYPSPA & C62-PSP
C62-PSP-FO-PIPEP_11_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSPA & C62-PSP-FO-PIPRMUYPBSB
C62-PSP-FO-PIPEP_12_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPBSB & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_12_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPBSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_12_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPBSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_12_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPBSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_12_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPBSB & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_12_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPBSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP



**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_12_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_12_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSB & C62-PSP-FO-PIPRMUYPSPA
C62-PSP-FO-PIPEP_12_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUFPSB & C62-PSP-FO-PIPRMUYPSPA & C62-PSP
C62-PSP-FO-PIPEP_12_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUFPSB & C62-PSP-FO-PIPRMUYPSPB
C62-PSP-FO-PIPEP_13_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUXPSA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_13_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUXPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_13_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUXPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_13_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUXPSA & C62-PSP-FO-PIPRMUYPSPA
C62-PSP-FO-PIPEP_13_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUXPSA & C62-PSP-FO-PIPRMUYPSPA & C62-PSP
C62-PSP-FO-PIPEP_13_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUXPSA & C62-PSP-FO-PIPRMUYPSPB
C62-PSP-FO-PIPEP_14_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUXPSB & C62-PSP-FO-PIPRMUYPSPA
C62-PSP-FO-PIPEP_14_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUXPSB & C62-PSP-FO-PIPRMUYPSPA & C62-PSP
C62-PSP-FO-PIPEP_14_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUXPSB & C62-PSP-FO-PIPRMUYPSPB
C62-PSP-FO-PIPEP_15_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUYPSPA & C62-PSP-FO-PIPRMUYPSPB
C62-PSP-FO-PIPEP_1_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_1_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_1_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_1_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_1_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_1_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_1_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_1_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSPA

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_1_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_1_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_1_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_1_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_1_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_1_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSB
C62-PSP-FO-PIPEP_1_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_1_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_1_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_1_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_1_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_1_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_1_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_1_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_1_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_1_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_1_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_1_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_1_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_1_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB
C62-PSP-FO-PIPEP_1_2_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_1_2_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_3	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_4	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_5	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_2_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_3	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA
C62-PSP-FO-PIPEP_1_3_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_4	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_1_3_5	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_3_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSA & C62-PSP
C62-PSP-FO-PIPEP_1_4	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB
C62-PSP-FO-PIPEP_1_4_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_5	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_4_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_1_5	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA
C62-PSP-FO-PIPEP_1_5_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_1_5_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_5_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_1_6	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB
C62-PSP-FO-PIPEP_1_6_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_6_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_1_7	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA
C62-PSP-FO-PIPEP_1_7_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_1_7_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_7_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_1_8	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_1_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_1_9	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_1_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_1_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_1_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_1_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_1_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_1_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_1_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_2_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_2_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_2_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_2_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_2_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_2_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_2_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFA
C62-PSP-FO-PIPEP_2_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_2_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_2_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_2_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_2_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_2_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFB
C62-PSP-FO-PIPEP_2_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_2_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_2_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_2_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_2_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_2_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_2_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_2_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_2_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_2_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_2_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_2_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_2_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_2_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_2_3	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA
C62-PSP-FO-PIPEP_2_3_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_4	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_5	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP
C62-PSP-FO-PIPEP_2_3_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPISA & C62-PSP



**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_2_4	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB
C62-PSP-FO-PIPEP_2_4_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_5	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_4_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIBCNTPSB & C62-PSP
C62-PSP-FO-PIPEP_2_5	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA
C62-PSP-FO-PIPEP_2_5_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_6	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_2_5_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_5_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_2_6	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB
C62-PSP-FO-PIPEP_2_6_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_6_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_2_7	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA
C62-PSP-FO-PIPEP_2_7_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_2_7_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_7_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_2_8	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_2_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_2_9	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_2_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_2_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPACNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_10	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_3_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_3_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_3_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_3_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_3_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_3_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_3_11	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPA
C62-PSP-FO-PIPEP_3_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_3_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_3_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_3_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_3_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_3_12	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPB
C62-PSP-FO-PIPEP_3_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_3_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_3_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_3_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_3_13	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_3_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_3_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_3_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_3_14	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_3_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_3_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_3_15	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_3_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_3_16	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB
C62-PSP-FO-PIPEP_3_4_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_5	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_6	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_7	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_4_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPISB & C62-PSP
C62-PSP-FO-PIPEP_3_5	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPISA
C62-PSP-FO-PIPEP_3_5_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPISA & C62-PSP
C62-PSP-FO-PIPEP_3_5_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPISA & C62-PSP
C62-PSP-FO-PIPEP_3_5_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPISA & C62-PSP
C62-PSP-FO-PIPEP_3_5_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPISA & C62-PSP
C62-PSP-FO-PIPEP_3_5_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPISA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_3_5_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_3_5_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_3_5_6	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_3_5_7	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_3_5_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_3_5_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_3_6	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB
C62-PSP-FO-PIPEP_3_6_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_7	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_6_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_3_7	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA
C62-PSP-FO-PIPEP_3_7_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_3_7_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_7_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_3_8	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_3_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_3_9	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_3_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_3_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_4_10	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_4_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_4_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_4_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_4_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_4_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_4_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_4_11	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFA
C62-PSP-FO-PIPEP_4_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_4_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_4_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_4_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_4_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFA & C62-PSP
C62-PSP-FO-PIPEP_4_12	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFB
C62-PSP-FO-PIPEP_4_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_4_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_4_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_4_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUFPFB & C62-PSP
C62-PSP-FO-PIPEP_4_13	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_4_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_4_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_4_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP



**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_4_14	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_4_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_4_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_4_15	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_4_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_4_16	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_4_5	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA
C62-PSP-FO-PIPEP_4_5_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_6	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_7	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_5_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSA & C62-PSP
C62-PSP-FO-PIPEP_4_6	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB
C62-PSP-FO-PIPEP_4_6_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_4_6_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_7	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_6_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_4_7	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA
C62-PSP-FO-PIPEP_4_7_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_8	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_7_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_4_8	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_4_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_4_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_4_9	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_4_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_4_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_4_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_4_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_4_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_4_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_4_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIBCNTPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_5_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_5_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_5_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_5_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_5_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_5_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_5_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSPA
C62-PSP-FO-PIPEP_5_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_5_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_5_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_5_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_5_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_5_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSB
C62-PSP-FO-PIPEP_5_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_5_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_5_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_5_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_5_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_5_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_5_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_5_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_5_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_5_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_5_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_5_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_5_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_5_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_5_6	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB
C62-PSP-FO-PIPEP_5_6_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_5_6_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_7	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_6_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUAPSB & C62-PSP
C62-PSP-FO-PIPEP_5_7	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA
C62-PSP-FO-PIPEP_5_7_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_7_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_5_8	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_5_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_5_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_5_9	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_5_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_5_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_6_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_6_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_6_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_6_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_6_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_6_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_6_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_6_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSPA
C62-PSP-FO-PIPEP_6_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_6_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_6_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_6_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_6_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_6_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSB
C62-PSP-FO-PIPEP_6_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_6_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_6_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_6_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_6_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_6_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_6_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_6_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_6_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_6_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_6_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_6_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_6_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_6_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_6_7	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA
C62-PSP-FO-PIPEP_6_7_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_6_7_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_8	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_7_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSA & C62-PSP
C62-PSP-FO-PIPEP_6_8	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_6_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_6_9	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_6_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_6_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_6_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_6_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_6_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_6_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP



**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_6_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUAPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_7_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_7_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_7_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_7_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_7_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_7_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_7_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_7_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPA
C62-PSP-FO-PIPEP_7_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_7_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_7_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_7_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_7_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_7_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPB
C62-PSP-FO-PIPEP_7_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_7_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_7_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_7_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_7_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_7_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_7_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_7_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_7_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_7_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_7_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_7_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUYPISA
C62-PSP-FO-PIPEP_7_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUYPISA & C62-PSP
C62-PSP-FO-PIPEP_7_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUYPISB
C62-PSP-FO-PIPEP_7_8	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB
C62-PSP-FO-PIPEP_7_8_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_8_9	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUBPSB & C62-PSP
C62-PSP-FO-PIPEP_7_9	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_7_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_7_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_7_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_7_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_7_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_7_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_7_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSA & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_8_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_8_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_8_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_8_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_8_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_8_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_8_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPA
C62-PSP-FO-PIPEP_8_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_8_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_8_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_8_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_8_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPA & C62-PSP
C62-PSP-FO-PIPEP_8_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPB
C62-PSP-FO-PIPEP_8_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_8_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_8_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_8_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUFPSPB & C62-PSP
C62-PSP-FO-PIPEP_8_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_8_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_8_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_8_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_8_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_8_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_8_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_8_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUYPSA
C62-PSP-FO-PIPEP_8_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUYPSA & C62-PSP
C62-PSP-FO-PIPEP_8_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUYPSB
C62-PSP-FO-PIPEP_8_9	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA
C62-PSP-FO-PIPEP_8_9_10	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_9_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_9_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_9_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_9_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_9_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_8_9_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUBPSB & C62-PSP-FO-PIPRMUEPSA & C62-PSP
C62-PSP-FO-PIPEP_9_10	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB
C62-PSP-FO-PIPEP_9_10_11	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_9_10_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_9_10_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_9_10_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_9_10_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PSP-FO-PIPEP_9_10_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUEPSB & C62-PSP
C62-PSP-FO-PIPEP_9_11	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSA
C62-PSP-FO-PIPEP_9_11_12	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_9_11_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_9_11_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_9_11_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_9_11_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSA & C62-PSP
C62-PSP-FO-PIPEP_9_12	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSB
C62-PSP-FO-PIPEP_9_12_13	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_9_12_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_9_12_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_9_12_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUFPSB & C62-PSP
C62-PSP-FO-PIPEP_9_13	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSA
C62-PSP-FO-PIPEP_9_13_14	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_9_13_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_9_13_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSA & C62-PSP
C62-PSP-FO-PIPEP_9_14	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSB
C62-PSP-FO-PIPEP_9_14_15	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_9_14_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUXPSB & C62-PSP
C62-PSP-FO-PIPEP_9_15	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUYPSA
C62-PSP-FO-PIPEP_9_15_16	3.81E-10	CCF of three components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUYPSA & C62-PSP
C62-PSP-FO-PIPEP_9_16	2.67E-08	CCF of two components: C62-PSP-FO-PIPRMUEPSA & C62-PSP-FO-PIPRMUYPSB
C62-PSP-FO-PIPEP_ALL	3.60E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSTC_1_2	3.84E-06	CCF of two components: C62-PT_-NO-TCCPPRSA & C62-PT_-NO-TCCPPRSB
C62-PT_-NO-CFSXX_10_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWPPRSB & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_10_11_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWPPRSB & C62-PT_-NO-FDWPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_10_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWPPRSB & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_11_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWPPRSC & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_1_10	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_1_10_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_10_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_11	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_1_11_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_12	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_1_2	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB
C62-PT_-NO-CFSXX_1_2_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_3	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_4	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_5	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_2_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSB & C62-PT_-NO-

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_1_3	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC
C62-PT_-NO-CFSXX_1_3_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_4	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_5	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_3_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD
C62-PT_-NO-CFSXX_1_4_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_5	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_4_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA
C62-PT_-NO-CFSXX_1_5_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_1_5_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_1_5_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_1_5_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_1_5_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_1_5_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_1_5_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_1_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB
C62-PT_-NO-CFSXX_1_6_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_1_6_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_1_6_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_1_6_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_1_6_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_1_6_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_1_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC
C62-PT_-NO-CFSXX_1_7_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_1_7_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_1_7_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_1_7_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_1_7_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_1_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_1_8_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_1_8_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_1_8_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO



**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_1_8_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_1_9	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_1_9_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSA & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_9_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSA & C62-PT_-NO-
C62-PT_-NO-CFSXX_1_9_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWPPRSA & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_10	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_2_10_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_10_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_11	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_2_11_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_12	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_2_3	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC
C62-PT_-NO-CFSXX_2_3_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_4	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_5	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_3_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSC & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_2_4_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_5	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_4_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_2_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA
C62-PT_-NO-CFSXX_2_5_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_5_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_5_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_5_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_5_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_5_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_5_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB
C62-PT_-NO-CFSXX_2_6_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_2_6_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_2_6_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_2_6_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_2_6_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_2_6_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_2_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC
C62-PT_-NO-CFSXX_2_7_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_2_7_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_2_7_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_2_7_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_2_7_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_2_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_2_8_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_2_8_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_2_8_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_2_8_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_2_9	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_2_9_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_9_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_2_9_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_10	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_3_10_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_10_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_11	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_3_11_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_3_12	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSD

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_3_4	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD
C62-PT_-NO-CFSXX_3_4_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_5	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_4_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-CNDPPRSD & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA
C62-PT_-NO-CFSXX_3_5_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_5_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_5_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_5_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_5_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_5_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_5_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_3_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB
C62-PT_-NO-CFSXX_3_6_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_6_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_6_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_6_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_3_6_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_6_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_3_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC
C62-PT_-NO-CFSXX_3_7_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_3_7_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_3_7_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_3_7_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_3_7_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_3_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_3_8_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_3_8_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_3_8_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_3_8_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_3_9	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_3_9_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSA & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_9_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSA & C62-PT_-NO-
C62-PT_-NO-CFSXX_3_9_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWPPRSA & C62-PT_-NO-
C62-PT_-NO-CFSXX_4_10	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_4_10_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_4_10_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSB & C62-PT_-NO-
C62-PT_-NO-CFSXX_4_11	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_4_11_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSC & C62-PT_-NO-

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_4_12	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_4_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA
C62-PT_-NO-CFSXX_4_5_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_5_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_5_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_5_6	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_5_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_5_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_5_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB
C62-PT_-NO-CFSXX_4_6_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_4_6_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_4_6_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_4_6_7	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_4_6_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_4_6_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_4_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC
C62-PT_-NO-CFSXX_4_7_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_4_7_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_4_7_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_4_7_8	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_4_7_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC & C62-PT_-NO

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_4_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_4_8_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_4_8_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_4_8_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_4_8_9	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSD & C62-PT_-NO
C62-PT_-NO-CFSXX_4_9	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_4_9_10	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_9_11	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_4_9_12	3.49E-09	CCF of three components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_5_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_5_10_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_5_10_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_5_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_5_11_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_5_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_5_6	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB
C62-PT_-NO-CFSXX_5_6_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-N
C62-PT_-NO-CFSXX_5_6_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-N
C62-PT_-NO-CFSXX_5_6_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-N
C62-PT_-NO-CFSXX_5_6_7	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-N
C62-PT_-NO-CFSXX_5_6_8	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-N
C62-PT_-NO-CFSXX_5_6_9	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB & C62-PT_-N

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_5_7	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC
C62-PT_-NO-CFSXX_5_7_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_5_7_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_5_7_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_5_7_8	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_5_7_9	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_5_8	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_5_8_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_5_8_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_5_8_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_5_8_9	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_5_9	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_5_9_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_5_9_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_5_9_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_6_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_6_10_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_6_10_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_6_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_6_11_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_6_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_6_7	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC



**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_6_7_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_6_7_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_6_7_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_6_7_8	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_6_7_9	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC & C62-PT_-N
C62-PT_-NO-CFSXX_6_8	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_6_8_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_6_8_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_6_8_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_6_8_9	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_6_9	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_6_9_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_6_9_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_6_9_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_7_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_7_10_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_7_10_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_7_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_7_11_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_7_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_7_8	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWH1PRSD
C62-PT_-NO-CFSXX_7_8_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-N

**Table 4.5-4a****I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_7_8_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_7_8_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_7_8_9	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWH1PRSD & C62-PT_-N
C62-PT_-NO-CFSXX_7_9	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_7_9_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_7_9_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_7_9_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSC & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_8_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_8_10_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_8_10_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_8_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_8_11_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSC & C62-PT_-NO
C62-PT_-NO-CFSXX_8_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_8_9	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSA
C62-PT_-NO-CFSXX_8_9_10	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_8_9_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_8_9_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWH1PRSD & C62-PT_-NO-FDWPPRSA & C62-PT_-NO
C62-PT_-NO-CFSXX_9_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWPPRSA & C62-PT_-NO-FDWPPRSB
C62-PT_-NO-CFSXX_9_10_11	3.49E-09	CCF of three components: C62-PT_-NO-FDWPPRSA & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_9_10_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWPPRSA & C62-PT_-NO-FDWPPRSB & C62-PT_-NO
C62-PT_-NO-CFSXX_9_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWPPRSA & C62-PT_-NO-FDWPPRSC
C62-PT_-NO-CFSXX_9_11_12	3.49E-09	CCF of three components: C62-PT_-NO-FDWPPRSA & C62-PT_-NO-FDWPPRSC & C62-PT_-NO

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-CFSXX_9_12	1.75E-07	CCF of two components: C62-PT_-NO-FDWPPRSA & C62-PT_-NO-FDWPPRSD
C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
C62-PT_-NO-DPSRX_1_2	6.40E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
C62-PT_-NO-DPSRX_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
C62-PT_-NO-DPSRX_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
C62-PT_-NO-DPSRX_1_3	6.40E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
C62-PT_-NO-DPSRX_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR
C62-PT_-NO-DPSRX_1_4	6.40E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
C62-PT_-NO-DPSRX_2_3	6.40E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
C62-PT_-NO-DPSRX_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR
C62-PT_-NO-DPSRX_2_4	6.40E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
C62-PT_-NO-DPSRX_3_4	6.40E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
C62-PT_-NO-NDCDW_1_2	6.40E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB
C62-PT_-NO-NDCDW_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR
C62-PT_-NO-NDCDW_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR
C62-PT_-NO-NDCDW_1_3	6.40E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSC
C62-PT_-NO-NDCDW_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPR
C62-PT_-NO-NDCDW_1_4	6.40E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSD
C62-PT_-NO-NDCDW_2_3	6.40E-07	CCF of two components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSC
C62-PT_-NO-NDCDW_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPR
C62-PT_-NO-NDCDW_2_4	6.40E-07	CCF of two components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSD
C62-PT_-NO-NDCDW_3_4	6.40E-07	CCF of two components: C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPRSD
C62-PT_-NO-NDCDW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-NDCDW'

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-PIPIA_1_2	6.40E-07	CCF of two components: C62-PT_-NO-IADPRA1 & C62-PT_-NO-IADPRA2
C62-PT_-NO-PIPIA_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-IADPRA1 & C62-PT_-NO-IADPRA2 & C62-PT_-NO-IA
C62-PT_-NO-PIPIA_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-IADPRA1 & C62-PT_-NO-IADPRA2 & C62-PT_-NO-IA
C62-PT_-NO-PIPIA_1_3	6.40E-07	CCF of two components: C62-PT_-NO-IADPRA1 & C62-PT_-NO-IADPRB1
C62-PT_-NO-PIPIA_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-IADPRA1 & C62-PT_-NO-IADPRB1 & C62-PT_-NO-IA
C62-PT_-NO-PIPIA_1_4	6.40E-07	CCF of two components: C62-PT_-NO-IADPRA1 & C62-PT_-NO-IADPRB2
C62-PT_-NO-PIPIA_2_3	6.40E-07	CCF of two components: C62-PT_-NO-IADPRA2 & C62-PT_-NO-IADPRB1
C62-PT_-NO-PIPIA_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-IADPRA2 & C62-PT_-NO-IADPRB1 & C62-PT_-NO-IA
C62-PT_-NO-PIPIA_2_4	6.40E-07	CCF of two components: C62-PT_-NO-IADPRA2 & C62-PT_-NO-IADPRB2
C62-PT_-NO-PIPIA_3_4	6.40E-07	CCF of two components: C62-PT_-NO-IADPRB1 & C62-PT_-NO-IADPRB2
C62-PT_-NO-PIPIA_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPIA'
C62-PT_-NO-PIP2_1_2	6.40E-07	CCF of two components: C62-PT_-NO-HPNPRA1 & C62-PT_-NO-HPNPRA2
C62-PT_-NO-PIP2_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-HPNPRA1 & C62-PT_-NO-HPNPRA2 & C62-PT_-NO-HP
C62-PT_-NO-PIP2_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-HPNPRA1 & C62-PT_-NO-HPNPRA2 & C62-PT_-NO-HP
C62-PT_-NO-PIP2_1_3	6.40E-07	CCF of two components: C62-PT_-NO-HPNPRA1 & C62-PT_-NO-HPNPRB1
C62-PT_-NO-PIP2_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-HPNPRA1 & C62-PT_-NO-HPNPRB1 & C62-PT_-NO-HP
C62-PT_-NO-PIP2_1_4	6.40E-07	CCF of two components: C62-PT_-NO-HPNPRA1 & C62-PT_-NO-HPNPRB2
C62-PT_-NO-PIP2_2_3	6.40E-07	CCF of two components: C62-PT_-NO-HPNPRA2 & C62-PT_-NO-HPNPRB1
C62-PT_-NO-PIP2_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-HPNPRA2 & C62-PT_-NO-HPNPRB1 & C62-PT_-NO-HP
C62-PT_-NO-PIP2_2_4	6.40E-07	CCF of two components: C62-PT_-NO-HPNPRA2 & C62-PT_-NO-HPNPRB2
C62-PT_-NO-PIP2_3_4	6.40E-07	CCF of two components: C62-PT_-NO-HPNPRB1 & C62-PT_-NO-HPNPRB2
C62-PT_-NO-PIP2_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIP2'
C62-PT_-NO-PIPRC_1_2	6.40E-07	CCF of two components: C62-PT_-NO-RCCPRA1 & C62-PT_-NO-RCCPRA2

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-PIPRC_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-RCCPRA1 & C62-PT_-NO-RCCPRA2 & C62-PT_-NO-RC
C62-PT_-NO-PIPRC_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-RCCPRA1 & C62-PT_-NO-RCCPRA2 & C62-PT_-NO-RC
C62-PT_-NO-PIPRC_1_3	6.40E-07	CCF of two components: C62-PT_-NO-RCCPRA1 & C62-PT_-NO-RCCPRB1
C62-PT_-NO-PIPRC_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-RCCPRA1 & C62-PT_-NO-RCCPRB1 & C62-PT_-NO-RC
C62-PT_-NO-PIPRC_1_4	6.40E-07	CCF of two components: C62-PT_-NO-RCCPRA1 & C62-PT_-NO-RCCPRB2
C62-PT_-NO-PIPRC_2_3	6.40E-07	CCF of two components: C62-PT_-NO-RCCPRA2 & C62-PT_-NO-RCCPRB1
C62-PT_-NO-PIPRC_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-RCCPRA2 & C62-PT_-NO-RCCPRB1 & C62-PT_-NO-RC
C62-PT_-NO-PIPRC_2_4	6.40E-07	CCF of two components: C62-PT_-NO-RCCPRA2 & C62-PT_-NO-RCCPRB2
C62-PT_-NO-PIPRC_3_4	6.40E-07	CCF of two components: C62-PT_-NO-RCCPRB1 & C62-PT_-NO-RCCPRB2
C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
C62-PT_-NO-PIPSA_1_2	6.40E-07	CCF of two components: C62-PT_-NO-SARPRA1 & C62-PT_-NO-SARPRA2
C62-PT_-NO-PIPSA_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-SARPRA1 & C62-PT_-NO-SARPRA2 & C62-PT_-NO-SA
C62-PT_-NO-PIPSA_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-SARPRA1 & C62-PT_-NO-SARPRA2 & C62-PT_-NO-SA
C62-PT_-NO-PIPSA_1_3	6.40E-07	CCF of two components: C62-PT_-NO-SARPRA1 & C62-PT_-NO-SARPRB1
C62-PT_-NO-PIPSA_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-SARPRA1 & C62-PT_-NO-SARPRB1 & C62-PT_-NO-SA
C62-PT_-NO-PIPSA_1_4	6.40E-07	CCF of two components: C62-PT_-NO-SARPRA1 & C62-PT_-NO-SARPRB2
C62-PT_-NO-PIPSA_2_3	6.40E-07	CCF of two components: C62-PT_-NO-SARPRA2 & C62-PT_-NO-SARPRB1
C62-PT_-NO-PIPSA_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-SARPRA2 & C62-PT_-NO-SARPRB1 & C62-PT_-NO-SA
C62-PT_-NO-PIPSA_2_4	6.40E-07	CCF of two components: C62-PT_-NO-SARPRA2 & C62-PT_-NO-SARPRB2
C62-PT_-NO-PIPSA_3_4	6.40E-07	CCF of two components: C62-PT_-NO-SARPRB1 & C62-PT_-NO-SARPRB2
C62-PT_-NO-PIPSA_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSA'
C62-PT_-NO-PIPSW_1_2	6.40E-07	CCF of two components: C62-PT_-NO-PSWPRA1 & C62-PT_-NO-PSWPRA2
C62-PT_-NO-PIPSW_1_2_3	6.40E-08	CCF of three components: C62-PT_-NO-PSWPRA1 & C62-PT_-NO-PSWPRA2 & C62-PT_-NO-PS

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-PT_-NO-PIPSW_1_2_4	6.40E-08	CCF of three components: C62-PT_-NO-PSWPRA1 & C62-PT_-NO-PSWPRA2 & C62-PT_-NO-PS
C62-PT_-NO-PIPSW_1_3	6.40E-07	CCF of two components: C62-PT_-NO-PSWPRA1 & C62-PT_-NO-PSWPRB1
C62-PT_-NO-PIPSW_1_3_4	6.40E-08	CCF of three components: C62-PT_-NO-PSWPRA1 & C62-PT_-NO-PSWPRB1 & C62-PT_-NO-PS
C62-PT_-NO-PIPSW_1_4	6.40E-07	CCF of two components: C62-PT_-NO-PSWPRA1 & C62-PT_-NO-PSWPRB2
C62-PT_-NO-PIPSW_2_3	6.40E-07	CCF of two components: C62-PT_-NO-PSWPRA2 & C62-PT_-NO-PSWPRB1
C62-PT_-NO-PIPSW_2_3_4	6.40E-08	CCF of three components: C62-PT_-NO-PSWPRA2 & C62-PT_-NO-PSWPRB1 & C62-PT_-NO-PS
C62-PT_-NO-PIPSW_2_4	6.40E-07	CCF of two components: C62-PT_-NO-PSWPRA2 & C62-PT_-NO-PSWPRB2
C62-PT_-NO-PIPSW_3_4	6.40E-07	CCF of two components: C62-PT_-NO-PSWPRB1 & C62-PT_-NO-PSWPRB2
C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
C62-TT_-NO-NDCRX_1_2	4.67E-07	CCF of two components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPB
C62-TT_-NO-NDCRX_1_2_3	4.67E-08	CCF of three components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPC
C62-TT_-NO-NDCRX_1_2_4	4.67E-08	CCF of three components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPD
C62-TT_-NO-NDCRX_1_3	4.67E-07	CCF of two components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPC
C62-TT_-NO-NDCRX_1_3_4	4.67E-08	CCF of three components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPC & C62-TT_-NO-TEMPD
C62-TT_-NO-NDCRX_1_4	4.67E-07	CCF of two components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPD
C62-TT_-NO-NDCRX_2_3	4.67E-07	CCF of two components: C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPC
C62-TT_-NO-NDCRX_2_3_4	4.67E-08	CCF of three components: C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPC & C62-TT_-NO-TEMPD
C62-TT_-NO-NDCRX_2_4	4.67E-07	CCF of two components: C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPD
C62-TT_-NO-NDCRX_3_4	4.67E-07	CCF of two components: C62-TT_-NO-TEMPC & C62-TT_-NO-TEMPD
C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
C62-TT_-NO-PIPRC_1_2	4.67E-07	CCF of two components: C62-TT_-NO-RCTMPA & C62-TT_-NO-RCTMPB
C62-TT_-NO-PIPRC_1_2_3	4.67E-08	CCF of three components: C62-TT_-NO-RCTMPA & C62-TT_-NO-RCTMPB & C62-TT_-NO-RCTM
C62-TT_-NO-PIPRC_1_2_4	4.67E-08	CCF of three components: C62-TT_-NO-RCTMPA & C62-TT_-NO-RCTMPB & C62-TT_-NO-RCTM

**Table 4.5-4a**  
**I&C System – Common Cause Failures (C62)**

The following CCF basic events are used in the C62 fault tree:

Basic Event	Prob	Description
C62-TT_-NO-PIPRC_1_3	4.67E-07	CCF of two components: C62-TT_-NO-RCTMPA & C62-TT_-NO-RCTMPC
C62-TT_-NO-PIPRC_1_3_4	4.67E-08	CCF of three components: C62-TT_-NO-RCTMPA & C62-TT_-NO-RCTMPC & C62-TT_-NO-RCTM
C62-TT_-NO-PIPRC_1_4	4.67E-07	CCF of two components: C62-TT_-NO-RCTMPA & C62-TT_-NO-RCTMPD
C62-TT_-NO-PIPRC_2_3	4.67E-07	CCF of two components: C62-TT_-NO-RCTMPB & C62-TT_-NO-RCTMPC
C62-TT_-NO-PIPRC_2_3_4	4.67E-08	CCF of three components: C62-TT_-NO-RCTMPB & C62-TT_-NO-RCTMPC & C62-TT_-NO-RCTM
C62-TT_-NO-PIPRC_2_4	4.67E-07	CCF of two components: C62-TT_-NO-RCTMPB & C62-TT_-NO-RCTMPD
C62-TT_-NO-PIPRC_3_4	4.67E-07	CCF of two components: C62-TT_-NO-RCTMPC & C62-TT_-NO-RCTMPD
C62-TT_-NO-PIPRC_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-PIPRC'
C62-TT_-NO-PIPSP_1_2	4.67E-07	CCF of two components: C62-TT_-NO-SPTMPA & C62-TT_-NO-SPTMPB
C62-TT_-NO-PIPSP_1_2_3	4.67E-08	CCF of three components: C62-TT_-NO-SPTMPA & C62-TT_-NO-SPTMPB & C62-TT_-NO-SPTM
C62-TT_-NO-PIPSP_1_2_4	4.67E-08	CCF of three components: C62-TT_-NO-SPTMPA & C62-TT_-NO-SPTMPB & C62-TT_-NO-SPTM
C62-TT_-NO-PIPSP_1_3	4.67E-07	CCF of two components: C62-TT_-NO-SPTMPA & C62-TT_-NO-SPTMPC
C62-TT_-NO-PIPSP_1_3_4	4.67E-08	CCF of three components: C62-TT_-NO-SPTMPA & C62-TT_-NO-SPTMPC & C62-TT_-NO-SPTM
C62-TT_-NO-PIPSP_1_4	4.67E-07	CCF of two components: C62-TT_-NO-SPTMPA & C62-TT_-NO-SPTMPD
C62-TT_-NO-PIPSP_2_3	4.67E-07	CCF of two components: C62-TT_-NO-SPTMPB & C62-TT_-NO-SPTMPC
C62-TT_-NO-PIPSP_2_3_4	4.67E-08	CCF of three components: C62-TT_-NO-SPTMPB & C62-TT_-NO-SPTMPC & C62-TT_-NO-SPTM
C62-TT_-NO-PIPSP_2_4	4.67E-07	CCF of two components: C62-TT_-NO-SPTMPB & C62-TT_-NO-SPTMPD
C62-TT_-NO-PIPSP_3_4	4.67E-07	CCF of two components: C62-TT_-NO-SPTMPC & C62-TT_-NO-SPTMPD
C62-TT_-NO-PIPSP_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-PIPSP'

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-DTM-FC-ESFLG_1_2	1.111E-05	CCF of two components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2
C63-DTM-FC-ESFLG_1_2_3	1.111E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
C63-DTM-FC-ESFLG_1_2_4	1.111E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4
C63-DTM-FC-ESFLG_1_3	1.111E-05	CCF of two components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD3
C63-DTM-FC-ESFLG_1_3_4	1.111E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD3 & C63-DTM-FC-ESFD4
C63-DTM-FC-ESFLG_1_4	1.111E-05	CCF of two components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD4
C63-DTM-FC-ESFLG_2_3	1.111E-05	CCF of two components: C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
C63-DTM-FC-ESFLG_2_3_4	1.111E-06	CCF of three components: C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3 & C63-DTM-FC-ESFD4
C63-DTM-FC-ESFLG_2_4	1.111E-05	CCF of two components: C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4
C63-DTM-FC-ESFLG_3_4	1.111E-05	CCF of two components: C63-DTM-FC-ESFD3 & C63-DTM-FC-ESFD4
C63-DTM-FC-ESFLG_ALL	3.000E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
C63-FT_-NO-ESFICC_1_2	6.133E-07	CCF of two components: C63-FT_-NO-ESF1ICFLWA & C63-FT_-NO-ESF2ICFLWB
C63-FT_-NO-ESFICC_1_2_3	6.133E-08	CCF of three components: C63-FT_-NO-ESF1ICFLWA & C63-FT_-NO-ESF2ICFLWB & C63-FT_-
C63-FT_-NO-ESFICC_1_2_4	6.133E-08	CCF of three components: C63-FT_-NO-ESF1ICFLWA & C63-FT_-NO-ESF2ICFLWB & C63-FT_-
C63-FT_-NO-ESFICC_1_3	6.133E-07	CCF of two components: C63-FT_-NO-ESF1ICFLWA & C63-FT_-NO-ESF3ICFLWC
C63-FT_-NO-ESFICC_1_3_4	6.133E-08	CCF of three components: C63-FT_-NO-ESF1ICFLWA & C63-FT_-NO-ESF3ICFLWC & C63-FT_-
C63-FT_-NO-ESFICC_1_4	6.133E-07	CCF of two components: C63-FT_-NO-ESF1ICFLWA & C63-FT_-NO-ESF4ICFLWD
C63-FT_-NO-ESFICC_2_3	6.133E-07	CCF of two components: C63-FT_-NO-ESF2ICFLWB & C63-FT_-NO-ESF3ICFLWC
C63-FT_-NO-ESFICC_2_3_4	6.133E-08	CCF of three components: C63-FT_-NO-ESF2ICFLWB & C63-FT_-NO-ESF3ICFLWC & C63-FT_-
C63-FT_-NO-ESFICC_2_4	6.133E-07	CCF of two components: C63-FT_-NO-ESF2ICFLWB & C63-FT_-NO-ESF4ICFLWD
C63-FT_-NO-ESFICC_3_4	6.133E-07	CCF of two components: C63-FT_-NO-ESF3ICFLWC & C63-FT_-NO-ESF4ICFLWD
C63-FT_-NO-ESFICC_ALL	1.656E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
C63-FT_-NO-ESFSD_1_2	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-FT_-NO-ESFSD_1_2_3	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA & C63-FT_
C63-FT_-NO-ESFSD_1_2_4	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA & C63-FT_
C63-FT_-NO-ESFSD_1_2_5	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA & C63-FT_
C63-FT_-NO-ESFSD_1_2_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA & C63-FT_
C63-FT_-NO-ESFSD_1_2_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA & C63-FT_
C63-FT_-NO-ESFSD_1_2_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF1SDFLOA & C63-FT_
C63-FT_-NO-ESFSD_1_3	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLIB
C63-FT_-NO-ESFSD_1_3_4	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_1_3_5	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_1_3_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_1_3_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_1_3_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_1_4	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLOC
C63-FT_-NO-ESFSD_1_4_5	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_1_4_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_1_4_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_1_4_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_1_5	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLIC
C63-FT_-NO-ESFSD_1_5_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_1_5_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_1_5_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_1_6	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLOB

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-FT_-NO-ESFSD_1_6_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_1_6_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_1_7	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF4SDFLID
C63-FT_-NO-ESFSD_1_7_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF4SDFLID & C63-FT_
C63-FT_-NO-ESFSD_1_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLIA & C63-FT_-NO-ESF4SDFLOD
C63-FT_-NO-ESFSD_2_3	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLIB
C63-FT_-NO-ESFSD_2_3_4	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_2_3_5	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_2_3_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_2_3_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_2_3_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLIB & C63-FT_
C63-FT_-NO-ESFSD_2_4	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLOC
C63-FT_-NO-ESFSD_2_4_5	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_2_4_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_2_4_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_2_4_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_2_5	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLIC
C63-FT_-NO-ESFSD_2_5_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_2_5_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_2_5_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_2_6	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLOB
C63-FT_-NO-ESFSD_2_6_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLOB & C63-FT_

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-FT_-NO-ESFSD_2_6_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_2_7	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF4SDFLID
C63-FT_-NO-ESFSD_2_7_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF4SDFLID & C63-FT_
C63-FT_-NO-ESFSD_2_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF1SDFLOA & C63-FT_-NO-ESF4SDFLOD
C63-FT_-NO-ESFSD_3_4	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF2SDFLOC
C63-FT_-NO-ESFSD_3_4_5	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_3_4_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_3_4_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_3_4_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF2SDFLOC & C63-FT_
C63-FT_-NO-ESFSD_3_5	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLIC
C63-FT_-NO-ESFSD_3_5_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_3_5_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_3_5_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_3_6	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLOB
C63-FT_-NO-ESFSD_3_6_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_3_6_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_3_7	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF4SDFLID
C63-FT_-NO-ESFSD_3_7_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF4SDFLID & C63-FT_
C63-FT_-NO-ESFSD_3_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLIB & C63-FT_-NO-ESF4SDFLOD
C63-FT_-NO-ESFSD_4_5	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLIC
C63-FT_-NO-ESFSD_4_5_6	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_4_5_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLIC & C63-FT_

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-FT_-NO-ESFSD_4_5_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLIC & C63-FT_
C63-FT_-NO-ESFSD_4_6	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLOB
C63-FT_-NO-ESFSD_4_6_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_4_6_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_4_7	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF4SDFLID
C63-FT_-NO-ESFSD_4_7_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF4SDFLID & C63-FT_
C63-FT_-NO-ESFSD_4_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF2SDFLOC & C63-FT_-NO-ESF4SDFLOB
C63-FT_-NO-ESFSD_5_6	2.629E-07	CCF of two components: C63-FT_-NO-ESF3SDFLIC & C63-FT_-NO-ESF3SDFLOB
C63-FT_-NO-ESFSD_5_6_7	8.762E-09	CCF of three components: C63-FT_-NO-ESF3SDFLIC & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_5_6_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF3SDFLIC & C63-FT_-NO-ESF3SDFLOB & C63-FT_
C63-FT_-NO-ESFSD_5_7	2.629E-07	CCF of two components: C63-FT_-NO-ESF3SDFLIC & C63-FT_-NO-ESF4SDFLID
C63-FT_-NO-ESFSD_5_7_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF3SDFLIC & C63-FT_-NO-ESF4SDFLID & C63-FT_
C63-FT_-NO-ESFSD_5_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF3SDFLIC & C63-FT_-NO-ESF4SDFLOB
C63-FT_-NO-ESFSD_6_7	2.629E-07	CCF of two components: C63-FT_-NO-ESF3SDFLOB & C63-FT_-NO-ESF4SDFLID
C63-FT_-NO-ESFSD_6_7_8	8.762E-09	CCF of three components: C63-FT_-NO-ESF3SDFLOB & C63-FT_-NO-ESF4SDFLID & C63-FT_
C63-FT_-NO-ESFSD_6_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF3SDFLOB & C63-FT_-NO-ESF4SDFLOB
C63-FT_-NO-ESFSD_7_8	2.629E-07	CCF of two components: C63-FT_-NO-ESF4SDFLID & C63-FT_-NO-ESF4SDFLOB
C63-FT_-NO-ESFSD_ALL	1.656E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
C63-LOG-FC-ESFLG_1_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_1_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_1_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_1_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_1_2	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
C63-LOG-FC-ESFLG_1_2_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_3	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_4	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_5	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_2_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
C63-LOG-FC-ESFLG_1_3_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_4	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_5	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_3_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LOG-FC-ESFLG_1_4	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1
C63-LOG-FC-ESFLG_1_4_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_5	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_4_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2
C63-LOG-FC-ESFLG_1_5_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_5_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_6	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3
C63-LOG-FC-ESFLG_1_6_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_6_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_6_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_6_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LOG-FC-ESFLG_1_6_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_6_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_7	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C1
C63-LOG-FC-ESFLG_1_7_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_7_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_7_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_7_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_7_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C2
C63-LOG-FC-ESFLG_1_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_1_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_1_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_10_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_10_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_10_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_11_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_2_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD4C1

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_2_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_2_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_2_3	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
C63-LOG-FC-ESFLG_2_3_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_4	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_5	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_3_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1
C63-LOG-FC-ESFLG_2_4_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4_5	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_2_4_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_4_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2
C63-LOG-FC-ESFLG_2_5_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_5_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_6	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3
C63-LOG-FC-ESFLG_2_6_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_6_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_6_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_6_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_6_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_6_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_7	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C1
C63-LOG-FC-ESFLG_2_7_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_7_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_7_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_7_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_2_7_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C2
C63-LOG-FC-ESFLG_2_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_2_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_2_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_3_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_3_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_3_4	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1
C63-LOG-FC-ESFLG_3_4_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_4_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_4_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_4_5	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_4_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_3_4_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_4_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_4_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2
C63-LOG-FC-ESFLG_3_5_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_5_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_6	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3
C63-LOG-FC-ESFLG_3_6_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_6_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_6_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_6_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_6_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_6_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_7	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C1
C63-LOG-FC-ESFLG_3_7_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_7_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_7_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_3_7_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_7_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C2
C63-LOG-FC-ESFLG_3_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_3_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_3_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_4_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_4_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_4_5	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
C63-LOG-FC-ESFLG_4_5_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_5_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_5_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_5_6	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LOG-FC-ESFLG_4_5_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_5_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_5_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_6	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
C63-LOG-FC-ESFLG_4_6_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_6_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_6_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_6_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_6_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_6_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_7	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C1
C63-LOG-FC-ESFLG_4_7_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_7_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_7_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_7_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_7_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C2
C63-LOG-FC-ESFLG_4_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C3

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LOG-FC-ESFLG_4_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_4_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_5_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_5_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_5_6	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
C63-LOG-FC-ESFLG_5_6_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_6_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_6_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_6_7	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_6_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_6_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_7	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C1
C63-LOG-FC-ESFLG_5_7_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_7_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_7_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_7_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_7_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LOG-FC-ESFLG_5_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C2
C63-LOG-FC-ESFLG_5_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_5_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_5_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_6_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_6_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_6_7	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C1
C63-LOG-FC-ESFLG_6_7_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_7_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_7_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_7_8	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_7_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C2

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-ESFLG_6_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_6_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_6_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD2C3 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_7_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_7_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_7_8	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
C63-LOG-FC-ESFLG_7_8_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_8_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_8_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_8_9	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_7_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_7_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LOG-FC-ESFLG_7_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_8_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_8_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_8_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_8_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_8_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_8_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_8_9	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
C63-LOG-FC-ESFLG_8_9_10	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_8_9_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_8_9_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_9_10	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ESFD4C1
C63-LOG-FC-ESFLG_9_10_11	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_9_10_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_9_11	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ESFD4C2
C63-LOG-FC-ESFLG_9_11_12	3.636E-08	CCF of three components: C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ES
C63-LOG-FC-ESFLG_9_12	1.818E-06	CCF of two components: C63-LOG-FC-ESFD3C3 & C63-LOG-FC-ESFD4C3
C63-LOG-FC-ESFLG_ALL	1.800E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
C63-LT_-NO-ATWRX_1_2	1.333E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB
C63-LT_-NO-ATWRX_1_2_3	1.333E-07	CCF of three components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB & C63-LT_-
C63-LT_-NO-ATWRX_1_2_4	1.333E-07	CCF of three components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB & C63-LT_-
C63-LT_-NO-ATWRX_1_3	1.333E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ATWRX_1_3_4	1.333E-07	CCF of three components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC & C63-LT_-
C63-LT_-NO-ATWRX_1_4	1.333E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
C63-LT_-NO-ATWRX_2_3	1.333E-06	CCF of two components: C63-LT_-NO-ATWSRXVLVB & C63-LT_-NO-ATWSRXLVLC
C63-LT_-NO-ATWRX_2_3_4	1.333E-07	CCF of three components: C63-LT_-NO-ATWSRXVLVB & C63-LT_-NO-ATWSRXLVLC & C63-LT_-
C63-LT_-NO-ATWRX_2_4	1.333E-06	CCF of two components: C63-LT_-NO-ATWSRXVLVB & C63-LT_-NO-ATWSRXLVLD
C63-LT_-NO-ATWRX_3_4	1.333E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
C63-LT_-NO-ATWRX_ALL	3.600E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
C63-LT_-NO-ESFPX_1_2	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB
C63-LT_-NO-ESFPX_1_2_3	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB & C63-LT_-N
C63-LT_-NO-ESFPX_1_2_4	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB & C63-LT_-N
C63-LT_-NO-ESFPX_1_2_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB & C63-LT_-N
C63-LT_-NO-ESFPX_1_2_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB & C63-LT_-N
C63-LT_-NO-ESFPX_1_2_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB & C63-LT_-N
C63-LT_-NO-ESFPX_1_2_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLB & C63-LT_-N
C63-LT_-NO-ESFPX_1_3	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLC
C63-LT_-NO-ESFPX_1_3_4	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_1_3_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_1_3_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_1_3_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_1_3_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_1_4	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLD
C63-LT_-NO-ESFPX_1_4_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLD & C63-LT_-N

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFPX_1_4_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_1_4_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_1_4_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_1_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLE
C63-LT_-NO-ESFPX_1_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_1_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_1_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_1_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLF
C63-LT_-NO-ESFPX_1_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_1_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_1_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLG
C63-LT_-NO-ESFPX_1_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLG & C63-LT_-N
C63-LT_-NO-ESFPX_1_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLA & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_2_3	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLC
C63-LT_-NO-ESFPX_2_3_4	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_2_3_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_2_3_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_2_3_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_2_3_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLC & C63-LT_-N
C63-LT_-NO-ESFPX_2_4	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLD
C63-LT_-NO-ESFPX_2_4_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_2_4_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLD & C63-LT_-N

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFPX_2_4_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_2_4_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_2_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLE
C63-LT_-NO-ESFPX_2_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_2_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_2_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_2_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLF
C63-LT_-NO-ESFPX_2_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_2_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_2_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLG
C63-LT_-NO-ESFPX_2_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLG & C63-LT_-N
C63-LT_-NO-ESFPX_2_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLB & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_3_4	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLD
C63-LT_-NO-ESFPX_3_4_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_3_4_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_3_4_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_3_4_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLD & C63-LT_-N
C63-LT_-NO-ESFPX_3_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLE
C63-LT_-NO-ESFPX_3_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_3_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_3_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_3_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLF

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFPX_3_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_3_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_3_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLG
C63-LT_-NO-ESFPX_3_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLG & C63-LT_-N
C63-LT_-NO-ESFPX_3_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLC & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_4_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLE
C63-LT_-NO-ESFPX_4_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_4_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_4_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLE & C63-LT_-N
C63-LT_-NO-ESFPX_4_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLF
C63-LT_-NO-ESFPX_4_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_4_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_4_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLG
C63-LT_-NO-ESFPX_4_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLG & C63-LT_-N
C63-LT_-NO-ESFPX_4_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLD & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_5_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLE & C63-LT_-NO-ESFPXLVLF
C63-LT_-NO-ESFPX_5_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLE & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_5_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLE & C63-LT_-NO-ESFPXLVLF & C63-LT_-N
C63-LT_-NO-ESFPX_5_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLE & C63-LT_-NO-ESFPXLVLG
C63-LT_-NO-ESFPX_5_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLE & C63-LT_-NO-ESFPXLVLG & C63-LT_-N
C63-LT_-NO-ESFPX_5_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLE & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_6_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLF & C63-LT_-NO-ESFPXLVLG

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFPX_6_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFPXLVLF & C63-LT_-NO-ESFPXLVLG & C63-LT_-N
C63-LT_-NO-ESFPX_6_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLF & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_7_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFPXLVLG & C63-LT_-NO-ESFPXLVLH
C63-LT_-NO-ESFPX_ALL	3.600E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
C63-LT_-NO-ESFRX_1_2	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB
C63-LT_-NO-ESFRX_1_2_3	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N
C63-LT_-NO-ESFRX_1_2_4	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N
C63-LT_-NO-ESFRX_1_2_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N
C63-LT_-NO-ESFRX_1_2_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N
C63-LT_-NO-ESFRX_1_2_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N
C63-LT_-NO-ESFRX_1_2_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N
C63-LT_-NO-ESFRX_1_3	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC
C63-LT_-NO-ESFRX_1_3_4	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_1_3_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_1_3_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_1_3_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_1_3_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_1_4	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLD
C63-LT_-NO-ESFRX_1_4_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_1_4_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_1_4_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_1_4_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_1_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLE

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFRX_1_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_1_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_1_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_1_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLF
C63-LT_-NO-ESFRX_1_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_1_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_1_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLG
C63-LT_-NO-ESFRX_1_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLG & C63-LT_-N
C63-LT_-NO-ESFRX_1_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_2_3	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC
C63-LT_-NO-ESFRX_2_3_4	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_2_3_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_2_3_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_2_3_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_2_3_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC & C63-LT_-N
C63-LT_-NO-ESFRX_2_4	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLD
C63-LT_-NO-ESFRX_2_4_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_2_4_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_2_4_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_2_4_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_2_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLE
C63-LT_-NO-ESFRX_2_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLE & C63-LT_-N

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFRX_2_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_2_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_2_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLF
C63-LT_-NO-ESFRX_2_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_2_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_2_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLG
C63-LT_-NO-ESFRX_2_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLG & C63-LT_-N
C63-LT_-NO-ESFRX_2_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_3_4	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLD
C63-LT_-NO-ESFRX_3_4_5	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_3_4_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_3_4_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_3_4_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLD & C63-LT_-N
C63-LT_-NO-ESFRX_3_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLE
C63-LT_-NO-ESFRX_3_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_3_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_3_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_3_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLF
C63-LT_-NO-ESFRX_3_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_3_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_3_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLG
C63-LT_-NO-ESFRX_3_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLG & C63-LT_-N



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-ESFRX_3_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLC & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_4_5	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLE
C63-LT_-NO-ESFRX_4_5_6	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_4_5_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_4_5_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLE & C63-LT_-N
C63-LT_-NO-ESFRX_4_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLF
C63-LT_-NO-ESFRX_4_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_4_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_4_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLG
C63-LT_-NO-ESFRX_4_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLG & C63-LT_-N
C63-LT_-NO-ESFRX_4_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLD & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_5_6	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLE & C63-LT_-NO-ESFRXLVLF
C63-LT_-NO-ESFRX_5_6_7	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLE & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_5_6_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLE & C63-LT_-NO-ESFRXLVLF & C63-LT_-N
C63-LT_-NO-ESFRX_5_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLE & C63-LT_-NO-ESFRXLVLG
C63-LT_-NO-ESFRX_5_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLE & C63-LT_-NO-ESFRXLVLG & C63-LT_-N
C63-LT_-NO-ESFRX_5_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLE & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_6_7	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLF & C63-LT_-NO-ESFRXLVLG
C63-LT_-NO-ESFRX_6_7_8	1.905E-08	CCF of three components: C63-LT_-NO-ESFRXLVLF & C63-LT_-NO-ESFRXLVLG & C63-LT_-N
C63-LT_-NO-ESFRX_6_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLF & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_7_8	5.714E-07	CCF of two components: C63-LT_-NO-ESFRXLVLG & C63-LT_-NO-ESFRXLVLH
C63-LT_-NO-ESFRX_ALL	3.600E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
C63-LT_-NO-RPSRX_1_2	1.333E-06	CCF of two components: C63-LT_-NO-RPSRXLVA & C63-LT_-NO-RPSRXVLB

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-LT_-NO-RPSRX_1_2_3	1.333E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVB & C63-LT_-N
C63-LT_-NO-RPSRX_1_2_4	1.333E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVB & C63-LT_-N
C63-LT_-NO-RPSRX_1_3	1.333E-06	CCF of two components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLC
C63-LT_-NO-RPSRX_1_3_4	1.333E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLC & C63-LT_-N
C63-LT_-NO-RPSRX_1_4	1.333E-06	CCF of two components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLD
C63-LT_-NO-RPSRX_2_3	1.333E-06	CCF of two components: C63-LT_-NO-RPSRXVLVB & C63-LT_-NO-RPSRXLVLC
C63-LT_-NO-RPSRX_2_3_4	1.333E-07	CCF of three components: C63-LT_-NO-RPSRXVLVB & C63-LT_-NO-RPSRXLVLC & C63-LT_-N
C63-LT_-NO-RPSRX_2_4	1.333E-06	CCF of two components: C63-LT_-NO-RPSRXVLVB & C63-LT_-NO-RPSRXLVLD
C63-LT_-NO-RPSRX_3_4	1.333E-06	CCF of two components: C63-LT_-NO-RPSRXLVLC & C63-LT_-NO-RPSRXLVLD
C63-LT_-NO-RPSRX_ALL	3.600E-06	CCF of all components in group 'C63-LT_-NO-RPSRX'
C63-PSP-FO-ATWEP_1_2	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB
C63-PSP-FO-ATWEP_1_2_3	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_2_4	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_2_5	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_2_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_2_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_2_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW1PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_3	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSA
C63-PSP-FO-ATWEP_1_3_4	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_3_5	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_3_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_3_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_3_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ATWEP_1_4	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSB
C63-PSP-FO-ATWEP_1_4_5	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_4_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_4_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_4_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_5	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSA
C63-PSP-FO-ATWEP_1_5_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_5_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_5_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_6	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSB
C63-PSP-FO-ATWEP_1_6_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_6_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_7	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW4PSA
C63-PSP-FO-ATWEP_1_7_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW4PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_1_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSA & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_2_3	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSA
C63-PSP-FO-ATWEP_2_3_4	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_3_5	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_3_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_3_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_3_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_4	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSB

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ATWEP_2_4_5	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_4_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_4_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_4_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_5	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSA
C63-PSP-FO-ATWEP_2_5_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_5_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_5_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_6	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSB
C63-PSP-FO-ATWEP_2_6_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_6_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_7	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW4PSA
C63-PSP-FO-ATWEP_2_7_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW4PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_2_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW1PSB & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_3_4	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW2PSB
C63-PSP-FO-ATWEP_3_4_5	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_4_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_4_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_4_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW2PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_5	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSA
C63-PSP-FO-ATWEP_3_5_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_5_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ATWEP_3_5_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_6	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSB
C63-PSP-FO-ATWEP_3_6_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_6_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_7	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW4PSA
C63-PSP-FO-ATWEP_3_7_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW4PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_3_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSA & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_4_5	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSA
C63-PSP-FO-ATWEP_4_5_6	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_4_5_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_4_5_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_4_6	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSB
C63-PSP-FO-ATWEP_4_6_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_4_6_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_4_7	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW4PSA
C63-PSP-FO-ATWEP_4_7_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW4PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_4_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW2PSB & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_5_6	5.714E-08	CCF of two components: C63-PSP-FO-ATW3PSA & C63-PSP-FO-ATW3PSB
C63-PSP-FO-ATWEP_5_6_7	1.905E-09	CCF of three components: C63-PSP-FO-ATW3PSA & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_5_6_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW3PSA & C63-PSP-FO-ATW3PSB & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_5_7	5.714E-08	CCF of two components: C63-PSP-FO-ATW3PSA & C63-PSP-FO-ATW4PSA
C63-PSP-FO-ATWEP_5_7_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW3PSA & C63-PSP-FO-ATW4PSA & C63-PSP-FO-AT

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ATWEP_5_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW3PSA & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_6_7	5.714E-08	CCF of two components: C63-PSP-FO-ATW3PSB & C63-PSP-FO-ATW4PSA
C63-PSP-FO-ATWEP_6_7_8	1.905E-09	CCF of three components: C63-PSP-FO-ATW3PSB & C63-PSP-FO-ATW4PSA & C63-PSP-FO-AT
C63-PSP-FO-ATWEP_6_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW3PSB & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_7_8	5.714E-08	CCF of two components: C63-PSP-FO-ATW4PSA & C63-PSP-FO-ATW4PSB
C63-PSP-FO-ATWEP_ALL	3.600E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
C63-PSP-FO-ESFEP_1_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_1_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_1_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_1_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_1_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_1_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_1_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_1_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_1_2	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB
C63-PSP-FO-ESFEP_1_2_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_3	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_4	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_5	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_1_2_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_2_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF1PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA
C63-PSP-FO-ESFEP_1_3_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_4	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_5	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_3_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB
C63-PSP-FO-ESFEP_1_4_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_1_4_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_5	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_4_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA
C63-PSP-FO-ESFEP_1_5_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_5_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_1_6_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_6_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA
C63-PSP-FO-ESFEP_1_7_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_7_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_1_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_1_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_1_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_1_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_1_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_10_11	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_10_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_12	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSB

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_10_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_13	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_10_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_14	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_10_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_15	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_10_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_10_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_11_12	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_11_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_13	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_11_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_11_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_14	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_11_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_15	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_11_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_11_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_12_13	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_12_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_12_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_12_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_12_14	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_12_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_12_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_12_15	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_12_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_12_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD2PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_13_14	2.667E-08	CCF of two components: C63-PSP-FO-ESFD3PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_13_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD3PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_13_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD3PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_13_15	2.667E-08	CCF of two components: C63-PSP-FO-ESFD3PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_13_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD3PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_13_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD3PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_14_15	2.667E-08	CCF of two components: C63-PSP-FO-ESFD3PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_14_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD3PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_14_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD3PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_15_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD4PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_2_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_2_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_2_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_2_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_2_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_2_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_2_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_2_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_2_3	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA
C63-PSP-FO-ESFEP_2_3_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_4	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_5	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_2_3_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_3_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB
C63-PSP-FO-ESFEP_2_4_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_5	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_4_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA
C63-PSP-FO-ESFEP_2_5_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_2_5_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_5_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB
C63-PSP-FO-ESFEP_2_6_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_6_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA
C63-PSP-FO-ESFEP_2_7_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_2_7_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_7_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_2_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_2_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_2_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_2_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF1PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_3_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_3_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_3_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_3_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_3_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_3_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_3_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_3_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_3_4	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB
C63-PSP-FO-ESFEP_3_4_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_5	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_4_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF2PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA
C63-PSP-FO-ESFEP_3_5_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_3_5_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_5_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB
C63-PSP-FO-ESFEP_3_6_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_6_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA
C63-PSP-FO-ESFEP_3_7_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_3_7_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_7_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_3_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_3_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_3_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_3_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_3_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_4_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_4_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_4_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSA

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_4_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_4_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_4_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_4_5	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA
C63-PSP-FO-ESFEP_4_5_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_6	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_5_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_4_6_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_6_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA
C63-PSP-FO-ESFEP_4_7_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_7_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_4_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_4_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_4_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_4_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_4_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF2PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_5_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_5_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_5_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_5_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_5_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_5_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_5_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_5_6	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_5_6_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_7	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_6_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF3PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA
C63-PSP-FO-ESFEP_5_7_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_7_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_5_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_5_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_5_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_5_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_5_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_6_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_6_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_6_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_6_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_6_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_6_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_6_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_6_7	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_6_7_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_8	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_7_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSA & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_6_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_6_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_6_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_6_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_6_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF3PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_7_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_7_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_7_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E



**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_7_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_7_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_7_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_7_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_7_8	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB
C63-PSP-FO-ESFEP_7_8_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_8_9	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESF4PSB & C63-PSP-FO-ES
C63-PSP-FO-ESFEP_7_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_7_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_7_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_7_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSA & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_10	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_8_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_11	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_8_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_12	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_8_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_8_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_13	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_8_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_14	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_8_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_15	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_8_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_16	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_8_9	2.667E-08	CCF of two components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA
C63-PSP-FO-ESFEP_8_9_10	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_9_11	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_9_12	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_9_13	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_9_14	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_9_15	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_8_9_16	3.810E-10	CCF of three components: C63-PSP-FO-ESF4PSB & C63-PSP-FO-ESFD1PSA & C63-PSP-FO-E
C63-PSP-FO-ESFEP_9_10	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB
C63-PSP-FO-ESFEP_9_10_11	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_10_12	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-ESFEP_9_10_13	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_10_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_10_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_10_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_11	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSA
C63-PSP-FO-ESFEP_9_11_12	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_11_13	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_11_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_11_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_11_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_12	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSB
C63-PSP-FO-ESFEP_9_12_13	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_12_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_12_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_12_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD2PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_13	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSA
C63-PSP-FO-ESFEP_9_13_14	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_13_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_13_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_14	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSB
C63-PSP-FO-ESFEP_9_14_15	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_14_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD3PSB & C63-PSP-FO-

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PSP-FO-ESFEP_9_15	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD4PSA
C63-PSP-FO-ESFEP_9_15_16	3.810E-10	CCF of three components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD4PSA & C63-PSP-FO-
C63-PSP-FO-ESFEP_9_16	2.667E-08	CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD4PSB
C63-PSP-FO-ESFEP_ALL	3.600E-07	CCF of all components in group 'C63-PSP-FO-ESFEP'
C63-PT_-NO-ATWRX_1_2	6.400E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
C63-PT_-NO-ATWRX_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
C63-PT_-NO-ATWRX_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
C63-PT_-NO-ATWRX_1_3	6.400E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
C63-PT_-NO-ATWRX_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-
C63-PT_-NO-ATWRX_1_4	6.400E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
C63-PT_-NO-ATWRX_2_3	6.400E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
C63-PT_-NO-ATWRX_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC & C63-PT_-
C63-PT_-NO-ATWRX_2_4	6.400E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
C63-PT_-NO-ATWRX_3_4	6.400E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
C63-PT_-NO-ATWRX_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
C63-PT_-NO-ESFDW_1_2	6.400E-07	CCF of two components: C63-PT_-NO-ESF1DWPRSA & C63-PT_-NO-ESF2DWPRSB
C63-PT_-NO-ESFDW_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-ESF1DWPRSA & C63-PT_-NO-ESF2DWPRSB & C63-PT_-
C63-PT_-NO-ESFDW_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-ESF1DWPRSA & C63-PT_-NO-ESF2DWPRSB & C63-PT_-
C63-PT_-NO-ESFDW_1_3	6.400E-07	CCF of two components: C63-PT_-NO-ESF1DWPRSA & C63-PT_-NO-ESF3DWPRSC
C63-PT_-NO-ESFDW_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ESF1DWPRSA & C63-PT_-NO-ESF3DWPRSC & C63-PT_-
C63-PT_-NO-ESFDW_1_4	6.400E-07	CCF of two components: C63-PT_-NO-ESF1DWPRSA & C63-PT_-NO-ESF4DWPRSD

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PT_-NO-ESFDW_2_3	6.400E-07	CCF of two components: C63-PT_-NO-ESF2DWPRSB & C63-PT_-NO-ESF3DWPRSC
C63-PT_-NO-ESFDW_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ESF2DWPRSB & C63-PT_-NO-ESF3DWPRSC & C63-PT_-
C63-PT_-NO-ESFDW_2_4	6.400E-07	CCF of two components: C63-PT_-NO-ESF2DWPRSB & C63-PT_-NO-ESF4DWPRSD
C63-PT_-NO-ESFDW_3_4	6.400E-07	CCF of two components: C63-PT_-NO-ESF3DWPRSC & C63-PT_-NO-ESF4DWPRSD
C63-PT_-NO-ESFDW_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
C63-PT_-NO-ESFFW_1_2	6.400E-07	CCF of two components: C63-PT_-NO-ESF1FWPRSA & C63-PT_-NO-ESF2FWPRSB
C63-PT_-NO-ESFFW_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-ESF1FWPRSA & C63-PT_-NO-ESF2FWPRSB & C63-PT_-
C63-PT_-NO-ESFFW_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-ESF1FWPRSA & C63-PT_-NO-ESF2FWPRSB & C63-PT_-
C63-PT_-NO-ESFFW_1_3	6.400E-07	CCF of two components: C63-PT_-NO-ESF1FWPRSA & C63-PT_-NO-ESF3FWPRSC
C63-PT_-NO-ESFFW_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ESF1FWPRSA & C63-PT_-NO-ESF3FWPRSC & C63-PT_-
C63-PT_-NO-ESFFW_1_4	6.400E-07	CCF of two components: C63-PT_-NO-ESF1FWPRSA & C63-PT_-NO-ESF4FWPRSD
C63-PT_-NO-ESFFW_2_3	6.400E-07	CCF of two components: C63-PT_-NO-ESF2FWPRSB & C63-PT_-NO-ESF3FWPRSC
C63-PT_-NO-ESFFW_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ESF2FWPRSB & C63-PT_-NO-ESF3FWPRSC & C63-PT_-
C63-PT_-NO-ESFFW_2_4	6.400E-07	CCF of two components: C63-PT_-NO-ESF2FWPRSB & C63-PT_-NO-ESF4FWPRSD
C63-PT_-NO-ESFFW_3_4	6.400E-07	CCF of two components: C63-PT_-NO-ESF3FWPRSC & C63-PT_-NO-ESF4FWPRSD
C63-PT_-NO-ESFFW_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
C63-PT_-NO-ESFRX_1_2	6.400E-07	CCF of two components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSB
C63-PT_-NO-ESFRX_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSB & C63-PT_-N
C63-PT_-NO-ESFRX_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSB & C63-PT_-N
C63-PT_-NO-ESFRX_1_3	6.400E-07	CCF of two components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSC
C63-PT_-NO-ESFRX_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSC & C63-PT_-N
C63-PT_-NO-ESFRX_1_4	6.400E-07	CCF of two components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSD
C63-PT_-NO-ESFRX_2_3	6.400E-07	CCF of two components: C63-PT_-NO-ESFRXPRSB & C63-PT_-NO-ESFRXPRSC

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PT_-NO-ESFRX_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-ESFRXPRSB & C63-PT_-NO-ESFRXPRSC & C63-PT_-N
C63-PT_-NO-ESFRX_2_4	6.400E-07	CCF of two components: C63-PT_-NO-ESFRXPRSB & C63-PT_-NO-ESFRXPRSD
C63-PT_-NO-ESFRX_3_4	6.400E-07	CCF of two components: C63-PT_-NO-ESFRXPRSC & C63-PT_-NO-ESFRXPRSD
C63-PT_-NO-ESFRX_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-ESFRX'
C63-PT_-NO-RPSCV_1_2	6.400E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB
C63-PT_-NO-RPSCV_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
C63-PT_-NO-RPSCV_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
C63-PT_-NO-RPSCV_1_3	6.400E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC
C63-PT_-NO-RPSCV_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR
C63-PT_-NO-RPSCV_1_4	6.400E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSD
C63-PT_-NO-RPSCV_2_3	6.400E-07	CCF of two components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC
C63-PT_-NO-RPSCV_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR
C63-PT_-NO-RPSCV_2_4	6.400E-07	CCF of two components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSD
C63-PT_-NO-RPSCV_3_4	6.400E-07	CCF of two components: C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPRSD
C63-PT_-NO-RPSCV_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-RPSCV'
C63-PT_-NO-RPSDW_1_2	6.400E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB
C63-PT_-NO-RPSDW_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
C63-PT_-NO-RPSDW_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
C63-PT_-NO-RPSDW_1_3	6.400E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC
C63-PT_-NO-RPSDW_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR
C63-PT_-NO-RPSDW_1_4	6.400E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSD
C63-PT_-NO-RPSDW_2_3	6.400E-07	CCF of two components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC
C63-PT_-NO-RPSDW_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR

**Table 4.5-4b**  
**I&C System – Common Cause Failures (C63)**

The following CCF basic events are used in the C63 fault tree:

Basic Event	Prob	Description
C63-PT_-NO-RPSDW_2_4	6.400E-07	CCF of two components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSD
C63-PT_-NO-RPSDW_3_4	6.400E-07	CCF of two components: C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPRSD
C63-PT_-NO-RPSDW_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-RPSDW'
C63-PT_-NO-RPSRX_1_2	6.400E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB
C63-PT_-NO-RPSRX_1_2_3	6.400E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N
C63-PT_-NO-RPSRX_1_2_4	6.400E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N
C63-PT_-NO-RPSRX_1_3	6.400E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC
C63-PT_-NO-RPSRX_1_3_4	6.400E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC & C63-PT_-N
C63-PT_-NO-RPSRX_1_4	6.400E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSD
C63-PT_-NO-RPSRX_2_3	6.400E-07	CCF of two components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC
C63-PT_-NO-RPSRX_2_3_4	6.400E-08	CCF of three components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC & C63-PT_-N
C63-PT_-NO-RPSRX_2_4	6.400E-07	CCF of two components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSD
C63-PT_-NO-RPSRX_3_4	6.400E-07	CCF of two components: C63-PT_-NO-RPSRXPRSC & C63-PT_-NO-RPSRXPRSD
C63-PT_-NO-RPSRX_ALL	1.728E-06	CCF of all components in group 'C63-PT_-NO-RPSRX'



**Table 4.5-4c**  
**I&C System – Common Cause Failures (C71)**

The following CCF basic events are used in the C71 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C12-SOV-FE_1_2	1.111E-04	CCF of two components: C12-SOV-FE-F036 & C12-SOV-FE-F037
C71-ACT-FC_1_2	2.133E-07	CCF of two components: C71-ACT-FC-D1APRM & C71-ACT-FC-D2APRM
C71-ACT-FC_1_2_3	2.133E-08	CCF of three components: C71-ACT-FC-D1APRM & C71-ACT-FC-D2APRM & C71-ACT-FC-D3AP
C71-ACT-FC_1_2_4	2.133E-08	CCF of three components: C71-ACT-FC-D1APRM & C71-ACT-FC-D2APRM & C71-ACT-FC-D4AP
C71-ACT-FC_1_3	2.133E-07	CCF of two components: C71-ACT-FC-D1APRM & C71-ACT-FC-D3APRM
C71-ACT-FC_1_3_4	2.133E-08	CCF of three components: C71-ACT-FC-D1APRM & C71-ACT-FC-D3APRM & C71-ACT-FC-D4AP
C71-ACT-FC_1_4	2.133E-07	CCF of two components: C71-ACT-FC-D1APRM & C71-ACT-FC-D4APRM
C71-ACT-FC_2_3	2.133E-07	CCF of two components: C71-ACT-FC-D2APRM & C71-ACT-FC-D3APRM
C71-ACT-FC_2_3_4	2.133E-08	CCF of three components: C71-ACT-FC-D2APRM & C71-ACT-FC-D3APRM & C71-ACT-FC-D4AP
C71-ACT-FC_2_4	2.133E-07	CCF of two components: C71-ACT-FC-D2APRM & C71-ACT-FC-D4APRM
C71-ACT-FC_3_4	2.133E-07	CCF of two components: C71-ACT-FC-D3APRM & C71-ACT-FC-D4APRM
C71-ACT-FC_ALL	5.760E-07	CCF of all components in group 'C71-ACT-FC'
C71-DTM-FC-R_1_2	1.111E-05	CCF of two components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV2
C71-DTM-FC-R_1_2_3	1.111E-06	CCF of three components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RP
C71-DTM-FC-R_1_2_4	1.111E-06	CCF of three components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RP
C71-DTM-FC-R_1_3	1.111E-05	CCF of two components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV3
C71-DTM-FC-R_1_3_4	1.111E-06	CCF of three components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV3 & C71-DTM-FC-RP
C71-DTM-FC-R_1_4	1.111E-05	CCF of two components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV4
C71-DTM-FC-R_2_3	1.111E-05	CCF of two components: C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RPSDIV3
C71-DTM-FC-R_2_3_4	1.111E-06	CCF of three components: C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RPSDIV3 & C71-DTM-FC-RP
C71-DTM-FC-R_2_4	1.111E-05	CCF of two components: C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RPSDIV4
C71-DTM-FC-R_3_4	1.111E-05	CCF of two components: C71-DTM-FC-RPSDIV3 & C71-DTM-FC-RPSDIV4
C71-DTM-FC-R_ALL	3.000E-05	CCF of all components in group 'C71-DTM-FC-R'

**Table 4.5-4c**  
**I&C System – Common Cause Failures (C71)**

The following CCF basic events are used in the C71 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-OLU-FC-R_1_2	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2
C71-OLU-FC-R_1_2_3	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-
C71-OLU-FC-R_1_2_4	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-
C71-OLU-FC-R_1_2_5	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-
C71-OLU-FC-R_1_2_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-
C71-OLU-FC-R_1_2_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-
C71-OLU-FC-R_1_2_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-
C71-OLU-FC-R_1_3	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV3
C71-OLU-FC-R_1_3_4	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_1_3_5	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_1_3_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_1_3_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_1_3_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_1_4	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV4
C71-OLU-FC-R_1_4_5	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_1_4_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_1_4_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_1_4_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_1_5	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV1
C71-OLU-FC-R_1_5_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_1_5_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_1_5_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R

**Table 4.5-4c**  
**I&C System – Common Cause Failures (C71)**

The following CCF basic events are used in the C71 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-OLU-FC-R_1_6	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV2
C71-OLU-FC-R_1_6_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_1_6_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_1_7	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV3
C71-OLU-FC-R_1_7_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-R
C71-OLU-FC-R_1_8	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV1 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_2_3	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV3
C71-OLU-FC-R_2_3_4	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_2_3_5	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_2_3_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_2_3_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_2_3_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-
C71-OLU-FC-R_2_4	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV4
C71-OLU-FC-R_2_4_5	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_2_4_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_2_4_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_2_4_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_2_5	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV1
C71-OLU-FC-R_2_5_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_2_5_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_2_5_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_2_6	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV2

**Table 4.5-4c**  
**I&C System – Common Cause Failures (C71)**

The following CCF basic events are used in the C71 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-OLU-FC-R_2_6_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_2_6_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_2_7	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV3
C71-OLU-FC-R_2_7_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-R
C71-OLU-FC-R_2_8	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV2 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_3_4	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-MSIVDIV4
C71-OLU-FC-R_3_4_5	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_3_4_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_3_4_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_3_4_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-
C71-OLU-FC-R_3_5	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV1
C71-OLU-FC-R_3_5_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_3_5_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_3_5_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_3_6	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV2
C71-OLU-FC-R_3_6_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_3_6_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_3_7	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV3
C71-OLU-FC-R_3_7_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-R
C71-OLU-FC-R_3_8	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV3 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_4_5	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV1
C71-OLU-FC-R_4_5_6	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R

**Table 4.5-4c**  
**I&C System – Common Cause Failures (C71)**

The following CCF basic events are used in the C71 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-OLU-FC-R_4_5_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_4_5_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV1 & C71-OLU-FC-R
C71-OLU-FC-R_4_6	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV2
C71-OLU-FC-R_4_6_7	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_4_6_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-R
C71-OLU-FC-R_4_7	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV3
C71-OLU-FC-R_4_7_8	9.522E-08	CCF of three components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-R
C71-OLU-FC-R_4_8	2.857E-06	CCF of two components: C71-OLU-FC-MSIVDIV4 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_5_6	2.857E-06	CCF of two components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV2
C71-OLU-FC-R_5_6_7	9.522E-08	CCF of three components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RP
C71-OLU-FC-R_5_6_8	9.522E-08	CCF of three components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RP
C71-OLU-FC-R_5_7	2.857E-06	CCF of two components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV3
C71-OLU-FC-R_5_7_8	9.522E-08	CCF of three components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-RP
C71-OLU-FC-R_5_8	2.857E-06	CCF of two components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_6_7	2.857E-06	CCF of two components: C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RPSDIV3
C71-OLU-FC-R_6_7_8	9.522E-08	CCF of three components: C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-RP
C71-OLU-FC-R_6_8	2.857E-06	CCF of two components: C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_7_8	2.857E-06	CCF of two components: C71-OLU-FC-RPSDIV3 & C71-OLU-FC-RPSDIV4
C71-OLU-FC-R_ALL	1.800E-05	CCF of all components in group 'C71-OLU-FC-R'
C71-SLU-FC-N_1_2	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV2
C71-SLU-FC-N_1_2_3	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NM
C71-SLU-FC-N_1_2_4	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NM
C71-SLU-FC-N_1_3	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV3

**Table 4.5-4c**  
**I&C System – Common Cause Failures (C71)**

The following CCF basic events are used in the C71 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-SLU-FC-N_1_3_4	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV3 & C71-SLU-FC-NM
C71-SLU-FC-N_1_4	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV4
C71-SLU-FC-N_2_3	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NMSDIV3
C71-SLU-FC-N_2_3_4	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NMSDIV3 & C71-SLU-FC-NM
C71-SLU-FC-N_2_4	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NMSDIV4
C71-SLU-FC-N_3_4	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV3 & C71-SLU-FC-NMSDIV4
C71-SLU-FC-N_ALL	4.500E-05	CCF of all components in group 'C71-SLU-FC-N'
C71-SLU-FC-R_1_2	1.667E-05	CCF of two components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2
C71-SLU-FC-R_1_2_3	1.667E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
C71-SLU-FC-R_1_2_4	1.667E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
C71-SLU-FC-R_1_3	1.667E-05	CCF of two components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3
C71-SLU-FC-R_1_3_4	1.667E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP
C71-SLU-FC-R_1_4	1.667E-05	CCF of two components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV4
C71-SLU-FC-R_2_3	1.667E-05	CCF of two components: C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RPSDIV3
C71-SLU-FC-R_2_3_4	1.667E-06	CCF of three components: C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP
C71-SLU-FC-R_2_4	1.667E-05	CCF of two components: C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RPSDIV4
C71-SLU-FC-R_3_4	1.667E-05	CCF of two components: C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RPSDIV4
C71-SLU-FC-R_ALL	4.500E-05	CCF of all components in group 'C71-SLU-FC-R'

**Table 4.5-4d**  
**I&C System – Common Cause Failures (C72)**

The following CCF basic events are used in the C72 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C12-INV-FC-X_1_2	3.997E-05	CCF of two components: C12-INV-FC-G1X205 & C12-INV-FC-G2X205
C12-INV-FC-X_1_2_3	7.994E-05	CCF of three components: C12-INV-FC-G1X205 & C12-INV-FC-G2X205 & C12-INV-FC-G3X2
C12-INV-FC-X_1_3	3.997E-05	CCF of two components: C12-INV-FC-G1X205 & C12-INV-FC-G3X205
C12-INV-FC-X_2_3	3.997E-05	CCF of two components: C12-INV-FC-G2X205 & C12-INV-FC-G3X205
C12-SOV-FE-ARI_1_2	9.259E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F039
C12-SOV-FE-ARI_1_2_3	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F039 & C12-SOV-FE-F042
C12-SOV-FE-ARI_1_2_4	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F039 & C12-SOV-FE-F043A
C12-SOV-FE-ARI_1_2_5	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F039 & C12-SOV-FE-F043B
C12-SOV-FE-ARI_1_2_6	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F039 & C12-SOV-FE-F044A
C12-SOV-FE-ARI_1_2_7	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F039 & C12-SOV-FE-F044B
C12-SOV-FE-ARI_1_3	9.259E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F042
C12-SOV-FE-ARI_1_3_4	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F042 & C12-SOV-FE-F043A
C12-SOV-FE-ARI_1_3_5	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F042 & C12-SOV-FE-F043B
C12-SOV-FE-ARI_1_3_6	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F042 & C12-SOV-FE-F044A
C12-SOV-FE-ARI_1_3_7	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F042 & C12-SOV-FE-F044B
C12-SOV-FE-ARI_1_4	9.259E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F043A
C12-SOV-FE-ARI_1_4_5	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F043A & C12-SOV-FE-F043B
C12-SOV-FE-ARI_1_4_6	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F043A & C12-SOV-FE-F044A
C12-SOV-FE-ARI_1_4_7	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F043A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_1_5	9.259E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F043B
C12-SOV-FE-ARI_1_5_6	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F043B & C12-SOV-FE-F044A
C12-SOV-FE-ARI_1_5_7	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F043B & C12-SOV-FE-F044B

**Table 4.5-4d**  
**I&C System – Common Cause Failures (C72)**

The following CCF basic events are used in the C72 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C12-SOV-FE-ARI_1_6	9.259E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F044A
C12-SOV-FE-ARI_1_6_7	3.704E-07	CCF of three components: C12-SOV-FE-F038 & C12-SOV-FE-F044A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_1_7	9.259E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F044B
C12-SOV-FE-ARI_2_3	9.259E-06	CCF of two components: C12-SOV-FE-F039 & C12-SOV-FE-F042
C12-SOV-FE-ARI_2_3_4	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F042 & C12-SOV-FE-F043A
C12-SOV-FE-ARI_2_3_5	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F042 & C12-SOV-FE-F043B
C12-SOV-FE-ARI_2_3_6	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F042 & C12-SOV-FE-F044A
C12-SOV-FE-ARI_2_3_7	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F042 & C12-SOV-FE-F044B
C12-SOV-FE-ARI_2_4	9.259E-06	CCF of two components: C12-SOV-FE-F039 & C12-SOV-FE-F043A
C12-SOV-FE-ARI_2_4_5	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F043A & C12-SOV-FE-F043B
C12-SOV-FE-ARI_2_4_6	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F043A & C12-SOV-FE-F044A
C12-SOV-FE-ARI_2_4_7	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F043A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_2_5	9.259E-06	CCF of two components: C12-SOV-FE-F039 & C12-SOV-FE-F043B
C12-SOV-FE-ARI_2_5_6	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F043B & C12-SOV-FE-F044A
C12-SOV-FE-ARI_2_5_7	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F043B & C12-SOV-FE-F044B
C12-SOV-FE-ARI_2_6	9.259E-06	CCF of two components: C12-SOV-FE-F039 & C12-SOV-FE-F044A
C12-SOV-FE-ARI_2_6_7	3.704E-07	CCF of three components: C12-SOV-FE-F039 & C12-SOV-FE-F044A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_2_7	9.259E-06	CCF of two components: C12-SOV-FE-F039 & C12-SOV-FE-F044B
C12-SOV-FE-ARI_3_4	9.259E-06	CCF of two components: C12-SOV-FE-F042 & C12-SOV-FE-F043A
C12-SOV-FE-ARI_3_4_5	3.704E-07	CCF of three components: C12-SOV-FE-F042 & C12-SOV-FE-F043A & C12-SOV-FE-F043B
C12-SOV-FE-ARI_3_4_6	3.704E-07	CCF of three components: C12-SOV-FE-F042 & C12-SOV-FE-F043A & C12-SOV-FE-F044A
C12-SOV-FE-ARI_3_4_7	3.704E-07	CCF of three components: C12-SOV-FE-F042 & C12-SOV-FE-F043A & C12-SOV-FE-F044B



**Table 4.5-4d**  
**I&C System – Common Cause Failures (C72)**

The following CCF basic events are used in the C72 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C12-SOV-FE-ARI_3_5	9.259E-06	CCF of two components: C12-SOV-FE-F042 & C12-SOV-FE-F043B
C12-SOV-FE-ARI_3_5_6	3.704E-07	CCF of three components: C12-SOV-FE-F042 & C12-SOV-FE-F043B & C12-SOV-FE-F044A
C12-SOV-FE-ARI_3_5_7	3.704E-07	CCF of three components: C12-SOV-FE-F042 & C12-SOV-FE-F043B & C12-SOV-FE-F044B
C12-SOV-FE-ARI_3_6	9.259E-06	CCF of two components: C12-SOV-FE-F042 & C12-SOV-FE-F044A
C12-SOV-FE-ARI_3_6_7	3.704E-07	CCF of three components: C12-SOV-FE-F042 & C12-SOV-FE-F044A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_3_7	9.259E-06	CCF of two components: C12-SOV-FE-F042 & C12-SOV-FE-F044B
C12-SOV-FE-ARI_4_5	9.259E-06	CCF of two components: C12-SOV-FE-F043A & C12-SOV-FE-F043B
C12-SOV-FE-ARI_4_5_6	3.704E-07	CCF of three components: C12-SOV-FE-F043A & C12-SOV-FE-F043B & C12-SOV-FE-F044A
C12-SOV-FE-ARI_4_5_7	3.704E-07	CCF of three components: C12-SOV-FE-F043A & C12-SOV-FE-F043B & C12-SOV-FE-F044B
C12-SOV-FE-ARI_4_6	9.259E-06	CCF of two components: C12-SOV-FE-F043A & C12-SOV-FE-F044A
C12-SOV-FE-ARI_4_6_7	3.704E-07	CCF of three components: C12-SOV-FE-F043A & C12-SOV-FE-F044A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_4_7	9.259E-06	CCF of two components: C12-SOV-FE-F043A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_5_6	9.259E-06	CCF of two components: C12-SOV-FE-F043B & C12-SOV-FE-F044A
C12-SOV-FE-ARI_5_6_7	3.704E-07	CCF of three components: C12-SOV-FE-F043B & C12-SOV-FE-F044A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_5_7	9.259E-06	CCF of two components: C12-SOV-FE-F043B & C12-SOV-FE-F044B
C12-SOV-FE-ARI_6_7	9.259E-06	CCF of two components: C12-SOV-FE-F044A & C12-SOV-FE-F044B
C12-SOV-FE-ARI_ALL	5.000E-05	CCF of all components in group 'C12-SOV-FE-ARI'
C71-ACT-FC-S_1_2	2.133E-07	CCF of two components: C71-ACT-FC-D1SRNM & C71-ACT-FC-D2SRNM
C71-ACT-FC-S_1_2_3	2.133E-08	CCF of three components: C71-ACT-FC-D1SRNM & C71-ACT-FC-D2SRNM & C71-ACT-FC-D3SR
C71-ACT-FC-S_1_2_4	2.133E-08	CCF of three components: C71-ACT-FC-D1SRNM & C71-ACT-FC-D2SRNM & C71-ACT-FC-D4SR
C71-ACT-FC-S_1_3	2.133E-07	CCF of two components: C71-ACT-FC-D1SRNM & C71-ACT-FC-D3SRNM
C71-ACT-FC-S_1_3_4	2.133E-08	CCF of three components: C71-ACT-FC-D1SRNM & C71-ACT-FC-D3SRNM & C71-ACT-FC-D4SR
C71-ACT-FC-S_1_4	2.133E-07	CCF of two components: C71-ACT-FC-D1SRNM & C71-ACT-FC-D4SRNM

**Table 4.5-4d**  
**I&C System – Common Cause Failures (C72)**

The following CCF basic events are used in the C72 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-ACT-FC-S_2_3	2.133E-07	CCF of two components: C71-ACT-FC-D2SRNM & C71-ACT-FC-D3SRNM
C71-ACT-FC-S_2_3_4	2.133E-08	CCF of three components: C71-ACT-FC-D2SRNM & C71-ACT-FC-D3SRNM & C71-ACT-FC-D4SR
C71-ACT-FC-S_2_4	2.133E-07	CCF of two components: C71-ACT-FC-D2SRNM & C71-ACT-FC-D4SRNM
C71-ACT-FC-S_3_4	2.133E-07	CCF of two components: C71-ACT-FC-D3SRNM & C71-ACT-FC-D4SRNM
C71-ACT-FC-S_ALL	5.760E-07	CCF of all components in group 'C71-ACT-FC-S'
C71-SLU-FC-N_1_2	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV2
C71-SLU-FC-N_1_2_3	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NM
C71-SLU-FC-N_1_2_4	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NM
C71-SLU-FC-N_1_3	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV3
C71-SLU-FC-N_1_3_4	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV3 & C71-SLU-FC-NM
C71-SLU-FC-N_1_4	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV1 & C71-SLU-FC-NMSDIV4
C71-SLU-FC-N_2_3	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NMSDIV3
C71-SLU-FC-N_2_3_4	1.667E-06	CCF of three components: C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NMSDIV3 & C71-SLU-FC-NM
C71-SLU-FC-N_2_4	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV2 & C71-SLU-FC-NMSDIV4
C71-SLU-FC-N_3_4	1.667E-05	CCF of two components: C71-SLU-FC-NMSDIV3 & C71-SLU-FC-NMSDIV4
C71-SLU-FC-N_ALL	4.500E-05	CCF of all components in group 'C71-SLU-FC-N'
C71-SLU-FC-S_1_2	1.667E-05	CCF of two components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2
C71-SLU-FC-S_1_2_3	1.667E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
C71-SLU-FC-S_1_2_4	1.667E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
C71-SLU-FC-S_1_3	1.667E-05	CCF of two components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV3
C71-SLU-FC-S_1_3_4	1.667E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV3 & C71-SLU-FC-SR
C71-SLU-FC-S_1_4	1.667E-05	CCF of two components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV4
C71-SLU-FC-S_2_3	1.667E-05	CCF of two components: C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SRNDIV3

**Table 4.5-4d**  
**I&C System – Common Cause Failures (C72)**

The following CCF basic events are used in the C72 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C71-SLU-FC-S_2_3_4	1.667E-06	CCF of three components: C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SRNDIV3 & C71-SLU-FC-SR
C71-SLU-FC-S_2_4	1.667E-05	CCF of two components: C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SRNDIV4
C71-SLU-FC-S_3_4	1.667E-05	CCF of two components: C71-SLU-FC-SRNDIV3 & C71-SLU-FC-SRNDIV4
C71-SLU-FC-S_ALL	4.500E-05	CCF of all components in group 'C71-SLU-FC-S'
C72-LOG-FC-D_1_2	9.998E-06	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
C72-LOG-FC-D_1_2_3	2.000E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
C72-LOG-FC-D_1_3	9.998E-06	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
C72-LOG-FC-D_2_3	9.998E-06	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
C72-MOD-FD-ASD1_1_2	1.111E-07	CCF of two components: C72-MOD-FD-ASD1A & C72-MOD-FD-ASD1B
C72-MOD-FD-ASD2_1_2	1.111E-07	CCF of two components: C72-MOD-FD-ASD2A & C72-MOD-FD-ASD2B
C72-MOD-FD-ASD3_1_2	1.111E-07	CCF of two components: C72-MOD-FD-ASD3A & C72-MOD-FD-ASD3B
C72-MOD-FD-ASD4_1_2	1.111E-07	CCF of two components: C72-MOD-FD-ASD4A & C72-MOD-FD-ASD4B
C74-ATM-FC-L2_1_2	1.852E-06	CCF of two components: C74-ATM-FC-LDIV1 & C74-ATM-FC-LDIV2
C74-ATM-FC-L2_1_2_3	1.852E-07	CCF of three components: C74-ATM-FC-LDIV1 & C74-ATM-FC-LDIV2 & C74-ATM-FC-LDIV3
C74-ATM-FC-L2_1_2_4	1.852E-07	CCF of three components: C74-ATM-FC-LDIV1 & C74-ATM-FC-LDIV2 & C74-ATM-FC-LDIV4
C74-ATM-FC-L2_1_3	1.852E-06	CCF of two components: C74-ATM-FC-LDIV1 & C74-ATM-FC-LDIV3
C74-ATM-FC-L2_1_3_4	1.852E-07	CCF of three components: C74-ATM-FC-LDIV1 & C74-ATM-FC-LDIV3 & C74-ATM-FC-LDIV4
C74-ATM-FC-L2_1_4	1.852E-06	CCF of two components: C74-ATM-FC-LDIV1 & C74-ATM-FC-LDIV4
C74-ATM-FC-L2_2_3	1.852E-06	CCF of two components: C74-ATM-FC-LDIV2 & C74-ATM-FC-LDIV3
C74-ATM-FC-L2_2_3_4	1.852E-07	CCF of three components: C74-ATM-FC-LDIV2 & C74-ATM-FC-LDIV3 & C74-ATM-FC-LDIV4
C74-ATM-FC-L2_2_4	1.852E-06	CCF of two components: C74-ATM-FC-LDIV2 & C74-ATM-FC-LDIV4
C74-ATM-FC-L2_3_4	1.852E-06	CCF of two components: C74-ATM-FC-LDIV3 & C74-ATM-FC-LDIV4
C74-ATM-FC-L2_ALL	5.000E-06	CCF of all components in group 'C74-ATM-FC-L2'

**Table 4.5-4d**  
**I&C System – Common Cause Failures (C72)**

The following CCF basic events are used in the C72 fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C74-ATM-FC-PR_1_2	1.852E-06	CCF of two components: C74-ATM-FC-PDIV1 & C74-ATM-FC-PDIV2
C74-ATM-FC-PR_1_2_3	1.852E-07	CCF of three components: C74-ATM-FC-PDIV1 & C74-ATM-FC-PDIV2 & C74-ATM-FC-PDIV3
C74-ATM-FC-PR_1_2_4	1.852E-07	CCF of three components: C74-ATM-FC-PDIV1 & C74-ATM-FC-PDIV2 & C74-ATM-FC-PDIV4
C74-ATM-FC-PR_1_3	1.852E-06	CCF of two components: C74-ATM-FC-PDIV1 & C74-ATM-FC-PDIV3
C74-ATM-FC-PR_1_3_4	1.852E-07	CCF of three components: C74-ATM-FC-PDIV1 & C74-ATM-FC-PDIV3 & C74-ATM-FC-PDIV4
C74-ATM-FC-PR_1_4	1.852E-06	CCF of two components: C74-ATM-FC-PDIV1 & C74-ATM-FC-PDIV4
C74-ATM-FC-PR_2_3	1.852E-06	CCF of two components: C74-ATM-FC-PDIV2 & C74-ATM-FC-PDIV3
C74-ATM-FC-PR_2_3_4	1.852E-07	CCF of three components: C74-ATM-FC-PDIV2 & C74-ATM-FC-PDIV3 & C74-ATM-FC-PDIV4
C74-ATM-FC-PR_2_4	1.852E-06	CCF of two components: C74-ATM-FC-PDIV2 & C74-ATM-FC-PDIV4
C74-ATM-FC-PR_3_4	1.852E-06	CCF of two components: C74-ATM-FC-PDIV3 & C74-ATM-FC-PDIV4
C74-ATM-FC-PR_ALL	5.000E-06	CCF of all components in group 'C74-ATM-FC-PR'
C74-LOG-FC-AT-_1_2	6.665E-06	CCF of two components: C74-LOG-FC-ATWSD1 & C74-LOG-FC-ATWSD2
C74-LOG-FC-AT-_1_2_3	6.665E-07	CCF of three components: C74-LOG-FC-ATWSD1 & C74-LOG-FC-ATWSD2 & C74-LOG-FC-ATWS
C74-LOG-FC-AT-_1_2_4	6.665E-07	CCF of three components: C74-LOG-FC-ATWSD1 & C74-LOG-FC-ATWSD2 & C74-LOG-FC-ATWS
C74-LOG-FC-AT-_1_3	6.665E-06	CCF of two components: C74-LOG-FC-ATWSD1 & C74-LOG-FC-ATWSD3
C74-LOG-FC-AT-_1_3_4	6.665E-07	CCF of three components: C74-LOG-FC-ATWSD1 & C74-LOG-FC-ATWSD3 & C74-LOG-FC-ATWS
C74-LOG-FC-AT-_1_4	6.665E-06	CCF of two components: C74-LOG-FC-ATWSD1 & C74-LOG-FC-ATWSD4
C74-LOG-FC-AT-_2_3	6.665E-06	CCF of two components: C74-LOG-FC-ATWSD2 & C74-LOG-FC-ATWSD3
C74-LOG-FC-AT-_2_3_4	6.665E-07	CCF of three components: C74-LOG-FC-ATWSD2 & C74-LOG-FC-ATWSD3 & C74-LOG-FC-ATWS
C74-LOG-FC-AT-_2_4	6.665E-06	CCF of two components: C74-LOG-FC-ATWSD2 & C74-LOG-FC-ATWSD4
C74-LOG-FC-AT-_3_4	6.665E-06	CCF of two components: C74-LOG-FC-ATWSD3 & C74-LOG-FC-ATWSD4
C74-LOG-FC-AT-_ALL	1.800E-05	CCF of all components in group 'C74-LOG-FC-AT-'

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-ATM-FC-IPR_1_2	1.85E-06	CCF of two components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD2
C63-ATM-FC-IPR_1_2_3	1.85E-07	CCF of three components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD3
C63-ATM-FC-IPR_1_2_4	1.85E-07	CCF of three components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD4
C63-ATM-FC-IPR_1_3	1.85E-06	CCF of two components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD3
C63-ATM-FC-IPR_1_3_4	1.85E-07	CCF of three components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD3 & C63-ATM-FC-IPRD4
C63-ATM-FC-IPR_1_4	1.85E-06	CCF of two components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD4
C63-ATM-FC-IPR_2_3	1.85E-06	CCF of two components: C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD3
C63-ATM-FC-IPR_2_3_4	1.85E-07	CCF of three components: C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD3 & C63-ATM-FC-IPRD4
C63-ATM-FC-IPR_2_4	1.85E-06	CCF of two components: C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD4
C63-ATM-FC-IPR_3_4	1.85E-06	CCF of two components: C63-ATM-FC-IPRD3 & C63-ATM-FC-IPRD4
C63-ATM-FC-IPR_ALL	5.00E-06	CCF of all components in group 'C63-ATM-FC-IPR'
C63-LOG-FC-IPRLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_10_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_1_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_1_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_1_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD4C3

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2
C63-LOG-FC-IPRLG_1_2_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_3	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_4	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_5	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_2_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3
C63-LOG-FC-IPRLG_1_3_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_4	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_5	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_3_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-LOG-FC-IPRD2C1
C63-LOG-FC-IPRLG_1_4_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_5	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_4_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2
C63-LOG-FC-IPRLG_1_5_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_5_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_6	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3
C63-LOG-FC-IPRLG_1_6_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_6_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_6_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_6_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_1_6_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_6_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_7	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C1
C63-LOG-FC-IPRLG_1_7_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_7_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_7_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_7_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_7_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_1_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_1_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_1_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_2_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_2_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 &



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3
C63-LOG-FC-IPRLG_2_3_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_4	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_5	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_3_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1
C63-LOG-FC-IPRLG_2_4_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_5	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_4_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_2_5_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_5_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_6	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3
C63-LOG-FC-IPRLG_2_6_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_6_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_6_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_6_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_6_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_6_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_7	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C1
C63-LOG-FC-IPRLG_2_7_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_7_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_7_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_7_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_7_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_2_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_2_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_2_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_3_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_3_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_3_4	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1
C63-LOG-FC-IPRLG_3_4_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_4_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_4_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_4_5	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_4_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_4_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_4_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_3_4_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2
C63-LOG-FC-IPRLG_3_5_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_5_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_6	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3
C63-LOG-FC-IPRLG_3_6_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_6_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_6_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_6_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_6_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_6_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_7	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C1
C63-LOG-FC-IPRLG_3_7_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_7_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_7_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_7_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_7_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_3_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_3_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_3_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD1C3 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_4_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_4_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2
C63-LOG-FC-IPRLG_4_5_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_5_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_5_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_5_6	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_5_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_4_5_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_5_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3
C63-LOG-FC-IPRLG_4_6_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_6_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_6_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_6_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_6_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_6_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_7	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C1
C63-LOG-FC-IPRLG_4_7_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_7_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_7_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_7_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_7_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_4_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_4_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_4_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_5_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_5_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3
C63-LOG-FC-IPRLG_5_6_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_6_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_6_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_6_7	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_6_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_6_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_7	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C1
C63-LOG-FC-IPRLG_5_7_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_7_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_7_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_7_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_7_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_5_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_5_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_5_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_5_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_6_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_6_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_6_7	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C1
C63-LOG-FC-IPRLG_6_7_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_7_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_7_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_7_8	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_7_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C3 &



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_6_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_6_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_6_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD2C3 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_7_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_7_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C2
C63-LOG-FC-IPRLG_7_8_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_8_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_8_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_8_9	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_7_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRLG_7_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_7_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C1 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_8_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_8_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_8_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_8_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_8_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_8_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD3C3
C63-LOG-FC-IPRLG_8_9_10	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_8_9_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_8_9_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C2 & C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_9_10	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IPRD4C1
C63-LOG-FC-IPRLG_9_10_11	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_9_10_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IPRD4C1 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_9_11	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IPRD4C2
C63-LOG-FC-IPRLG_9_11_12	3.64E-08	CCF of three components: C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IPRD4C2 & C63-LOG-FC-IP
C63-LOG-FC-IPRLG_9_12	1.82E-06	CCF of two components: C63-LOG-FC-IPRD3C3 & C63-LOG-FC-IPRD4C3
C63-LOG-FC-IPRLG_ALL	1.80E-05	CCF of all components in group 'C63-LOG-FC-IPRLG'
C63-LT_-NO-IPRRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLB
C63-LT_-NO-IPRRX_1_2_3	1.33E-07	CCF of three components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLB & C63-LT_-N
C63-LT_-NO-IPRRX_1_2_4	1.33E-07	CCF of three components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLB & C63-LT_-N

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LT_-NO-IPRRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLC
C63-LT_-NO-IPRRX_1_3_4	1.33E-07	CCF of three components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLC & C63-LT_-N
C63-LT_-NO-IPRRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLD
C63-LT_-NO-IPRRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-IPRRXLVLB & C63-LT_-NO-IPRRXLVLC
C63-LT_-NO-IPRRX_2_3_4	1.33E-07	CCF of three components: C63-LT_-NO-IPRRXLVLB & C63-LT_-NO-IPRRXLVLC & C63-LT_-N
C63-LT_-NO-IPRRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-IPRRXLVLB & C63-LT_-NO-IPRRXLVLD
C63-LT_-NO-IPRRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-IPRRXLVLC & C63-LT_-NO-IPRRXLVLD
C63-LT_-NO-IPRRX_ALL	3.60E-06	CCF of all components in group 'C63-LT_-NO-IPRRX'
C63-PSP-FO-IPREP_10_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_10_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_10_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_10_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_10_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_10_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_10_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_10_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_10_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_10_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_10_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_10_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_10_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_10_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_11_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_11_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_11_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_11_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_11_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_11_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_11_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_11_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_11_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_11_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_11_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_11_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_11_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_11_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_11_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSA &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_12_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_12_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_12_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_12_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_12_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_12_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_12_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_12_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_12_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_12_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_13_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_13_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_13_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_13_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_13_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_13_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_14_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_14_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_14_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_15_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_1_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_1_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_1_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_1_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_1_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_1_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_1_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_1_2	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB
C63-PSP-FO-IPREP_1_2_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_3	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_4	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_5	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_2_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_1_3_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_4	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_5	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_3_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB
C63-PSP-FO-IPREP_1_4_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_5	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA &



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_4_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA
C63-PSP-FO-IPREP_1_5_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_5_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB
C63-PSP-FO-IPREP_1_6_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_1_6_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_6_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA
C63-PSP-FO-IPREP_1_7_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_7_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_1_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_1_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_1_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_2_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_2_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_2_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_2_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_2_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_2_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_2_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_2_3	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA
C63-PSP-FO-IPREP_2_3_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_4	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_5	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_3_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB
C63-PSP-FO-IPREP_2_4_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_5	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_2_4_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_4_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA
C63-PSP-FO-IPREP_2_5_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_5_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB
C63-PSP-FO-IPREP_2_6_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_6_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA
C63-PSP-FO-IPREP_2_7_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_7_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_2_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_2_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_2_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_2_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD1PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_3_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_3_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA &



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_3_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_3_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_3_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_3_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_3_4	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB
C63-PSP-FO-IPREP_3_4_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_3_4_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_5	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_4_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA
C63-PSP-FO-IPREP_3_5_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_5_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB
C63-PSP-FO-IPREP_3_6_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_6_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA
C63-PSP-FO-IPREP_3_7_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_7_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_3_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_3_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_3_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_3_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_4_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_4_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_4_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_4_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_4_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_4_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_4_5	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_4_5_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_6	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_5_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB
C63-PSP-FO-IPREP_4_6_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_6_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA
C63-PSP-FO-IPREP_4_7_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_7_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_4_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_4_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_4_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_4_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_4_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD2PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_5_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_5_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_5_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA &



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_5_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_5_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_5_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_5_6	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB
C63-PSP-FO-IPREP_5_6_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_7	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_5_6_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_6_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA
C63-PSP-FO-IPREP_5_7_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_7_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_5_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSA &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_5_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_5_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_6_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_6_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSB

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_6_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_6_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_6_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_6_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_6_7	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA
C63-PSP-FO-IPREP_6_7_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_8	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_7_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_6_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_6_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_6_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD3PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_7_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_7_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_7_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_7_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_7_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_7_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_7_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_7_8	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB
C63-PSP-FO-IPREP_7_8_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_8_9	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRD4PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_7_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_7_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSA & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_8_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_8_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_8_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_8_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_8_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB &



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_8_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_8_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_8_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_8_9	2.67E-08	CCF of two components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA
C63-PSP-FO-IPREP_8_9_10	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_9_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_9_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_9_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_9_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_9_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_8_9_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRD4PSB & C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_10	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB
C63-PSP-FO-IPREP_9_10_11	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_10_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_10_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_10_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_10_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_10_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ1PSB & C63-PSP-FO-

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-PSP-FO-IPREP_9_11	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSA
C63-PSP-FO-IPREP_9_11_12	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_11_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_11_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_11_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_11_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_12	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSB
C63-PSP-FO-IPREP_9_12_13	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_12_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_12_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_12_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ2PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_13	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSA
C63-PSP-FO-IPREP_9_13_14	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_13_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_13_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_14	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSB
C63-PSP-FO-IPREP_9_14_15	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_14_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ3PSB & C63-PSP-FO-
C63-PSP-FO-IPREP_9_15	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ4PSA
C63-PSP-FO-IPREP_9_15_16	3.81E-10	CCF of three components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ4PSA & C63-PSP-FO-
C63-PSP-FO-IPREP_9_16	2.67E-08	CCF of two components: C63-PSP-FO-IPRZ1PSA & C63-PSP-FO-IPRZ4PSB
C63-PSP-FO-IPREP_ALL	3.60E-07	CCF of all components in group 'C63-PSP-FO-IPREP'

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_10_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_10_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_10_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_10_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_10_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_10_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_10_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_10_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_10_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_10_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_10_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_10_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_10_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_10_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_10_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_10_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_10_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_10_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_10_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_10_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_10_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_11_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-B &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_11_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_11_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_11_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_11_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_11_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_11_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_11_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_11_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_11_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_11_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_11_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_11_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_11_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_11_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_12_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_12_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_12_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_12_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_12_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_12_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_12_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003C-D & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_12_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_12_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_12_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003B-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_13_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F003C-B & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_13_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003C-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_13_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003C-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_13_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F003C-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_13_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003C-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_13_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003C-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_14_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F003C-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_14_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003C-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_14_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003C-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_15_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003D-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_1_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_1_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_1_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_1_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_1_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_1_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_1_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_1_2	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D
C99-VLU-FC-LOCAICP_1_2_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_1_2_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_3	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_4	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_5	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_2_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D & C99-VLU
C99-VLU-FC-LOCAICP_1_3	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B
C99-VLU-FC-LOCAICP_1_3_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_4	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_5	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_3_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_1_4	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D
C99-VLU-FC-LOCAICP_1_4_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_5	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_4_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_1_5	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B
C99-VLU-FC-LOCAICP_1_5_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_1_5_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_5_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_1_6	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D
C99-VLU-FC-LOCAICP_1_6_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_6_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_1_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B
C99-VLU-FC-LOCAICP_1_7_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_7_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_1_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_1_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_1_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_1_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_1_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_1_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_1_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_1_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_1_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_1_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_2_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_2_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_2_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_2_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_2_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_2_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_2_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_2_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_2_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_2_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_2_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_2_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_2_3	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B
C99-VLU-FC-LOCAICP_2_3_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_4	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_5	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_2_3_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_3_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-B & C99-VLU
C99-VLU-FC-LOCAICP_2_4	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D
C99-VLU-FC-LOCAICP_2_4_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_5	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_4_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_2_5	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B
C99-VLU-FC-LOCAICP_2_5_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_5_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_2_6	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D
C99-VLU-FC-LOCAICP_2_6_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_6_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_2_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B
C99-VLU-FC-LOCAICP_2_7_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_2_7_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_7_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_2_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_2_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_2_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_2_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_2_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002A-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_3_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_3_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_3_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_3_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_3_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_3_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_3_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_3_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_3_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_3_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_3_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_3_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_3_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_3_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_3_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-B & C99-VLU



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_3_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_3_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_3_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_3_4	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D
C99-VLU-FC-LOCAICP_3_4_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_5	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_4_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002B-D & C99-VLU
C99-VLU-FC-LOCAICP_3_5	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C99-VLU-FC-B32F002C-B
C99-VLU-FC-LOCAICP_3_5_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_5_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_3_6	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D
C99-VLU-FC-LOCAICP_3_6_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_6_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_3_6_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_3_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B
C99-VLU-FC-LOCAICP_3_7_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_7_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_3_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_3_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_3_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_3_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_3_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_4_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_4_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_4_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_4_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_4_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_4_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_4_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_4_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_4_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_4_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_4_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_4_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_4_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_4_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-D & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_4_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_4_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_4_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_4_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_4_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_4_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_4_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_4_5	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B
C99-VLU-FC-LOCAICP_4_5_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_6	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_5_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-B & C99-VLU
C99-VLU-FC-LOCAICP_4_6	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D
C99-VLU-FC-LOCAICP_4_6_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_6_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_4_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B
C99-VLU-FC-LOCAICP_4_7_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_4_7_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_7_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_4_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_4_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_4_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_4_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_4_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002B-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_5_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_5_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_5_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_5_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_5_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_5_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_5_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_5_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_5_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_5_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_5_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_5_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_5_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_5_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_5_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_5_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_5_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_5_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_5_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_5_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_5_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_5_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-D



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_5_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_5_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_5_6	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D
C99-VLU-FC-LOCAICP_5_6_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_7	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_6_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002C-D & C99-VLU
C99-VLU-FC-LOCAICP_5_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B
C99-VLU-FC-LOCAICP_5_7_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_7_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_5_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_5_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_5_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_5_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_5_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-B & C99-VLU-FC-B32F003A-B & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_6_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_6_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_6_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_6_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_6_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_6_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_6_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_6_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_6_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_6_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_6_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_6_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_6_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_6_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_6_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_6_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_6_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_6_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_6_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_6_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_6_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_6_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_6_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_6_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_6_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_6_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_6_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_6_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B
C99-VLU-FC-LOCAICP_6_7_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_8	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_7_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-B & C99-VLU
C99-VLU-FC-LOCAICP_6_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_6_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_6_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_6_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_6_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_6_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_6_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_6_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_6_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_6_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_6_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002C-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_7_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_7_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_7_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_7_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_7_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_7_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_7_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_7_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_7_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_7_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_7_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_7_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_7_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_7_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_7_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_7_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_7_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_7_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_7_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_7_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_7_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_7_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_7_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_7_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_7_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_7_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_7_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_7_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D
C99-VLU-FC-LOCAICP_7_8_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_8_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_7_8_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_8_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_8_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_8_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_8_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_8_9	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F002D-D & C99-VLU
C99-VLU-FC-LOCAICP_7_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B
C99-VLU-FC-LOCAICP_7_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_7_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-B & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_8_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_8_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_8_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_8_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_8_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_8_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_8_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D &

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_8_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_8_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_8_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_8_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_8_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_8_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_8_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_8_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_8_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_8_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_8_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_8_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_8_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_8_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_8_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_8_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_8_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_8_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_8_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_8_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_8_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B



**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-LOCAICP_8_9_10	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_9_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_9_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_9_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_9_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_9_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_8_9_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F002D-D & C99-VLU-FC-B32F003A-B & C99-VLU
C99-VLU-FC-LOCAICP_9_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D
C99-VLU-FC-LOCAICP_9_10_11	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_9_10_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_9_10_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_9_10_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_9_10_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_9_10_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003A-D & C99-VLU
C99-VLU-FC-LOCAICP_9_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-B
C99-VLU-FC-LOCAICP_9_11_12	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_9_11_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_9_11_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_9_11_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_9_11_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-B & C99-VLU
C99-VLU-FC-LOCAICP_9_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-D
C99-VLU-FC-LOCAICP_9_12_13	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B

**Table 4.5-4e**

**I&C System – Common Cause Failures (ICPs FOR HP CRD ISOLATION BYPASS AND  
ICS DPV ISOLATION)**

The following CCF basic events are used in the fault tree:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
		& C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_9_12_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_9_12_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_9_12_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003B-D & C99-VLU
C99-VLU-FC-LOCAICP_9_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-B
C99-VLU-FC-LOCAICP_9_13_14	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_9_13_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_9_13_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-B & C99-VLU
C99-VLU-FC-LOCAICP_9_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-D
C99-VLU-FC-LOCAICP_9_14_15	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_9_14_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003C-D & C99-VLU
C99-VLU-FC-LOCAICP_9_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003D-B
C99-VLU-FC-LOCAICP_9_15_16	4.13E-09	CCF of three components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003D-B & C99-VLU
C99-VLU-FC-LOCAICP_9_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F003A-B & C99-VLU-FC-B32F003D-D
C99-VLU-FC-LOCAICP_ALL	3.90E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'

**Table 4.5-5**

I&C System - Human Error Events

(See Section 6 Human Reliability Analysis)

**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-C12-C001A	Failure to provide start signal to pump CRD Pump A	665
C62-C12-C001A-MAN	Manual Failure to provide start signal to pump A	2
C62-C12-C001A-SPUR	Spurious trip signal to CRD pump A	788
C62-C12-C001B	Failure to provide start signal to CRD pump B	640
C62-C12-C001B-MAN	Manual Failure to provide start signal to CRD pump B	68
C62-C12-C001B-SPUR	Spurious trip signal to CRD pump B	639
C62-C12-CCFSOFTWARE_S	SPURIOUS COMMON CAUSE SOFTWARE EVENT	1
C62-C12-F020A-SPUR	Spurious closure signal for valve C12-F020A	638
C62-C12-F020B-SPUR	Spurious closure signal for valve C12-F020B	637
C62-C72-ARIDPSD1LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV I (L2)	787
C62-C72-ARIDPSD1LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV I (L2)	786
C62-C72-ARIDPSD1LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV I (L2)	785
C62-C72-ARIDPSD1LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV I (L2)	784
C62-C72-ARIDPSD1PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV I	763
C62-C72-ARIDPSD1PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV I	762
C62-C72-ARIDPSD1PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV I	761
C62-C72-ARIDPSD1PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV I	760
C62-C72-ARIDPSD2LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV II	783
C62-C72-ARIDPSD2LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV II	782
C62-C72-ARIDPSD2LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV II	781
C62-C72-ARIDPSD2LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV II	780
C62-C72-ARIDPSD2PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV II	759
C62-C72-ARIDPSD2PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV II	758
C62-C72-ARIDPSD2PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV II	757
C62-C72-ARIDPSD2PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV II	756
C62-C72-ARIDPSD3LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV III	779

**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-C72-ARIDPSD3LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV III	778
C62-C72-ARIDPSD3LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV III	777
C62-C72-ARIDPSD3LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV III	776
C62-C72-ARIDPSD3PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV III	753
C62-C72-ARIDPSD3PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV III	752
C62-C72-ARIDPSD3PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV III	751
C62-C72-ARIDPSD3PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV III	750
C62-C72-DPSCNTLPSA-FIX	DPS CONTROLLER POWER SUPPLY A FAILS	7
C62-C72-DPSCNTLPSB-FIX	DPS CONTROLLER POWER SUPPLY B FAILS	4
C62-C72-ICSPOOL1	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 1	743
C62-C72-ICSPOOL2	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 2	738
C62-C72-ISO-DPRA	Feedwater Differential Pressure Isolation Signal A to DPS	43
C62-C72-ISO-DPRB	Feedwater Differential Pressure Isolation Signal B to DPS	34
C62-C72-ISO-DPRC	Feedwater Differential Pressure Isolation Signal C to DPS	25
C62-C72-ISO-DPRD	Feedwater Differential Pressure Isolation Signal D to DPS	10
C62-C72-L1D1LLA	FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV I	775
C62-C72-L1D1LLB	FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV I	774
C62-C72-L1D1LLC	FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV I	773
C62-C72-L1D1LLD	FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV I	772
C62-C72-L1D2LLA	FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV II	771
C62-C72-L1D2LLB	FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV II	770
C62-C72-L1D2LLC	FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV II	769
C62-C72-L1D2LLD	FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV II	768
C62-C72-L1D3LLA	FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV III	767
C62-C72-L1D3LLB	FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV III	766
C62-C72-L1D3LLC	FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV III	765

**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-C72-L1D3LLD	FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV III	764
C62-C72-RPSDPSD1LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SCRAM SIGNAL TO DPS DIV I	719
C62-C72-RPSDPSD1LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SCRAM SIGNAL TO DPS DIV I	718
C62-C72-RPSDPSD1LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SCRAM SIGNAL TO DPS DIV I	717
C62-C72-RPSDPSD1LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SCRAM SIGNAL TO DPS DIV I	716
C62-C72-RPSDPSD1PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS DIV I	737
C62-C72-RPSDPSD1PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SCRAM SIGNAL TO DPS DIV I	736
C62-C72-RPSDPSD1PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL C SCRAM SIGNAL TO DPS DIV I	735
C62-C72-RPSDPSD1PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SCRAM SIGNAL TO DPS DIV I	734
C62-C72-RPSDPSD2LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SCRAM SIGNAL TO DPS DIV II	715
C62-C72-RPSDPSD2LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SCRAM SIGNAL TO DPS DIV I	714
C62-C72-RPSDPSD2LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SCRAM SIGNAL TO DPS DIV II	713
C62-C72-RPSDPSD2LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SCRAM SIGNAL TO DPS DIV II	712
C62-C72-RPSDPSD2PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS DIV II	733
C62-C72-RPSDPSD2PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SCRAM SIGNAL TO DPS DIV II	732
C62-C72-RPSDPSD2PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS DIV II	731
C62-C72-RPSDPSD2PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SCRAM SIGNAL TO DPS DIV II	730
C62-C72-RPSDPSD3LLA	FAILURE OF RPV LOW LEVEL CHANNEL A SCRAM SIGNAL TO DPS DIV III	701
C62-C72-RPSDPSD3LLB	FAILURE OF RPV LOW LEVEL CHANNEL B SCRAM SIGNAL TO DPS DIV III	700
C62-C72-RPSDPSD3LLC	FAILURE OF RPV LOW LEVEL CHANNEL C SCRAM SIGNAL TO DPS DIV III	699
C62-C72-RPSDPSD3LLD	FAILURE OF RPV LOW LEVEL CHANNEL D SCRAM SIGNAL TO DPS DIV III	698
C62-C72-RPSDPSD3PRA	FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS DIV III	729

**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-C72-RPSDPSD3PRB	FAILURE OF RPV HIGH PRESSURE CHANNEL B SCRAM SIGNAL TO DPS DIV III	726
C62-C72-RPSDPSD3PRC	FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS DIV III	723
C62-C72-RPSDPSD3PRD	FAILURE OF RPV HIGH PRESSURE CHANNEL D SCRAM SIGNAL TO DPS DIV III	720
C62-DPSRMUADWPRSGA	DW PRESSURE RMU LOGIC FAILS	676
C62-DPSRMUADWPRSGC	DW PRESSURE RMU LOGIC FAILS	672
C62-DPSRMUBDWPRSGB	DW PRESSURE RMU LOGIC FAILS	674
C62-DPSRMUBDWPRSGD	DW PRESSURE RMU LOGIC FAILS	670
C62-DPSRMUBRXLVLGF	RX FZ LVLGF RMU LOGIC FAILS	688
C62-DPSRMUBRXLVLGH	RX FZ LVLH RMU LOGIC FAILS	678
C62-G21-C001A-A	Failure of the start signal to FAPCS A	630
C62-G21-C001A-A-MAN	Manual Failure of the start signal to FAPCS A	629
C62-G21-C001B-B	Failure of the start signal to FAPCS B	626
C62-G21-C001B-B-MAN	Manual Failure of the start signal to FAPCS B	625
C62-G31-F004A-TRAIN-A	Failure to generate isolation signal for valve G31-F004A	321
C62-G31-F004B-TRAIN-B	Failure to generate isolation signal for valve G31-F004B	320
C62-G31-F044A-TRAIN-A	Failure to generate isolation signal for valve G31-F044A	283
C62-G31-F044B-TRAIN-B	Failure to generate isolation signal for valve G31-F044B	276
C62-N21-C001A	NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP A.	246
C62-N21-C001A-MAN	Manual NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP A.	245
C62-N21-C001B	NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP B.	244
C62-N21-C001B-MAN	Manual NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP B.	243
C62-N21-C001C	NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP C.	205
C62-N21-C001C-MAN	Manual NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP C.	204
C62-N21-C001D	NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP D.	203
C62-N21-C001D-MAN	Manual NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP D.	202
C62-N21-CONDA	NO AUTO START SIGNAL TO CONDENSATE PUMP A	199
C62-N21-CONDAHUA	NO AUTO START SIGNAL TO AIR HANDLING UNIT COND PUMP ROOM TRAIN A	183
C62-N21-CONDAHUB	NO AUTO START SIGNAL TO AIR HANDLING UNIT COND PUMP ROOM TRAIN B	182
C62-N21-CONDA-MAN	Manual NO AUTO START SIGNAL TO CONDENSATE PUMP A	198

**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-N21-CONDB	NO AUTO START SIGNAL TO CONDENSATE PUMP B.	197
C62-N21-CONDB-MAN	Manual NO AUTO START SIGNAL TO CONDENSATE PUMP B.	196
C62-N21-CONDC	NO AUTO START SIGNAL TO CONDENSATE PUMP C	195
C62-N21-CONDC-MAN	Manual NO AUTO START SIGNAL TO CONDENSATE PUMP C	194
C62-N21-CONDD	NO AUTO START SIGNAL TO CONDENSATE PUMP D	193
C62-N21-CONDD-MAN	Manual NO AUTO START SIGNAL TO CONDENSATE PUMP D	192
C62-N21-F0033	NO AUTO OPEN SIGNAL TO FW PUMP A MOV ISOLATION VALVE.	181
C62-N21-F0033-MAN	Manual NO AUTO OPEN SIGNAL TO FW PUMP A MOV ISOLATION VALVE.	180
C62-N21-F0034	NO AUTO OPEN SIGNAL TO FW PUMP B MOV ISOLATION VALVE F0034.	170
C62-N21-F0034-MAN	Manual NO AUTO OPEN SIGNAL TO FW PUMP B MOV ISOLATION VALVE F0034.	169
C62-N21-F0035	NO AUTO OPEN SIGNAL TO FW PUMP C MOV ISOLATION VALVE F0035.	168
C62-N21-F0035-MAN	Manual NO AUTO OPEN SIGNAL TO FW PUMP C MOV ISOLATION VALVE F0035.	167
C62-N21-F0036	NO AUTO OPEN SIGNAL TO FW PUMP D MOV ISOLATION VALVE.	166
C62-N21-F0036-MAN	Manual NO AUTO OPEN SIGNAL TO FW PUMP D MOV ISOLATION VALVE.	165
C62-N21-F005	NO AUTO OPEN SIGNAL TO COND PUMP A MOV ISOLATION VALVE F005.	164
C62-N21-F005-MAN	Manual NO AUTO OPEN SIGNAL TO COND PUMP A MOV ISOLATION VALVE F005.	163
C62-N21-F006	NO AUTO OPEN SIGNAL TO COND PUMP B MOV ISOLATION VALVE F006.	162
C62-N21-F006-MAN	Manual NO AUTO OPEN SIGNAL TO COND PUMP B MOV ISOLATION VALVE F006.	161
C62-N21-F007	NO AUTO OPEN SIGNAL TO COND PUMP C MOV ISOLATION VALVE F007.	151
C62-N21-F007-MAN	Manual NO AUTO OPEN SIGNAL TO COND PUMP C MOV ISOLATION VALVE F007.	150
C62-N21-F008	NO AUTO OPEN SIGNAL TO COND PUMP D MOV ISOLATION VALVE F008.	122
C62-N21-F008-MAN	Manual NO AUTO OPEN SIGNAL TO COND PUMP D MOV ISOLATION VALVE F008.	121
C62-N21-FWAHUA	NO AUTO START SIGNAL TO AIR HANDLING UNIT FW PUMP ROOM TRAIN A	201
C62-N21-FWAHUB	NO AUTO START SIGNAL TO AIR HANDLING UNIT FW PUMP ROOM TRAIN B	200



**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-P21-C001A	No auto start actuation signal to RCCW pump C001A.	536
C62-P21-C001A-MAN	Manual No auto start actuation signal to RCCW pump C001A.	535
C62-P21-C001A-SPUR	Spurious trip signal	534
C62-P21-C001B	No auto start actuation signal to RCCW pump C001B.	533
C62-P21-C001B-MAN	Manual No auto start actuation signal to RCCW pump C001B.	532
C62-P21-C001B-SPUR	Spurious trip signal	531
C62-P21-C002A	No auto start actuation signal to RCCW pump C002A.	530
C62-P21-C002A-MAN	Manual No auto start actuation signal to RCCW pump C002A.	529
C62-P21-C002A-SPUR	Spurious trip signal	528
C62-P21-C002B	No auto start actuation signal to RCCW pump C002B.	527
C62-P21-C002B-MAN	Manual No auto start actuation signal to RCCW pump C002B.	526
C62-P21-C002B-SPUR	Spurious trip signal	525
C62-P21-C003A	No auto start actuation signal to RCCW pump C003A.	524
C62-P21-C003A-MAN	Manual No auto start actuation signal to RCCW pump C003A.	523
C62-P21-C003A-SPUR	Spurious trip signal	522
C62-P21-C003B	No auto start actuation signal to RCCW pump C003B.	521
C62-P21-C003B-MAN	Manual No auto start actuation signal to RCCW pump C003B.	520
C62-P21-C003B-SPUR	Spurious trip signal	519
C62-P21-F0004	Failure to close F004	52
C62-P21-F0010A1	No Auto Actuation signal to open RCCW valve F0010A1.	518
C62-P21-F0010A2	No Auto Actuation signal to open RCCW valve F0010A2.	517
C62-P21-F0010A3	No Auto Actuation signal to open RCCW valve F0010A3.	516
C62-P21-F0010B1	No Auto Actuation signal to open RCCW valve F0010B1.	515
C62-P21-F0010B2	No Auto Actuation signal to open RCCW valve F0010B2.	514
C62-P21-F0010B3	No Auto Actuation signal to open RCCW valve F0010B3.	513
C62-P21-F0023A	FAILURE OF CONTROL SIGNAL TO VALVE F0023A	512
C62-P21-F0023B	FAILURE OF CONTROL SIGNAL TO VALVE F0023B	511
C62-P21-F0027	Failure to close F0027	67
C62-P21-F0061	NO CONTROL SIGNAL TO CLOSE RCCW VALVE F0061	53
C62-P21-RCCWAHUA	NO AUTO START SIGNAL TO AIR HANDLING UNIT RCCW ROOM A	510
C62-P21-RCCWAHUB	NO AUTO START SIGNAL TO AIR HANDLING UNIT RCCW ROOM B	509
C62-P21-RCCWPA	PRESSURE CONTROL FAILURES RCCW HX TRAIN A	508
C62-P21-RCCWPB	PRESSURE CONTROL FAILURES RCCW HX TRAIN B	507
C62-P21-RCCWTA	TEMPERATURE CONTROL FAILURES RCCW HX TRAIN A	440
C62-P21-RCCWTB	TEMPERATURE CONTROL FAILURES RCCW HX TRAIN B	437
C62-P22-C001A	NO AUTO START SIGNAL TO TCCW PUMP 1A ON LOPP.	116
C62-P22-C001A-MAN	Manual NO AUTO START SIGNAL TO TCCW PUMP 1A ON LOPP.	115
C62-P22-C001B	NO AUTO START SIGNAL TO TCCW PUMP 1B ON LOPP.	114

**Table 4.5-6a**  
**I&C System – Top Events(C62)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C62 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C62-P22-C001B-MAN	Manual NO AUTO START SIGNAL TO TCCW PUMP 1B ON LOPP.	113
C62-P22-C001C	NO AUTO START SIGNAL TO TCCW PUMP 1C ON LOPP.	112
C62-P22-C001C-MAN	Manual NO AUTO START SIGNAL TO TCCW PUMP 1C ON LOPP.	111
C62-P22-F0005A-MAN	Manual Manual actuation signal fails TCCW F0005A.	110
C62-P22-F0005B-MAN	Manual Manual actuation signal fails TCCW F0005B.	109
C62-P22-F0005C-MAN	Manual Manual actuation signal fails TCCW F0005C.	108
C62-P22-F0005D-MAN	Manual Manual actuation signal fails TCCW F0005D.	107
C62-P22-TCCWT	TEMPERATURE CONTROL FAILS TCCW HXs. If indicated temperature fails low for cont	106
C62-P30-F0023	Condensate Makeup valve train A control fails	249
C62-P30-F0026	Condensate Makeup valve train B control fails	247
C62-P41-C001A	Auto actuation signal to start pump C001A fails.	397
C62-P41-C001B	Auto actuation signal to start pump C001B fails.	396
C62-P41-C002A	Auto actuation signal to start pump C002A fails.	395
C62-P41-C002B	Auto actuation signal to start pump C002B fails.	394
C62-P41-F001A-MAN	Manual NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001A	105
C62-P41-F001B-MAN	Manual NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001B	104
C62-P41-F001C-MAN	Manual NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001C	103
C62-P41-F001D-MAN	Manual NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001D	102
C62-P41-F002A	No auto actuation signal to open valve F002A.	393
C62-P41-F002B	No auto actuation signal to open valve F002B.	392
C62-P41-F004A	No auto actuation signal to open valve F004A.	325
C62-P41-F004B	No auto actuation signal to open valve F004B.	322
C62-P41-F006A	NO AUTO ACTUATION SIGNAL TO OPEN VALVE F006A.	436
C62-P41-F006B	NO AUTO ACTUATION SIGNAL TO OPEN VALVE F006B.	435
C62-P41-F009A	NO AUTO ACTUATION SIGNAL TO OPEN VALVE F009A.	434
C62-P41-F009B	NO AUTO ACTUATION SIGNAL TO OPEN VALVE F009B.	433
C62-P51-CMP-C001A	Failure of control signal to Service Air Compressor A	620
C62-P51-CMP-C001B	Failure of control signal to Service Air Compressor B	615
C62-P52-ACV-ABV0002A	Failure of control signal to AOV ABV0002A	610
C62-P52-ACV-ABV0002B	Failure of control signal to AOV ABV0002B	605
C62-P54-F014	HPNS Reg Valve F014 control	537
C62-U43-P1B-B	Failure of the manual start signal to fire pump 1	399
C62-U43-P2B-B	Failure of the manual start signal to fire pump 2	398

**Table 4.5-6b****I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-B21-F004A-A	Failure to fire Squib A on DPV A	972
C63-B21-F004A-B	Failure to fire Squib B on DPV A	971
C63-B21-F004A-C	Failure to fire Squib C on DPV A	970
C63-B21-F004B-A	Failure to fire Squib A on DPV B	969
C63-B21-F004B-B	Failure to fire Squib B on DPV B	968
C63-B21-F004B-C	Failure to fire Squib C on DPV B	967
C63-B21-F004C-A	Failure to fire Squib A on DPV C	966
C63-B21-F004C-B	Failure to fire Squib B on DPV C	965
C63-B21-F004C-C	Failure to fire Squib C on DPV C	964
C63-B21-F004D-A	Failure to fire Squib A on DPV D	963
C63-B21-F004D-B	Failure to fire Squib B on DPV D	962
C63-B21-F004D-C	Failure to fire Squib C on DPV D	961
C63-B21-F004E-A	Failure to fire Squib A on DPV E	960
C63-B21-F004E-B	Failure to fire Squib B on DPV E	959
C63-B21-F004E-C	Failure to fire Squib C on DPV E	958
C63-B21-F004F-A	Failure to fire Squib A on DPV F	957
C63-B21-F004F-B	Failure to fire Squib B on DPV F	956
C63-B21-F004F-C	Failure to fire Squib C on DPV F	955
C63-B21-F004G-A	Failure to fire Squib A on DPV G	954
C63-B21-F004G-B	Failure to fire Squib B on DPV G	953
C63-B21-F004G-C	Failure to fire Squib C on DPV G	952
C63-B21-F004H-A	Failure to fire Squib A on DPV H	951
C63-B21-F004H-B	Failure to fire Squib B on DPV H	950
C63-B21-F004H-C	Failure to fire Squib C on DPV H	949
C63-B21-F006A-A	Failure to energize solenoid A on SRV A	948
C63-B21-F006A-B	Failure to energize solenoid B on SRV A	947
C63-B21-F006A-C	Failure to energize solenoid C on SRV A	946
C63-B21-F006B-A	Failure to energize solenoid A on SRV B	945
C63-B21-F006B-B	Failure to energize solenoid B on SRV B	944
C63-B21-F006B-C	Failure to energize solenoid C on SRV B	943
C63-B21-F006C-A	Failure to energize solenoid A on SRV C	942
C63-B21-F006C-B	Failure to energize solenoid B on SRV C	941
C63-B21-F006C-C	Failure to energize solenoid C on SRV C	940
C63-B21-F006D-A	Failure to energize solenoid A on SRV D	939
C63-B21-F006D-B	Failure to energize solenoid B on SRV D	938
C63-B21-F006D-C	Failure to energize solenoid C on SRV D	937
C63-B21-F006E-A	Failure to energize solenoid A on SRV E	936
C63-B21-F006E-B	Failure to energize solenoid B on SRV E	935
C63-B21-F006E-C	Failure to energize solenoid C on SRV E	934
C63-B21-F006F-A	Failure to energize solenoid A on SRV F	933
C63-B21-F006F-B	Failure to energize solenoid B on SRV F	932

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-B21-F006F-C	Failure to energize solenoid C on SRV F	931
C63-B21-F006G-A	Failure to energize solenoid A on SRV G	930
C63-B21-F006G-B	Failure to energize solenoid B on SRV G	929
C63-B21-F006G-C	Failure to energize solenoid C on SRV G	928
C63-B21-F006H-A	Failure to energize solenoid A on SRV H	927
C63-B21-F006H-B	Failure to energize solenoid B on SRV H	926
C63-B21-F006H-C	Failure to energize solenoid C on SRV H	925
C63-B21-F006J-A	Failure to energize solenoid A on SRV J	924
C63-B21-F006J-B	Failure to energize solenoid B on SRV H	923
C63-B21-F006J-C	Failure to energize solenoid C on SRV H	922
C63-B21-F006K-A	Failure to energize solenoid A on SRV K	921
C63-B21-F006K-B	Failure to energize solenoid B on SRV K	920
C63-B21-F006K-C	Failure to energize solenoid C on SRV K	919
C63-B32-F001-SPUR-A	Spurious actuation	918
C63-B32-F001-SPUR-B	Spurious actuation	917
C63-B32-F001-SPUR-C	Spurious actuation	916
C63-B32-F001-SPUR-D	Spurious actuation	915
C63-B32-F002-SPUR-A	Spurious actuation	914
C63-B32-F002-SPUR-B	Spurious actuation	913
C63-B32-F002-SPUR-C	Spurious actuation	912
C63-B32-F002-SPUR-D	Spurious actuation	911
C63-B32-F003-SPUR-A	Spurious actuation	910
C63-B32-F003-SPUR-B	Spurious actuation	909
C63-B32-F003-SPUR-C	Spurious actuation	908
C63-B32-F003-SPUR-D	Spurious actuation	907
C63-B32-F004-SPUR-A	Spurious actuation	906
C63-B32-F004-SPUR-B	Spurious actuation	905
C63-B32-F004-SPUR-C	Spurious actuation	904
C63-B32-F004-SPUR-D	Spurious actuation	903
C63-B32-F005A-DIV2	FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F005A	902
C63-B32-F005A-DIV4	FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F005A	901
C63-B32-F005B-DIV1	FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F005B	900
C63-B32-F005B-DIV3	FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F005B	899
C63-B32-F005C-DIV2	FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F005C	898
C63-B32-F005C-DIV4	FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F005C	897
C63-B32-F005D-DIV1	FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F005D	896

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-B32-F005D-DIV3	FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F005D	895
C63-B32-F006A-DIV1	FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F006A	894
C63-B32-F006A-DIV3	FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F006A	893
C63-B32-F006B-DIV2	FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F006B	892
C63-B32-F006B-DIV4	FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F006B	891
C63-B32-F006C-DIV1	FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F006C	890
C63-B32-F006C-DIV3	FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F006C	889
C63-B32-F006D-DIV2	FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F006D	888
C63-B32-F006D-DIV4	FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F006D	858
C63-B32-F009A-DIV2(NP)	No signal from Q-DCIS Div 2 for valve B32-F009A to de-energize	36
C63-B32-F009A-DIV4(NP)	No signal from Q-DCIS Div 4 for valve B32-F009A to de-energize	35
C63-B32-F009B-DIV1(NP)	No signal from Q-DCIS Div 1 for valve B32-F009B to de-energize	33
C63-B32-F009B-DIV3(NP)	No signal from Q-DCIS Div 3 for valve B32-F009B to de-energize	34
C63-B32-F009C-DIV2(NP)	No signal from Q-DCIS Div 2 for valve B32-F009C to de-energize	31
C63-B32-F009C-DIV4(NP)	No signal from Q-DCIS Div 4 for valve B32-F009C to de-energize	32
C63-B32-F009D-DIV1(NP)	No signal from Q-DCIS Div 1 for valve B32-F009D to de-energize	1
C63-B32-F009D-DIV3(NP)	No signal from Q-DCIS Div 3 for valve B32-F009D to de-energize	30
C63-B32-F012A-DIV1-MAN	FAILURE OF MANUAL DIV 1 OPEN SIGNAL FOR VENT VALVE B32-F012A	825
C63-B32-F012B-DIV2-MAN	FAILURE OF MANUAL DIV 2 OPEN SIGNAL FOR VENT VALVE B32-F012B	824
C63-B32-F012C-DIV3-MAN	FAILURE OF MANUAL DIV 3 OPEN SIGNAL FOR VENT VALVE B32-F012C	798
C63-B32-F012D-DIV4-MAN	FAILURE OF MANUAL DIV 4 OPEN SIGNAL FOR VENT VALVE B32-F012D	772
C63-B32-F104A-DIV1	FAILURE TO GENERATE A DIV 1 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A	771
C63-B32-F104A-DIV1-MAN	FAILURE OF MANUAL DIV I OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A	770
C63-B32-F104A-DIV3	FAILURE TO GENERATE A DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A	769
C63-B32-F104A-DIV3-MAN	FAILURE TO GENERATE A DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A	768
C63-B32-F104B-DIV1	FAILURE TO GENERATE A DIV 1 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B	767

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-B32-F104B-DIV1-MAN	FAILURE OF MANUAL DIV 1 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B	766
C63-B32-F104B-DIV3	FAILURE TO GENERATE A DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B	738
C63-B32-F104B-DIV3-MAN	FAILURE OF MANUAL DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B	737
C63-B32-F105A-DIV2	FAILURE TO GENERATE A DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A	713
C63-B32-F105A-DIV2-MAN	FAILURE OF MANUAL DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A	735
C63-B32-F105A-DIV4	FAILURE TO GENERATE A DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A	736
C63-B32-F105A-DIV4-MAN	FAILURE OF MANUAL DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A	973
C63-B32-F105B-DIV2	FAILURE TO GENERATE A DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B	974
C63-B32-F105B-DIV2-MAN	FAILURE OF MANUAL DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B	975
C63-B32-F105B-DIV4	FAILURE TO GENERATE A DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B	976
C63-B32-F105B-DIV4-MAN	FAILURE OF MANUAL DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B	977
C63-C12-CCFSOFTWARE_S	Spurious Trip Signal to CRD System due to Q-DCIS Software Failure	321
C63-C12-GDCS-LEVEL-SPUR	Spurious GDCS Level Trip Signal to CRD System due to Q-DCIS Software Failure	318
C63-C12-HDWL-SPUR	Spurious High Drywell Level Trip Signal to CRD System due to Q-DCIS Software Failure	320
C63-C12-HDWP-SPUR	Spurious High Drywell Pressure Trip Signal to CRD System due to Q-DCIS Software Failure	319
C63-C41-F002A-A	ACCUMULATOR 1A LEVEL SIGNAL A TO AOV F002A	705
C63-C41-F002A-B	ACCUMULATOR 1A LEVEL SIGNAL B TO AOV F002A	706
C63-C41-F002B-A	ACCUMULATOR 1B LEVEL SIGNAL A TO AOV F002B	707
C63-C41-F002B-B	ACCUMULATOR 1B LEVEL SIGNAL B TO AOV F002B	708
C63-C41-F002C-A	ACCUMULATOR 1A LEVEL SIGNAL A TO AOV F002C	709
C63-C41-F002C-B	ACCUMULATOR 1A LEVEL SIGNAL B TO AOV F002C	710
C63-C41-F002D-A	ACCUMULATOR 1B LEVEL SIGNAL A TO AOV F002D	711
C63-C41-F002D-B	ACCUMULATOR 1B LEVEL SIGNAL B TO AOV F002D	712
C63-C41-F003A-A	Squib actuation signal	699
C63-C41-F003A-B	Squib actuation signal	698
C63-C41-F003A-C	Squib actuation signal	697
C63-C41-F003B-A	Squib actuation signal	696
C63-C41-F003B-B	Squib actuation signal	695
C63-C41-F003B-C	Squib actuation signal	694

Table 4.5-6b

## I&amp;C System – Top Events (C63)

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

Top Event	Description	Sheet
C63-C41-F003C-A	Squib actuation signal	693
C63-C41-F003C-B	Squib actuation signal	692
C63-C41-F003C-C	Squib actuation signal	691
C63-C41-F003D-A	Squib actuation signal	690
C63-C41-F003D-B	Squib actuation signal	689
C63-C41-F003D-C	Squib actuation signal	688
C63-C71-D1DTM-CV	FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV I DTM	590
C63-C71-D1DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV I DTM	587
C63-C71-D1DTM-LV	Failure to generate low RCS level signal for RPS Div 1 DTM	583
C63-C71-D1DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV I DTM	580
C63-C71-D2DTM-CV	FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV II DTM	577
C63-C71-D2DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV II DTM	574
C63-C71-D2DTM-LV	Failure to generate low RCS level signal for RPS Div 2 DTM	570
C63-C71-D2DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV II DTM	567
C63-C71-D3DTM-CV	FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV III DTM	564
C63-C71-D3DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV III DTM	561
C63-C71-D3DTM-LV	Failure to generate low RCS level signal for RPS Div 3 DTM	557
C63-C71-D3DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV III DTM	554
C63-C71-D4DTM-CV	FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV IV DTM	551
C63-C71-D4DTM-DP	FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV IV DTM	548
C63-C71-D4DTM-LV	Failure to generate low RCS level signal for RPS Div 4 DTM	544
C63-C71-D4DTM-PR	FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV IV DTM	1005
C63-C74-D1ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV I LOGIC (L2)	355
C63-C74-D1ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC	343
C63-C74-D1ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV I LOGIC (L2)	339
C63-C74-D1ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC	327
C63-C74-D1ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV I LOGIC (L2)	323

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-C74-D1ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC	359
C63-C74-D1ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV I LOGIC (L2)	371
C63-C74-D1ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC	375
C63-C74-D2ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV II LOGIC (L2)	387
C63-C74-D2ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC	388
C63-C74-D2ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV II LOGIC (L2)	389
C63-C74-D2ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC	390
C63-C74-D2ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV II LOGIC (L2)	391
C63-C74-D2ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC	392
C63-C74-D2ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV II LOGIC (L2)	393
C63-C74-D2ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC	394
C63-C74-D3ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV III LOGIC (L2)	395
C63-C74-D3ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC	396
C63-C74-D3ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV III LOGIC	397
C63-C74-D3ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC	398
C63-C74-D3ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV III LOGIC (L2)	399
C63-C74-D3ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC	400
C63-C74-D3ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV III LOGIC (L2)	401
C63-C74-D3ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC	532
C63-C74-D4ATWSD1LL	FAILURE OF DIV I LOW RPV LEVEL ATWS DIV IV LOGIC (L2)	533
C63-C74-D4ATWSD1PR	FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC	534
C63-C74-D4ATWSD2LL	FAILURE OF DIV II LOW RPV LEVEL ATWS DIV IV LOGIC (L2)	535
C63-C74-D4ATWSD2PR	FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC	700



**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-C74-D4ATWSD3LL	FAILURE OF DIV III LOW RPV LEVEL ATWS DIV IV LOGIC (L2)	701
C63-C74-D4ATWSD3PR	FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC	702
C63-C74-D4ATWSD4LL	FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV IV LOGIC (L2)	703
C63-C74-D4ATWSD4PR	FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC	704
C63-E50-F002A-A	Failure to actuate squib A on GDCS valve 2A	687
C63-E50-F002A-A-MAN	Manual Failure to actuate squib A on GDCS valve 2A	686
C63-E50-F002A-B	Failure to actuate squib B on GDCS valve 2A	685
C63-E50-F002A-B-MAN	Manual Failure to actuate squib B on GDCS valve 2A	684
C63-E50-F002A-C	Failure to actuate squib C on GDCS valve 2A	683
C63-E50-F002A-C-MAN	Manual Failure to actuate squib C on GDCS valve 2A	682
C63-E50-F002B-A	Failure to actuate squib A on GDCS valve 2B	681
C63-E50-F002B-A-MAN	Manual Failure to actuate squib A on GDCS valve 2B	680
C63-E50-F002B-B	Failure to actuate squib B on GDCS valve 2B	679
C63-E50-F002B-B-MAN	Manual Failure to actuate squib B on GDCS valve 2B	678
C63-E50-F002B-C	Failure to actuate squib C on GDCS valve 2B	677
C63-E50-F002B-C-MAN	Manual Failure to actuate squib C on GDCS valve 2B	676
C63-E50-F002C-A	Failure to actuate squib A on GDCS valve 2C	675
C63-E50-F002C-A-MAN	Manual Failure to actuate squib A on GDCS valve 2C	674
C63-E50-F002C-B	Failure to actuate squib B on GDCS valve 2C	673
C63-E50-F002C-B-MAN	Manual Failure to actuate squib B on GDCS valve 2C	672
C63-E50-F002C-C	Failure to actuate squib C on GDCS valve 2C	671
C63-E50-F002C-C-MAN	Manual Failure to actuate squib C on GDCS valve 2C	670
C63-E50-F002D-A	Failure to actuate squib A on GDCS valve 2D	669
C63-E50-F002D-A-MAN	Manual Failure to actuate squib A on GDCS valve 2D	668
C63-E50-F002D-B	Failure to actuate squib B on GDCS valve 2D	667
C63-E50-F002D-B-MAN	Manual Failure to actuate squib B on GDCS valve 2D	666
C63-E50-F002D-C	Failure to actuate squib C on GDCS valve 2D	665
C63-E50-F002D-C-MAN	Manual Failure to actuate squib C on GDCS valve 2D	664
C63-E50-F002E-A	Failure to actuate squib A on GDCS valve 2E	663
C63-E50-F002E-A-MAN	Manual Failure to actuate squib A on GDCS valve 2E	662
C63-E50-F002E-B	Failure to actuate squib B on GDCS valve 2E	661
C63-E50-F002E-B-MAN	Manual Failure to actuate squib B on GDCS valve 2E	660
C63-E50-F002E-C	Failure to actuate squib C on GDCS valve 2E	659
C63-E50-F002E-C-MAN	Manual Failure to actuate squib C on GDCS valve 2E	658
C63-E50-F002F-A	Failure to actuate squib A on GDCS valve 2F	657
C63-E50-F002F-A-MAN	Manual Failure to actuate squib A on GDCS valve 2F	656
C63-E50-F002F-B	Failure to actuate squib B on GDCS valve 2F	655
C63-E50-F002F-B-MAN	Manual Failure to actuate squib B on GDCS valve 2F	654
C63-E50-F002F-C	Failure to actuate squib C on GDCS valve 2F	653

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-E50-F002F-C-MAN	Manual Failure to actuate squib C on GDCS valve 2F	652
C63-E50-F002G-A	Failure to actuate squib A on GDCS valve 2G	651
C63-E50-F002G-A-MAN	Manual Failure to actuate squib A on GDCS valve 2G	650
C63-E50-F002G-B	Failure to actuate squib B on GDCS valve 2G	649
C63-E50-F002G-B-MAN	Manual Failure to actuate squib B on GDCS valve 2G	648
C63-E50-F002G-C	Failure to actuate squib C on GDCS valve 2G	647
C63-E50-F002G-C-MAN	Manual Failure to actuate squib C on GDCS valve 2G	646
C63-E50-F002H-A	Failure to actuate squib A on GDCS valve 2H	645
C63-E50-F002H-A-MAN	Manual Failure to actuate squib A on GDCS valve 2H	644
C63-E50-F002H-B	Failure to actuate squib B on GDCS valve 2H	643
C63-E50-F002H-B-MAN	Manual Failure to actuate squib B on GDCS valve 2H	642
C63-E50-F002H-C	Failure to actuate squib C on GDCS valve 2H	641
C63-E50-F002H-C-MAN	Manual Failure to actuate squib C on GDCS valve 2H	640
C63-E50-F006A-A	Failure to actuate squib A on GDCS valve 6A	639
C63-E50-F006A-A-MAN	Manual Failure to actuate squib A on GDCS valve 6A	638
C63-E50-F006A-B	Failure to actuate squib B on GDCS valve 6A	637
C63-E50-F006A-B-MAN	Manual Failure to actuate squib B on GDCS valve 6A	636
C63-E50-F006A-C	Failure to actuate squib C on GDCS valve 6A	635
C63-E50-F006A-C-MAN	Manual Failure to actuate squib C on GDCS valve 6A	634
C63-E50-F006B-A	Failure to actuate squib A on GDCS valve 6B	633
C63-E50-F006B-A-MAN	Manual Failure to actuate squib A on GDCS valve 6B	632
C63-E50-F006B-B	Failure to actuate squib B on GDCS valve 6B	631
C63-E50-F006B-B-MAN	Manual Failure to actuate squib B on GDCS valve 6B	630
C63-E50-F006B-C	Failure to actuate squib C on GDCS valve 6B	629
C63-E50-F006B-C-MAN	Manual Failure to actuate squib C on GDCS valve 6B	628
C63-E50-F006C-A	Failure to actuate squib A on GDCS valve 6C	627
C63-E50-F006C-A-MAN	Manual Failure to actuate squib A on GDCS valve 6C	626
C63-E50-F006C-B	Failure to actuate squib B on GDCS valve 6C	625
C63-E50-F006C-B-MAN	Manual Failure to actuate squib B on GDCS valve 6C	624
C63-E50-F006C-C	Failure to actuate squib C on GDCS valve 6C	623
C63-E50-F006C-C-MAN	Manual Failure to actuate squib C on GDCS valve 6C	622
C63-E50-F006D-A	Failure to actuate squib A on GDCS valve 6D	621
C63-E50-F006D-A-MAN	Manual Failure to actuate squib A on GDCS valve 6D	620
C63-E50-F006D-B	Failure to actuate squib B on GDCS valve 6D	619
C63-E50-F006D-B-MAN	Manual Failure to actuate squib B on GDCS valve 6D	618
C63-E50-F006D-C	Failure to actuate squib C on GDCS valve 6D	597
C63-E50-F006D-C-MAN	Manual Failure to actuate squib C on GDCS valve 6D	593
C63-N21-CCFSOFTWARE_S	Spurious Trip Signal to Condensate and Feedwater System (N21) due to Q-DCIS Software Failure	322
C74-B21-F100A-DIV1	Failure of Feedwater Isolation signal Div 1	978
C74-B21-F100A-DIV3	Failure of Feedwater Isolation signal Div 3	996
C74-B21-F100B-DIV1	Failure of Feedwater Isolation signal Div 1	997

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C74-B21-F100B-DIV3	Failure of Feedwater Isolation signal Div 3	998
C74-B21-F101A-DIV2	Failure of Feedwater Isolation signal Div 2	999
C74-B21-F101A-DIV4	Failure of Feedwater Isolation signal Div 4	1000
C74-B21-F101B-DIV2	Failure of Feedwater Isolation signal Div 2	1001
C74-B21-F101B-DIV4	Failure of Feedwater Isolation signal Div 4	1002
C74-B32-F001-DIV1	Failure of ICS isolation for F001 Div 1	531
C74-B32-F001-DIV3	Failure of ICS isolation for F001 Div 3	530
C74-B32-F002-DIV2	Failure of ICS isolation for F002 Div 2	529
C74-B32-F002-DIV4	Failure of ICS isolation for F002 Div 4	528
C74-B32-F003-DIV2	Failure of ICS isolation for F003 Div 2	527
C74-B32-F003-DIV4	Failure of ICS isolation for F003 Div 4	526
C74-B32-F004-DIV1	Failure of ICS isolation for F004 Div 1	525
C74-B32-F004-DIV3	Failure of ICS isolation for F004 Div 3	516
C74-B32-LOCAISOL-F001A-DIV1	Failure of ICS Isolation for F001A Div 1 following LOCA	109
C74-B32-LOCAISOL-F001A-DIV3	Failure of ICS Isolation for F001A Div 3 following LOCA	224
C74-B32-LOCAISOL-F001B-DIV1	Failure of ICS Isolation for F001B Div 1 following LOCA	106
C74-B32-LOCAISOL-F001B-DIV3	Failure of ICS Isolation for F001B Div 3 following LOCA	105
C74-B32-LOCAISOL-F001C-DIV1	Failure of ICS Isolation for F001C Div 1 following LOCA	218
C74-B32-LOCAISOL-F001C-DIV3	Failure of ICS Isolation for F001C Div 3 following LOCA	217
C74-B32-LOCAISOL-F001D-DIV1	Failure of ICS Isolation for F001D Div 1 following LOCA	225
C74-B32-LOCAISOL-F001D-DIV3	Failure of ICS Isolation for F001D Div 3 following LOCA	223
C74-B32-LOCAISOL-F002A-DIV2	Failure of ICS Isolation for F002A Div 2 following LOCA	65
C74-B32-LOCAISOL-F002A-DIV4	Failure of ICS Isolation for F002A Div 4 following LOCA	97
C74-B32-LOCAISOL-F002B-DIV2	Failure of ICS Isolation for F002B Div 2 following LOCA	108
C74-B32-LOCAISOL-F002B-DIV4	Failure of ICS Isolation for F002B Div 4 following LOCA	107
C74-B32-LOCAISOL-F002C-DIV2	Failure of ICS Isolation for F002C Div 2 following LOCA	216
C74-B32-LOCAISOL-F002C-DIV4	Failure of ICS Isolation for F002C Div 4 following LOCA	215
C74-B32-LOCAISOL-F002D-DIV2	Failure of ICS Isolation for F002D Div 2 following LOCA	227
C74-B32-LOCAISOL-F002D-DIV4	Failure of ICS Isolation for F002D Div 4 following LOCA	226
C74-B32-LOCAISOL-F003A-DIV2	Failure of ICS Isolation for F003A Div 2 following LOCA	100
C74-B32-LOCAISOL-F003A-DIV4	Failure of ICS Isolation for F003A Div 4 following LOCA	99
C74-B32-LOCAISOL-F003B-DIV2	Failure of ICS Isolation for F003B Div 2 following LOCA	211
C74-B32-LOCAISOL-F003B-DIV4	Failure of ICS Isolation for F003B Div 4 following LOCA	212
C74-B32-LOCAISOL-F003C-DIV2	Failure of ICS Isolation for F003C Div 2 following LOCA	219
C74-B32-LOCAISOL-F003C-DIV4	Failure of ICS Isolation for F003C Div 4 following LOCA	220
C74-B32-LOCAISOL-F003D-DIV2	Failure of ICS Isolation for F003D Div 2 following LOCA	228
C74-B32-LOCAISOL-F003D-DIV4	Failure of ICS Isolation for F003D Div 4 following LOCA	229
C74-B32-LOCAISOL-F004A-DIV1	Failure of ICS Isolation for F004A Div 1 following LOCA	103
C74-B32-LOCAISOL-F004A-DIV3	Failure of ICS Isolation for F004A Div 3 following LOCA	101
C74-B32-LOCAISOL-F004B-DIV1	Failure of ICS Isolation for F004B Div 1 following LOCA	213
C74-B32-LOCAISOL-F004B-DIV3	Failure of ICS Isolation for F004B Div 3 following LOCA	214
C74-B32-LOCAISOL-F004C-DIV1	Failure of ICS Isolation for F004C Div 1 following LOCA	221

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C74-B32-LOCAISOL-F004C-DIV3	Failure of ICS Isolation for F004C Div 3 following LOCA	222
C74-B32-LOCAISOL-F004D-DIV1	Failure of ICS Isolation for F004D Div 1 following LOCA	230
C74-B32-LOCAISOL-F004D-DIV3	Failure of ICS Isolation for F004D Div 3 following LOCA	231
C74-G31-ATWSF002A-DIV2	FAILURE TO ISOLATE RWCU VALVE F002A (SLC ACTUATION FAILS)	314
C74-G31-ATWSF002A-DIV4	FAILURE TO ISOLATE RWCU VALVE F002A (SLC ACTUATION FAILS)	315
C74-G31-ATWSF002B-DIV2	FAILURE TO ISOLATE RWCU VALVE F002B (SLC ACTUATION FAILS)	316
C74-G31-ATWSF002B-DIV4	FAILURE TO ISOLATE RWCU VALVE F002B (SLC ACTUATION FAILS)	317
C74-G31-ATWSF003A-DIV1	FAILURE TO ISOLATE RWCU VALVE F003A (SLC ACTUATION FAILS)	313
C74-G31-ATWSF003A-DIV3	FAILURE TO ISOLATE RWCU VALVE F003A (SLC ACTUATION FAILS)	312
C74-G31-ATWSF003B-DIV1	FAILURE TO ISOLATE RWCU VALVE F003B (SLC ACTUATION FAILS)	311
C74-G31-ATWSF003B-DIV3	FAILURE TO ISOLATE RWCU VALVE F003B (SLC ACTUATION FAILS)	310
C74-G31-ATWSF007A-DIV2	FAILURE TO ISOLATE RWCU VALVE F007A (SLC ACTUATION FAILS)	309
C74-G31-ATWSF007A-DIV4	FAILURE TO ISOLATE RWCU VALVE F007A (SLC ACTUATION FAILS)	308
C74-G31-ATWSF007B-DIV2	FAILURE TO ISOLATE RWCU VALVE F007B (SLC ACTUATION FAILS)	307
C74-G31-ATWSF007B-DIV4	FAILURE TO ISOLATE RWCU VALVE F007B (SLC ACTUATION FAILS)	274
C74-G31-ATWSF008A-DIV1	FAILURE TO ISOLATE RWCU VALVE F008A (SLC ACTUATION FAILS)	273
C74-G31-ATWSF008A-DIV3	FAILURE TO ISOLATE RWCU VALVE F008A (SLC ACTUATION FAILS)	272
C74-G31-ATWSF008B-DIV1	FAILURE TO ISOLATE RWCU VALVE F008B (SLC ACTUATION FAILS)	271
C74-G31-ATWSF008B-DIV3	FAILURE TO ISOLATE RWCU VALVE F008B (SLC ACTUATION FAILS)	232
C74-G31-F002A-DIV2	Failure to isolate RWCU F002A Div 2	515
C74-G31-F002A-DIV4	Failure to isolate RWCU F002A Div 4	514
C74-G31-F002B-DIV2	Failure to isolate RWCU F002B Div 2	513
C74-G31-F002B-DIV4	Failure to isolate RWCU F002B Div 4	512
C74-G31-F003A-DIV1	Failure to isolate RWCU F003A Div 1	511
C74-G31-F003A-DIV3	Failure to isolate RWCU F003A Div 3	510
C74-G31-F003B-DIV1	Failure to isolate RWCU F003B Div 1	509
C74-G31-F003B-DIV3	Failure to isolate RWCU F003B Div 3	508
C74-G31-F007A-DIV2	Failure to isolate RWCU F007A Div 2	507
C74-G31-F007A-DIV4	Failure to isolate RWCU F007A Div 4	506

**Table 4.5-6b**  
**I&C System – Top Events (C63)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C74-G31-F007B-DIV2	Failure to isolate RWCU F007B Div 2	505
C74-G31-F007B-DIV4	Failure to isolate RWCU F007B Div 4	484
C74-G31-F008A-DIV1	Failure to isolate RWCU F008A Div 1	483
C74-G31-F008A-DIV3	Failure to isolate RWCU F008A Div 3	482
C74-G31-F008B-DIV1	Failure to isolate RWCU F008B Div 1	481
C74-G31-F008B-DIV3	Failure to isolate RWCU F008B Div 3	402

**Table 4.5-6c**  
**I&C System – Top Events (C71)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C71 FAULT TREE

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C71-B21-F001A-CLOSE	F001A MSIV Closure	50
C71-B21-F001B-CLOSE	F001B MSIV Closure	36
C71-B21-F001C-CLOSE	F001C MSIV Closure	22
C71-B21-F001D-CLOSE	F001D MSIV Closure	8
C71-B21-F002A-CLOSE	F002A MSIV Closure	43
C71-B21-F002B-CLOSE	F002B MSIV Closure	29
C71-B21-F002C-CLOSE	F002C MSIV Closure	15
C71-B21-F002D-CLOSE	F002D MSIV Closure	1
CR-TOPCR	SCRAM FAILURE	105

**Table 4.5-6d**  
**I&C System – Top Events (C72)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C72 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C12-C71-FMCRD	FAILURE OF FMCRD SCRAM FOLLOW UP FUNCTION	333
C72-B21-F001A-DPS	AUTOMATIC DPS ISOLATION OF F001A FAILS	87
C72-B21-F001B-DPS	AUTOMATIC DPS ISOLATION OF F001B FAILS	85
C72-B21-F001C-DPS	AUTOMATIC DPS ISOLATION OF F001C FAILS	83
C72-B21-F001D-DPS	AUTOMATIC DPS ISOLATION OF F001D FAILS	81
C72-B21-F002A-DPS	AUTOMATIC DPS ISOLATION OF F002A FAILS	79
C72-B21-F002B-DPS	AUTOMATIC DPS ISOLATION OF F002B FAILS	77
C72-B21-F002C-DPS	AUTOMATIC DPS ISOLATION OF F002C FAILS	75
C72-B21-F002D-DPS	AUTOMATIC DPS ISOLATION OF F002D FAILS	72
C72-B21-F004A-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004A	226
C72-B21-F004B-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004B	223
C72-B21-F004C-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004C	220
C72-B21-F004D-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004D	217
C72-B21-F004E-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004E	214
C72-B21-F004F-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004F	211
C72-B21-F004G-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004G	201
C72-B21-F004H-DPS	FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004H	198
C72-B21-F006A-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006A	193
C72-B21-F006B-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006B	191
C72-B21-F006C-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006C	189
C72-B21-F006D-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006D	187
C72-B21-F006E-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006E	185
C72-B21-F006F-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006F	183
C72-B21-F006G-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006G	181
C72-B21-F006H-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006H	179
C72-B21-F006J-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006J	177

**Table 4.5-6d**  
**I&C System – Top Events (C72)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C72 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C72-B21-F006K-DPS	FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006K	175
C72-B21-F100A-DPS	FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F100A	30
C72-B21-F100B-DPS	FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F100B	29
C72-B21-F101A-DPS	FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F101A	28
C72-B21-F101B-DPS	FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F101B	24
C72-B32-F006A-DPS	FAILURE OF DPS OPEN SIGNAL TO B32-F006A	70
C72-B32-F006B-DPS	FAILURE OF DPS OPEN SIGNAL TO B32-F006B	68
C72-B32-F006C-DPS	FAILURE OF DPS OPEN SIGNAL TO B32-F006C	66
C72-B32-F006D-DPS	FAILURE OF DPS OPEN SIGNAL TO B32-F006D	59
C72-B32-F010A-DPS(NP)	No signal from DPS for valve B32-F010A to de-energize	3
C72-B32-F010B-DPS(NP)	No signal from DPS for valve B32-F010B to de-energize	4
C72-B32-F010C-DPS(NP)	No signal from DPS for valve B32-F010C to de-energize	2
C72-B32-F010D-DPS(NP)	No signal from DPS for valve B32-F010D to de-energize	1
C72-B32-F104A-DPS	FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F104A	100
C72-B32-F104A-DPS-MAN	DPS MANUAL SIGNAL TO F104A FAILS	54
C72-B32-F104B-DPS	FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F104B	96
C72-B32-F104B-DPS-MAN	DPS MANUAL SIGNAL TO F104B FAILS	52
C72-B32-F105A-DPS	FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F105A	21
C72-B32-F105A-DPS-MAN	DPS MANUAL SIGNAL TO F105A FAILS	20
C72-B32-F105B-DPS	FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F105B	19
C72-B32-F105B-DPS-MAN	DPS MANUAL SIGNAL TO F105B FAILS	11
C72-C41-F003A-DPS	FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003A	238
C72-C41-F003B-DPS	FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003B	235
C72-C41-F003C-DPS	FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003C	232
C72-C41-F003D-DPS	FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003D	229
C72-C71-ARI	ARI FAILURE	359
C72-E50-F002A-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002A	307
C72-E50-F002B-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002B	304



**Table 4.5-6d**  
**I&C System – Top Events (C72)**

THE FOLLOWING TOP EVENTS ARE USED IN THE C72 FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C72-E50-F002C-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002C	301
C72-E50-F002D-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002D	298
C72-E50-F002E-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002E	295
C72-E50-F002F-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002F	289
C72-E50-F002G-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002G	286
C72-E50-F002H-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002H	283
C72-E50-F006A-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006A	139
C72-E50-F006B-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006B	136
C72-E50-F006C-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006C	133
C72-E50-F006D-DPS	FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006D	130
C72-G31-ATWSF003A-DPS	FAILURE TO ISOLATE RWCU VALVE F003A (SLC ACTUATION FAILS)	10
C72-G31-ATWSF003B-DPS	FAILURE TO ISOLATE RWCU VALVE F003B (SLC ACTUATION FAILS)	9
C72-G31-ATWSF008A-DPS	FAILURE TO ISOLATE RWCU VALVE F008A (SLC ACTUATION FAILS)	8
C72-G31-ATWSF008B-DPS	FAILURE TO ISOLATE RWCU VALVE F008B (SLC ACTUATION FAILS)	7
C72-G31-F003A-DPS	DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F003A	126
C72-G31-F003B-DPS	DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F003B	122
C72-G31-F008A-DPS	DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F008A	115
C72-G31-F008B-DPS	DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F008B	104
C72-RPS	DPS RPS SCRAM FAILS	36
CF-TOPRB	FEEDWATER RUN BACK FAILURE	146
XI-TOPINH	FAILURE OF ADS INHIBIT SIGNAL	310

**Table 4.5-6e**

**I&C System – Top Events (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV  
ISOLATION)**

THE FOLLOWING TOP EVENTS ARE USED IN THE FAULT TREE:

<b>Top Event</b>	<b>Description</b>	<b>Sheet</b>
C63-C12-LL-SIG-AUTO	FAILURE OF AUTOMATIC CRD INJECTION SIGNAL FROM INDEPENDENT REPLICATED LOGIC	291
C63-C12-LL-SIG-MAN	FAILURE OF MANUAL CRD INJECTION SIGNAL FROM INDEPENDENT REPLICATED LOGIC	287
C99-B32-LOCAISOL-F002A-B	Failure of Div 2 ICP Isolation for F002A following LOCA	252
C99-B32-LOCAISOL-F002A-D	Failure of Div 4 ICP Isolation for F002A following LOCA	271
C99-B32-LOCAISOL-F002B-B	Failure of Div 2 ICP Isolation for F002B following LOCA	201
C99-B32-LOCAISOL-F002B-D	Failure of Div 4 ICP Isolation for F002B following LOCA	182
C99-B32-LOCAISOL-F002C-B	Failure of Div 2 ICP Isolation for F002C following LOCA	131
C99-B32-LOCAISOL-F002C-D	Failure of Div 4 ICP Isolation for F002C following LOCA	112
C99-B32-LOCAISOL-F002D-B	Failure of Div 2 ICP Isolation for F002D following LOCA	61
C99-B32-LOCAISOL-F002D-D	Failure of Div 4 ICP Isolation for F002D following LOCA	41
C99-B32-LOCAISOL-F003A-B	Failure of Div 2 ICP Isolation for F003A following LOCA	236
C99-B32-LOCAISOL-F003A-D	Failure of Div 4 ICP Isolation for F003A following LOCA	217
C99-B32-LOCAISOL-F003B-B	Failure of Div 2 ICP Isolation for F003B following LOCA	147
C99-B32-LOCAISOL-F003B-D	Failure of Div 4 ICP Isolation for F003B following LOCA	166
C99-B32-LOCAISOL-F003C-B	Failure of Div 2 ICP Isolation for F003C following LOCA	77
C99-B32-LOCAISOL-F003C-D	Failure of Div 4 ICP Isolation for F003C following LOCA	93
C99-B32-LOCAISOL-F003D-B	Failure of Div 2 ICP Isolation for F003D following LOCA	1
C99-B32-LOCAISOL-F003D-D	Failure of Div 4 ICP Isolation for F003D following LOCA	25

**Table 4.5-7a**  
**I&C System – Basic Events (C62)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C62 FAULT TREE:

Basic Event	Prob	Description
C62-CCFSOFTWARE	1.00E-04	Common cause failure of software
C62-CCFSOFTWARE_S	1.00E-04	Common cause failure of software, for spurious
C62-DTM-FC-BOP	6.00E-04	BOP MASTER DTM FAILS
C62-DTM-FC-CFS	6.00E-04	CFS MASTER DTM
C62-DTM-FC-PIPA	6.00E-04	PIP A MASTER DTM
C62-DTM-FC-PIPB	6.00E-04	PIP B MASTER DTM
C62-FT_-NO-SDFLINA	3.31E-05	RWCU IN-FLOW SENSOR TRANSMITTER A FAILS
C62-FT_-NO-SDFLINB	3.31E-05	RWCU IN-FLOW SENSOR TRANSMITTER B FAILS
C62-FT_-NO-SDFLINC	3.31E-05	RWCU IN-FLOW SENSOR TRANSMITTER C FAILS
C62-FT_-NO-SDFLIND	3.31E-05	RWCU IN-FLOW SENSOR TRANSMITTER D FAILS
C62-FT_-NO-SDFLOUTA	3.31E-05	RWCU OUT-FLOW SENSOR TRANSMITTER A FAILS
C62-FT_-NO-SDFLOUTB	3.31E-05	RWCU OUT-FLOW SENSOR TRANSMITTER B FAILS
C62-FT_-NO-SDFLOUTC	3.31E-05	RWCU OUT-FLOW SENSOR TRANSMITTER CB FAILS
C62-FT_-NO-SDFLOUTD	3.31E-05	RWCU OUT-FLOW SENSOR TRANSMITTER D FAILS
C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
C62-LOG-FC-BOP1	3.60E-04	BOP PROCESSOR #1 FAILS
C62-LOG-FC-BOP2	3.60E-04	BOP PROCESSOR #2 FAILS
C62-LOG-FC-CFS1	3.60E-04	CFS PROCESSOR #1 FAILS
C62-LOG-FC-CFS2	3.60E-04	CFS PROCESSOR #2 FAILS
C62-LOG-FC-CFS3	3.60E-04	CFS PROCESSOR #3 FAILS
C62-LOG-FC-PIPA1	3.60E-04	PIP A1 PROCESSOR FAILS
C62-LOG-FC-PIPA2	3.60E-04	PIP A2 PROCESSOR FAILS
C62-LOG-FC-PIPB1	3.60E-04	PIP B1 PROCESSOR FAILS
C62-LOG-FC-PIPB2	3.60E-04	PIP B2 PROCESSOR FAILS
C62-LT_-NO-PLLVLA	7.20E-05	ICS/PCCS POOL LEVEL A SENSOR TRANSMITTER FAILS
C62-LT_-NO-PLLVLB	7.20E-05	ICS/PCCS POOL LEVEL B SENSOR TRANSMITTER FAILS
C62-LT_-NO-PLLVLC	7.20E-05	ICS/PCCS POOL LEVEL C SENSOR TRANSMITTER FAILS
C62-LT_-NO-PLLVLD	7.20E-05	ICS/PCCS POOL LEVEL D SENSOR TRANSMITTER FAILS
C62-LT_-NO-QLVLA	7.20E-05	CONDENSER LVL A TRANSMITTER SENSOR FAILS
C62-LT_-NO-QLVLB	7.20E-05	CONDENSER LVL B TRANSMITTER SENSOR FAILS
C62-LT_-NO-QLVLC	7.20E-05	CONDENSER LVL C TRANSMITTER SENSOR FAILS
C62-LT_-NO-QLVLD	7.20E-05	CONDENSER LVL D TRANSMITTER SENSOR FAILS
C62-LT_-NO-RXLVLA	7.20E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
C62-LT_-NO-RXLVLB	7.20E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
C62-LT_-NO-RXLVLC	7.20E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
C62-LT_-NO-RXLVLD	7.20E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
C62-LT_-NO-RXLVLE	7.20E-05	NDCIS FZ RX LEVEL SENSOR TRANSMITTER E FAILS
C62-LT_-NO-RXLVLF	7.20E-05	RX FZ LEVEL TRANSMITTER FAILS
C62-LT_-NO-RXLVLG	7.20E-05	NDCIS FZ LEVEL G SENSOR TRANSMITTER FAILS

**Table 4.5-7a**  
**I&C System – Basic Events (C62)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C62 FAULT TREE:

Basic Event	Prob	Description
C62-LT_-NO-RXLVLH	7.20E-05	RX FZ LEVEL TRANSMITTER FAILS
C62-MOD-FO-CNDPPRSA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER
C62-MOD-FO-CNDPPRSB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-CNDPPRSC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-CNDPPRSD	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-DWPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-DWPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-DWPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-DWPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-FDWH1PRSA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWH1PRSB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWH1PRSC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWH1PRSD	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWPPRSA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWPPRSB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWPPRSC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-FDWPPRSD	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-HPNPRA1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILURE
C62-MOD-FO-HPNPRA2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILURE
C62-MOD-FO-HPNPRB1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILURE
C62-MOD-FO-HPNPRB2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILURE
C62-MOD-FO-IADPRA1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-IADPRA2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-IADPRB1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-IADPRB2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PLLVLA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PLLVLB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PLLVLC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PLLVLD	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PSWPRA1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PSWPRA2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PSWPRB1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-PSWPRB2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-QLVLA	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS

**Table 4.5-7a**  
**I&C System – Basic Events (C62)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C62 FAULT TREE:

Basic Event	Prob	Description
C62-MOD-FO-QLVLB	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-QLVLC	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-QLVLD	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-RCCPRA1	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-RCCPRA2	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-RCCPRB1	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-RCCPRB2	1.09E-04	TRANSDUCER OR SIGNAL PROCESSOR FAILS
C62-MOD-FO-RCTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C62-MOD-FO-RCTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-RCTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C62-MOD-FO-RCTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C62-MOD-FO-RXLVLE	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXLVLF	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXLVLG	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXLVLH	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-SARPRA1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SARPRA2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SARPRB1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SARPRB2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLINA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLINB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLINC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLIND	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLOUTA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLOUTB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLOUTC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SDFLOUTD	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-SPTMPA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-SPTMPB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-SPTMPC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-SPTMPD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
C62-MOD-FO-TCCPPRSA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C62-MOD-FO-TCCPPRSB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS

**Table 4.5-7a**  
**I&C System – Basic Events (C62)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C62 FAULT TREE:

Basic Event	Prob	Description
C62-PSP-FO-BOPPSA	7.20E-06	BOP CONTROLLER POWER SUPPLY A FAILS
C62-PSP-FO-BOPPSB	7.20E-06	BOP CONTROLLER POWER SUPPLY B FAILS
C62-PSP-FO-BOPRAPSA	7.20E-06	BOP RMUA POWER SUPPLY A FAILS
C62-PSP-FO-BOPRAPSB	7.20E-06	BOP RMUA POWER SUPPLY B FAILS
C62-PSP-FO-BOPRBPSA	7.20E-06	BOP RMUB POWER SUPPLY A FAILS
C62-PSP-FO-BOPRBPSB	7.20E-06	BOP RMUB POWER SUPPLY B FAILS
C62-PSP-FO-CFSAPSA	7.20E-06	RMU A POWER SUPPLY A FAILS
C62-PSP-FO-CFSAPSB	7.20E-06	RMU A POWER SUPPLY B FAILS
C62-PSP-FO-CFSBPSA	7.20E-06	RMU B POWER SUPPLY A FAILS
C62-PSP-FO-CFSBPSB	7.20E-06	RMU B POWER SUPPLY B FAILS
C62-PSP-FO-CFSPSA	7.20E-06	CFS POWER SUPPLY A FAILS
C62-PSP-FO-CFSPSB	7.20E-06	CFS POWER SUPPLY B FAILS
C62-PSP-FO-DPSAPSA	7.20E-06	DPS RMU A POWER SUPPLY A FAILS
C62-PSP-FO-DPSAPSB	7.20E-06	DPS RMU A POWER SUPPLY B FAILS
C62-PSP-FO-DPSBPSA	7.20E-06	DPS RMU B POWER SUPPLY A FAILS
C62-PSP-FO-DPSBPSB	7.20E-06	DPS RMU B POWER SUPPLY B FAILS
C62-PSP-FO-PIPACNTPSA	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C62-PSP-FO-PIPACNTPSB	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C62-PSP-FO-PIBCNTPSA	7.20E-06	PIP B CABINET POWER SUPPLY A FAILS
C62-PSP-FO-PIBCNTPSB	7.20E-06	PIP B CABINET POWER SUPPLY B FAILS
C62-PSP-FO-PIPRMUAPSA	7.20E-06	PIP RMU A CABINET POWER SUPPLY A FAILS
C62-PSP-FO-PIPRMUAPSB	7.20E-06	PIP RMU A CABINET POWER SUPPLY B FAILS
C62-PSP-FO-PIPRMUBPSA	7.20E-06	PIP RMU B CABINET POWER SUPPLY A FAILS
C62-PSP-FO-PIPRMUBPSB	7.20E-06	PIP RMU B CABINET POWER SUPPLY B FAILS
C62-PSP-FO-PIPRMUEPSA	7.20E-06	PIP RMU E CABINET POWER SUPPLY A FAILS
C62-PSP-FO-PIPRMUEPSB	7.20E-06	PIP RMU E CABINET POWER SUPPLY B FAILS
C62-PSP-FO-PIPRMUFP SA	7.20E-06	PIP RMU F CABINET POWER SUPPLY A FAILS
C62-PSP-FO-PIPRMUFP SB	7.20E-06	PIP RMU F CABINET POWER SUPPLY B FAILS
C62-PSP-FO-PIPRMUXPSA	7.20E-06	PIP RMU X CABINET POWER SUPPLY A FAILS
C62-PSP-FO-PIPRMUXPSB	7.20E-06	PIP RMU X CABINET POWER SUPPLY B FAILS
C62-PSP-FO-PIPRMUYP SA	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C62-PSP-FO-PIPRMUYP SB	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C62-PT_-NO-CNDPPRSA	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER A FAILS
C62-PT_-NO-CNDPPRSB	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER B FAILS

**Table 4.5-7a**  
**I&C System – Basic Events (C62)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C62 FAULT TREE:

Basic Event	Prob	Description
C62-PT_-NO-CNDPPRSC	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER C FAILS
C62-PT_-NO-CNDPPRSD	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER D FAILS
C62-PT_-NO-DWPRSA	3.46E-05	NDCIS DRYWELL PRESSURE SENSOR TRANSMITTER A FAILS
C62-PT_-NO-DWPRSB	3.46E-05	DRYWELL PRESSURE SENSOR TRANSMITTER B FAILS
C62-PT_-NO-DWPRSC	3.46E-05	NDCIS DRYWELL PRESSURE SENSOR TRANSMITTER C FAILS
C62-PT_-NO-DWPRSD	3.46E-05	DRYWELL PRESSURE SENSOR TRANSMITTER D FAILS
C62-PT_-NO-FDWH1PRSA	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
C62-PT_-NO-FDWH1PRSB	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
C62-PT_-NO-FDWH1PRSC	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
C62-PT_-NO-FDWH1PRSD	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
C62-PT_-NO-FDWPPRSA	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER A FAILS
C62-PT_-NO-FDWPPRSB	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER B FAILS
C62-PT_-NO-FDWPPRSC	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER C FAILS
C62-PT_-NO-FDWPPRSD	3.46E-05	LINE FLOW/PRESSURE SENSOR TRANSMITTER D FAILS
C62-PT_-NO-HPNPRA1	3.46E-05	HPNS LOW PRESSURE A1 SENSOR TRANSMITTER FAILS
C62-PT_-NO-HPNPRA2	3.46E-05	HPNS LOW PRESSURE A2 SENSOR TRANSMITTER FAILS
C62-PT_-NO-HPNPRB1	3.46E-05	HPNS LOW PRESSURE B1 SENSOR TRANSMITTER FAILS
C62-PT_-NO-HPNPRB2	3.46E-05	HPNS LOW PRESSURE B2 SENSOR TRANSMITTER FAILS
C62-PT_-NO-IADPRA1	3.46E-05	IAS PRESSURE A1 TRANSMITTER SENSOR FAILS
C62-PT_-NO-IADPRA2	3.46E-05	IAS PRESSURE A2 TRANSMITTER SENSOR FAILS
C62-PT_-NO-IADPRB1	3.46E-05	IAS PRESSURE B1 TRANSMITTER SENSOR FAILS
C62-PT_-NO-IADPRB2	3.46E-05	IAS PRESSURE B2 TRANSMITTER SENSOR FAILS
C62-PT_-NO-PSWPRA1	3.46E-05	PSW HEADER PRESSURE A1 TRANSMITTER SENSOR FAILS
C62-PT_-NO-PSWPRA2	3.46E-05	PSW HEADER PRESSURE A2 TRANSMITTER SENSOR FAILS
C62-PT_-NO-PSWPRB1	3.46E-05	PSW HEADER PRESSURE B1 TRANSMITTER SENSOR FAILS
C62-PT_-NO-PSWPRB2	3.46E-05	PSW HEADER PRESSURE B2 TRANSMITTER SENSOR FAILS
C62-PT_-NO-RCCPRA1	3.46E-05	RCC HEADER PRESSURE A1 SENSOR TRANSMITTER FAILS
C62-PT_-NO-RCCPRA2	3.46E-05	RCC HEADER PRESSURE A2 SENSOR TRANSMITTER FAILS
C62-PT_-NO-RCCPRB1	3.46E-05	RCC HEADER PRESSURE B1 SENSOR TRANSMITTER FAILS
C62-PT_-NO-RCCPRB2	3.46E-05	RCC HEADER PRESSURE B2 SENSOR TRANSMITTER FAILS
C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
C62-PT_-NO-SARPRA1	3.46E-05	SA PRESSURE A1 TRANSMITTER SENSOR FAILS
C62-PT_-NO-SARPRA2	3.46E-05	SA PRESSURE A2 TRANSMITTER SENSOR FAILS
C62-PT_-NO-SARPRB1	3.46E-05	SA PRESSURE B1 TRANSMITTER SENSOR FAILS
C62-PT_-NO-SARPRB2	3.46E-05	SA PRESSURE B2 TRANSMITTER SENSOR FAILS

**Table 4.5-7a**  
**I&C System – Basic Events (C62)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C62 FAULT TREE:

Basic Event	Prob	Description
C62-PT_-NO-TCCPPRSA	3.46E-05	TCC HEADER PRESSURE A SENSOR TRANSMITTER FAILS
C62-PT_-NO-TCCPPRSB	3.46E-05	TCC HEADER PRESSURE B SENSOR TRANSMITTER FAILS
C62-TT_-NO-RCTMPA	2.52E-05	RCC TEMPERATURE A SENSOR TRANSMITTER FAILS
C62-TT_-NO-RCTMPB	2.52E-05	RCC TEMPERATURE B SENSOR TRANSMITTER FAILS
C62-TT_-NO-RCTMPC	2.52E-05	RCC TEMPERATURE C SENSOR TRANSMITTER FAILS
C62-TT_-NO-RCTMPD	2.52E-05	RCC TEMPERATURE D SENSOR TRANSMITTER FAILS
C62-TT_-NO-SPTMPA	2.52E-05	SUPPRESSION POOL TEMPERATURE SENSOR TRANSMITTER A FAILS
C62-TT_-NO-SPTMPB	2.52E-05	SUPPRESSION POOL TEMPERATURE SENSOR TRANSMITTER B FAILS
C62-TT_-NO-SPTMPC	2.52E-05	SUPPRESSION POOL TEMPERATURE SENSOR TRANSMITTER C FAILS
C62-TT_-NO-SPTMPD	2.52E-05	SUPPRESSION POOL TEMPERATURE SENSOR TRANSMITTER D FAILS
C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C72-PSP-FO-DPSCNTPSA	7.20E-06	DPS CONTROLLER POWER SUPPLY A FAILS
C72-PSP-FO-DPSCNTPSB	7.20E-06	DPS CONTROLLER POWER SUPPLY B FAILS



**Table 4.5-7b****I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
B21-ZS_-FC-CCFALL	9.00E-06	CCF of all DPV ESF limit switches
B21-ZS_-FC-F004A-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004A-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004A-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004A-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004B-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004B-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004B-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004B-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004C-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004C-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004C-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004C-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004D-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004D-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004D-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004D-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004E-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004E-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004E-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004E-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004F-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004F-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004F-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004F-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004G-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004G-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004G-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004G-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004H-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004H-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004H-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-F004H-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
C63-CCFSOFTWARE	1.00E-04	Common cause failure of software
C63-CCFSOFTWARE_S	1.00E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE
C63-DTM-FC-ESFD1	6.00E-04	ESF DIV 1 MASTER DTM
C63-DTM-FC-ESFD2	6.00E-04	ESF DIV 2 MASTER DTM
C63-DTM-FC-ESFD3	6.00E-04	ESF DIV 3 MASTER DTM
C63-DTM-FC-ESFD4	6.00E-04	ESF DIV 4 MASTER DTM
C63-FT_-NO-ESF1ICFLWA	3.31E-05	ICS STEAM FLOW SENSOR FAILS

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-FT_-NO-ESF1SDFLIA	3.31E-05	RWCU FLOW IN SENSOR FAILS
C63-FT_-NO-ESF1SDFLOA	3.31E-05	RWCU FLOW OUT SENSOR FAILS
C63-FT_-NO-ESF2ICFLWB	3.31E-05	ICS STEAM FLOW SENSOR FAILS
C63-FT_-NO-ESF2SDFLIB	3.31E-05	RWCU FLOW IN SENSOR FAILS
C63-FT_-NO-ESF2SDFLOC	3.31E-05	RWCU FLOW OUT SENSOR FAILS
C63-FT_-NO-ESF3ICFLWC	3.31E-05	ICS STEAM FLOW SENSOR FAILS
C63-FT_-NO-ESF3SDFLIC	3.31E-05	RWCU FLOW IN SENSOR FAILS
C63-FT_-NO-ESF3SDFLOB	3.31E-05	RWCU FLOW OUT SENSOR FAILS
C63-FT_-NO-ESF4ICFLWD	3.31E-05	ICS STEAM FLOW SENSOR FAILS
C63-FT_-NO-ESF4SDFLID	3.31E-05	RWCU FLOW IN SENSOR FAILS
C63-FT_-NO-ESF4SDFLOD	3.31E-05	RWCU FLOW OUT SENSOR FAILS
C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
C63-LDD-FC-S1B21F004A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F004H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S1B21F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006J-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006J-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006J-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006K-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006K-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B21F006K-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F005D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006B-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F006D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S1B32F009A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F009D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F010D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F012A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F012B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F012C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F012D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1B32F104D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1C41F003D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S1E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S1E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S2B21F004C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F004H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S2B21F006H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006J-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006J-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006J-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006K-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006K-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B21F006K-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F005D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006B-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F006D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F009D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F010D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F012A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F012B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S2B32F012C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F012D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2B32F104D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2C41F003D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION



**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S2E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S2E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B21F004H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S3B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3C41F003D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LDD-FC-S3E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LDD-FC-S3E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C63-LOG-FC-ESFD1C1	3.60E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-ESFD1C2	3.60E-04	ESF DIV 1 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-ESFD1C3	3.60E-04	ESF DIV 1 MAIN PROCESSOR #3 FAILS
C63-LOG-FC-ESFD2C1	3.60E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-ESFD2C2	3.60E-04	ESF DIV 2 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-ESFD2C3	3.60E-04	ESF DIV 2 MAIN PROCESSOR #3 FAILS
C63-LOG-FC-ESFD3C1	3.60E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-ESFD3C2	3.60E-04	ESF DIV 3 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-ESFD3C3	3.60E-04	ESF DIV 3 MAIN PROCESSOR #3 FAILS
C63-LOG-FC-ESFD4C1	3.60E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-ESFD4C2	3.60E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-ESFD4C3	3.60E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS
C63-LT_-NO-ATWSRXLVLA	7.20E-05	ATWS/SLC RX LEVEL A SENSOR TRANSMITTER FAILS
C63-LT_-NO-ATWSRXLVLB	7.20E-05	ATWS/SLC RX LEVEL B SENSOR TRANSMITTER FAILS
C63-LT_-NO-ATWSRXLVLC	7.20E-05	ATWS/SLC RX LEVEL C SENSOR TRANSMITTER FAILS
C63-LT_-NO-ATWSRXLVLD	7.20E-05	ATWS/SLC RX LEVEL D SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLA	7.20E-05	ICS/PCCS POOL 1 LEVEL A SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLB	7.20E-05	ICS/PCCS POOL 1 LEVEL B SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLC	7.20E-05	ICS/PCCS POOL 1 LEVEL C SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLD	7.20E-05	ICS/PCCS POOL 1 LEVEL D SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLE	7.20E-05	ICS/PCCS POOL 2 LEVEL E SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLF	7.20E-05	ICS/PCCS POOL 2 LEVEL F SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLG	7.20E-05	ICS/PCCS POOL 2 LEVEL G SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFPXLVLH	7.20E-05	ICS/PCCS POOL 2 LEVEL H SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFRXLVLA	7.20E-05	RX LVL A SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFRXLVLB	7.20E-05	RX LVL B SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFRXLVLC	7.20E-05	RX LVL C FAILS
C63-LT_-NO-ESFRXLVLD	7.20E-05	RX LVL D FAILS
C63-LT_-NO-ESFRXLVLE	7.20E-05	RX FZ LVL E SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFRXLVLF	7.20E-05	RX FZ LVL F SENSOR TRANSMITTER FAILS

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-LT_-NO-ESFRXLVLG	7.20E-05	RX FZ LEVLE G SENSOR TRANSMITTER FAILS
C63-LT_-NO-ESFRXLVLH	7.20E-05	RX FZ LEVEL H SENSOR TRANSMITTER FAILS
C63-LT_-NO-RPSRXLVLA	7.20E-05	RPS RX LVL A SENSOR TRANSMITTER FAILS
C63-LT_-NO-RPSRXVLB	7.20E-05	RPS RX LVL B SENSOR TRANSMITTER FAILS
C63-LT_-NO-RPSRXLVLC	7.20E-05	RPS RX LVL C SENSOR TRANSMITTER FAILS
C63-LT_-NO-RPSRXLVLD	7.20E-05	RPS RX LVL D SENSOR TRANSMITTER FAILS
C63-MOD-FO-ATWSCTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C63-MOD-FO-ATWSCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
C63-MOD-FO-ATWSRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ATWSRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-CVPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-CVPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-CVPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-CVPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-DWPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-DWPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-DWPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-DWPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF1DWPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF1FWPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF1ICFLWA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF1SDFLIA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF1SDFLOA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF2DWPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF2FWPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF2ICFLWB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF2SDFLIB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF2SDFLOB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF3DWPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF3FWPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF3ICFLWC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF3SDFLIC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF3SDFLOC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-MOD-FO-ESF4DWPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF4FWPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF4ICFLWD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF4SDFLID	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
C63-MOD-FO-ESF4SDFLOD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPE	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPF	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPG	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFCTTMPH	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLE	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLF	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLG	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFPXLVLH	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLE	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLF	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLG	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXLVLH	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-ESFRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSCTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-MOD-FO-RPSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-RPSRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-PSP-FO-ATW1PSA	7.20E-06	ATWS/SLC POWER SUPPLY A FAILS
C63-PSP-FO-ATW1PSB	7.20E-06	ATWS/SLC POWER SUPPLY A FAILS
C63-PSP-FO-ATW2PSA	7.20E-06	ATWS/SLC DIVII POWER SUPPLY A FAILS
C63-PSP-FO-ATW2PSB	7.20E-06	ATWS/SLC DIVII POWER SUPPLY B FAILS
C63-PSP-FO-ATW3PSA	7.20E-06	ATWS/SLC DIVIII POWER SUPPLY A FAILS
C63-PSP-FO-ATW3PSB	7.20E-06	ATWS/SLC DIVIII POWER SUPPLY B FAILS
C63-PSP-FO-ATW4PSA	7.20E-06	ATWS/SLC DIVIV POWER SUPPLY A FAILS
C63-PSP-FO-ATW4PSB	7.20E-06	ATWS/SLC DIVIV POWER SUPPLY B FAILS
C63-PSP-FO-ESF1PSA	7.20E-06	DIV 1 RMU POWER SUPPLY A FAILS
C63-PSP-FO-ESF1PSB	7.20E-06	DIV 1 RMU POWER SUPPLY B FAILS
C63-PSP-FO-ESF2PSA	7.20E-06	DIV 2 RMU POWER SUPPLY A FAILS
C63-PSP-FO-ESF2PSB	7.20E-06	DIV 2 RMU POWER SUPPLY B FAILS
C63-PSP-FO-ESF3PSA	7.20E-06	DIV 3 RMU POWER SUPPLY A FAILS
C63-PSP-FO-ESF3PSB	7.20E-06	DIV 3 RMU POWER SUPPLY B FAILS
C63-PSP-FO-ESF4PSA	7.20E-06	DIV 4 RMU POWER SUPPLY A FAILS
C63-PSP-FO-ESF4PSB	7.20E-06	DIV 4 RMU POWER SUPPLY B FAILS
C63-PSP-FO-ESFD1PSA	7.20E-06	DIV 1 POWER SUPPLY A FAILS
C63-PSP-FO-ESFD1PSB	7.20E-06	DIV 1 POWER SUPPLY B FAILS
C63-PSP-FO-ESFD2PSA	7.20E-06	DIV 2 POWER SUPPLY A FAILS
C63-PSP-FO-ESFD2PSB	7.20E-06	DIV 2 POWER SUPPLY B FAILS
C63-PSP-FO-ESFD3PSA	7.20E-06	DIV 3 POWER SUPPLY A FAILS
C63-PSP-FO-ESFD3PSB	7.20E-06	DIV 3 POWER SUPPLY B FAILS
C63-PSP-FO-ESFD4PSA	7.20E-06	DIV 4 POWER SUPPLY A FAILS
C63-PSP-FO-ESFD4PSB	7.20E-06	DIV 4 POWER SUPPLY B FAILS
C63-PSP-FO-RPSR1PSA	7.20E-06	Div I RPS Power Supply A Fails
C63-PSP-FO-RPSR1PSB	7.20E-06	Div I RPS Power Supply B Fails
C63-PSP-FO-RPSR2PSA	7.20E-06	Div II RPS Power Supply A Fails
C63-PSP-FO-RPSR2PSB	7.20E-06	Div II RPS Power Supply B Fails
C63-PSP-FO-RPSR3PSA	7.20E-06	Div III RPS Power Supply A Fails
C63-PSP-FO-RPSR3PSB	7.20E-06	Div III RPS Power Supply B Fails
C63-PSP-FO-RPSR4PSA	7.20E-06	Div IV RPS Power Supply A Fails
C63-PSP-FO-RPSR4PSB	7.20E-06	Div IV RPS Power Supply B Fails
C63-PT_-NO-ATWSRXPRSA	3.46E-05	ATWS/SLC RX PRESSURE A SENSOR TRANSMITTER FAILS
C63-PT_-NO-ATWSRXPRSB	3.46E-05	ATWS/SLC RX PRESSURE B SENSOR TRANSMITTER FAILS
C63-PT_-NO-ATWSRXPRSC	3.46E-05	ATWS/SLC RX PRESSURE C SENSOR TRANSMITTER FAILS
C63-PT_-NO-ATWSRXPRSD	3.46E-05	ATWS/SLC RX PRESSURE D SENSOR TRANSMITTER FAILS
C63-PT_-NO-CVPRSA	3.46E-05	RPS CONDENSER VACUUM PRESSURE A SENSOR TRANSMITTER FAILS

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-PT_-NO-CVPRSB	3.46E-05	RPS CONDENSER VACUUM PRESSURE B SENSOR TRANSMITTER FAILS
C63-PT_-NO-CVPRSC	3.46E-05	CONDENSER VACUUM PRESSURE C SENSOR TRANSMITTER FAILS
C63-PT_-NO-CVPRSD	3.46E-05	CONDENSER VACCUM PRESSURE D SENSOR TRANSMITTER FAILS
C63-PT_-NO-DWPRSA	3.46E-05	RPS DRYWELL PRESSURE A SENSOR TRANSMITTER FAILS
C63-PT_-NO-DWPRSB	3.46E-05	DRYWELL PRESSURE B SENSOR TRANSMITTER FAILS
C63-PT_-NO-DWPRSC	3.46E-05	DRYWELL PRESSURE C SENSOR TRANSMITTER FAILS
C63-PT_-NO-DWPRSD	3.46E-05	DRYWELL PRESSURE D SENSOR TRANSMITTER FAILS
C63-PT_-NO-ESF1DWPRSA	3.46E-05	DRYWELL PRESSURE SENSOR FAILS
C63-PT_-NO-ESF1FWPRSA	3.46E-05	DIV 1 FDW DP SENSORS /TRANSMITTERS FAIL
C63-PT_-NO-ESF2DWPRSB	3.46E-05	DRYWELL PRESSURE SENSOR FAILS
C63-PT_-NO-ESF2FWPRSB	3.46E-05	DIV 2 FDW DP SENSORS /TRANSMITTERS FAIL
C63-PT_-NO-ESF3DWPRSC	3.46E-05	DRYWELL PRESSURE SENSOR FAILS
C63-PT_-NO-ESF3FWPRSC	3.46E-05	DIV 3 FDW DP SENSORS /TRANSMITTERS FAIL
C63-PT_-NO-ESF4DWPRSD	3.46E-05	DRYWELL PRESSURE SENSOR FAILS
C63-PT_-NO-ESF4FWPRSD	3.46E-05	DIV 4 FDW DP SENSORS/ TRANSMITTERS FAIL
C63-PT_-NO-ESFRXPRSA	3.46E-05	ESF RX PRESSURE A SENSOR TRANSMITTER FAILS
C63-PT_-NO-ESFRXPRSB	3.46E-05	ESF RX PRESSURE B SENSOR TRANSMITTER FAILS
C63-PT_-NO-ESFRXPRSC	3.46E-05	ESF RX PRESSURE C SENSOR TRANSMITTER FAILS
C63-PT_-NO-ESFRXPRSD	3.46E-05	ESF RX PRESSURE D SENSOR TRANSMITTER FAILS
C63-PT_-NO-RPSRXPRSA	3.46E-05	RPS RX PRESSURE A SENSOR TRANSMITTER FAILS
C63-PT_-NO-RPSRXPRSB	3.46E-05	RPS RX PRESSURE B SENSOR TRANSMITTER FAILS
C63-PT_-NO-RPSRXPRSC	3.46E-05	RPS RX PRESSURE C SENSOR TRANSMITTER FAILS
C63-PT_-NO-RPSRXPRSD	3.46E-05	RPS RX PRESSURE D SENSOR TRANSMITTER FAILS
C63-TT_-NO-ATWSTEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C63-TT_-NO-ATWSTEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C63-TT_-NO-ATWSTEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C63-TT_-NO-ATWSTEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C63-TT_-NO-ESFTEMPA	2.52E-05	TEMPERATURE A FAILS
C63-TT_-NO-ESFTEMPB	2.52E-05	TEMPERATURE B FAILS
C63-TT_-NO-ESFTEMPC	2.52E-05	TEMPERATURE C FAILS
C63-TT_-NO-ESFTEMPD	2.52E-05	TEMPERATURE D FAILS
C63-TT_-NO-ESFTEMPE	2.52E-05	TEMPERATURE E SENSOR TRANSMITTER FAILS
C63-TT_-NO-ESFTEMPF	2.52E-05	TEMPERATURE F SENSOR TRANSMITTER FAILS
C63-TT_-NO-ESFTEMPG	2.52E-05	TEMPERATURE G SENSOR TRANSMITTER FAILS
C63-TT_-NO-ESFTEMPH	2.52E-05	TEMPERATURE H SENSOR TRANSMITTER FAILS

**Table 4.5-7b**  
**I&C System – Basic Events (C63)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C63 FAULT TREE:

Basic Event	Prob	Description
C63-TT_-NO-RPSTEMPA	2.52E-05	TEMPERATURE A FAILS
C63-TT_-NO-RPSTEMPB	2.52E-05	TEMPERATURE B SENSOR TRANSMITTER FAILS
C63-TT_-NO-RPSTEMPC	2.52E-05	TEMPERATURE C FAILS
C63-TT_-NO-RPSTEMPD	2.52E-05	TEMPERATURE D FAILS
FL_ICS_O1	1.00E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
FL_ICS_O2	1.00E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY



**Table 4.5-7c**  
**I&C System – Basic Events (C71)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C71 FAULT TREE:

Basic Event	Prob	Description
%BOC-FDWA	1.70E-03	FEEDWATER LINE A BREAK OUTSIDE CONTAINMENT
%BOC-FDWB	1.70E-03	FEEDWATER LINE B BREAK OUTSIDE CONTAINMENT
%BOC-IC	1.53E-06	IC LINE BREAK OUTSIDE CONTAINMENT
%BOC-MS	6.20E-03	MAIN STEAM LINE BREAK OUTSIDE CONTAINMENT
%BOC-RWCU	3.40E-03	RWCU LINE BREAK OUTSIDE CONTAINMENT
%ISLOCA	6.42E-08	ISLOCA
%LL-S	3.39E-04	LARGE STEAM LOCA (NO FW LINE BREAK)
%LL-S-FDWA	5.55E-06	LARGE STEAM LOCA IN FW LINE A
%LL-S-FDWB	5.55E-06	LARGE STEAM LOCA IN FW LINE B
%ML-L	3.22E-05	MEDIUM LIQUID LOCA (NO RWCU BREAK)
%RVR	1.00E-10	REACTOR VESSEL RUPTURE
%SL-L	3.65E-04	SMALL LIQUID LOCA (NO RWCU BREAK)
%SL-S	7.62E-04	SMALL STEAM LOCA (NO RWCU BREAK)
%T-FDW	1.17E-01	LOSS OF FEEDWATER
%T-GEN	1.18E+00	GENERAL TRANSIENT
%T-IA	1.02E-02	COMPLETE LOSS OF AIR SYSTEMS
%T-IORV	2.83E-02	IORV
%T-LOPP-GR	1.86E-02	GRID RELATED LOSS OF PREFERRED POWER
%T-LOPP-PC	2.07E-03	PLANT CENTERED LOSS OF PREFERRED POWER
%T-LOPP-SC	1.04E-02	SWITCHYARD CENTERED LOSS OF PREFERRED POWER
%T-LOPP-WR	4.83E-03	WEATHER RELATED LOSS OF PREFERRED POWER
%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
%T-SW	9.70E-04	COMPLETE LOSS OF PSWS
C12-ACV-CC-SCRV126	6.90E-09	CCF TO OPEN OF AIR OPERATED SCRAM VALVE AOV-126
C12-RE_-FD-R1V36	1.00E-04	RELAY (FAILURE TO CLOSE AND ENERGIZE PATH)
C12-RE_-FD-R1V37	1.00E-04	RELAY (FAILURE TO CLOSE AND ENERGIZE PATH)
C12-RE_-FD-R2V36	1.00E-04	RELAY (FAILURE TO CLOSE AND ENERGIZE PATH)
C12-RE_-FD-R2V37	1.00E-04	RELAY (FAILURE TO CLOSE AND ENERGIZE PATH)
C12-ROD-CF-SCRAM	2.50E-07	CCF OF CONTROL RODS TO INSERT
C12-SOV-FD-SCRV139	1.70E-06	CCF TO OPEN (VENT) OF SCRAM PILOT SOLENOID VALVES SOV-139
C12-SOV-FE-F036	1.00E-03	AIR HEADER DUMP VALVE SOV-F036 FAILS TO OPEN
C12-SOV-FE-F037	1.00E-03	AIR HEADER DUMP VALVE SOV-F037 FAILS TO OPEN
C51-CCFSOFTWARE	1.00E-04	NMS COMMON CAUSE SOFTWARE FAILURE
C71-ACT-FC-D1APRM	1.15E-05	DIV I APRM FAILS TO GENERATE TRIP SIGNAL
C71-ACT-FC-D2APRM	1.15E-05	DIV II APRM FAILS TO GENERATE TRIP SIGNAL
C71-ACT-FC-D3APRM	1.15E-05	DIV III APRM FAILS TO GENERATE TRIP SIGNAL
C71-ACT-FC-D4APRM	1.15E-05	DIV IV APRM FAILS TO GENERATE TRIP SIGNAL
C71-BYP-TM-D1APRM	3.00E-03	BYPASS UNIT - UNAVAILABILITY OF APRM SIGNAL FOR TESTING
C71-BYP-TM-D2APRM	3.00E-03	BYPASS UNIT - UNAVAILABILITY OF APRM SIGNAL FOR TESTING

**Table 4.5-7c**  
**I&C System – Basic Events (C71)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C71 FAULT TREE:

Basic Event	Prob	Description
C71-BYP-TM-D3APRM	3.00E-03	BYPASS UNIT - UNAVAILABILITY OF APRM SIGNAL FOR TESTING
C71-BYP-TM-D4APRM	3.00E-03	BYPASS UNIT - UNAVAILABILITY OF APRM SIGNAL FOR TESTING
C71-CCFSOFTWARE	1.00E-04	RPS COMMON CAUSE SOFTWARE FAILURE
C71-DTM-FC-RPSDIV1	6.00E-04	DIGITAL TRIP MODULE FAILS TO FUNCTION
C71-DTM-FC-RPSDIV2	6.00E-04	DIGITAL TRIP MODULE FAILS TO FUNCTION
C71-DTM-FC-RPSDIV3	6.00E-04	DIGITAL TRIP MODULE FAILS TO FUNCTION
C71-DTM-FC-RPSDIV4	6.00E-04	DIGITAL TRIP MODULE FAILS TO FUNCTION
C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
C71-LDD-FC-G1FLDA	1.09E-03	GROUP 1 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G1FLDB	1.09E-03	GROUP 1 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G1FLDC	1.09E-03	GROUP 1 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G1FLDD	1.09E-03	GROUP 1 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G1SLDA	1.09E-03	GROUP 1 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G1SLDB	1.09E-03	GROUP 1 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G1SLDC	1.09E-03	GROUP 1 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G1SLDD	1.09E-03	GROUP 1 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G2FLDA	1.09E-03	GROUP 2 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G2FLDB	1.09E-03	GROUP 2 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G2FLDC	1.09E-03	GROUP 2 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G2FLDD	1.09E-03	GROUP 2 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G2SLDA	1.09E-03	GROUP 2 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G2SLDB	1.09E-03	GROUP 2 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G2SLDC	1.09E-03	GROUP 2 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G2SLDD	1.09E-03	GROUP 2 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G3FLDA	1.09E-03	GROUP 3 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G3FLDB	1.09E-03	GROUP 3 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G3FLDC	1.09E-03	GROUP 3 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G3FLDD	1.09E-03	GROUP 3 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G3SLDA	1.09E-03	GROUP 3 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G3SLDB	1.09E-03	GROUP 3 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G3SLDC	1.09E-03	GROUP 4 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G3SLDD	1.09E-03	GROUP 4 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G4FLDA	1.09E-03	GROUP 4 LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G4FLDB	1.09E-03	GROUP 4 LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G4FLDC	1.09E-03	GROUP 4 LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G4FLDD	1.09E-03	GROUP 4 LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-G4SLDA	1.09E-03	GROUP 4 DIV I LOAD DRIVER A FAILS TO DE-ENERGIZE
C71-LDD-FC-G4SLDB	1.09E-03	GROUP 4 DIV II LOAD DRIVER B FAILS TO DE-ENERGIZE
C71-LDD-FC-G4SLDC	1.09E-03	GROUP 4 DIV III LOAD DRIVER C FAILS TO DE-ENERGIZE
C71-LDD-FC-G4SLDD	1.09E-03	GROUP 4 DIV IV LOAD DRIVER D FAILS TO DE-ENERGIZE
C71-LDD-FC-L1INFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND

**Table 4.5-7c**  
**I&C System – Basic Events (C71)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C71 FAULT TREE:

Basic Event	Prob	Description
C71-LDD-FC-L1INFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1INFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1INFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1INSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1INSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1INSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1INSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L1OBSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2INSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND

**Table 4.5-7c**  
**I&C System – Basic Events (C71)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C71 FAULT TREE:

Basic Event	Prob	Description
C71-LDD-FC-L2OBSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L2OBSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3INSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L3OBSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4INSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBFLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBFLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBFLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBFLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND

**Table 4.5-7c**  
**I&C System – Basic Events (C71)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C71 FAULT TREE:

Basic Event	Prob	Description
C71-LDD-FC-L4OBSLDA	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBSLDB	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBSLDC	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-LDD-FC-L4OBSLDD	1.09E-03	LOAD DRIVER FAILS TO INTERRUPT CURRENT ON DEMAND
C71-OLU-FC-MSIVDIV1	3.60E-04	OUTPUT LOGIC COMPONENT FAILS TO FUNCTION
C71-OLU-FC-MSIVDIV2	3.60E-04	OUTPUT LOGIC COMPONENT FAILS TO FUNCTION
C71-OLU-FC-MSIVDIV3	3.60E-04	OUTPUT LOGIC COMPONENT FAILS TO FUNCTION
C71-OLU-FC-MSIVDIV4	3.60E-04	OUTPUT LOGIC COMPONENT FAILS TO FUNCTION
C71-OLU-FC-RPSDIV1	3.60E-04	RPS DIV I OUPUT LOGIC UNIT FAILS TO GENERATE TRIP SIGNAL
C71-OLU-FC-RPSDIV2	3.60E-04	RPS DIV II OUPUT LOGIC UNIT FAILS TO GENERATE TRIP SIGNAL
C71-OLU-FC-RPSDIV3	3.60E-04	RPS DIV III OUPUT LOGIC UNIT FAILS TO GENERATE TRIP SIGNAL
C71-OLU-FC-RPSDIV4	3.60E-04	RPS DIV IV OUPUT LOGIC UNIT FAILS TO GENERATE TRIP SIGNAL
C71-SLU-FC-NMSDIV1	9.00E-04	NMS DIV 1 TRIP LOGIC UNIT FAILS TO PASS STATUS OF APRMS TO TLU 1
C71-SLU-FC-NMSDIV2	9.00E-04	NMS DIV 2 TRIP LOGIC UNIT FAILS TO PASS STATUS OF APRMS TO TLU 2
C71-SLU-FC-NMSDIV3	9.00E-04	NMS DIV 3 TRIP LOGIC UNIT UNIT FAILS TO PASS STATUS OF APRMS TO TLU 3
C71-SLU-FC-NMSDIV4	9.00E-04	NMS DIV 4 TRIP LOGIC UNIT FAILS TO PASS STATURS OF APRMS TO TLU 4
C71-SLU-FC-RPSDIV1	9.00E-04	RPS DIV I TLU FAILS
C71-SLU-FC-RPSDIV2	9.00E-04	RPS DIV II TLU FAILS
C71-SLU-FC-RPSDIV3	9.00E-04	RPS DIV III TLU FAILS
C71-SLU-FC-RPSDIV4	9.00E-04	RPS DIV IV TLU FAILS
C71-XHE-FO-SCRAM	1.00E-01	OPERATOR FAILS TO PERFORM MANUAL SCRAM

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
%BOC-FDWA	1.70E-03	FEEDWATER LINE A BREAK OUTSIDE CONTAINMENT
%BOC-FDWB	1.70E-03	FEEDWATER LINE B BREAK OUTSIDE CONTAINMENT
%BOC-IC	1.53E-06	IC LINE BREAK OUTSIDE CONTAINMENT
%BOC-MS	6.20E-03	MAIN STEAM LINE BREAK OUTSIDE CONTAINMENT
%BOC-RWCU	3.40E-03	RWCU LINE BREAK OUTSIDE CONTAINMENT
%ISLOCA	6.42E-08	ISLOCA
%LL-S	3.39E-04	LARGE STEAM LOCA (NO FW LINE BREAK)
%LL-S-FDWA	5.55E-06	LARGE STEAM LOCA IN FW LINE A
%LL-S-FDWB	5.55E-06	LARGE STEAM LOCA IN FW LINE B
%ML-L	3.22E-05	MEDIUM LIQUID LOCA (NO RWCU BREAK)
%RVR	1.00E-10	REACTOR VESSEL RUPTURE
%SL-L	3.65E-04	SMALL LIQUID LOCA (NO RWCU BREAK)
%SL-S	7.62E-04	SMALL STEAM LOCA (NO RWCU BREAK)
%T-FDW	1.17E-01	LOSS OF FEEDWATER
%T-GEN	1.18E+00	GENERAL TRANSIENT
%T-IA	1.02E-02	COMPLETE LOSS OF AIR SYSTEMS
%T-IORV	2.83E-02	IORV
%T-LOPP-GR	1.86E-02	GRID RELATED LOSS OF PREFERRED POWER
%T-LOPP-PC	2.07E-03	PLANT CENTERED LOSS OF PREFERRED POWER
%T-LOPP-SC	1.04E-02	SWITCHYARD CENTERED LOSS OF PREFERRED POWER
%T-LOPP-WR	4.83E-03	WEATHER RELATED LOSS OF PREFERRED POWER
%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
%T-SW	9.70E-04	COMPLETE LOSS OF PSWS
C11-LOG-FC-CHNLA	3.60E-04	LOGIC UNIT FAILS TO FUNCTION
C11-LOG-FC-CHNLB	3.60E-04	LOGIC UNIT FAILS TO FUNCTION
C12-ACV-CC-SCRV126	6.90E-09	CCF TO OPEN OF AIR OPERATED SCRAM VALVE AOV-126
C12-INV-FC-G1X205	1.44E-03	FMCRD ELECTRICAL GROUP 1 X205 INVERTER FAILS DURING OPERATION
C12-INV-FC-G2X205	1.44E-03	FMCRD ELECTRICAL GROUP 2 X205 INVERTER FAILS DURING OPERATION
C12-INV-FC-G3X205	1.44E-03	FMCRD ELECTRICAL GROUP 3 X205 INVERTER FAILS DURING OPERATION
C12-MOT-FR-CFFMCRD	1.00E-06	COMMON CAUSE FAILURE OF FMCRD MOTORS TO RUN
C12-MOT-FS-CFFMCRD	1.50E-06	COMMON CAUSE FAILURE OF FMCRD MOTORS TO START
C12-ROD-CF-SCRAM	2.50E-07	CCF OF CONTROL RODS TO INSERT
C12-SOV-FD-SCRV139	1.70E-06	CCF TO OPEN (VENT) OF SCRAM PILOT SOLENOID VALVES SOV-139
C12-SOV-FE-F038	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
C12-SOV-FE-F039	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
C12-SOV-FE-F042	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
C12-SOV-FE-F043A	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C12-SOV-FE-F043B	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
C12-SOV-FE-F044A	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
C12-SOV-FE-F044B	1.00E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
C51-CCFSOFTWARE	1.00E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
C62-CCFSOFTWARE	1.00E-04	N-DCIS COMMON CAUSE SOFTWARE FAILURE
C62-CCFSOFTWARE_S	1.00E-04	N-DCIS SPURIOUS COMMON CAUSE SOFTWARE FAILURE
C71-ACT-FC-D1SRNM	1.15E-05	DIV I SRNM FAILS TO GENERATE TRIP SIGNAL
C71-ACT-FC-D2SRNM	1.15E-05	DIV II SRNM FAILS TO GENERATE TRIP SIGNAL
C71-ACT-FC-D3SRNM	1.15E-05	DIV III SRNM FAILS TO GENERATE TRIP SIGNAL
C71-ACT-FC-D4SRNM	1.15E-05	DIV IV SRNM FAILS TO GENERATE TRIP SIGNAL
C71-BYP-TM-D1SRNM	3.00E-03	UNAVAILABLE FOR TEST/MAINTENANCE
C71-BYP-TM-D2SRNM	3.00E-03	UNAVAILABLE FOR TEST/MAINTENANCE
C71-BYP-TM-D3SRNM	3.00E-03	UNAVAILABLE FOR TEST/MAINTENANCE
C71-BYP-TM-D4SRNM	3.00E-03	UNAVAILABLE FOR TEST/MAINTENANCE
C71-SLU-FC-NMSDIV1	9.00E-04	NMS DIV 1 TRIP LOGIC UNIT FAILS TO PASS STATUS OF APRMS TO TLU 1
C71-SLU-FC-NMSDIV2	9.00E-04	NMS DIV 2 TRIP LOGIC UNIT FAILS TO PASS STATUS OF APRMS TO TLU 2
C71-SLU-FC-NMSDIV3	9.00E-04	NMS DIV 3 TRIP LOGIC UNIT UNIT FAILS TO PASS STATUS OF APRMS TO TLU 3
C71-SLU-FC-NMSDIV4	9.00E-04	NMS DIV 4 TRIP LOGIC UNIT FAILS TO PASS STATURS OF APRMS TO TLU 4
C71-SLU-FC-SRNDIV1	9.00E-04	NMS DIV 1 TRIP LOGIC UNIT FAILS TO PASS STATUS OF SRNMS TO TLU 1
C71-SLU-FC-SRNDIV2	9.00E-04	NMS DIV 2 TRIP LOGIC UNIT FAILS TO PASS STATUS OF SRNMS TO TLU 2
C71-SLU-FC-SRNDIV3	9.00E-04	NMS DIV 3 TRIP LOGIC UNIT FAILS TO PASS STATUS OF SRNMS TO TLU 3
C71-SLU-FC-SRNDIV4	9.00E-04	NMS DIV 4 TRIP LOGIC UNIT FAILS TO PASS STATUS OF SRNMS TO TLU 4
C72-CCFSOFTWARE	1.00E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
C72-LDD-FC-FWRB1X	1.09E-03	DPS OUTPUT SWITCH 1 TO FWC FAILS
C72-LDD-FC-FWRB1Y	1.09E-03	FEEDWATER RUNBACK INPUT SWITCH 1 FAILS
C72-LDD-FC-FWRB2X	1.09E-03	DPS OUTPUT SWITCH 2 TO FWC FAILS
C72-LDD-FC-FWRB2Y	1.09E-03	FEEDWATER RUNBACK INPUT SWITCH 2 FAILS
C72-LDD-FC-FWRB3X	1.09E-03	DPS OUTPUT SWITCH 3 TO FWC FAILS
C72-LDD-FC-FWRB3Y	1.09E-03	FEEDWATER RUNBACK INPUT SWITCH 3 FAILS
C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
C72-LDD-FC-S1AB32P1	1.09E-03	VALVE F104A FIRST LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1B21F006A	1.09E-03	SRV F006A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006B	1.09E-03	SRV F006B FIRST SERIES LOAD DRIVER FAILS ACTUATE

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C72-LDD-FC-S1B21F006C	1.09E-03	SRV F006C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006D	1.09E-03	SRV F006D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006E	1.09E-03	SRV F006E FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006F	1.09E-03	SRV F006F FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006G	1.09E-03	SRV F006G FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006H	1.09E-03	SRV F006H FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006J	1.09E-03	SRV F006J FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F006K	1.09E-03	SRV F006K FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1B21F100A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1B21F100B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1B21F101A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1B21F101B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1BB32P2	1.09E-03	VALVE F104B FIRST LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1DPSRPS	1.09E-03	RPS FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1E50F006A	1.09E-03	GDSCS F006A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1E50F006B	1.09E-03	GDSCS F006B FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1E50F006C	1.09E-03	GDSCS F006C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1E50F006D	1.09E-03	GDSCS F006D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002A	1.09E-03	F002A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002B	1.09E-03	F002B FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002C	1.09E-03	F002C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002D	1.09E-03	F002D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002E	1.09E-03	F002E FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002F	1.09E-03	F002F FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002G	1.09E-03	F002G FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F002H	1.09E-03	F002H FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F003A	1.09E-03	F003A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F003B	1.09E-03	F003B FIRST SERIES LOAD DRIVER FAILS ACTUATE



**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C72-LDD-FC-S1F003C	1.09E-03	F003C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F003D	1.09E-03	F003D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004A	1.09E-03	F004A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004B	1.09E-03	F004B FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004C	1.09E-03	F004C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004D	1.09E-03	F004D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004E	1.09E-03	F004E FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004F	1.09E-03	F004F FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004G	1.09E-03	F004G FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F004H	1.09E-03	F004H FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F006A	1.09E-03	F006A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F006B	1.09E-03	F006B FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F006C	1.09E-03	F006C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F006D	1.09E-03	F006D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1F010A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1F010B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1F010C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1F010D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S1G31F3A	1.09E-03	RWCU/SDC F003A FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1G31F3B	1.09E-03	RWCU/SDC F003B FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1G31F8A	1.09E-03	RWCU/SDC F008A FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1G31F8B	1.09E-03	RWCU/SDC F008B FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1MF001A	1.09E-03	B21-F001A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF001B	1.09E-03	B21-F001B FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF001C	1.09E-03	B21-F001C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF001D	1.09E-03	B21-F001D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF002A	1.09E-03	B21-F002A FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF002B	1.09E-03	B21-F002B FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF002C	1.09E-03	B21-F002C FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1MF002D	1.09E-03	B21-F002D FIRST SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S1XB32P1	1.09E-03	VALVE F105A FIRST LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S1YB32P2	1.09E-03	VALVE F105B FIRST LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2AB32P1	1.09E-03	VALVE F104A SECOND LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2B21F006A	1.09E-03	SRV F006A SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006B	1.09E-03	SRV F006B SECOND SERIES LOAD DRIVER FAILS ACTUATE

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C72-LDD-FC-S2B21F006C	1.09E-03	SRV F006C SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006D	1.09E-03	SRV F006D SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006E	1.09E-03	SRV F006E SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006F	1.09E-03	SRV F006F SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006G	1.09E-03	SRV F006G SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006H	1.09E-03	SRV F006H SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006J	1.09E-03	SRV F006J SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F006K	1.09E-03	SRV F006K SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2B21F100A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2B21F100B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2B21F101A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2B21F101B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2BB32P2	1.09E-03	VALVE F104B SECOND LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2DPSRPS	1.09E-03	RPS SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2E50F006A	1.09E-03	GDSCS F002A SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2E50F006B	1.09E-03	GDSCS F006B SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2E50F006C	1.09E-03	GDSCS F006C SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2E50F006D	1.09E-03	GDSCS F006D SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2F002A	1.09E-03	F002A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002B	1.09E-03	F002B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002C	1.09E-03	F002C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002D	1.09E-03	F002D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002E	1.09E-03	F002E SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002F	1.09E-03	F002F SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002G	1.09E-03	F002G SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F002H	1.09E-03	F002H SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F003A	1.09E-03	F003A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F003B	1.09E-03	F003B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C72-LDD-FC-S2F003C	1.09E-03	F003C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F003D	1.09E-03	F003D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004A	1.09E-03	F004A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004B	1.09E-03	F004B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004C	1.09E-03	F004C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004D	1.09E-03	F004D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004E	1.09E-03	F004E SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004F	1.09E-03	F004F SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004G	1.09E-03	F004G SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F004H	1.09E-03	F004H SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F006A	1.09E-03	F006A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F006B	1.09E-03	F006B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F006C	1.09E-03	F006C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F006D	1.09E-03	F006D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2F010A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2F010B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2F010C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2F010D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S2G31F3A	1.09E-03	RWCU/SDC F003A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2G31F3B	1.09E-03	RWCU/SDC F003B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2G31F8A	1.09E-03	RWCU/SDC F008A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2G31F8B	1.09E-03	RWCU/SDC F008B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2MF001A	1.09E-03	B21-F001A SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF001B	1.09E-03	B21-F001B SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF001C	1.09E-03	B21-F001C SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF001D	1.09E-03	B21-F001D SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF002A	1.09E-03	B21-F002A SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF002B	1.09E-03	B21-F002B SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF002C	1.09E-03	B21-F002C SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2MF002D	1.09E-03	B21-F002D SECOND SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S2XB32P1	1.09E-03	VALVE F105A SECOND LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S2YB32P2	1.09E-03	VALVE F105B SECOND LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3AB32P1	1.09E-03	VALVE F104A SECOND LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3BB32P2	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C72-LDD-FC-S3DPSRPS	1.09E-03	RPS THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3E50F006A	1.09E-03	GDACS F002A THIRD SERIES LOAD DRIVER FAILS ACTUATE

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C72-LDD-FC-S3E50F006B	1.09E-03	GDCS F006B THIRD SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S3E50F006C	1.09E-03	GDCS F006C THIRD SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S3E50F006D	1.09E-03	GDCS F006D THIRD SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S3F002A	1.09E-03	F002A THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002B	1.09E-03	F002B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002C	1.09E-03	F002C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002D	1.09E-03	F002D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002E	1.09E-03	F002E THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002F	1.09E-03	F002F THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002G	1.09E-03	F002G THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F002H	1.09E-03	F002H THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F003A	1.09E-03	F003A THIRD SERIES LOAD DRIVER FAILS ACTUATE
C72-LDD-FC-S3F003B	1.09E-03	F003B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F003C	1.09E-03	F003C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F003D	1.09E-03	F003D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004A	1.09E-03	F004A THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004B	1.09E-03	F004B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004C	1.09E-03	F004C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004D	1.09E-03	F004D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004E	1.09E-03	F004E THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004F	1.09E-03	F004F THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004G	1.09E-03	F004G THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LDD-FC-S3F004H	1.09E-03	F004H THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
C72-LOG-FC-D1DPS	3.60E-04	LOGIC UNIT FAILS TO FUNCTION
C72-LOG-FC-D2DPS	3.60E-04	LOGIC UNIT FAILS TO FUNCTION
C72-LOG-FC-D3DPS	3.60E-04	LOGIC UNIT FAILS TO FUNCTION
C72-MOD-FD-ASD1A	1.00E-06	SIGNAL TO ASD 1 FAILS
C72-MOD-FD-ASD1B	1.00E-06	SIGNAL TO ASD 1 FAILS
C72-MOD-FD-ASD2A	1.00E-06	SIGNAL TO ASD 2 FAILS
C72-MOD-FD-ASD2B	1.00E-06	SIGNAL TO ASD 2 FAILS
C72-MOD-FD-ASD3A	1.00E-06	SIGNAL TO ASD 3 FAILS
C72-MOD-FD-ASD3B	1.00E-06	SIGNAL TO ASD 3 FAILS
C72-MOD-FD-ASD4A	1.00E-06	SIGNAL TO ASD 4 FAILS
C72-MOD-FD-ASD4B	1.00E-06	SIGNAL TO ASD 4 FAILS
C74-ATM-FC-LDIV1	1.00E-04	DIV I LOW RPV LEVEL ANALOG TRIP MODULE
C74-ATM-FC-LDIV2	1.00E-04	DIV II LOW RPV LEVEL ANALOG TRIP MODULE
C74-ATM-FC-LDIV3	1.00E-04	DIV III LOW RPV LEVEL ANALOG TRIP MODULE
C74-ATM-FC-LDIV4	1.00E-04	DIV IV LOW RPV LEVEL ANALOG TRIP MODULE
C74-ATM-FC-PDIV1	1.00E-04	DIV I HIGH RPV PRESSURE ANALOG TRIP MODULE

**Table 4.5-7d**  
**I&C System – Basic Events (C72)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE C72 FAULT TREE:

Basic Event	Prob	Description
C74-ATM-FC-PDIV2	1.00E-04	DIV II HIGH RPV PRESSURE ANALOG TRIP MODULE
C74-ATM-FC-PDIV3	1.00E-04	DIV III HIGH RPV PRESSURE ANALOG TRIP MODULE
C74-ATM-FC-PDIV4	1.00E-04	DIV IV HIGH RPV PRESSURE ANALOG TRIP MODULE
C74-LOG-FC-ATWSD1	3.60E-04	DIV I ATWS LOGIC PROCESSOR UNIT FAILS TO FUNCTION
C74-LOG-FC-ATWSD2	3.60E-04	DIV II ATWS LOGIC PROCESSOR UNIT FAILS TO FUNCTION
C74-LOG-FC-ATWSD3	3.60E-04	DIV III ATWS LOGIC PROCESSOR UNIT FAILS TO FUNCTION
C74-LOG-FC-ATWSD4	3.60E-04	DIV IV ATWS LOGIC PROCESSOR UNIT FAILS TO FUNCTION

**Table 4.5-7e**

**I&C System – Basic Events (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV ISOLATION)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE FAULT TREE:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
B21-ZS_-FC-ICCFALL	9.00E-06	Common Cause Failure of All ICP DPV Limit Switches
B21-ZS_-FC-IF004A-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004A-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004A-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004A-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004B-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004B-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004B-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004B-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004C-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004C-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004C-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004C-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004D-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004D-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004D-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004D-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004E-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004E-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004E-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004E-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004F-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004F-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004F-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004F-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004G-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004G-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004G-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004G-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004H-A	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004H-B	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004H-C	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
B21-ZS_-FC-IF004H-D	5.41E-03	VALVE LIMIT SWITCH FAILS TO OPERATE
C63-ATM-FC-IPRD1	1.00E-04	ANALOG TRIP MODULE FAILS TO OPERATE
C63-ATM-FC-IPRD2	1.00E-04	ANALOG TRIP MODULE FAILS TO OPERATE
C63-ATM-FC-IPRD3	1.00E-04	ANALOG TRIP MODULE FAILS TO OPERATE
C63-ATM-FC-IPRD4	1.00E-04	ANALOG TRIP MODULE FAILS TO OPERATE
C63-LOG-FC-IPRD1C1	3.60E-04	ICP DIV 1 MAIN PROCESSOR #1 FAILS

**Table 4.5-7e**

**I&C System – Basic Events (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV ISOLATION)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE FAULT TREE:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C63-LOG-FC-IPRD1C2	3.60E-04	ICP DIV 1 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-IPRD1C3	3.60E-04	ICP DIV 1 MAIN PROCESSOR #3 FAILS
C63-LOG-FC-IPRD2C1	3.60E-04	ICP DIV 2 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-IPRD2C2	3.60E-04	ICP DIV 2 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-IPRD2C3	3.60E-04	ICP DIV 2 MAIN PROCESSOR #3 FAILS
C63-LOG-FC-IPRD3C1	3.60E-04	ICP DIV 3 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-IPRD3C2	3.60E-04	ICP DIV 3 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-IPRD3C3	3.60E-04	ICP DIV 3 MAIN PROCESSOR #3 FAILS
C63-LOG-FC-IPRD4C1	3.60E-04	ICP DIV 4 MAIN PROCESSOR #1 FAILS
C63-LOG-FC-IPRD4C2	3.60E-04	ICP DIV 4 MAIN PROCESSOR #2 FAILS
C63-LOG-FC-IPRD4C3	3.60E-04	ICP DIV 4 MAIN PROCESSOR #3 FAILS
C63-LT_-NO-IPRRXLVLA	7.20E-05	RX LEVEL A SENSOR TRANSMITTER FAILS
C63-LT_-NO-IPRRXLVLB	7.20E-05	RX LEVEL B SENSOR TRANSMITTER FAILS
C63-LT_-NO-IPRRXLVLC	7.20E-05	RX LEVEL C SENSOR TRANSMITTER FAILS
C63-LT_-NO-IPRRXLVLD	7.20E-05	RX LEVEL D SENSOR TRANSMITTER FAILS
C63-MOD-FO-IPRCTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRRXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-MOD-FO-IPRRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
C63-PSP-FO-IPRD1PSA	7.20E-06	DIV 1 POWER SUPPLY A FAILS
C63-PSP-FO-IPRD1PSB	7.20E-06	DIV 1 POWER SUPPLY B FAILS
C63-PSP-FO-IPRD2PSA	7.20E-06	DIV 2 POWER SUPPLY A FAILS
C63-PSP-FO-IPRD2PSB	7.20E-06	DIV 2 POWER SUPPLY B FAILS
C63-PSP-FO-IPRD3PSA	7.20E-06	DIV 3 POWER SUPPLY A FAILS
C63-PSP-FO-IPRD3PSB	7.20E-06	DIV 3 POWER SUPPLY B FAILS
C63-PSP-FO-IPRD4PSA	7.20E-06	DIV 4 POWER SUPPLY A FAILS
C63-PSP-FO-IPRD4PSB	7.20E-06	DIV 4 POWER SUPPLY B FAILS
C63-PSP-FO-IPRZ1PSA	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ1PSB	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ2PSA	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ2PSB	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ3PSA	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ3PSB	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ4PSA	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-PSP-FO-IPRZ4PSB	7.20E-06	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE
C63-TT_-NO-IPRTEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN

**Table 4.5-7e**

**I&C System – Basic Events (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV ISOLATION)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE FAULT TREE:

Basic Event	Prob	Description
		TEMPERATURE
C63-TT_-NO-IPRTEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C63-TT_-NO-IPRTEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C63-TT_-NO-IPRTEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
C99-LDD-FC-B32F002A1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002A1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002A2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002A2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002B1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002B1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002B2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002B2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002C1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002C1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002C2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002C2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002D1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002D1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002D2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F002D2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003A1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003A1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003A2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003A2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003B1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003B1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003B2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003B2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003C1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003C1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003C2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003C2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003D1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003D1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003D2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32F003D2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation



**Table 4.5-7e**

**I&C System – Basic Events (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV  
ISOLATION)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE FAULT TREE:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-LOG-FC-B32ISOLALL	6.00E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002A-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002A-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002A-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002A-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002B-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002B-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002B-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002B-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002C-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002C-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002C-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002C-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002D-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002D-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002D-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F002D-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003A-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003A-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003A-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003A-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003B-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003B-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003B-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003B-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003C-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003C-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003C-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003C-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003D-A	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003D-B	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003D-C	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-LOG-FC-F003D-D	1.20E-04	LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002A-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002A-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002B-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002B-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002C-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002C-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F002D-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION

**Table 4.5-7e**

**I&C System – Basic Events (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV  
ISOLATION)**

THE FOLLOWING BASIC EVENTS ARE USED IN THE FAULT TREE:

<b>Basic Event</b>	<b>Prob</b>	<b>Description</b>
C99-VLU-FC-B32F002D-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003A-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003A-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003B-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003B-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003C-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003C-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003D-B	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
C99-VLU-FC-B32F003D-D	7.80E-05	VOTER LOGIC UNIT FAILS TO FUNCTION

**Table 4.5-8a**  
**I&C System – Cutsets (C62)**

For each C62 system top event, the dominant cutsets are shown below.

C62-C12-C001A Failure to provide start signal to pump CRD Pump A

Probability	% of Top	Event	Probability	Description
1.E-04	33.2	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.2	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.1	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
3.6E-06	1.2	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2

C62-C12-C001A-MAN MANUAL FAILURE TO PROVIDE START SIGNAL TO PUMP A

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'

Probability	% of Top	Event	Probability	Description
1.3E-07	0.1	C62-LOG-FC-PIPA1	3.6E-04	PIP A1 PROCESSOR FAILS
		C62-LOG-FC-PIPA2	3.6E-04	PIP A2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB

## C62-C12-C001A-SPUR SPURIOUS TRIP SIGNAL TO CRD PUMP A

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-C12-C001B FAILURE TO PROVIDE START SIGNAL TO CRD PUMP B

Probability	% of Top	Event	Probability	Description
1.E-04	33.2	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.2	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.1	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-06	1.2	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2

## C62-C12-C001B-MAN MANUAL FAILURE TO PROVIDE START SIGNAL TO CRD PUMP B

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2

Probability	% of Top	Event	Probability	Description
6.67E-07	0.3	C62-LOG-FC-PIPM2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPB1	3.6E-04	PIP B1 PROCESSOR FAILS
		C62-LOG-FC-PIPB2	3.6E-04	PIP B2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPSB

## C62-C12-C001B-SPUR SPURIOUS TRIP SIGNAL TO CRD PUMP B

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-C12-CCFSOFTWARE\_S SPURIOUS COMMON CAUSE SOFTWARE EVENT

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-C12-F020A-SPUR SPURIOUS CLOSURE SIGNAL FOR VALVE C12-F020A

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-C12-F020B-SPUR SPURIOUS CLOSURE SIGNAL FOR VALVE C12-F020B

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-C72-ARIDPSD1LLA FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV I (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD1LLB FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV I (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD1LLC FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV I (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD1LLD FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV I (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD1PRA FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD1PRB FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD1PRC FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR



## C62-C72-ARIDPSD1PRD FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD2LLA FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD2LLB FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD2LLC FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD2LLD FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD2PRA FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD2PRB FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD2PRC FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD2PRD FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD3LLA FAILURE OF RPV LOW LEVEL CHANNEL A SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD3LLB FAILURE OF RPV LOW LEVEL CHANNEL B SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD3LLC FAILURE OF RPV LOW LEVEL CHANNEL C SIGNAL TO DPS DIV III

PROBABILITY	% OF TOP	EVENT	PROBABILITY	DESCRIPTION
1.09E-04	33.4	C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF OF ALL COMPONENTS IN GROUP 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF OF ALL COMPONENTS IN GROUP 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF OF TWO COMPONENTS: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF OF TWO COMPONENTS: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF OF TWO COMPONENTS: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD

PROBABILITY	% OF TOP	EVENT	PROBABILITY	DESCRIPTION
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF OF TWO COMPONENTS: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD3LLD FAILURE OF RPV LOW LEVEL CHANNEL D SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

## C62-C72-ARIDPSD3PRA FAILURE OF RPV HIGH PRESSURE CHANNEL A SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD3PRB FAILURE OF RPV HIGH PRESSURE CHANNEL B SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD3PRC FAILURE OF RPV HIGH PRESSURE CHANNEL C SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR



Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-ARIDPSD3PRD FAILURE OF RPV HIGH PRESSURE CHANNEL D SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-DPSCNTLPSA-FIX DPS CONTROLLER POWER SUPPLY A FAILS

Probability	% of Top	Event	Probability	Description
7.2E-06	90.0	C72-PSP-FO-DPSCNTPSA	7.2E-06	DPS CONTROLLER POWER SUPPLY A FAILS
3.6E-07	4.5	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	1.0	C62-PSP-FO-DPSEP_1_5	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C72-PSP-FO-DPSCNTPSA
8.E-08	1.0	C62-PSP-FO-DPSEP_2_5	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSB & C72-PSP-FO-DPSCNTPSA
8.E-08	1.0	C62-PSP-FO-DPSEP_3_5	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C72-PSP-FO-DPSCNTPSA
8.E-08	1.0	C62-PSP-FO-DPSEP_4_5	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSB & C72-PSP-FO-DPSCNTPSA
8.E-08	1.0	C62-PSP-FO-DPSEP_5_6	8.E-08	CCF of two components: C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-DPSCNTPSB
4.E-09	0.1	C62-PSP-FO-DPSEP_1_2_5	4.E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB & C72-PSP-FO-DP

Probability	% of Top	Event	Probability	Description
4.E-09	0.1	C62-PSP-FO-DPSEP_1_3_5	4.E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSBPSA & C72-PSP-FO-DP
4.E-09	0.1	C62-PSP-FO-DPSEP_1_4_5	4.E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSBPSB & C72-PSP-FO-DP

## C62-C72-DPSCNTLPSB-FIX DPS CONTROLLER POWER SUPPLY B FAILS

Probability	% of Top	Event	Probability	Description
7.2E-06	90.0	C72-PSP-FO-DPSCNTPSB	7.2E-06	DPS CONTROLLER POWER SUPPLY B FAILS
3.6E-07	4.5	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	1.0	C62-PSP-FO-DPSEP_1_6	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C72-PSP-FO-DPSCNTPSB
8.E-08	1.0	C62-PSP-FO-DPSEP_2_6	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSB & C72-PSP-FO-DPSCNTPSB
8.E-08	1.0	C62-PSP-FO-DPSEP_3_6	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C72-PSP-FO-DPSCNTPSB
8.E-08	1.0	C62-PSP-FO-DPSEP_4_6	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSB & C72-PSP-FO-DPSCNTPSB
8.E-08	1.0	C62-PSP-FO-DPSEP_5_6	8.E-08	CCF of two components: C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-DPSCNTPSB
4.E-09	0.1	C62-PSP-FO-DPSEP_1_2_6	4.E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB & C72-PSP-FO-DP
4.E-09	0.1	C62-PSP-FO-DPSEP_1_3_6	4.E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSBPSA & C72-PSP-FO-DP
4.E-09	0.1	C62-PSP-FO-DPSEP_1_4_6	4.E-09	CCF of three components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSBPSB & C72-PSP-FO-DP

## C62-C72-ICSPPOOL1 FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 1

Probability	% of Top	Event	Probability	Description
3.6E-06	64.4	C62-LT_-NO-DPSPX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-DPSPX'
1.33E-06	23.8	C62-LT_-NO-DPSPX_1_4	1.33E-06	CCF of two components: C62-LT_-NO-PLLVA & C62-LT_-NO-PLLVLD
3.6E-07	6.4	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
1.33E-07	2.4	C62-LT_-NO-DPSPX_1_2_4	1.33E-07	CCF of three components: C62-LT_-NO-PLLVA & C62-LT_-NO-PLLVLB & C62-LT_-NO-PLLV
1.33E-07	2.4	C62-LT_-NO-DPSPX_1_3_4	1.33E-07	CCF of three components: C62-LT_-NO-PLLVA & C62-LT_-NO-PLLVLC & C62-LT_-NO-PLLV
1.19E-08	0.2	C62-MOD-FO-PLLVA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS

Probability	% of Top	Event	Probability	Description
		C62-MOD-FO-PLLVL D	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
7.86E-09	0.1	C62-LT_-NO-PLL VLA	7.2E-05	ICS/PCCS POOL LEVEL A SENSOR TRANSMITTER FAILS
		C62-MOD-FO-PLLVL D	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
7.86E-09	0.1	C62-LT_-NO-PLLVL D	7.2E-05	ICS/PCCS POOL LEVEL D SENSOR TRANSMITTER FAILS
		C62-MOD-FO-PLL VLA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
5.18E-09	0.1	C62-LT_-NO-PLL VLA	7.2E-05	ICS/PCCS POOL LEVEL A SENSOR TRANSMITTER FAILS
		C62-LT_-NO-PLLVL D	7.2E-05	ICS/PCCS POOL LEVEL D SENSOR TRANSMITTER FAILS
1.E-09	0.0	R13-NSR-RBA	1.E-03	Loss of Power from R13-NSR-RBA
		R13-NSR-RBB	1.E-03	Loss of Power from R13-NSR-RBB
		R13-NSR-RBC	1.E-03	Loss of Power from R13-NSR-RBC

## C62-C72-ICSPPOOL2 FAILURE OF LOW LEVEL SIGNAL FOR ICSPPOOL 2

Probability	% of Top	Event	Probability	Description
3.6E-06	64.4	C62-LT_-NO-DPSPX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-DPSPX'
1.33E-06	23.8	C62-LT_-NO-DPSPX_2_3	1.33E-06	CCF of two components: C62-LT_-NO-PLLVL B & C62-LT_-NO-PLLVL C
3.6E-07	6.4	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
1.33E-07	2.4	C62-LT_-NO-DPSPX_1_2_3	1.33E-07	CCF of three components: C62-LT_-NO-PLL VLA & C62-LT_-NO-PLLVL B & C62-LT_-NO-PLL V
1.33E-07	2.4	C62-LT_-NO-DPSPX_2_3_4	1.33E-07	CCF of three components: C62-LT_-NO-PLLVL B & C62-LT_-NO-PLLVL C & C62-LT_-NO-PLL V
1.19E-08	0.2	C62-MOD-FO-PLLVL B	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
		C62-MOD-FO-PLLVL C	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
7.86E-09	0.1	C62-LT_-NO-PLLVL B	7.2E-05	ICS/PCCS POOL LEVEL B SENSOR TRANSMITTER FAILS
		C62-MOD-FO-PLLVL C	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
7.86E-09	0.1	C62-LT_-NO-PLLVL C	7.2E-05	ICS/PCCS POOL LEVEL C SENSOR TRANSMITTER FAILS
		C62-MOD-FO-PLLVL B	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
5.18E-09	0.1	C62-LT_-NO-PLLVL B	7.2E-05	ICS/PCCS POOL LEVEL B SENSOR TRANSMITTER FAILS
		C62-LT_-NO-PLLVL C	7.2E-05	ICS/PCCS POOL LEVEL C SENSOR TRANSMITTER FAILS

Probability	% of Top	Event	Probability	Description
1.E-09	0.0	R13-NSR-RBA	1.E-03	Loss of Power from R13-NSR-RBA
		R13-NSR-RBB	1.E-03	Loss of Power from R13-NSR-RBB
		R13-NSR-RBC	1.E-03	Loss of Power from R13-NSR-RBC

## C62-C72-ISO-DPRA FEEDWATER DIFFERENTIAL PRESSURE ISOLATION SIGNAL A TO DPS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-FDWH1PRSA	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
3.46E-05	23.3	C62-PT_-NO-FDWH1PRSA	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
1.73E-06	1.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
1.75E-07	0.1	C62-PT_-NO-CFSXX_1_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSA
1.75E-07	0.1	C62-PT_-NO-CFSXX_2_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSA
1.75E-07	0.1	C62-PT_-NO-CFSXX_3_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSA
1.75E-07	0.1	C62-PT_-NO-CFSXX_4_5	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSA
1.75E-07	0.1	C62-PT_-NO-CFSXX_5_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSB
1.75E-07	0.1	C62-PT_-NO-CFSXX_5_11	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWPPRSC

## C62-C72-ISO-DPRB FEEDWATER DIFFERENTIAL PRESSURE ISOLATION SIGNAL B TO DPS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-FDWH1PRSB	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
3.46E-05	23.3	C62-PT_-NO-FDWH1PRSB	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
1.73E-06	1.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
1.75E-07	0.1	C62-PT_-NO-CFSXX_1_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSB
1.75E-07	0.1	C62-PT_-NO-CFSXX_2_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSB
1.75E-07	0.1	C62-PT_-NO-CFSXX_3_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSB

Probability	% of Top	Event	Probability	Description
1.75E-07	0.1	C62-PT_-NO-CFSXX_4_6	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSB
1.75E-07	0.1	C62-PT_-NO-CFSXX_5_6	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSB
1.75E-07	0.1	C62-PT_-NO-CFSXX_6_10	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWPPRSB

## C62-C72-ISO-DPRC FEEDWATER DIFFERENTIAL PRESSURE ISOLATION SIGNAL C TO DPS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-FDWH1PRSC	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
3.46E-05	23.3	C62-PT_-NO-FDWH1PRSC	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
1.73E-06	1.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
1.75E-07	0.1	C62-PT_-NO-CFSXX_1_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSC
1.75E-07	0.1	C62-PT_-NO-CFSXX_2_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSC
1.75E-07	0.1	C62-PT_-NO-CFSXX_3_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSC
1.75E-07	0.1	C62-PT_-NO-CFSXX_4_7	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSC
1.75E-07	0.1	C62-PT_-NO-CFSXX_5_7	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSC
1.75E-07	0.1	C62-PT_-NO-CFSXX_6_7	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSC

## C62-C72-ISO-DPRD FEEDWATER DIFFERENTIAL PRESSURE ISOLATION SIGNAL D TO DPS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-FDWH1PRSD	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILS
3.46E-05	23.3	C62-PT_-NO-FDWH1PRSD	3.46E-05	PRESSURE TRANSMITTER FAILS TO RESPOND TO CHANGE IN PRESSURE
1.73E-06	1.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
1.75E-07	0.1	C62-PT_-NO-CFSXX_1_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSA & C62-PT_-NO-FDWH1PRSD
1.75E-07	0.1	C62-PT_-NO-CFSXX_2_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSB & C62-PT_-NO-FDWH1PRSD

Probability	% of Top	Event	Probability	Description
1.75E-07	0.1	C62-PT_-NO-CFSXX_3_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSC & C62-PT_-NO-FDWH1PRSD
1.75E-07	0.1	C62-PT_-NO-CFSXX_4_8	1.75E-07	CCF of two components: C62-PT_-NO-CNDPPRSD & C62-PT_-NO-FDWH1PRSD
1.75E-07	0.1	C62-PT_-NO-CFSXX_5_8	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSA & C62-PT_-NO-FDWH1PRSD
1.75E-07	0.1	C62-PT_-NO-CFSXX_6_8	1.75E-07	CCF of two components: C62-PT_-NO-FDWH1PRSB & C62-PT_-NO-FDWH1PRSD

## C62-C72-L1D1LLA FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-L1D1LLB FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'

Probability	% of Top	Event	Probability	Description
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-L1D1LLC FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-L1D1LLD FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

## C62-C72-L1D2LLA FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-L1D2LLB FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB



Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-L1D2LLC FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-L1D2LLD FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

## C62-C72-L1D3LLA FAILURE OF RPV LOW LEVEL L1 CHANNEL A SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-L1D3LLB FAILURE OF RPV LOW LEVEL L1 CHANNEL B SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-L1D3LLC FAILURE OF RPV LOW LEVEL L1 CHANNEL C SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMP	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMP	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-L1D3LLD FAILURE OF RPV LOW LEVEL L1 CHANNEL D SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD1LLA FAILURE OF RPV LOW LEVEL CHANNEL A SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD1LLB FAILURE OF RPV LOW LEVEL CHANNEL B SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD1LLC FAILURE OF RPV LOW LEVEL CHANNEL C SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD1LLD FAILURE OF RPV LOW LEVEL CHANNEL D SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

C62-C72-RPSDPSD1PRA FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS  
DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

C62-C72-RPSDPSD1PRB FAILURE OF RPV HIGH PRESSURE CHANNEL B SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPASA & C62-PSP-FO-DPSBPASB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

## C62-C72-RPSDPSD1PRC FAILURE OF RPV HIGH PRESSURE CHANNEL C SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-RPSDPSD1PRD FAILURE OF RPV HIGH PRESSURE CHANNEL D SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPISA & C62-PSP-FO-DPSBPISB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-RPSDPSD2LLA FAILURE OF RPV LOW LEVEL CHANNEL A SCRAM SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD2LLB FAILURE OF RPV LOW LEVEL CHANNEL B SCRAM SIGNAL TO DPS DIV I

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE



## C62-C72-RPSDPSD2LLC FAILURE OF RPV LOW LEVEL CHANNEL C SCRAM SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD2LLD FAILURE OF RPV LOW LEVEL CHANNEL D SCRAM SIGNAL TO DPS DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

C62-C72-RPSDPSD2PRA FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS  
DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

C62-C72-RPSDPSD2PRB FAILURE OF RPV HIGH PRESSURE CHANNEL B SCRAM SIGNAL TO DPS  
DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPISA & C62-PSP-FO-DPSBPISB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

C62-C72-RPSDPSD2PRC FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS  
DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

C62-C72-RPSDPSD2PRD FAILURE OF RPV HIGH PRESSURE CHANNEL D SCRAM SIGNAL TO DPS  
DIV II

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-C72-RPSDPSD3LLA FAILURE OF RPV LOW LEVEL CHANNEL A SCRAM SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.4	C62-MOD-FO-RXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLA	7.2E-05	NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD3LLB FAILURE OF RPV LOW LEVEL CHANNEL B SCRAM SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLB	7.2E-05	NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_2	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD3LLC FAILURE OF RPV LOW LEVEL CHANNEL C SCRAM SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMP	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLC	7.2E-05	NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMP	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_3	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE

## C62-C72-RPSDPSD3LLD FAILURE OF RPV LOW LEVEL CHANNEL D SCRAM SIGNAL TO DPS DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.0	C62-LT_-NO-RXLVLD	7.2E-05	NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_4	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_5	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE

C62-C72-RPSDPSD3PRA FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS  
DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSA	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

C62-C72-RPSDPSD3PRB FAILURE OF RPV HIGH PRESSURE CHANNEL B SCRAM SIGNAL TO DPS  
DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSB	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_2	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR

C62-C72-RPSDPSD3PRC FAILURE OF RPV HIGH PRESSURE CHANNEL A SCRAM SIGNAL TO DPS  
DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSC	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_3	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSC
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

C62-C72-RPSDPSD3PRD FAILURE OF RPV HIGH PRESSURE CHANNEL D SCRAM SIGNAL TO DPS  
DIV III

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-RXPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-RXPRSD	3.46E-05	NDCIS RX PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-DPSRX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-DPSRX'
6.4E-07	0.4	C62-PT_-NO-DPSRX_1_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_2_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPRSD
6.4E-07	0.4	C62-PT_-NO-DPSRX_3_4	6.4E-07	CCF of two components: C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'

Probability	% of Top	Event	Probability	Description
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSB & C62-PT_-NO-RXPR
6.4E-08	0.0	C62-PT_-NO-DPSRX_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-RXPRSA & C62-PT_-NO-RXPRSC & C62-PT_-NO-RXPR

## C62-DPSRMUADWPRSGA DW PRESSURE RMU LOGIC FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-DWPRSA	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-DWPRSA	3.46E-05	NDCIS DRYWELL PRESSURE SENSOR TRANSMITTER A FAILS
1.73E-06	1.2	C62-PT_-NO-NDCDW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-NDCDW'
6.4E-07	0.4	C62-PT_-NO-NDCDW_1_2	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB
6.4E-07	0.4	C62-PT_-NO-NDCDW_1_3	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSC
6.4E-07	0.4	C62-PT_-NO-NDCDW_1_4	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR

## C62-DPSRMUADWPRSGC DW PRESSURE RMU LOGIC FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-DWPRSC	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-DWPRSC	3.46E-05	NDCIS DRYWELL PRESSURE SENSOR TRANSMITTER C FAILS
1.73E-06	1.2	C62-PT_-NO-NDCDW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-NDCDW'
6.4E-07	0.4	C62-PT_-NO-NDCDW_1_3	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSC
6.4E-07	0.4	C62-PT_-NO-NDCDW_2_3	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSC
6.4E-07	0.4	C62-PT_-NO-NDCDW_3_4	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'



8.E-08	0.1	C62-PSP-FO-DPSEP_1_2	8.E-08	CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPR

## C62-DPSRMUBDWPRSGB DW PRESSURE RMU LOGIC FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-DWPRSB	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-DWPRSB	3.46E-05	DRYWELL PRESSURE SENSOR TRANSMITTER B FAILS
1.73E-06	1.2	C62-PT_-NO-NDCDW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-NDCDW'
6.4E-07	0.4	C62-PT_-NO-NDCDW_1_2	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB
6.4E-07	0.4	C62-PT_-NO-NDCDW_2_3	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSC
6.4E-07	0.4	C62-PT_-NO-NDCDW_2_4	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_2_3	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR

## C62-DPSRMUBDWPRSGD DW PRESSURE RMU LOGIC FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	73.8	C62-MOD-FO-DWPRSD	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
3.46E-05	23.3	C62-PT_-NO-DWPRSD	3.46E-05	DRYWELL PRESSURE SENSOR TRANSMITTER D FAILS
1.73E-06	1.2	C62-PT_-NO-NDCDW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-NDCDW'
6.4E-07	0.4	C62-PT_-NO-NDCDW_1_4	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSD
6.4E-07	0.4	C62-PT_-NO-NDCDW_2_4	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPRSD
6.4E-07	0.4	C62-PT_-NO-NDCDW_3_4	6.4E-07	CCF of two components: C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPRSD
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'

Probability	% of Top	Event	Probability	Description
8.E-08	0.1	C62-PSP-FO-DPSEP_3_4	8.E-08	CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_2_4	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSB & C62-PT_-NO-DWPR
6.4E-08	0.0	C62-PT_-NO-NDCDW_1_3_4	6.4E-08	CCF of three components: C62-PT_-NO-DWPRSA & C62-PT_-NO-DWPRSC & C62-PT_-NO-DWPR

## C62-DPSRMUBRXLVLGF RX FZ LVLF RMU LOGIC FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLF	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLF	7.2E-05	RX FZ LEVEL TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLF
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLF
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLF
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_6	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLF

## C62-DPSRMUBRXLVLGH RX FZ LVLH RMU LOGIC FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	33.4	C62-MOD-FO-CTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.4	C62-MOD-FO-RXLVLH	1.09E-04	TRANSDUCER SIGNAL PROCESSOR FAILS
7.2E-05	22.0	C62-LT_-NO-RXLVLH	7.2E-05	RX FZ LEVEL TRANSMITTER FAILS
2.52E-05	7.7	C62-TT_-NO-TEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C62-LT_-NO-NDCRX_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-NDCRX'
1.26E-06	0.4	C62-TT_-NO-NDCRX_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-NDCRX'
5.71E-07	0.2	C62-LT_-NO-NDCRX_1_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLH
5.71E-07	0.2	C62-LT_-NO-NDCRX_2_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLH

Probability	% of Top	Event	Probability	Description
5.71E-07	0.2	C62-LT_-NO-NDCRX_3_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLH
5.71E-07	0.2	C62-LT_-NO-NDCRX_4_8	5.71E-07	CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLH

## C62-G21-C001A-A FAILURE OF THE START SIGNAL TO FAPCS A

Probability	% of Top	Event	Probability	Description
1.E-04	33.7	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.7	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPM_P_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.1	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIMP'
6.67E-06	2.2	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.26E-06	0.4	C62-TT_-NO-PIPSP_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-PIPSP'
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-G21-C001A-A-MAN MANUAL FAILURE OF THE START SIGNAL TO FAPCS A

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIMP'
6.67E-06	2.9	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPA1	3.6E-04	PIP A1 PROCESSOR FAILS
		C62-LOG-FC-PIPA2	3.6E-04	PIP A2 PROCESSOR FAILS

Probability	% of Top	Event	Probability	Description
2.67E-08	0.0	C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB

## C62-G21-C001B-B FAILURE OF THE START SIGNAL TO FAPCS B

Probability	% of Top	Event	Probability	Description
1.E-04	33.7	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.7	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPM_P_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.1	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.2	C62-LOG-FC-PIPM_P_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.26E-06	0.4	C62-TT_-NO-PIPSP_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-PIPSP'
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-G21-C001B-B-MAN MANUAL FAILURE OF THE START SIGNAL TO FAPCS B

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.9	C62-LOG-FC-PIPM_P_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.3	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPB1	3.6E-04	PIP B1 PROCESSOR FAILS
		C62-LOG-FC-PIPB2	3.6E-04	PIP B2 PROCESSOR FAILS

Probability	% of Top	Event	Probability	Description
2.67E-08	0.0	C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPSB

## C62-G31-F004A-TRAIN-A FAILURE TO GENERATE ISOLATION SIGNAL FOR VALVE G31-F004A

Probability	% of Top	Event	Probability	Description
1.E-04	43.4	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.4	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.8	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.66E-06	0.7	C62-FT_-NO-PIPSD_ALL	1.66E-06	CCF of all components in group 'C62-FT_-NO-PIPSD'
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'

## C62-G31-F004B-TRAIN-B FAILURE TO GENERATE ISOLATION SIGNAL FOR VALVE G31-F004B

Probability	% of Top	Event	Probability	Description
1.E-04	43.4	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.4	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.8	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.66E-06	0.7	C62-FT_-NO-PIPSD_ALL	1.66E-06	CCF of all components in group 'C62-FT_-NO-PIPSD'
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.3	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'

Probability	% of Top	Event	Probability	Description
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'

## C62-G31-F044A-TRAIN-A FAILURE TO GENERATE ISOLATION SIGNAL FOR VALVE G31-F044A

Probability	% of Top	Event	Probability	Description
1.E-04	43.4	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.4	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.8	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.66E-06	0.7	C62-FT_-NO-PIPSD_ALL	1.66E-06	CCF of all components in group 'C62-FT_-NO-PIPSD'
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'

## C62-G31-F044B-TRAIN-B FAILURE TO GENERATE ISOLATION SIGNAL FOR VALVE G31-F044B

Probability	% of Top	Event	Probability	Description
1.E-04	43.4	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.4	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.8	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.66E-06	0.7	C62-FT_-NO-PIPSD_ALL	1.66E-06	CCF of all components in group 'C62-FT_-NO-PIPSD'
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.3	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-DPSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-DPSEP'
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'

## C62-N21-C001A NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP A.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-C001A-MAN MANUAL NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP A.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-C001B NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP B.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-C001B-MAN MANUAL NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP B.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS



## C62-N21-C001C NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP C.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-C001C-MAN MANUAL NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP C.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-C001D NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP D.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-C001D-MAN MANUAL NO AUTO START SIGNAL TO FEEDWATER PUMP/ FEEDWATER BOOSTER PUMP D.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-CONDA NO AUTO START SIGNAL TO CONDENSATE PUMP A

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-CONDAHUA NO AUTO START SIGNAL TO AIR HANDLING UNIT COND PUMP ROOM TRAIN A

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

C62-N21-CONDAHUB NO AUTO START SIGNAL TO AIR HANDLING UNIT COND PUMP ROOM  
TRAIN B

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

C62-N21-CONDA-MAN MANUAL NO AUTO START SIGNAL TO CONDENSATE PUMP A

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-CONDB NO AUTO START SIGNAL TO CONDENSATE PUMP B.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-CONDB-MAN MANUAL NO AUTO START SIGNAL TO CONDENSATE PUMP B.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-CONDC NO AUTO START SIGNAL TO CONDENSATE PUMP C

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-CONDC-MAN MANUAL NO AUTO START SIGNAL TO CONDENSATE PUMP C

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-CONDD NO AUTO START SIGNAL TO CONDENSATE PUMP D

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-CONDD-MAN MANUAL NO AUTO START SIGNAL TO CONDENSATE PUMP D

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F0033 NO AUTO OPEN SIGNAL TO FW PUMP A MOV ISOLATION VALVE.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F0033-MAN Manual NO AUTO OPEN SIGNAL TO FW PUMP A MOV ISOLATION VALVE.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS



## C62-N21-F0034 NO AUTO OPEN SIGNAL TO FW PUMP B MOV ISOLATION VALVE F0034.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F0034-MAN Manual NO AUTO OPEN SIGNAL TO FW PUMP B MOV ISOLATION VALVE F0034.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F0035 NO AUTO OPEN SIGNAL TO FW PUMP C MOV ISOLATION VALVE F0035.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F0035-MAN Manual NO AUTO OPEN SIGNAL TO FW PUMP C MOV ISOLATION VALVE F0035.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F0036 NO AUTO OPEN SIGNAL TO FW PUMP D MOV ISOLATION VALVE.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F0036-MAN Manual NO AUTO OPEN SIGNAL TO FW PUMP D MOV ISOLATION VALVE.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F005 NO AUTO OPEN SIGNAL TO COND PUMP A MOV ISOLATION VALVE F005.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F005-MAN Manual NO AUTO OPEN SIGNAL TO COND PUMP A MOV ISOLATION VALVE F005.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F006 NO AUTO OPEN SIGNAL TO COND PUMP B MOV ISOLATION VALVE F006.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F006-MAN Manual NO AUTO OPEN SIGNAL TO COND PUMP B MOV ISOLATION VALVE F006.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F007 NO AUTO OPEN SIGNAL TO COND PUMP C MOV ISOLATION VALVE F007.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F007-MAN Manual NO AUTO OPEN SIGNAL TO COND PUMP C MOV ISOLATION VALVE F007.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-F008 NO AUTO OPEN SIGNAL TO COND PUMP D MOV ISOLATION VALVE F008.

Probability	% of Top	Event	Probability	Description
6.E-04	71.7	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	12.0	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	12.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-CFSXX_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-CFSXX'
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-N21-F008-MAN Manual NO AUTO OPEN SIGNAL TO COND PUMP D MOV ISOLATION VALVE F008.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-FWAHUA NO AUTO START SIGNAL TO AIR HANDLING UNIT FW PUMP ROOM TRAIN A

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-N21-FWAHUB NO AUTO START SIGNAL TO AIR HANDLING UNIT FW PUMP ROOM TRAIN B

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS



## C62-P21-C001A NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C001A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-C001A-MAN MANUAL NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C001A.

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPA1	3.6E-04	PIP A1 PROCESSOR FAILS
		C62-LOG-FC-PIPA2	3.6E-04	PIP A2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPA1 & C62-PSP-FO-PIPA2

## C62-P21-C001A-SPUR SPURIOUS TRIP SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-P21-C001B NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C001B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPM_P_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.2	C62-LOG-FC-PIPM_P_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-C001B-MAN MANUAL NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C001B.

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.9	C62-LOG-FC-PIPM_P_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.3	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPB1	3.6E-04	PIP B1 PROCESSOR FAILS
		C62-LOG-FC-PIPB2	3.6E-04	PIP B2 PROCESSOR FAILS

Probability	% of Top	Event	Probability	Description
2.67E-08	0.0	C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPSB

## C62-P21-C001B-SPUR SPURIOUS TRIP SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-P21-C002A NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C002A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-C002A-MAN MANUAL NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C002A.

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2

Probability	% of Top	Event	Probability	Description
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPA1	3.6E-04	PIP A1 PROCESSOR FAILS
		C62-LOG-FC-PIPA2	3.6E-04	PIP A2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPACNTPSA & C62-PSP-FO-PIPACNTPSB

## C62-P21-C002A-SPUR SPURIOUS TRIP SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-P21-C002B NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C002B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-C002B-MAN MANUAL NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C002B.

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.9	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2

Probability	% of Top	Event	Probability	Description
6.67E-07	0.3	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPB1	3.6E-04	PIP B1 PROCESSOR FAILS
		C62-LOG-FC-PIPB2	3.6E-04	PIP B2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIBCNTPSA & C62-PSP-FO-PIBCNTPSB

## C62-P21-C002B-SPUR SPURIOUS TRIP SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-P21-C003A NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C003A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPM_P_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.2	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-C003A-MAN MANUAL NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C003A.

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.9	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPA1	3.6E-04	PIP A1 PROCESSOR FAILS
		C62-LOG-FC-PIPA2	3.6E-04	PIP A2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPA1 & C62-PSP-FO-PIPB1

## C62-P21-C003A-SPUR SPURIOUS TRIP SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-P21-C003B NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C003B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-C003B-MAN MANUAL NO AUTO START ACTUATION SIGNAL TO RCCW PUMP C003B.

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'

Probability	% of Top	Event	Probability	Description
6.67E-06	2.9	C62-LOG-FC-PIPM_P_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.3	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPB1	3.6E-04	PIP B1 PROCESSOR FAILS
		C62-LOG-FC-PIPB2	3.6E-04	PIP B2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIPB1 & C62-PSP-FO-PIPB2

## C62-P21-C003B-SPUR SPURIOUS TRIP SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

## C62-P21-F0004 FAILURE TO CLOSE F004

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPM_P_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.2	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0010A1 NO AUTO ACTUATION SIGNAL TO OPEN RCCW VALVE F0010A1.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0010A2 NO AUTO ACTUATION SIGNAL TO OPEN RCCW VALVE F0010A2.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0010A3 NO AUTO ACTUATION SIGNAL TO OPEN RCCW VALVE F0010A3.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious



Probability	% of Top	Event	Probability	Description
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0010B1 NO AUTO ACTUATION SIGNAL TO OPEN RCCW VALVE F0010B1.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0010B2 NO AUTO ACTUATION SIGNAL TO OPEN RCCW VALVE F0010B2.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB

Probability	% of Top	Event	Probability	Description
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0010B3 NO AUTO ACTUATION SIGNAL TO OPEN RCCW VALVE F0010B3.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0023A FAILURE OF CONTROL SIGNAL TO VALVE F0023A

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'

Probability	% of Top	Event	Probability	Description
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0023B FAILURE OF CONTROL SIGNAL TO VALVE F0023B

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0027 FAILURE TO CLOSE F0027

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2

Probability	% of Top	Event	Probability	Description
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-F0061 NO CONTROL SIGNAL TO CLOSE RCCW VALVE F0061

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-RCCWAHUA NO AUTO START SIGNAL TO AIR HANDLING UNIT RCCW ROOM A

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-RCCWAHUB NO AUTO START SIGNAL TO AIR HANDLING UNIT RCCW ROOM B

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-RCCWPA PRESSURE CONTROL FAILURES RCCW HX TRAIN A

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'

Probability	% of Top	Event	Probability	Description
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-RCCWPB PRESSURE CONTROL FAILURES RCCW HX TRAIN B

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-RCCWTA TEMPERATURE CONTROL FAILURES RCCW HX TRAIN A

Probability	% of Top	Event	Probability	Description
1.E-04	33.7	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.7	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.1	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.26E-06	0.4	C62-TT_-NO-PIPRC_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-PIPRC'

Probability	% of Top	Event	Probability	Description
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P21-RCCWTB TEMPERATURE CONTROL FAILURES RCCW HX TRAIN B

Probability	% of Top	Event	Probability	Description
1.E-04	33.7	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.7	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.1	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.26E-06	0.4	C62-TT_-NO-PIPRC_ALL	1.26E-06	CCF of all components in group 'C62-TT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P22-C001A NO AUTO START SIGNAL TO TCCW PUMP 1A ON LOPP.

Probability	% of Top	Event	Probability	Description
6.E-04	71.6	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	11.9	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.9	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
3.84E-06	0.5	C62-PT_-NO-CFSTC_1_2	3.84E-06	CCF of two components: C62-PT_-NO-TCCPPRSA & C62-PT_-NO-TCCPPRSB
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3

Probability	% of Top	Event	Probability	Description
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

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Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

C62-P22-C001B NO AUTO START SIGNAL TO TCCW PUMP 1B ON LOPP.

Probability	% of Top	Event	Probability	Description
6.E-04	71.6	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	11.9	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.9	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
3.84E-06	0.5	C62-PT_-NO-CFSTC_1_2	3.84E-06	CCF of two components: C62-PT_-NO-TCCPPRSA & C62-PT_-NO-TCCPPRSB
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'



## C62-P22-C001B-MAN MANUAL NO AUTO START SIGNAL TO TCCW PUMP 1B ON LOPP.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P22-C001C NO AUTO START SIGNAL TO TCCW PUMP 1C ON LOPP.

Probability	% of Top	Event	Probability	Description
6.E-04	71.6	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	11.9	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.9	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
3.84E-06	0.5	C62-PT_-NO-CFSTC_1_2	3.84E-06	CCF of two components: C62-PT_-NO-TCCPPRSA & C62-PT_-NO-TCCPPRSB
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

## C62-P22-C001C-MAN MANUAL NO AUTO START SIGNAL TO TCCW PUMP 1C ON LOPP.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P22-F0005A-MAN MANUAL MANUAL ACTUATION SIGNAL FAILS TCCW F0005A.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P22-F0005B-MAN MANUAL MANUAL ACTUATION SIGNAL FAILS TCCW F0005B.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious

Probability	% of Top	Event	Probability	Description
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P22-F0005C-MAN MANUAL MANUAL ACTUATION SIGNAL FAILS TCCW F0005C.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P22-F0005D-MAN MANUAL MANUAL ACTUATION SIGNAL FAILS TCCW F0005D.

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2

Probability	% of Top	Event	Probability	Description
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

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Probability	% of Top	Event	Probability	Description
6.E-04	71.6	C62-DTM-FC-CFS	6.E-04	CFS MASTER DTM
1.E-04	11.9	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.9	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	1.2	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	1.2	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	1.2	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
3.84E-06	0.5	C62-PT_-NO-CFSTC_1_2	3.84E-06	CCF of two components: C62-PT_-NO-TCCPPRSA & C62-PT_-NO-TCCPPRSB
2.E-06	0.2	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.0	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'

C62-P30-F0023 CONDENSATE MAKEUP VALVE TRAIN A CONTROL FAILS

Probability	% of Top	Event	Probability	Description
6.E-04	70.9	C62-DTM-FC-BOP	6.E-04	BOP MASTER DTM FAILS
1.E-04	11.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
4.E-05	4.7	C62-LOG-FC-BOPMP_1_2	4.E-05	CCF of two components: C62-LOG-FC-BOP1 & C62-LOG-FC-BOP2
3.6E-06	0.4	C62-LT_-NO-BOPQQ_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-BOPQQ'

Probability	% of Top	Event	Probability	Description
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.0	C62-PSP-FO-BOPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-BOPEP'
1.33E-07	0.0	C62-LT_-NO-BOPQQ_1_2_3	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLC
1.33E-07	0.0	C62-LT_-NO-BOPQQ_1_2_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLD
1.33E-07	0.0	C62-LT_-NO-BOPQQ_1_3_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLC & C62-LT_-NO-QLVLD

## C62-P30-F0026 CONDENSATE MAKEUP VALVE TRAIN B CONTROL FAILS

Probability	% of Top	Event	Probability	Description
6.E-04	70.9	C62-DTM-FC-BOP	6.E-04	BOP MASTER DTM FAILS
1.E-04	11.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
4.E-05	4.7	C62-LOG-FC-BOPMP_1_2	4.E-05	CCF of two components: C62-LOG-FC-BOP1 & C62-LOG-FC-BOP2
3.6E-06	0.4	C62-LT_-NO-BOPQQ_ALL	3.6E-06	CCF of all components in group 'C62-LT_-NO-BOPQQ'
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.0	C62-PSP-FO-BOPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-BOPEP'
1.33E-07	0.0	C62-LT_-NO-BOPQQ_1_2_3	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLC
1.33E-07	0.0	C62-LT_-NO-BOPQQ_1_2_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLB & C62-LT_-NO-QLVLD
1.33E-07	0.0	C62-LT_-NO-BOPQQ_1_3_4	1.33E-07	CCF of three components: C62-LT_-NO-QLVLA & C62-LT_-NO-QLVLC & C62-LT_-NO-QLVLD

## C62-P41-C001A AUTO ACTUATION SIGNAL TO START PUMP C001A FAILS.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2

Probability	% of Top	Event	Probability	Description
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-C001B AUTO ACTUATION SIGNAL TO START PUMP C001B FAILS.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-C002A AUTO ACTUATION SIGNAL TO START PUMP C002A FAILS.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-C002B AUTO ACTUATION SIGNAL TO START PUMP C002B FAILS.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F001A-MAN Manual NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001A

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3

Probability	% of Top	Event	Probability	Description
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P41-F001B-MAN MANUAL NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001B

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P41-F001C-MAN MANUAL NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001C

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS



Probability	% of Top	Event	Probability	Description
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P41-F001D-MAN MANUAL NO AUTO OPEN SIGNAL TO AIR OPERATED VALVE P41-F001D

Probability	% of Top	Event	Probability	Description
1.E-04	42.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	42.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.E-05	4.3	C62-LOG-FC-CFSMP_1_2	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2
1.E-05	4.3	C62-LOG-FC-CFSMP_1_3	1.E-05	CCF of two components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS3
1.E-05	4.3	C62-LOG-FC-CFSMP_2_3	1.E-05	CCF of two components: C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
2.E-06	0.9	C62-LOG-FC-CFSMP_1_2_3	2.E-06	CCF of three components: C62-LOG-FC-CFS1 & C62-LOG-FC-CFS2 & C62-LOG-FC-CFS3
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
3.6E-07	0.2	C62-PSP-FO-CFSEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-CFSEP'
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS2	3.6E-04	CFS PROCESSOR #2 FAILS
1.3E-07	0.1	C62-LOG-FC-CFS1	3.6E-04	CFS PROCESSOR #1 FAILS
		C62-LOG-FC-CFS3	3.6E-04	CFS PROCESSOR #3 FAILS

## C62-P41-F002A NO AUTO ACTUATION SIGNAL TO OPEN VALVE F002A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPM_P_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIMP'
6.67E-06	2.2	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPM_P_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1

Probability	% of Top	Event	Probability	Description
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F002B NO AUTO ACTUATION SIGNAL TO OPEN VALVE F002B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F004A NO AUTO ACTUATION SIGNAL TO OPEN VALVE F004A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1

Probability	% of Top	Event	Probability	Description
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F004B NO AUTO ACTUATION SIGNAL TO OPEN VALVE F004B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPSW_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSW'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F006A NO AUTO ACTUATION SIGNAL TO OPEN VALVE F006A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1

Probability	% of Top	Event	Probability	Description
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F006B NO AUTO ACTUATION SIGNAL TO OPEN VALVE F006B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F009A NO AUTO ACTUATION SIGNAL TO OPEN VALVE F009A.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1

Probability	% of Top	Event	Probability	Description
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P41-F009B NO AUTO ACTUATION SIGNAL TO OPEN VALVE F009B.

Probability	% of Top	Event	Probability	Description
1.E-04	33.6	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	33.6	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	22.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	2.2	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIPRC_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPRC'
6.67E-07	0.2	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.2	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM

## C62-P51-CMP-C001A FAILURE OF CONTROL SIGNAL TO SERVICE AIR COMPRESSOR A

Probability	% of Top	Event	Probability	Description
6.E-04	66.9	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
1.E-04	11.1	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.1	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	7.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	2.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	0.7	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-PIPSA_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSA'
6.67E-07	0.1	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1

Probability	% of Top	Event	Probability	Description
6.67E-07	0.1	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2

## C62-P51-CMP-C001B FAILURE OF CONTROL SIGNAL TO SERVICE AIR COMPRESSOR B

Probability	% of Top	Event	Probability	Description
6.E-04	66.9	C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM
1.E-04	11.1	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.1	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	7.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	2.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	0.7	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-PIPSA_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPSA'
6.67E-07	0.1	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.1	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2

## C62-P52-ACV-ABV0002A FAILURE OF CONTROL SIGNAL TO AOV ABV0002A

Probability	% of Top	Event	Probability	Description
6.E-04	66.9	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
1.E-04	11.1	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.1	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	7.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	2.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	0.7	C62-LOG-FC-PIPMP_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-PIPIA_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPIA'
6.67E-07	0.1	C62-LOG-FC-PIPMP_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.1	C62-LOG-FC-PIPMP_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2

## C62-P52-ACV-ABV0002B FAILURE OF CONTROL SIGNAL TO AOV ABV0002B

Probability	% of Top	Event	Probability	Description
6.E-04	66.9	C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM
1.E-04	11.1	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	11.1	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	7.4	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	2.0	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
6.67E-06	0.7	C62-LOG-FC-PIPMP_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.2	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.2	C62-PT_-NO-PIPIA_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIPIA'
6.67E-07	0.1	C62-LOG-FC-PIPMP_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.1	C62-LOG-FC-PIPMP_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2

## C62-P54-F014 HPNS REG VALVE F014 CONTROL

Probability	% of Top	Event	Probability	Description
1.E-04	34.5	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	34.5	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
6.67E-05	23.0	C62-DTM-FC-PIPMP_1_2	6.67E-05	CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB
1.8E-05	6.2	C62-LOG-FC-PIPMP_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPMP'
1.86E-06	0.6	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
1.73E-06	0.6	C62-PT_-NO-PIP2_ALL	1.73E-06	CCF of all components in group 'C62-PT_-NO-PIP2'
3.6E-07	0.1	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-DTM-FC-PIPB	6.E-04	PIP B MASTER DTM
3.6E-07	0.1	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
6.55E-08	0.0	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-MOD-FO-HPNPRB1	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILURE
6.55E-08	0.0	C62-DTM-FC-PIPA	6.E-04	PIP A MASTER DTM
		C62-MOD-FO-HPNPRB2	1.09E-04	TRANSDUCER OR SIGNAL CONVERTER FAILURE

## C62-U43-P1B-B FAILURE OF THE MANUAL START SIGNAL TO FIRE PUMP 1

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.9	C62-LOG-FC-PIPM_P_1_2	6.67E-06	CCF of two components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_2_3	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_2_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPA1	3.6E-04	PIP A1 PROCESSOR FAILS
		C62-LOG-FC-PIPA2	3.6E-04	PIP A2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_1_2	2.67E-08	CCF of two components: C62-PSP-FO-PIPA1 & C62-PSP-FO-PIPB1

## C62-U43-P2B-B FAILURE OF THE MANUAL START SIGNAL TO FIRE PUMP 2

Probability	% of Top	Event	Probability	Description
1.E-04	43.8	C62-CCFSOFTWARE	1.E-04	Common cause failure of software
1.E-04	43.8	C62-CCFSOFTWARE_S	1.E-04	Common cause failure of software, for spurious
1.8E-05	7.9	C62-LOG-FC-PIPM_P_ALL	1.8E-05	CCF of all components in group 'C62-LOG-FC-PIPM_P'
6.67E-06	2.9	C62-LOG-FC-PIPM_P_3_4	6.67E-06	CCF of two components: C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
1.86E-06	0.8	C62-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS
6.67E-07	0.3	C62-LOG-FC-PIPM_P_1_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA1 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
6.67E-07	0.3	C62-LOG-FC-PIPM_P_2_3_4	6.67E-07	CCF of three components: C62-LOG-FC-PIPA2 & C62-LOG-FC-PIPB1 & C62-LOG-FC-PIPB2
3.6E-07	0.2	C62-PSP-FO-PIPEP_ALL	3.6E-07	CCF of all components in group 'C62-PSP-FO-PIPEP'
1.3E-07	0.1	C62-LOG-FC-PIPB1	3.6E-04	PIP B1 PROCESSOR FAILS
		C62-LOG-FC-PIPB2	3.6E-04	PIP B2 PROCESSOR FAILS
2.67E-08	0.0	C62-PSP-FO-PIPEP_3_4	2.67E-08	CCF of two components: C62-PSP-FO-PIPB1 & C62-PSP-FO-PIPB2



**Table 4.5-8b**  
**I&C System – Cutsets (C63)**

For each C63 system top event, the dominant cutsets are shown below.

**C63-B21-F004A-A FAILURE TO FIRE SQUIB A ON DPV A**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.09E-03	31.8	C63-LDD-FC-S1B21F004A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

**C63-B21-F004A-B FAILURE TO FIRE SQUIB B ON DPV A**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.09E-03	31.8	C63-LDD-FC-S1B21F004A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004A-C FAILURE TO FIRE SQUIB C ON DPV A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004B-A FAILURE TO FIRE SQUIB A ON DPV B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004B-B FAILURE TO FIRE SQUIB B ON DPV B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004B-C FAILURE TO FIRE SQUIB C ON DPV B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004C-A FAILURE TO FIRE SQUIB A ON DPV C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004C-B FAILURE TO FIRE SQUIB B ON DPV C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004C-C FAILURE TO FIRE SQUIB C ON DPV C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004D-A FAILURE TO FIRE SQUIB A ON DPV D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004D-B FAILURE TO FIRE SQUIB B ON DPV D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004D-C FAILURE TO FIRE SQUIB C ON DPV D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004E-A FAILURE TO FIRE SQUIB A ON DPV E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004E-B FAILURE TO FIRE SQUIB B ON DPV E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004E-C FAILURE TO FIRE SQUIB C ON DPV E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004F-A FAILURE TO FIRE SQUIB A ON DPV F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004F-B FAILURE TO FIRE SQUIB B ON DPV F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004F-C FAILURE TO FIRE SQUIB C ON DPV F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004G-A FAILURE TO FIRE SQUIB A ON DPV G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION



Probability	% of Top	Event	Probability	Description
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004G-B FAILURE TO FIRE SQUIB B ON DPV G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004G-C FAILURE TO FIRE SQUIB C ON DPV G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F004H-A FAILURE TO FIRE SQUIB A ON DPV H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-B21-F004H-B FAILURE TO FIRE SQUIB B ON DPV H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-B21-F004H-C FAILURE TO FIRE SQUIB C ON DPV H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B21F004H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B21F004H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B21F004H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B21-F006A-A FAILURE TO ENERGIZE SOLENOID A ON SRV A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006A-B FAILURE TO ENERGIZE SOLENOID B ON SRV A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006A-C FAILURE TO ENERGIZE SOLENOID C ON SRV A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006B-A FAILURE TO ENERGIZE SOLENOID A ON SRV B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006B-B FAILURE TO ENERGIZE SOLENOID B ON SRV B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006B-C FAILURE TO ENERGIZE SOLENOID C ON SRV B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006C-A FAILURE TO ENERGIZE SOLENOID A ON SRV C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006C-B FAILURE TO ENERGIZE SOLENOID B ON SRV C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006C-C FAILURE TO ENERGIZE SOLENOID C ON SRV C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006D-A FAILURE TO ENERGIZE SOLENOID A ON SRV D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006D-B FAILURE TO ENERGIZE SOLENOID B ON SRV D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006D-C FAILURE TO ENERGIZE SOLENOID C ON SRV D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006E-A FAILURE TO ENERGIZE SOLENOID A ON SRV E

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3



## C63-B21-F006E-B FAILURE TO ENERGIZE SOLENOID B ON SRV E

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006E-C FAILURE TO ENERGIZE SOLENOID C ON SRV E

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006F-A FAILURE TO ENERGIZE SOLENOID A ON SRV F

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006F-B FAILURE TO ENERGIZE SOLENOID B ON SRV F

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006F-C FAILURE TO ENERGIZE SOLENOID C ON SRV F

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006G-A FAILURE TO ENERGIZE SOLENOID A ON SRV G

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006G-B FAILURE TO ENERGIZE SOLENOID B ON SRV G

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006G-C FAILURE TO ENERGIZE SOLENOID C ON SRV G

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006H-A FAILURE TO ENERGIZE SOLENOID A ON SRV H

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006H-B FAILURE TO ENERGIZE SOLENOID B ON SRV H

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006H-C FAILURE TO ENERGIZE SOLENOID C ON SRV H

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006J-A FAILURE TO ENERGIZE SOLENOID A ON SRV J

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006J-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006J-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006J-B FAILURE TO ENERGIZE SOLENOID B ON SRV H

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006J-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006J-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006J-C FAILURE TO ENERGIZE SOLENOID C ON SRV H

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006J-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006J-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B21-F006K-A FAILURE TO ENERGIZE SOLENOID A ON SRV K

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006K-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006K-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-B21-F006K-B FAILURE TO ENERGIZE SOLENOID B ON SRV K

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006K-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006K-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B21-F006K-C FAILURE TO ENERGIZE SOLENOID C ON SRV K

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B21F006K-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B21F006K-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-B32-F001-SPUR-A SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F001-SPUR-B SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F001-SPUR-C SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F001-SPUR-D SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F002-SPUR-A SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F002-SPUR-B SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F002-SPUR-C SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE



## C63-B32-F002-SPUR-D SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F003-SPUR-A SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F003-SPUR-B SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F003-SPUR-C SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F003-SPUR-D SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F004-SPUR-A SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F004-SPUR-B SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F004-SPUR-C SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F004-SPUR-D SPURIOUS ACTUATION

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-B32-F005A-DIV2 FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F005A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005A-DIV4 FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F005A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005B-DIV1 FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F005B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005B-DIV3 FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F005B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005C-DIV2 FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F005C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005C-DIV4 FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F005C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005D-DIV1 FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F005D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F005D-DIV3 FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F005D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F005D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F005D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
		FL_ICS_O1	1.E+00	ICS CONTROL LOGIC WITH POWER DEPENDENCY

## C63-B32-F006A-DIV1 FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F006A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006A-DIV3 FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F006A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS



Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006B-DIV2 FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F006B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006B-DIV4 FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F006B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006B-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006B-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006C-DIV1 FAILURE TO GENERATE DIV 1 OPEN SIGNAL FOR B32-F006C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006C-DIV3 FAILURE TO GENERATE DIV 3 OPEN SIGNAL FOR B32-F006C

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006D-DIV2 FAILURE TO GENERATE DIV 2 OPEN SIGNAL FOR B32-F006D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F006D-DIV4 FAILURE TO GENERATE DIV 4 OPEN SIGNAL FOR B32-F006D

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F006D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F006D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
3.6E-06	0.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

C63-B32-F009A-DIV2(NP) No signal from Q-DCIS Div 2 for valve B32-F009A to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD2C1	3.6E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD2C2	3.6E-04	ESF DIV 2 MAIN PROCESSOR #2 FAILS
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD2C3	3.6E-04	ESF DIV 2 MAIN PROCESSOR #3 FAILS
		C63-LOG-FC-ESFD2C1	3.6E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS

C63-B32-F009A-DIV4(NP) No signal from Q-DCIS Div 4 for valve B32-F009A to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009A-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD4C1	3.6E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD4C2	3.6E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS

Probability	% of Top	Event	Probability	Description
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD4C3	3.6E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS
		C63-LOG-FC-ESFD4C1	3.6E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS

C63-B32-F009B-DIV1(NP) No signal from Q-DCIS Div 1 for valve B32-F009B to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD1C1	3.6E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD1C2	3.6E-04	ESF DIV 1 MAIN PROCESSOR #2 FAILS
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD1C3	3.6E-04	ESF DIV 1 MAIN PROCESSOR #3 FAILS
		C63-LOG-FC-ESFD1C1	3.6E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS

C63-B32-F009B-DIV3(NP) No signal from Q-DCIS Div 3 for valve B32-F009B to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD3C1	3.6E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD3C2	3.6E-04	ESF DIV 3 MAIN PROCESSOR #2 FAILS
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD3C3	3.6E-04	ESF DIV 3 MAIN PROCESSOR #3 FAILS
		C63-LOG-FC-ESFD3C1	3.6E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS

C63-B32-F009C-DIV2(NP) No signal from Q-DCIS Div 2 for valve B32-F009C to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2



Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD2C1	3.6E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD2C2	3.6E-04	ESF DIV 2 MAIN PROCESSOR #2 FAILS
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD2C3	3.6E-04	ESF DIV 2 MAIN PROCESSOR #3 FAILS
		C63-LOG-FC-ESFD2C1	3.6E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS

C63-B32-F009C-DIV4(NP) No signal from Q-DCIS Div 4 for valve B32-F009C to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD4C1	3.6E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD4C2	3.6E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS

Probability	% of Top	Event	Probability	Description
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD4C3	3.6E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS
		C63-LOG-FC-ESFD4C1	3.6E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS

C63-B32-F009D-DIV1(NP) No signal from Q-DCIS Div 1 for valve B32-F009D to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD1C1	3.6E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD1C2	3.6E-04	ESF DIV 1 MAIN PROCESSOR #2 FAILS
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD1C3	3.6E-04	ESF DIV 1 MAIN PROCESSOR #3 FAILS
		C63-LOG-FC-ESFD1C1	3.6E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS

C63-B32-F009D-DIV3(NP) No signal from Q-DCIS Div 3 for valve B32-F009D to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F009D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F009D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	4.3	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD3C1	3.6E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD3C2	3.6E-04	ESF DIV 3 MAIN PROCESSOR #2 FAILS
1.3E-07	0.0	FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
		C63-LOG-FC-ESFD3C3	3.6E-04	ESF DIV 3 MAIN PROCESSOR #3 FAILS
		C63-LOG-FC-ESFD3C1	3.6E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS

## C63-B32-F012A-DIV1-MAN FAILURE OF MANUAL DIV 1 OPEN SIGNAL FOR VENT VALVE B32-F012A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F012A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F012A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD1C1	3.6E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD1C2	3.6E-04	ESF DIV 1 MAIN PROCESSOR #2 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD1C1	3.6E-04	ESF DIV 1 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD1C3	3.6E-04	ESF DIV 1 MAIN PROCESSOR #3 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F012B-DIV2-MAN FAILURE OF MANUAL DIV 2 OPEN SIGNAL FOR VENT VALVE B32-F012B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F012B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F012B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

Probability	% of Top	Event	Probability	Description
1.3E-07	0.0	C63-LOG-FC-ESFD2C1	3.6E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD2C2	3.6E-04	ESF DIV 2 MAIN PROCESSOR #2 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD2C1	3.6E-04	ESF DIV 2 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD2C3	3.6E-04	ESF DIV 2 MAIN PROCESSOR #3 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F012C-DIV3-MAN FAILURE OF MANUAL DIV 3 OPEN SIGNAL FOR VENT VALVE B32-F012C

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F012C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F012C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD3C1	3.6E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD3C2	3.6E-04	ESF DIV 3 MAIN PROCESSOR #2 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD3C1	3.6E-04	ESF DIV 3 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD3C3	3.6E-04	ESF DIV 3 MAIN PROCESSOR #3 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

## C63-B32-F012D-DIV4-MAN FAILURE OF MANUAL DIV 4 OPEN SIGNAL FOR VENT VALVE B32-F012D

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F012D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S2B32F012D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD4C1	3.6E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD4C2	3.6E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY
1.3E-07	0.0	C63-LOG-FC-ESFD4C1	3.6E-04	ESF DIV 4 MAIN PROCESSOR #1 FAILS
		C63-LOG-FC-ESFD4C3	3.6E-04	ESF DIV 4 MAIN PROCESSOR #2 FAILS
		FL_ICS_O2	1.E+00	ESF ICS CONTROL LOGIC NO POWER DEPENDENCY

C63-B32-F104A-DIV1 FAILURE TO GENERATE A DIV 1 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

C63-B32-F104A-DIV1-MAN FAILURE OF MANUAL DIV I OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A

Probability	% of Top	Event	Probability	Description
1.09E-03	32.1	C63-LDD-FC-S1B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S2B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S3B32F104A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.E-06	0.0	R13-11-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR CONTROL BLDG
		R13-12-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR CONTROL BLDG

C63-B32-F104A-DIV3 FAILURE TO GENERATE A DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B32-F104A-DIV3-MAN FAILURE TO GENERATE A DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104A

Probability	% of Top	Event	Probability	Description
1.09E-03	32.1	C63-LDD-FC-S1B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S2B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S3B32F104A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.E-06	0.0	R13-31-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR CONTROL BLDG
		R13-32-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR CONTROL BLDG

## C63-B32-F104B-DIV1 FAILURE TO GENERATE A DIV 1 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3



## C63-B32-F104B-DIV1-MAN FAILURE OF MANUAL DIV 1 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B

Probability	% of Top	Event	Probability	Description
1.09E-03	32.1	C63-LDD-FC-S1B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S2B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S3B32F104B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.E-06	0.0	R13-11-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR CONTROL BLDG
		R13-12-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR CONTROL BLDG

## C63-B32-F104B-DIV3 FAILURE TO GENERATE A DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-B32-F104B-DIV3-MAN FAILURE OF MANUAL DIV 3 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F104B

Probability	% of Top	Event	Probability	Description
1.09E-03	32.1	C63-LDD-FC-S1B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S2B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	32.1	C63-LDD-FC-S3B32F104B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.E-06	0.0	R13-31-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR CONTROL BLDG
		R13-32-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR CONTROL BLDG

## C63-B32-F105A-DIV2 FAILURE TO GENERATE A DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F104C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F104C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B32-F105A-DIV2-MAN FAILURE OF MANUAL DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F104C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F104C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CONTROL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CONTROL BLDG
3.6E-07	0.0	C63-PSP-FO-ESFEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ESFEP'

## C63-B32-F105A-DIV4 FAILURE TO GENERATE A DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105A

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F104C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F104C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3

C63-B32-F105A-DIV4-MAN FAILURE OF MANUAL DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE  
B32-F105A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F104C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F104C-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CONTROL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CONTROL BLDG
3.6E-07	0.0	C63-PSP-FO-ESFEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ESFEP'

C63-B32-F105B-DIV2 FAILURE TO GENERATE A DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE  
B32-F105B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F104D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F104D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-B32-F105B-DIV2-MAN FAILURE OF MANUAL DIV 2 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F104D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F104D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CONTROL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CONTROL BLDG
3.6E-07	0.0	C63-PSP-FO-ESFEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ESFEP'

## C63-B32-F105B-DIV4 FAILURE TO GENERATE A DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B

Probability	% of Top	Event	Probability	Description
1.09E-03	46.5	C63-LDD-FC-S1B32F104D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	46.5	C63-LDD-FC-S2B32F104D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	1.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.2	C63-LT_-NO-ESFPX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFPX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3

C63-B32-F105B-DIV4-MAN FAILURE OF MANUAL DIV 4 OPEN SIGNAL FOR CROSS CONNECT VALVE B32-F105B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.3	C63-LDD-FC-S1B32F104D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.3	C63-LDD-FC-S2B32F104D-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
1.8E-05	0.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CONTROL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CONTROL BLDG
3.6E-07	0.0	C63-PSP-FO-ESFEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ESFEP'

C63-C12-CCFSOFTWARE\_S Spurious Trip Signal to CRD System due to Q-DCIS Software Failure

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

C63-C12-GDCS-LEVEL-SPUR Spurious GDCS Level Trip Signal to CRD System due to Q-DCIS Software Failure

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

C63-C12-HDWL-SPUR Spurious High Drywell Level Trip Signal to CRD System due to Q-DCIS Software Failure

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

C63-C12-HDWP-SPUR Spurious High Drywell Pressure Trip Signal to CRD System due to Q-DCIS Software Failure

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002A-A ACCUMULATOR 1A LEVEL SIGNAL A TO AOV F002A

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002A-B ACCUMULATOR 1A LEVEL SIGNAL B TO AOV F002A

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002B-A ACCUMULATOR 1B LEVEL SIGNAL A TO AOV F002B

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002B-B ACCUMULATOR 1B LEVEL SIGNAL B TO AOV F002B

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002C-A ACCUMULATOR 1A LEVEL SIGNAL A TO AOV F002C

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002C-B ACCUMULATOR 1A LEVEL SIGNAL B TO AOV F002C

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002D-A ACCUMULATOR 1B LEVEL SIGNAL A TO AOV F002D

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F002D-B ACCUMULATOR 1B LEVEL SIGNAL B TO AOV F002D

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

## C63-C41-F003A-A SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-C41-F003A-B SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-C41-F003A-C SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS



Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-C41-F003B-A SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-C41-F003B-B SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-C41-F003B-C SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-C41-F003C-A SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-C41-F003C-B SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-C41-F003C-C SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-C41-F003D-A SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-C41-F003D-B SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-C41-F003D-C SQUIB ACTUATION SIGNAL

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1C41F003D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2C41F003D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3C41F003D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-C71-D1DTM-CV FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV I DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-CVPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-CVPRSA	3.46E-05	RPS CONDENSER VACUUM PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSCV_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSCV'
6.4E-07	0.4	C63-PT_-NO-RPSCV_1_2	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB
6.4E-07	0.4	C63-PT_-NO-RPSCV_1_3	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC
6.4E-07	0.4	C63-PT_-NO-RPSCV_1_4	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSD
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR

## C63-C71-D1DTM-DP FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV I DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-DWPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-DWPRSA	3.46E-05	RPS DRYWELL PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSDW'
6.4E-07	0.4	C63-PT_-NO-RPSDW_1_2	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB
6.4E-07	0.4	C63-PT_-NO-RPSDW_1_3	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC
6.4E-07	0.4	C63-PT_-NO-RPSDW_1_4	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSD
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR

## C63-C71-D1DTM-LV FAILURE TO GENERATE LOW RCS LEVEL SIGNAL FOR RPS DIV 1 DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	33.7	C63-MOD-FO-RPSCCTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.7	C63-MOD-FO-RPSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.3	C63-LT_-NO-RPSRXLVLA	7.2E-05	RPS RX LVL A SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-RPSTEMPA	2.52E-05	TEMPERATURE A FAILS
3.6E-06	1.1	C63-LT_-NO-RPSRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-RPSRX'
1.33E-06	0.4	C63-LT_-NO-RPSRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVB
1.33E-06	0.4	C63-LT_-NO-RPSRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVC
1.33E-06	0.4	C63-LT_-NO-RPSRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVD
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_2_3	1.33E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVB & C63-LT_-N
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_2_4	1.33E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLVB & C63-LT_-N

## C63-C71-D1DTM-PR FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV 1 DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-RPSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-RPSRXPRSA	3.46E-05	RPS RX PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSRX'
6.4E-07	0.4	C63-PT_-NO-RPSRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB
6.4E-07	0.4	C63-PT_-NO-RPSRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC
6.4E-07	0.4	C63-PT_-NO-RPSRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSD
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC & C63-PT_-N

## C63-C71-D2DTM-CV FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV II DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-CVPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-CVPRSB	3.46E-05	RPS CONDENSER VACUUM PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSCV_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSCV'
6.4E-07	0.4	C63-PT_-NO-RPSCV_1_2	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB
6.4E-07	0.4	C63-PT_-NO-RPSCV_2_3	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC
6.4E-07	0.4	C63-PT_-NO-RPSCV_2_4	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSD
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR

## C63-C71-D2DTM-DP FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV II DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-DWPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-DWPRSB	3.46E-05	DRYWELL PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSDW'
6.4E-07	0.4	C63-PT_-NO-RPSDW_1_2	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB
6.4E-07	0.4	C63-PT_-NO-RPSDW_2_3	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC
6.4E-07	0.4	C63-PT_-NO-RPSDW_2_4	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSD
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
6.4E-08	0.0	C63-PT_-NO-RPSDW_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR

## C63-C71-D2DTM-LV FAILURE TO GENERATE LOW RCS LEVEL SIGNAL FOR RPS DIV 2 DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	33.7	C63-MOD-FO-RPSCCTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.7	C63-MOD-FO-RPSRXVLVB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.3	C63-LT_-NO-RPSRXVLVB	7.2E-05	RPS RX LVL B SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-RPSTEMPB	2.52E-05	TEMPERATURE B SENSOR TRANSMITTER FAILS
3.6E-06	1.1	C63-LT_-NO-RPSRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-RPSRX'
1.33E-06	0.4	C63-LT_-NO-RPSRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXVLVA & C63-LT_-NO-RPSRXVLVB
1.33E-06	0.4	C63-LT_-NO-RPSRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXVLVB & C63-LT_-NO-RPSRXVLVC
1.33E-06	0.4	C63-LT_-NO-RPSRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXVLVB & C63-LT_-NO-RPSRXVLVD
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_2_3	1.33E-07	CCF of three components: C63-LT_-NO-RPSRXVLVA & C63-LT_-NO-RPSRXVLVB & C63-LT_-N
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_2_4	1.33E-07	CCF of three components: C63-LT_-NO-RPSRXVLVA & C63-LT_-NO-RPSRXVLVB & C63-LT_-N

## C63-C71-D2DTM-PR FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV II DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-RPSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-RPSRXPRSB	3.46E-05	RPS RX PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSRX'
6.4E-07	0.4	C63-PT_-NO-RPSRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB
6.4E-07	0.4	C63-PT_-NO-RPSRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC
6.4E-07	0.4	C63-PT_-NO-RPSRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSD
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N



Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-RPSRX_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC & C63-PT_-N

C63-C71-D3DTM-CV FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV III DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-CVPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-CVPRSC	3.46E-05	CONDENSER VACUUM PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSCV_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSCV'
6.4E-07	0.4	C63-PT_-NO-RPSCV_1_3	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC
6.4E-07	0.4	C63-PT_-NO-RPSCV_2_3	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC
6.4E-07	0.4	C63-PT_-NO-RPSCV_3_4	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPRSD
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR

C63-C71-D3DTM-DP FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV III DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-DWPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-DWPRSC	3.46E-05	DRYWELL PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSDW'
6.4E-07	0.4	C63-PT_-NO-RPSDW_1_3	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC
6.4E-07	0.4	C63-PT_-NO-RPSDW_2_3	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC
6.4E-07	0.4	C63-PT_-NO-RPSDW_3_4	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPRSD
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-RPSDW_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR

## C63-C71-D3DTM-LV FAILURE TO GENERATE LOW RCS LEVEL SIGNAL FOR RPS DIV 3 DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	33.7	C63-MOD-FO-RPSCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.7	C63-MOD-FO-RPSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.3	C63-LT_-NO-RPSRXLVLC	7.2E-05	RPS RX LVL C SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-RPSTEMPC	2.52E-05	TEMPERATURE C FAILS
3.6E-06	1.1	C63-LT_-NO-RPSRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-RPSRX'
1.33E-06	0.4	C63-LT_-NO-RPSRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLC
1.33E-06	0.4	C63-LT_-NO-RPSRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXVLB & C63-LT_-NO-RPSRXLVLC
1.33E-06	0.4	C63-LT_-NO-RPSRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-RPSRXLVLC & C63-LT_-NO-RPSRXLVD
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_2_3	1.33E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXVLB & C63-LT_-N
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_3_4	1.33E-07	CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLC & C63-LT_-N

## C63-C71-D3DTM-PR FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV III DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-RPSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-RPSRXPRSC	3.46E-05	RPS RX PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSRX'
6.4E-07	0.4	C63-PT_-NO-RPSRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC
6.4E-07	0.4	C63-PT_-NO-RPSRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC
6.4E-07	0.4	C63-PT_-NO-RPSRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-RPSRXPRSC & C63-PT_-NO-RPSRXPRSD
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC & C63-PT_-N
6.4E-08	0.0	C63-PT_-NO-RPSRX_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC & C63-PT_-N

C63-C71-D4DTM-CV FAILURE TO GENERATE HIGH CONDENSER PRESSURE SIGNAL FOR RPS DIV IV DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-CVPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-CVPRSD	3.46E-05	CONDENSER VACCUM PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSCV_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSCV'
6.4E-07	0.4	C63-PT_-NO-RPSCV_1_4	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSD
6.4E-07	0.4	C63-PT_-NO-RPSCV_2_4	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSD
6.4E-07	0.4	C63-PT_-NO-RPSCV_3_4	6.4E-07	CCF of two components: C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPRSD
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSA & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR
6.4E-08	0.0	C63-PT_-NO-RPSCV_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-CVPRSB & C63-PT_-NO-CVPRSC & C63-PT_-NO-CVPR

C63-C71-D4DTM-DP FAILURE TO GENERATE HIGH DRYWELL PRESSURE SIGNAL FOR RPS DIV IV DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-DWPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-DWPRSD	3.46E-05	DRYWELL PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSDW'
6.4E-07	0.4	C63-PT_-NO-RPSDW_1_4	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSD
6.4E-07	0.4	C63-PT_-NO-RPSDW_2_4	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSD
6.4E-07	0.4	C63-PT_-NO-RPSDW_3_4	6.4E-07	CCF of two components: C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPRSD
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPR

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-RPSDW_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSA & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR
6.4E-08	0.0	C63-PT_-NO-RPSDW_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-DWPRSB & C63-PT_-NO-DWPRSC & C63-PT_-NO-DWPR

## C63-C71-D4DTM-LV Failure to generate low RCS level signal for RPS Div 4 DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	33.7	C63-MOD-FO-RPSC TTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.7	C63-MOD-FO-RPSRX LVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.3	C63-LT_-NO-RPSRX LVLD	7.2E-05	RPS RX LVL D SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-RPSTEMP D	2.52E-05	TEMPERATURE D FAILS
3.6E-06	1.1	C63-LT_-NO-RPSRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-RPSRX'
1.33E-06	0.4	C63-LT_-NO-RPSRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-RPSRX LVLA & C63-LT_-NO-RPSRX LVLD
1.33E-06	0.4	C63-LT_-NO-RPSRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-RPSRX LVLB & C63-LT_-NO-RPSRX LVLD
1.33E-06	0.4	C63-LT_-NO-RPSRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-RPSRX LVLC & C63-LT_-NO-RPSRX LVLD
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_2_4	1.33E-07	CCF of three components: C63-LT_-NO-RPSRX LVLA & C63-LT_-NO-RPSRX LVLB & C63-LT_-NO-RPSRX LVLC
1.33E-07	0.0	C63-LT_-NO-RPSRX_1_3_4	1.33E-07	CCF of three components: C63-LT_-NO-RPSRX LVLA & C63-LT_-NO-RPSRX LVLC & C63-LT_-NO-RPSRX LVLD

## C63-C71-D4DTM-PR FAILURE TO GENERATE HIGH REACTOR PRESSURE SIGNAL FOR RPS DIV IV DTM

Probability	% of Top	Event	Probability	Description
1.09E-04	74.0	C63-MOD-FO-RPSRX PRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.4	C63-PT_-NO-RPSRX PRSD	3.46E-05	RPS RX PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-RPSRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-RPSRX'
6.4E-07	0.4	C63-PT_-NO-RPSRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-RPSRX PRSA & C63-PT_-NO-RPSRX PRSD
6.4E-07	0.4	C63-PT_-NO-RPSRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-RPSRX PRSB & C63-PT_-NO-RPSRX PRSD
6.4E-07	0.4	C63-PT_-NO-RPSRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-RPSRX PRSC & C63-PT_-NO-RPSRX PRSD

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSB & C63-PT_-N
6.4E-08	0.0	C63-PT_-NO-RPSRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSA & C63-PT_-NO-RPSRXPRSC & C63-PT_-N
6.4E-08	0.0	C63-PT_-NO-RPSRX_2_3_4	6.4E-08	CCF of three components: C63-PT_-NO-RPSRXPRSB & C63-PT_-NO-RPSRXPRSC & C63-PT_-N

## C63-C74-D1ATWSD1LL FAILURE OF DIV I LOW RPV LEVEL ATWS DIV I LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCCTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLA	7.2E-05	ATWS/SLC RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D1ATWSD1PR FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSA	3.46E-05	ATWS/SLC RX PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'

Probability	% of Top	Event	Probability	Description
1.E-06	0.7	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D1ATWSD2LL FAILURE OF DIV II LOW RPV LEVEL ATWS DIV I LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLB	7.2E-05	ATWS/SLC RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D1ATWSD2PR FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSC	3.46E-05	ATWS/SLC RX PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D1ATWSD3LL FAILURE OF DIV III LOW RPV LEVEL ATWS DIV I LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLC	7.2E-05	ATWS/SLC RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLC

Probability	% of Top	Event	Probability	Description
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D1ATWSD3PR FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSB	3.46E-05	ATWS/SLC RX PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D1ATWSD4LL FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV I LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLD	7.2E-05	ATWS/SLC RX LEVEL D SENSOR TRANSMITTER FAILS



Probability	% of Top	Event	Probability	Description
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D1ATWSD4PR FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV I LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSD	3.46E-05	ATWS/SLC RX PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D2ATWSD1LL FAILURE OF DIV I LOW RPV LEVEL ATWS DIV II LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCCTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLA	7.2E-05	ATWS/SLC RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D2ATWSD1PR FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSA	3.46E-05	ATWS/SLC RX PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD

Probability	% of Top	Event	Probability	Description
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D2ATWSD2LL FAILURE OF DIV II LOW RPV LEVEL ATWS DIV II LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCCTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXVLB	7.2E-05	ATWS/SLC RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLA & C63-LT_-NO-ATWSRXVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLB & C63-LT_-NO-ATWSRXVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLB & C63-LT_-NO-ATWSRXVLD
1.E-06	0.3	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D2ATWSD2PR FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSC	3.46E-05	ATWS/SLC RX PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)

Probability	% of Top	Event	Probability	Description
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D2ATWSD3LL FAILURE OF DIV III LOW RPV LEVEL ATWS DIV II LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLC	7.2E-05	ATWS/SLC RX LEVLE C SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D2ATWSD3PR FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS

Probability	% of Top	Event	Probability	Description
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSB	3.46E-05	ATWS/SLC RX PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D2ATWSD4LL FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV II LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLD	7.2E-05	ATWS/SLC RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLB & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLC & C63-LT_-NO-ATWSRXLVLD

Probability	% of Top	Event	Probability	Description
1.E-06	0.3	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D2ATWSD4PR FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV II LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSD	3.46E-05	ATWS/SLC RX PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D3ATWSD1LL FAILURE OF DIV I LOW RPV LEVEL ATWS DIV III LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLA	7.2E-05	ATWS/SLC RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'

Probability	% of Top	Event	Probability	Description
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D3ATWSD1PR FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSA	3.46E-05	ATWS/SLC RX PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D3ATWSD2LL FAILURE OF DIV II LOW RPV LEVEL ATWS DIV III LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSRXVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXVLB	7.2E-05	ATWS/SLC RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLB & C63-LT_-NO-ATWSRXVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLB & C63-LT_-NO-ATWSRXVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLB & C63-LT_-NO-ATWSRXVLB
1.E-06	0.3	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D3ATWSD2PR FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSC	3.46E-05	ATWS/SLC RX PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'



Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D3ATWSD3LL FAILURE OF DIV III LOW RPV LEVEL ATWS DIV III LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCCTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLC	7.2E-05	ATWS/SLC RX LEVEL C SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D3ATWSD3PR FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSB	3.46E-05	ATWS/SLC RX PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)

Probability	% of Top	Event	Probability	Description
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D3ATWSD4LL FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV III LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLD	7.2E-05	ATWS/SLC RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D3ATWSD4PR FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV III LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS

Probability	% of Top	Event	Probability	Description
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSD	3.46E-05	ATWS/SLC RX PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D4ATWSD1LL FAILURE OF DIV I LOW RPV LEVEL ATWS DIV IV LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLA	7.2E-05	ATWS/SLC RX LEVEL A SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPA	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLB
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD

Probability	% of Top	Event	Probability	Description
1.E-06	0.3	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D4ATWSD1PR FAILURE OF DIV I HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSA	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSA	3.46E-05	ATWS/SLC RX PRESSURE A SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-11-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-11 FOR RX BLDG (SHORT TERM)
		R13-12-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-12 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D4ATWSD2LL FAILURE OF DIV II LOW RPV LEVEL ATWS DIV IV LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLB	7.2E-05	ATWS/SLC RX LEVEL B SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPB	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'

Probability	% of Top	Event	Probability	Description
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_2	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXVLVB
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLVB & C63-LT_-NO-ATWSRXVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXVLVB & C63-LT_-NO-ATWSRXVLD
1.E-06	0.3	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D4ATWSD2PR FAILURE OF DIV II HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSB	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSC	3.46E-05	ATWS/SLC RX PRESSURE C SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-21-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR RX BLDG (SHORT TERM)
		R13-22-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-C74-D4ATWSD3LL FAILURE OF DIV III LOW RPV LEVEL ATWS DIV IV LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCTTMPC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILURE
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLC	7.2E-05	ATWS/SLC RX LEVLE C SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPC	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_3	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLC
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D4ATWSD3PR FAILURE OF DIV III HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSC	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSB	3.46E-05	ATWS/SLC RX PRESSURE B SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-31-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-31 FOR RX BLDG (SHORT TERM)
		R13-32-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-32 FOR RX BLDG (SHORT TERM)
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_2	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_3	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSC
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

Probability	% of Top	Event	Probability	Description
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_3	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-

## C63-C74-D4ATWSD4LL FAILURE OF DIV IV LOW RPV LEVEL ATWS DIV IV LOGIC (L2)

Probability	% of Top	Event	Probability	Description
1.09E-04	33.6	C63-MOD-FO-ATWSCCTMPD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
1.09E-04	33.6	C63-MOD-FO-ATWSRXLVLD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
7.2E-05	22.2	C63-LT_-NO-ATWSRXLVLD	7.2E-05	ATWS/SLC RX LEVEL D SENSOR TRANSMITTER FAILS
2.52E-05	7.8	C63-TT_-NO-ATWSTEMPD	2.52E-05	TEMPERATURE XMTR FAILS TO RESPOND TO CHANGE IN TEMPERATURE
3.6E-06	1.1	C63-LT_-NO-ATWRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ATWRX'
1.33E-06	0.4	C63-LT_-NO-ATWRX_1_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLA & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_2_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLB & C63-LT_-NO-ATWSRXLVLD
1.33E-06	0.4	C63-LT_-NO-ATWRX_3_4	1.33E-06	CCF of two components: C63-LT_-NO-ATWSRXLVLC & C63-LT_-NO-ATWSRXLVLD
1.E-06	0.3	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)
3.6E-07	0.1	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'

## C63-C74-D4ATWSD4PR FAILURE OF DIV IV HIGH RPV PRESSURE SIGNAL TO ATWS DIV IV LOGIC

Probability	% of Top	Event	Probability	Description
1.09E-04	73.3	C63-MOD-FO-ATWSRXPRSD	1.09E-04	TRANSDUCER SIGNAL CONVERTER FAILS
3.46E-05	23.2	C63-PT_-NO-ATWSRXPRSD	3.46E-05	ATWS/SLC RX PRESSURE D SENSOR TRANSMITTER FAILS
1.73E-06	1.2	C63-PT_-NO-ATWRX_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ATWRX'
1.E-06	0.7	R13-41-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR RX BLDG (SHORT TERM)
		R13-42-RB-ST	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR RX BLDG (SHORT TERM)

Probability	% of Top	Event	Probability	Description
6.4E-07	0.4	C63-PT_-NO-ATWRX_1_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_2_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSB & C63-PT_-NO-ATWSRXPRSD
6.4E-07	0.4	C63-PT_-NO-ATWRX_3_4	6.4E-07	CCF of two components: C63-PT_-NO-ATWSRXPRSC & C63-PT_-NO-ATWSRXPRSD
3.6E-07	0.2	C63-PSP-FO-ATWEP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-ATWEP'
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_2_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSB & C63-PT_-
6.4E-08	0.0	C63-PT_-NO-ATWRX_1_3_4	6.4E-08	CCF of three components: C63-PT_-NO-ATWSRXPRSA & C63-PT_-NO-ATWSRXPRSC & C63-PT_-

## C63-E50-F002A-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002A-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'



Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002A-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002A-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002A-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002A-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002B-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002B-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002B-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002B-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDSCS VALVE 2B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002B-C FAILURE TO ACTUATE SQUIB C ON GDSCS VALVE 2B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002B-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002C-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002C-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002C-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002C-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002C-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002C-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002D-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002D-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002D-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION



Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002D-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002D-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002D-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDSCS VALVE 2D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002E-A FAILURE TO ACTUATE SQUIB A ON GDSCS VALVE 2E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002E-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002E-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002E-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002E-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002E-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002E-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002E-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2E

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002E-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002F-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002F-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002F-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002F-B FAILURE TO ACTUATE SQUIB B ON GDACS VALVE 2F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002F-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDACS VALVE 2F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002F-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002F-C FAILURE TO ACTUATE SQUIB C ON GDACS VALVE 2F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002F-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2F

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002F-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002G-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002G-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002G-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002G-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2



Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002G-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDSCS VALVE 2G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002G-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002G-C FAILURE TO ACTUATE SQUIB C ON GDSCS VALVE 2G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002G-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDSCS VALVE 2G

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002G-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F002H-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F002H-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 2H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002H-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F002H-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F002H-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 2H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002H-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F002H-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F002H-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 2H

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F002H-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F006A-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 6A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F006A-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 6A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006A-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F006A-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 6A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F006A-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDSCS VALVE 6A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006A-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F006A-C FAILURE TO ACTUATE SQUIB C ON GDSCS VALVE 6A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F006A-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 6A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006A-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F006B-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 6B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F006B-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 6B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006B-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F006B-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 6B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F006B-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 6B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006B-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'



Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F006B-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 6B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F006B-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 6B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006B-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F006C-A FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 6C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F006C-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDCS VALVE 6C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006C-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F006C-B FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 6C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F006C-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDCS VALVE 6C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006C-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F006C-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 6C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F006C-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDSCS VALVE 6C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006C-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

## C63-E50-F006D-A FAILURE TO ACTUATE SQUIB A ON GDSCS VALVE 6D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2

Probability	% of Top	Event	Probability	Description
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3

## C63-E50-F006D-A-MAN MANUAL FAILURE TO ACTUATE SQUIB A ON GDSCS VALVE 6D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006D-A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

## C63-E50-F006D-B FAILURE TO ACTUATE SQUIB B ON GDSCS VALVE 6D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

## C63-E50-F006D-B-MAN MANUAL FAILURE TO ACTUATE SQUIB B ON GDSCS VALVE 6D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S2E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006D-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3

## C63-E50-F006D-C FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 6D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	0.1	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3

## C63-E50-F006D-C-MAN MANUAL FAILURE TO ACTUATE SQUIB C ON GDCS VALVE 6D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.8	C63-LDD-FC-S1E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S2E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	31.8	C63-LDD-FC-S3E50F006D-C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	0.9	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	0.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	0.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	0.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	0.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

C63-N21-CCFSOFTWARE\_S Spurious Trip Signal to Condensate and Feedwater System (N21) due to Q-DCIS Software Failure

Probability	% of Top	Event	Probability	Description
1.E-04	100.0	C63-CCFSOFTWARE_S	1.E-04	ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE

C74-B21-F100A-DIV1 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

C74-B21-F100A-DIV3 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B21-F100B-DIV1 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B21-F100B-DIV3 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'



Probability	% of Top	Event	Probability	Description
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B21-F101A-DIV2 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B21-F101A-DIV4 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B21-F101B-DIV2 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B21-F101B-DIV4 FAILURE OF FEEDWATER ISOLATION SIGNAL DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.1	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.73E-06	1.0	C63-PT_-NO-ESFDW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFDW'
1.73E-06	1.0	C63-PT_-NO-ESFFW_ALL	1.73E-06	CCF of all components in group 'C63-PT_-NO-ESFFW'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

## C74-B32-F001-DIV1 FAILURE OF ICS ISOLATION FOR F001 DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'

Probability	% of Top	Event	Probability	Description
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F001-DIV3 FAILURE OF ICS ISOLATION FOR F001 DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F002-DIV2 FAILURE OF ICS ISOLATION FOR F002 DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F002-DIV4 FAILURE OF ICS ISOLATION FOR F002 DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F003-DIV2 FAILURE OF ICS ISOLATION FOR F003 DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F003-DIV4 FAILURE OF ICS ISOLATION FOR F003 DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F004-DIV1 FAILURE OF ICS ISOLATION FOR F004 DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'

Probability	% of Top	Event	Probability	Description
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-F004-DIV3 FAILURE OF ICS ISOLATION FOR F004 DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.8	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.2	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.9	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.66E-06	1.0	C63-FT_-NO-ESFICC_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFICC'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F001A-DIV1 Failure of ICS Isolation for F001A Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-

Probability	% of Top	Event	Probability	Description
				ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F001A-DIV3 Failure of ICS Isolation for F001A Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F001B-DIV1 Failure of ICS Isolation for F001B Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

C74-B32-LOCAISOL-F001B-DIV3 Failure of ICS Isolation for F001B Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

C74-B32-LOCAISOL-F001C-DIV1 Failure of ICS Isolation for F001C Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

C74-B32-LOCAISOL-F001C-DIV3 Failure of ICS Isolation for F001C Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software



Probability	% of Top	Event	Probability	Description
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F001D-DIV1 Failure of ICS Isolation for F001D Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F001D-DIV3 Failure of ICS Isolation for F001D Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-

Probability	% of Top	Event	Probability	Description
				FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F002A-DIV2 Failure of ICS Isolation for F002A Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F002A-DIV4 Failure of ICS Isolation for F002A Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F002B-DIV2 Failure of ICS Isolation for F002B Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F002B-DIV4 Failure of ICS Isolation for F002B Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-

Probability	% of Top	Event	Probability	Description
				ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F002C-DIV2 Failure of ICS Isolation for F002C Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F002C-DIV4 Failure of ICS Isolation for F002C Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

C74-B32-LOCAISOL-F002D-DIV2 Failure of ICS Isolation for F002D Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

C74-B32-LOCAISOL-F002D-DIV4 Failure of ICS Isolation for F002D Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003A-DIV2 Failure of ICS Isolation for F003A Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003A-DIV4 Failure of ICS Isolation for F003A Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003B-DIV2 Failure of ICS Isolation for F003B Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003B-DIV4 Failure of ICS Isolation for F003B Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003C-DIV2 Failure of ICS Isolation for F003C Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003C-DIV4 Failure of ICS Isolation for F003C Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003D-DIV2 Failure of ICS Isolation for F003D Div 2 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-



Probability	% of Top	Event	Probability	Description
				FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F003D-DIV4 Failure of ICS Isolation for F003D Div 4 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004A-DIV1 Failure of ICS Isolation for F004A Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004A-DIV3 Failure of ICS Isolation for F004A Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004B-DIV1 Failure of ICS Isolation for F004B Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-

Probability	% of Top	Event	Probability	Description
				ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004B-DIV3 Failure of ICS Isolation for F004B Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004C-DIV1 Failure of ICS Isolation for F004C Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004C-DIV3 Failure of ICS Isolation for F004C Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004D-DIV1 Failure of ICS Isolation for F004D Div 1 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-B32-LOCAISOL-F004D-DIV3 Failure of ICS Isolation for F004D Div 3 following LOCA

Probability	% of Top	Event	Probability	Description
1.E-04	58.3	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	17.5	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.5	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
9.E-06	5.2	B21-ZS_-FC-CCFALL	9.E-06	CCF of all DPV ESF limit switches
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.6	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF002A-DIV2 FAILURE TO ISOLATE RWCU VALVE F002A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF002A-DIV4 FAILURE TO ISOLATE RWCU VALVE F002A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF002B-DIV2 FAILURE TO ISOLATE RWCU VALVE F002B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF002B-DIV4 FAILURE TO ISOLATE RWCU VALVE F002B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF003A-DIV1 FAILURE TO ISOLATE RWCU VALVE F003A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF003A-DIV3 FAILURE TO ISOLATE RWCU VALVE F003A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software

Probability	% of Top	Event	Probability	Description
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF003B-DIV1 FAILURE TO ISOLATE RWCU VALVE F003B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF003B-DIV3 FAILURE TO ISOLATE RWCU VALVE F003B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'



Probability	% of Top	Event	Probability	Description
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF007A-DIV2 FAILURE TO ISOLATE RWCU VALVE F007A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF007A-DIV4 FAILURE TO ISOLATE RWCU VALVE F007A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF007B-DIV2 FAILURE TO ISOLATE RWCU VALVE F007B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF007B-DIV4 FAILURE TO ISOLATE RWCU VALVE F007B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3

Probability	% of Top	Event	Probability	Description
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF008A-DIV1 FAILURE TO ISOLATE RWCU VALVE F008A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF008A-DIV3 FAILURE TO ISOLATE RWCU VALVE F008A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF008B-DIV1 FAILURE TO ISOLATE RWCU VALVE F008B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-ATWSF008B-DIV3 FAILURE TO ISOLATE RWCU VALVE F008B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.E-04	60.2	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.0	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	10.8	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
3.6E-06	2.2	C63-LT_-NO-ESFRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-ESFRX'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3

Probability	% of Top	Event	Probability	Description
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F002A-DIV2 FAILURE TO ISOLATE RWCU F002A DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F002A-DIV4 FAILURE TO ISOLATE RWCU F002A DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F002B-DIV2 FAILURE TO ISOLATE RWCU F002B DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F002B-DIV4 FAILURE TO ISOLATE RWCU F002B DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F003A-DIV1 FAILURE TO ISOLATE RWCU F003A DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F003A-DIV3 FAILURE TO ISOLATE RWCU F003A DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F003B-DIV1 FAILURE TO ISOLATE RWCU F003B DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F003B-DIV3 FAILURE TO ISOLATE RWCU F003B DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4



## C74-G31-F007A-DIV2 FAILURE TO ISOLATE RWCU F007A DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F007A-DIV4 FAILURE TO ISOLATE RWCU F007A DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F007B-DIV2 FAILURE TO ISOLATE RWCU F007B DIV 2

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_5	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_4_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C1 & C63-LOG-FC-ESFD2C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_5_6	1.82E-06	CCF of two components: C63-LOG-FC-ESFD2C2 & C63-LOG-FC-ESFD2C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F007B-DIV4 FAILURE TO ISOLATE RWCU F007B DIV 4

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_11	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_10_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C1 & C63-LOG-FC-ESFD4C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_11_12	1.82E-06	CCF of two components: C63-LOG-FC-ESFD4C2 & C63-LOG-FC-ESFD4C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F008A-DIV1 FAILURE TO ISOLATE RWCU F008A DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F008A-DIV3 FAILURE TO ISOLATE RWCU F008A DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F008B-DIV1 FAILURE TO ISOLATE RWCU F008B DIV 1

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_2	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_1_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_2_3	1.82E-06	CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

## C74-G31-F008B-DIV3 FAILURE TO ISOLATE RWCU F008B DIV 3

Probability	% of Top	Event	Probability	Description
1.E-04	60.9	C63-CCFSOFTWARE	1.E-04	Common cause failure of software
3.E-05	18.3	C63-DTM-FC-ESFLG_ALL	3.E-05	CCF of all components in group 'C63-DTM-FC-ESFLG'
1.8E-05	11.0	C63-LOG-FC-ESFLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-ESFLG'
1.86E-06	1.1	C63-LDD-FC-ESFLOADS	1.86E-06	CCF OF ALL ESF LOAD DRIVERS
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_8	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C2
1.82E-06	1.1	C63-LOG-FC-ESFLG_7_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C1 & C63-LOG-FC-ESFD3C3
1.82E-06	1.1	C63-LOG-FC-ESFLG_8_9	1.82E-06	CCF of two components: C63-LOG-FC-ESFD3C2 & C63-LOG-FC-ESFD3C3
1.66E-06	1.0	C63-FT_-NO-ESFSD_ALL	1.66E-06	CCF of all components in group 'C63-FT_-NO-ESFSD'
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_3	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3
1.11E-06	0.7	C63-DTM-FC-ESFLG_1_2_4	1.11E-06	CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4

**Table 4.5-8c**  
**I&C System – Cutsets (C71)**

For each C71 system top event, the dominant cutsets are shown below.

**C71-B21-F001A-CLOSE F001A MSIV CLOSURE**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

**C71-B21-F001B-CLOSE F001B MSIV CLOSURE**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

**C71-B21-F001C-CLOSE F001C MSIV CLOSURE**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'

Probability	% of Top	Event	Probability	Description
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

## C71-B21-F001D-CLOSE F001D MSIV CLOSURE

Probability	% of Top	Event	Probability	Description
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

## C71-B21-F002A-CLOSE F002A MSIV CLOSURE

Probability	% of Top	Event	Probability	Description
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)

Probability	% of Top	Event	Probability	Description
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

## C71-B21-F002B-CLOSE F002B MSIV CLOSURE

Probability	% of Top	Event	Probability	Description
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

## C71-B21-F002C-CLOSE F002C MSIV CLOSURE

Probability	% of Top	Event	Probability	Description
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

## C71-B21-F002D-CLOSE F002D MSIV CLOSURE

Probability	% of Top	Event	Probability	Description
1.E-04	44.0	C71-CCFSOFTWARE	1.E-04	RPS COMMON CAUSE SOFTWARE FAILURE

Probability	% of Top	Event	Probability	Description
4.5E-05	19.8	C71-SLU-FC-R_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-R'
3.54E-05	15.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-GEN	1.18E+00	GENERAL TRANSIENT
1.8E-05	7.9	C71-OLU-FC-R_ALL	1.8E-05	CCF of all components in group 'C71-OLU-FC-R'
5.91E-06	2.6	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-PCS	1.97E-01	TRANSIENT WITH PCS UNAVAILABLE
3.51E-06	1.5	C71-DTM-FC-R_ALL	3.E-05	CCF of all components in group 'C71-DTM-FC-R'
		%T-FDW	1.17E-01	LOSS OF FEEDWATER
1.86E-06	0.8	C71-LDD-FC-2OF4G	1.86E-06	CCF LOAD DRIVER (2 or more of 4 GROUPS)
1.67E-06	0.7	C71-SLU-FC-R_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP
1.67E-06	0.7	C71-SLU-FC-R_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP

## CR-TOPCR SCRAM FAILURE

Probability	% of Top	Event	Probability	Description
2.5E-07	100.0	C12-ROD-CF-SCRAM	2.5E-07	CCF OF CONTROL RODS TO INSERT



**Table 4.5-8d**  
**I&C System – Cutsets (C72)**

For each C72 system top event, the dominant cutsets are shown below.

**C12-C71-FMCRD FAILURE OF FMCRD SCRAM FOLLOW UP FUNCTION**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
3.6E-04	31.5	C11-LOG-FC-CHNLA	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
3.6E-04	31.5	C11-LOG-FC-CHNLB	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
1.E-04	8.8	C62-CCFSOFTWARE	1.E-04	N-DCIS COMMON CAUSE SOFTWARE FAILURE
1.E-04	8.8	C62-CCFSOFTWARE_S	1.E-04	N-DCIS SPURIOUS COMMON CAUSE SOFTWARE FAILURE
7.99E-05	7.0	C12-INV-FC-X_1_2_3	7.99E-05	CCF of three components: C12-INV-FC-G1X205 & C12-INV-FC-G2X205 & C12-INV-FC-G3X205
4.E-05	3.5	C12-INV-FC-X_1_2	4.E-05	CCF of two components: C12-INV-FC-G1X205 & C12-INV-FC-G2X205
4.E-05	3.5	C12-INV-FC-X_1_3	4.E-05	CCF of two components: C12-INV-FC-G1X205 & C12-INV-FC-G3X205
4.E-05	3.5	C12-INV-FC-X_2_3	4.E-05	CCF of two components: C12-INV-FC-G2X205 & C12-INV-FC-G3X205
2.07E-06	0.2	C12-INV-FC-G1X205	1.44E-03	FMCRD ELECTRICAL GROUP 1 X205 INVERTER FAILS DURING OPERATION
		C12-INV-FC-G2X205	1.44E-03	FMCRD ELECTRICAL GROUP 2 X205 INVERTER FAILS DURING OPERATION
2.07E-06	0.2	C12-INV-FC-G1X205	1.44E-03	FMCRD ELECTRICAL GROUP 1 X205 INVERTER FAILS DURING OPERATION
		C12-INV-FC-G3X205	1.44E-03	FMCRD ELECTRICAL GROUP 3 X205 INVERTER FAILS DURING OPERATION

**C72-B21-F001A-DPS AUTOMATIC DPS ISOLATION OF F001A FAILS**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.09E-03	47.1	C72-LDD-FC-S1MF001A	1.09E-03	B21-F001A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF001A	1.09E-03	B21-F001A SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F001B-DPS AUTOMATIC DPS ISOLATION OF F001B FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF001B	1.09E-03	B21-F001B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF001B	1.09E-03	B21-F001B SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F001C-DPS AUTOMATIC DPS ISOLATION OF F001C FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF001C	1.09E-03	B21-F001C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF001C	1.09E-03	B21-F001C SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPISA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPISB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F001D-DPS AUTOMATIC DPS ISOLATION OF F001D FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF001D	1.09E-03	B21-F001D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF001D	1.09E-03	B21-F001D SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPISA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPISB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F002A-DPS AUTOMATIC DPS ISOLATION OF F002A FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF002A	1.09E-03	B21-F002A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF002A	1.09E-03	B21-F002A SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F002B-DPS AUTOMATIC DPS ISOLATION OF F002B FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF002B	1.09E-03	B21-F002B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF002B	1.09E-03	B21-F002B SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F002C-DPS AUTOMATIC DPS ISOLATION OF F002C FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF002C	1.09E-03	B21-F002C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF002C	1.09E-03	B21-F002C SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F002D-DPS AUTOMATIC DPS ISOLATION OF F002D FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1MF002D	1.09E-03	B21-F002D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2MF002D	1.09E-03	B21-F002D SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F004A-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004A

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004A	1.09E-03	F004A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004A	1.09E-03	F004A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004A	1.09E-03	F004A THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS

Probability	% of Top	Event	Probability	Description
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004B-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004B

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004B	1.09E-03	F004B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004B	1.09E-03	F004B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004B	1.09E-03	F004B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004C-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004C

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004C	1.09E-03	F004C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004C	1.09E-03	F004C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004C	1.09E-03	F004C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004D-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004D

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004D	1.09E-03	F004D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004D	1.09E-03	F004D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004D	1.09E-03	F004D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004E-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004E

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004E	1.09E-03	F004E FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004E	1.09E-03	F004E SECOND SERIES LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S3F004E	1.09E-03	F004E THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004F-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004F

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004F	1.09E-03	F004F FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004F	1.09E-03	F004F SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004F	1.09E-03	F004F THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004G-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004G

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004G	1.09E-03	F004G FIRST SERIES LOAD DRIVER FAILS ACTUATE



Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S2F004G	1.09E-03	F004G SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004G	1.09E-03	F004G THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F004H-DPS FAILURE TO GENERATE DPS SIGNAL FOR DPV SQUIB VALVE F004H

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F004H	1.09E-03	F004H FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F004H	1.09E-03	F004H SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F004H	1.09E-03	F004H THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B21-F006A-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006A	1.09E-03	SRV F006A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006A	1.09E-03	SRV F006A SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006B-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006B	1.09E-03	SRV F006B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006B	1.09E-03	SRV F006B SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

Probability	% of Top	Event	Probability	Description
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006C-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006C

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006C	1.09E-03	SRV F006C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006C	1.09E-03	SRV F006C SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006D-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006D

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006D	1.09E-03	SRV F006D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006D	1.09E-03	SRV F006D SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS

Probability	% of Top	Event	Probability	Description
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006E-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006E

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006E	1.09E-03	SRV F006E FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006E	1.09E-03	SRV F006E SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006F-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006F

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006F	1.09E-03	SRV F006F FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006F	1.09E-03	SRV F006F SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006G-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006G

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006G	1.09E-03	SRV F006G FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006G	1.09E-03	SRV F006G SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006H-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006H

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006H	1.09E-03	SRV F006H FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006H	1.09E-03	SRV F006H SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006J-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006J

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006J	1.09E-03	SRV F006J FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006J	1.09E-03	SRV F006J SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F006K-DPS FAILURE TO GENERATE DPS SIGNAL FOR SRV VALVE F006K

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F006K	1.09E-03	SRV F006K FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2B21F006K	1.09E-03	SRV F006K SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F100A-DPS FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F100A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F100A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.1	C72-LDD-FC-S2B21F100A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F100B-DPS FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F100B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F100B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.1	C72-LDD-FC-S2B21F100B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS

Probability	% of Top	Event	Probability	Description
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F101A-DPS FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F101A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F101A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.1	C72-LDD-FC-S2B21F101A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B21-F101B-DPS FAILURE TO GENERATE SIGNAL FOR FEEDWATER VALVE F101B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1B21F101B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.1	C72-LDD-FC-S2B21F101B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS



Probability	% of Top	Event	Probability	Description
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B32-F006A-DPS FAILURE OF DPS OPEN SIGNAL TO B32-F006A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F006A	1.09E-03	F006A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2F006A	1.09E-03	F006A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B32-F006B-DPS FAILURE OF DPS OPEN SIGNAL TO B32-F006B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F006B	1.09E-03	F006B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2F006B	1.09E-03	F006B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B32-F006C-DPS FAILURE OF DPS OPEN SIGNAL TO B32-F006C

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F006C	1.09E-03	F006C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2F006C	1.09E-03	F006C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B32-F006D-DPS FAILURE OF DPS OPEN SIGNAL TO B32-F006D

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F006D	1.09E-03	F006D FIRST SERIES LOAD DRIVER FAILS ACTUATE

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S2F006D	1.09E-03	F006D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

C72-B32-F010A-DPS(NP) No signal from DPS for valve B32-F010A to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F010A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.1	C72-LDD-FC-S2F010A	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D3DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

C72-B32-F010B-DPS(NP) No signal from DPS for valve B32-F010B to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F010B	1.09E-03	LOAD DRIVER FAILS DURING

Probability	% of Top	Event	Probability	Description
				OPERATION
1.09E-03	47.1	C72-LDD-FC-S2F010B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D3DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

C72-B32-F010C-DPS(NP) No signal from DPS for valve B32-F010C to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F010C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.1	C72-LDD-FC-S2F010C	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D3DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

C72-B32-F010D-DPS(NP) No signal from DPS for valve B32-F010D to de-energize

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1F010D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S2F010D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B32-F104A-DPS FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F104A

Probability	% of Top	Event	Probability	Description
1.09E-03	24.8	C72-LDD-FC-S1AB32P1	1.09E-03	VALVE F104A FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	24.8	C72-LDD-FC-S2AB32P1	1.09E-03	VALVE F104A SECOND LOAD DRIVER FAILS TO ACTUATE
1.09E-03	24.8	C72-LDD-FC-S3AB32P1	1.09E-03	VALVE F104A SECOND LOAD DRIVER FAILS TO ACTUATE
1.E-03	22.7	C62-C72-ICSPool1	1.E-03	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 1
1.E-04	2.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.2	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.2	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.2	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.0	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.0	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS

## C72-B32-F104A-DPS-MAN DPS MANUAL SIGNAL TO F104A FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1AB32P1	1.09E-03	VALVE F104A FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2AB32P1	1.09E-03	VALVE F104A SECOND LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S3AB32P1	1.09E-03	VALVE F104A SECOND LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B32-F104B-DPS FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F104B

Probability	% of Top	Event	Probability	Description
1.09E-03	24.8	C72-LDD-FC-S1BB32P2	1.09E-03	VALVE F104B FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	24.8	C72-LDD-FC-S2BB32P2	1.09E-03	VALVE F104B SECOND LOAD DRIVER FAILS TO ACTUATE
1.09E-03	24.8	C72-LDD-FC-S3BB32P2	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-03	22.7	C62-C72-ICSPool2	1.E-03	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 2
1.E-04	2.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.2	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.2	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.2	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.0	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.0	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS

## C72-B32-F104B-DPS-MAN DPS MANUAL SIGNAL TO F104B FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1BB32P2	1.09E-03	VALVE F104B FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2BB32P2	1.09E-03	VALVE F104B SECOND LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S3BB32P2	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B32-F105A-DPS FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F105A

Probability	% of Top	Event	Probability	Description
1.09E-03	32.9	C72-LDD-FC-S1XB32P1	1.09E-03	VALVE F105A FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.9	C72-LDD-FC-S2XB32P1	1.09E-03	VALVE F105A SECOND LOAD DRIVER FAILS TO ACTUATE
1.E-03	30.2	C62-C72-ICSPool1	1.E-03	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 1
1.E-04	3.0	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-B32-F105A-DPS-MAN DPS MANUAL SIGNAL TO F105A FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1XB32P1	1.09E-03	VALVE F105A FIRST LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S2XB32P1	1.09E-03	VALVE F105A SECOND LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-B32-F105B-DPS FAILURE TO GENERATE DPS SIGNAL TO OPEN CROSS CONNECT VALVE F105B

Probability	% of Top	Event	Probability	Description
1.09E-03	32.9	C72-LDD-FC-S1YB32P2	1.09E-03	VALVE F105B FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.9	C72-LDD-FC-S2YB32P2	1.09E-03	VALVE F105B SECOND LOAD DRIVER FAILS TO ACTUATE
1.E-03	30.2	C62-C72-ICSPool2	1.E-03	FAILURE OF LOW LEVEL SIGNAL FOR ICS POOL 2
1.E-04	3.0	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause



## C72-B32-F105B-DPS-MAN DPS MANUAL SIGNAL TO F105B FAILS

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1YB32P2	1.09E-03	VALVE F105B FIRST LOAD DRIVER FAILS TO ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2YB32P2	1.09E-03	VALVE F105B SECOND LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-C41-F003A-DPS FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003A

Probability	% of Top	Event	Probability	Description
1.09E-03	31.5	C72-LDD-FC-S1F003A	1.09E-03	F003A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	31.5	C72-LDD-FC-S2F003A	1.09E-03	F003A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	31.5	C72-LDD-FC-S3F003A	1.09E-03	F003A THIRD SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	2.9	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.3	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.5	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.0	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-C41-F003B-DPS FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003B

Probability	% of Top	Event	Probability	Description
1.09E-03	31.5	C72-LDD-FC-S1F003B	1.09E-03	F003B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	31.5	C72-LDD-FC-S2F003B	1.09E-03	F003B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	31.5	C72-LDD-FC-S3F003B	1.09E-03	F003B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.3	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.5	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.0	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-C41-F003C-DPS FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003C

Probability	% of Top	Event	Probability	Description
1.09E-03	31.5	C72-LDD-FC-S1F003C	1.09E-03	F003C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	31.5	C72-LDD-FC-S2F003C	1.09E-03	F003C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	31.5	C72-LDD-FC-S3F003C	1.09E-03	F003C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.3	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.5	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.0	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-C41-F003D-DPS FAILURE TO GENERATE ATWS/SLC SIGNAL FOR SLC SQUIB VALVE F003D

Probability	% of Top	Event	Probability	Description
1.09E-03	31.5	C72-LDD-FC-S1F003D	1.09E-03	F003D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	31.5	C72-LDD-FC-S2F003D	1.09E-03	F003D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	31.5	C72-LDD-FC-S3F003D	1.09E-03	F003D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.3	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.5	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.0	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-C71-ARI ARI FAILURE

Probability	% of Top	Event	Probability	Description
1.E-04	49.8	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
5.E-05	24.9	C12-SOV-FE-ARI_ALL	5.E-05	CCF of all components in group 'C12-SOV-FE-ARI'
1.E-05	5.0	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	5.0	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	5.0	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
9.26E-06	4.6	C12-SOV-FE-ARI_1_2	9.26E-06	CCF of two components: C12-SOV-FE-F038 & C12-SOV-FE-F039
2.E-06	1.0	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.9	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.5	C12-SOV-FE-F038	1.E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)
		C12-SOV-FE-F039	1.E-03	SOLENOID VALVE (FAILURE TO ENERGIZE)

Probability	% of Top	Event	Probability	Description
1.E-06	0.5	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002A-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDSCS SQUIB VALVE F002A

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002A	1.09E-03	F002A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002A	1.09E-03	F002A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002A	1.09E-03	F002A THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002B-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDSCS SQUIB VALVE F002B

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002B	1.09E-03	F002B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002B	1.09E-03	F002B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002B	1.09E-03	F002B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002C-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDSCS SQUIB VALVE F002C

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002C	1.09E-03	F002C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002C	1.09E-03	F002C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002C	1.09E-03	F002C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002D-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDSCS SQUIB VALVE F002D

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002D	1.09E-03	F002D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002D	1.09E-03	F002D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002D	1.09E-03	F002D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002E-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002E

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002E	1.09E-03	F002E FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002E	1.09E-03	F002E SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002E	1.09E-03	F002E THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002F-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002F

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002F	1.09E-03	F002F FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002F	1.09E-03	F002F SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002F	1.09E-03	F002F THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002G-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002G

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002G	1.09E-03	F002G FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002G	1.09E-03	F002G SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002G	1.09E-03	F002G THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F002H-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F002H

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1F002H	1.09E-03	F002H FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2F002H	1.09E-03	F002H SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3F002H	1.09E-03	F002H THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS

Probability	% of Top	Event	Probability	Description
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F006A-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006A

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1E50F006A	1.09E-03	GDSCS F006A FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2E50F006A	1.09E-03	GDSCS F002A SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3E50F006A	1.09E-03	GDSCS F002A THIRD SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F006B-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006B

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1E50F006B	1.09E-03	GDSCS F006B FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2E50F006B	1.09E-03	GDSCS F006B SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3E50F006B	1.09E-03	GDSCS F006B THIRD SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS



Probability	% of Top	Event	Probability	Description
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F006C-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006C

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1E50F006C	1.09E-03	GDCS F006C FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2E50F006C	1.09E-03	GDCS F006C SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3E50F006C	1.09E-03	GDCS F006C THIRD SERIES LOAD DRIVER FAILS ACTUATE
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-E50-F006D-DPS FAILURE TO GENERATE DPS SIGNAL FOR GDCS SQUIB VALVE F006D

Probability	% of Top	Event	Probability	Description
1.09E-03	32.0	C72-LDD-FC-S1E50F006D	1.09E-03	GDCS F006D FIRST SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S2E50F006D	1.09E-03	GDCS F006D SECOND SERIES LOAD DRIVER FAILS ACTUATE
1.09E-03	32.0	C72-LDD-FC-S3E50F006D	1.09E-03	GDCS F006D THIRD SERIES LOAD DRIVER FAILS ACTUATE

Probability	% of Top	Event	Probability	Description
1.E-04	2.9	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.3	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.3	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.3	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

## C72-G31-ATWSF003A-DPS FAILURE TO ISOLATE RWCU VALVE F003A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.09E-03	45.9	C72-LDD-FC-S1G31F3A	1.09E-03	RWCU/SDC F003A FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	45.9	C72-LDD-FC-S2G31F3A	1.09E-03	RWCU/SDC F003A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.2	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.9	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.8	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.1	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
1.67E-06	0.1	C71-SLU-FC-S_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-G31-ATWSF003B-DPS FAILURE TO ISOLATE RWCU VALVE F003B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.09E-03	45.9	C72-LDD-FC-S1G31F3B	1.09E-03	RWCU/SDC F003B FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	45.9	C72-LDD-FC-S2G31F3B	1.09E-03	RWCU/SDC F003B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.E-04	4.2	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.9	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.8	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.1	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
1.67E-06	0.1	C71-SLU-FC-S_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-G31-ATWSF008A-DPS FAILURE TO ISOLATE RWCU VALVE F008A (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.09E-03	45.9	C72-LDD-FC-S1G31F8A	1.09E-03	RWCU/SDC F008A FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	45.9	C72-LDD-FC-S2G31F8A	1.09E-03	RWCU/SDC F008A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.2	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	1.9	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	0.8	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.2	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.1	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
1.67E-06	0.1	C71-SLU-FC-S_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

## C72-G31-ATWSF008B-DPS FAILURE TO ISOLATE RWCU VALVE F008B (SLC ACTUATION FAILS)

Probability	% of Top	Event	Probability	Description
1.09E-03	84.9	C72-LDD-FC-S1G31F8B	1.09E-03	RWCU/SDC F008B FIRST SERIES LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.E-04	7.8	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	3.5	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	1.4	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
5.9E-06	0.5	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	0.5	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.67E-06	0.1	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
1.67E-06	0.1	C71-SLU-FC-S_1_2_4	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR
1.67E-06	0.1	C71-SLU-FC-S_1_3_4	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV3 & C71-SLU-FC-SR

## C72-G31-F003A-DPS DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F003A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1G31F3A	1.09E-03	RWCU/SDC F003A FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2G31F3A	1.09E-03	RWCU/SDC F003A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-G31-F003B-DPS DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F003B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1G31F3B	1.09E-03	RWCU/SDC F003B FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2G31F3B	1.09E-03	RWCU/SDC F003B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-G31-F008A-DPS DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F008A

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1G31F8A	1.09E-03	RWCU/SDC F008A FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2G31F8A	1.09E-03	RWCU/SDC F008A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause

Probability	% of Top	Event	Probability	Description
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-G31-F008B-DPS DPS FAILS TO GENERATE ISOLATION SIGNAL FOR G31-F008B

Probability	% of Top	Event	Probability	Description
1.09E-03	47.1	C72-LDD-FC-S1G31F8B	1.09E-03	RWCU/SDC F008B FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
1.09E-03	47.1	C72-LDD-FC-S2G31F8B	1.09E-03	RWCU/SDC F008B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
1.E-04	4.3	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	0.4	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	0.4	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	0.4	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	0.1	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	0.1	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.E-06	0.0	C62-C72-DPSCNTLPSA-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
		C62-C72-DPSCNTLPSB-FIX	1.E-03	LOW VOLTAGE POWER SUPPLY FAILS TO OPERATE -- including common cause
1.3E-07	0.0	C72-LOG-FC-D1DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION
		C72-LOG-FC-D2DPS	3.6E-04	LOGIC UNIT FAILS TO FUNCTION

## C72-RPS DPS RPS SCRAM FAILS

Probability	% of Top	Event	Probability	Description
1.E-04	71.0	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-05	7.1	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	7.1	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	7.1	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
2.E-06	1.4	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.86E-06	1.3	C72-LDD-FC-LOADS	1.86E-06	COMMON CAUSE FAILURE OF DPS LOAD DRIVERS
1.7E-06	1.2	C12-SOV-FD-SCRV139	1.7E-06	CCF TO OPEN (VENT) OF SCRAM PILOT SOLENOID VALVES SOV-139
1.19E-06	0.8	C72-LDD-FC-S1DPSRPS	1.09E-03	RPS FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
		C72-LDD-FC-S2DPSRPS	1.09E-03	RPS SECOND SERIES LOAD DRIVER FAILS TO ACTUATE

Probability	% of Top	Event	Probability	Description
1.19E-06	0.8	C72-LDD-FC-S1DPSRPS	1.09E-03	RPS FIRST SERIES LOAD DRIVER FAILS TO ACTUATE
		C72-LDD-FC-S3DPSRPS	1.09E-03	RPS THIRD SERIES LOAD DRIVER FAILS TO ACTUATE
1.19E-06	0.8	C72-LDD-FC-S2DPSRPS	1.09E-03	RPS SECOND SERIES LOAD DRIVER FAILS TO ACTUATE
		C72-LDD-FC-S3DPSRPS	1.09E-03	RPS THIRD SERIES LOAD DRIVER FAILS TO ACTUATE

CF-TOPRB FEEDWATER RUN BACK FAILURE

Probability	% of Top	Event	Probability	Description
1.E-04	30.1	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-04	30.1	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	13.6	C71-SLU-FC-S_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-S'
1.8E-05	5.4	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
1.E-05	3.0	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	3.0	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	3.0	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
5.9E-06	1.8	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
2.E-06	0.6	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS
1.67E-06	0.5	C71-SLU-FC-S_1_2_3	1.67E-06	CCF of three components: C71-SLU-FC-SRNDIV1 & C71-SLU-FC-SRNDIV2 & C71-SLU-FC-SR

XI-TOPINH FAILURE OF ADS INHIBIT SIGNAL

Probability	% of Top	Event	Probability	Description
1.E-04	30.7	C51-CCFSOFTWARE	1.E-04	NMS COMMON CAUSE FAILURE OF DPS PROCESSORS
1.E-04	30.7	C72-CCFSOFTWARE	1.E-04	COMMON CAUSE FAILURE OF DPS PROCESSORS
4.5E-05	13.8	C71-SLU-FC-N_ALL	4.5E-05	CCF of all components in group 'C71-SLU-FC-N'
1.8E-05	5.5	C74-LOG-FC-AT-_ALL	1.8E-05	CCF of all components in group 'C74-LOG-FC-AT-'
1.E-05	3.1	C72-LOG-FC-D_1_2	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS
1.E-05	3.1	C72-LOG-FC-D_1_3	1.E-05	CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS
1.E-05	3.1	C72-LOG-FC-D_2_3	1.E-05	CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS

Probability	% of Top	Event	Probability	Description
5.9E-06	1.8	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-L2_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-L2'
5.9E-06	1.8	%T-GEN	1.18E+00	GENERAL TRANSIENT
		C74-ATM-FC-PR_ALL	5.E-06	CCF of all components in group 'C74-ATM-FC-PR'
2.E-06	0.6	C72-LOG-FC-D_1_2_3	2.E-06	CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS



**Table 4.5-8e**

**I&C System – Cutsets (ICPs FOR HP CRD ISOLATION BYPASS AND ICS DPV ISOLATION)**

For each system top event (HP CRD Isolation Bypass Independent Control Platform), the dominant cutsets are shown below.

**C63-C12-LL-SIG-AUTO FAILURE OF AUTOMATIC CRD INJECTION SIGNAL FROM INDEPENDENT REPLICATED LOGIC**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.8E-05	63.8	C63-LOG-FC-IPRLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-IPRLG'
5.E-06	17.7	C63-ATM-FC-IPR_ALL	5.E-06	CCF of all components in group 'C63-ATM-FC-IPR'
3.6E-06	12.8	C63-LT_-NO-IPRRX_ALL	3.6E-06	CCF of all components in group 'C63-LT_-NO-IPRRX'
3.6E-07	1.3	C63-PSP-FO-IPREP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-IPREP'
1.85E-07	0.7	C63-ATM-FC-IPR_1_2_3	1.85E-07	CCF of three components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD3
1.85E-07	0.7	C63-ATM-FC-IPR_1_2_4	1.85E-07	CCF of three components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD4
1.85E-07	0.7	C63-ATM-FC-IPR_1_3_4	1.85E-07	CCF of three components: C63-ATM-FC-IPRD1 & C63-ATM-FC-IPRD3 & C63-ATM-FC-IPRD4
1.85E-07	0.7	C63-ATM-FC-IPR_2_3_4	1.85E-07	CCF of three components: C63-ATM-FC-IPRD2 & C63-ATM-FC-IPRD3 & C63-ATM-FC-IPRD4
1.33E-07	0.5	C63-LT_-NO-IPRRX_1_2_3	1.33E-07	CCF of three components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLB & C63-LT_-N
1.33E-07	0.5	C63-LT_-NO-IPRRX_1_2_4	1.33E-07	CCF of three components: C63-LT_-NO-IPRRXLVLA & C63-LT_-NO-IPRRXLVLB & C63-LT_-N

**C63-C12-LL-SIG-MAN FAILURE OF MANUAL CRD INJECTION SIGNAL FROM INDEPENDENT REPLICATED LOGIC**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.8E-05	98.0	C63-LOG-FC-IPRLG_ALL	1.8E-05	CCF of all components in group 'C63-LOG-FC-IPRLG'
3.6E-07	2.0	C63-PSP-FO-IPREP_ALL	3.6E-07	CCF of all components in group 'C63-PSP-FO-IPREP'

**C99-B32-LOCAISOL-F002A-B Failure of Div 2 ICP Isolation for F002A following LOCA**

<b>Probability</b>	<b>% of Top</b>	<b>Event</b>	<b>Probability</b>	<b>Description</b>
1.09E-03	47.7	C99-LDD-FC-B32F002A1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002A2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002A-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D

C99-B32-LOCAISOL-F002A-D Failure of Div 4 ICP Isolation for F002A following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002A1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002A2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002A-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_2	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002A-D

C99-B32-LOCAISOL-F002B-B Failure of Div 2 ICP Isolation for F002B following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002B1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002B2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002B-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_3	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-B

C99-B32-LOCAISOL-F002B-D Failure of Div 4 ICP Isolation for F002B following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002B1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002B2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002B-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_4	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002B-D

C99-B32-LOCAISOL-F002C-B Failure of Div 2 ICP Isolation for F002C following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002C1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002C2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002C-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_5	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002C-B

C99-B32-LOCAISOL-F002C-D Failure of Div 4 ICP Isolation for F002C following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002C1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002C2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002C-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_6	2.89E-07	CCF of two components: C99-VLU-FC-

Probability	% of Top	Event	Probability	Description
				B32F002A-B & C99-VLU-FC-B32F002C-D

C99-B32-LOCAISOL-F002D-B Failure of Div 2 ICP Isolation for F002D following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002D1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002D2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002D-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_7	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-B

C99-B32-LOCAISOL-F002D-D Failure of Div 4 ICP Isolation for F002D following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F002D1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F002D2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F002D-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG

Probability	% of Top	Event	Probability	Description
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_8	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F002D-D

C99-B32-LOCAISOL-F003A-B Failure of Div 2 ICP Isolation for F003A following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003A1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003A2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003A-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_9	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-B

C99-B32-LOCAISOL-F003A-D Failure of Div 4 ICP Isolation for F003A following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003A1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003A2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003A-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation

Probability	% of Top	Event	Probability	Description
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_10	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003A-D

## C99-B32-LOCAISOL-F003B-B Failure of Div 2 ICP Isolation for F003B following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003B1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003B2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003B-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_11	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-B

## C99-B32-LOCAISOL-F003B-D Failure of Div 4 ICP Isolation for F003B following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003B1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003B2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003B-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-

Probability	% of Top	Event	Probability	Description
				VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_12	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003B-D

## C99-B32-LOCAISOL-F003C-B Failure of Div 2 ICP Isolation for F003C following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003C1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003C2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003C-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_13	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-B

## C99-B32-LOCAISOL-F003C-D Failure of Div 4 ICP Isolation for F003C following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003C1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003C2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003C-D	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches



Probability	% of Top	Event	Probability	Description
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_14	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003C-D

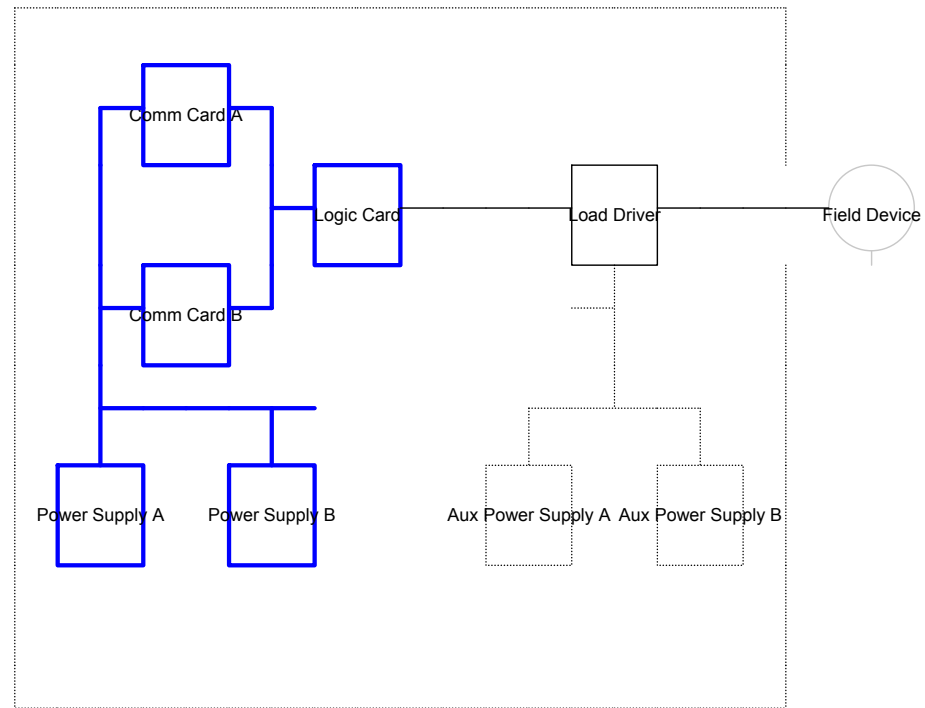
## C99-B32-LOCAISOL-F003D-B Failure of Div 2 ICP Isolation for F003D following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003D1-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003D2-B	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003D-B	7.8E-05	VOTER LOGIC UNIT FAILS TO FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-21-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-21 FOR CTRL BLDG
		R13-22-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-22 FOR CTRL BLDG
1.E-06	0.0	R13-21-RB	1.E-03	
		R13-22-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_15	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003D-B

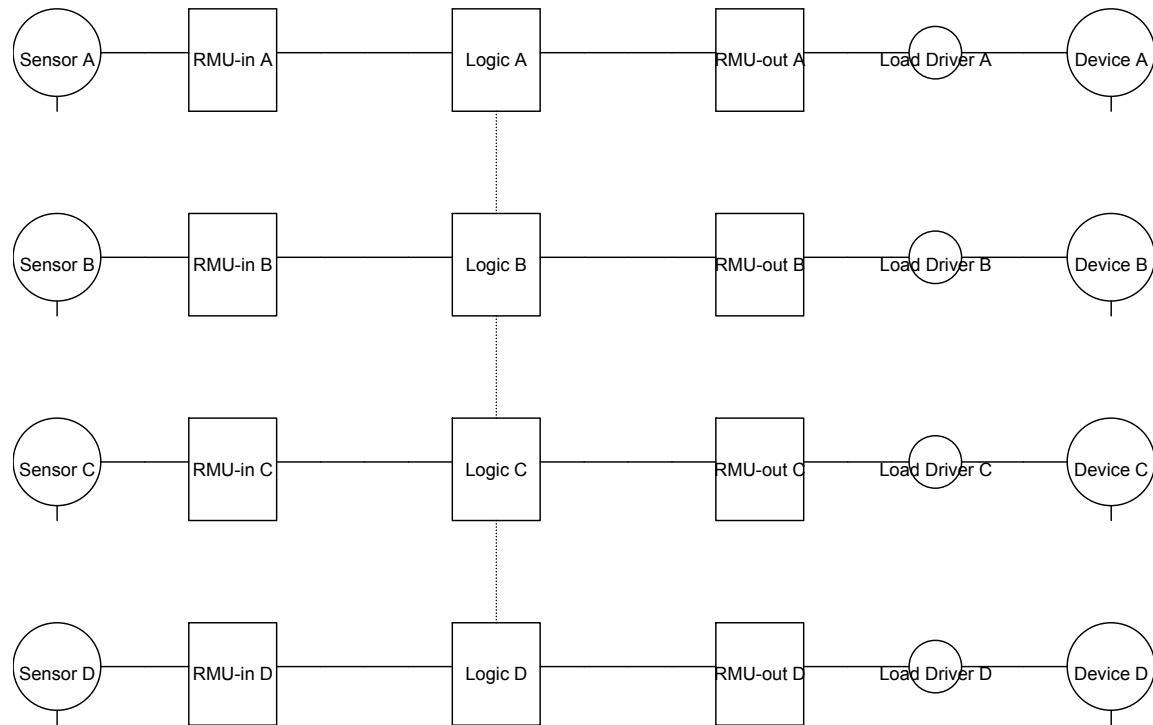
## C99-B32-LOCAISOL-F003D-D Failure of Div 4 ICP Isolation for F003D following LOCA

Probability	% of Top	Event	Probability	Description
1.09E-03	47.7	C99-LDD-FC-B32F003D1-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
1.09E-03	47.7	C99-LDD-FC-B32F003D2-D	1.09E-03	LOAD DRIVER FAILS DURING OPERATION
7.8E-05	3.4	C99-VLU-FC-B32F003D-D	7.8E-05	VOTER LOGIC UNIT FAILS TO

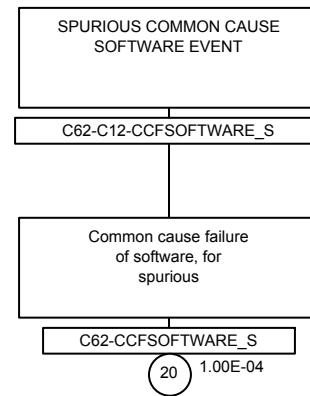
Probability	% of Top	Event	Probability	Description
				FUNCTION
9.E-06	0.4	B21-ZS_-FC-ICCFALL	9.E-06	Common Cause Failure of All ICP DPV Limit Switches
6.E-06	0.3	C99-LOG-FC-B32ISOLALL	6.E-06	CCF of ALL ICP LOGIC UNIT FAILS TO FUNCTION
3.9E-06	0.2	C99-VLU-FC-LOCAICP_ALL	3.9E-06	CCF of all components in group 'C99-VLU-FC-LOCAICP'
1.86E-06	0.1	C99-LDD-FC-B32ISOLALL	1.86E-06	CCF of all ICP Load Drivers for ICS Isolation
1.E-06	0.0	R13-41-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-41 FOR CTRL BLDG
		R13-42-CB	1.E-03	LOSS OF SR 120VAC UPS FROM BUS R13-42 FOR CTRL BLDG
1.E-06	0.0	R13-41-RB	1.E-03	
		R13-42-RB	1.E-03	
2.89E-07	0.0	C99-VLU-FC-LOCAICP_1_16	2.89E-07	CCF of two components: C99-VLU-FC-B32F002A-B & C99-VLU-FC-B32F003D-D



**Figure 4.5-1. Typical Remote Monitoring Unit**



**Figure 4.5-2. Typical Q-DCIS Logic**



**Figure 4.5-3a. N-DCIS Non Safety Control System**  
Sheet 1

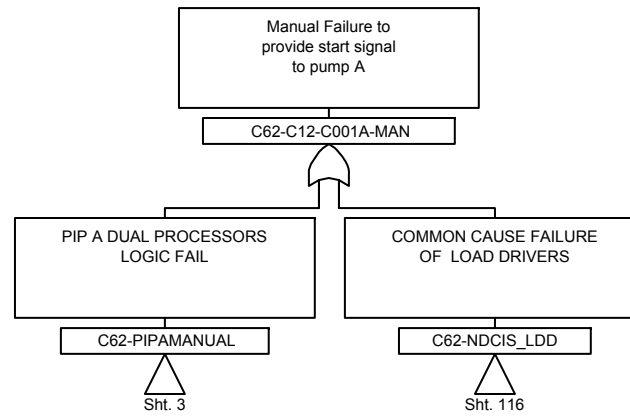


Figure 4.5-3a. Sheet 2 N-DCIS Non Safety Control System

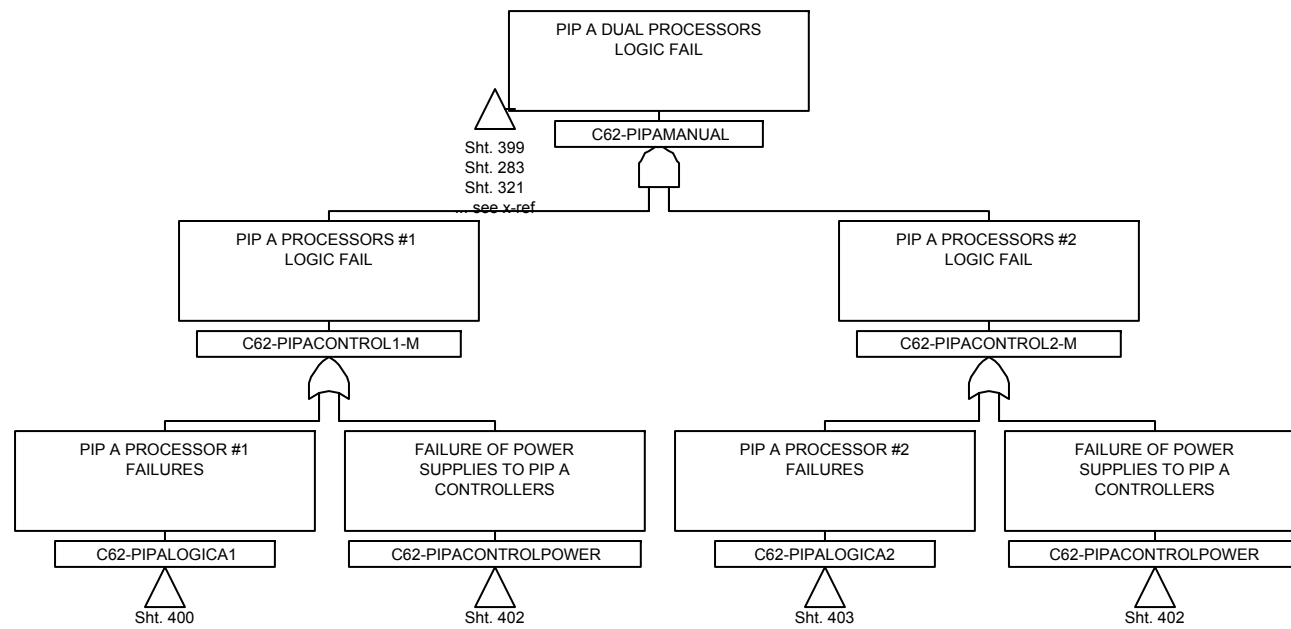


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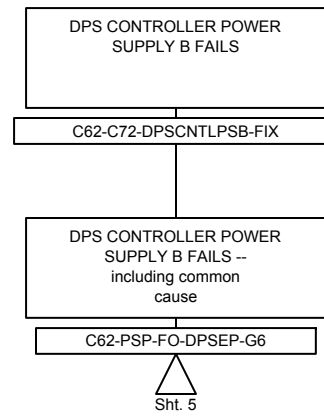


Figure 4.5-3a. Sheet 4 N-DCIS Non Safety Control System



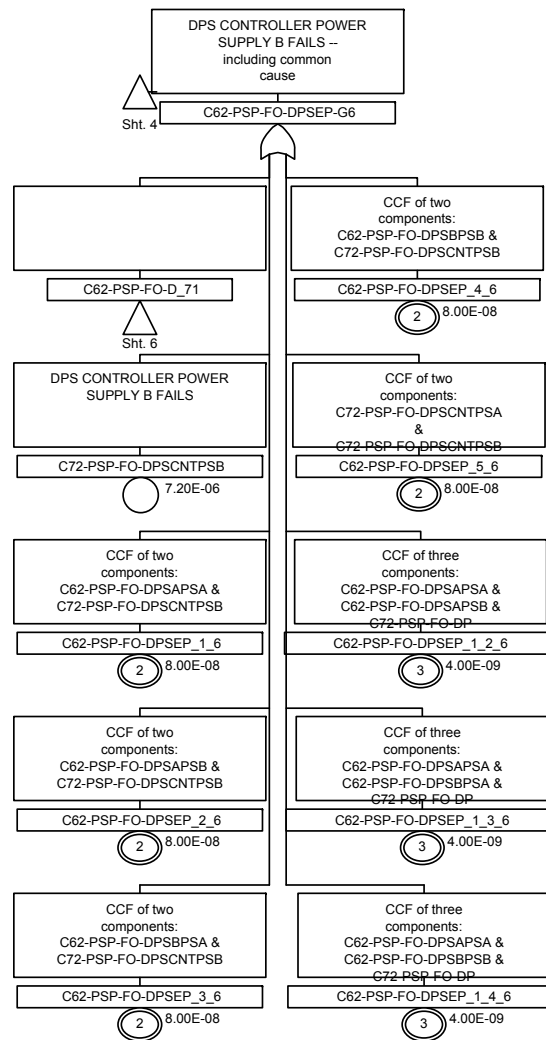


Figure 4.5-3a. Sheet 5 N-DCIS Non Safety Control System

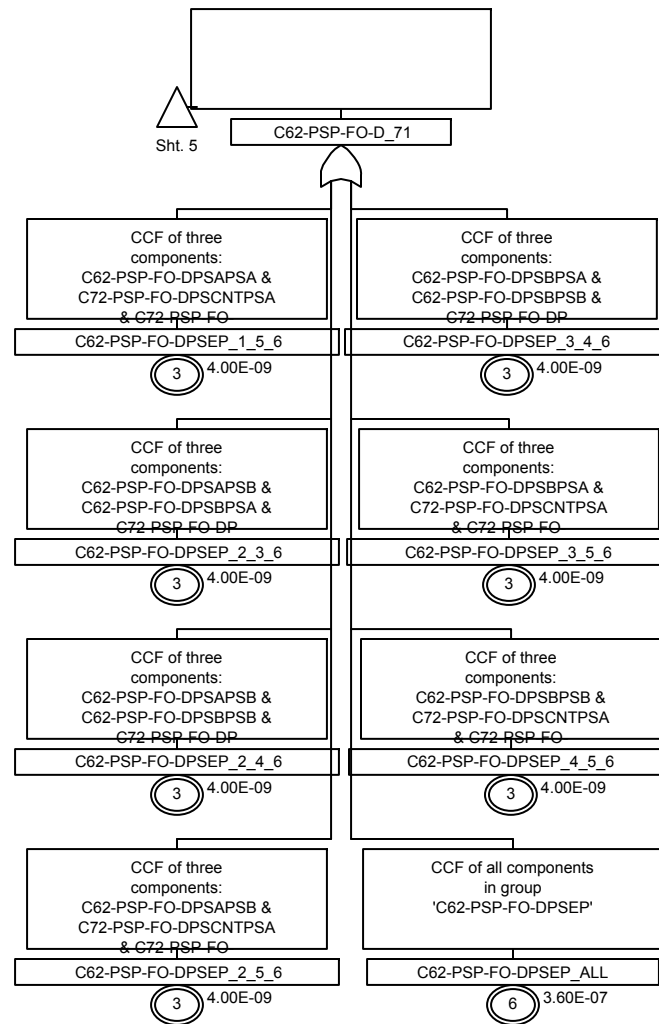


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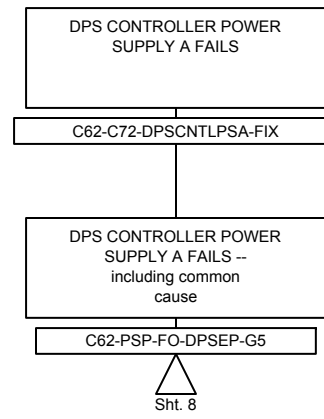


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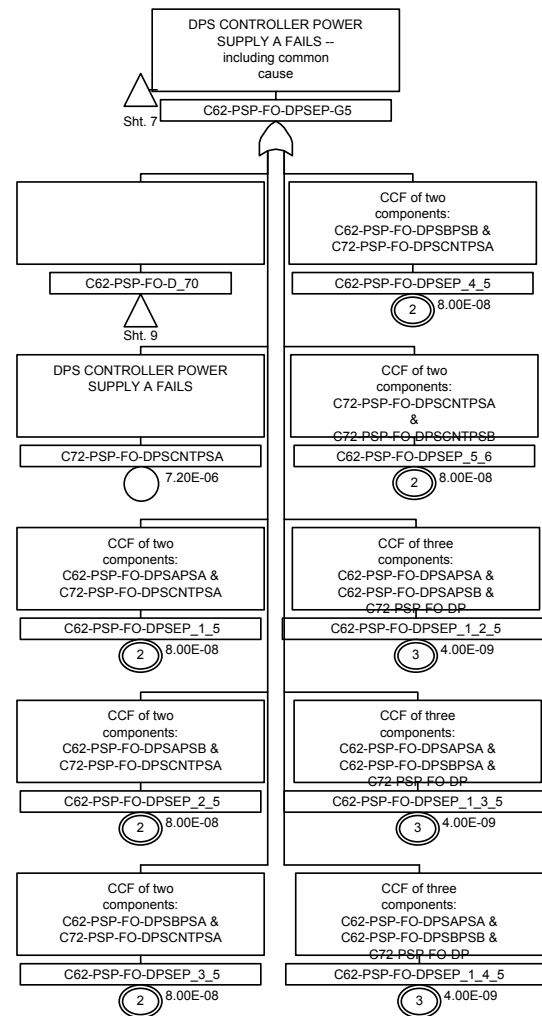


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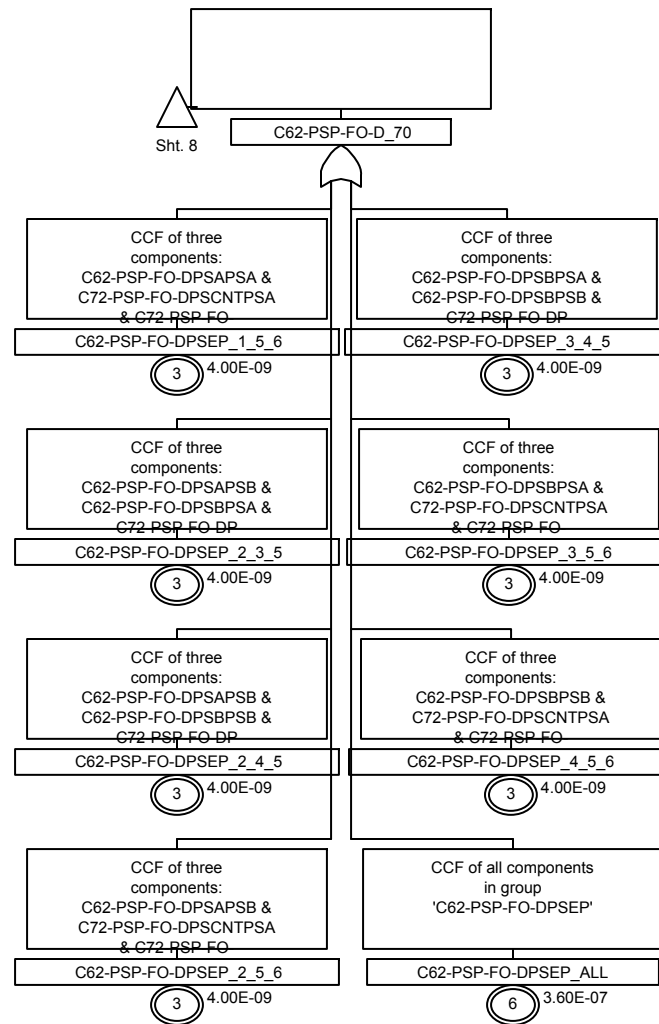


Figure 4.5-3a. Sheet 9 N-DCIS Non Safety Control System

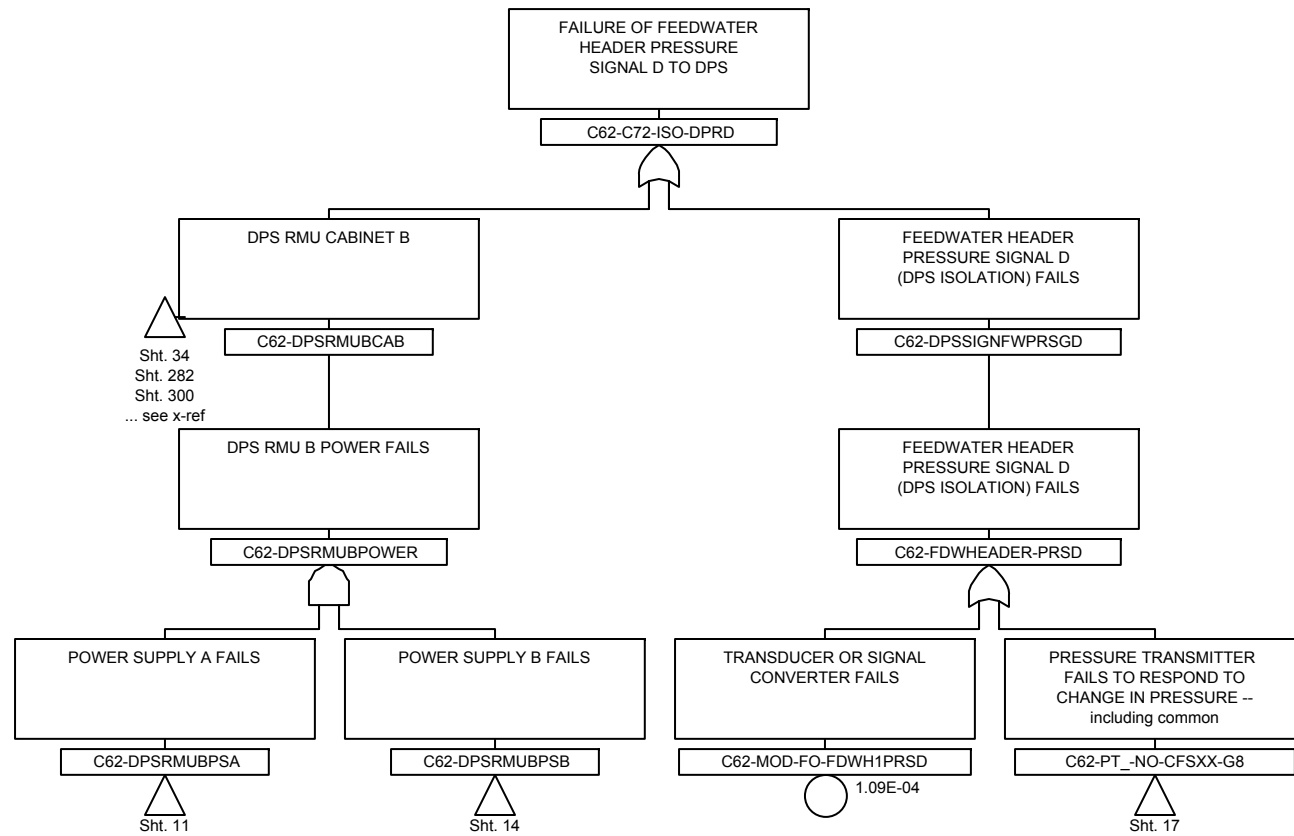


Figure 4.5-3a. Sheet 10 N-DCIS Non Safety Control System

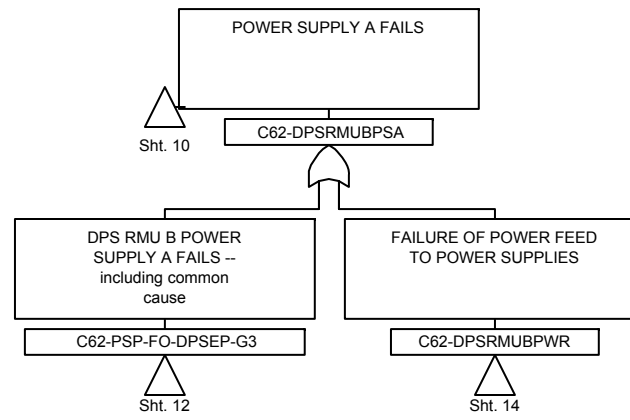


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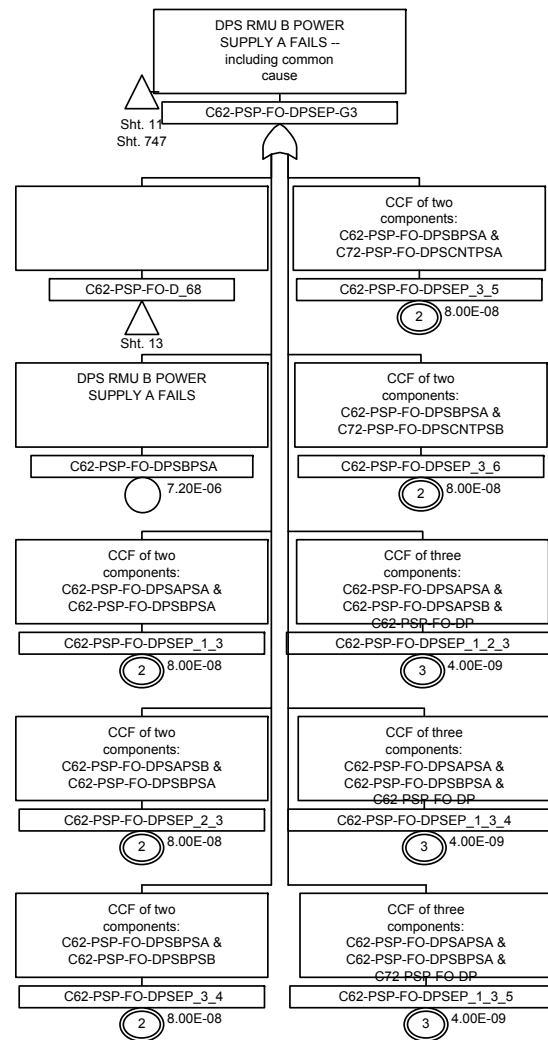


Figure 4.5-3a. Sheet 12 N-DCIS Non Safety Control System



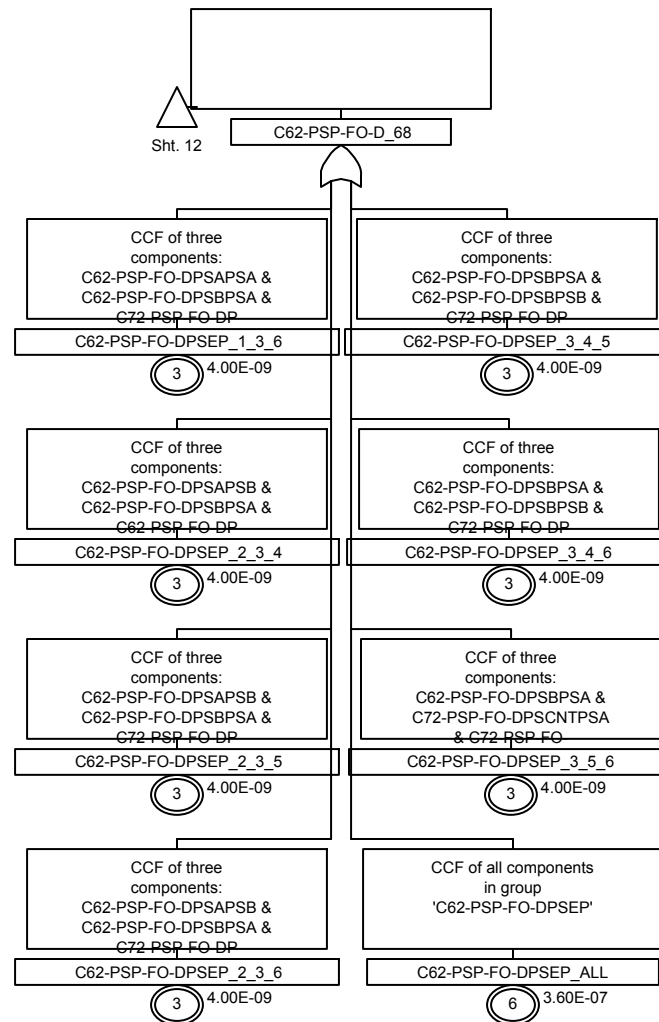


Figure 4.5-3a. Sheet 13 N-DCIS Non Safety Control System

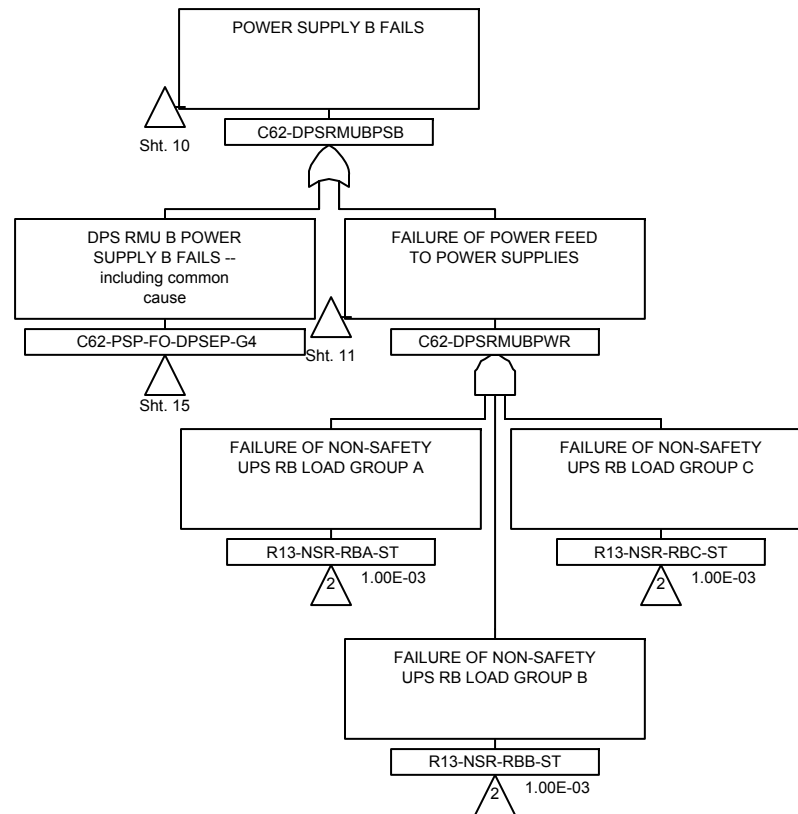


Figure 4.5-3a. Sheet 14 N-DCIS Non Safety Control System

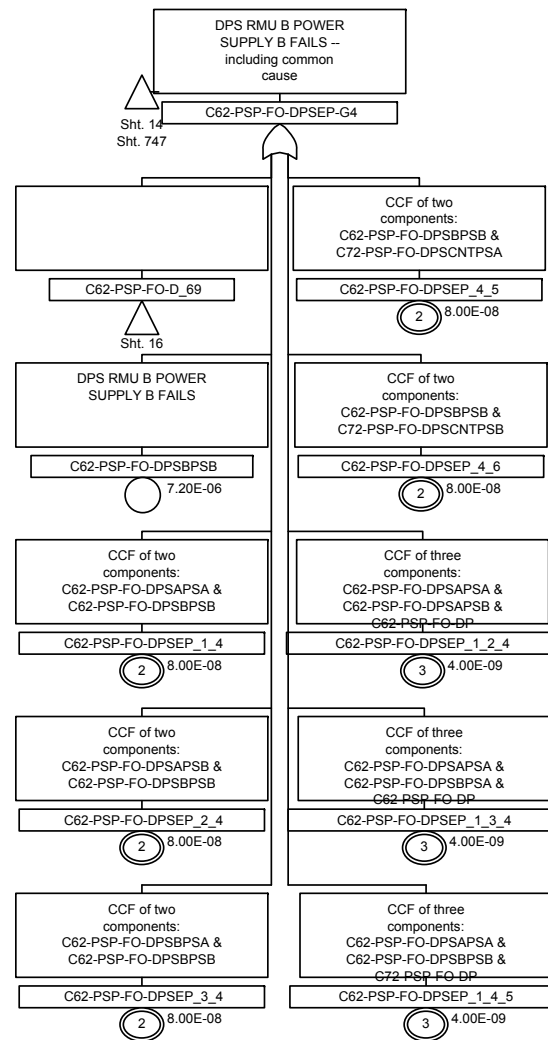


Figure 4.5-3a. Sheet 15 N-DCIS Non Safety Control System

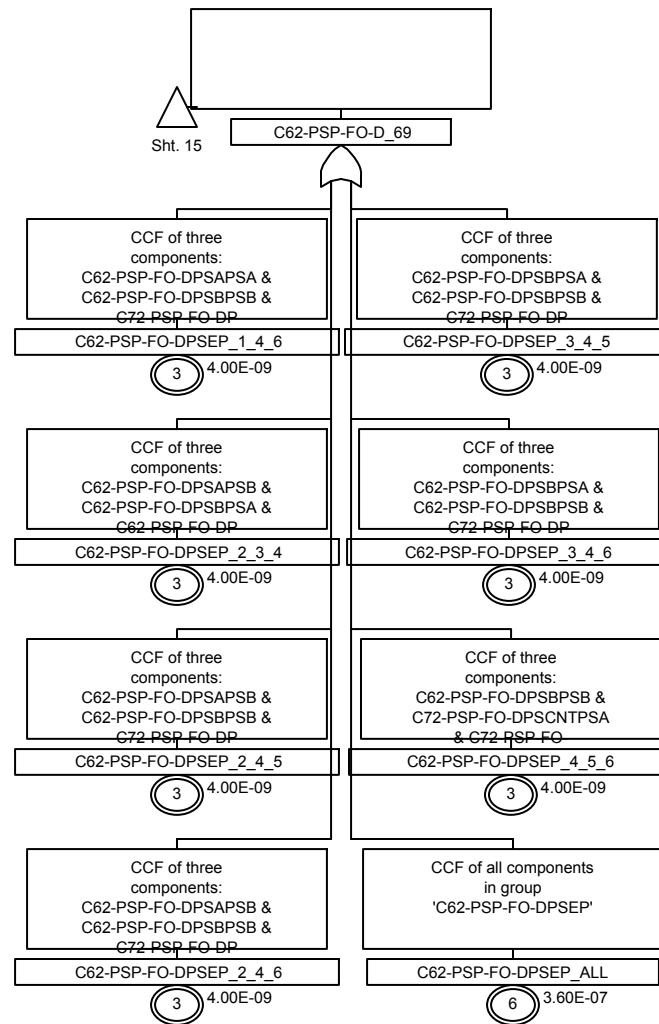


Figure 4.5-3a. Sheet 16 N-DCIS Non Safety Control System

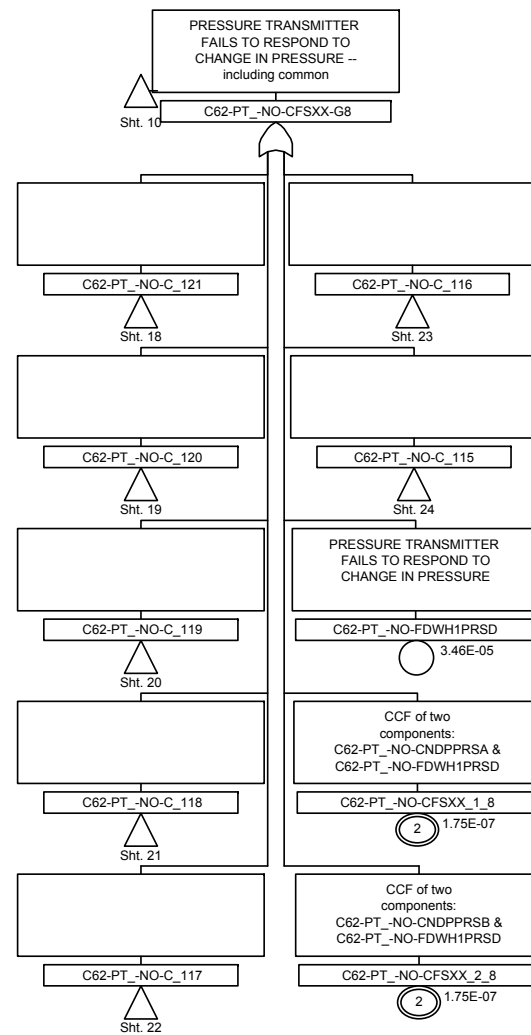


Figure 4.5-3a. Sheet 17 N-DCIS Non Safety Control System

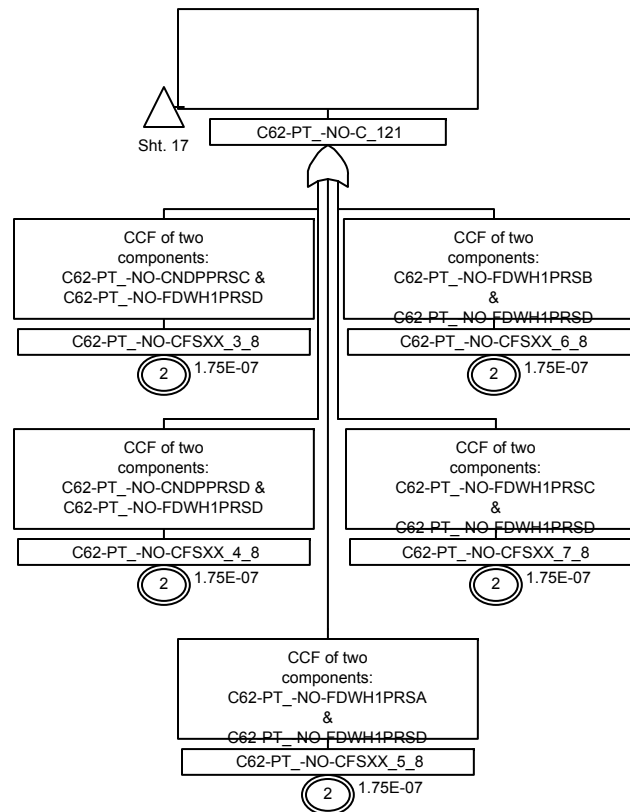


Figure 4.5-3a. Sheet 18 N-DCIS Non Safety Control System

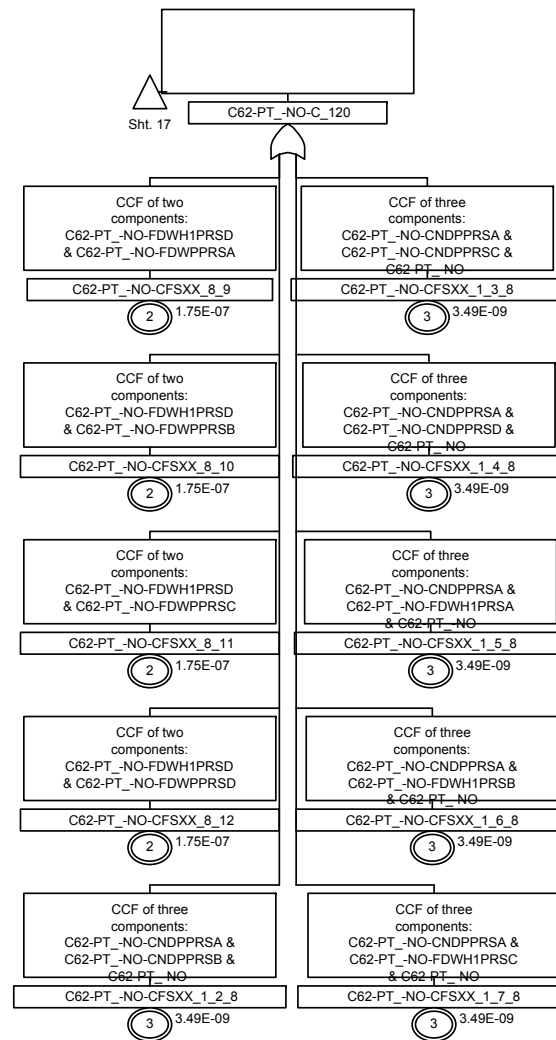


Figure 4.5-3a. Sheet 19 N-DCIS Non Safety Control System

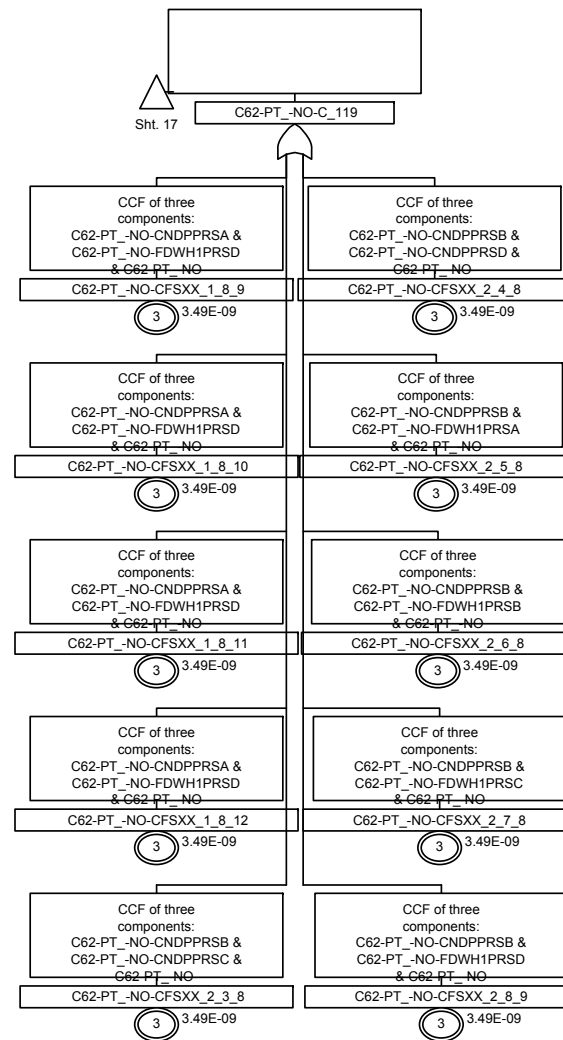


Figure 4.5-3a. Sheet 20 N-DCIS Non Safety Control System



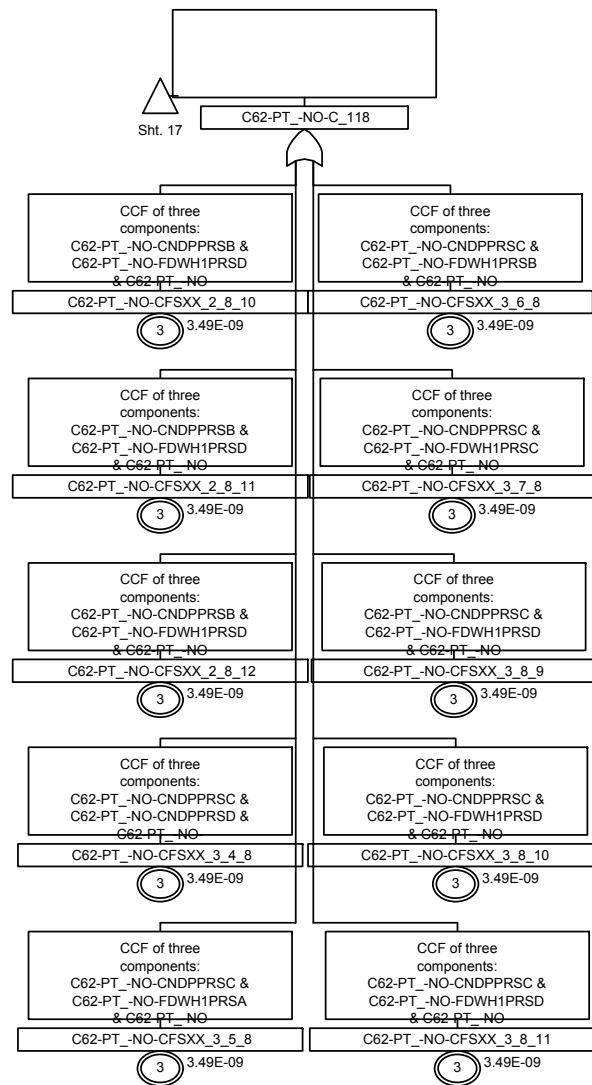


Figure 4.5-3a. Sheet 21 N-DCIS Non Safety Control System

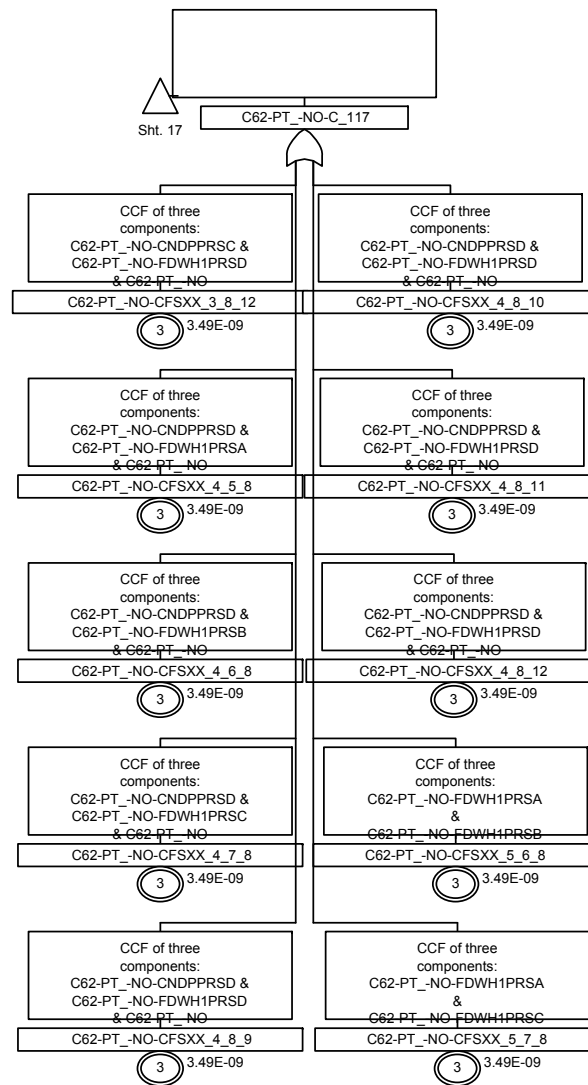


Figure 4.5-3a. Sheet 22 N-DCIS Non Safety Control System

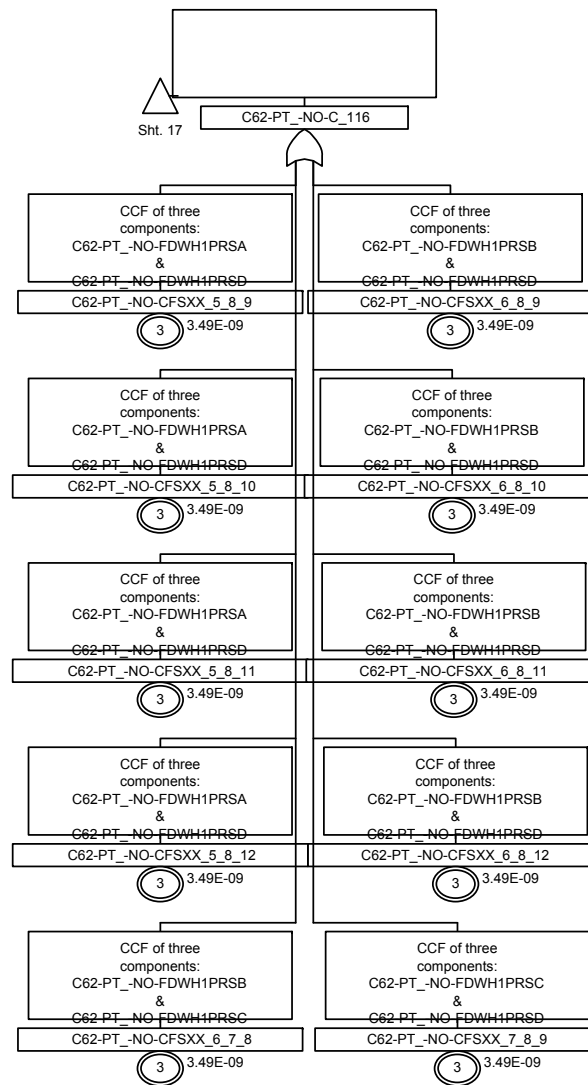


Figure 4.5-3a. Sheet 23 N-DCIS Non Safety Control System

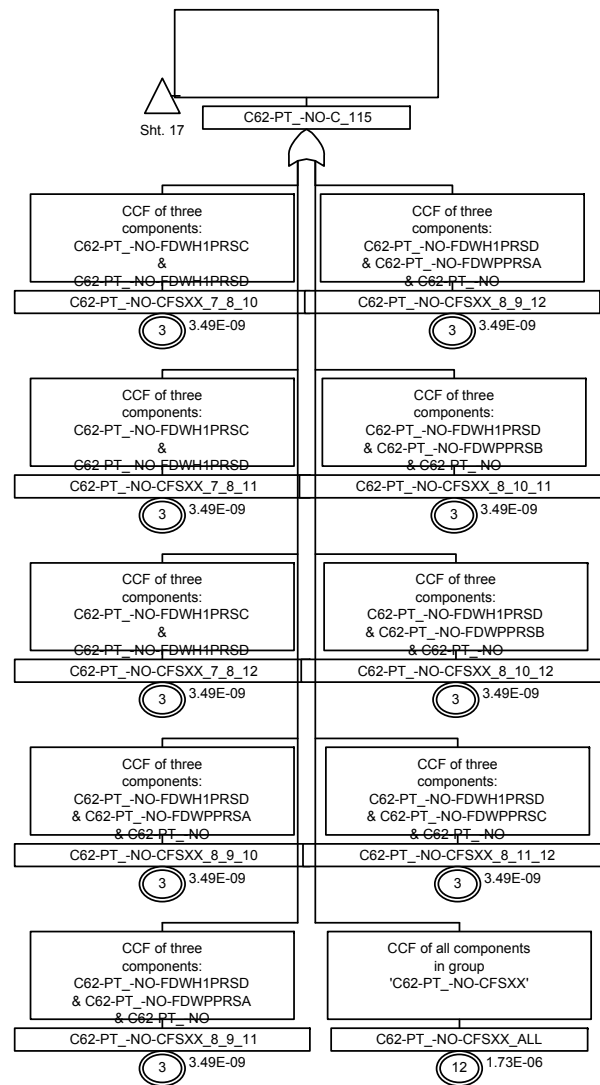


Figure 4.5-3a. Sheet 24 N-DCIS Non Safety Control System

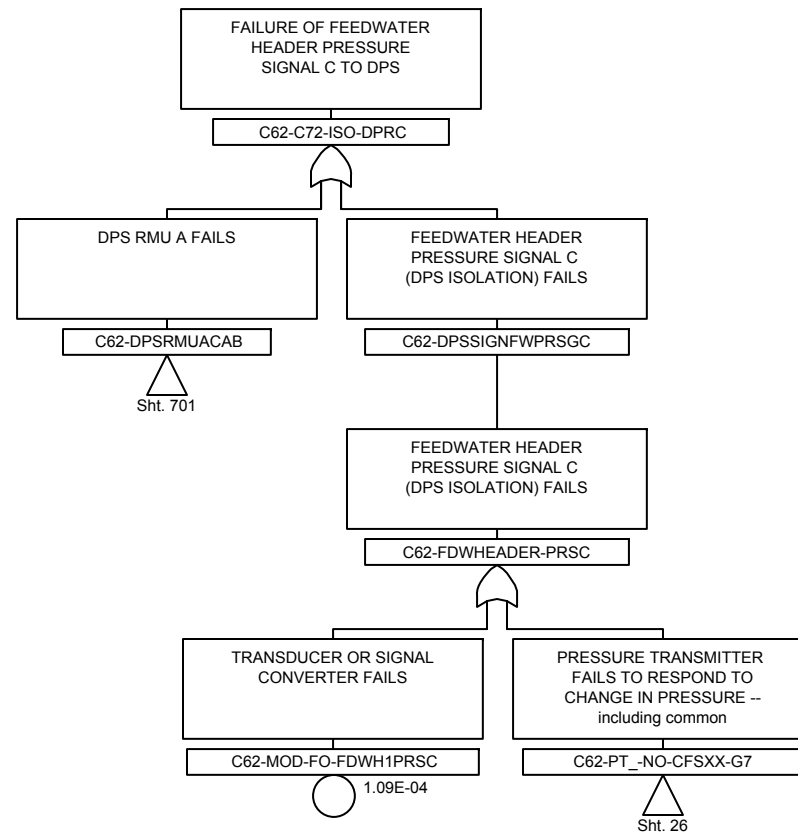


Figure 4.5-3a. Sheet 25 N-DCIS Non Safety Control System

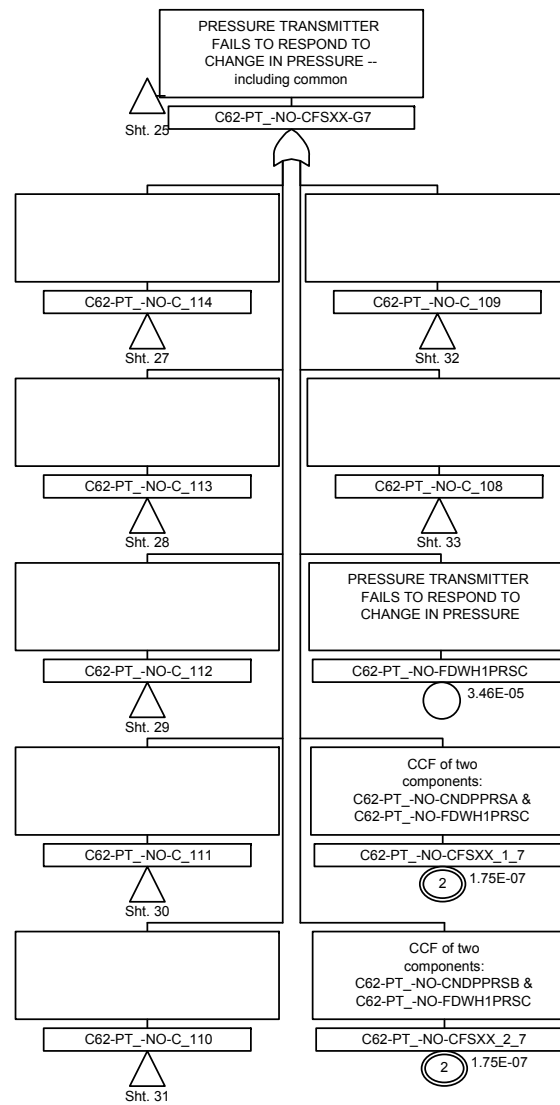


Figure 4.5-3a. Sheet 26 N-DCIS Non Safety Control System

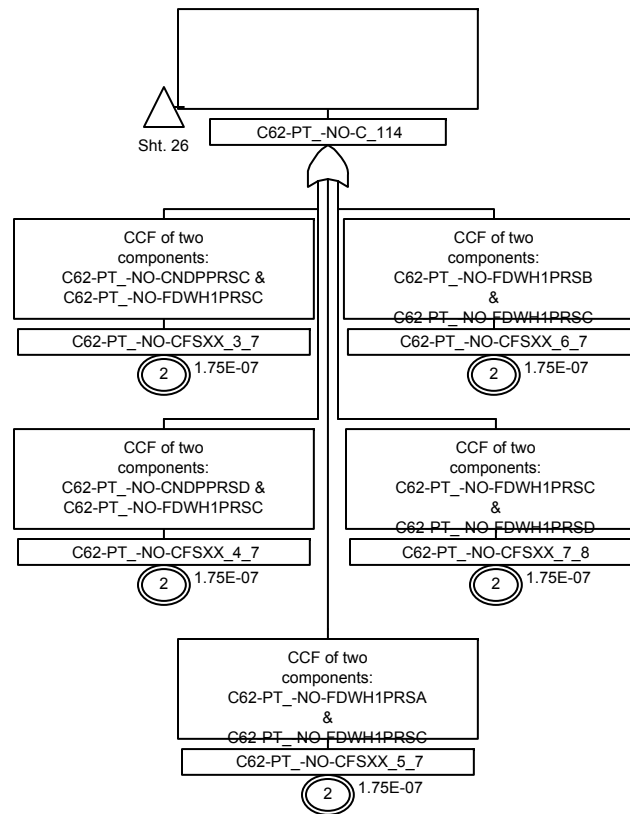


Figure 4.5-3a. Sheet 27 N-DCIS Non Safety Control System

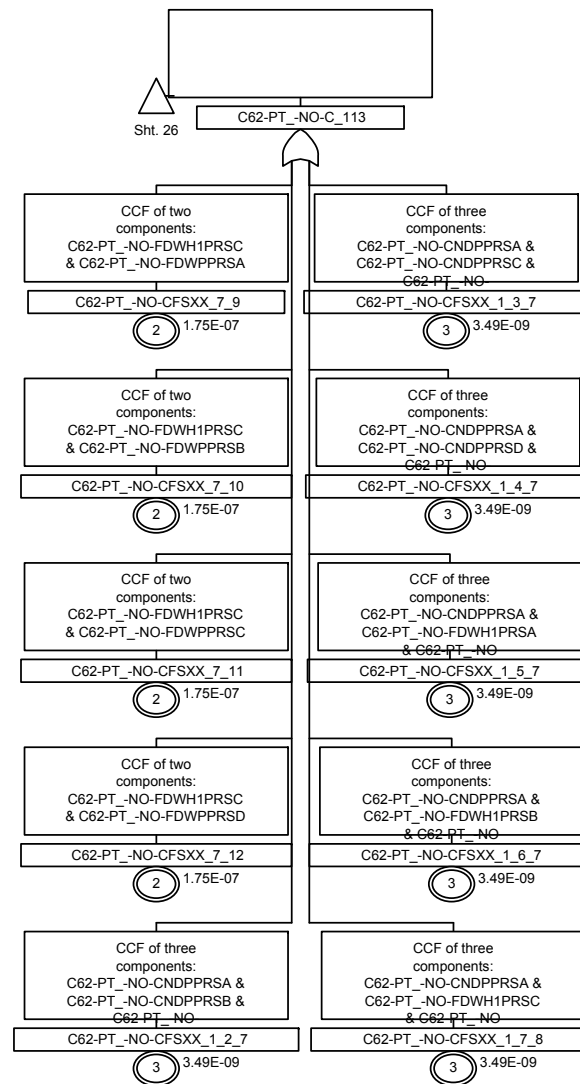


Figure 4.5-3a. Sheet 28 N-DCIS Non Safety Control System



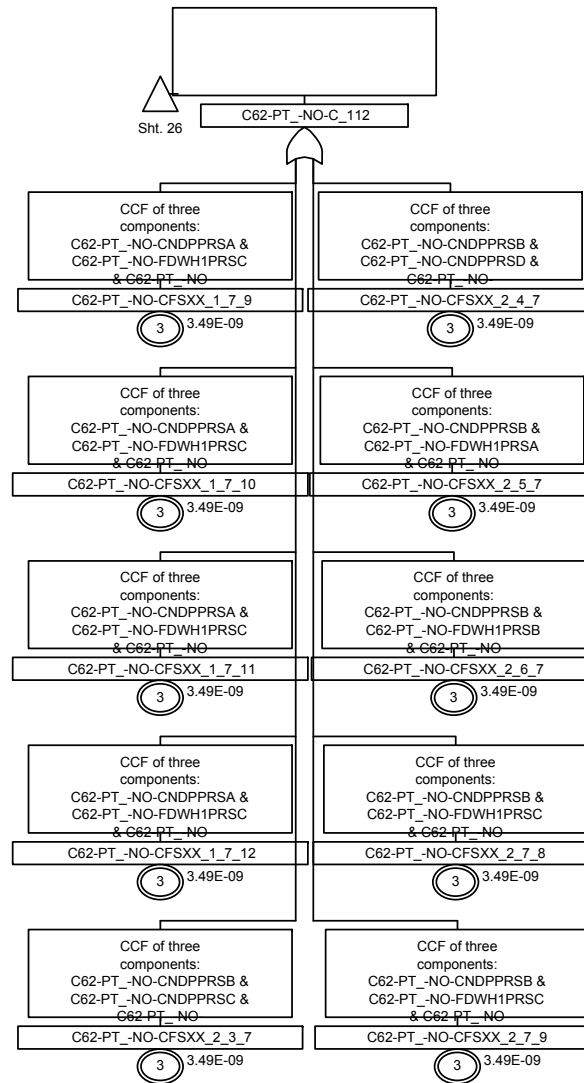


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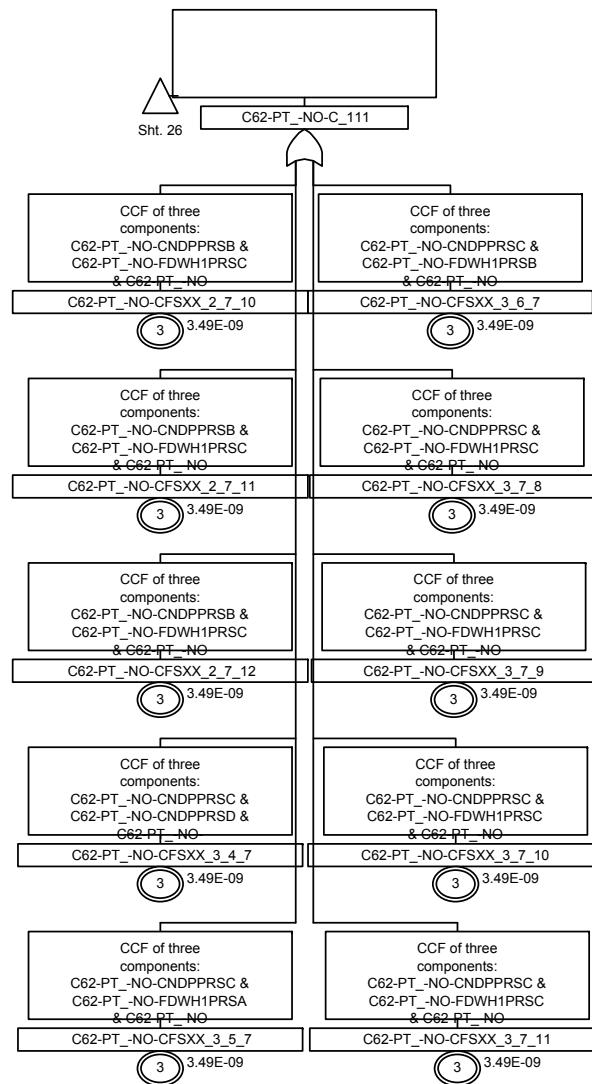


Figure 4.5-3a. Sheet 30 N-DCIS Non Safety Control System

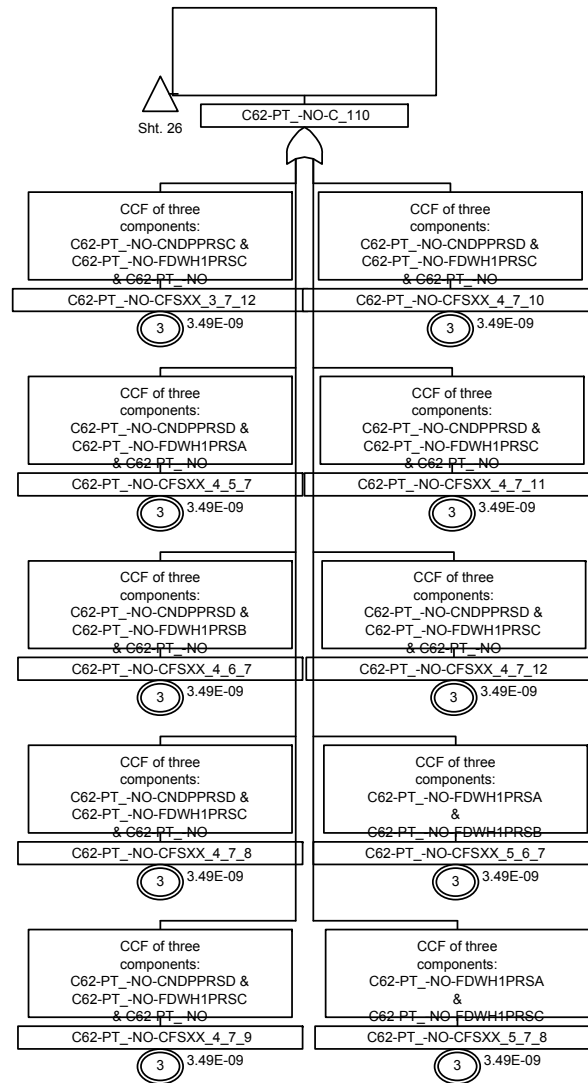


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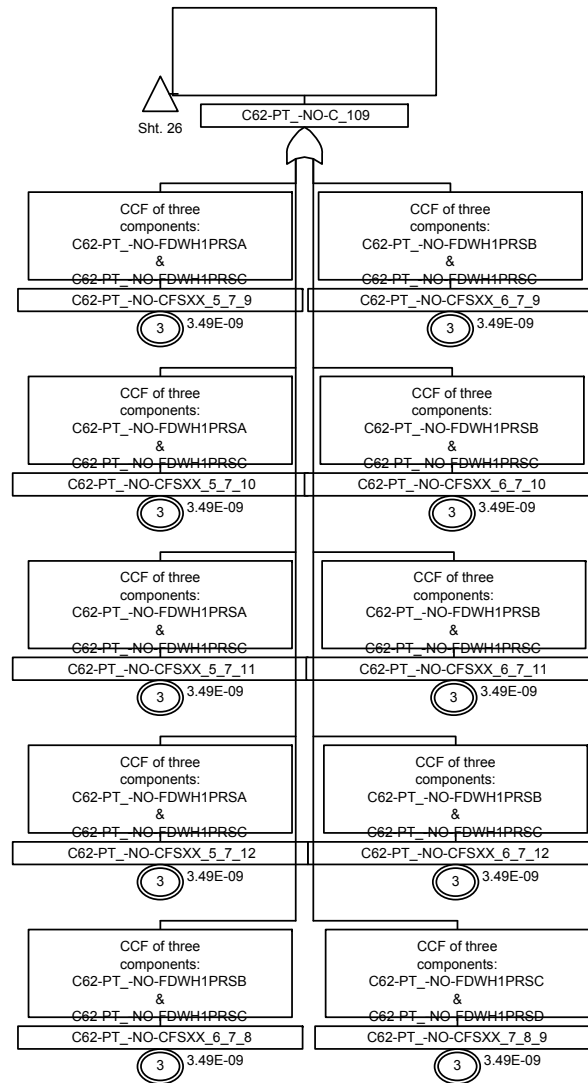


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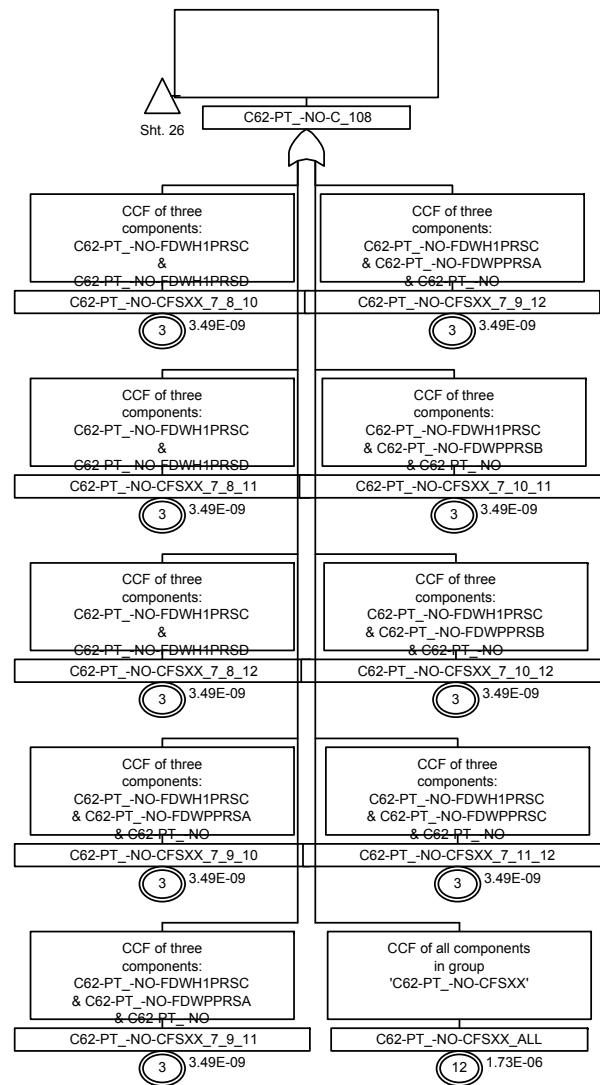


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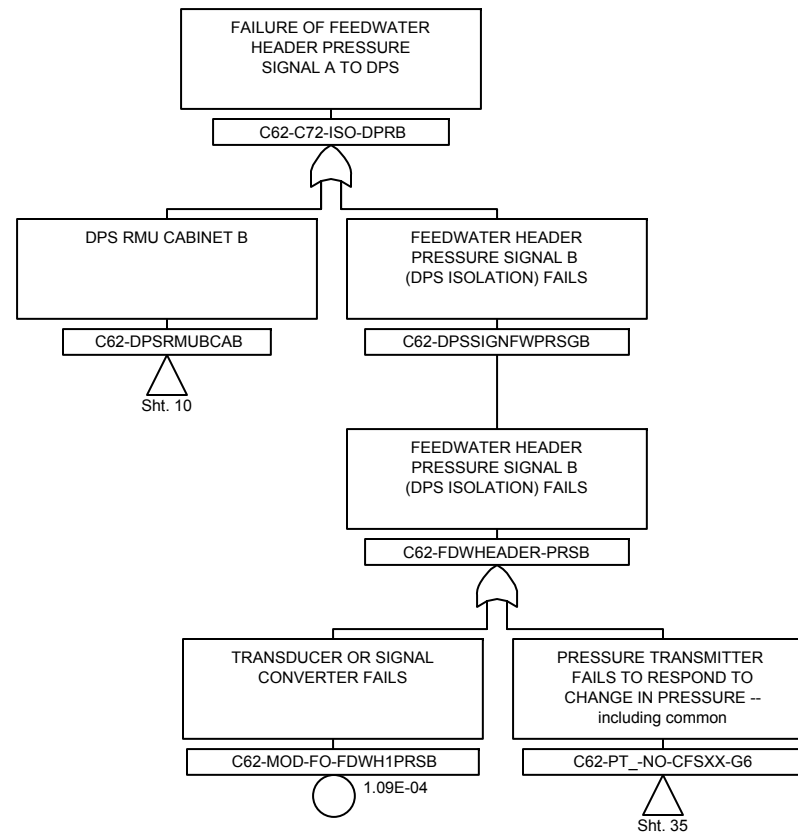


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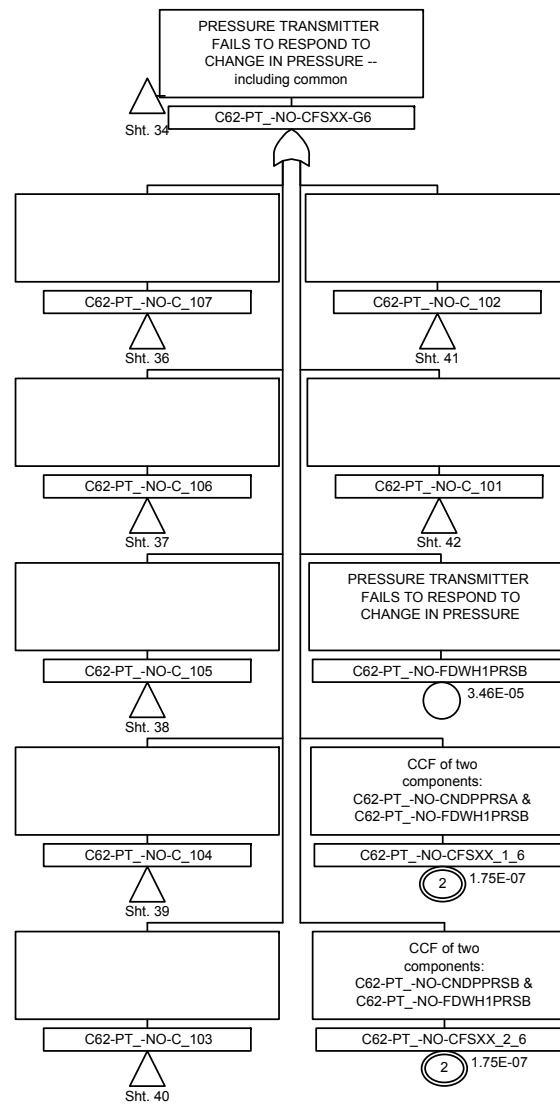


Figure 4.5-3a. Sheet 35 N-DCIS Non Safety Control System

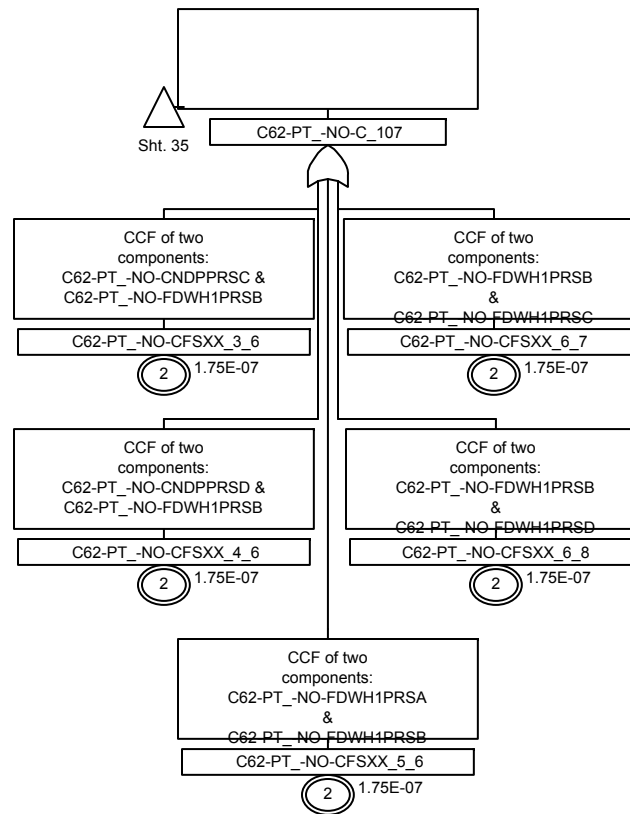


Figure 4.5-3a. Sheet 36 N-DCIS Non Safety Control System



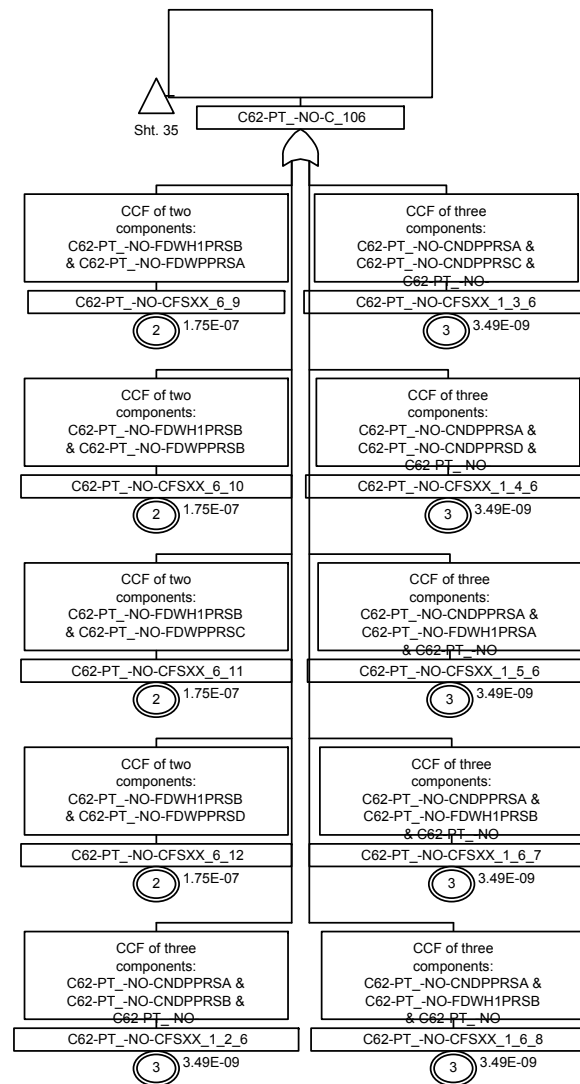


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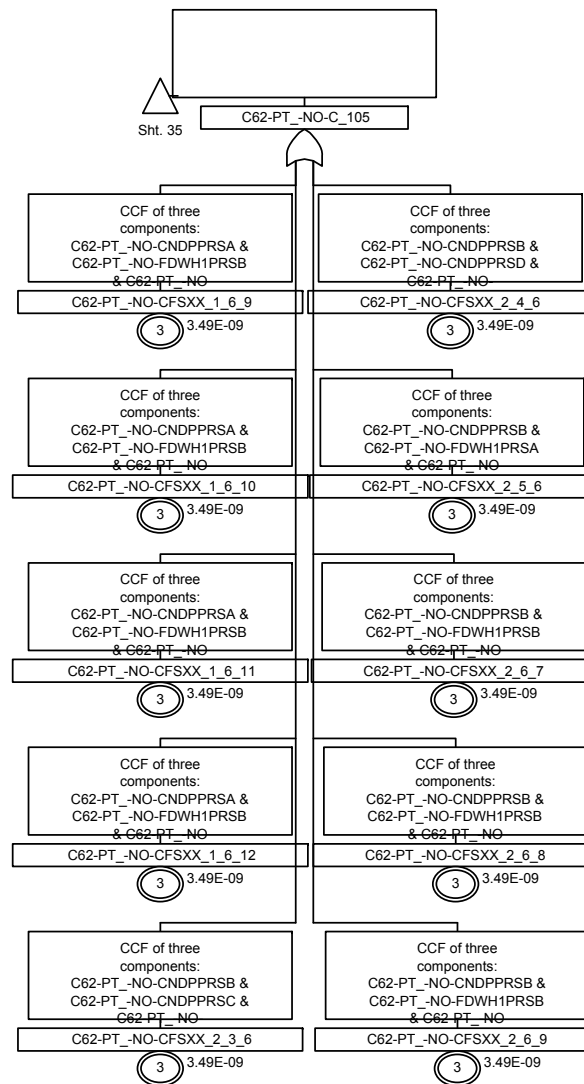


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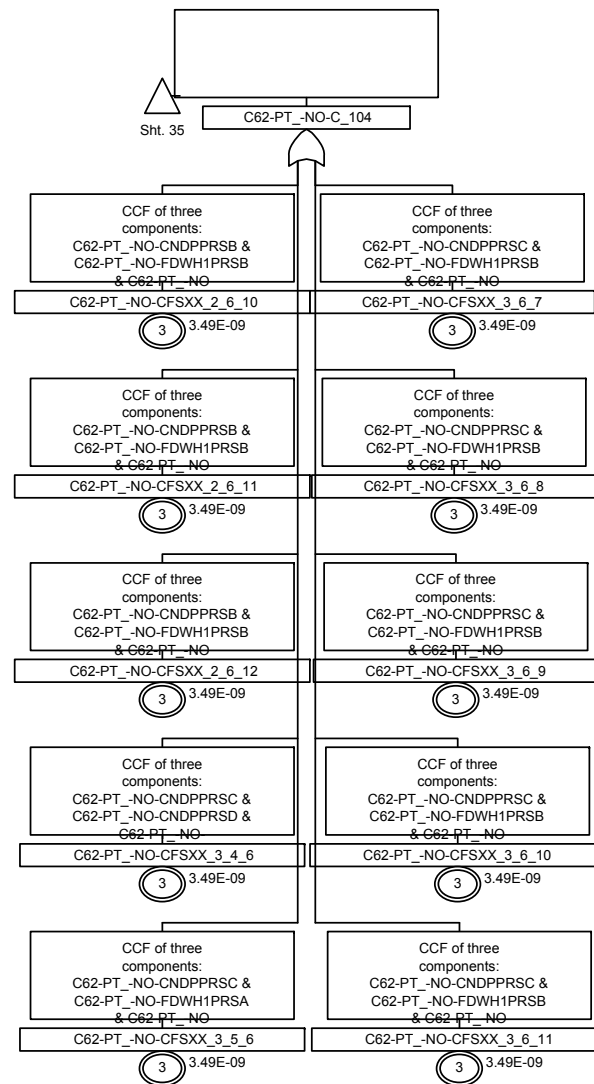


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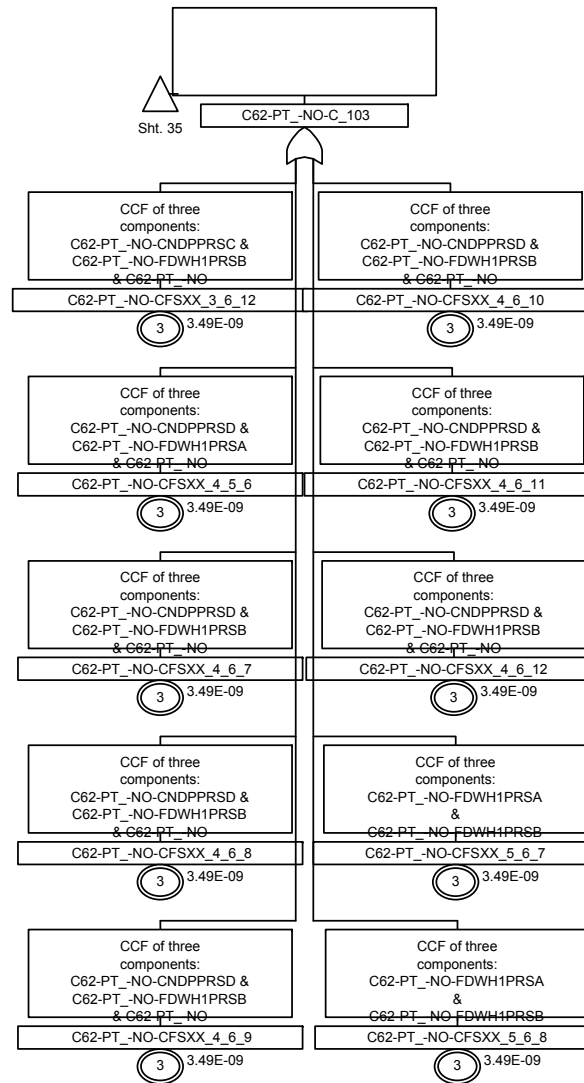


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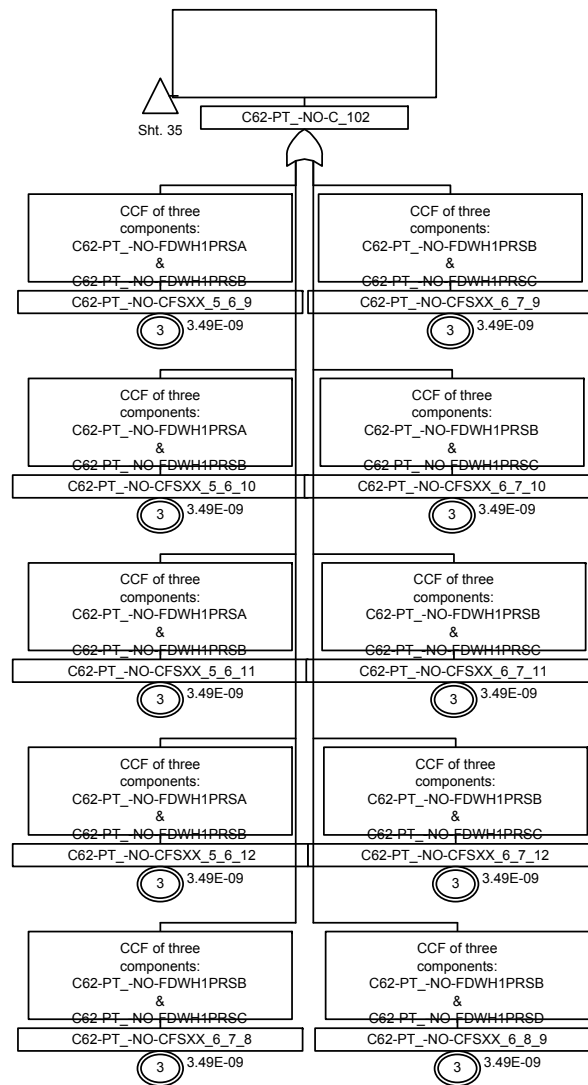


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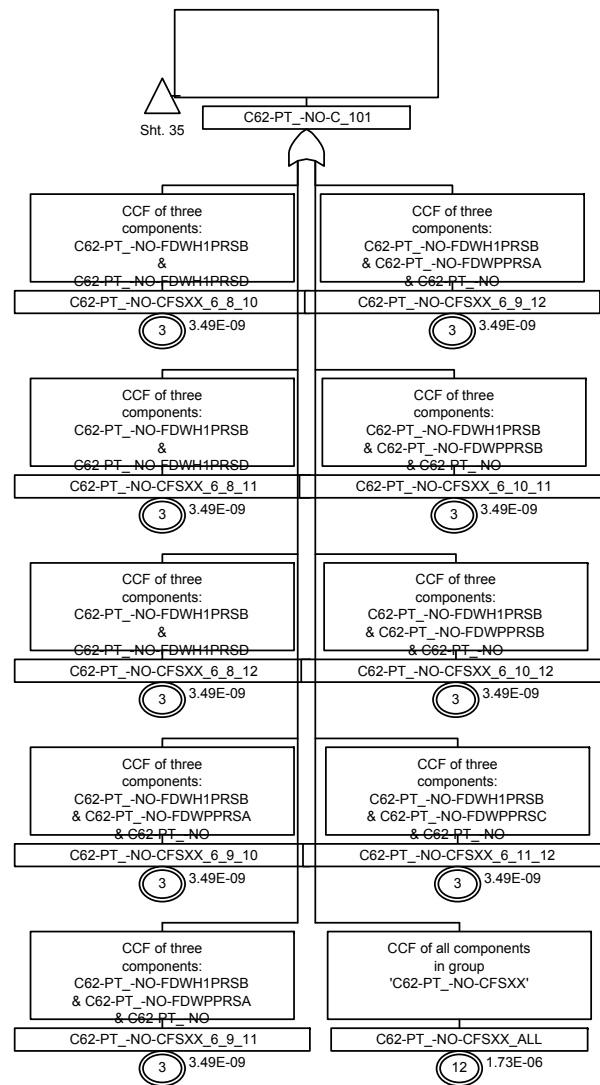


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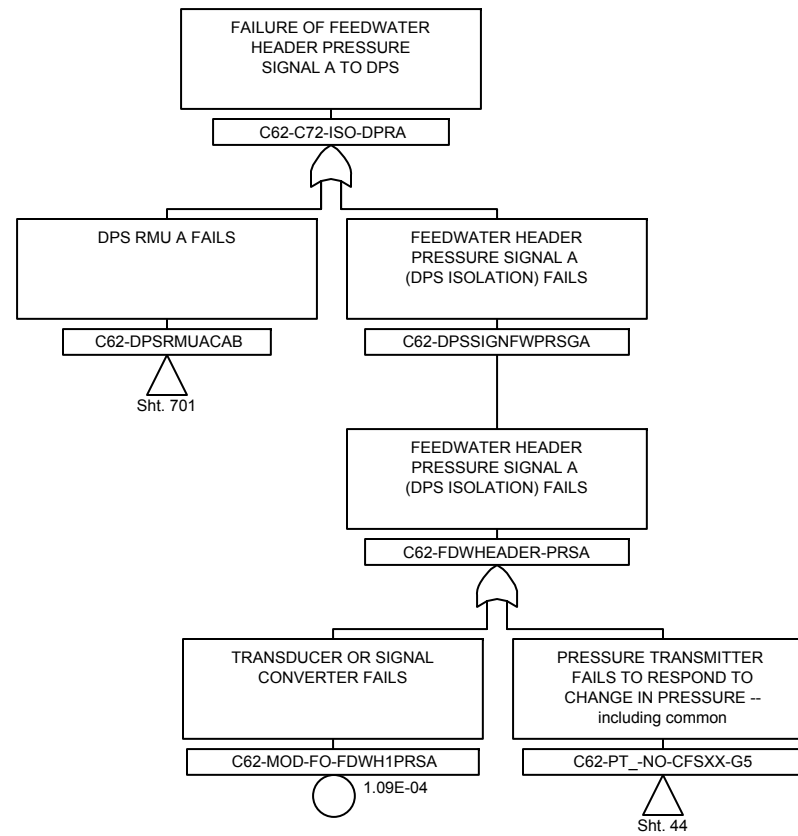


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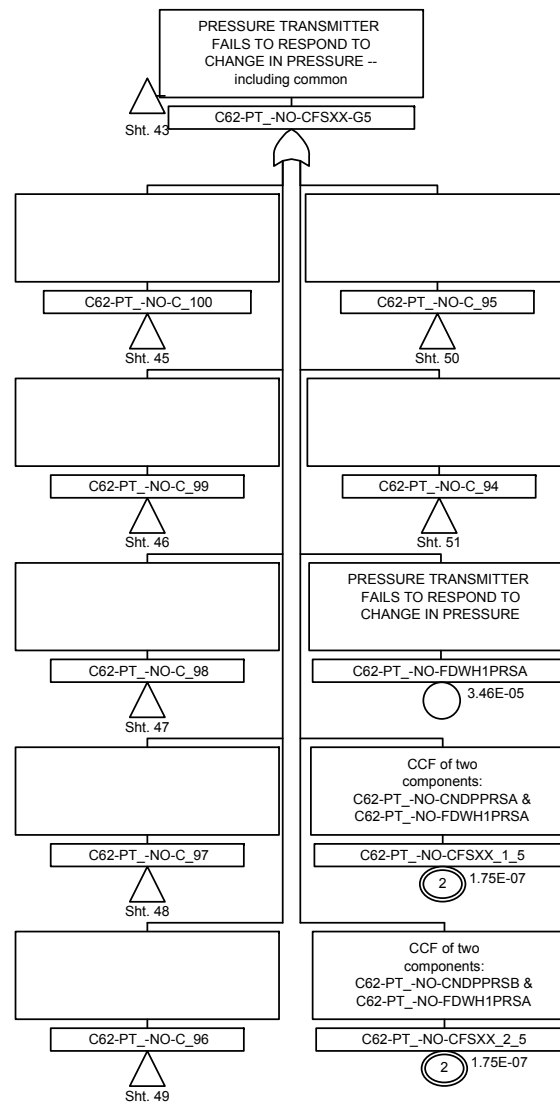


Figure 4.5-3a. Sheet 44 N-DCIS Non Safety Control System



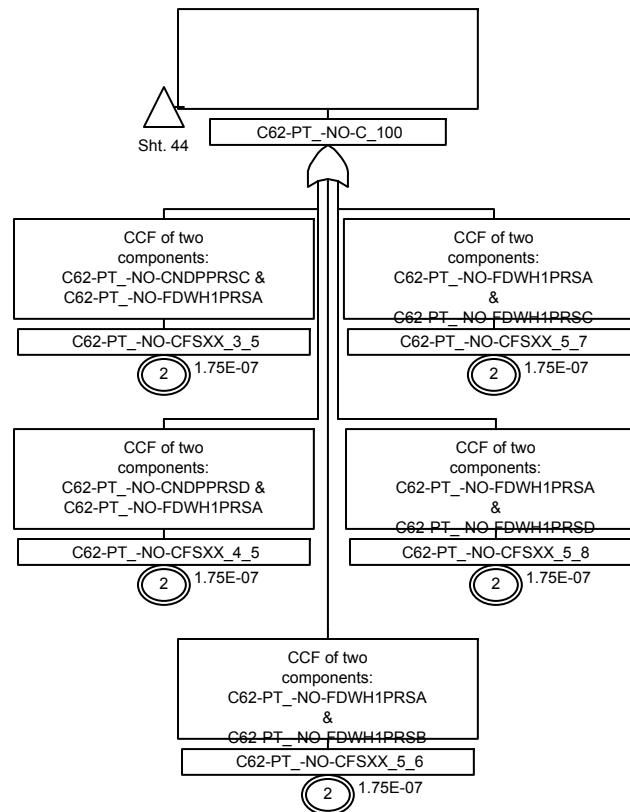


Figure 4.5-3a. Sheet 45 N-DCIS Non Safety Control System

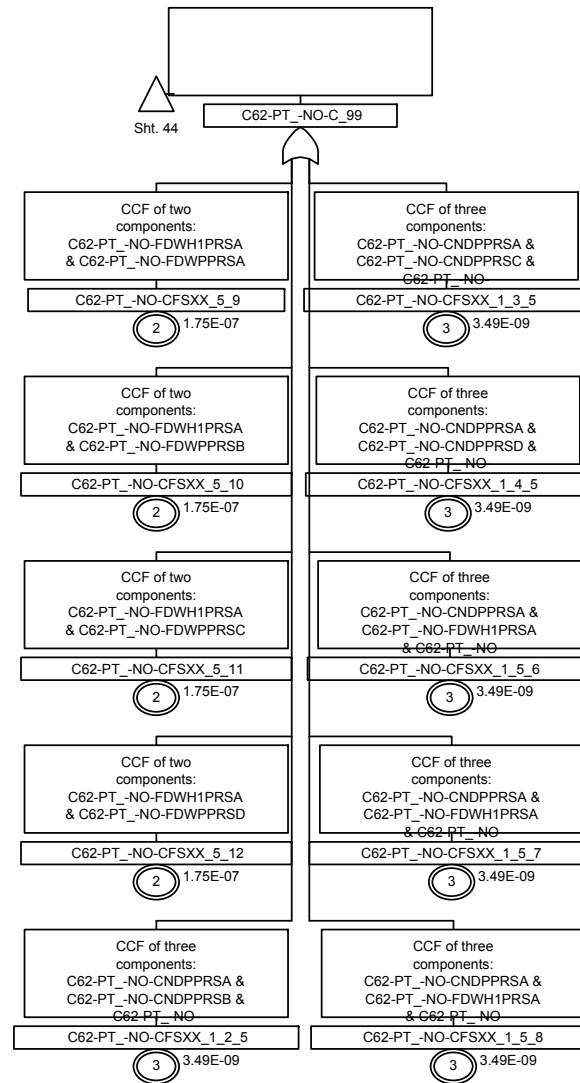


Figure 4.5-3a. Sheet 46 N-DCIS Non Safety Control System

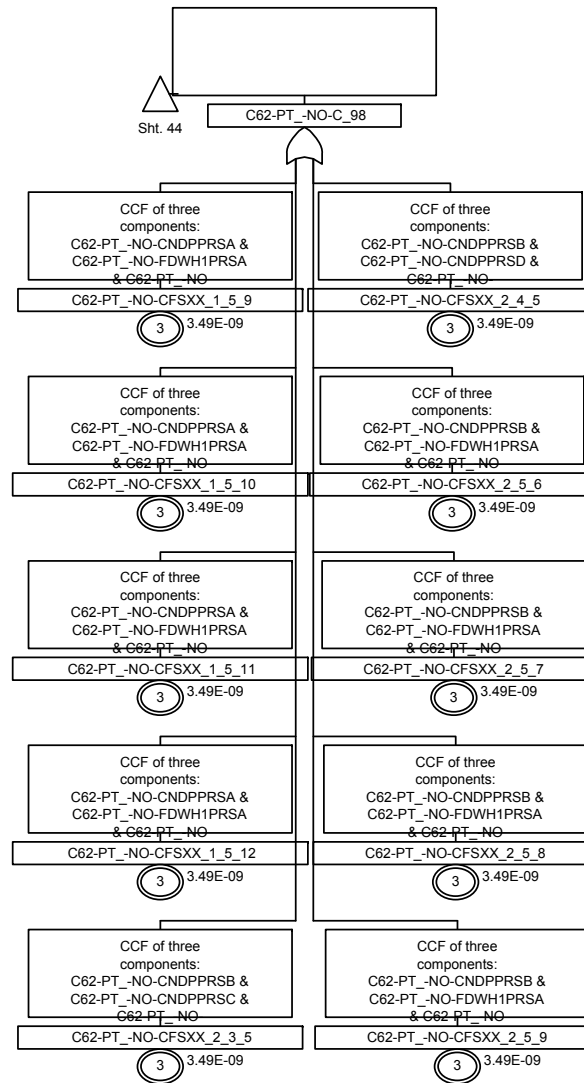


Figure 4.5-3a. Sheet 47 N-DCIS Non Safety Control System

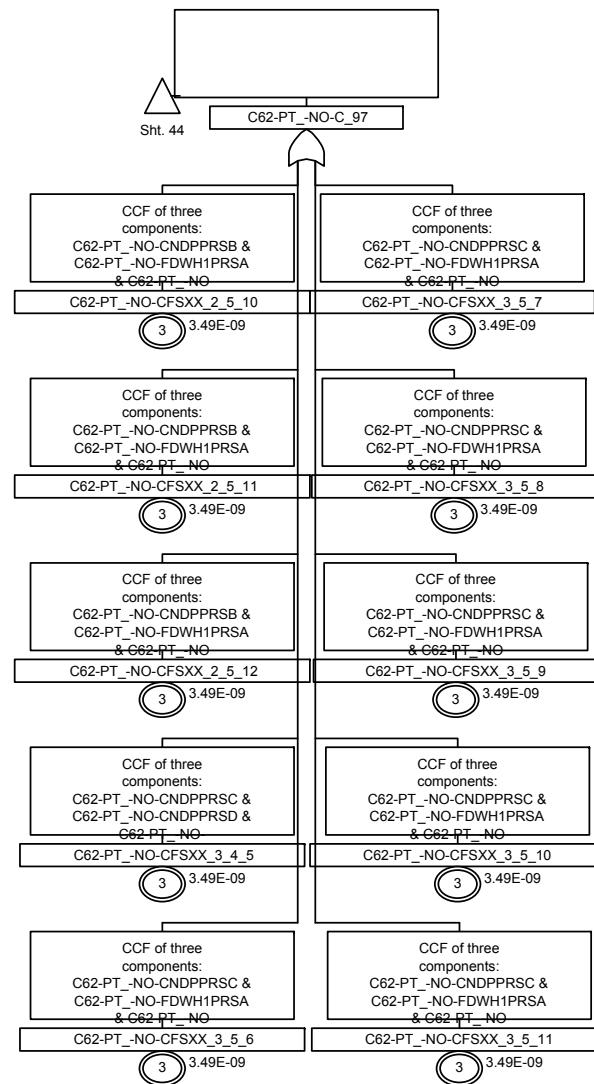


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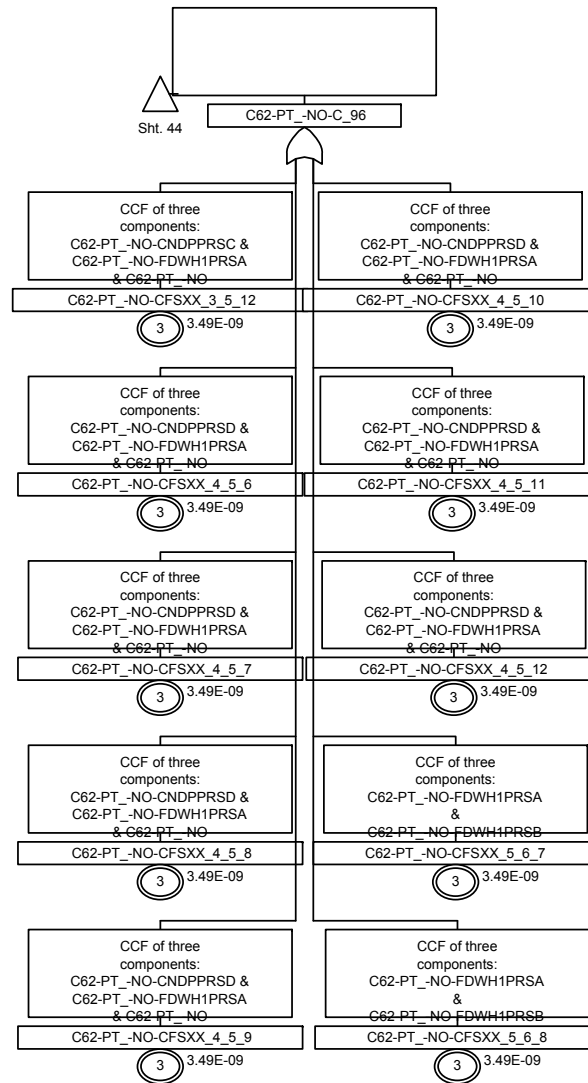


Figure 4.5-3a. Sheet 49 N-DCIS Non Safety Control System

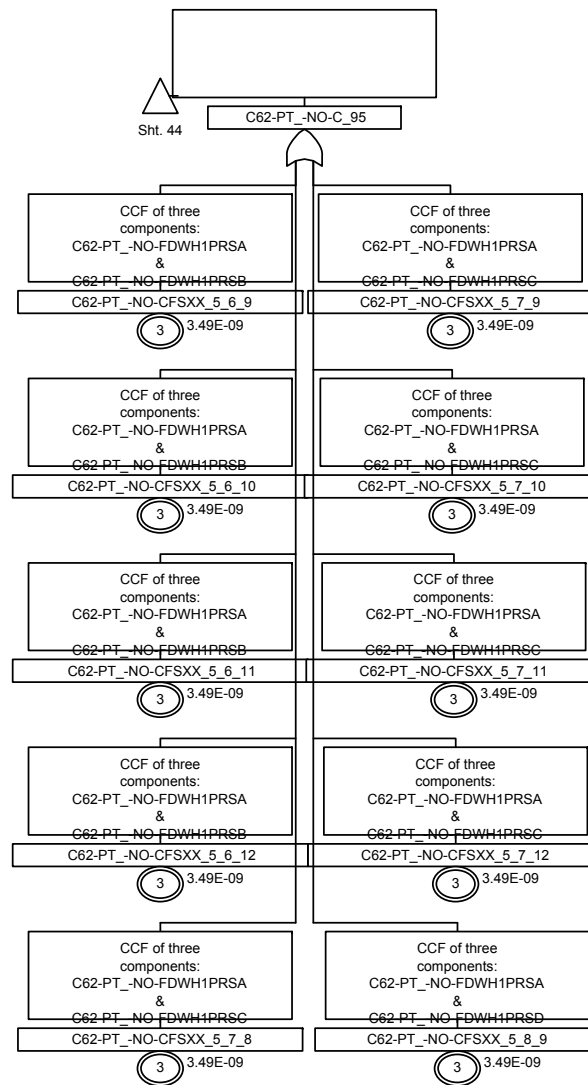


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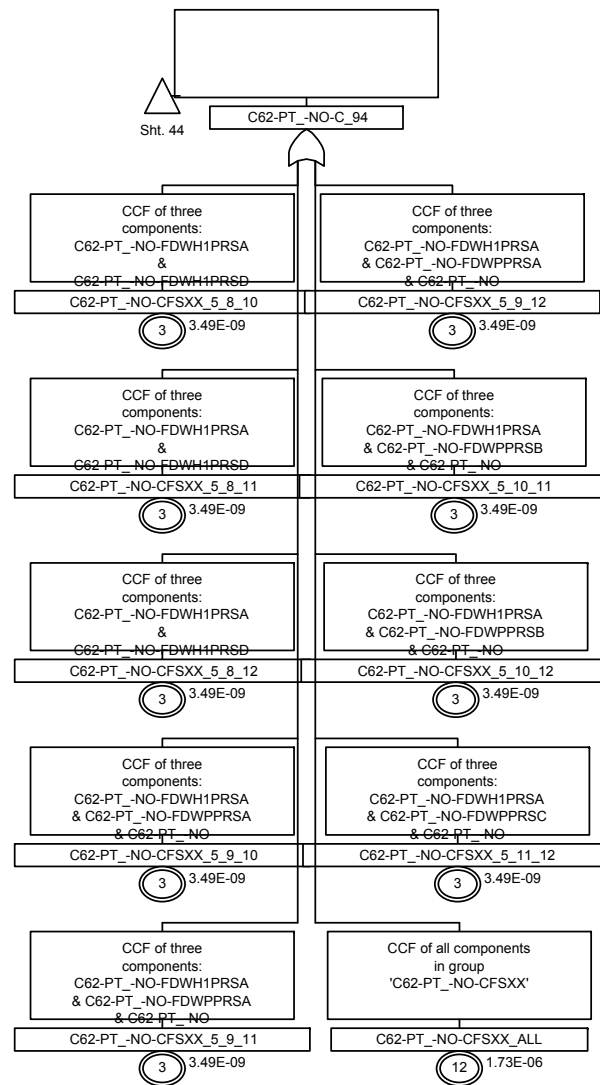


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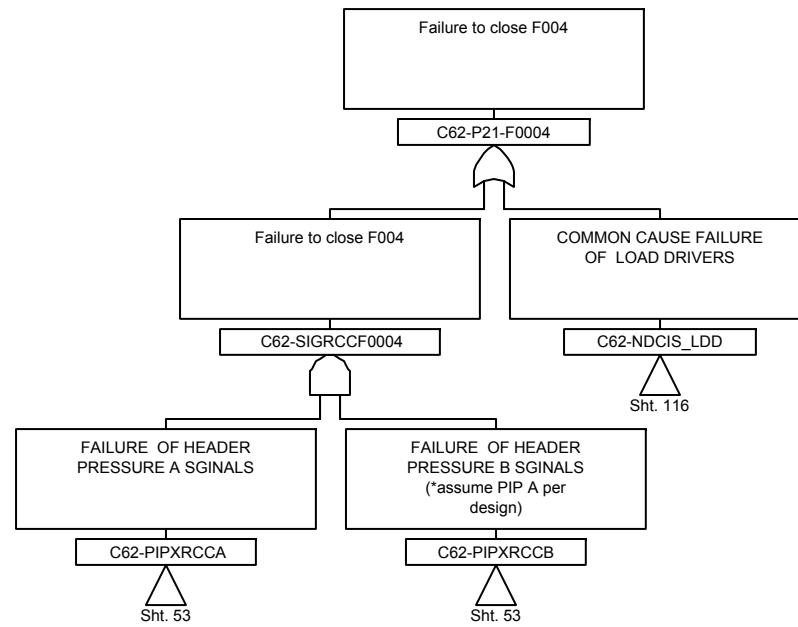


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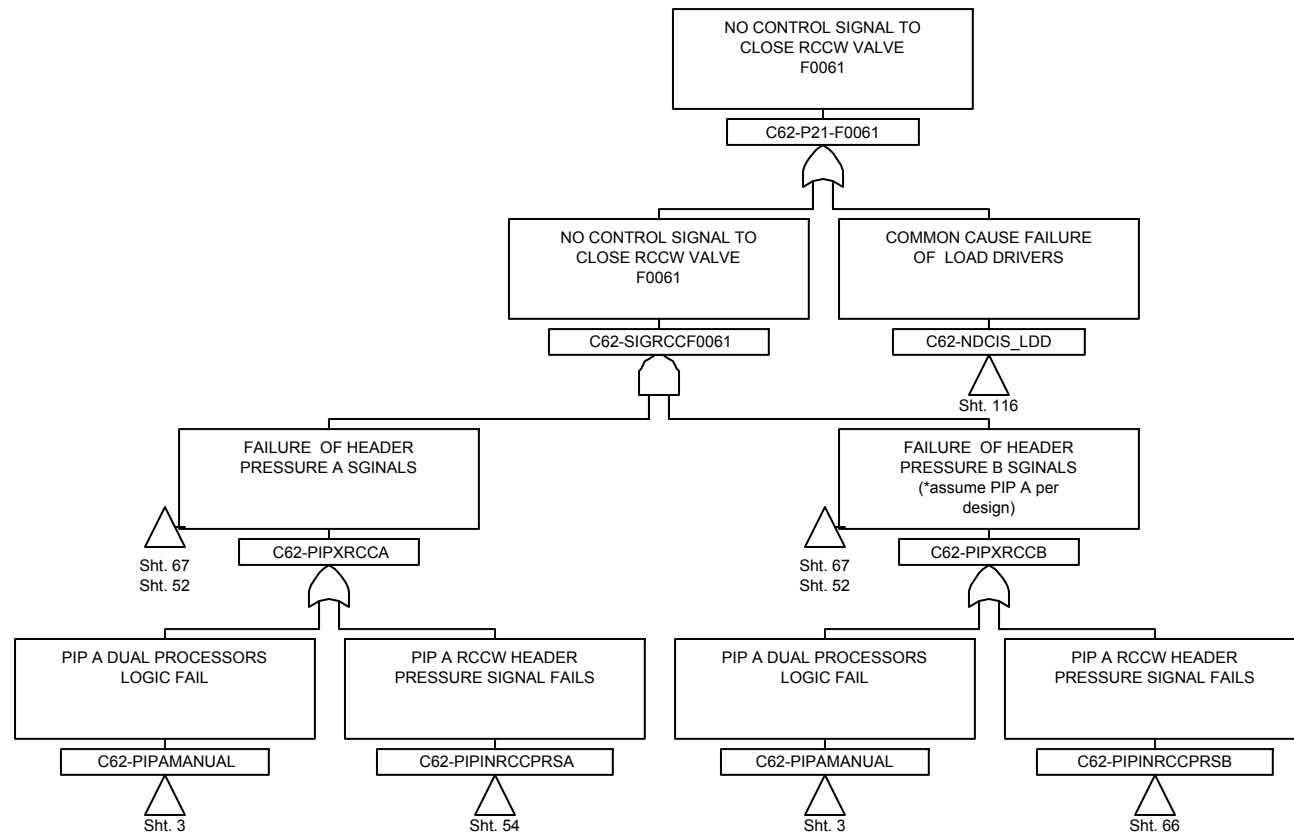


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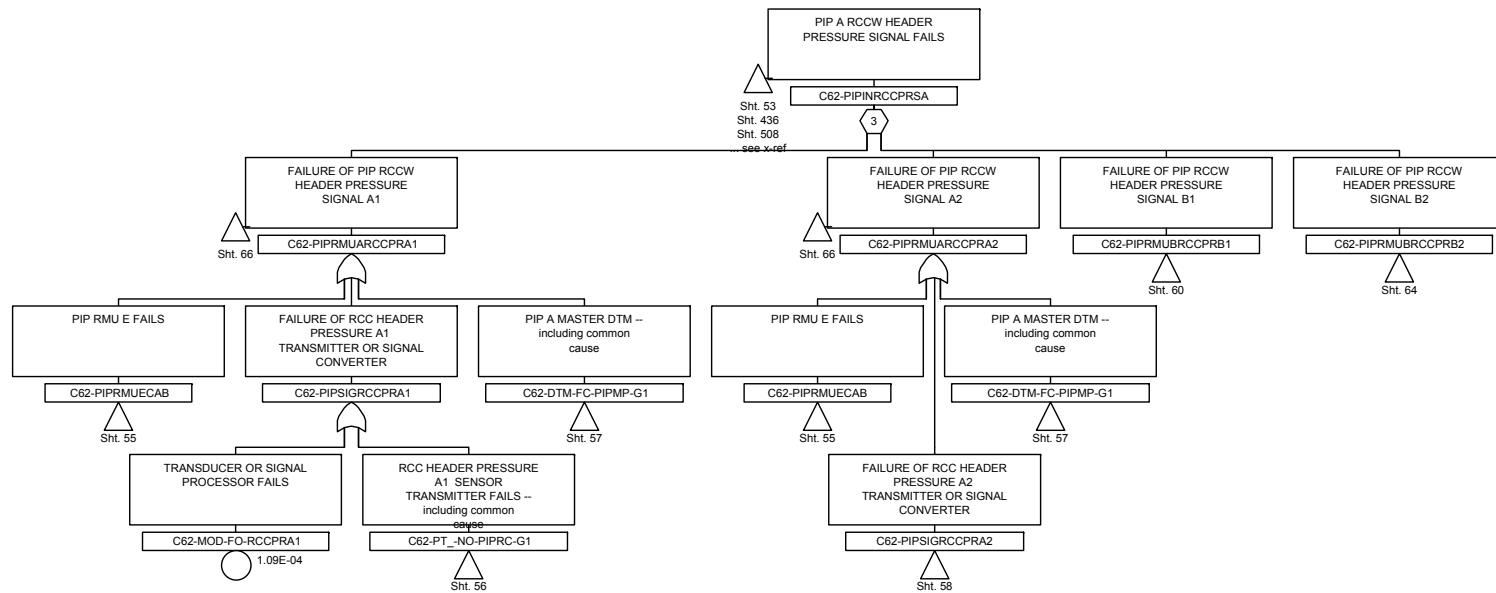


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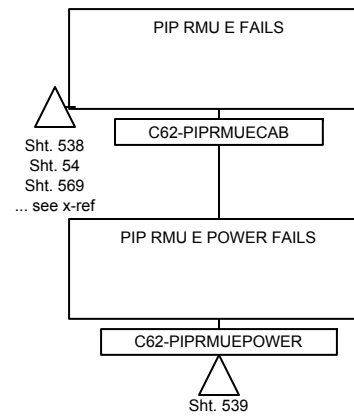


Figure 4.5-3a. Sheet 55 N-DCIS Non Safety Control System

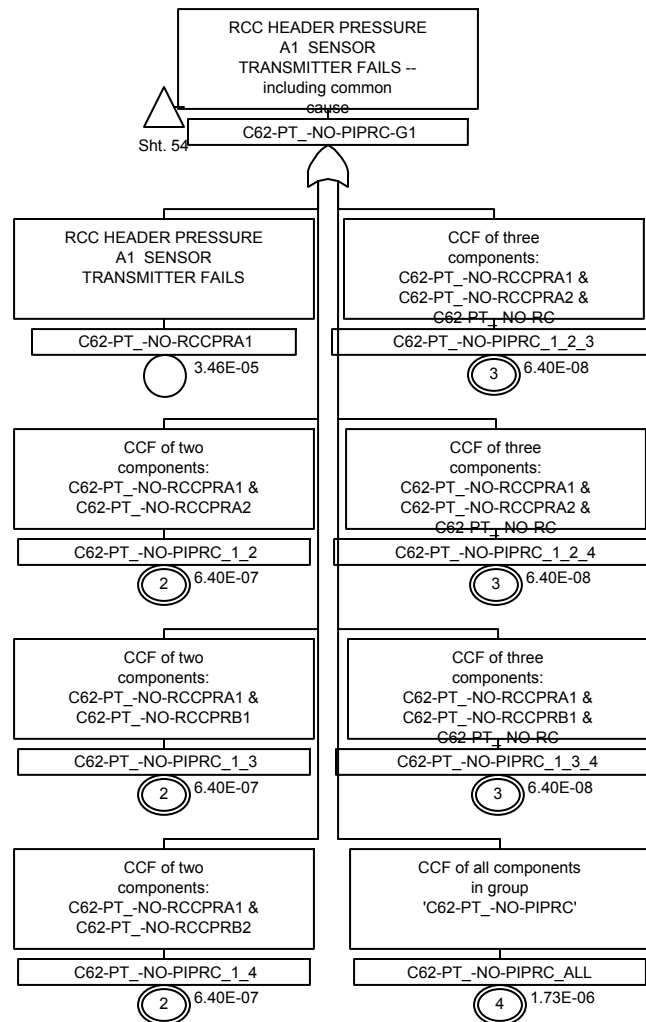


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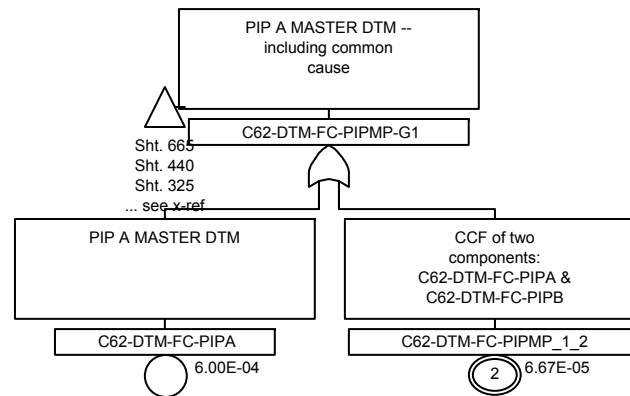


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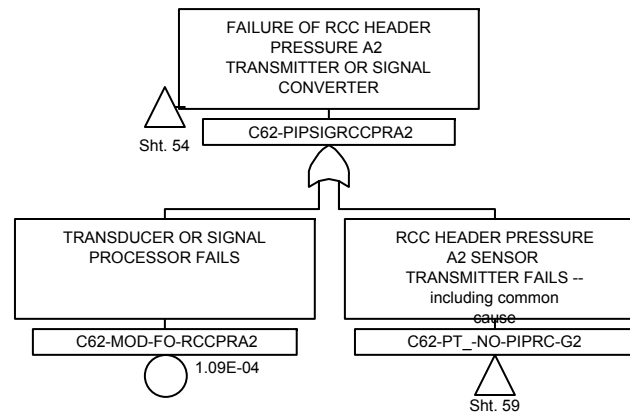


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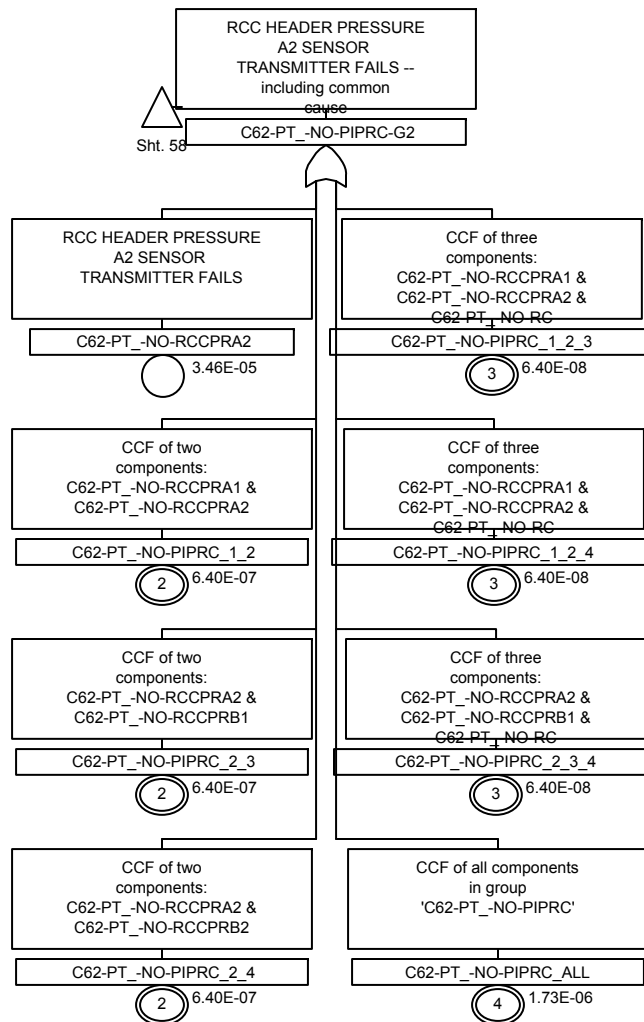


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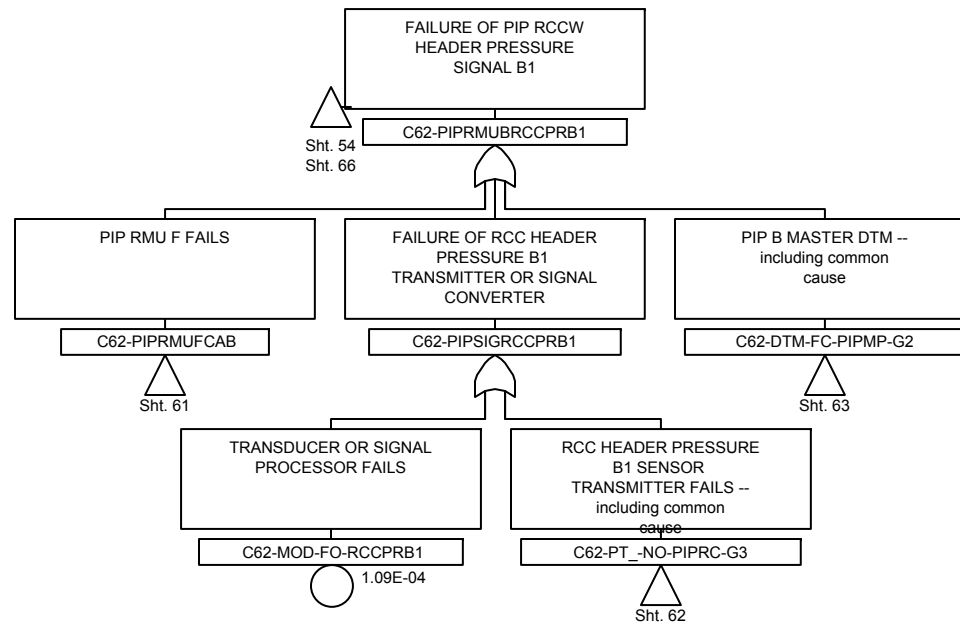


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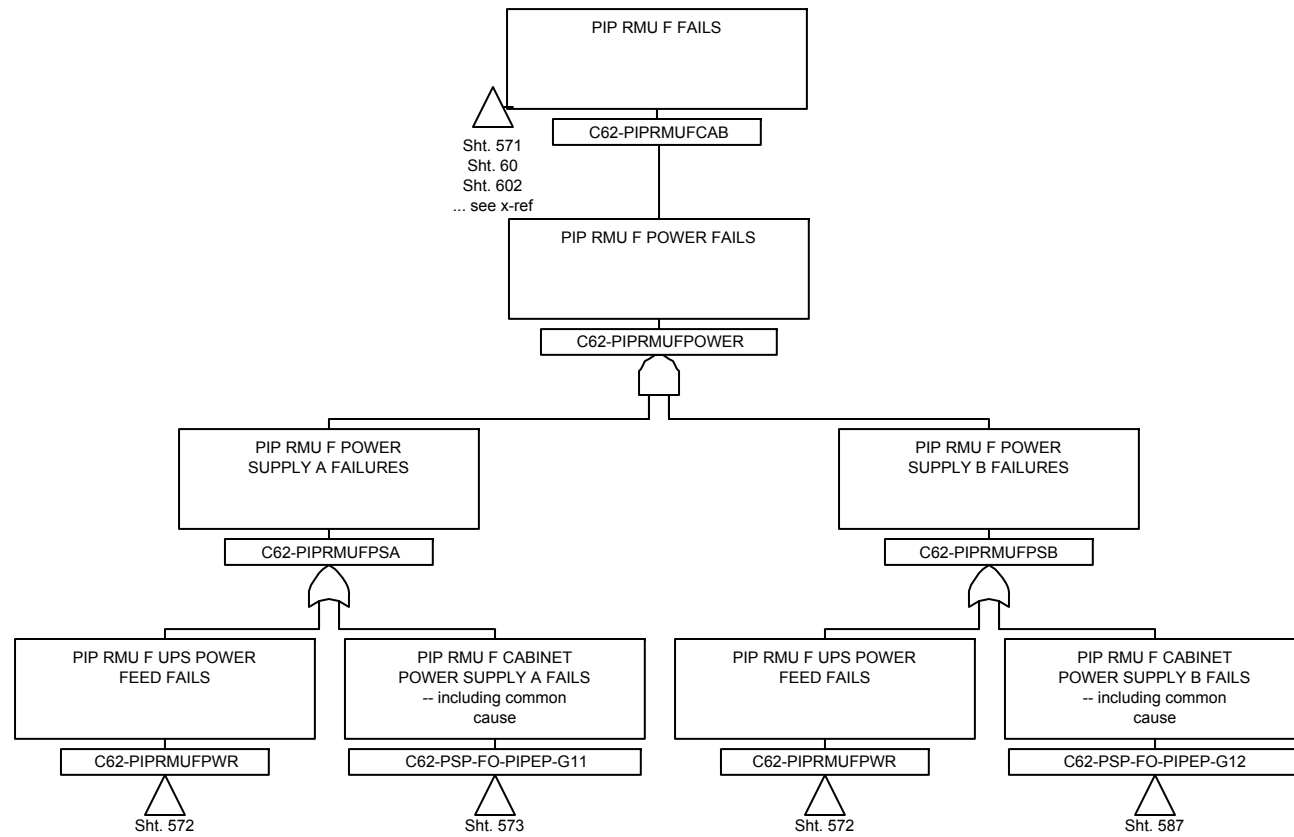


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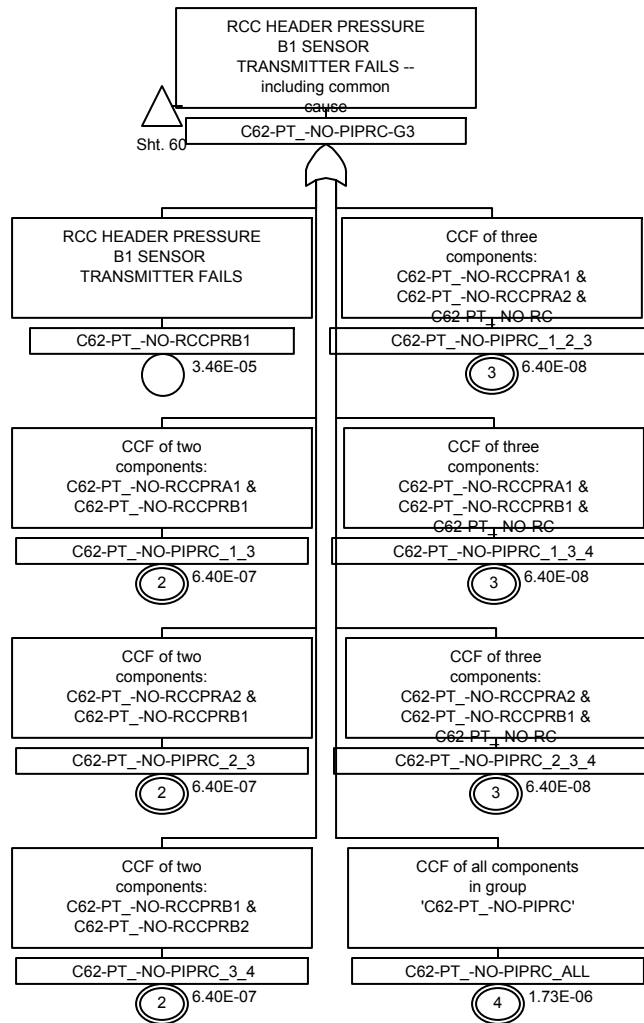


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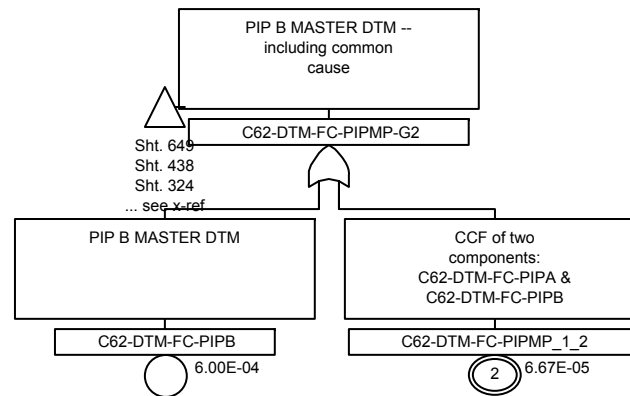


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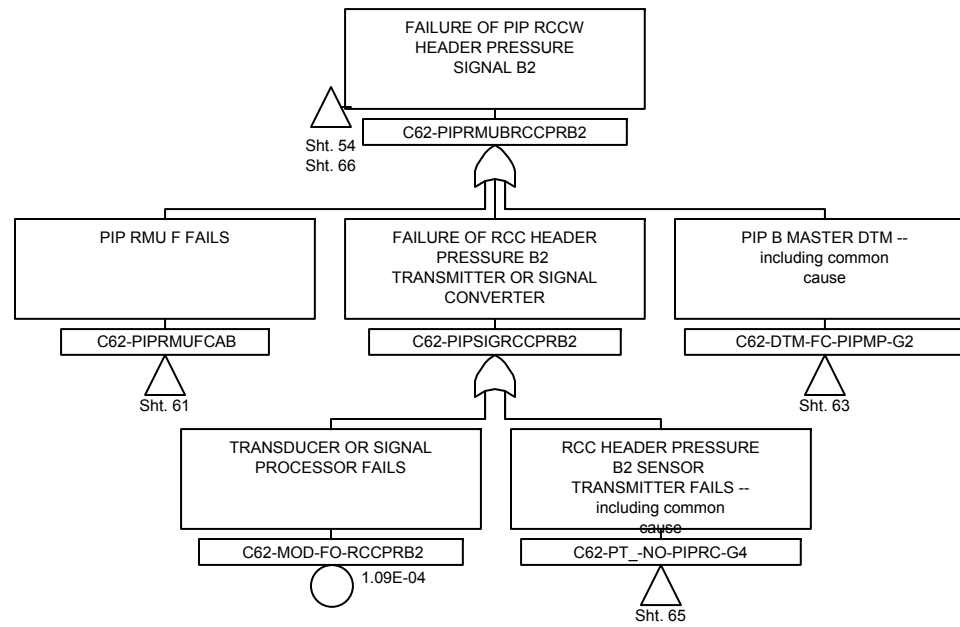


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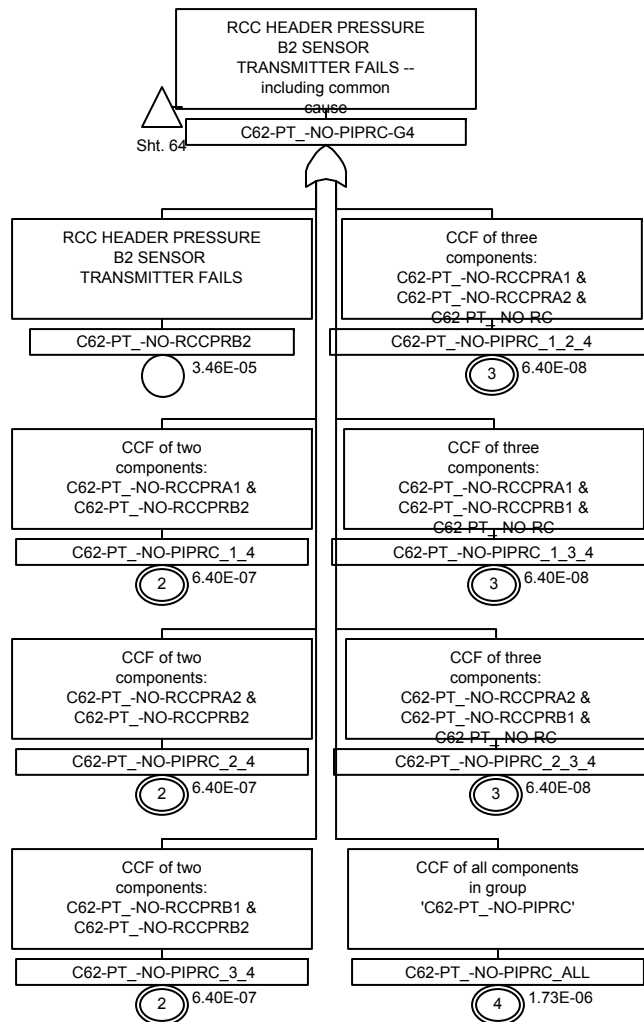


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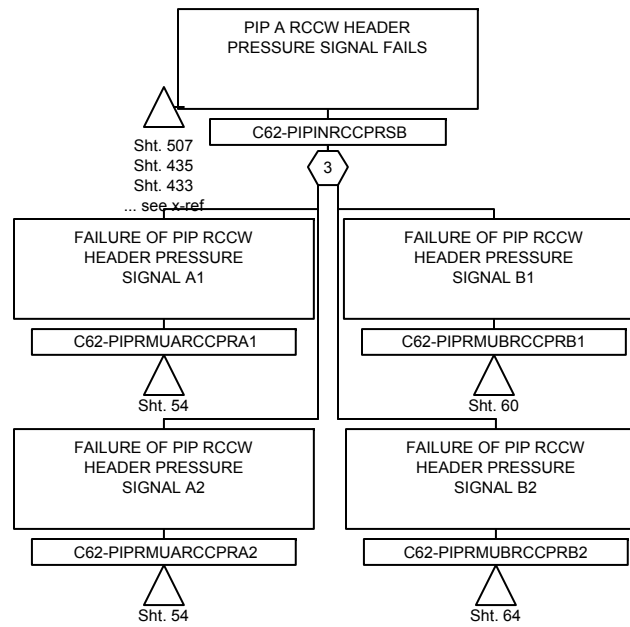


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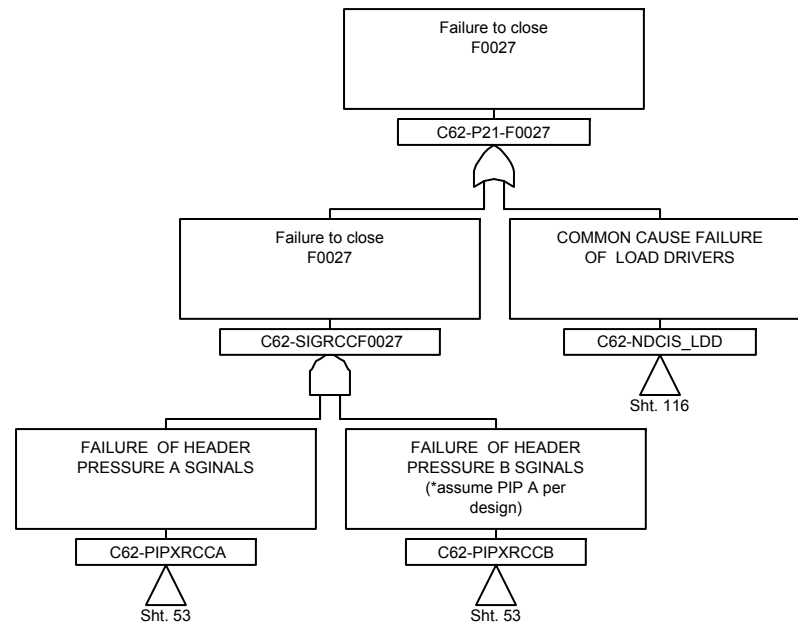


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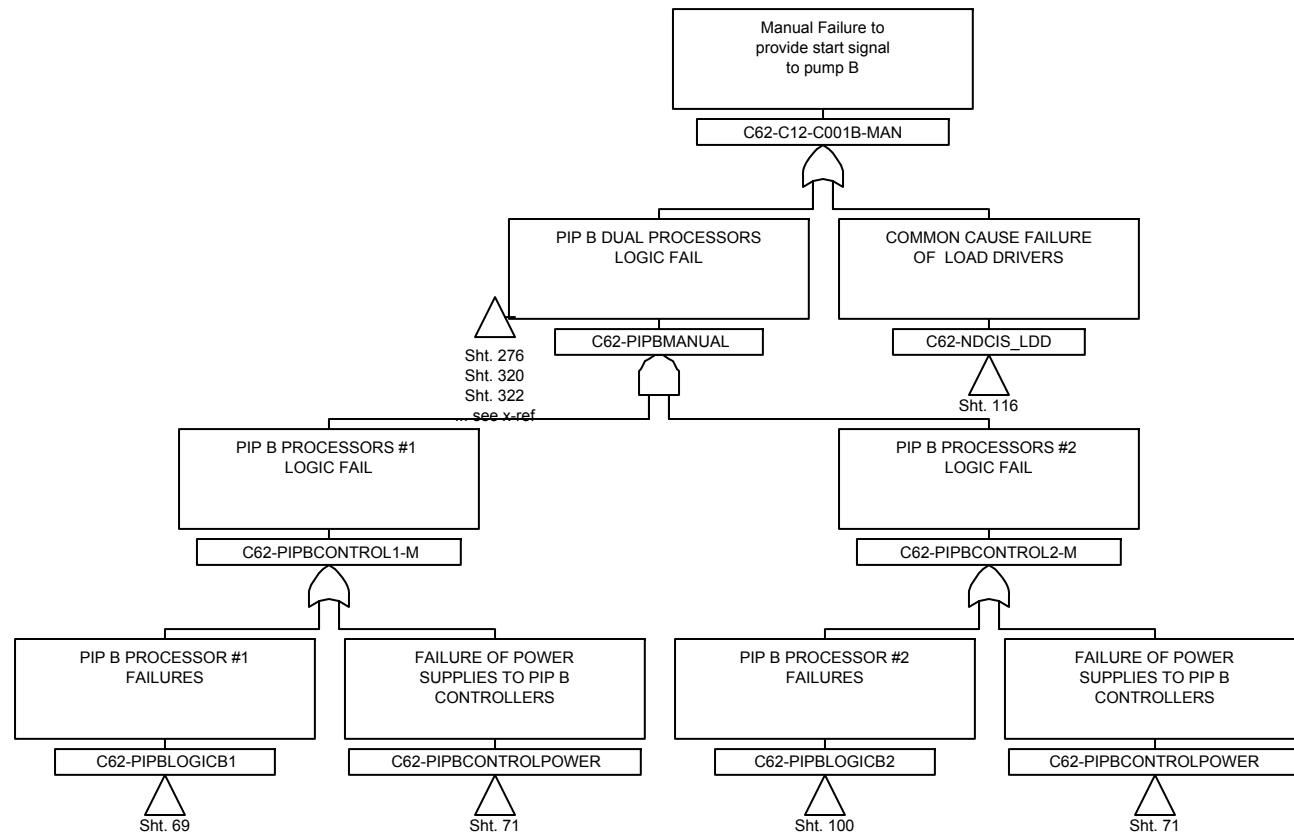


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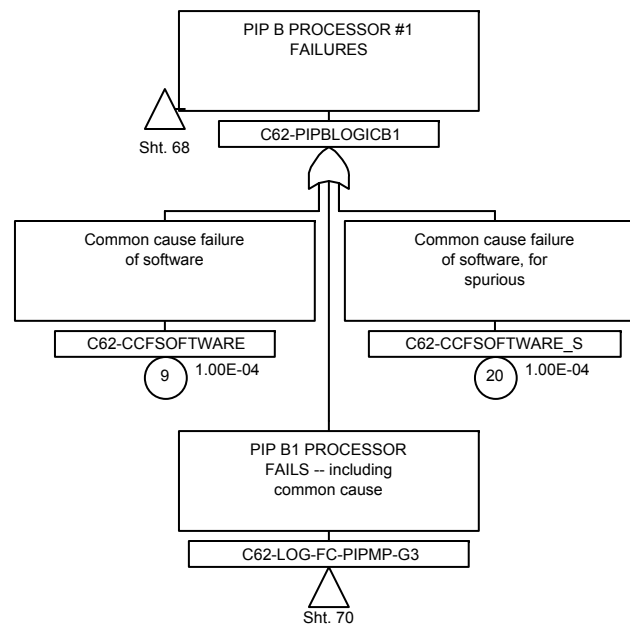


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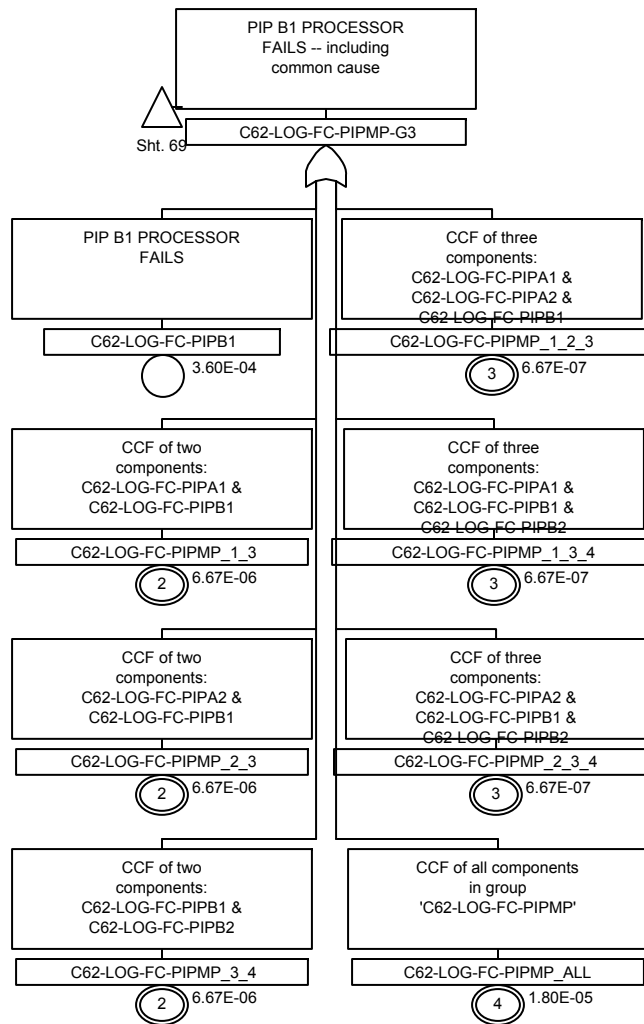


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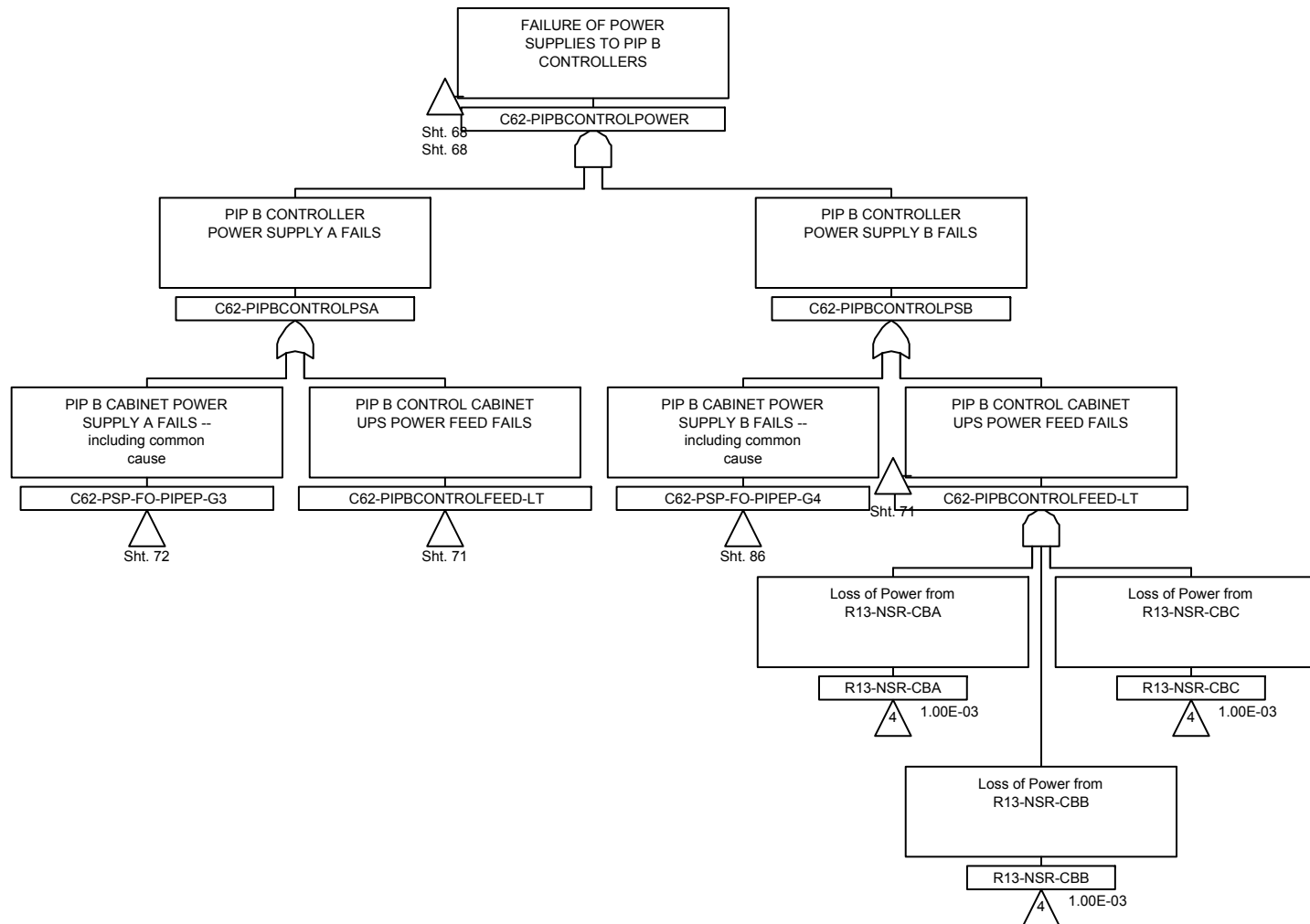


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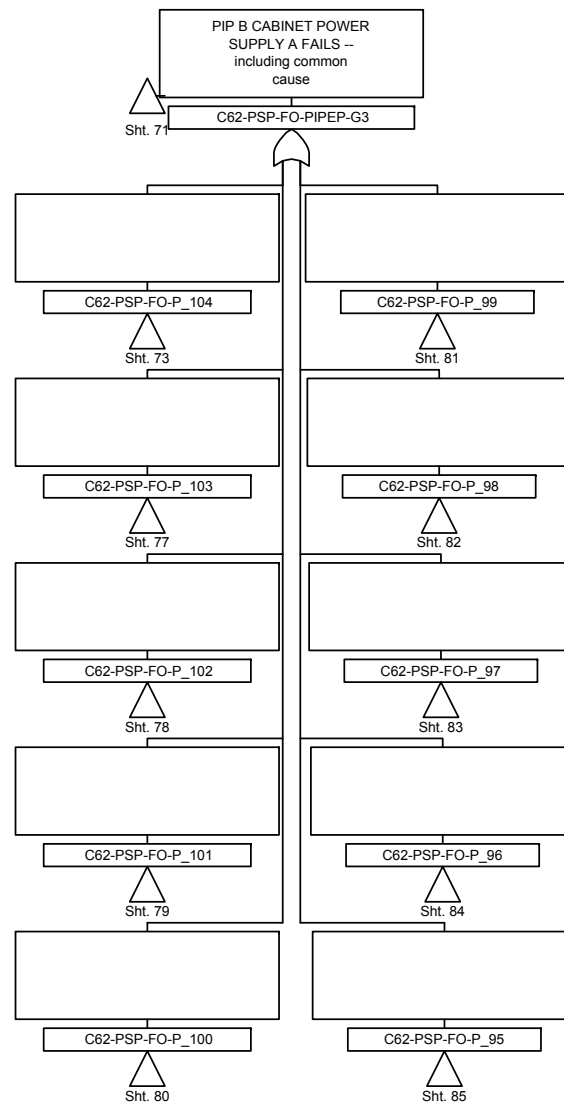


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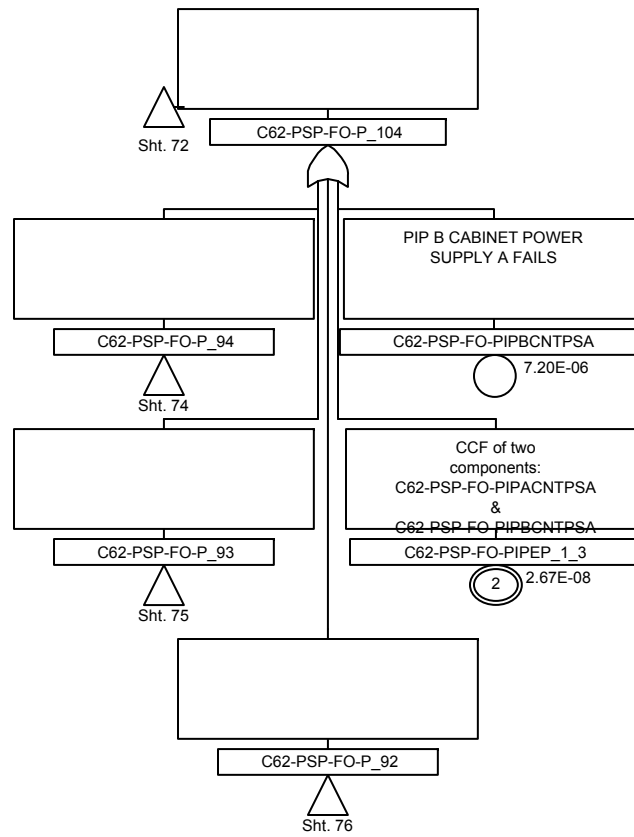


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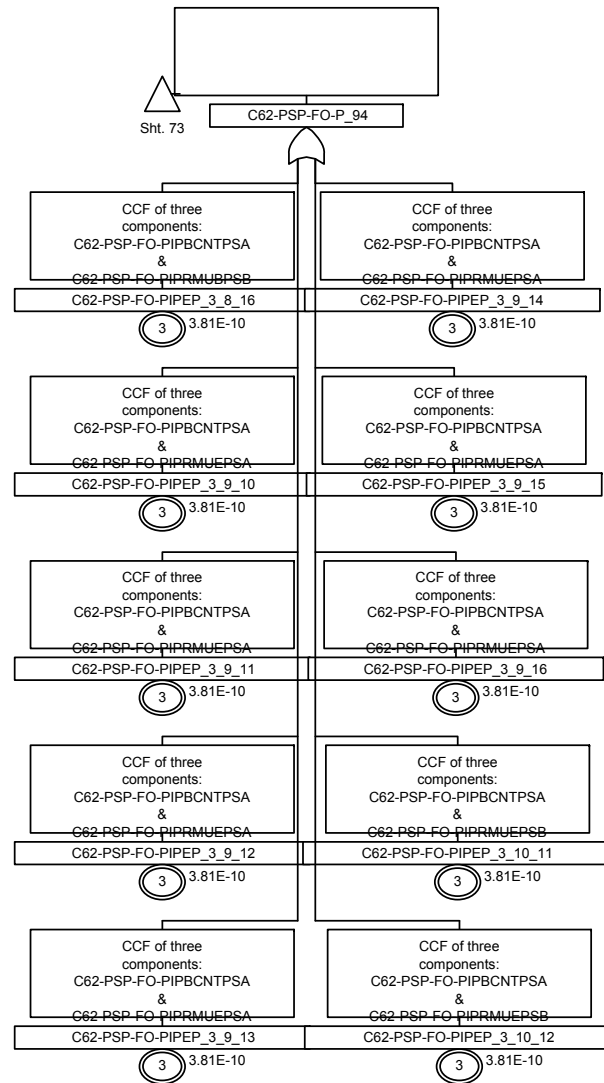


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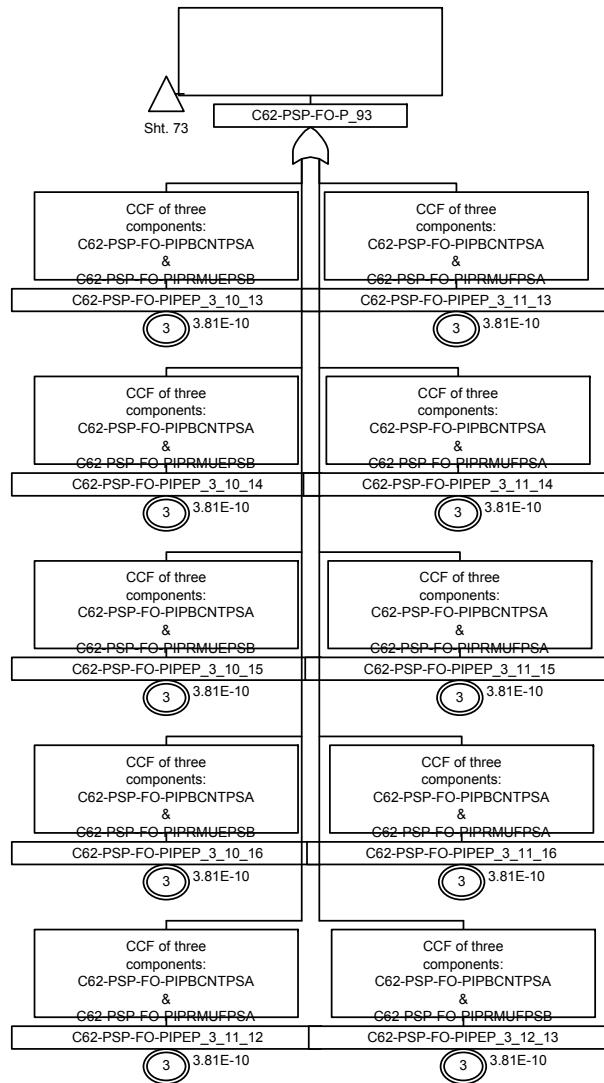


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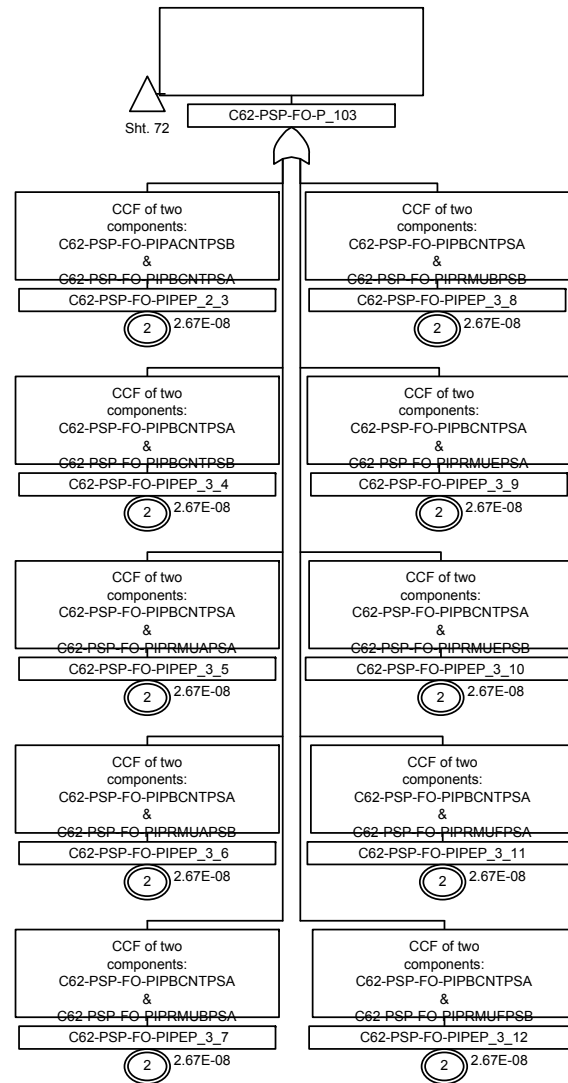


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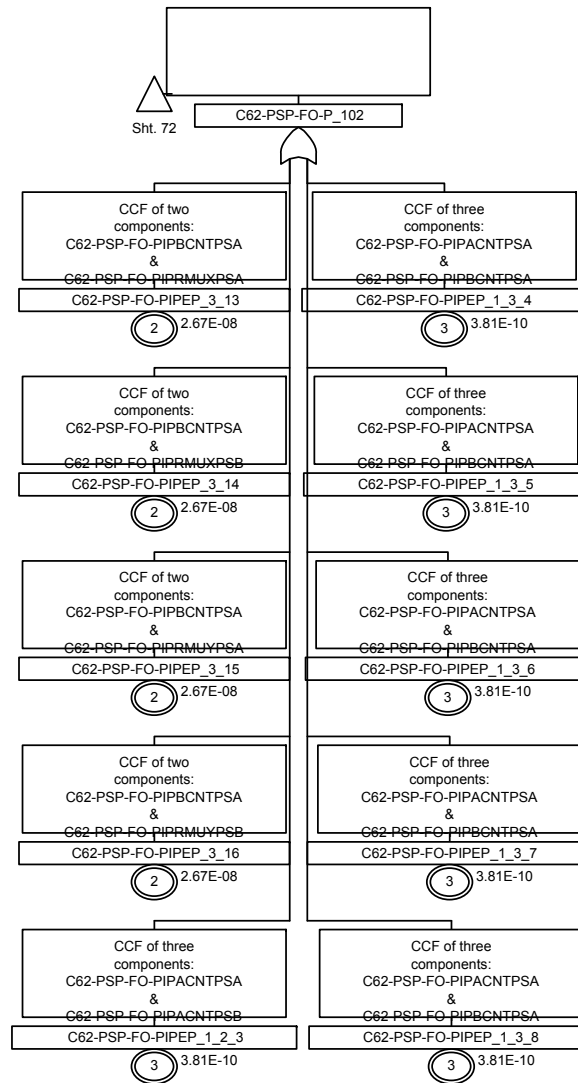


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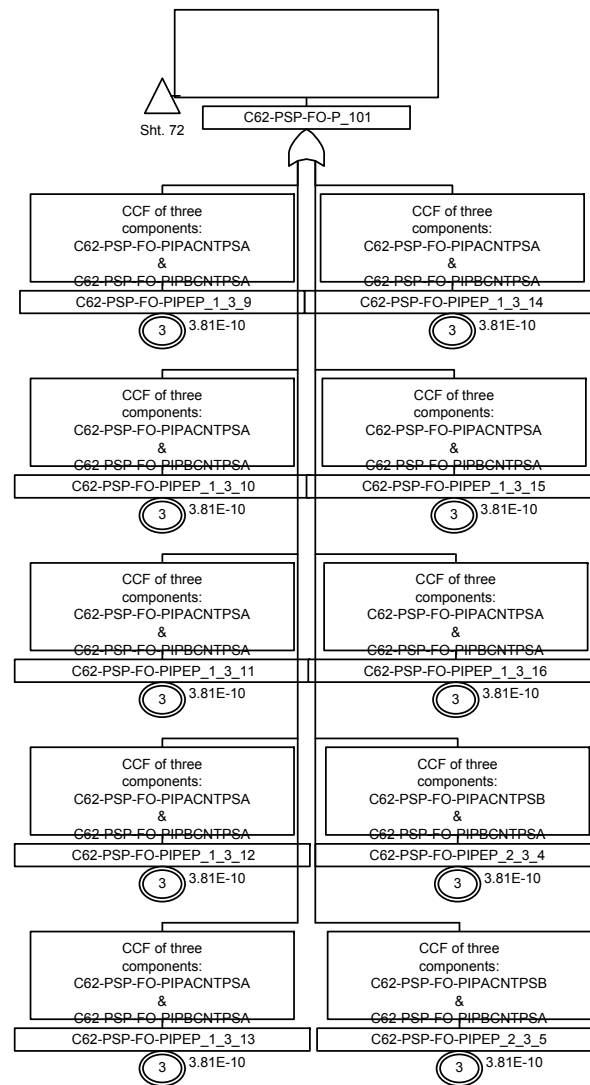


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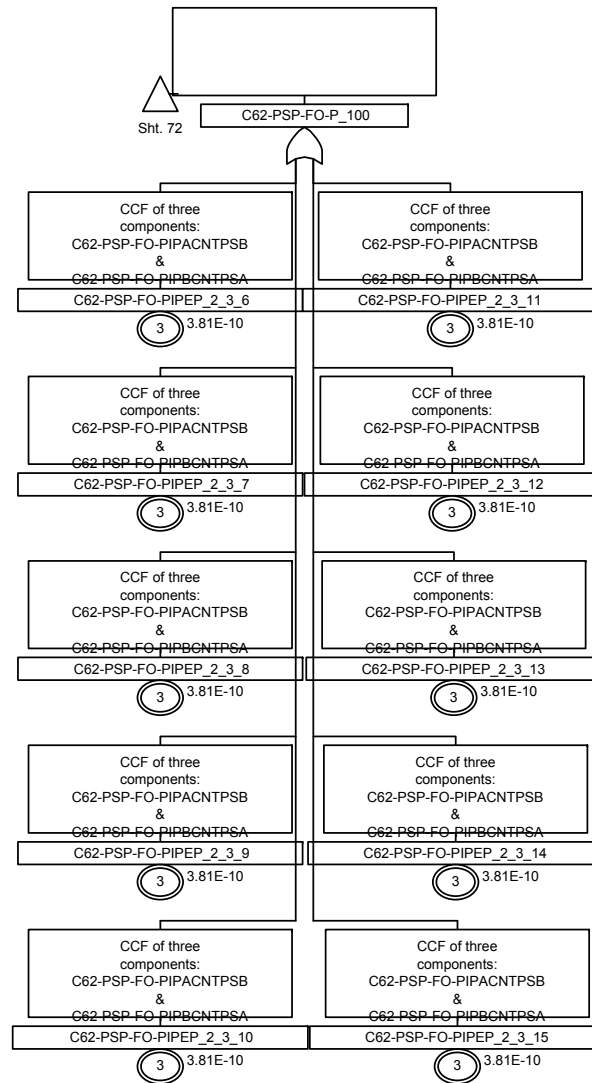


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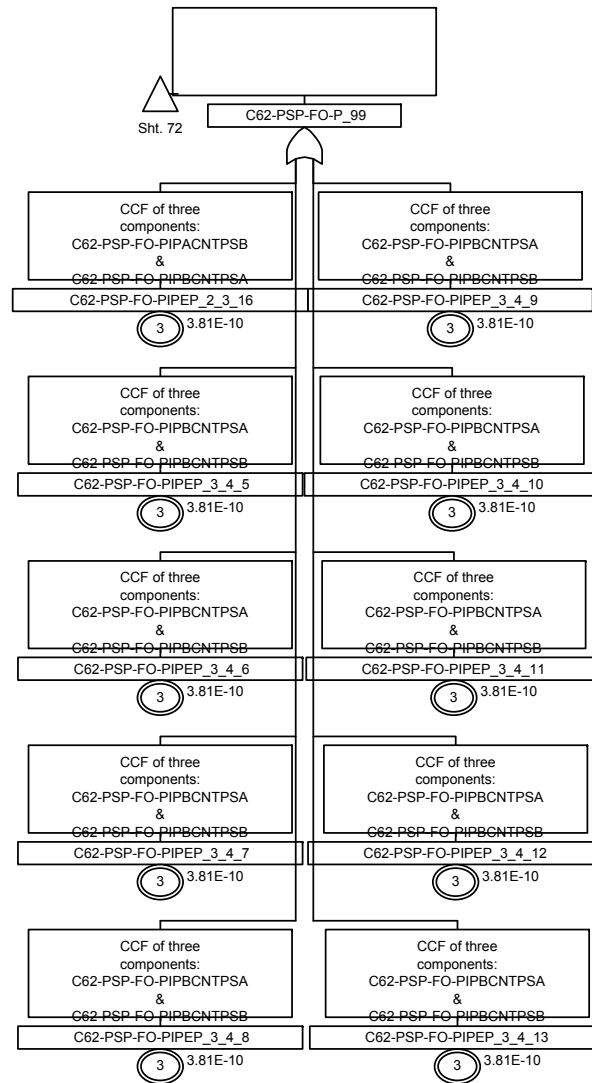


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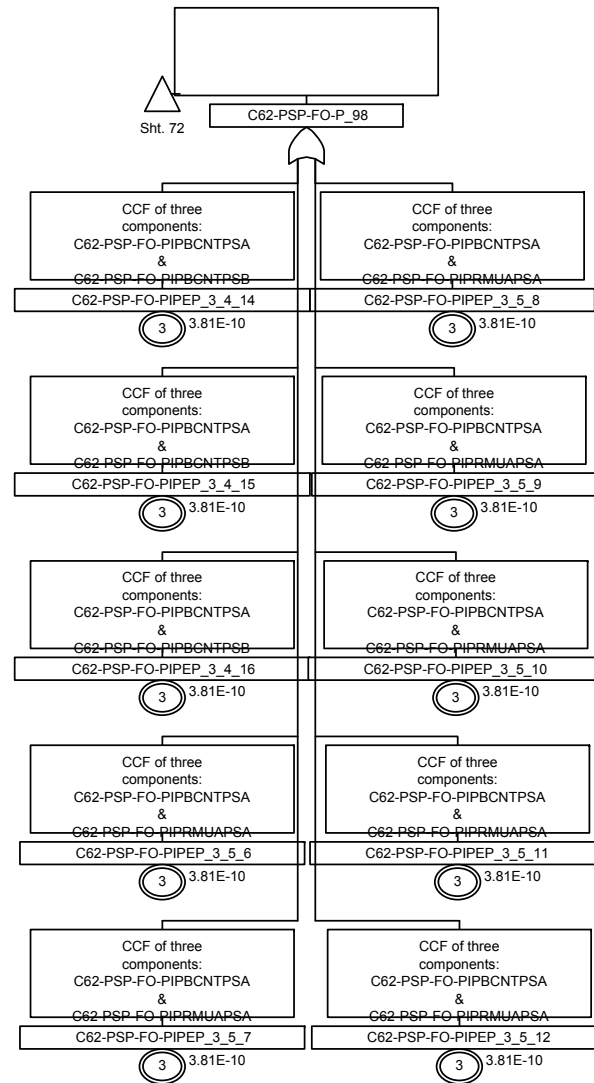


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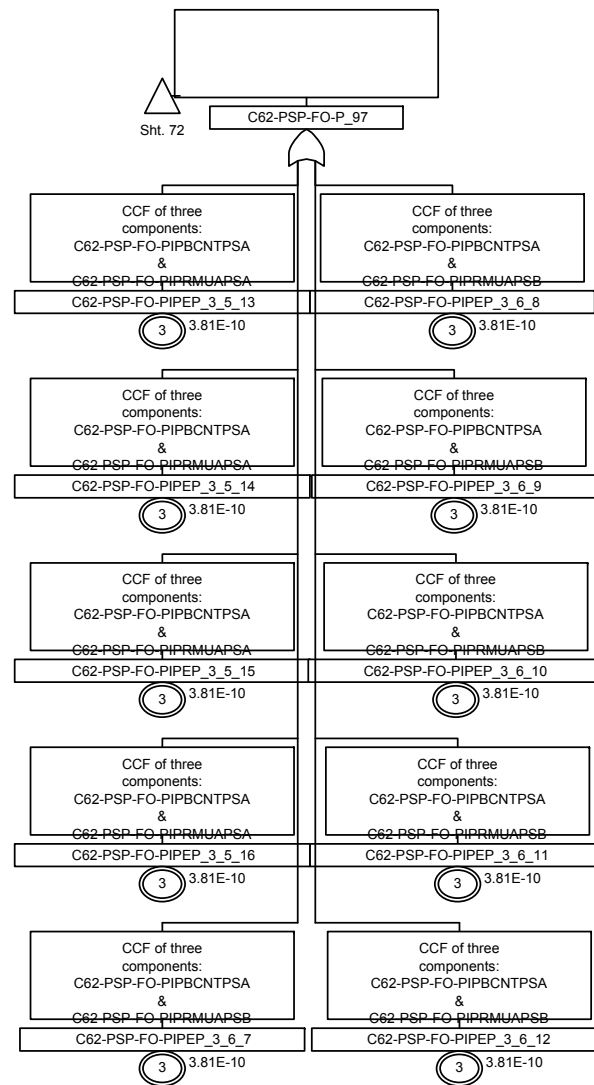


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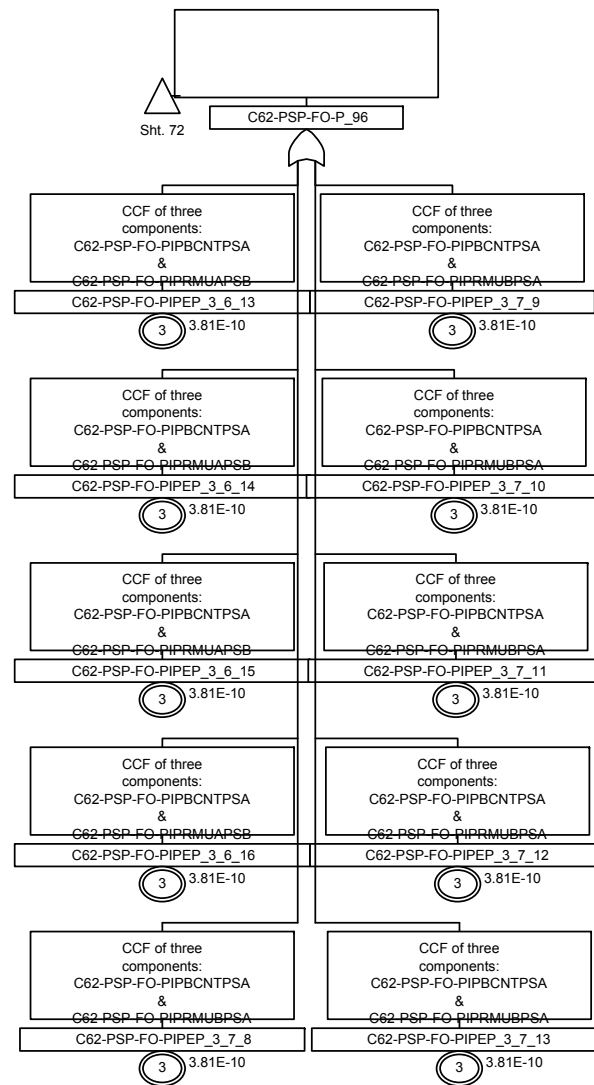


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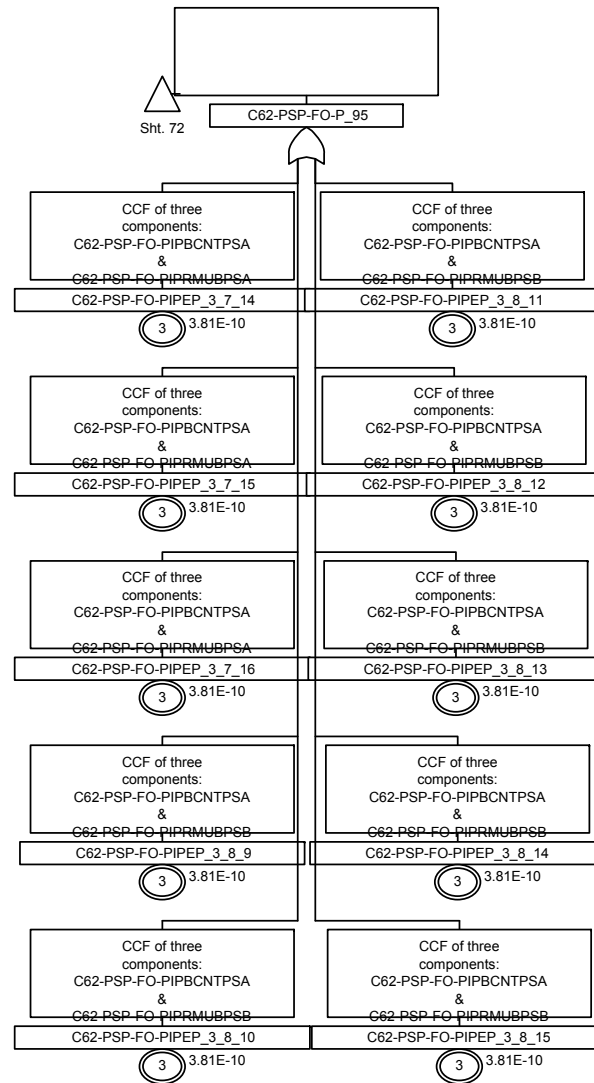


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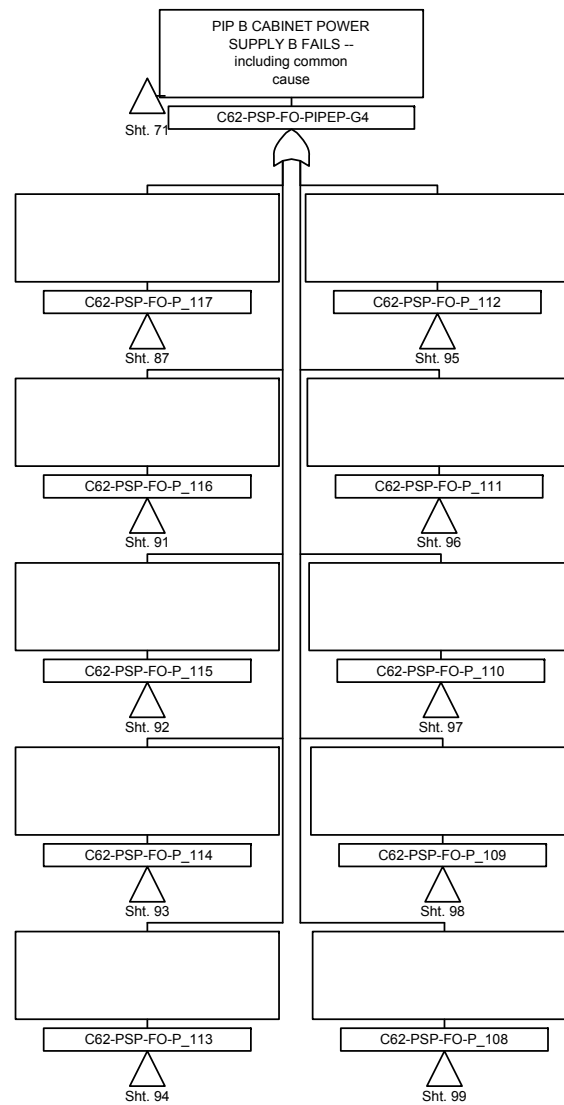


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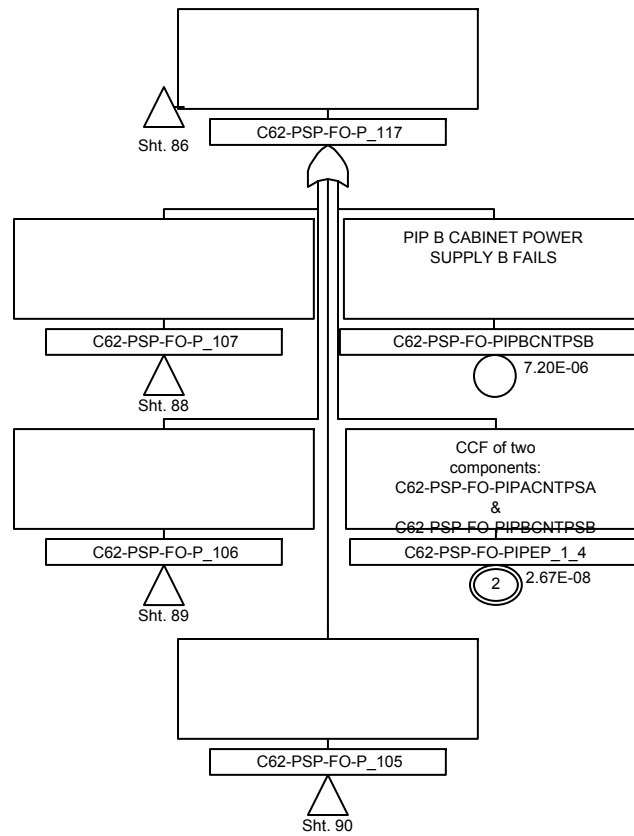


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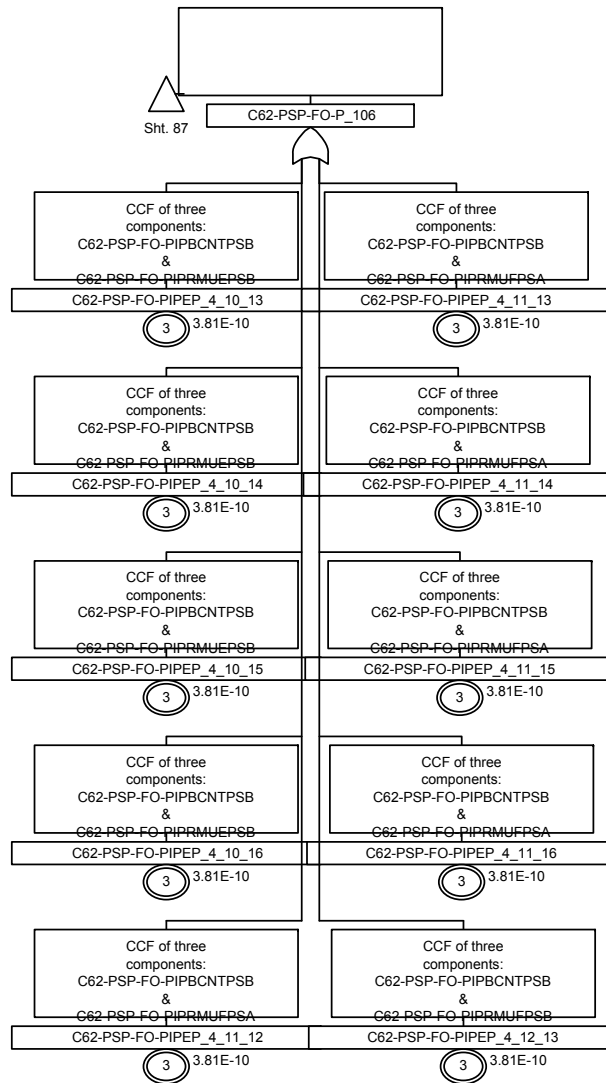


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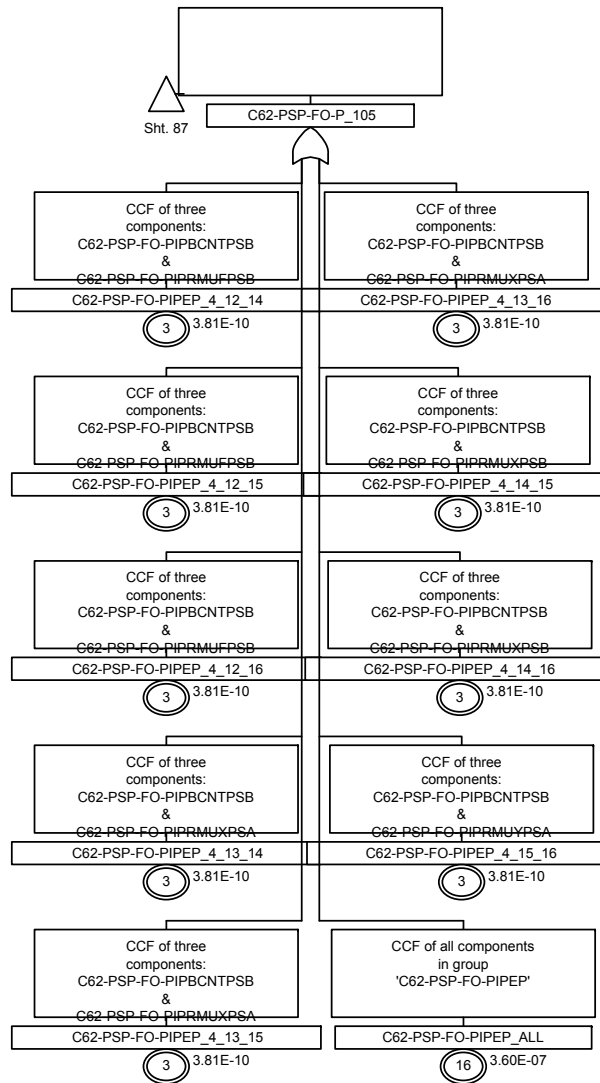


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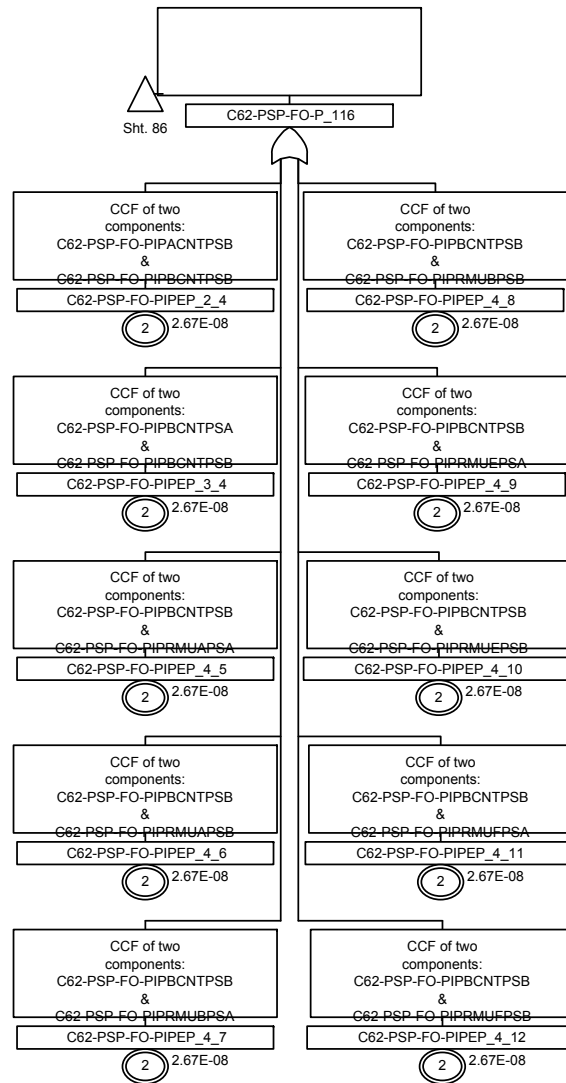


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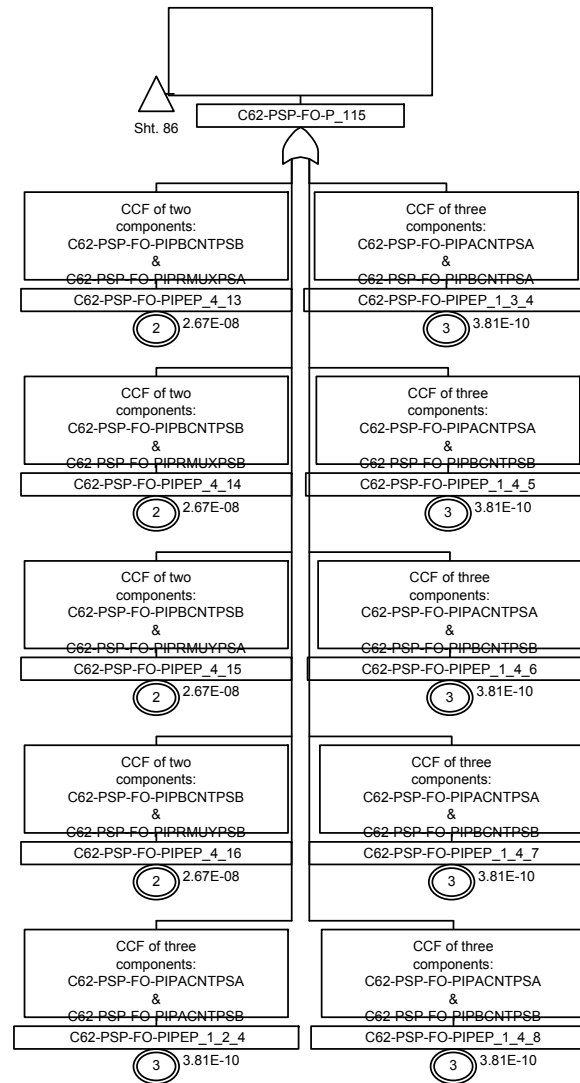


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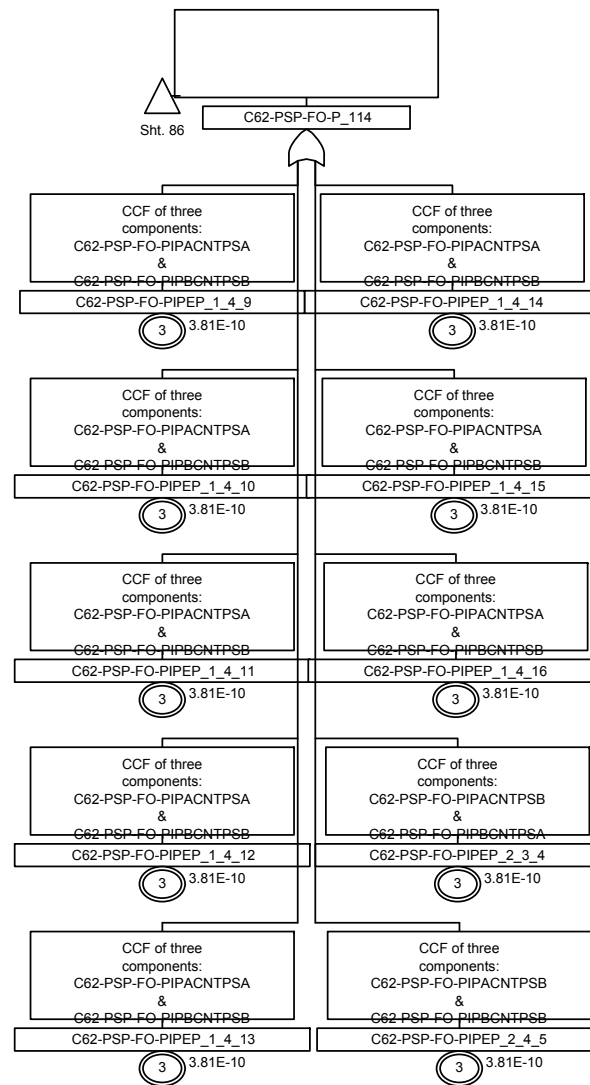


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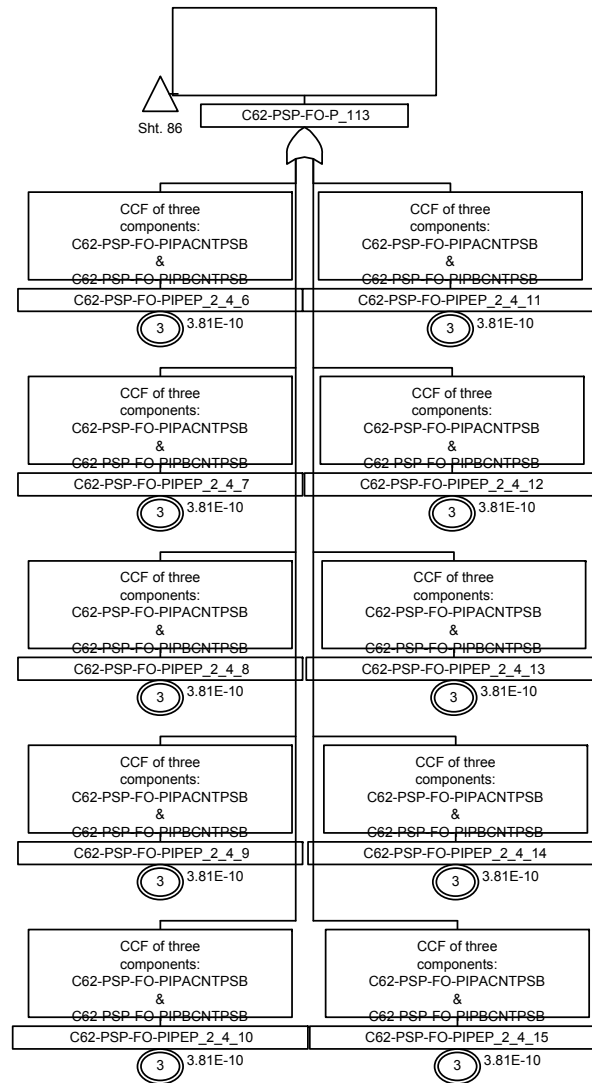


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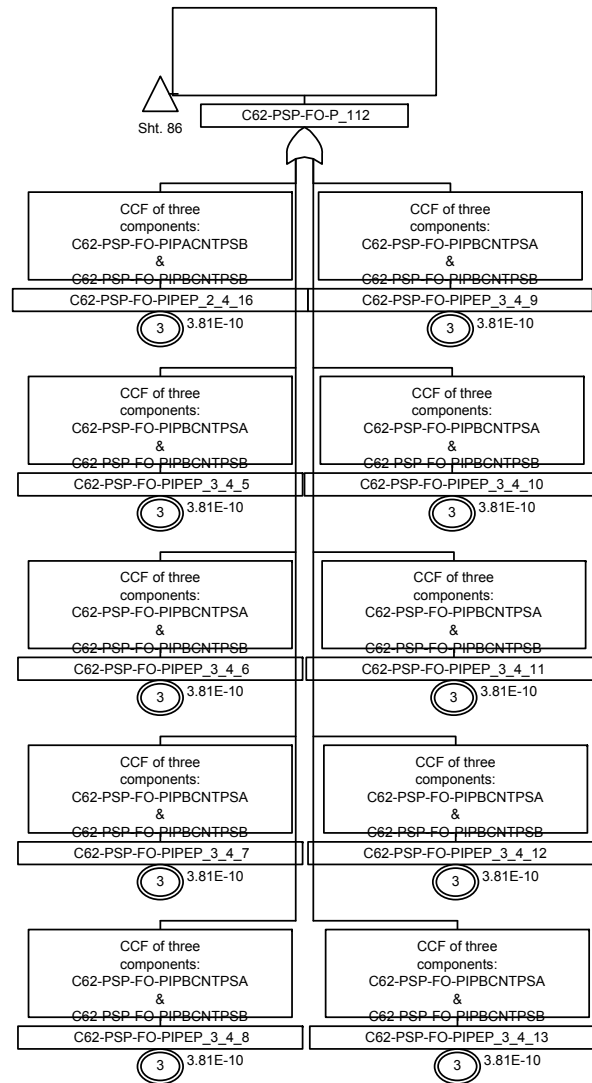


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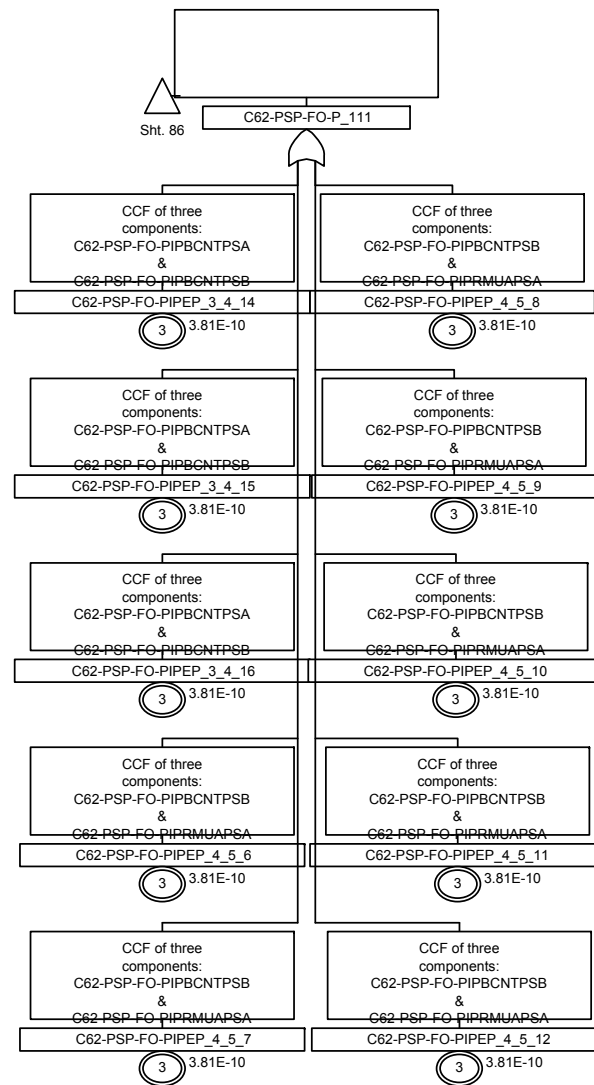


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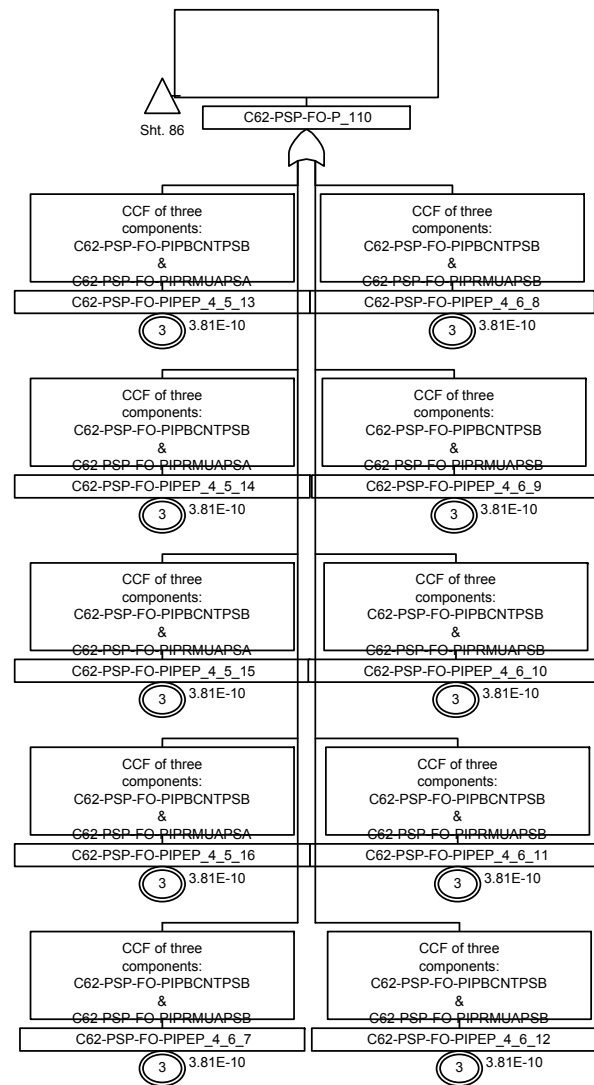


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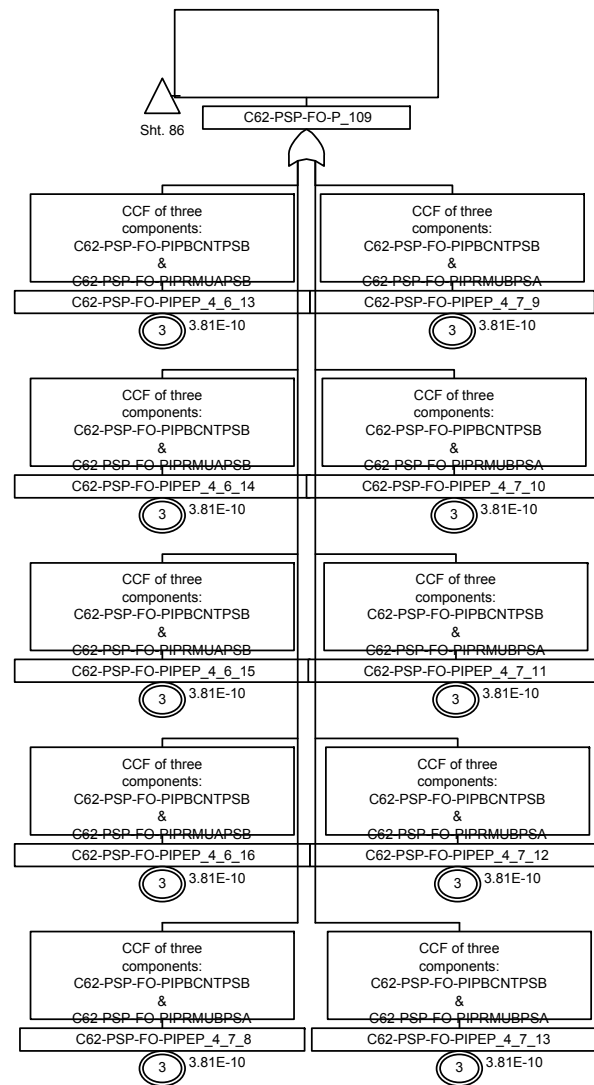


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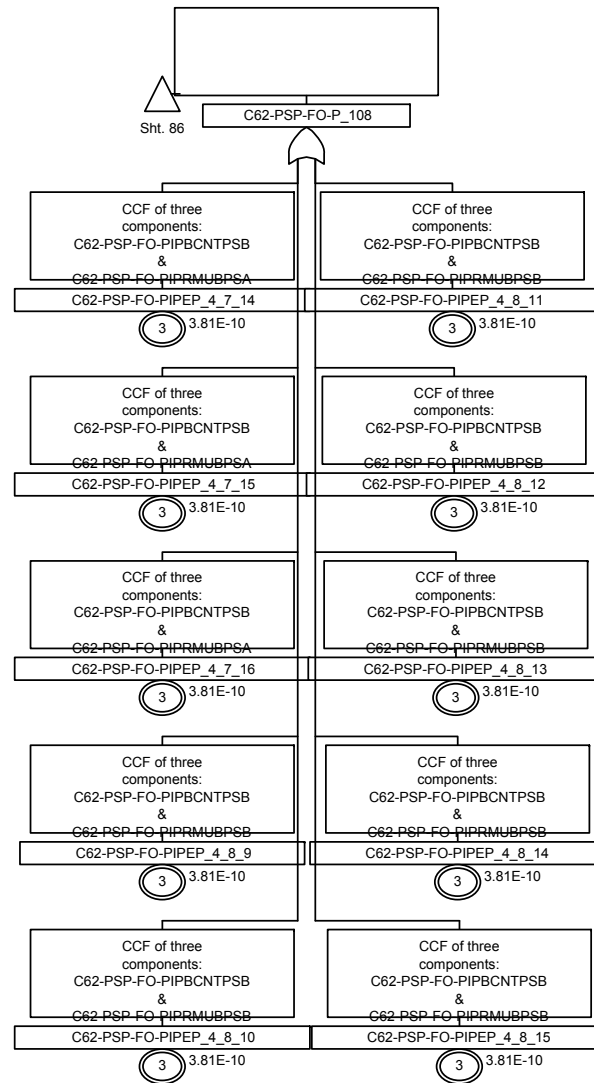


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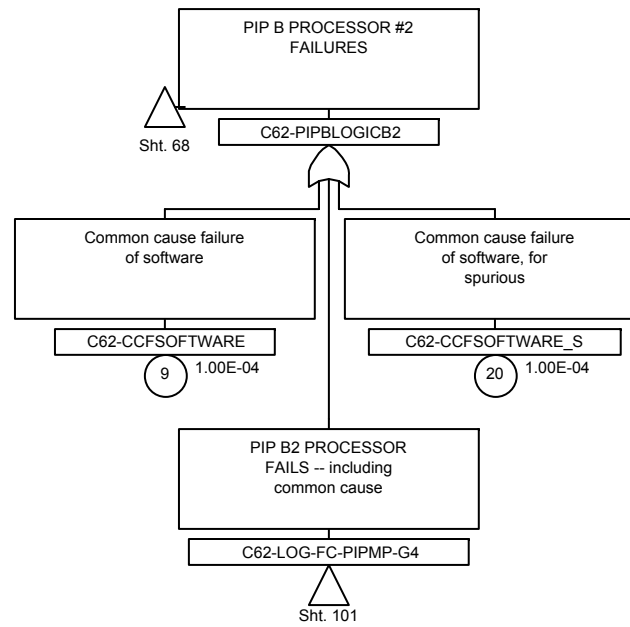


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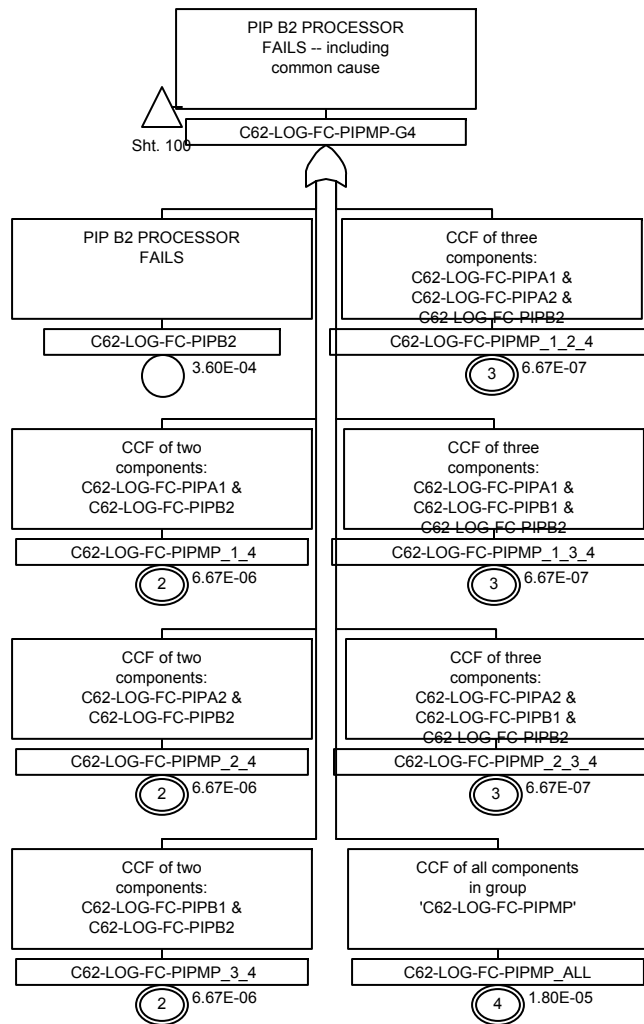


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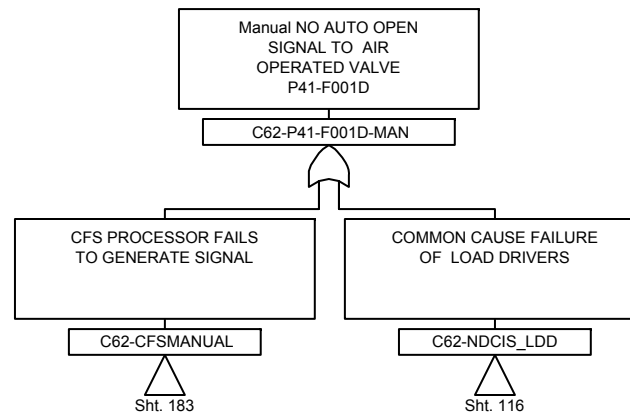


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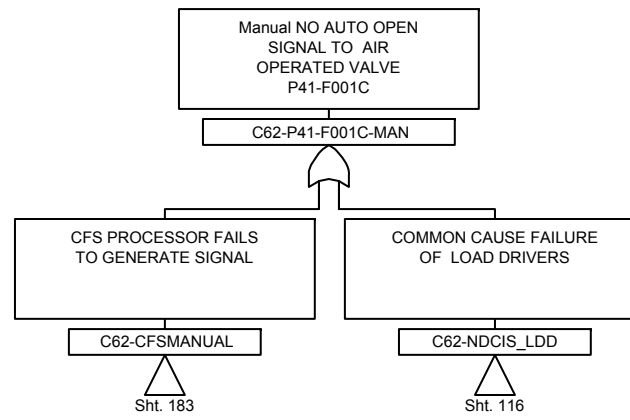


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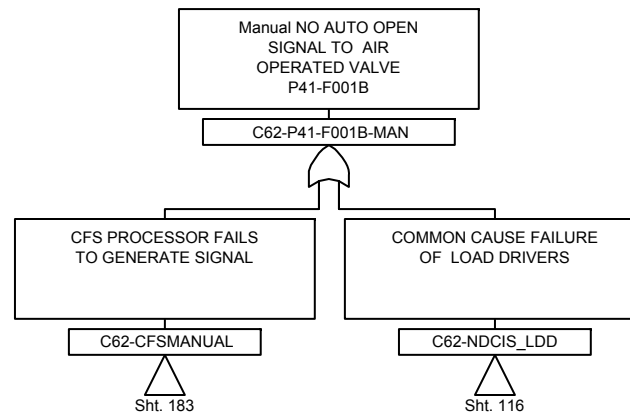


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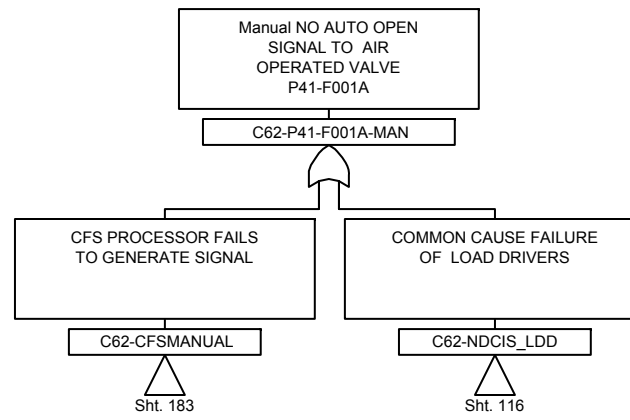


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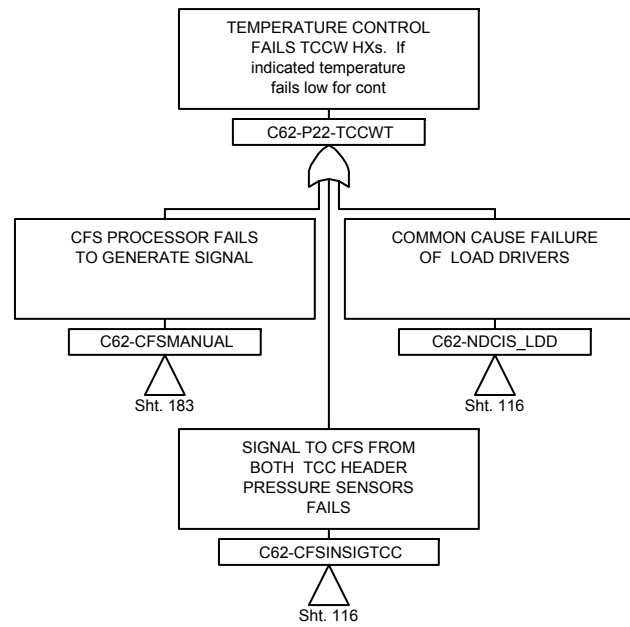


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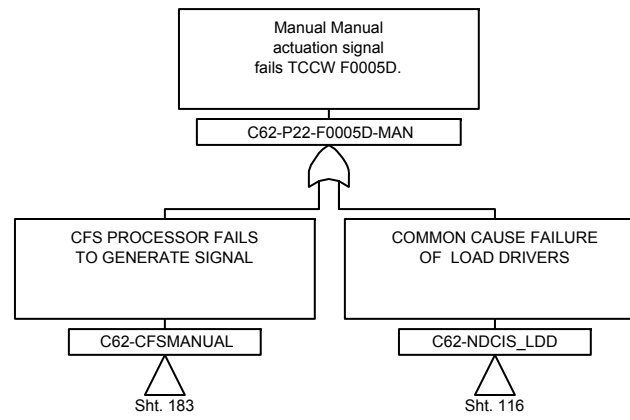


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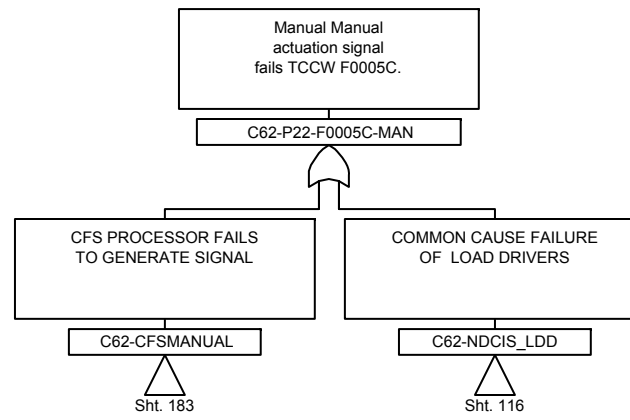


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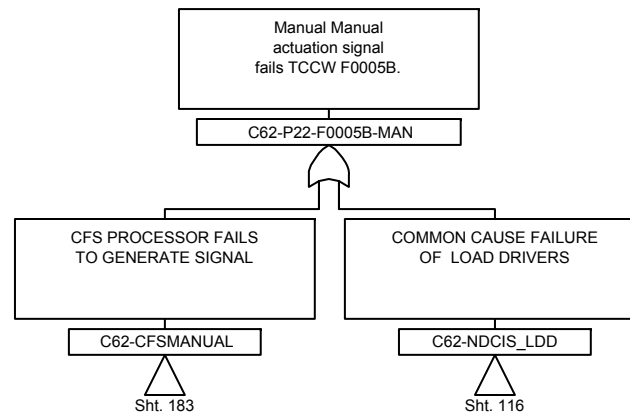


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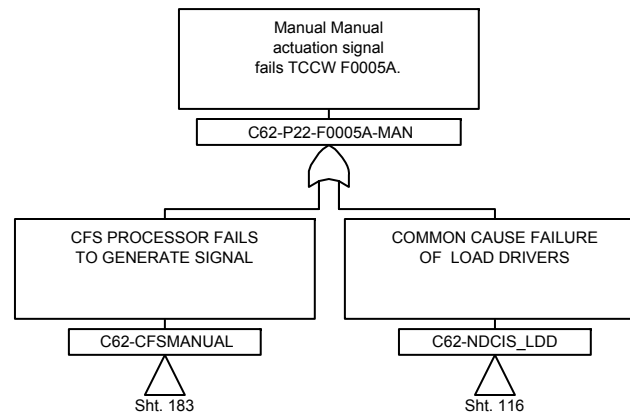


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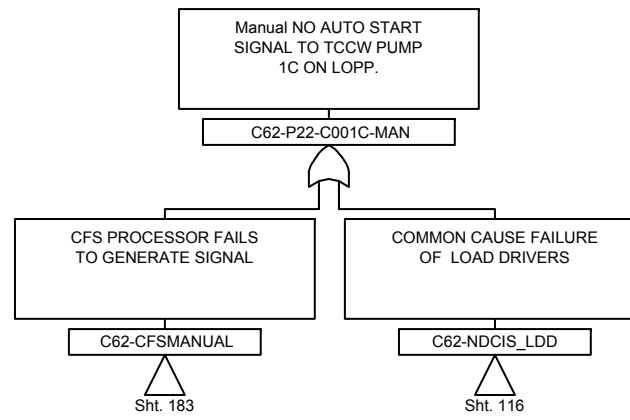


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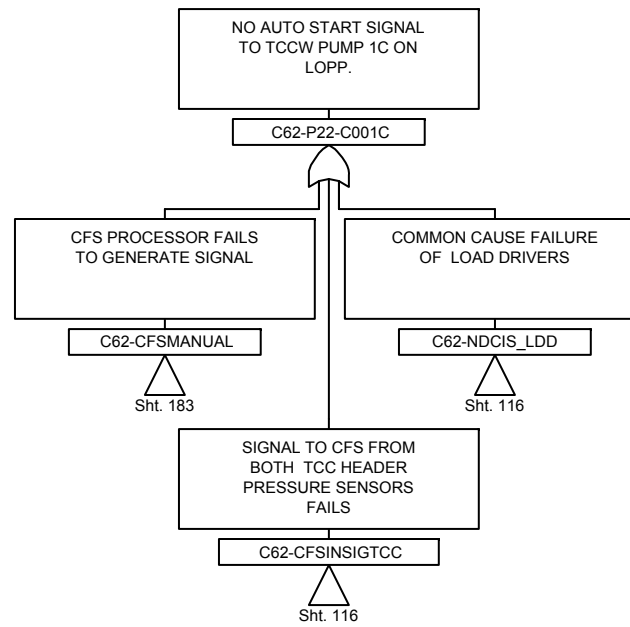


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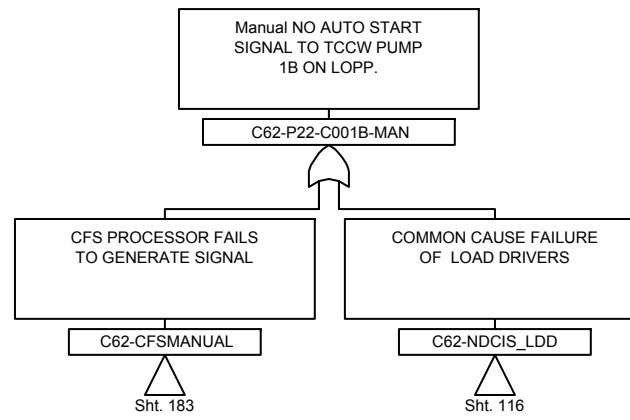


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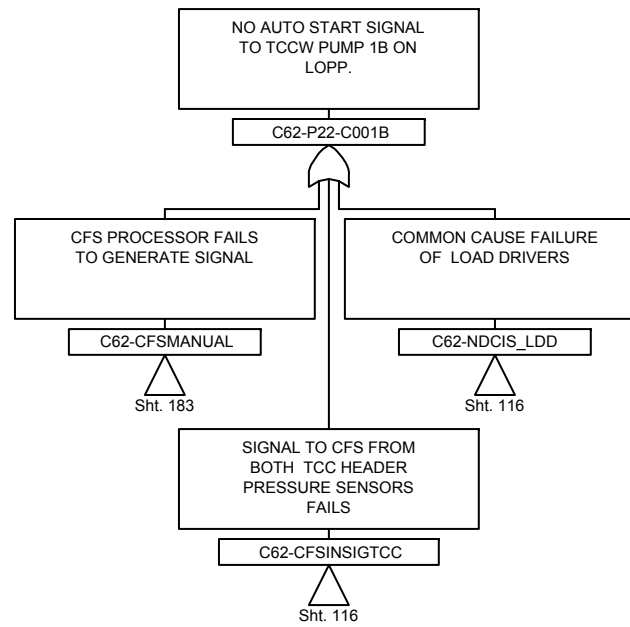


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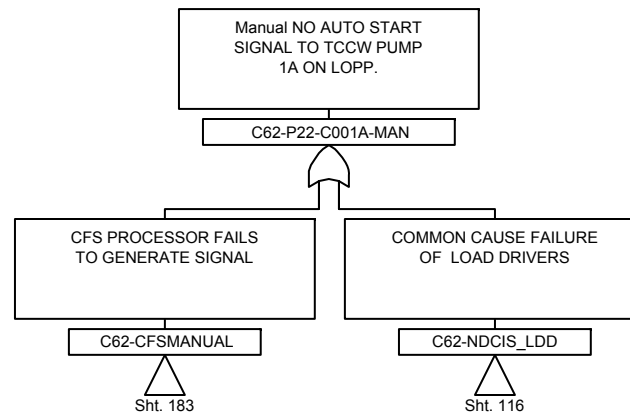


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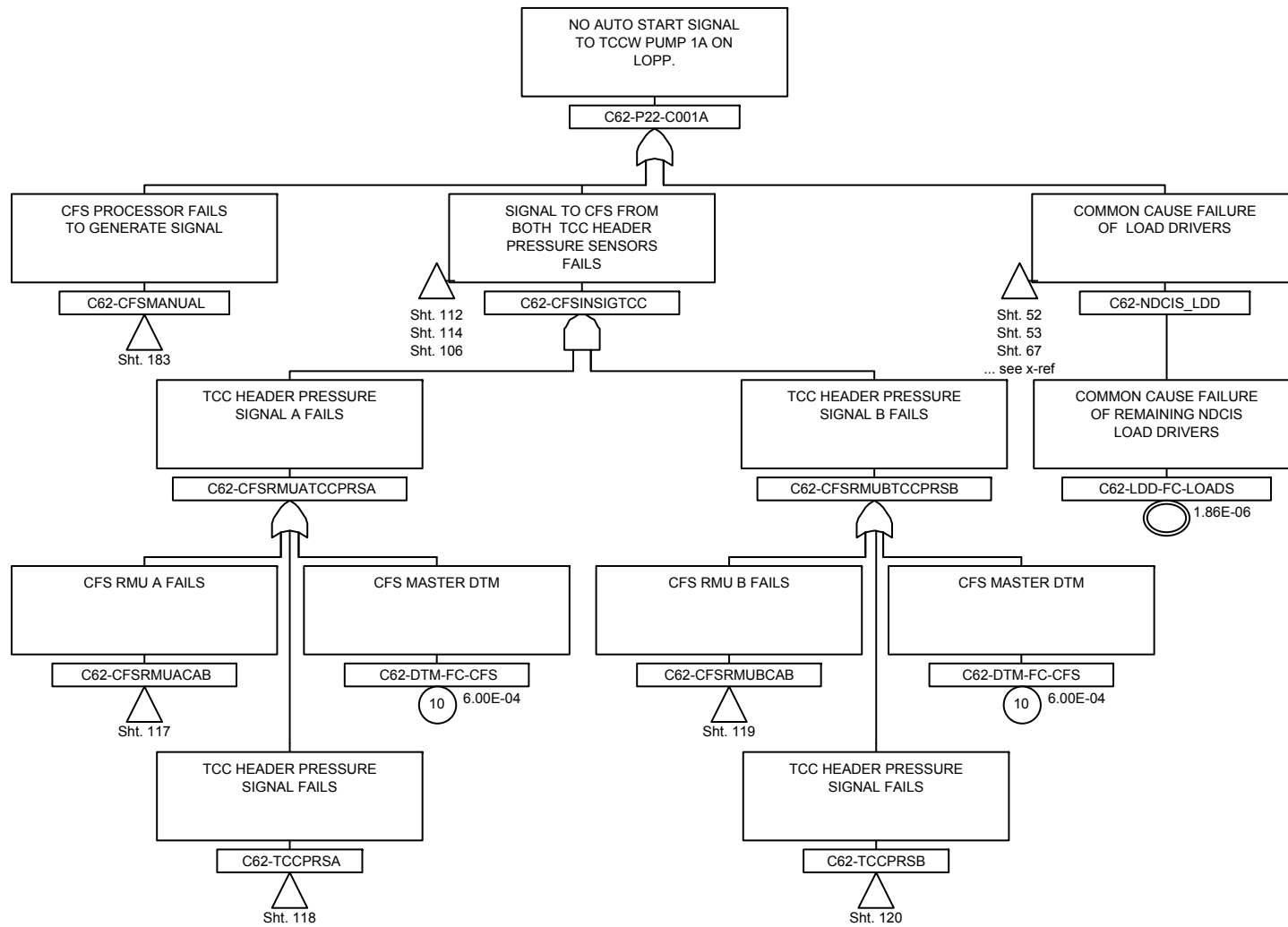


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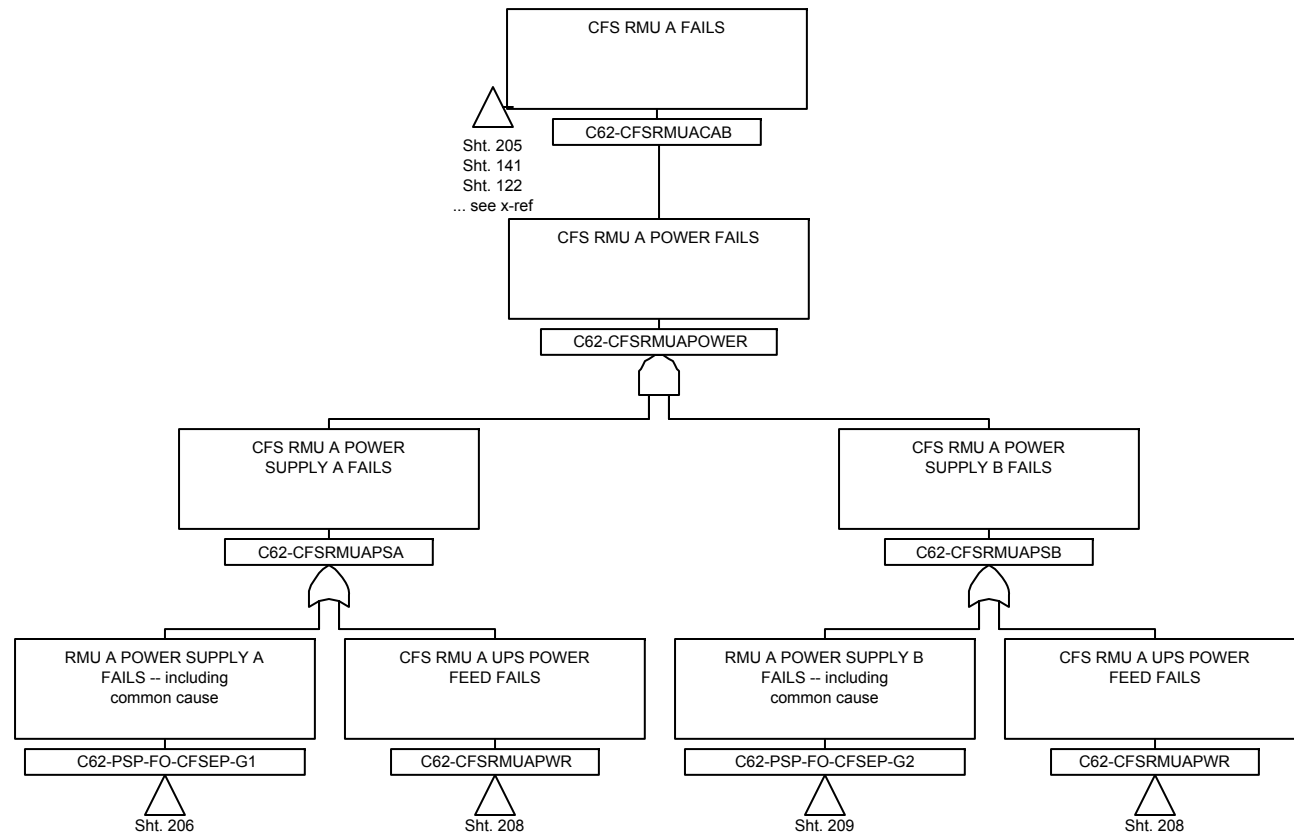


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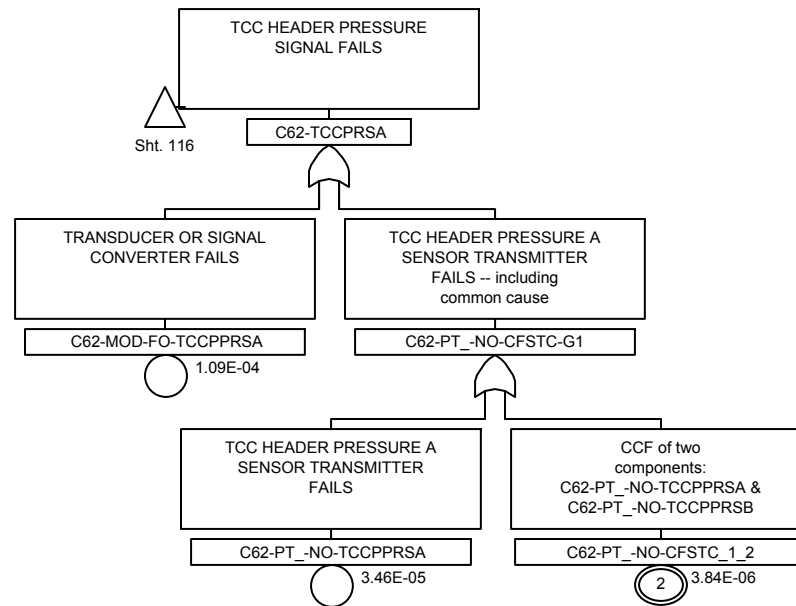


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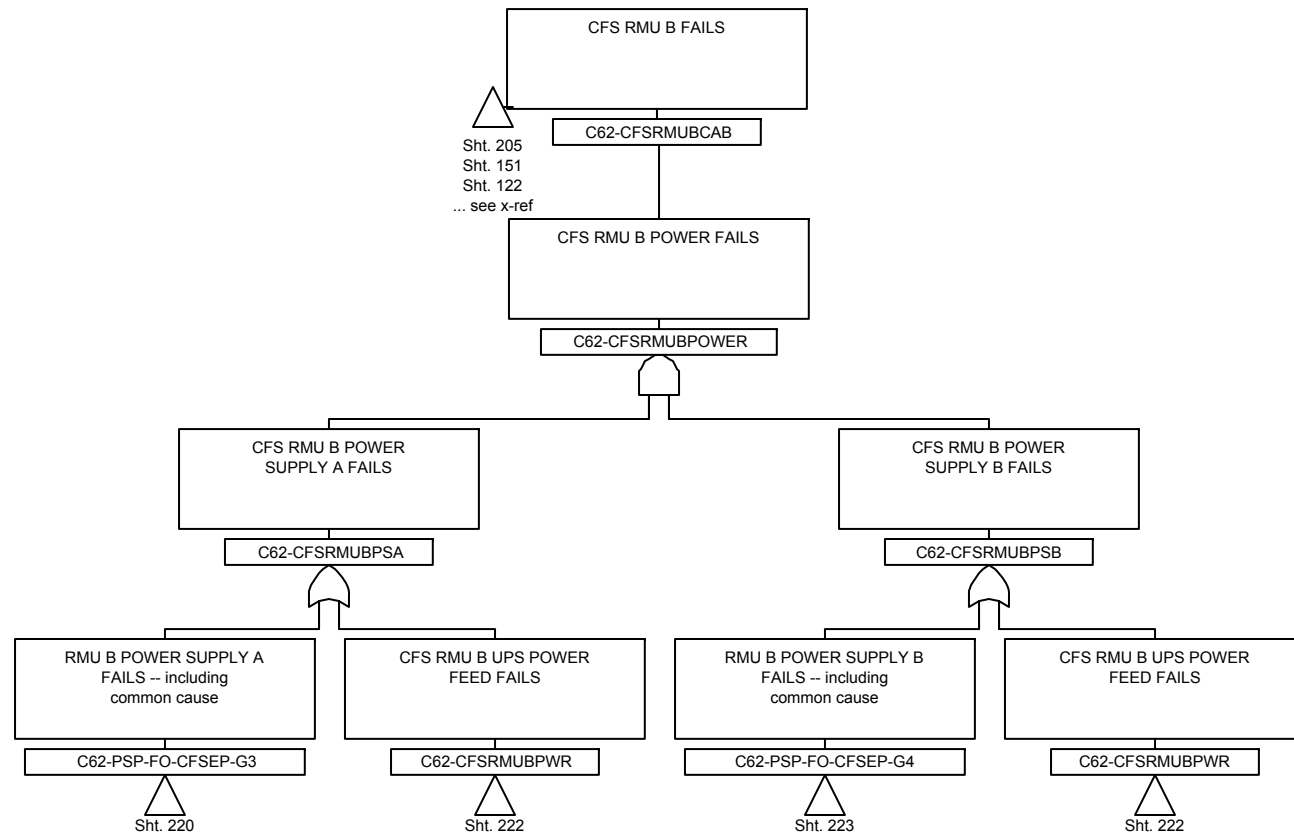


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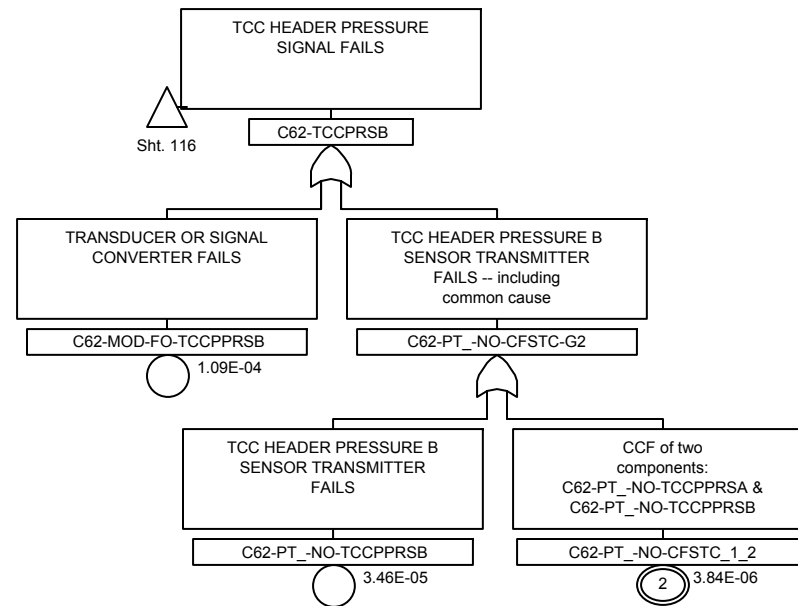


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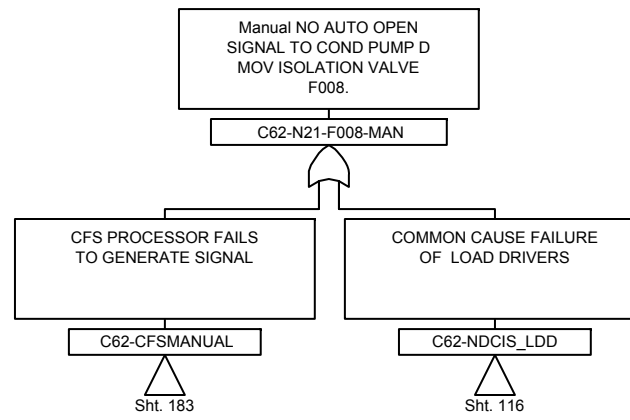


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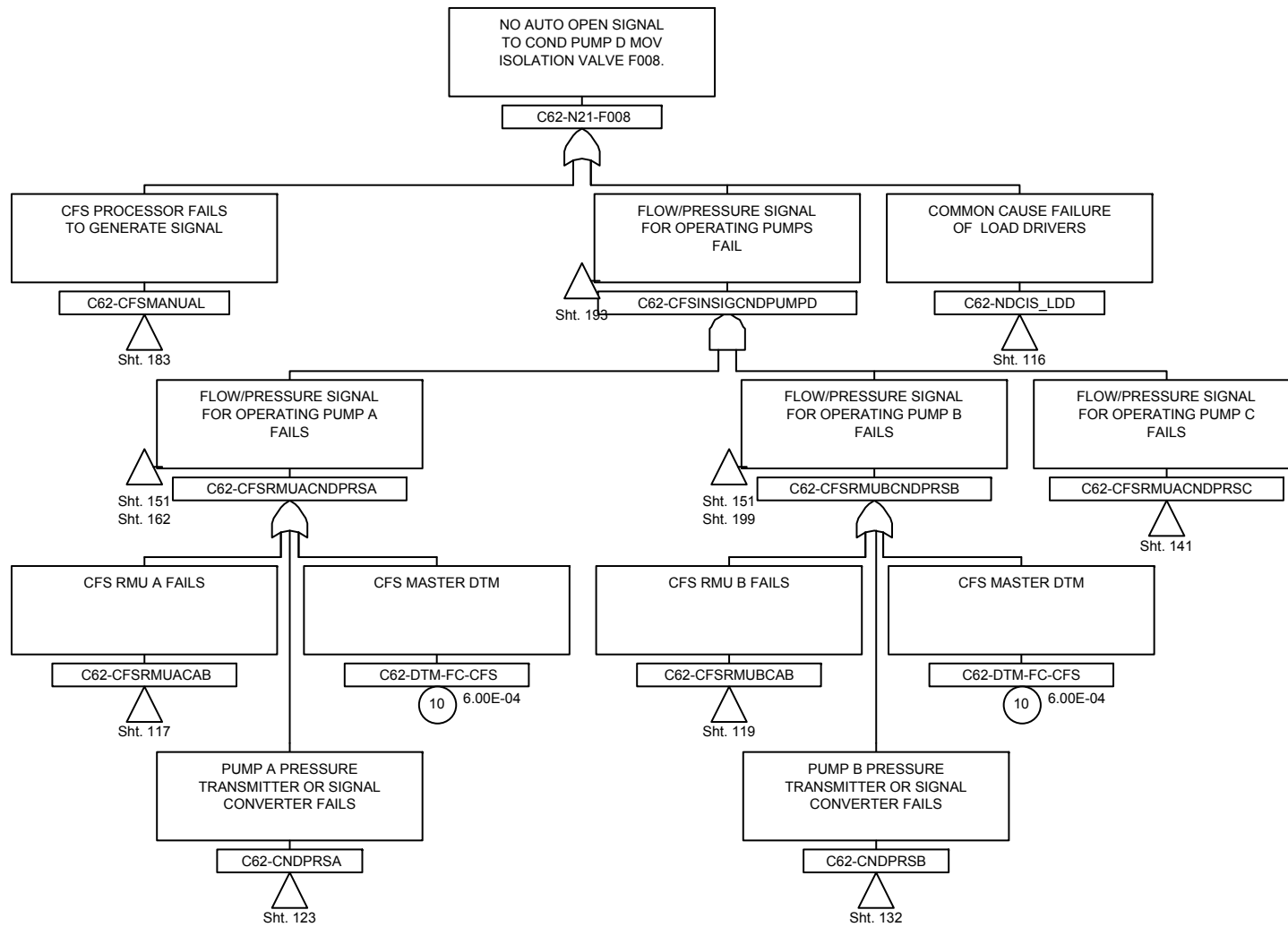


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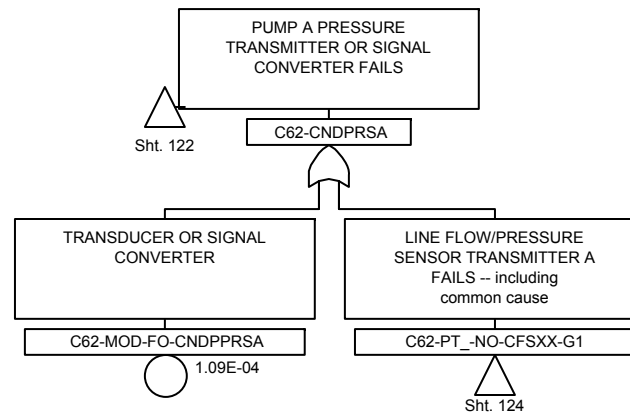


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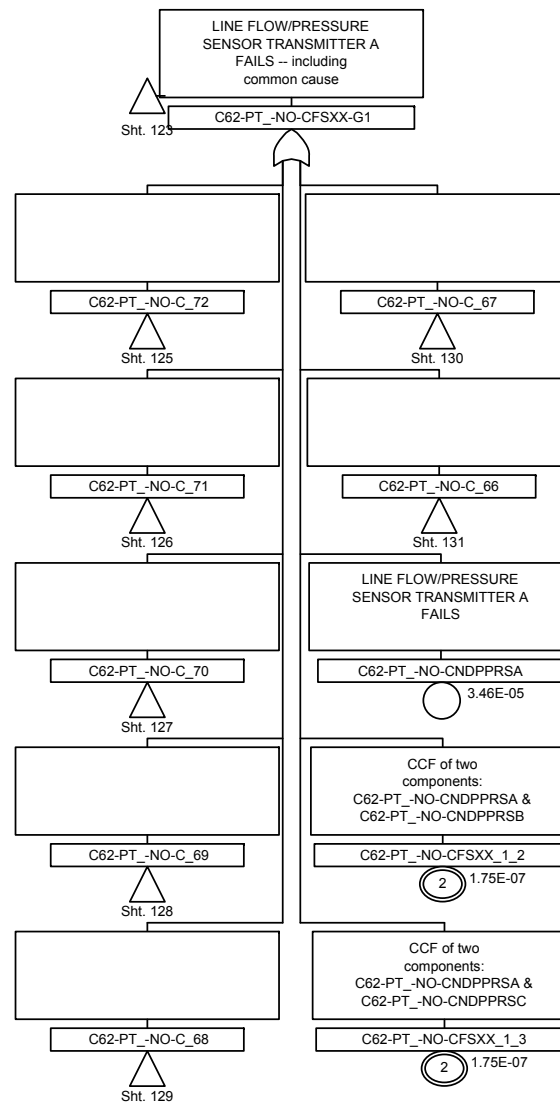


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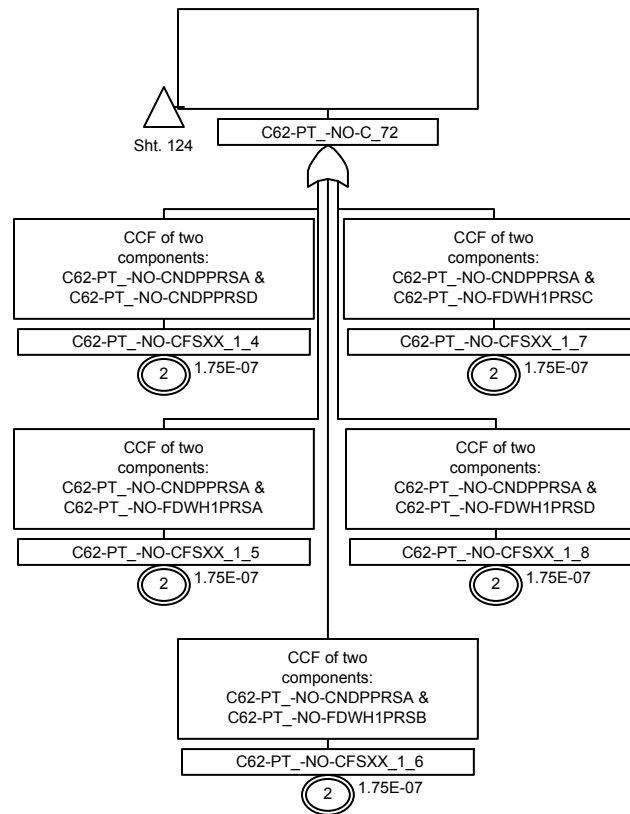


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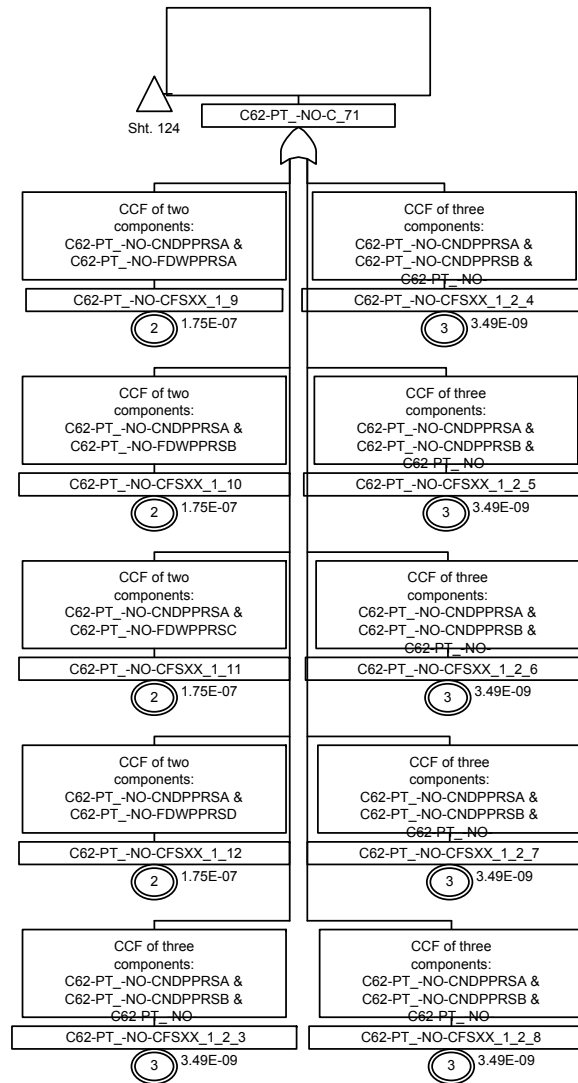


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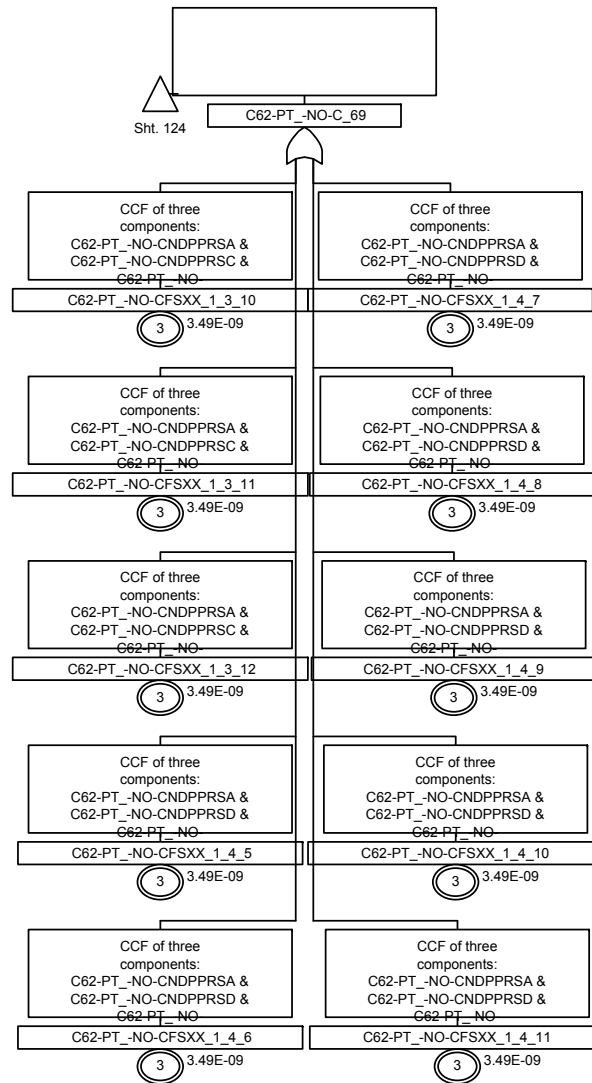


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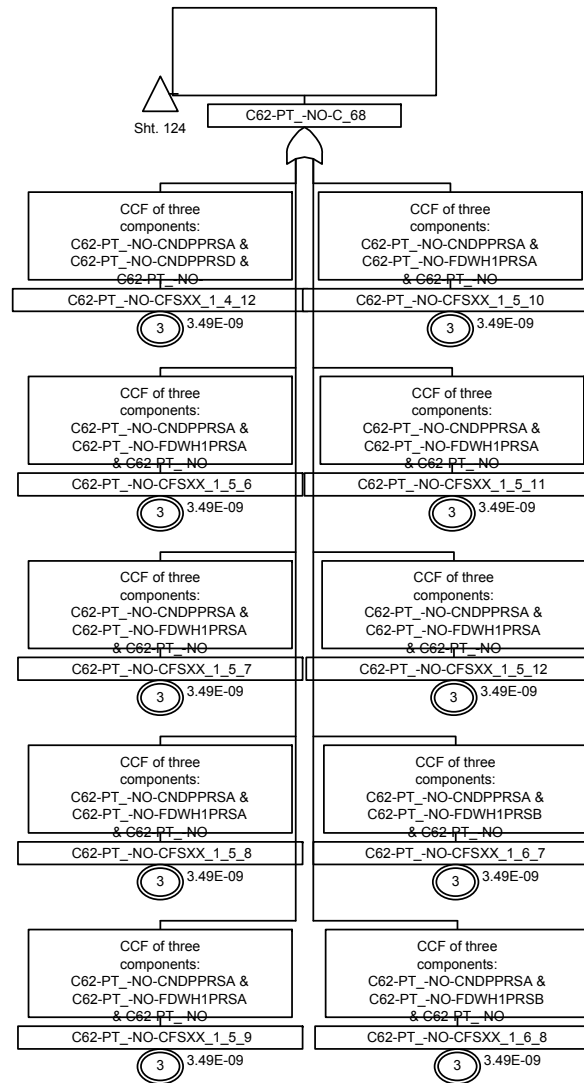


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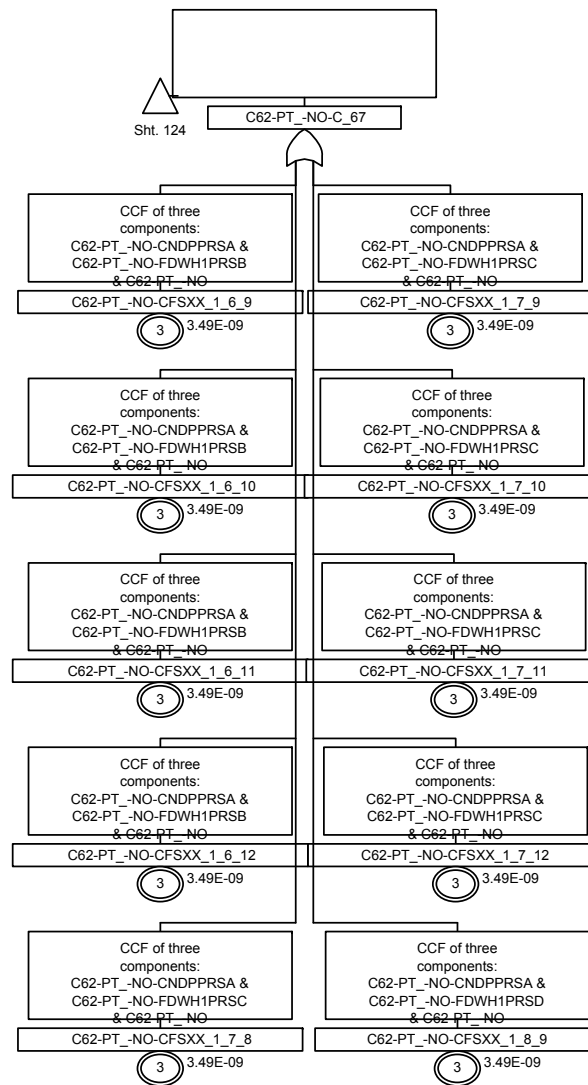


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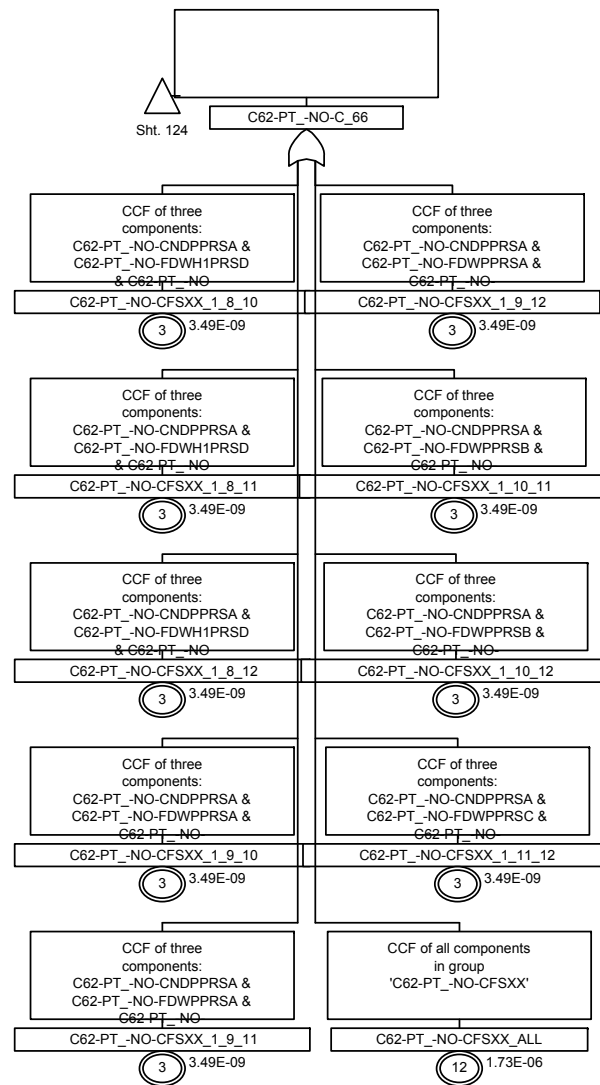


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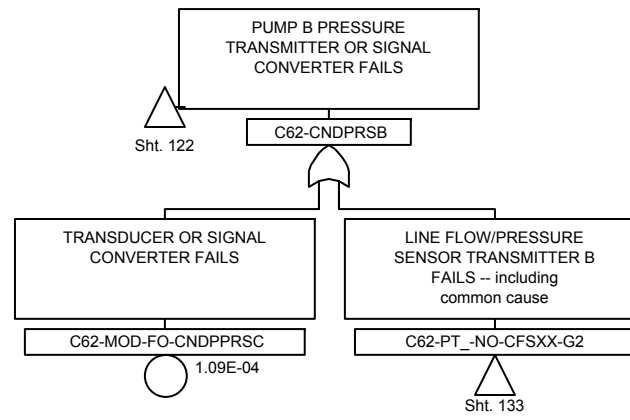


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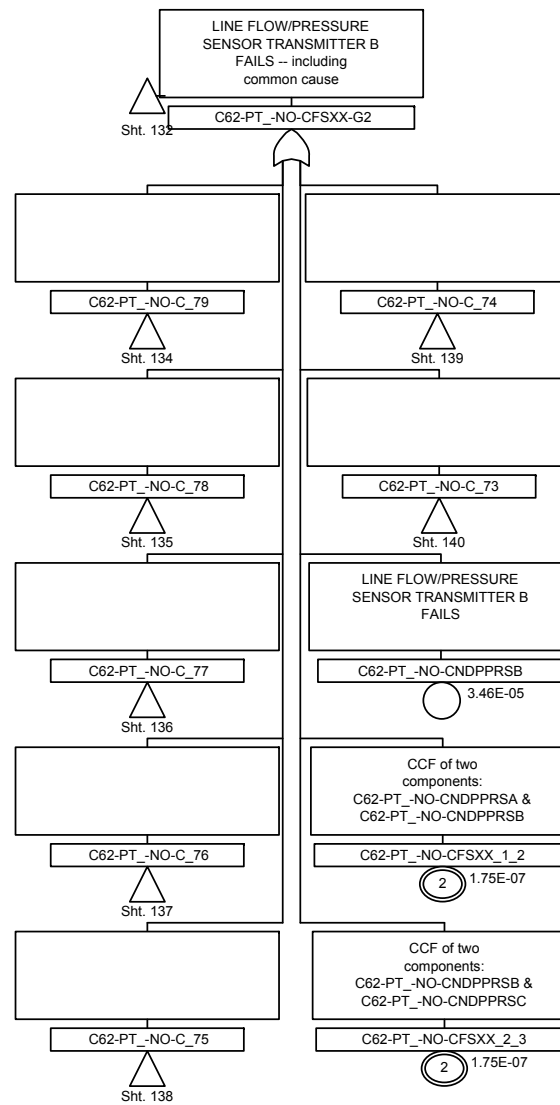


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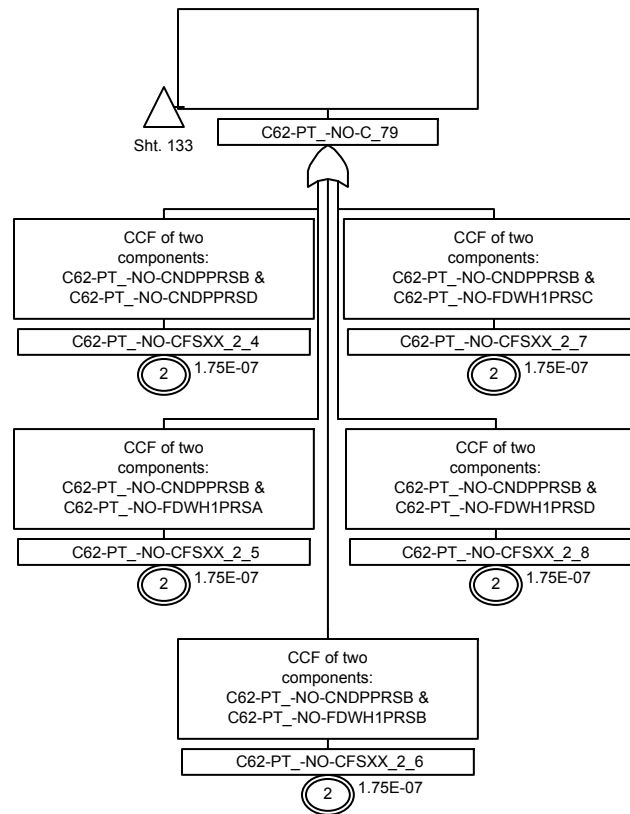


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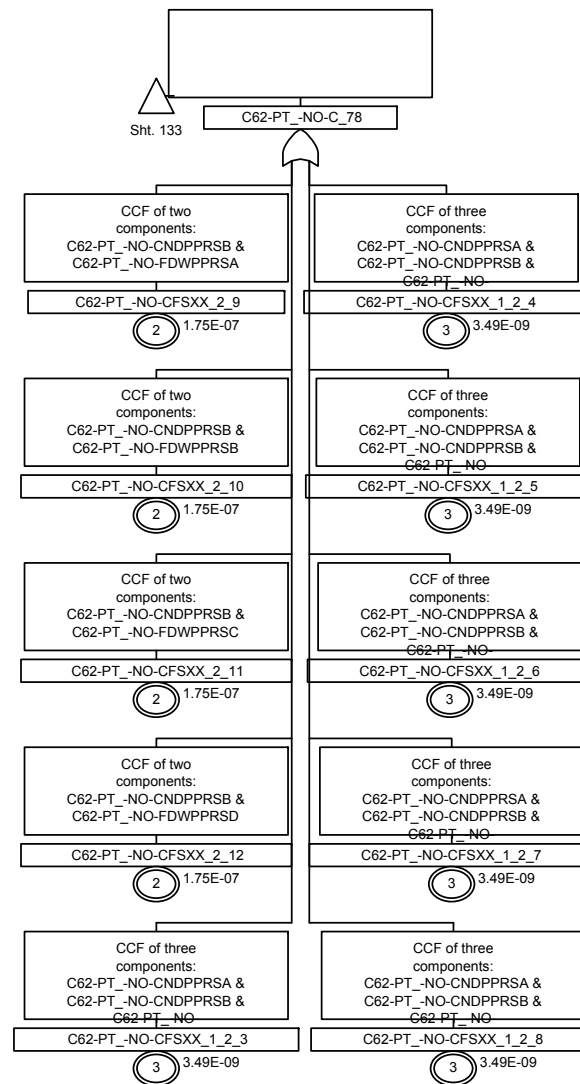


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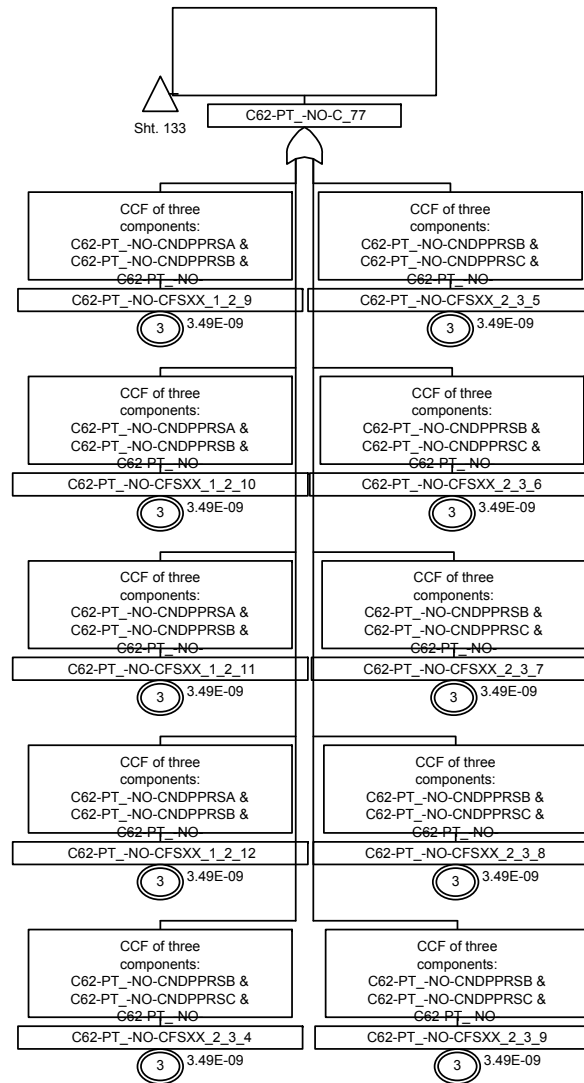


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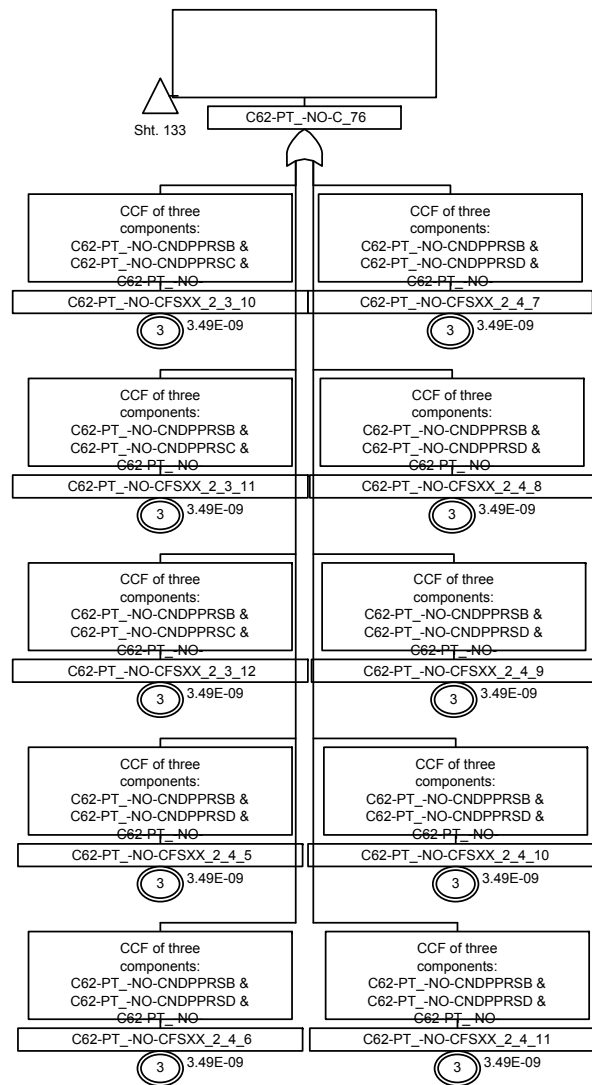


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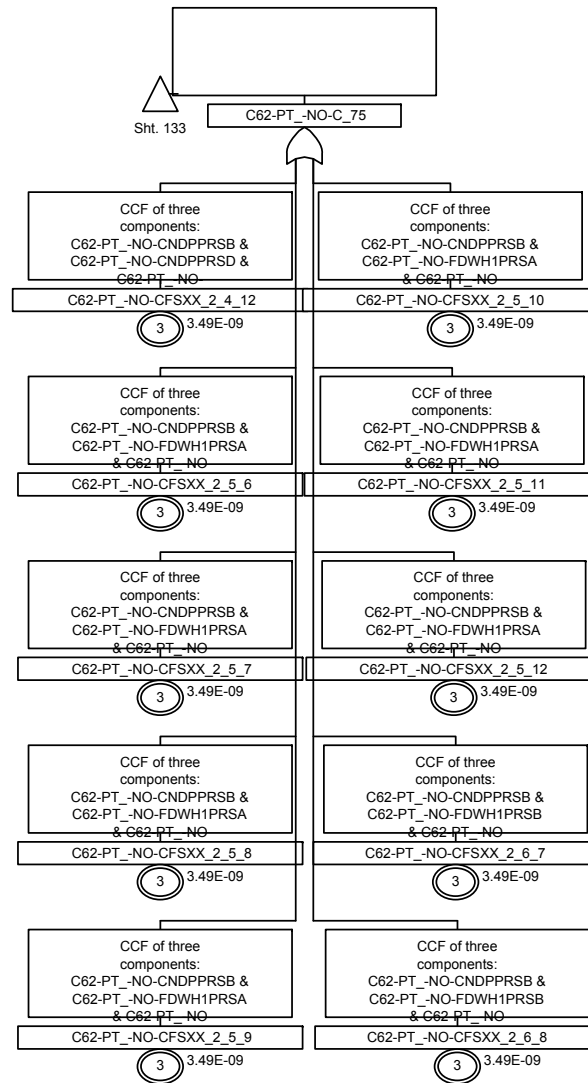


Figure 4.5-3a. Sheet 138 N-DCIS Non Safety Control System

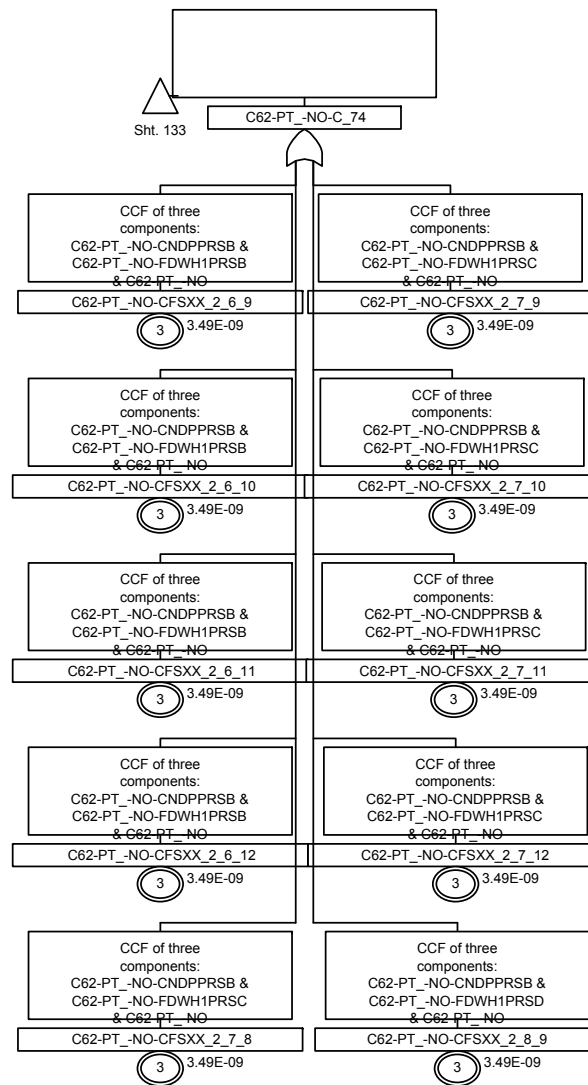


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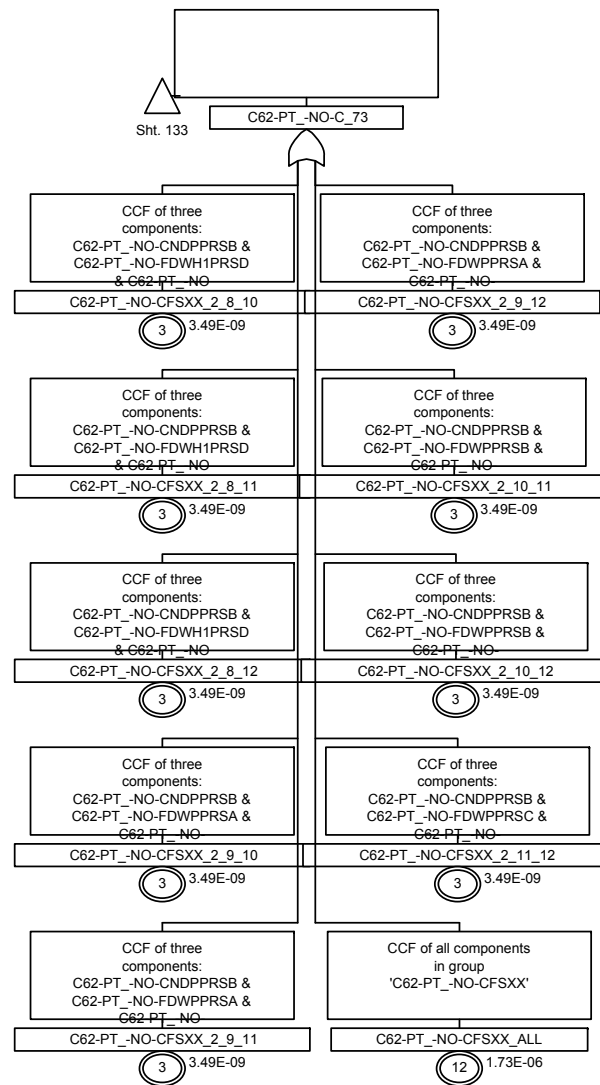


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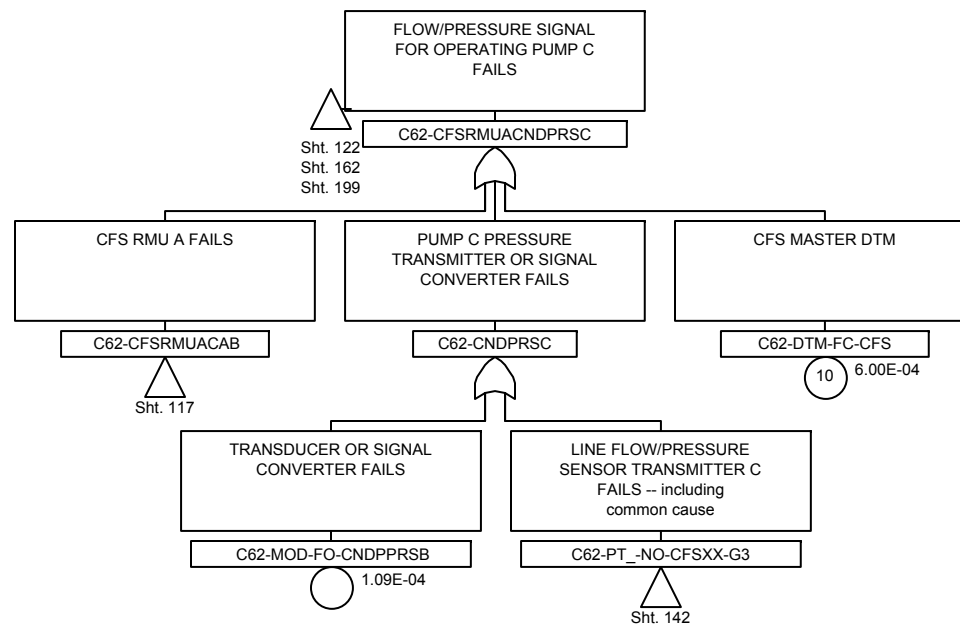


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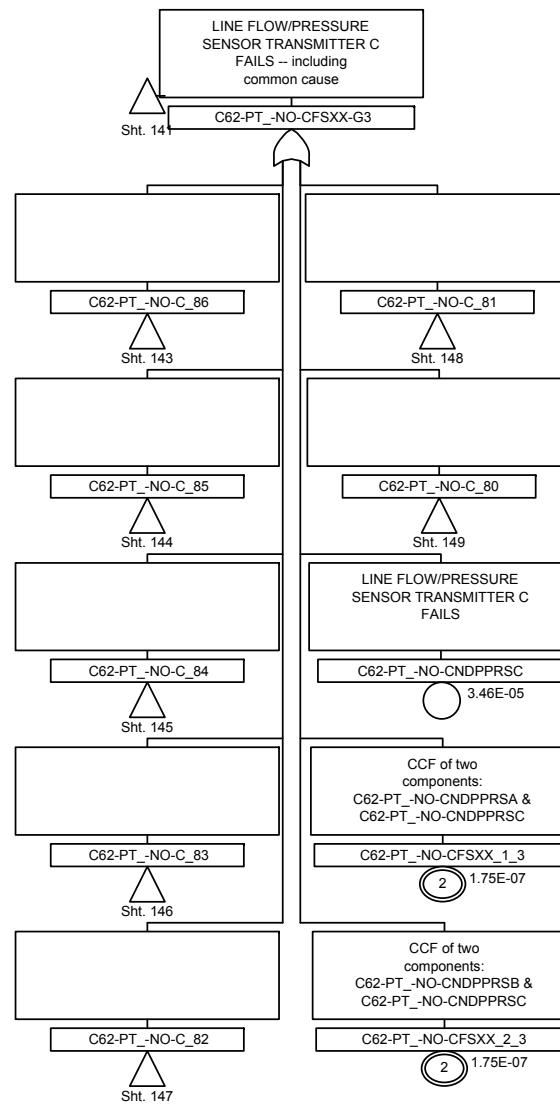


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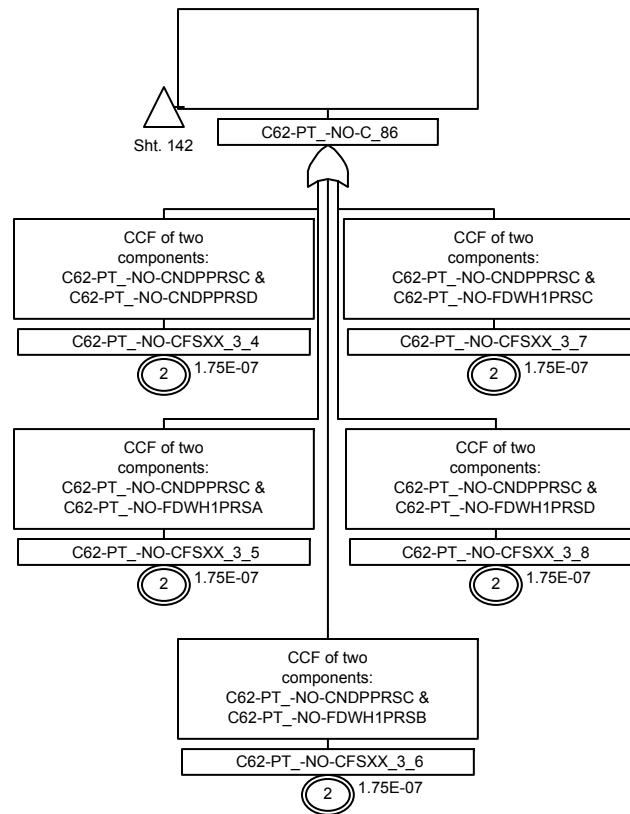


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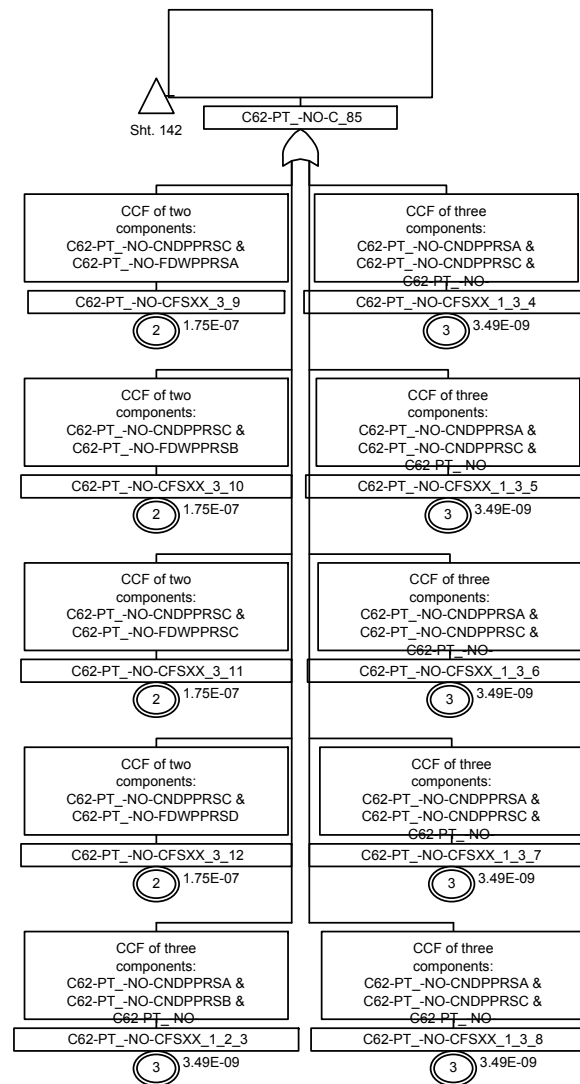


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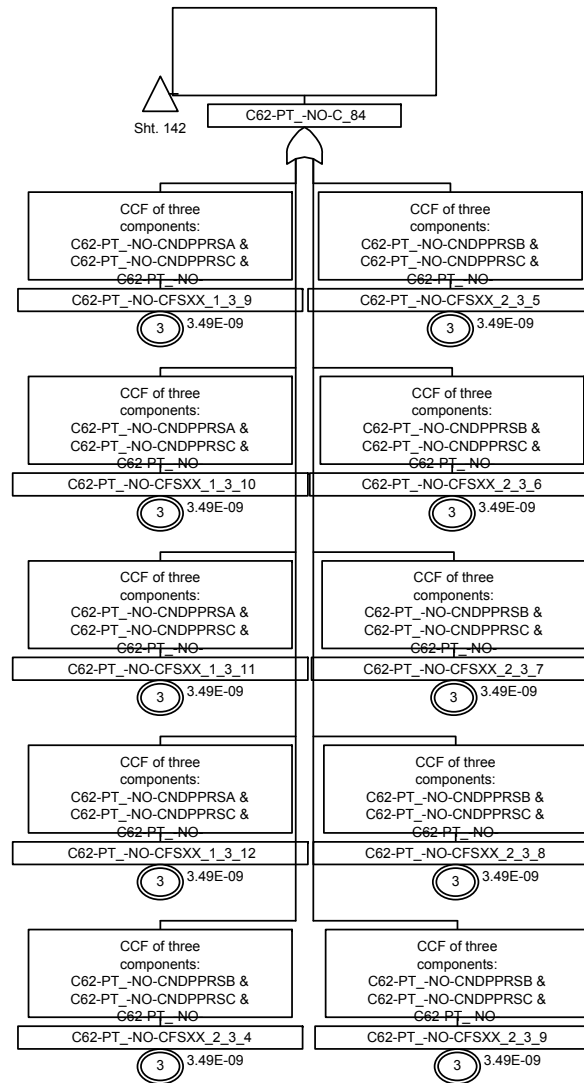


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4.5-766

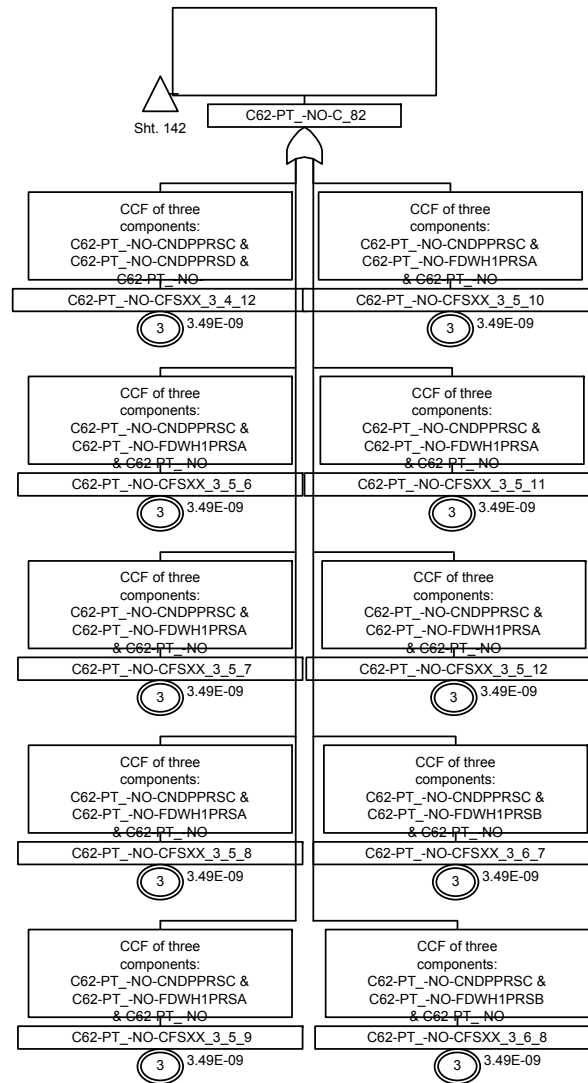


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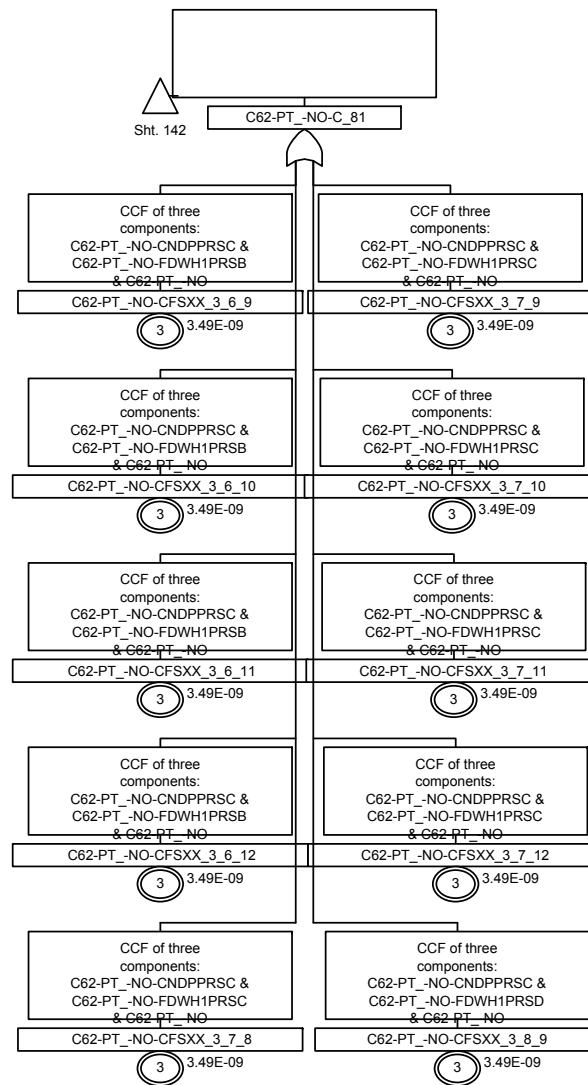


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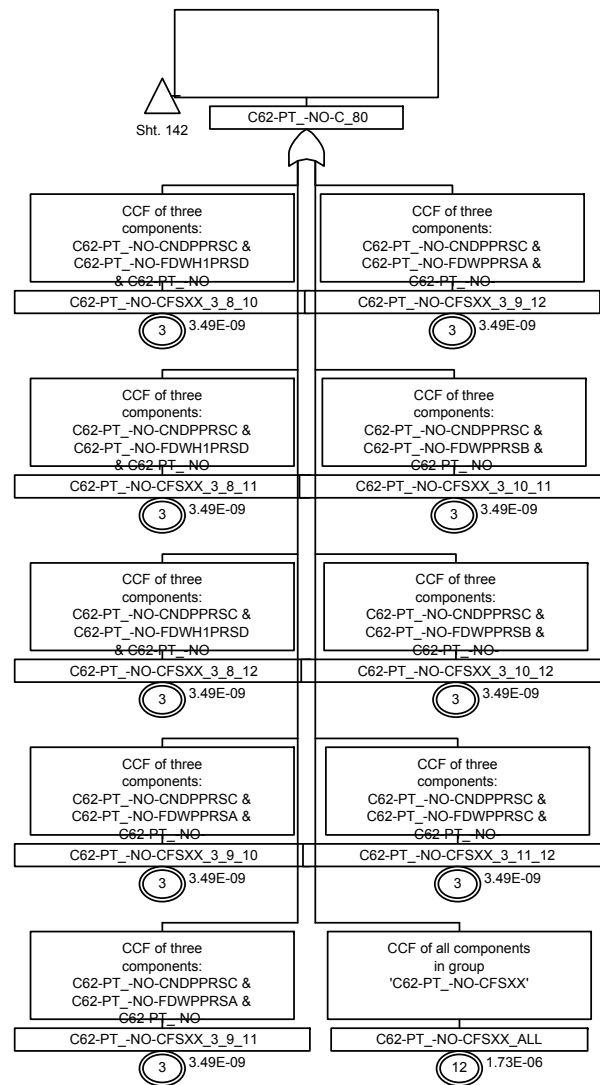


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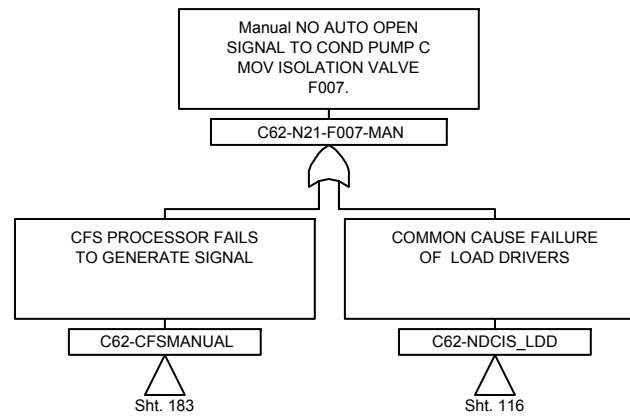


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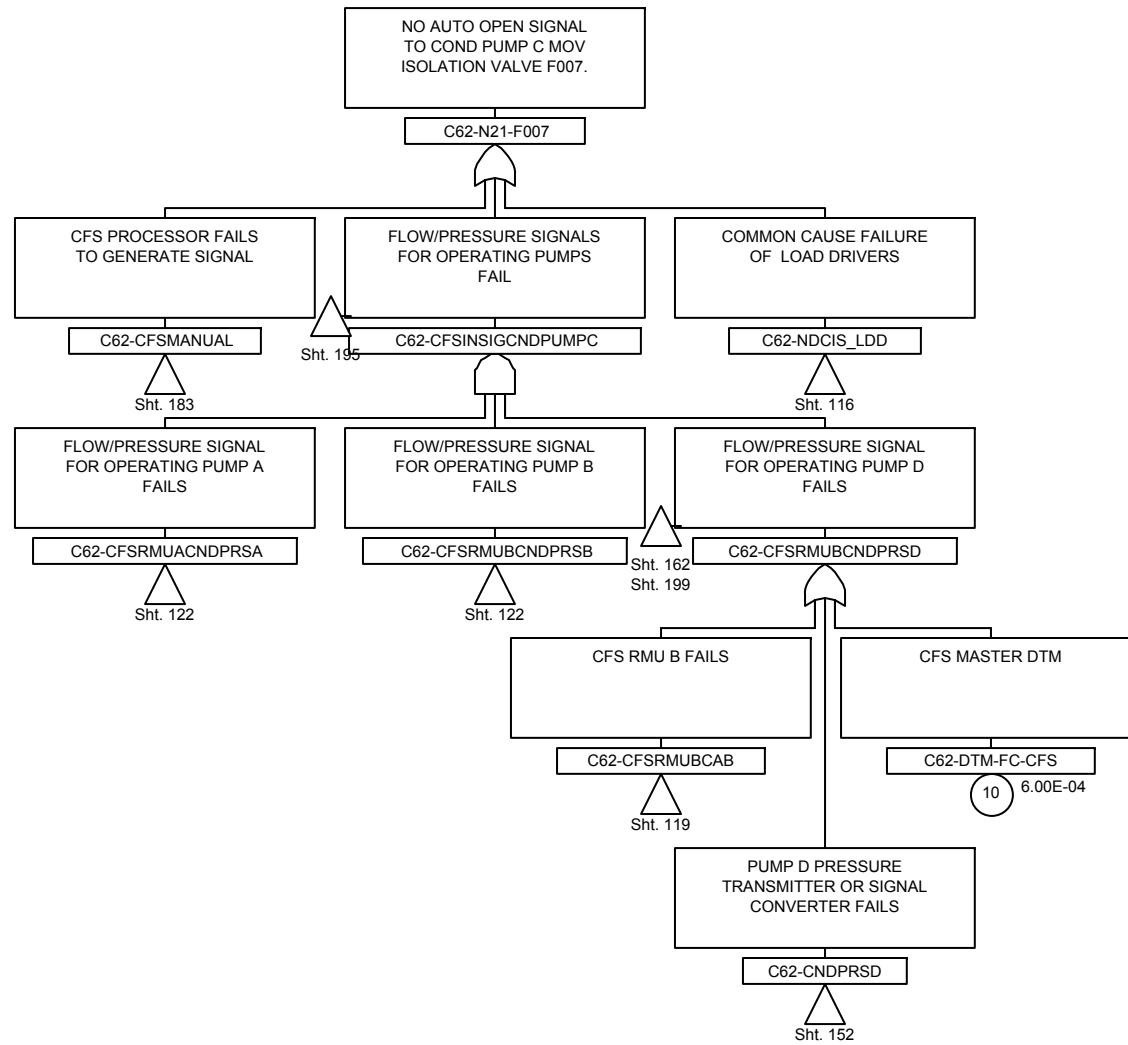


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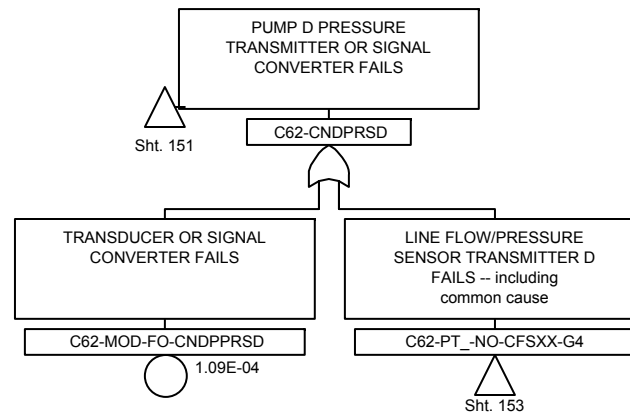


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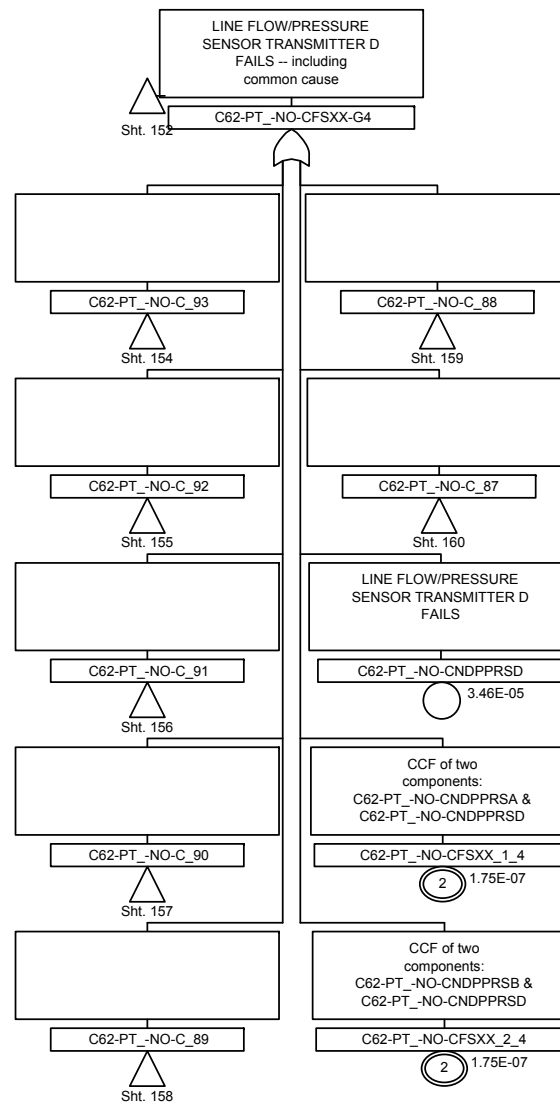


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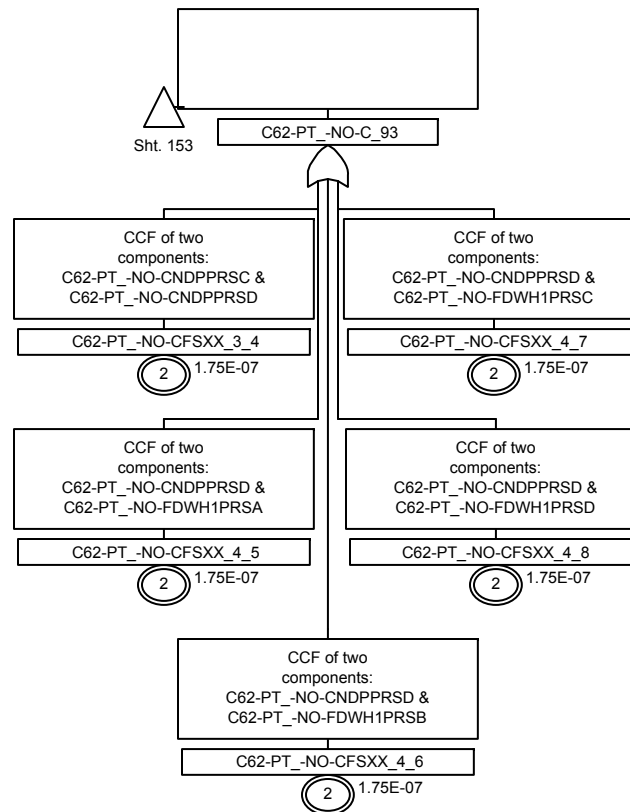


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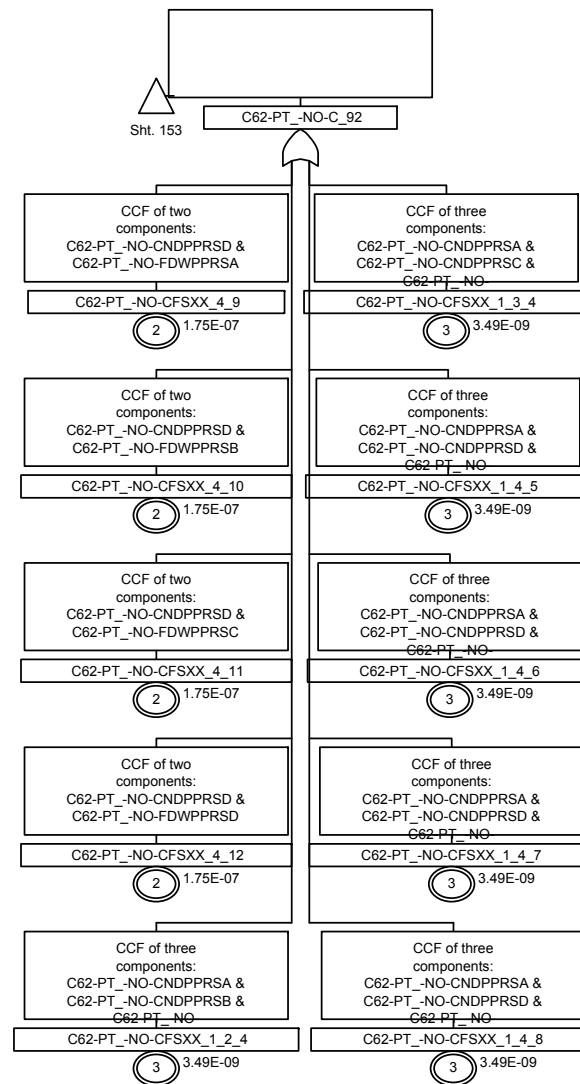


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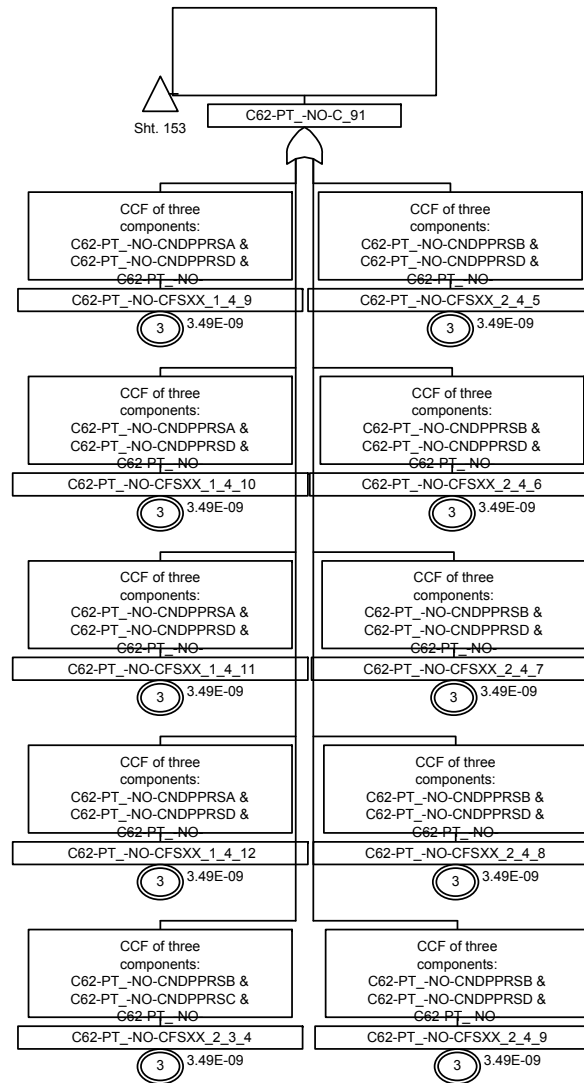


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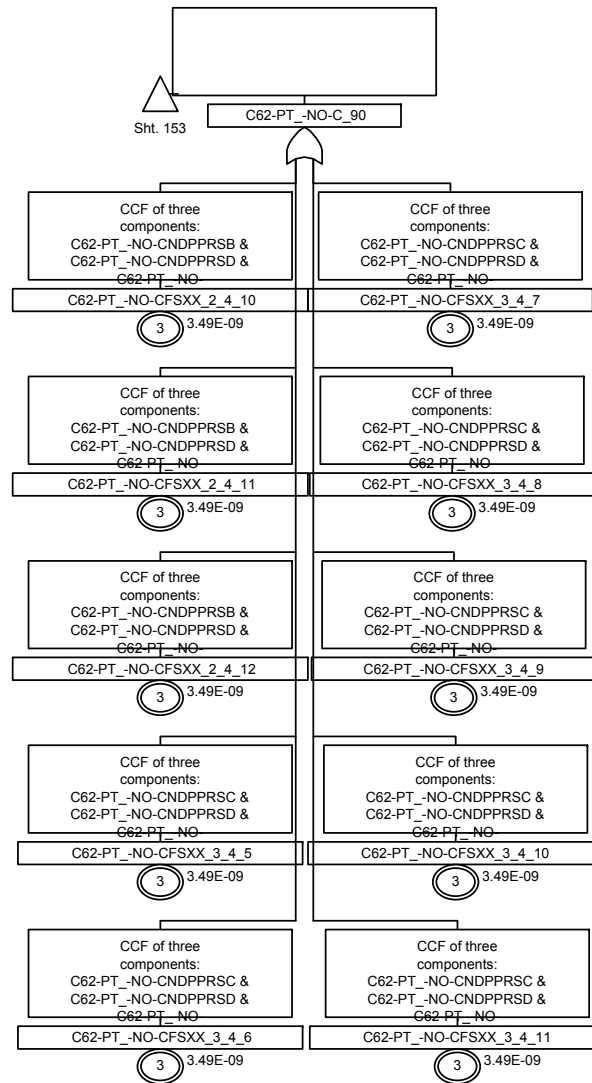


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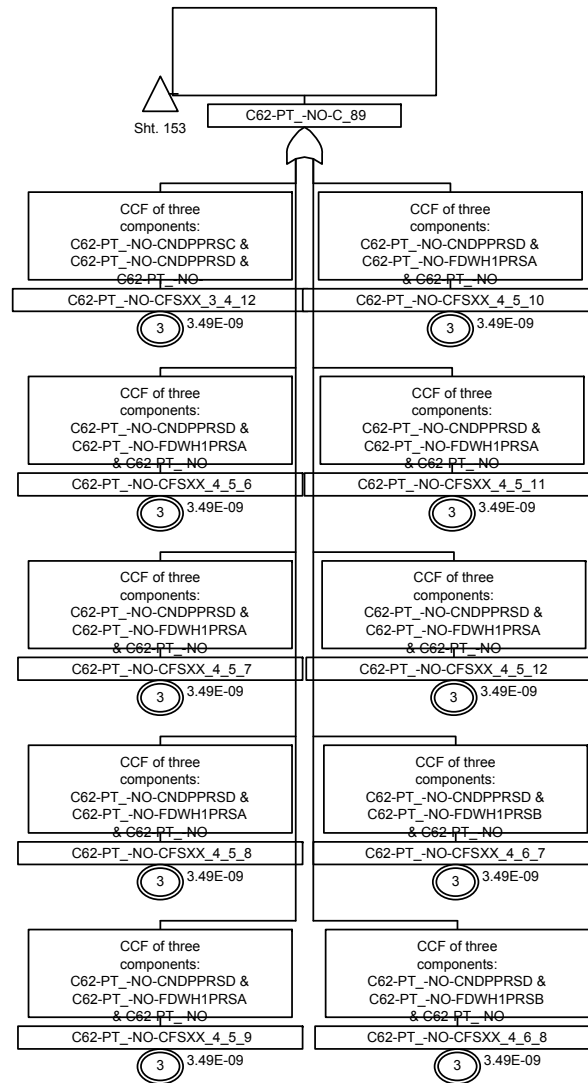


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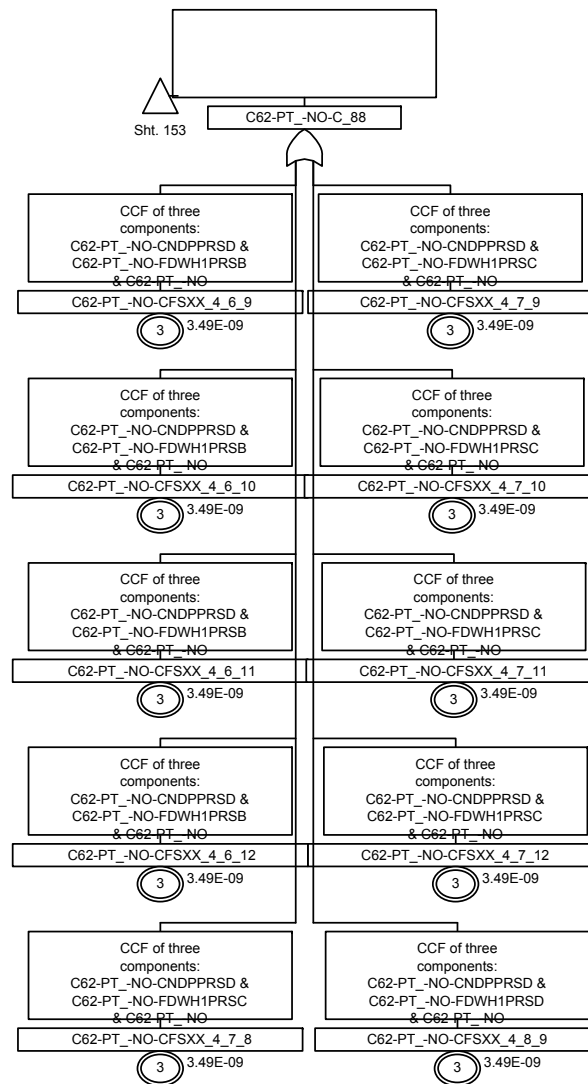


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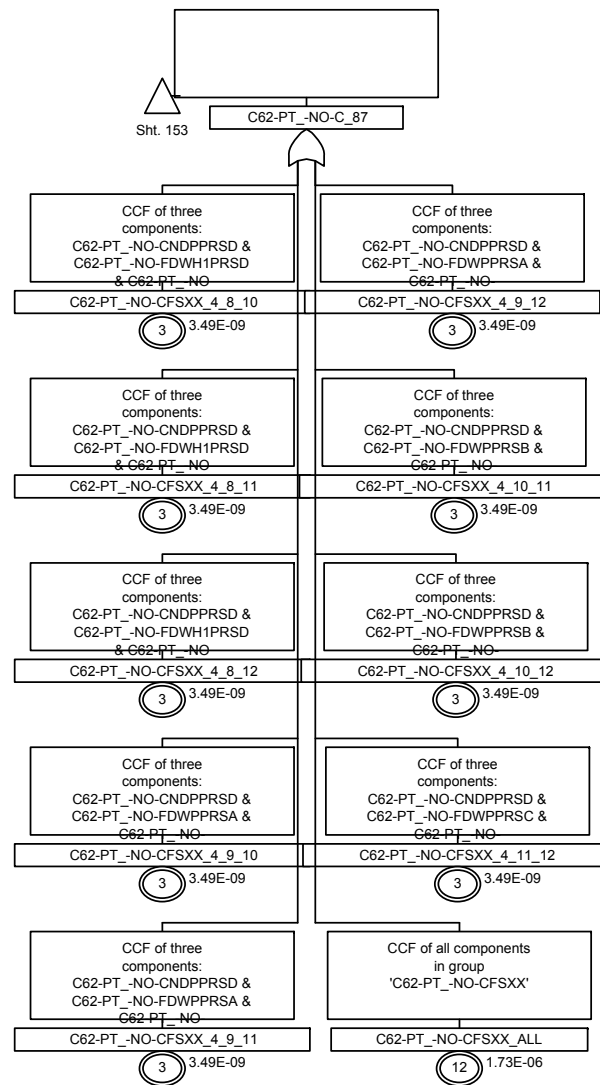


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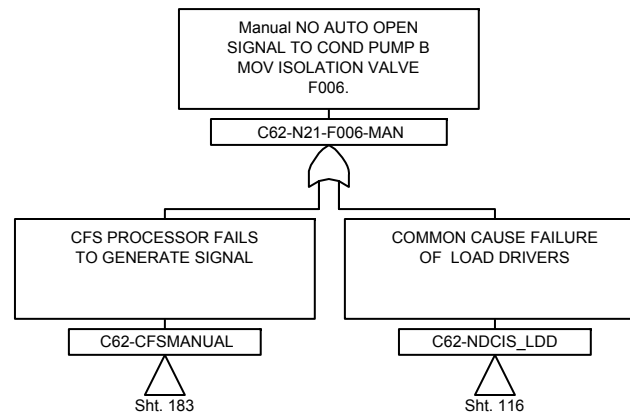


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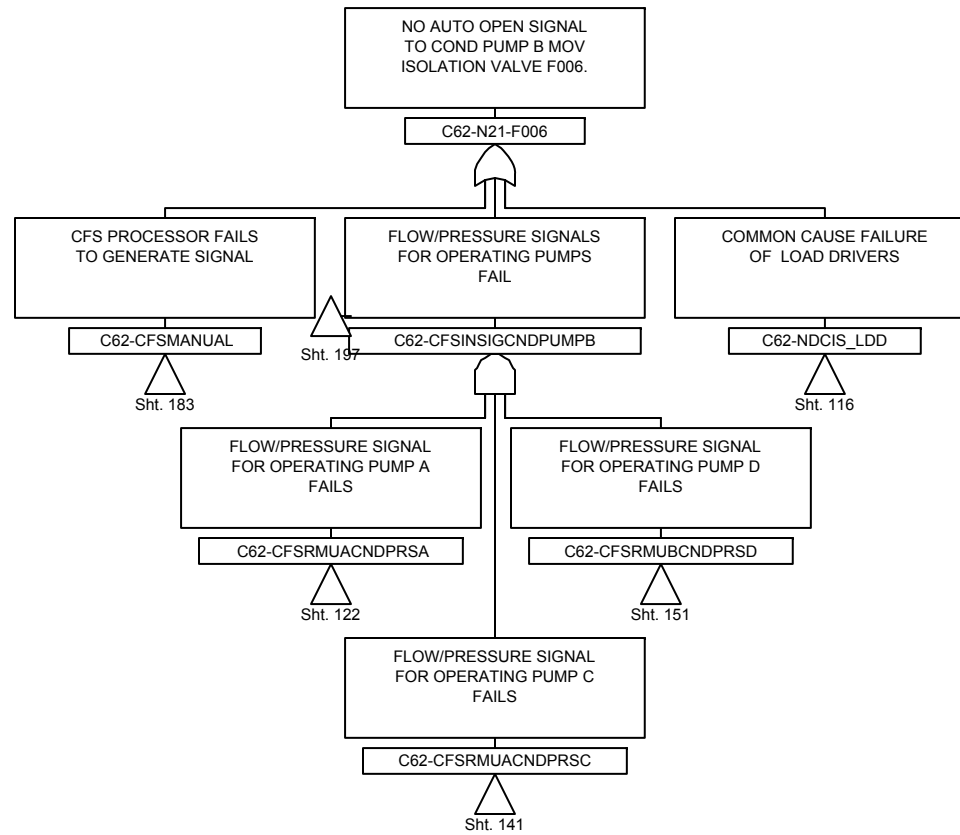


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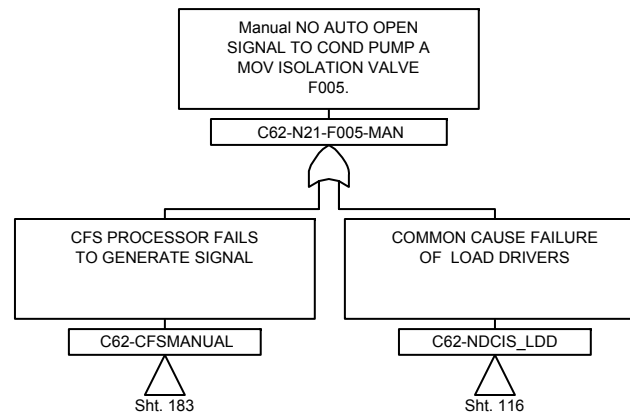


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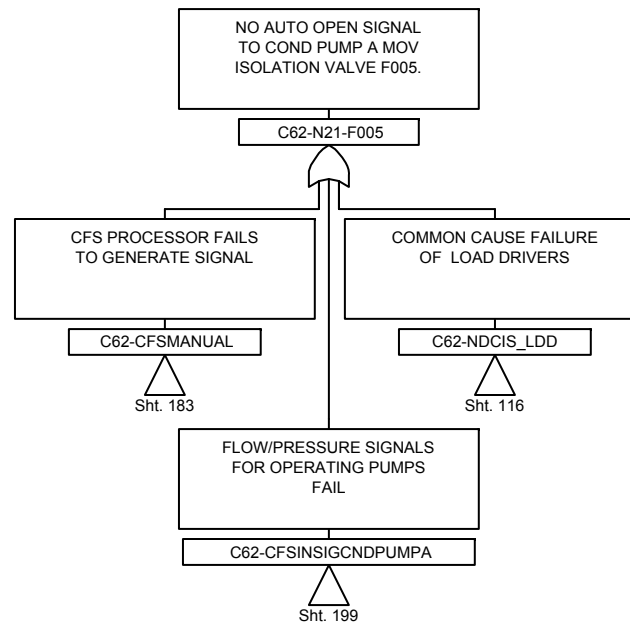


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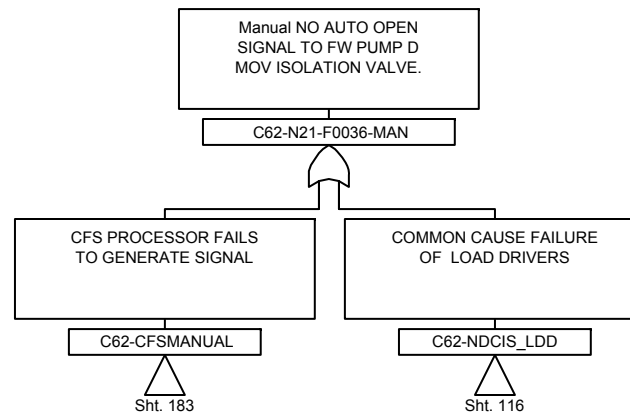


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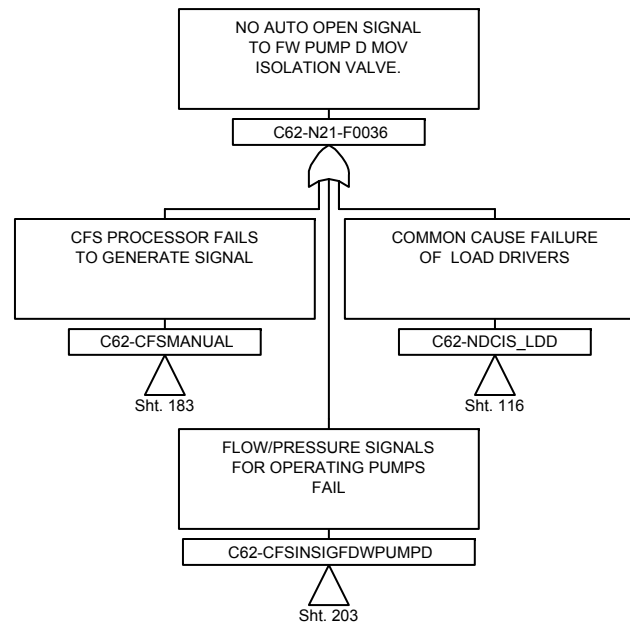


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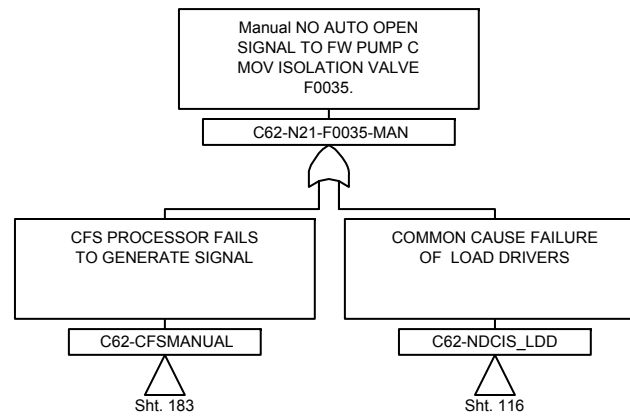


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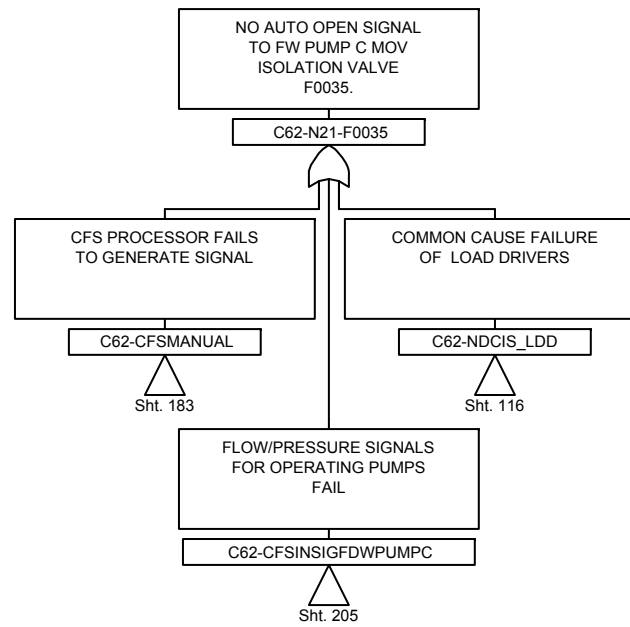


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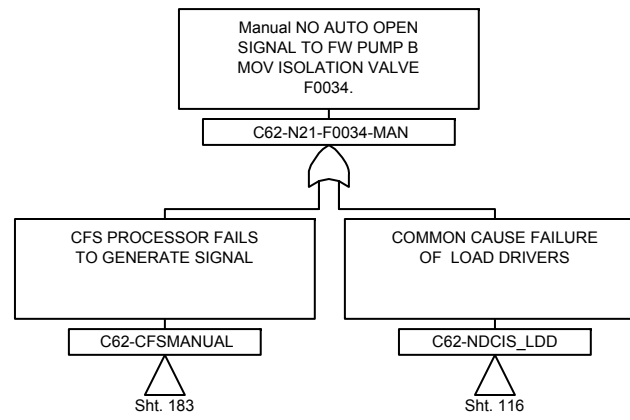


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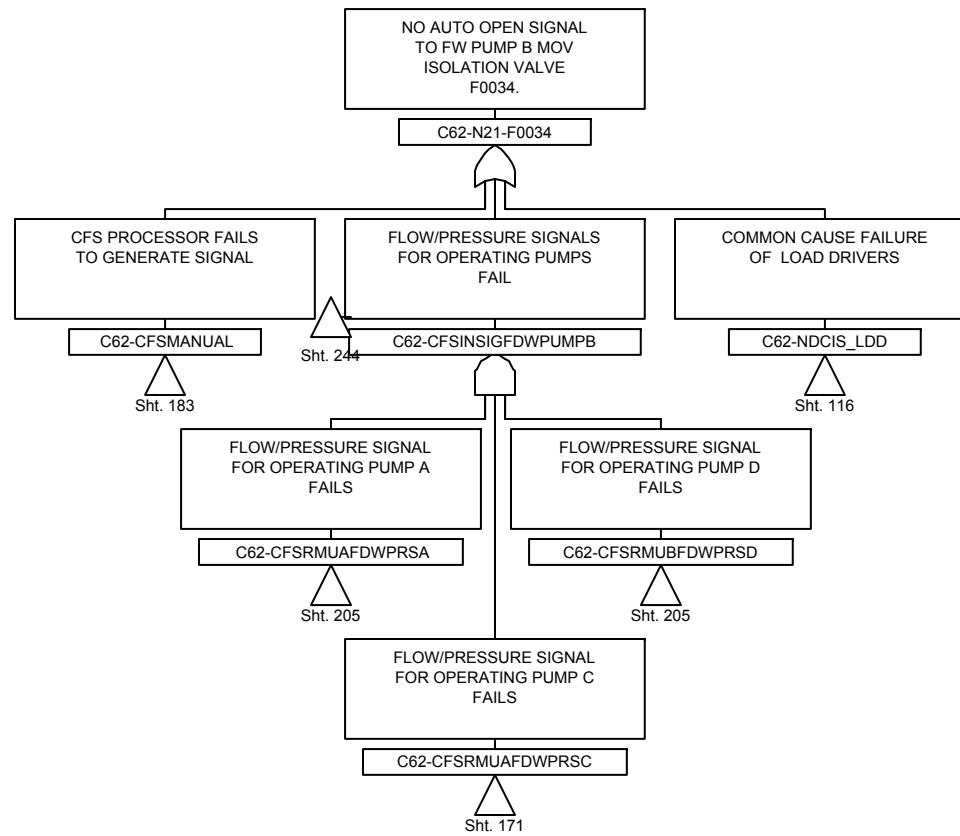


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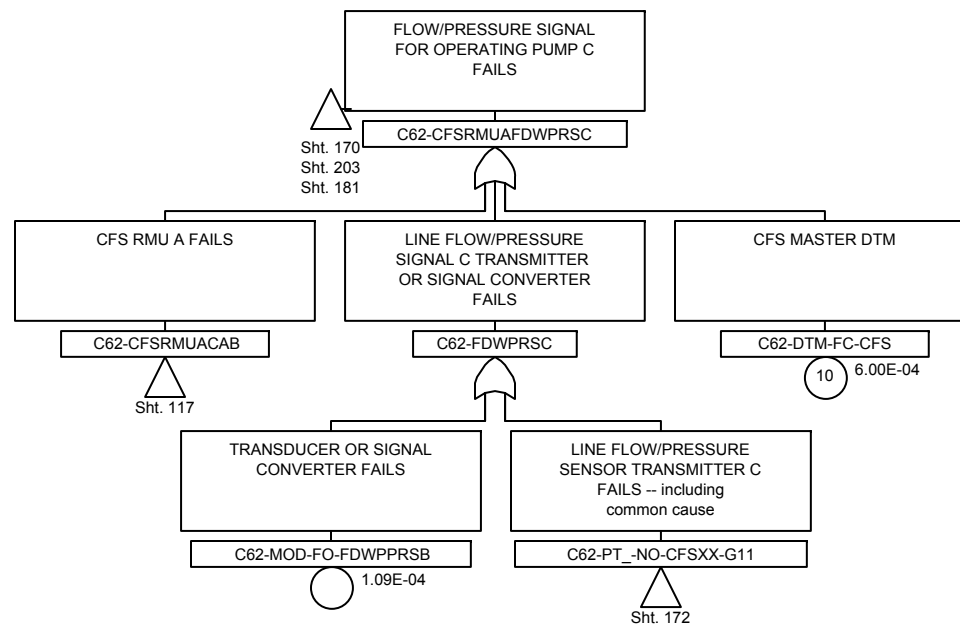


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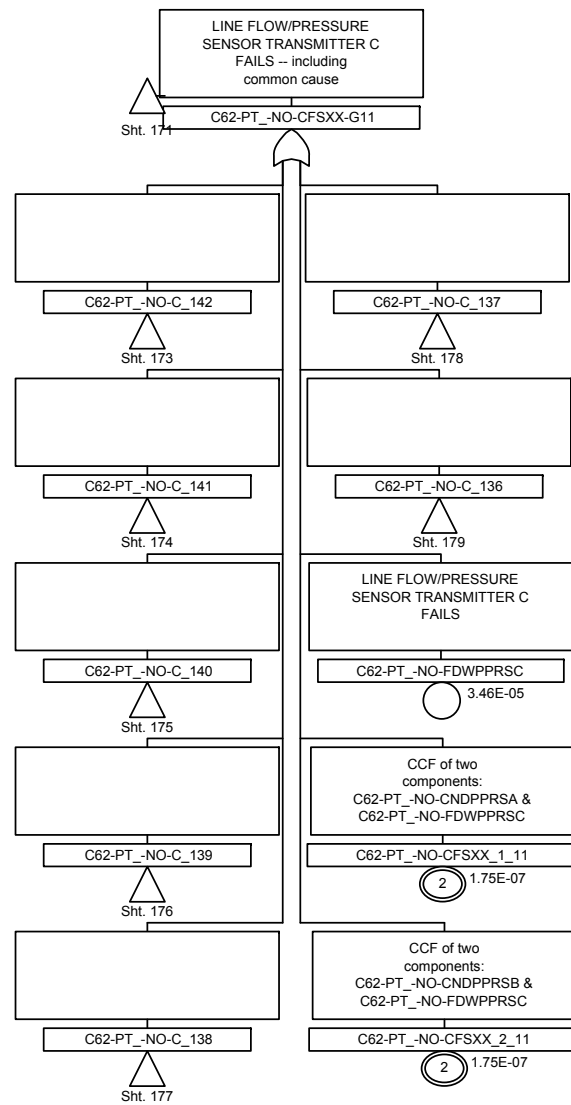


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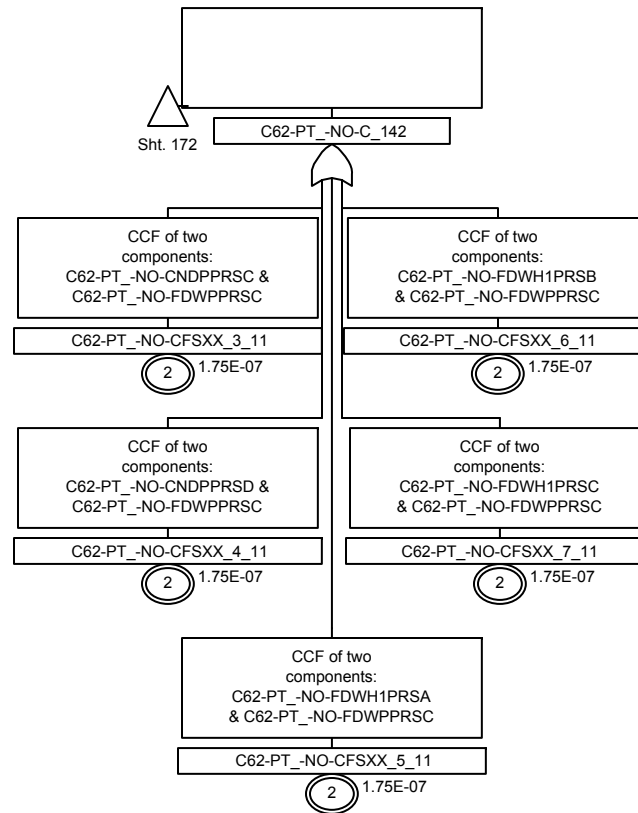


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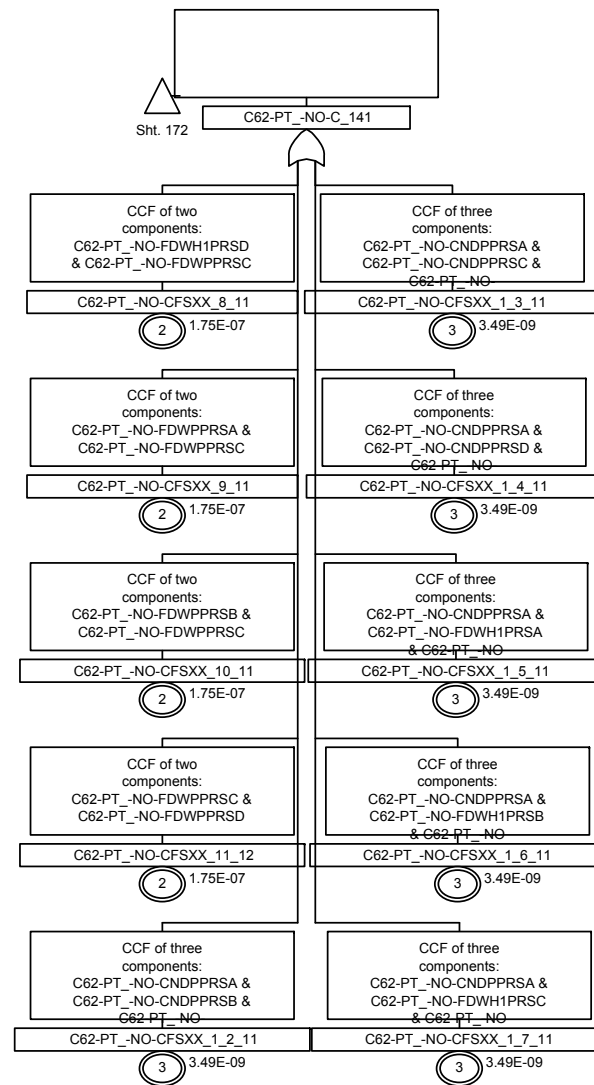


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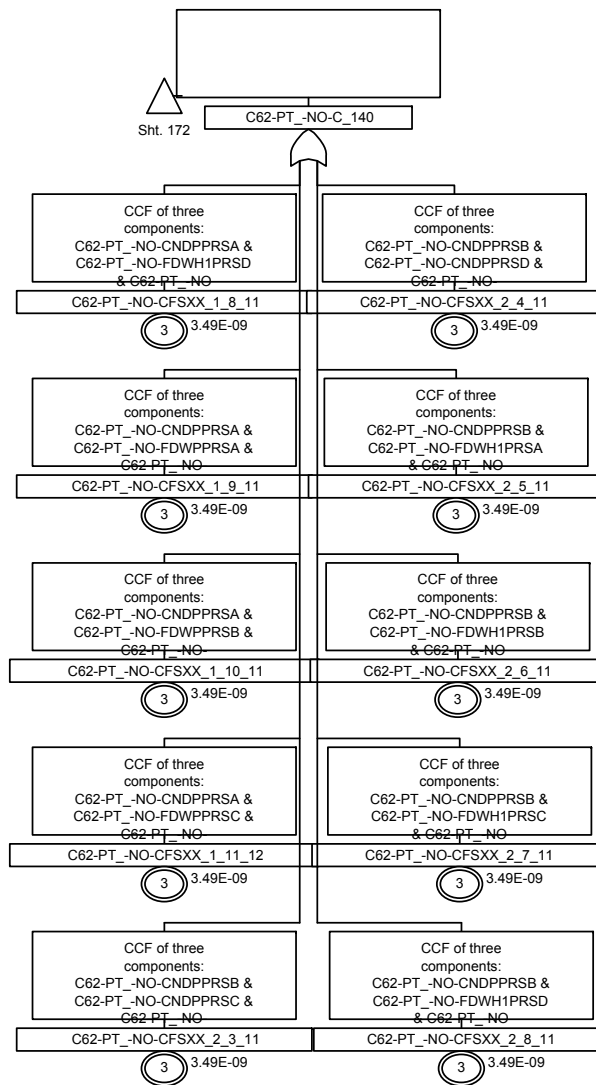


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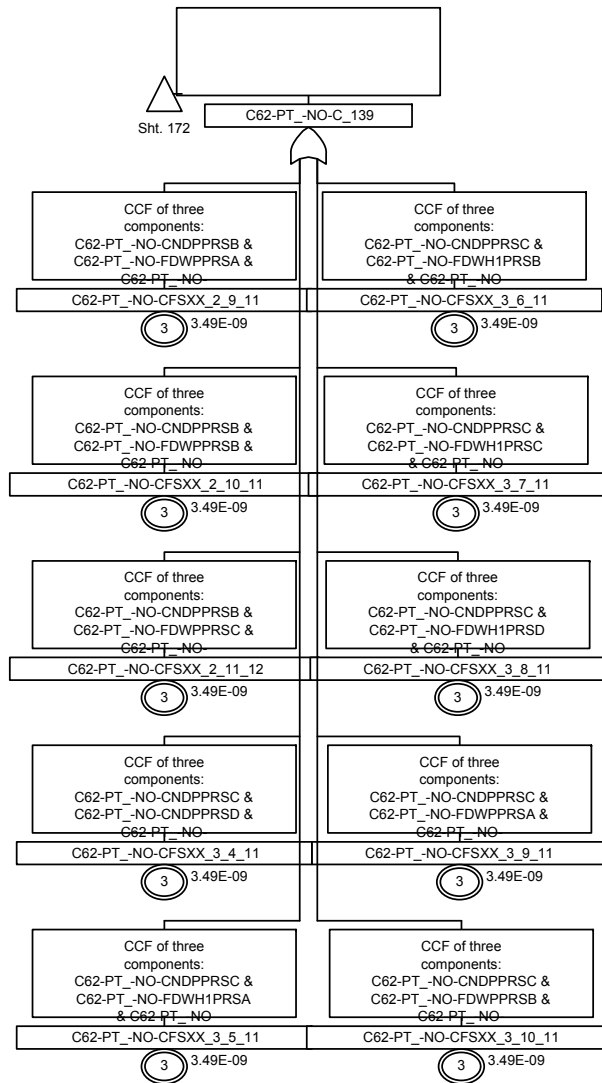


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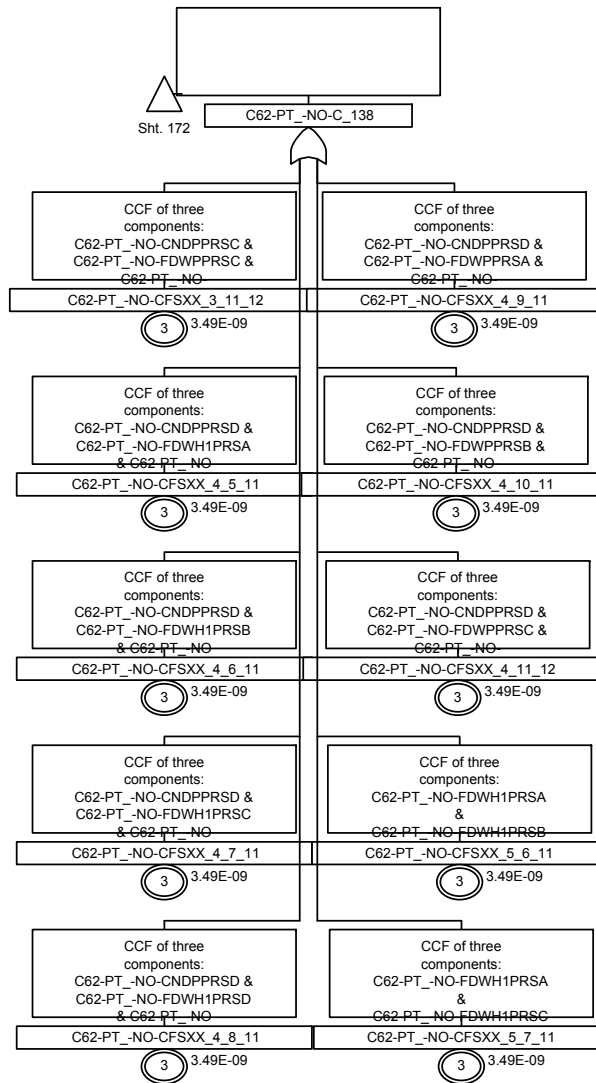


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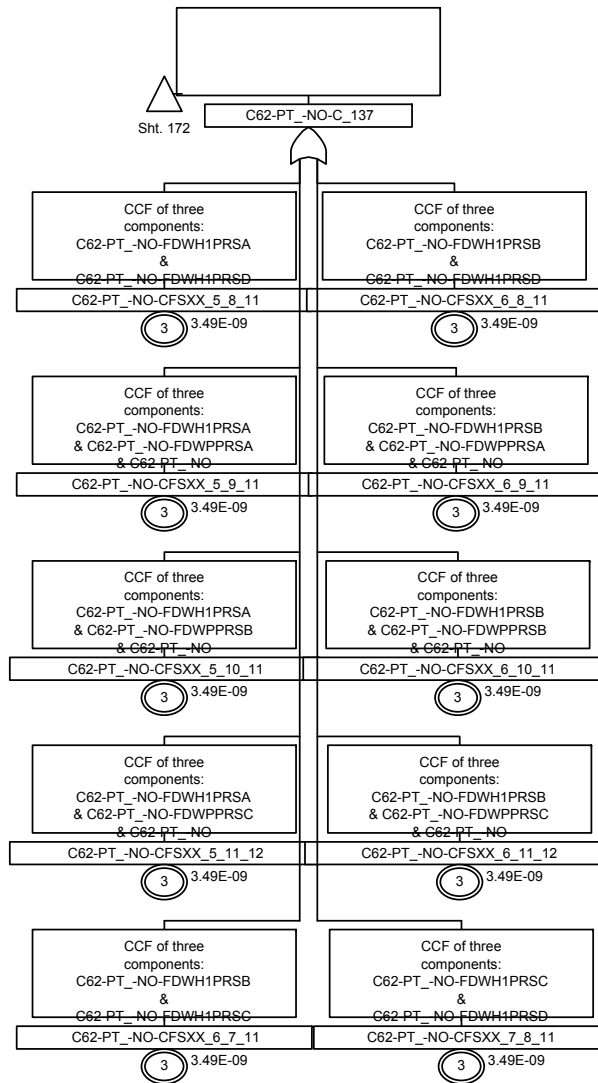


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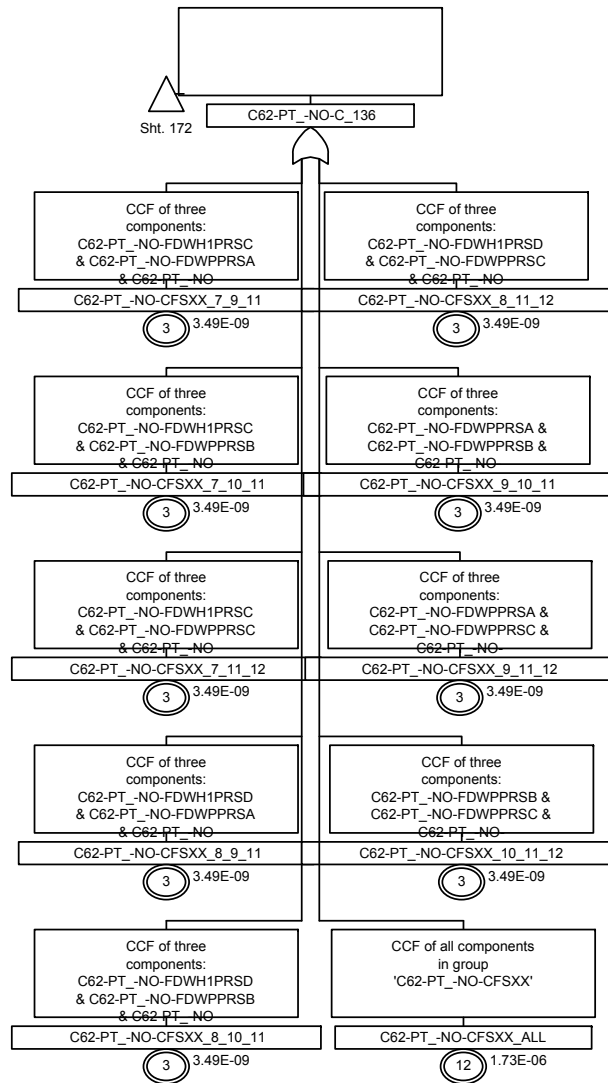


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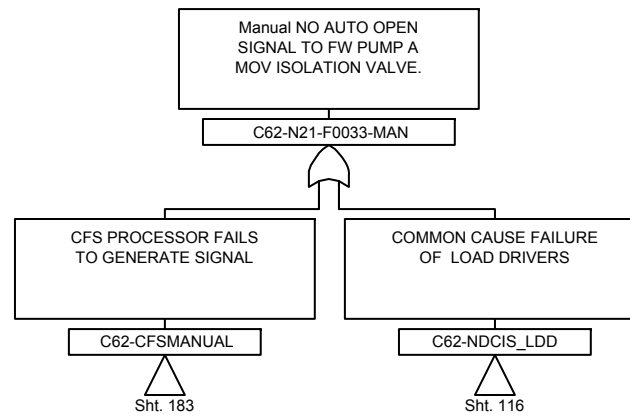


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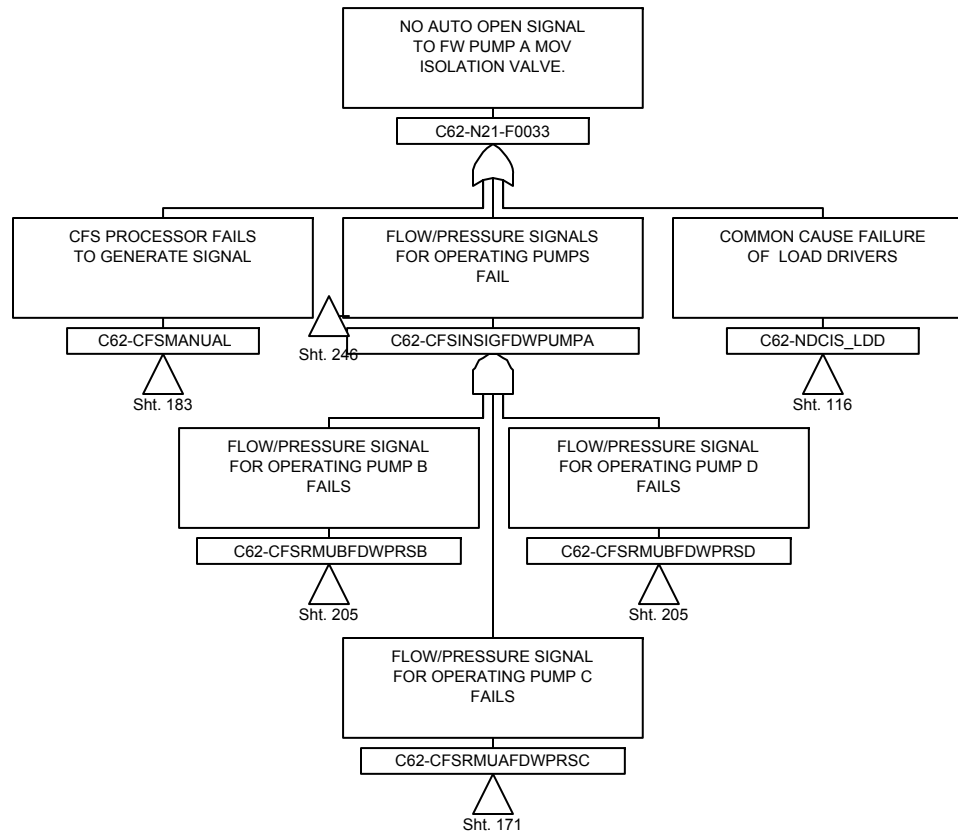


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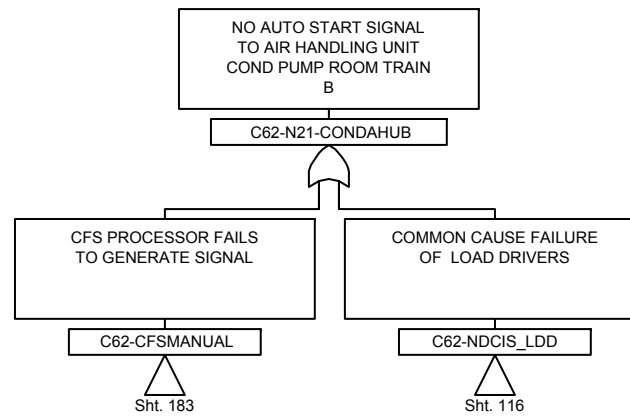


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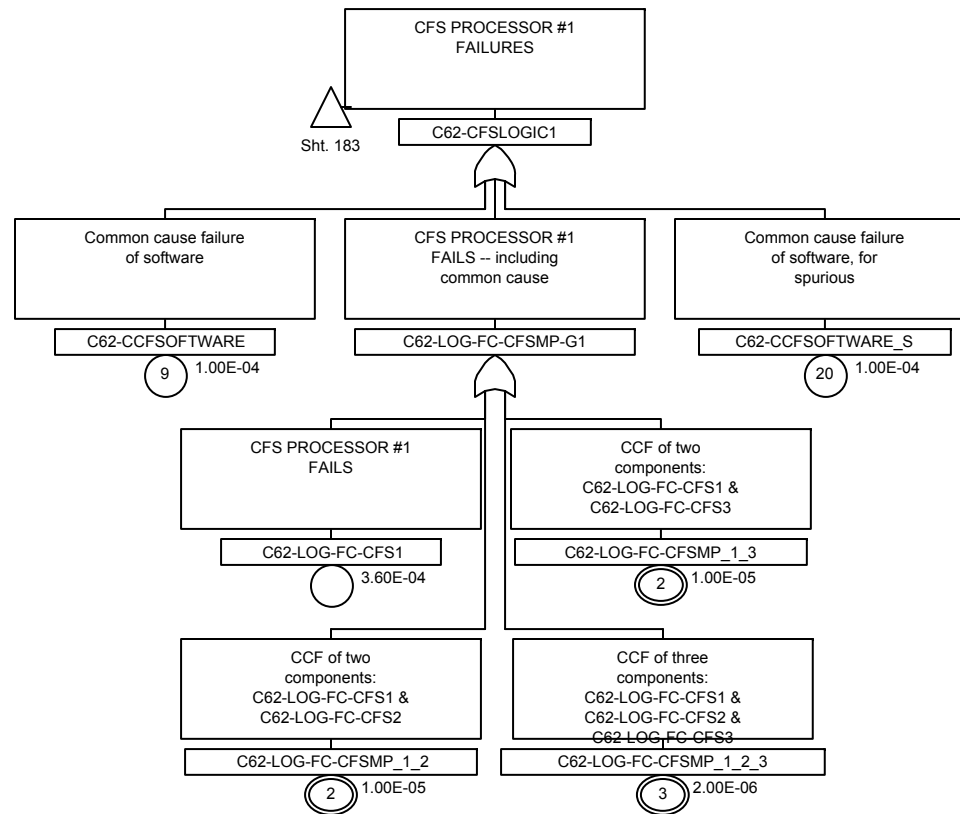


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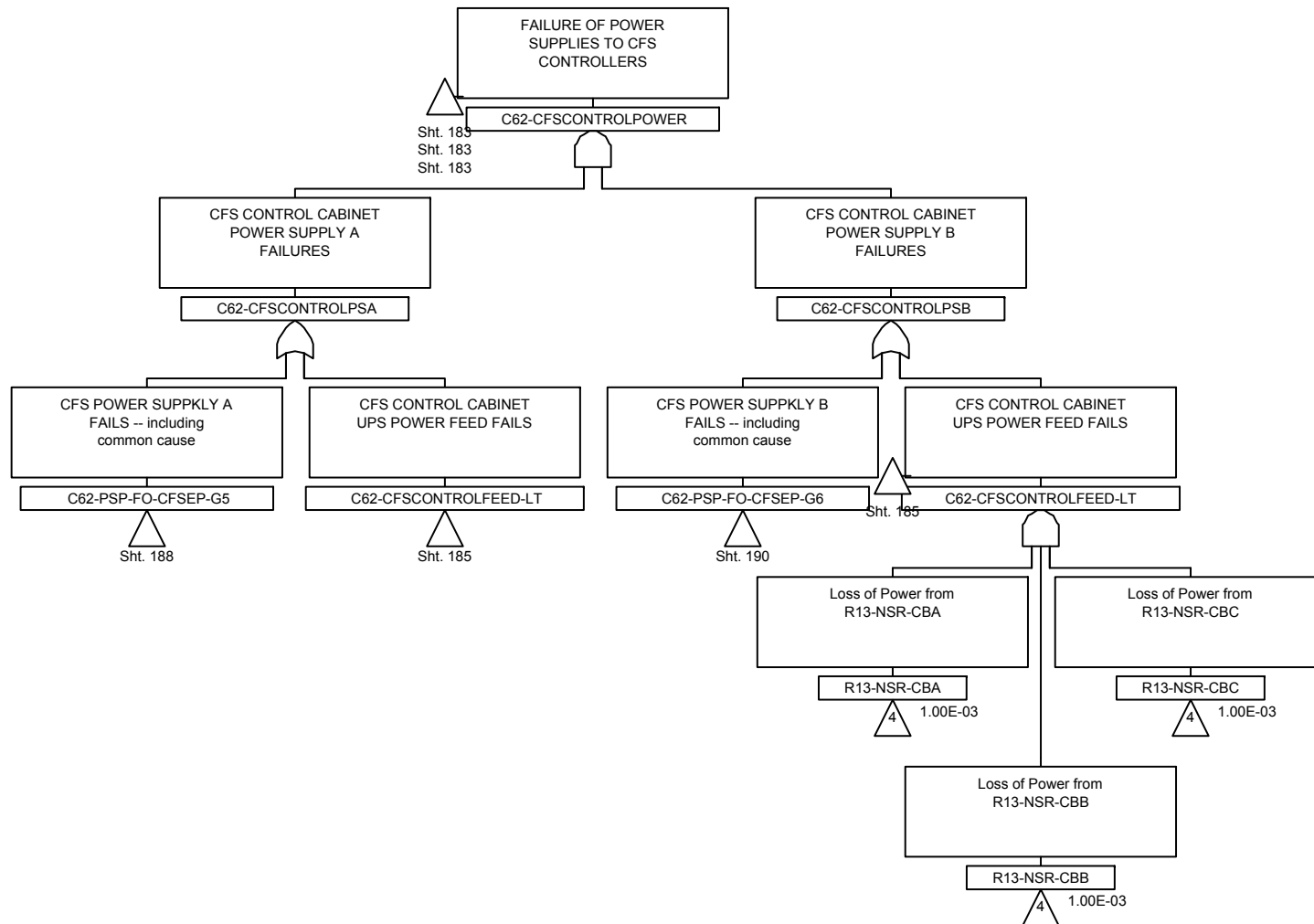


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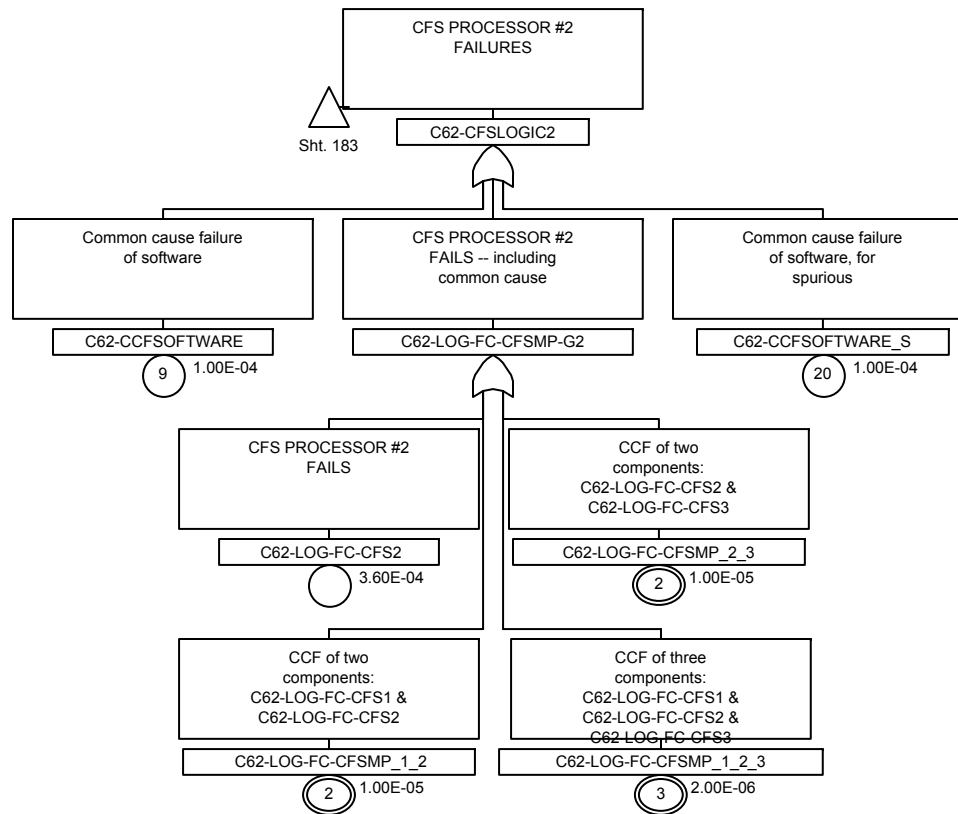


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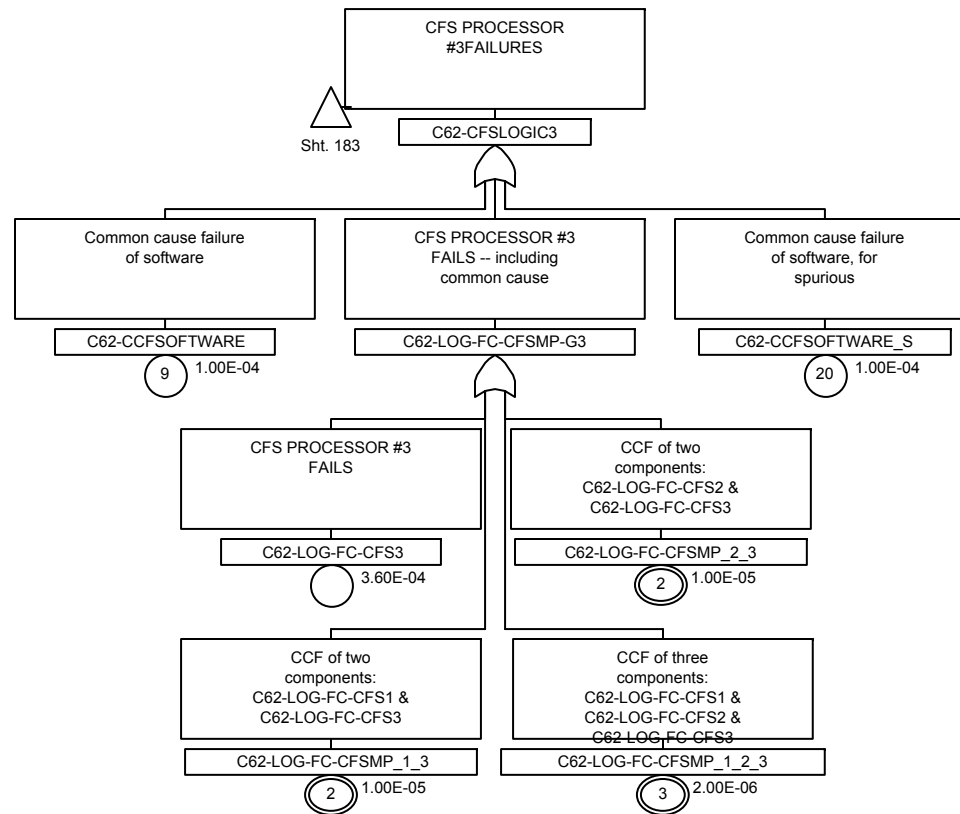


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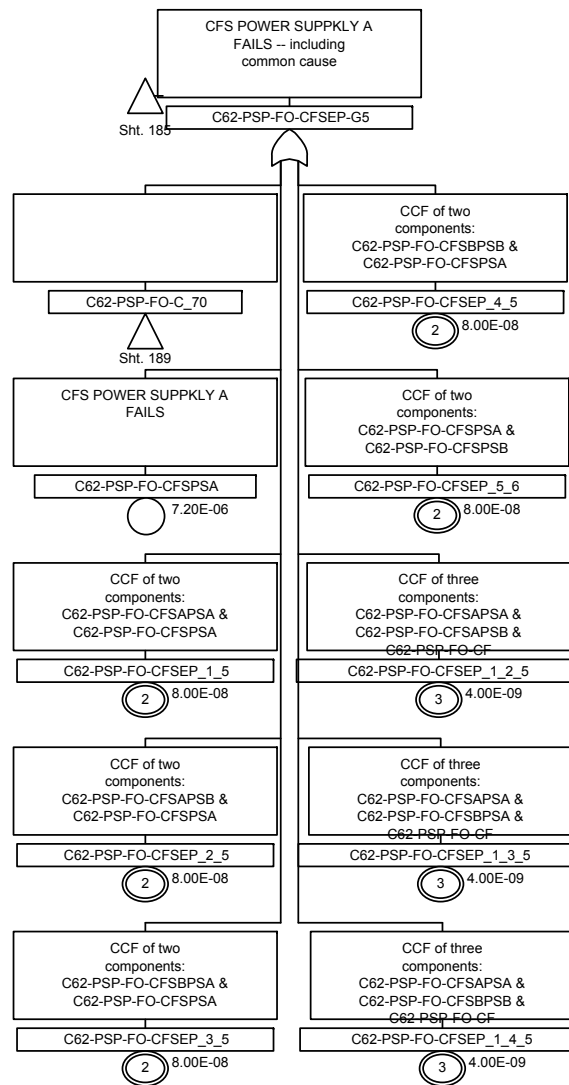


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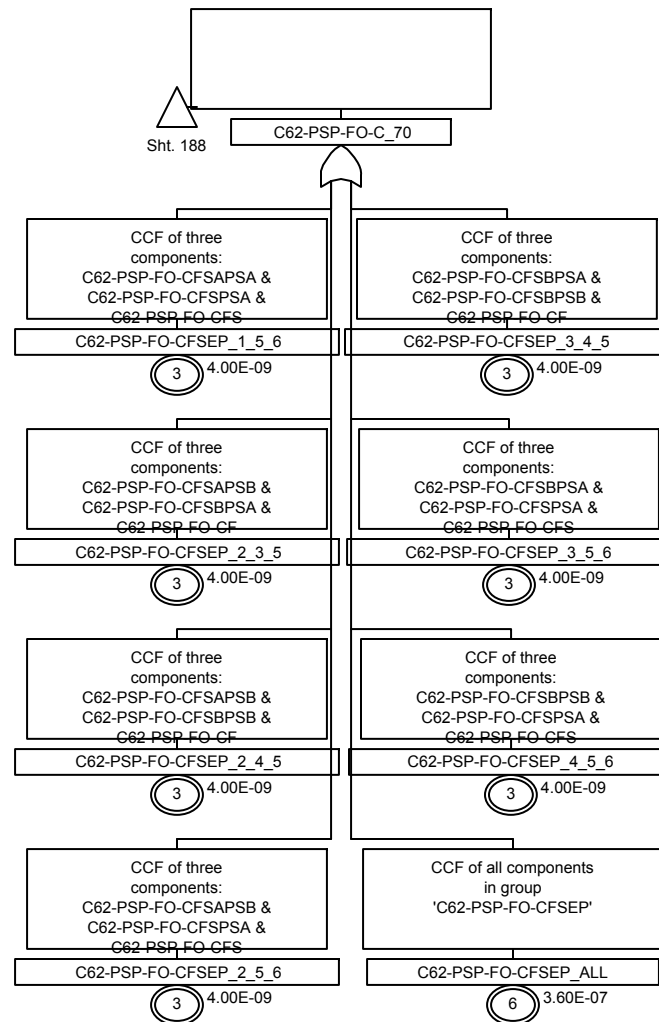


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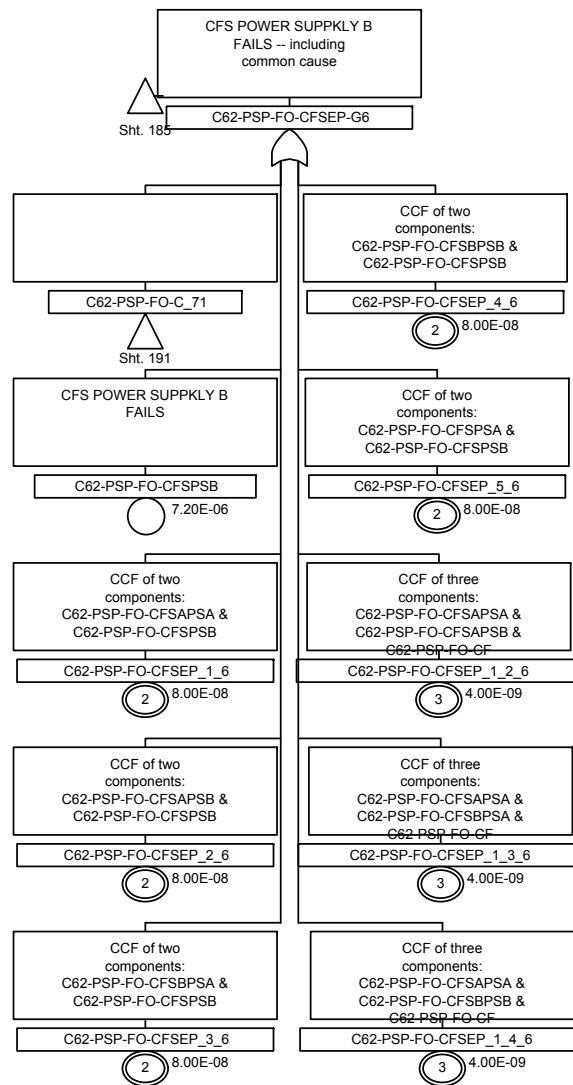


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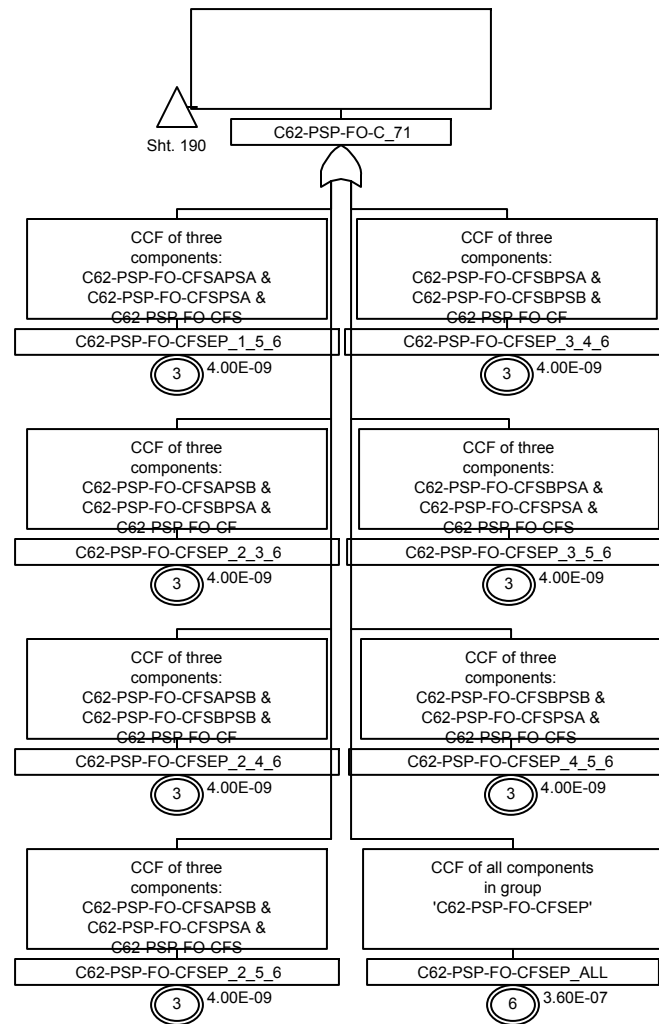


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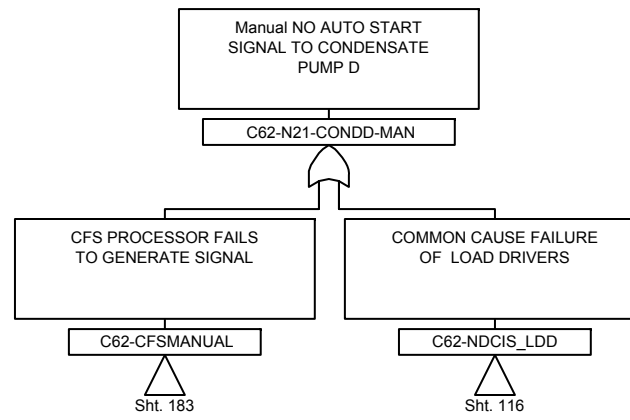


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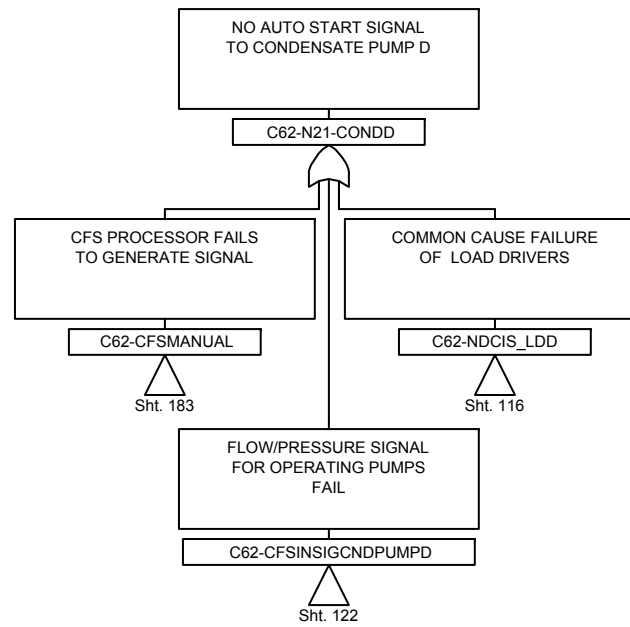


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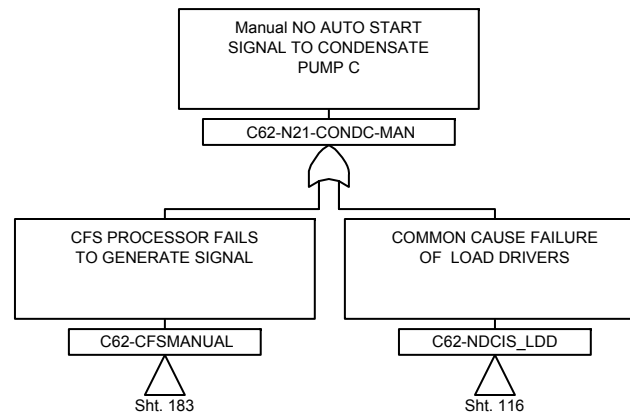


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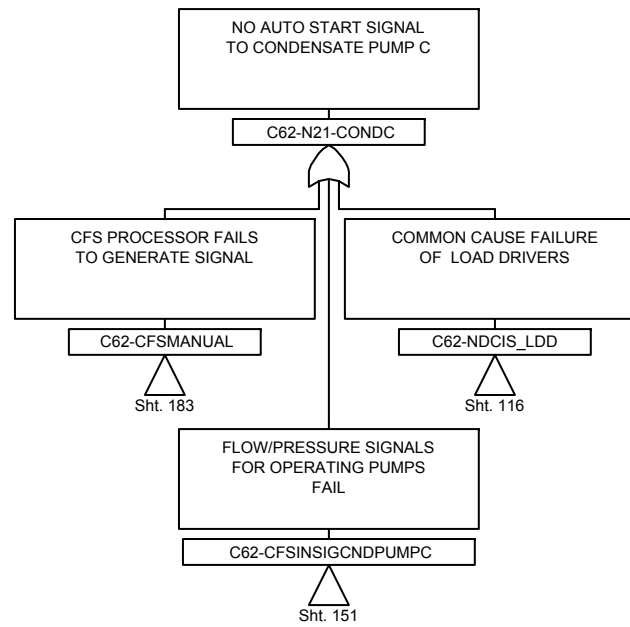


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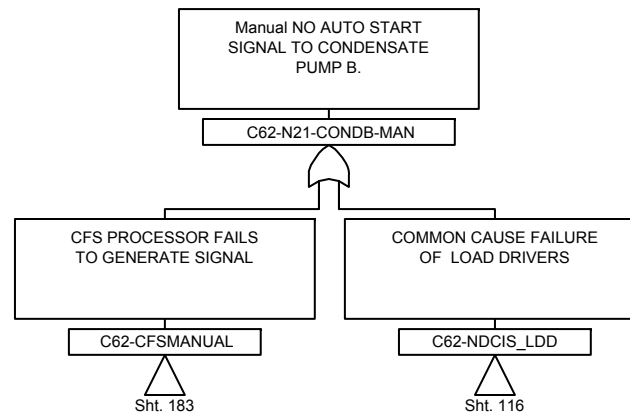


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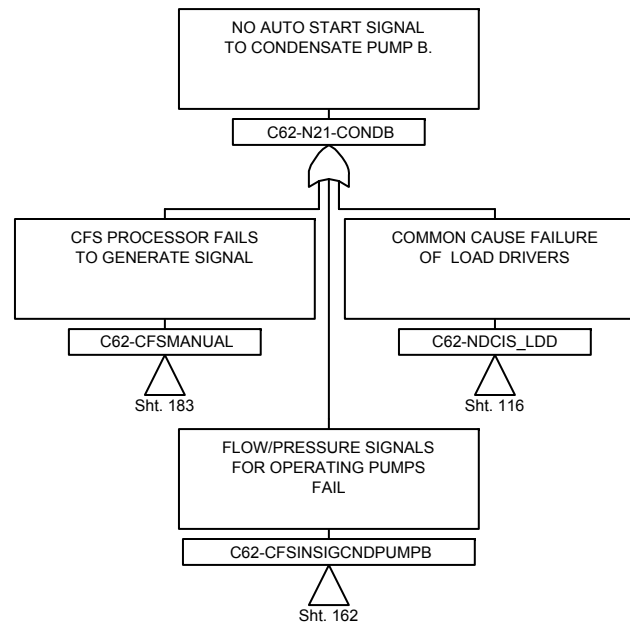


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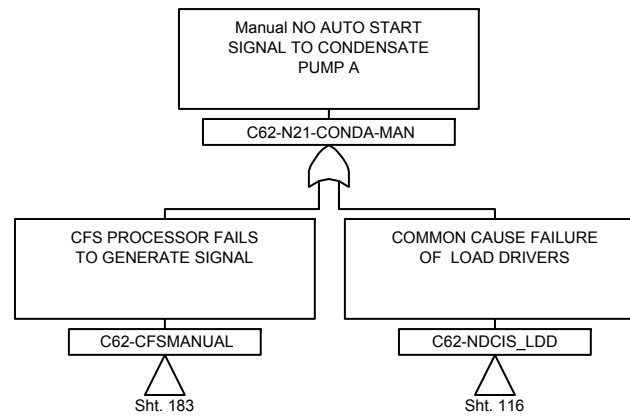


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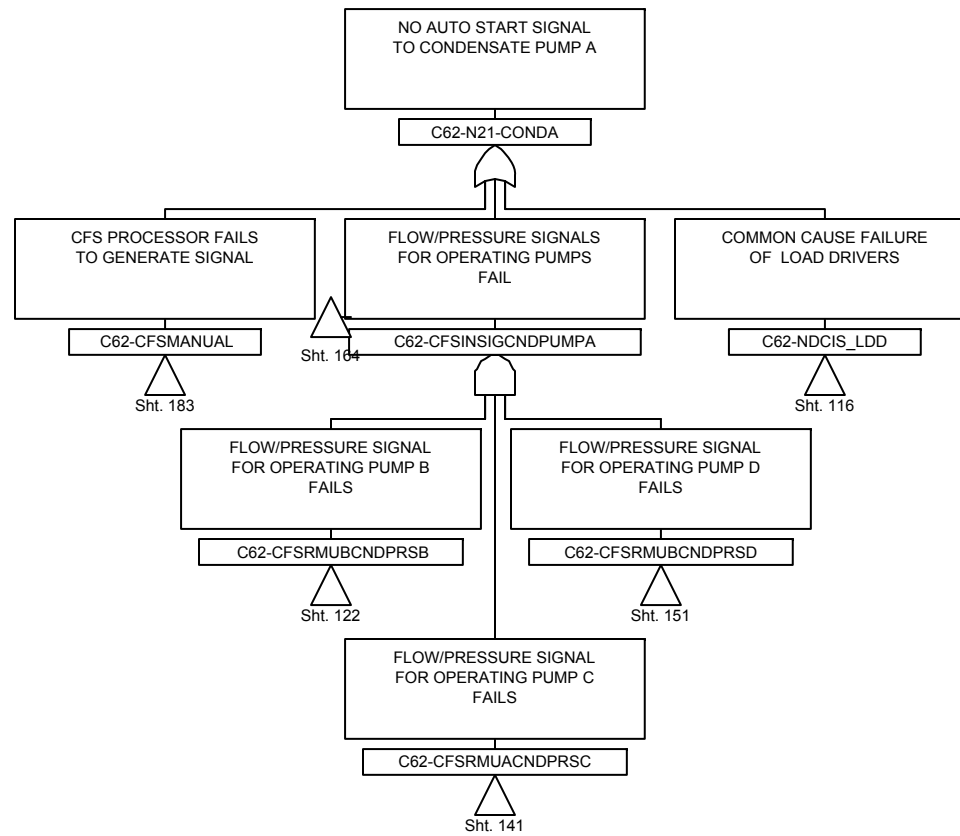


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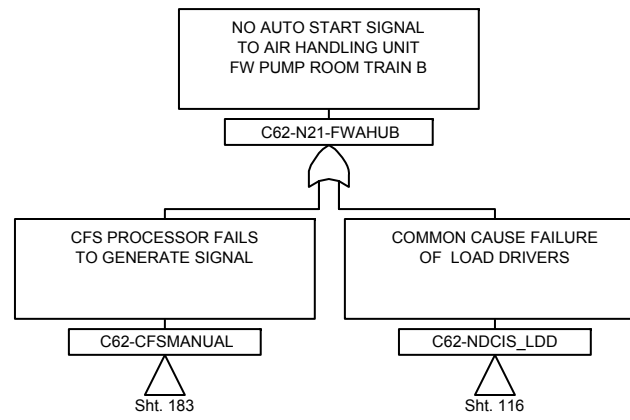


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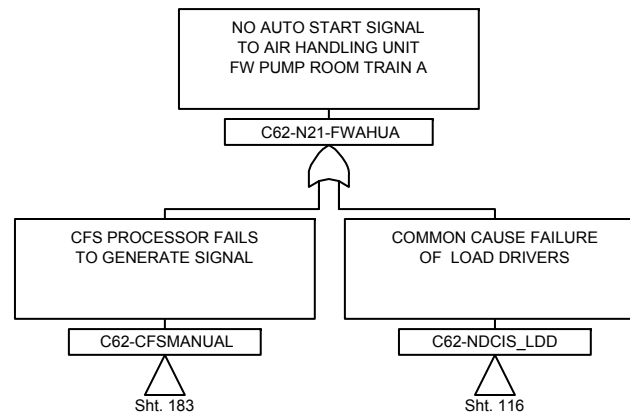


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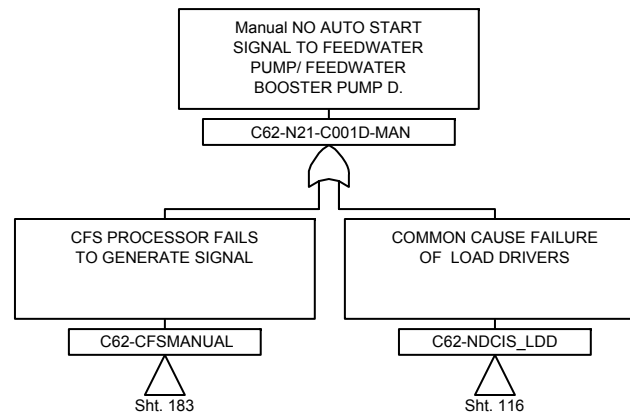


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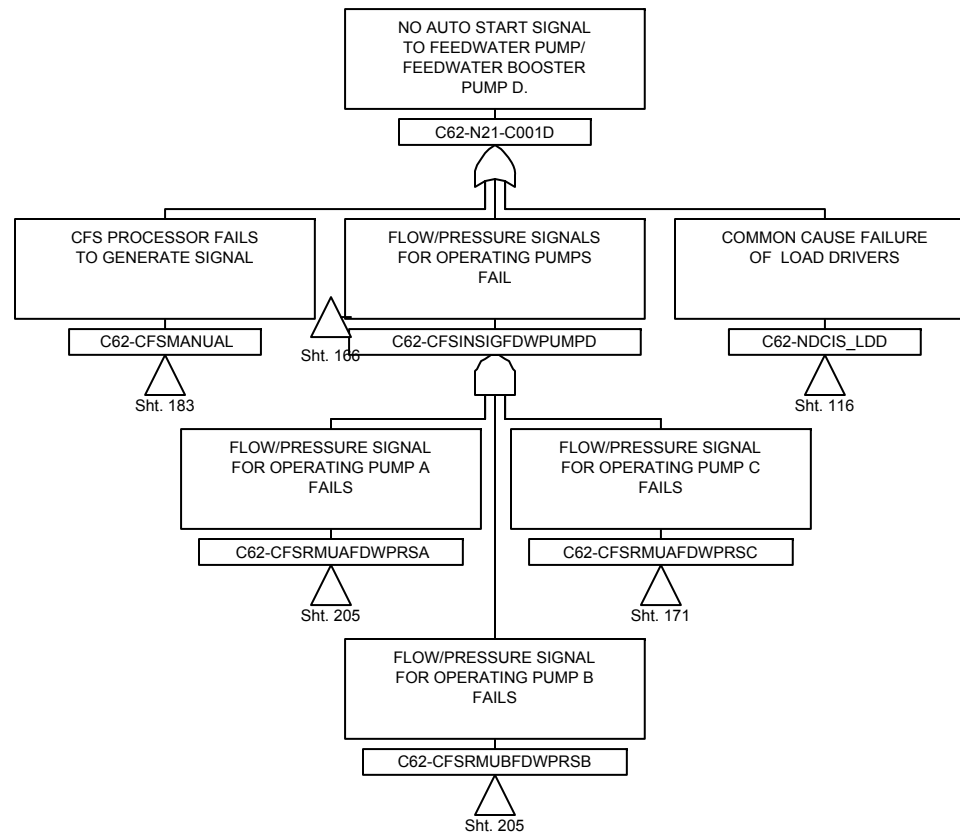


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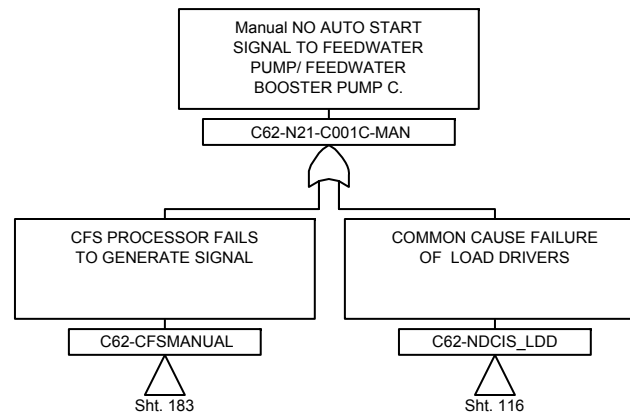


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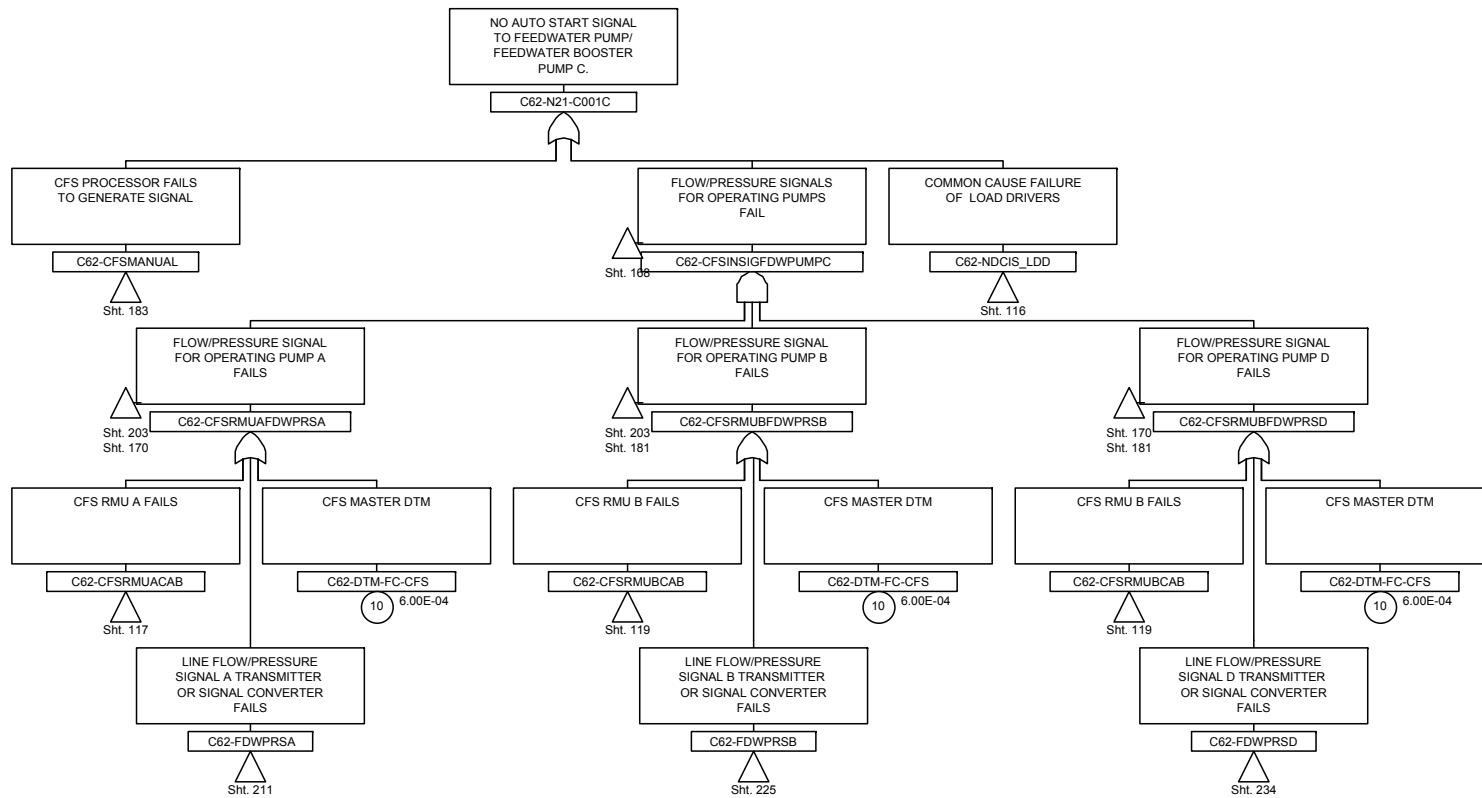


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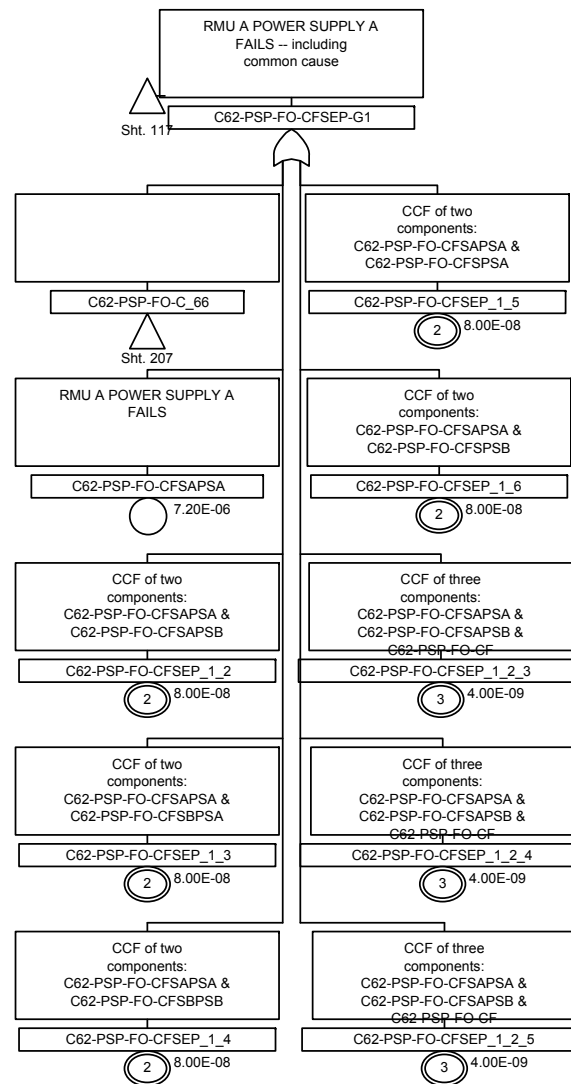


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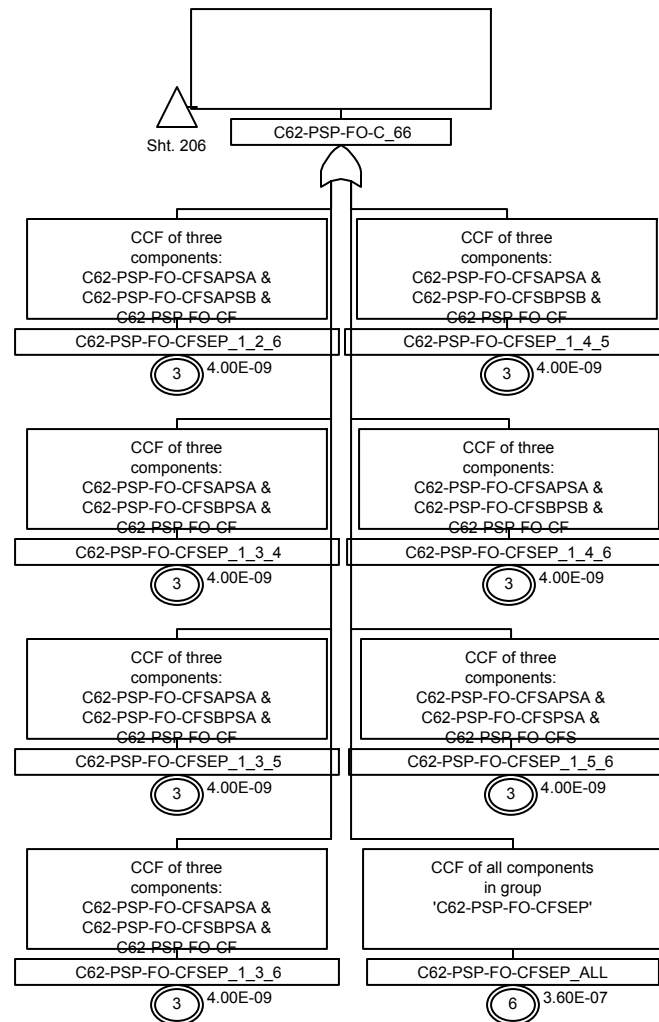


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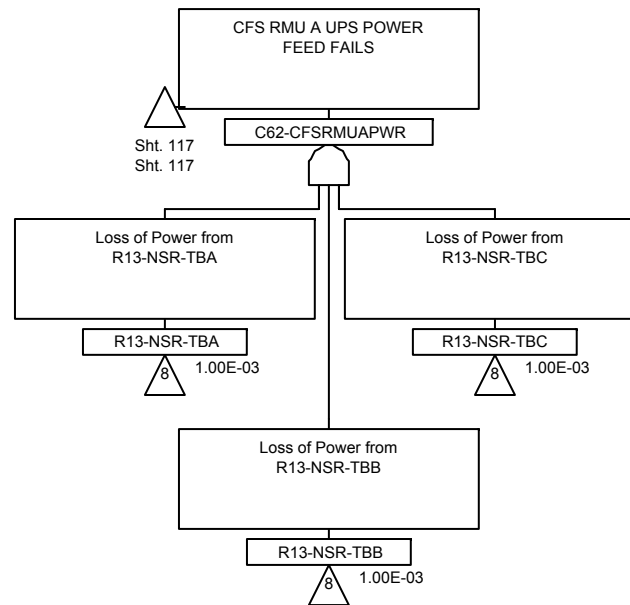


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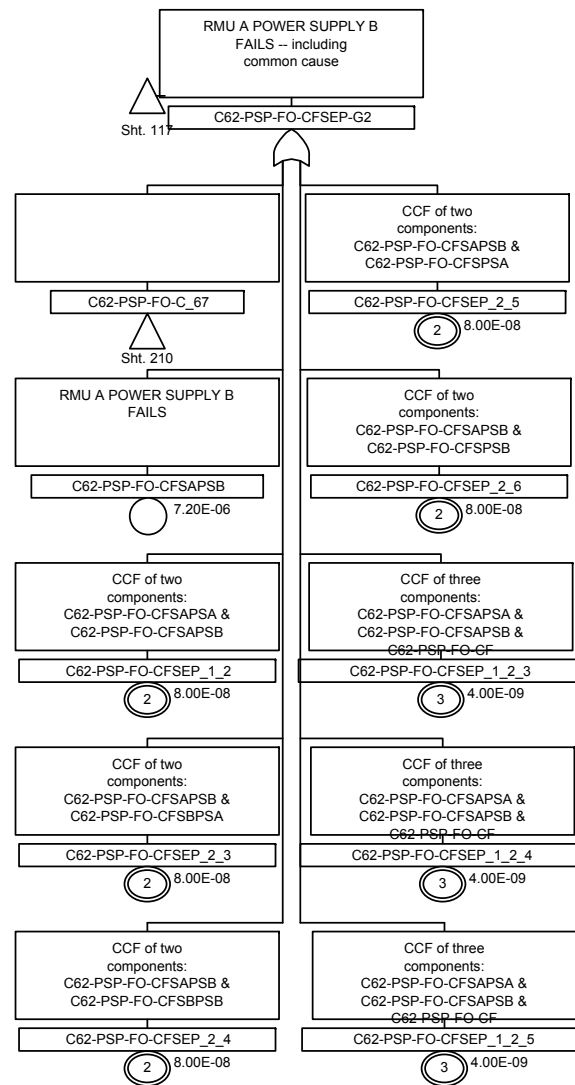


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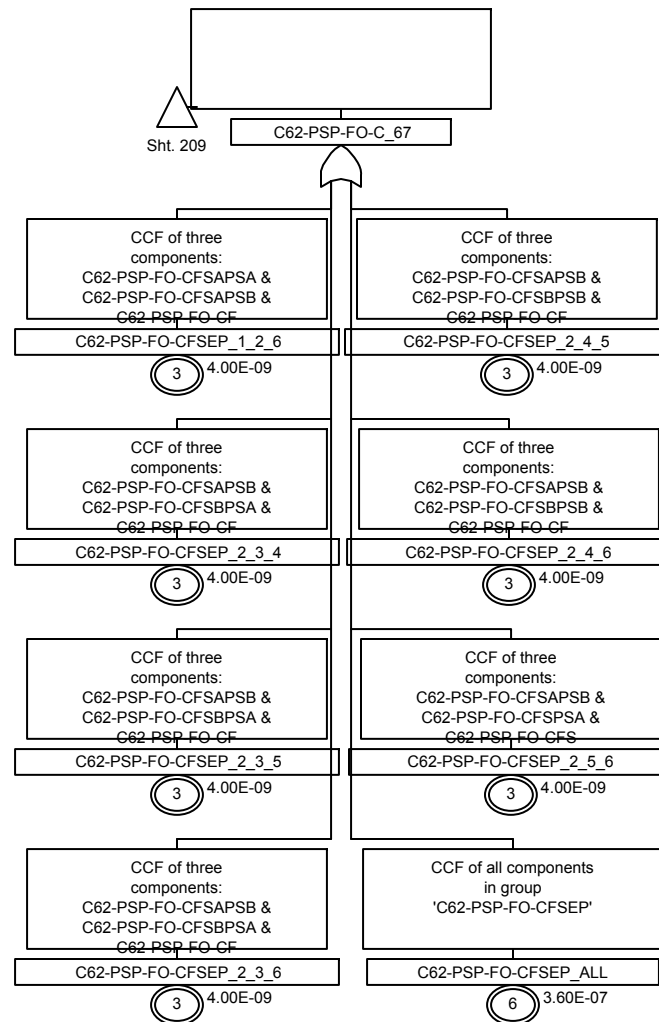


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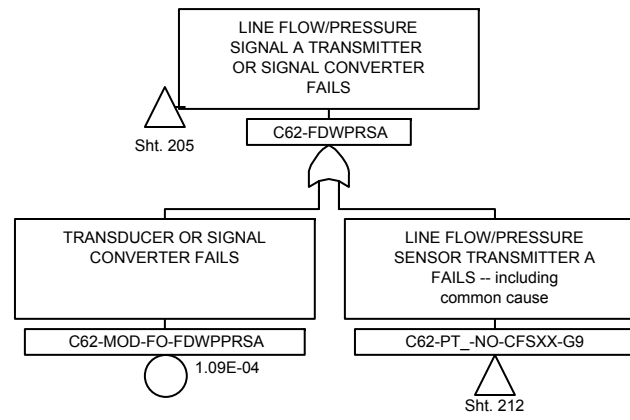


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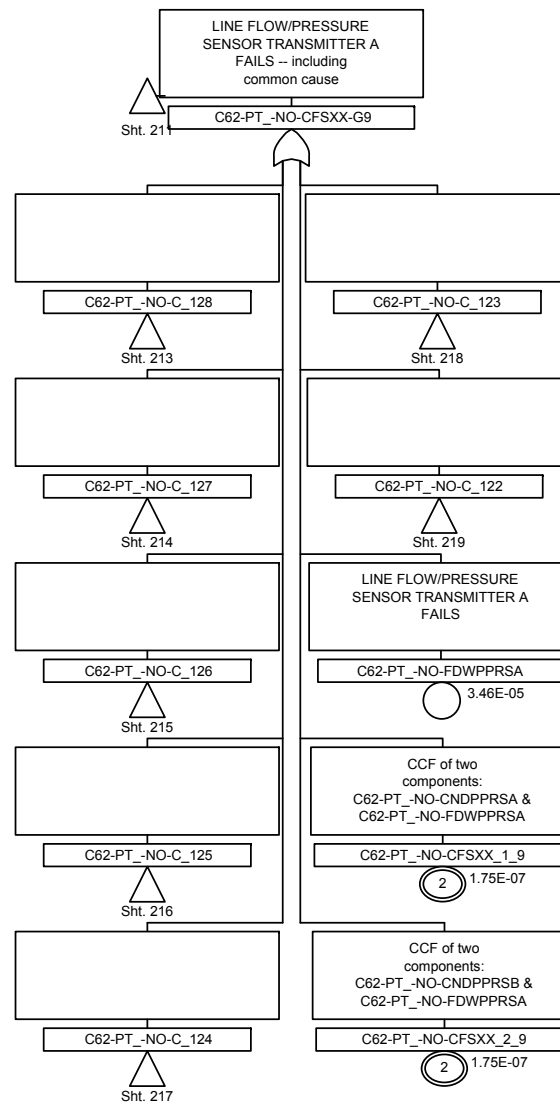


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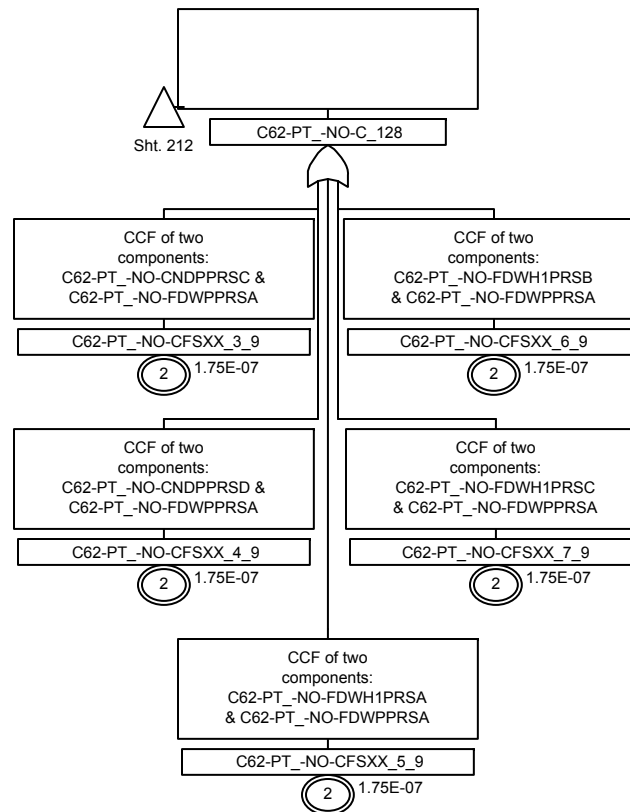


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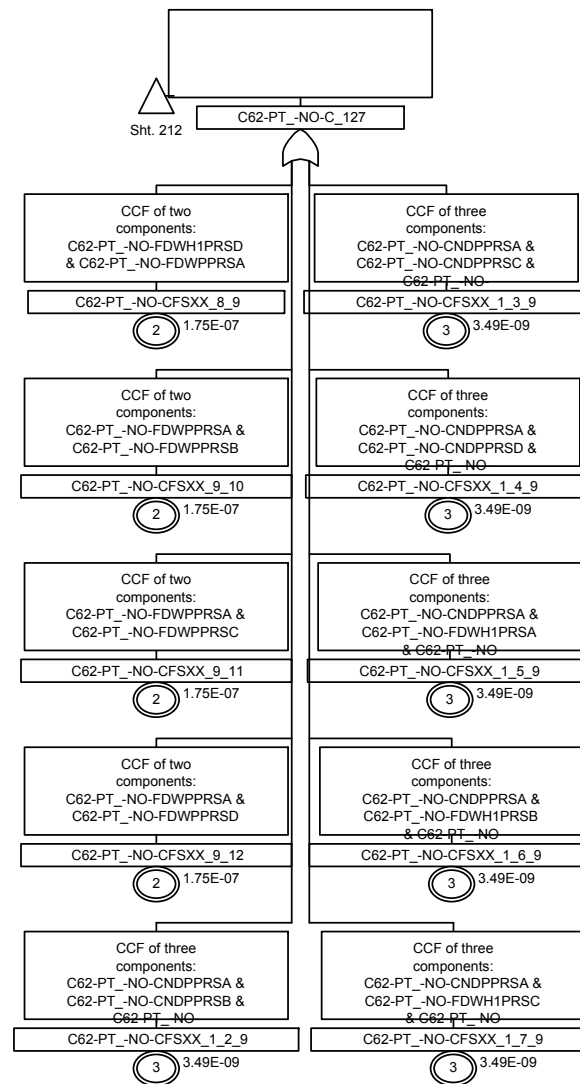


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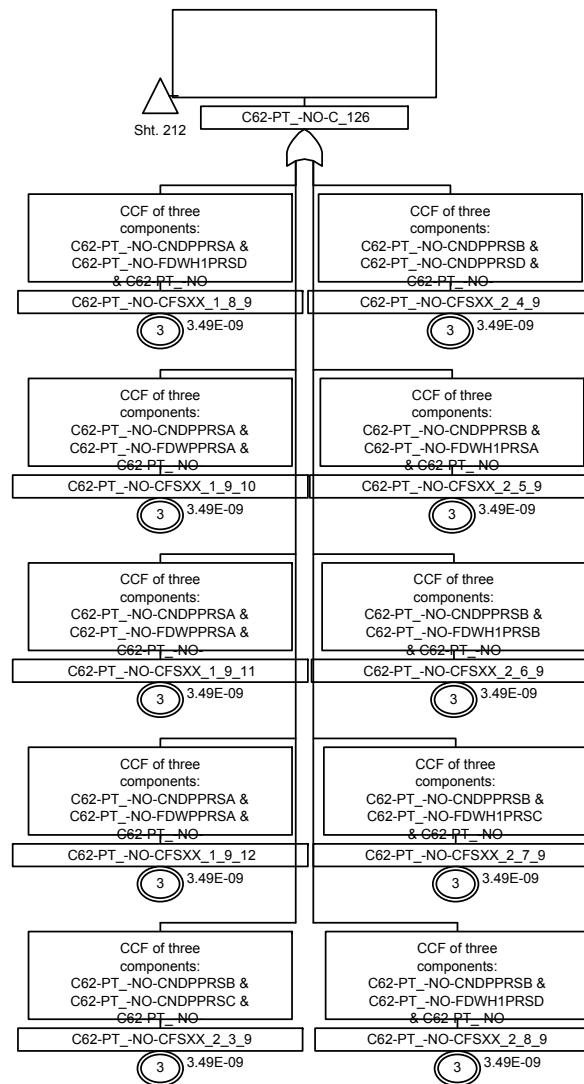


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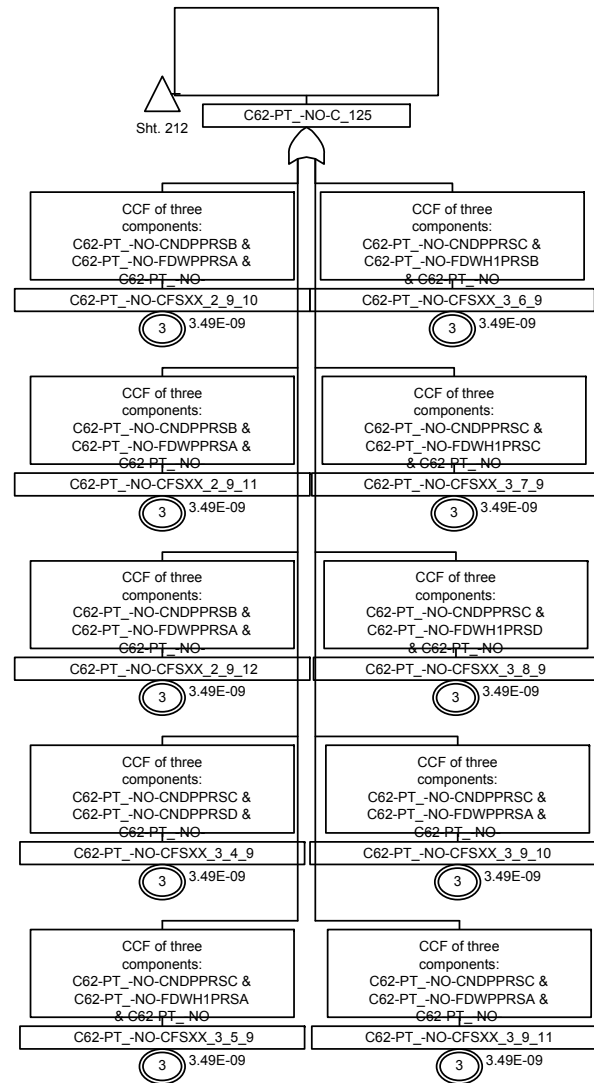


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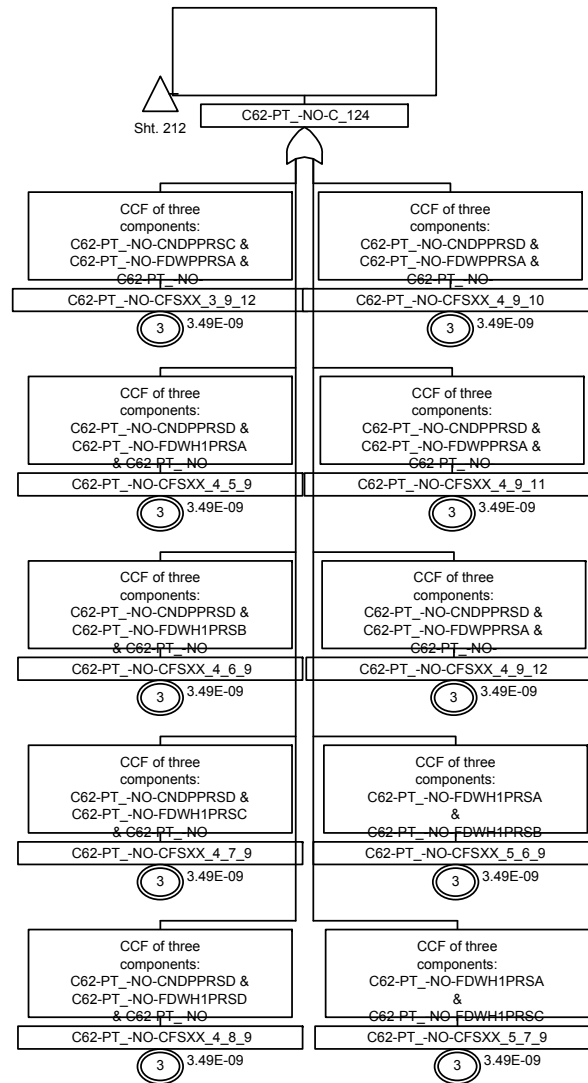


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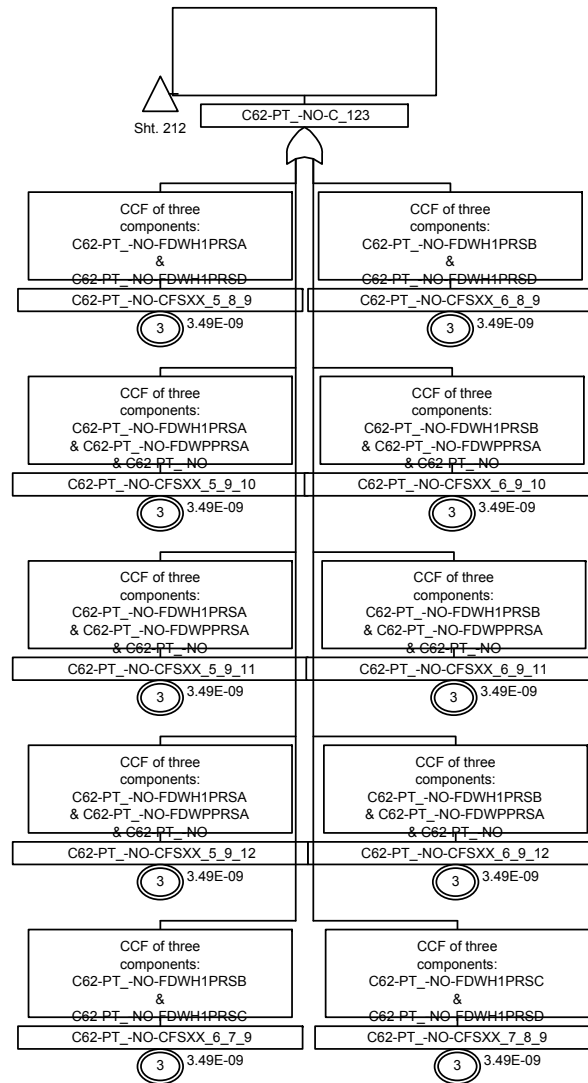


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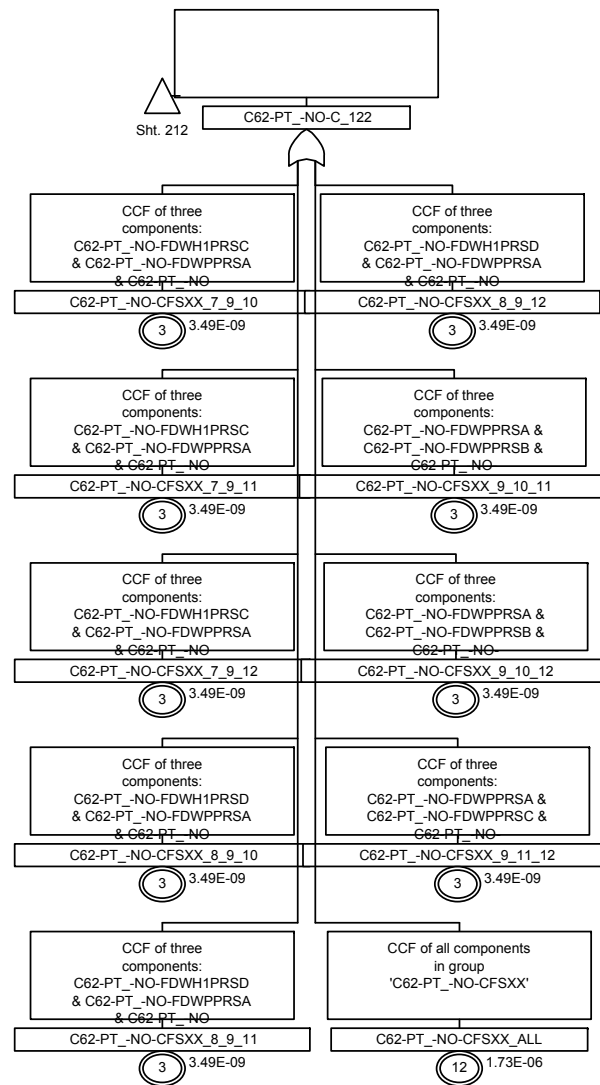


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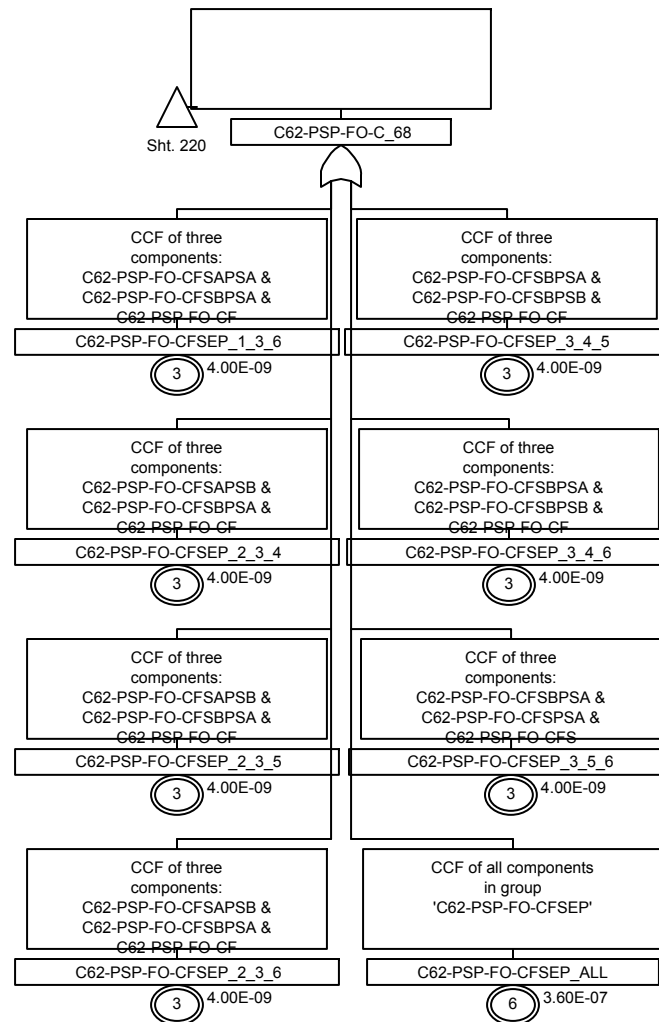


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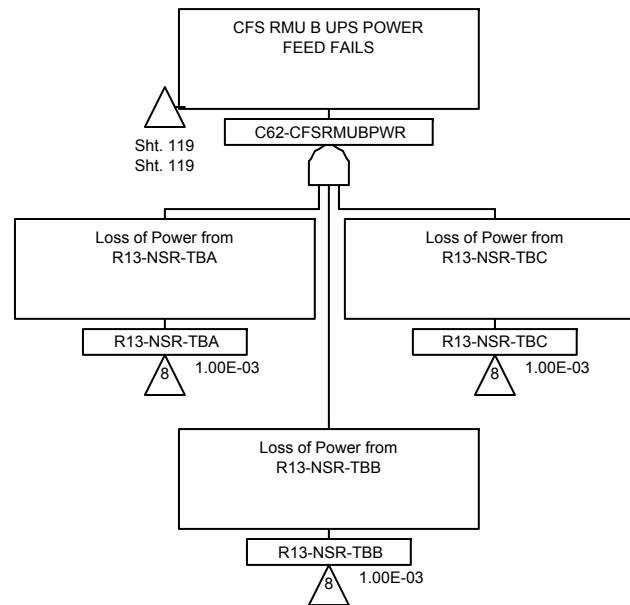


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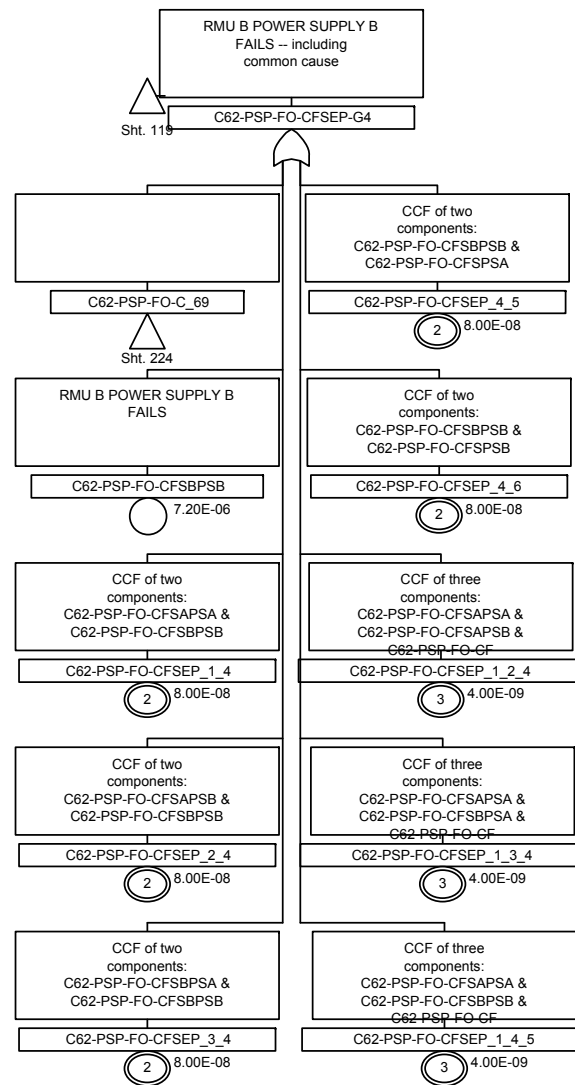


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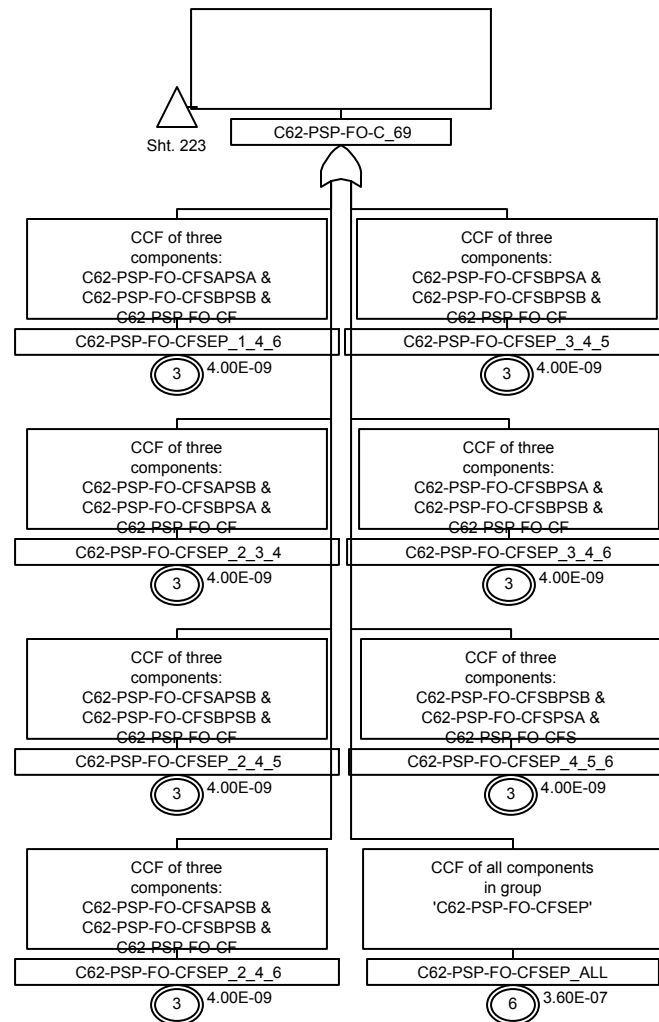


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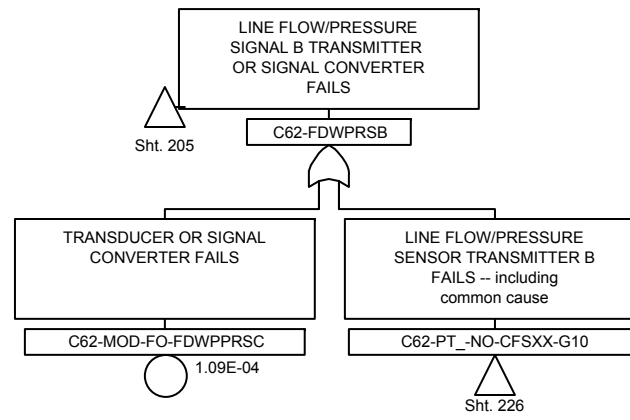


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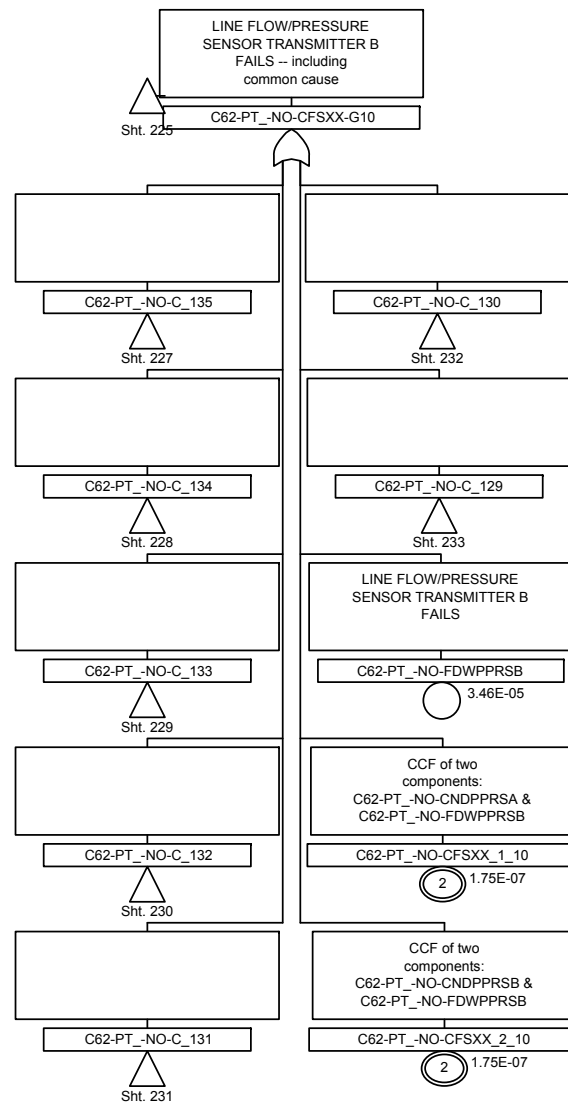


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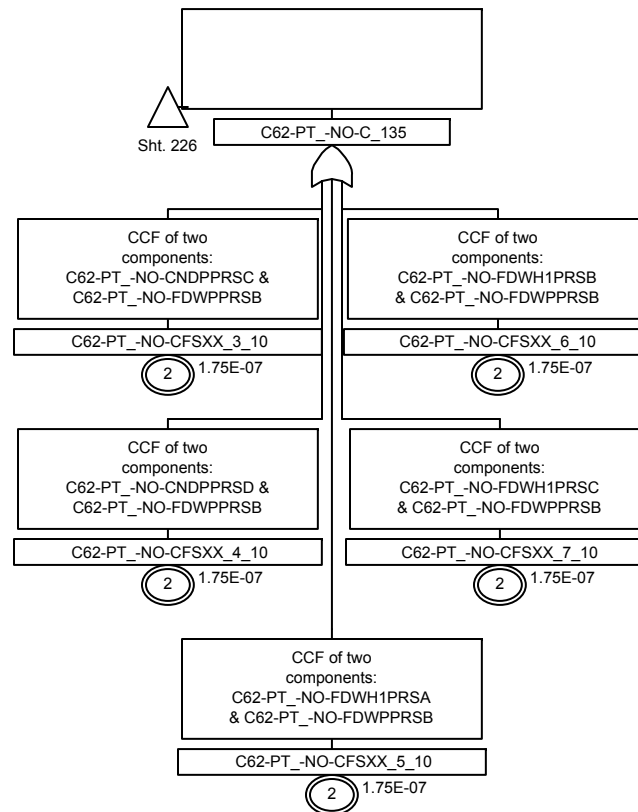


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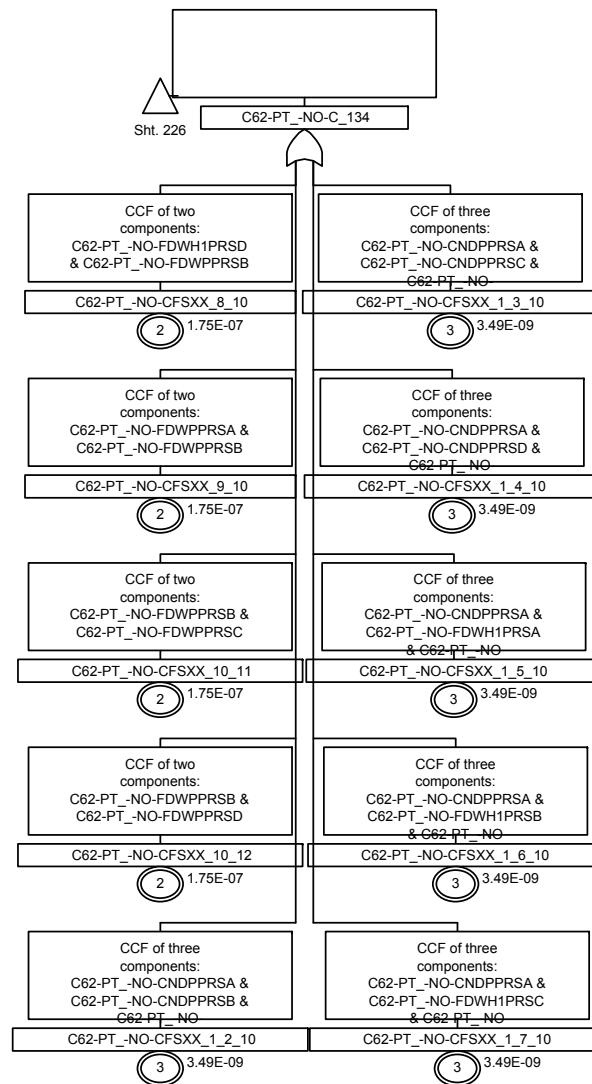


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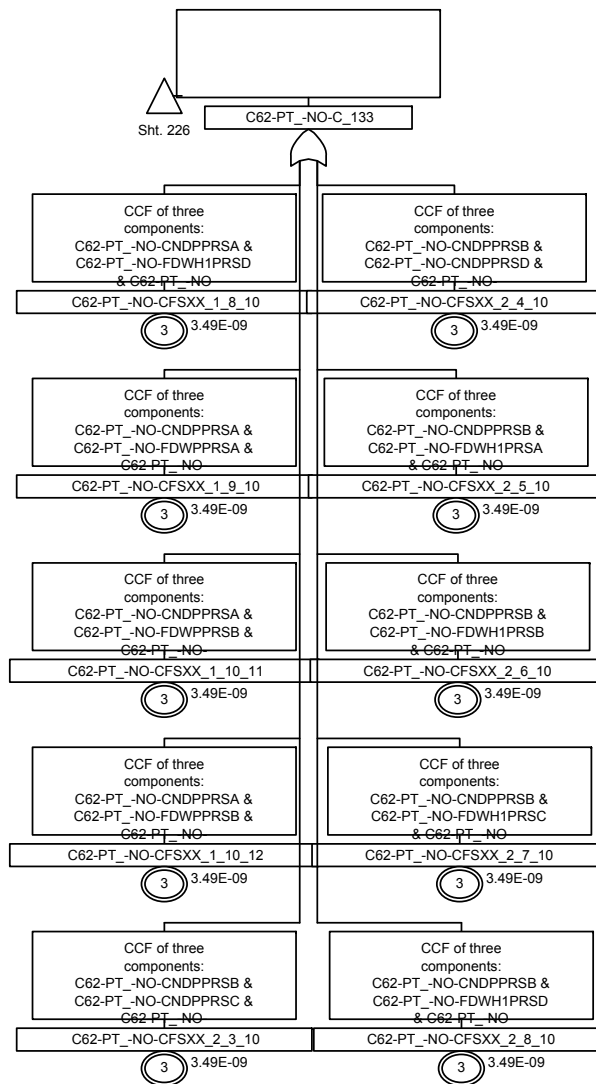


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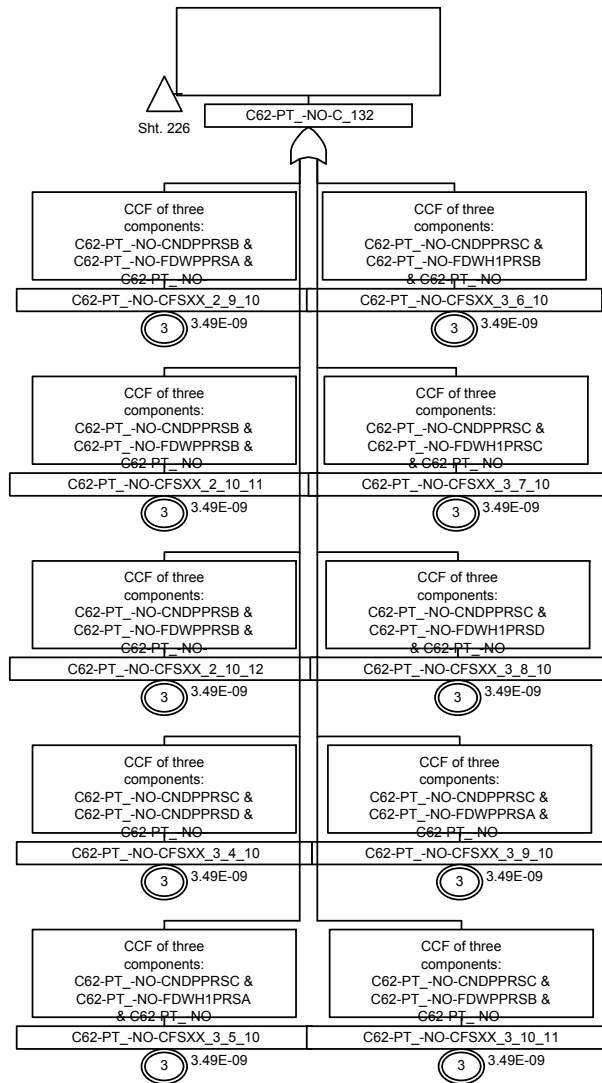


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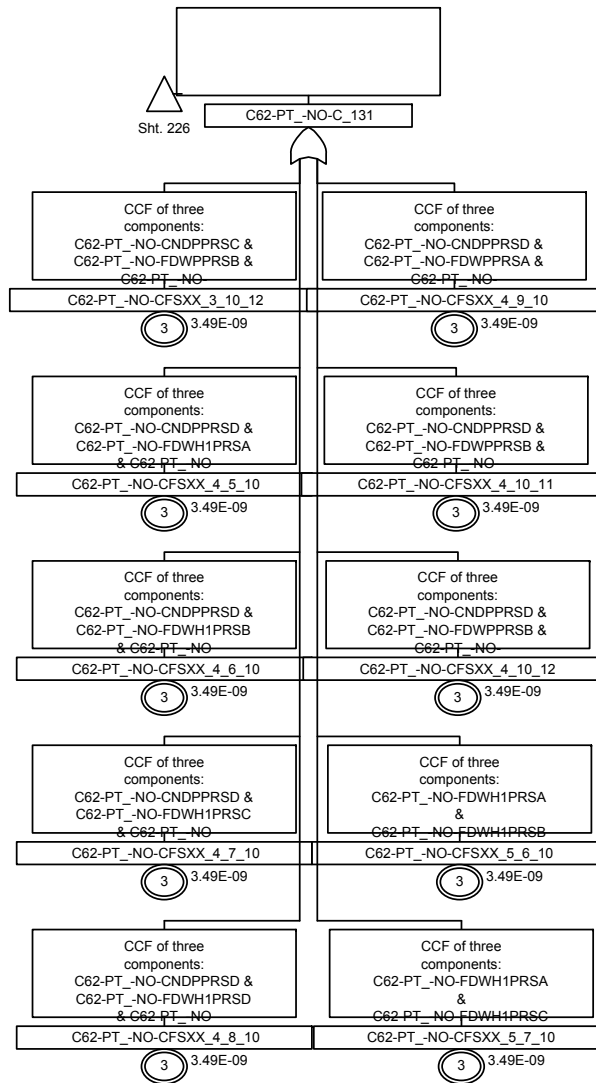


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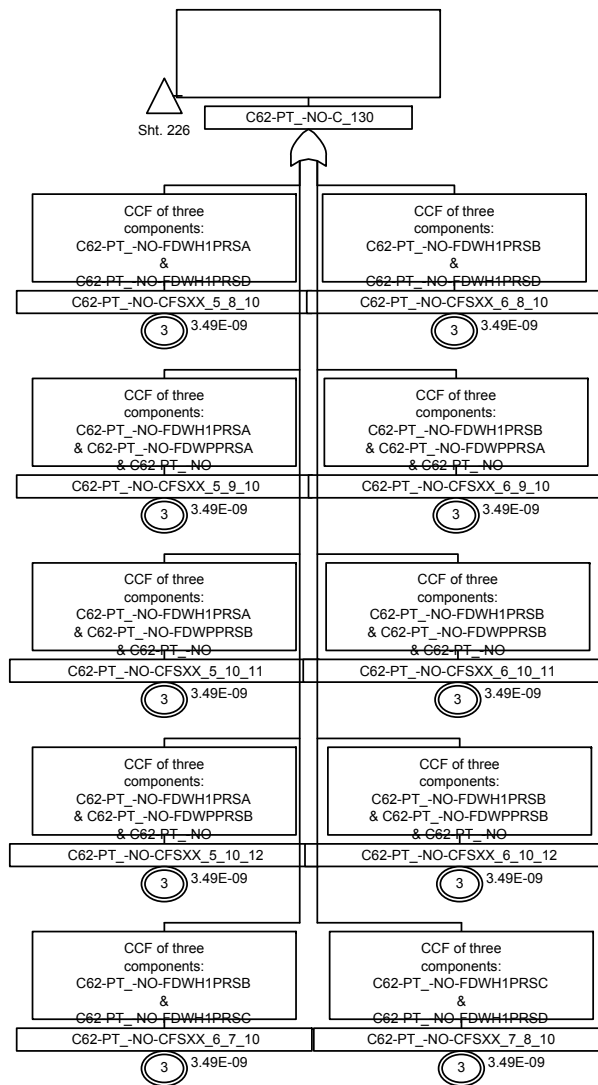


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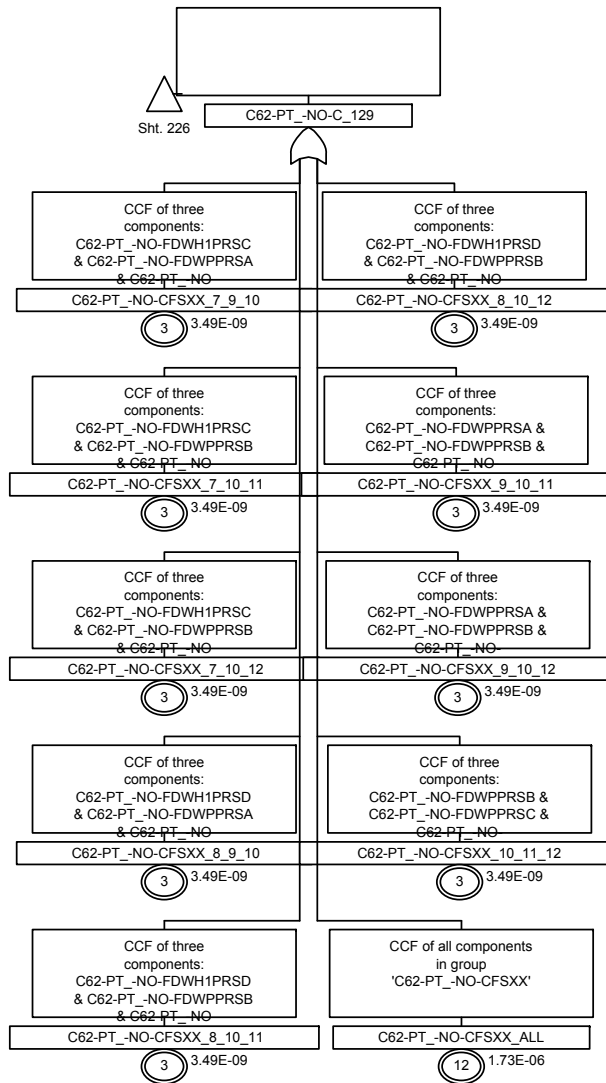


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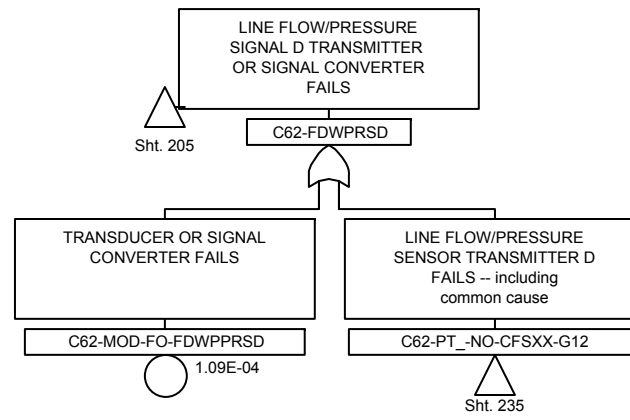


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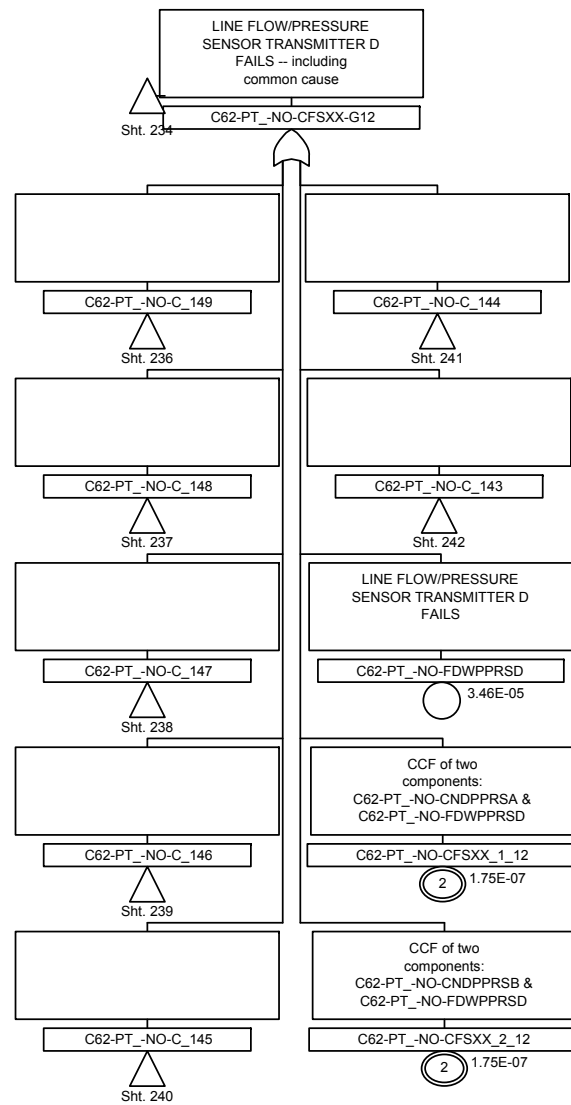


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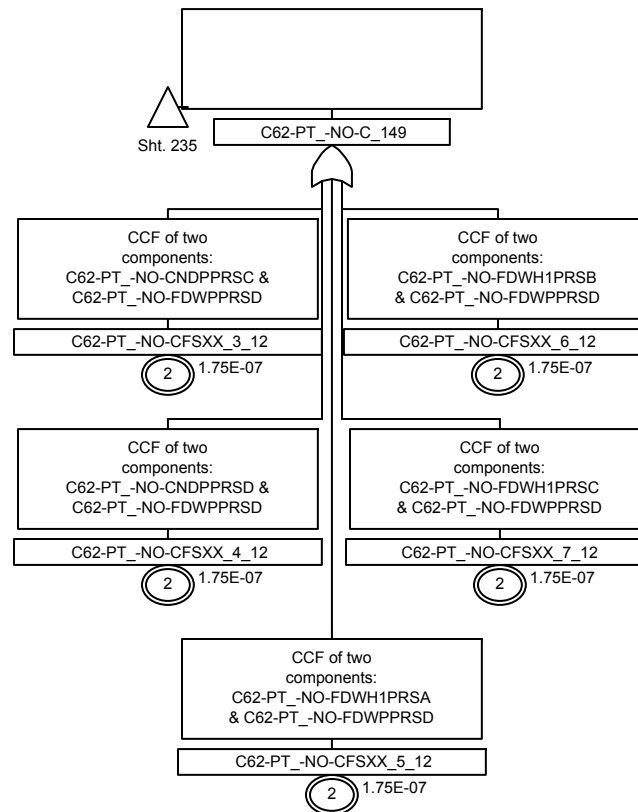


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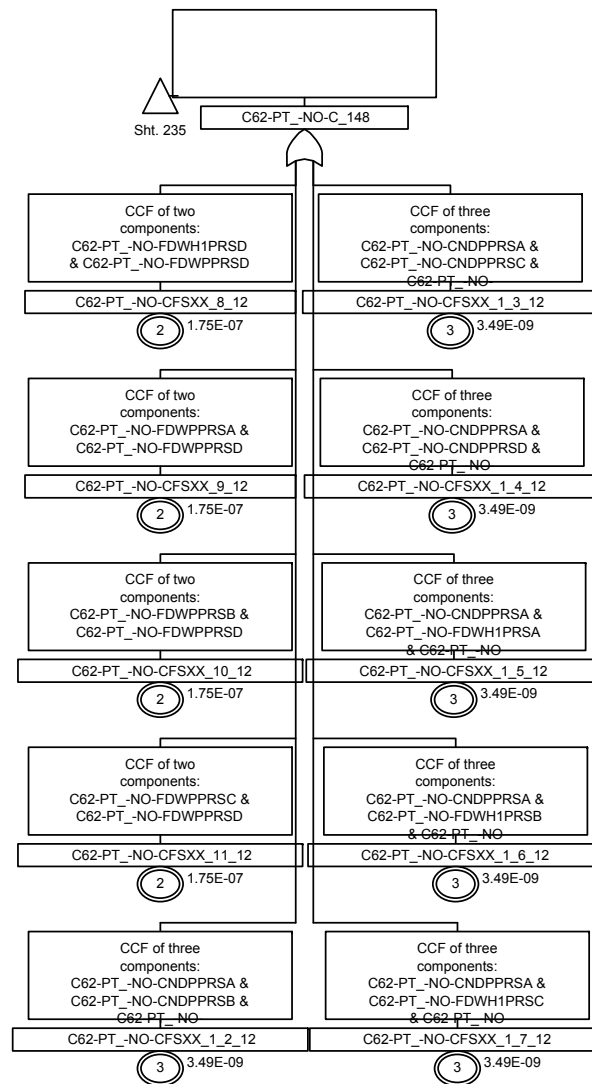


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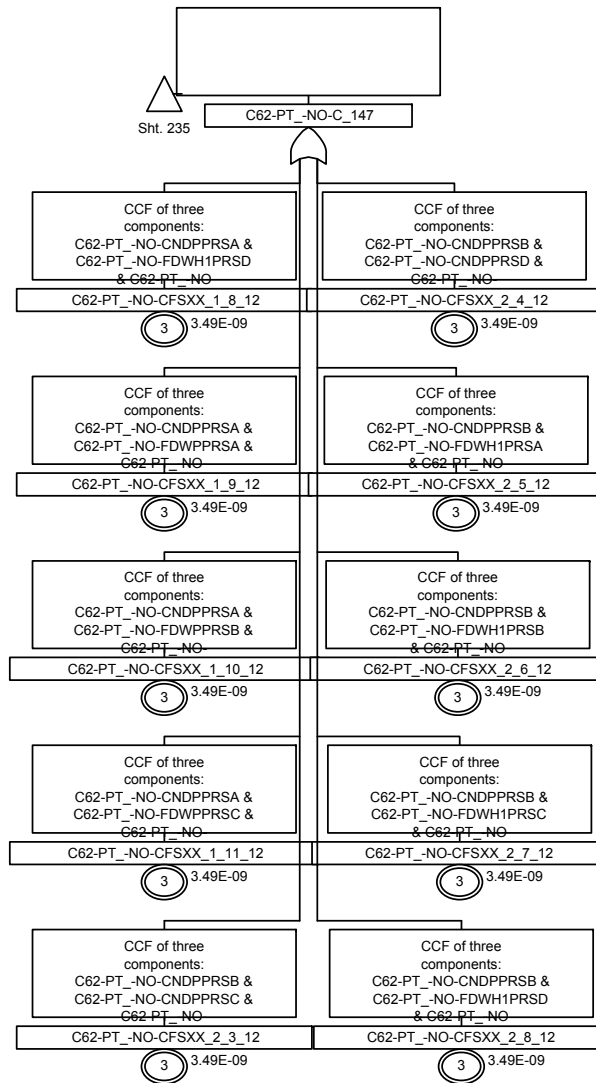


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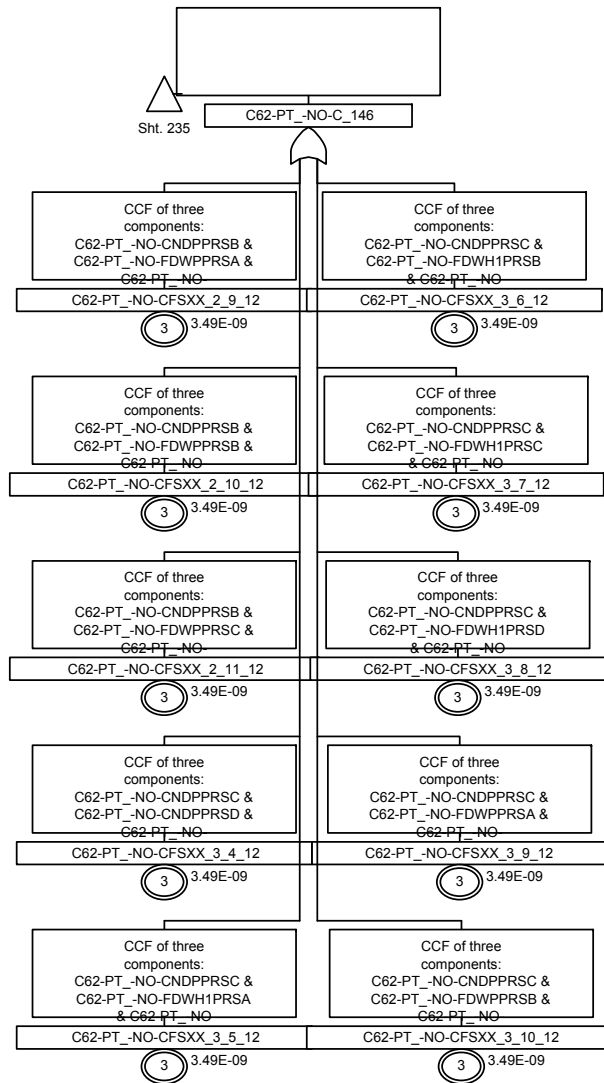


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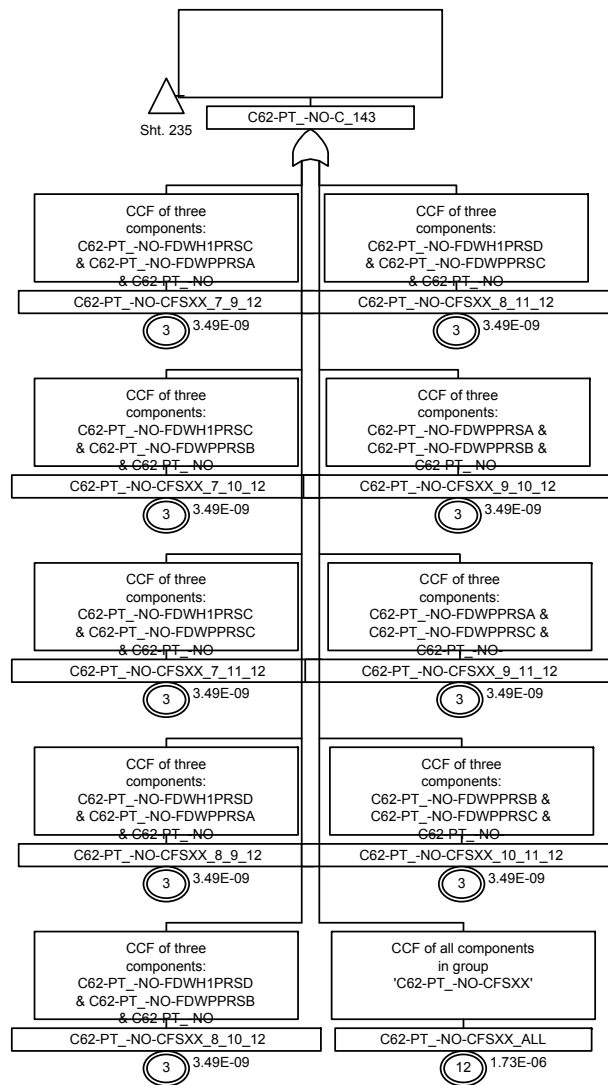


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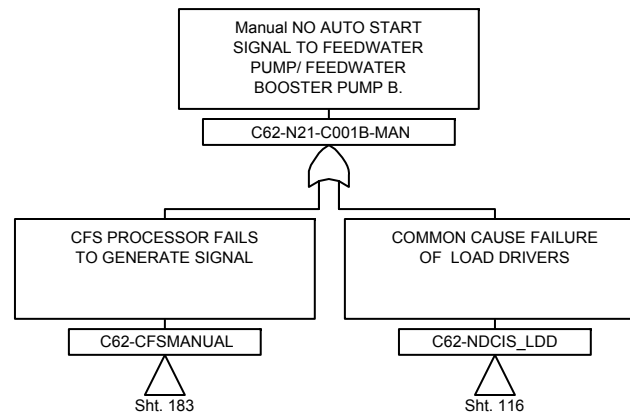


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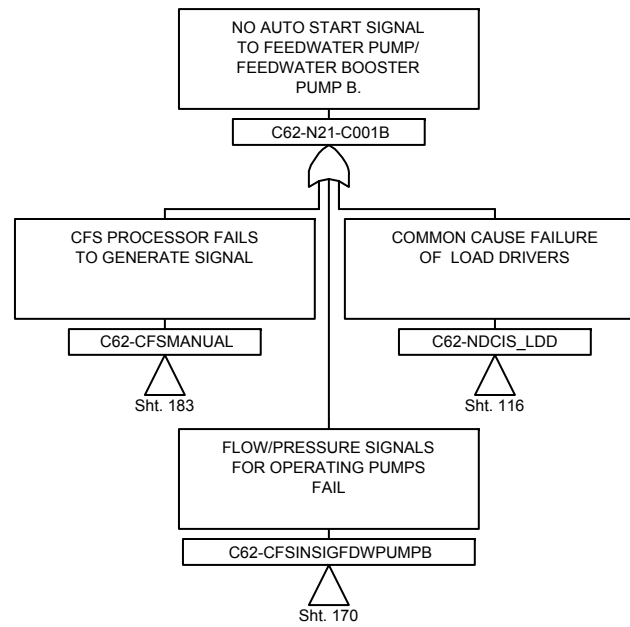


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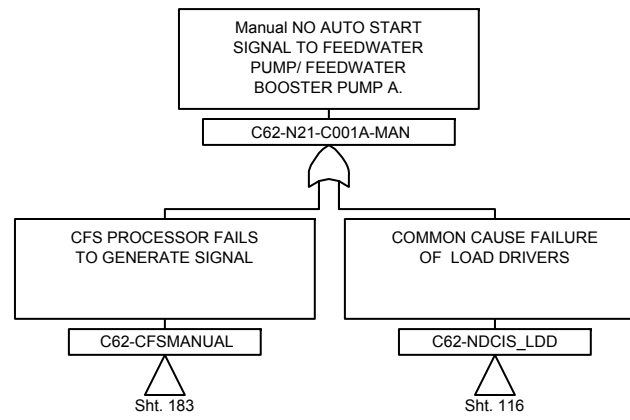


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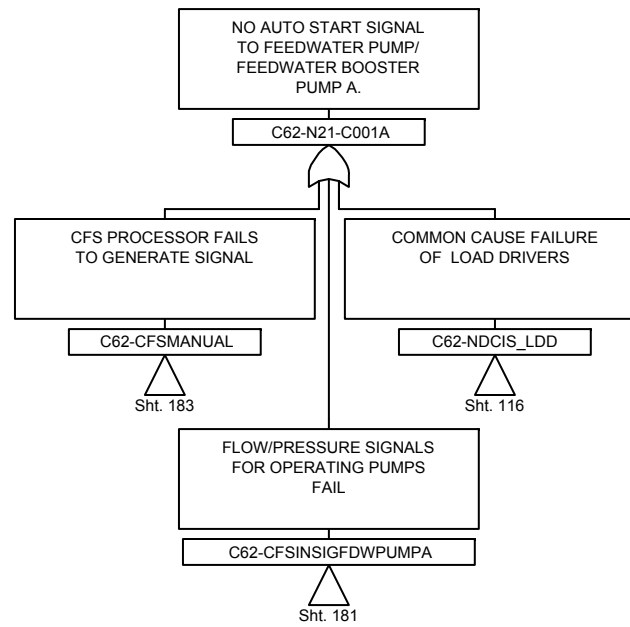


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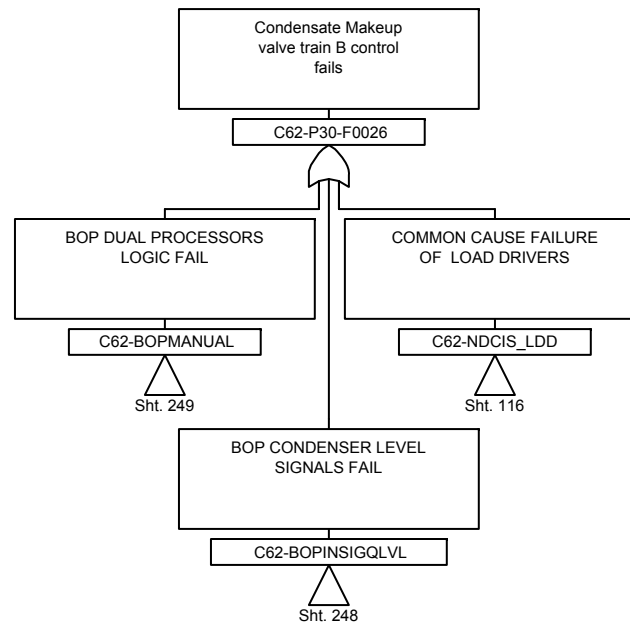


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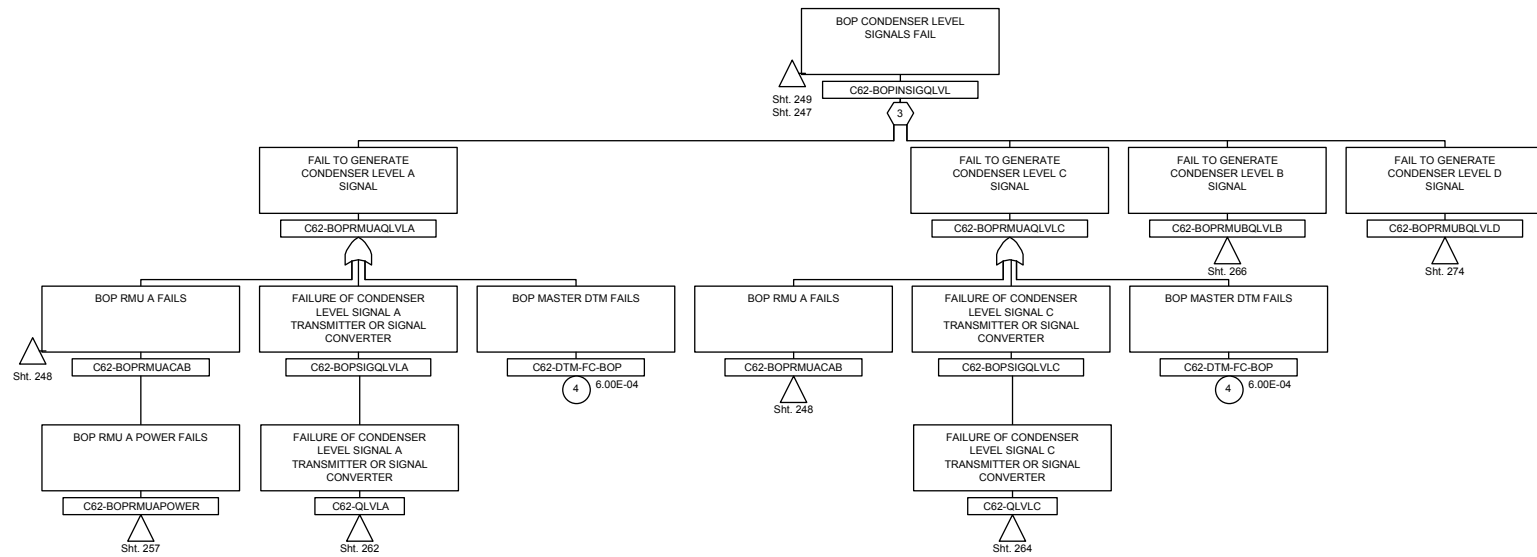


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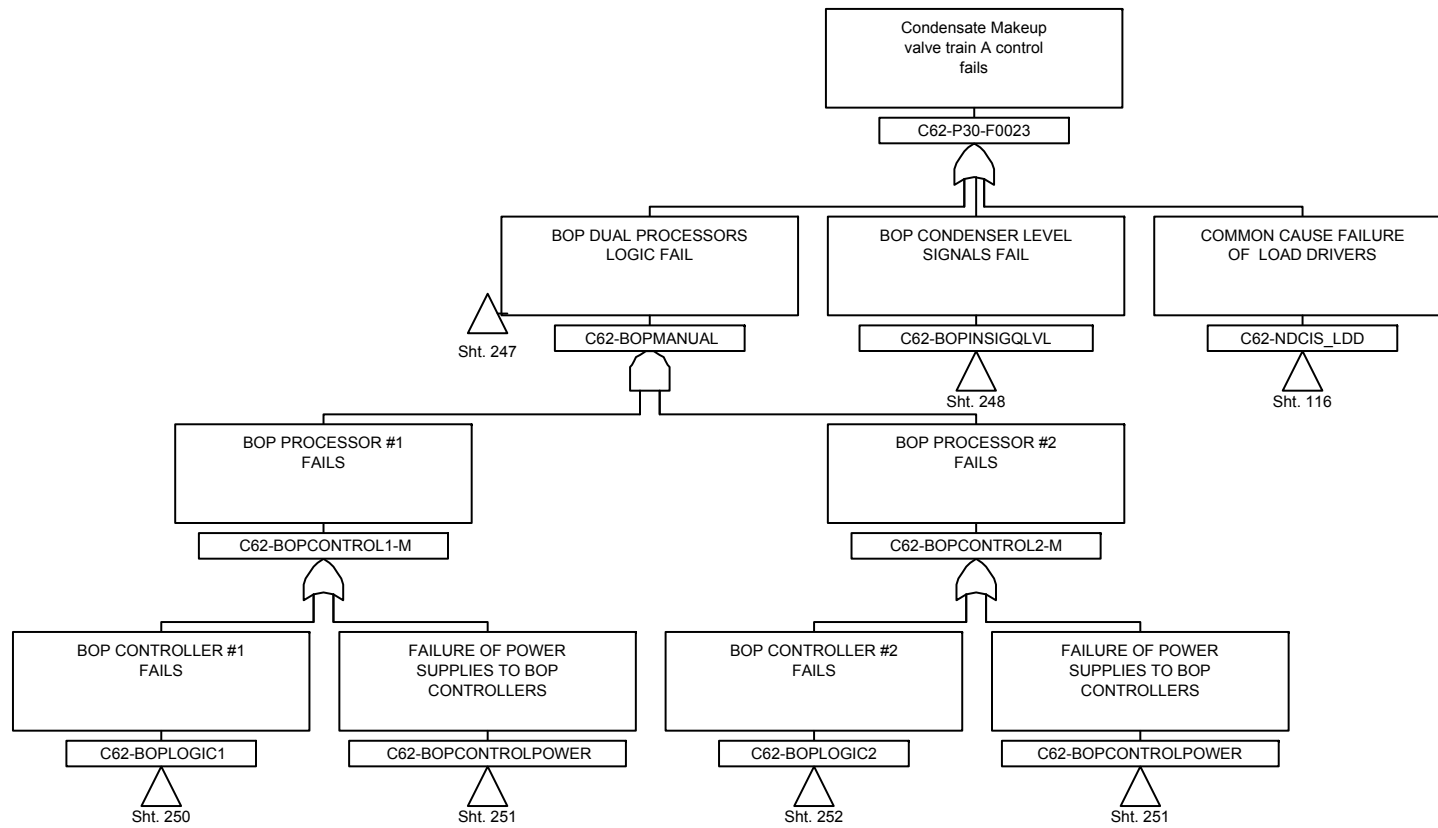


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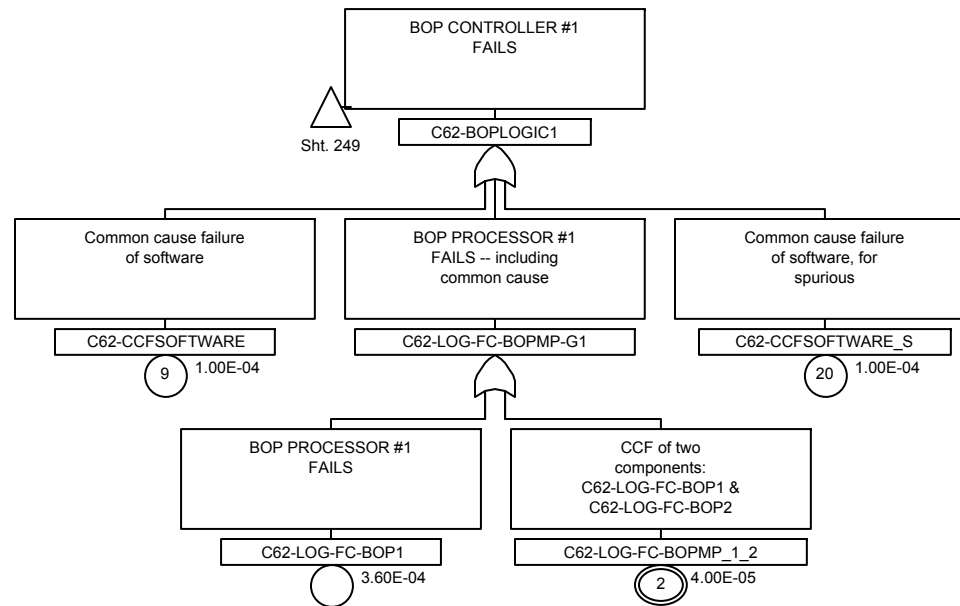


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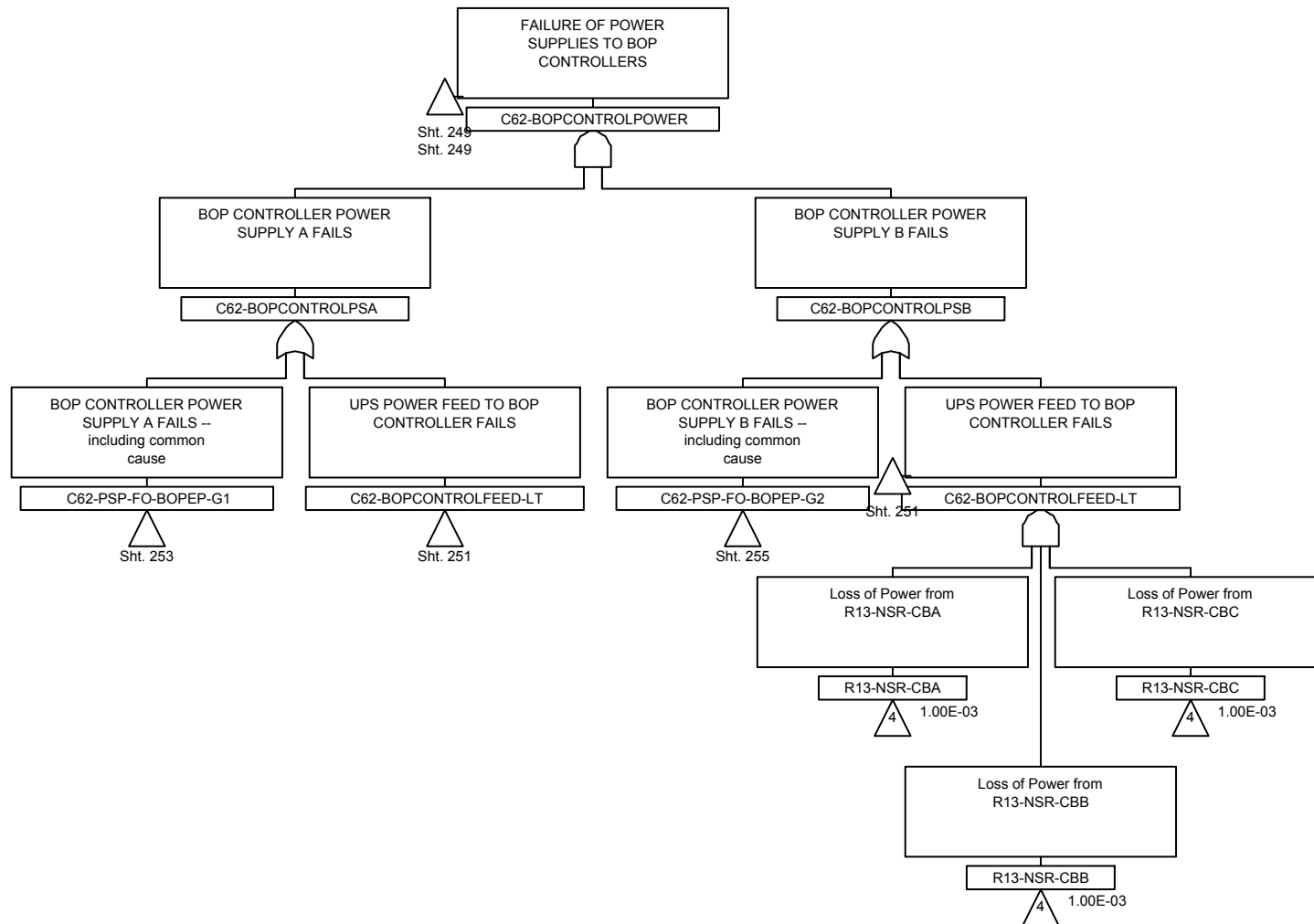


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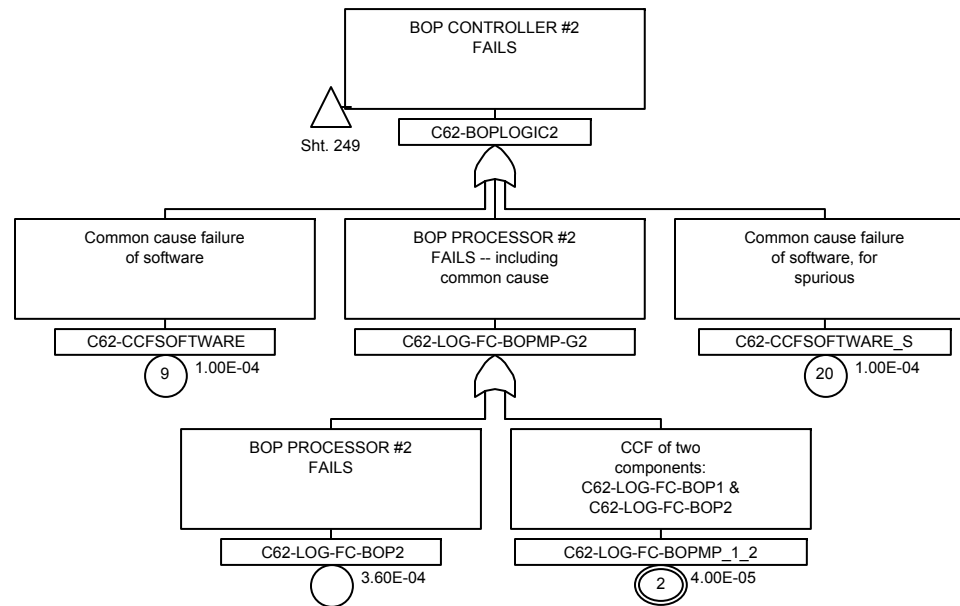


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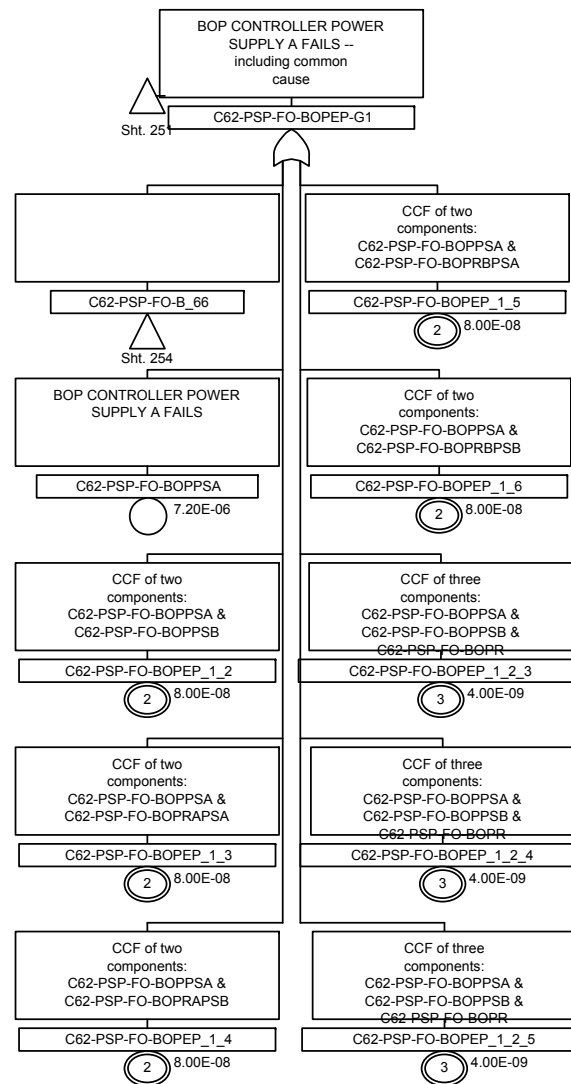


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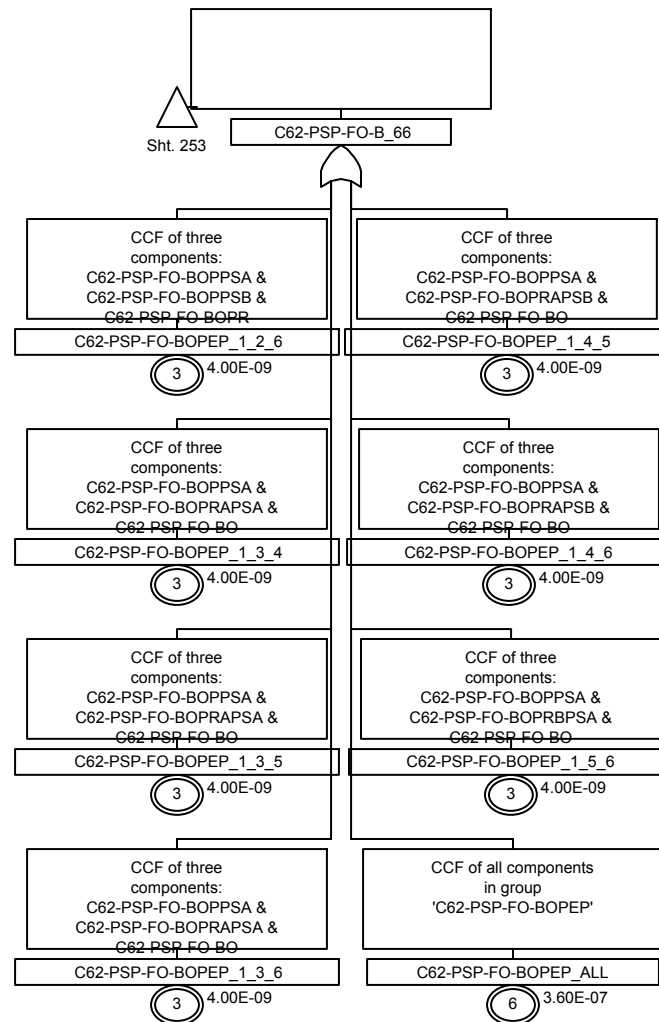


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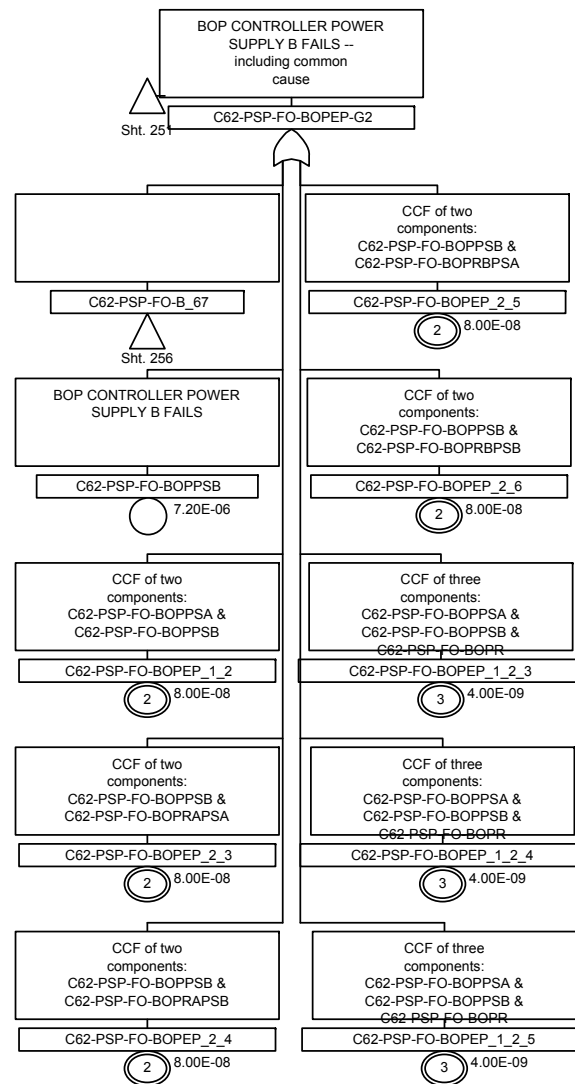


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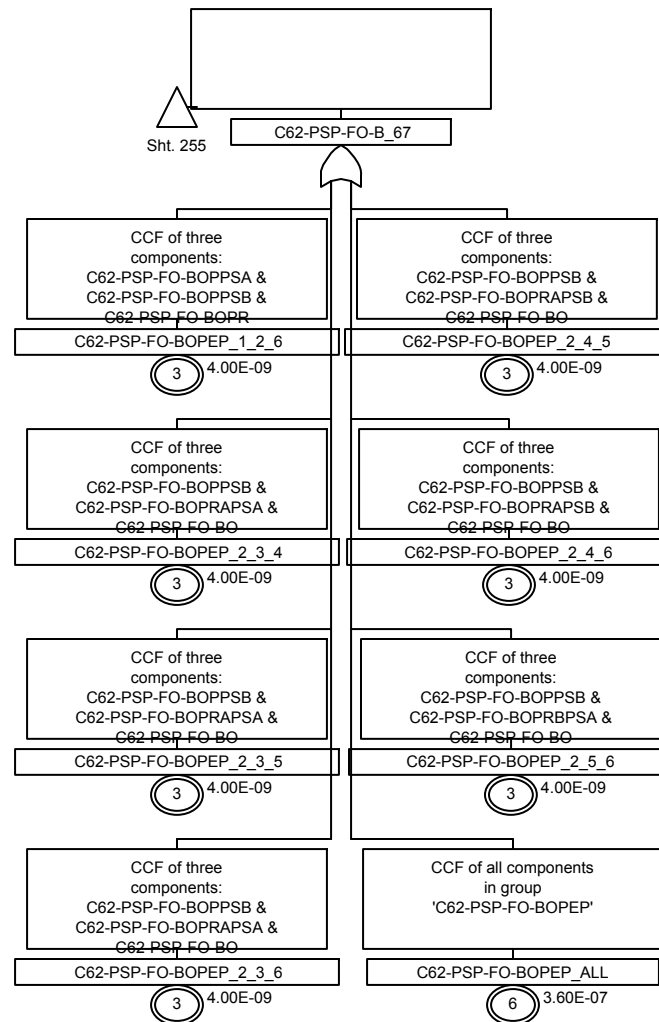


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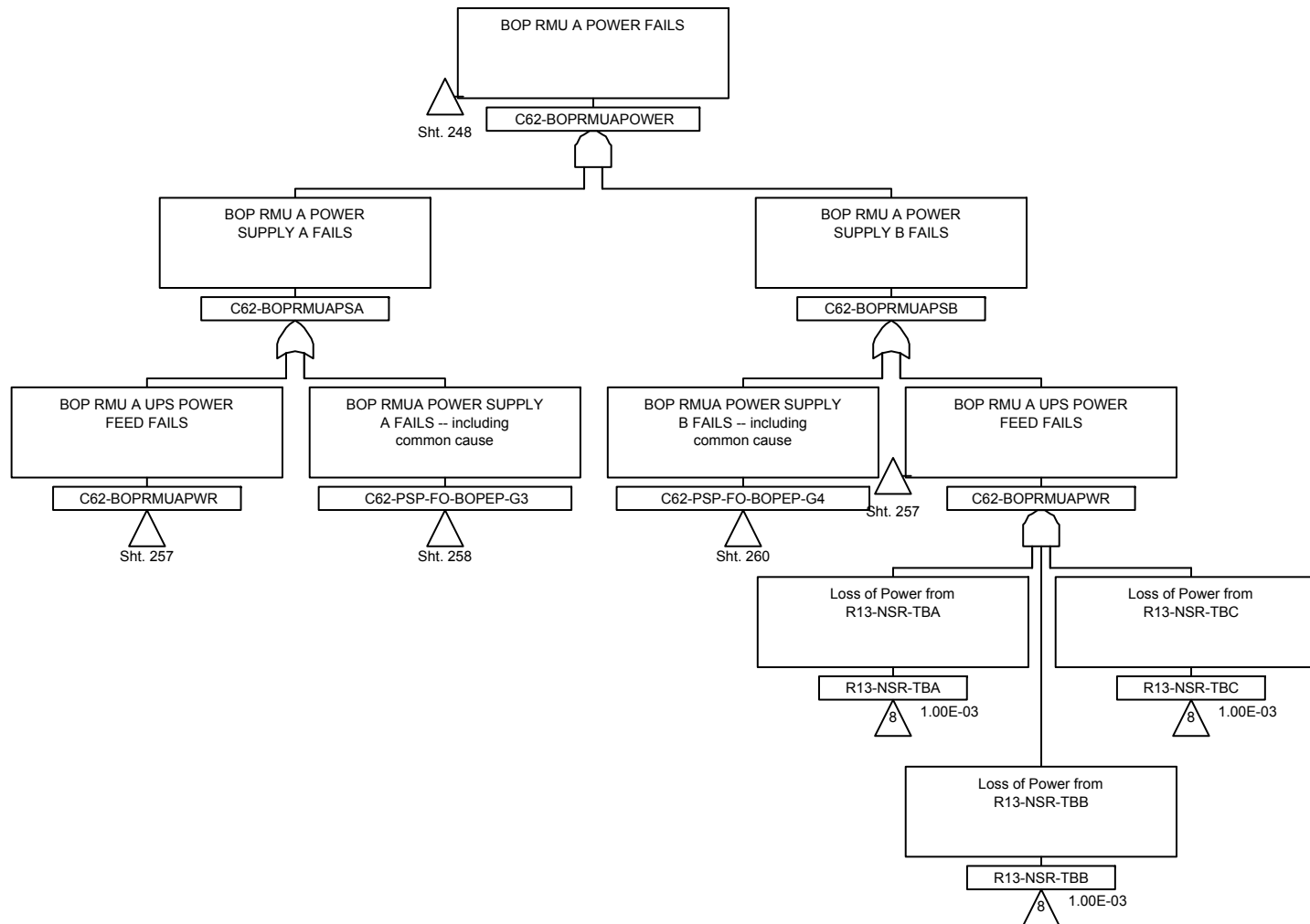


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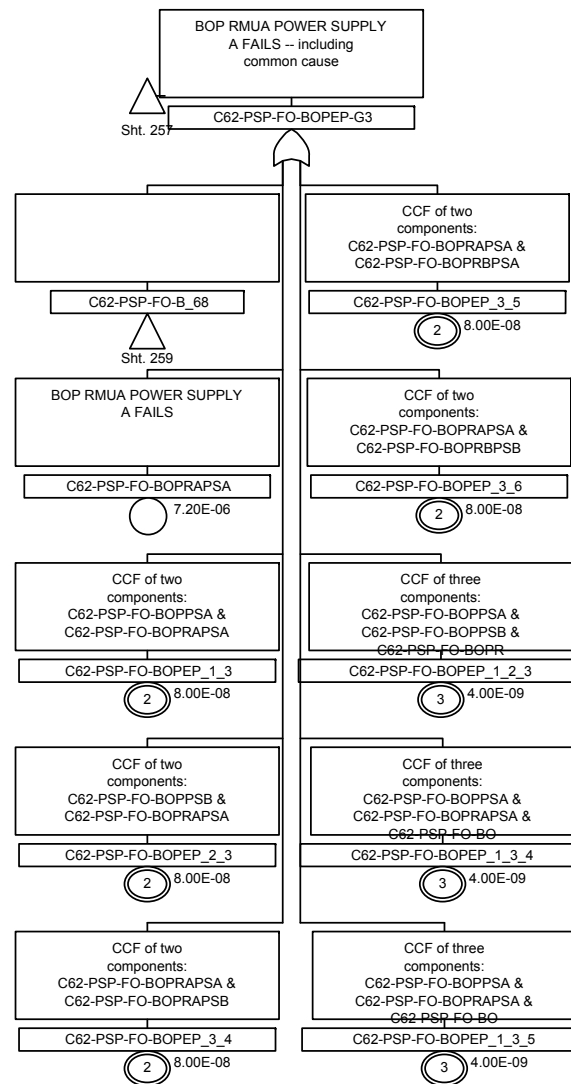


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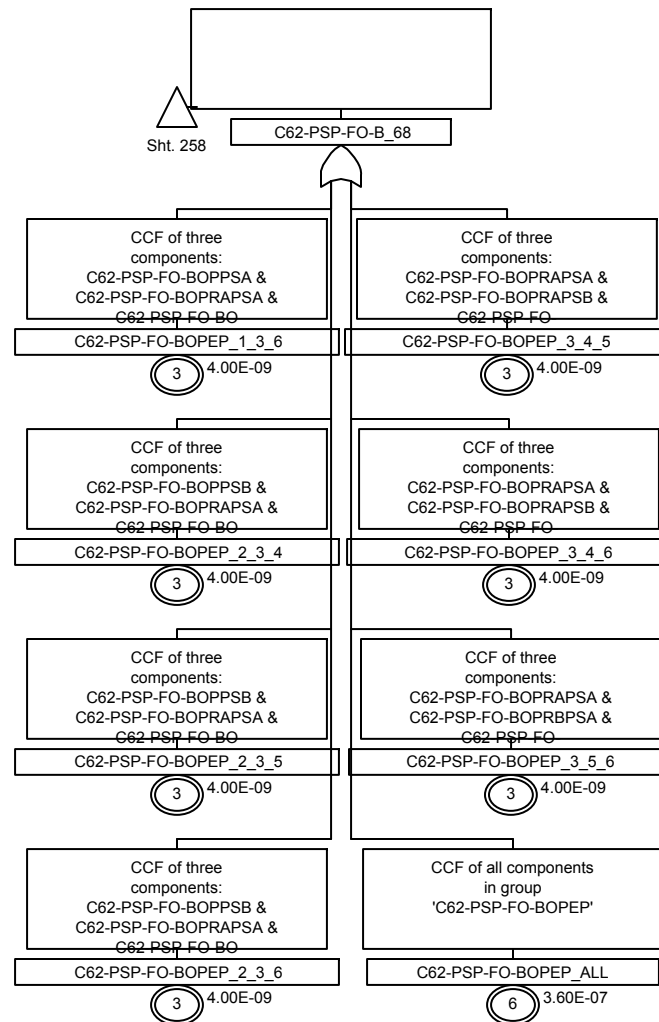


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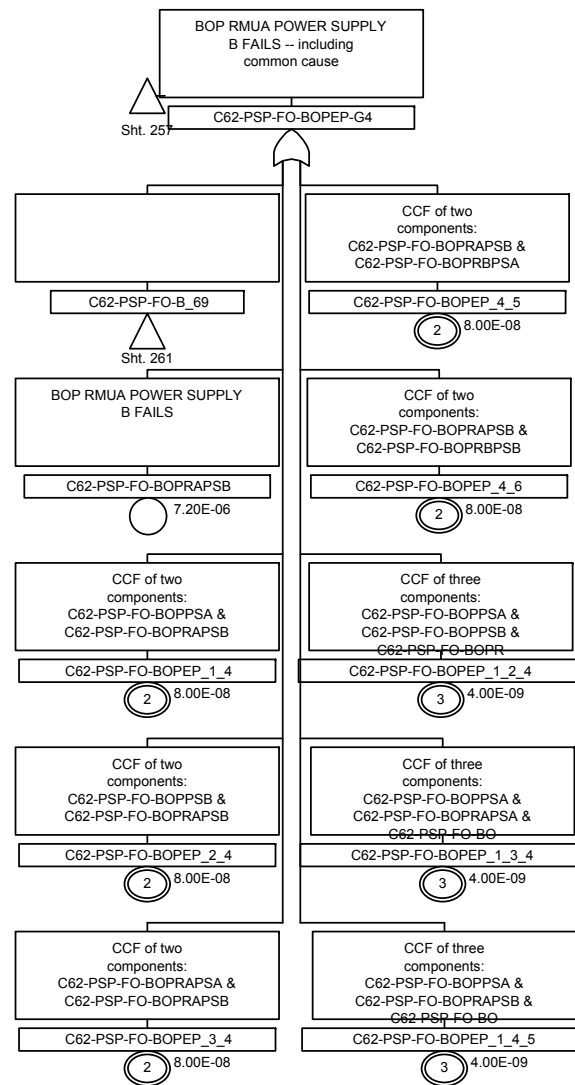


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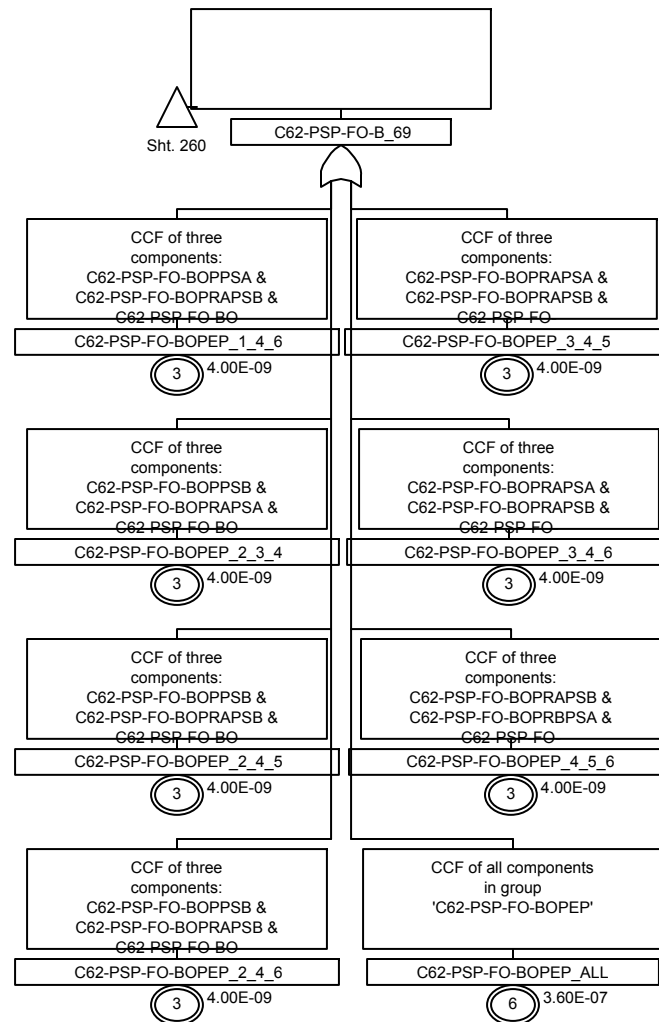


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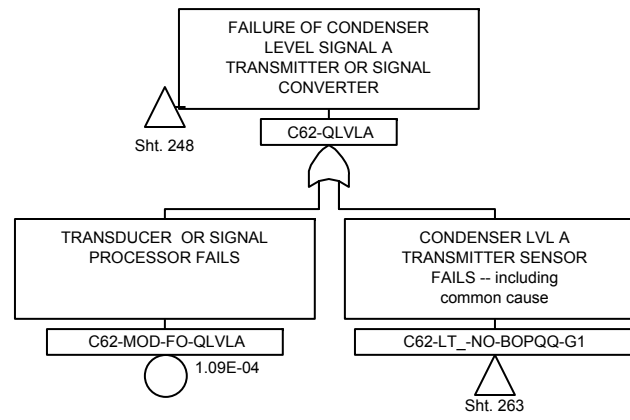


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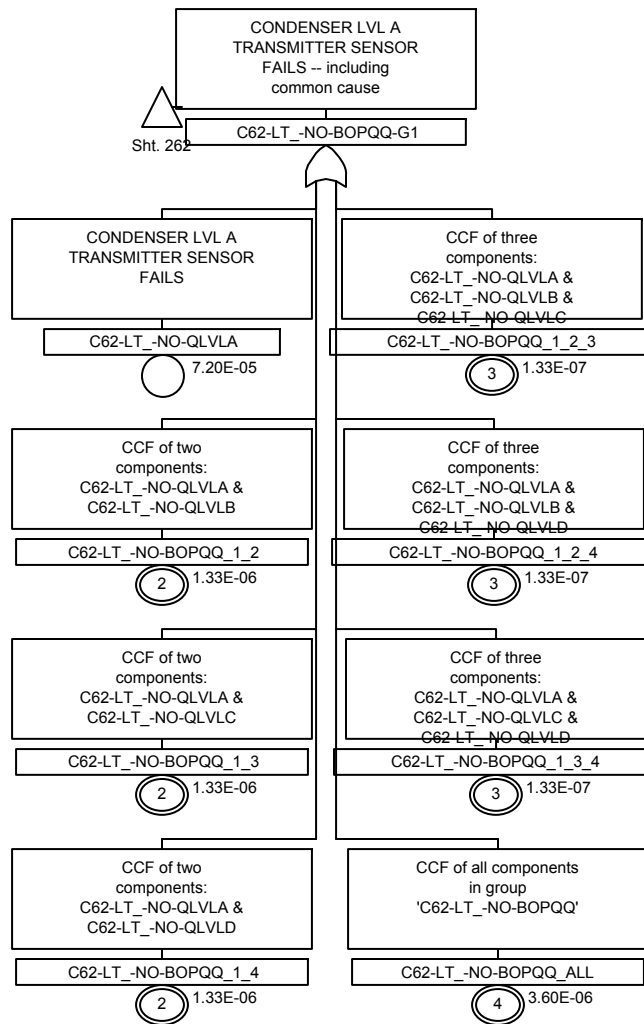


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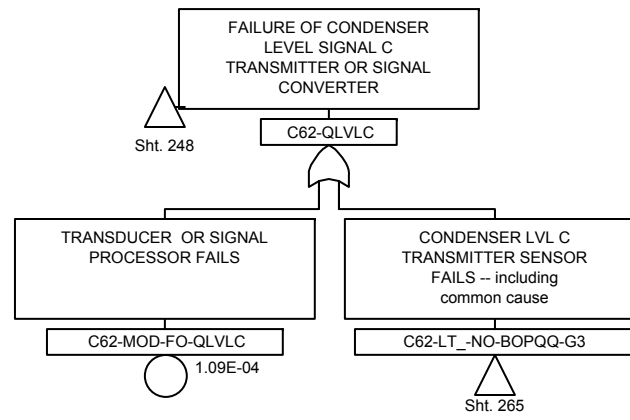


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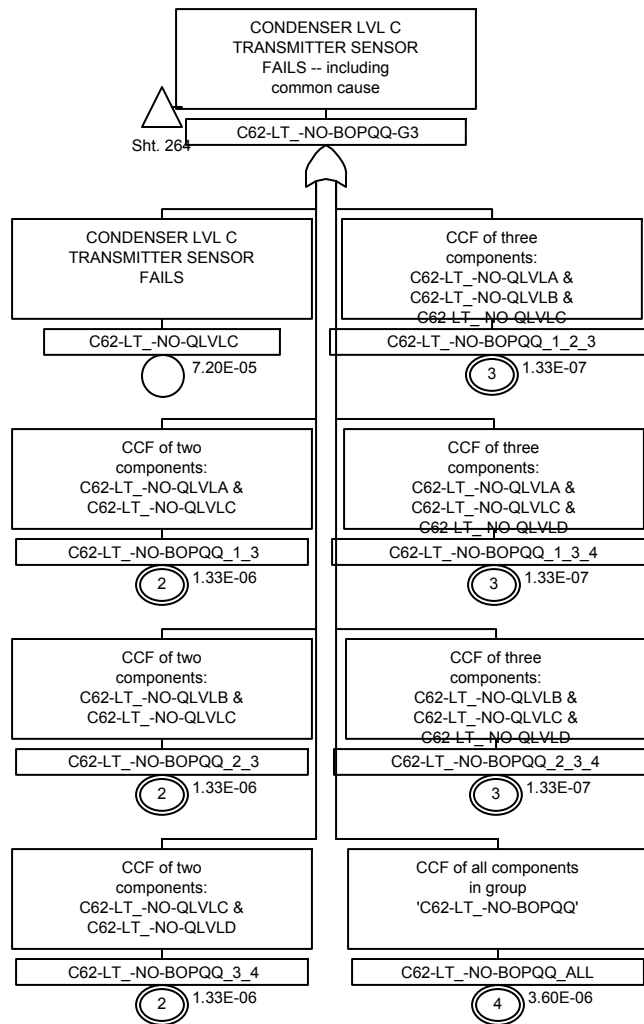


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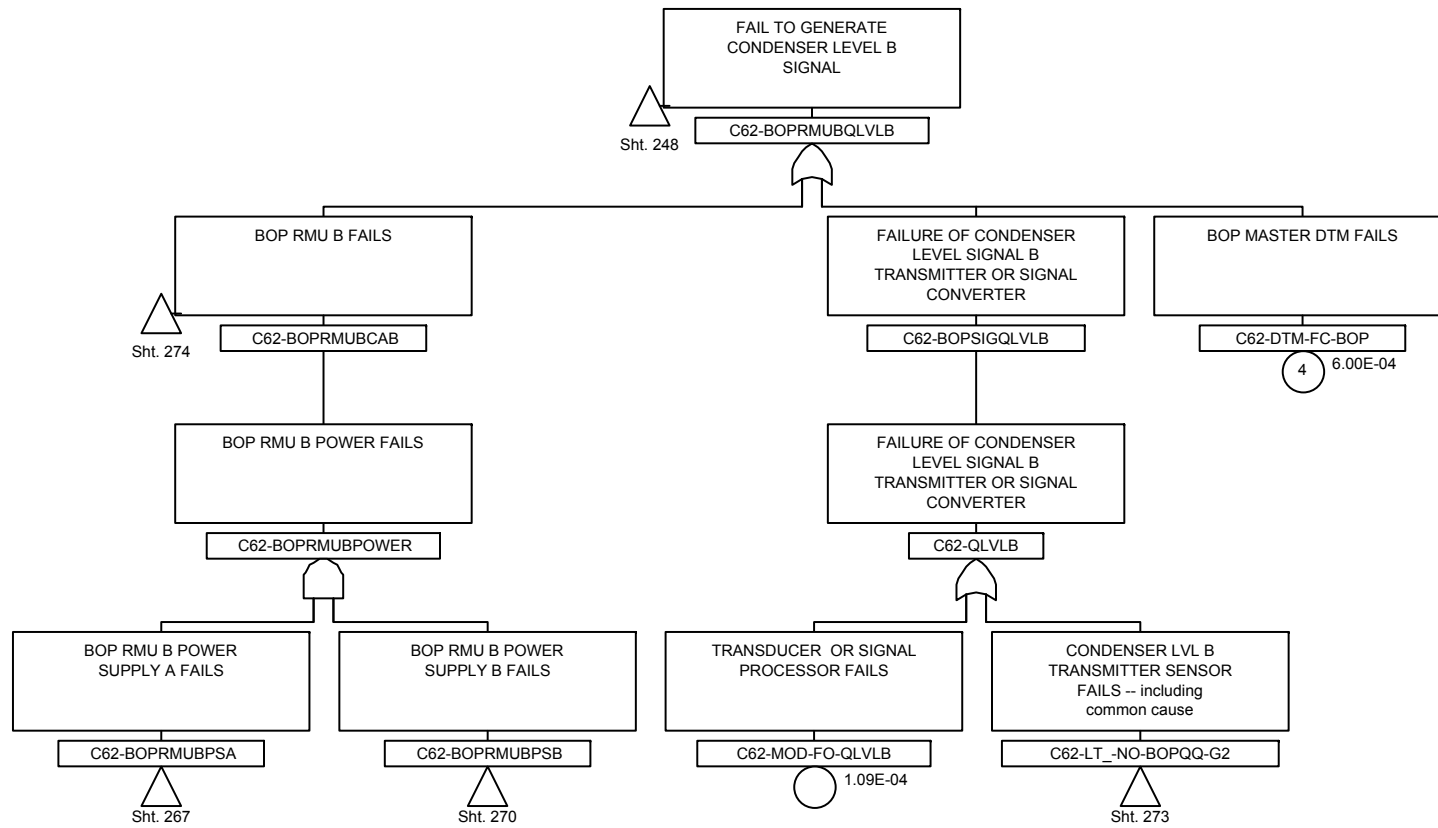


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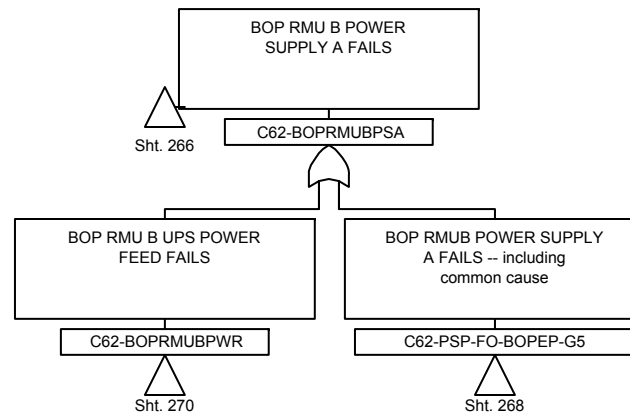


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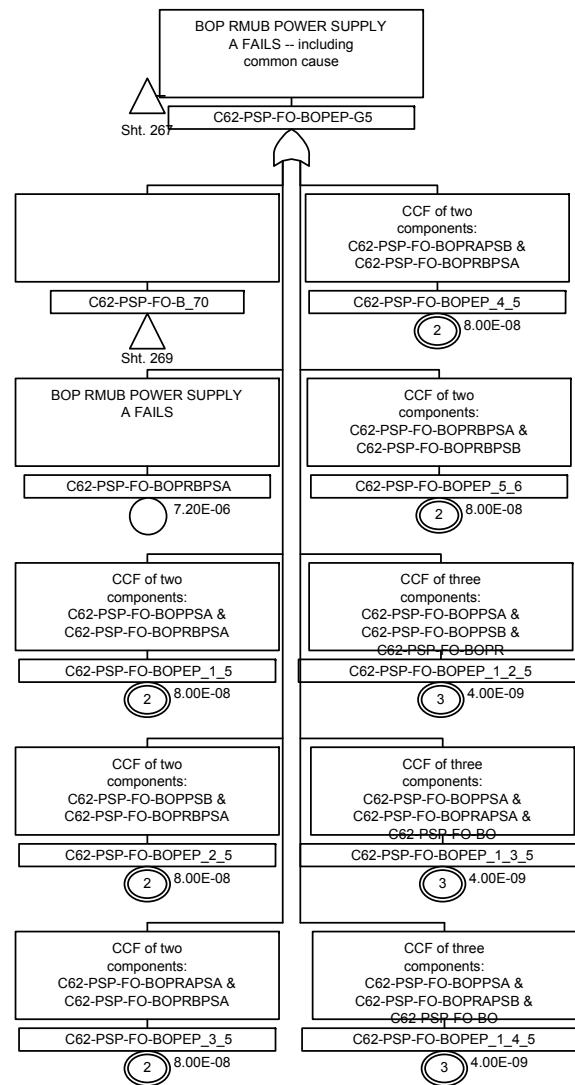


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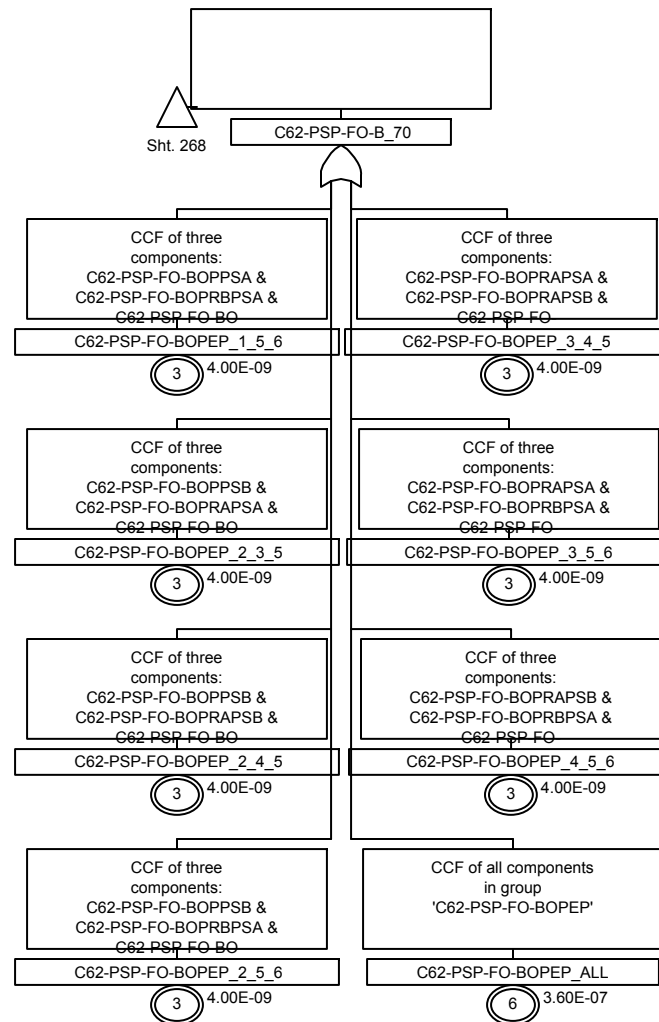


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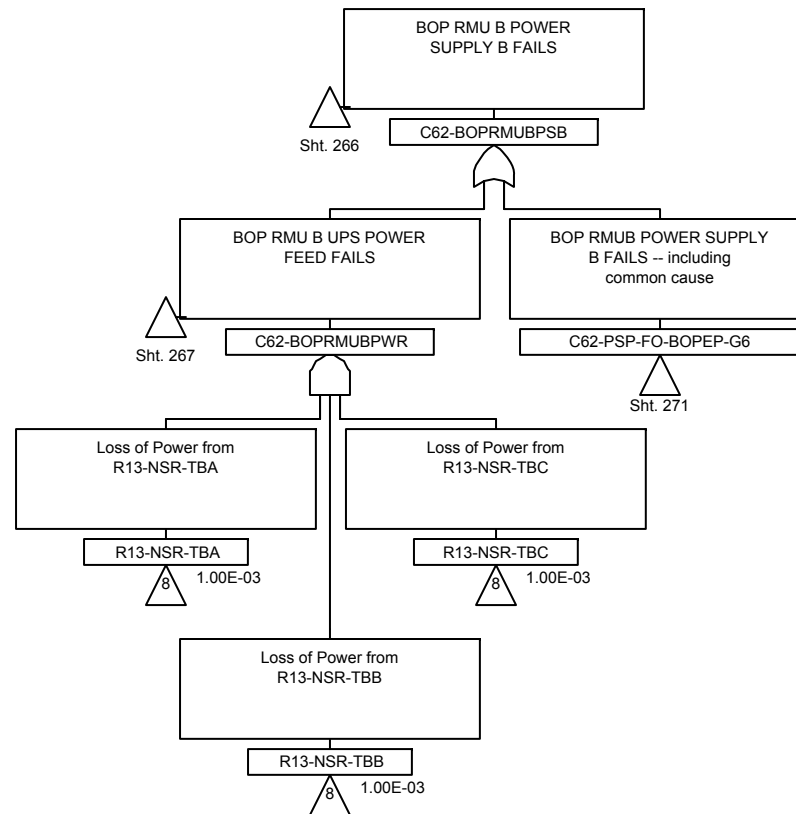


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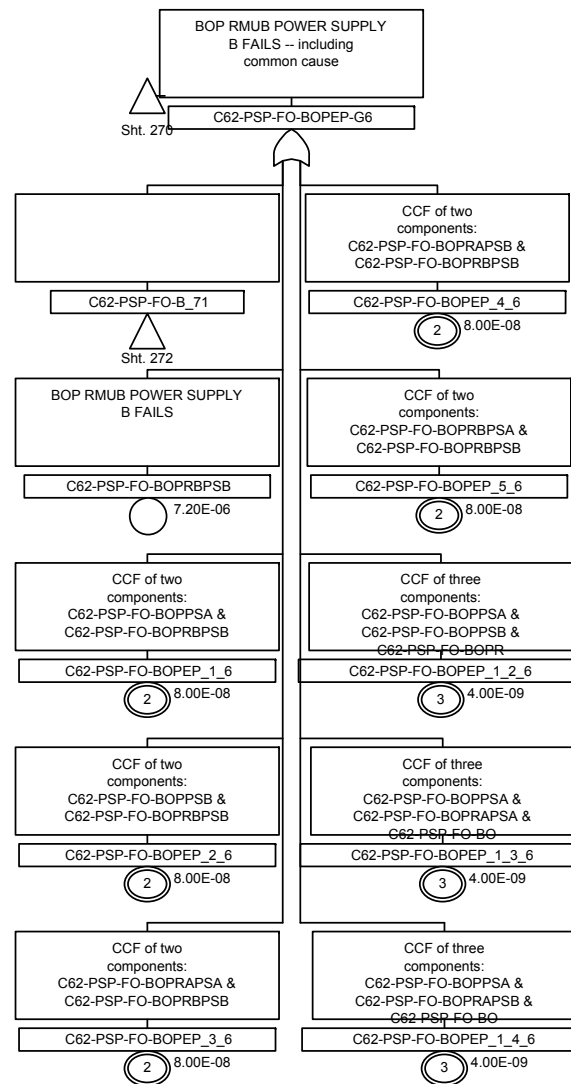


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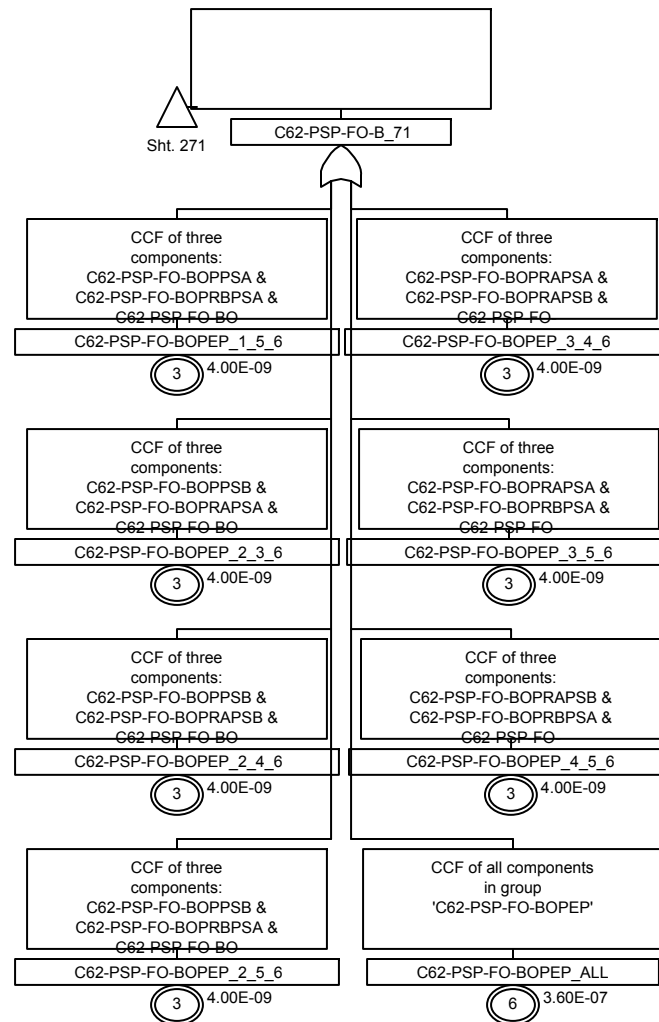


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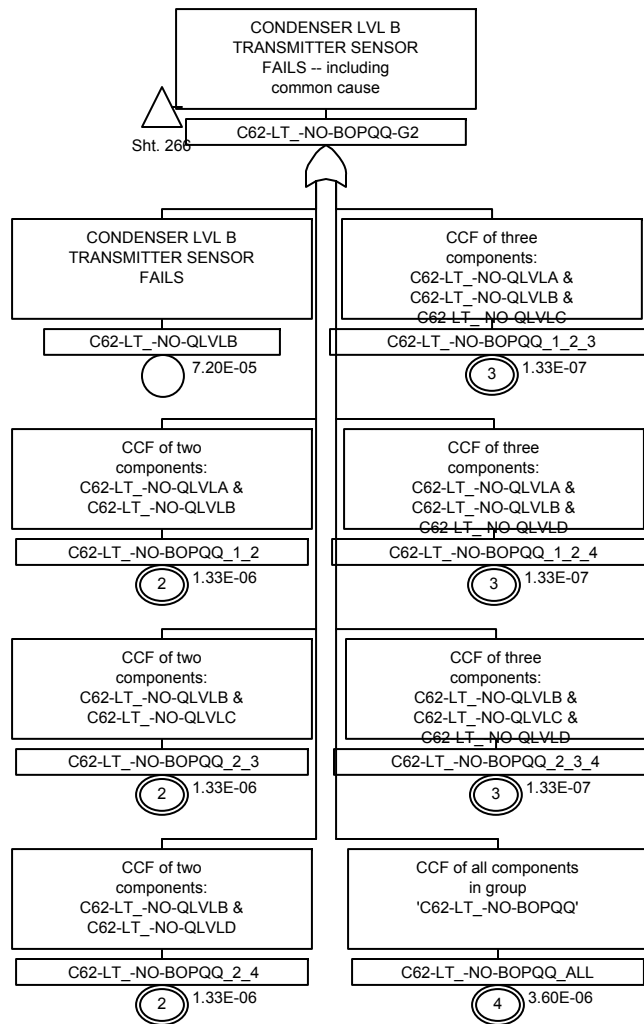


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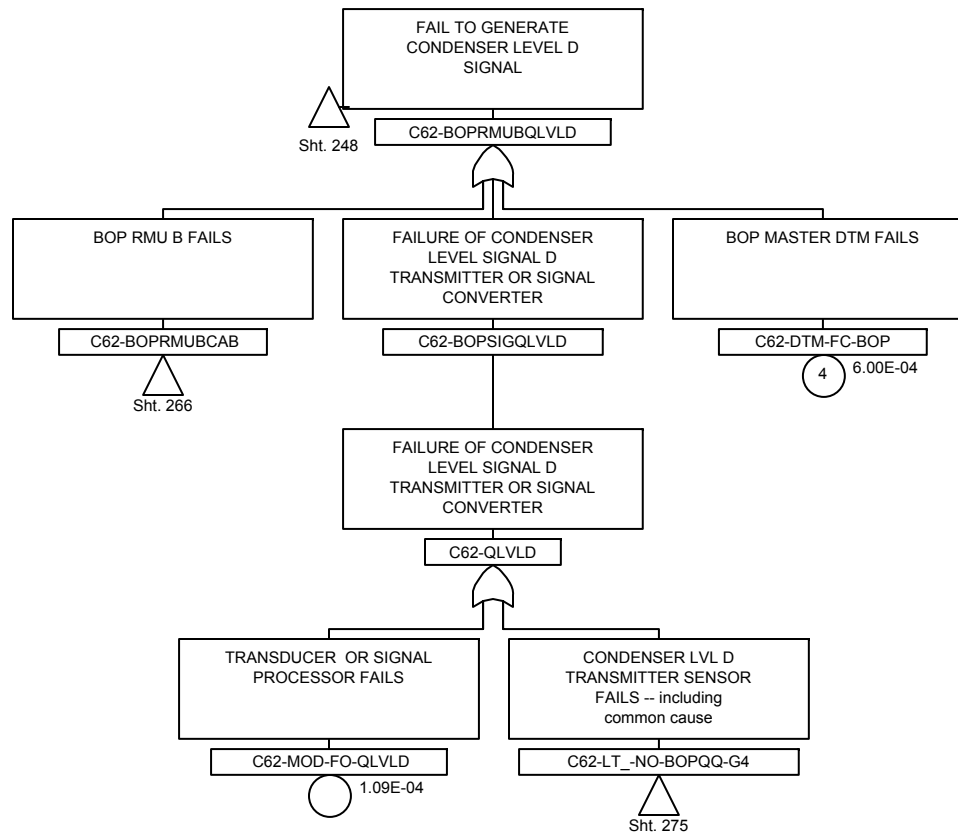


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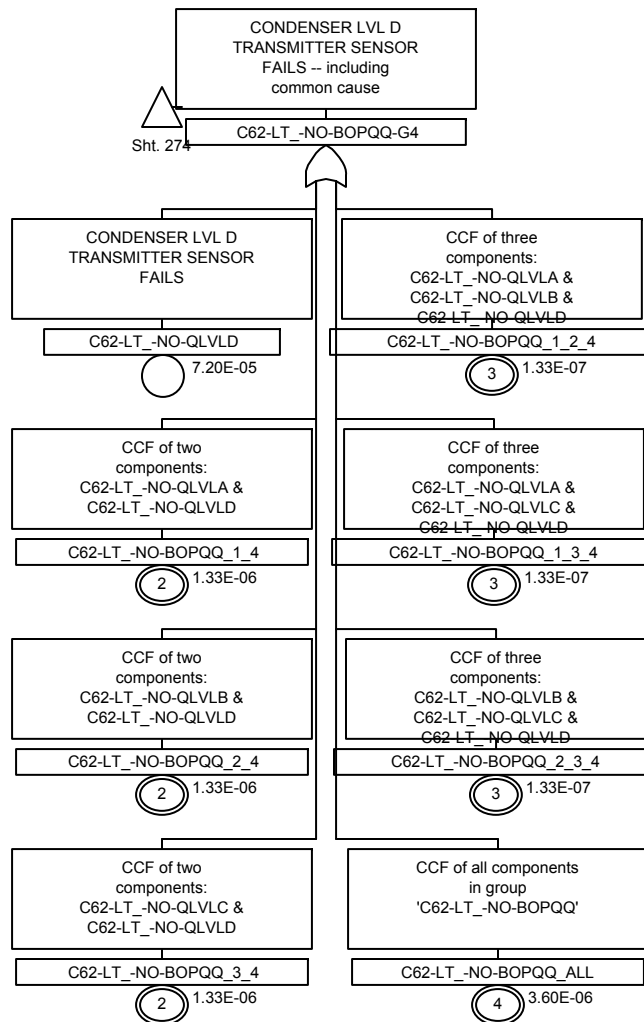


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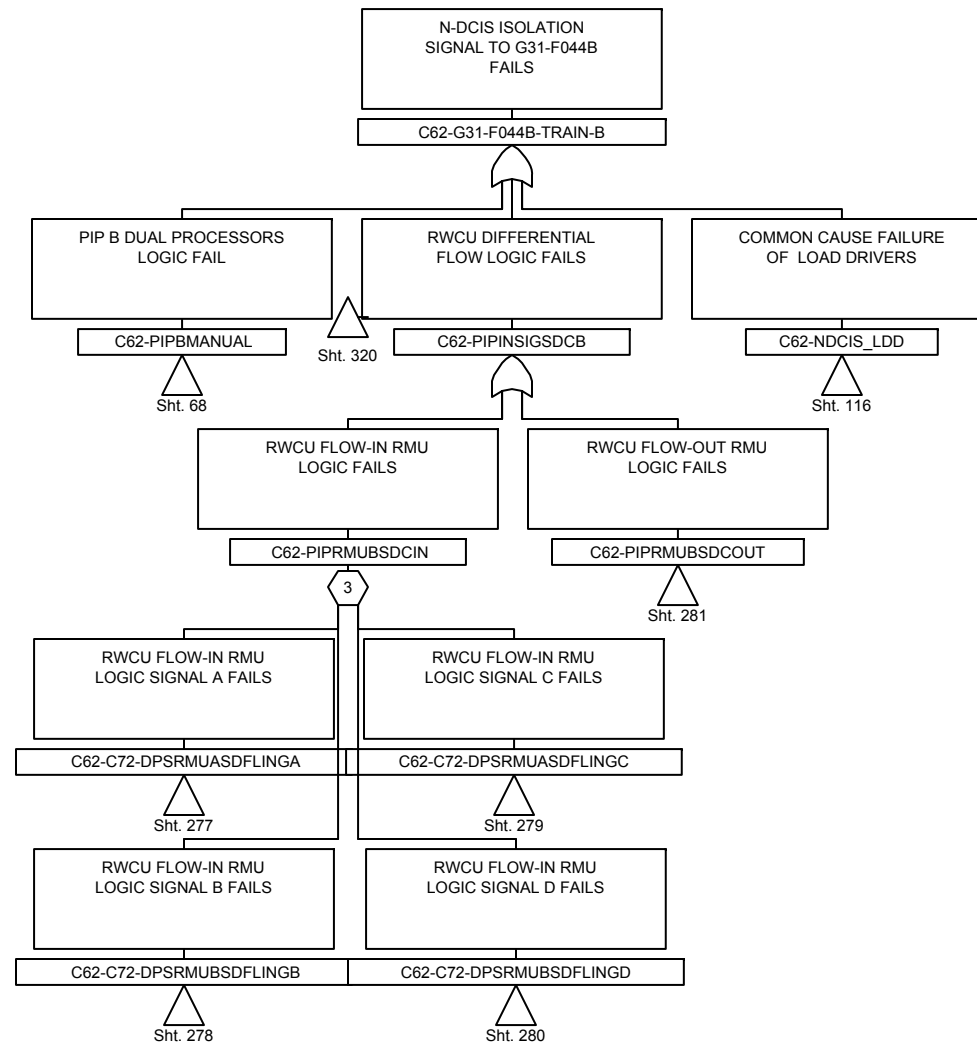


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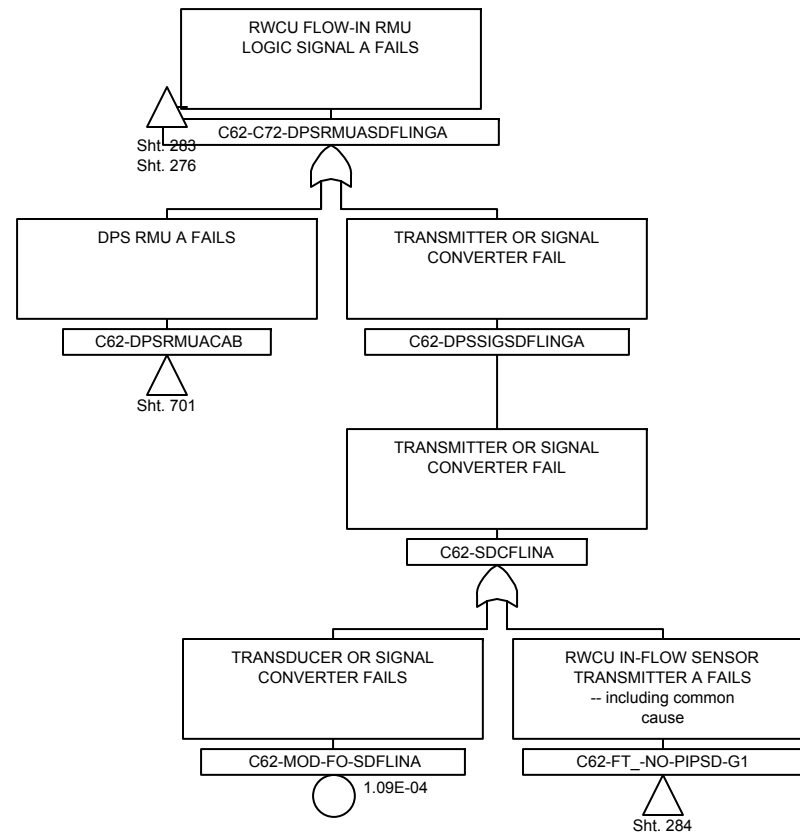


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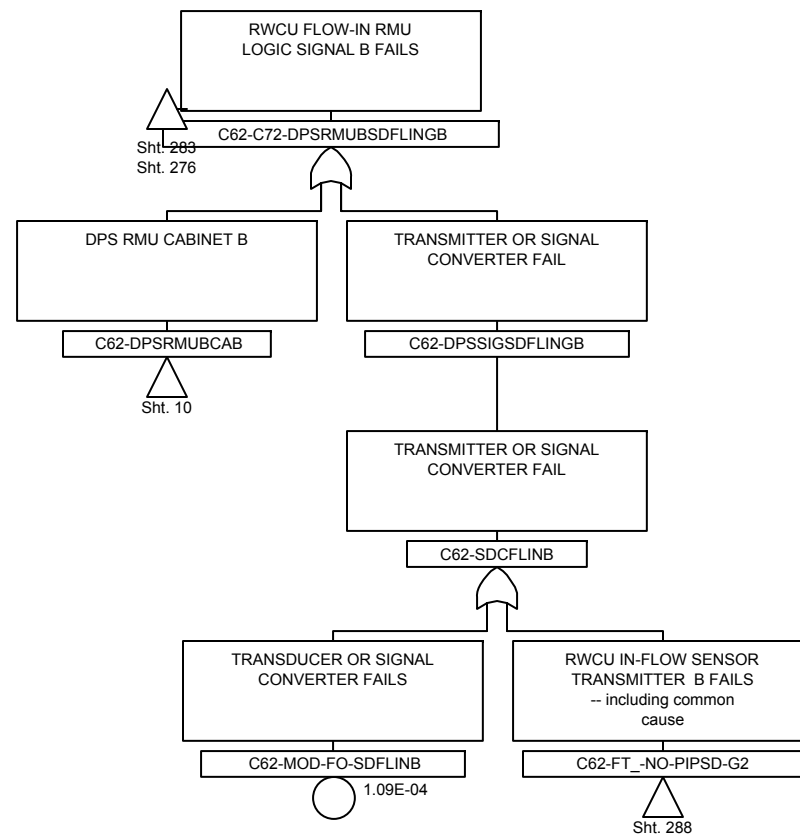


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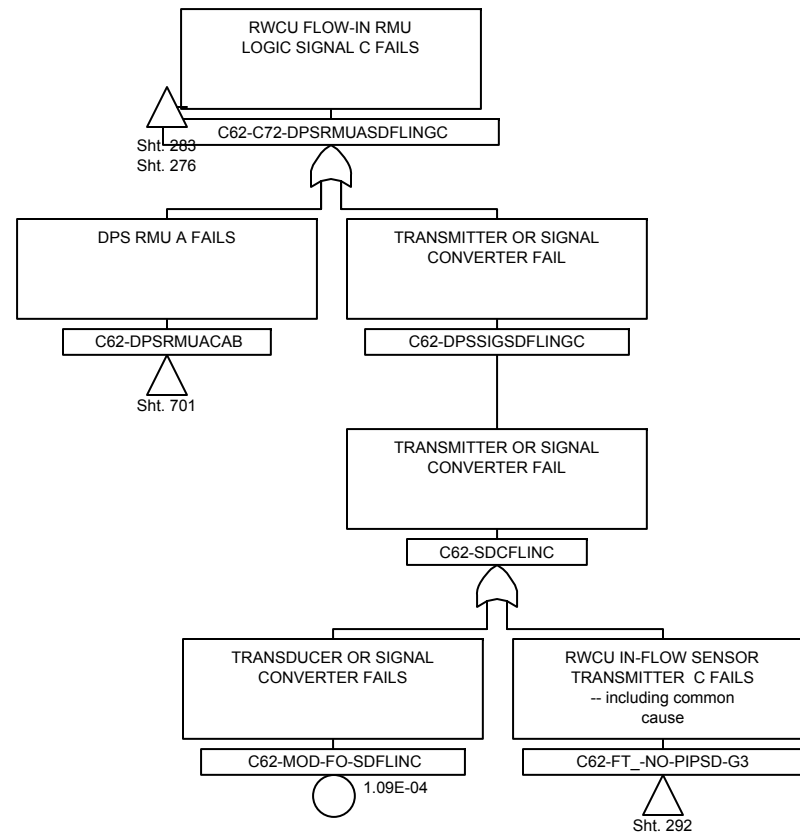


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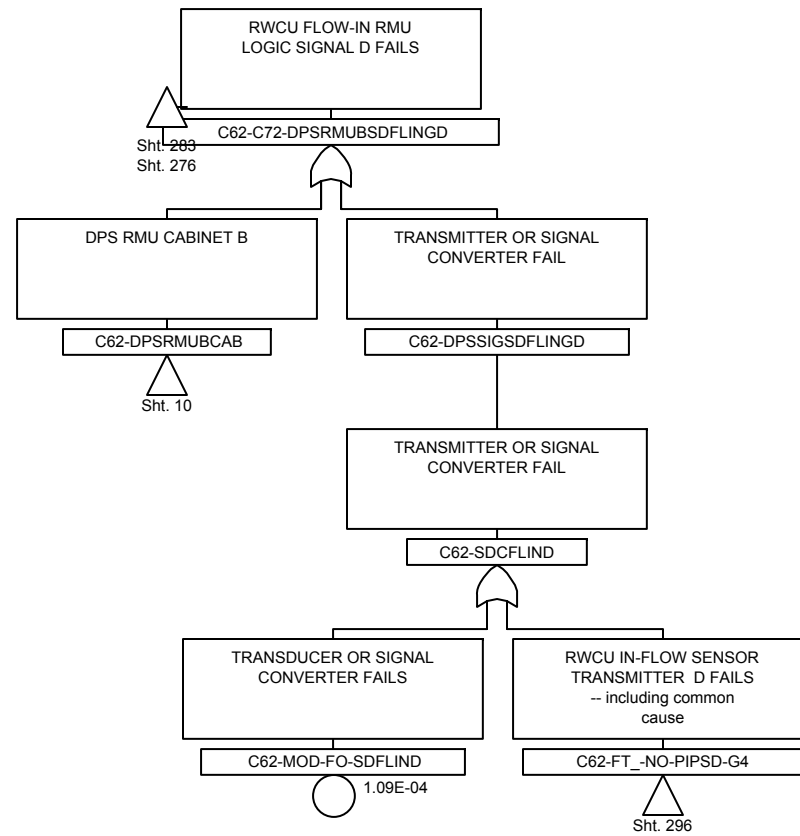


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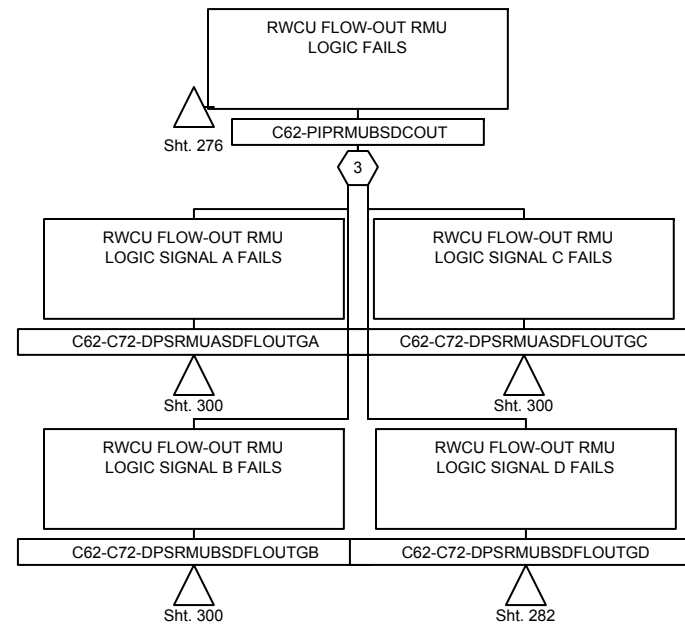


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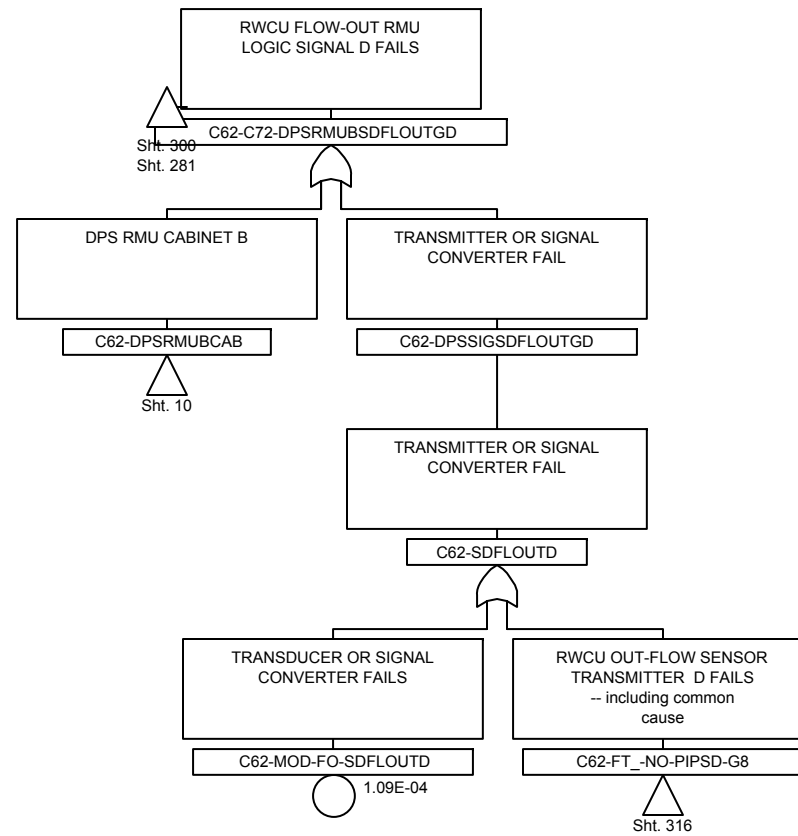


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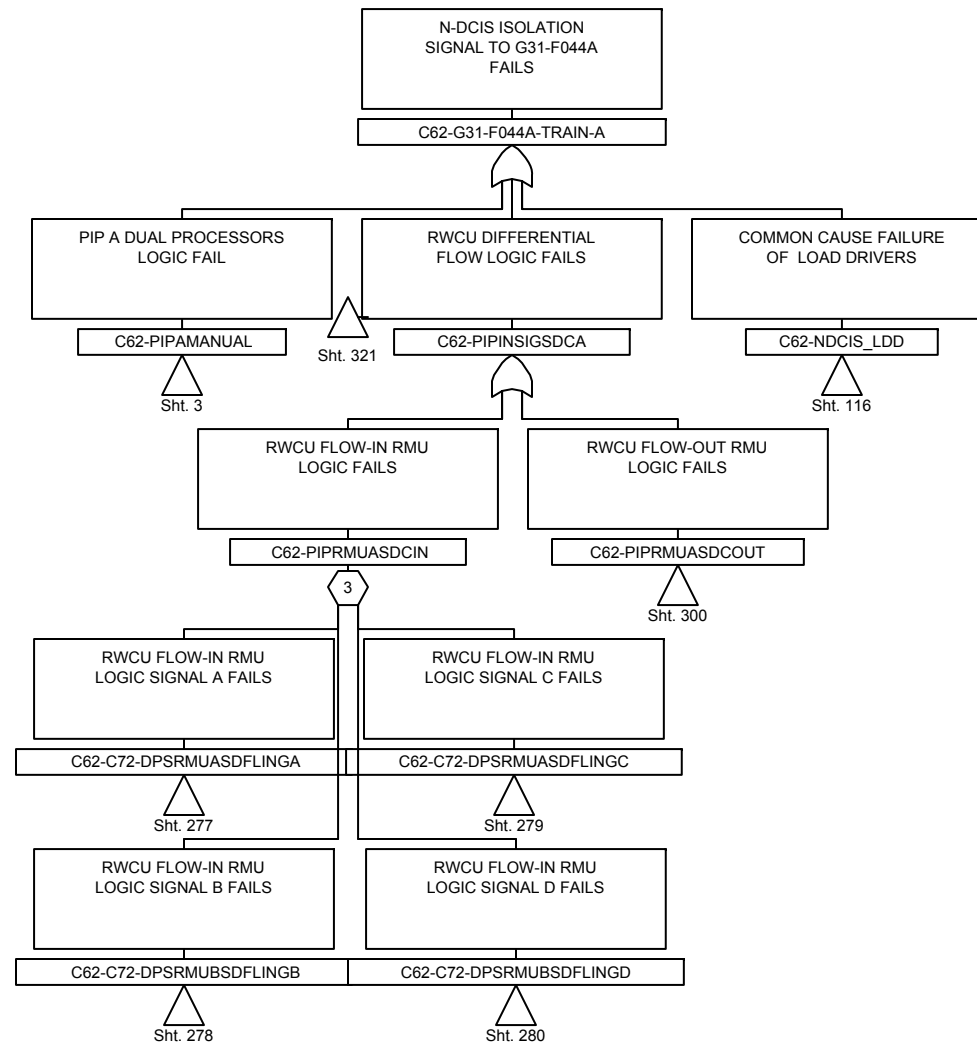


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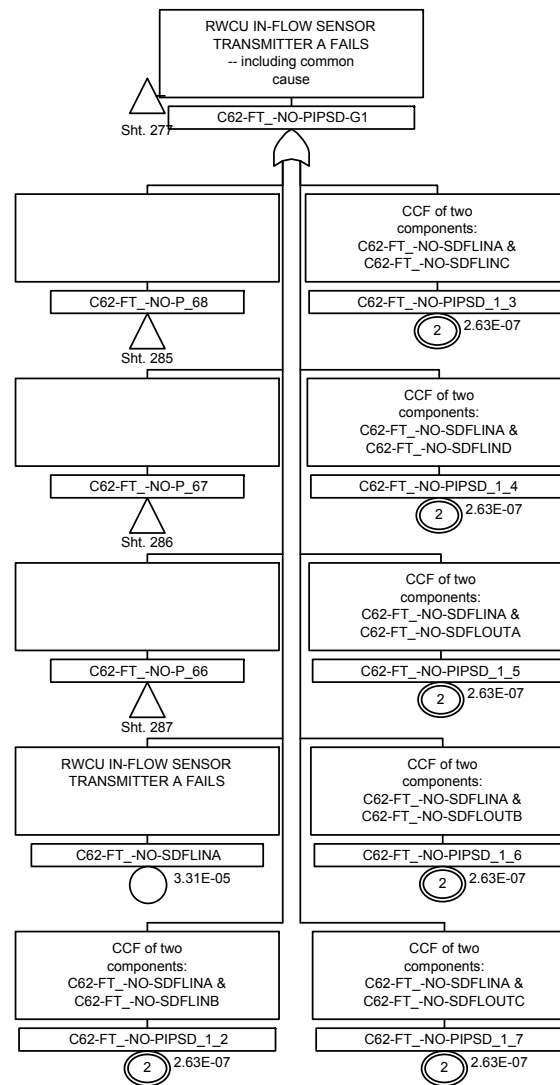


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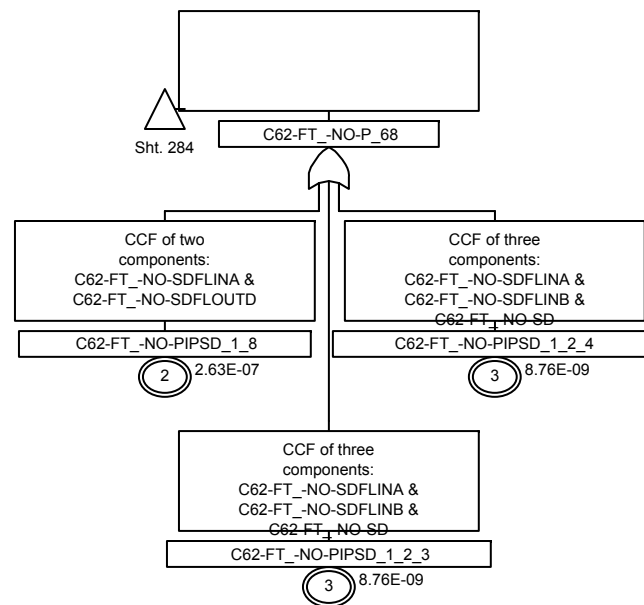


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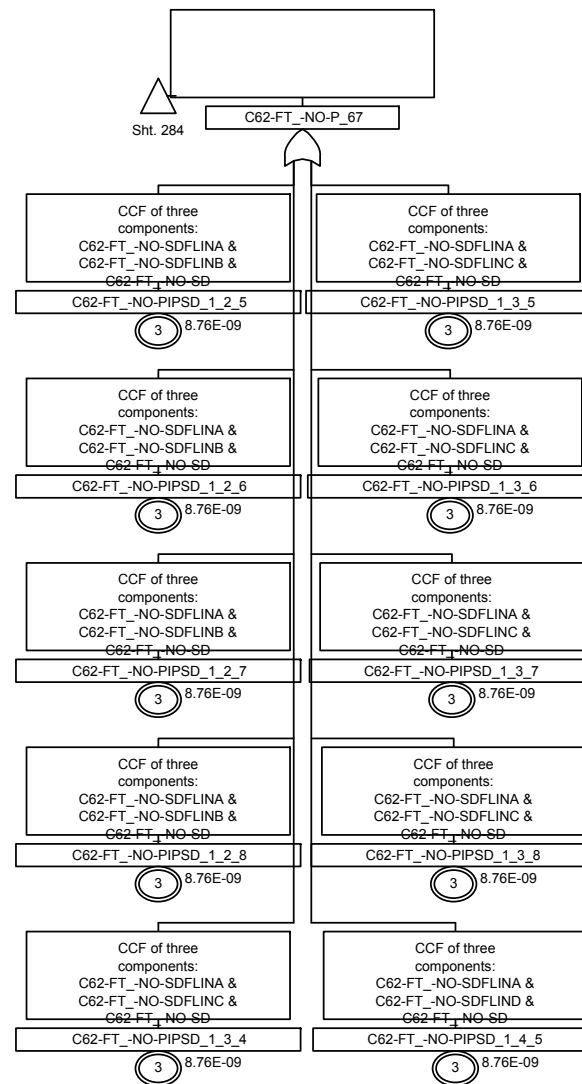


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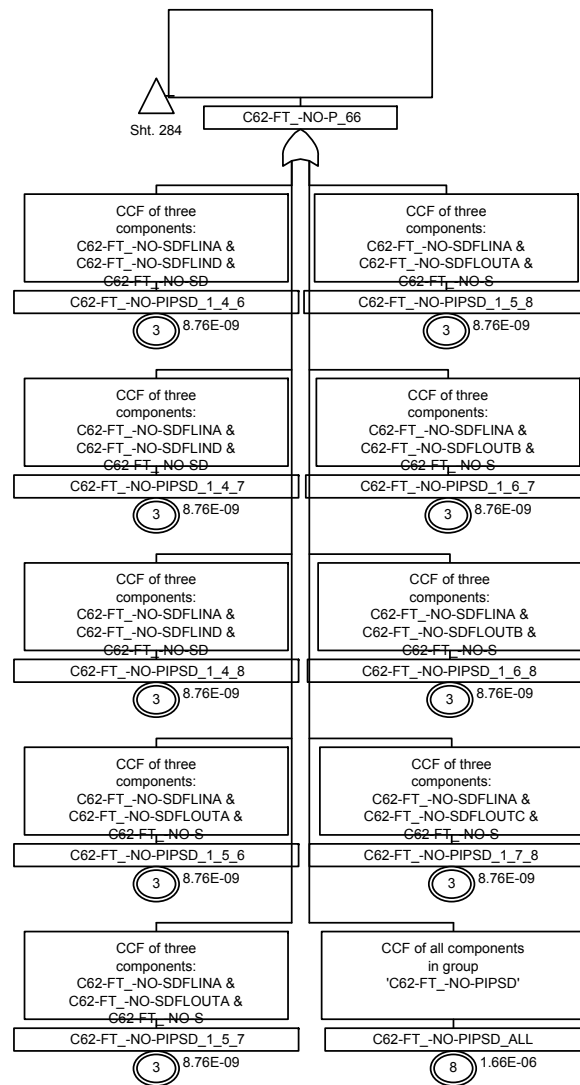


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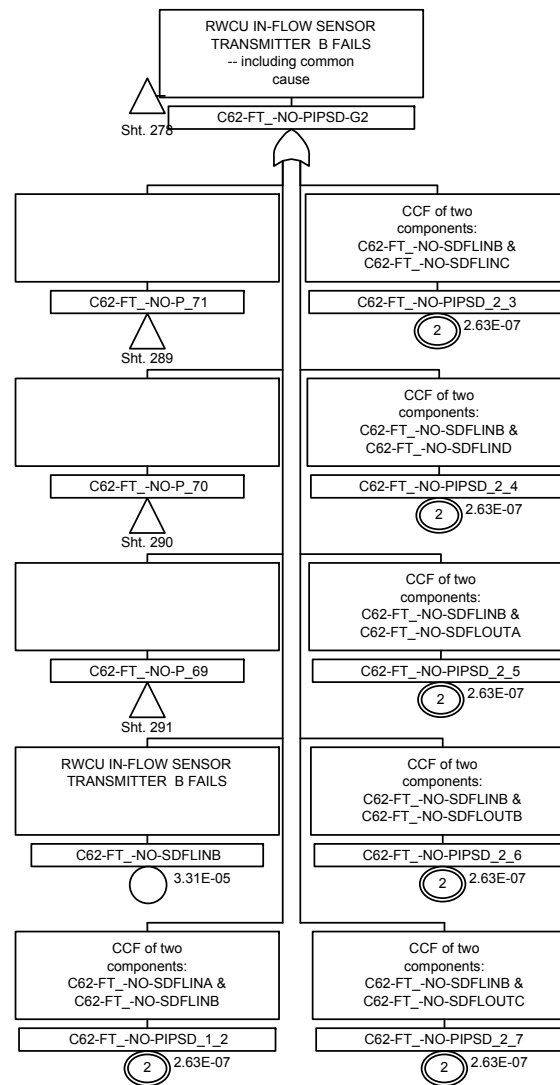


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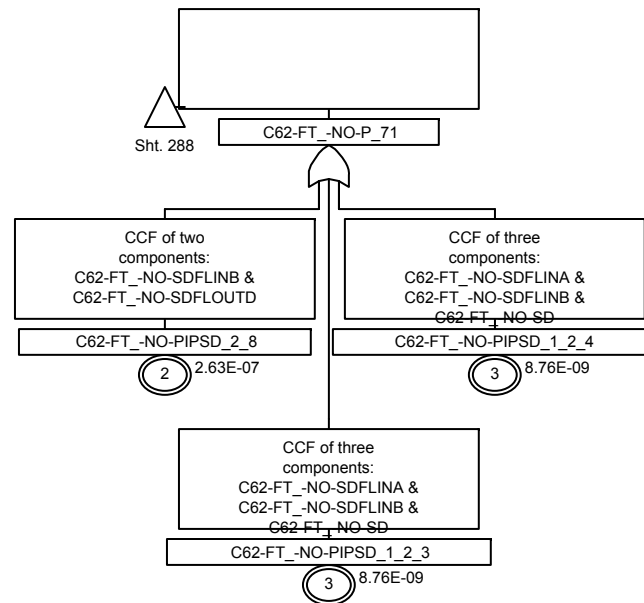


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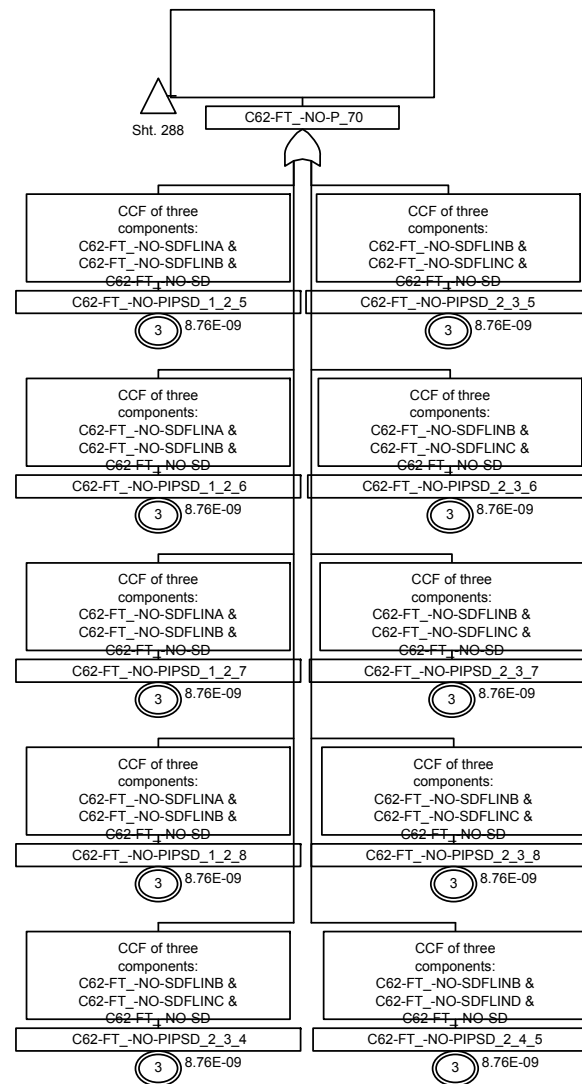


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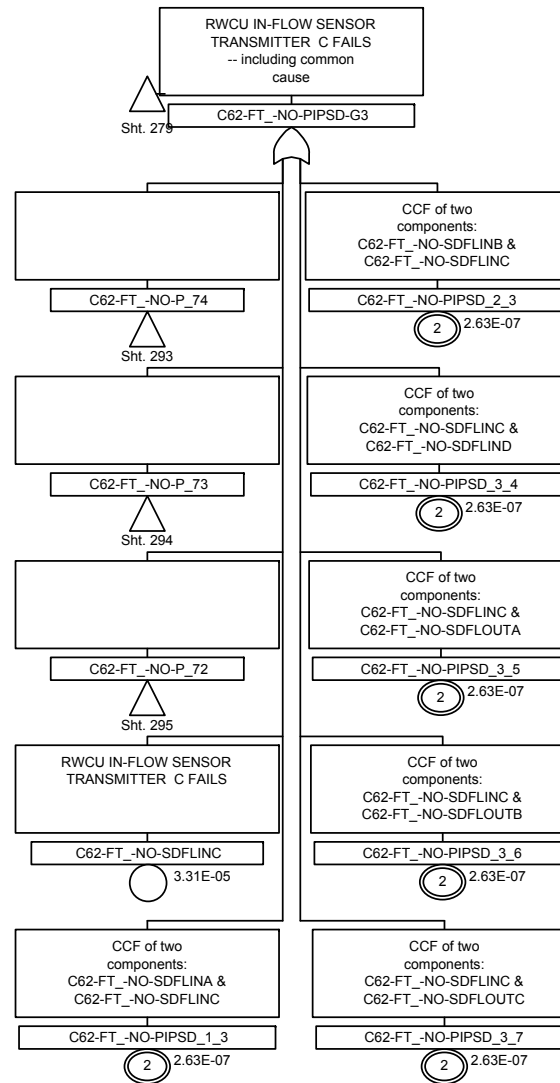


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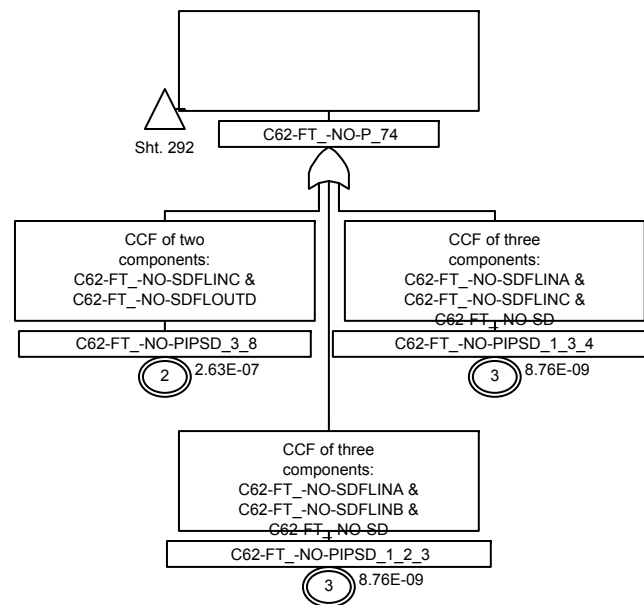


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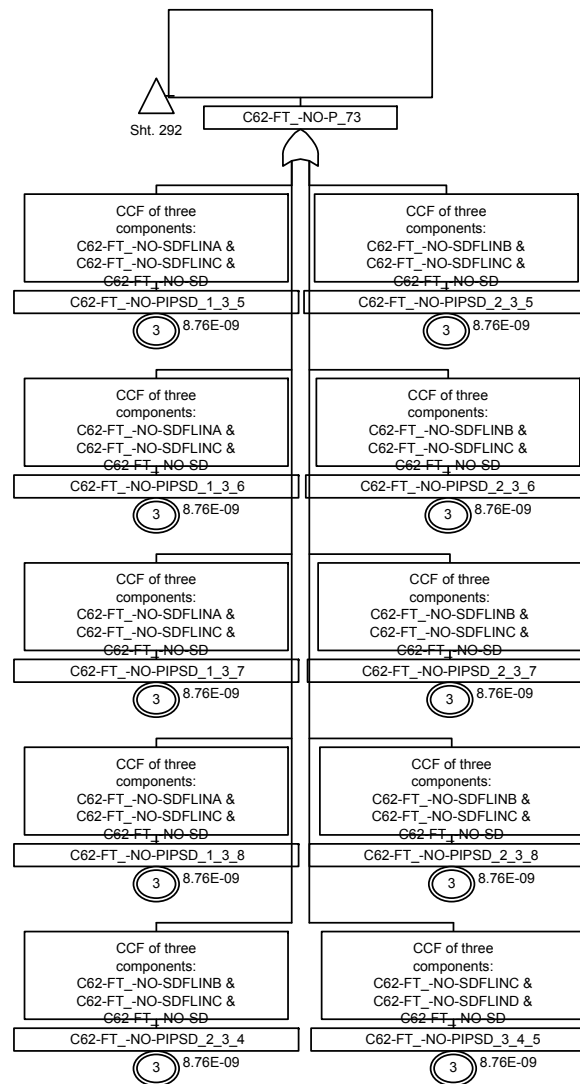


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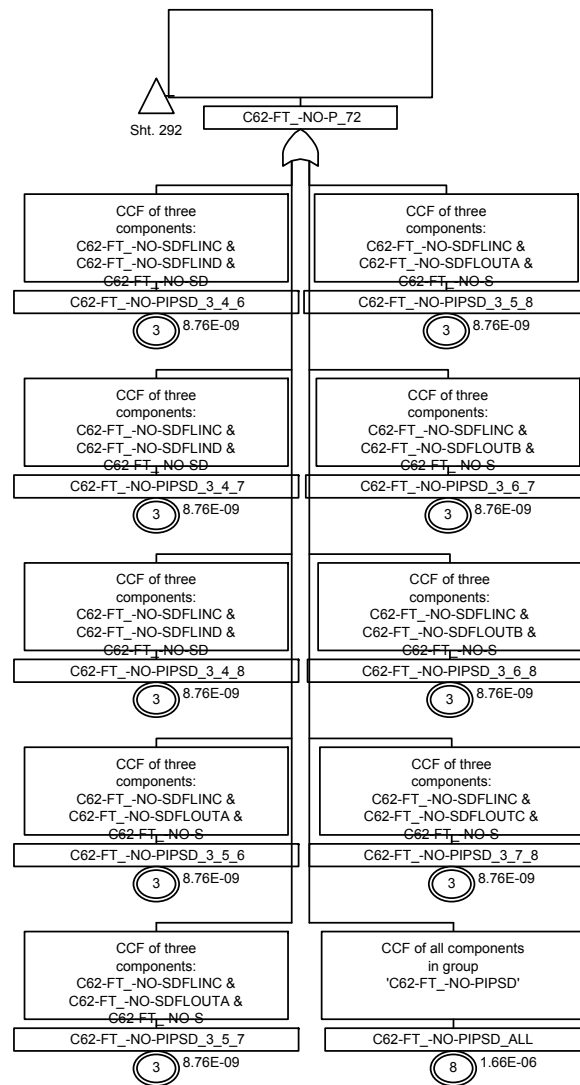


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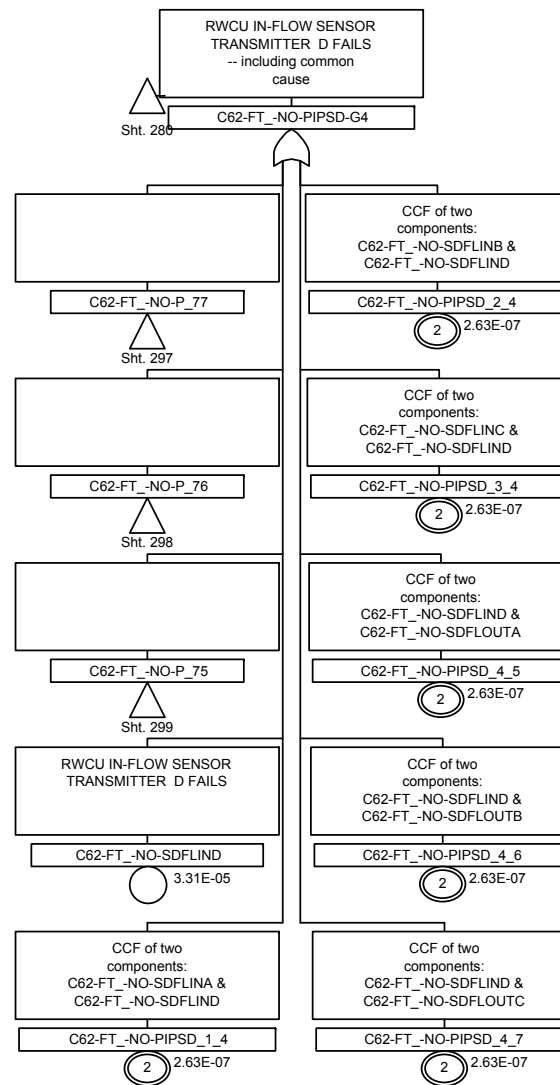


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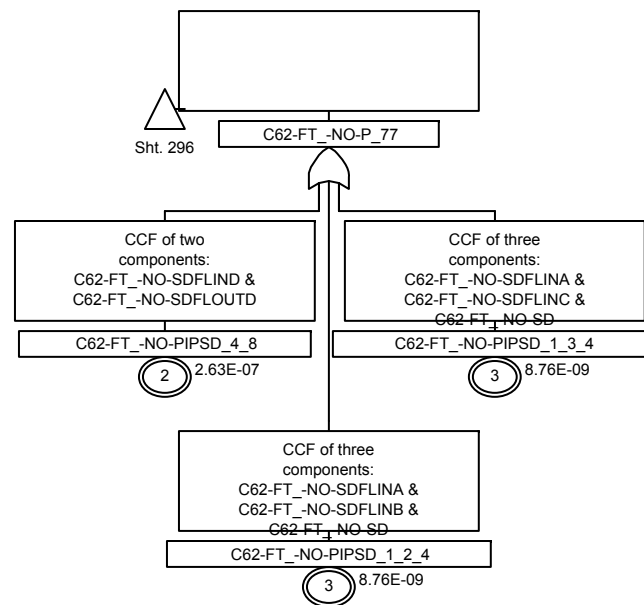


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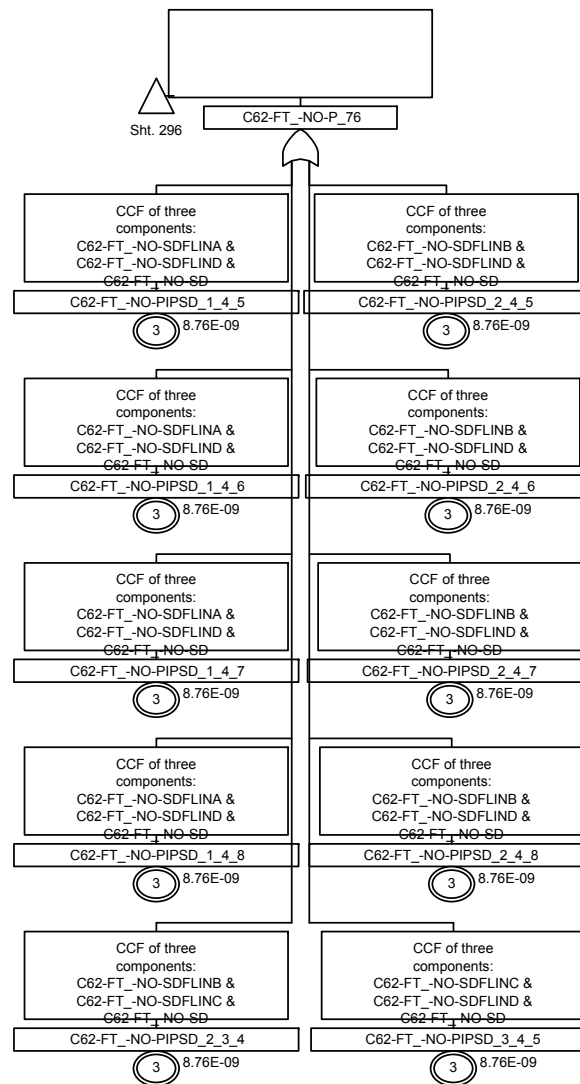


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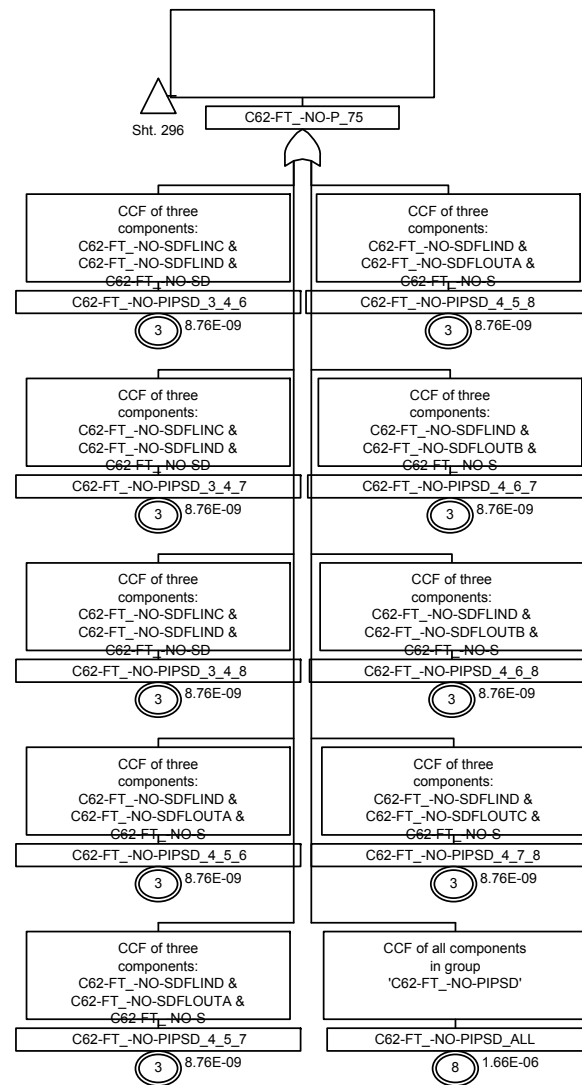


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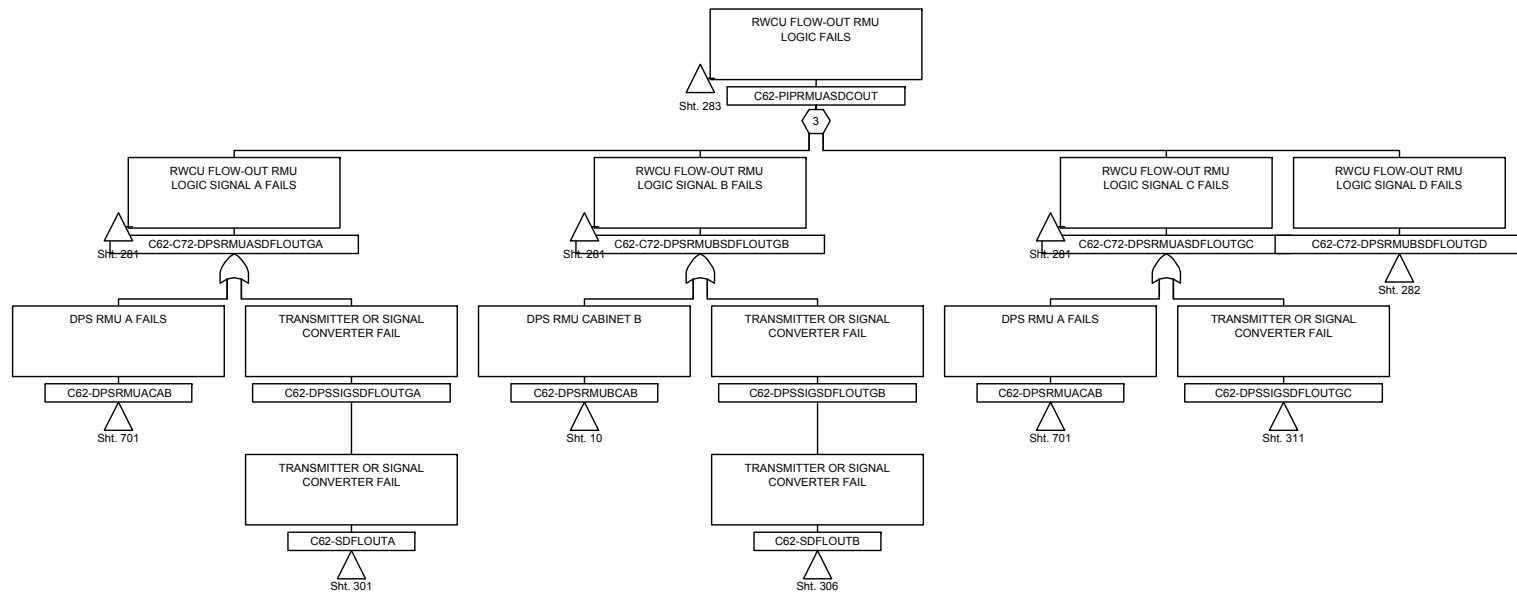


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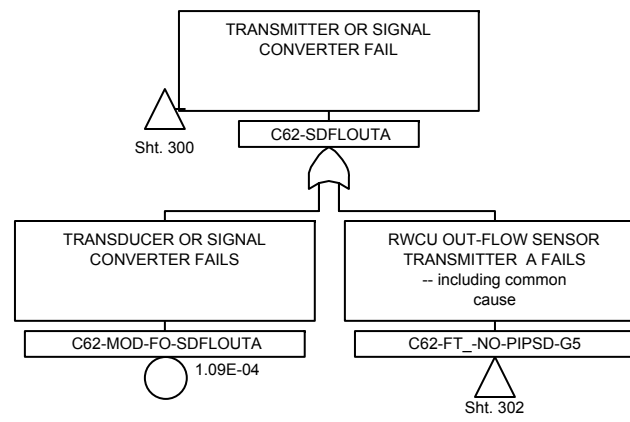


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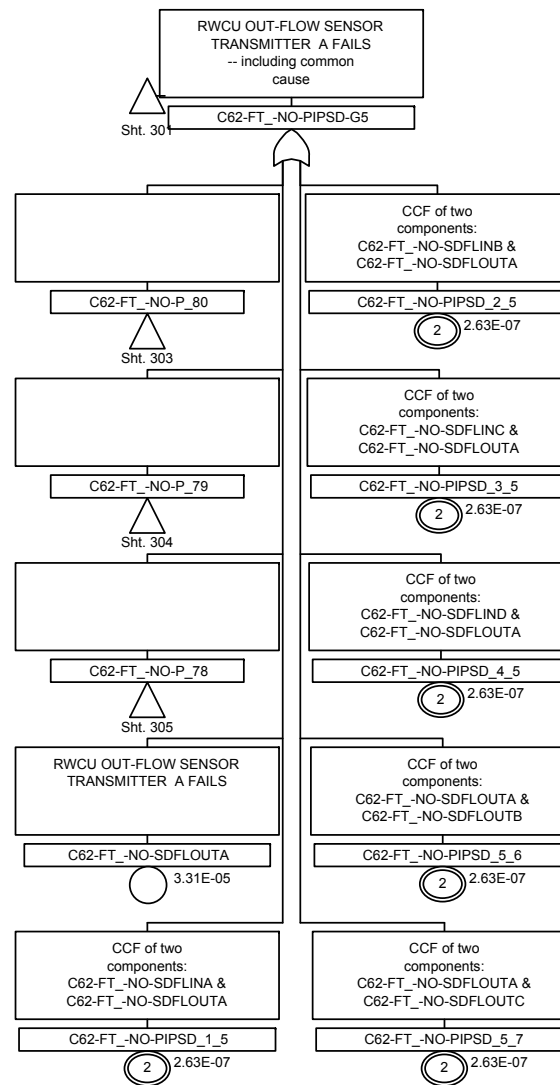


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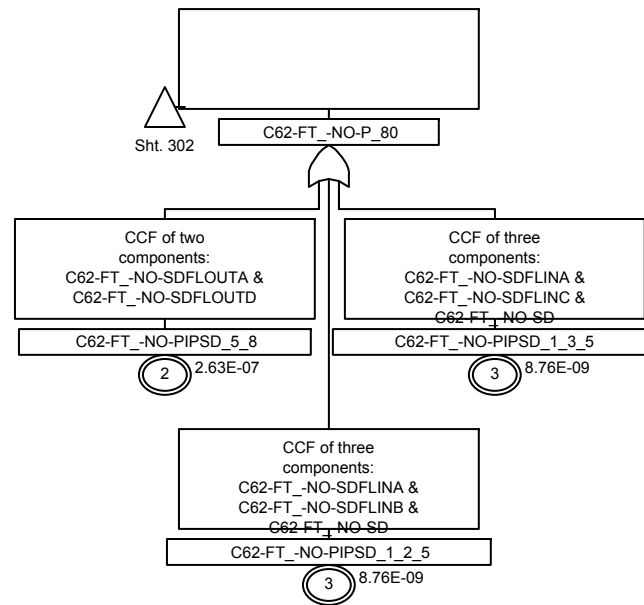


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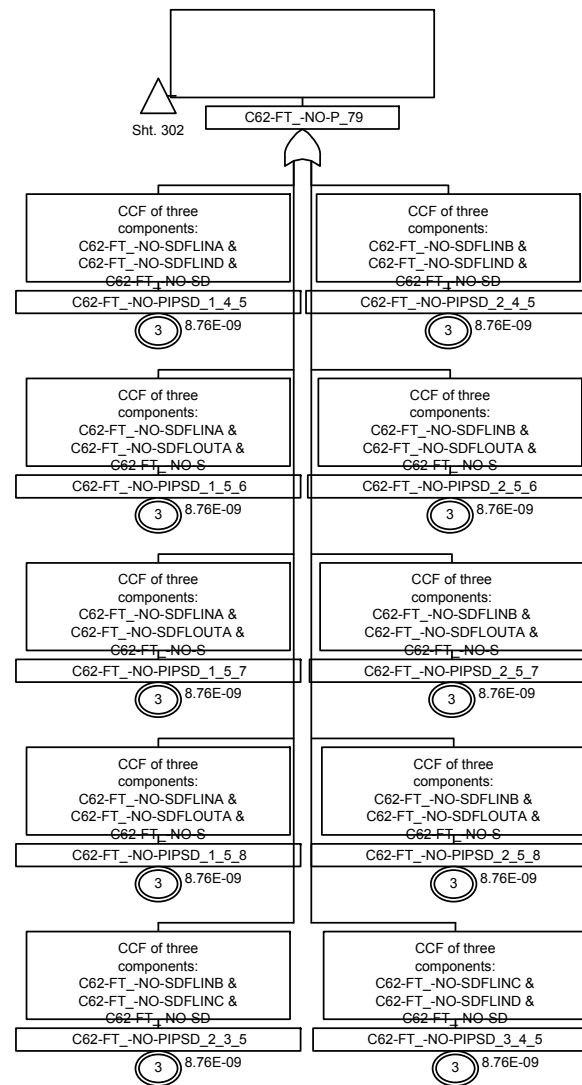


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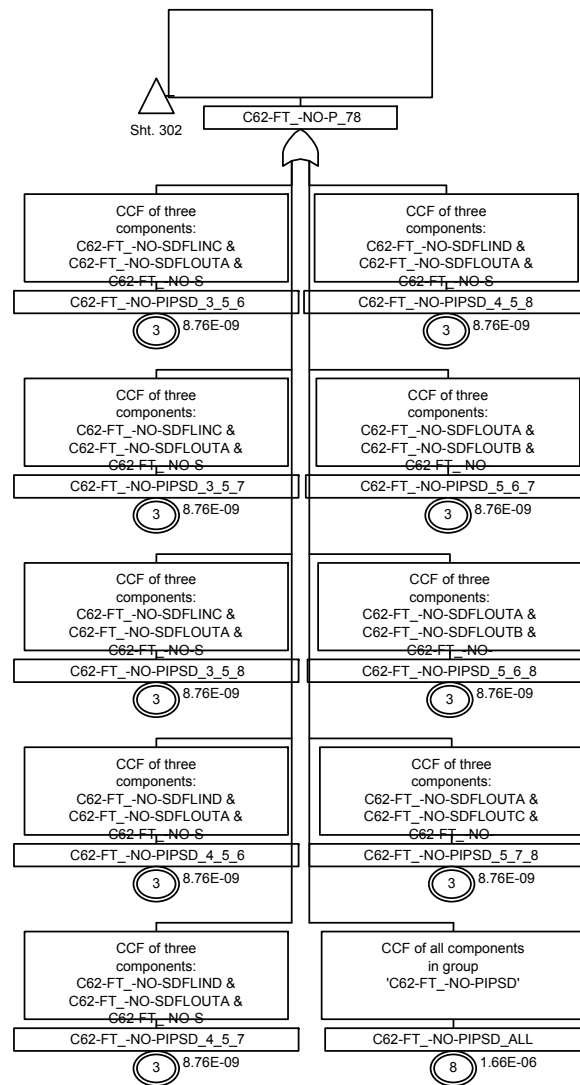


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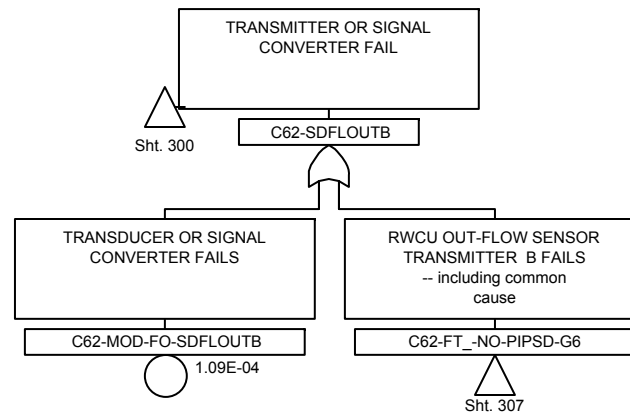


Figure 4.5-3a. Sheet 306 N-DCIS Non Safety Control System



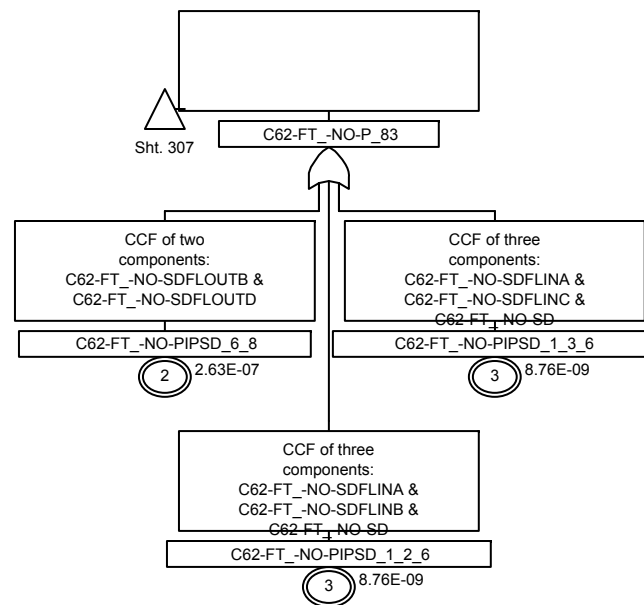


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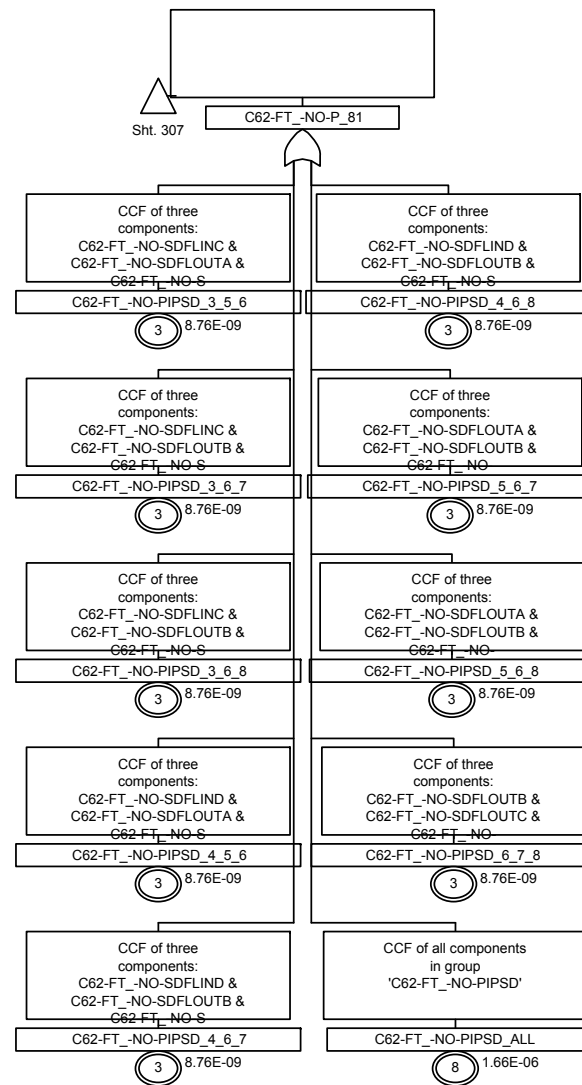


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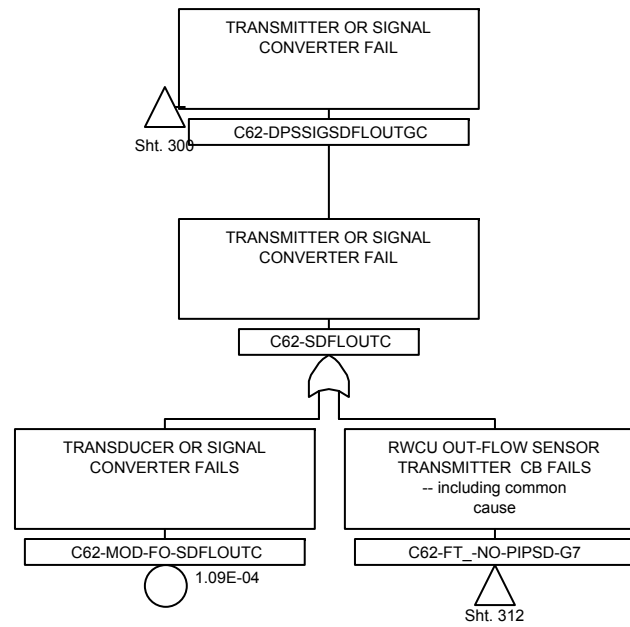


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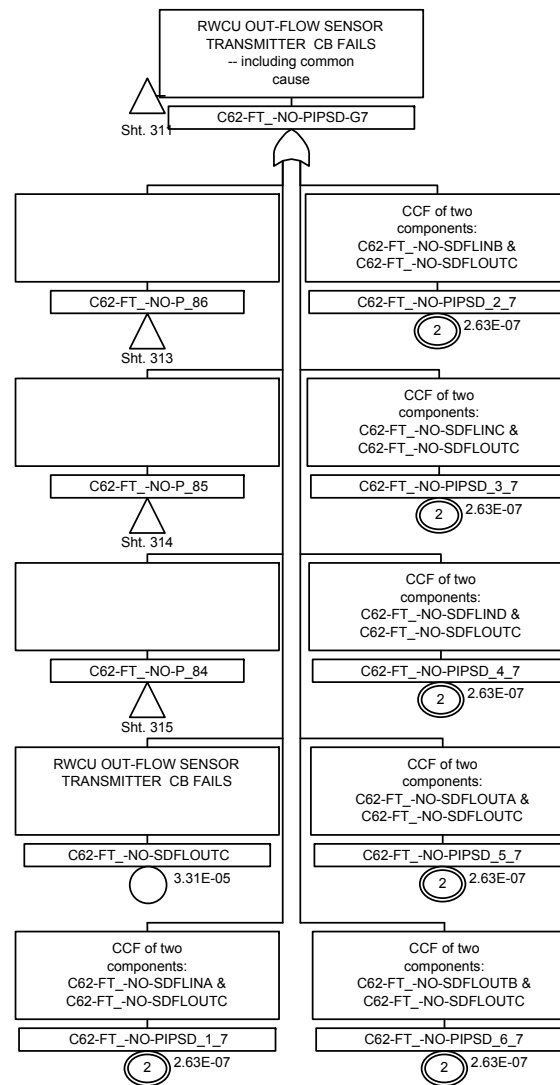


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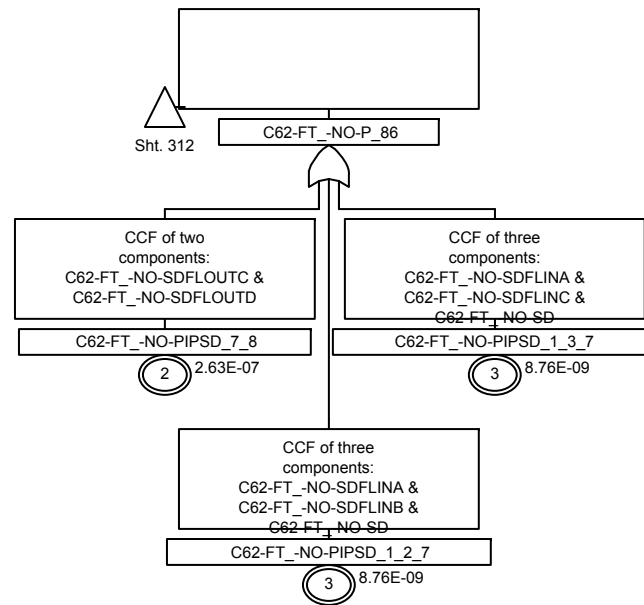


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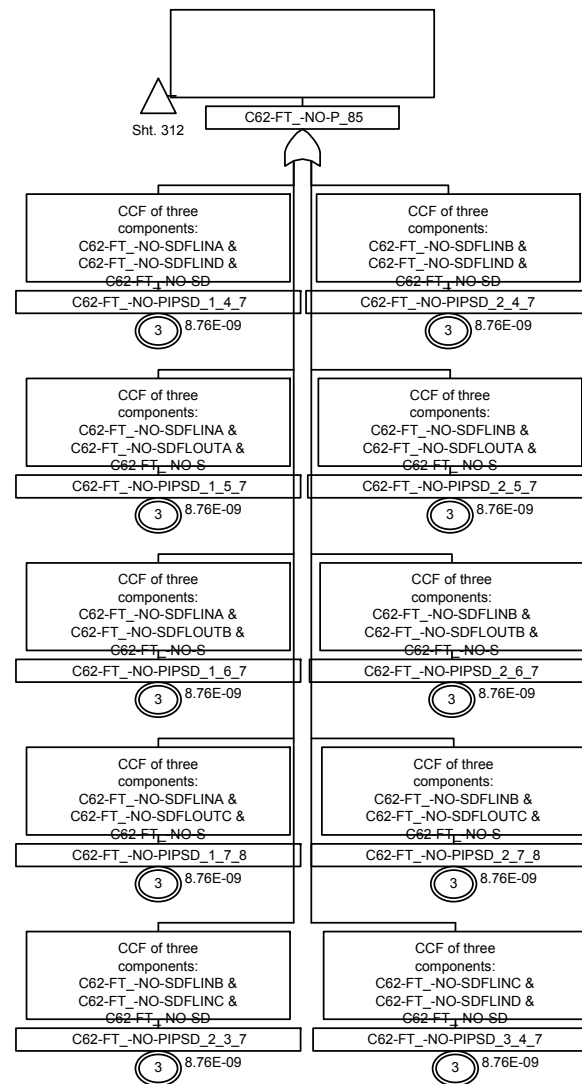


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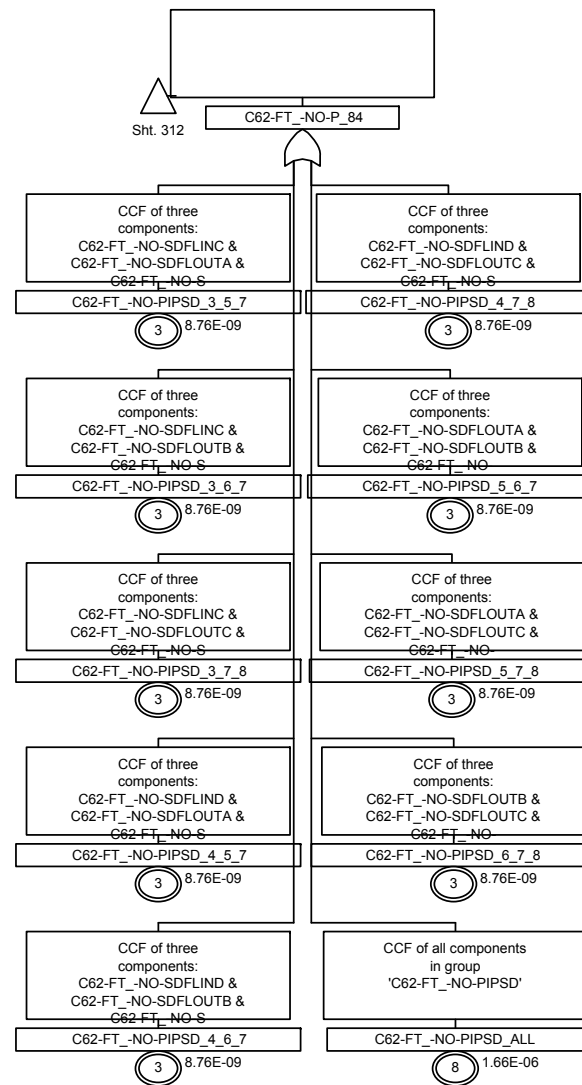


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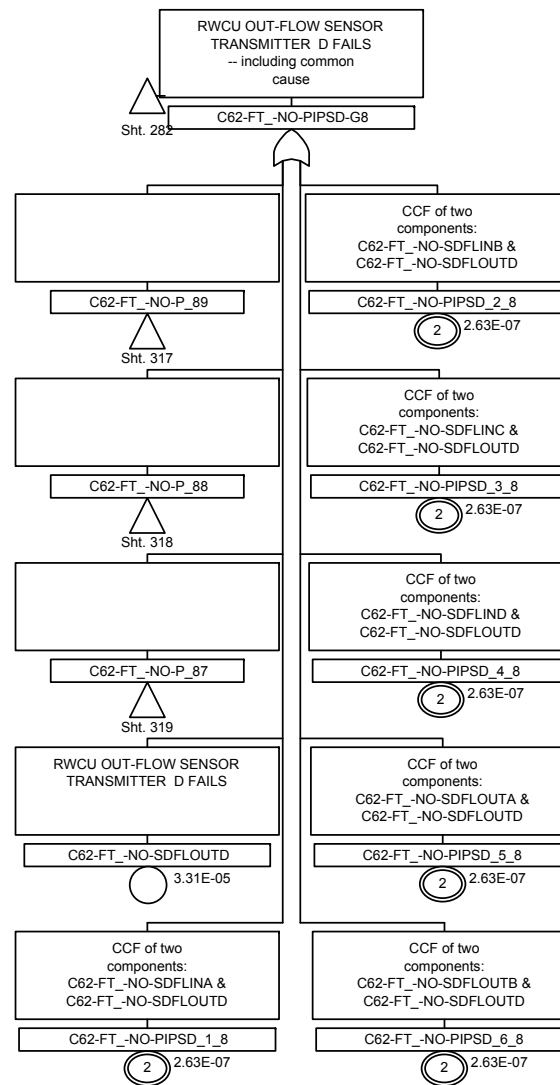


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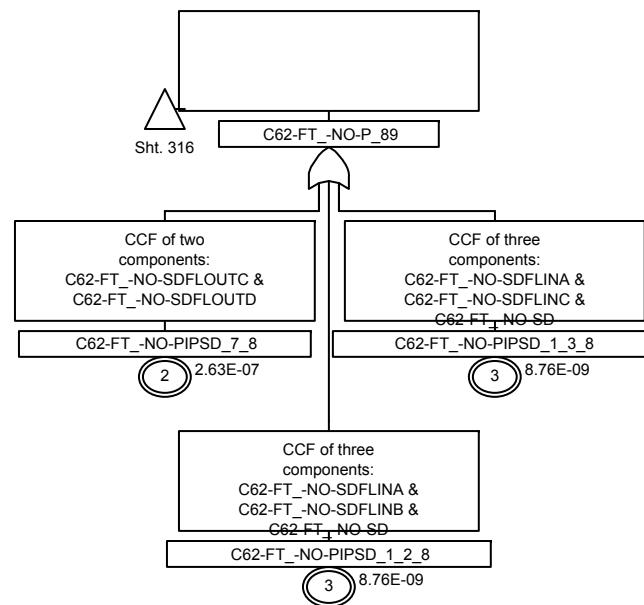


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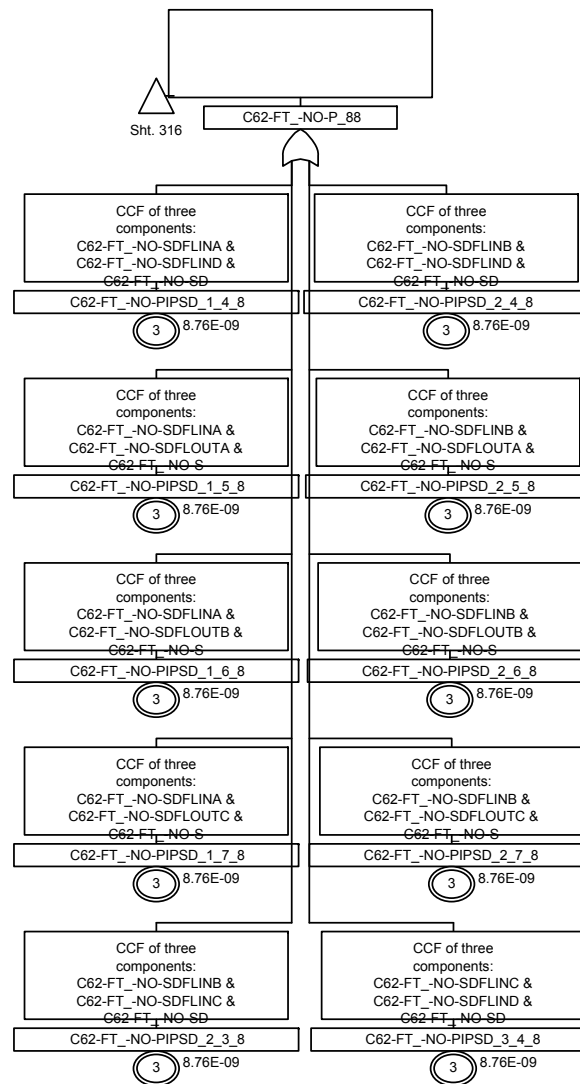


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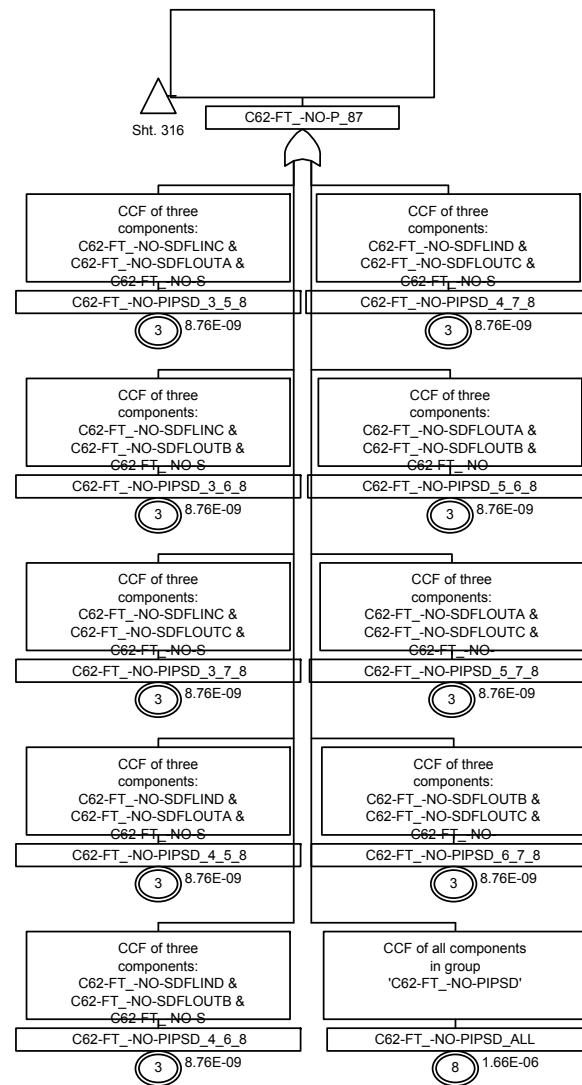


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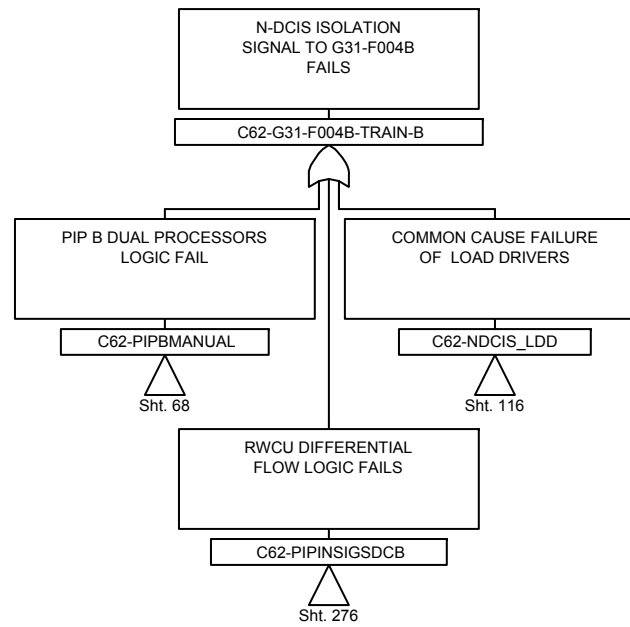


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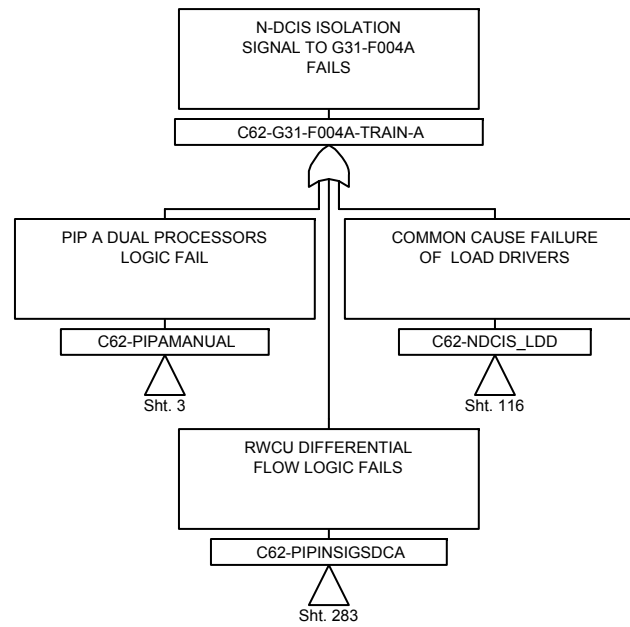


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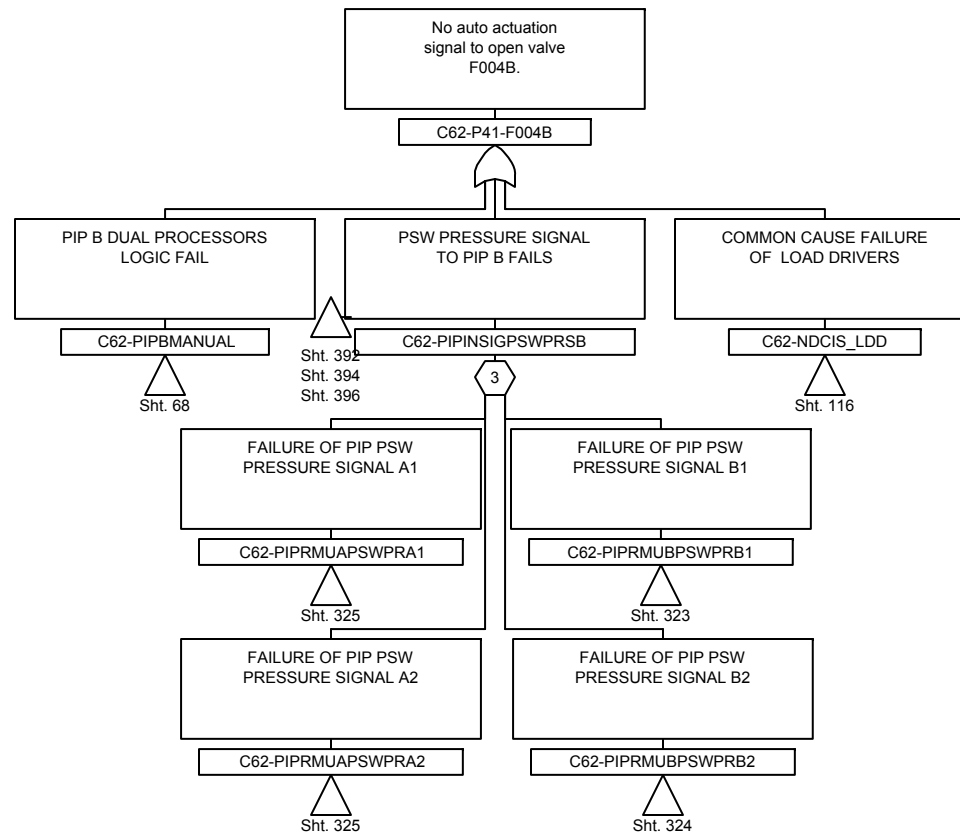


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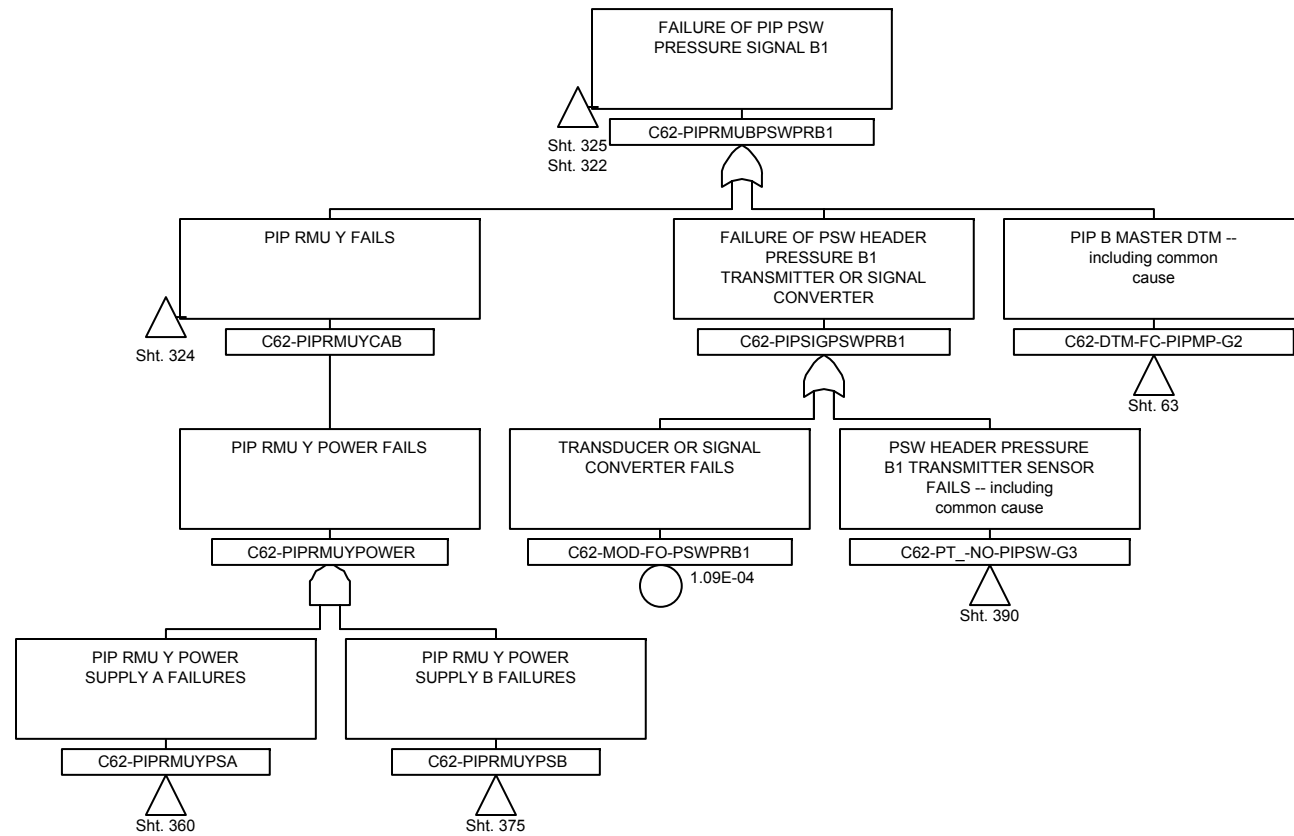


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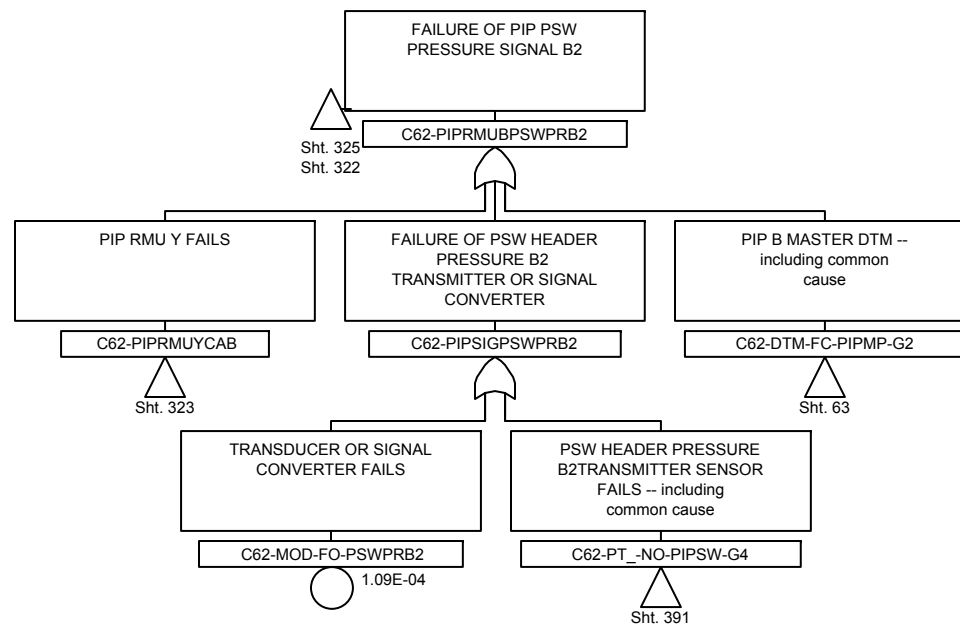


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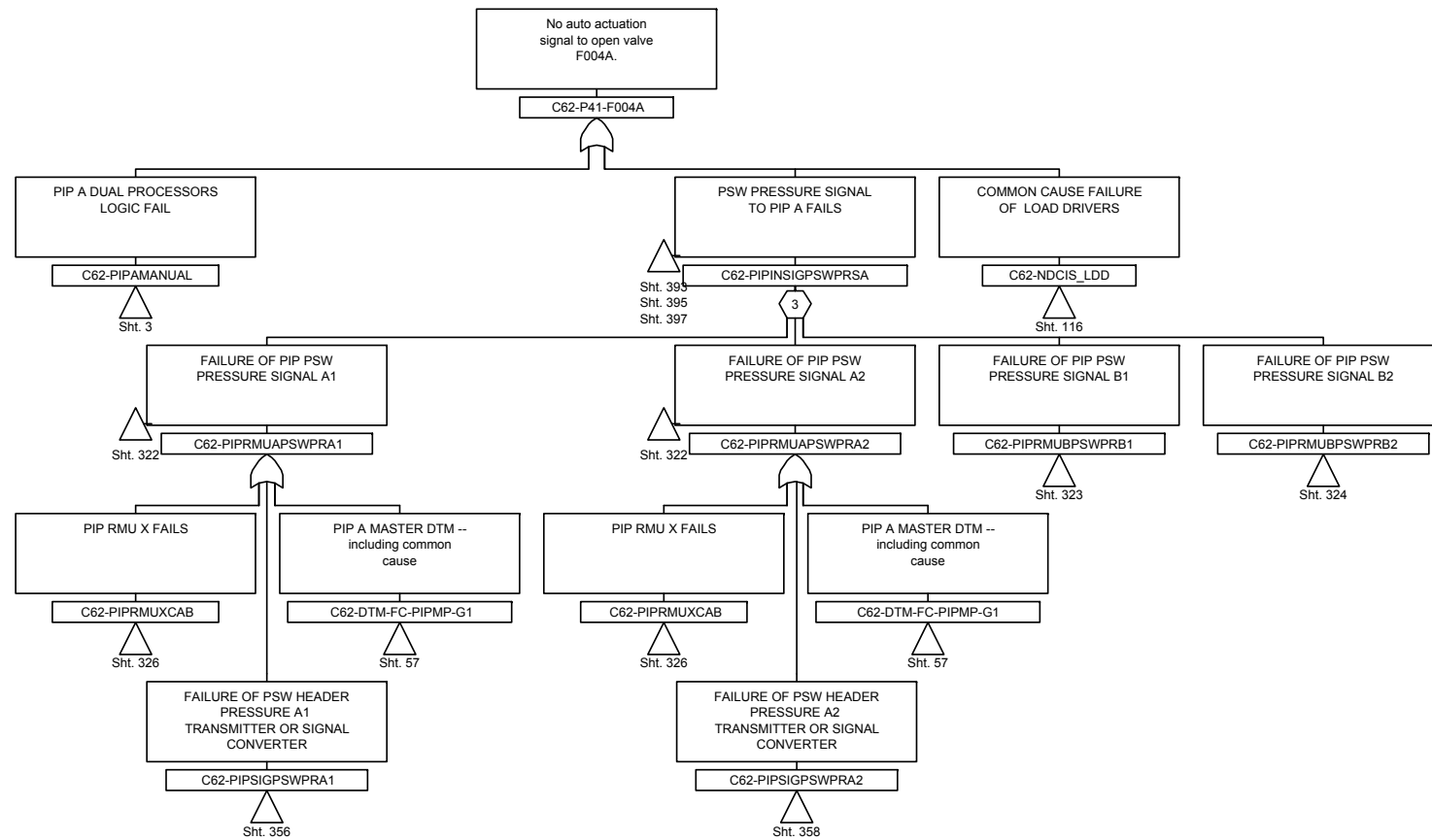


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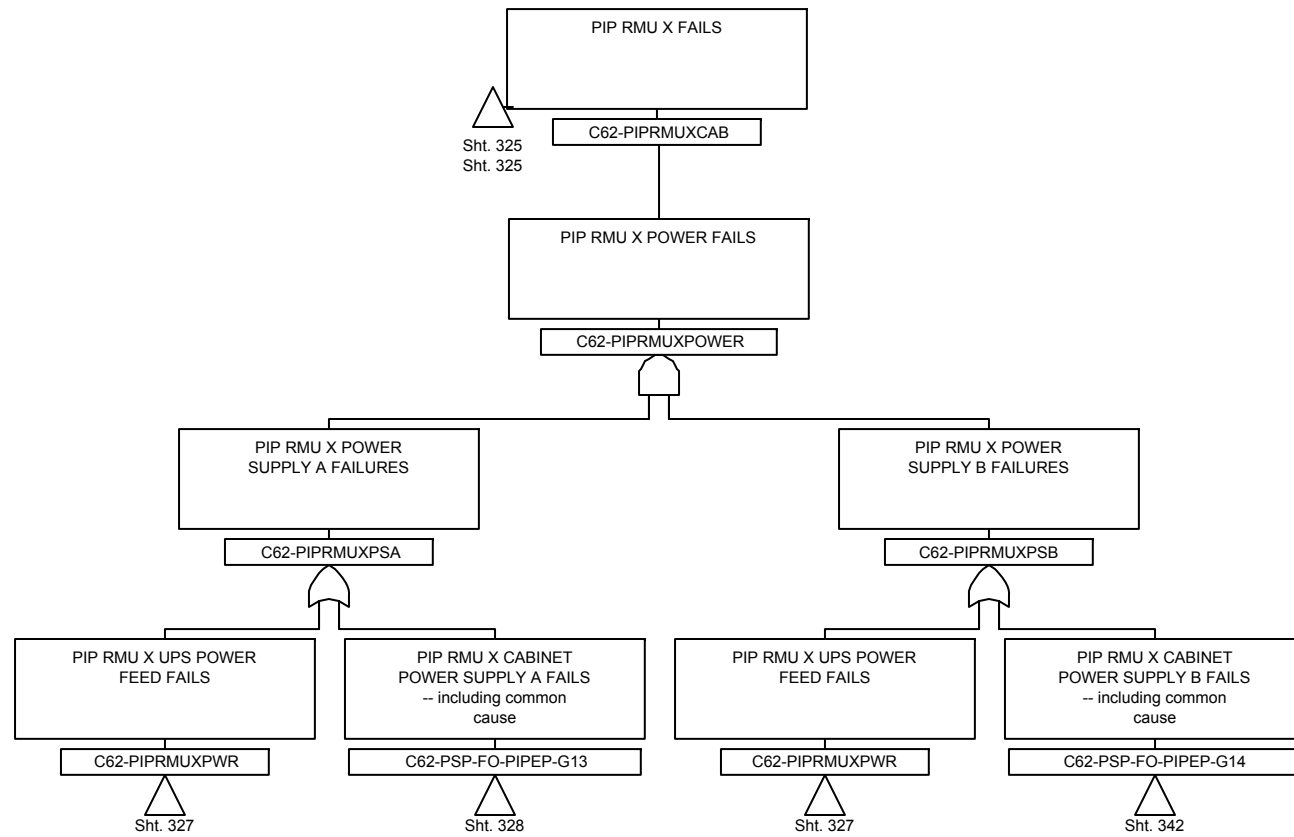


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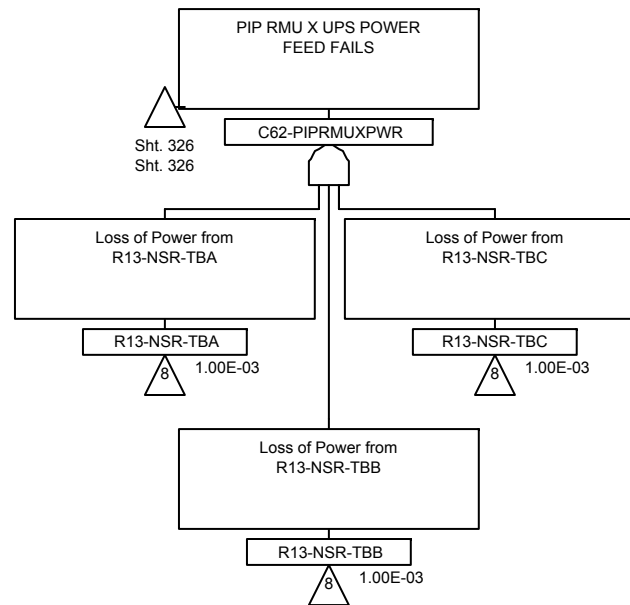


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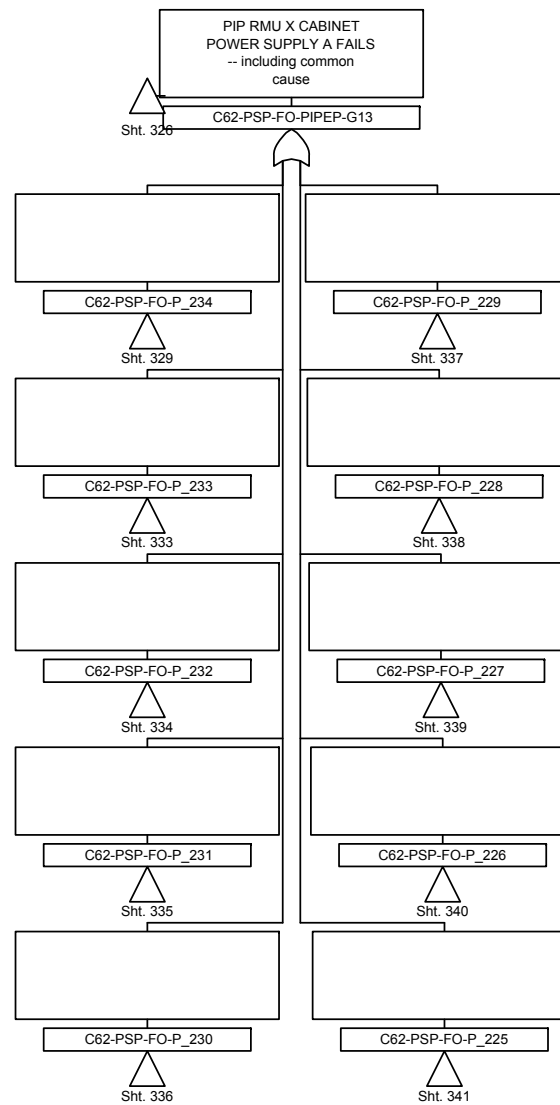


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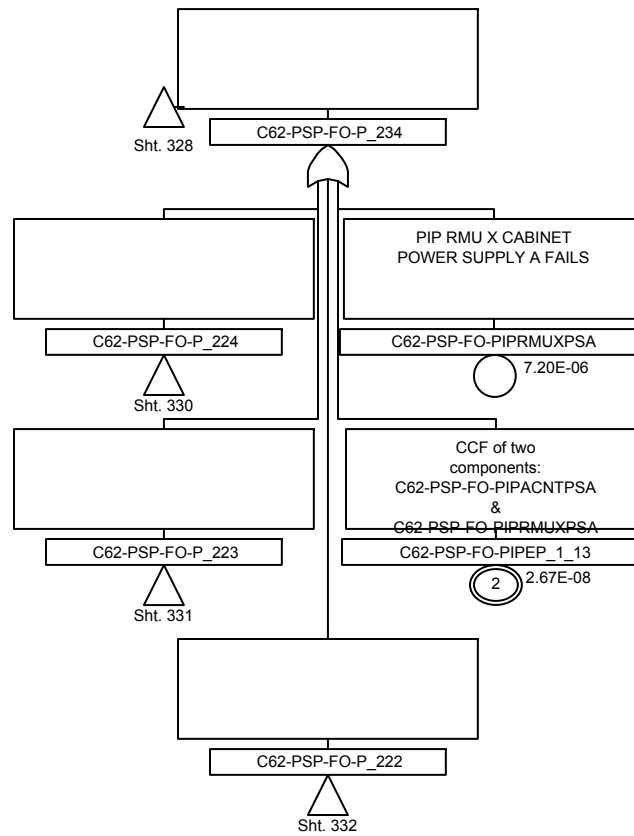


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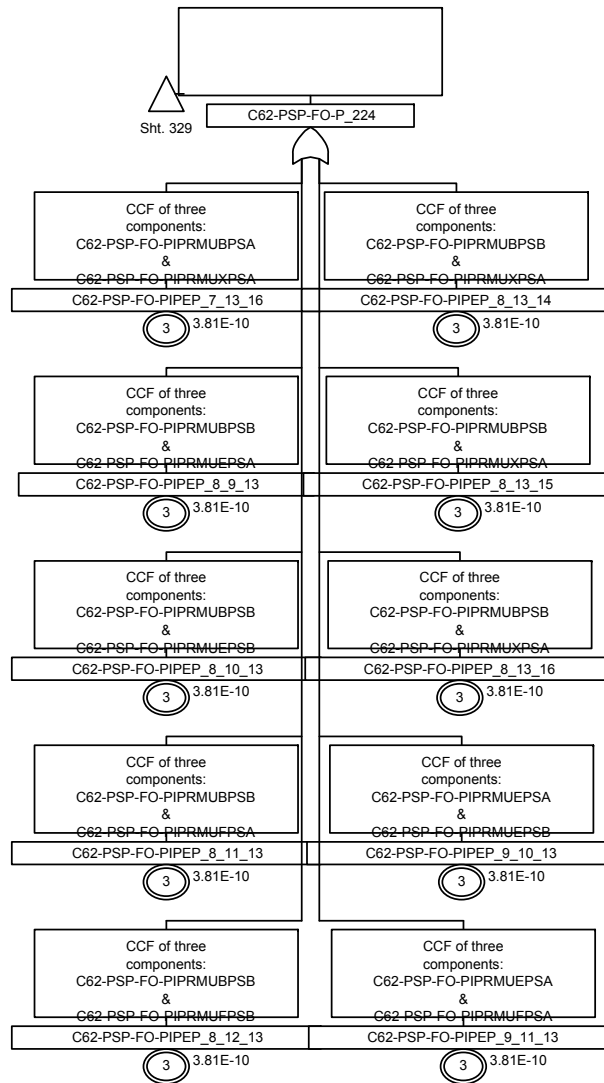


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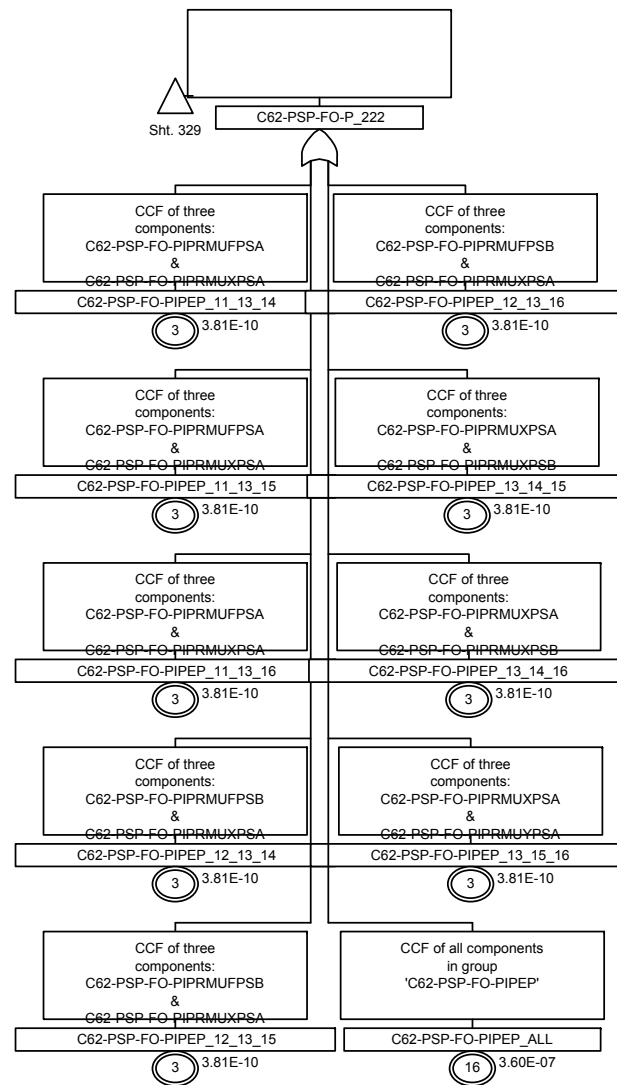


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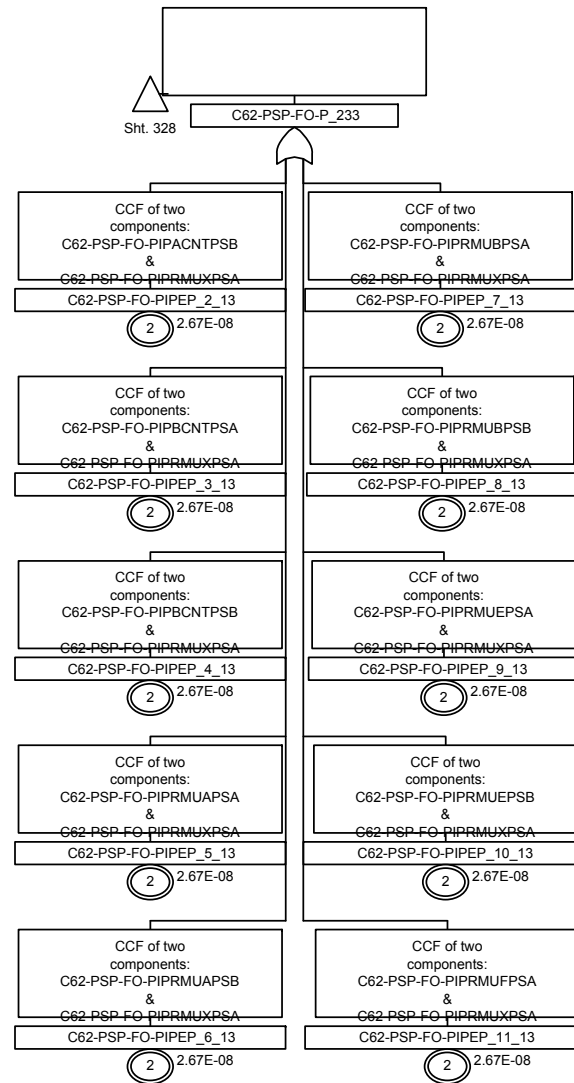


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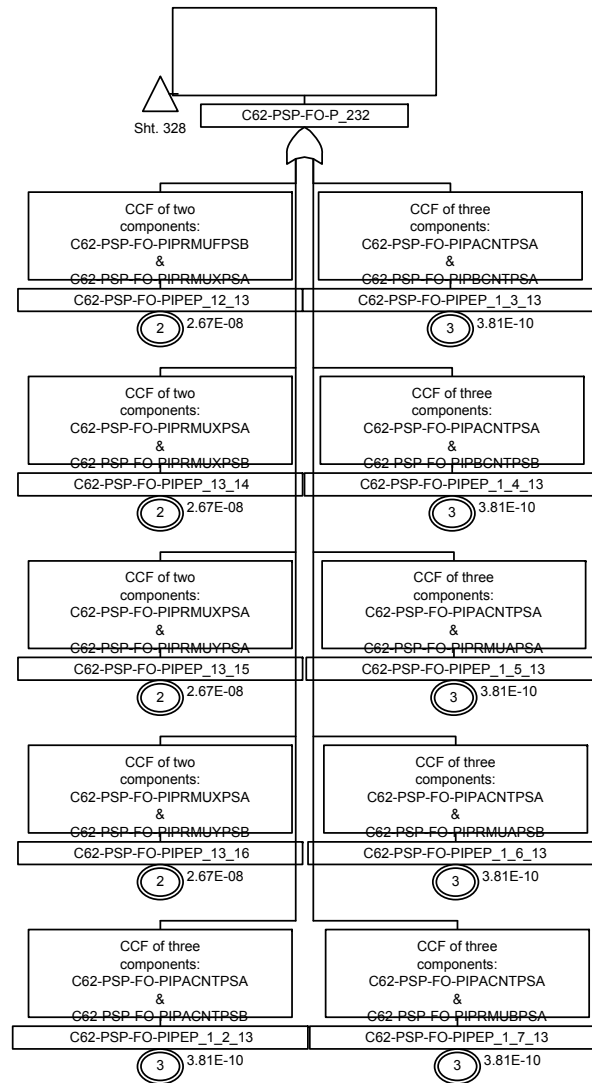


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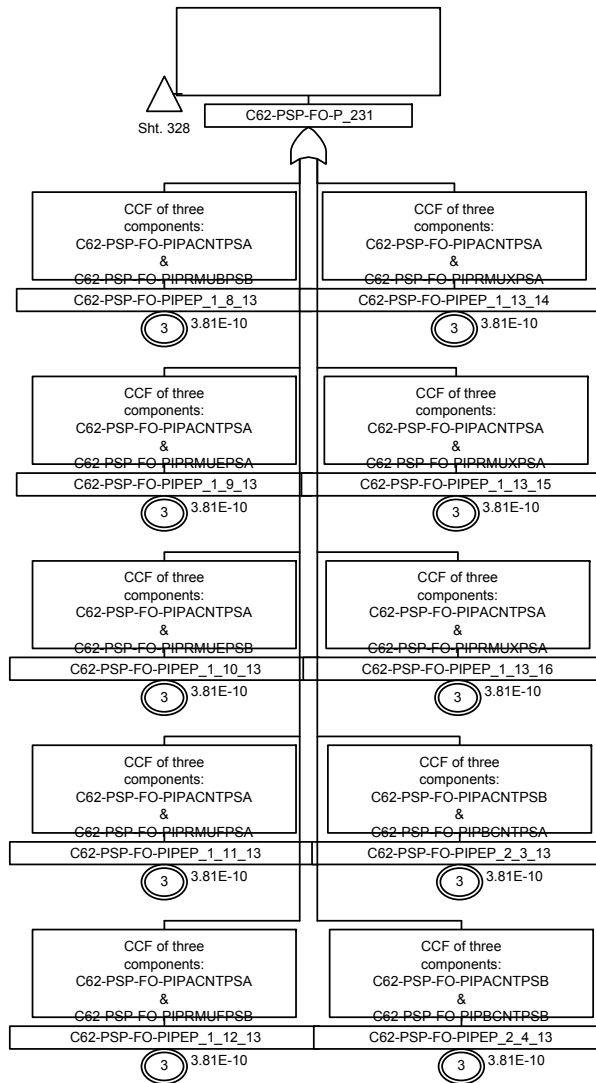


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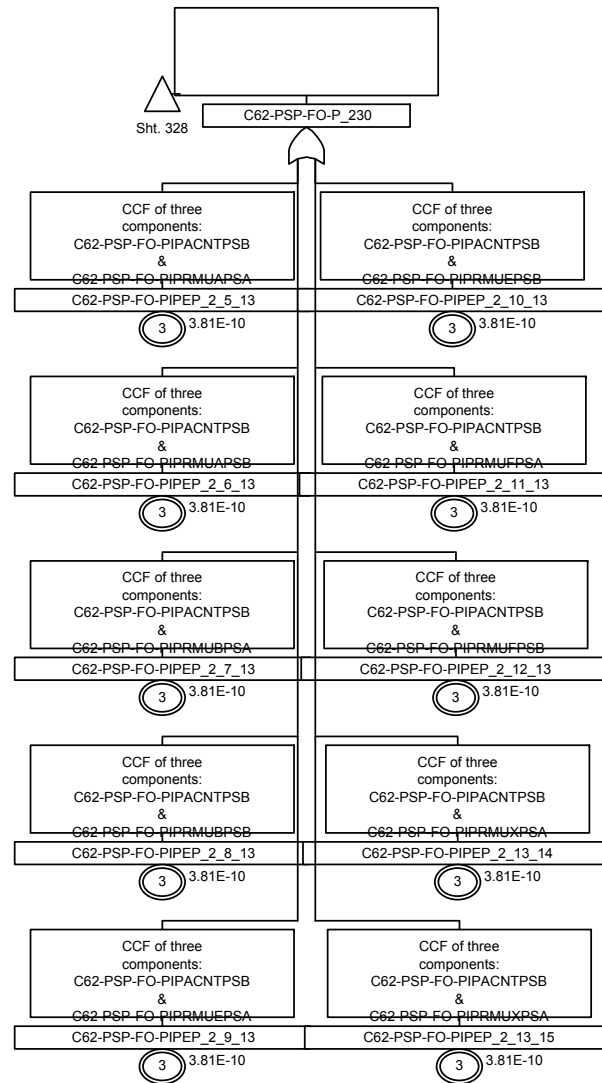


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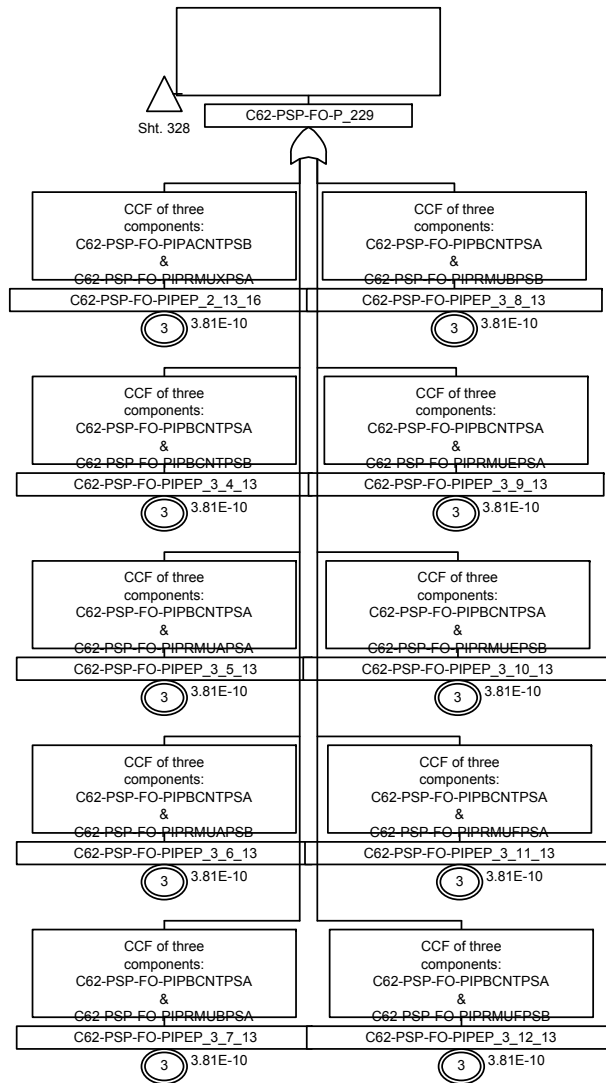


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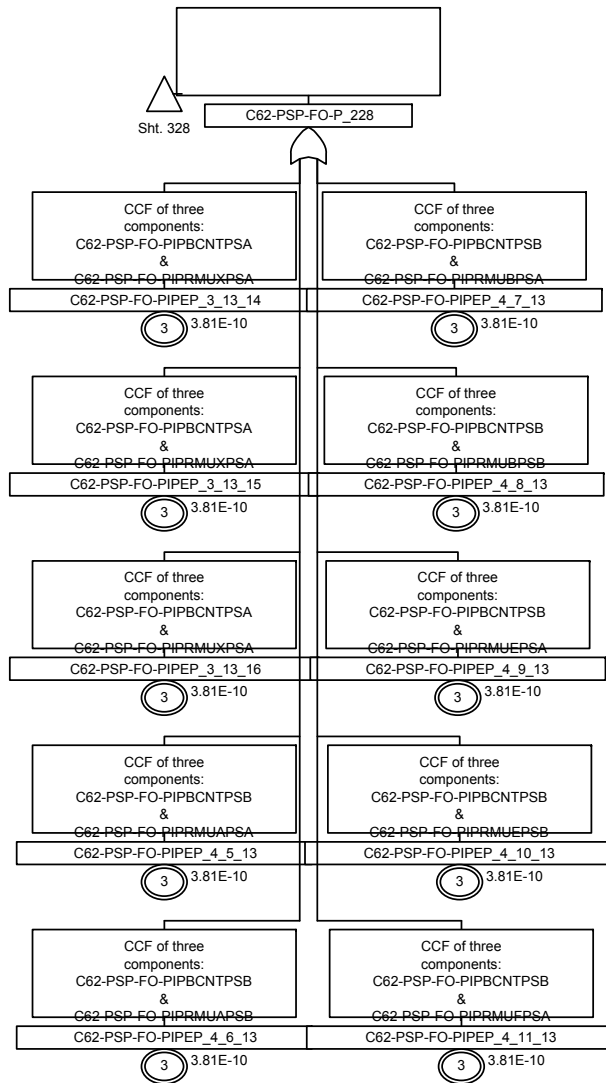


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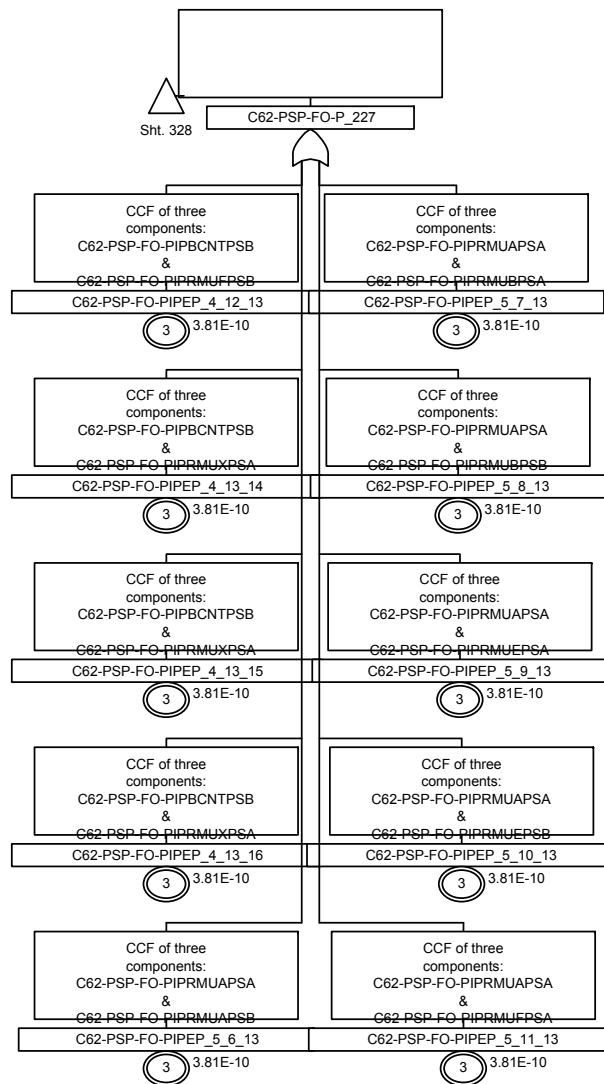


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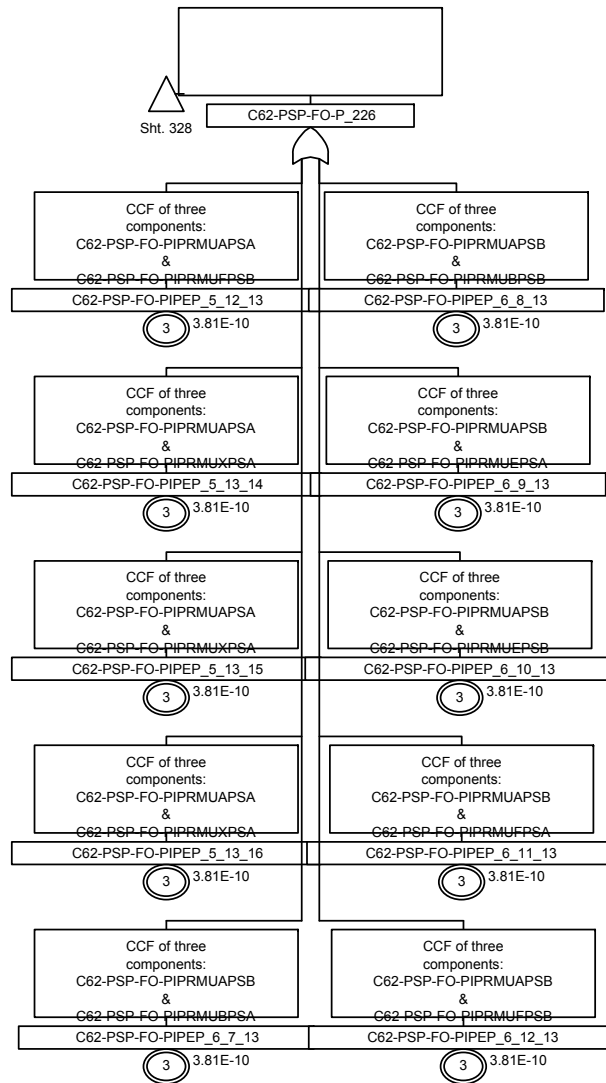


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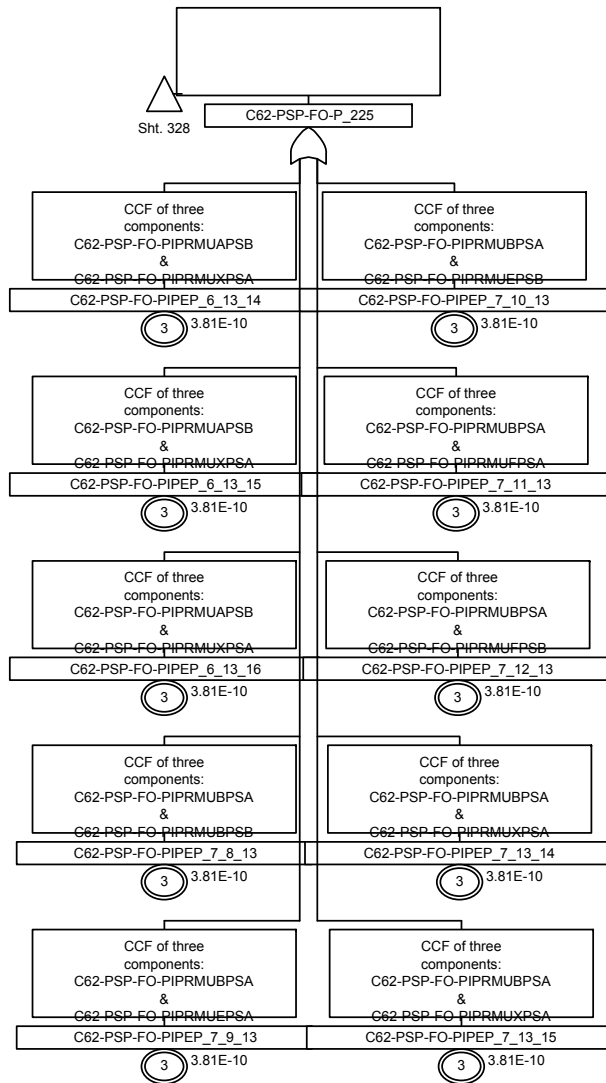


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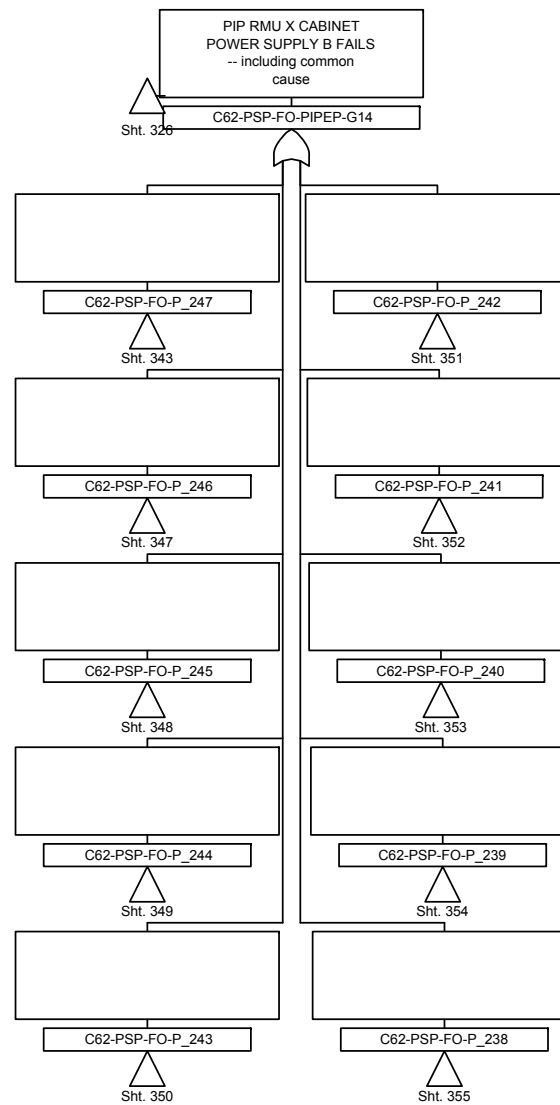


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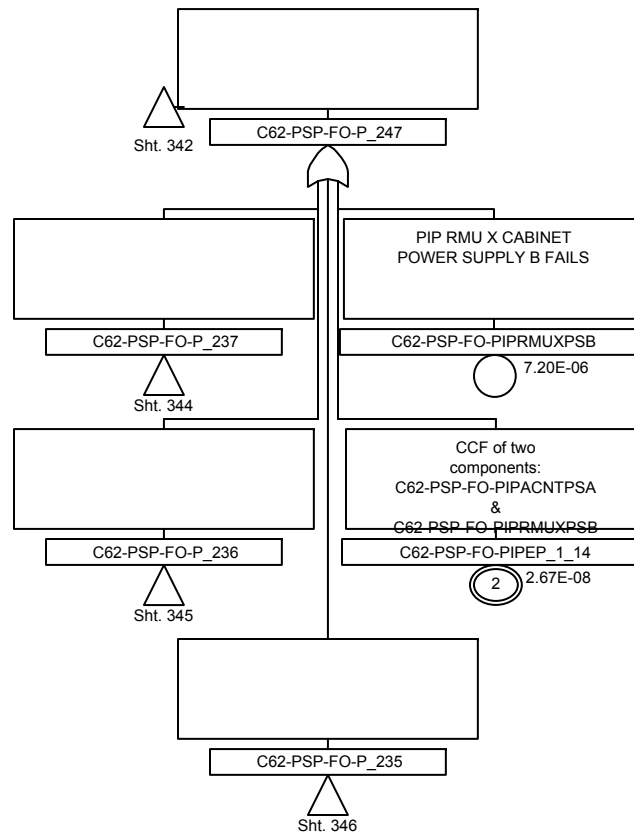


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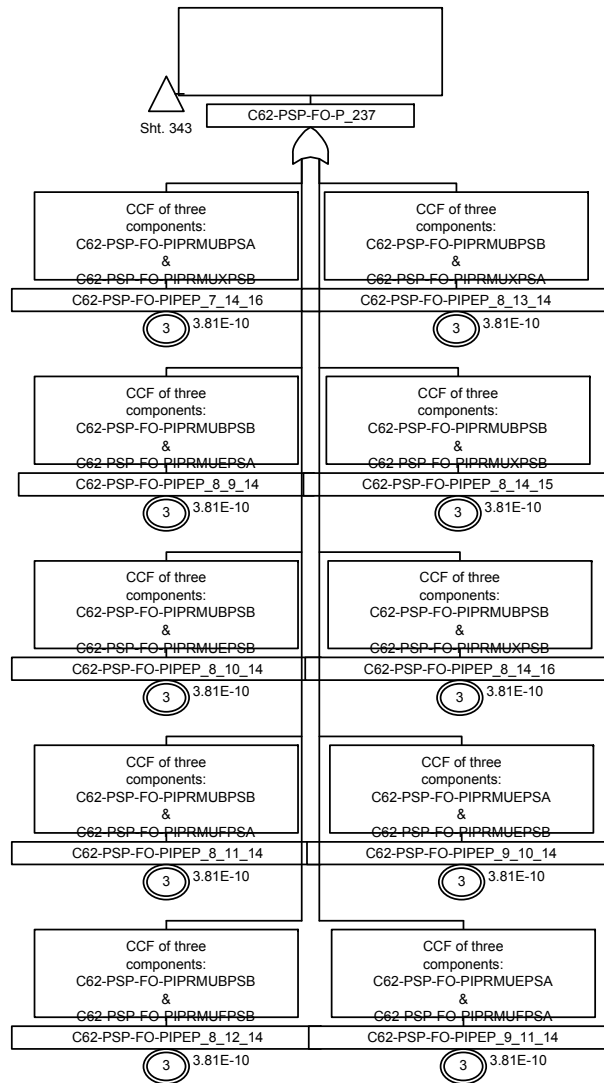


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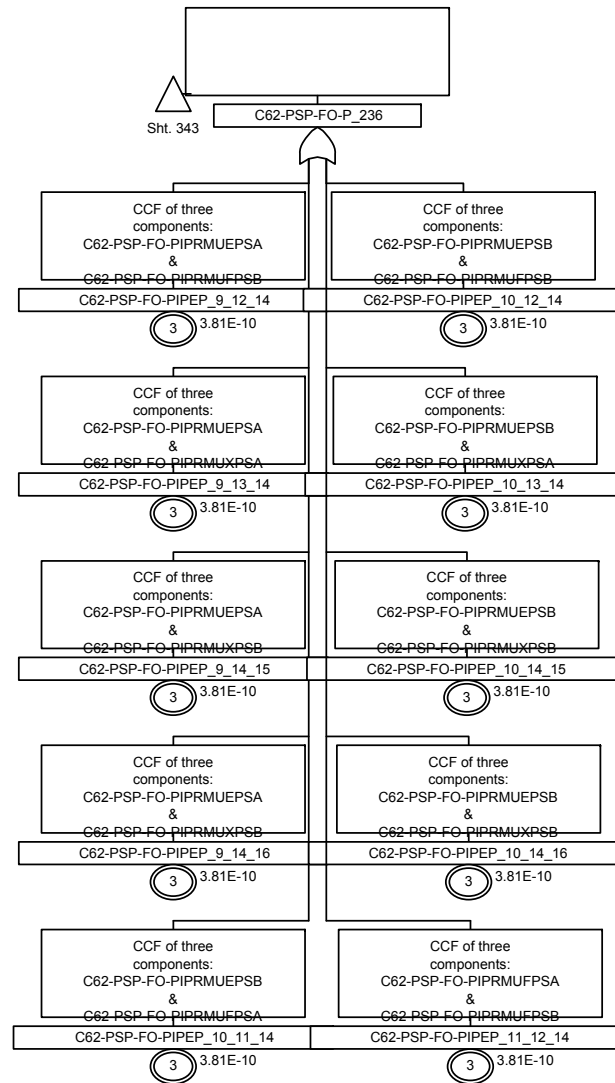


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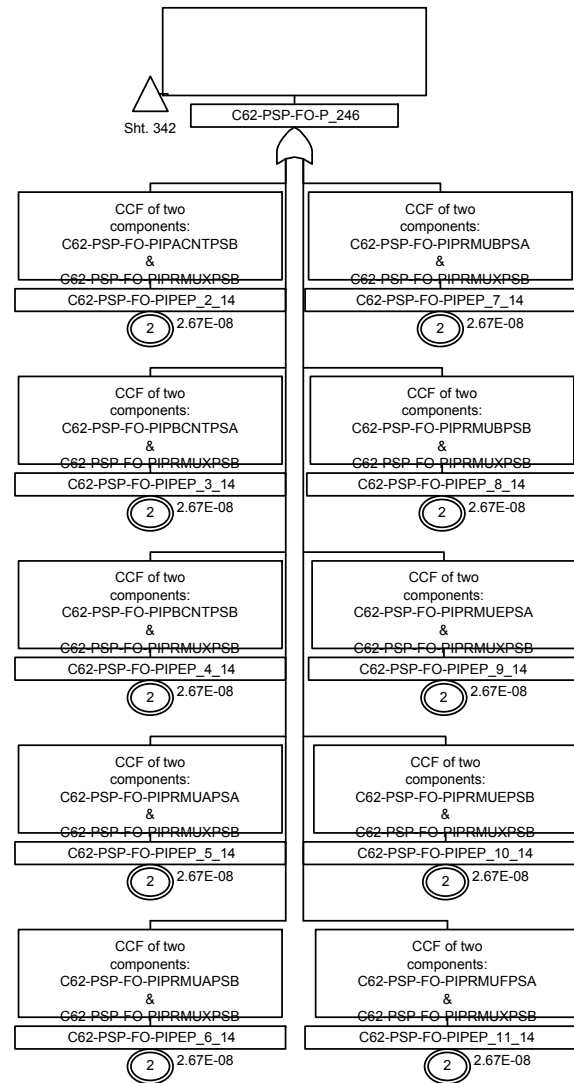


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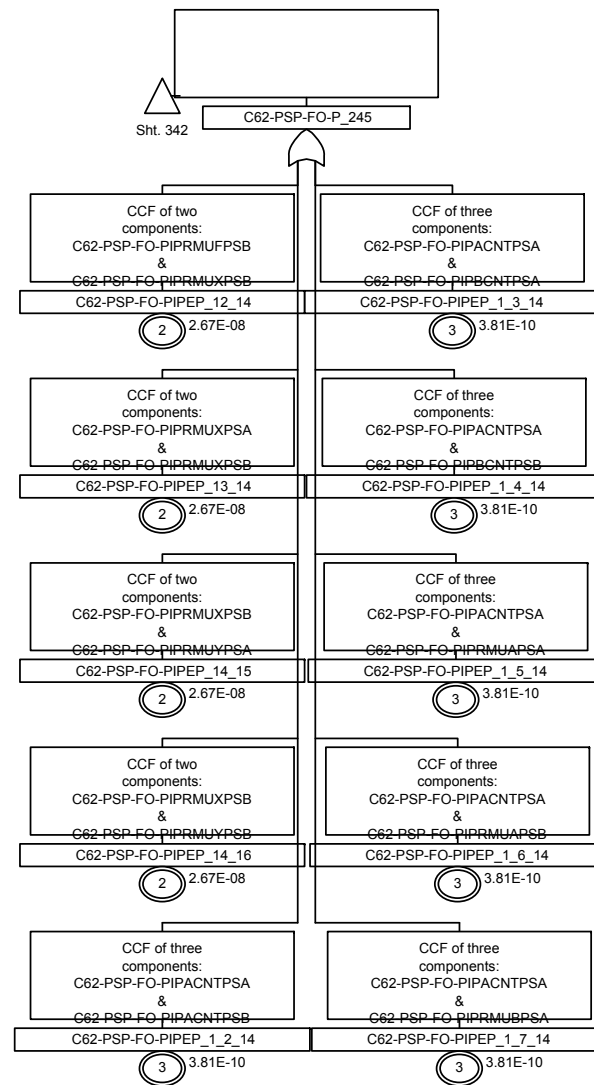


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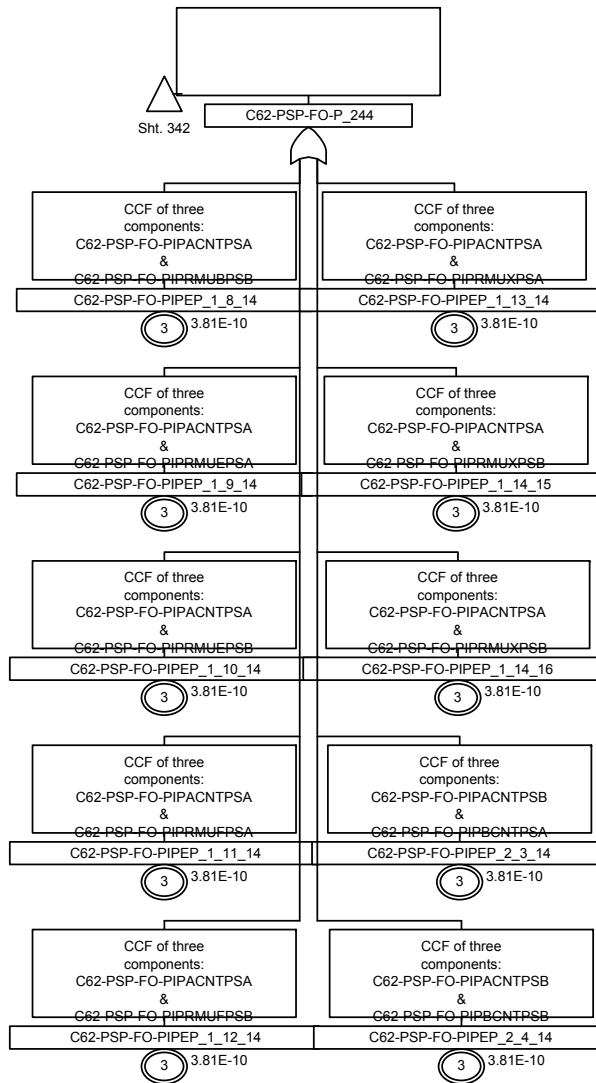


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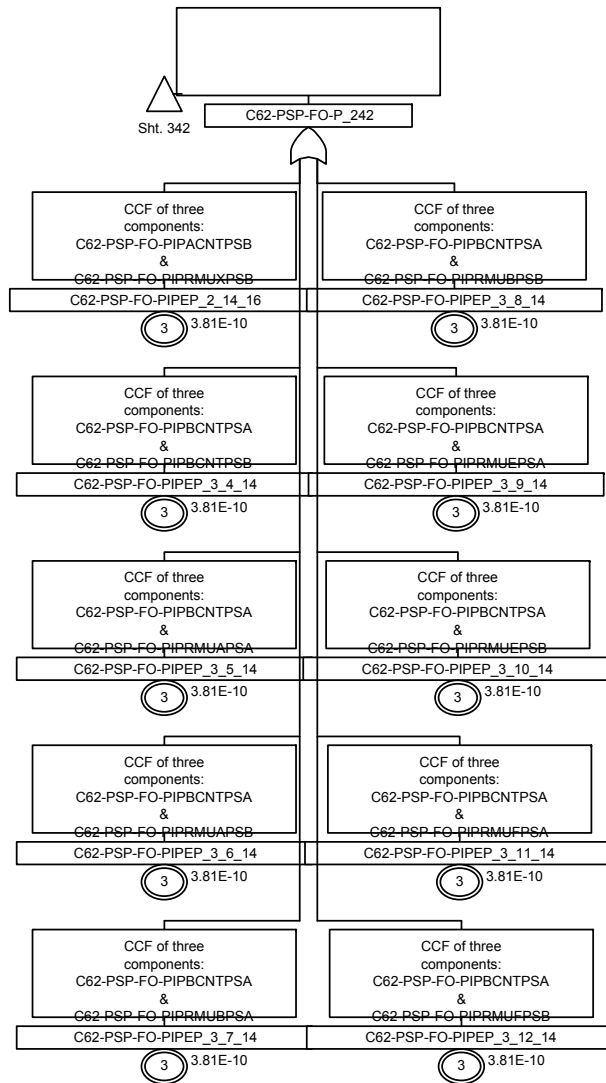


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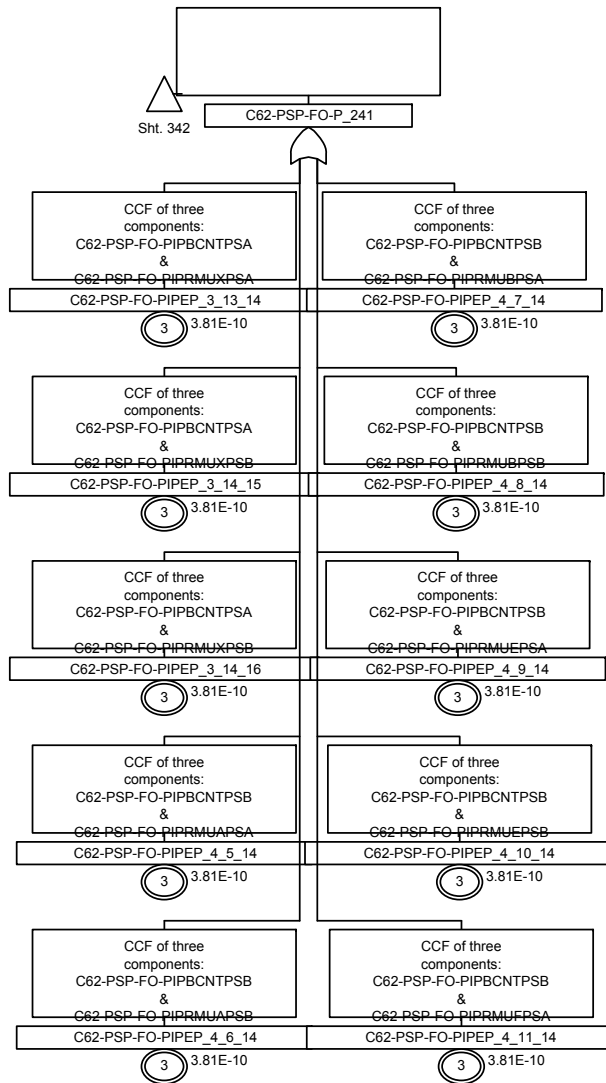


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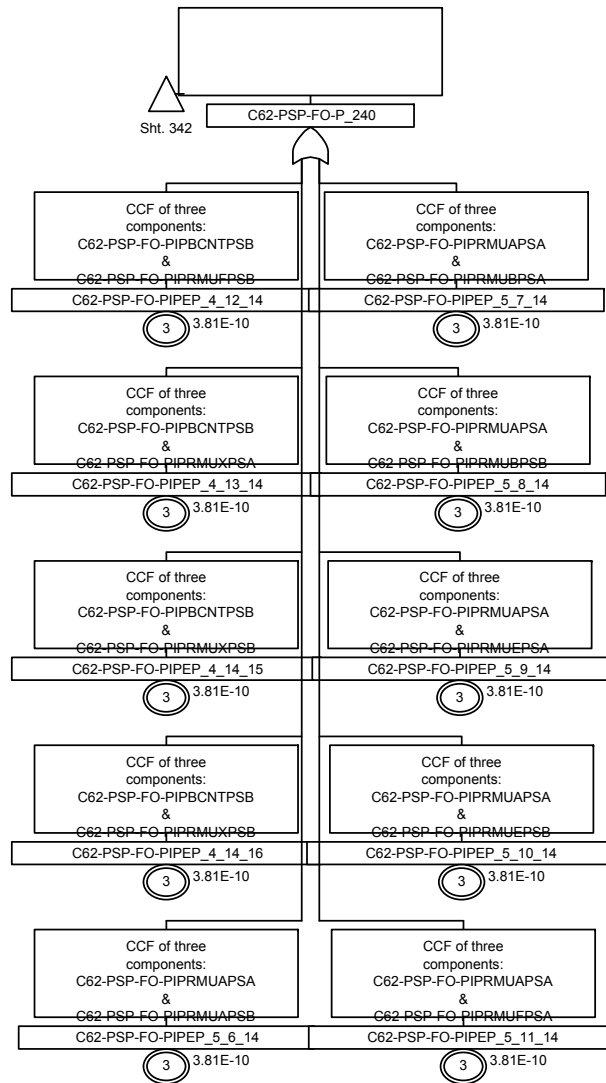


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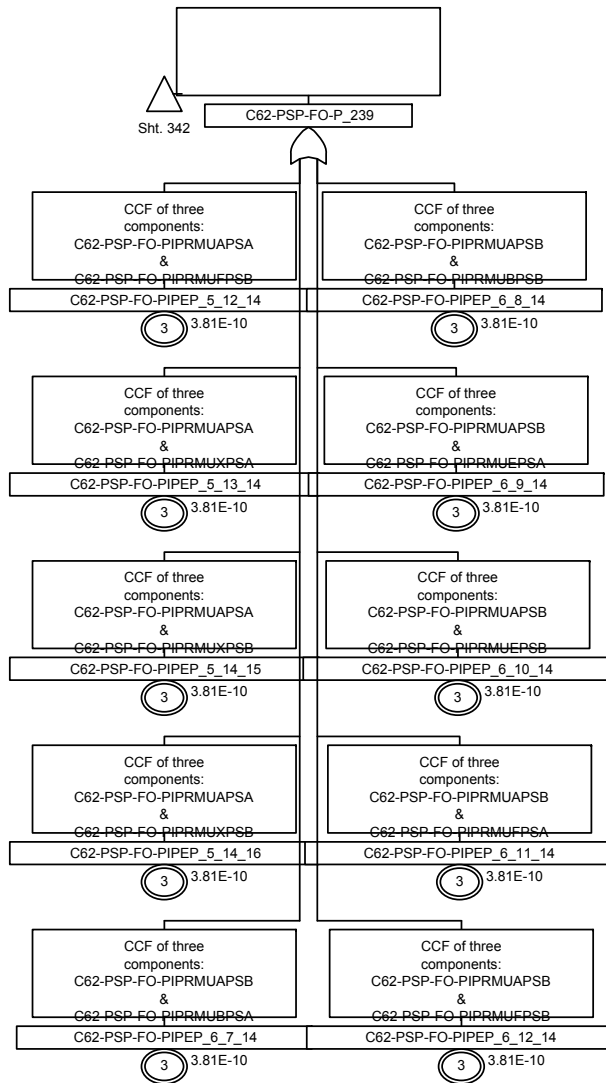


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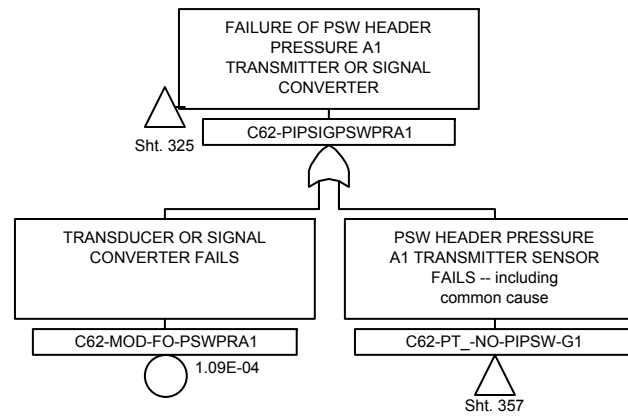


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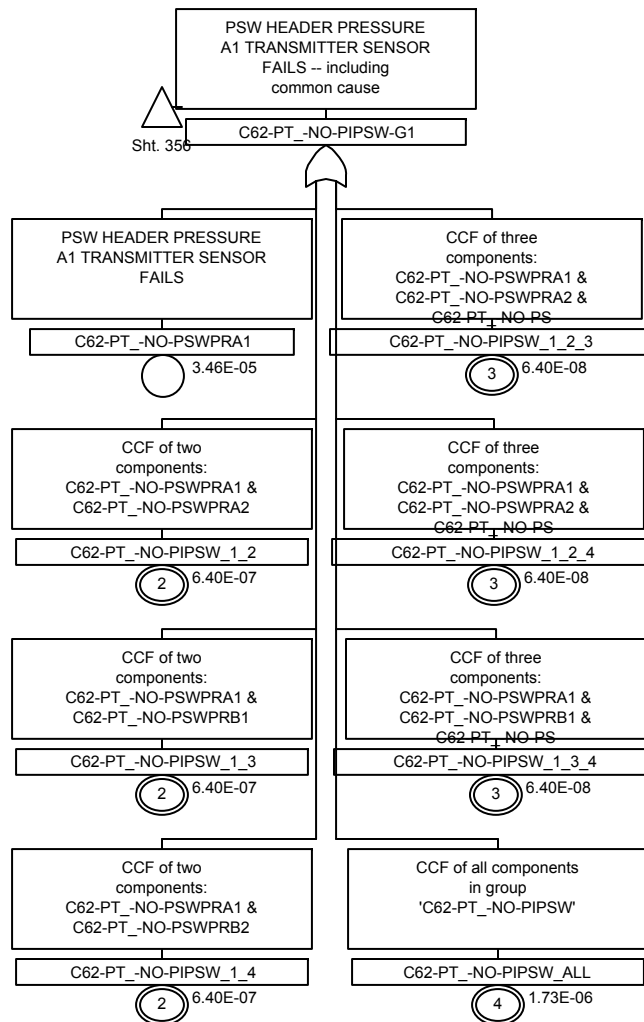


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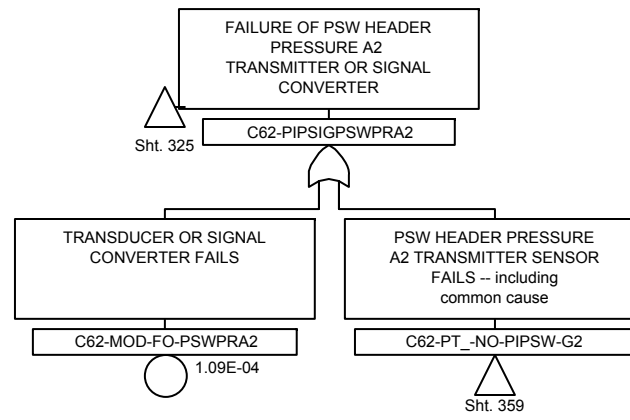


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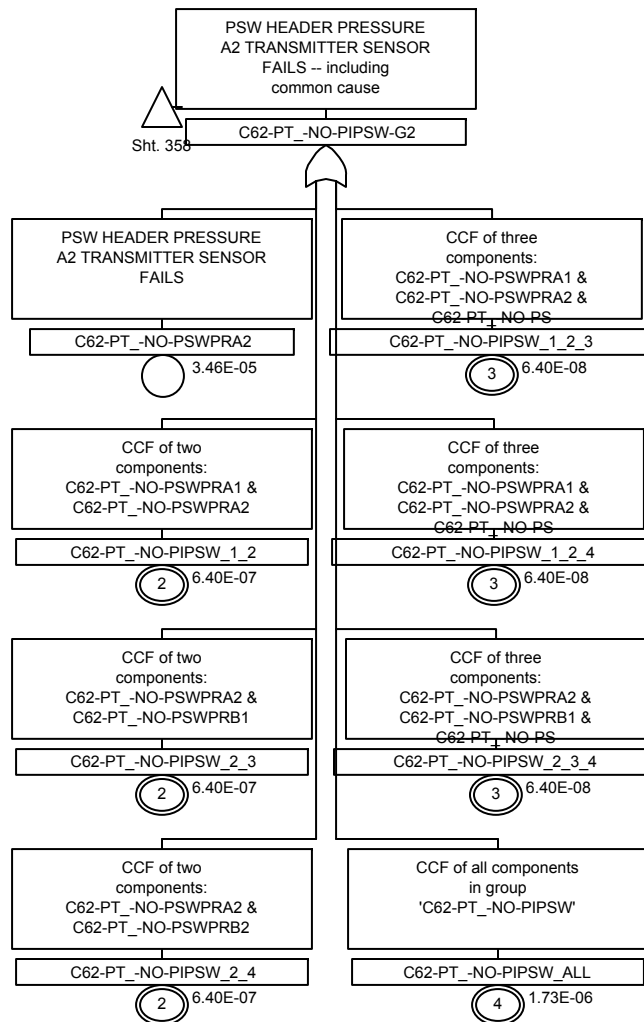


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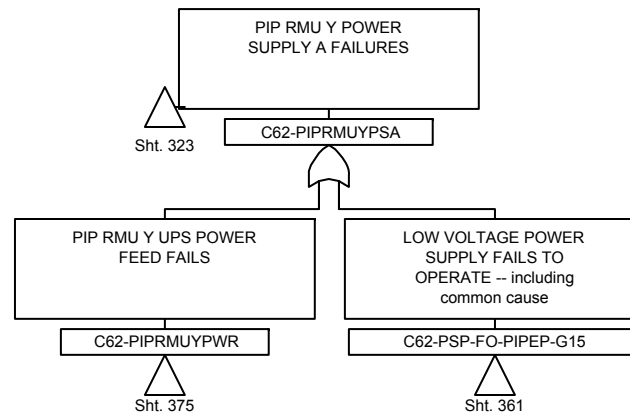


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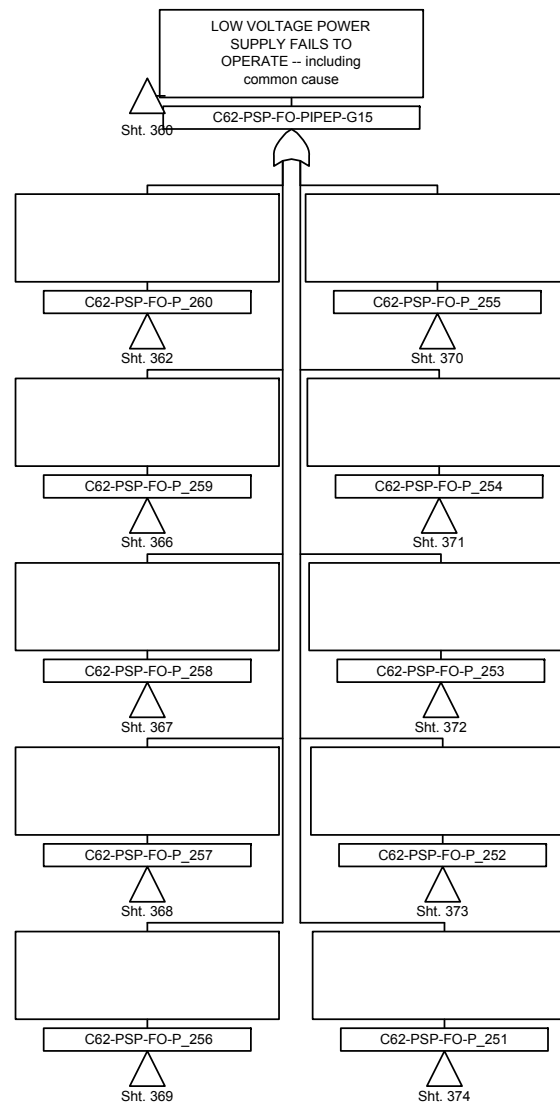


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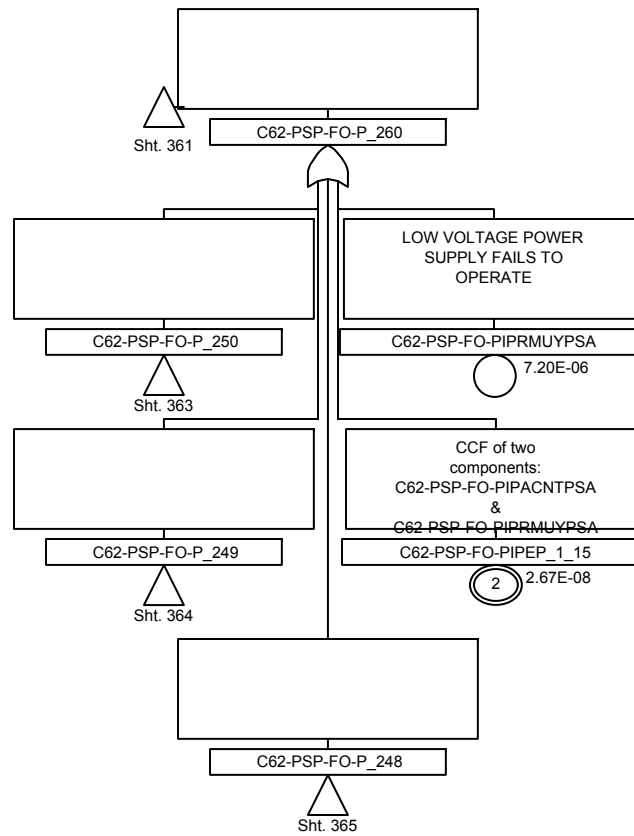


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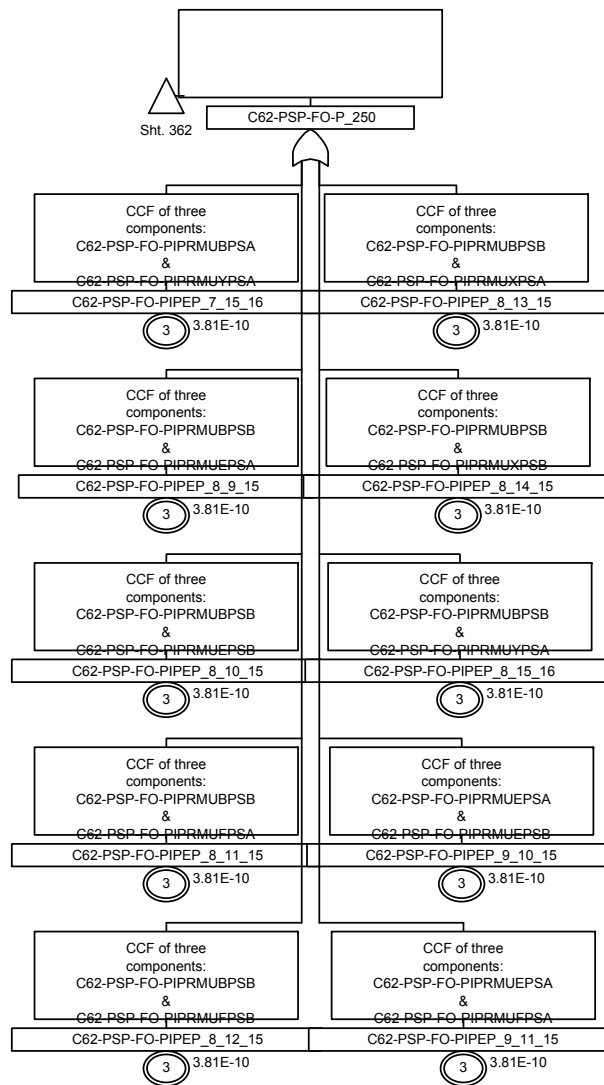


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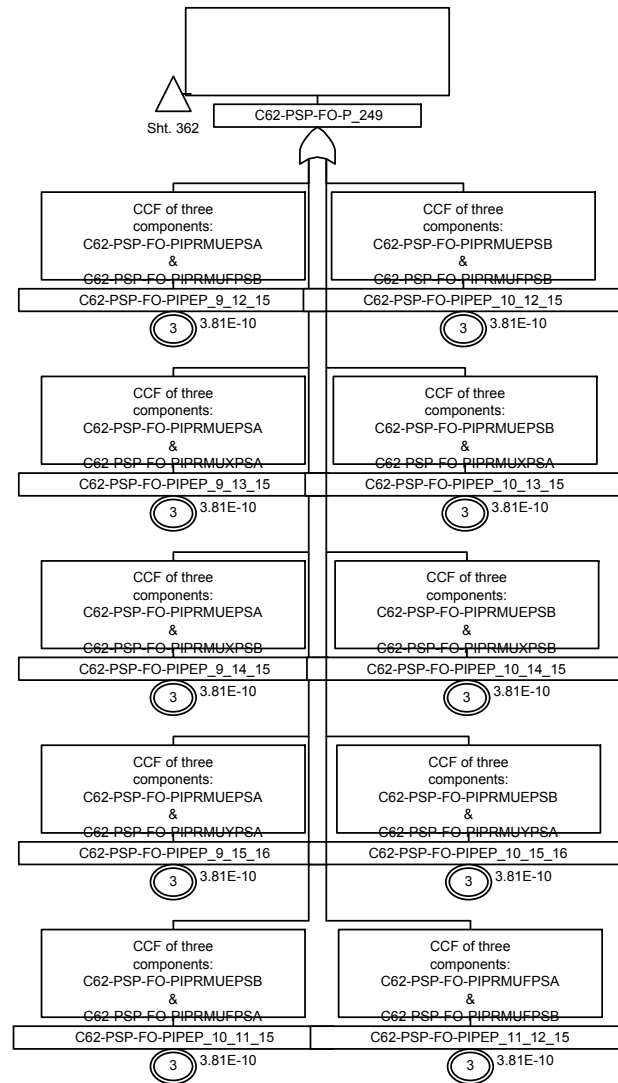


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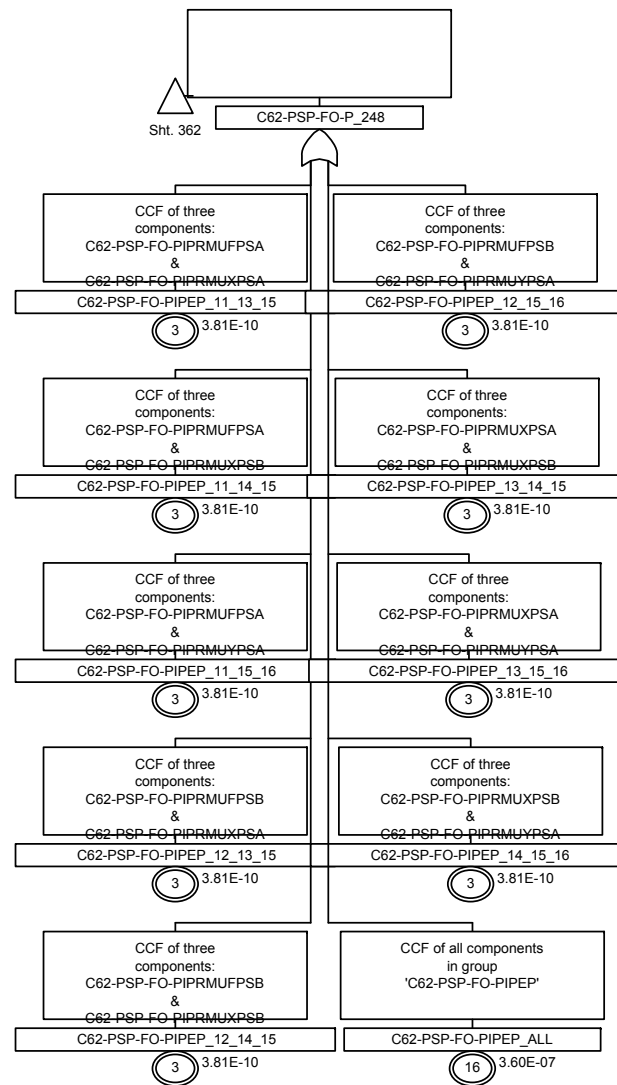


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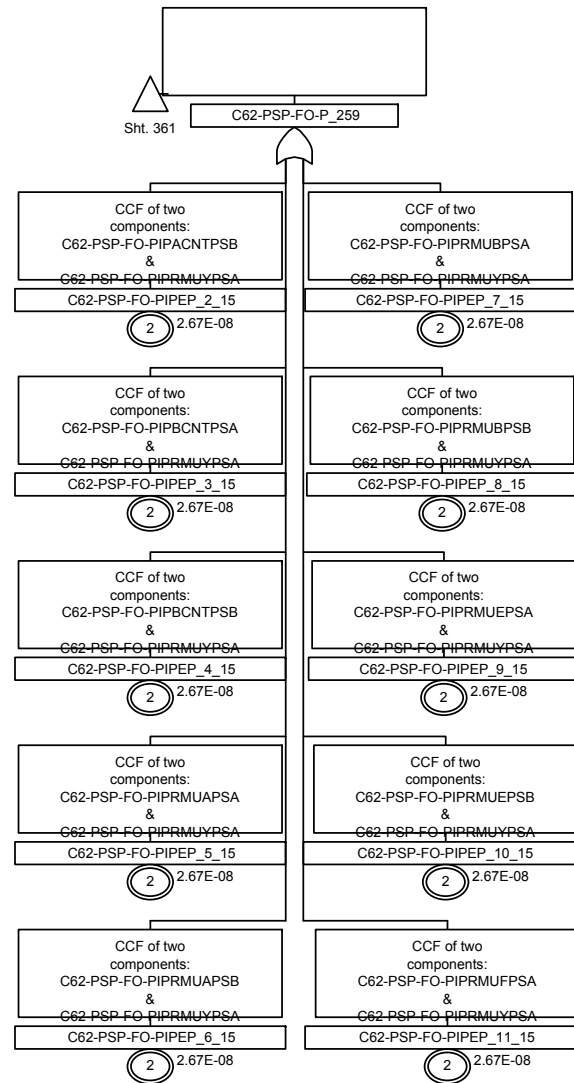


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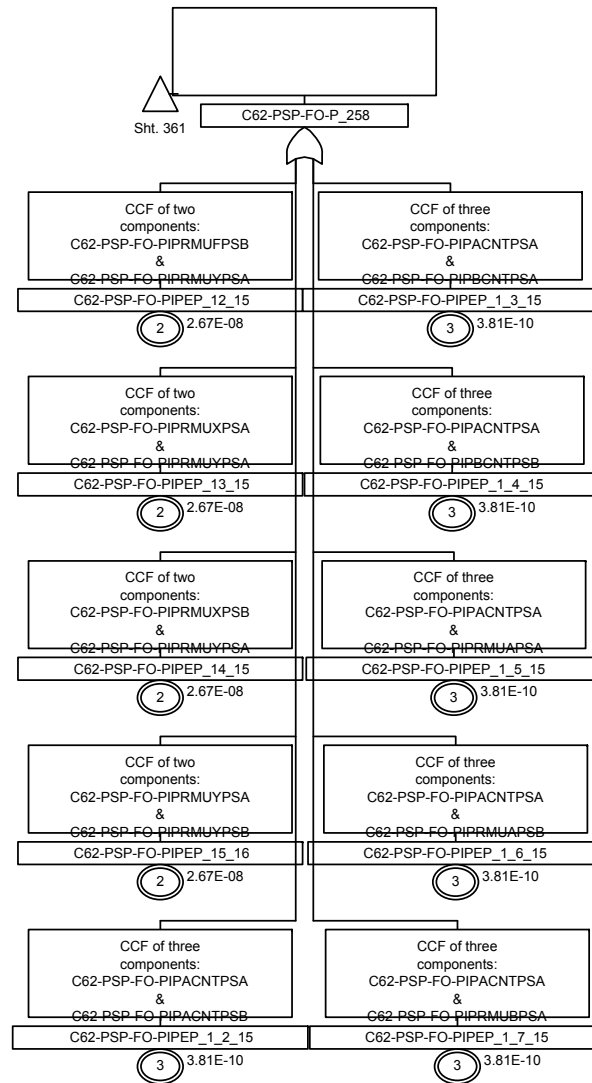


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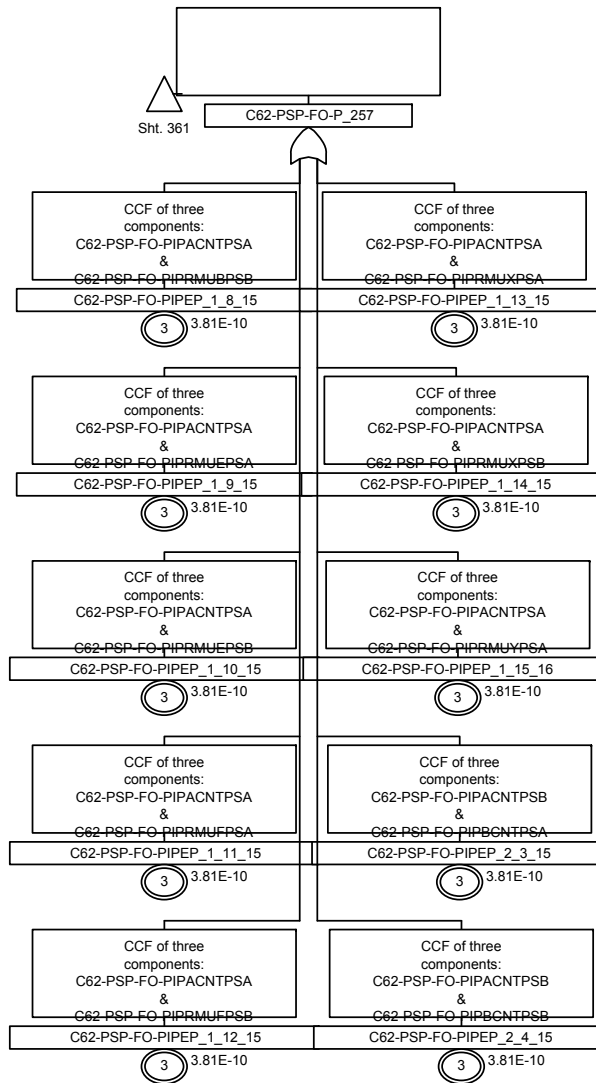


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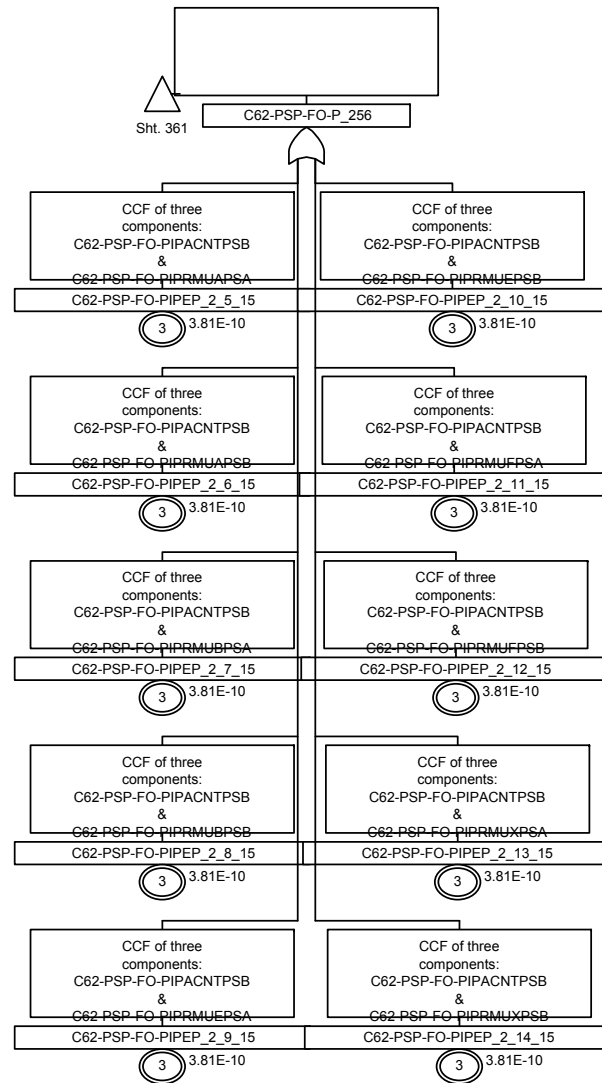


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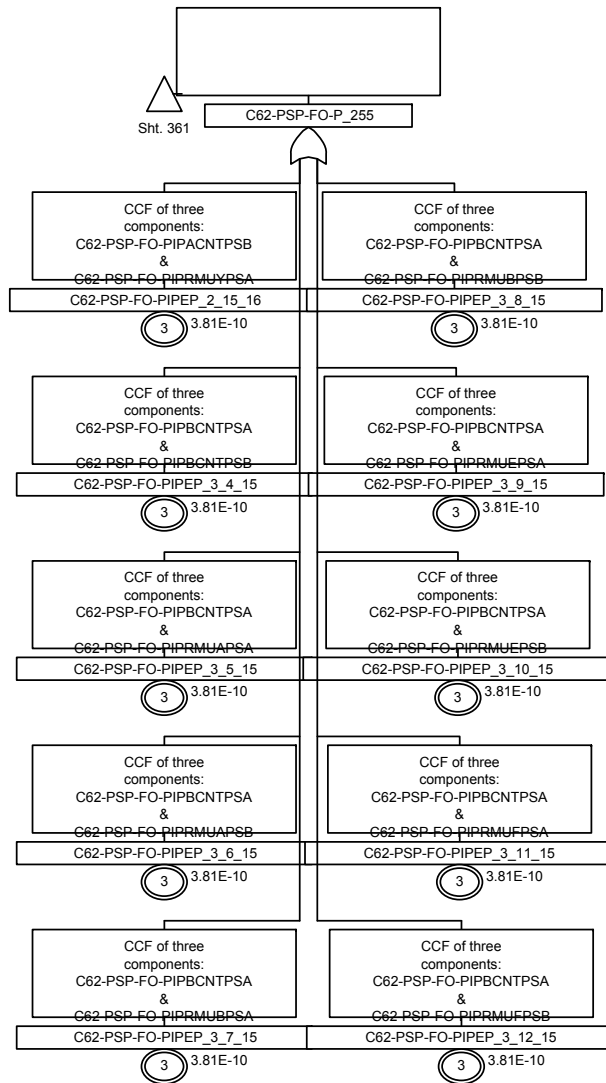


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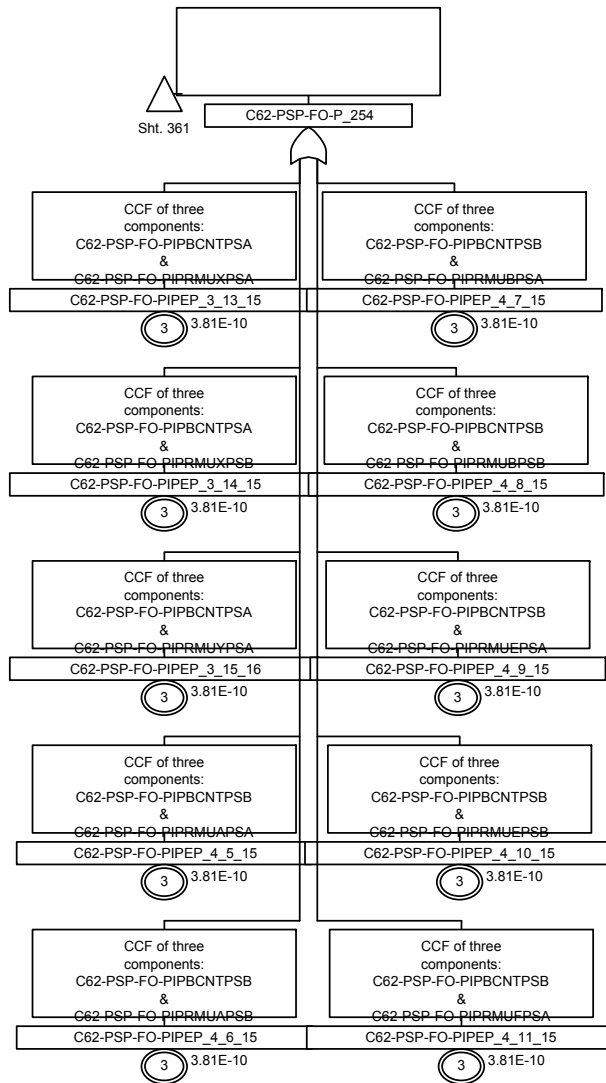


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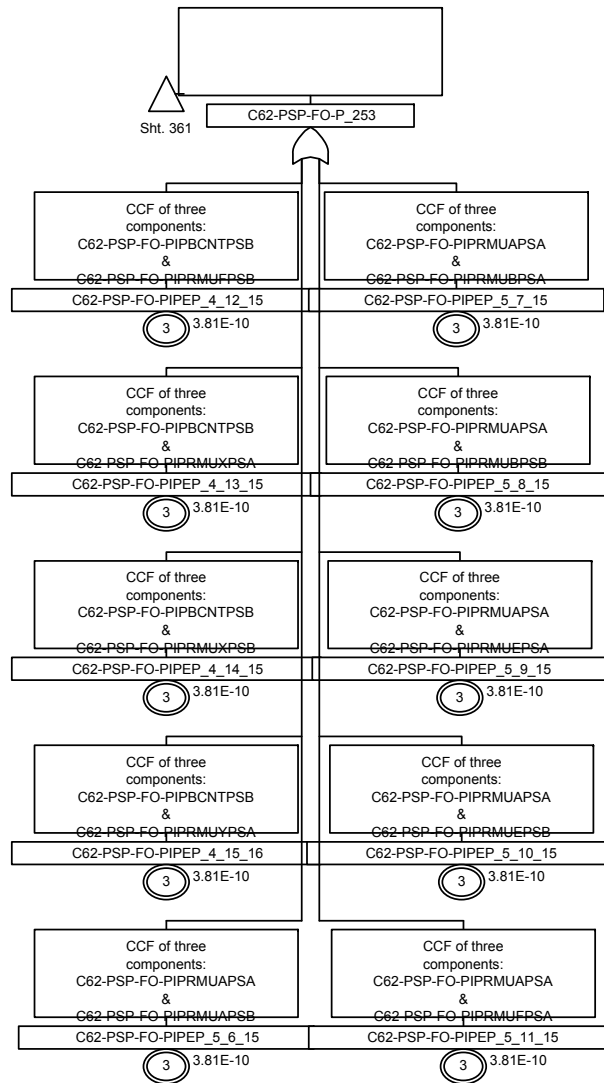


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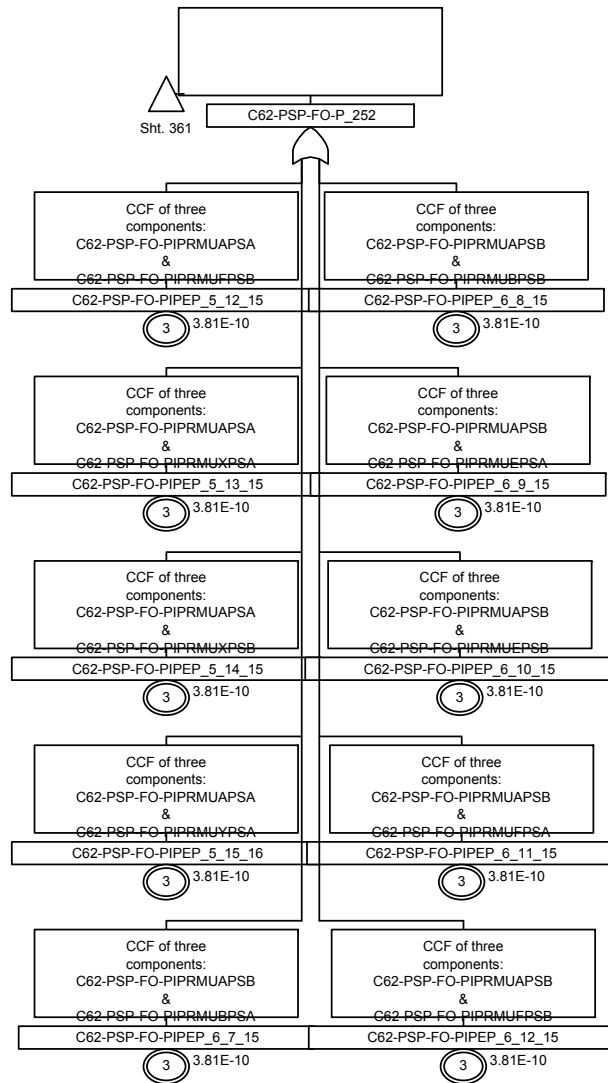


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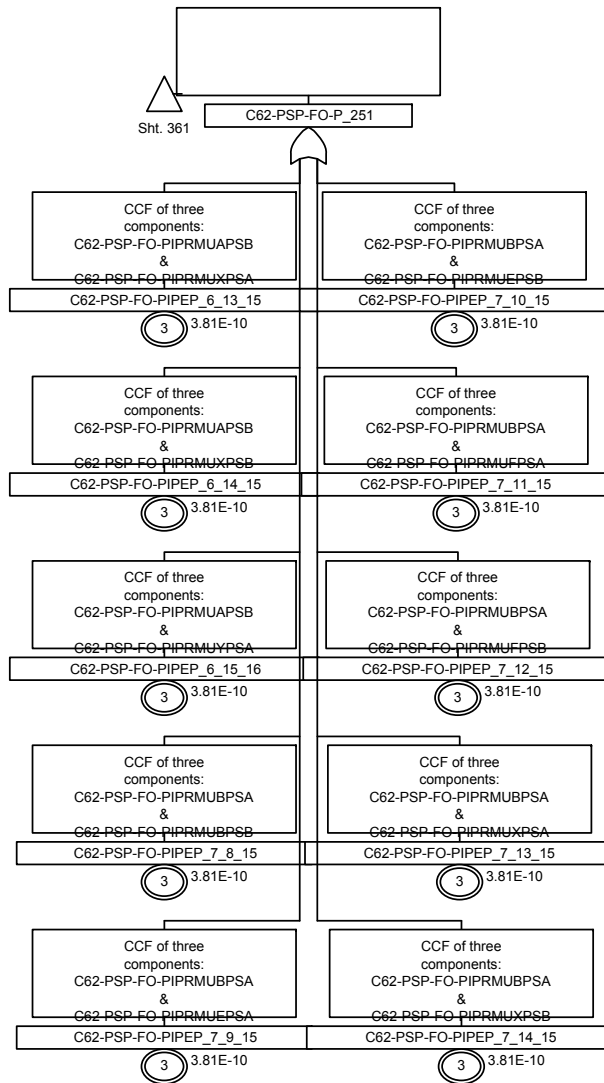


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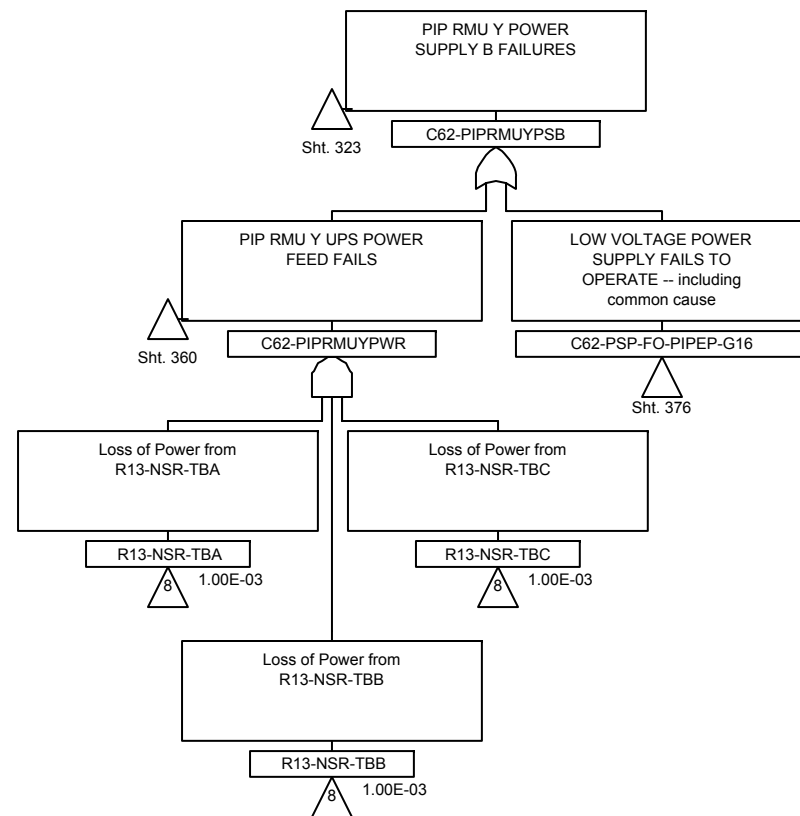


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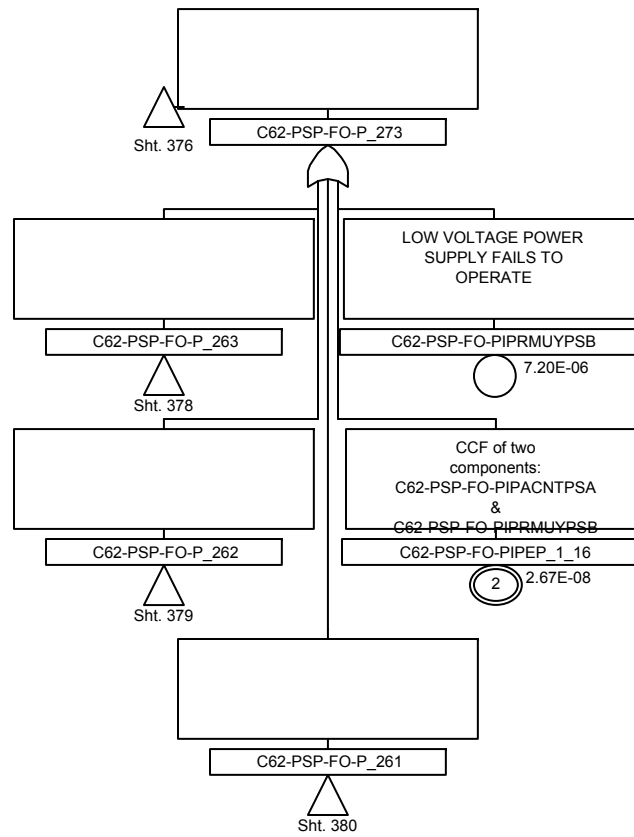


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Figure 4.5-3a. Sheet 378 N-DCIS Non Safety Control System

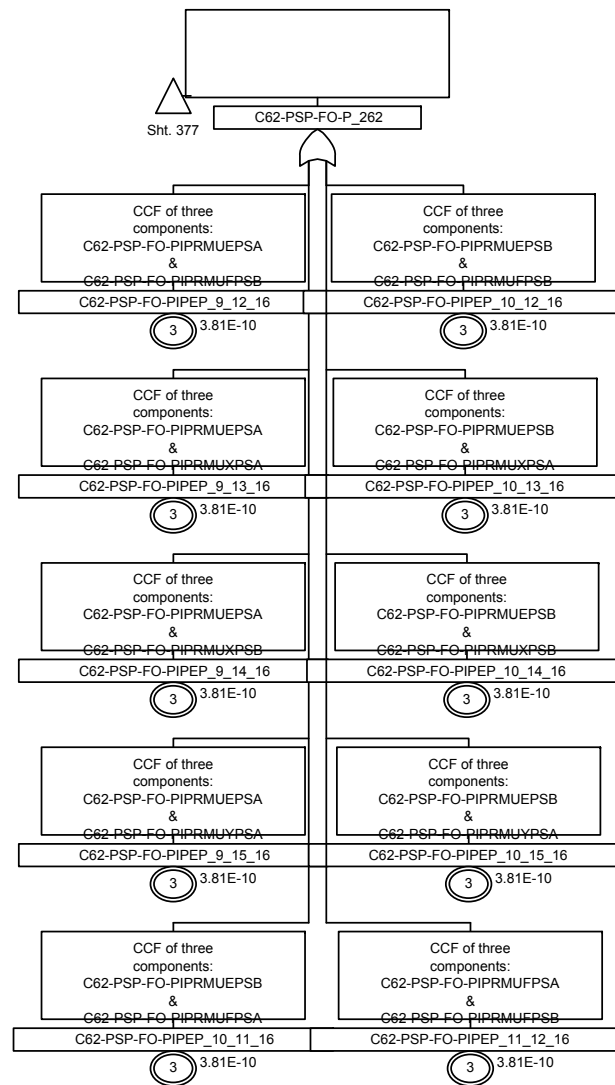


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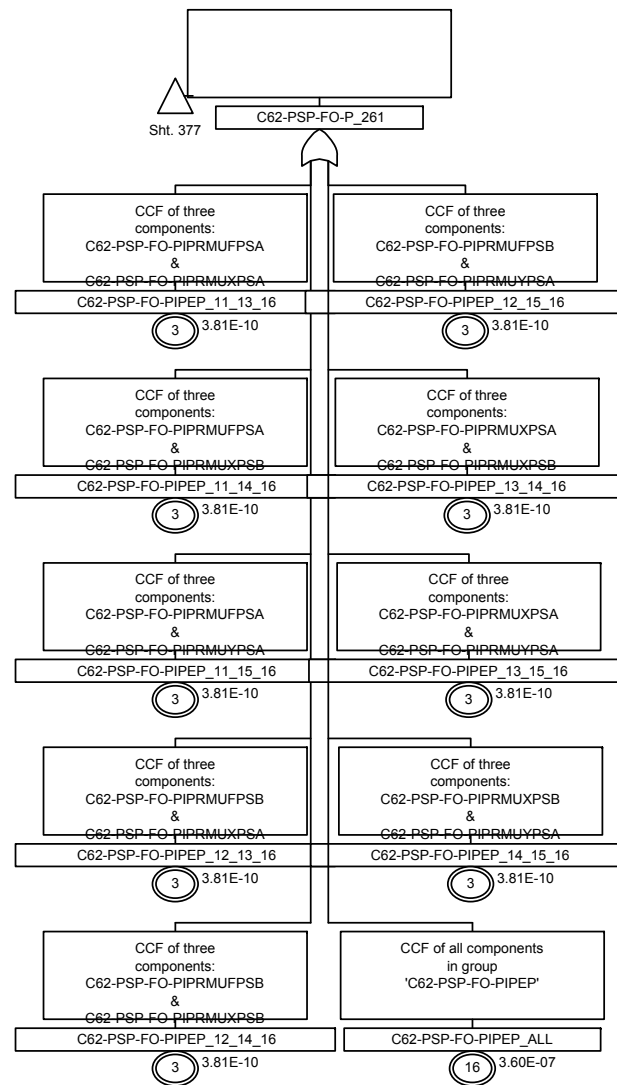


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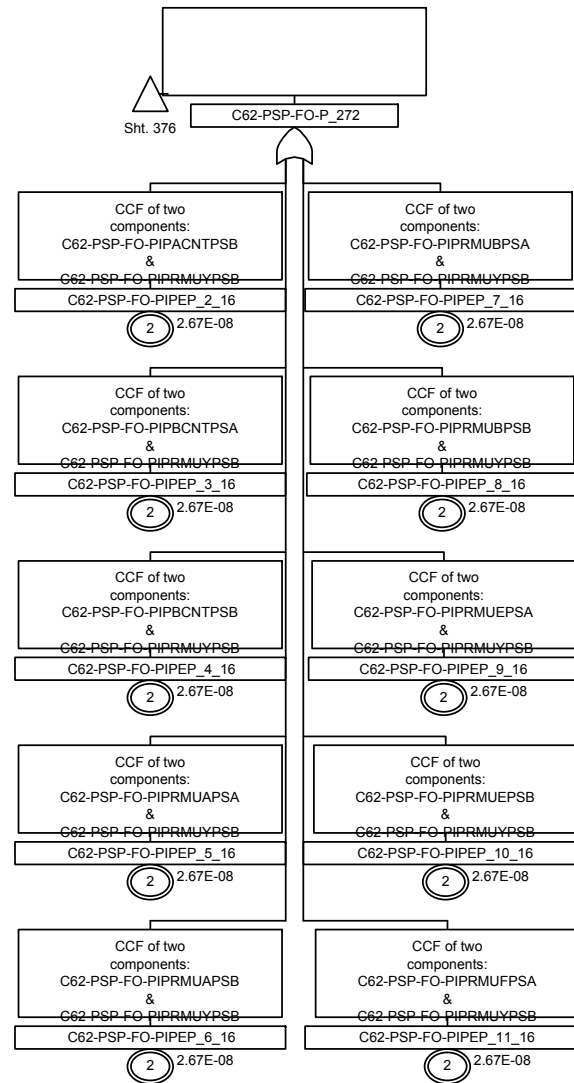


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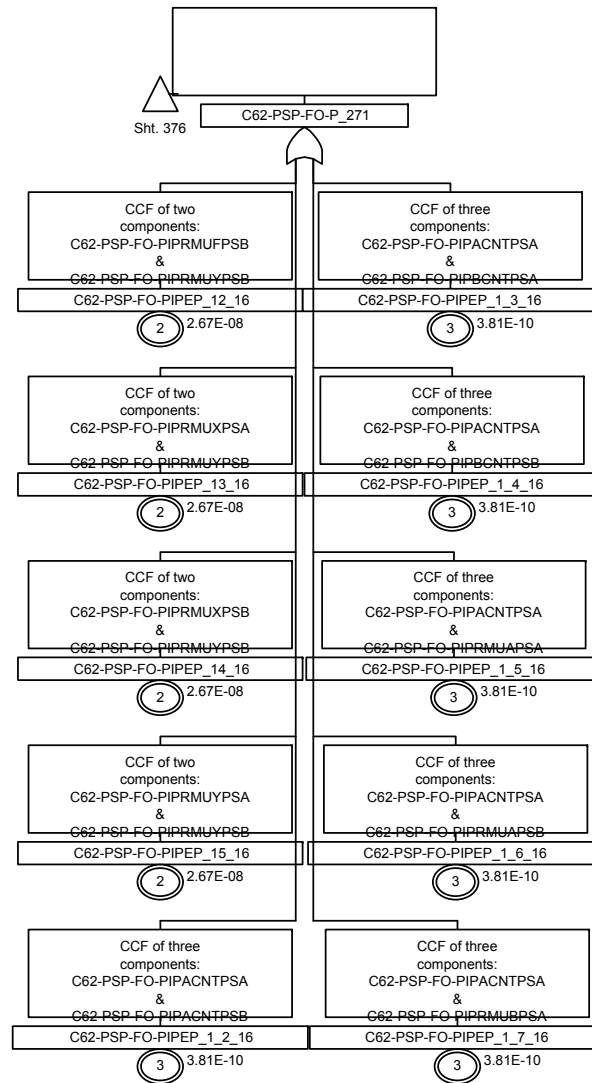


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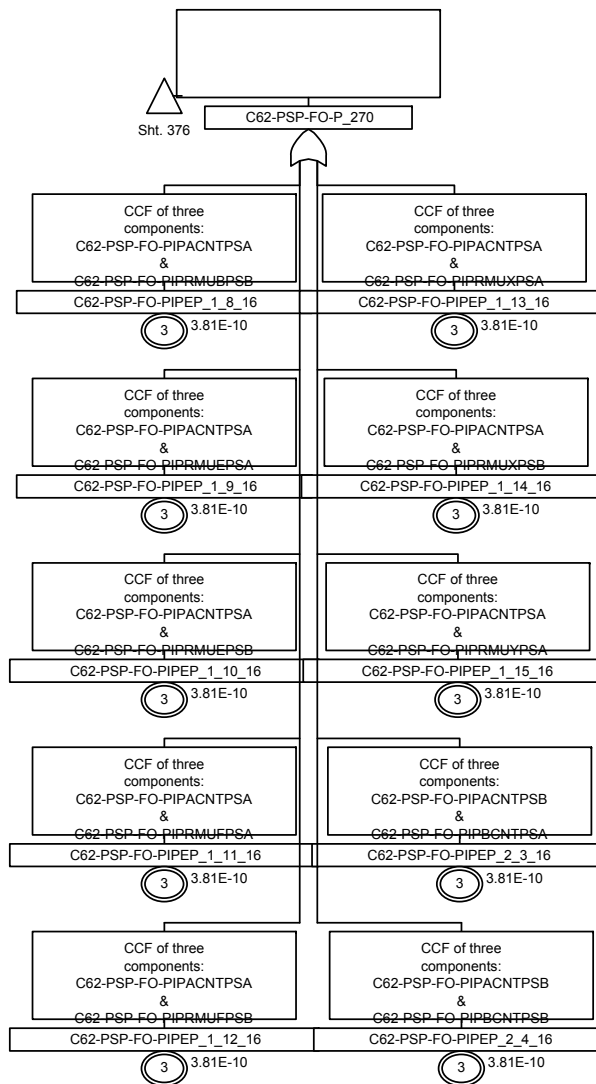


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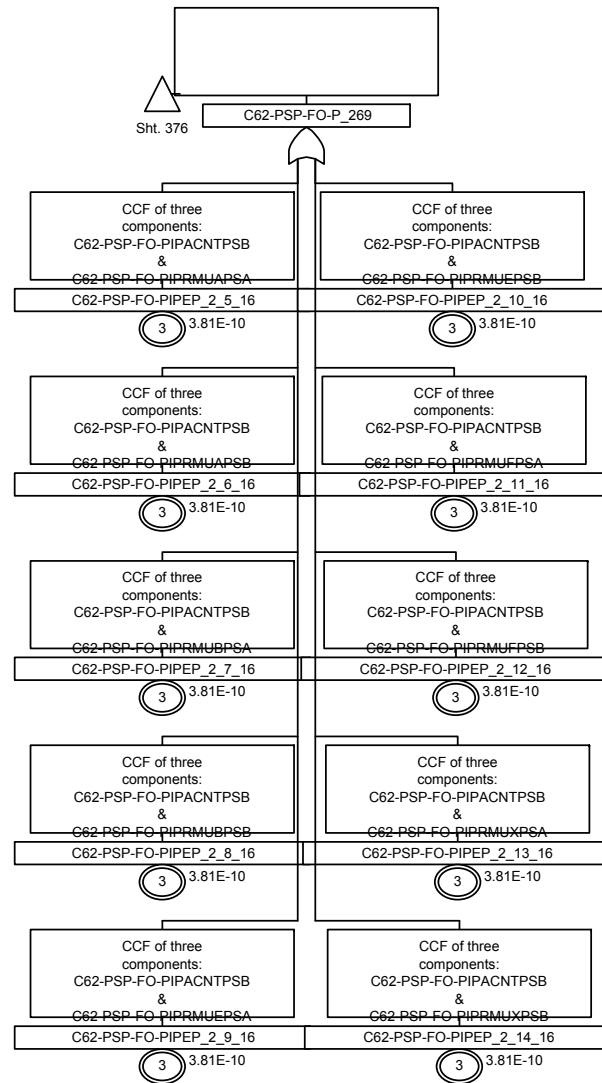


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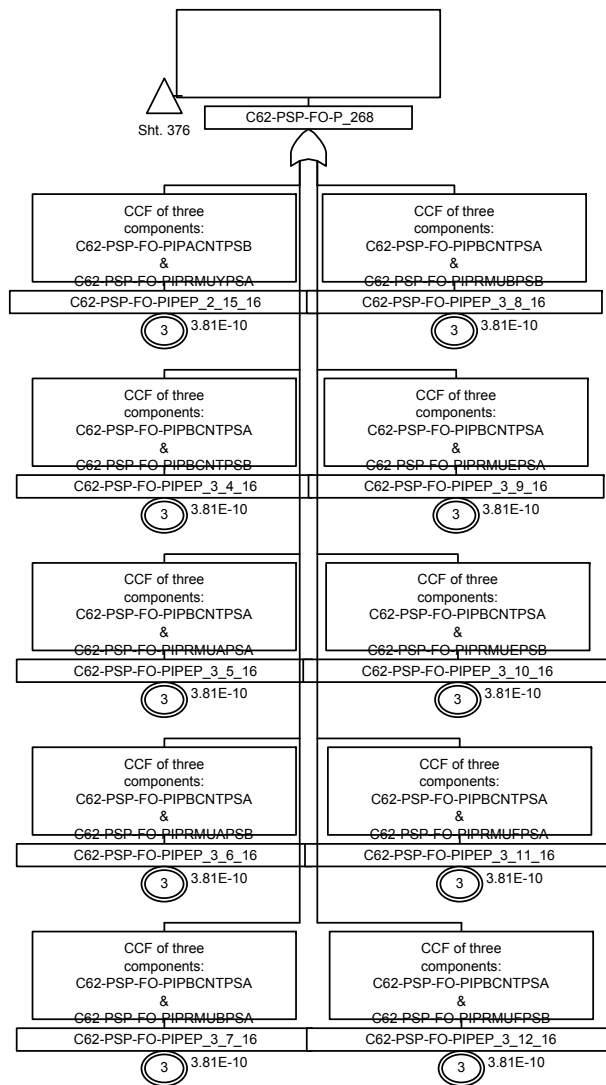


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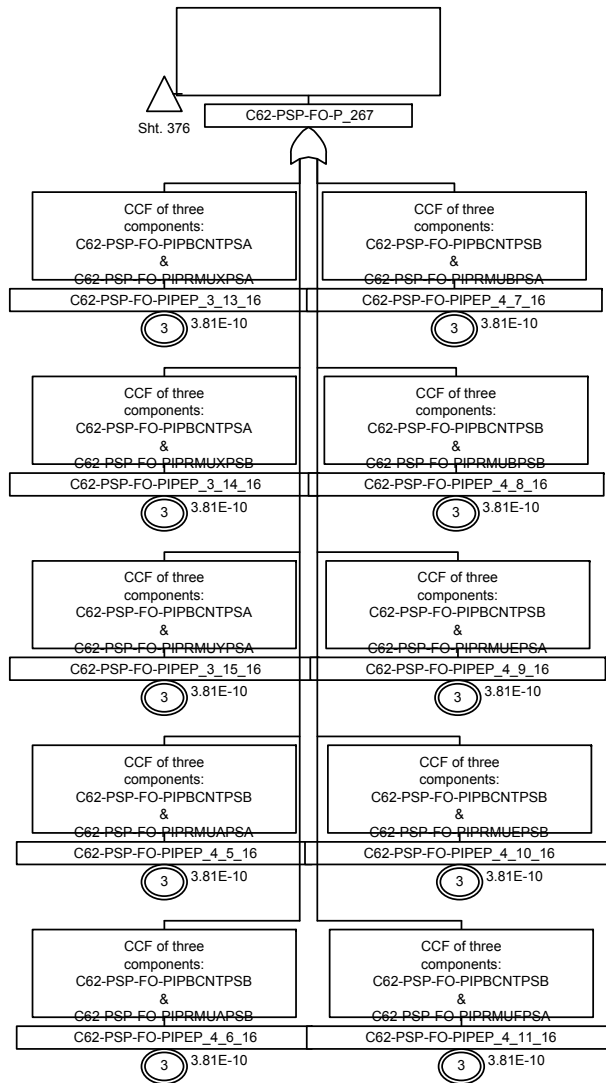


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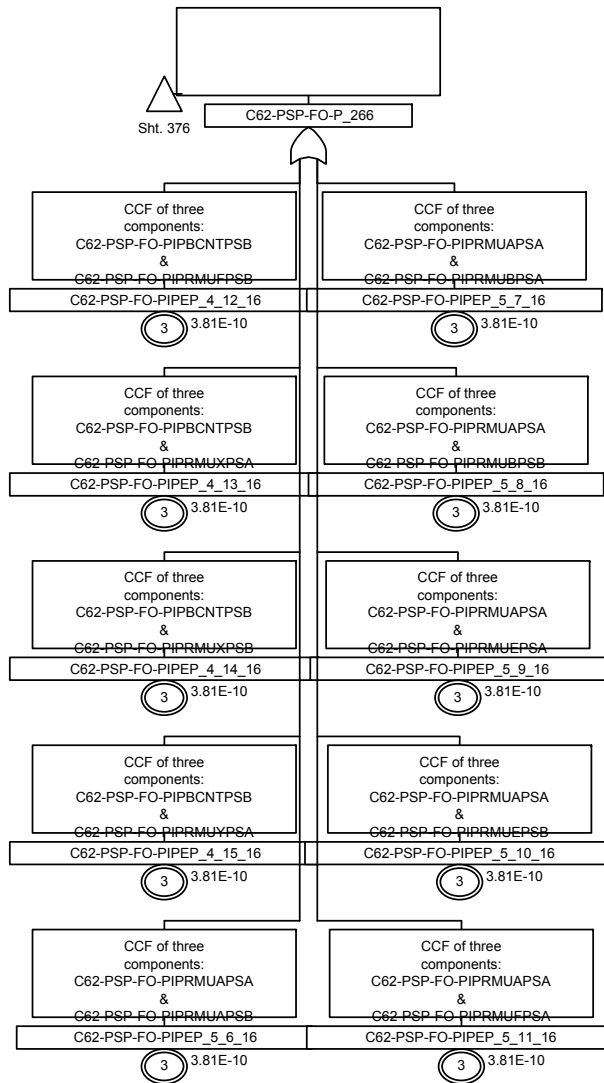


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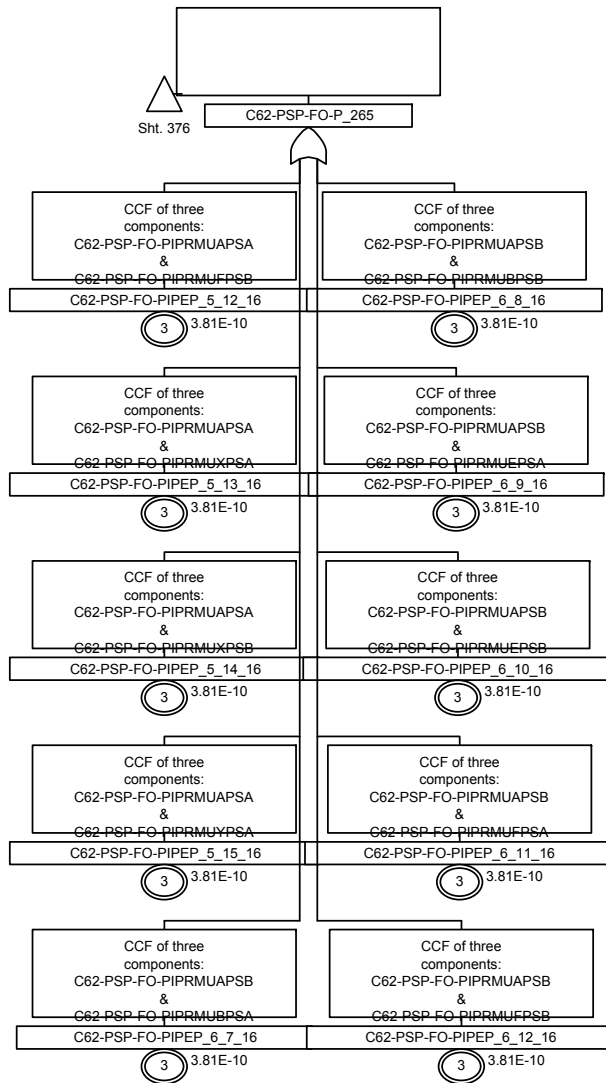


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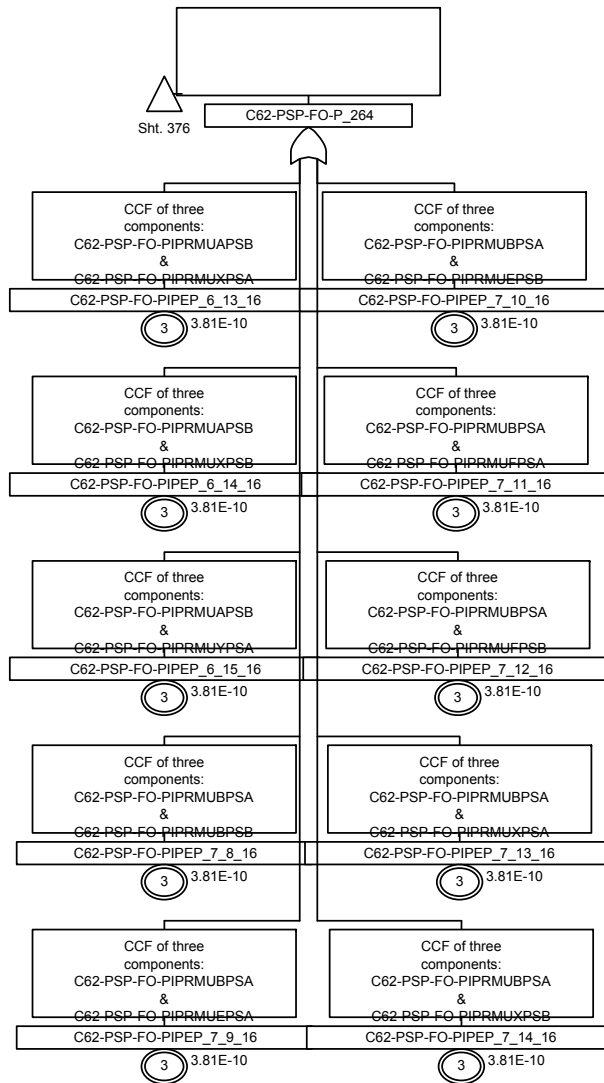


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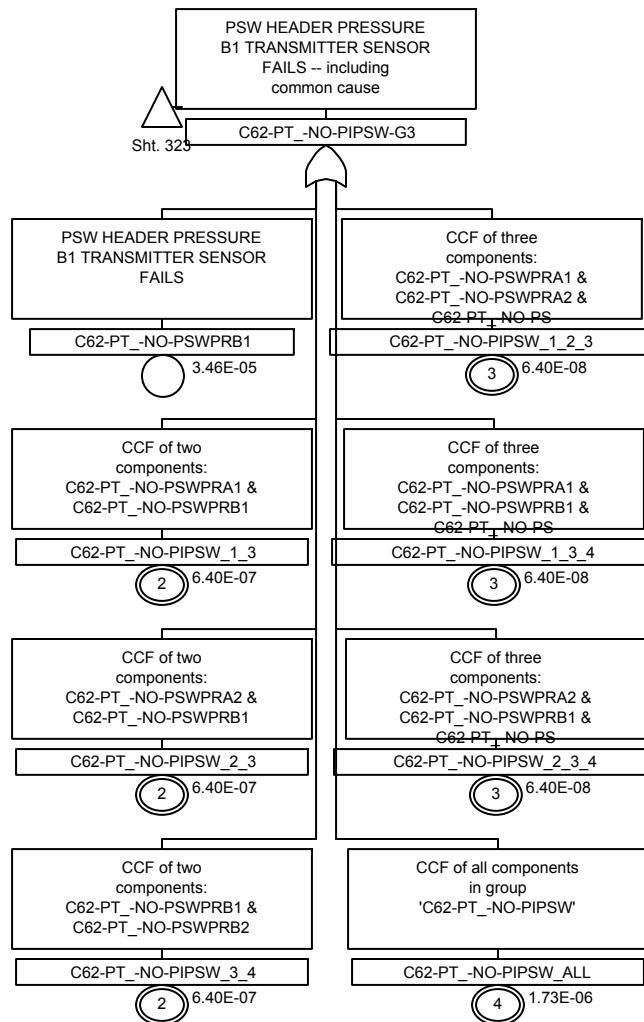


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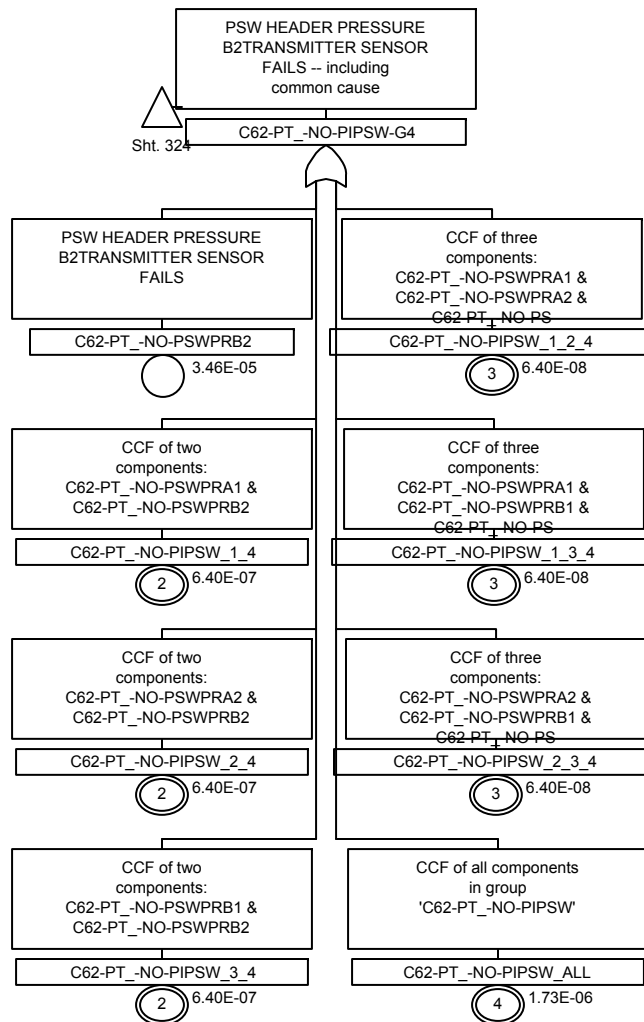


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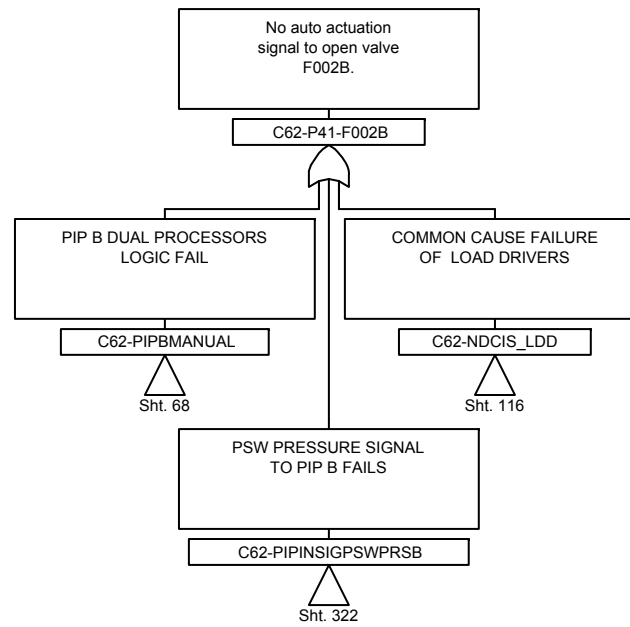


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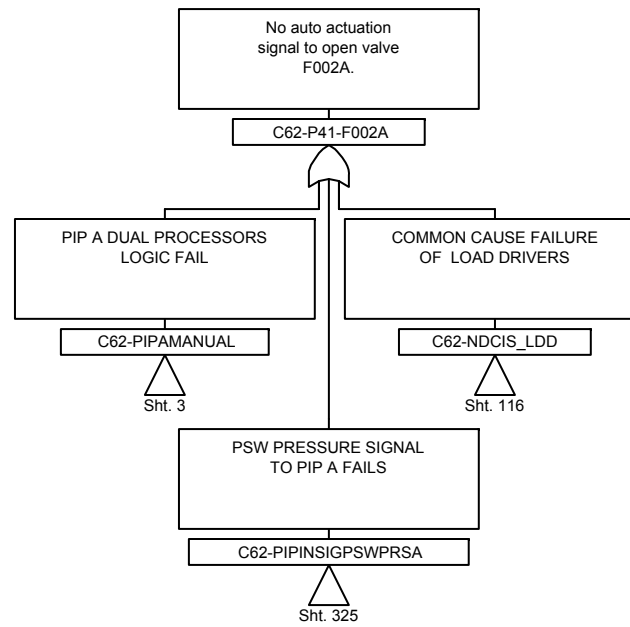


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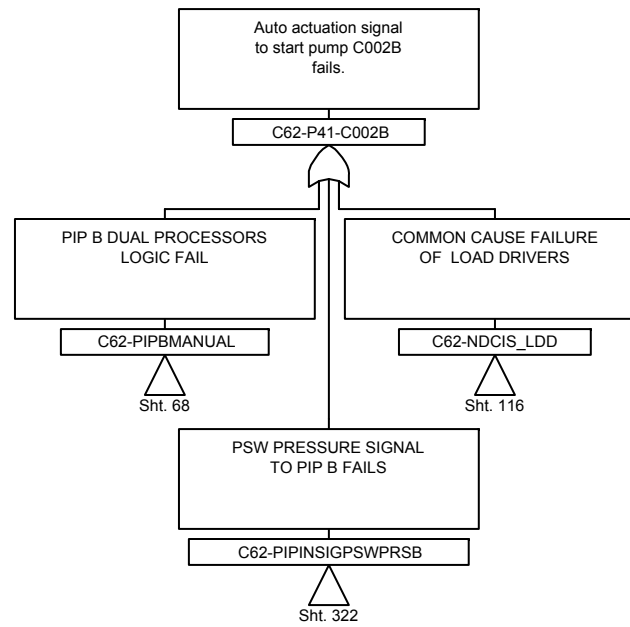


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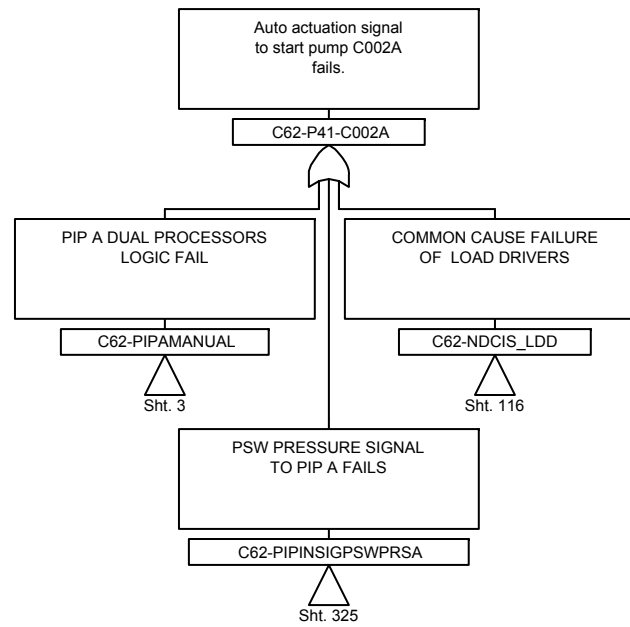


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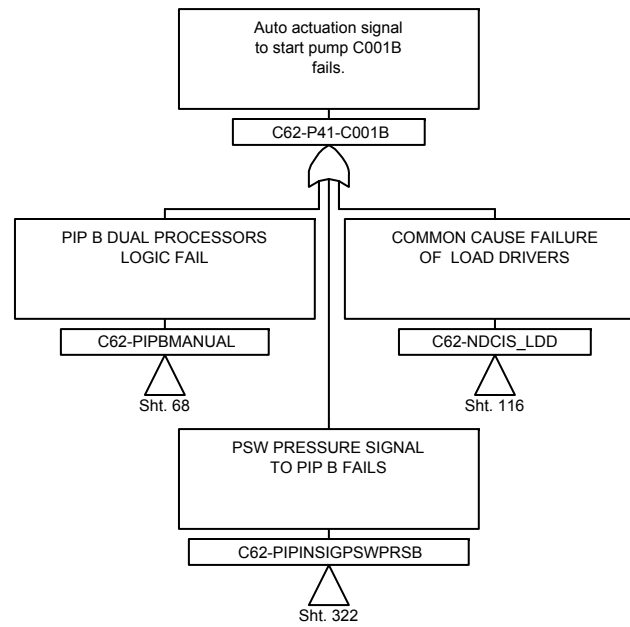


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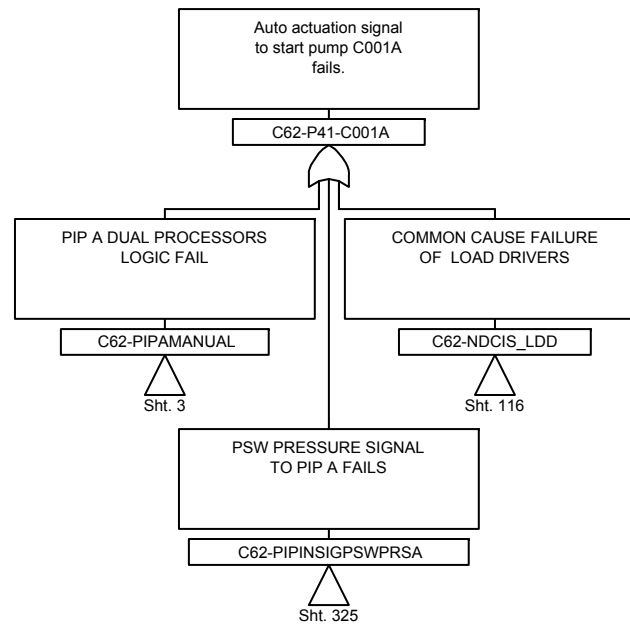


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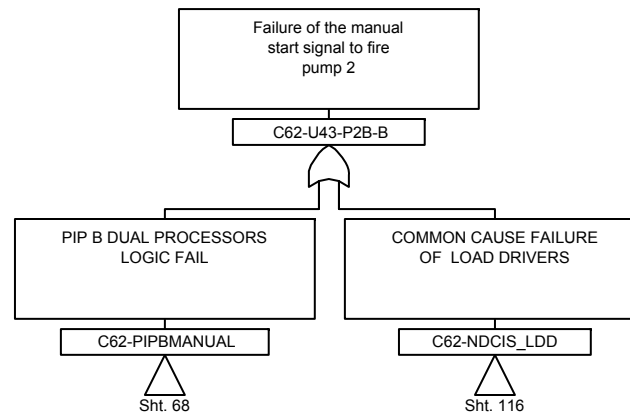


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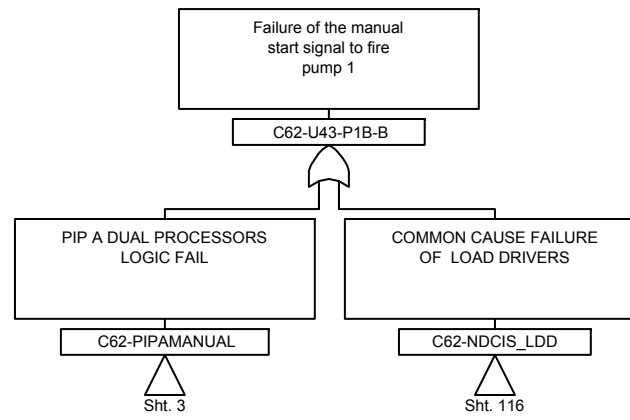


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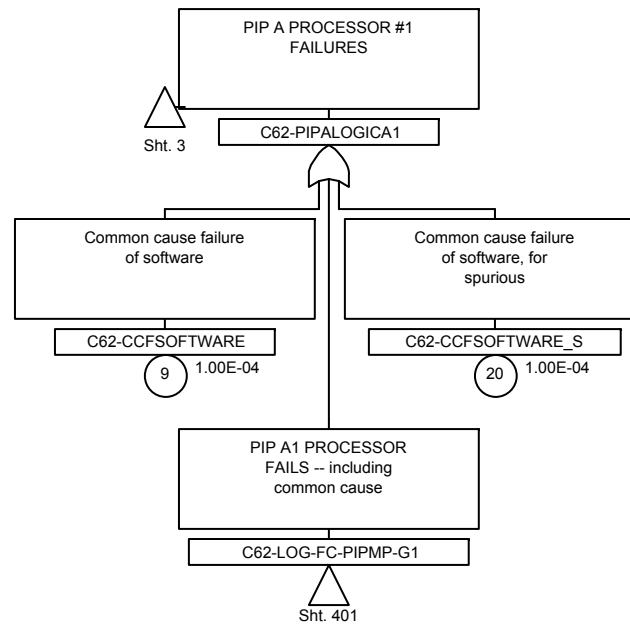


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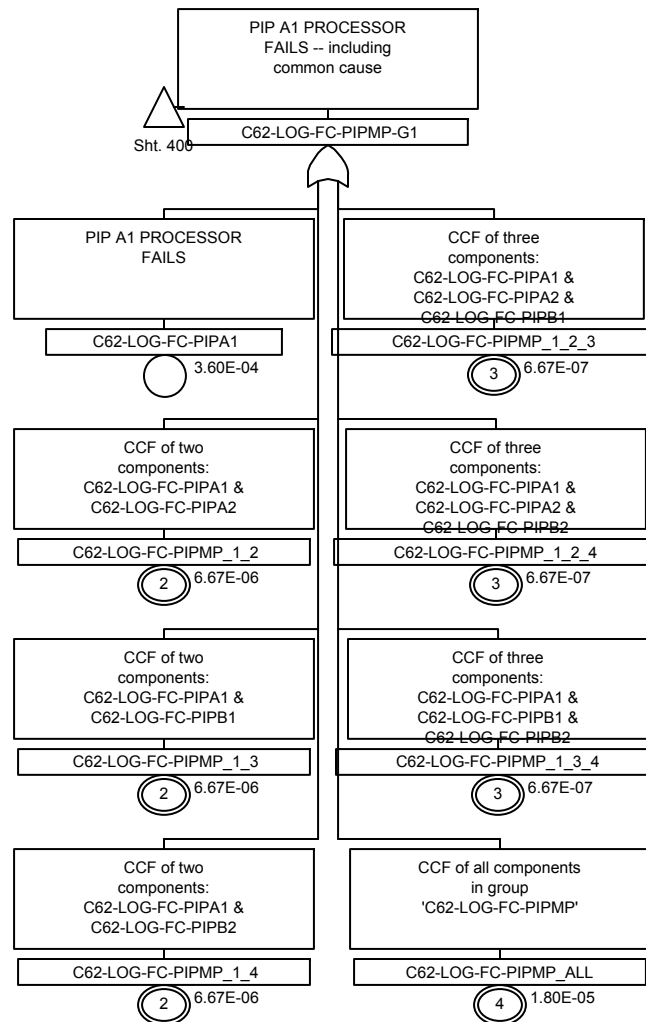


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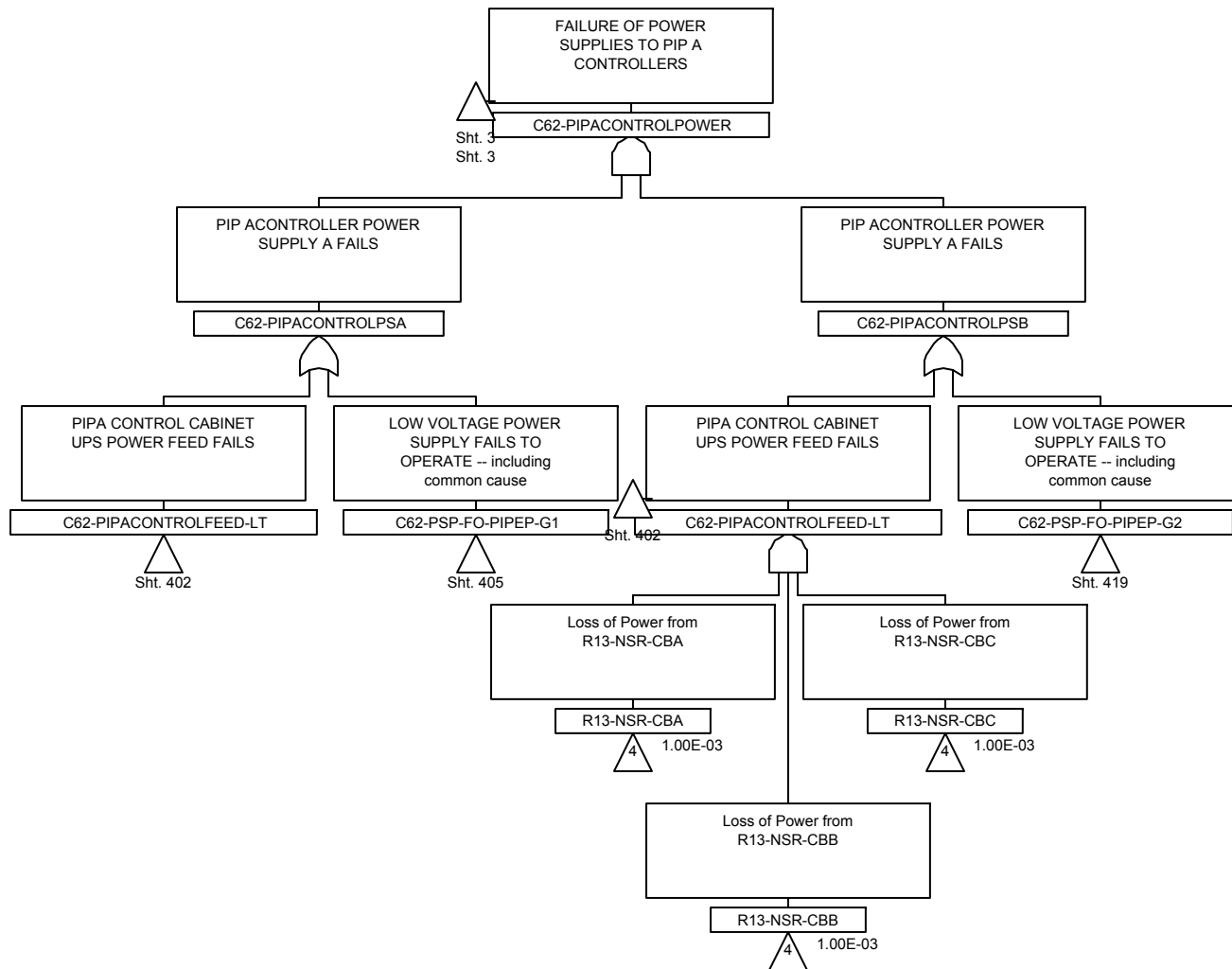


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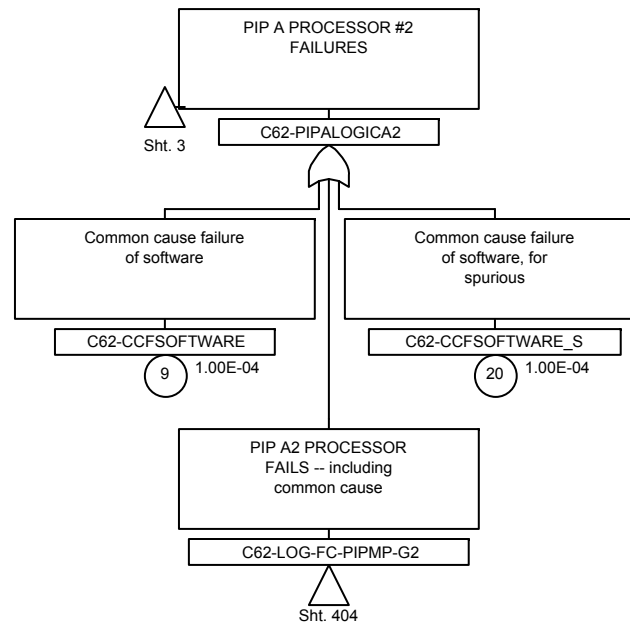


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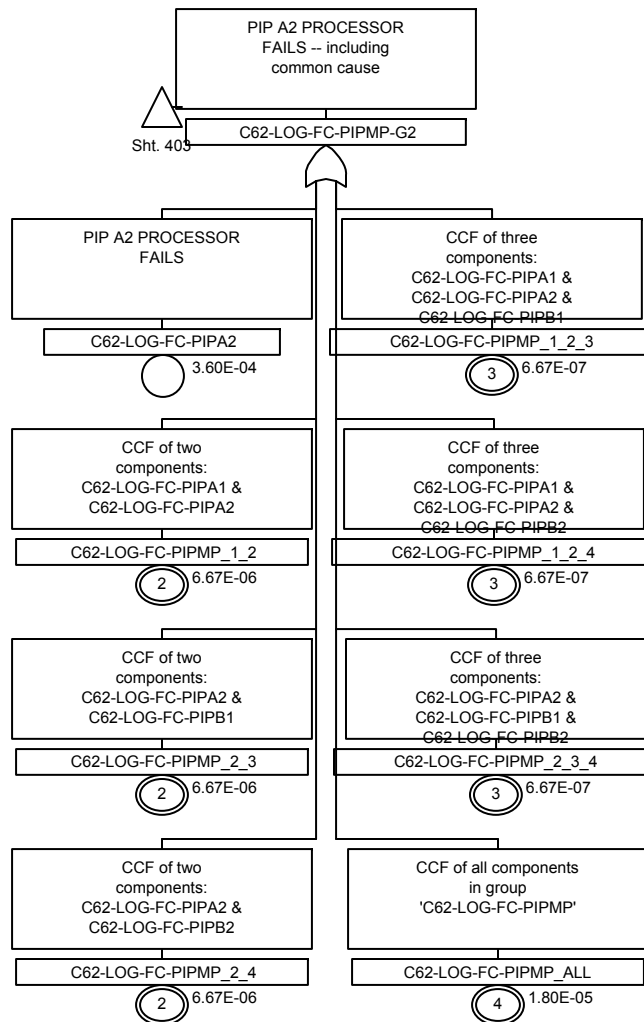


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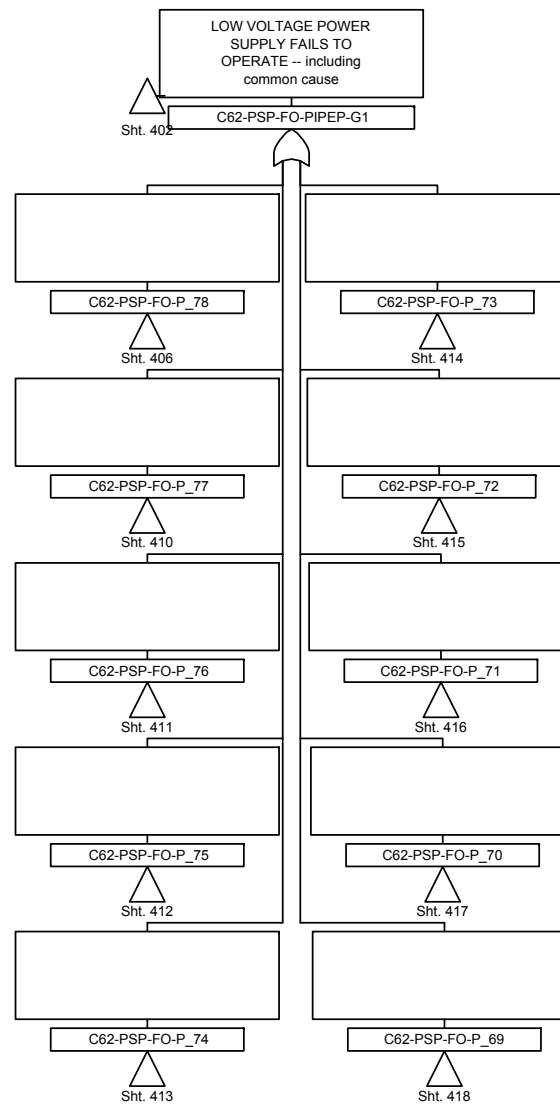


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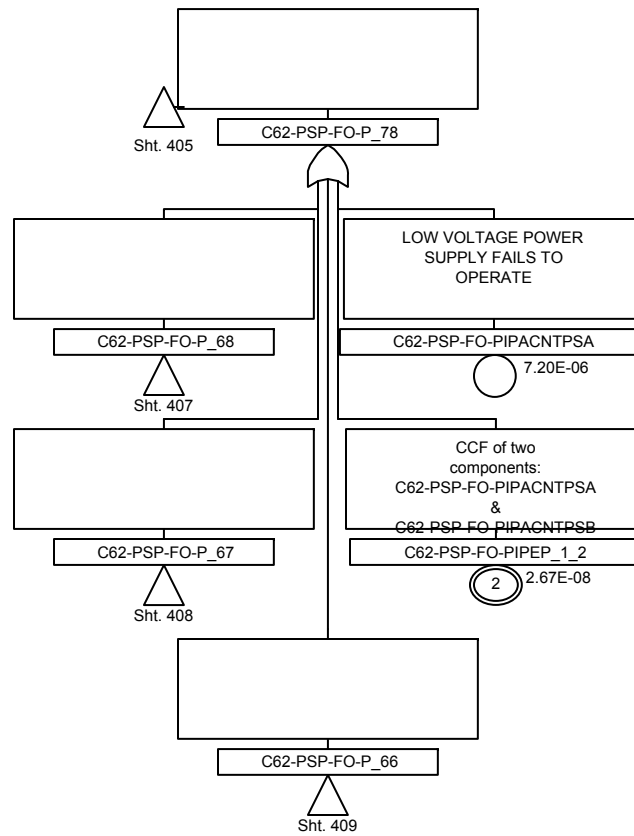


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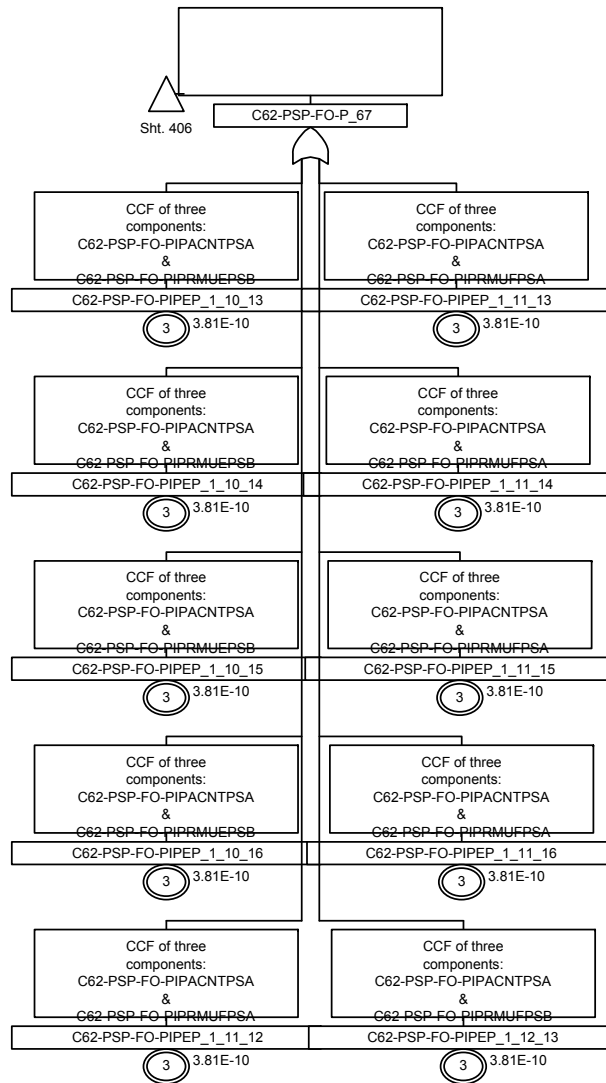


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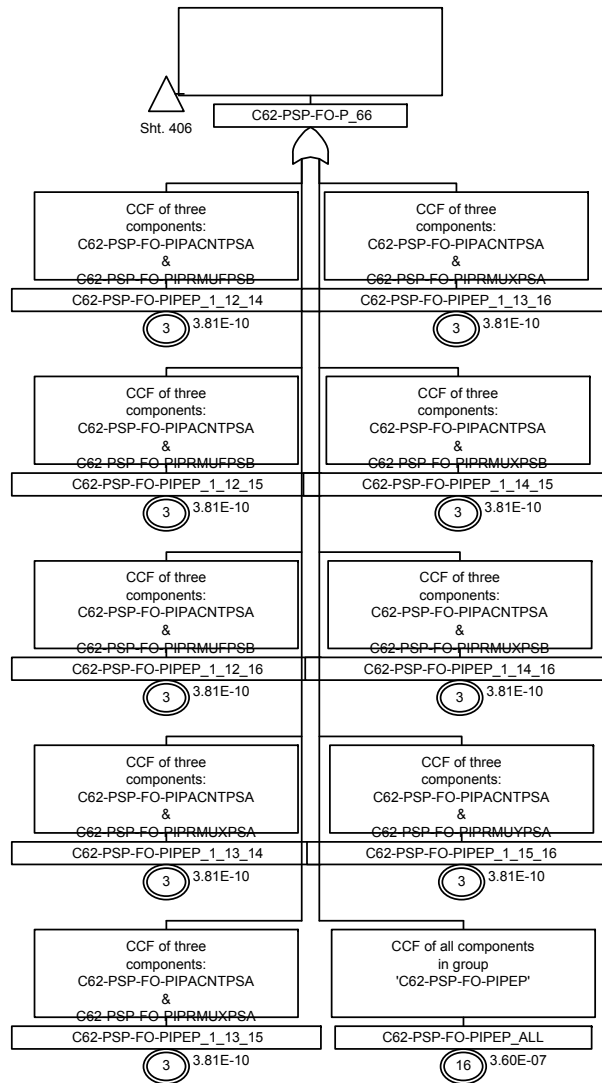


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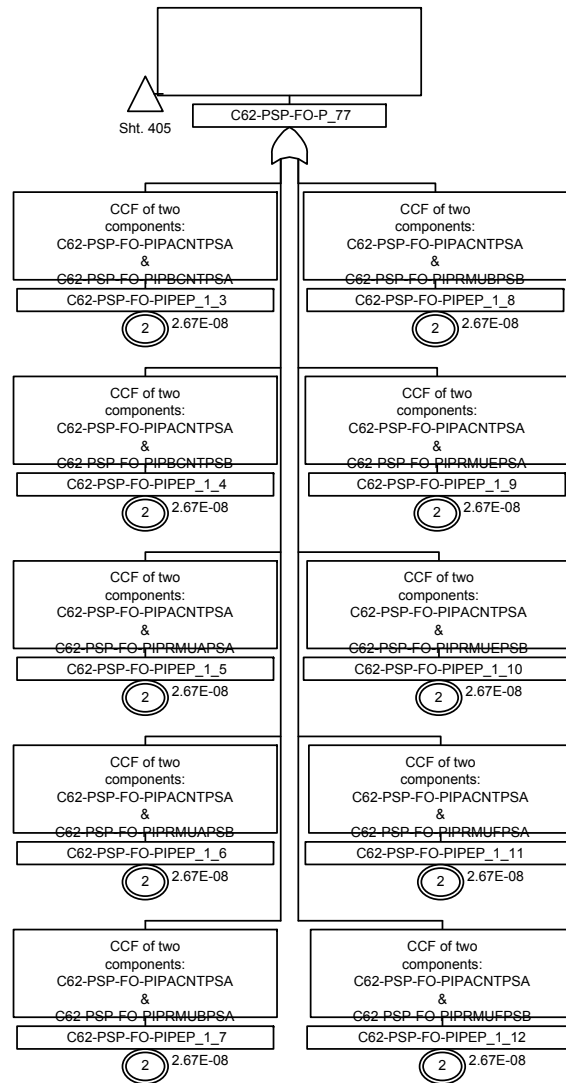


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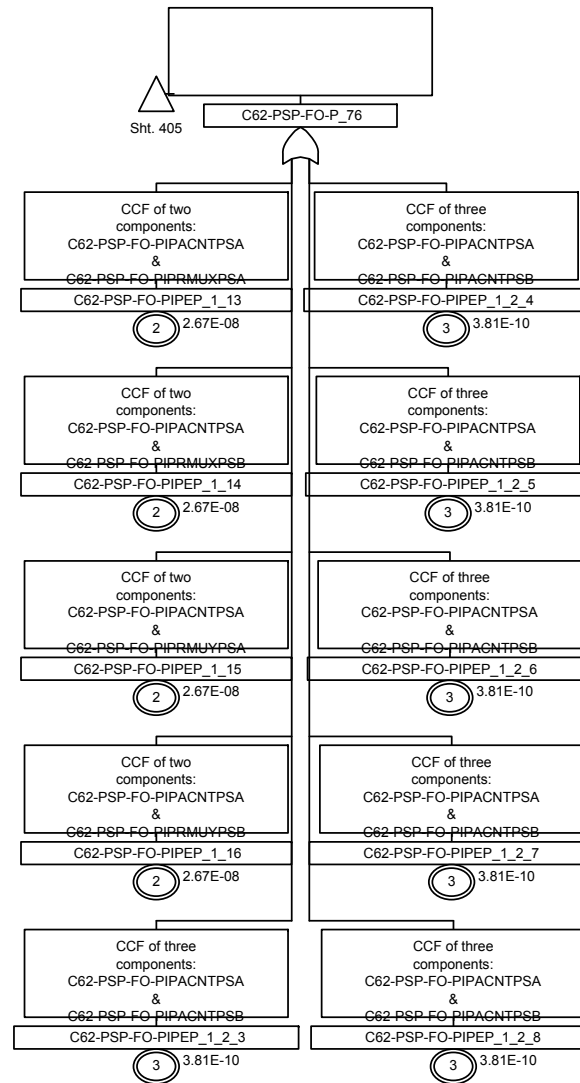


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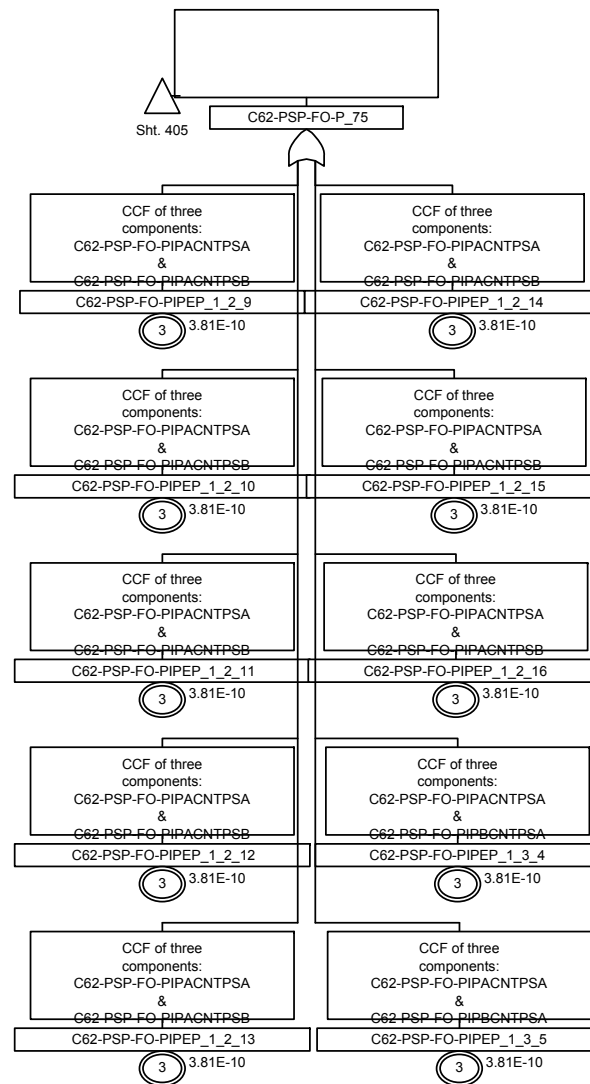


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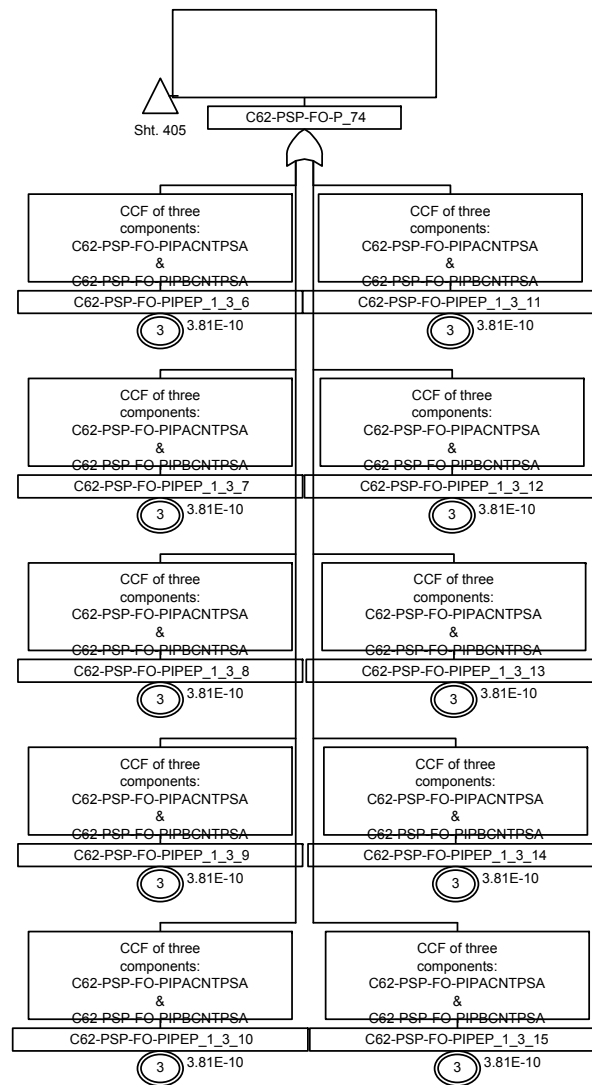


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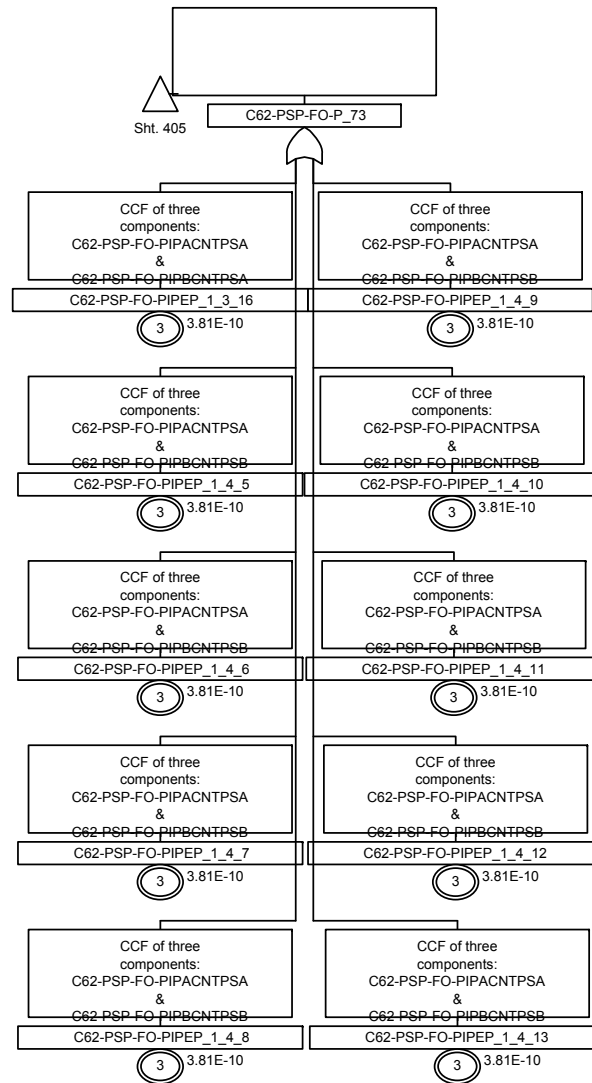


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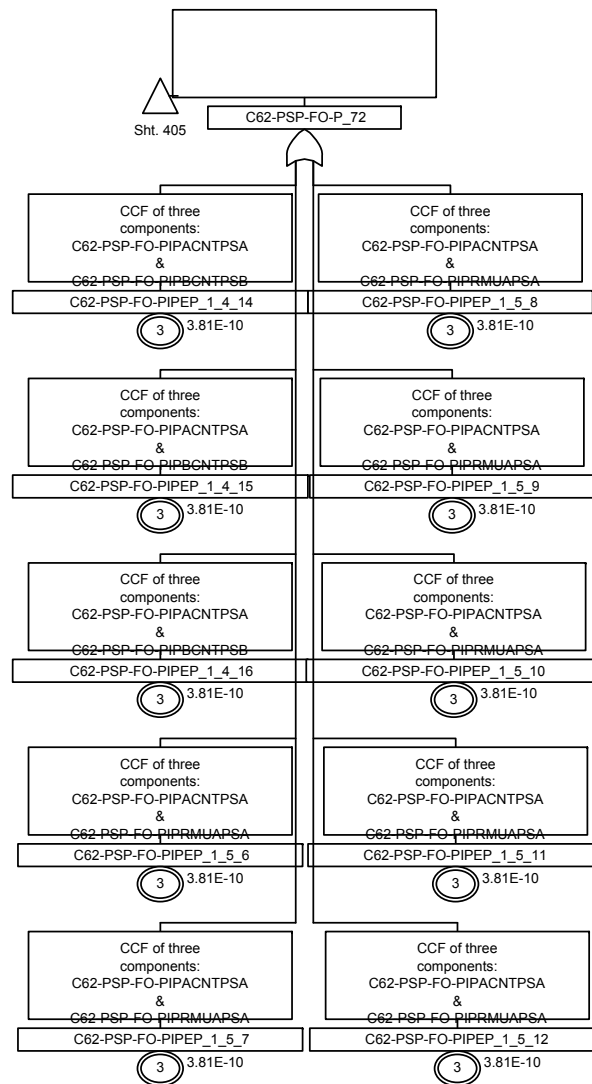


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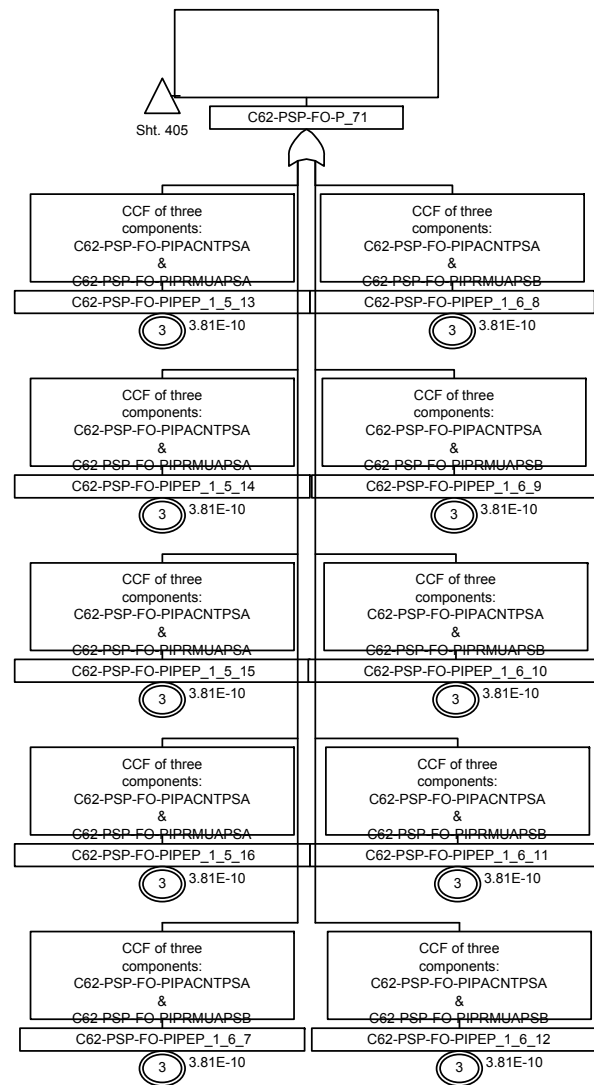


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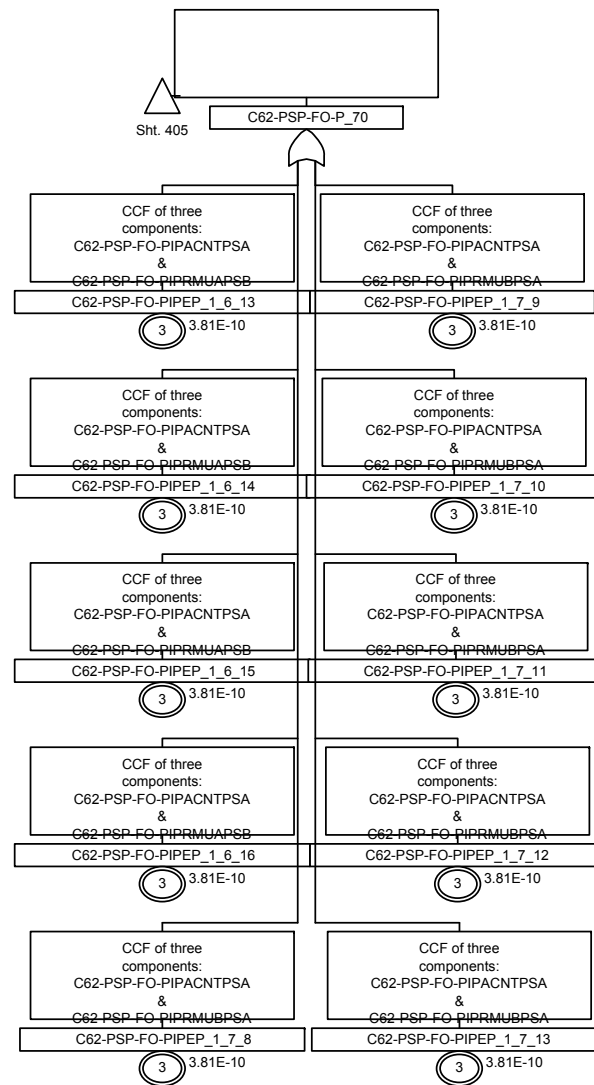


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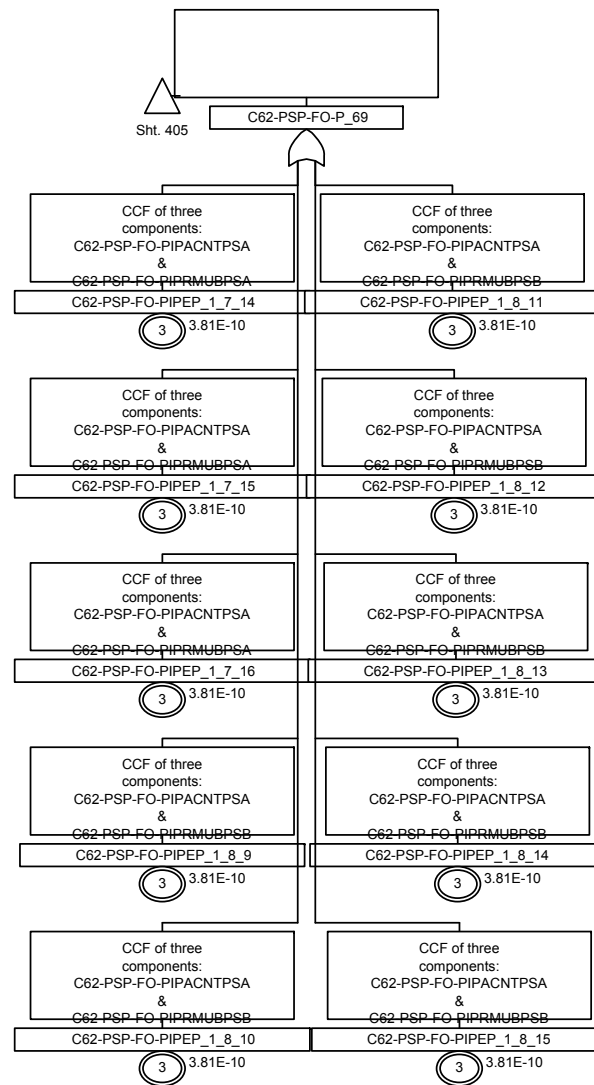


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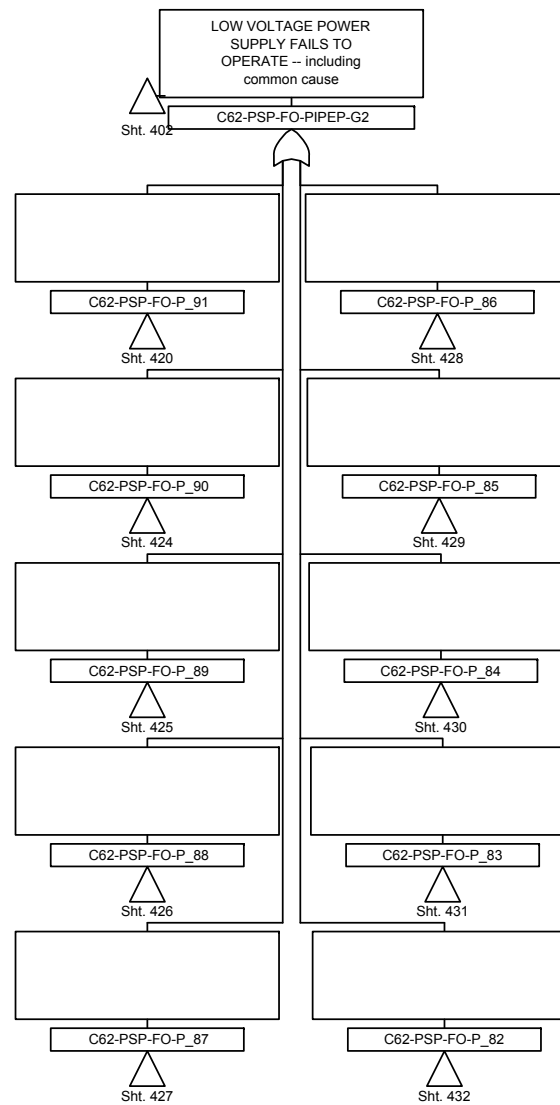


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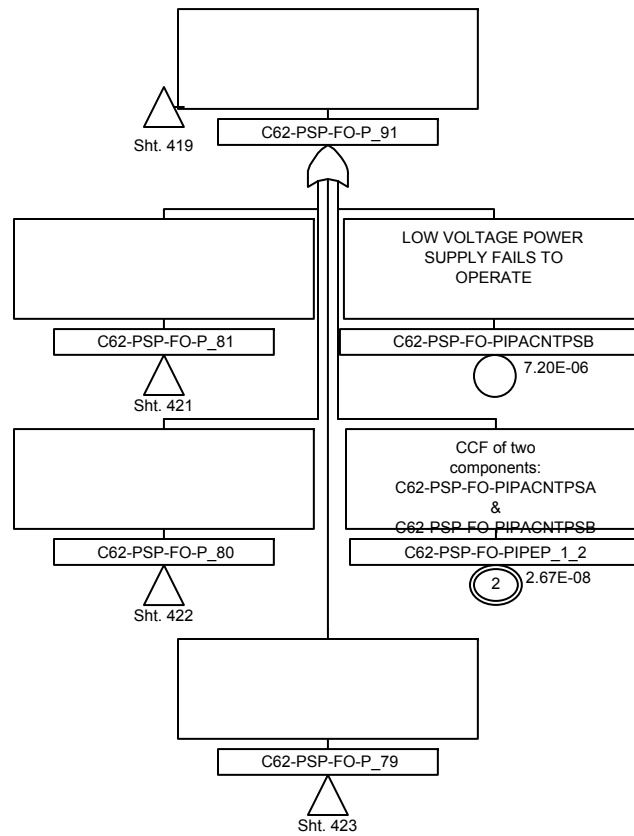


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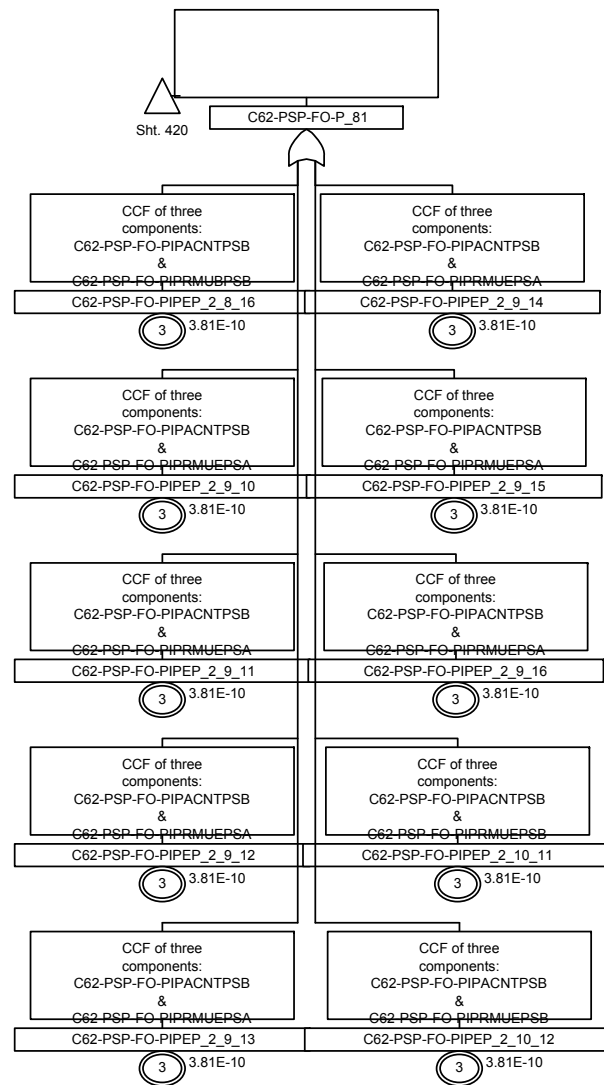


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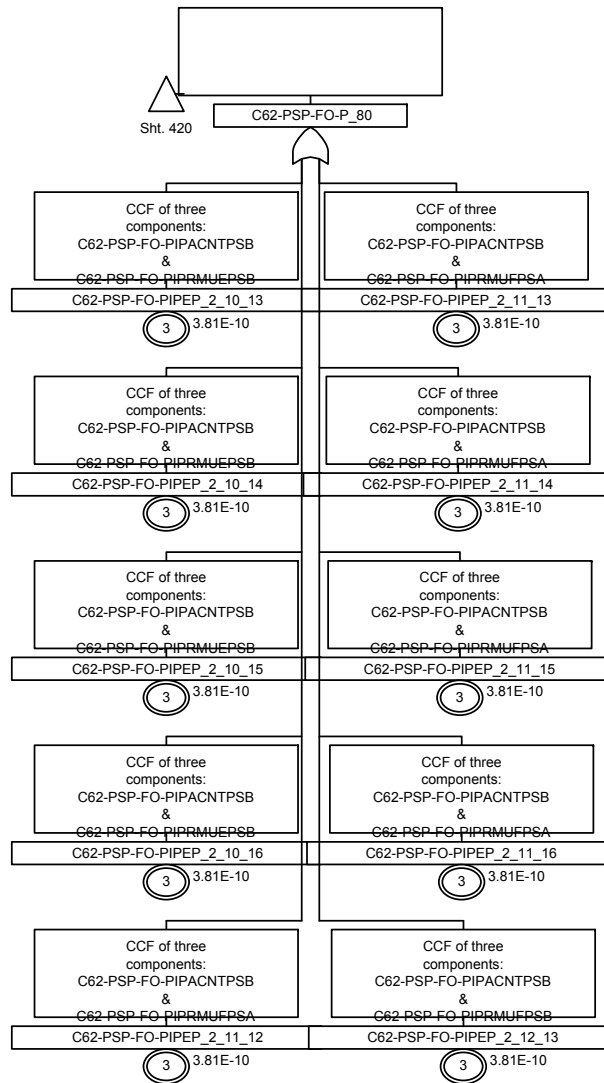


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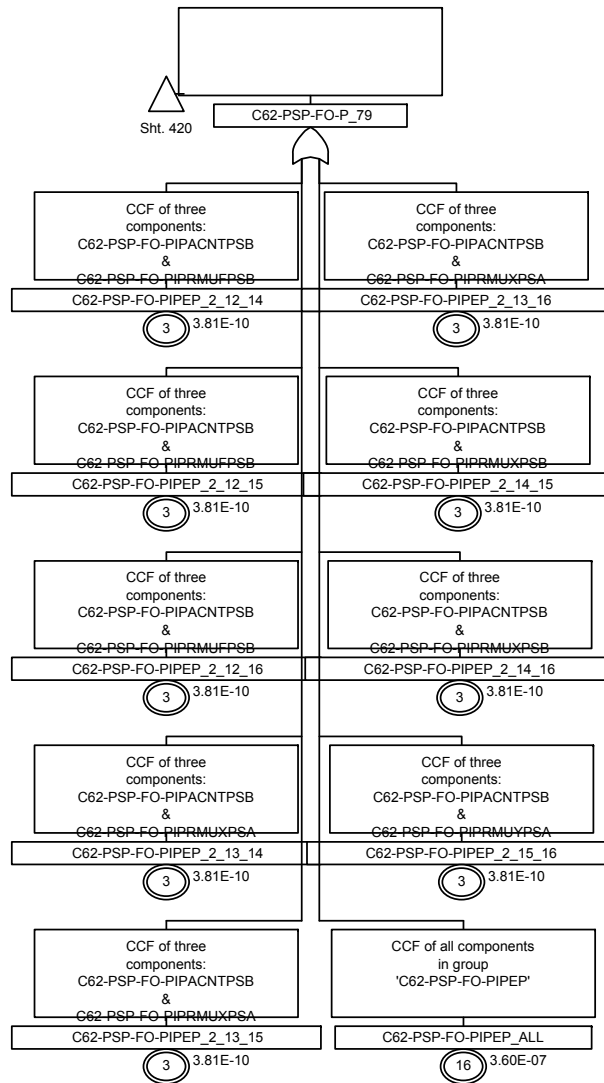


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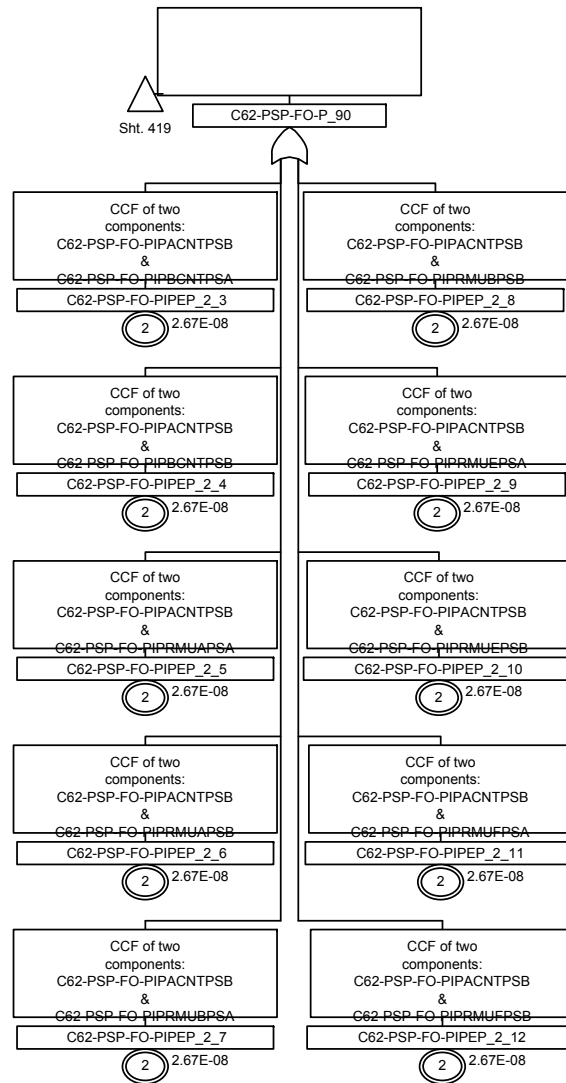


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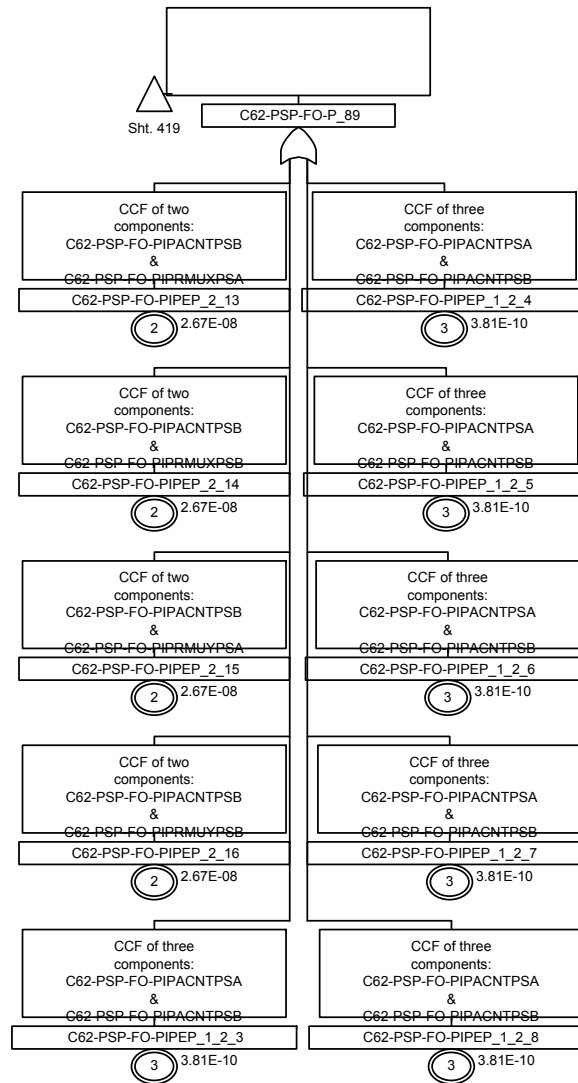


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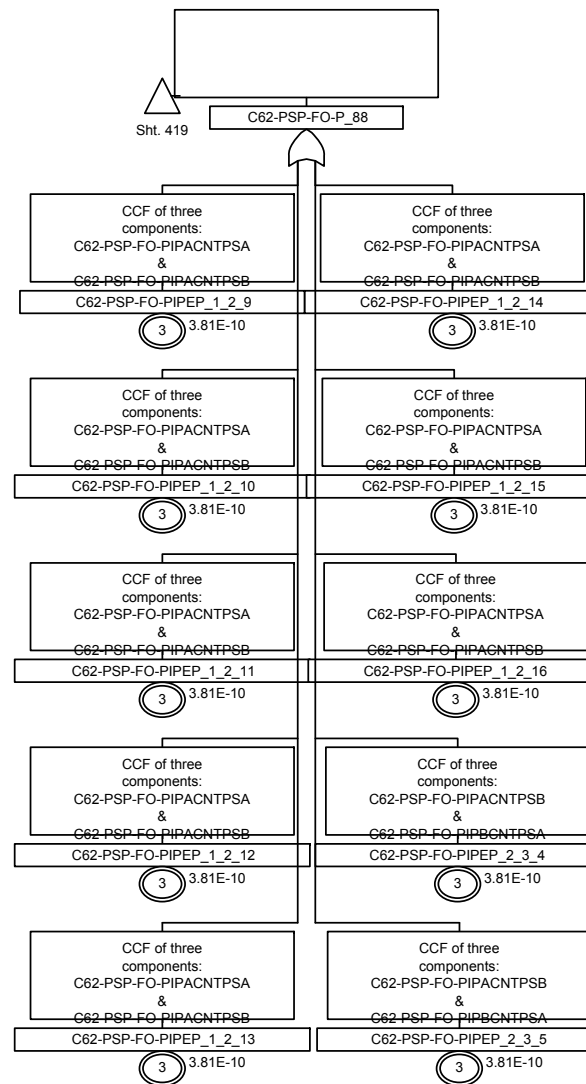


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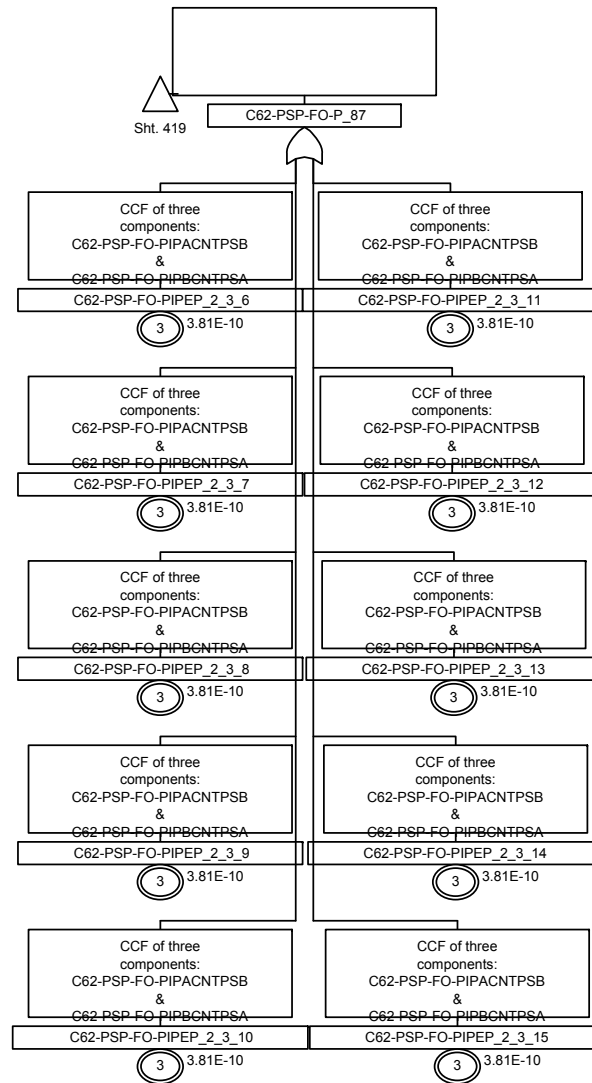


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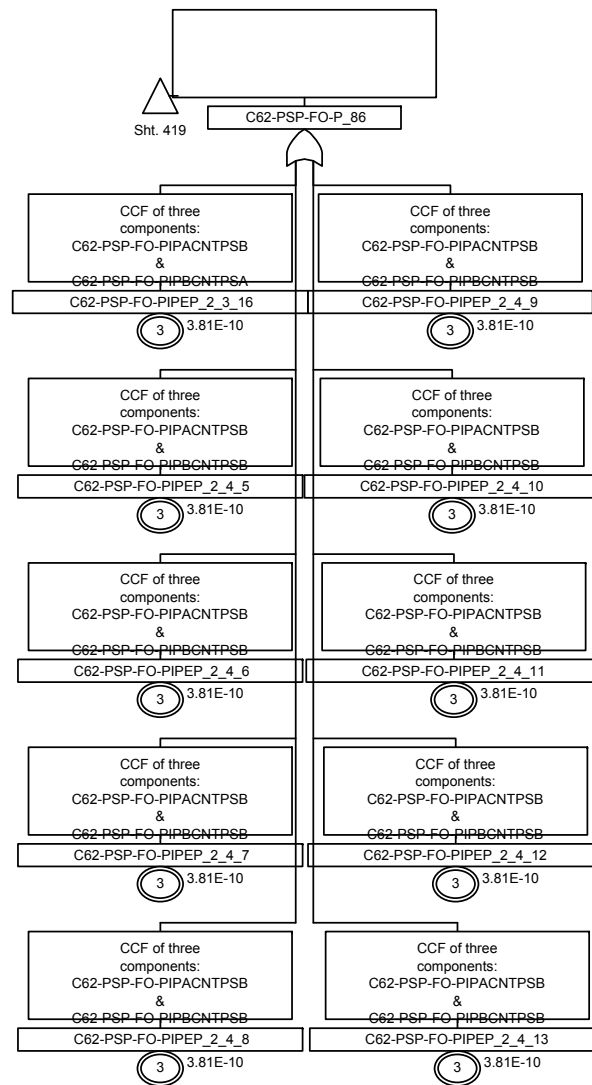


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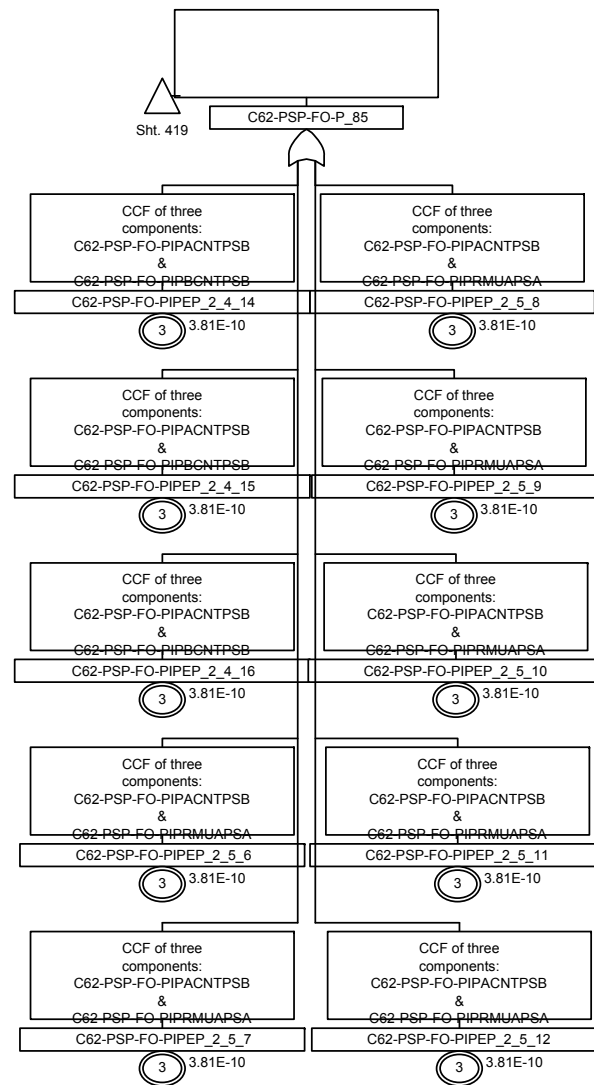


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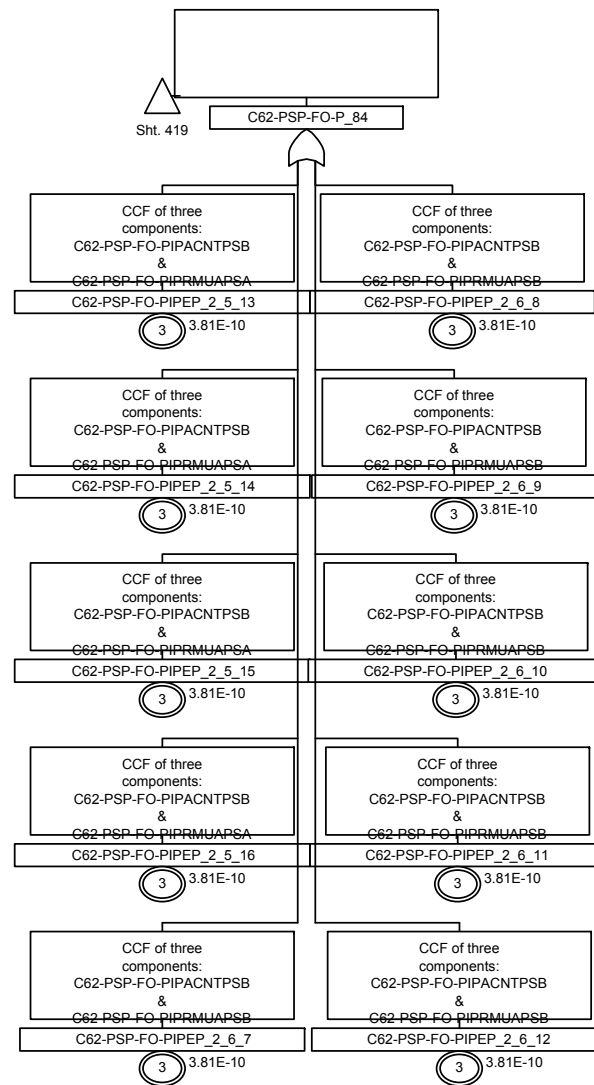


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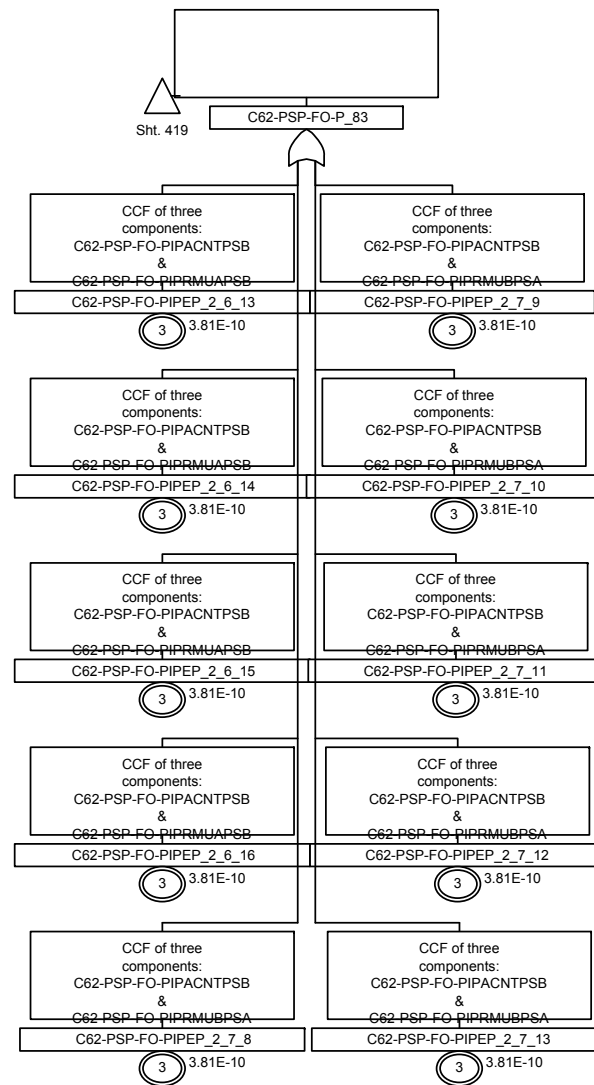


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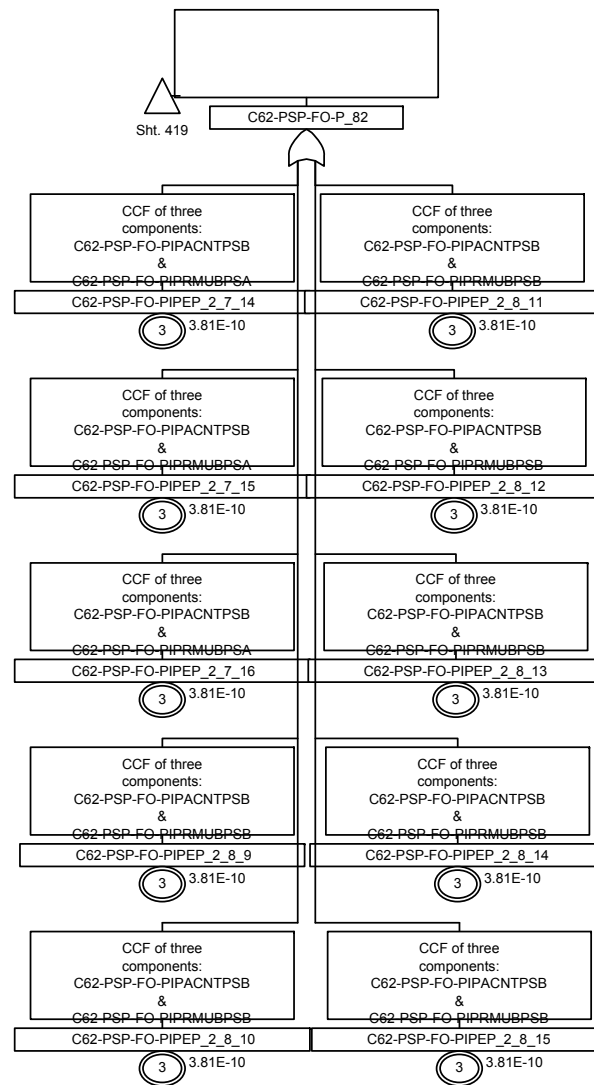


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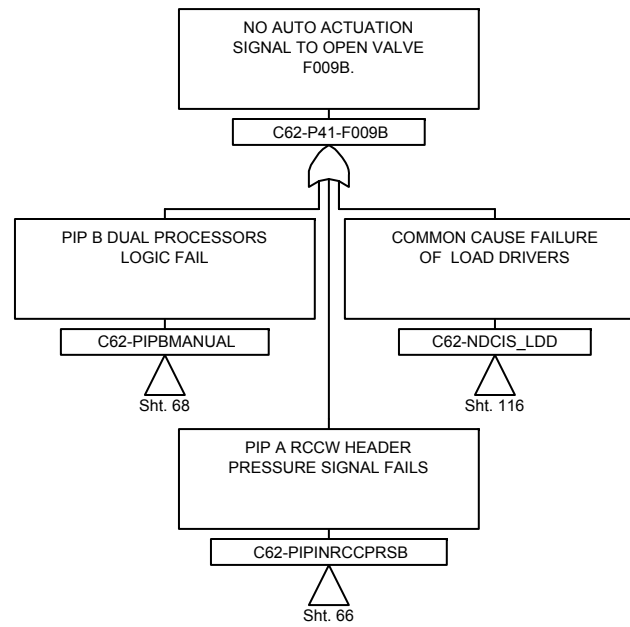


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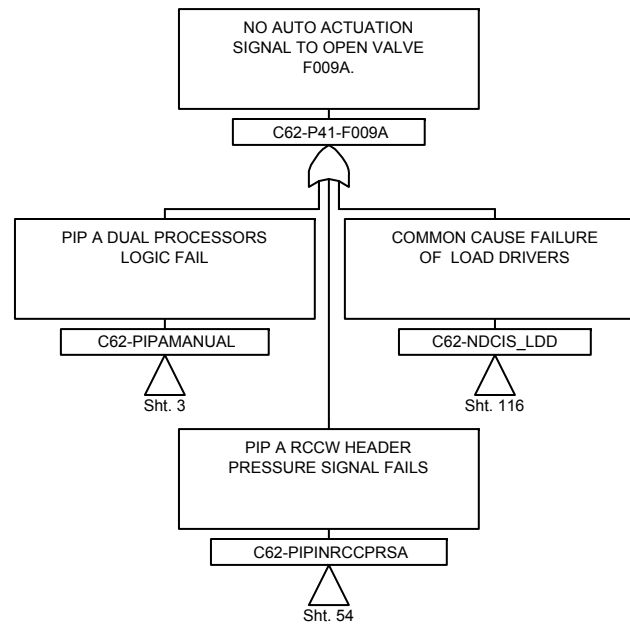


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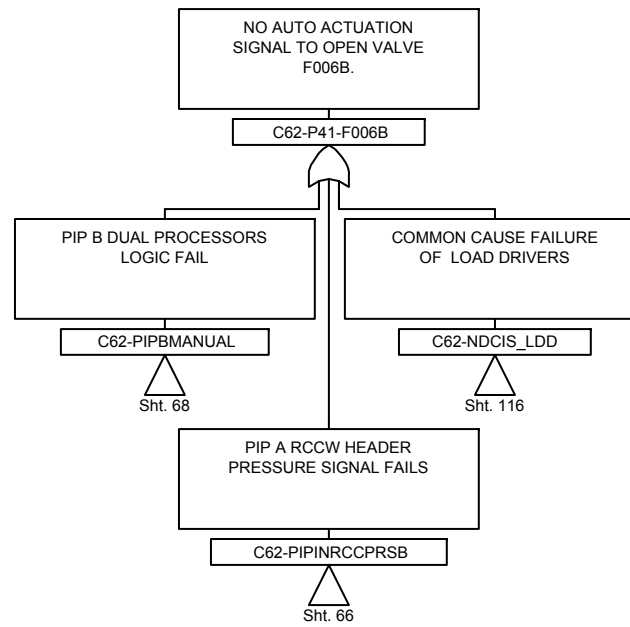


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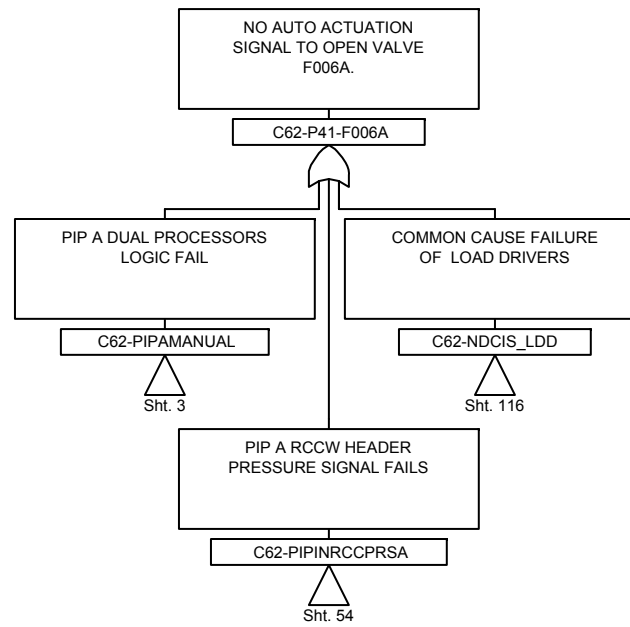


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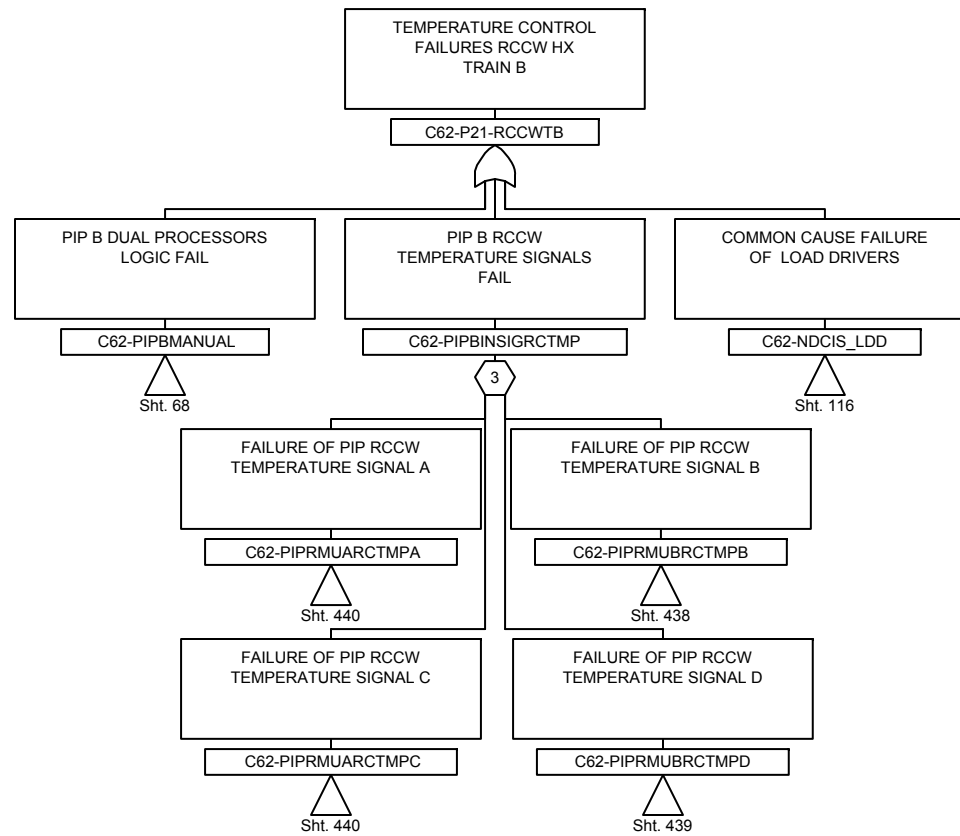


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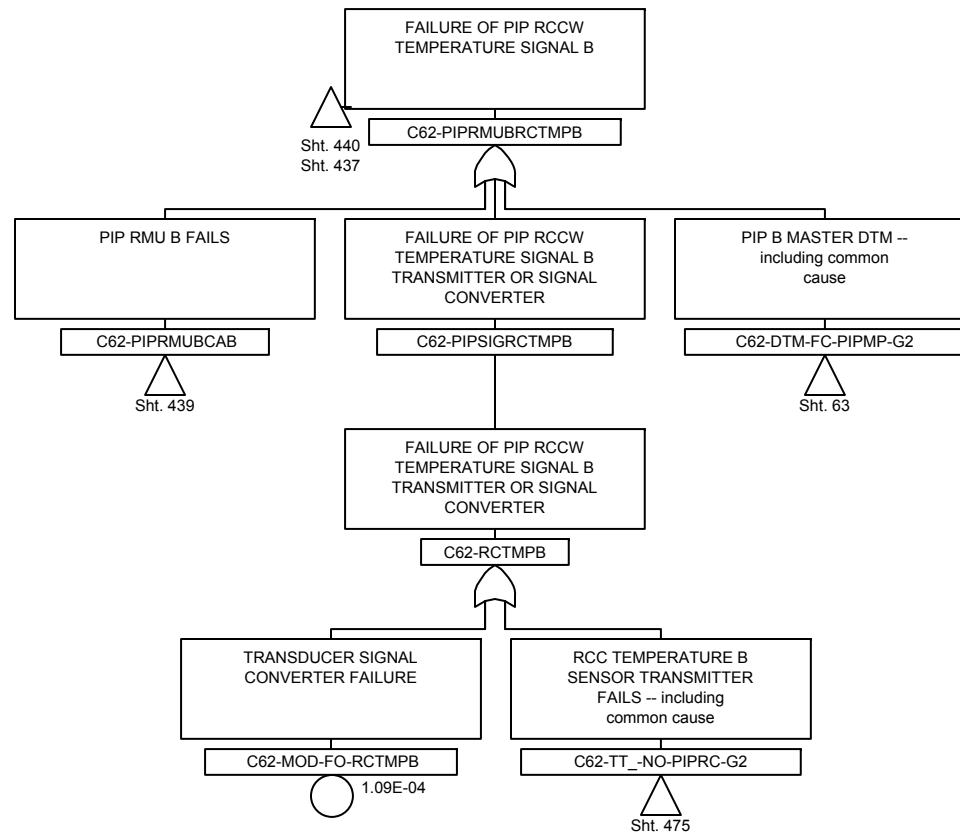


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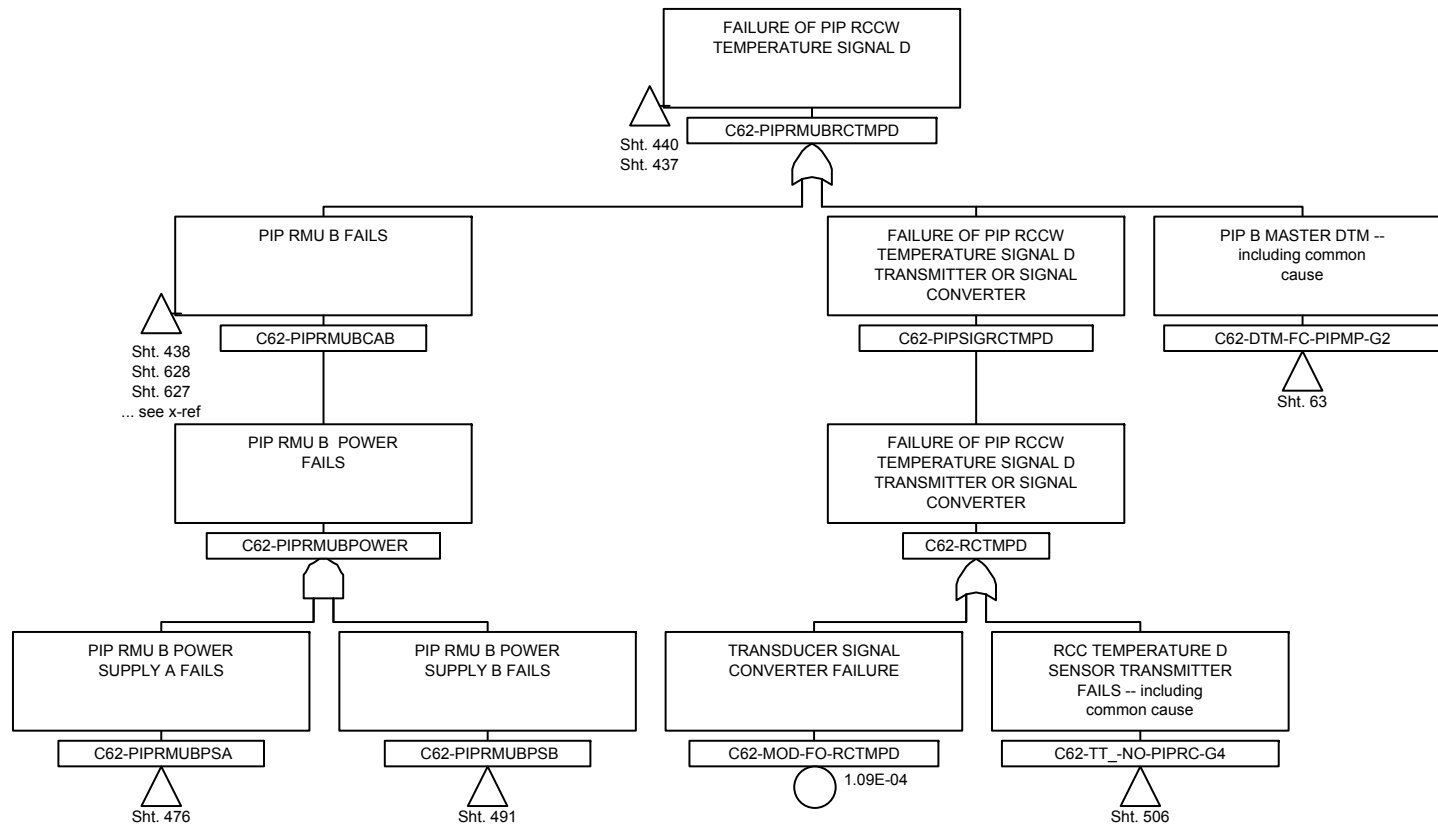


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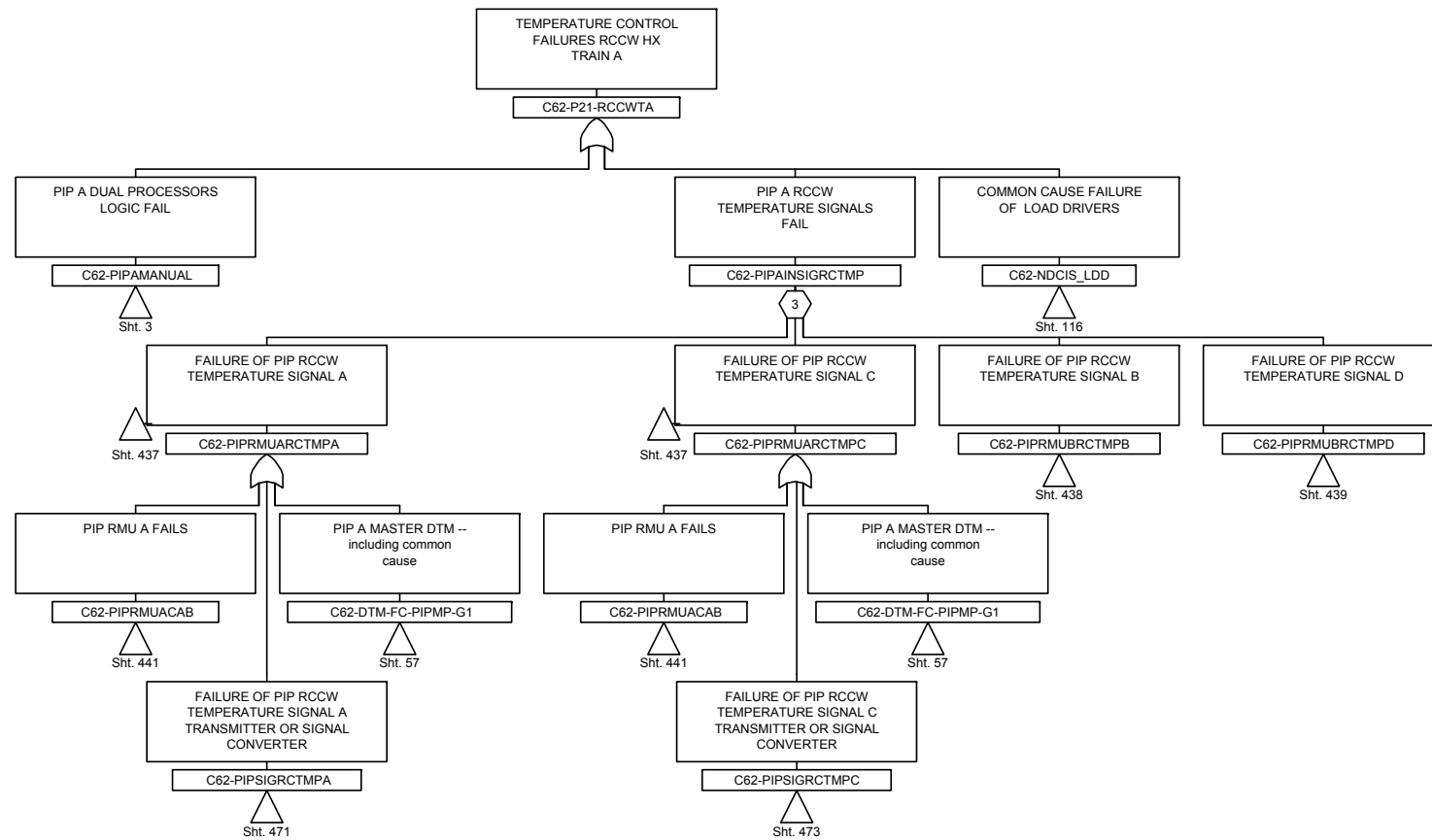


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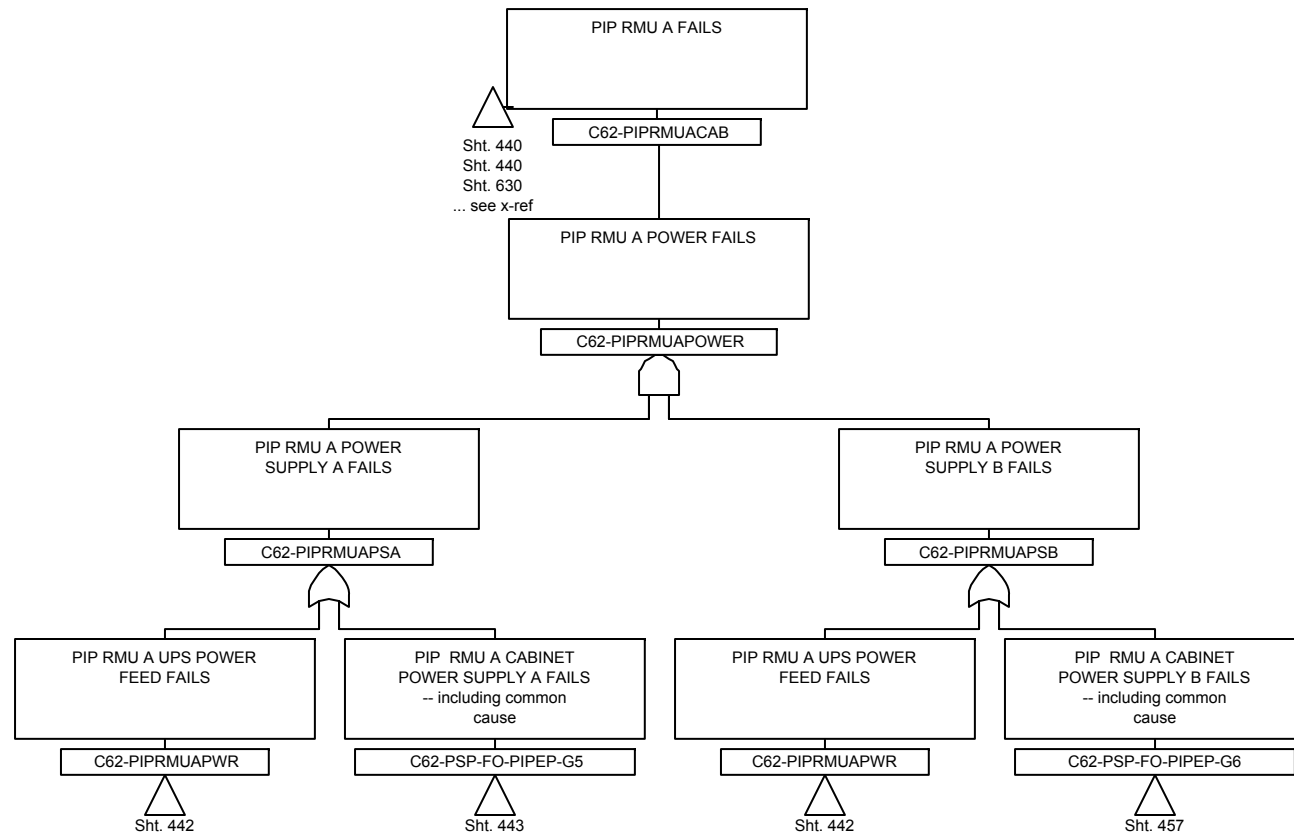


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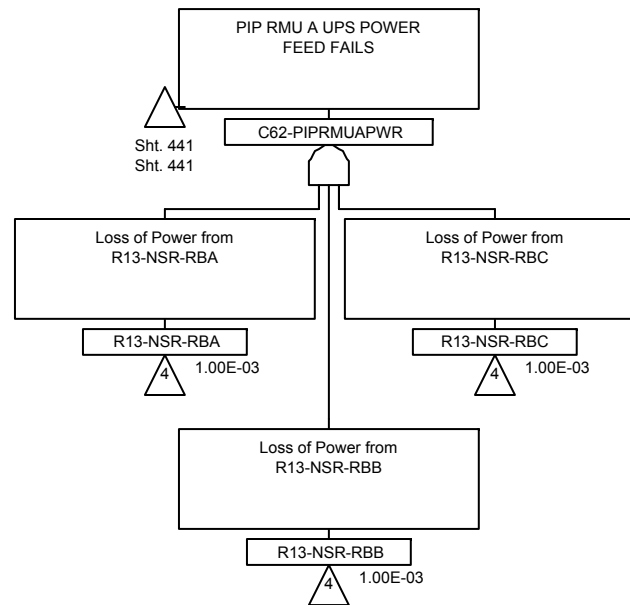


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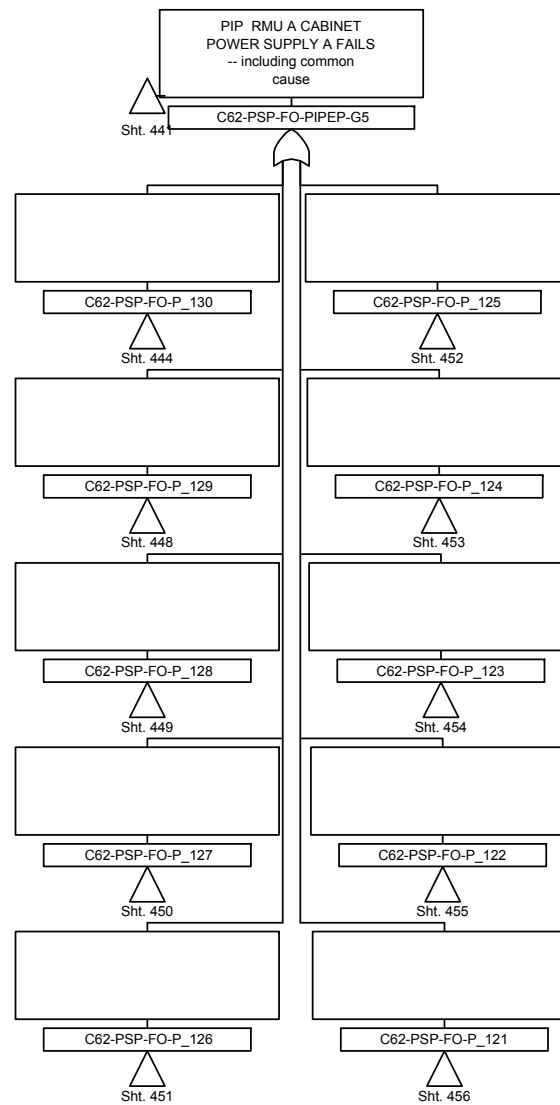


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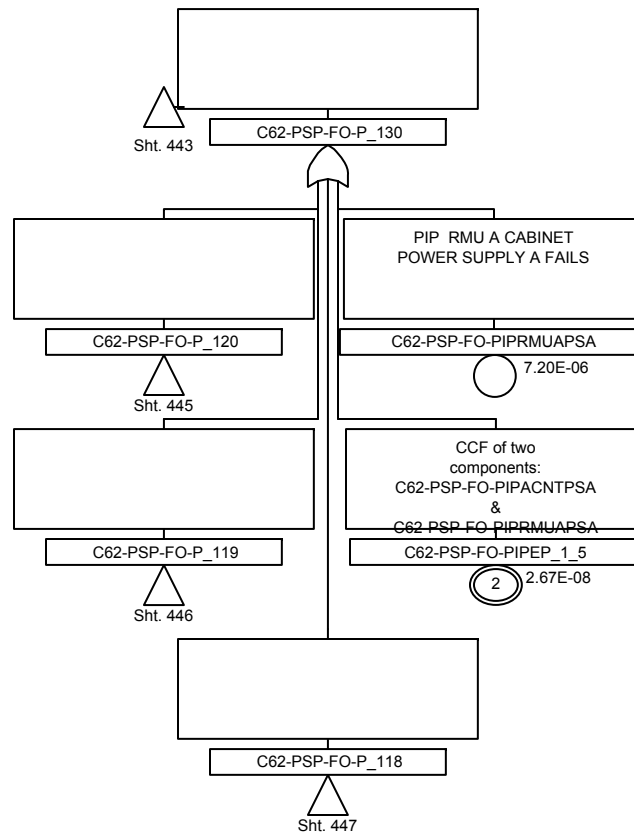


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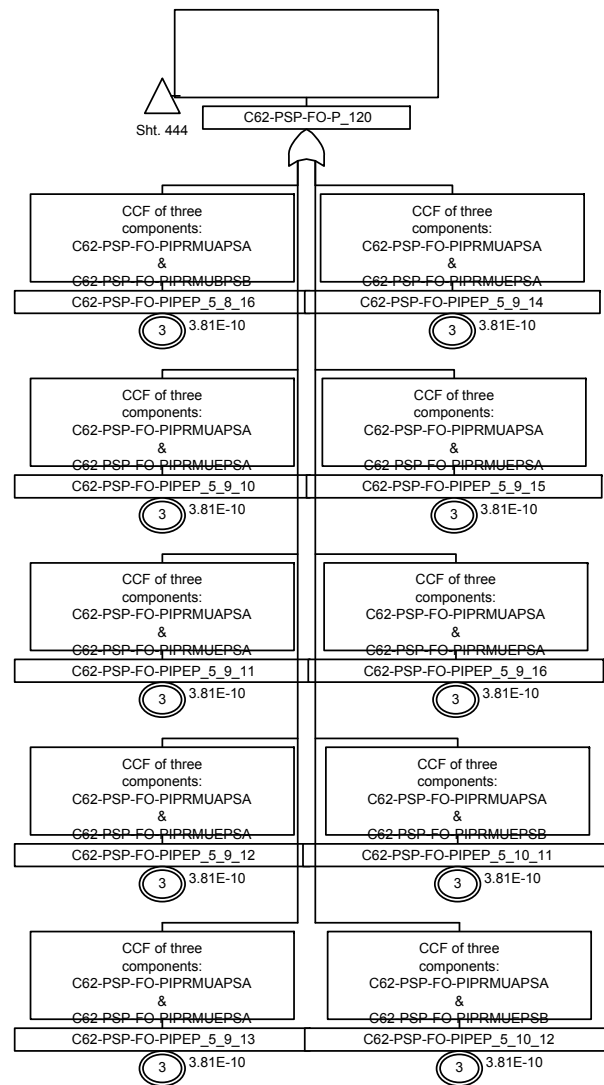


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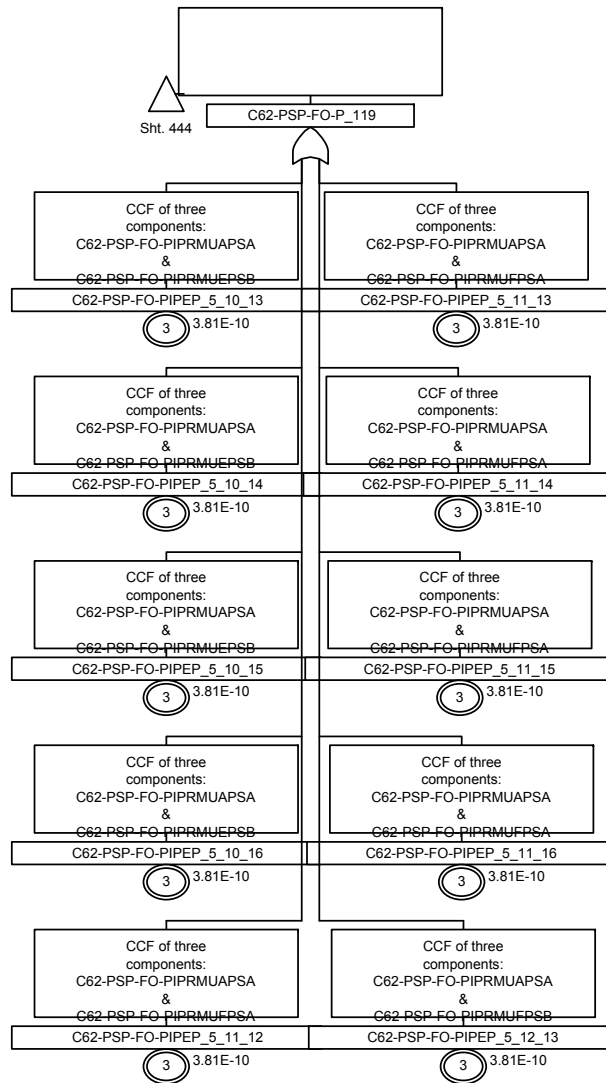


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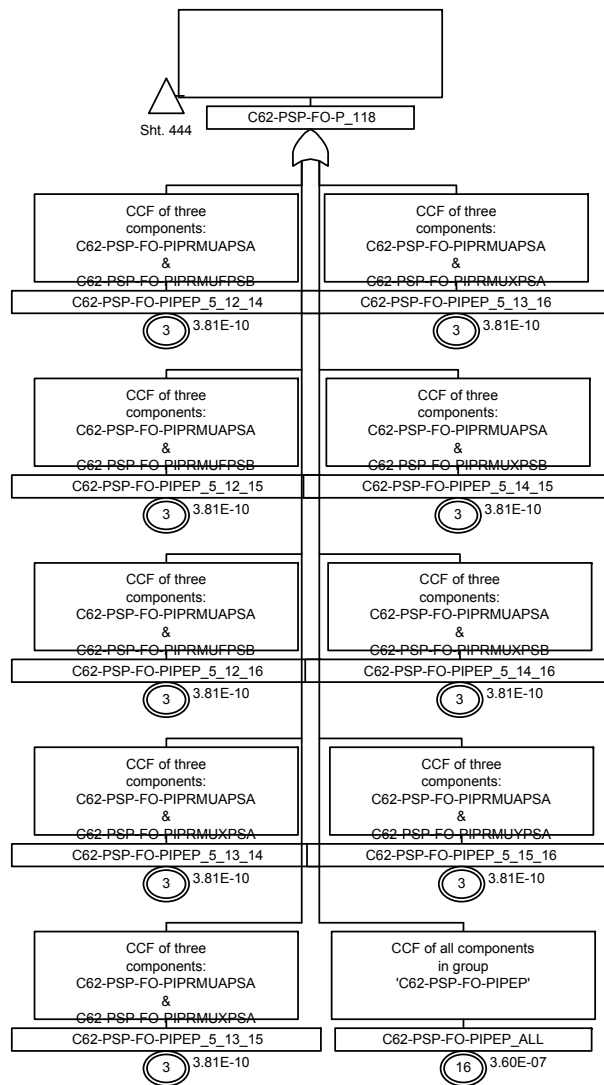


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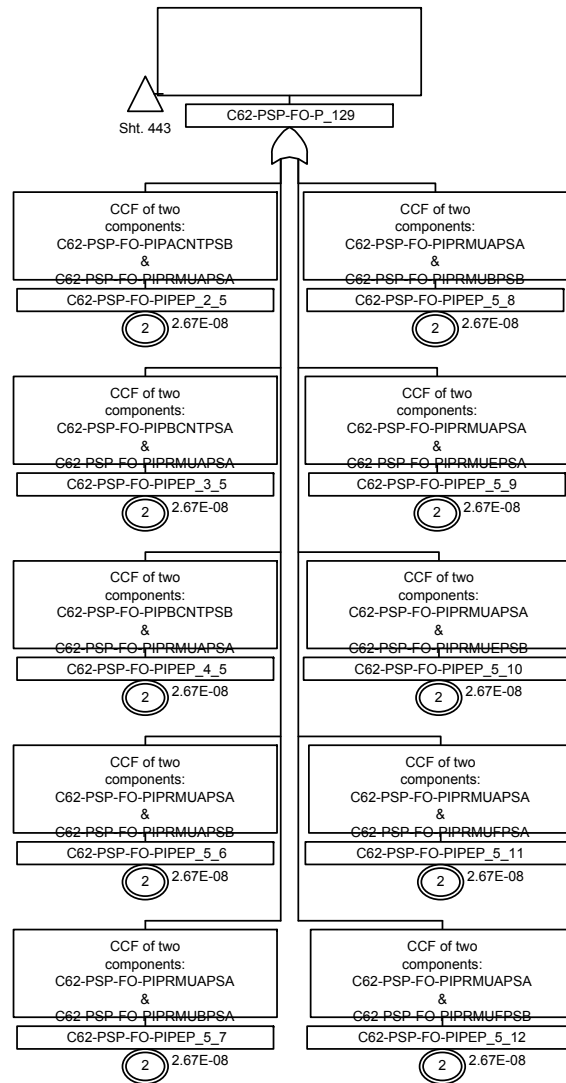


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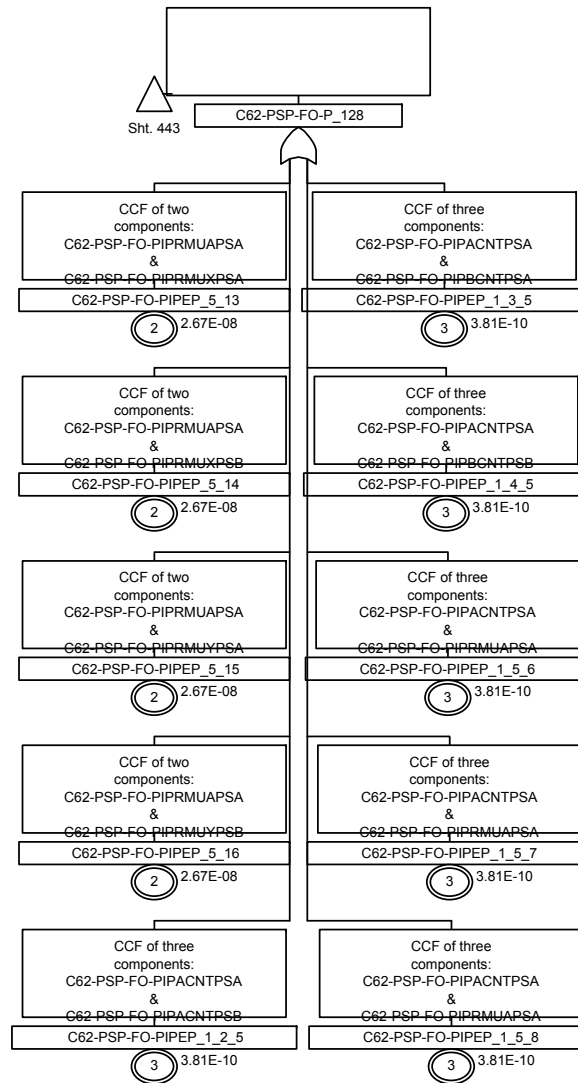


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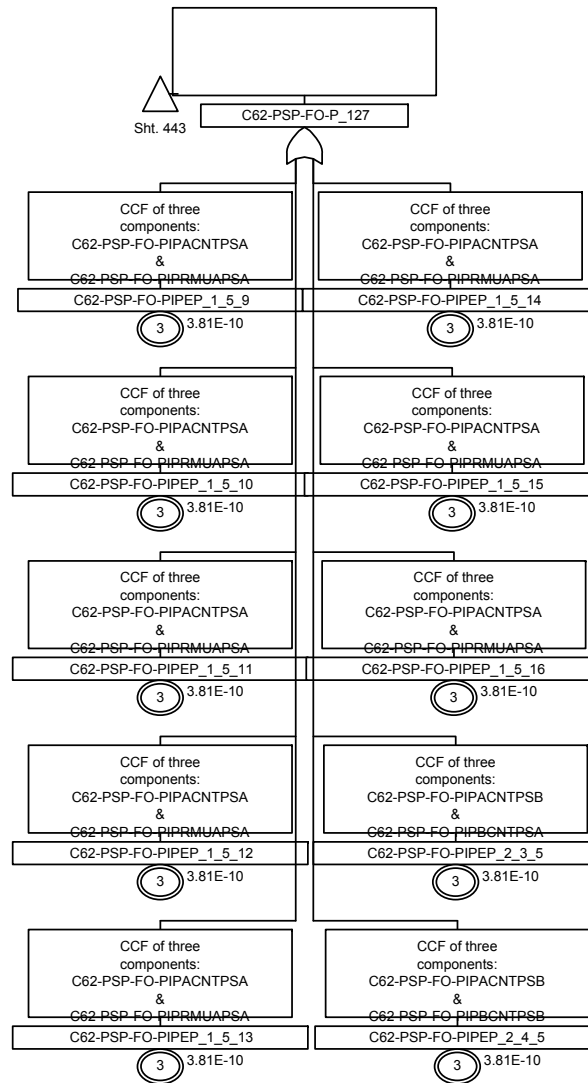


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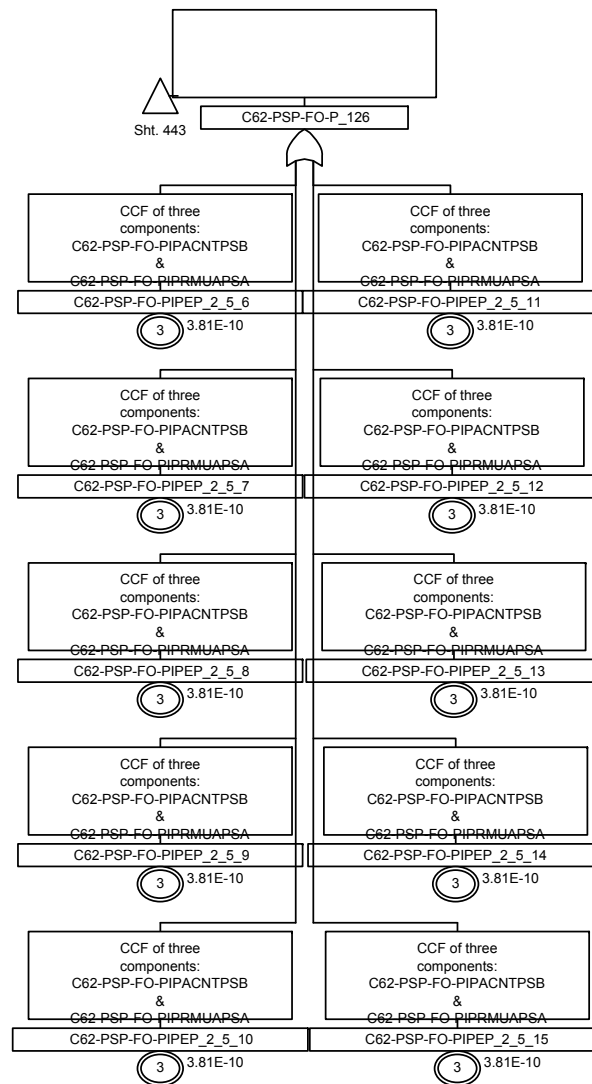


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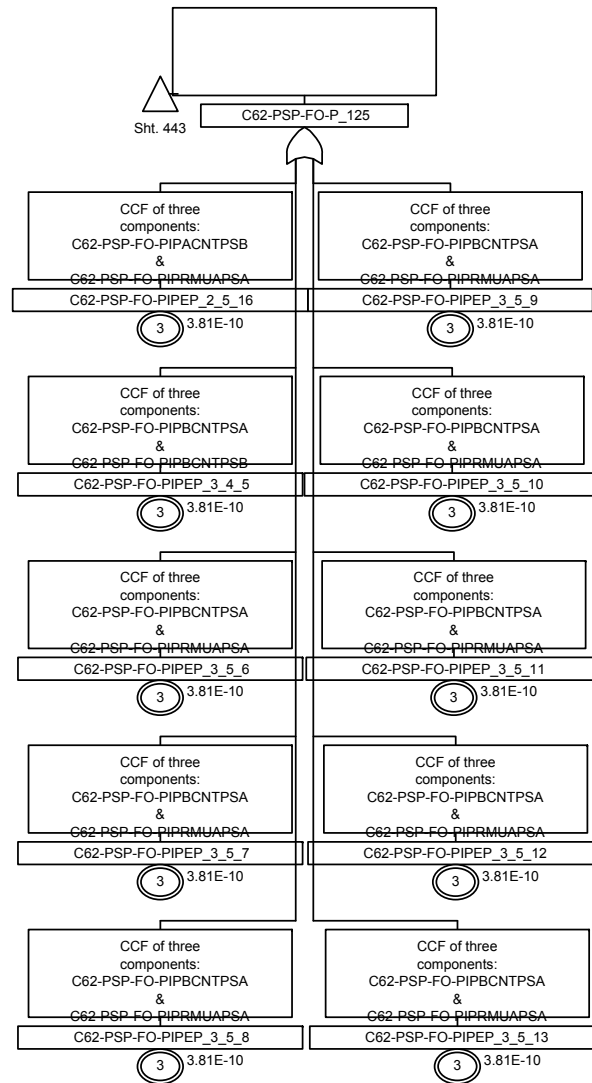


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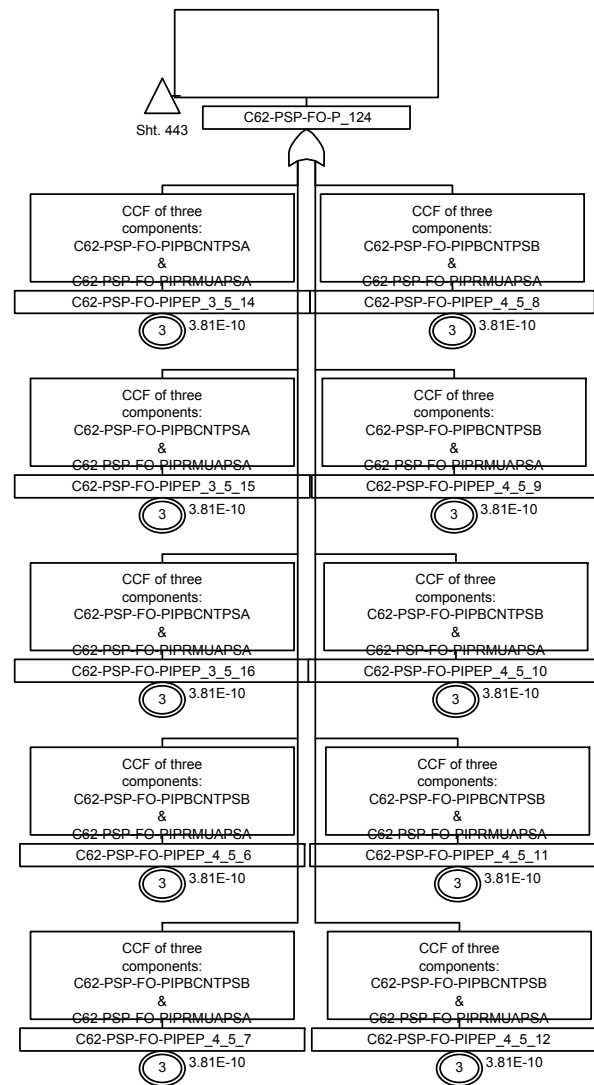


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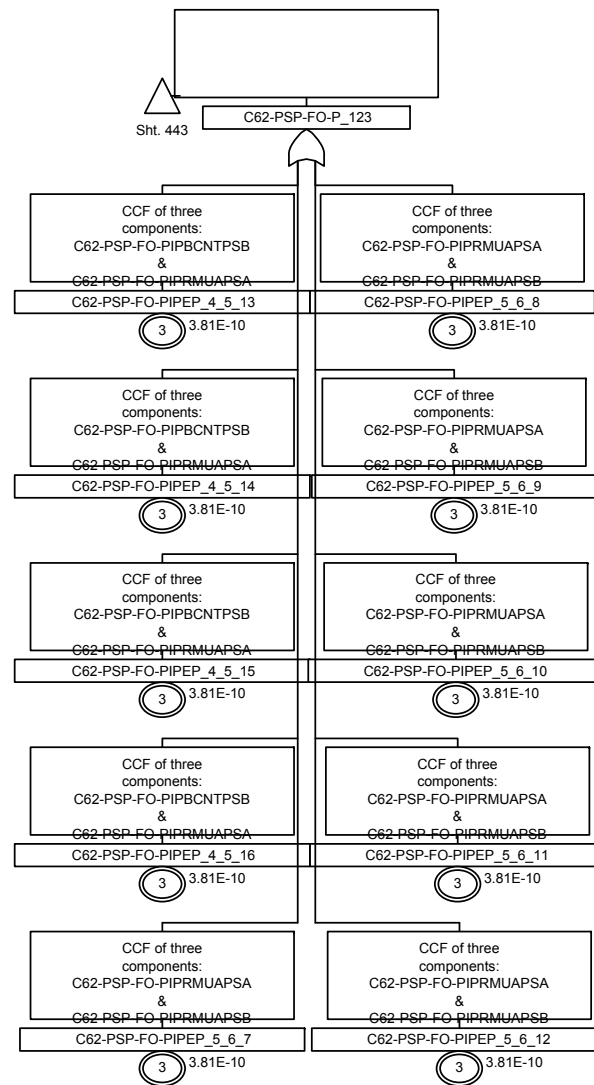


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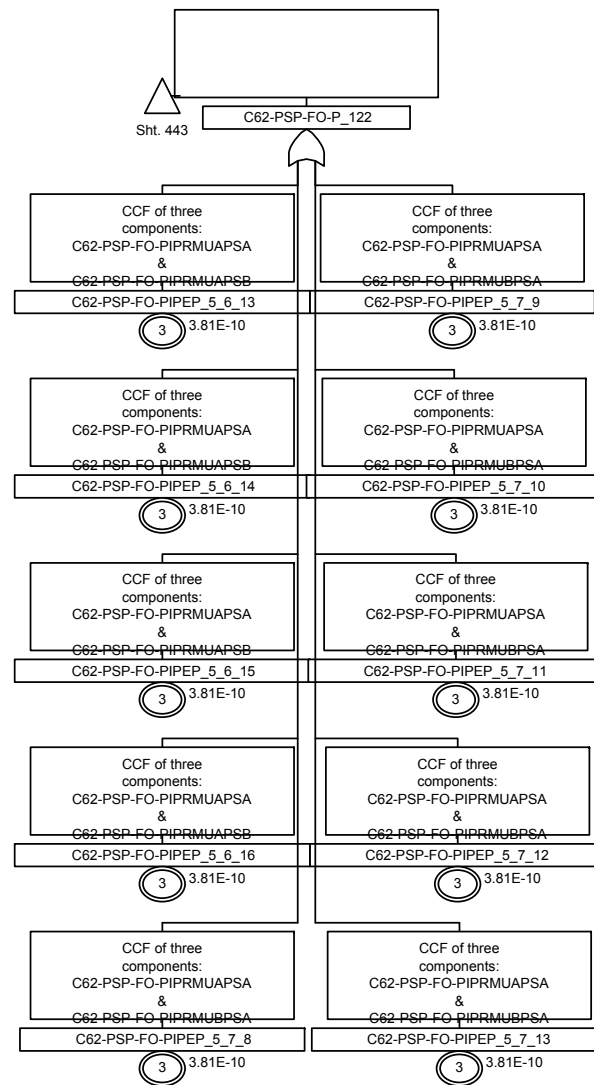


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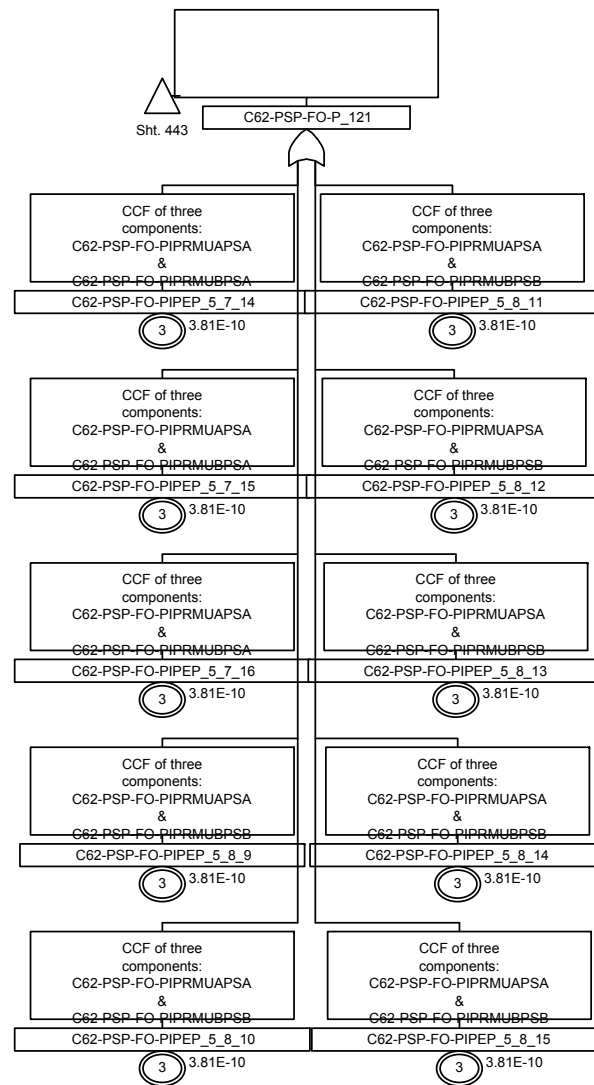


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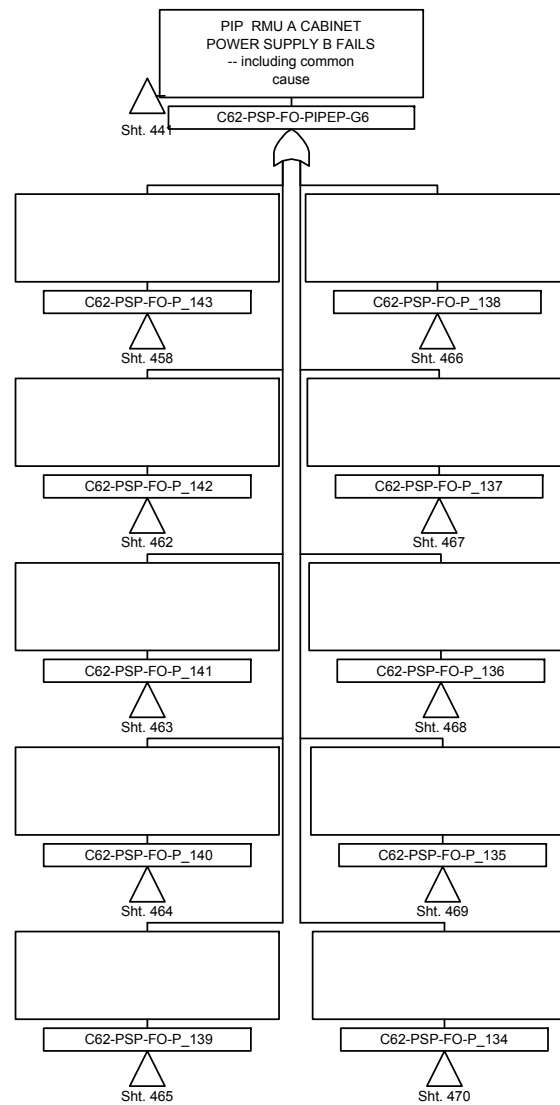


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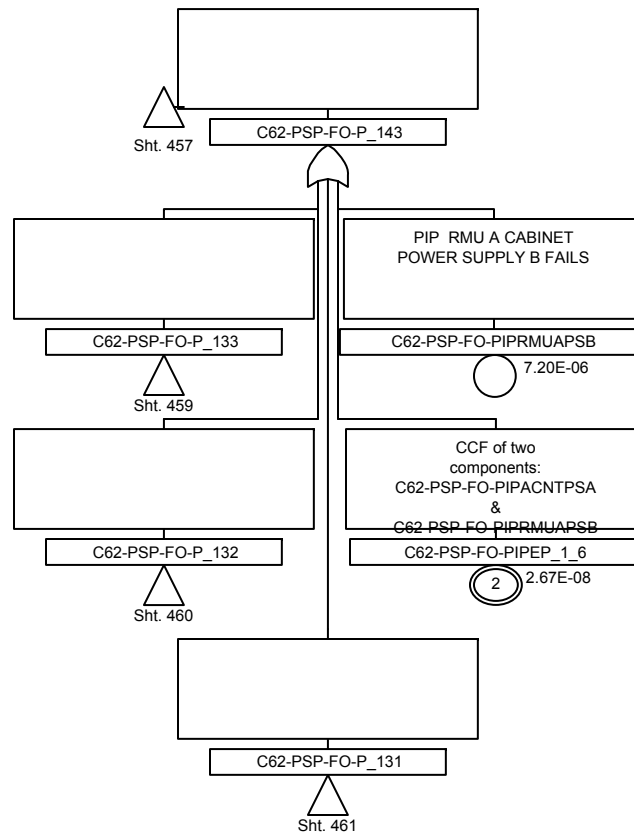


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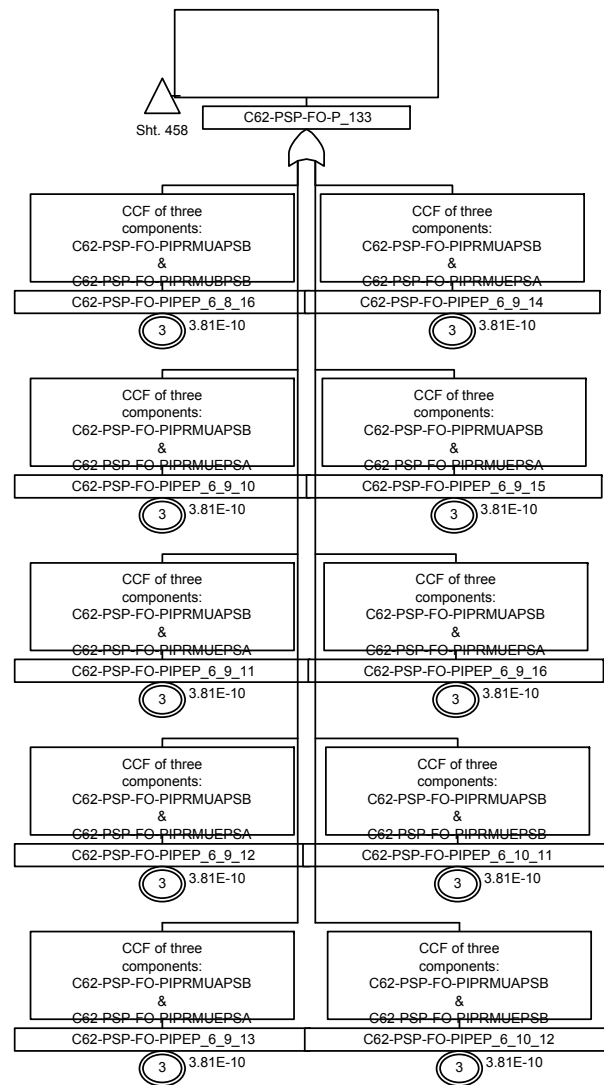


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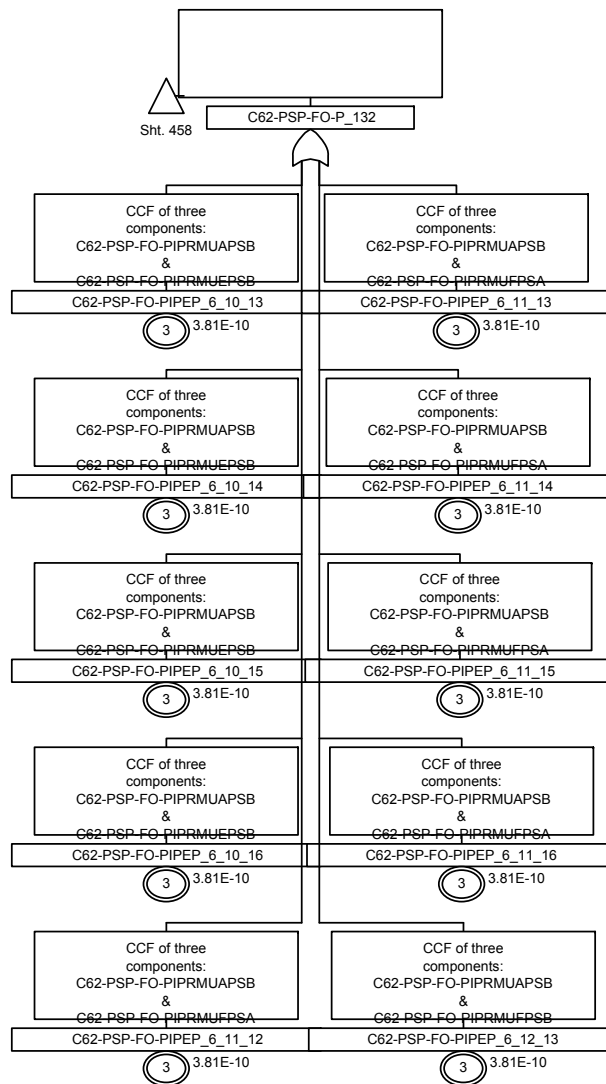


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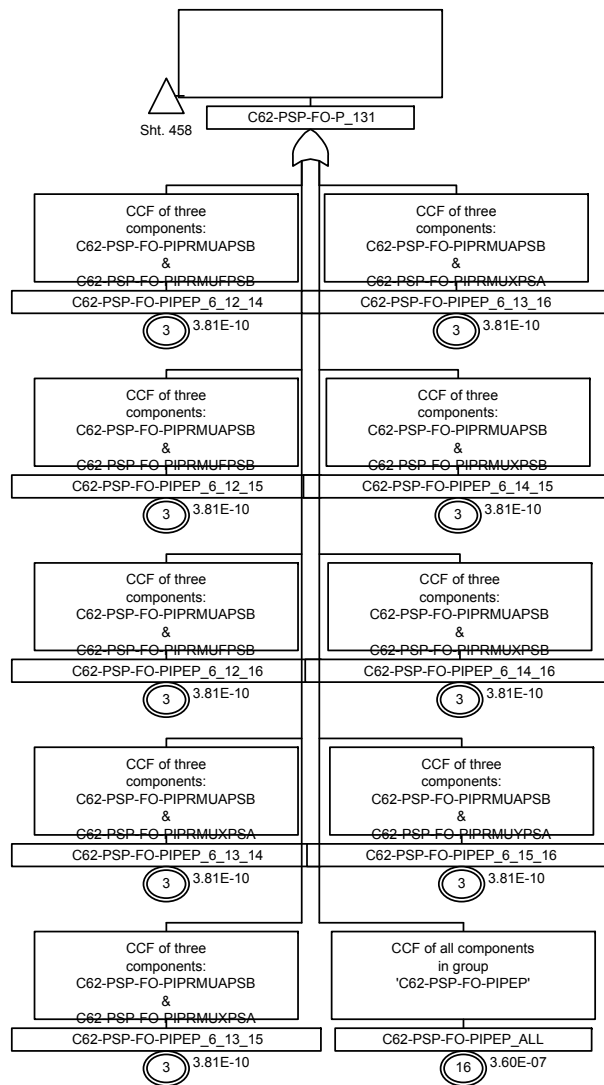


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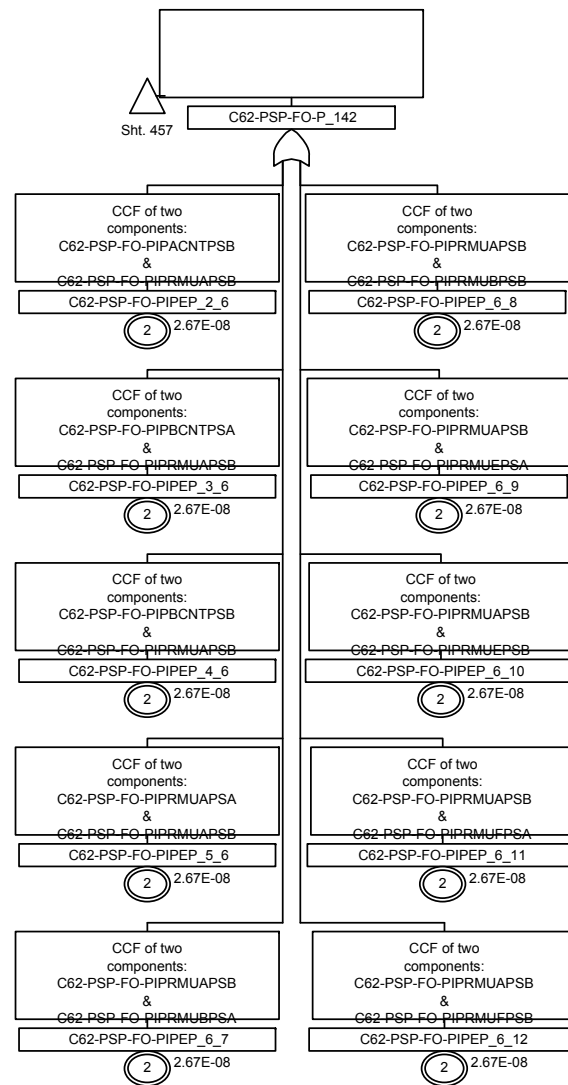


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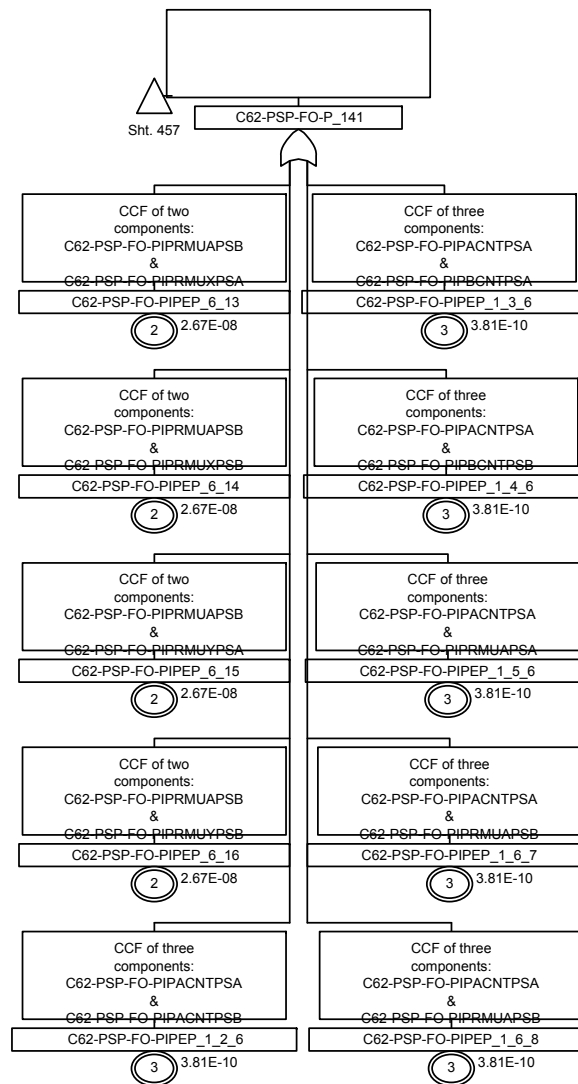


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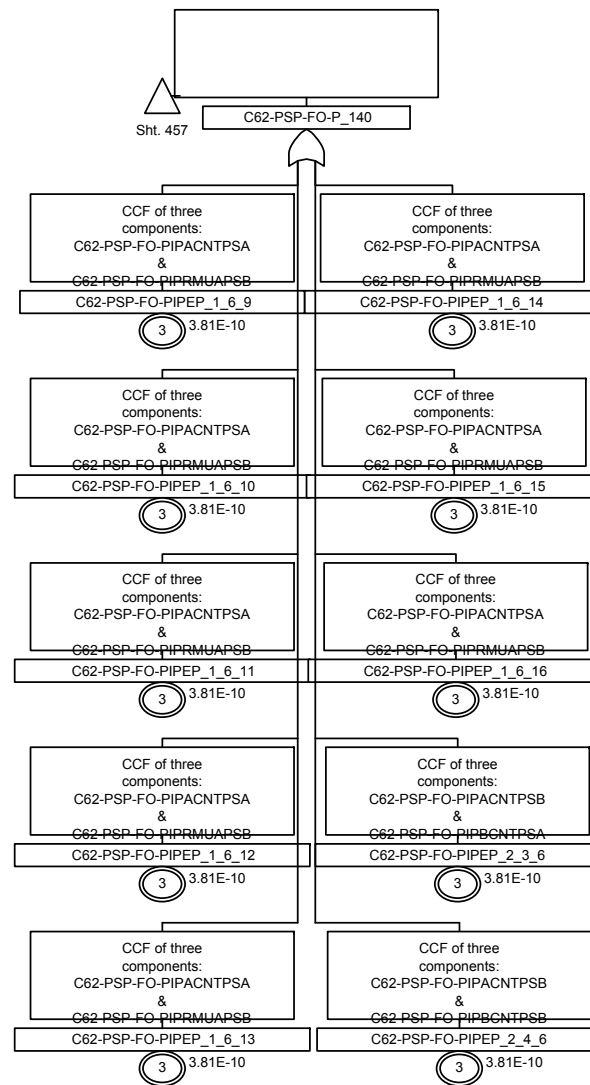


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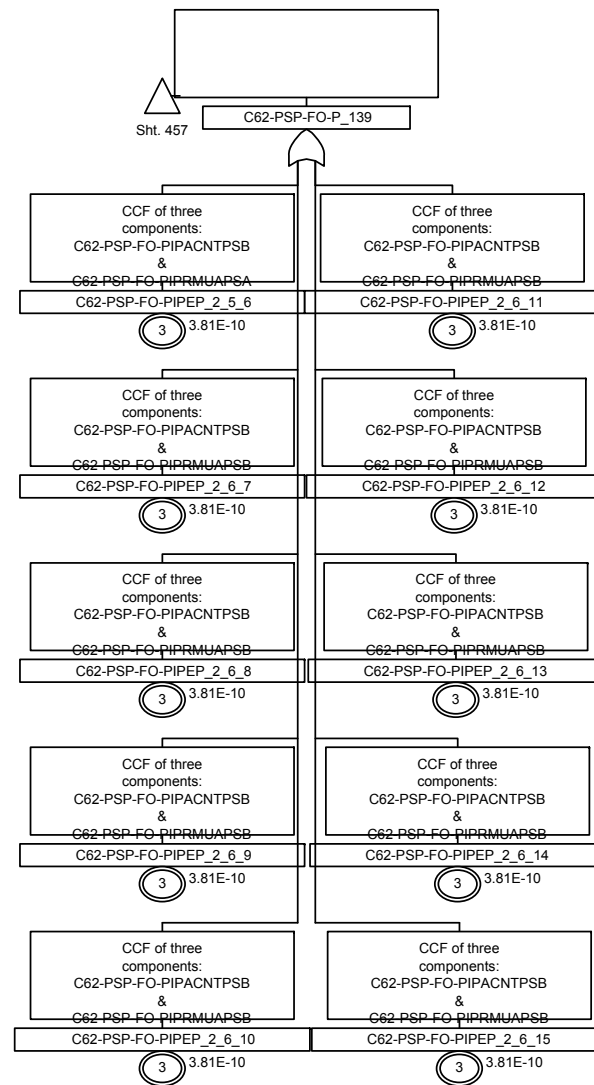


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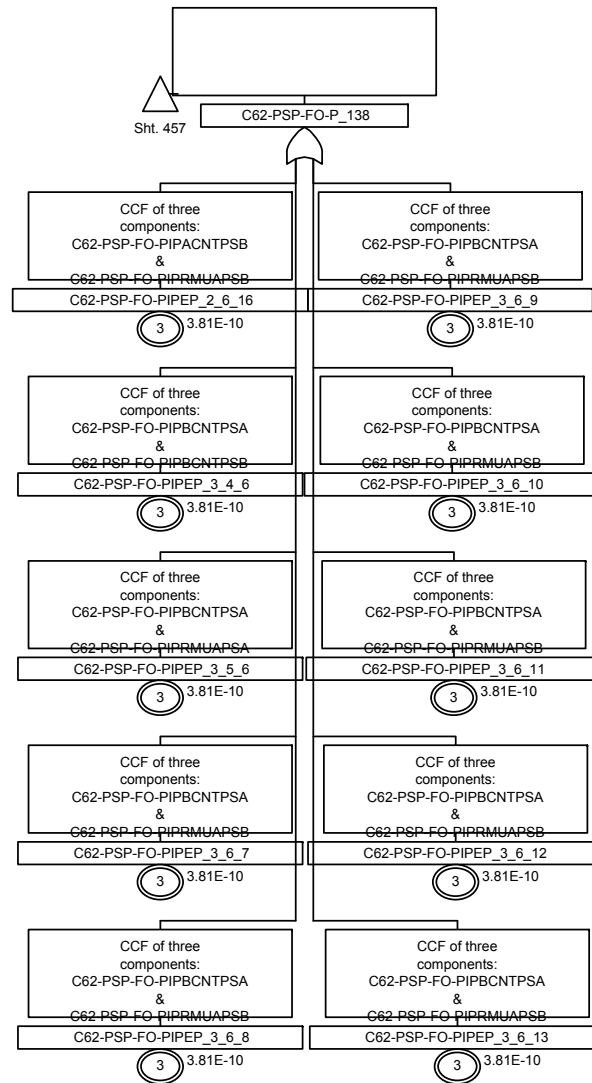


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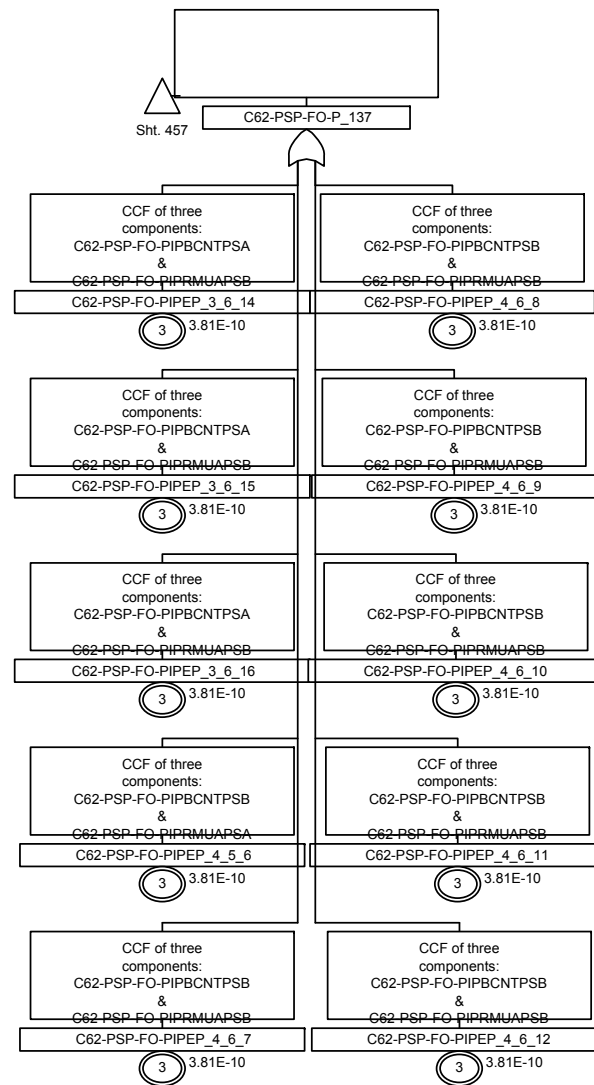


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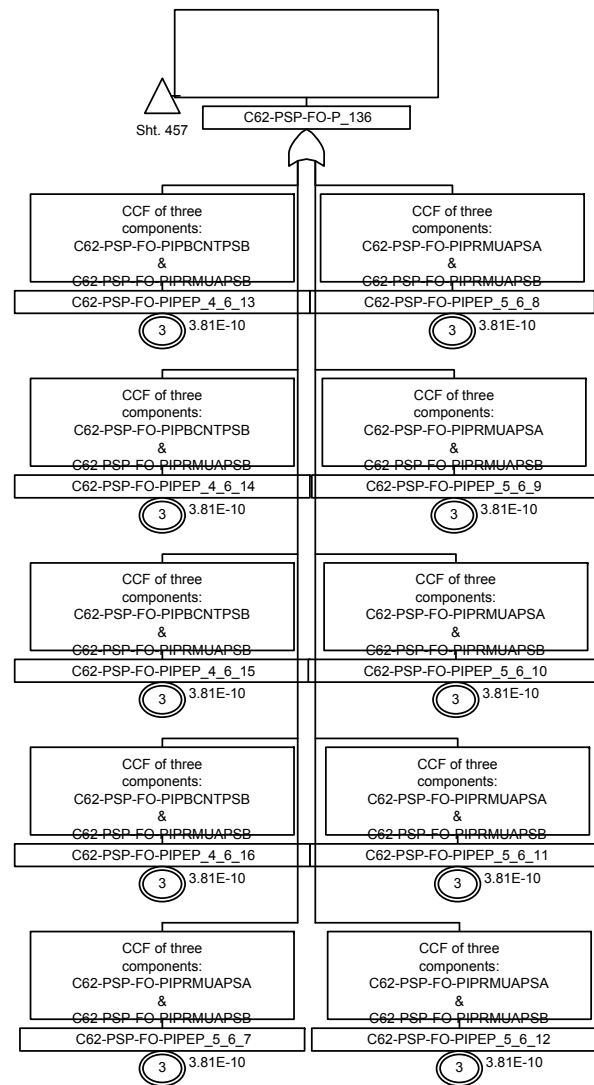


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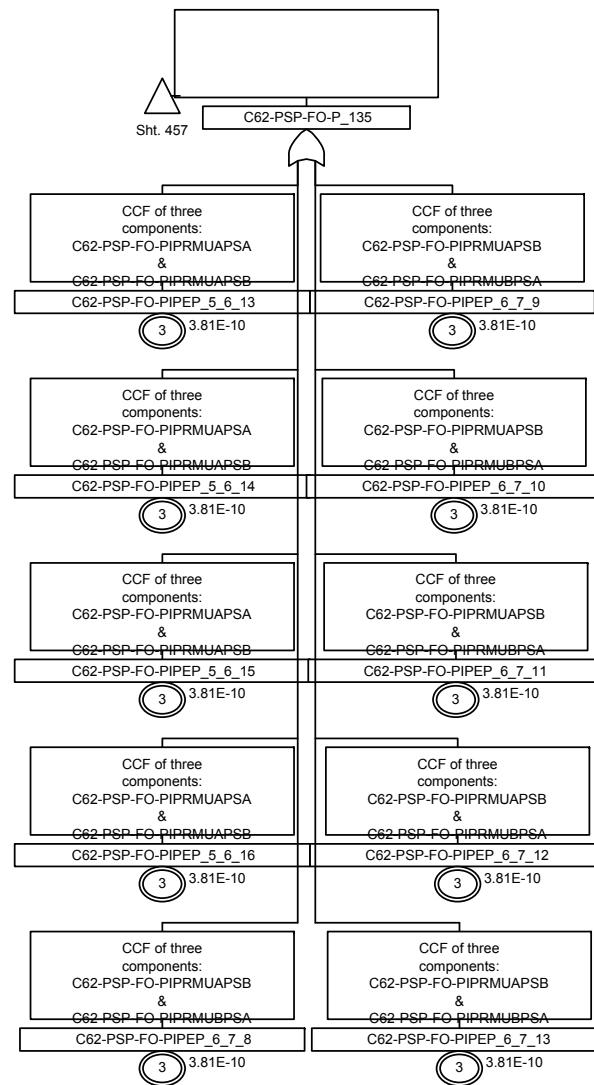


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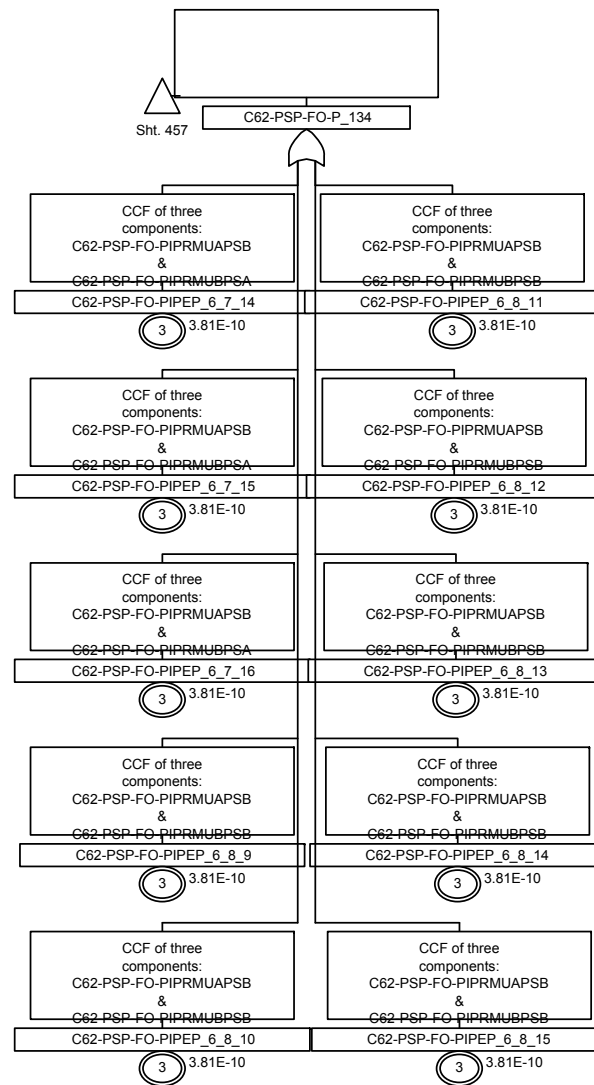


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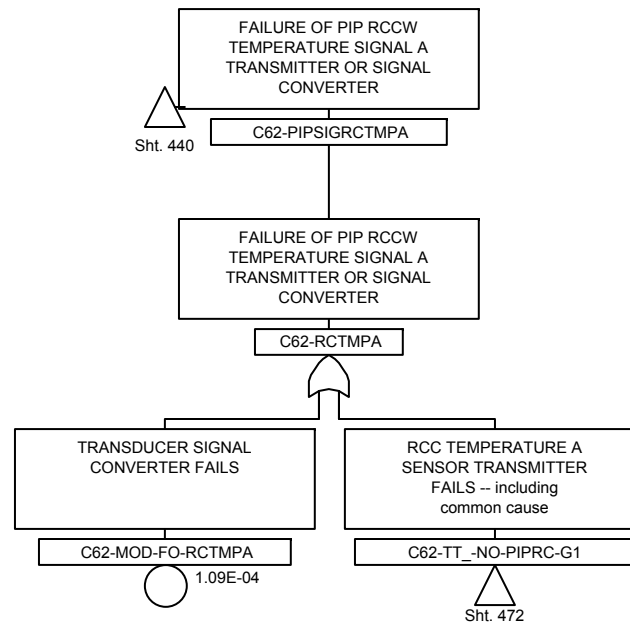


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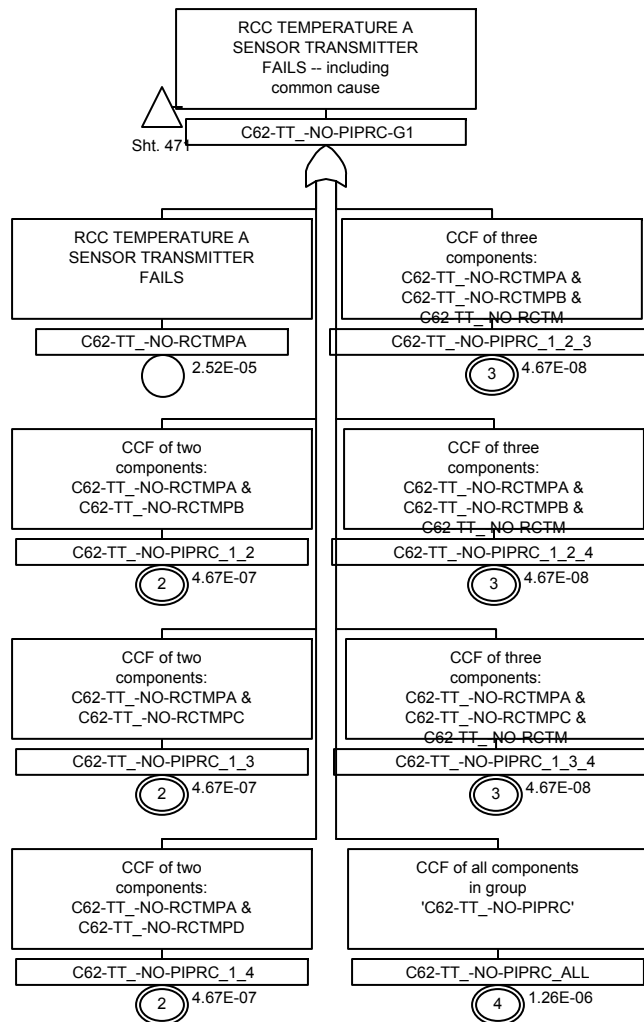


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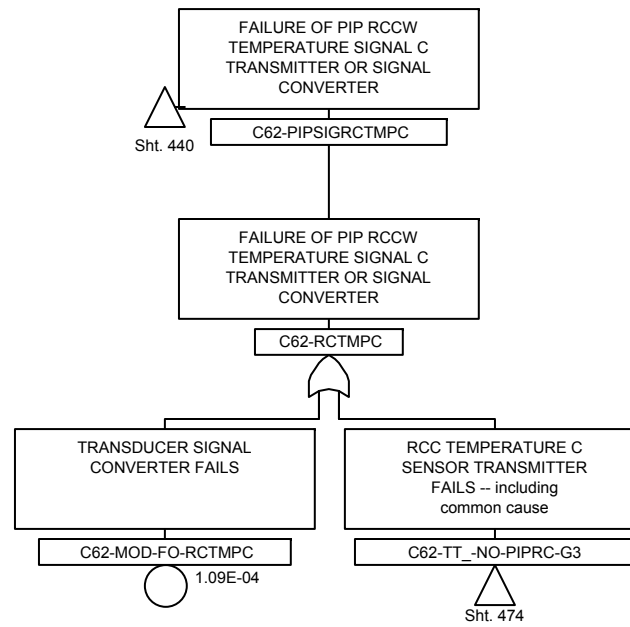


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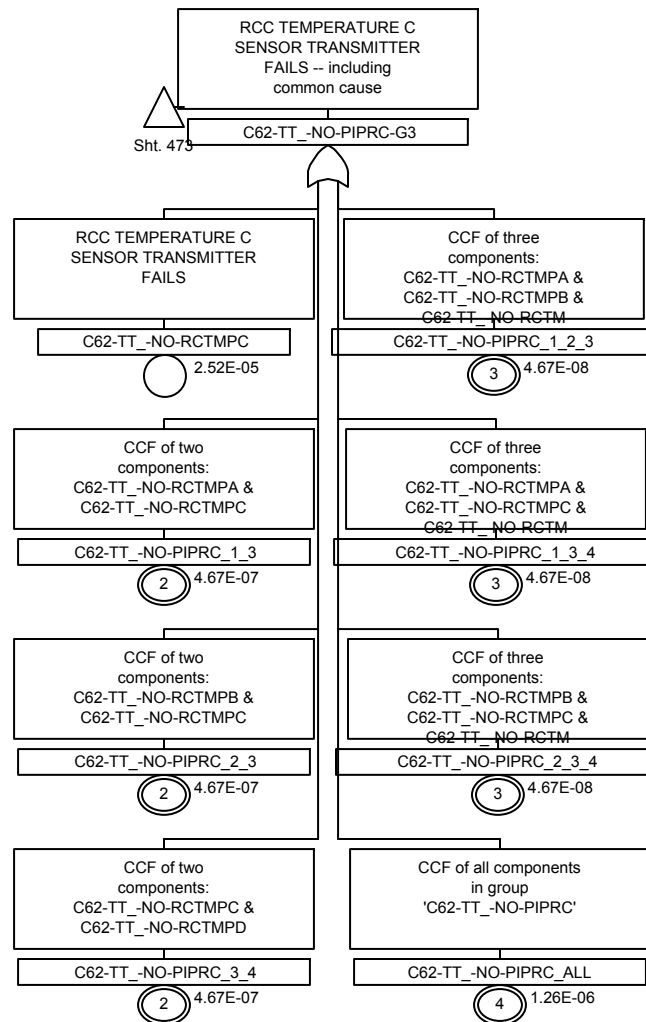


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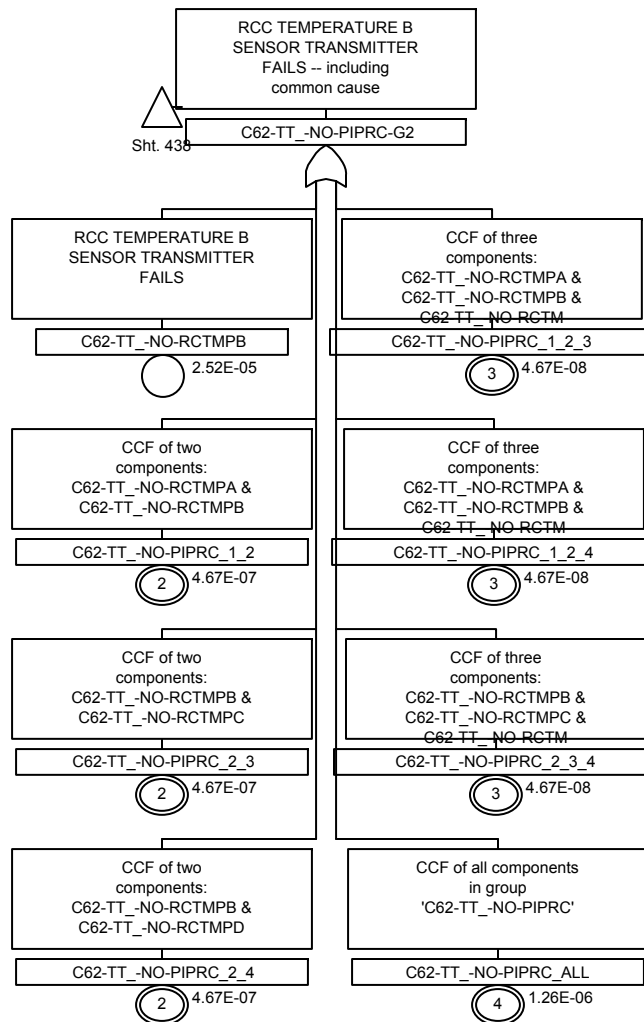


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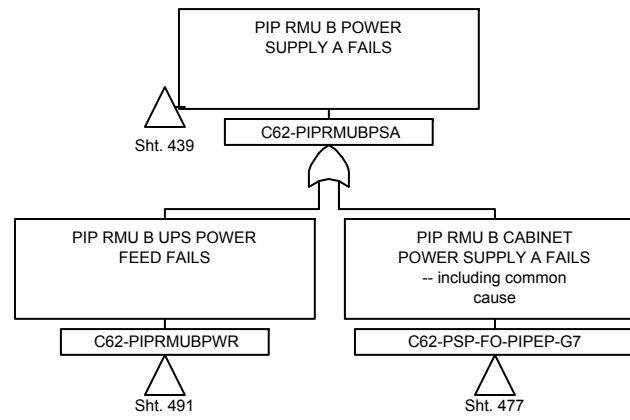


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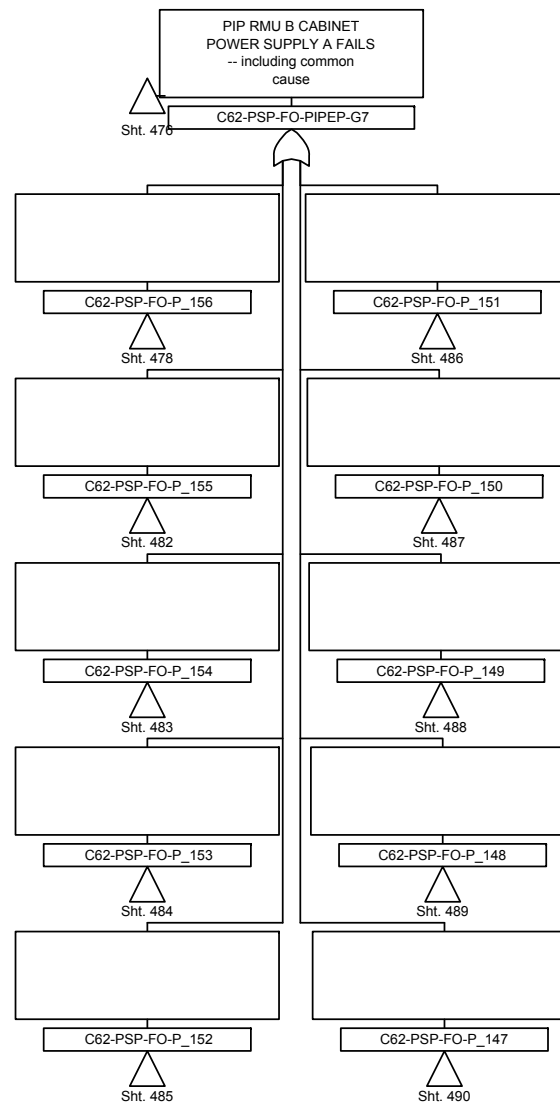


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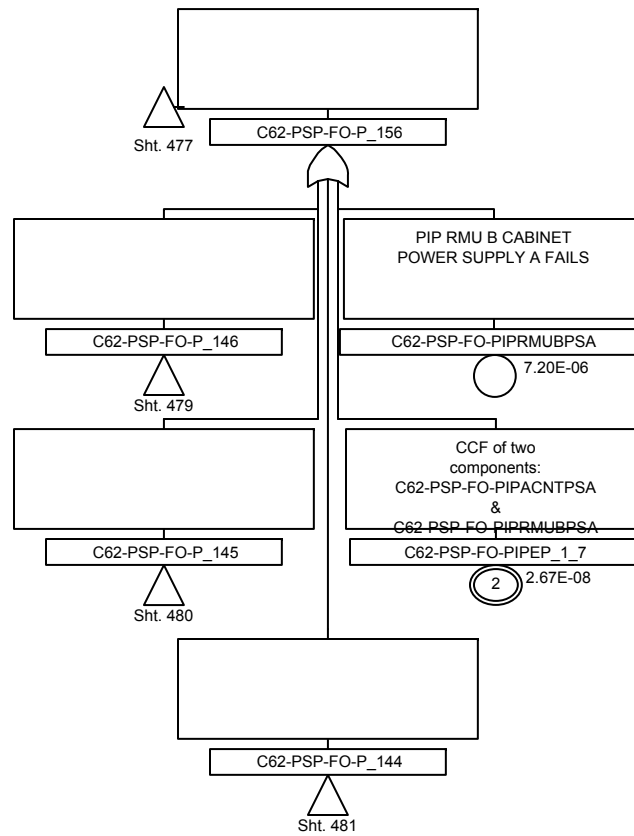


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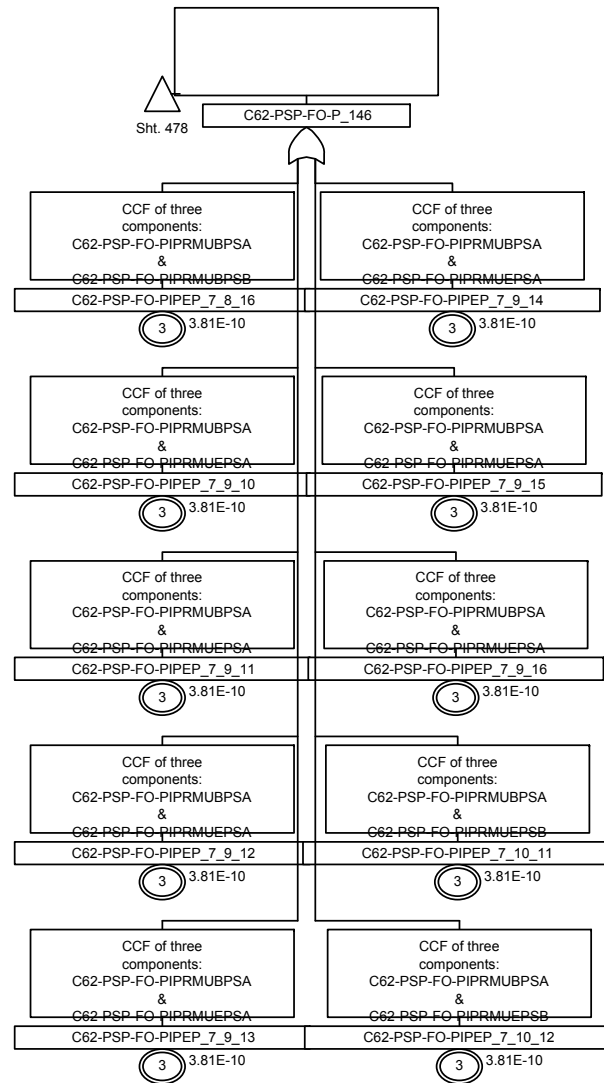


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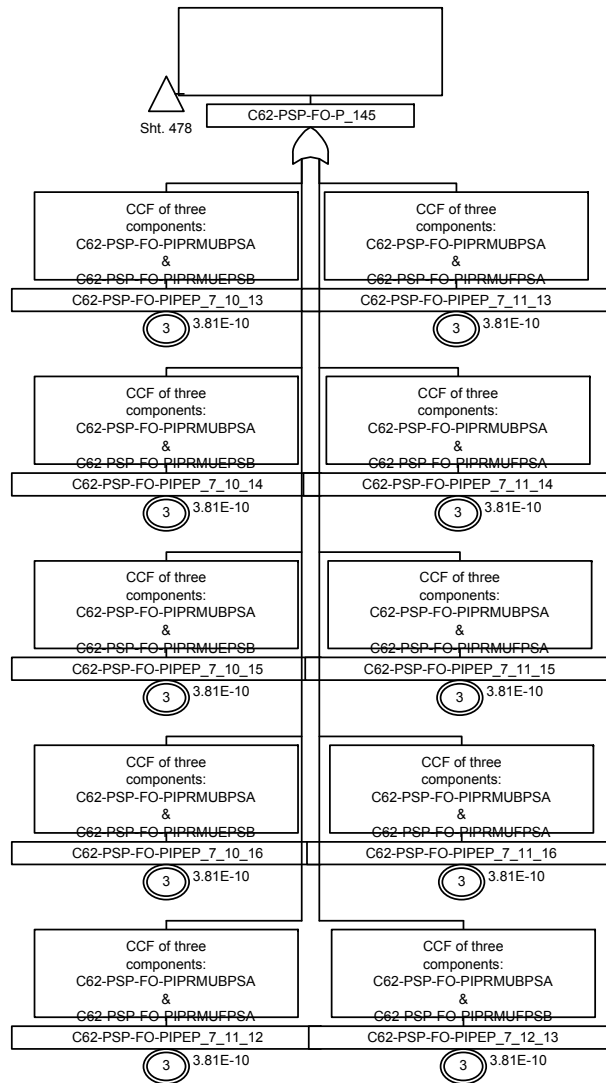


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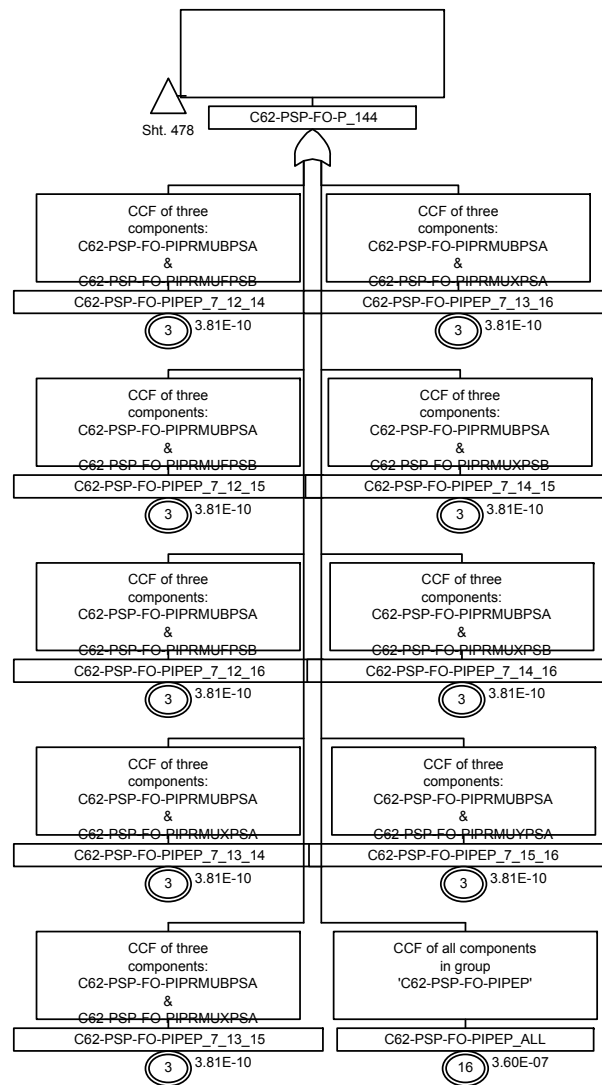


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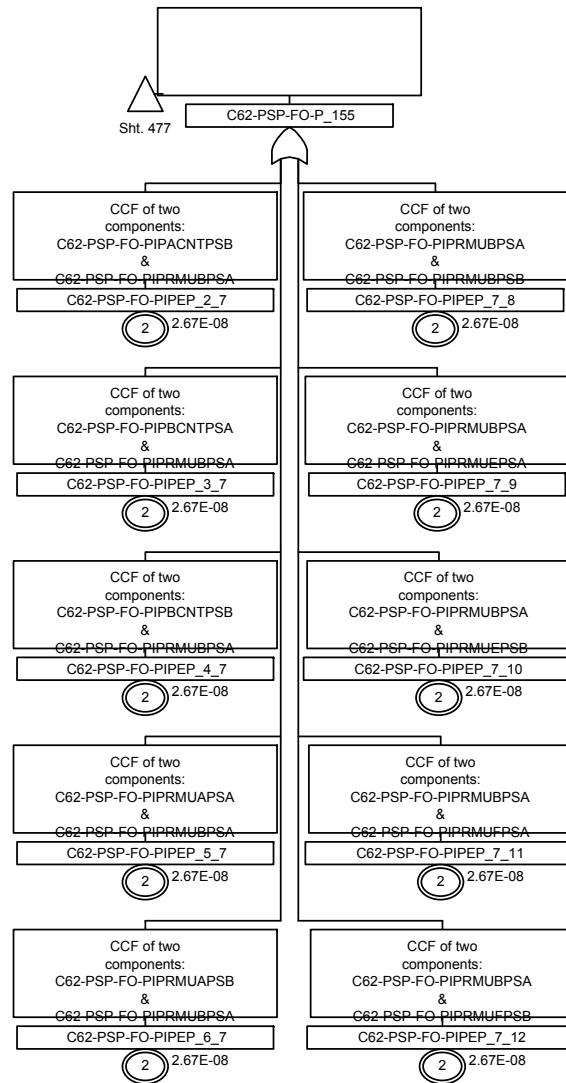


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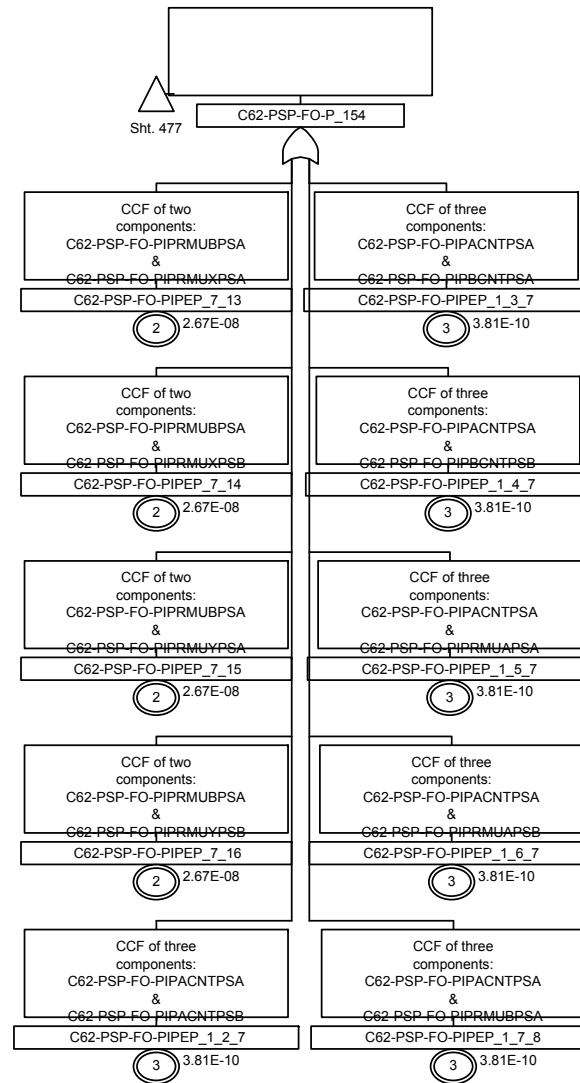


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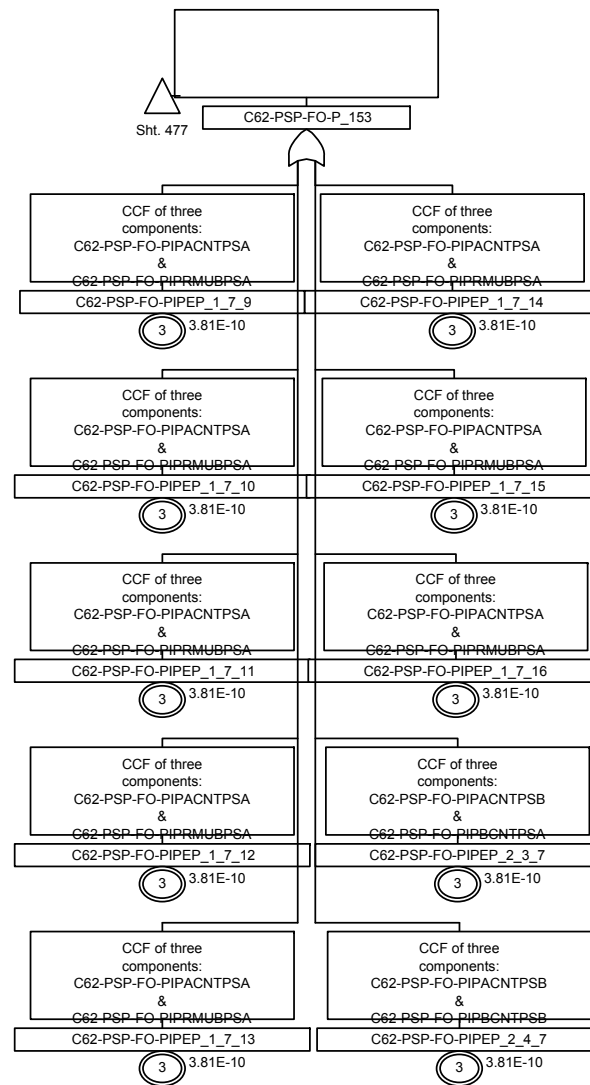


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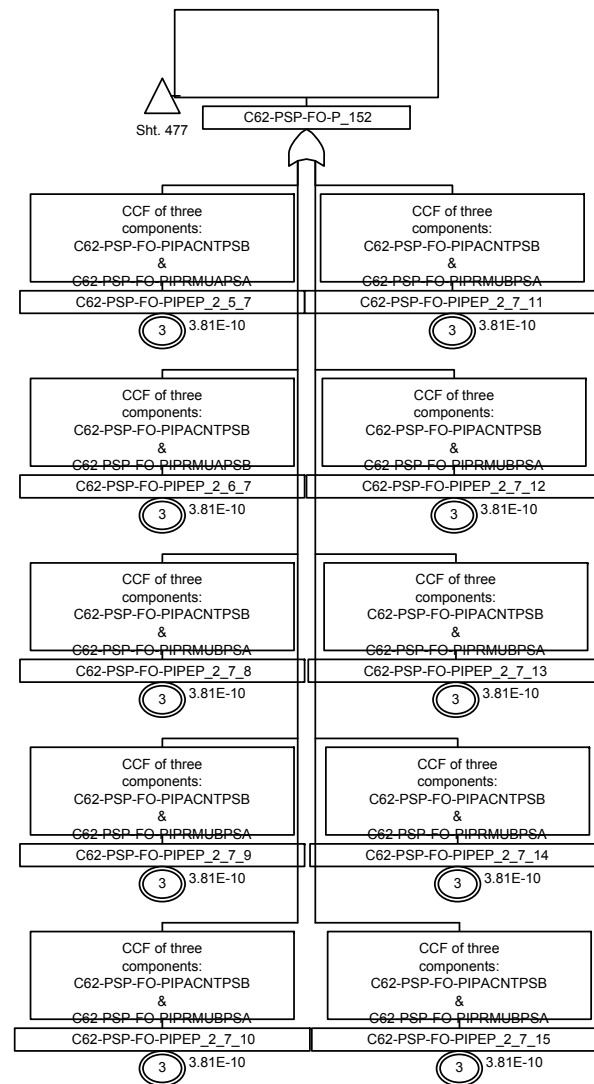


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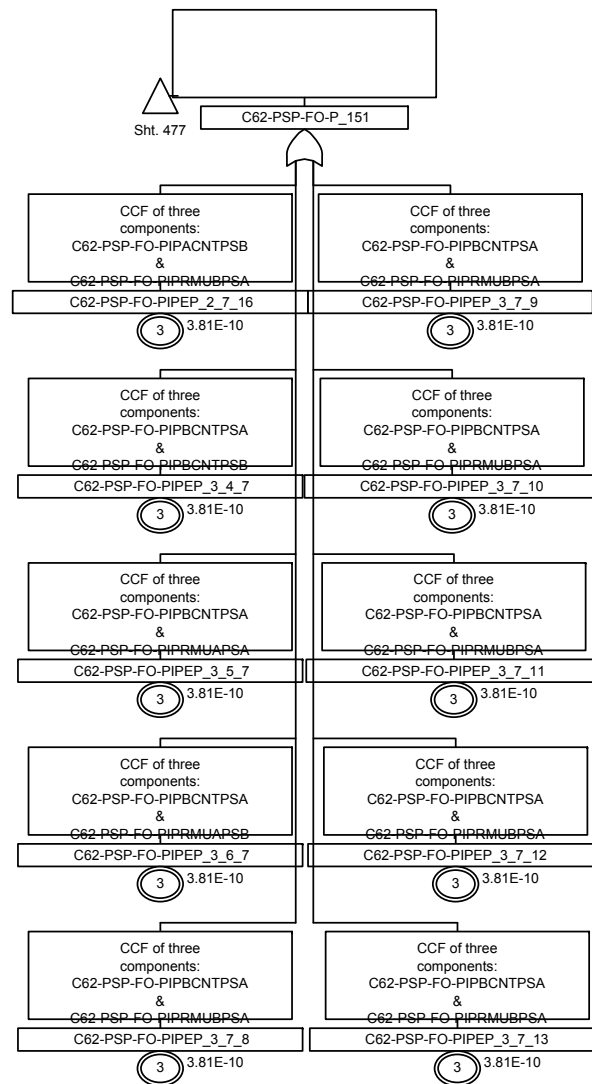


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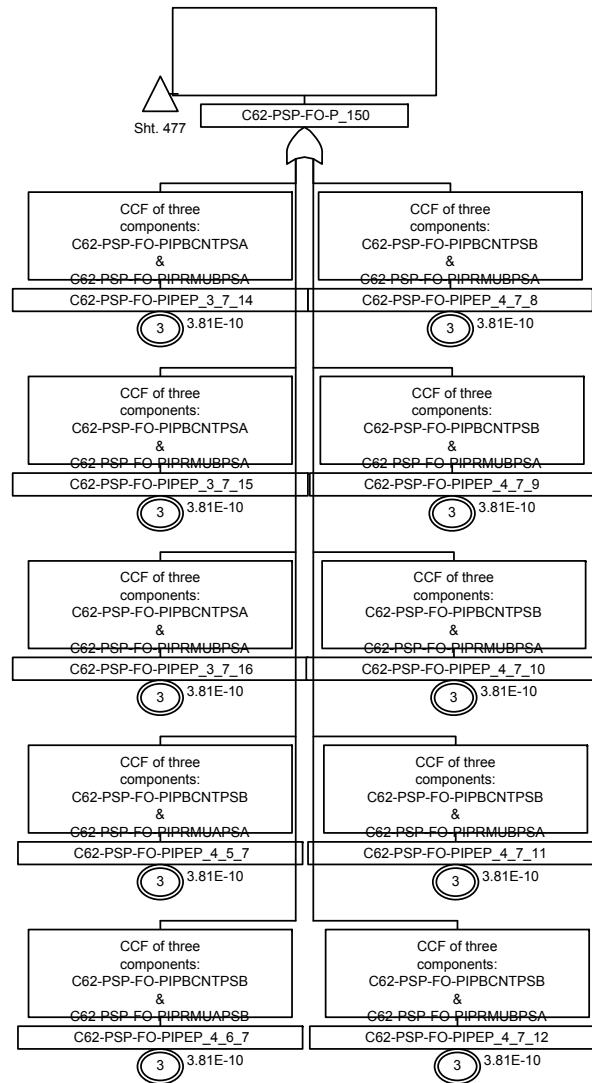


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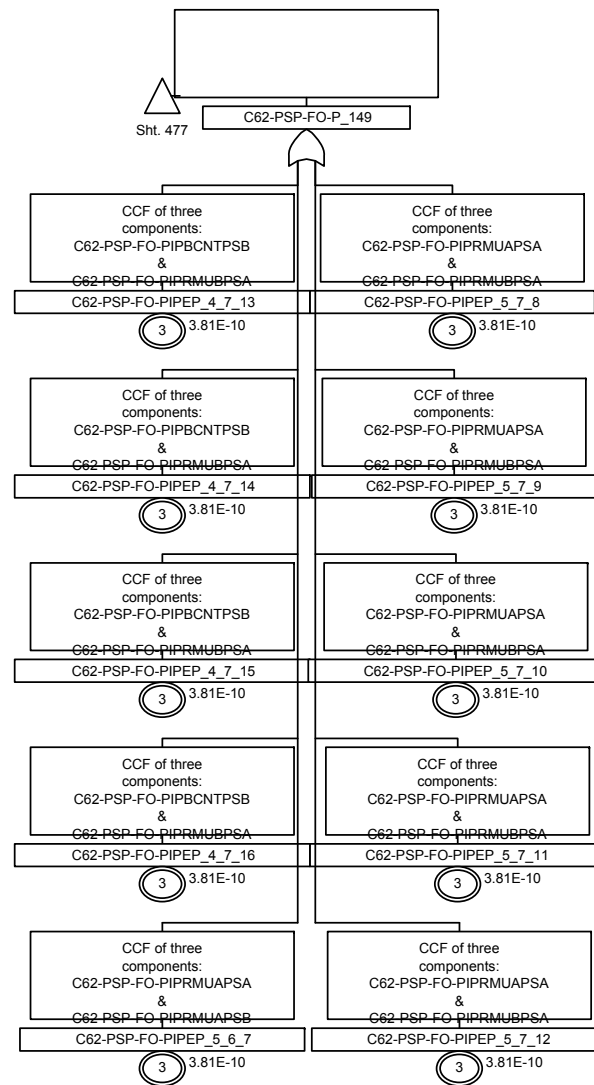


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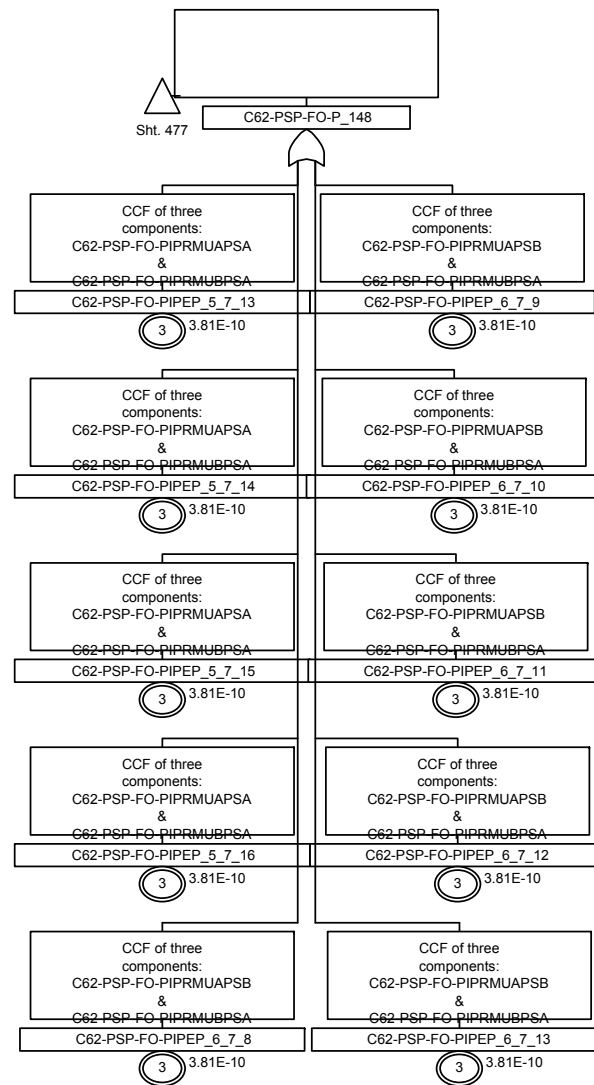


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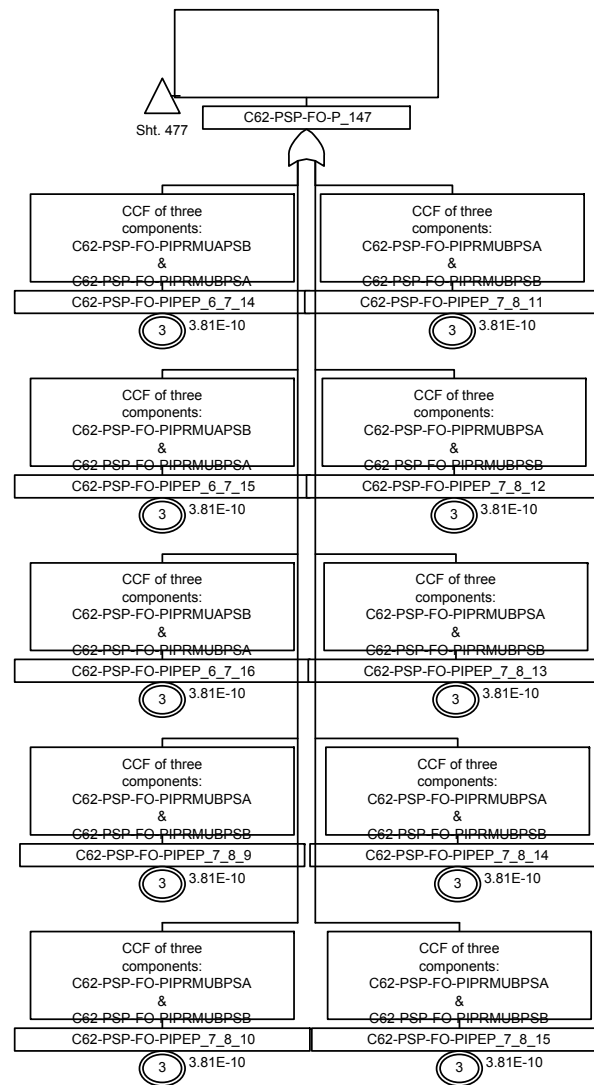


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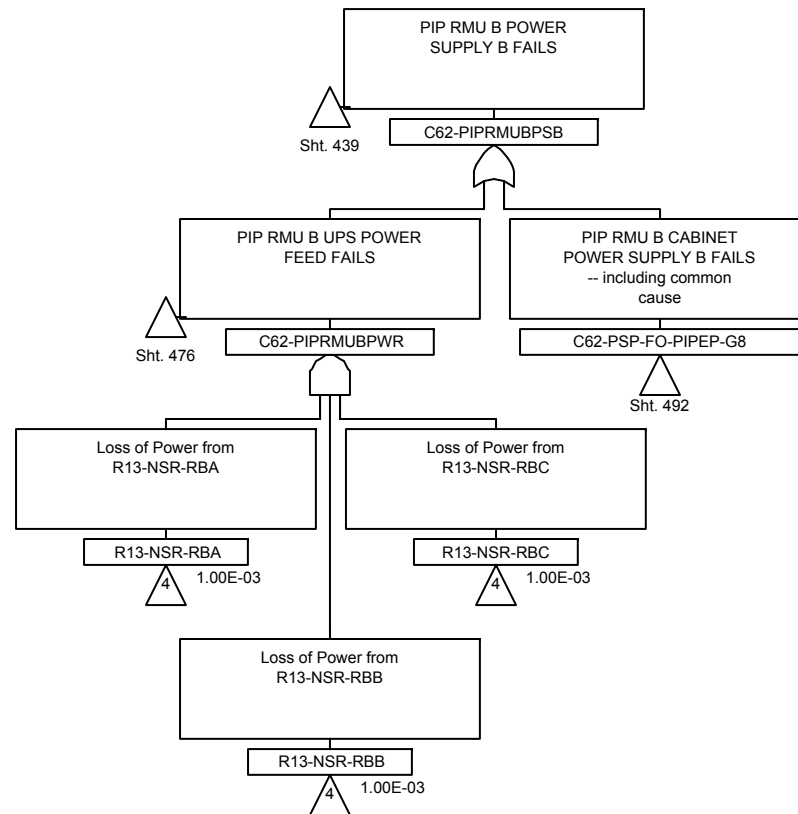


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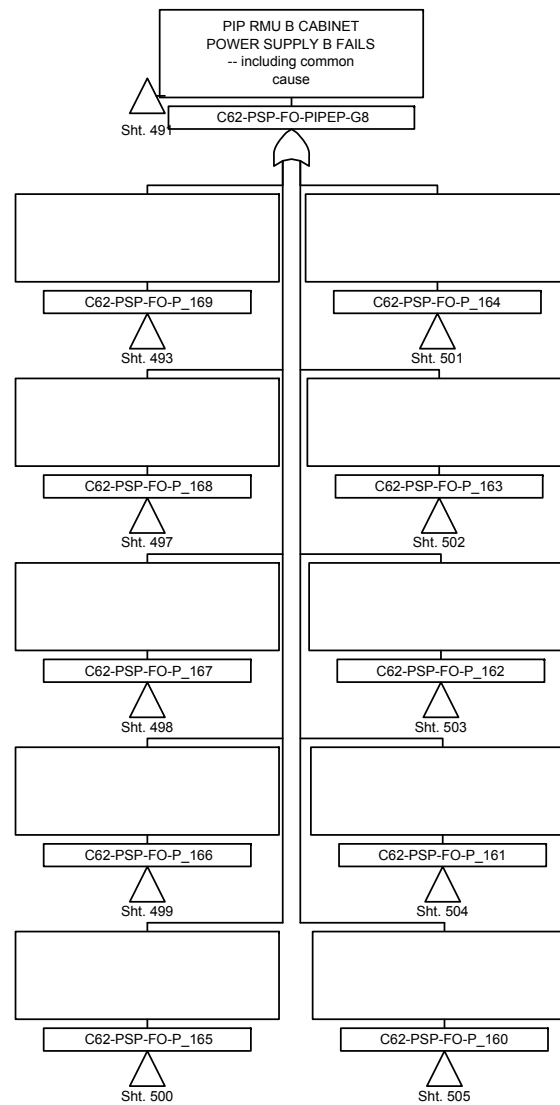


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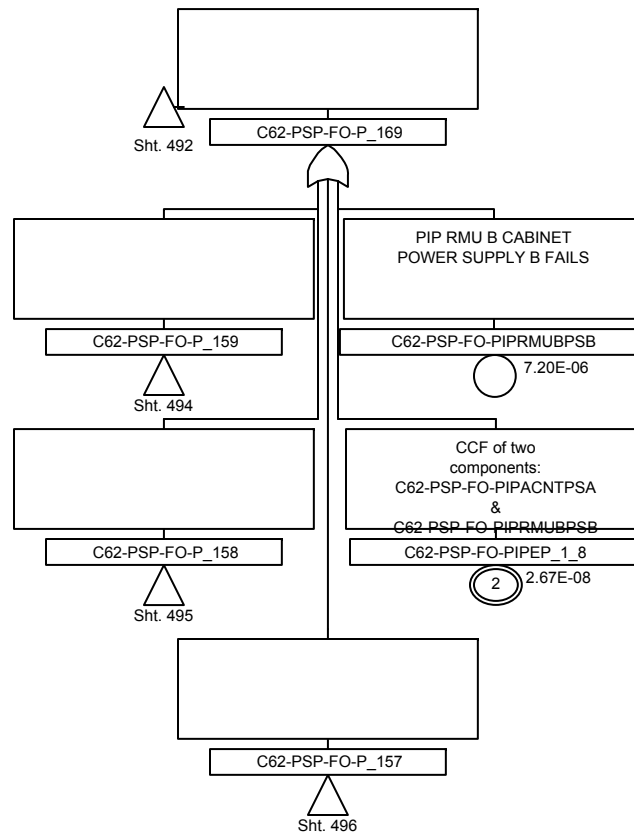


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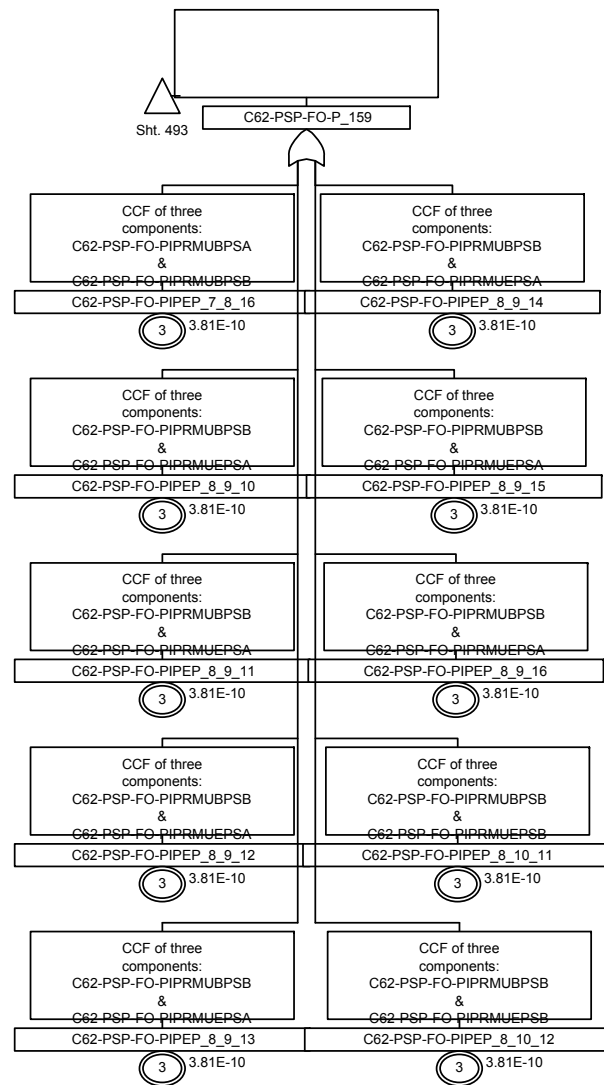


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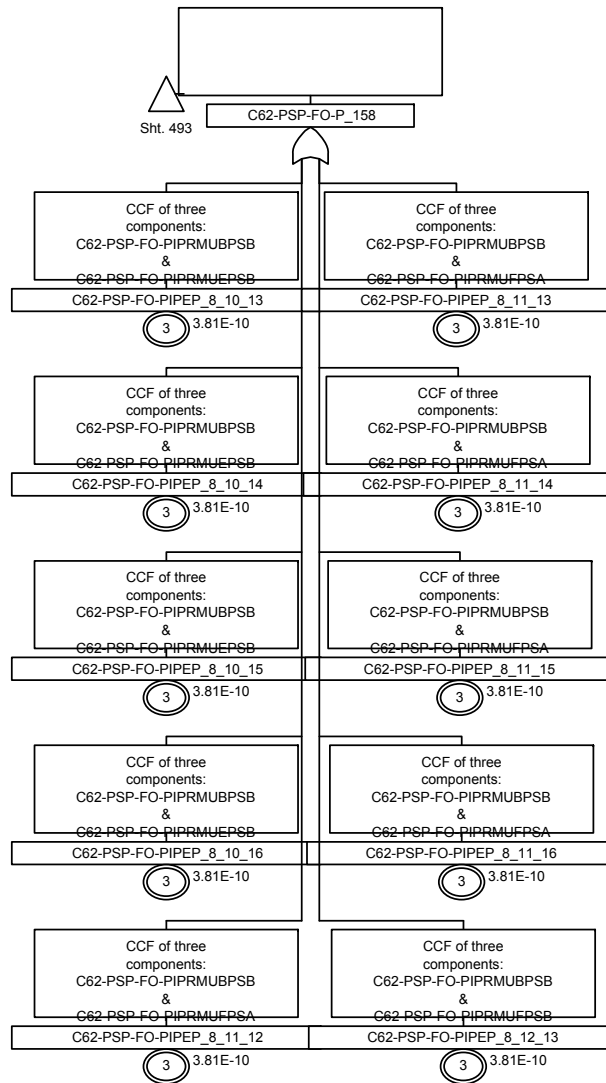


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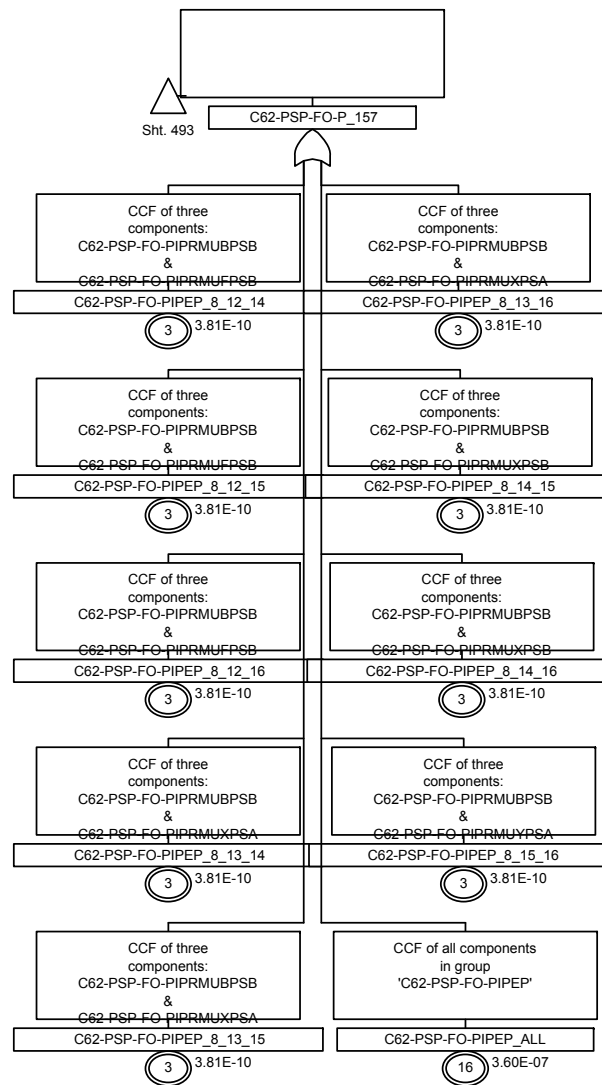


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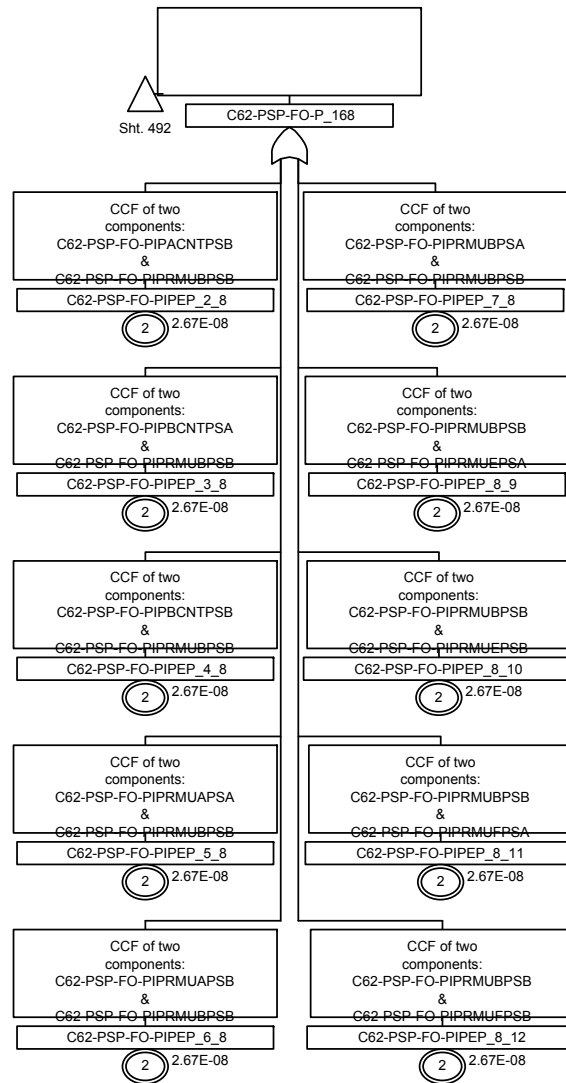


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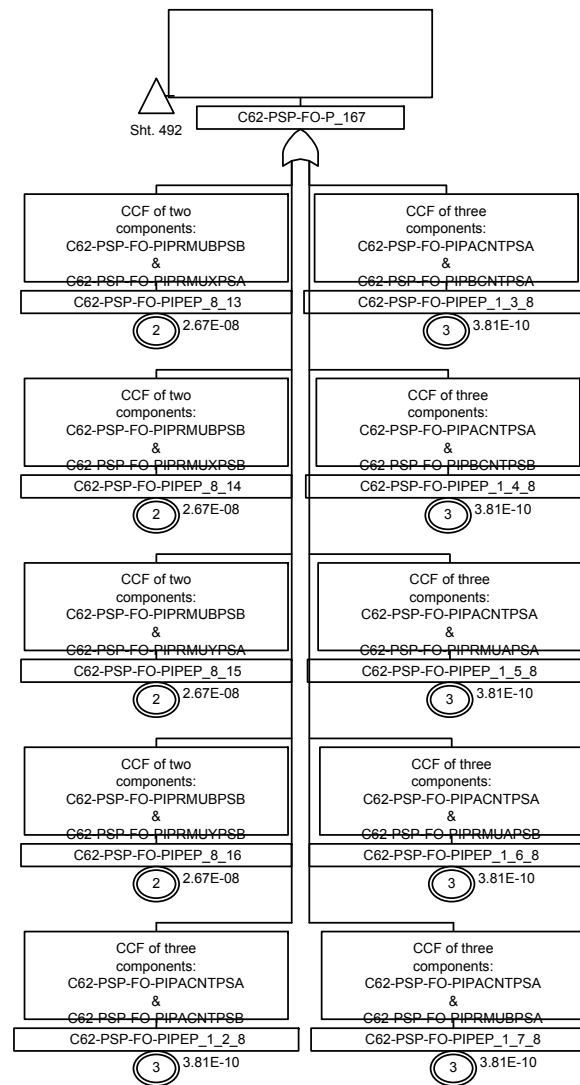


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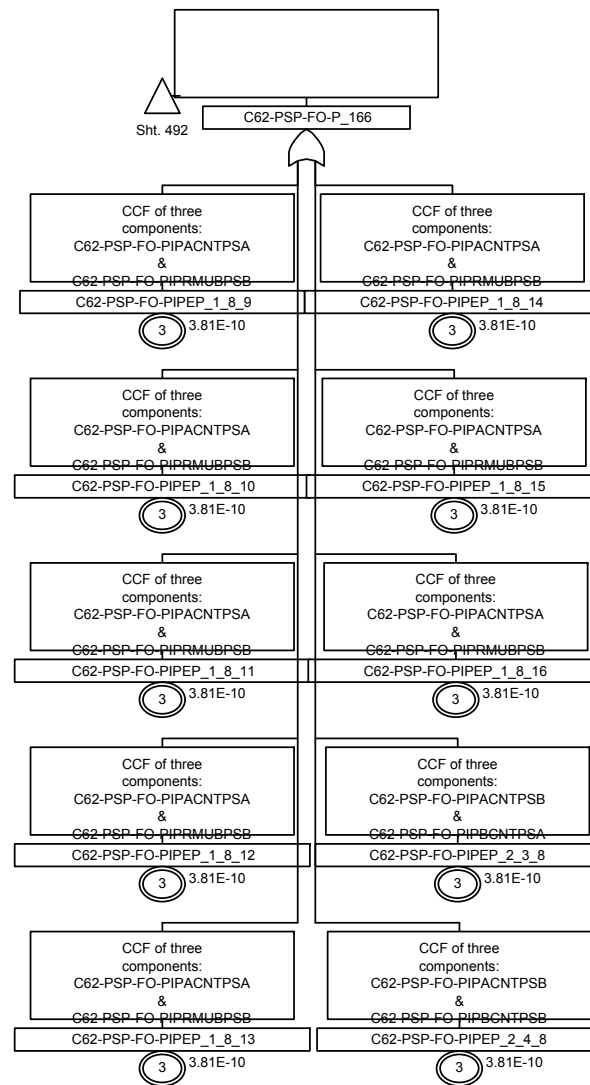


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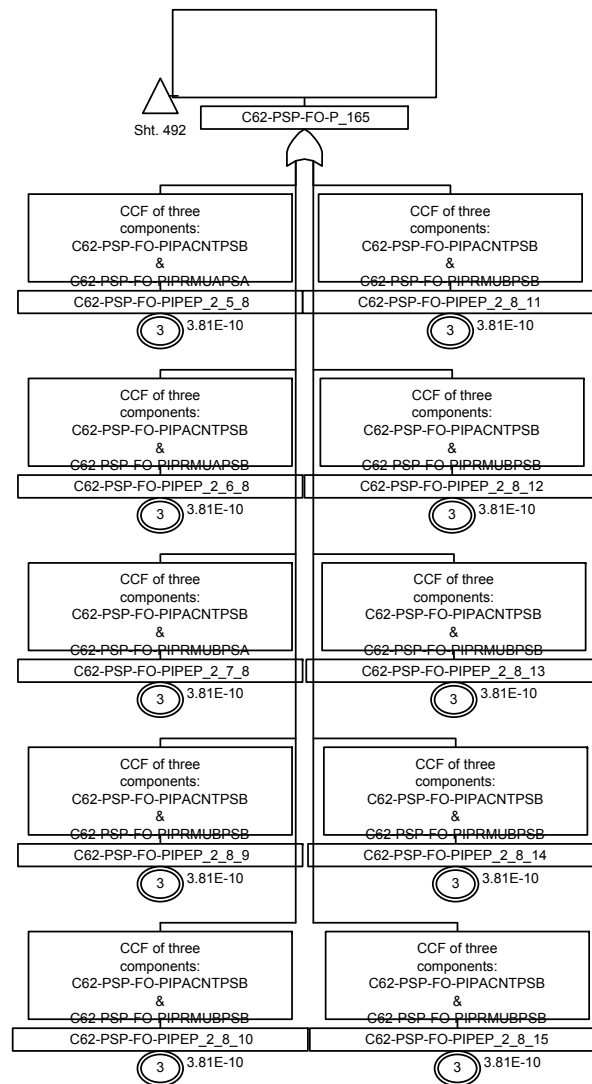


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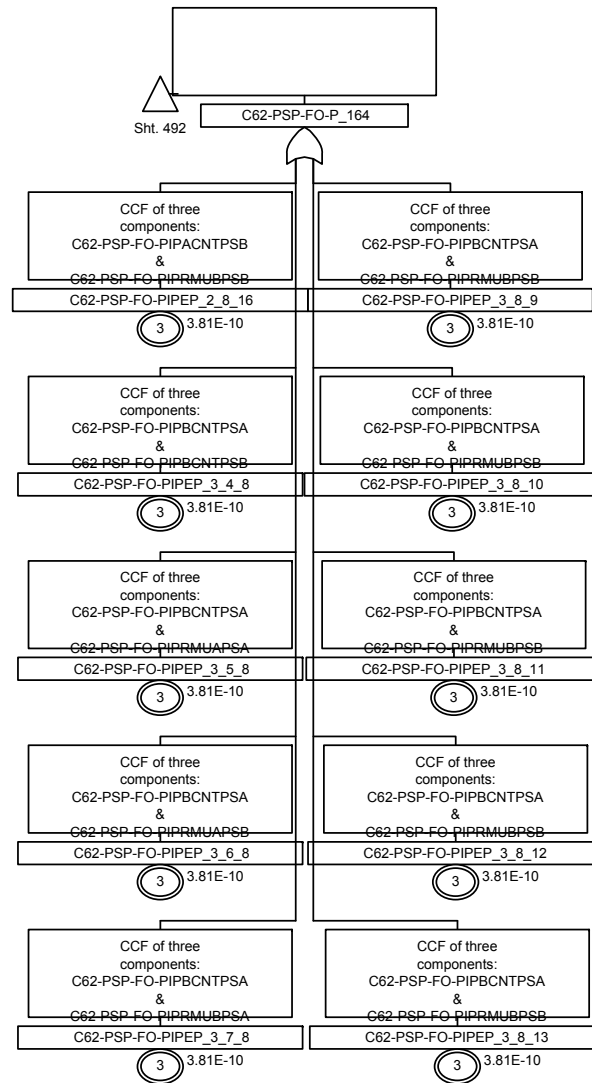


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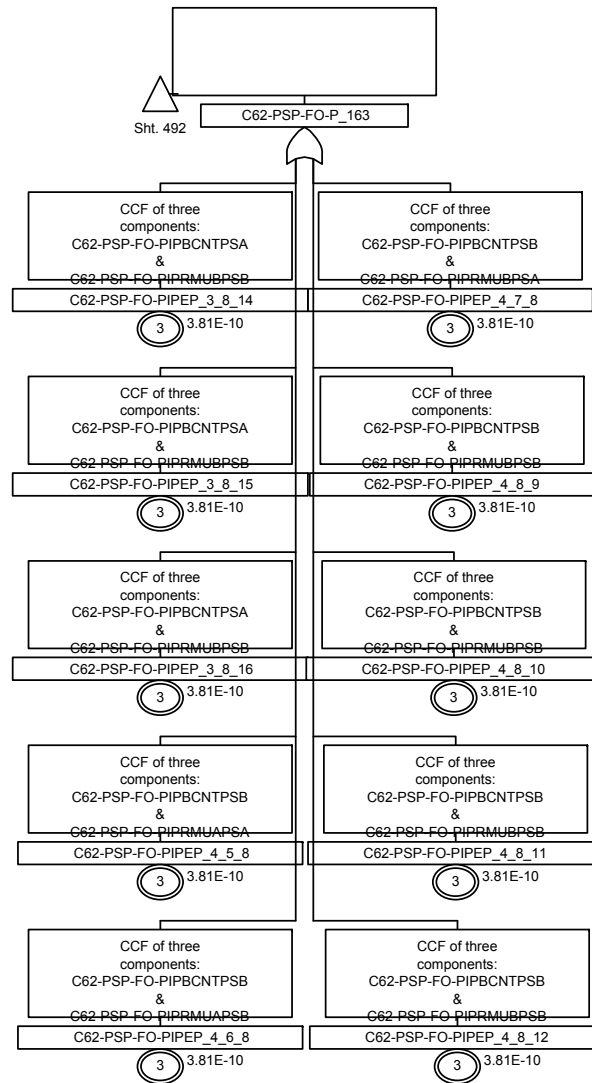


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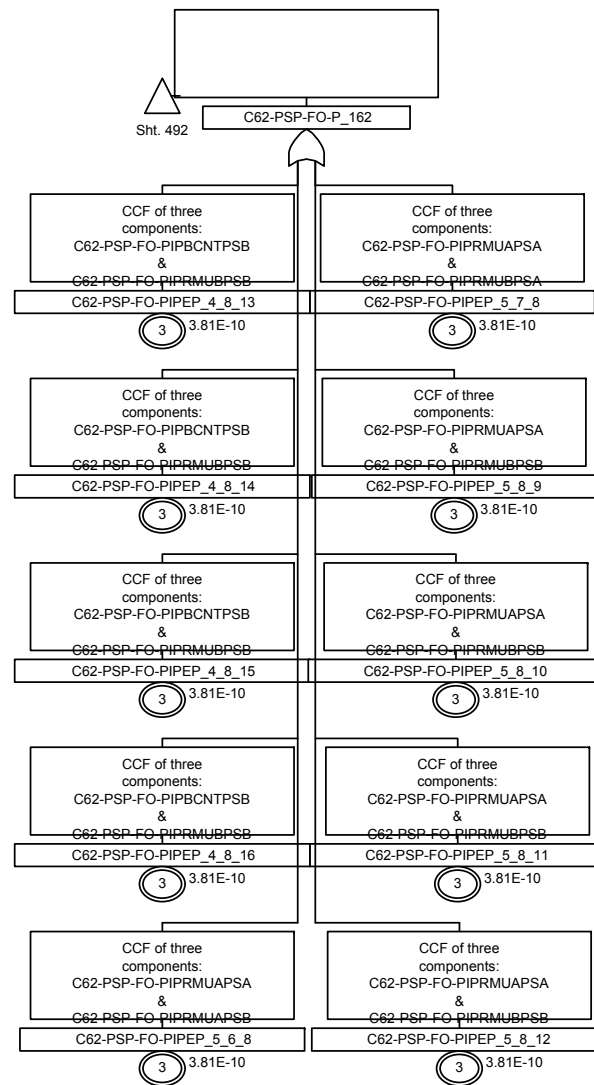


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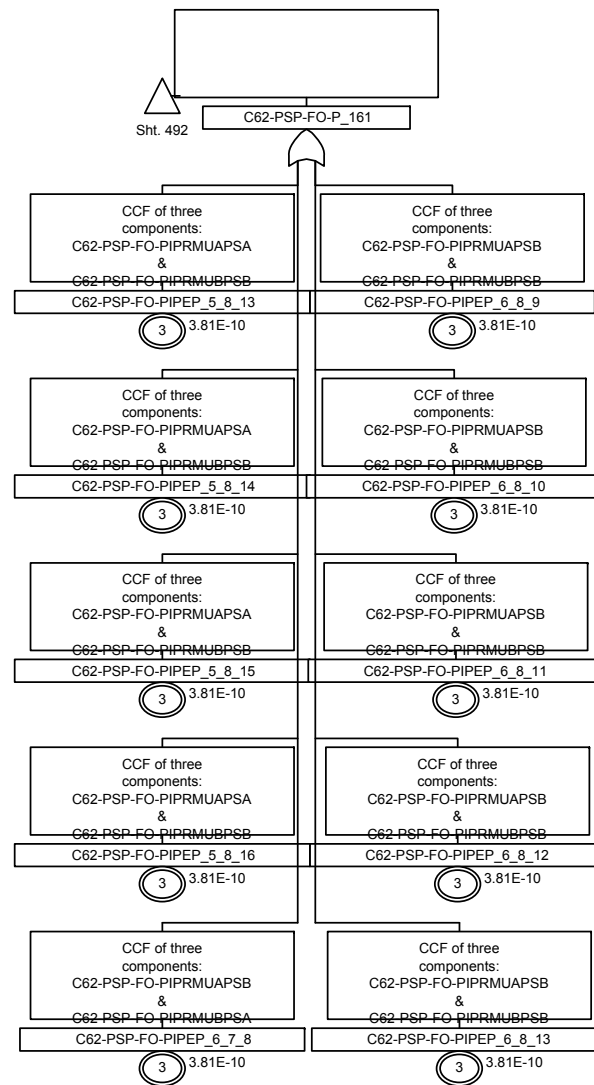


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4.5-1125

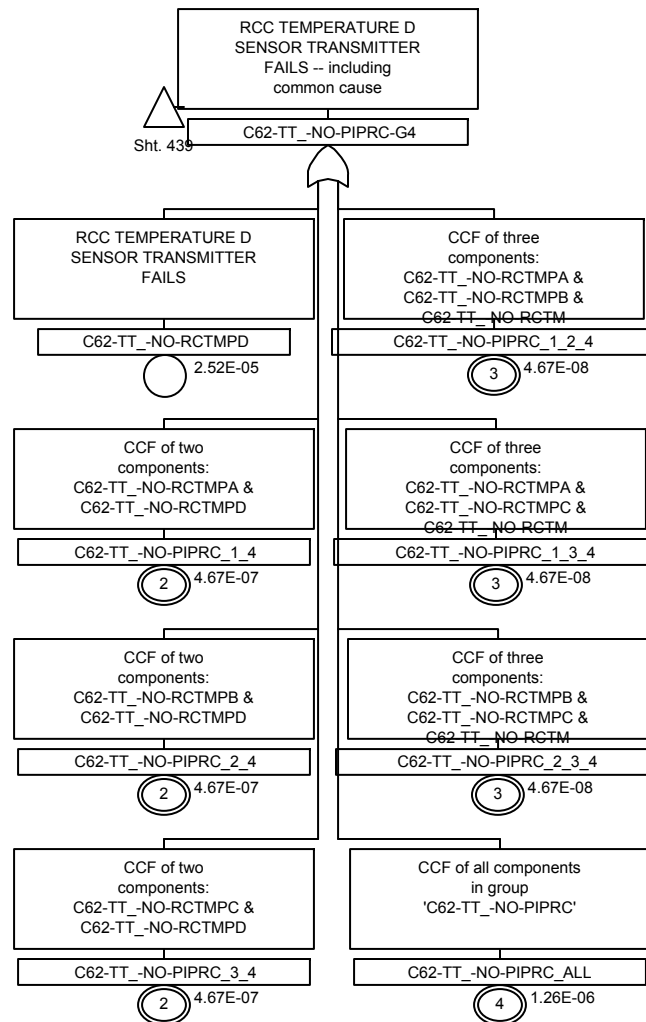


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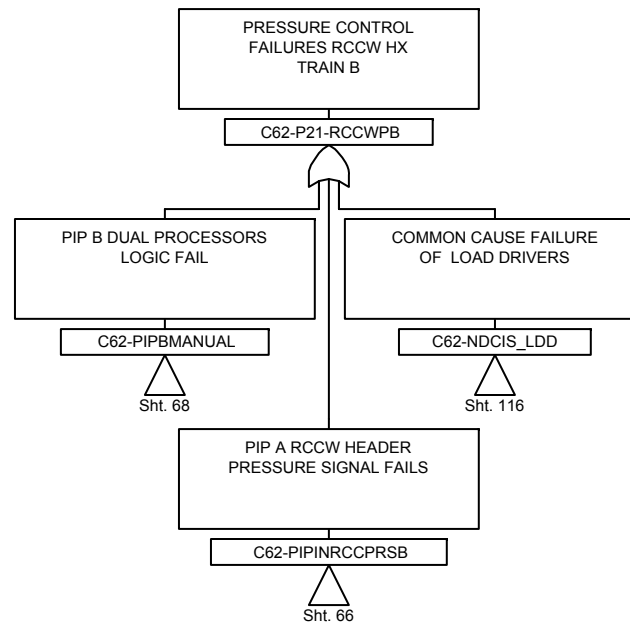


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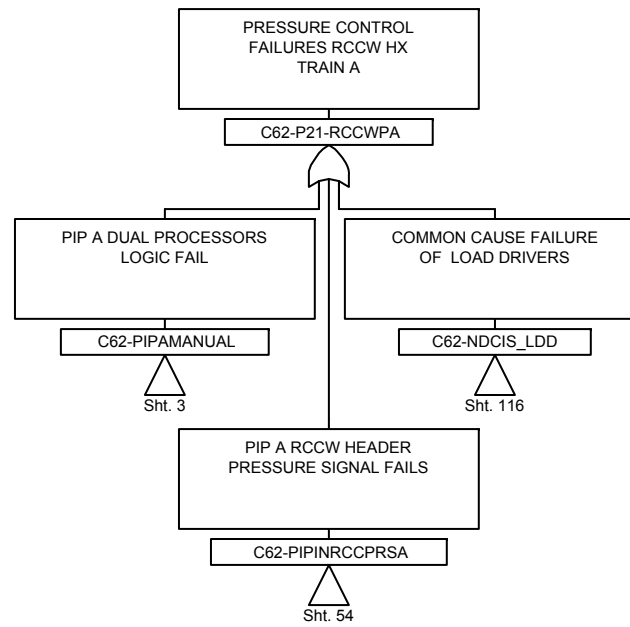


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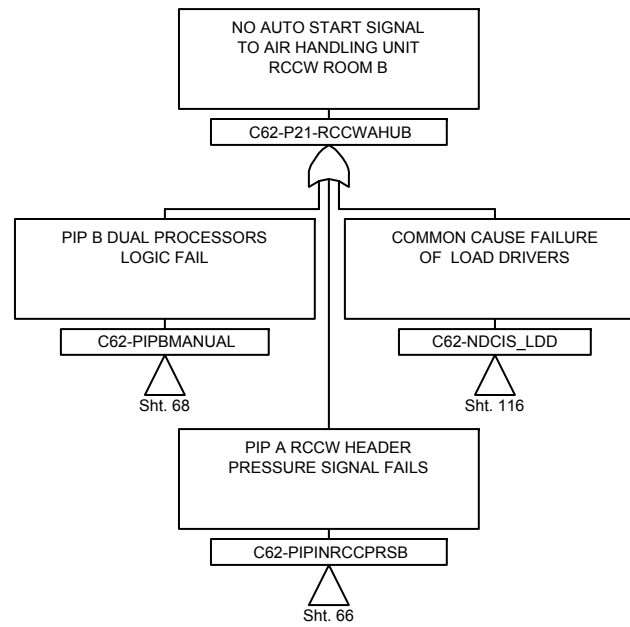


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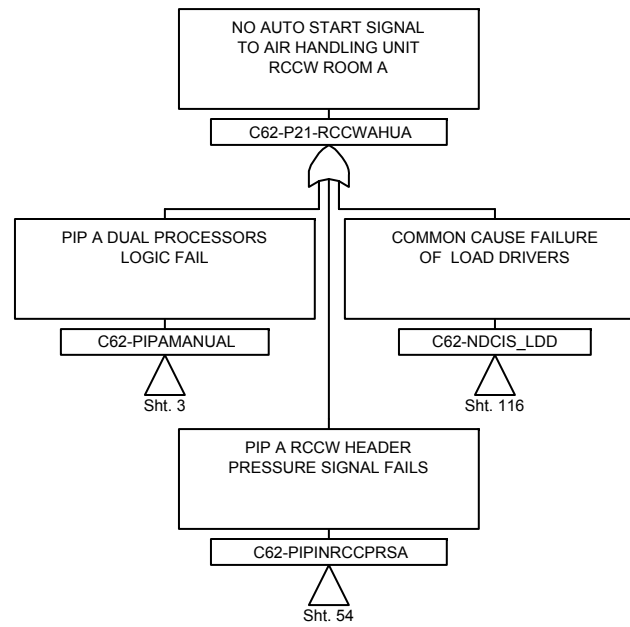


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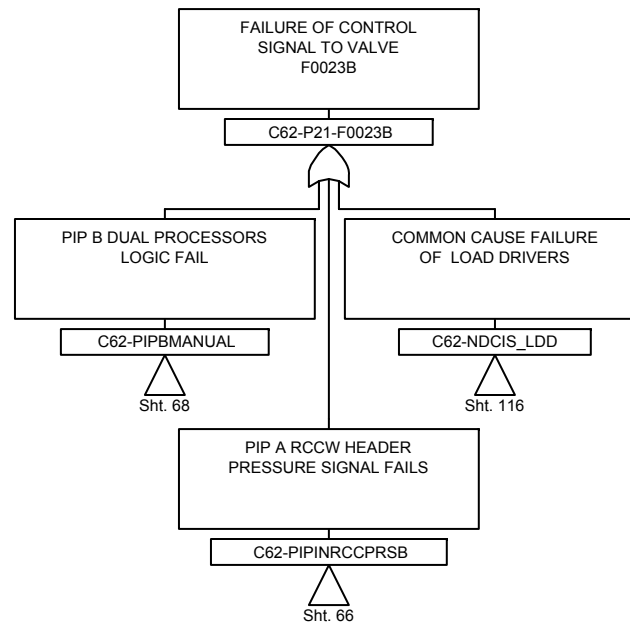


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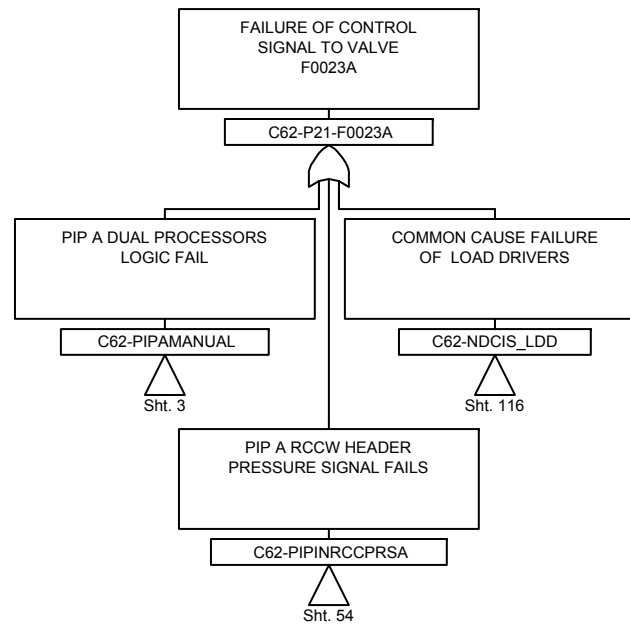


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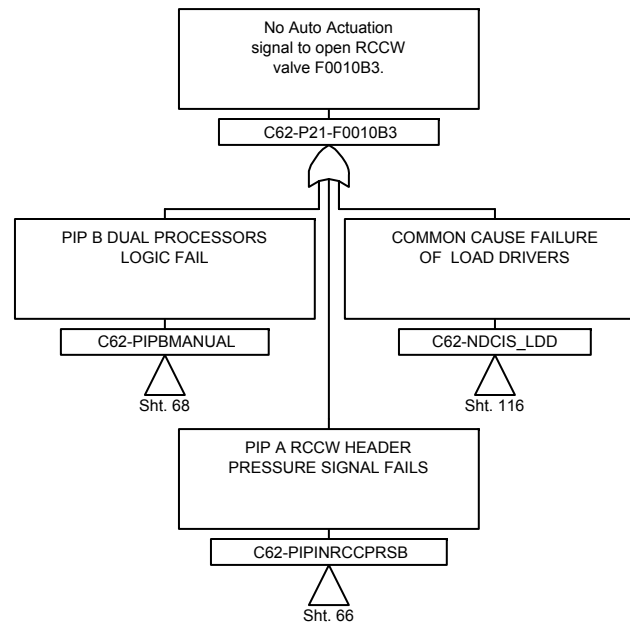


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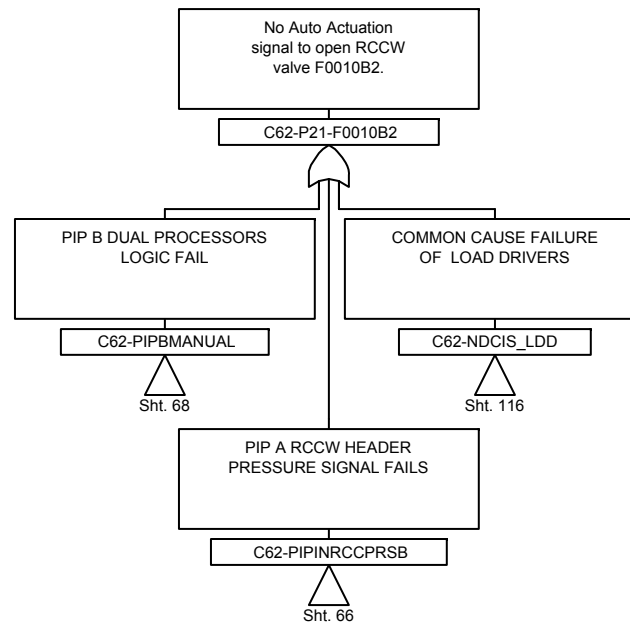


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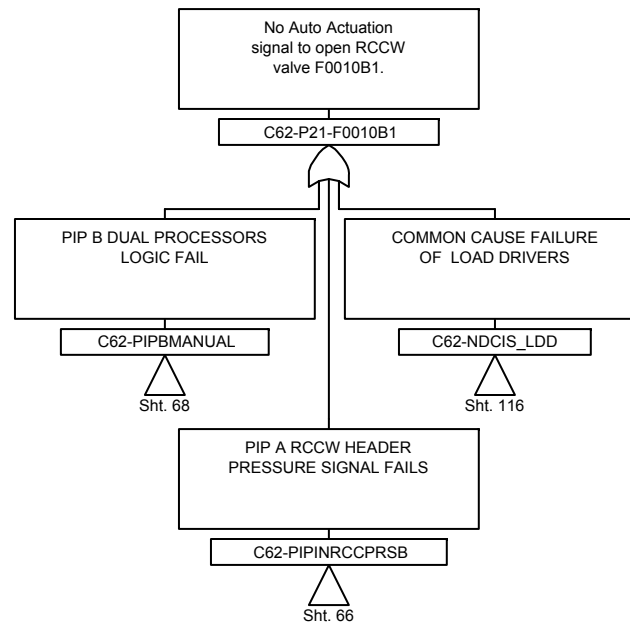


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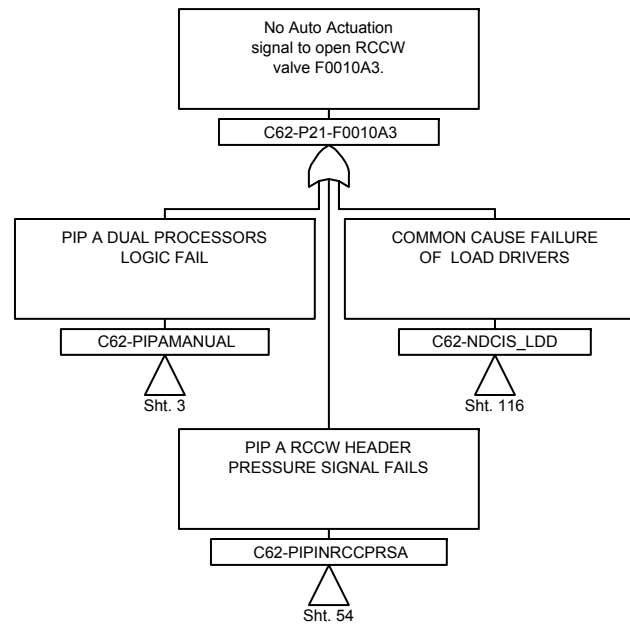


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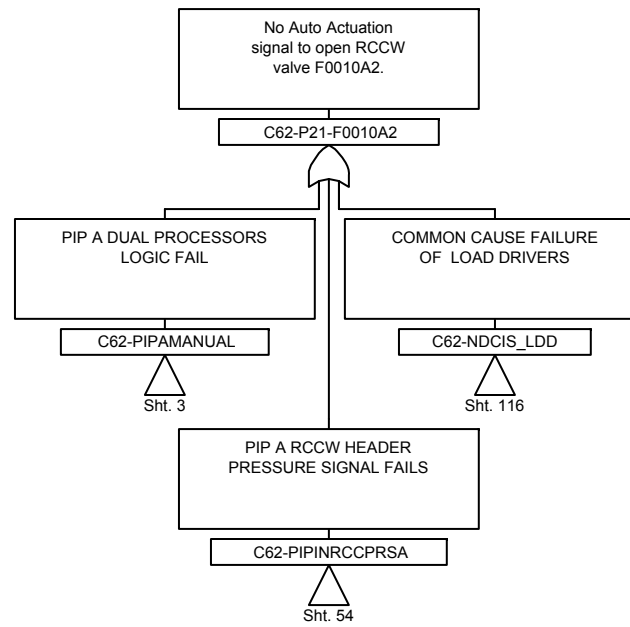


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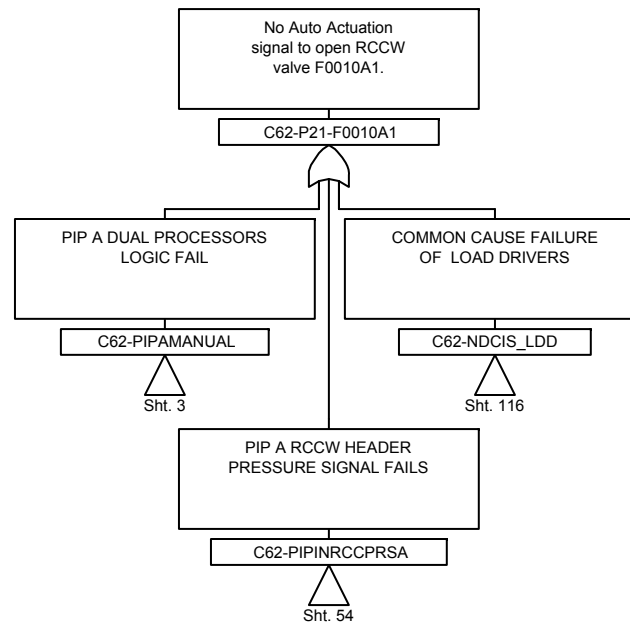


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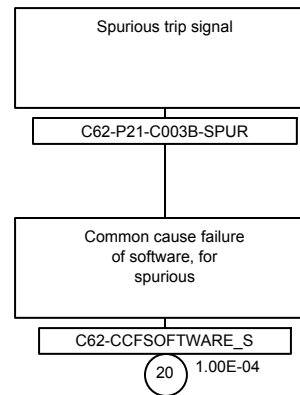


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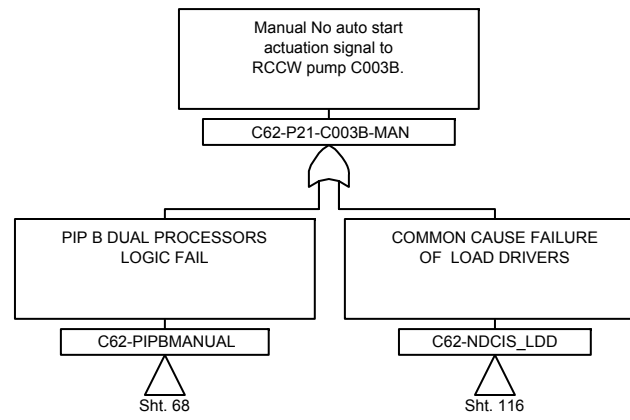


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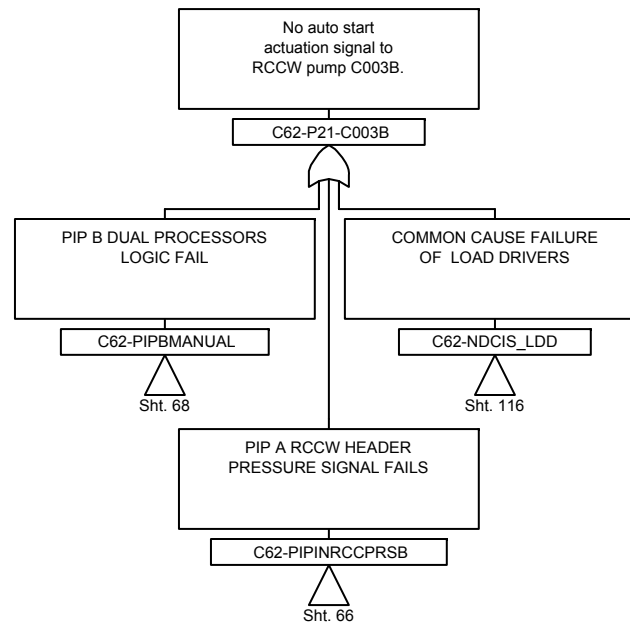


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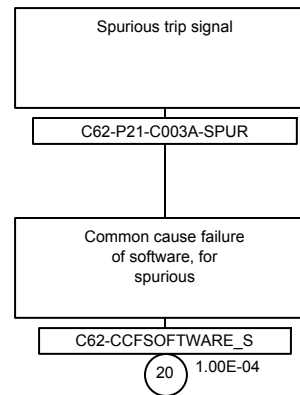


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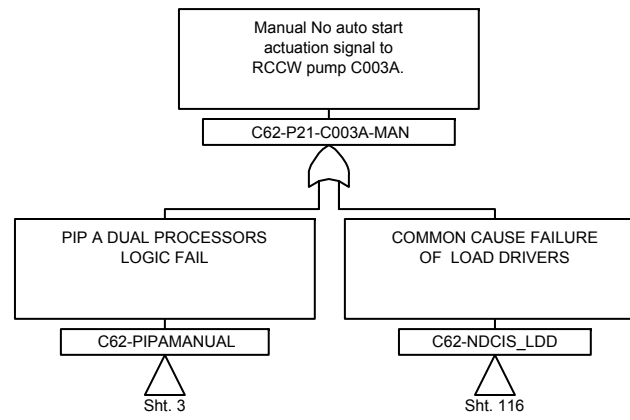


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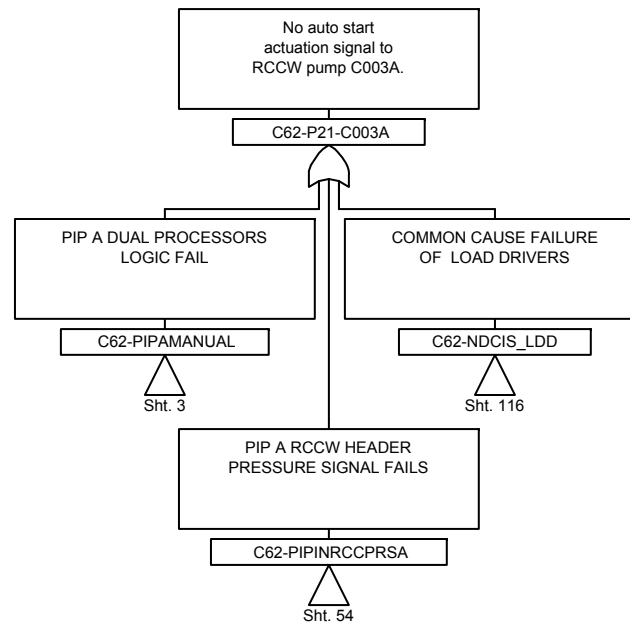


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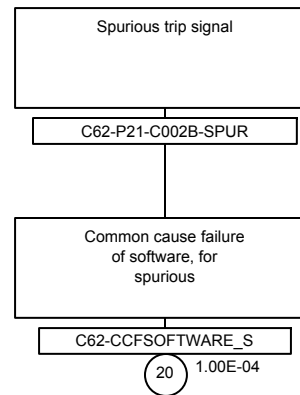


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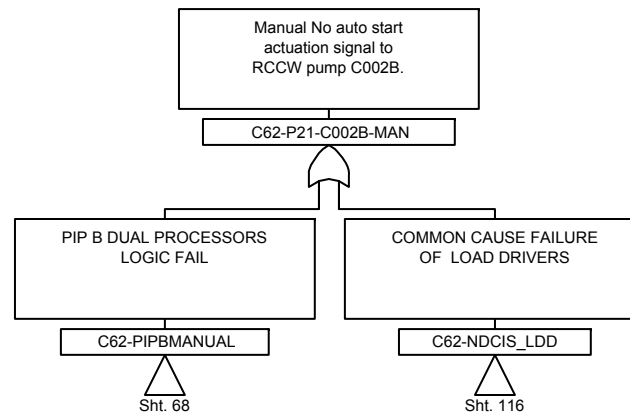


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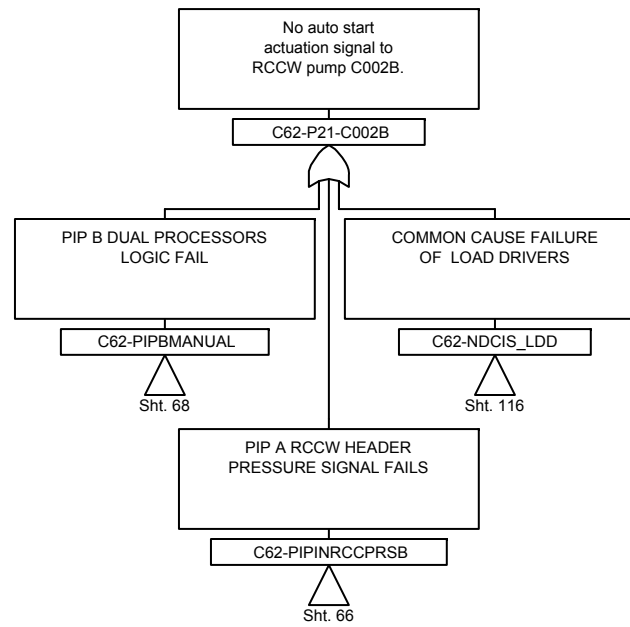


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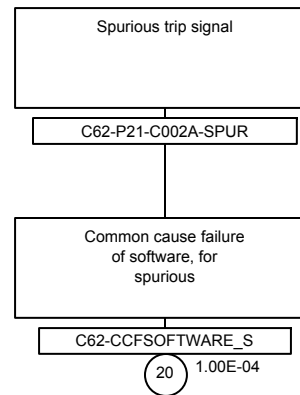


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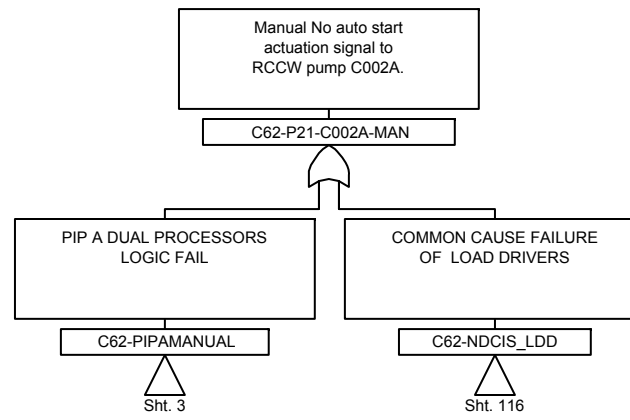


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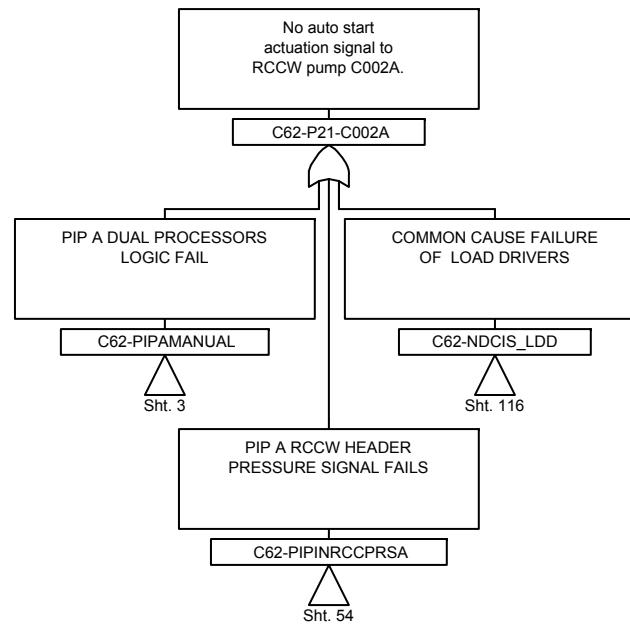


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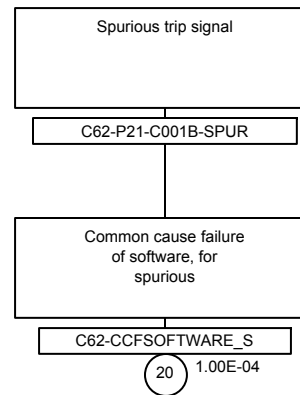


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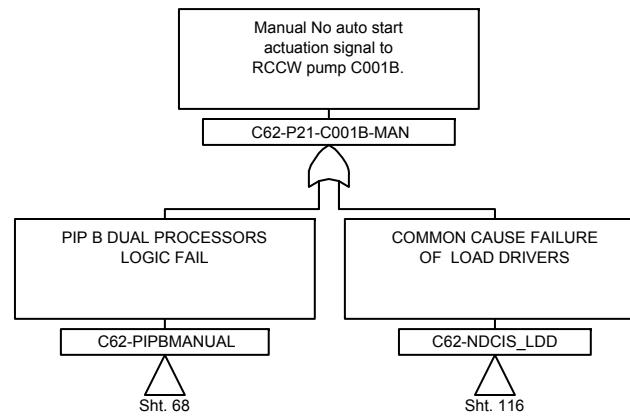


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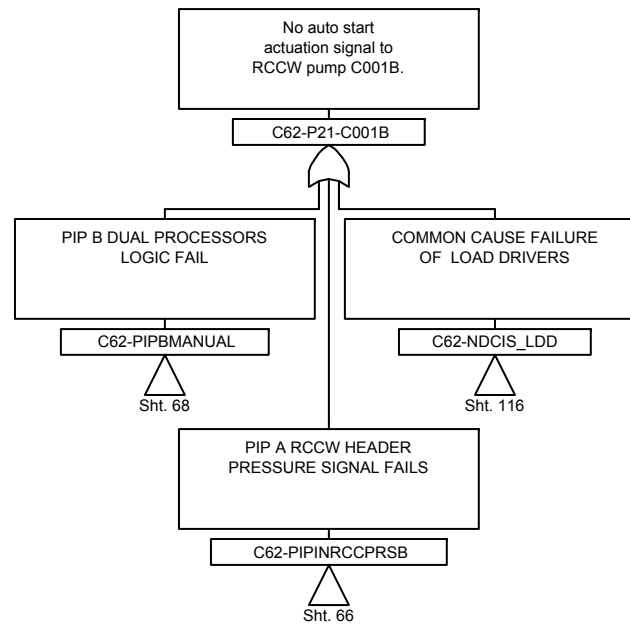


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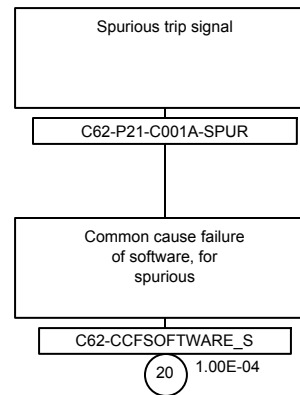


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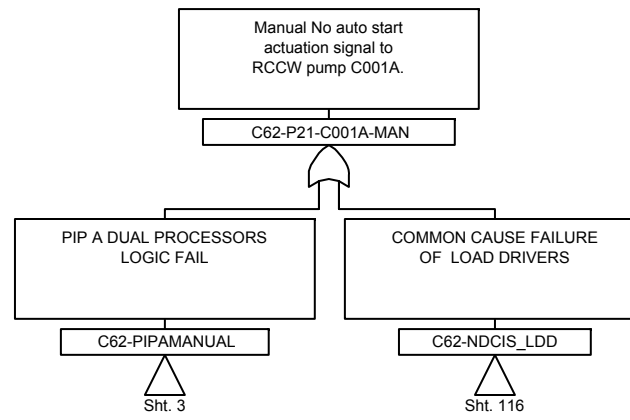


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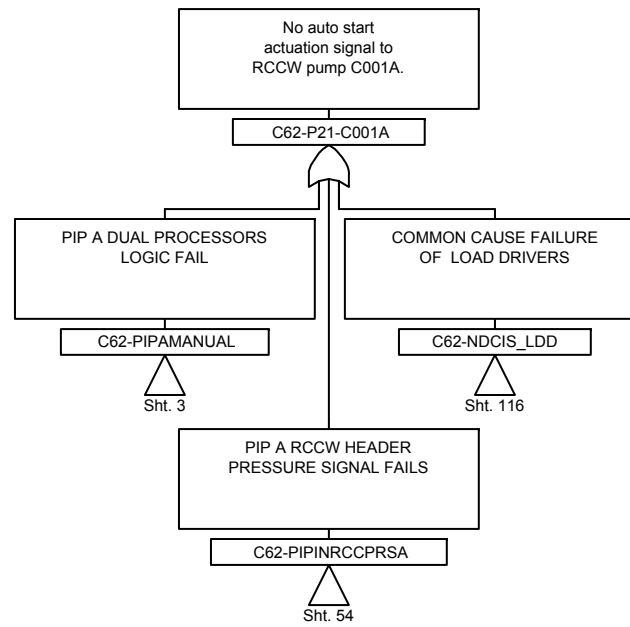


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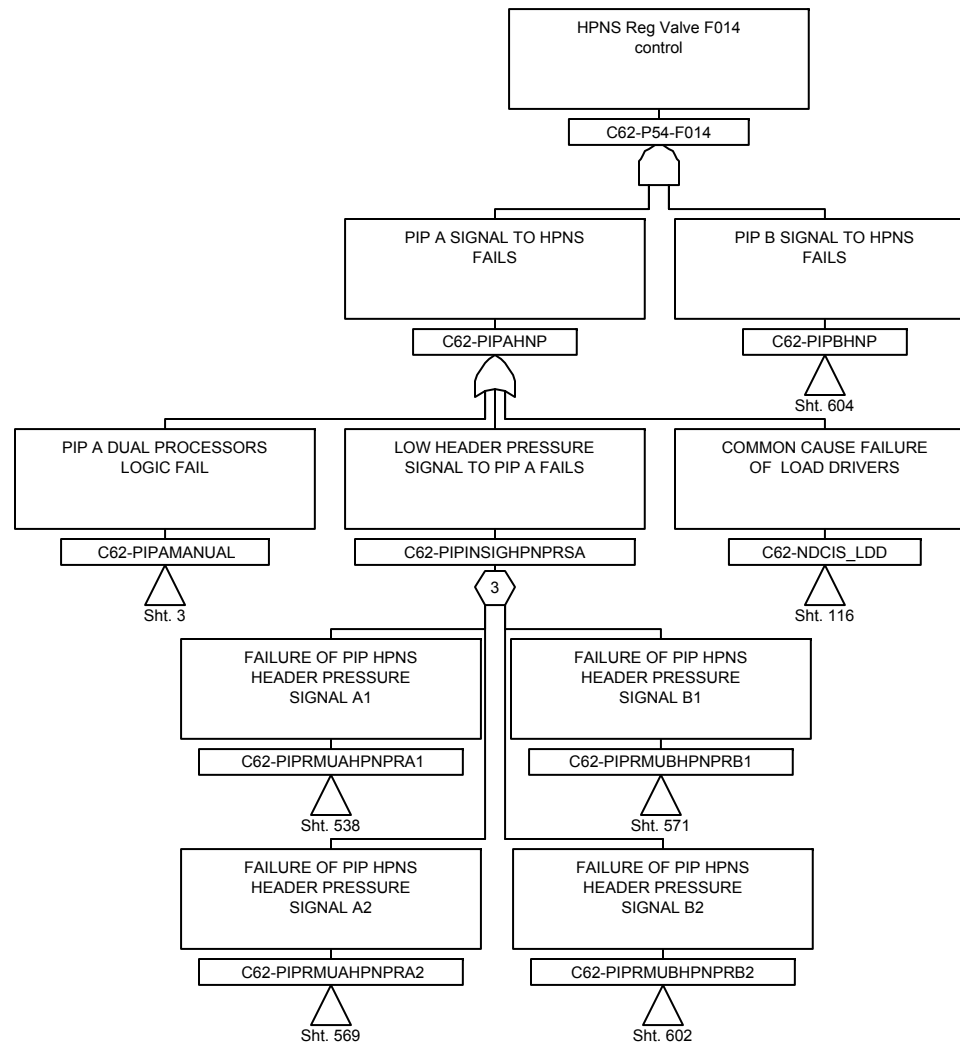


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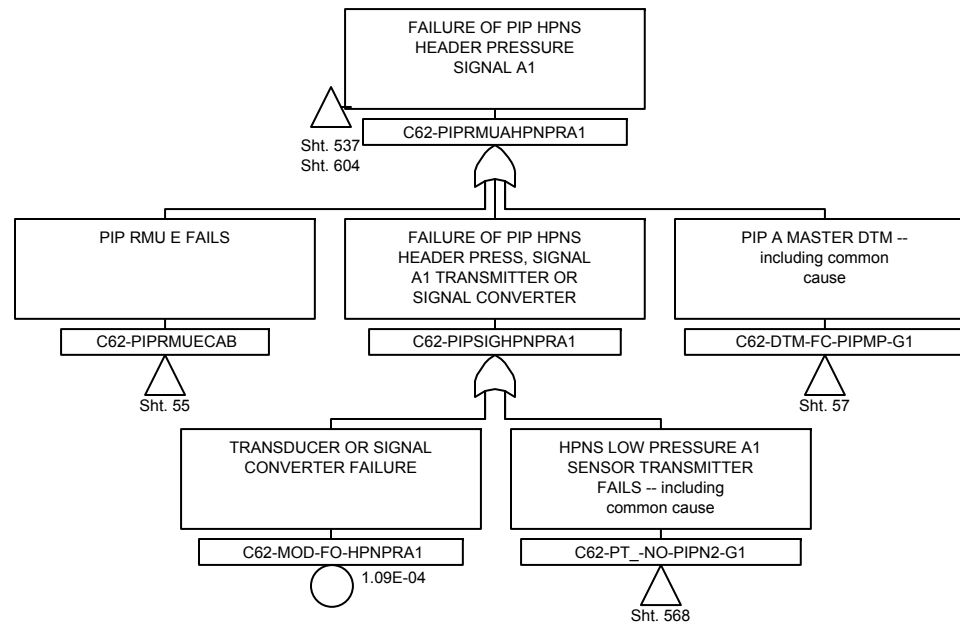


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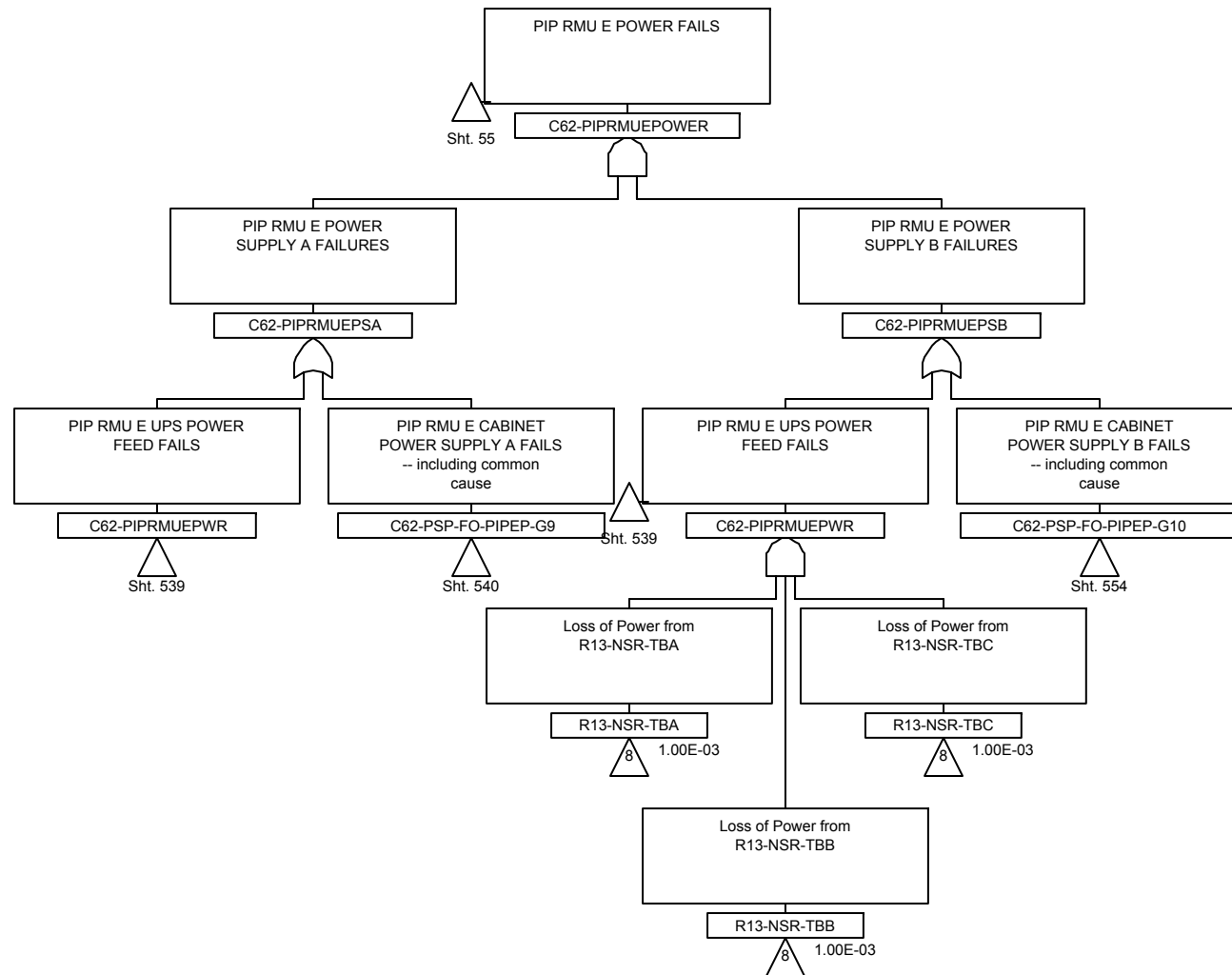


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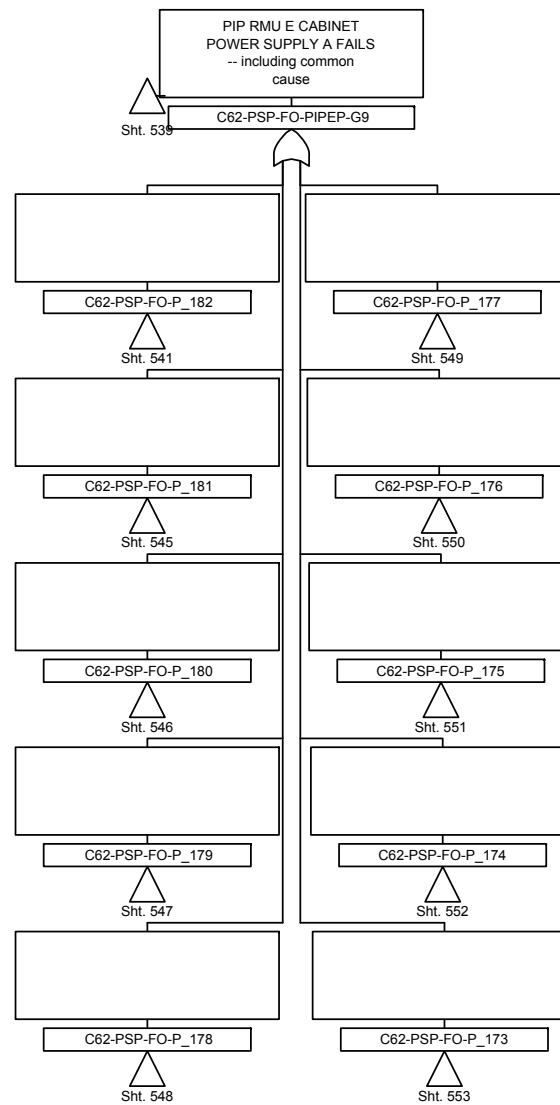


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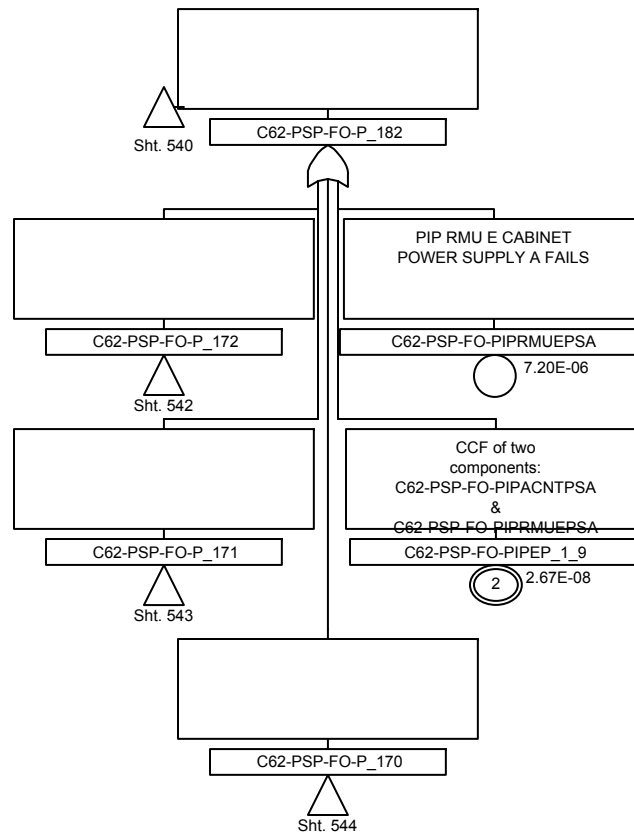


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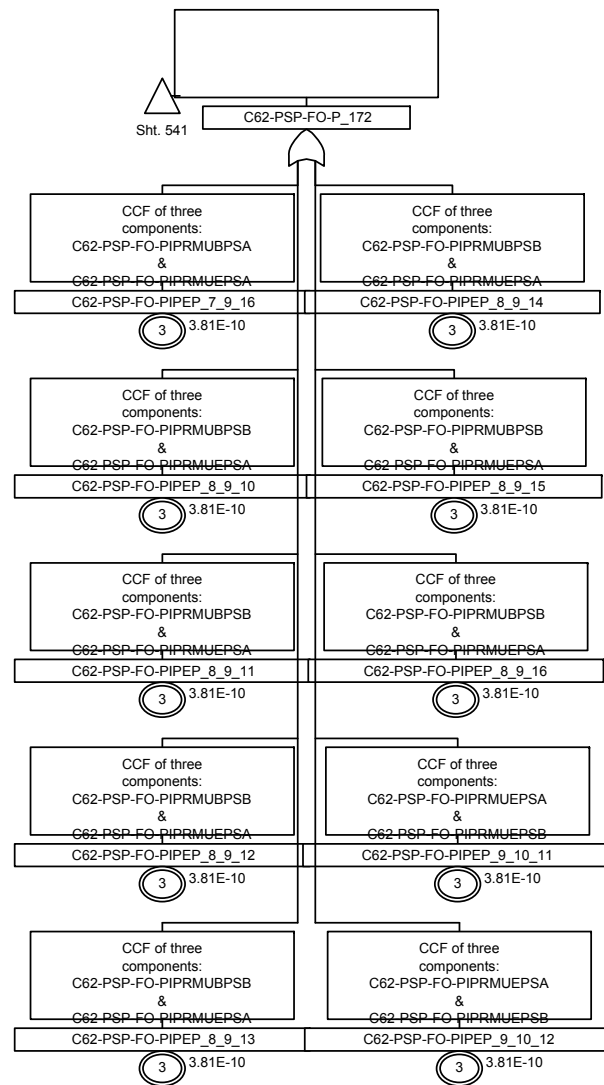


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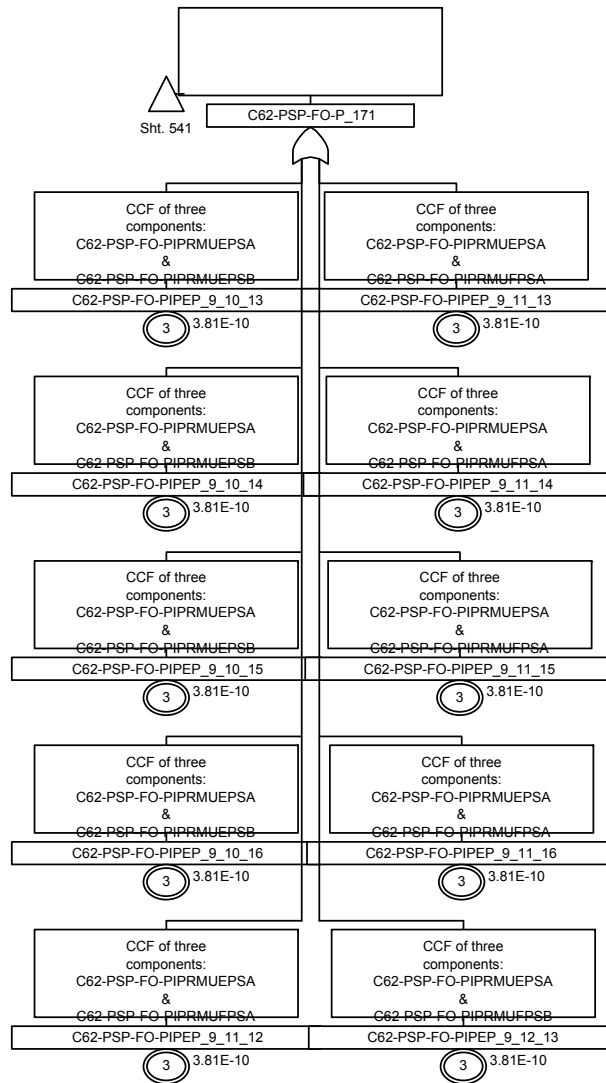


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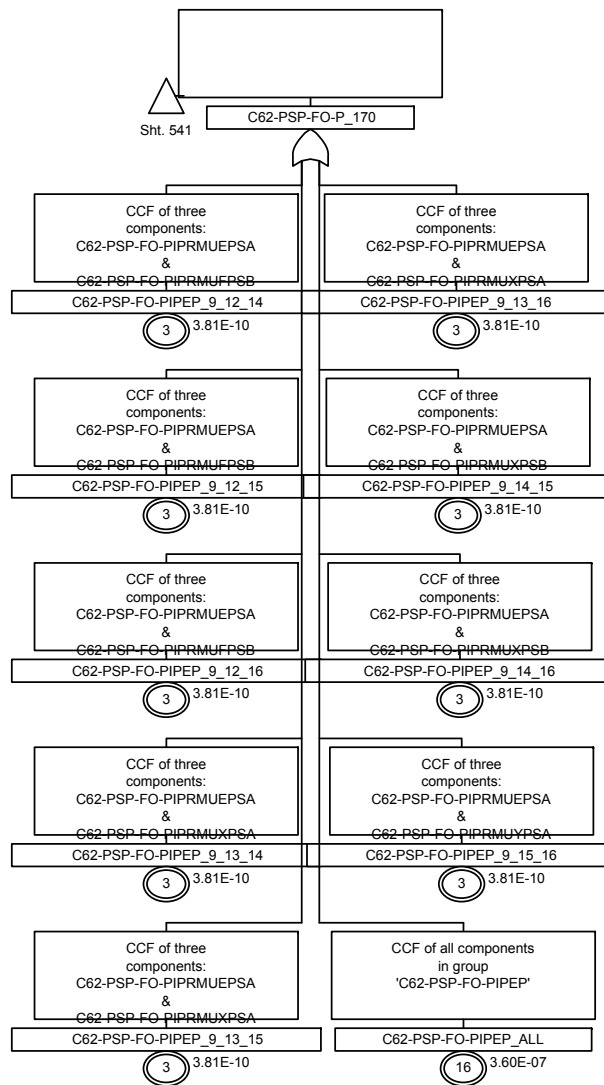


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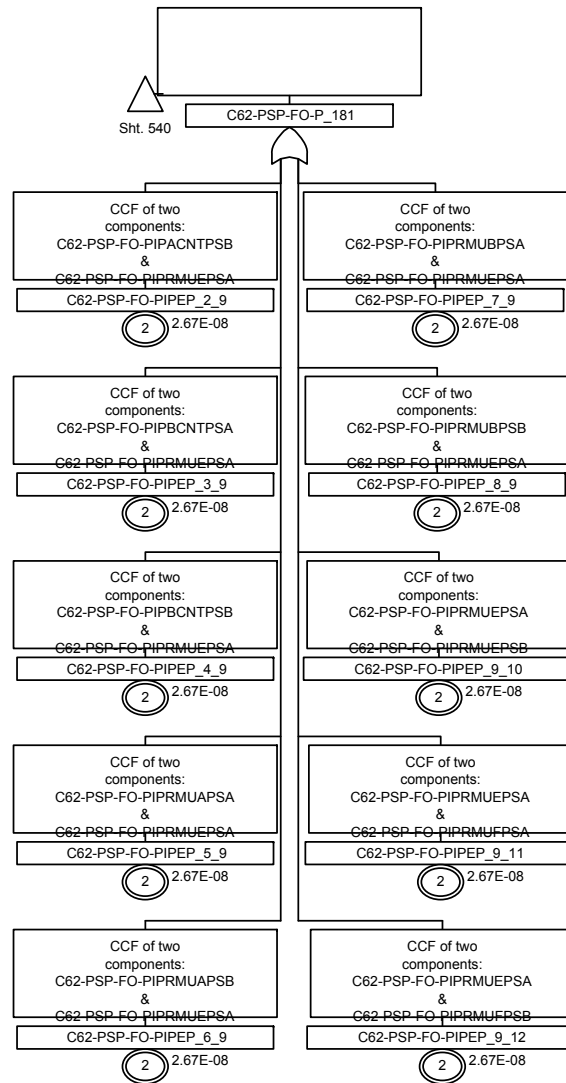


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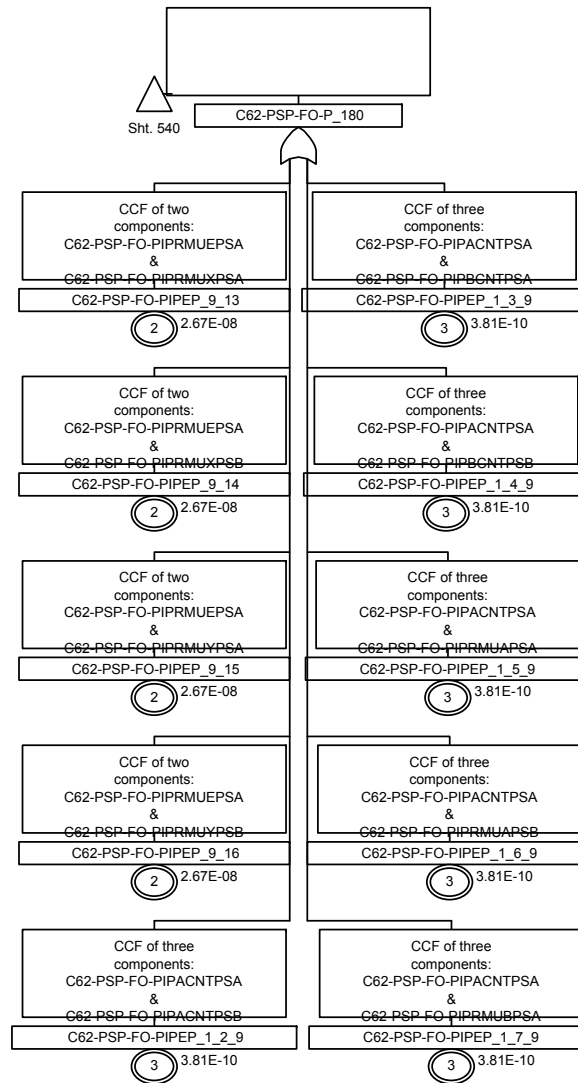


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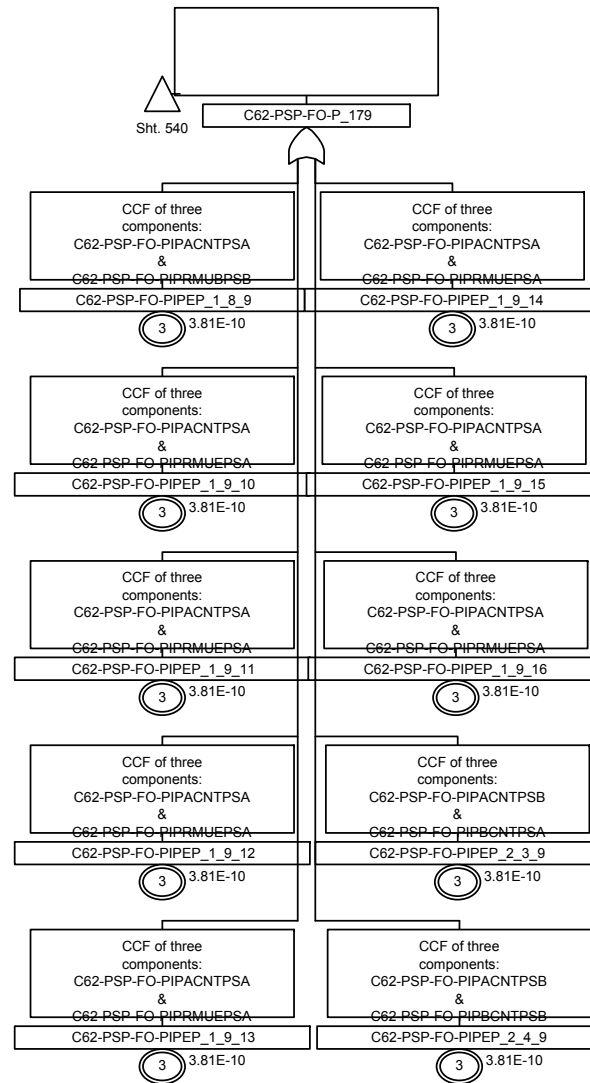


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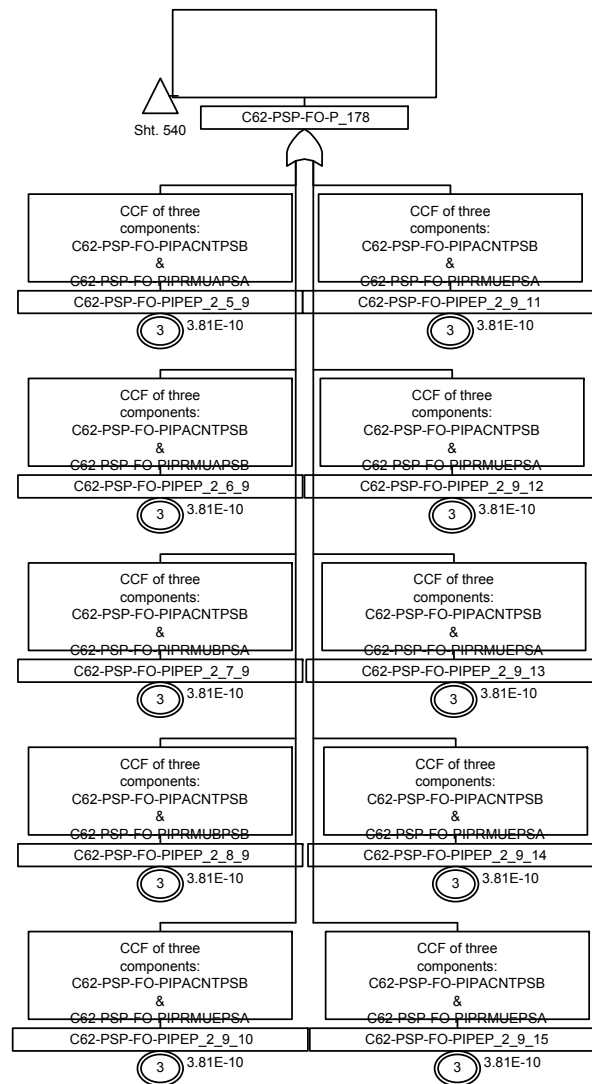


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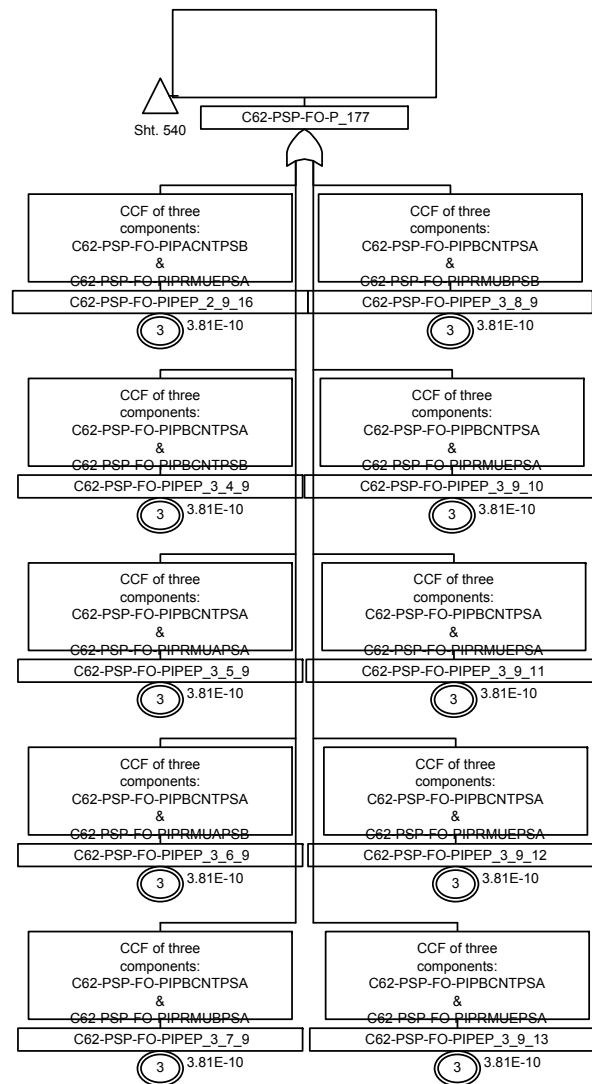


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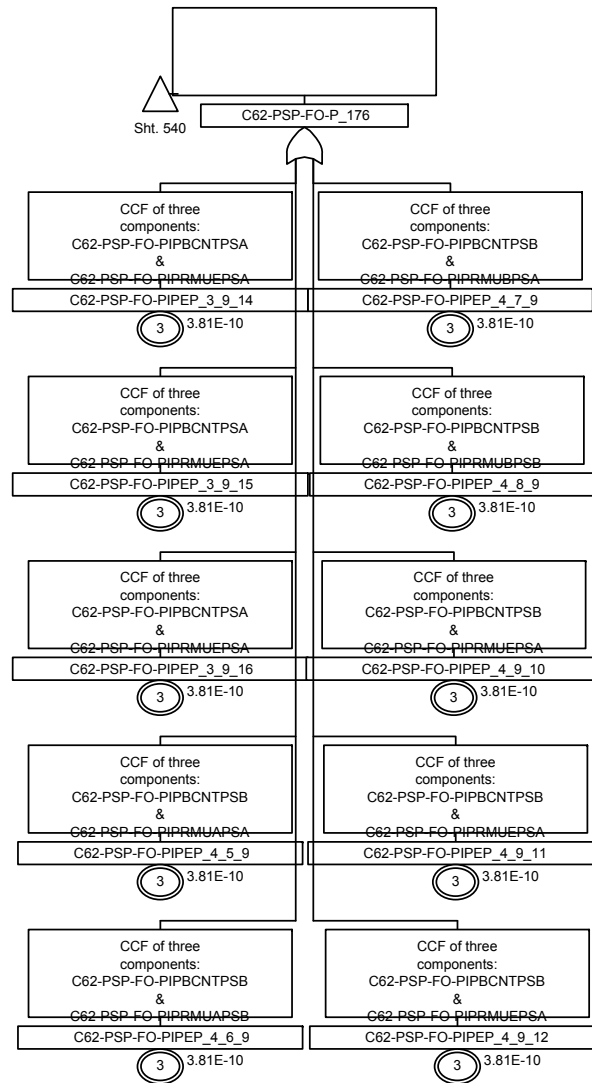


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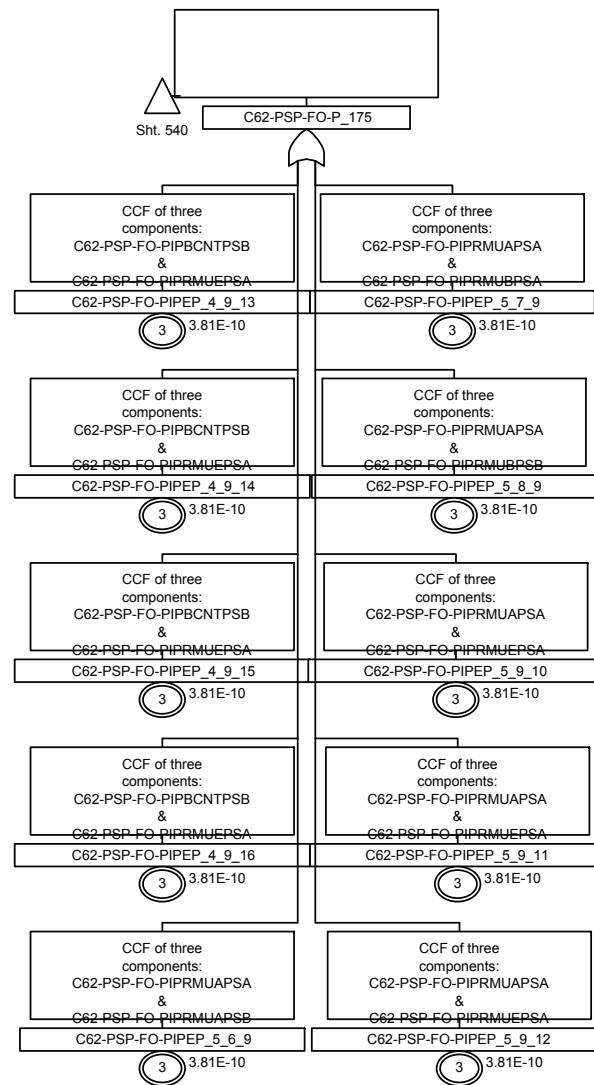


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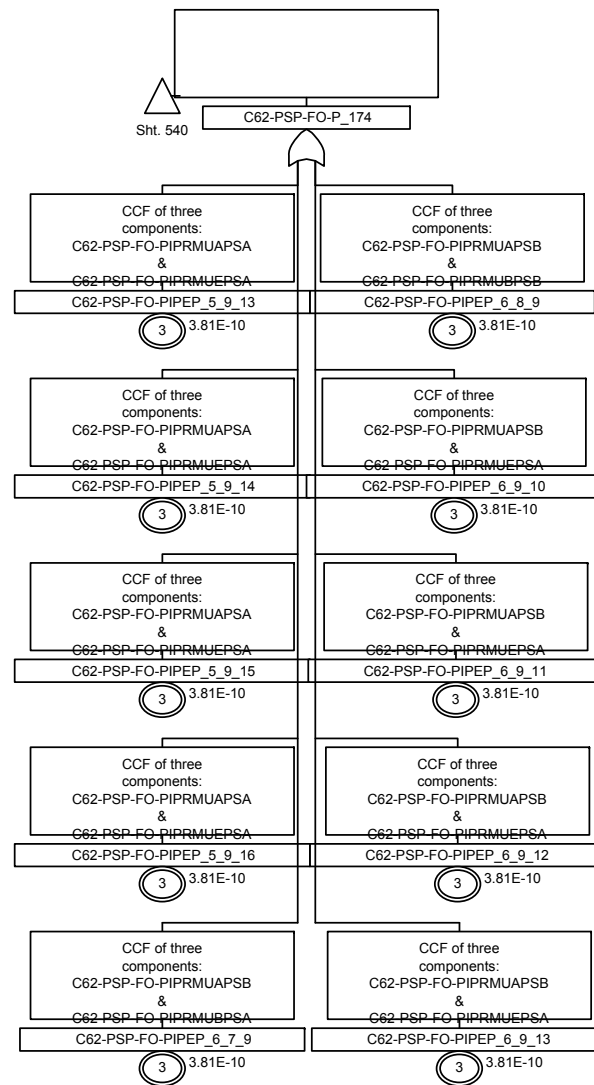


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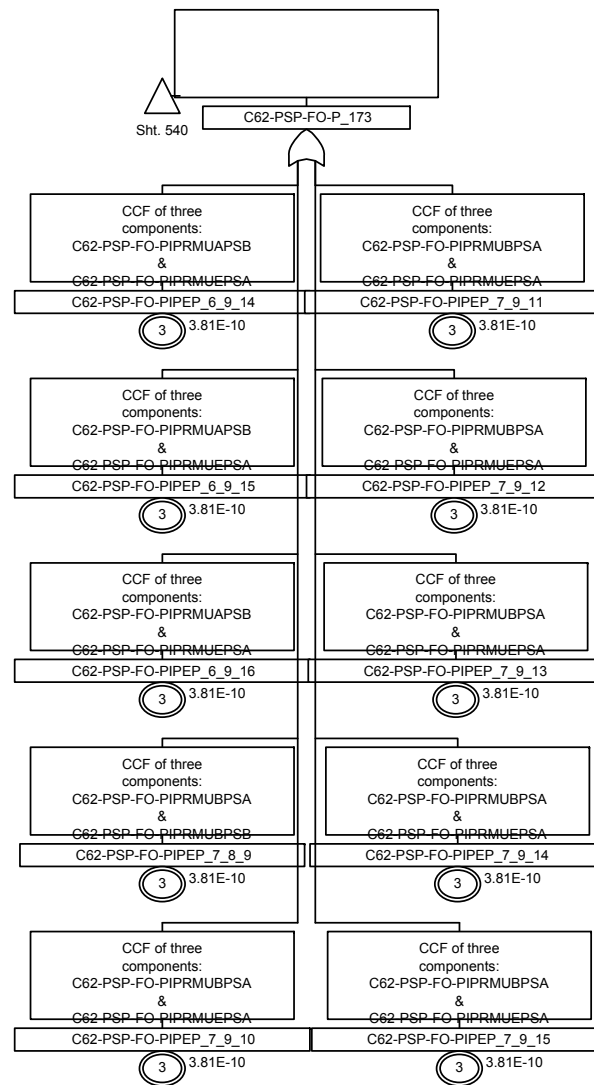


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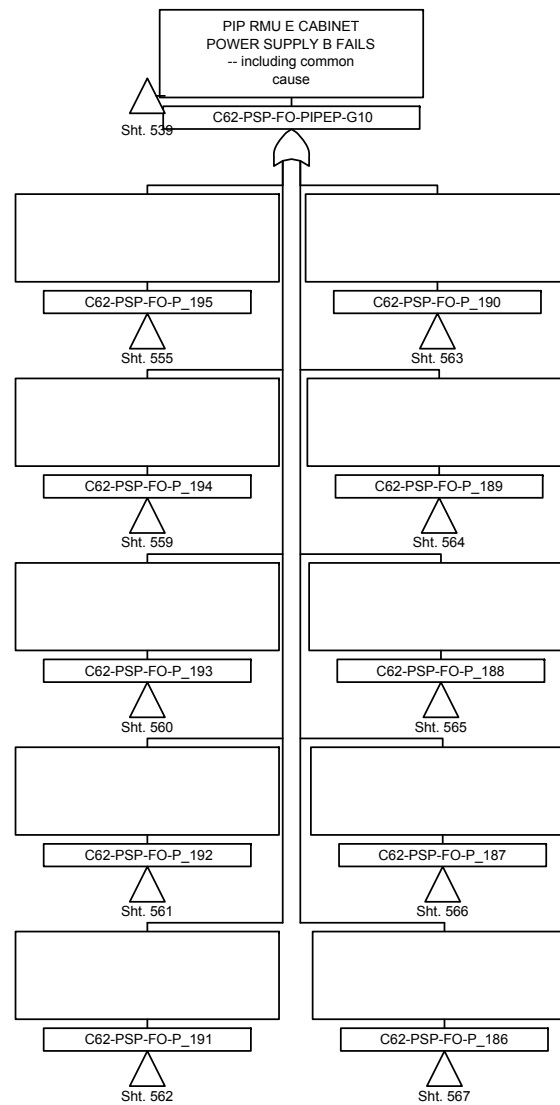


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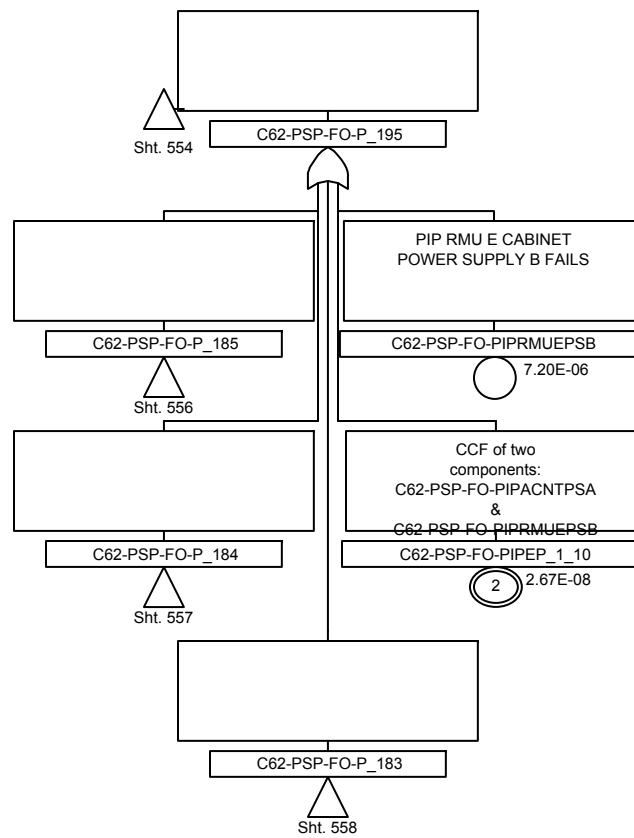


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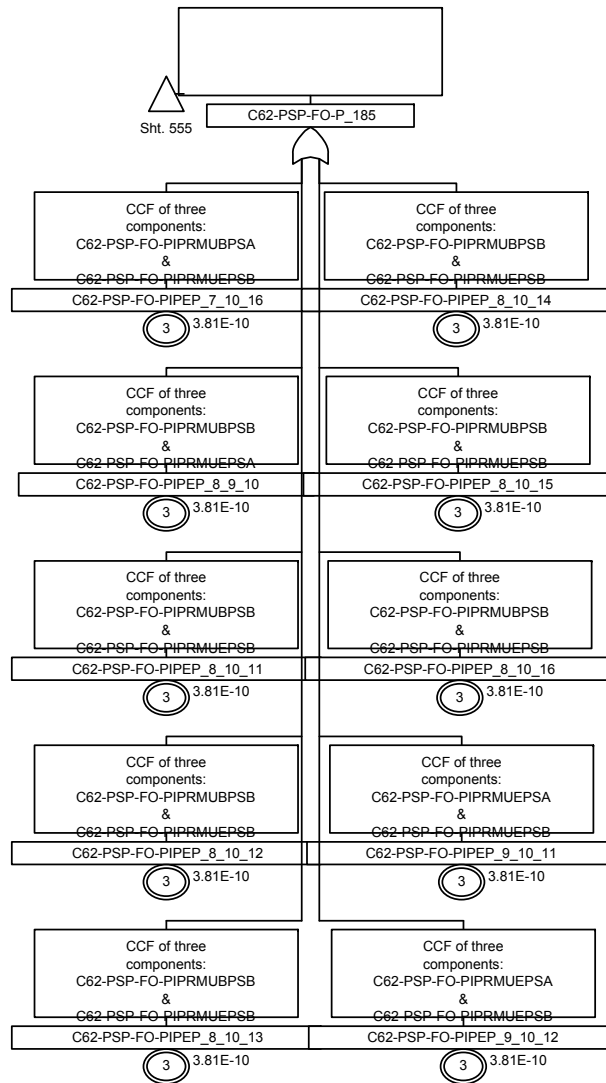


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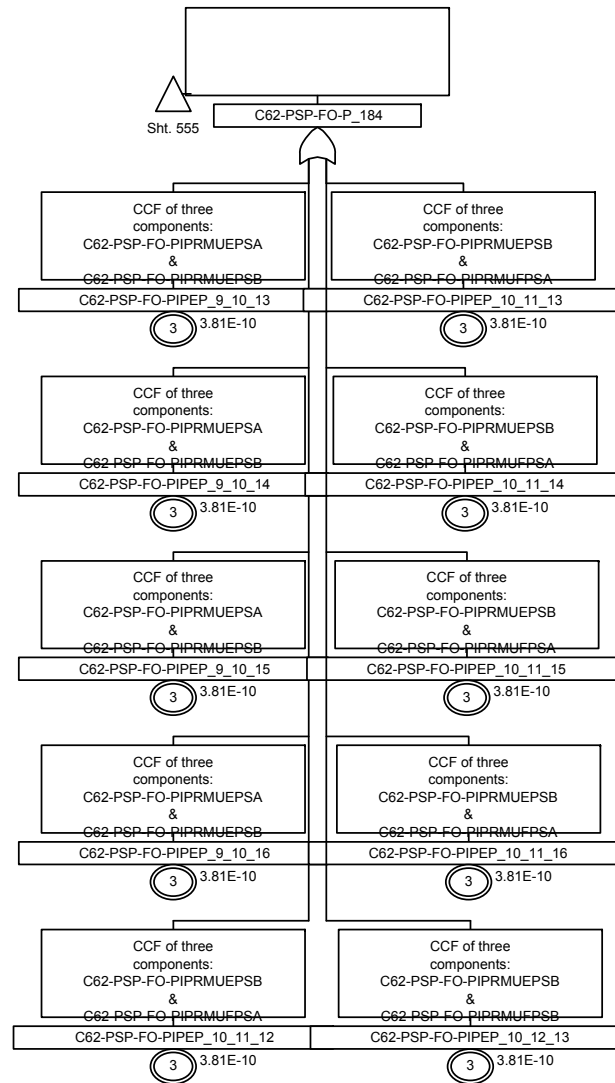


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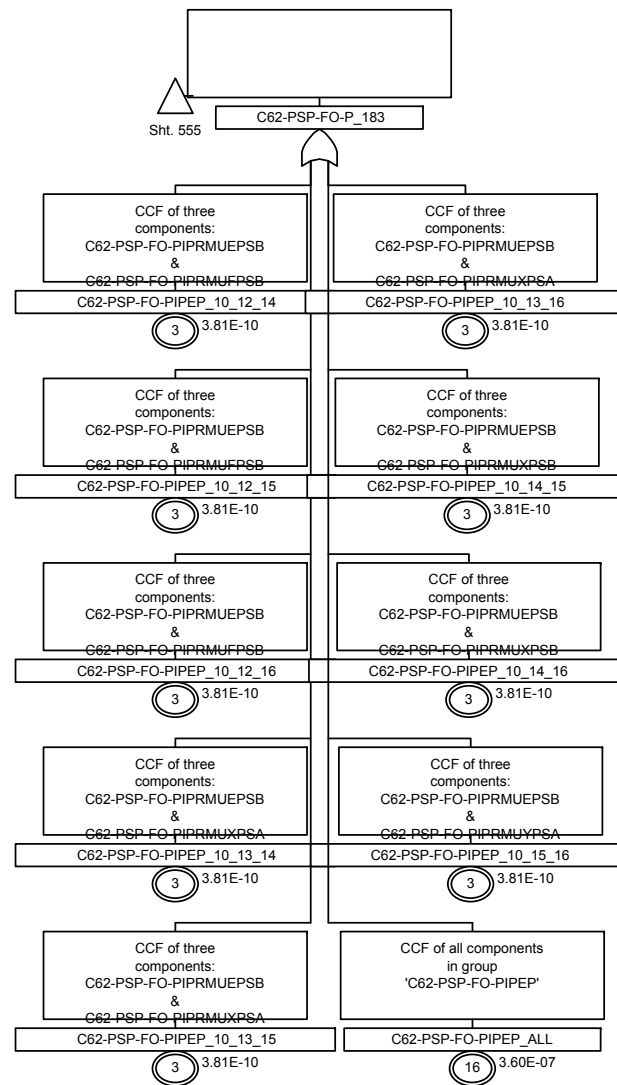


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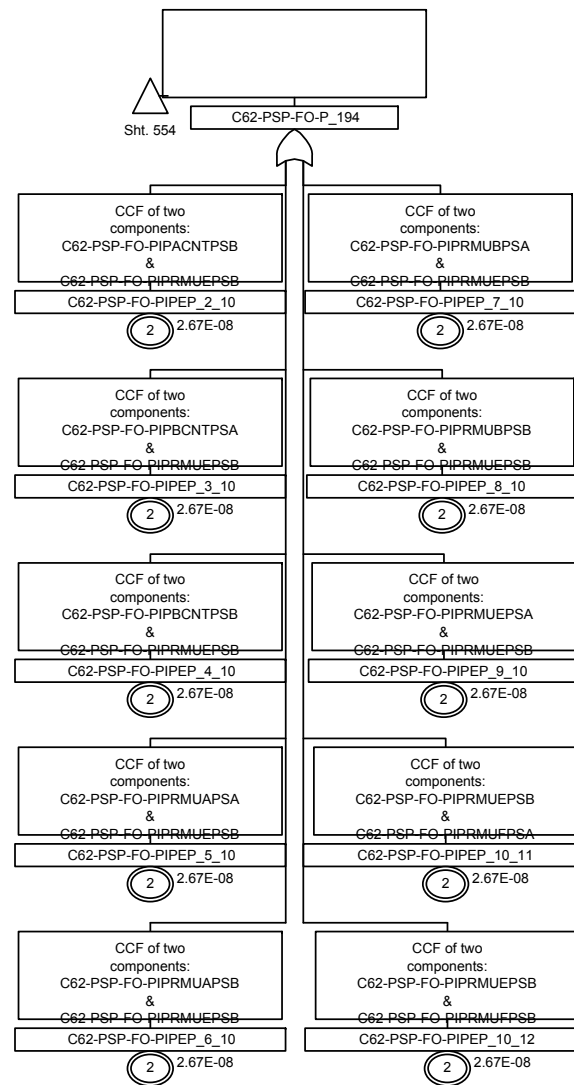


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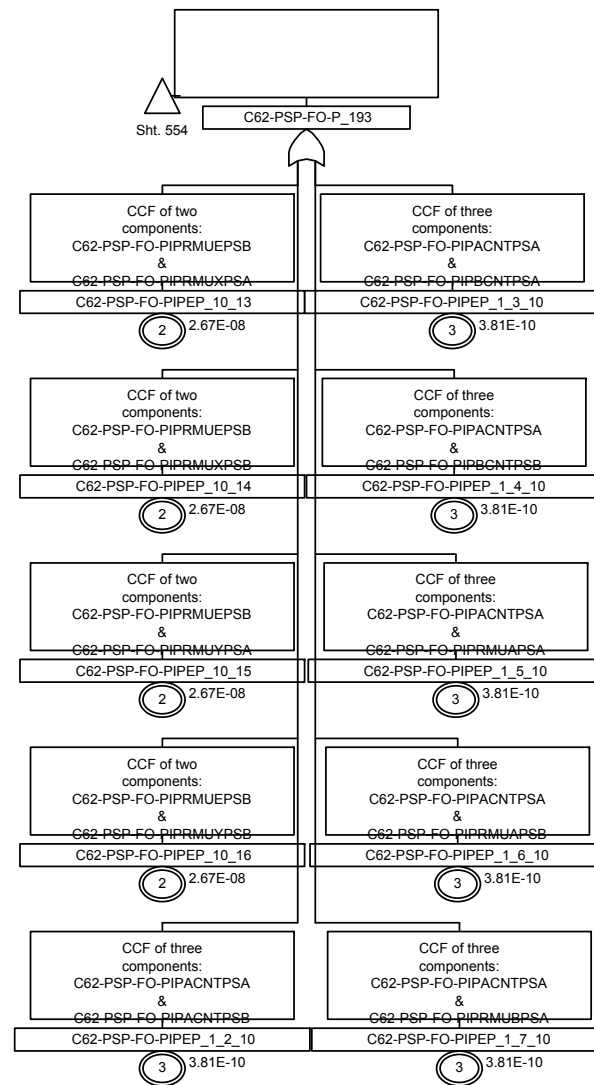


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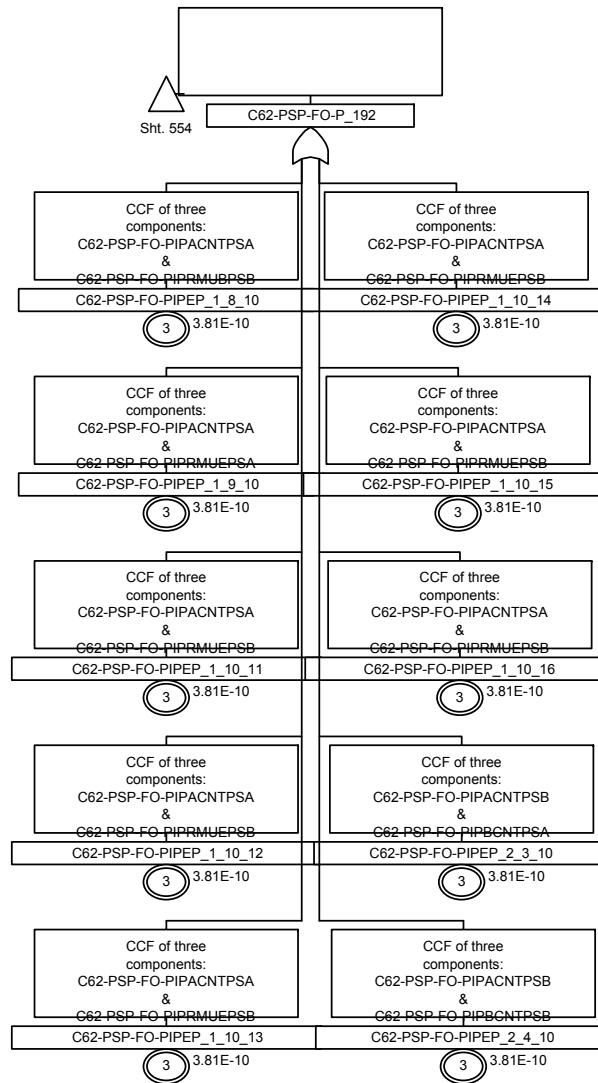


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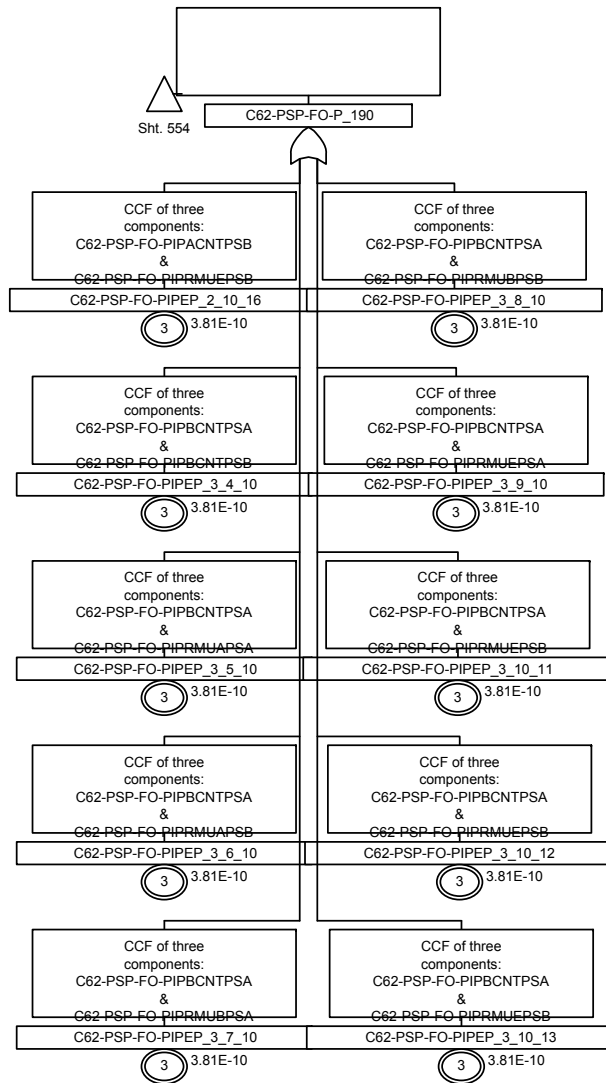


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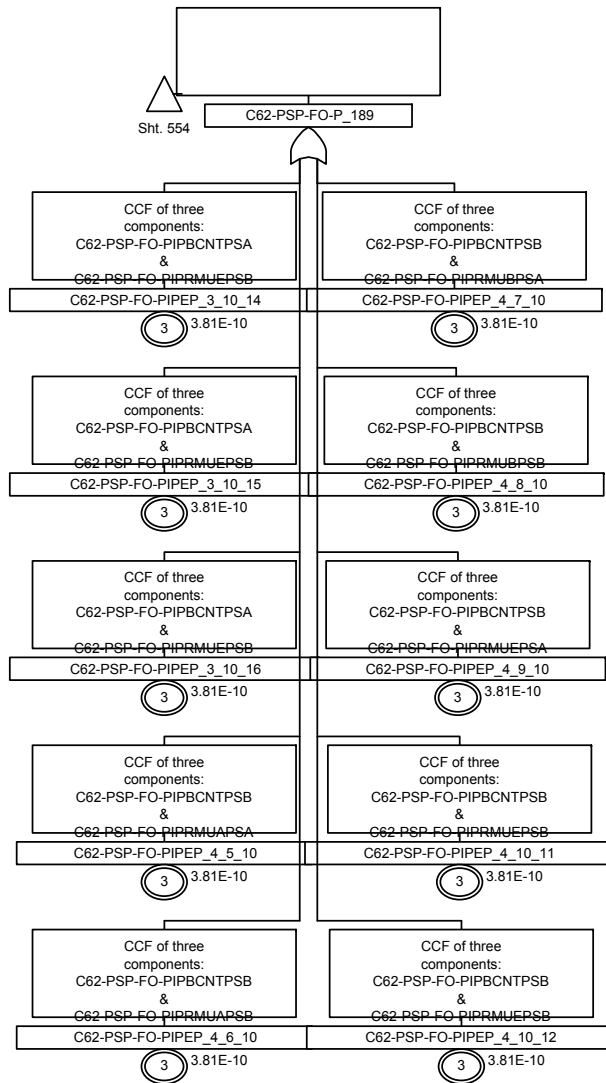


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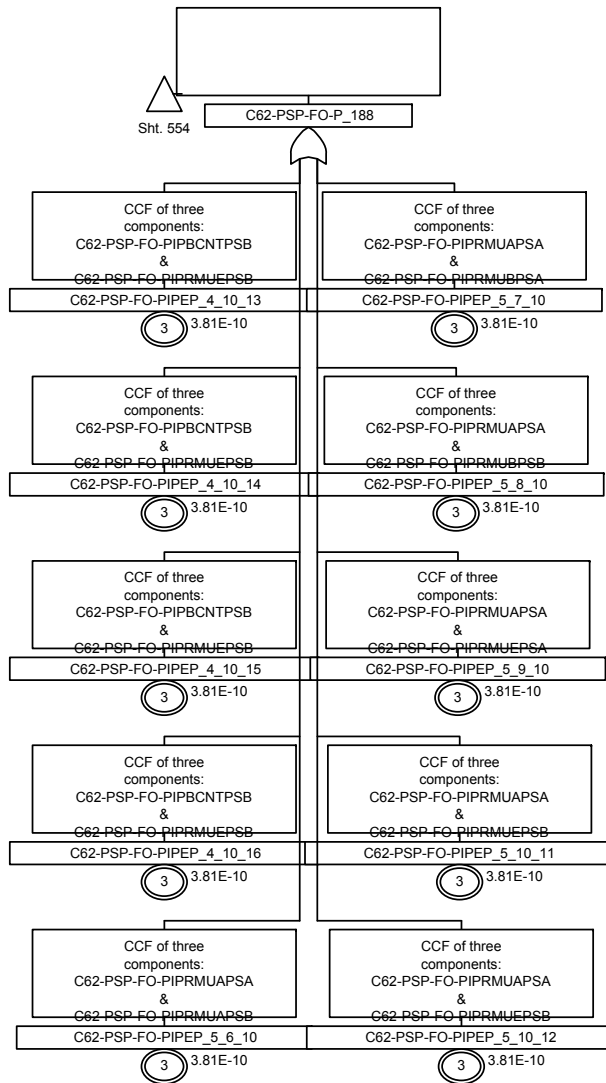


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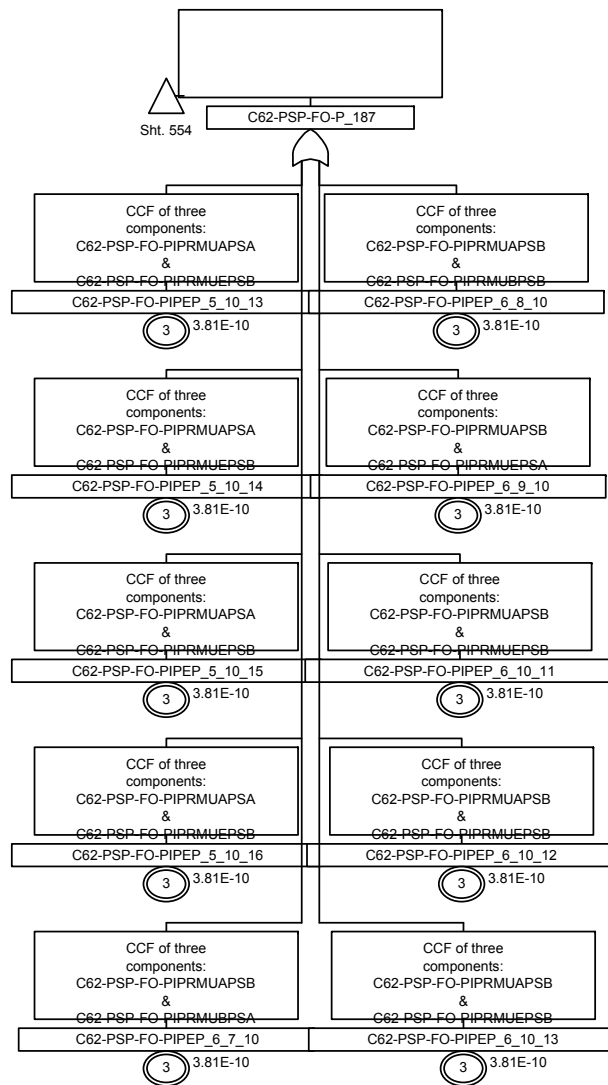


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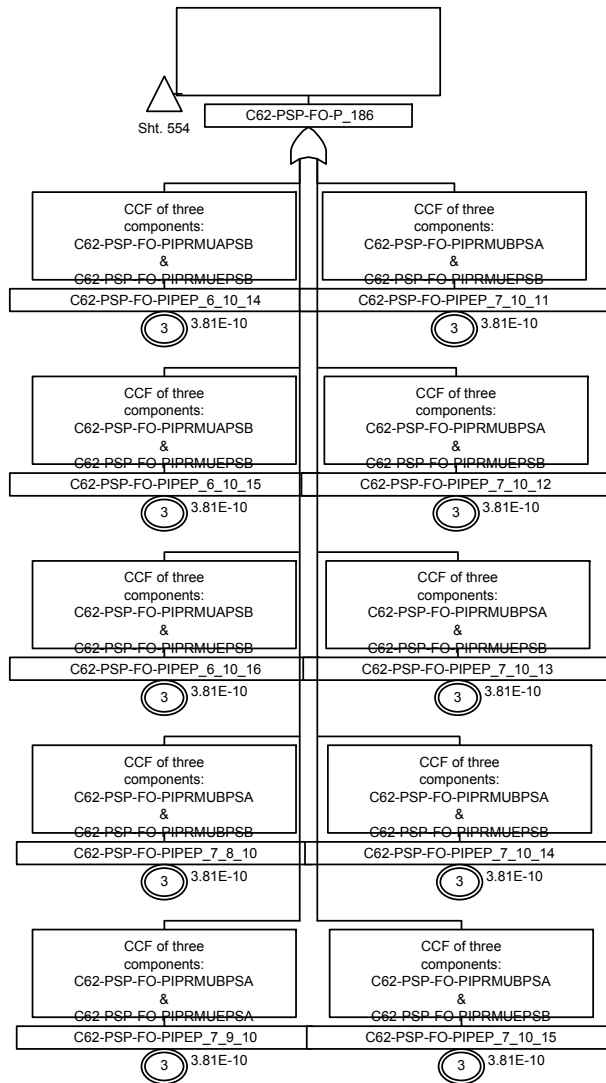


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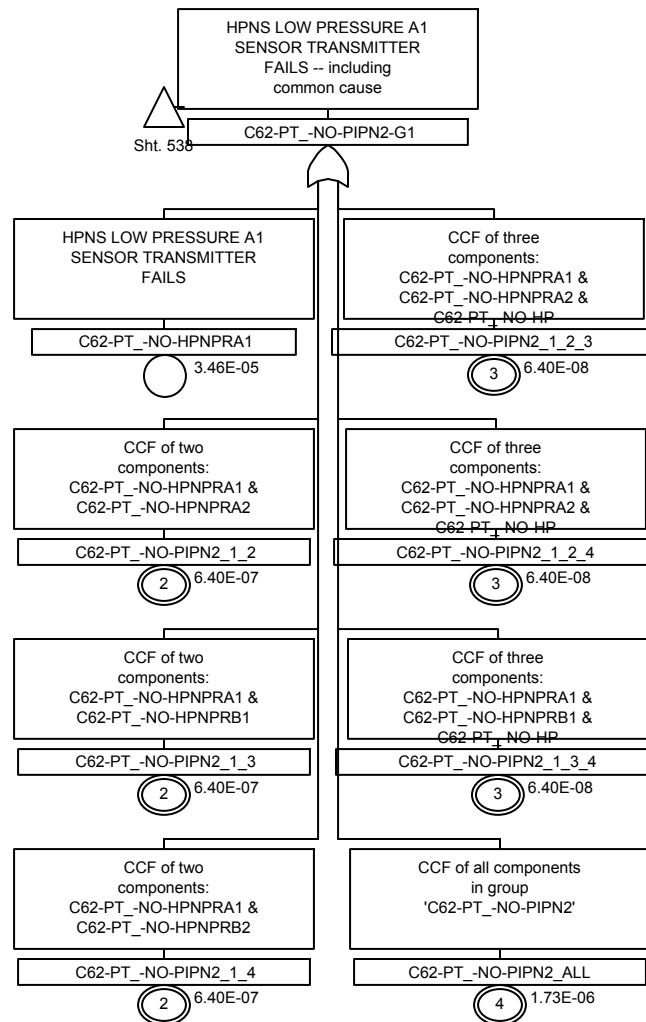


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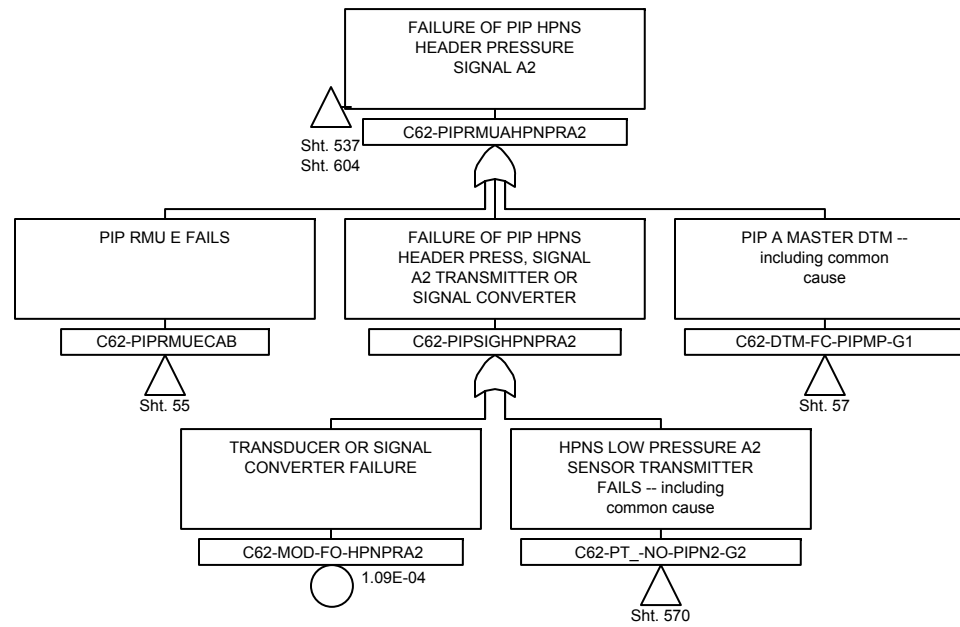


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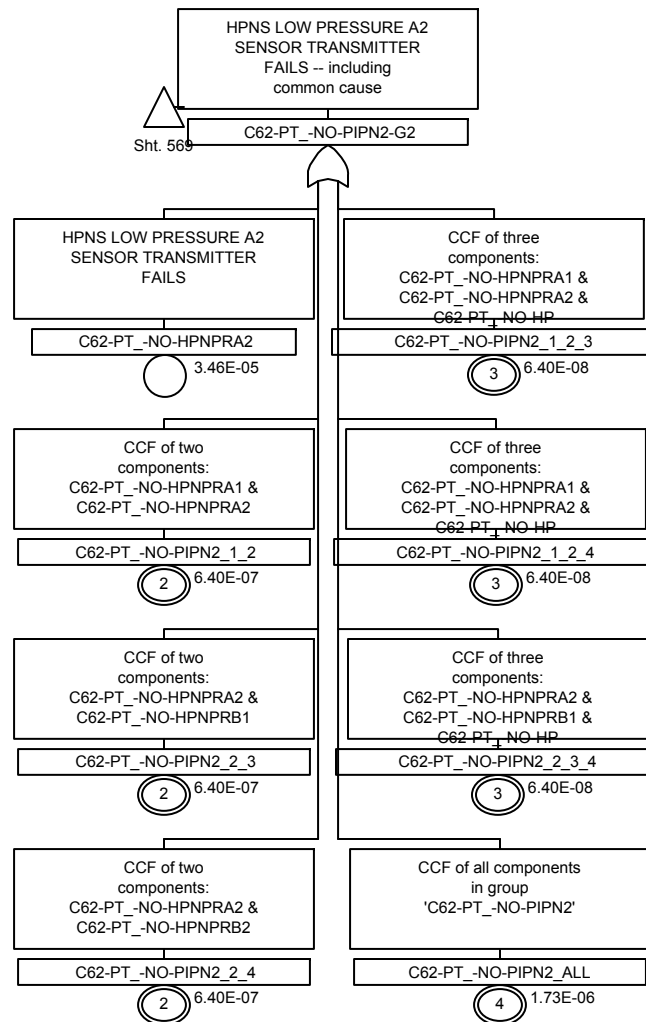


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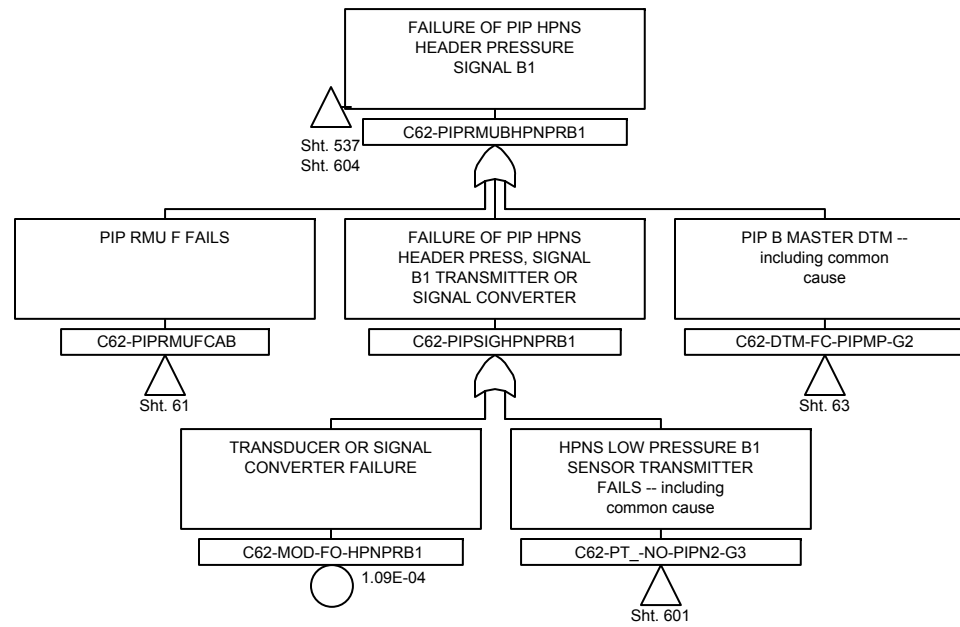


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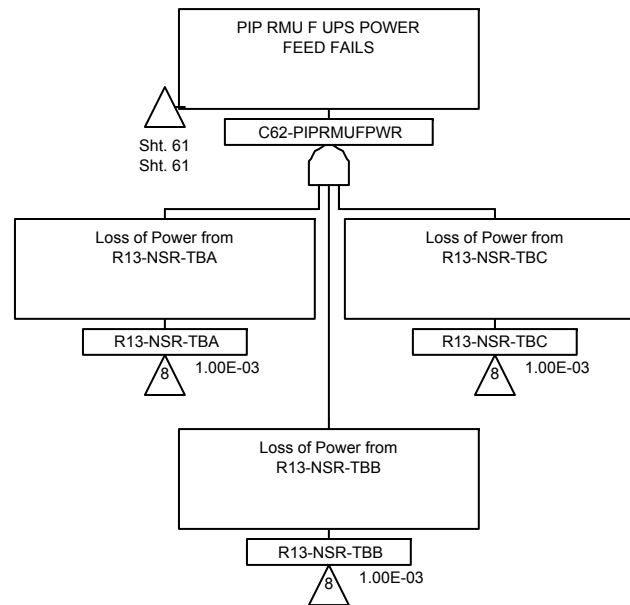


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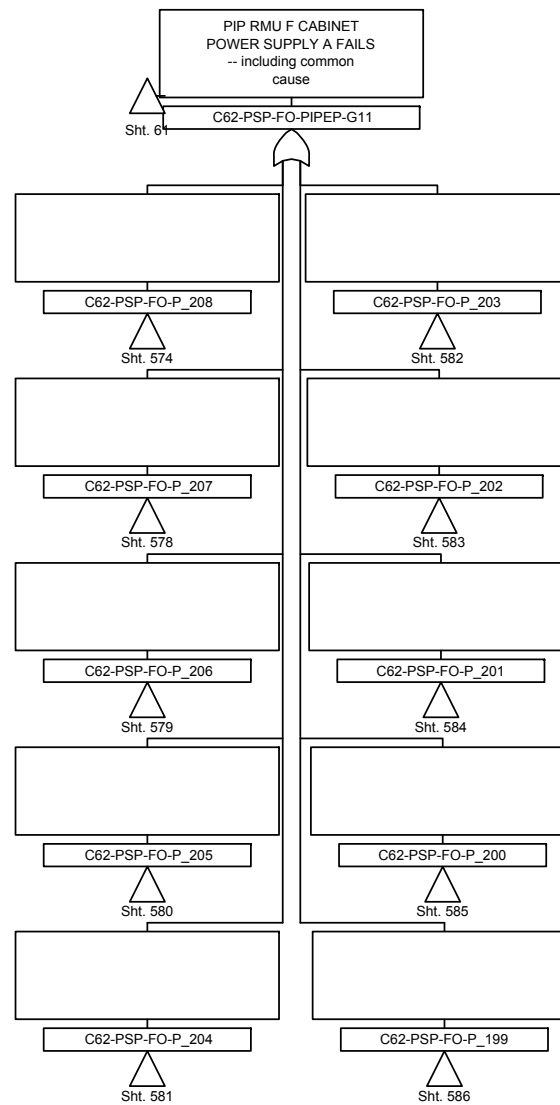


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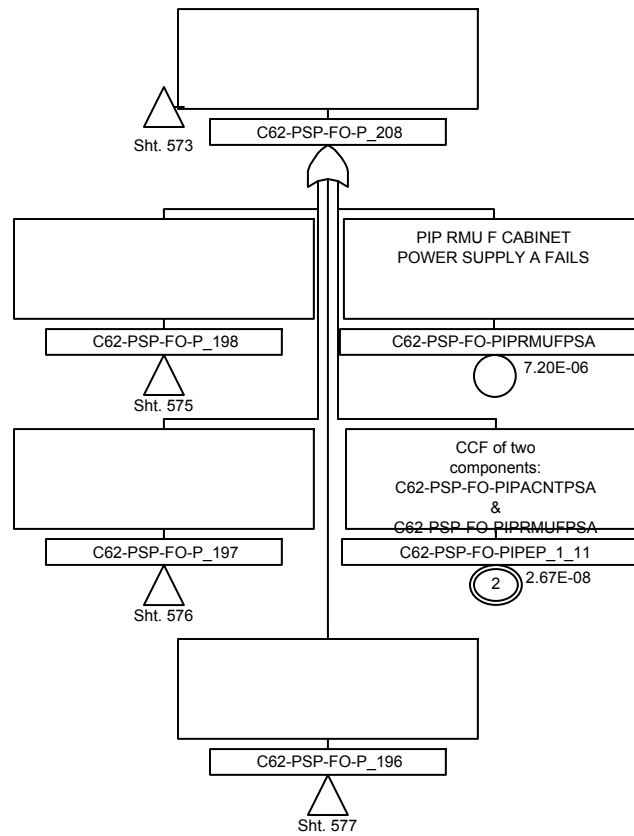


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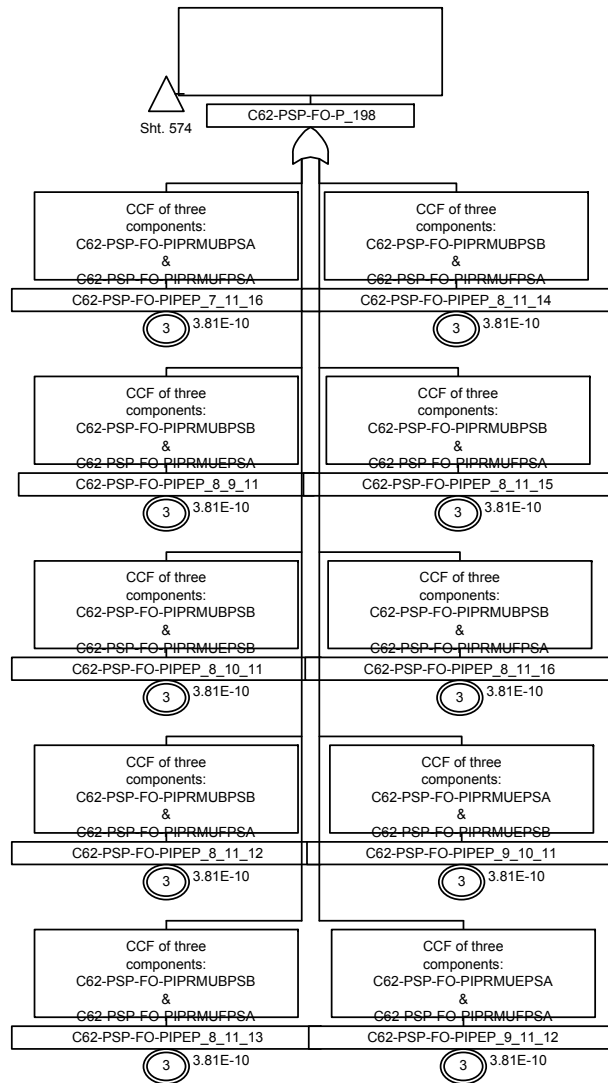


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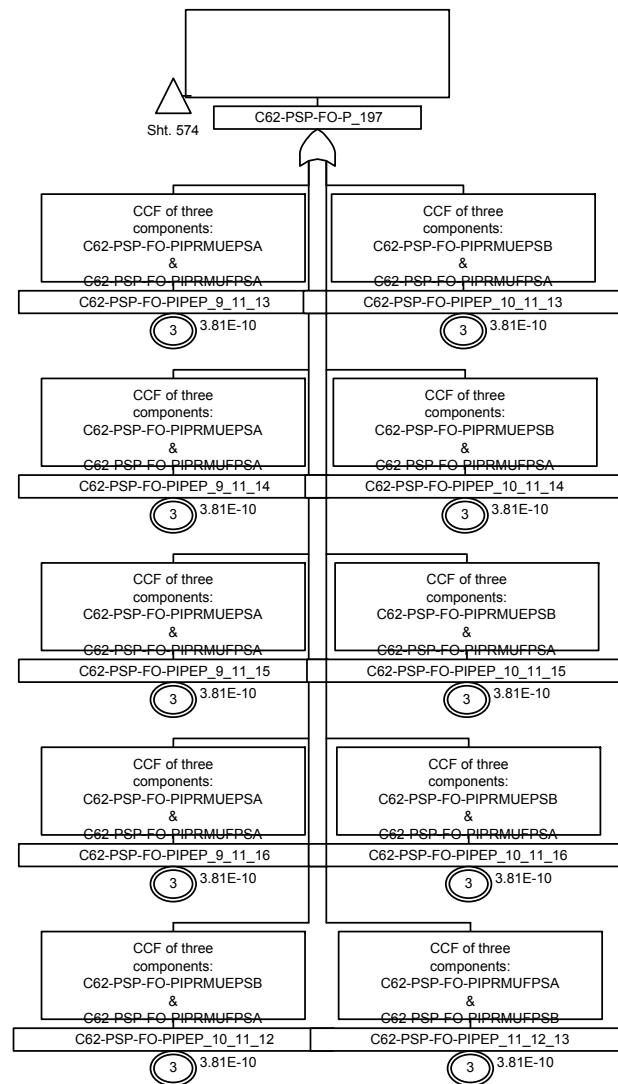


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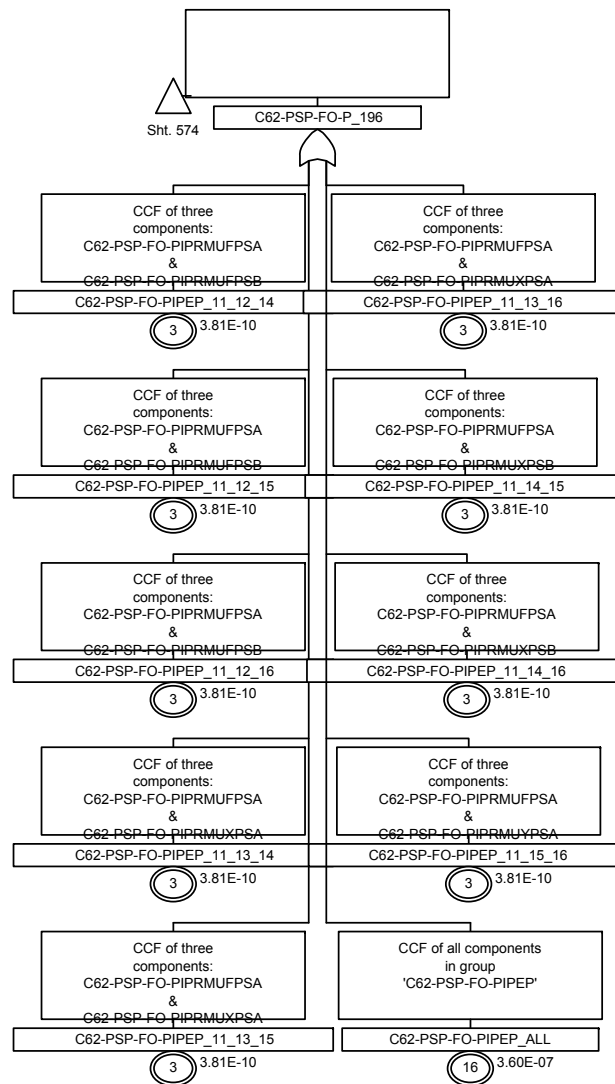


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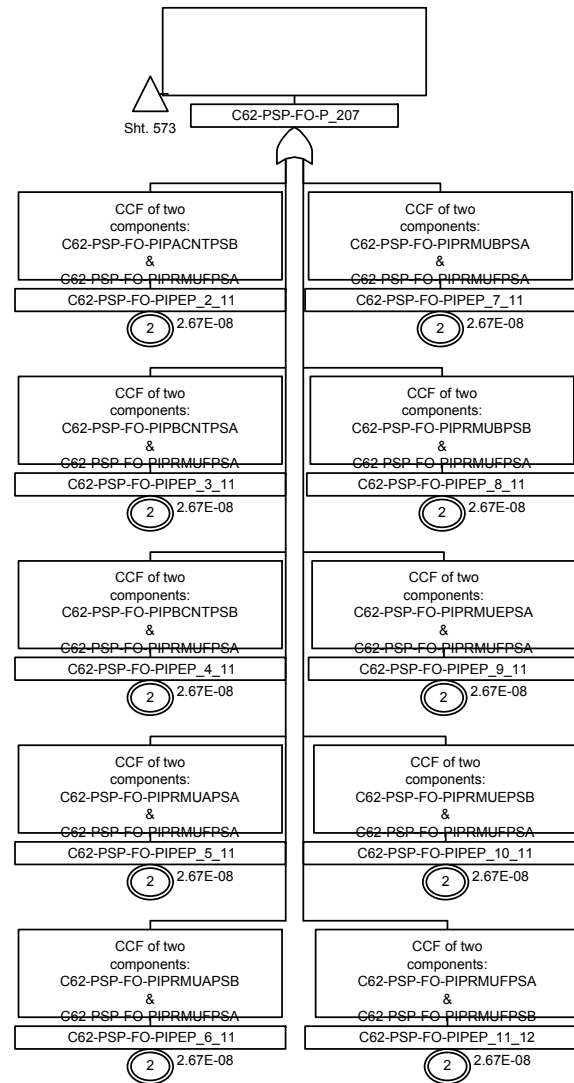


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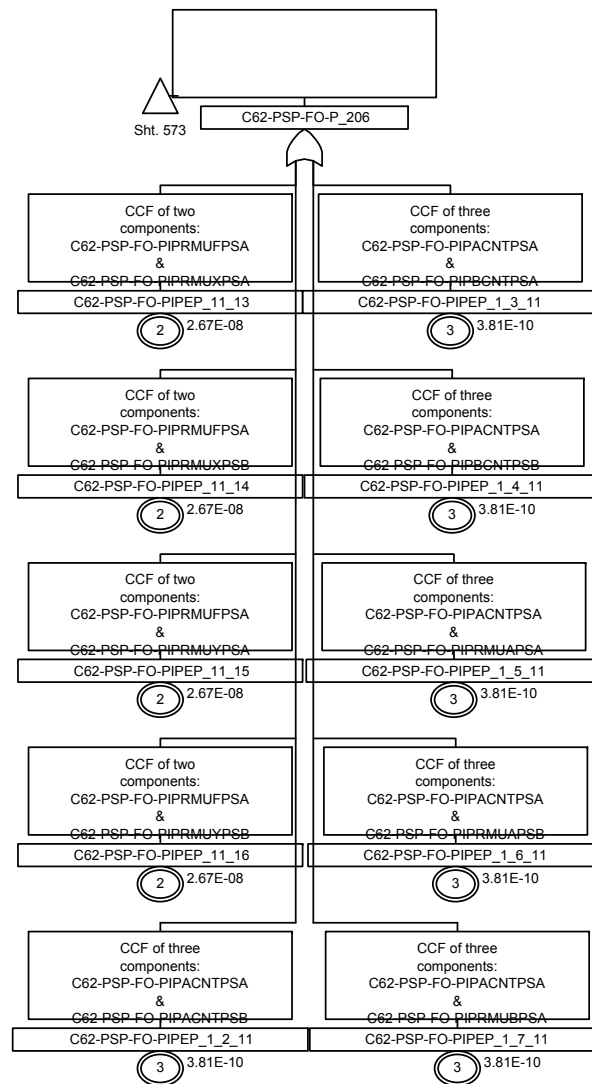


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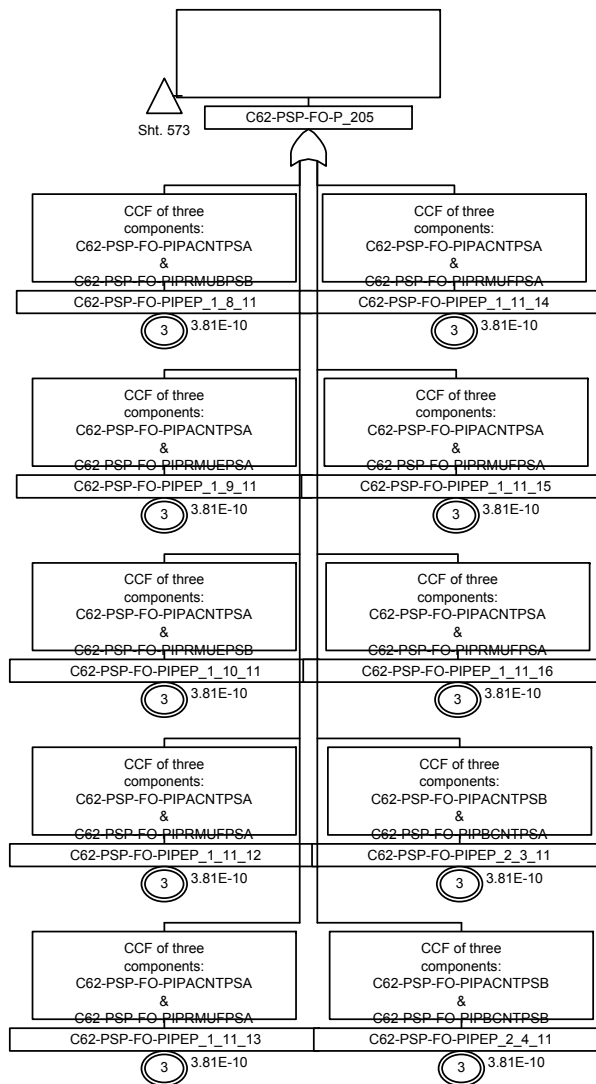


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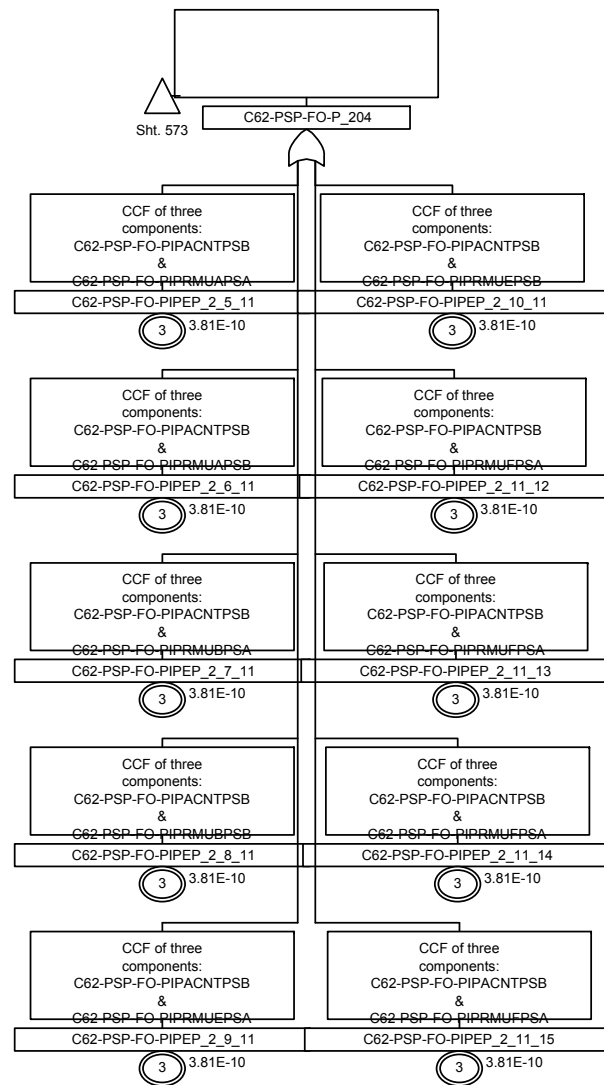


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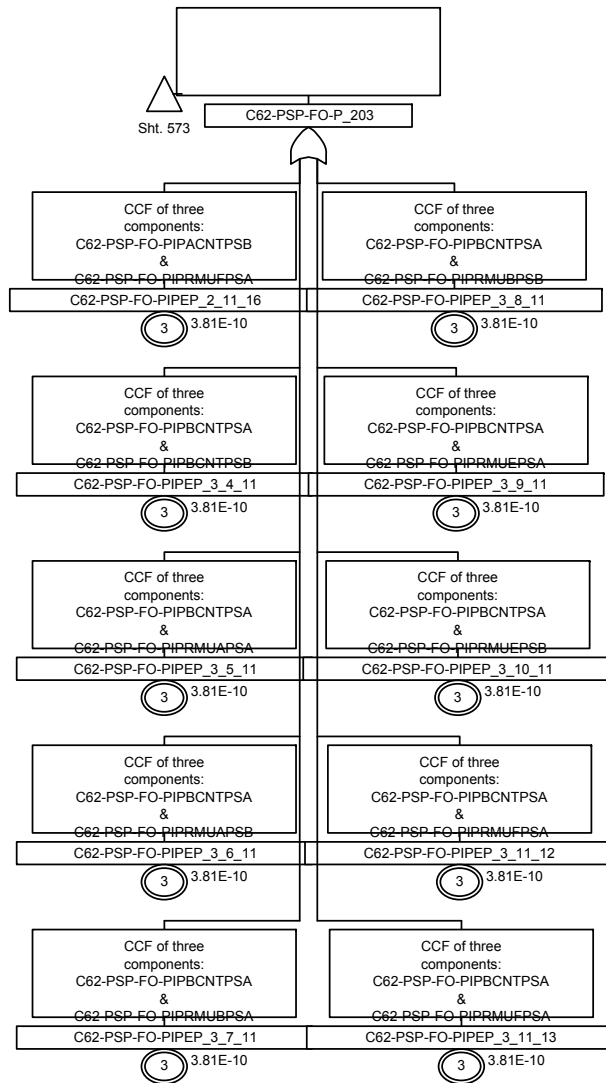


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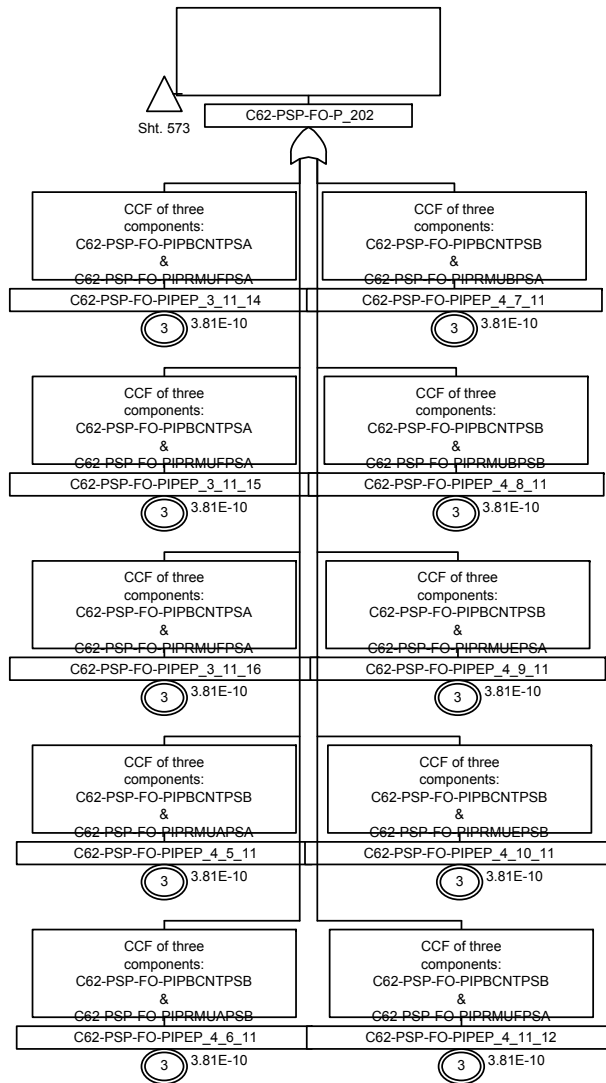


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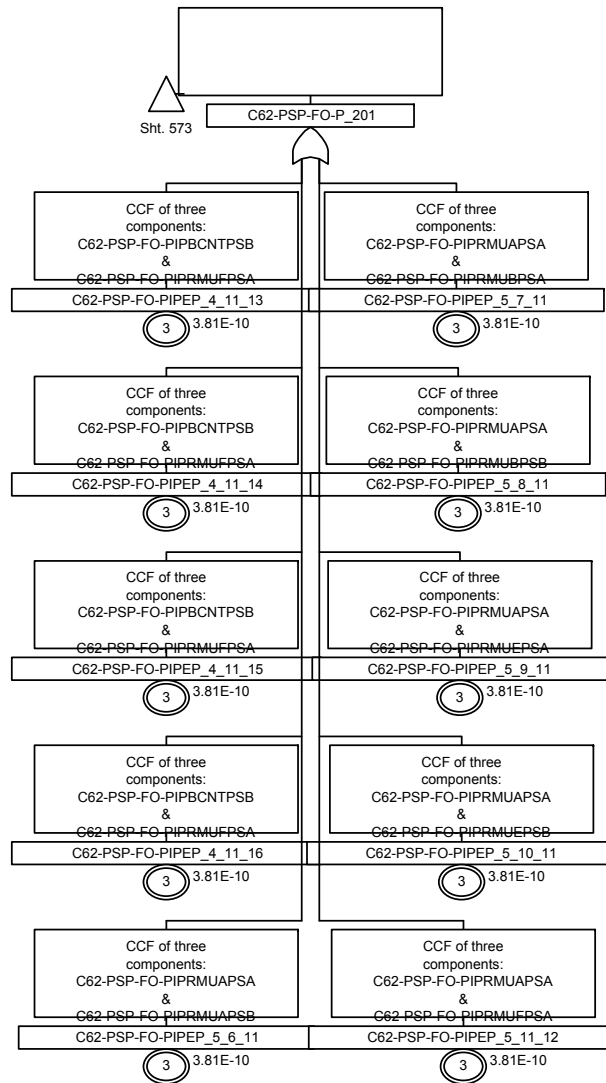


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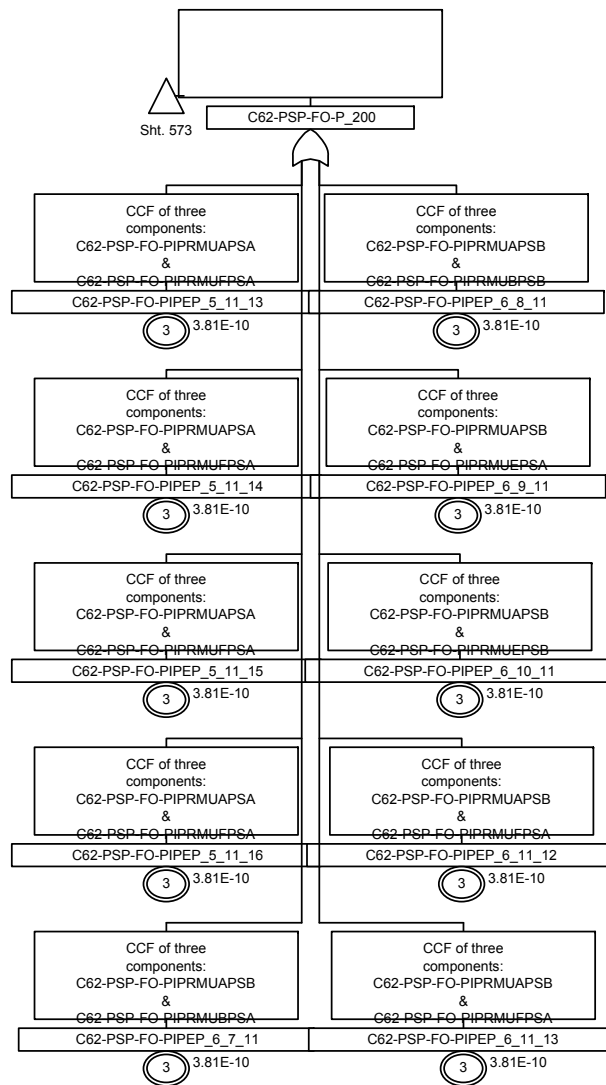


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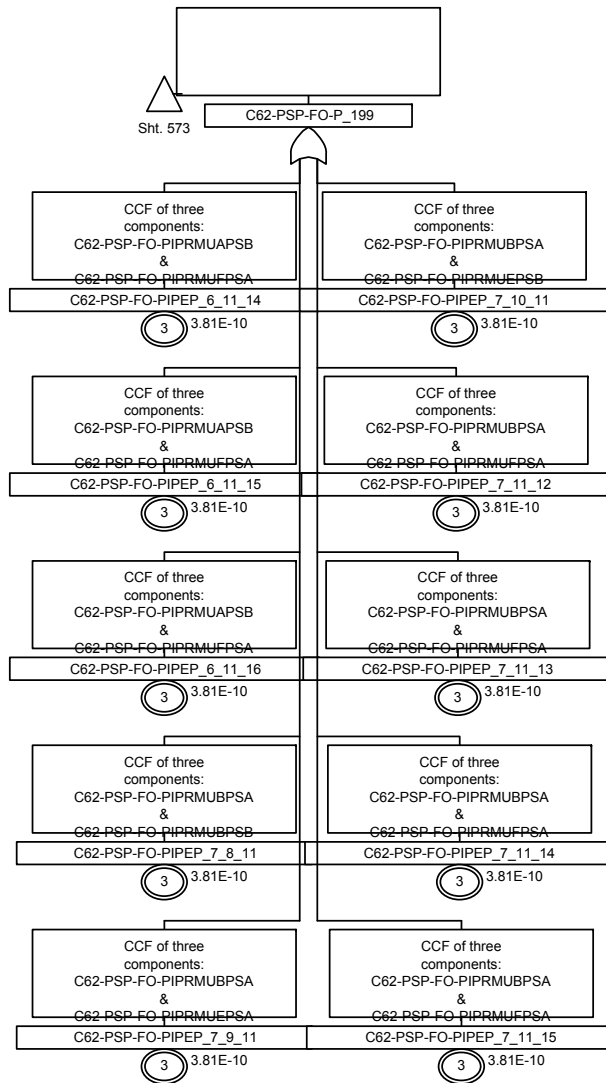


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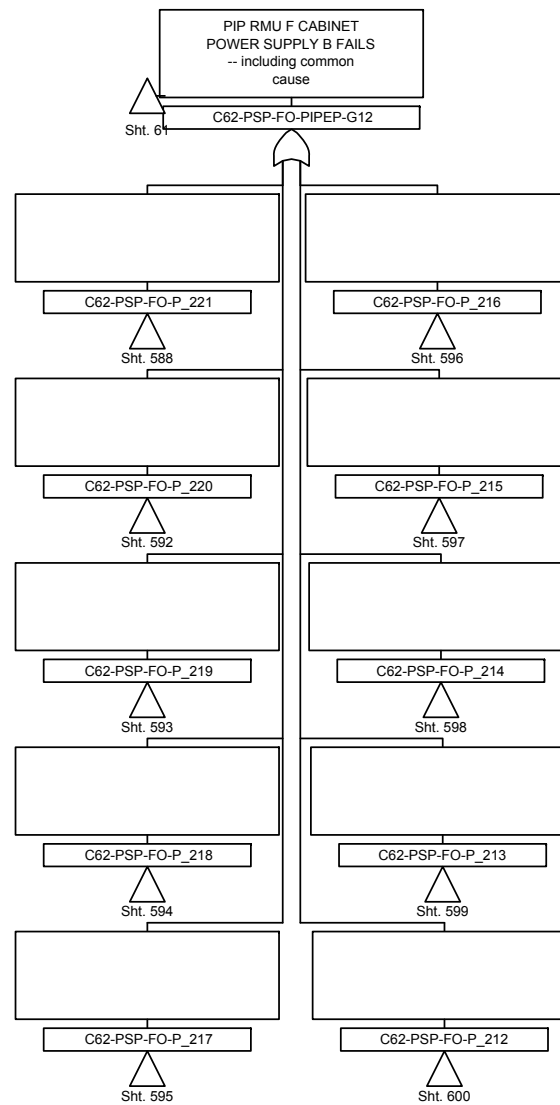


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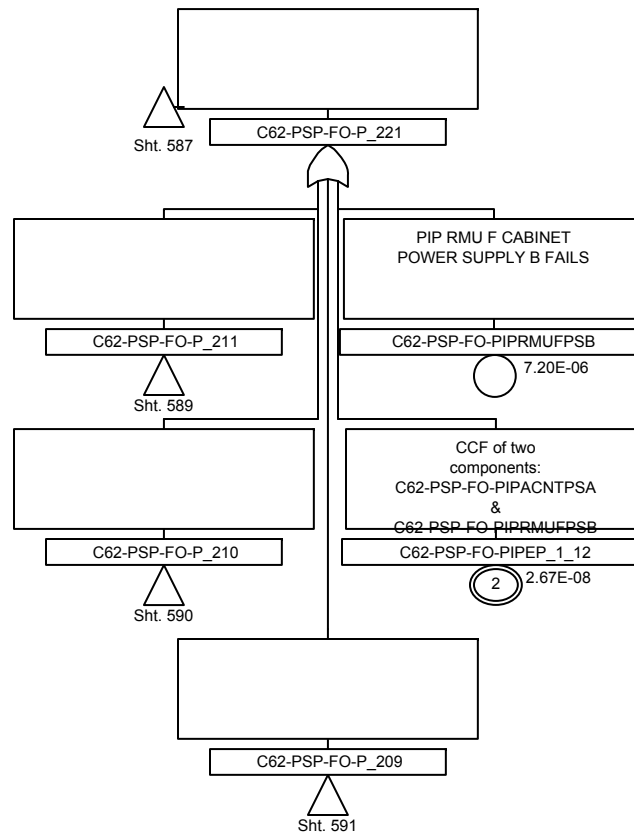


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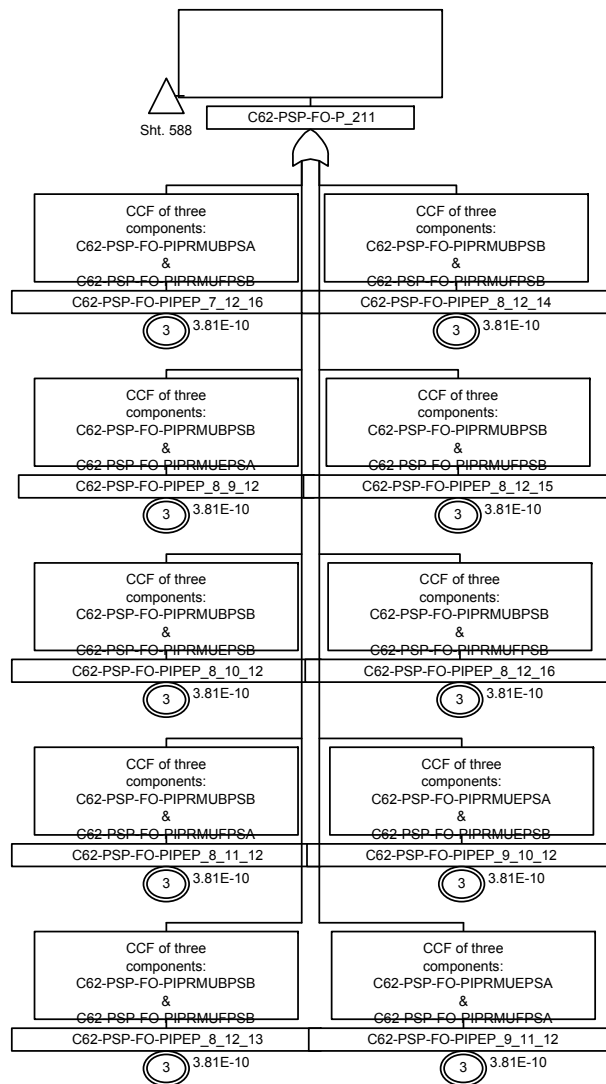


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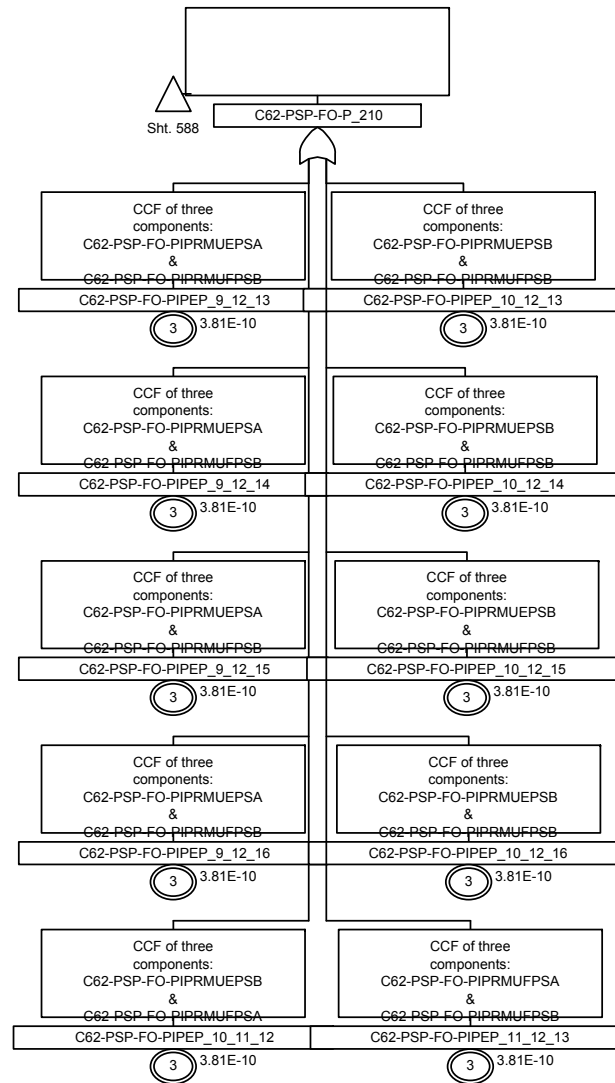


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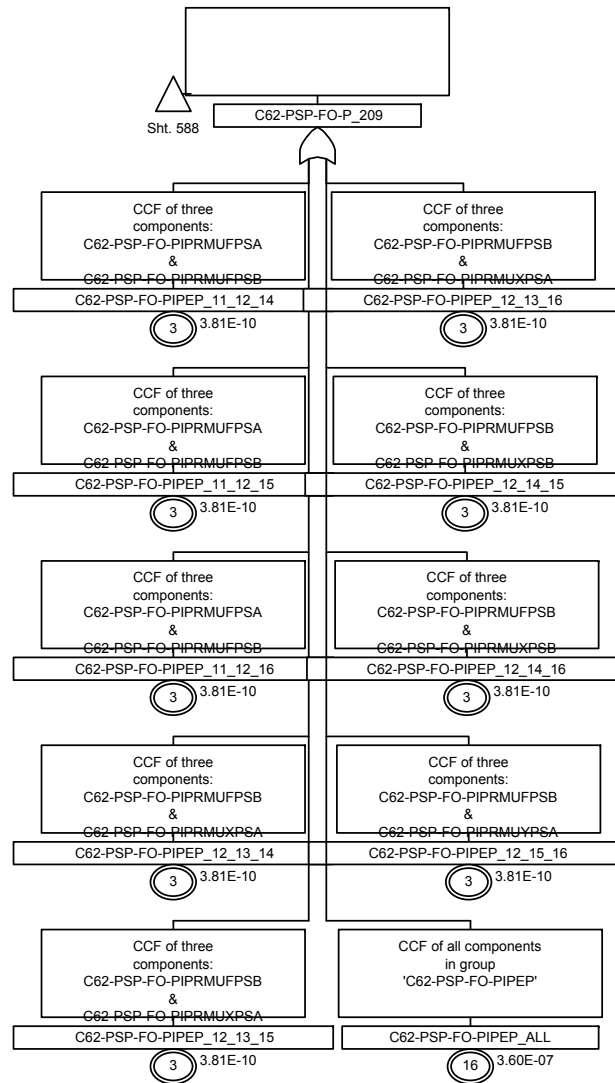


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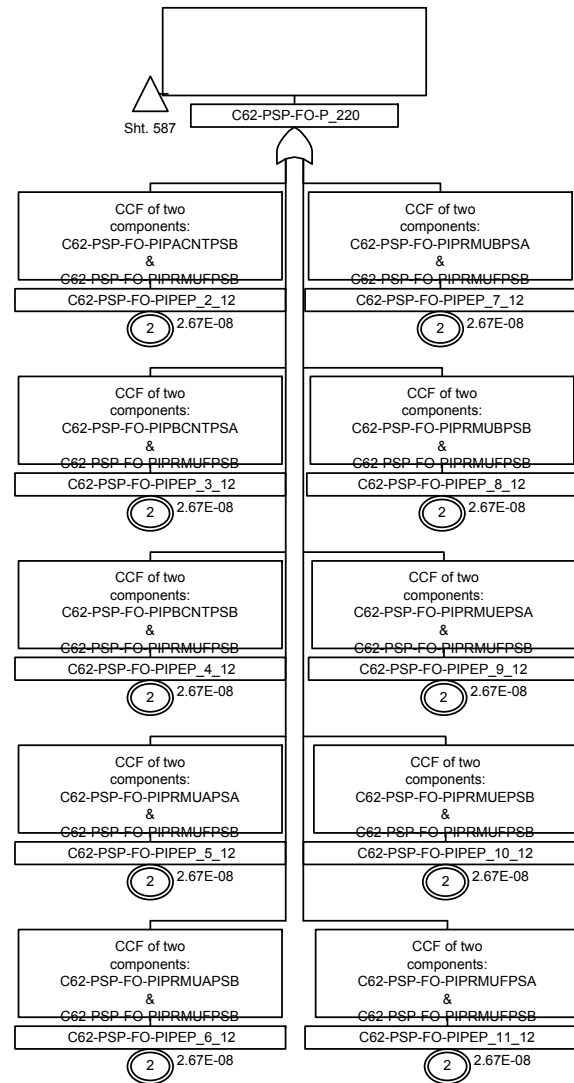


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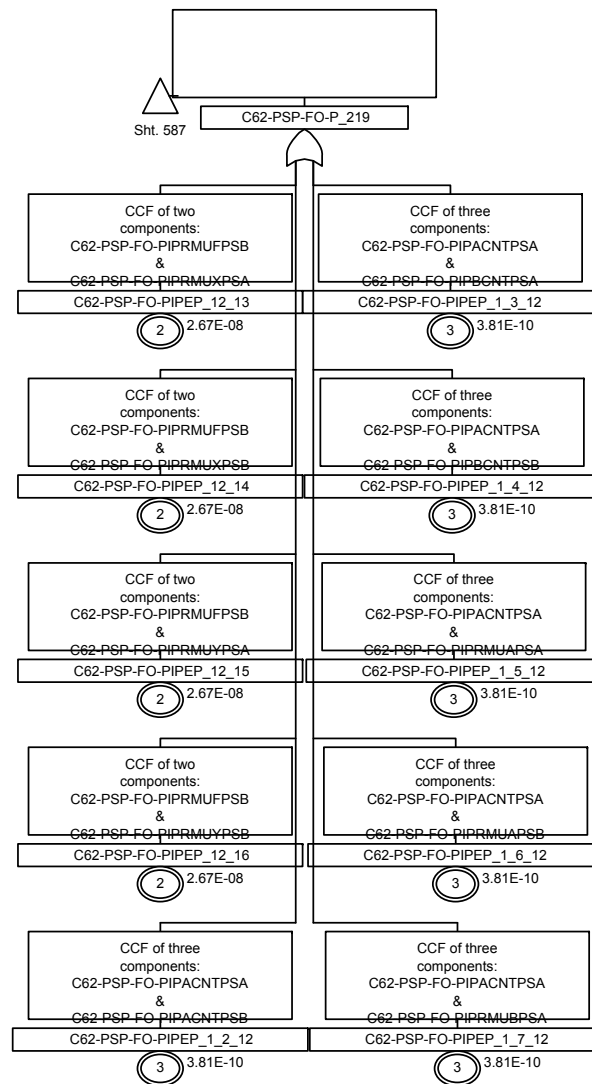


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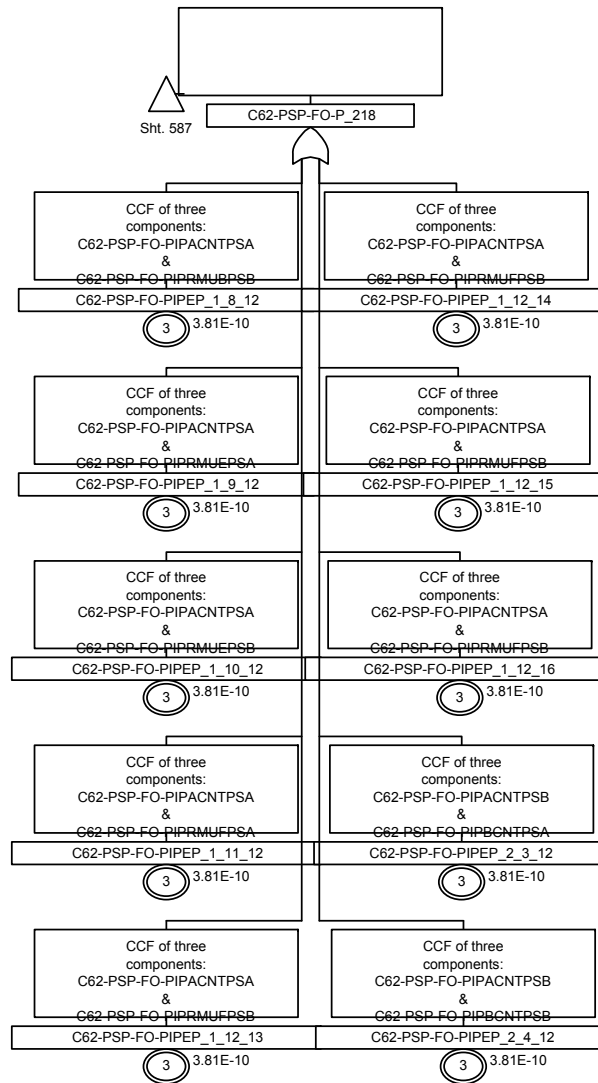


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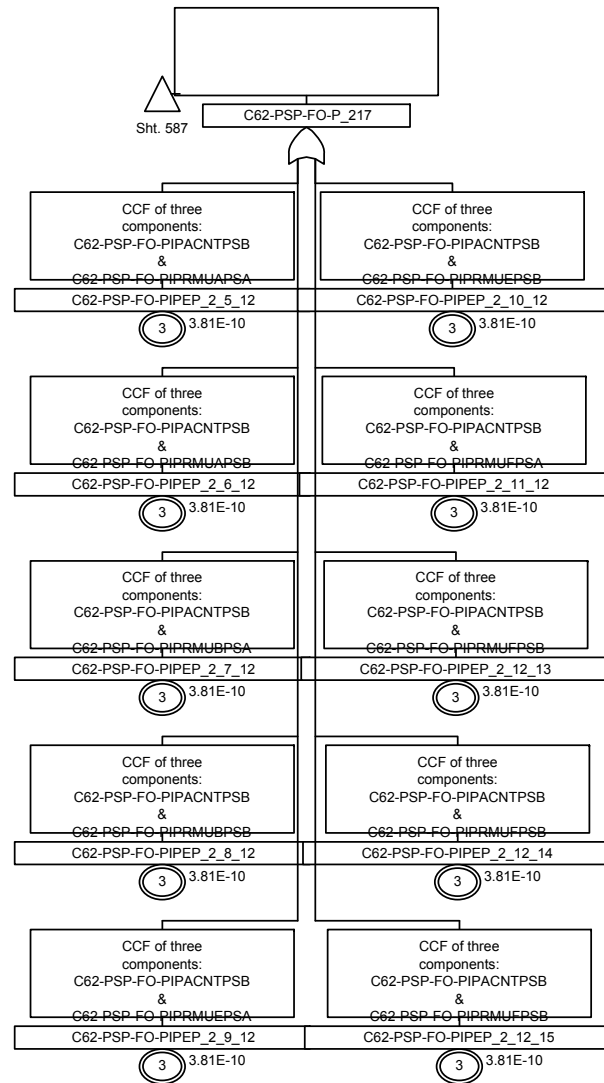


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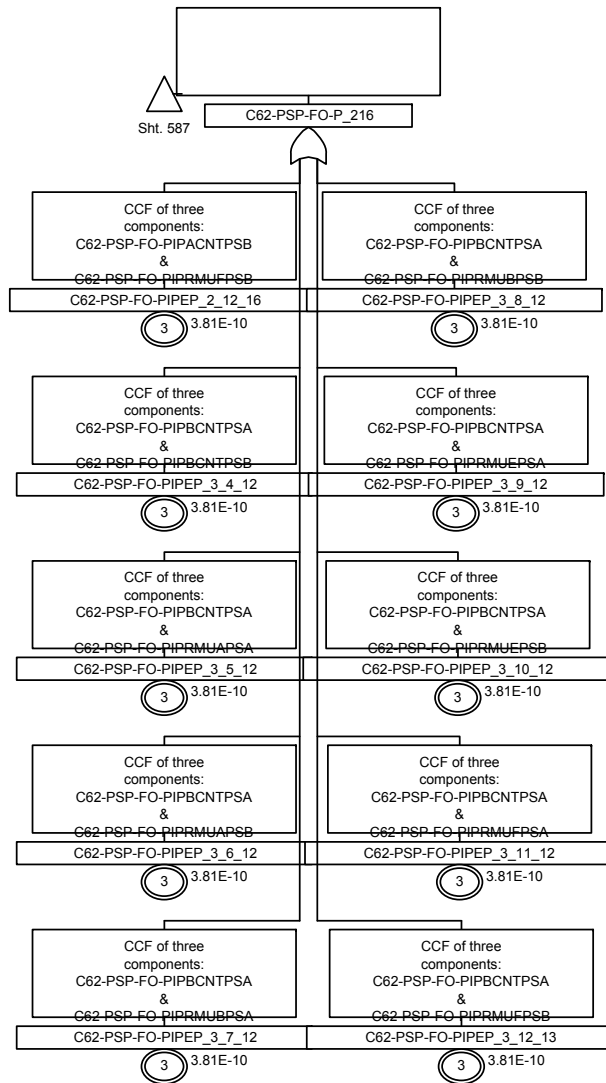


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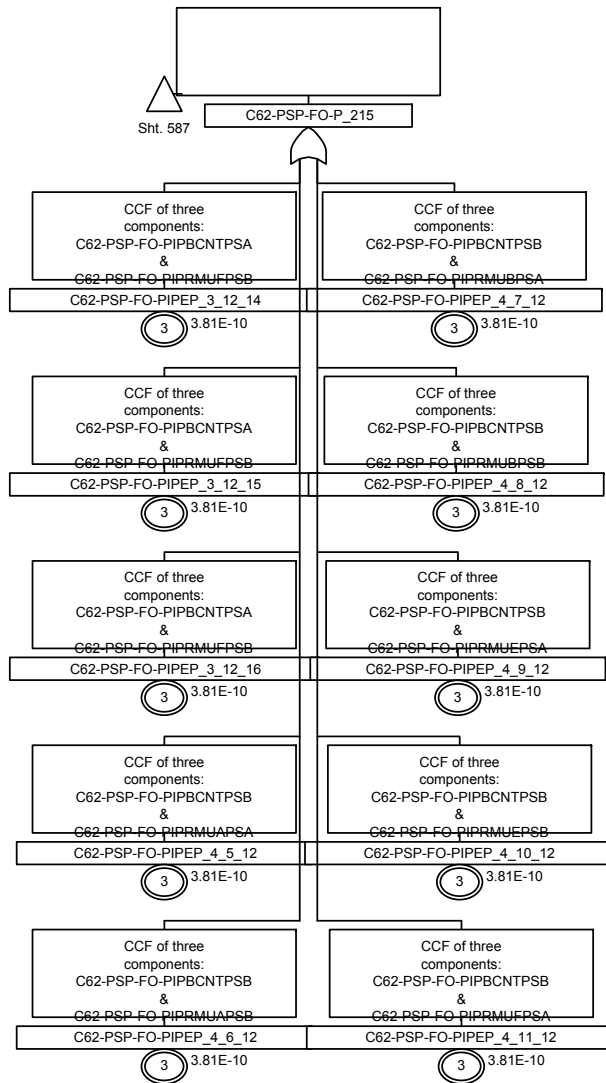


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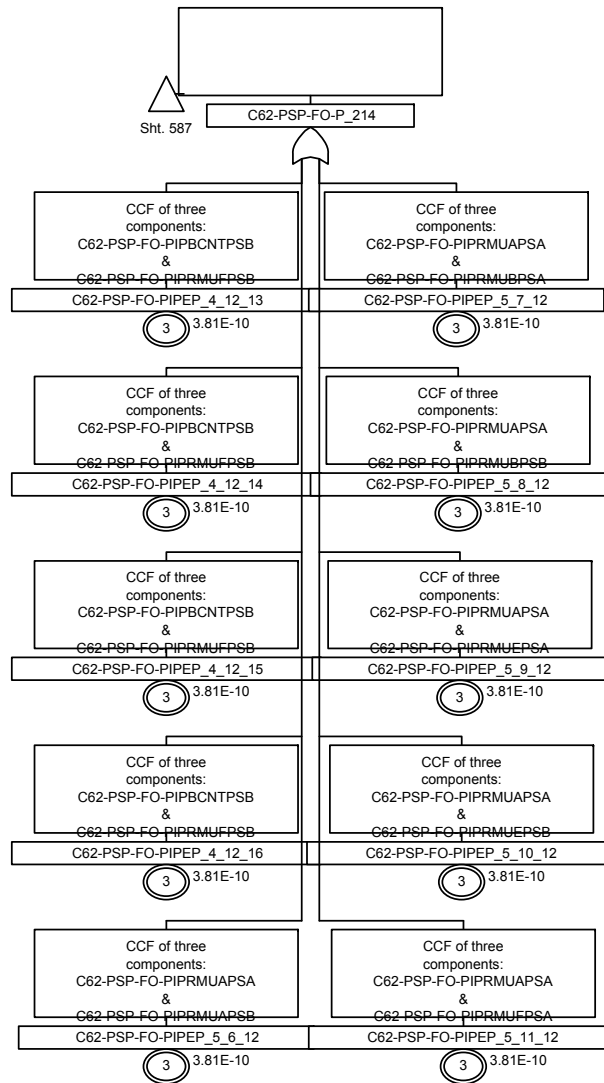


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4.5-1219

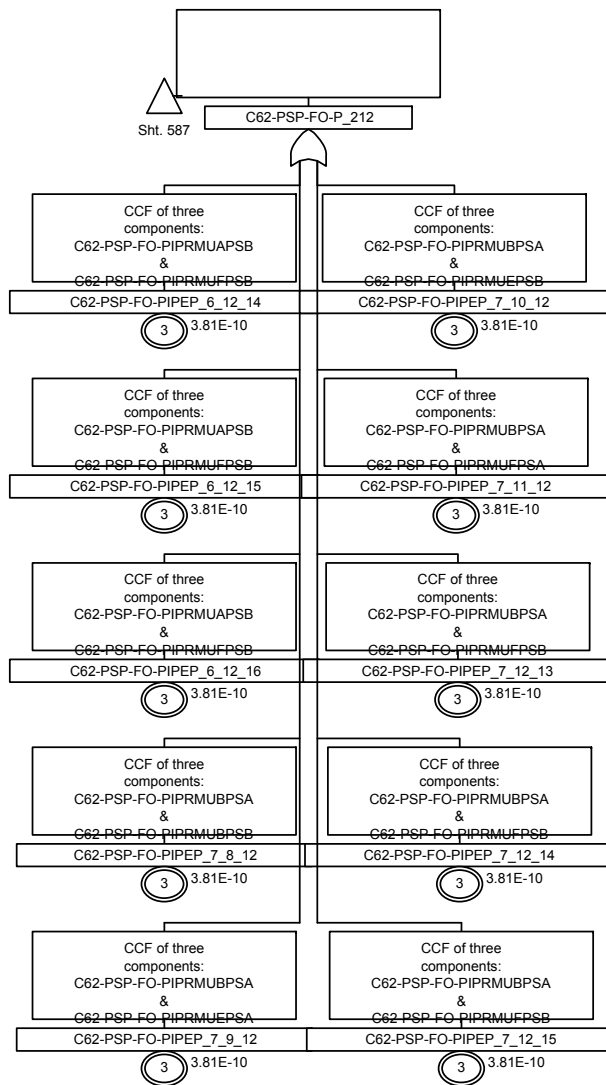


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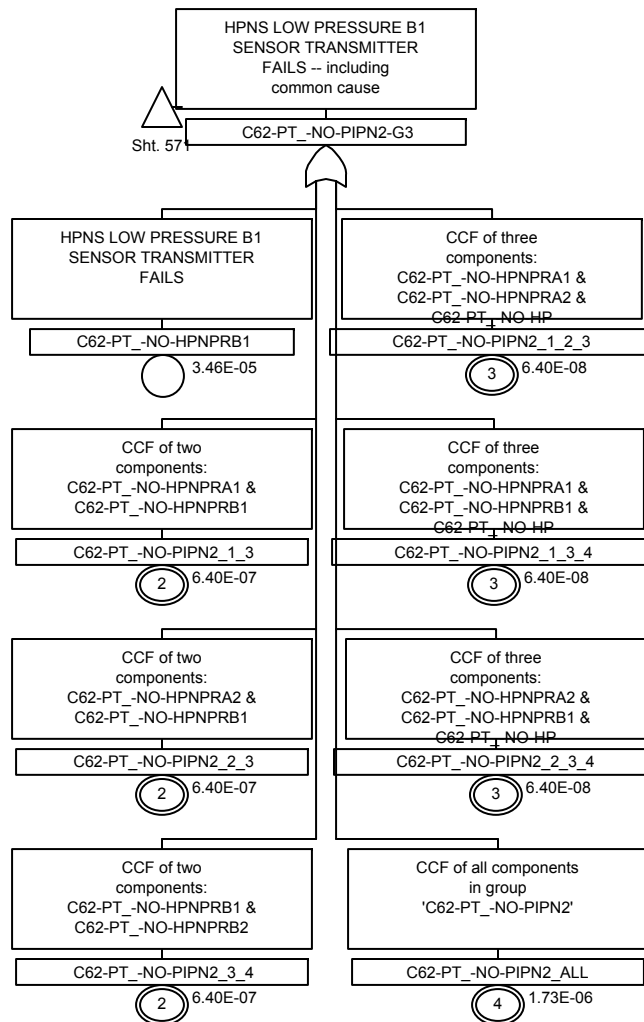


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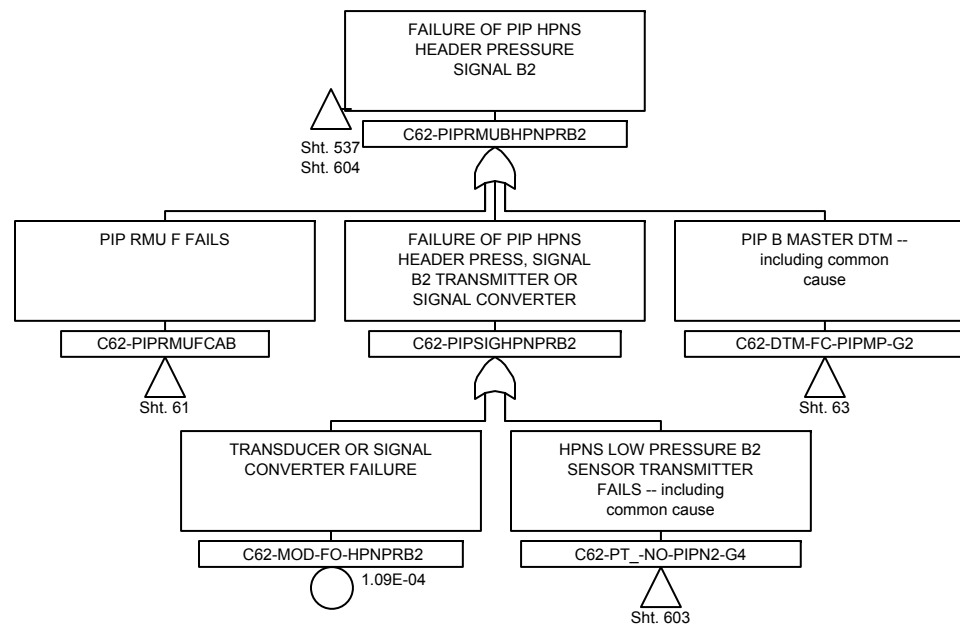


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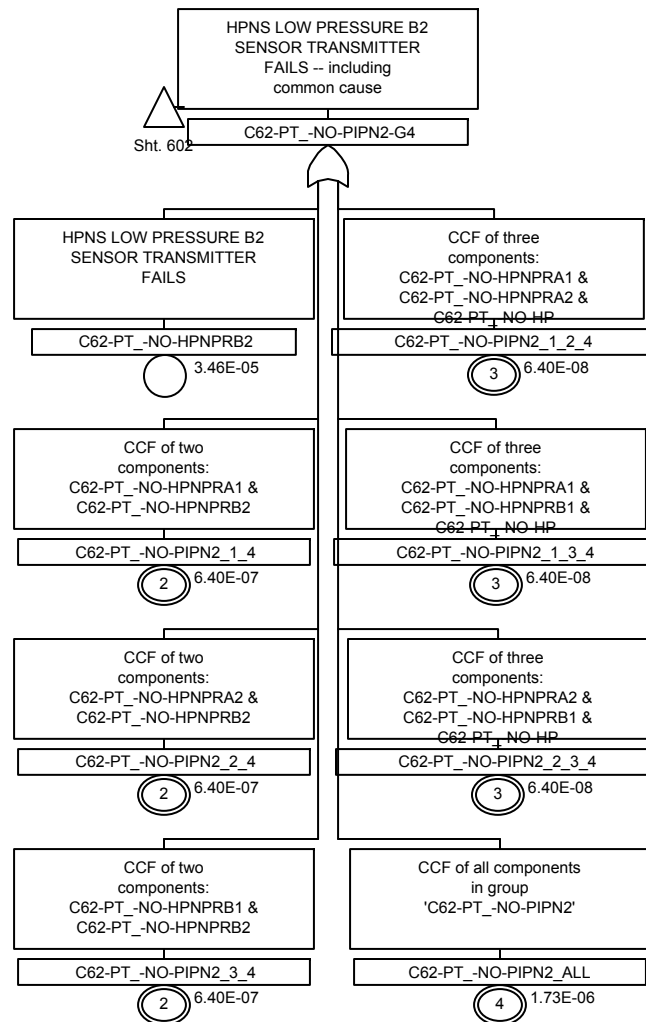


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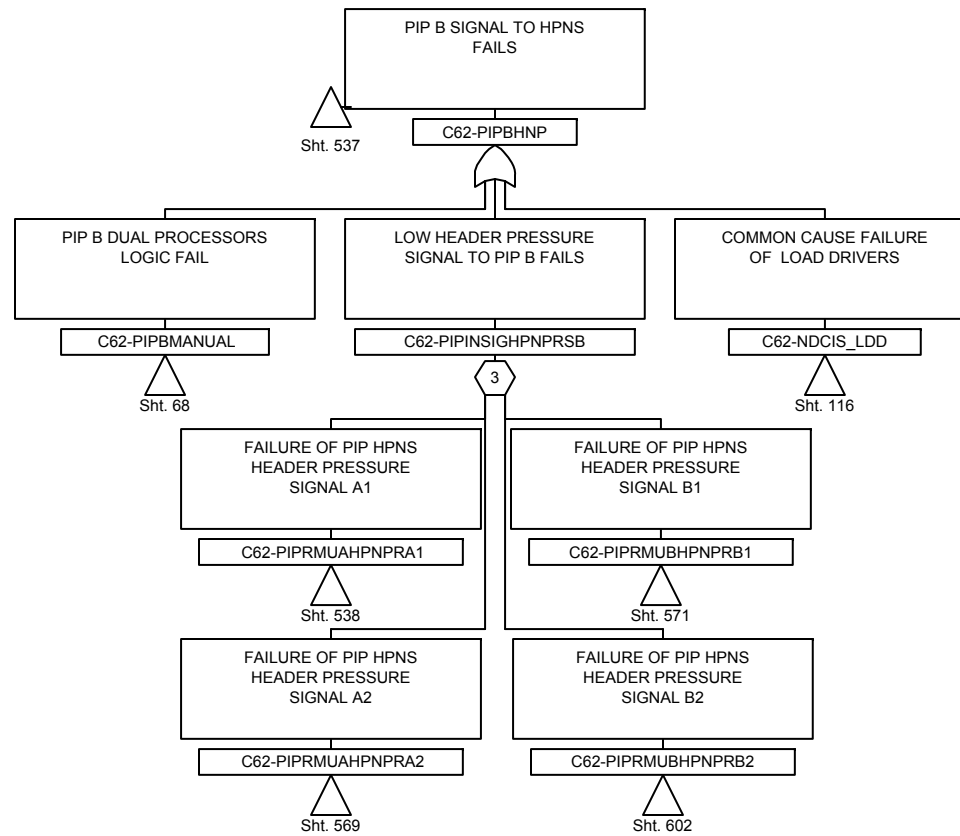


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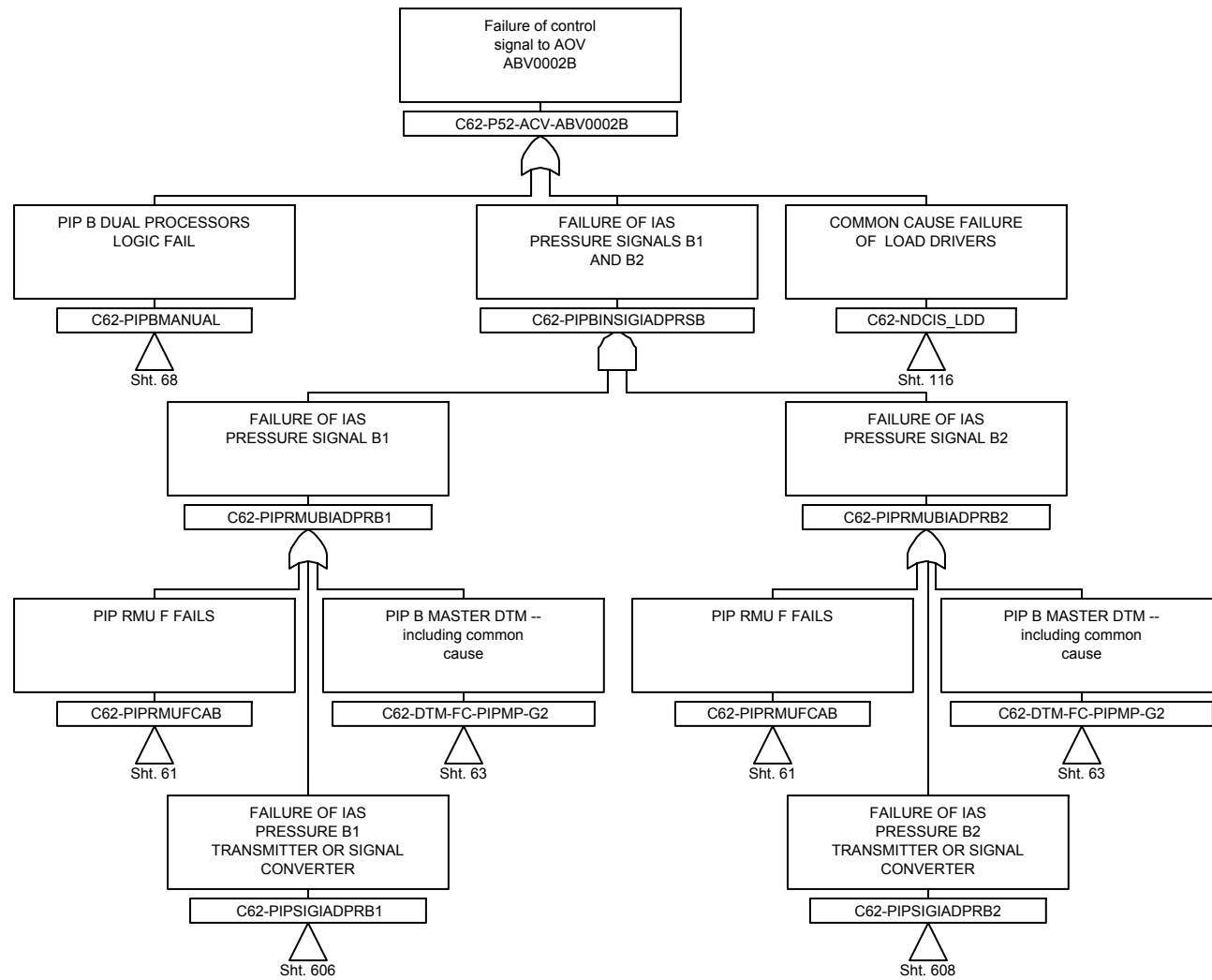


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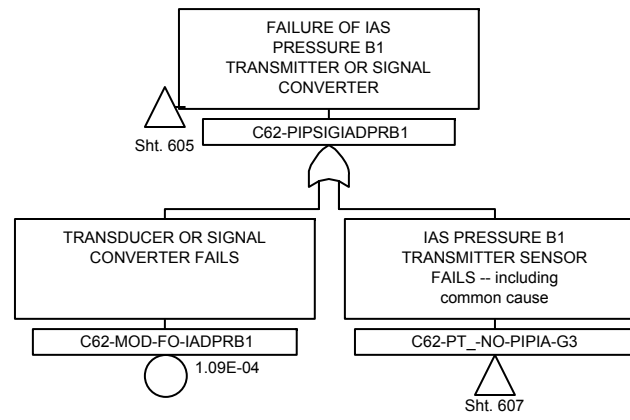


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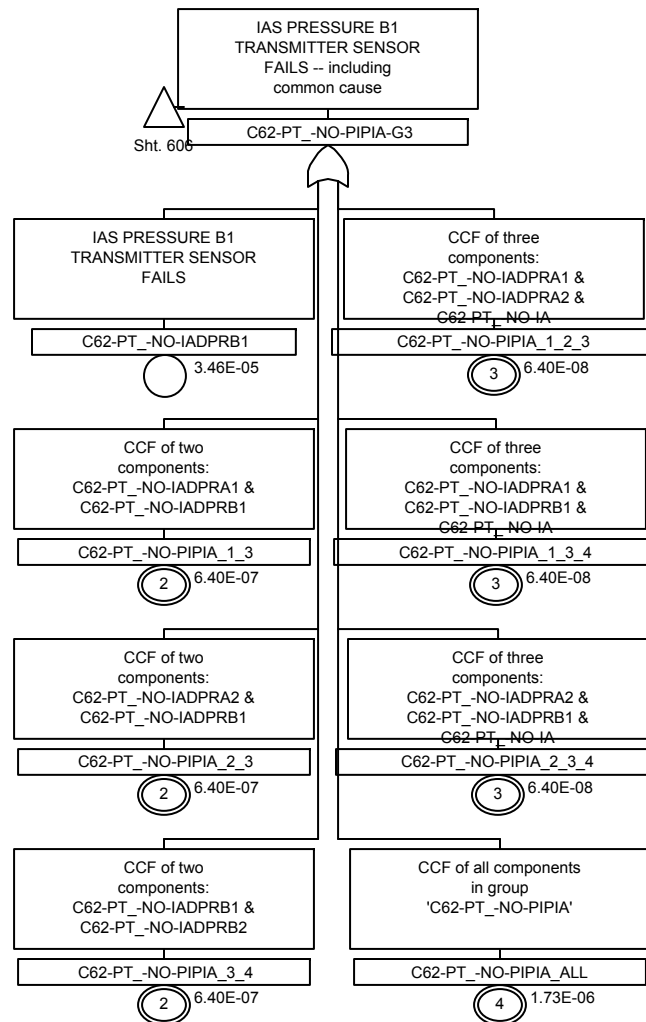


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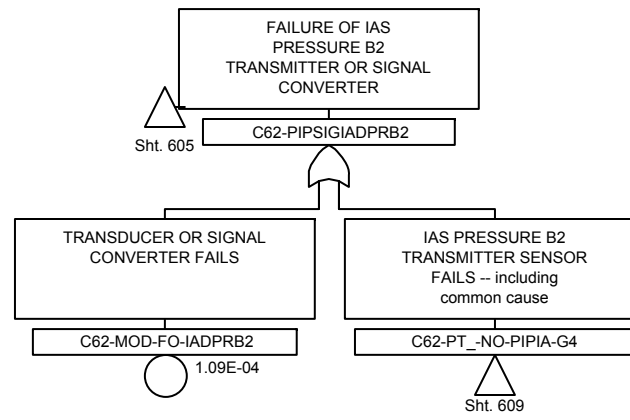


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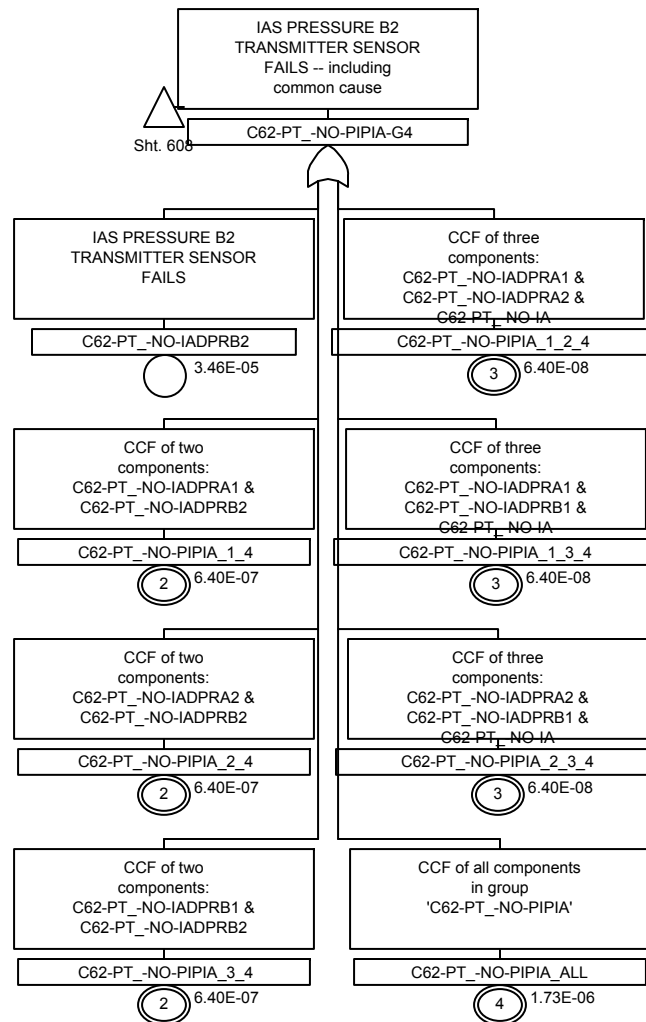


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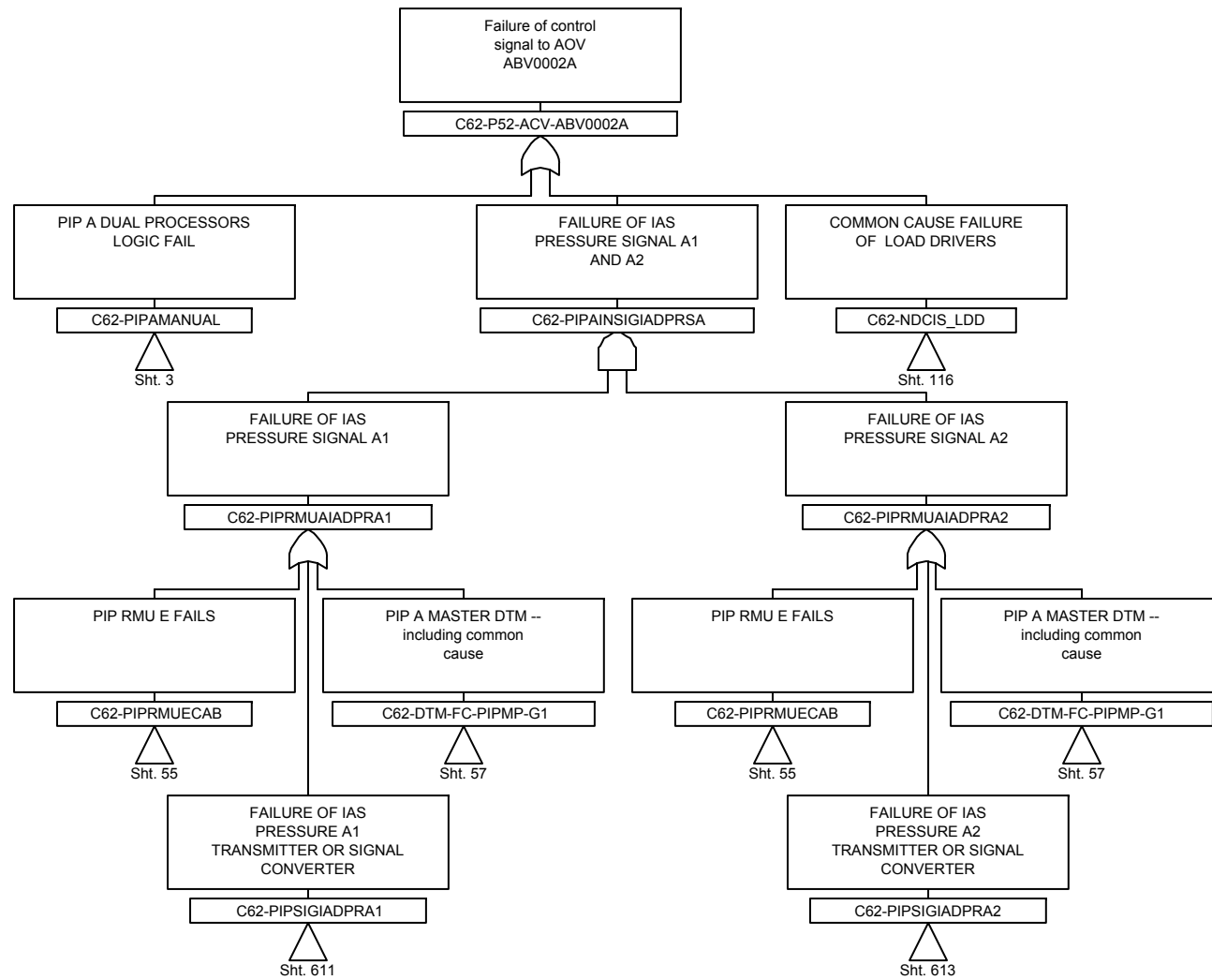


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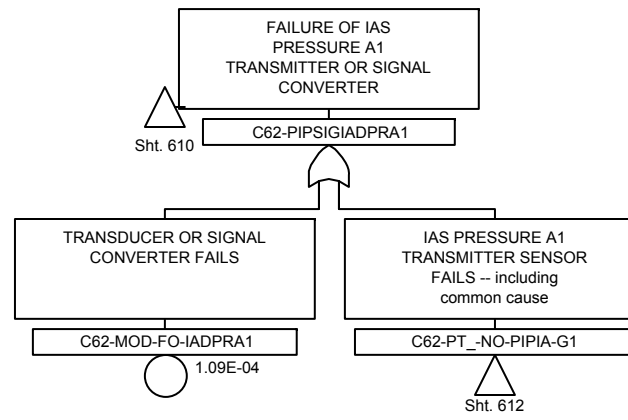


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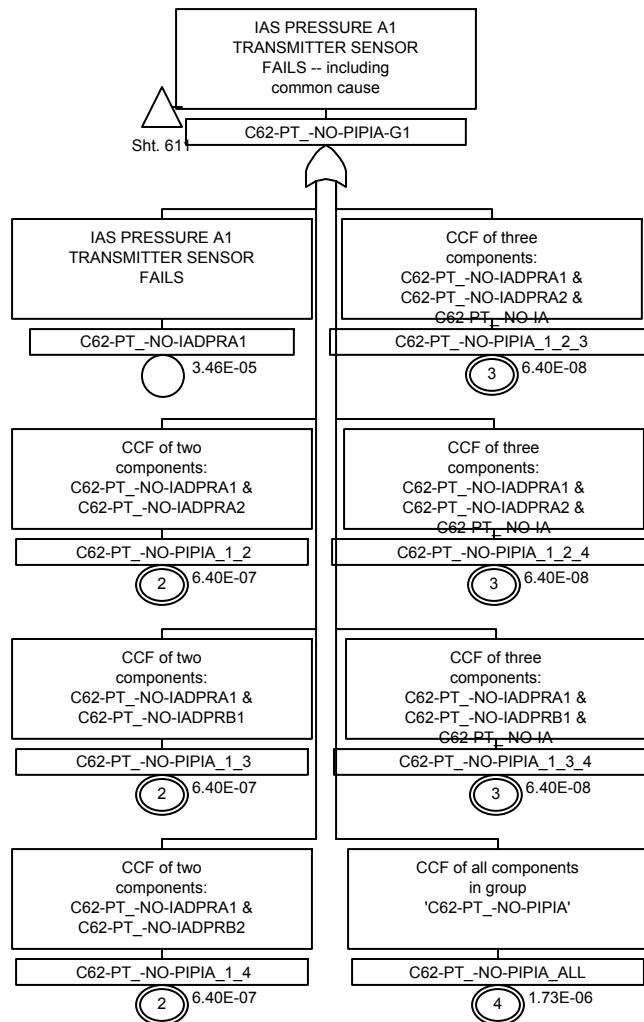


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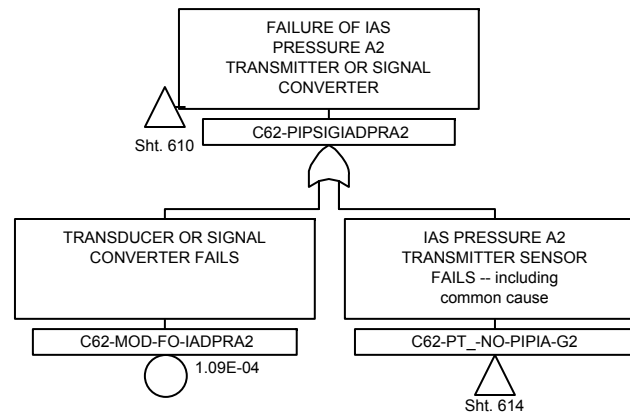


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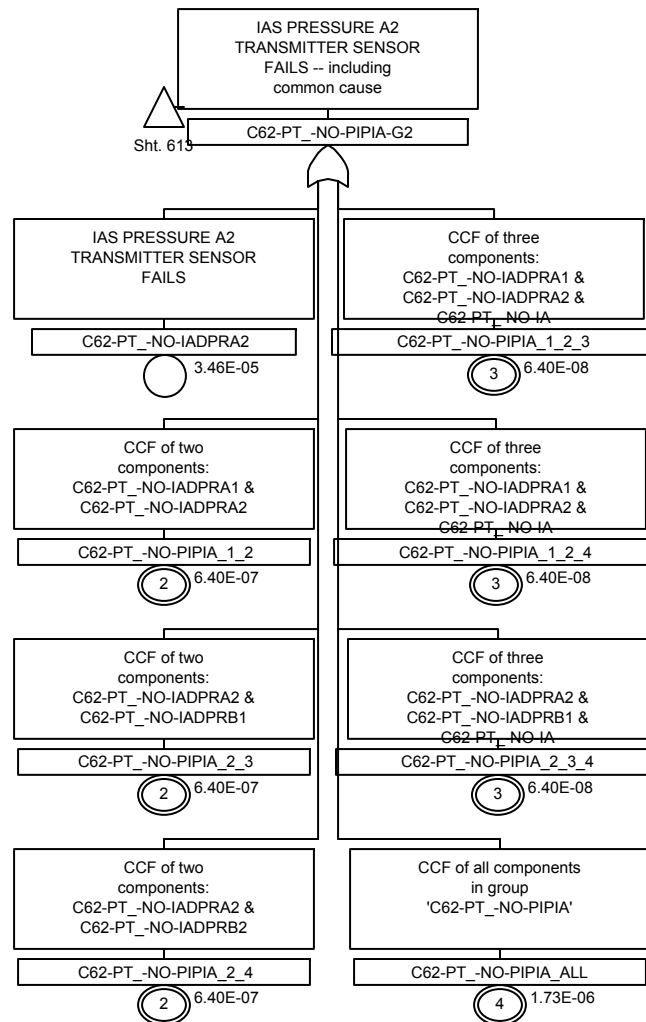


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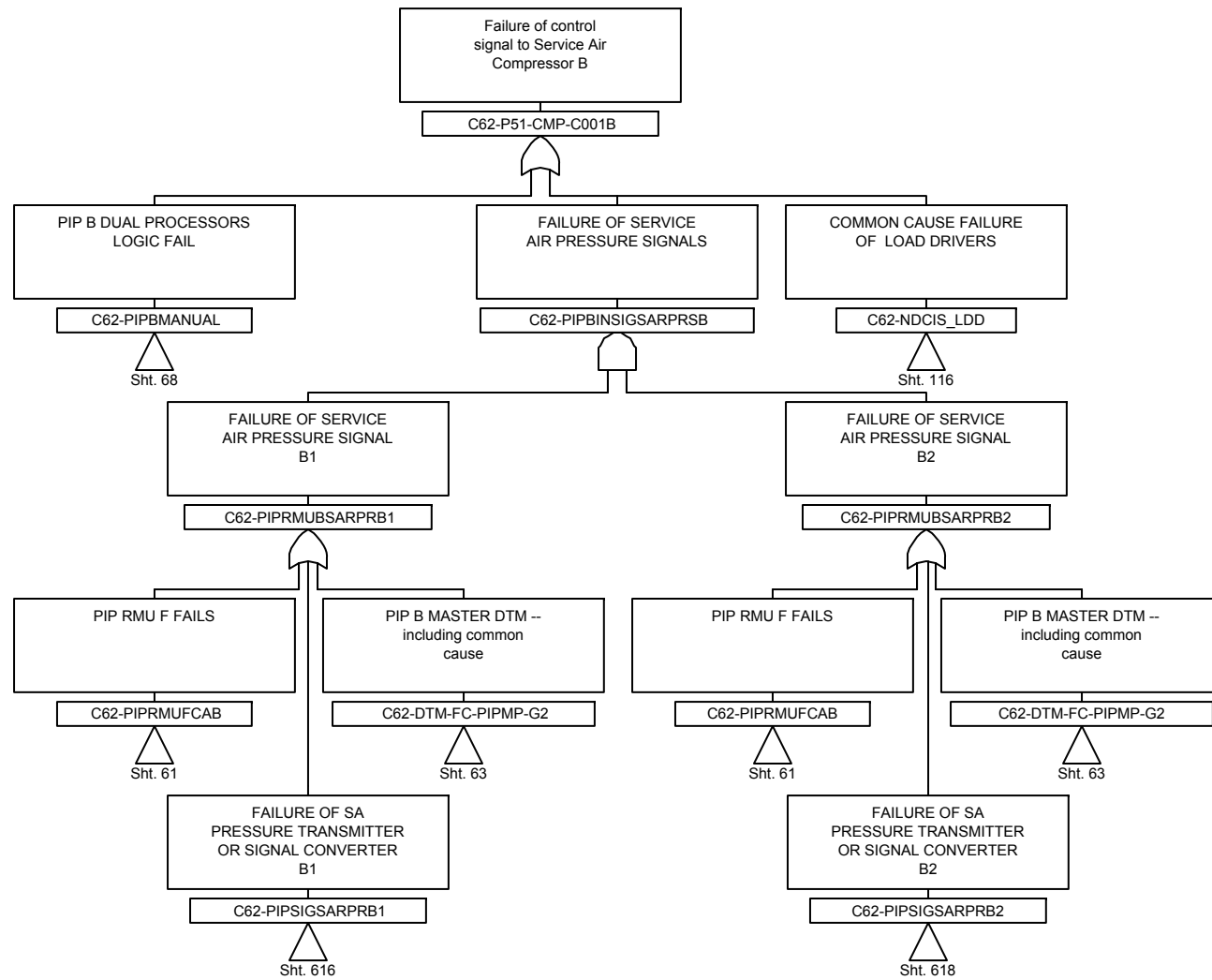


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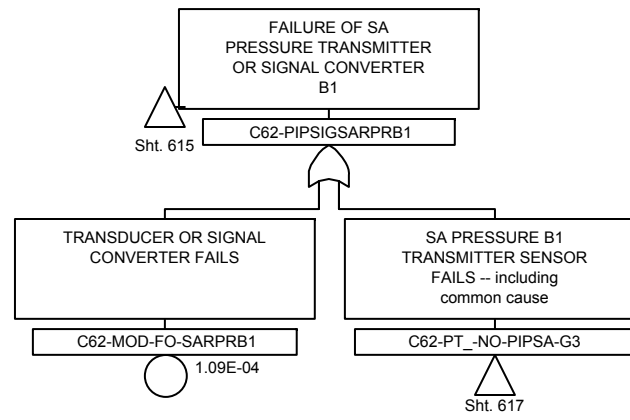


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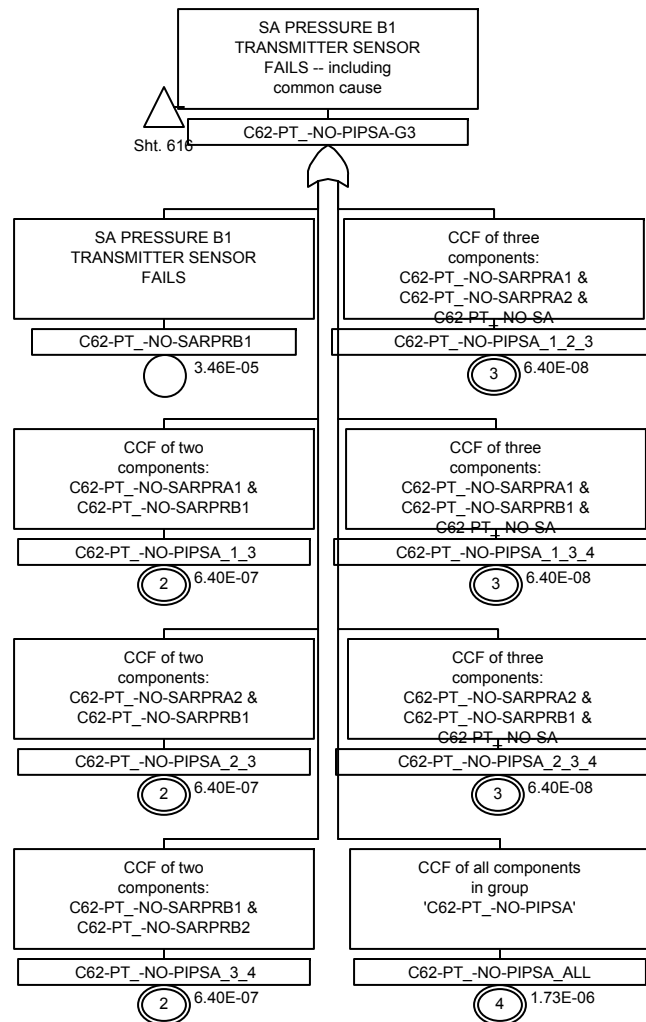


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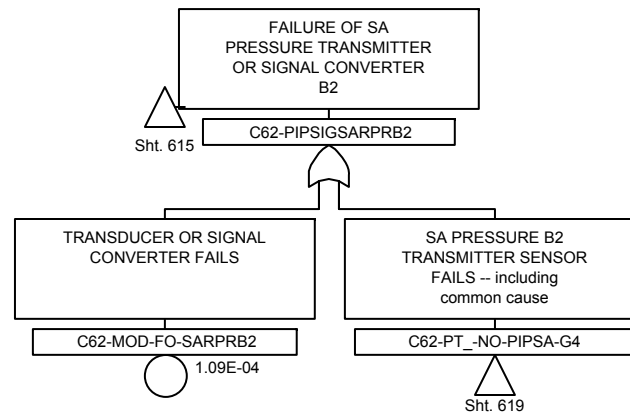


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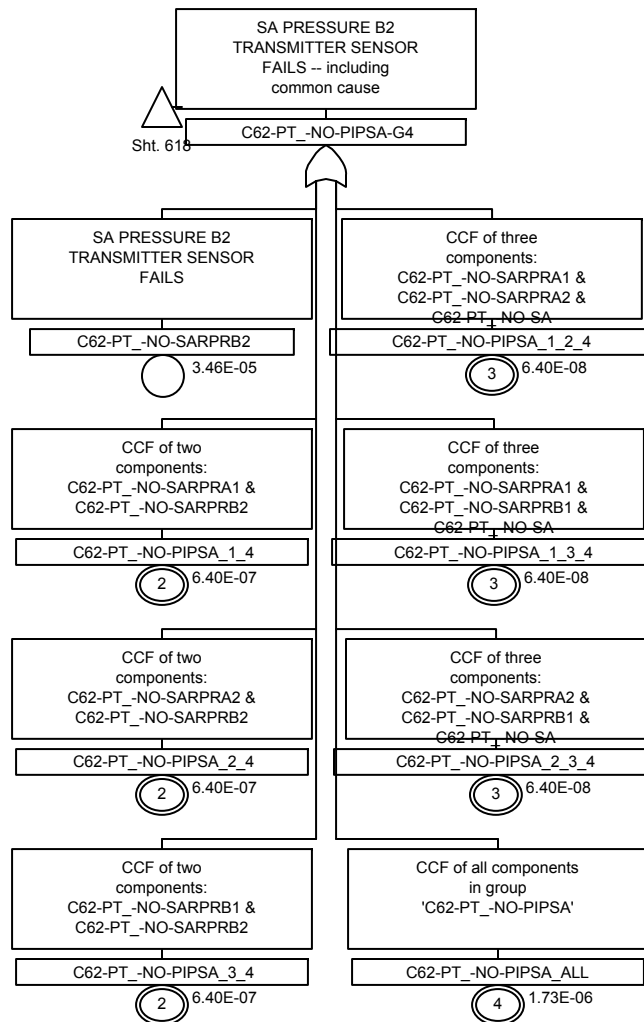


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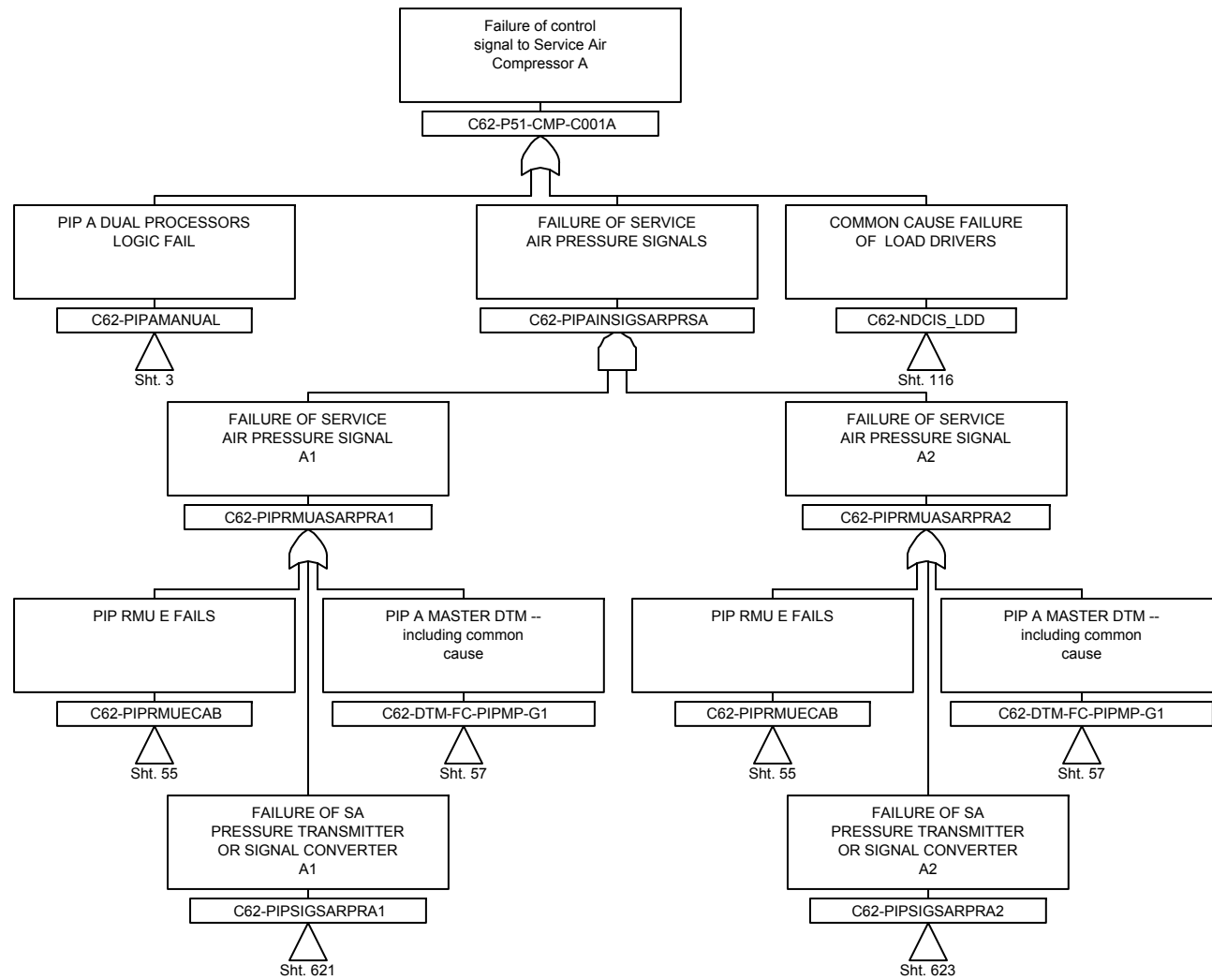


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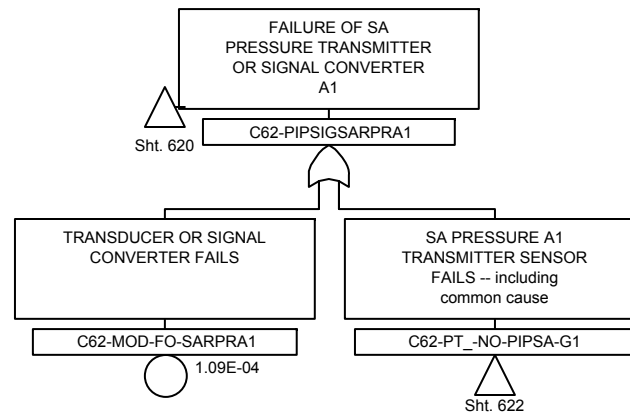


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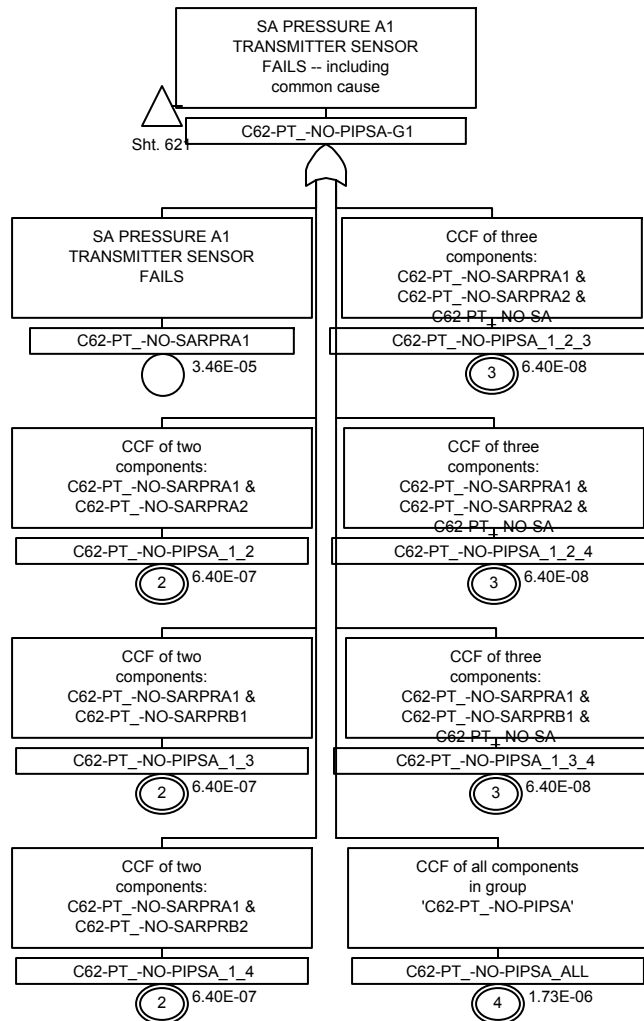


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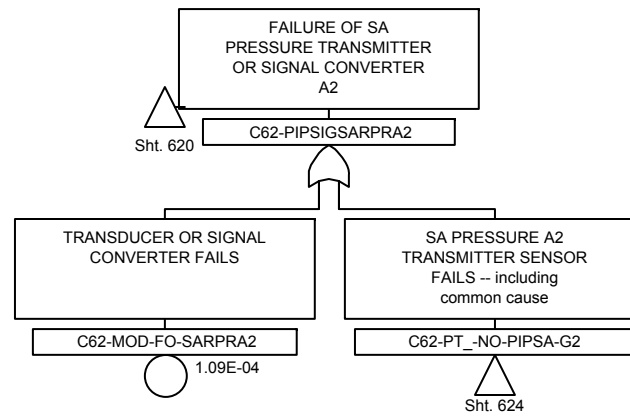


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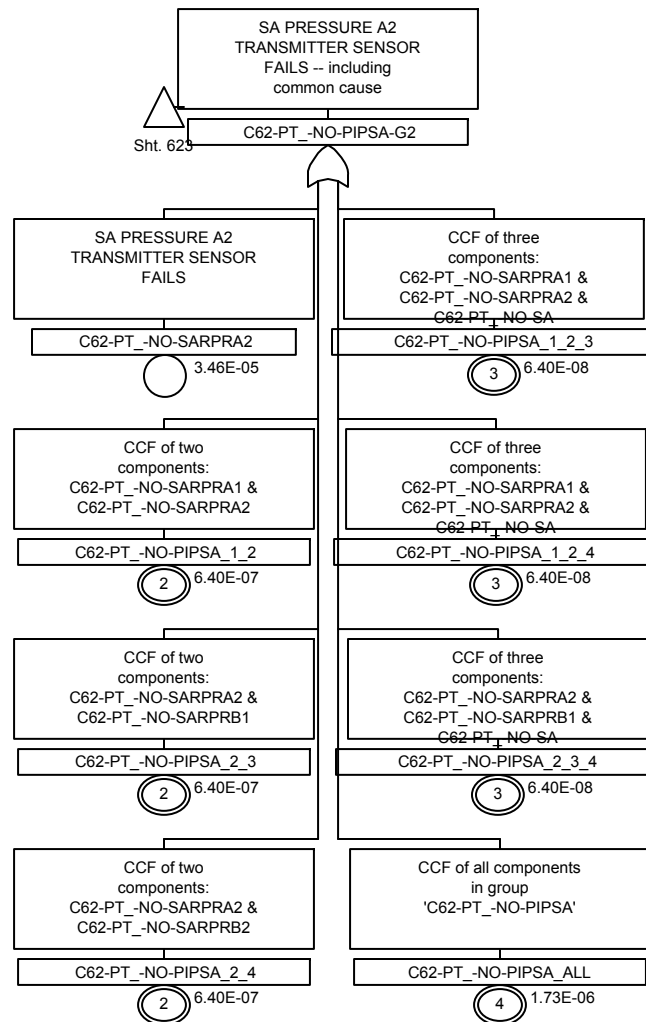


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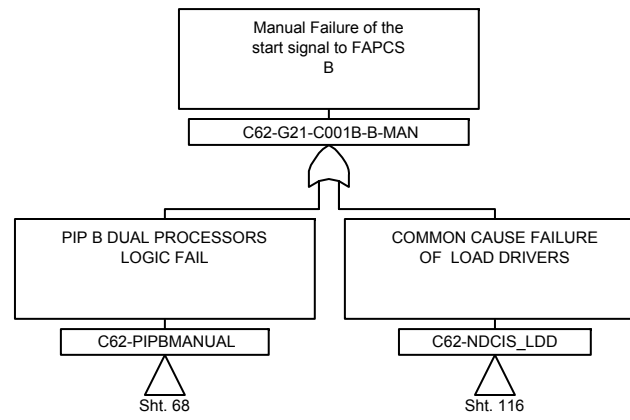


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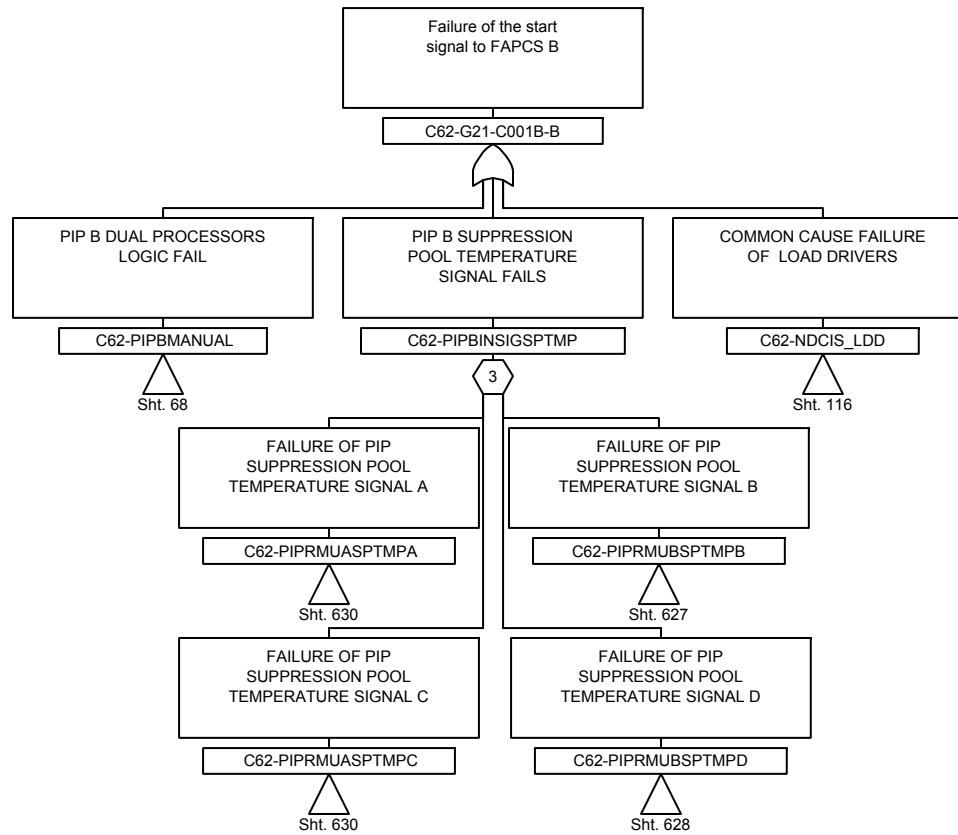


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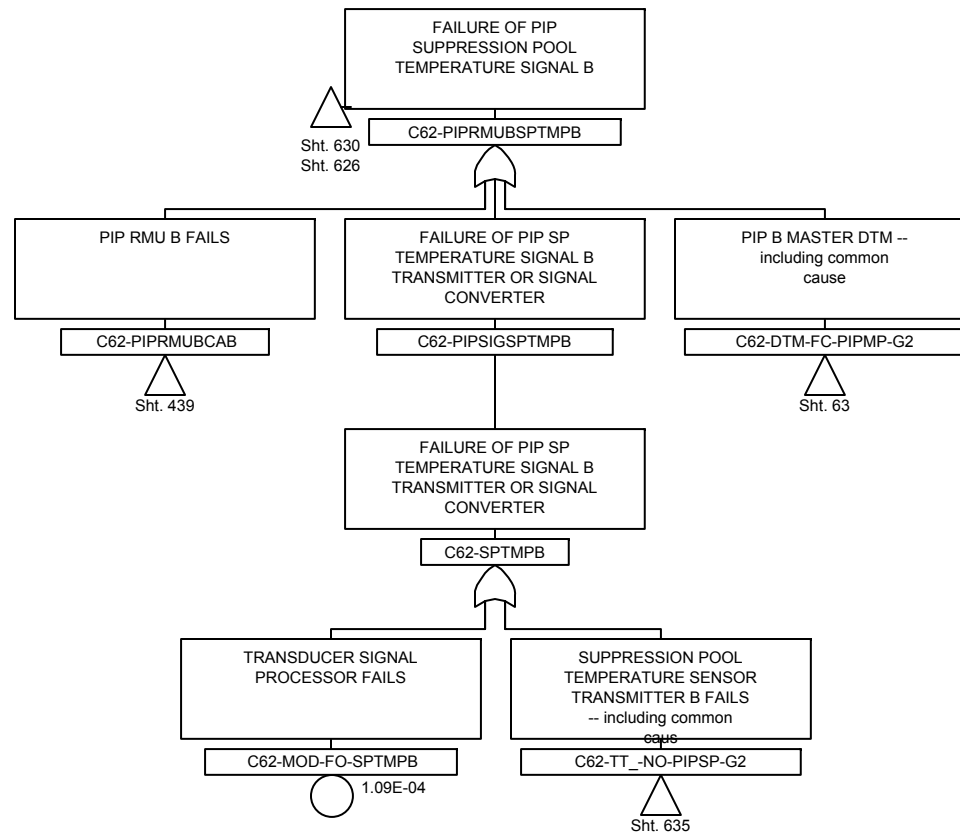


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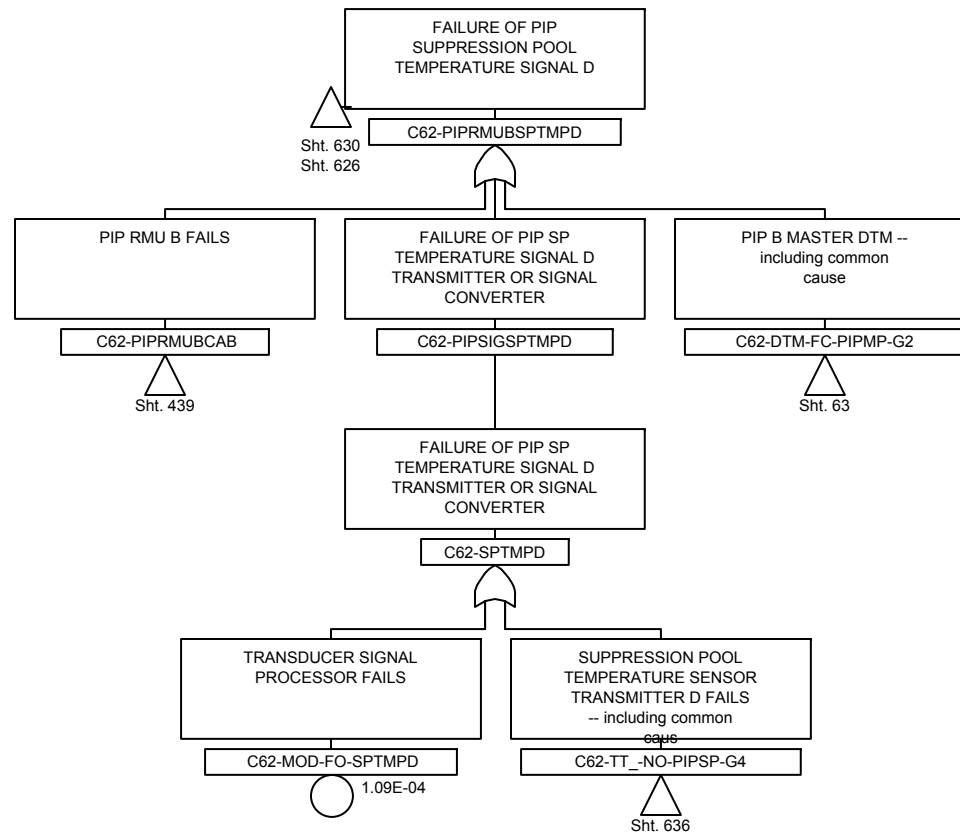


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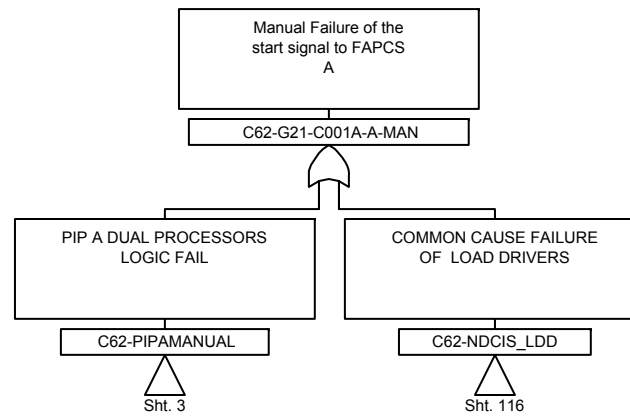


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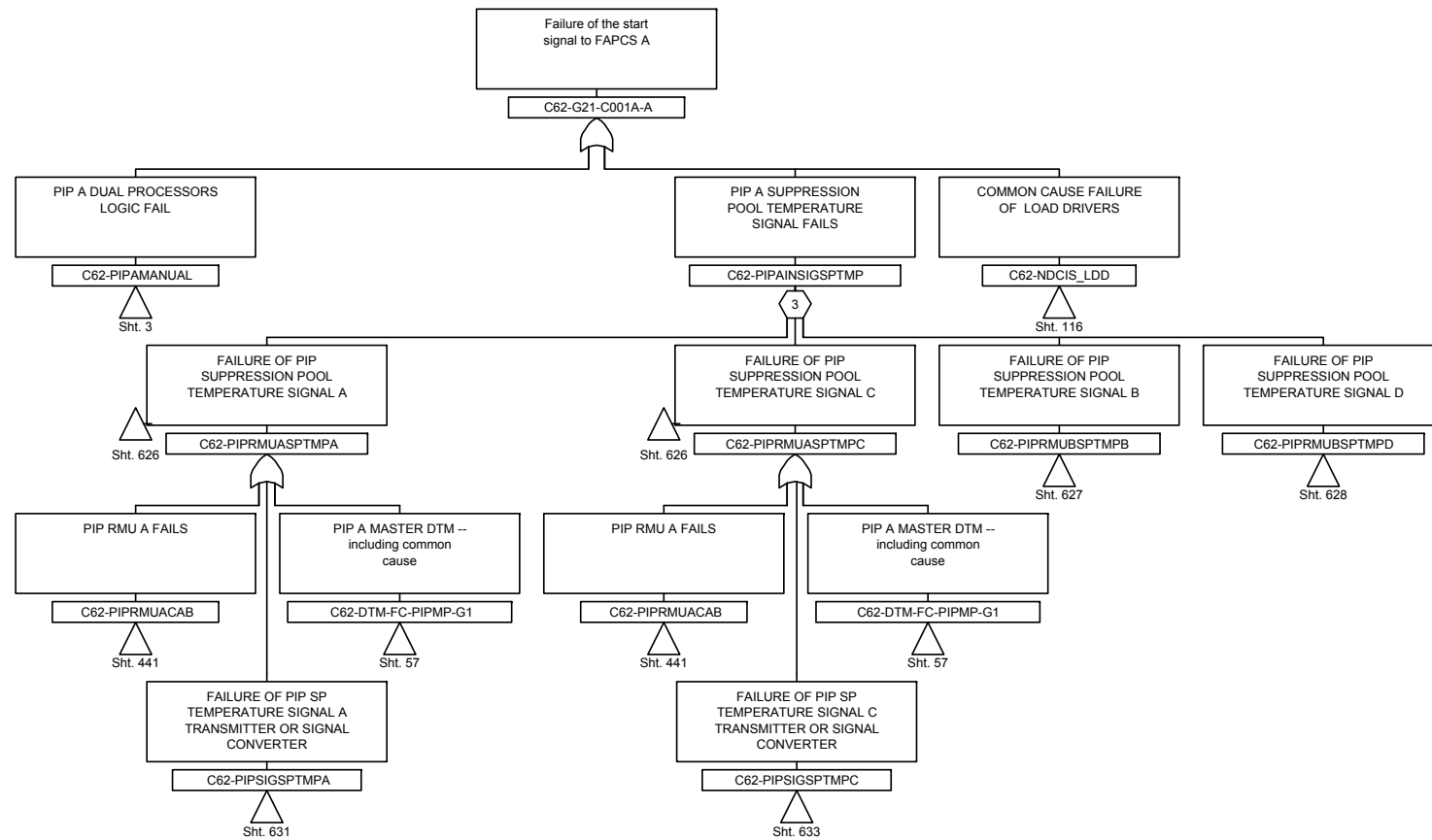


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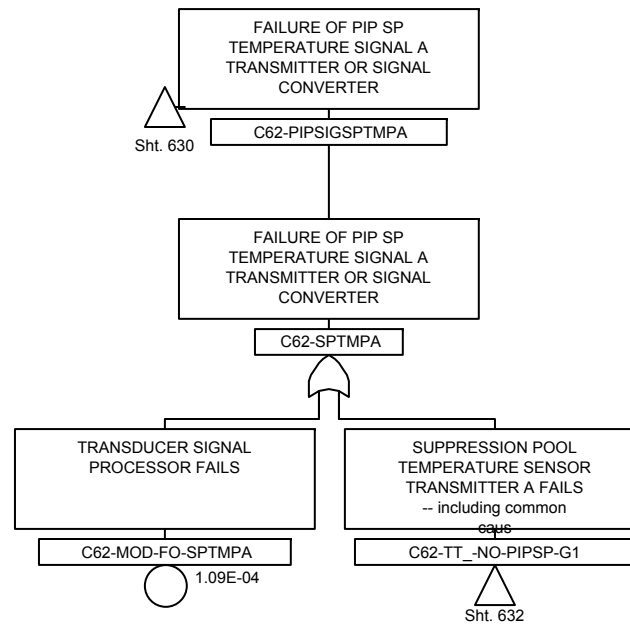


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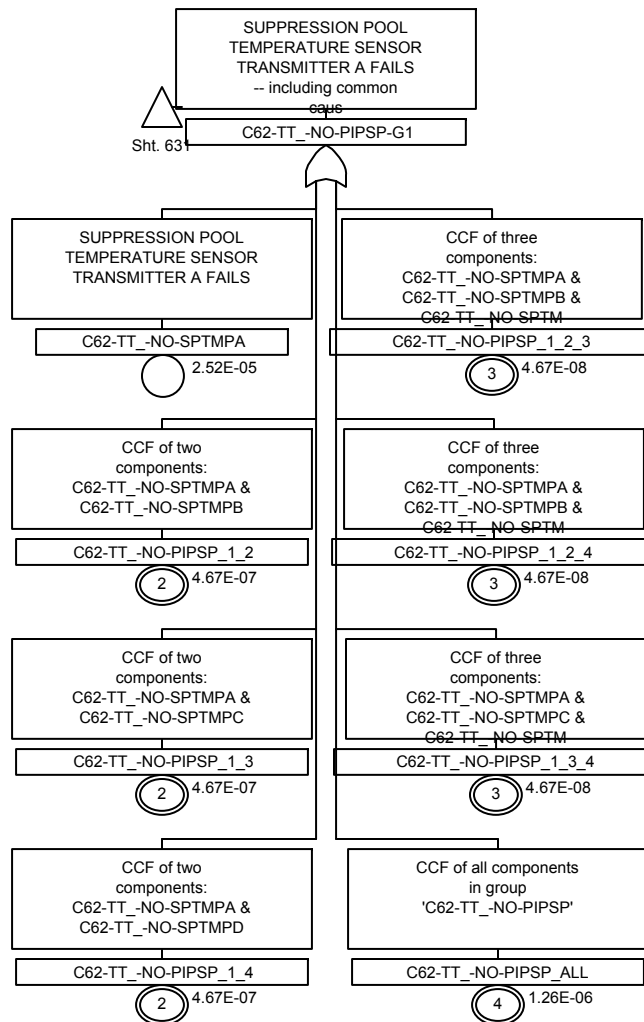


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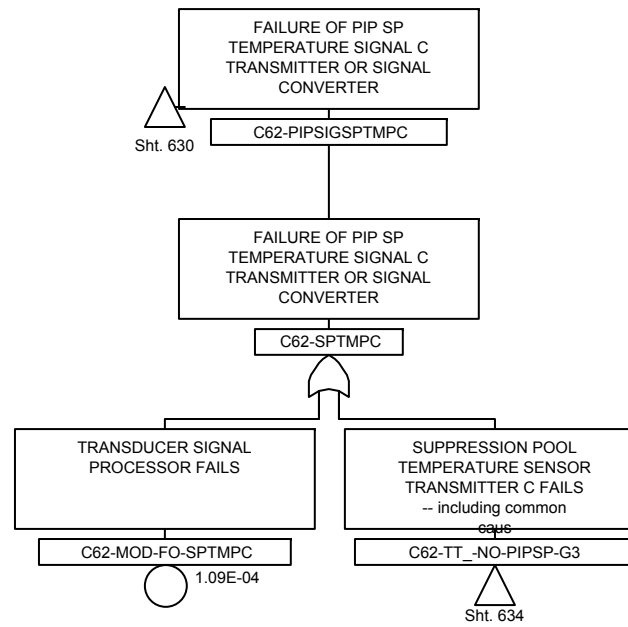


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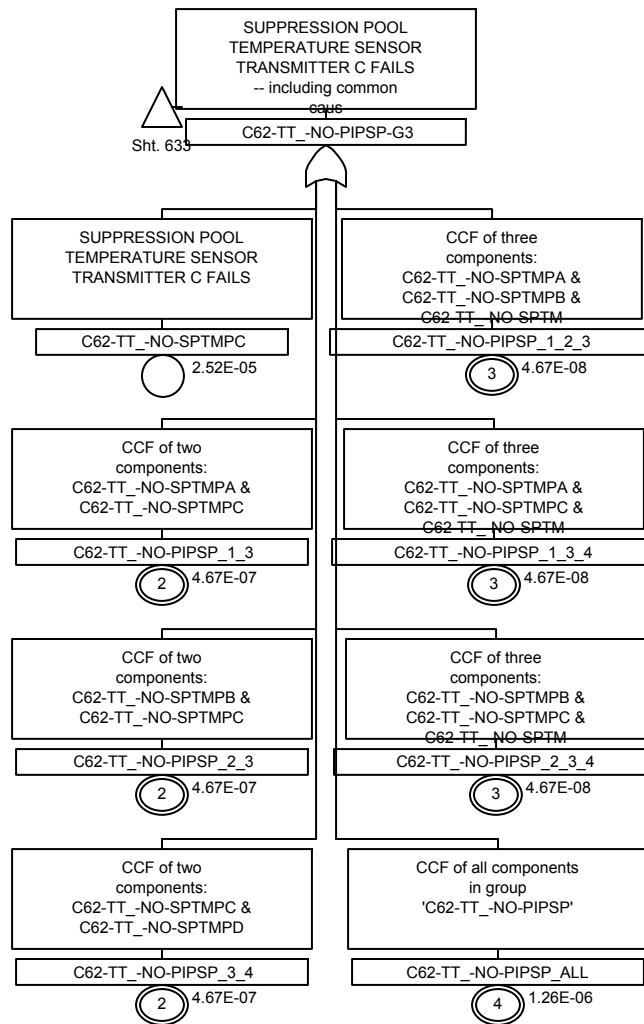


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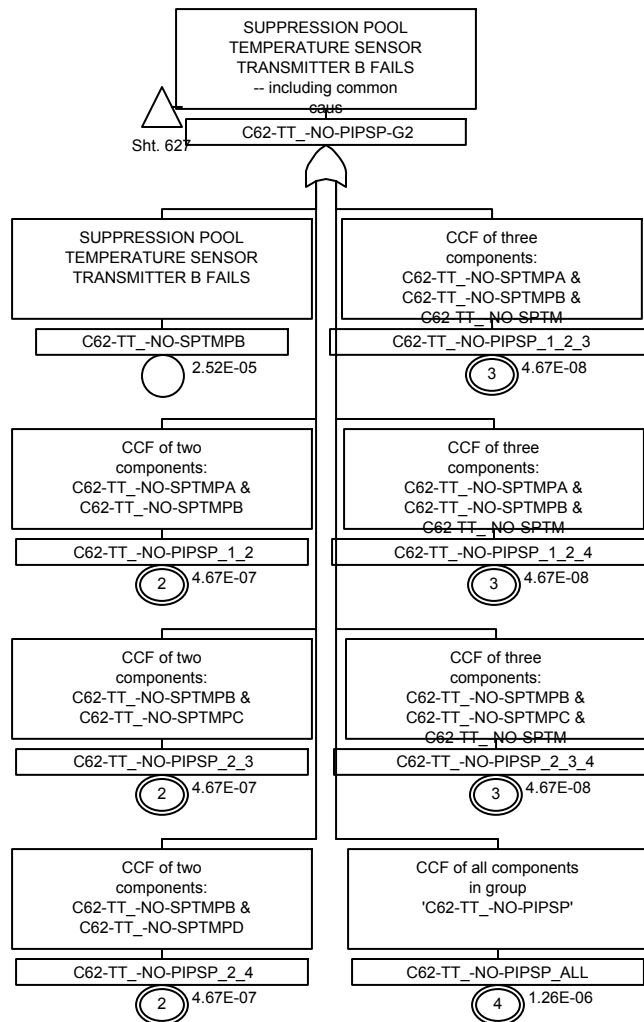


Figure 4.5-3a. Sheet 635 N-DCIS Non Safety Control System

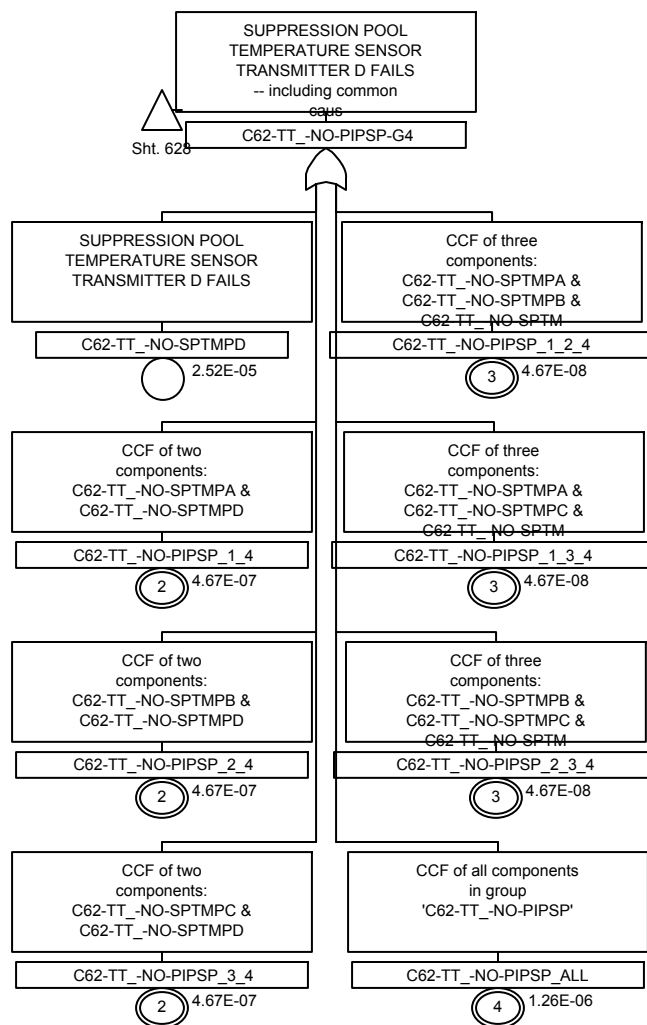


Figure 4.5-3a. Sheet 636 N-DCIS Non Safety Control System



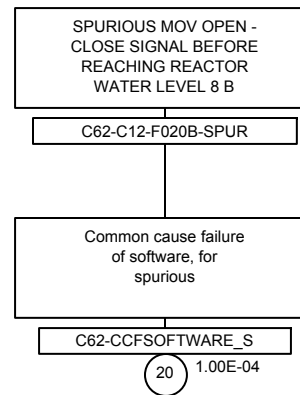


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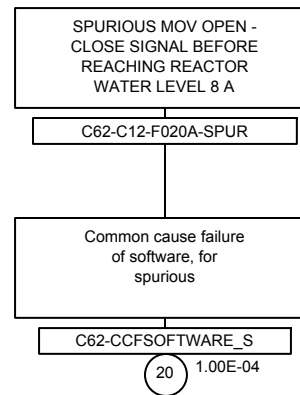


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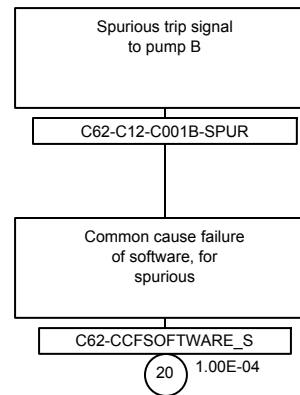


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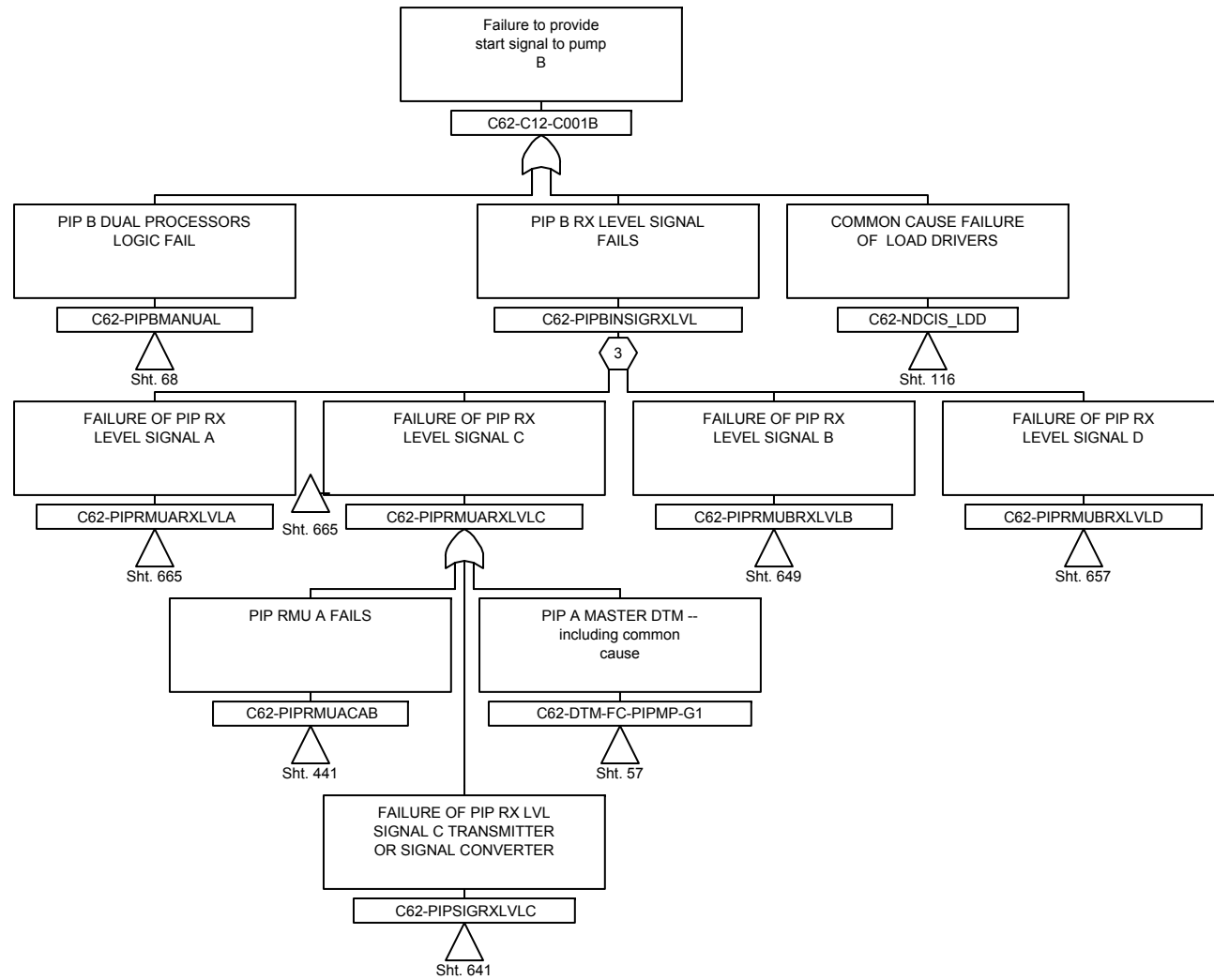


Figure 4.5-3a. Sheet 640 N-DCIS Non Safety Control System

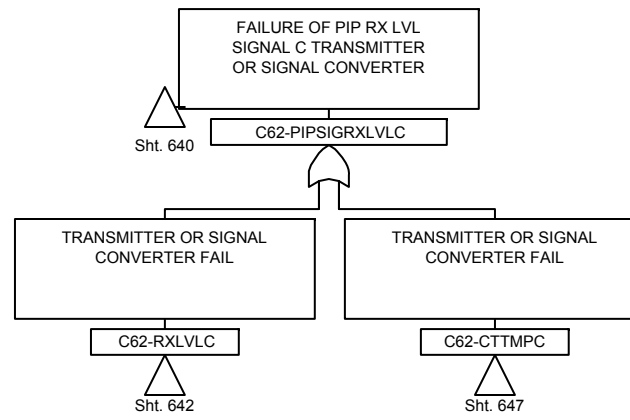


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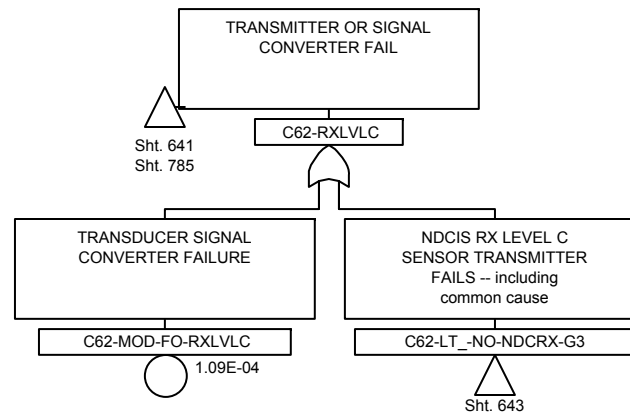


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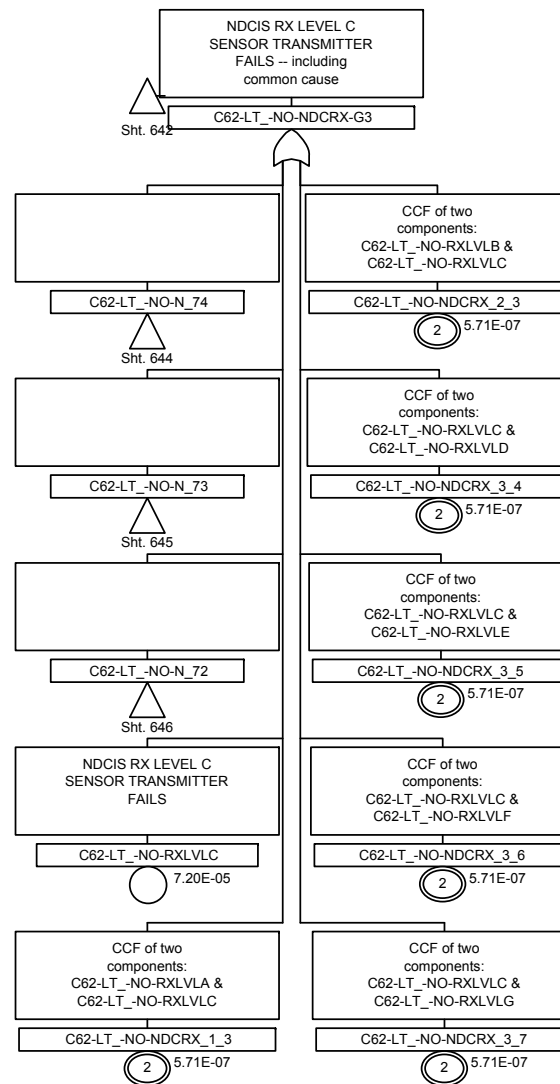


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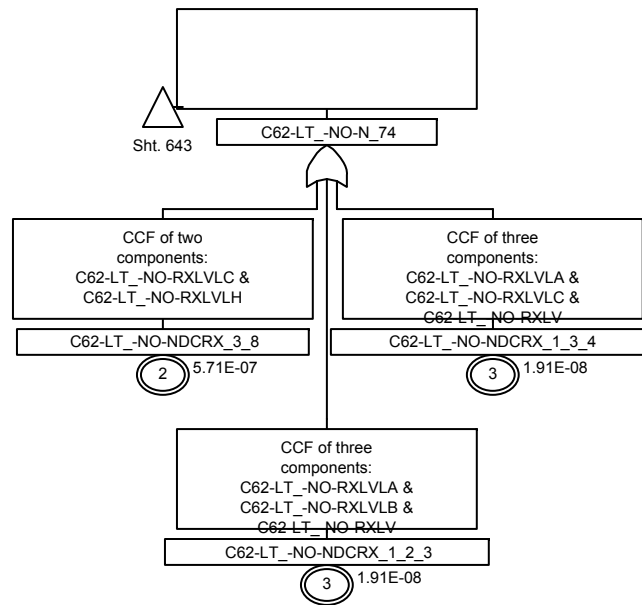


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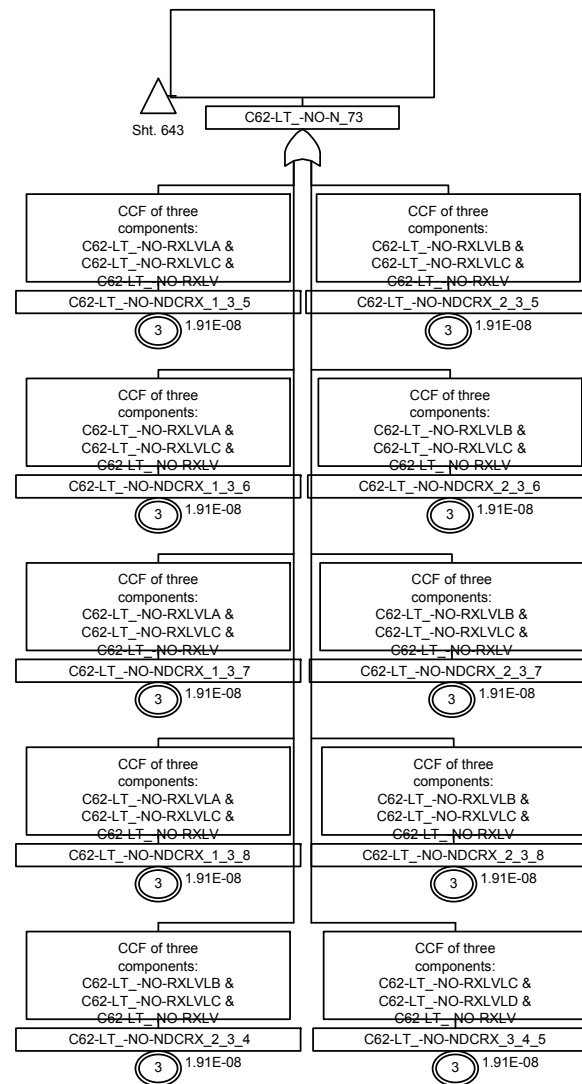


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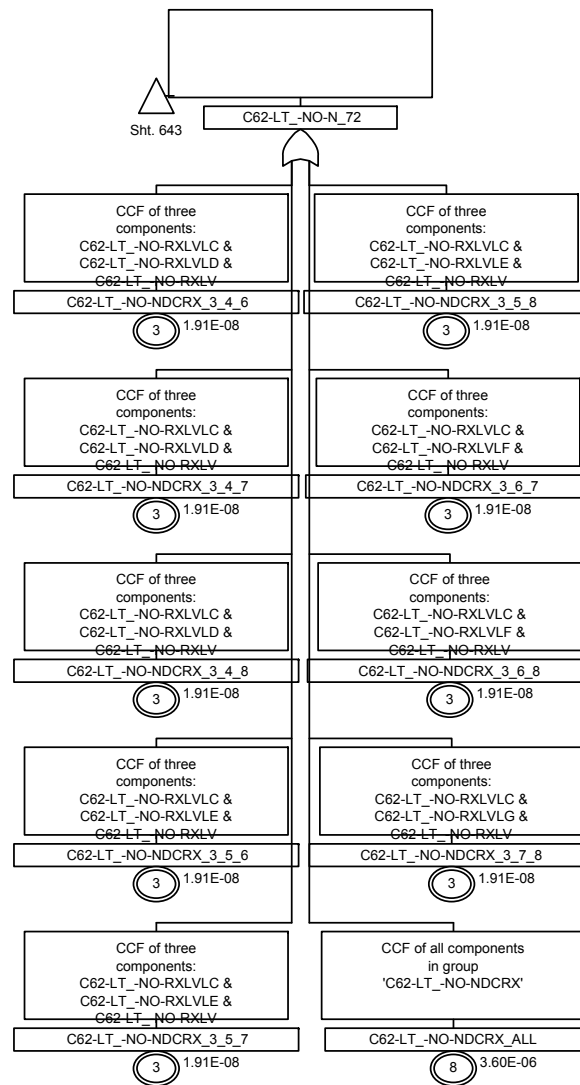


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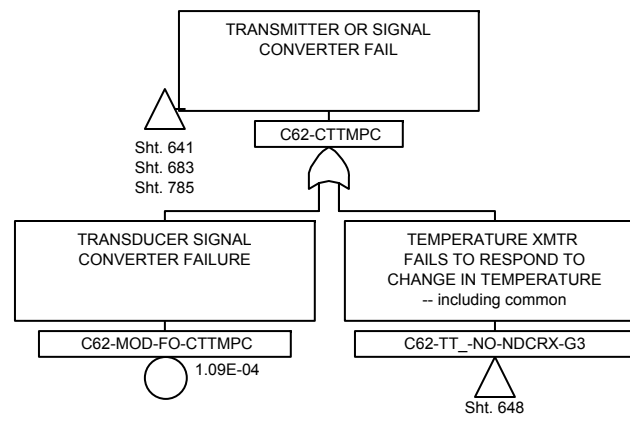


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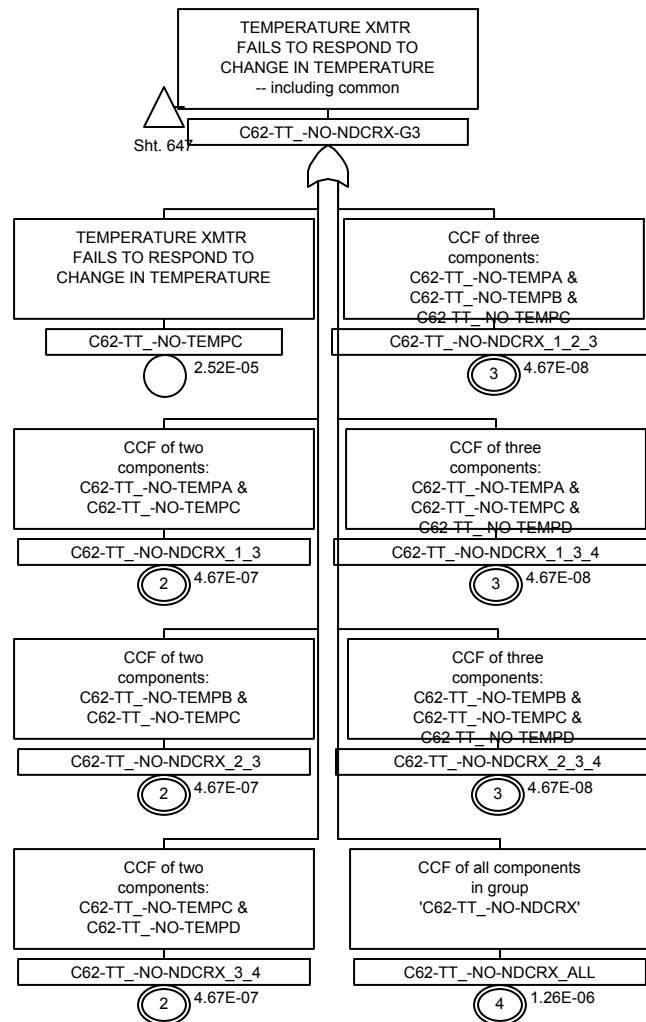


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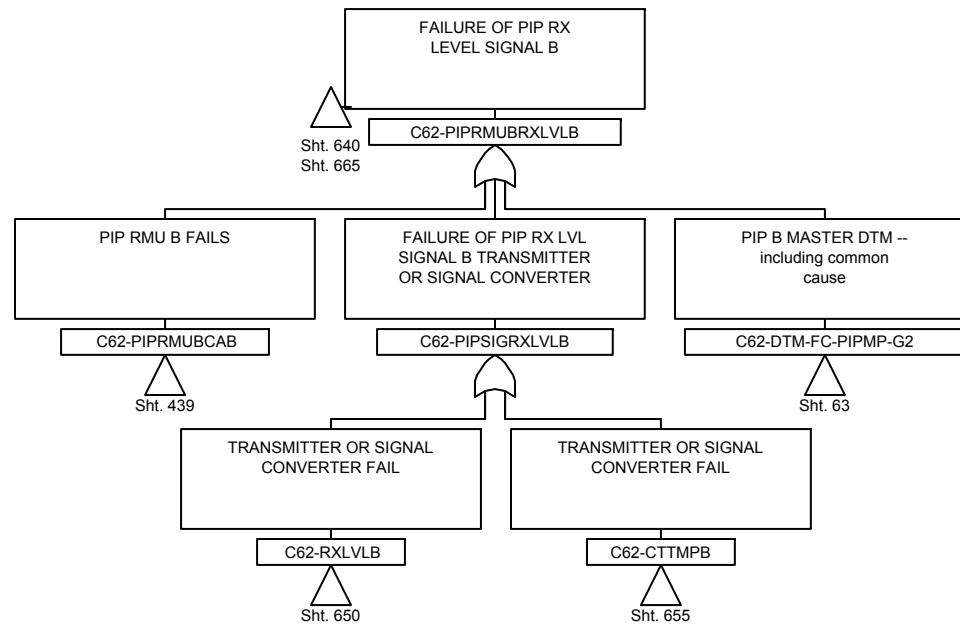


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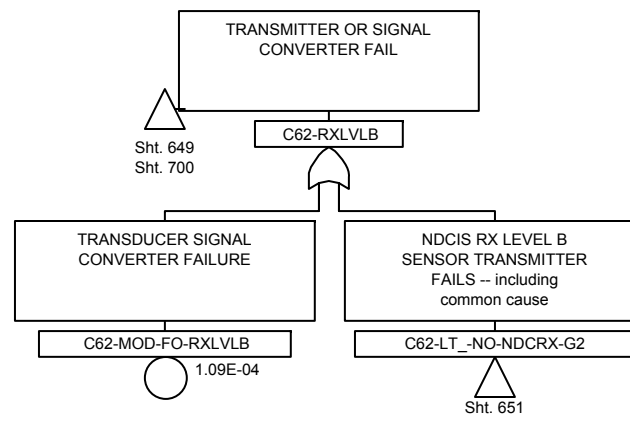


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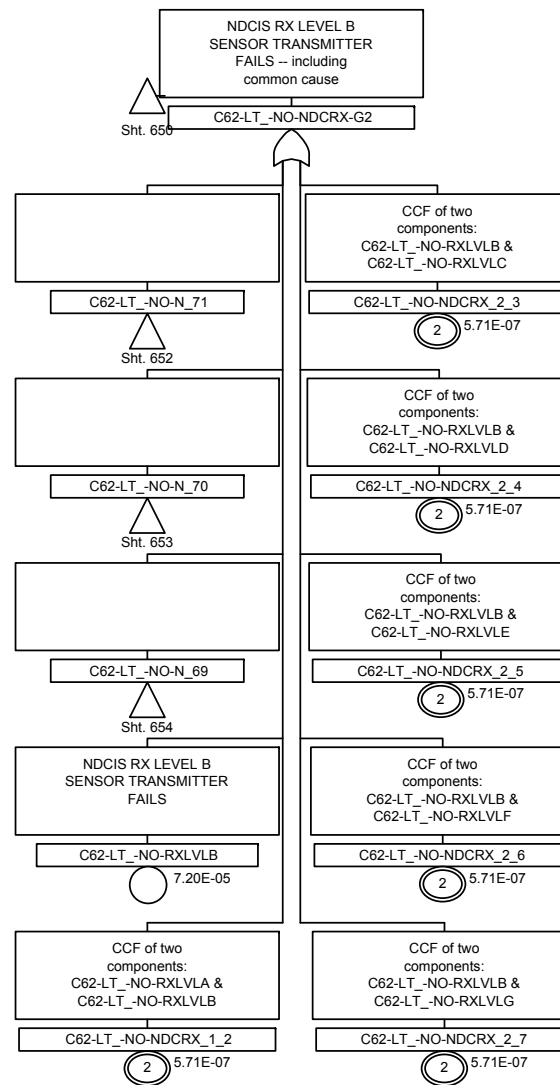


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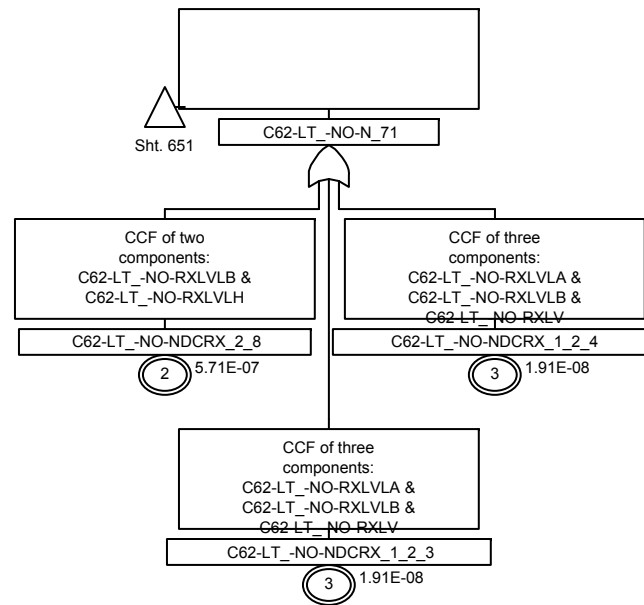


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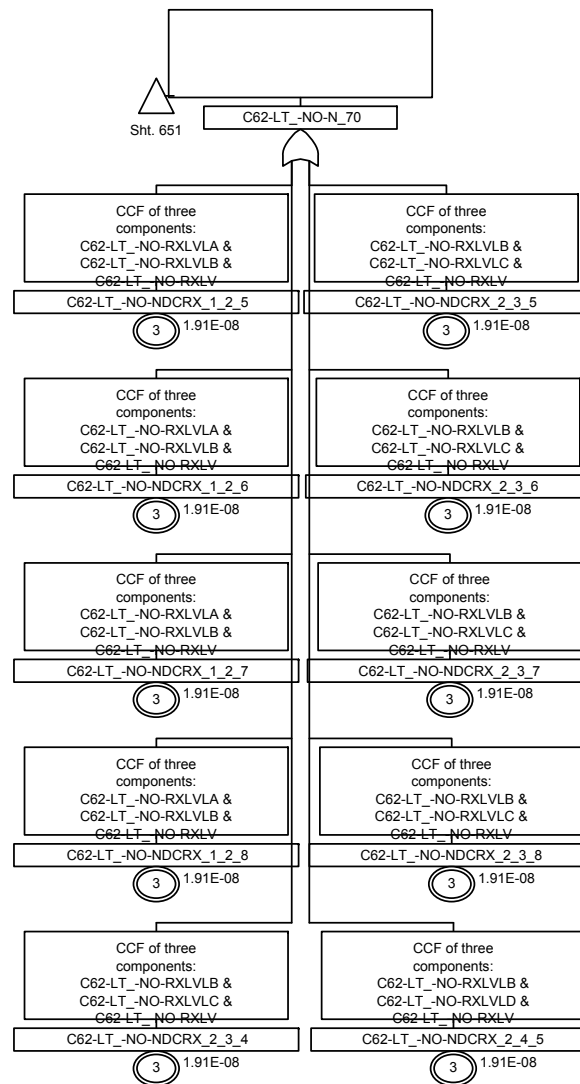


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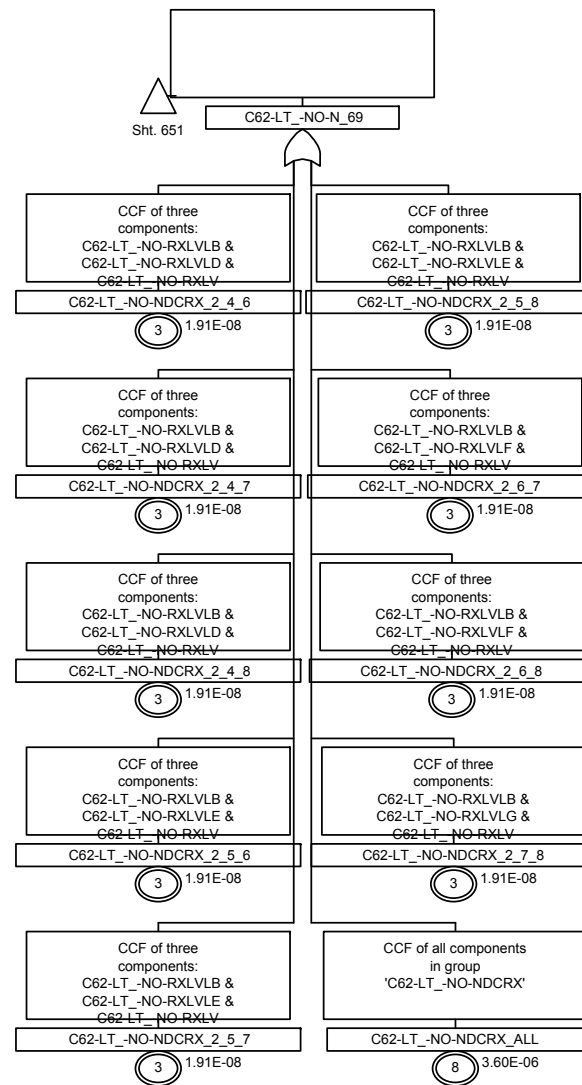


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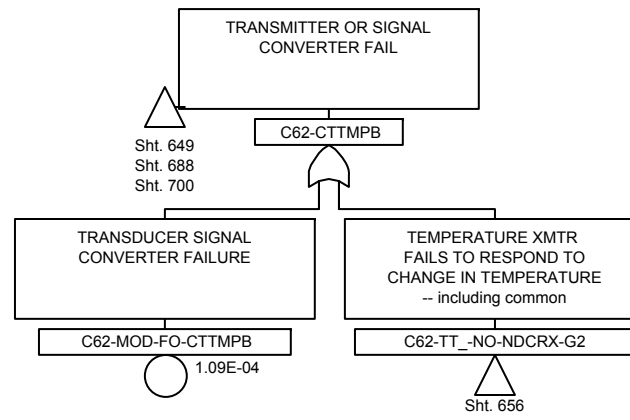


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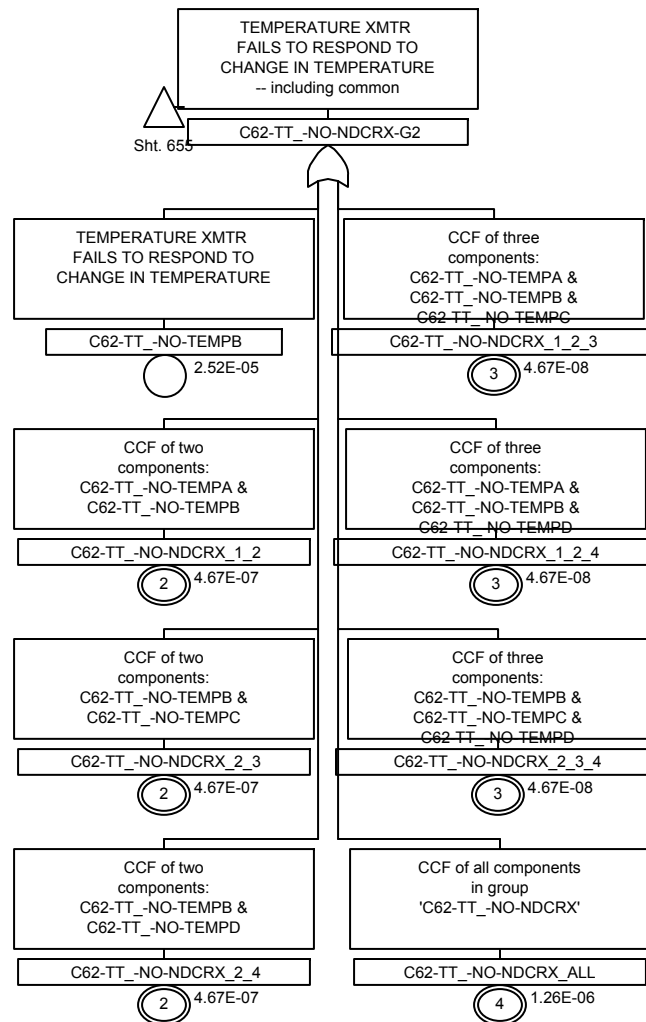


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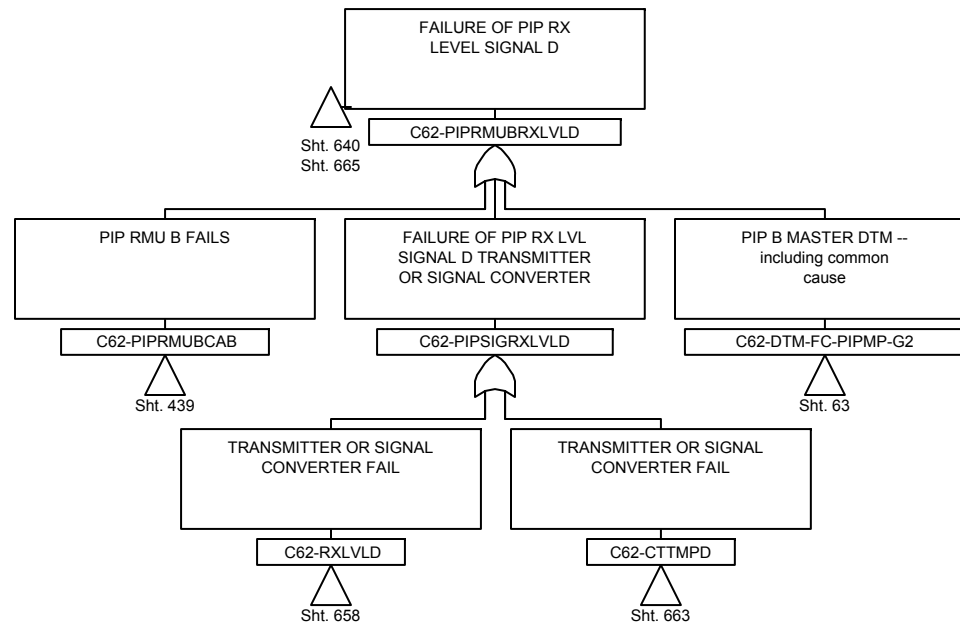


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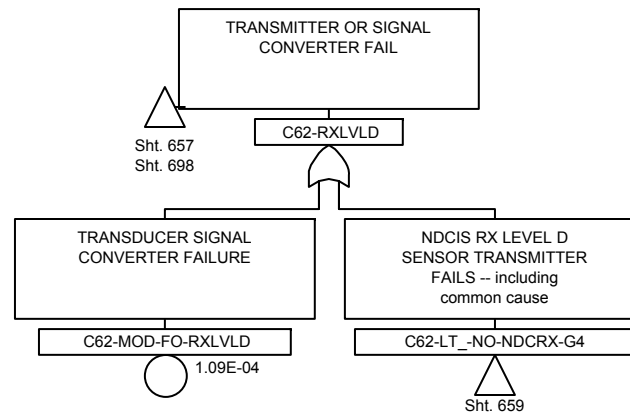


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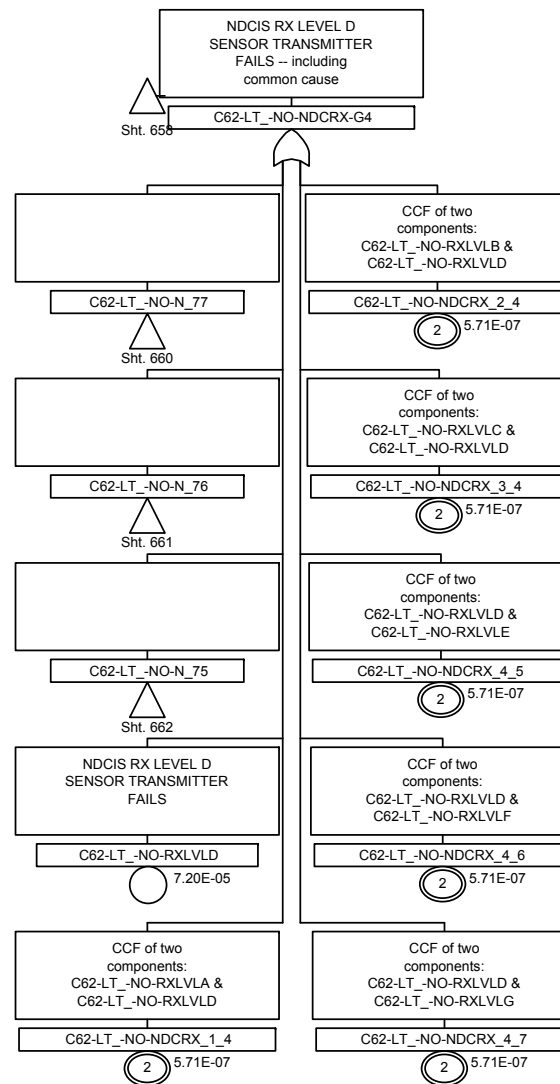


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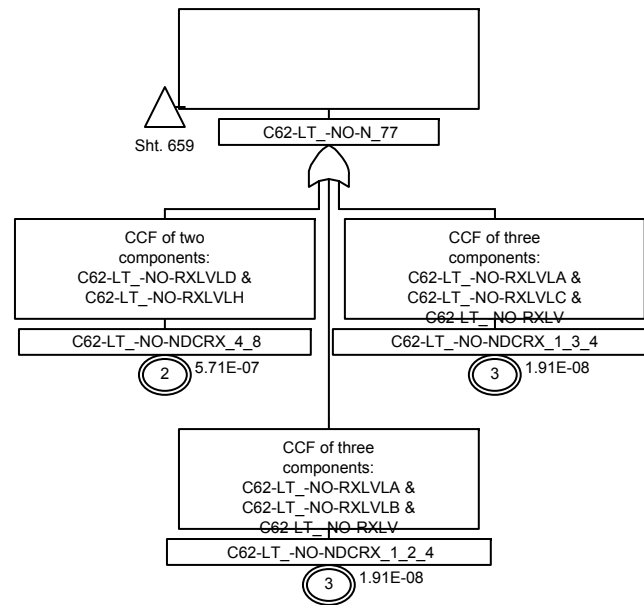


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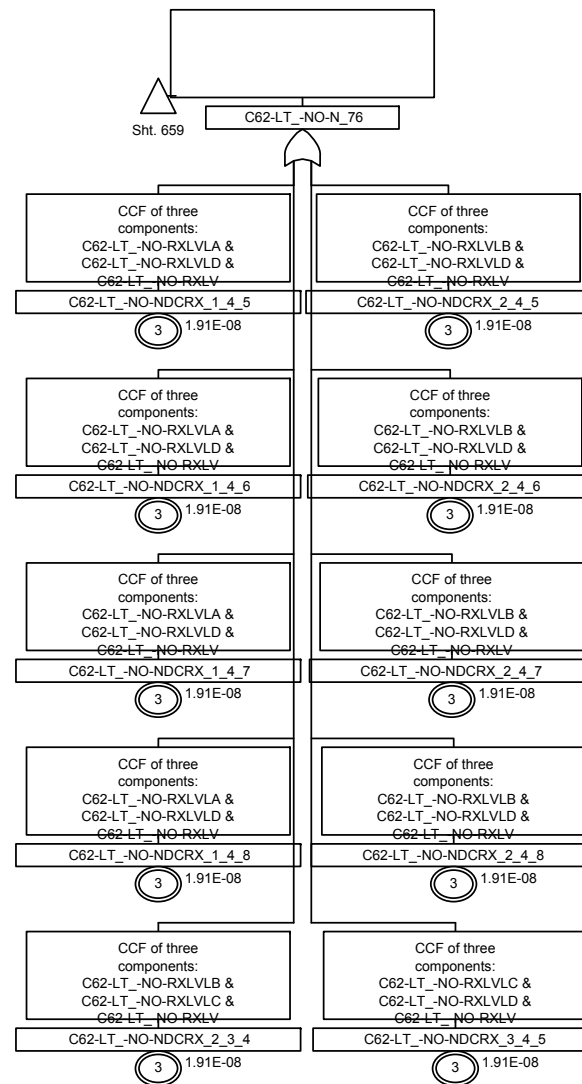


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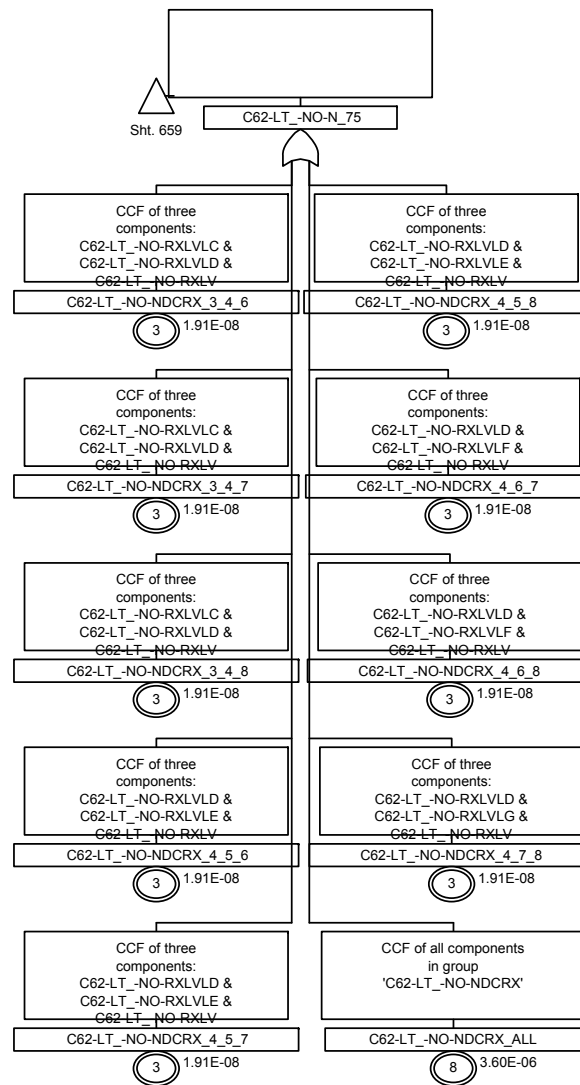


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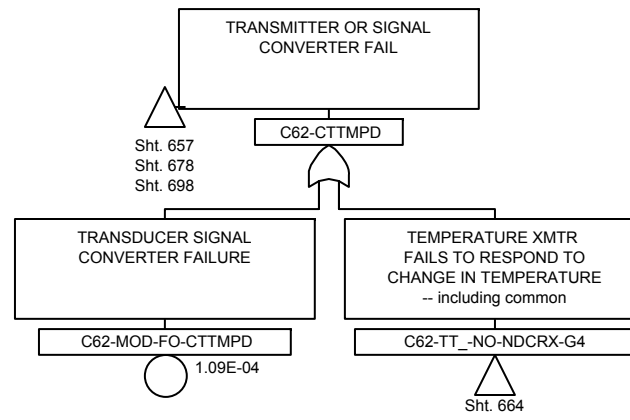


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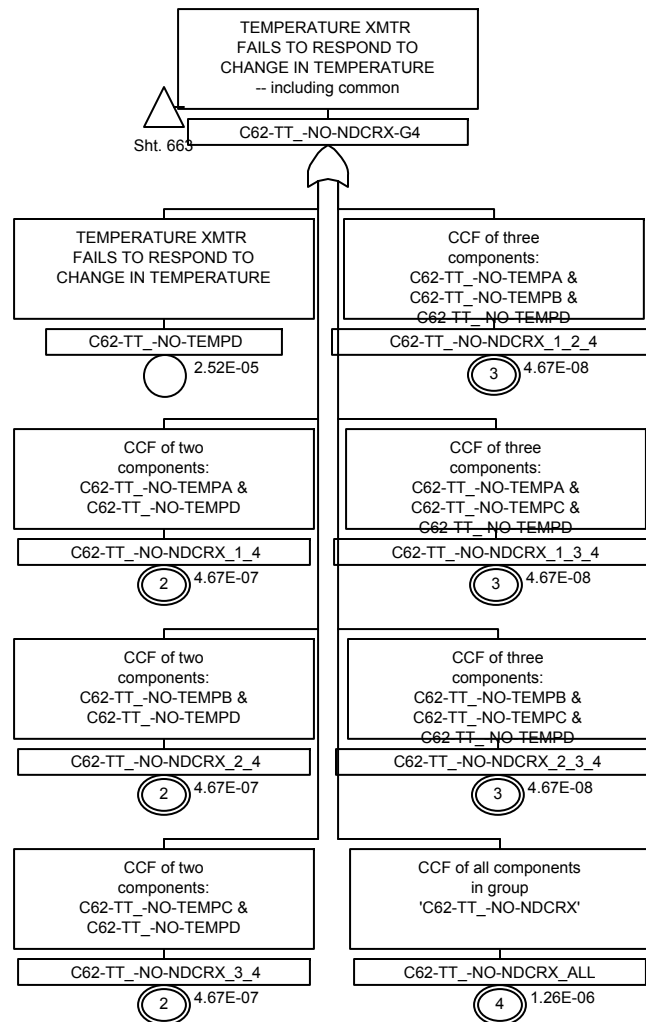


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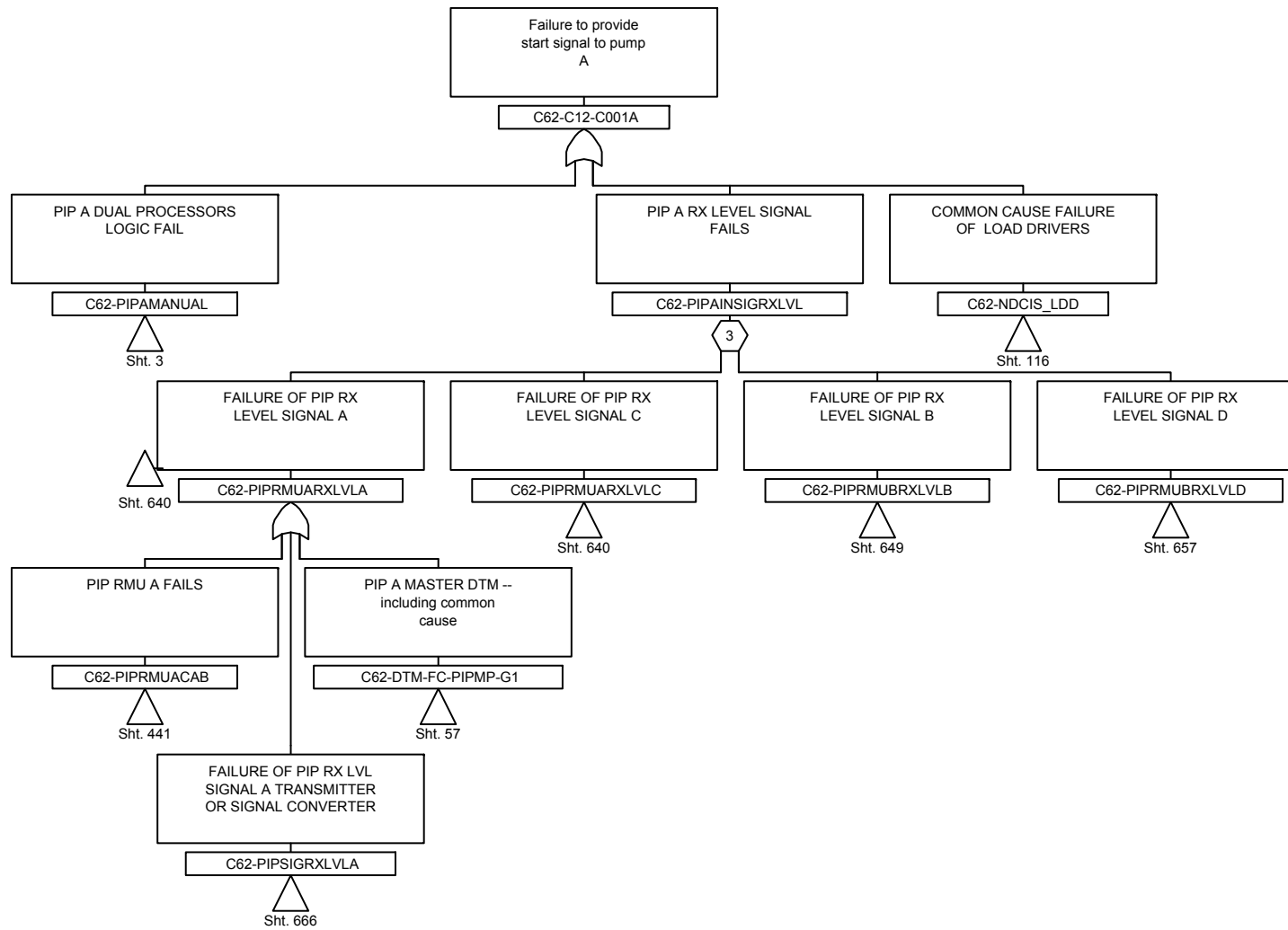


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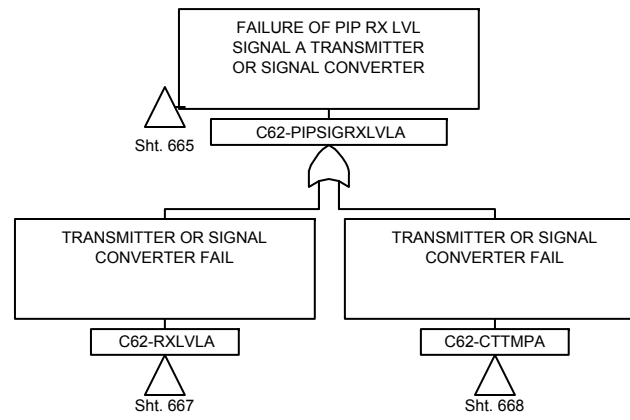


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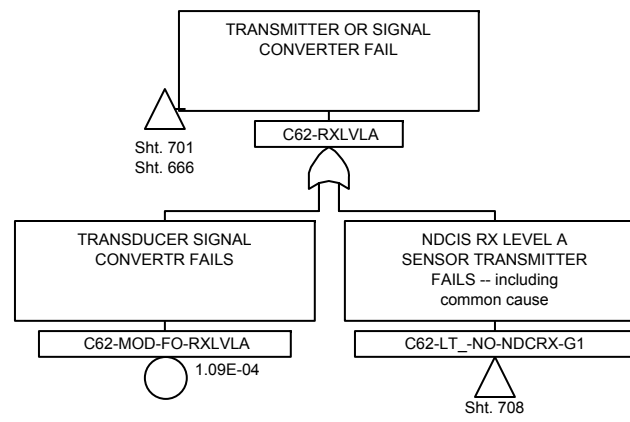


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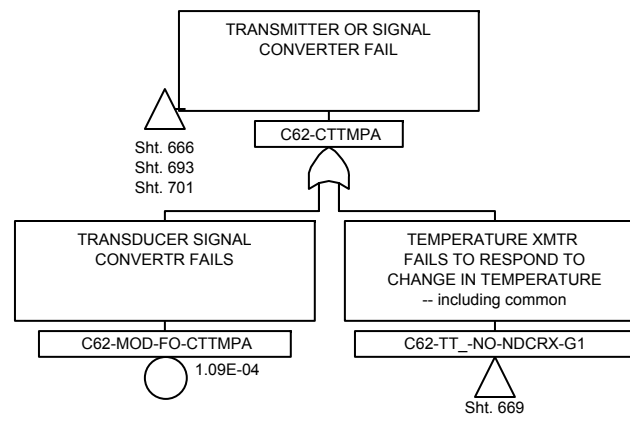


Figure 4.5-3a. Sheet 668 N-DCIS Non Safety Control System



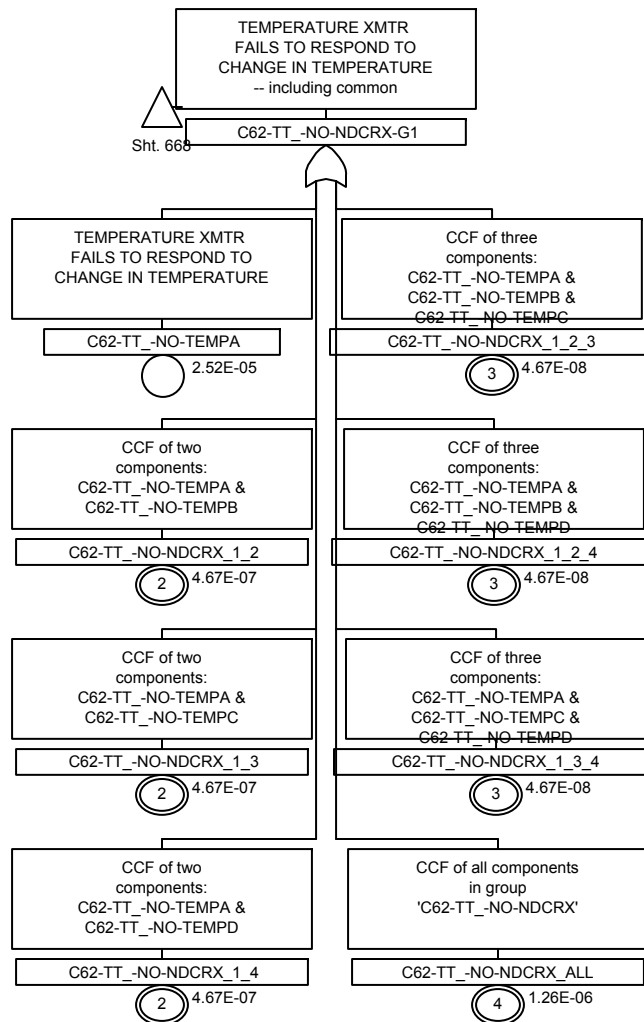


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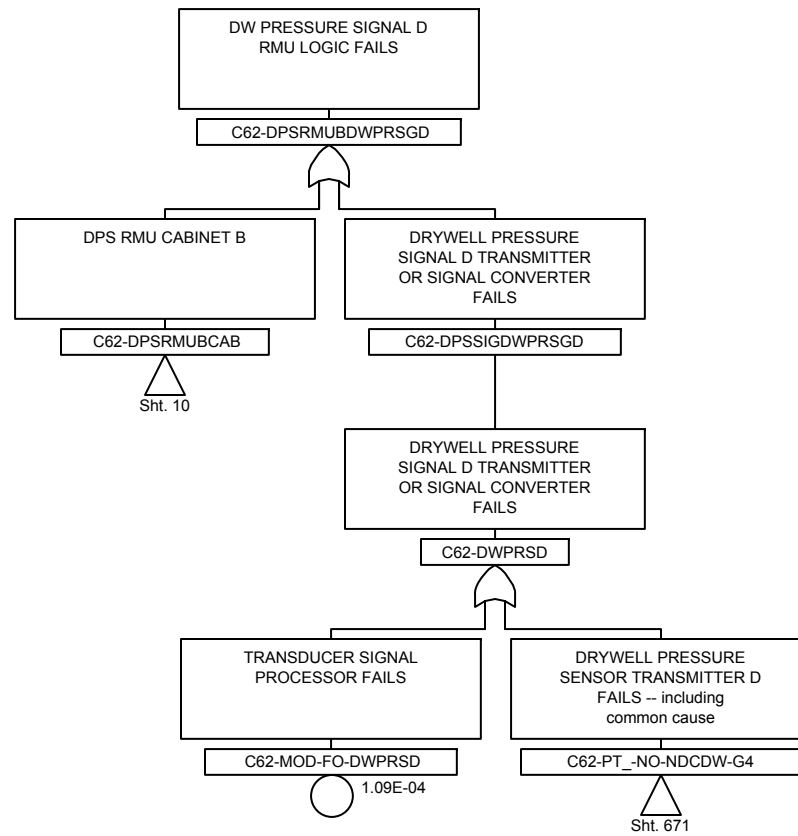


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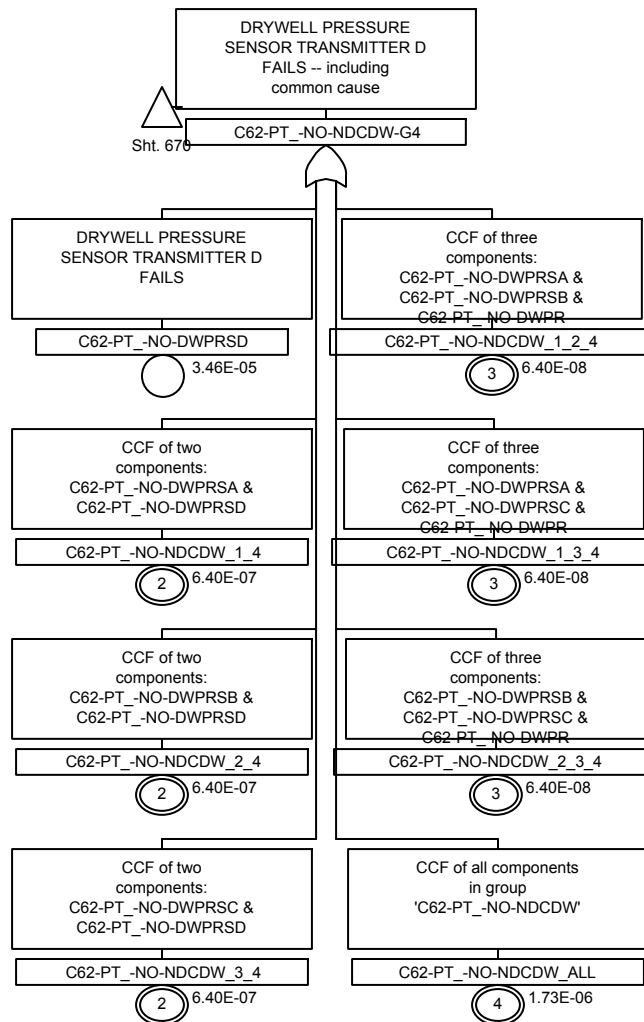


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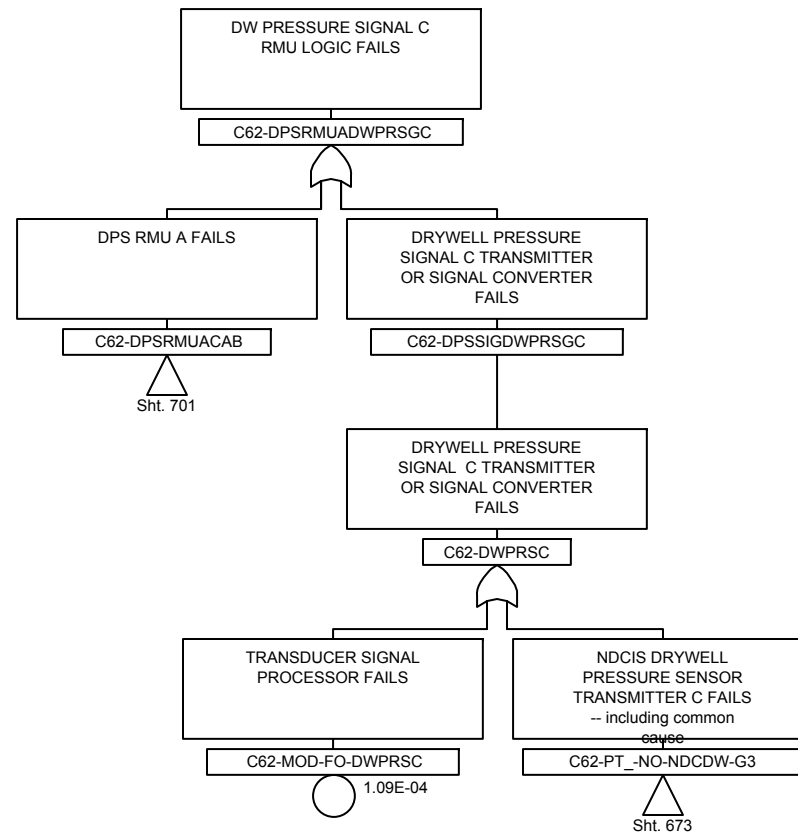


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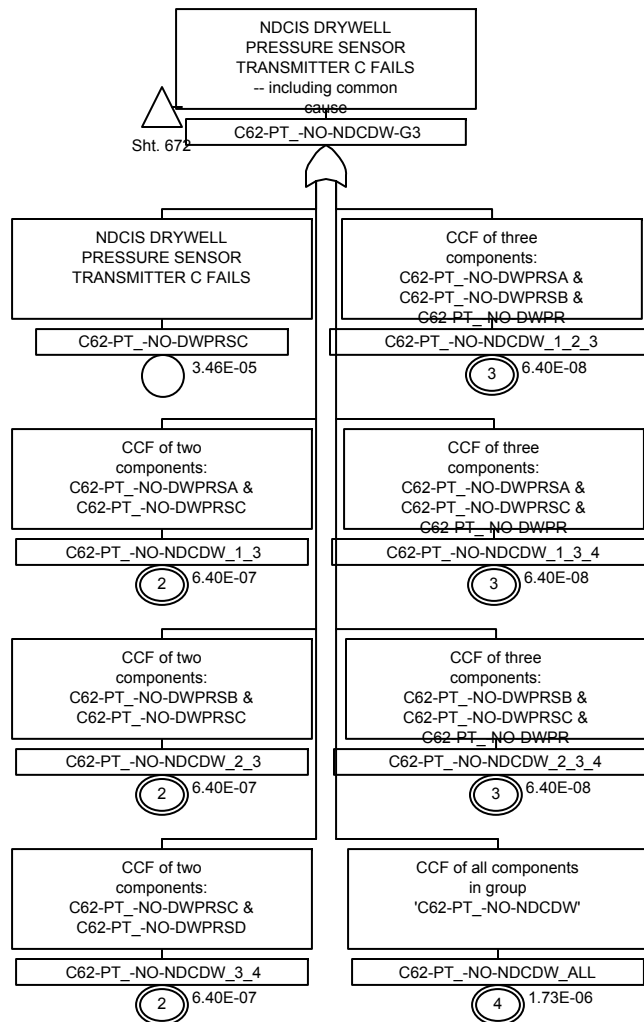


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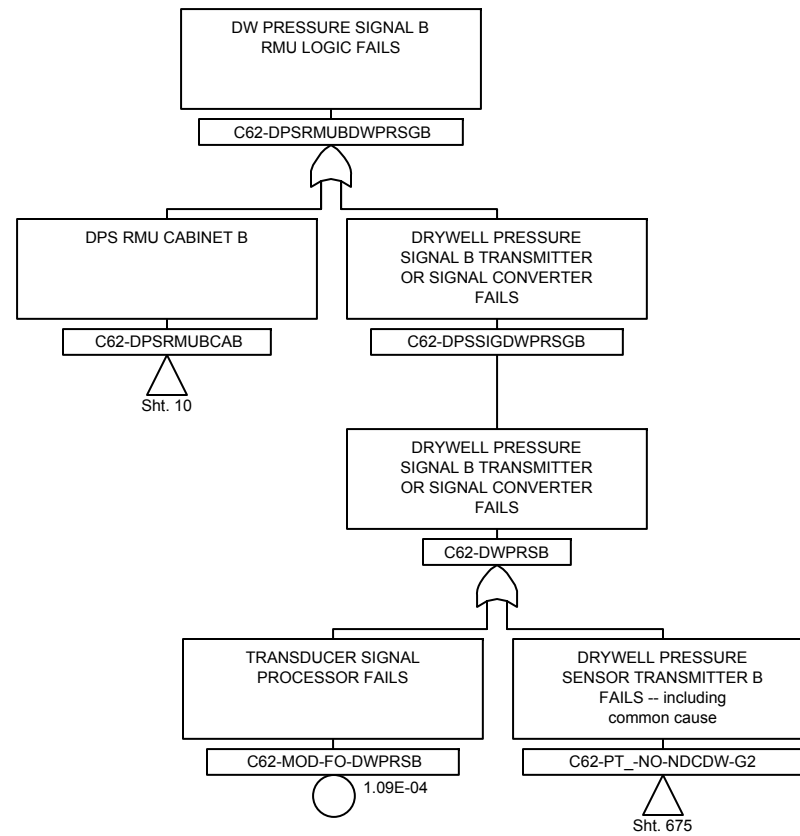


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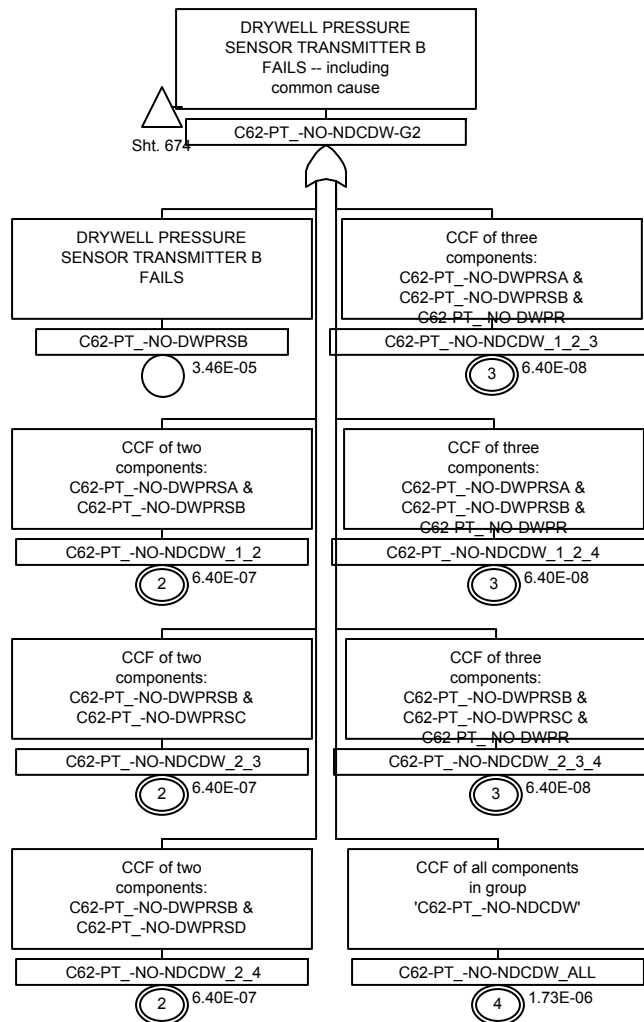


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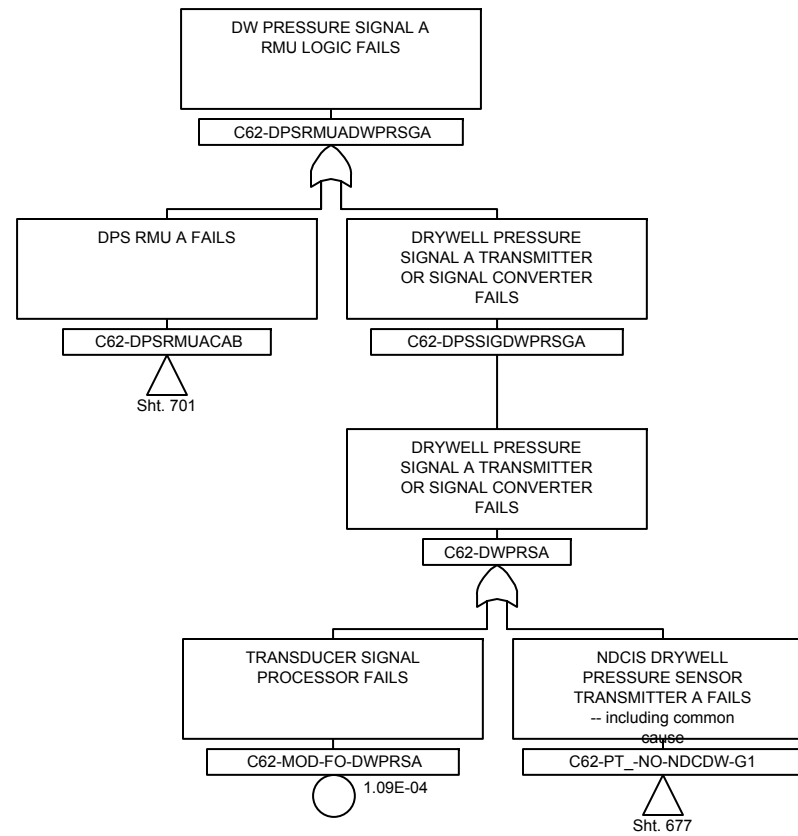


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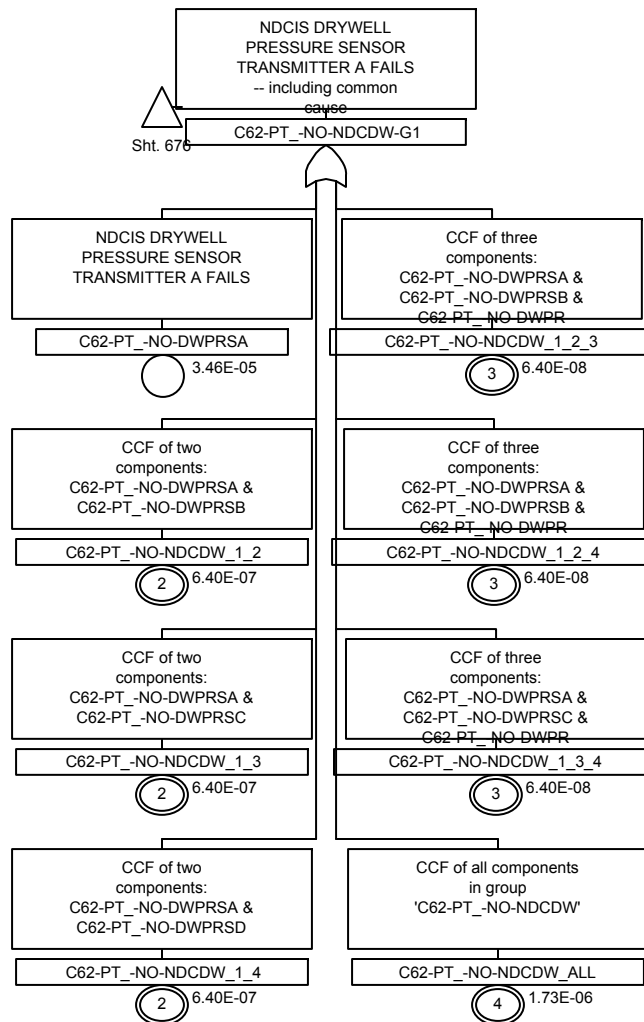


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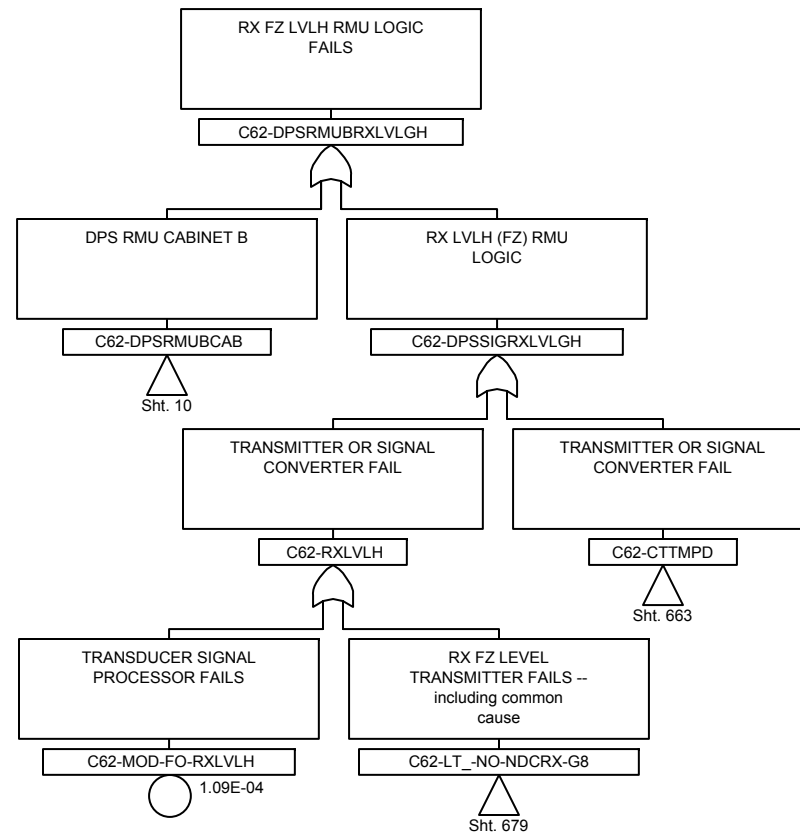


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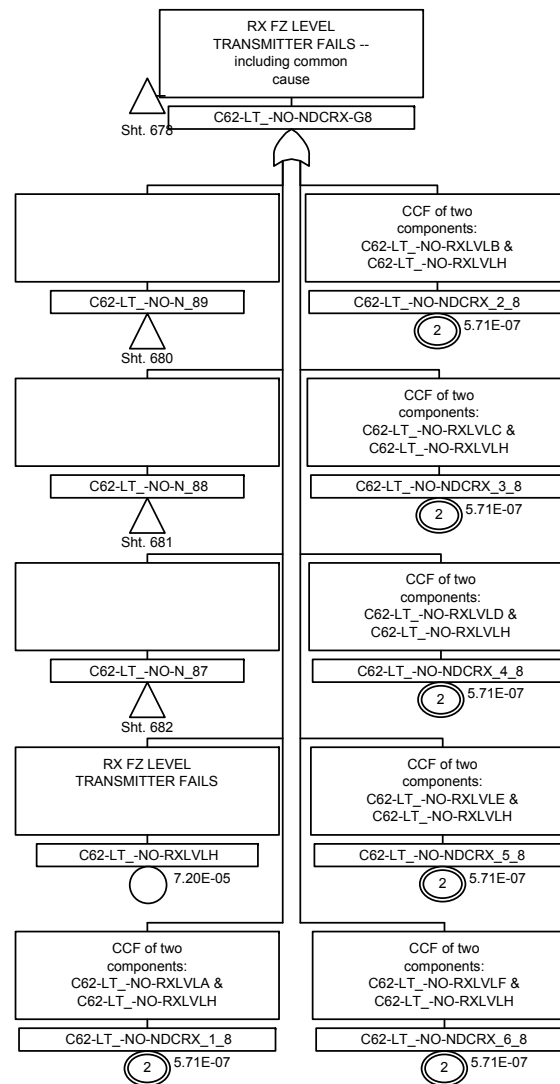


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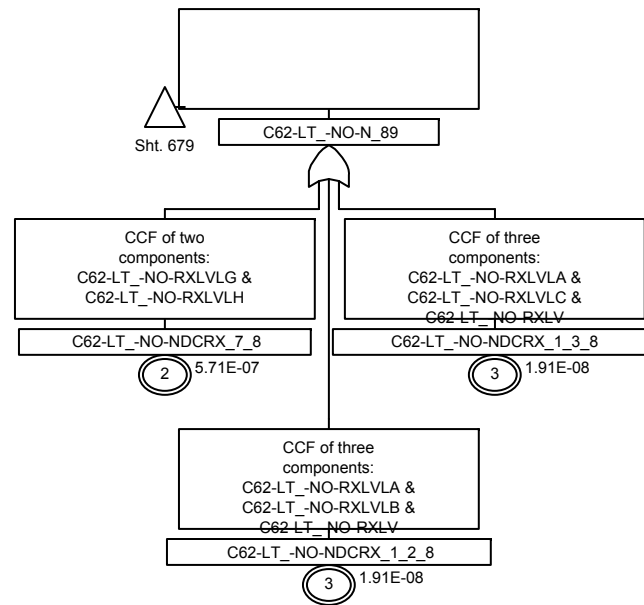


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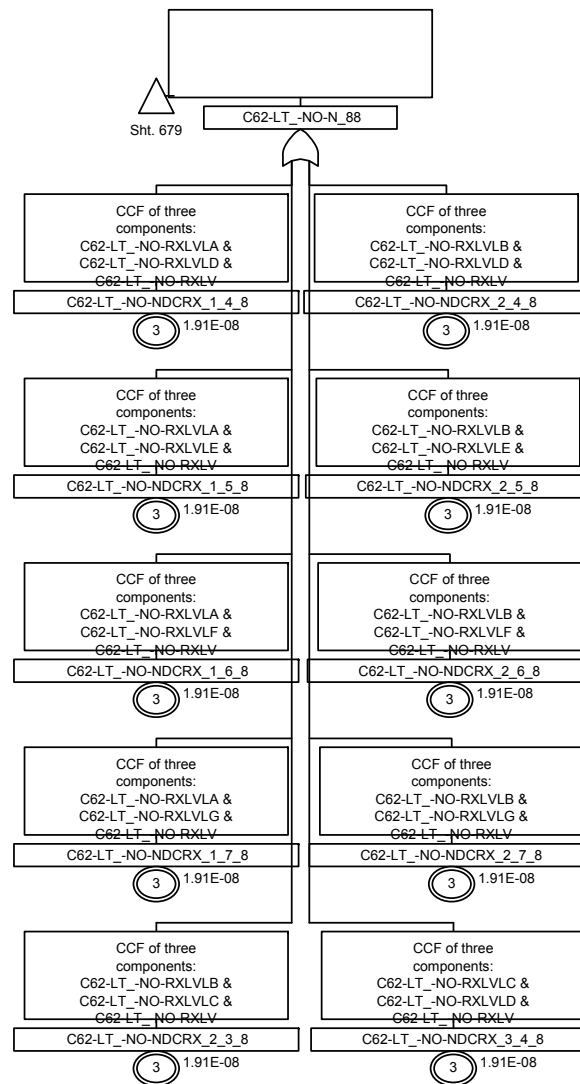


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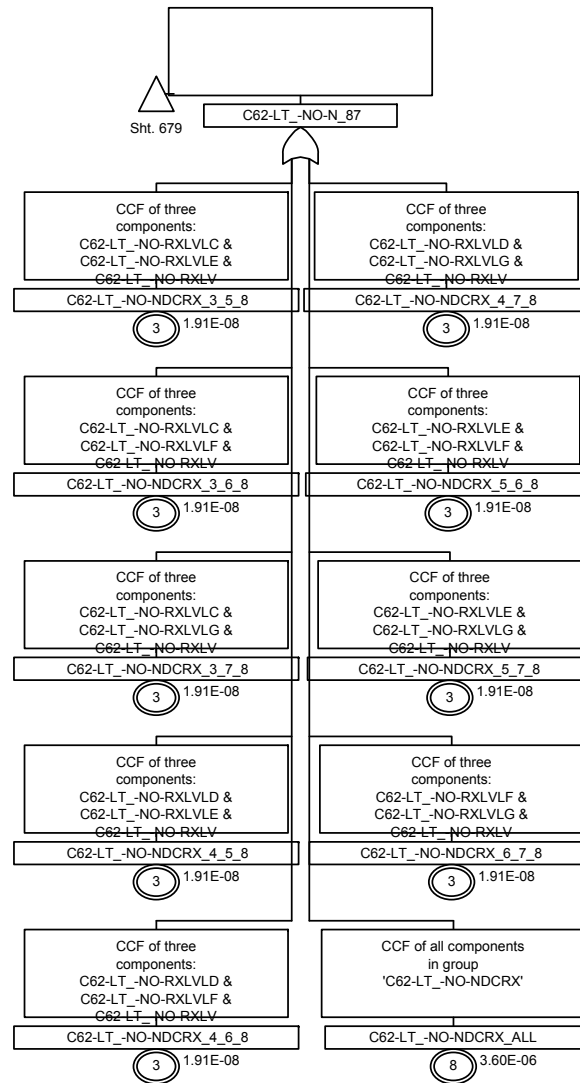


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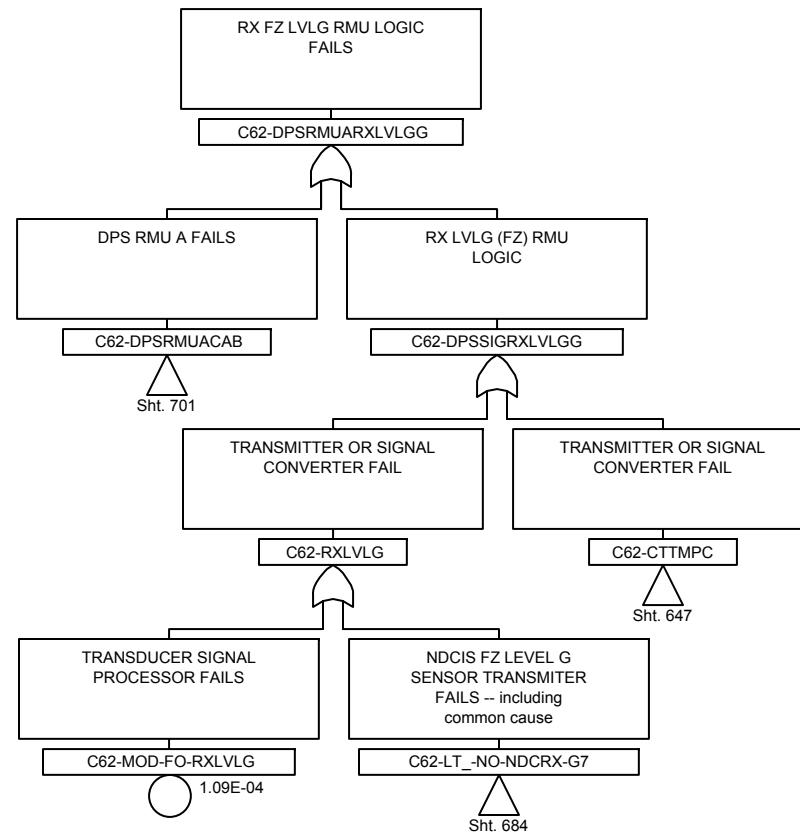


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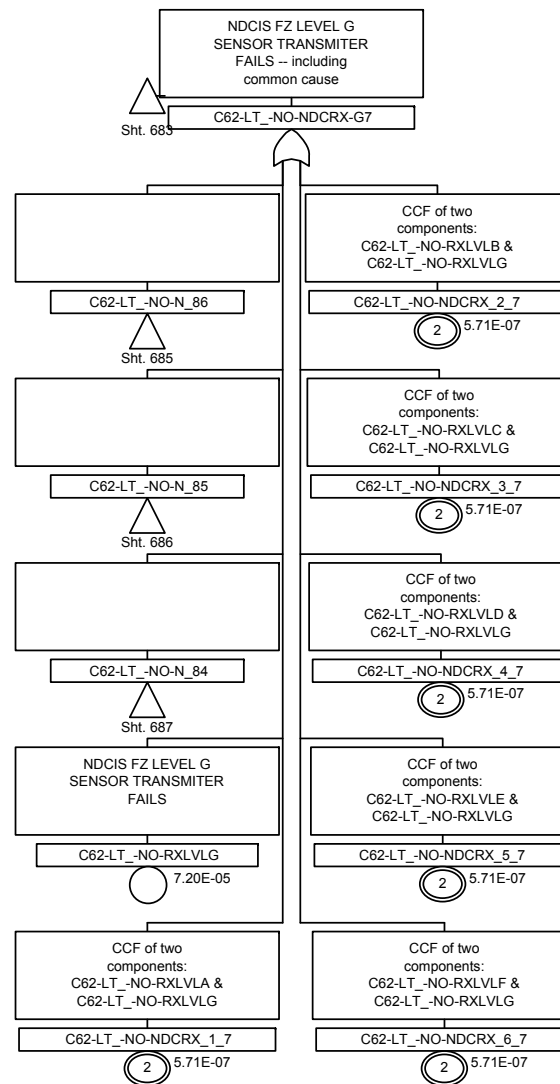


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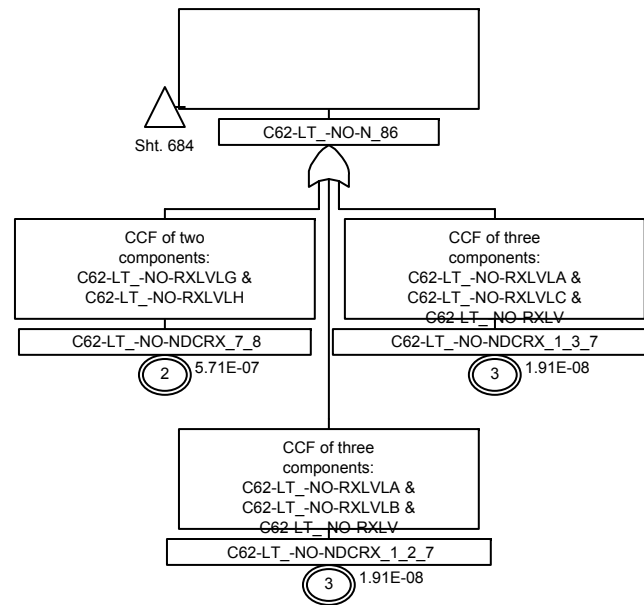


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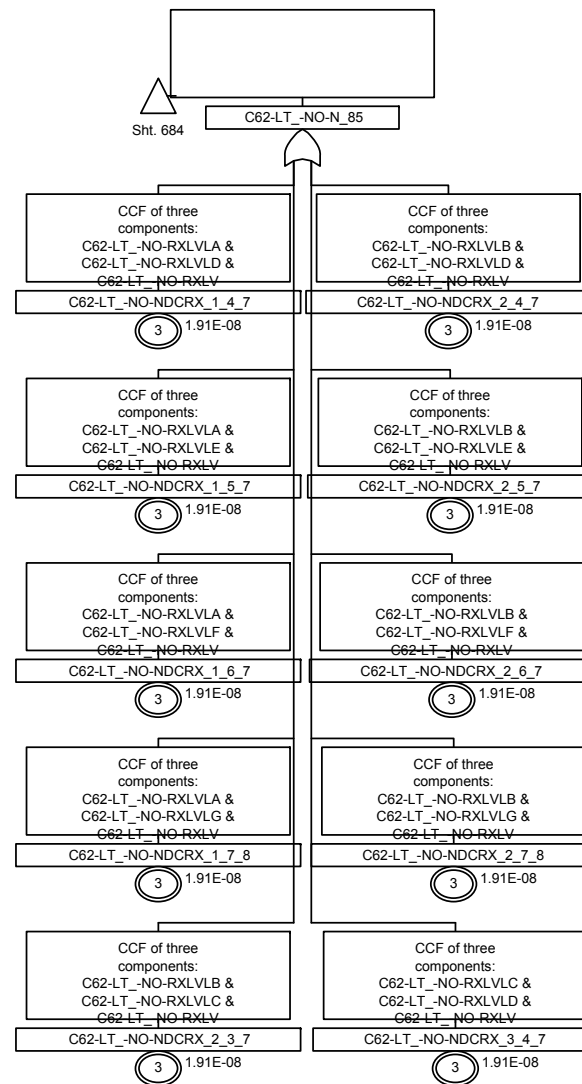


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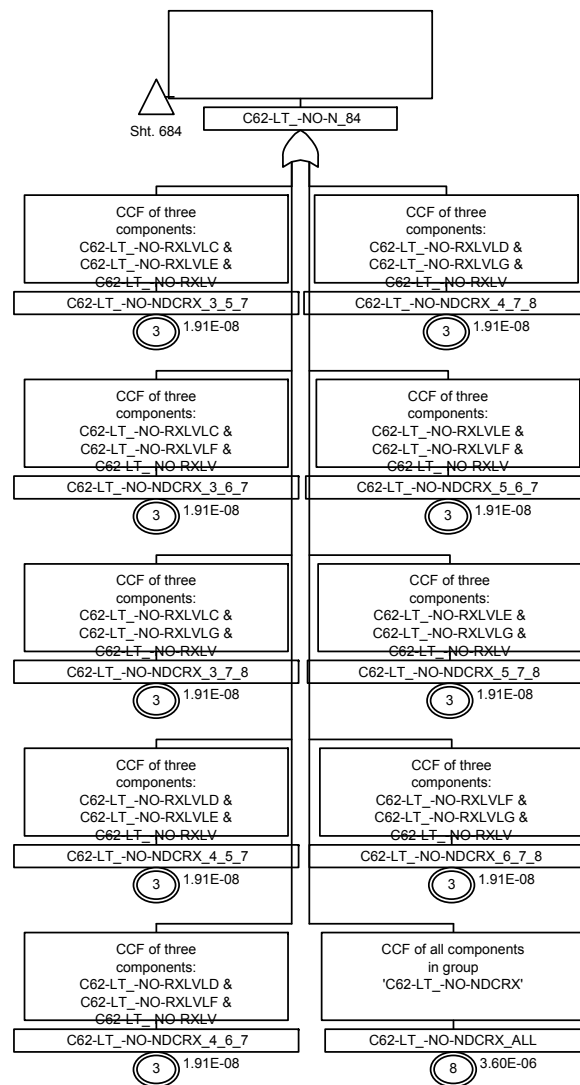


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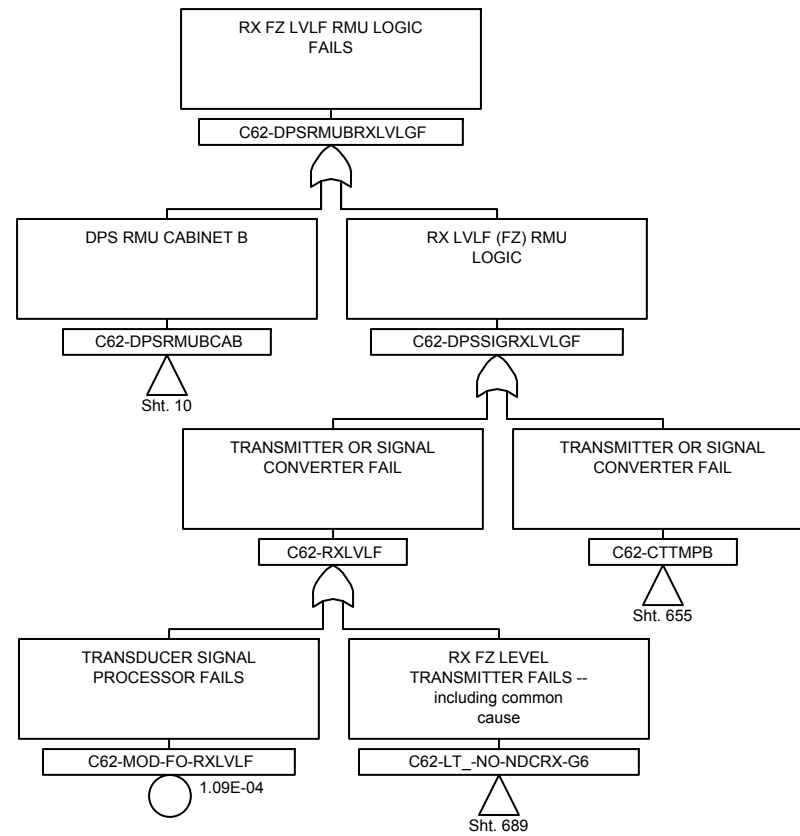


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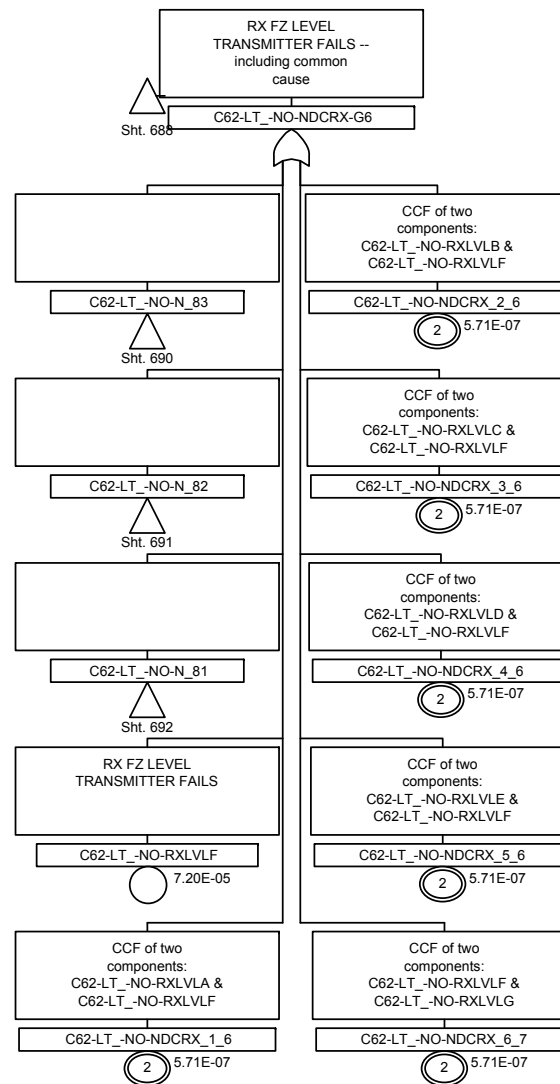


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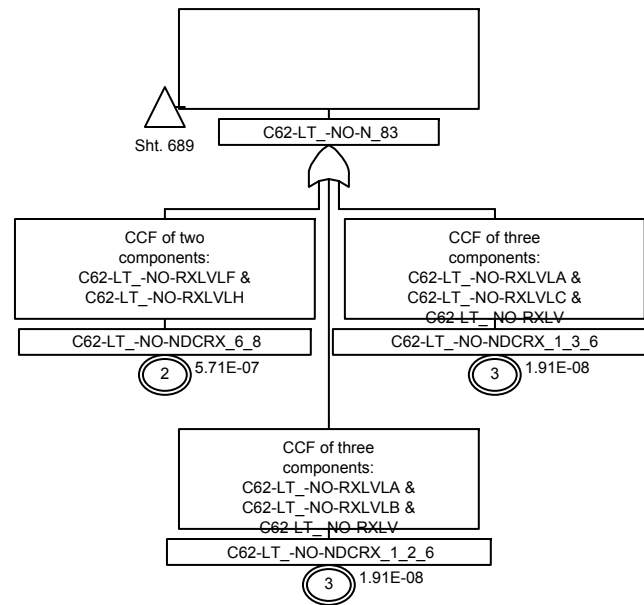


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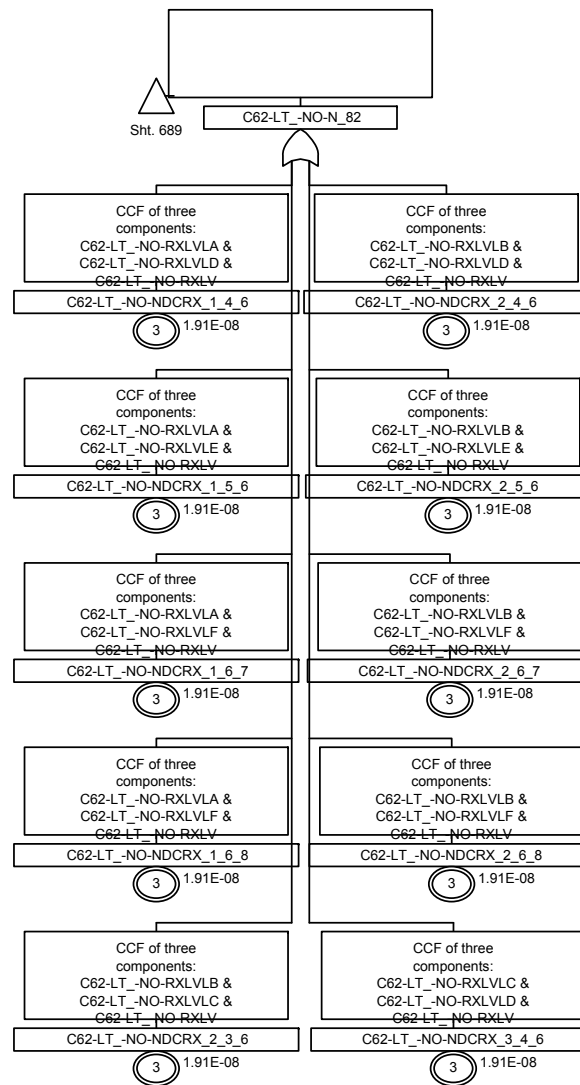


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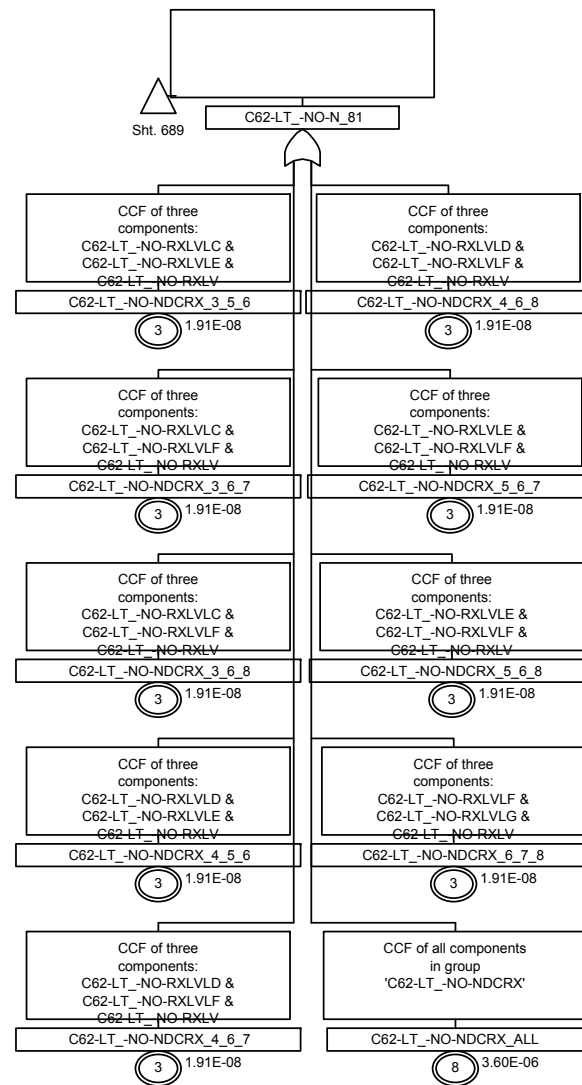


Figure 4.5-3a. Sheet 692 N-DCIS Non Safety Control System



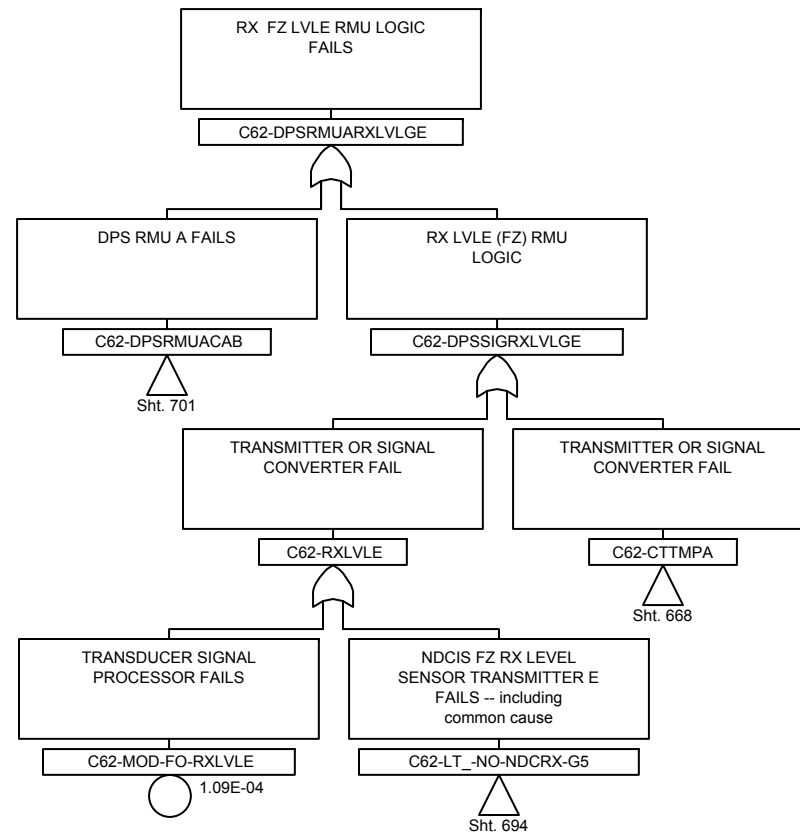


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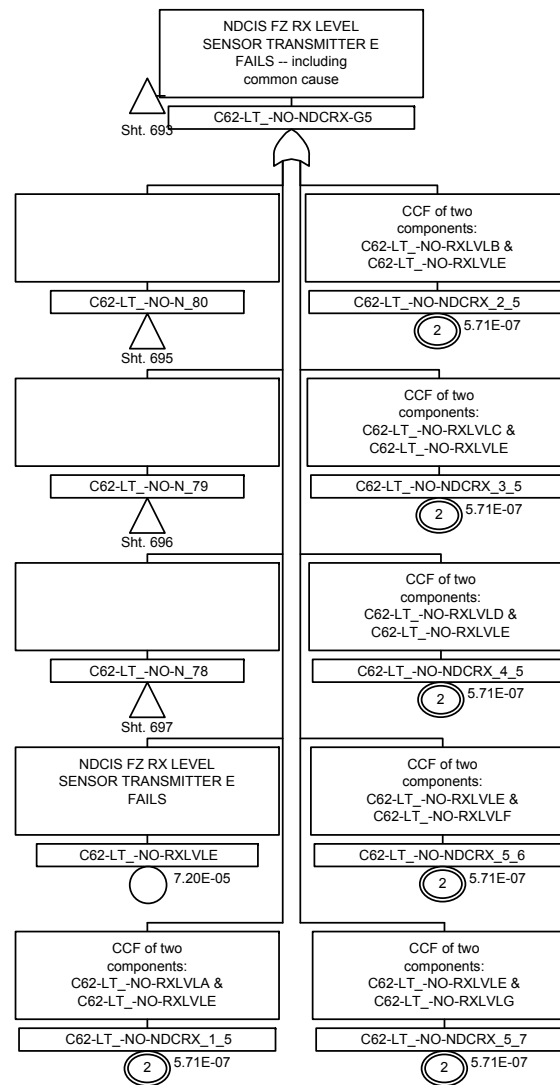


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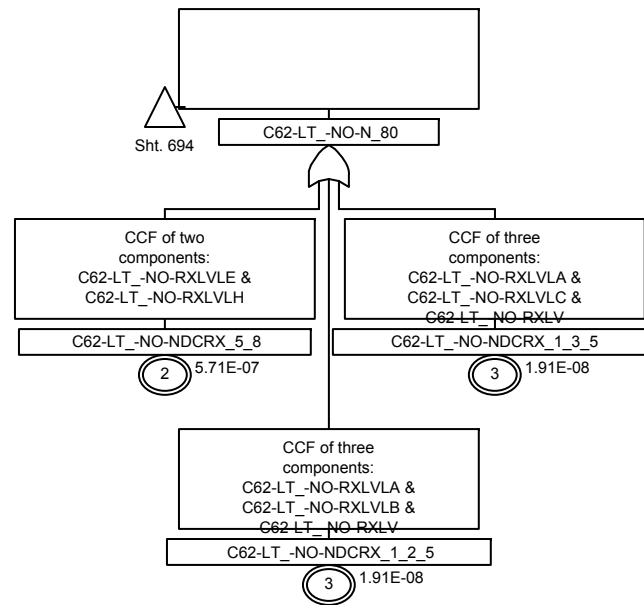


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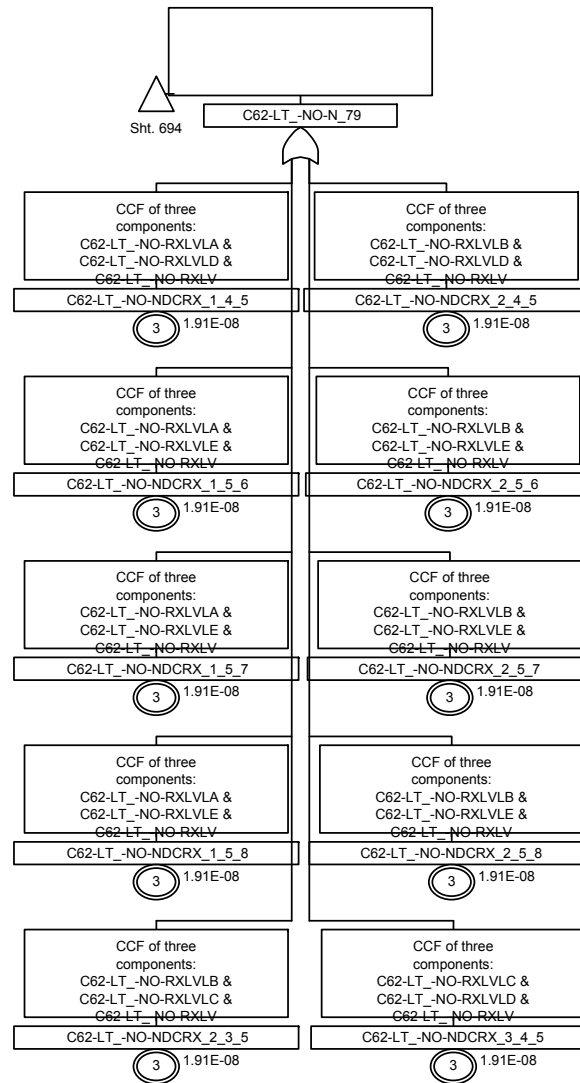


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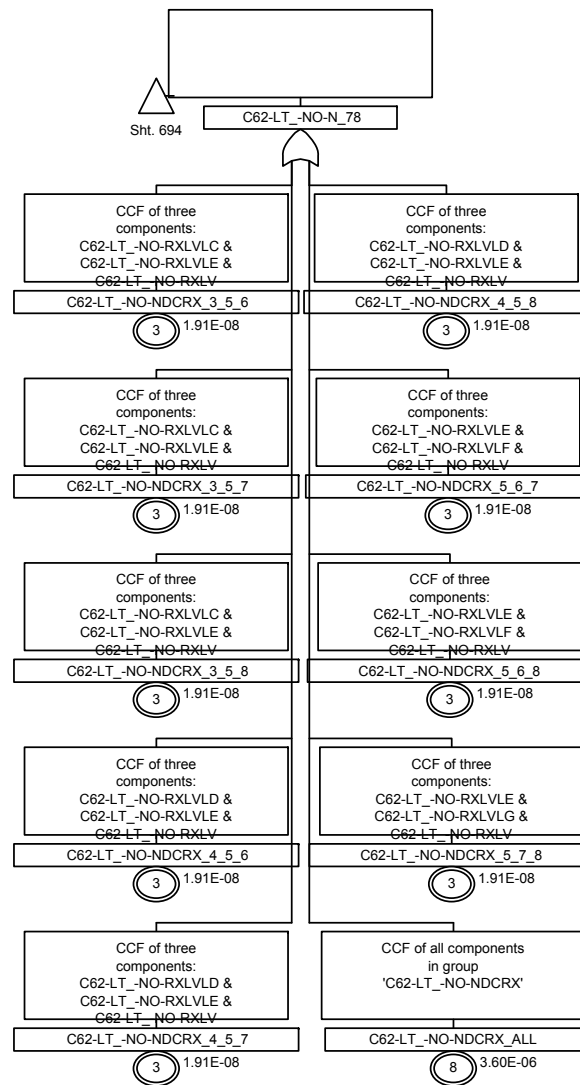


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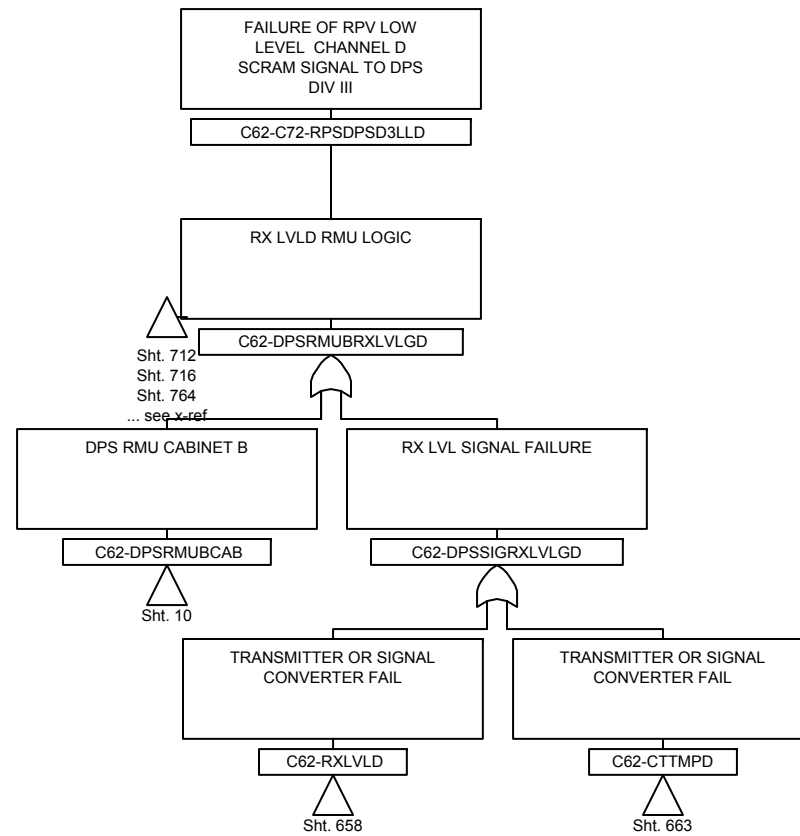


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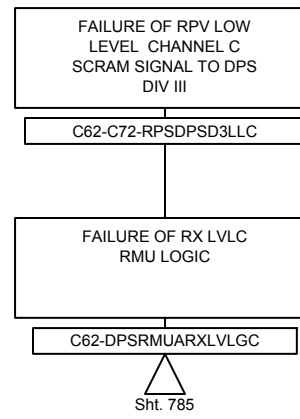


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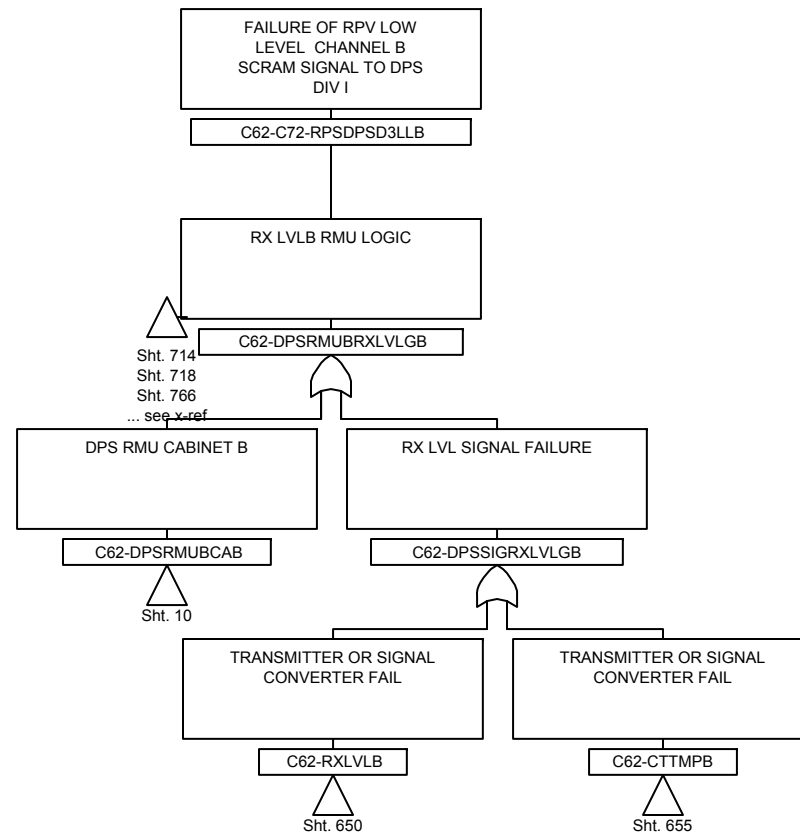


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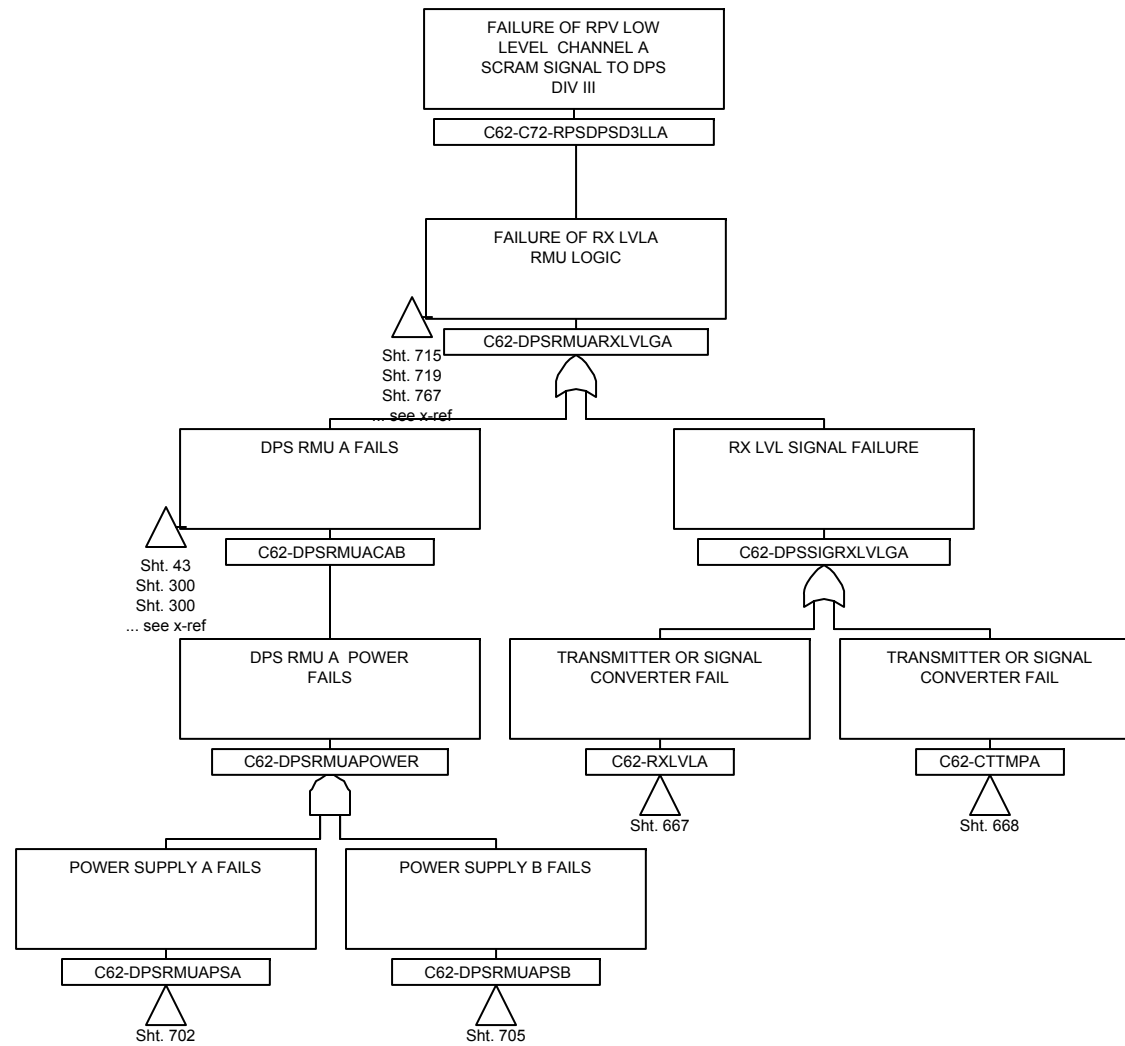


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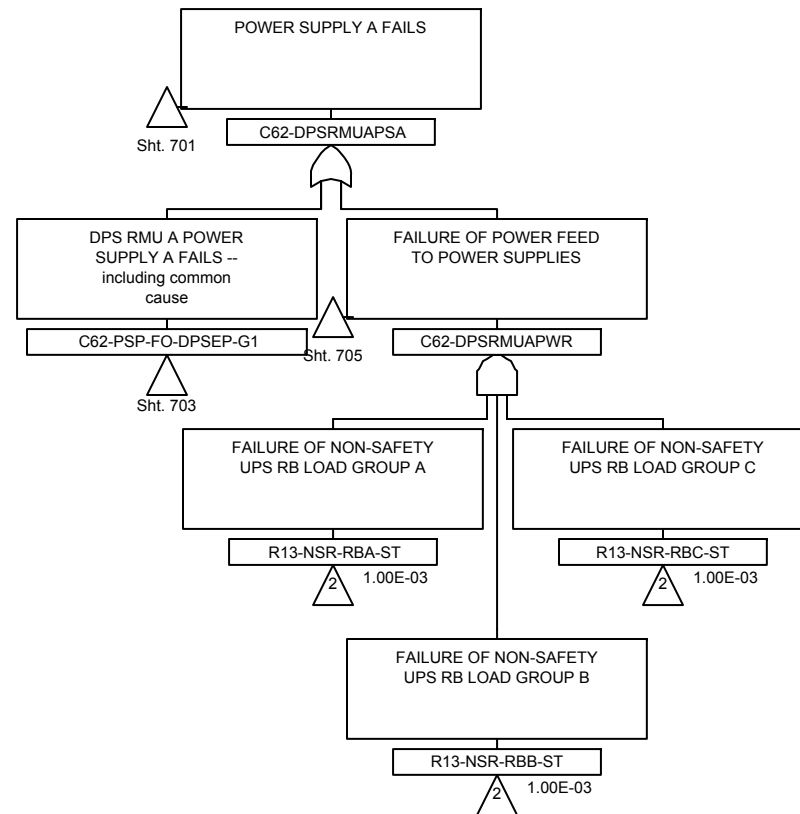


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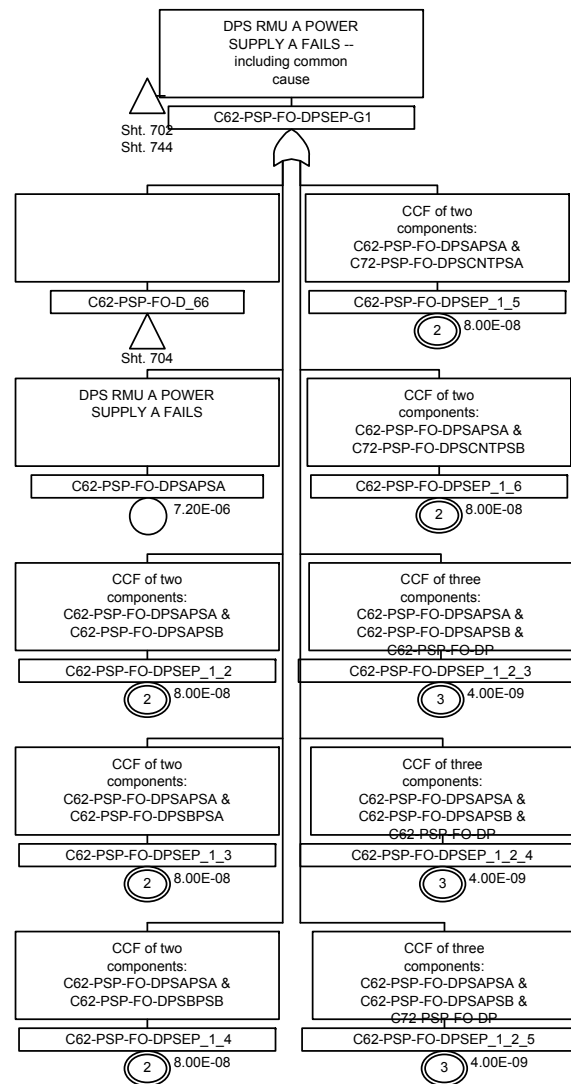


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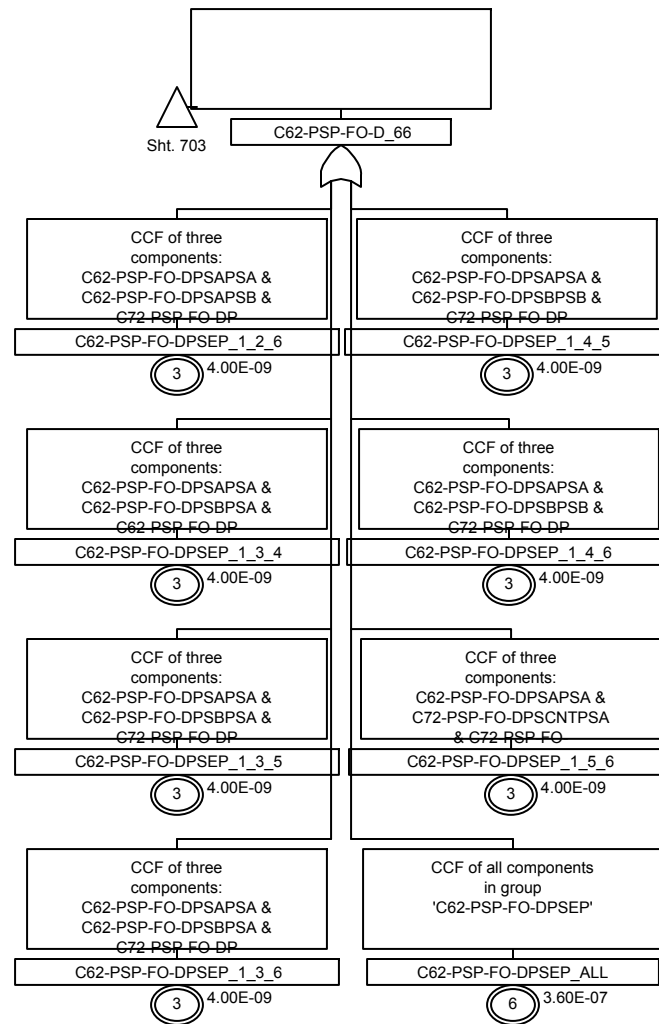


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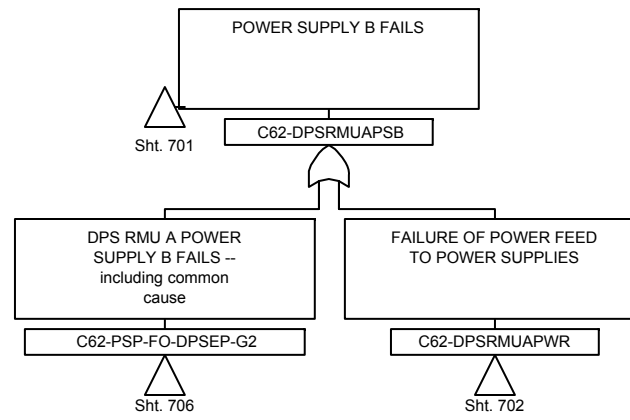


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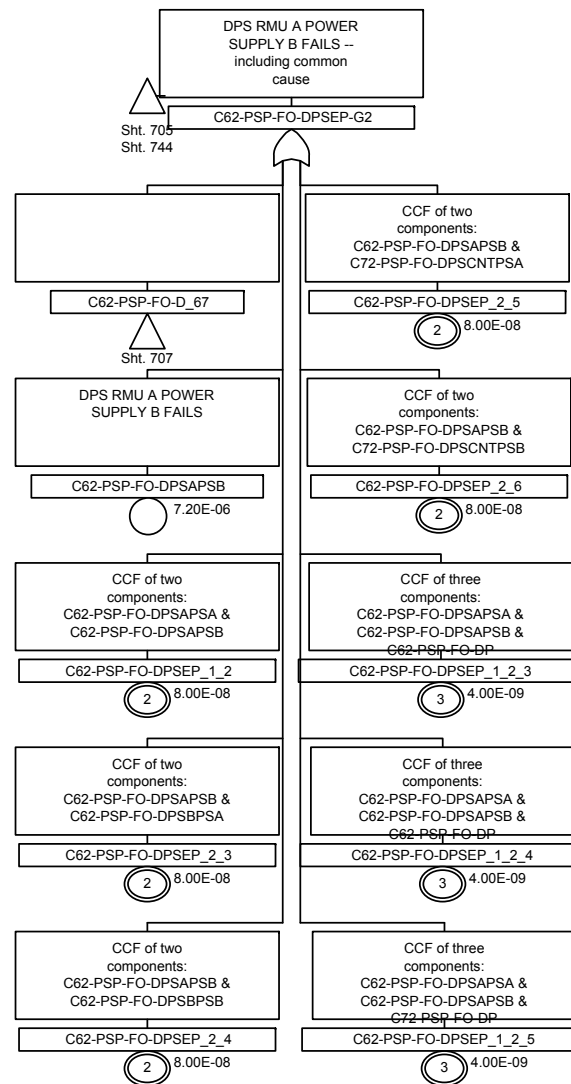


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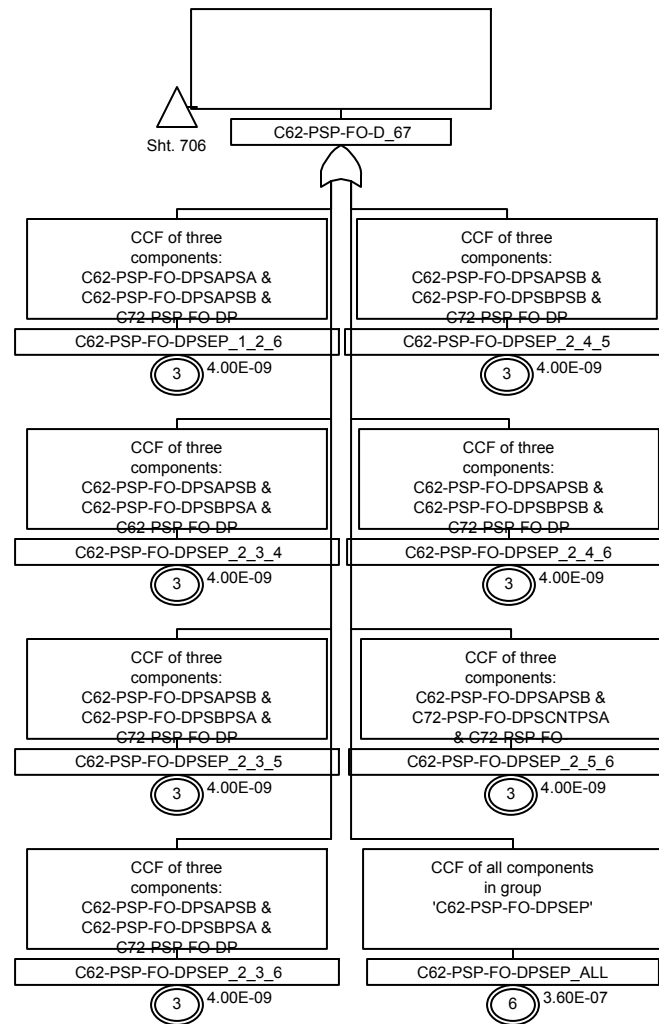


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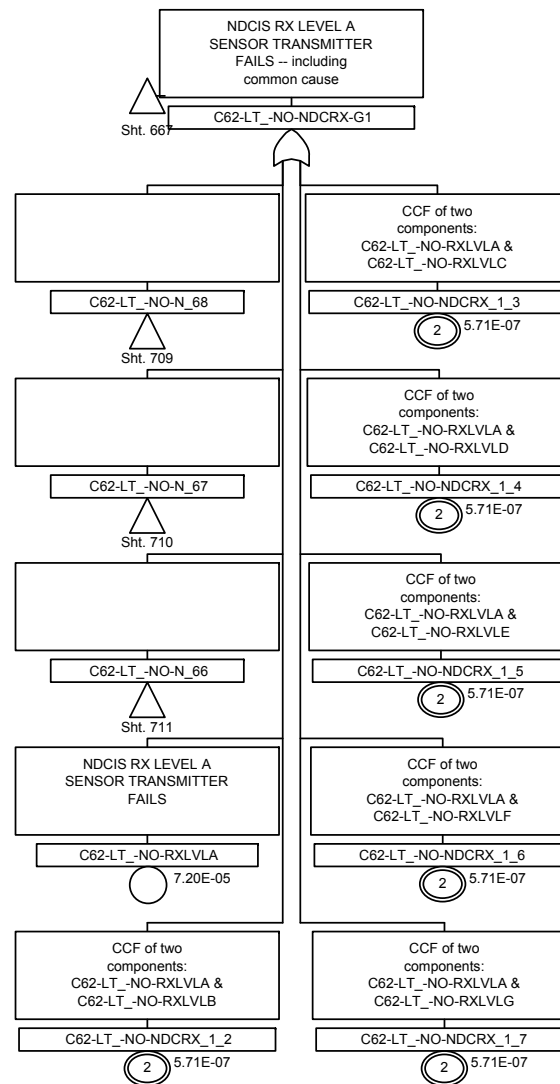


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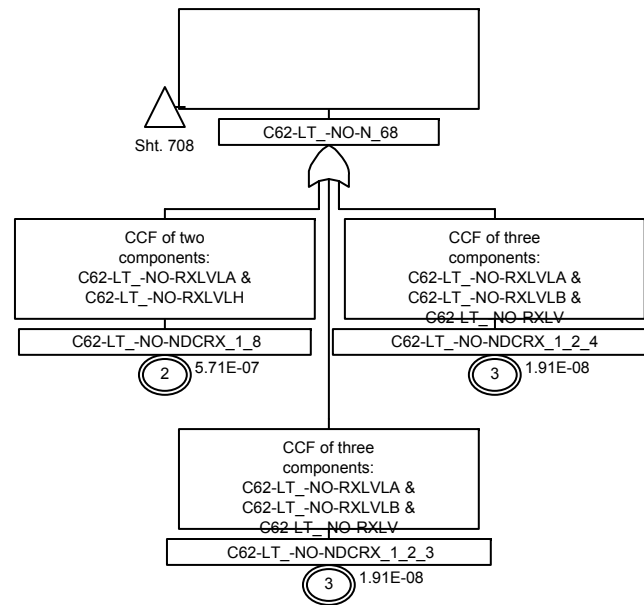


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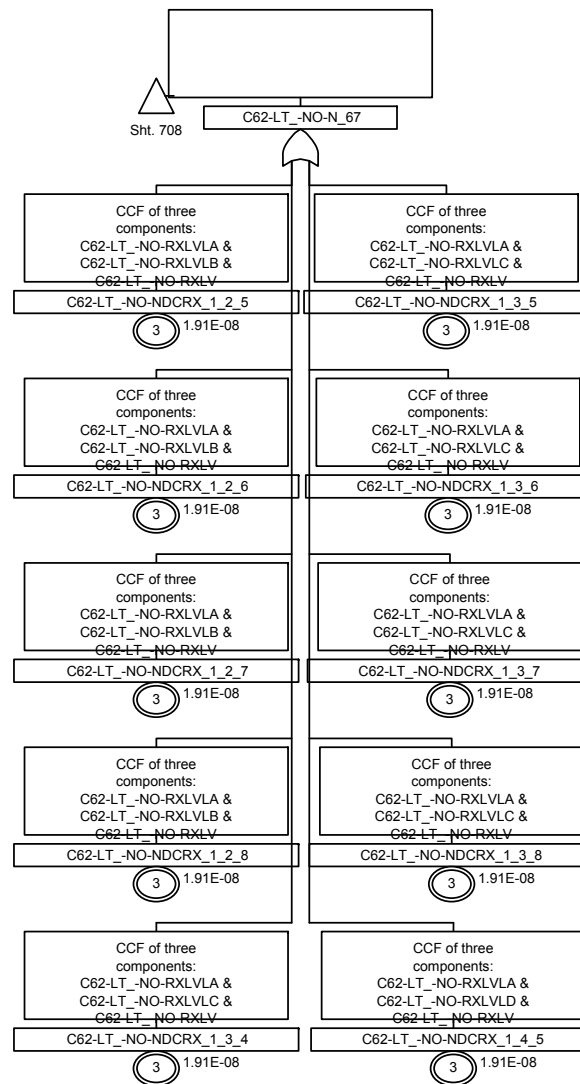


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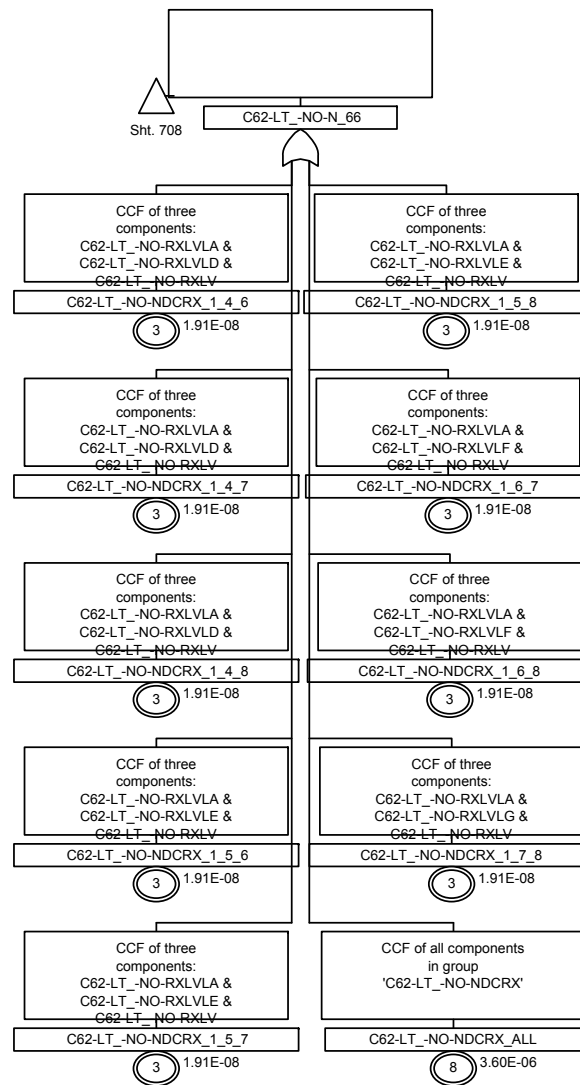


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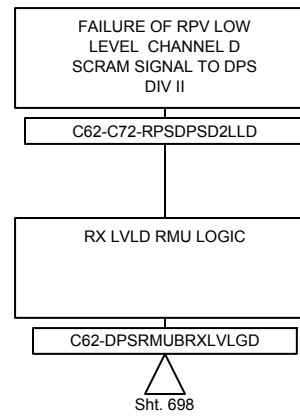


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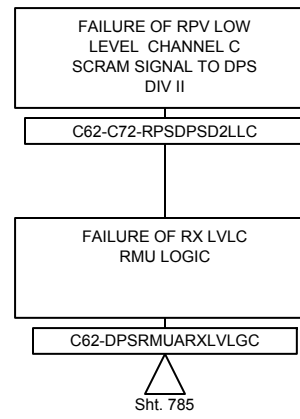


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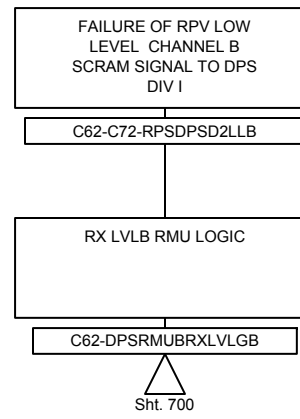


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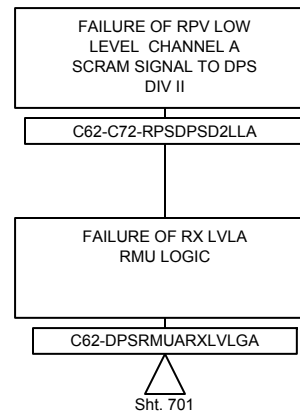


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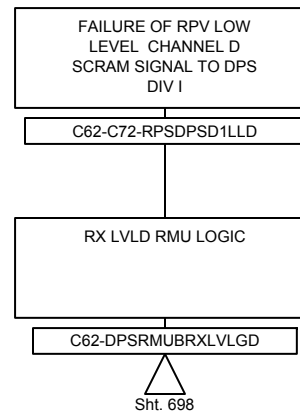


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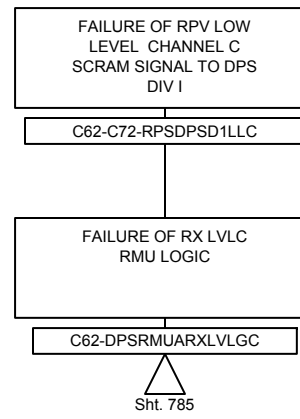


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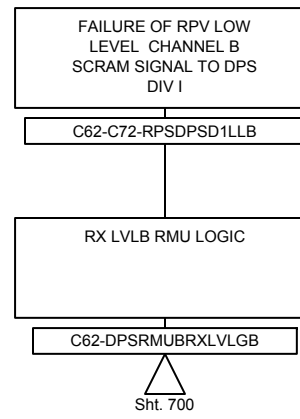


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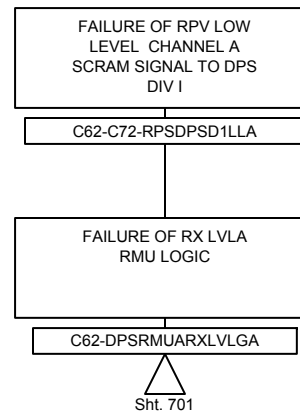


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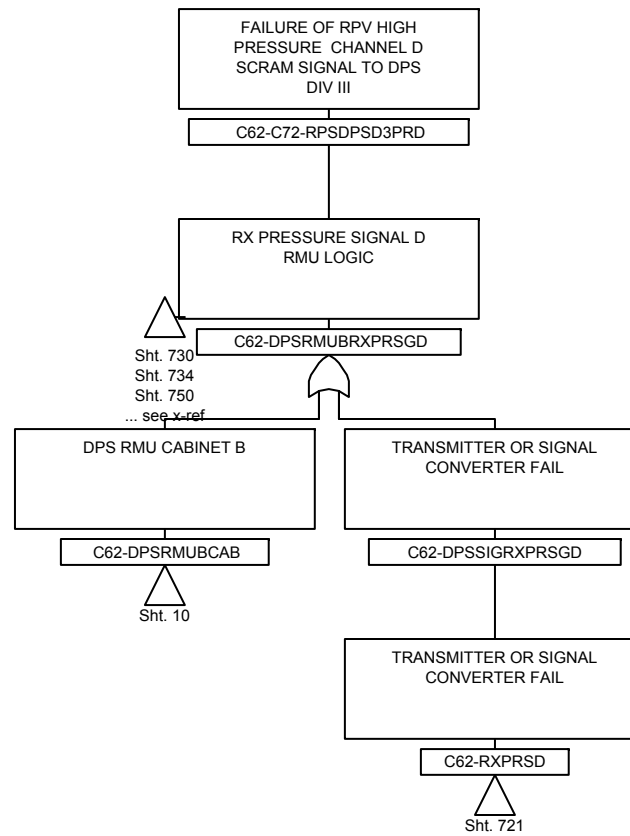


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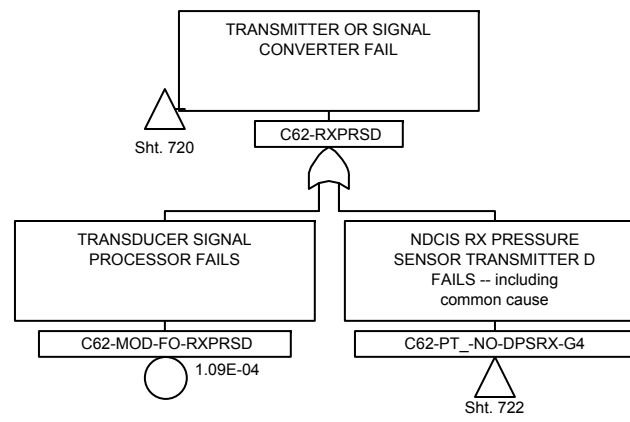


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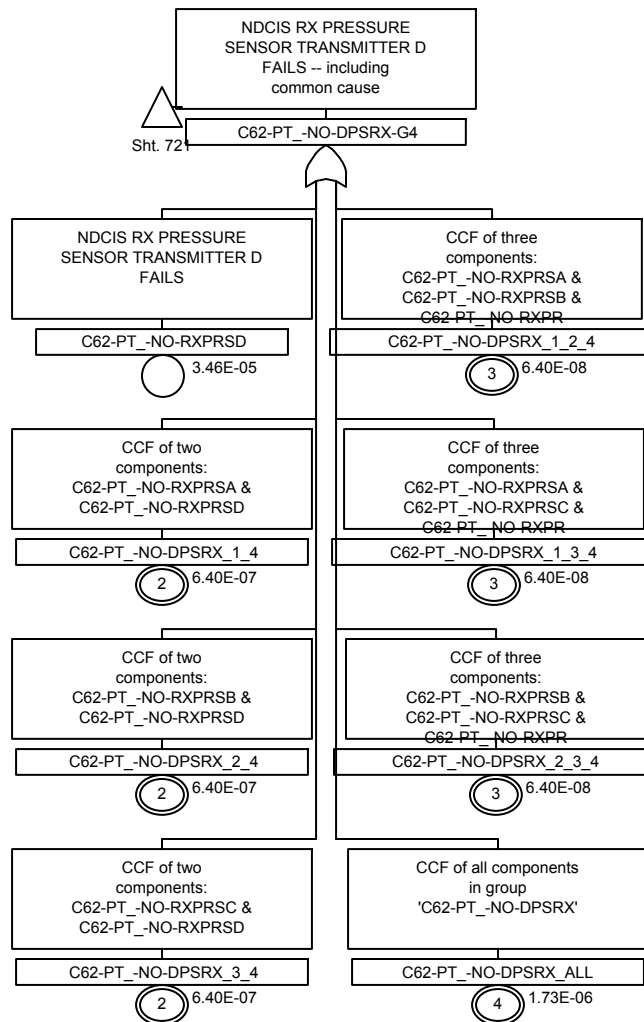


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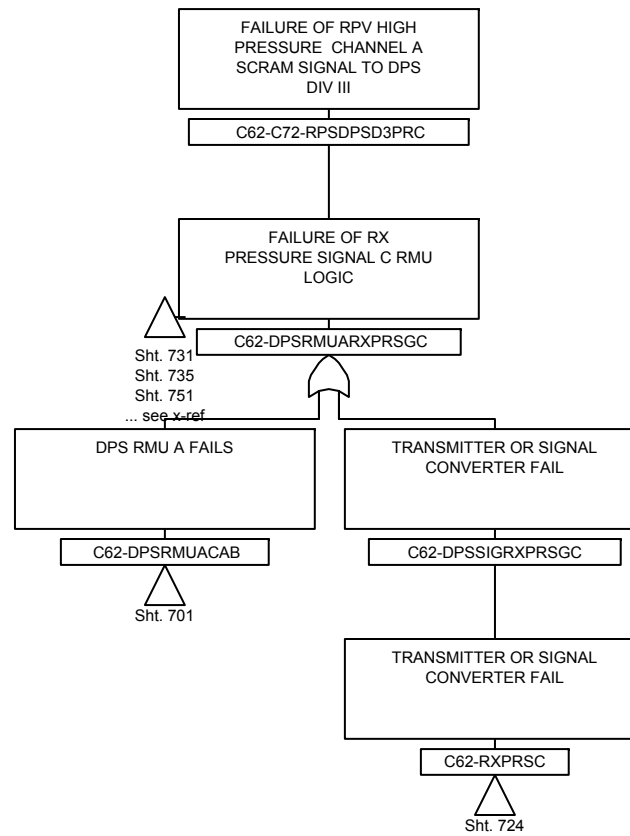


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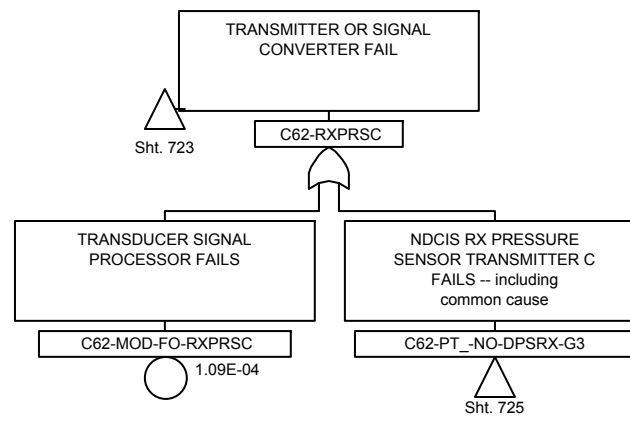


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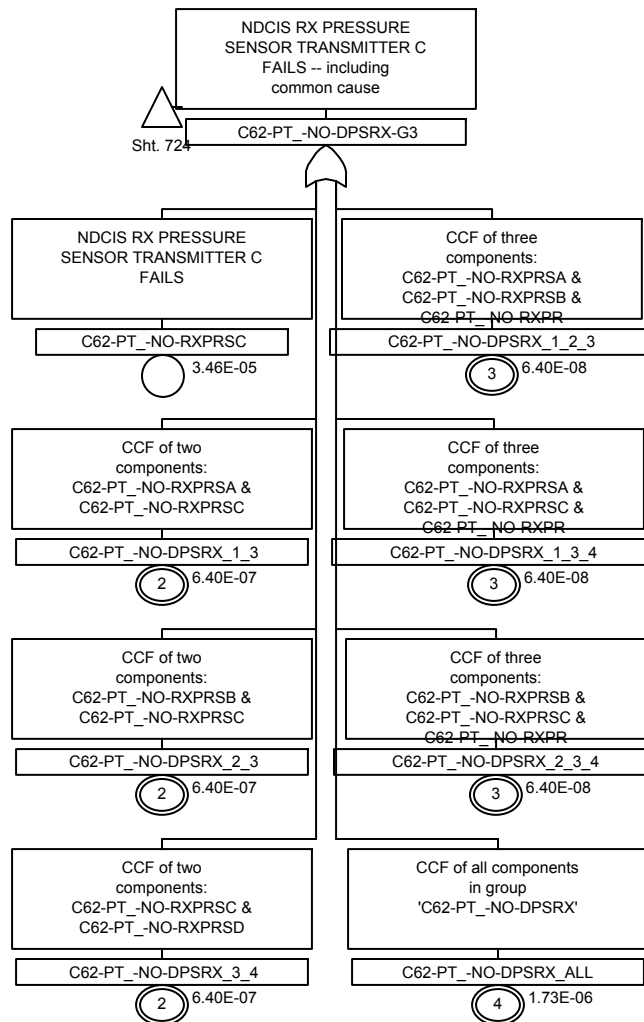


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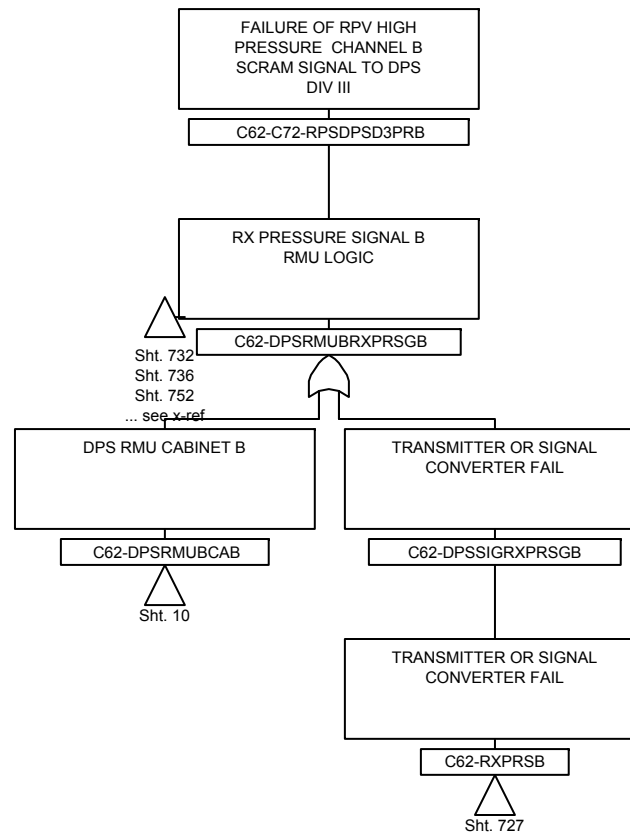


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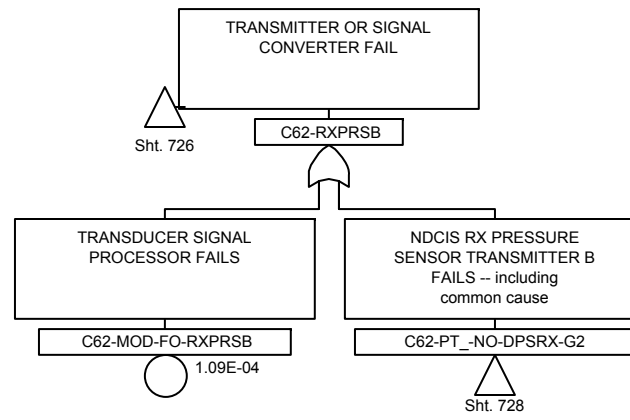


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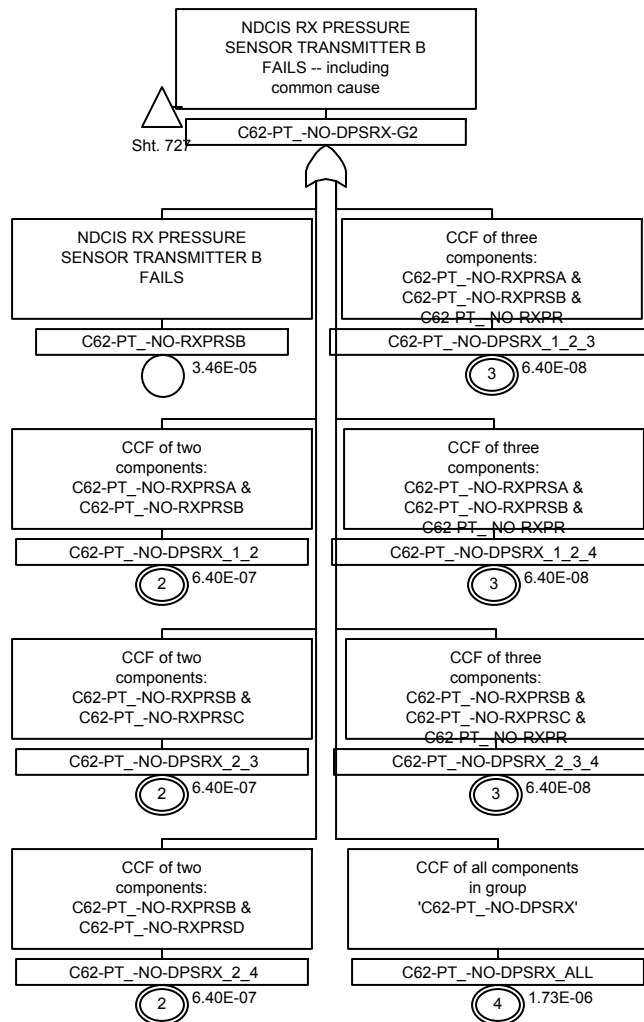


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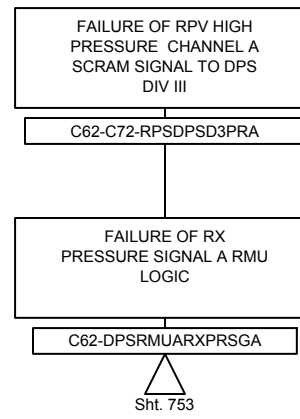


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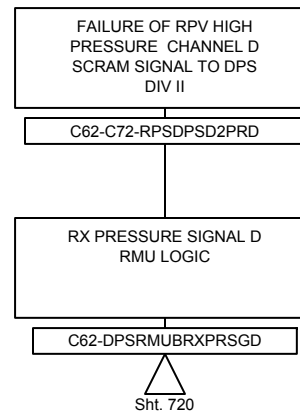


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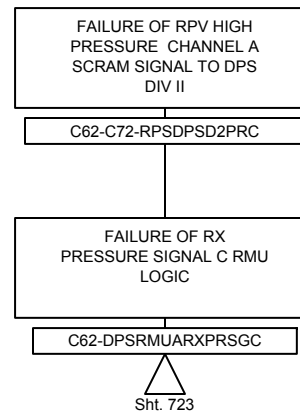


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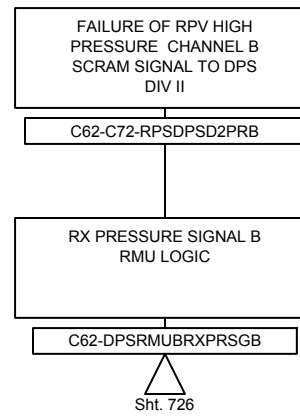


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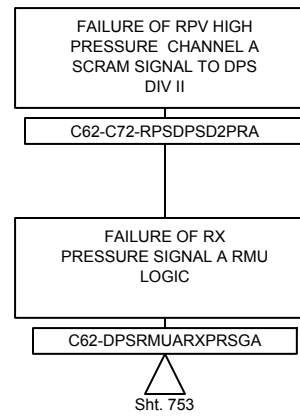


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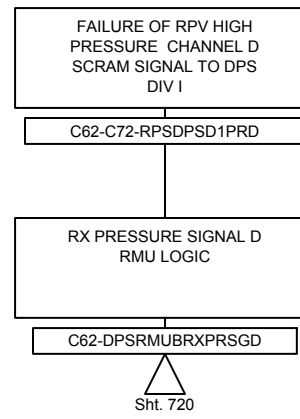


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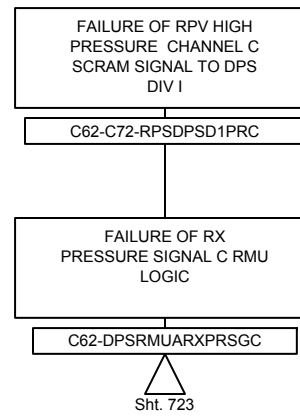


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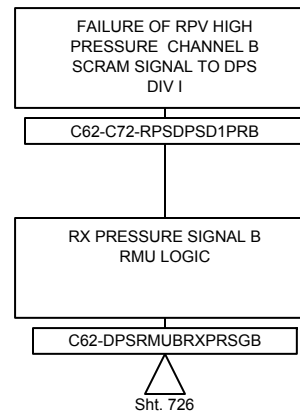


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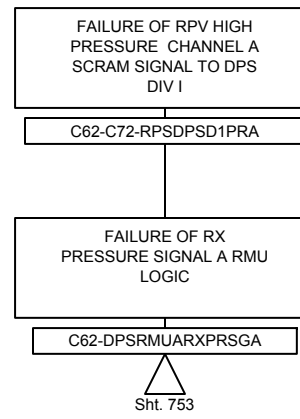


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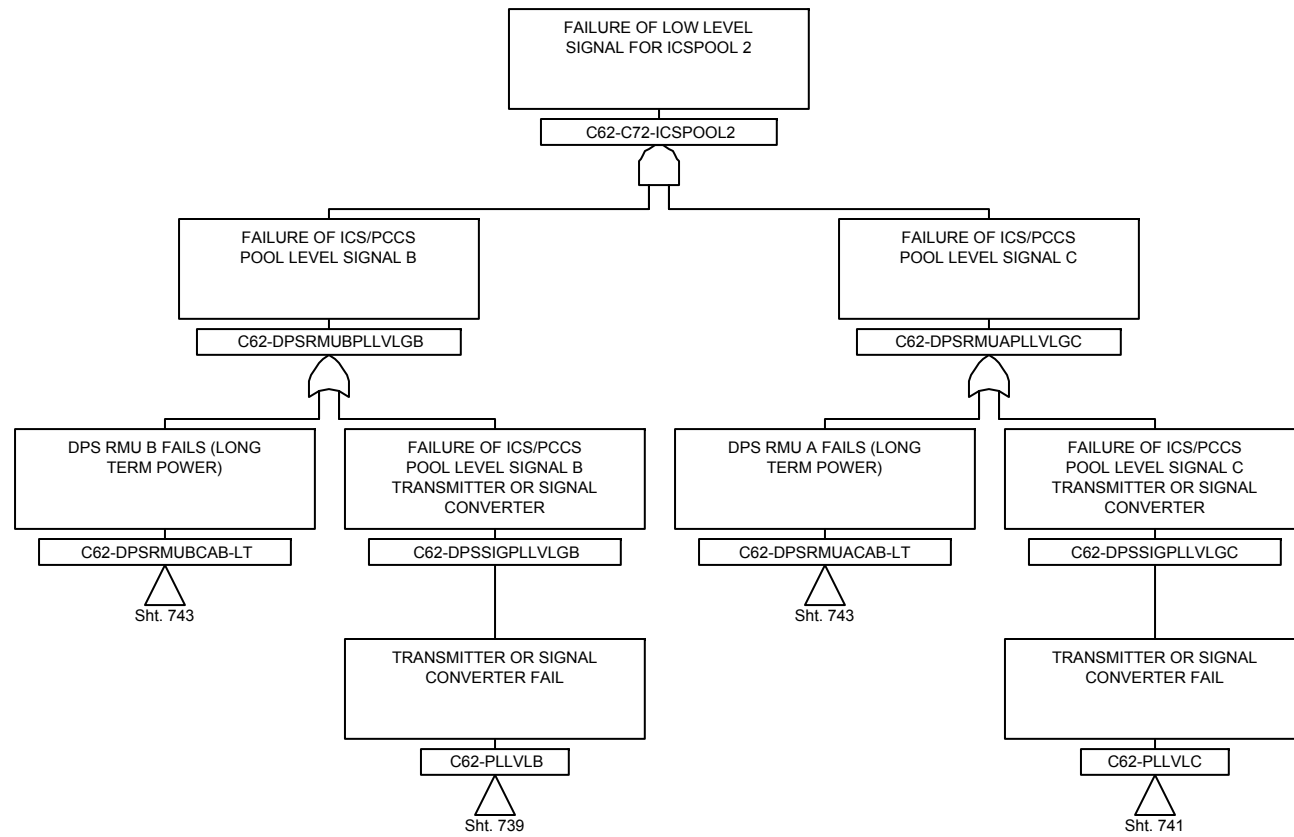


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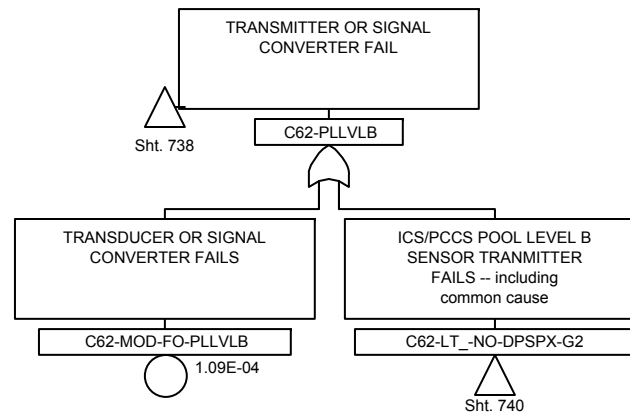


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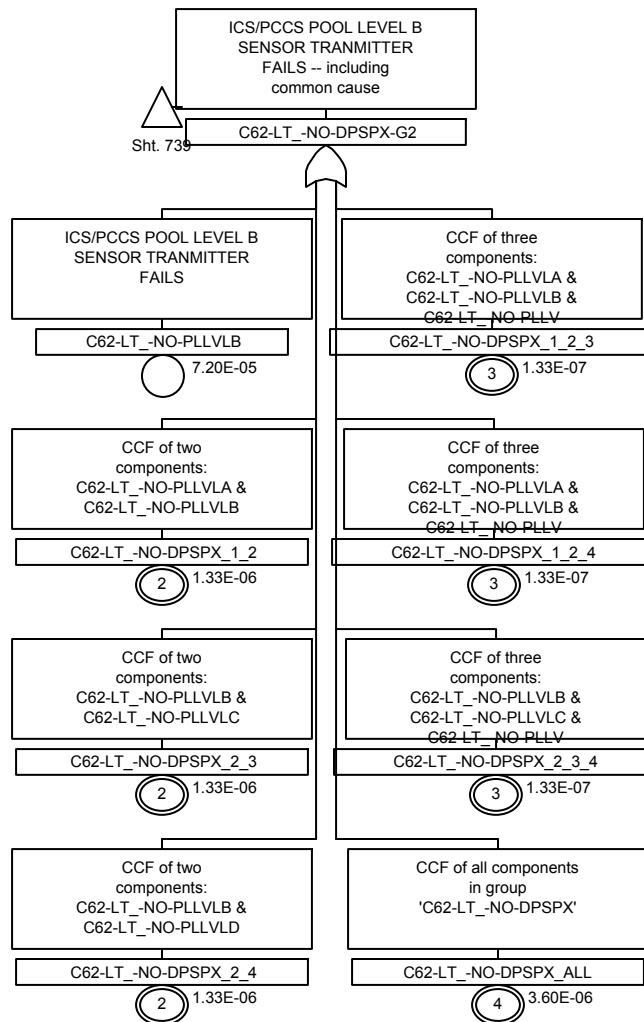


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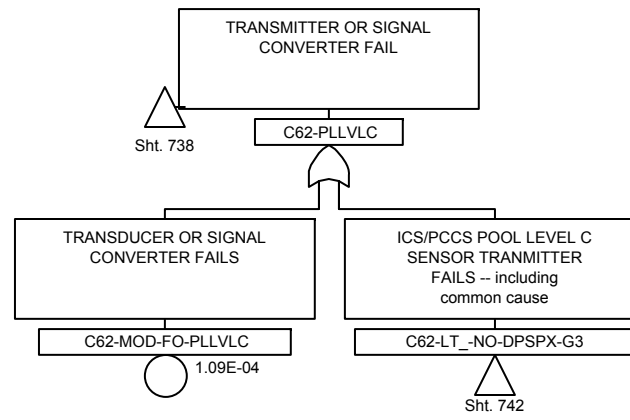


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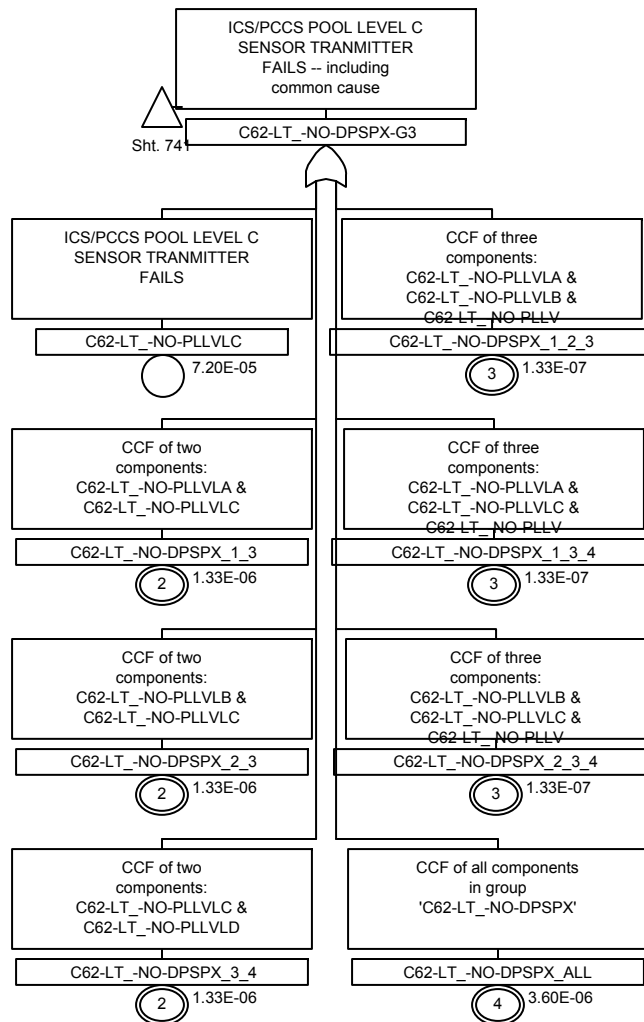


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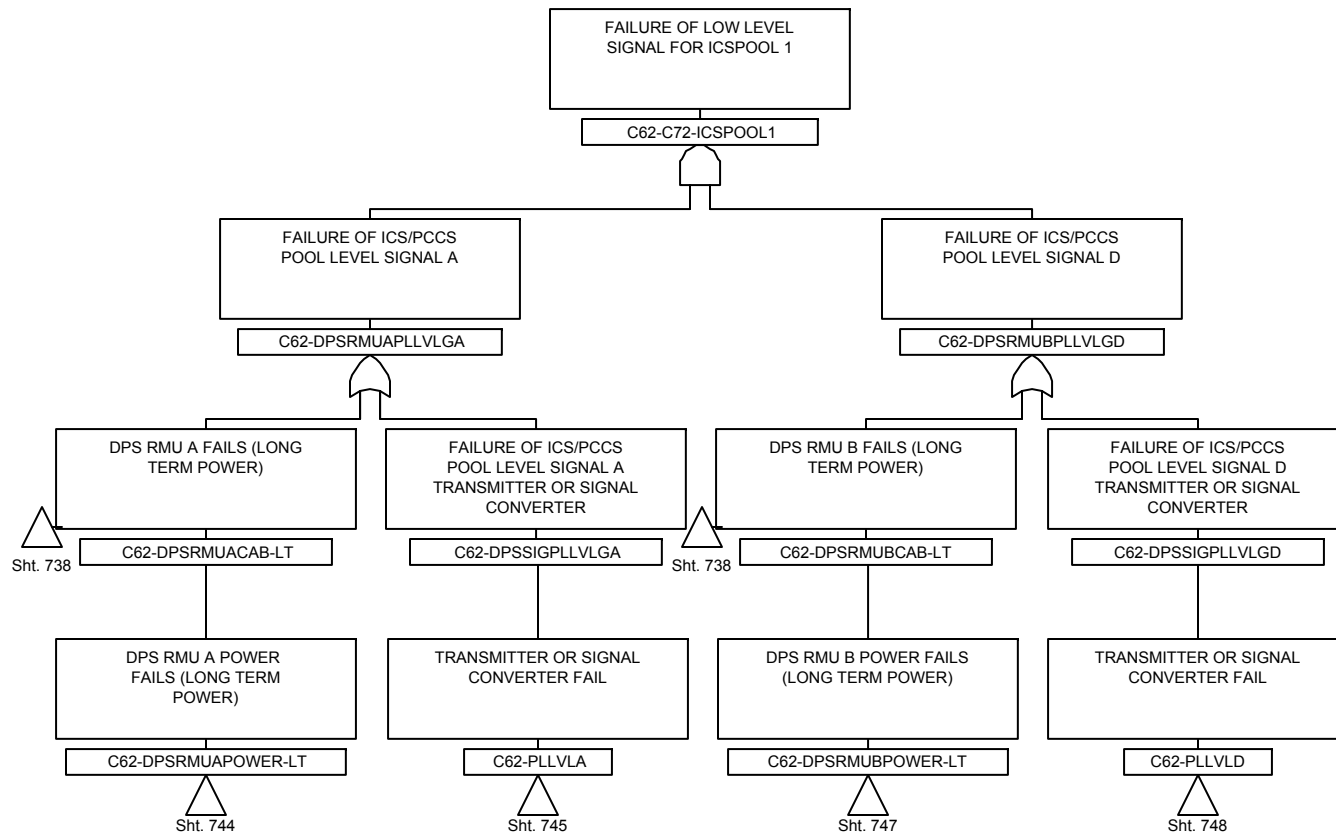


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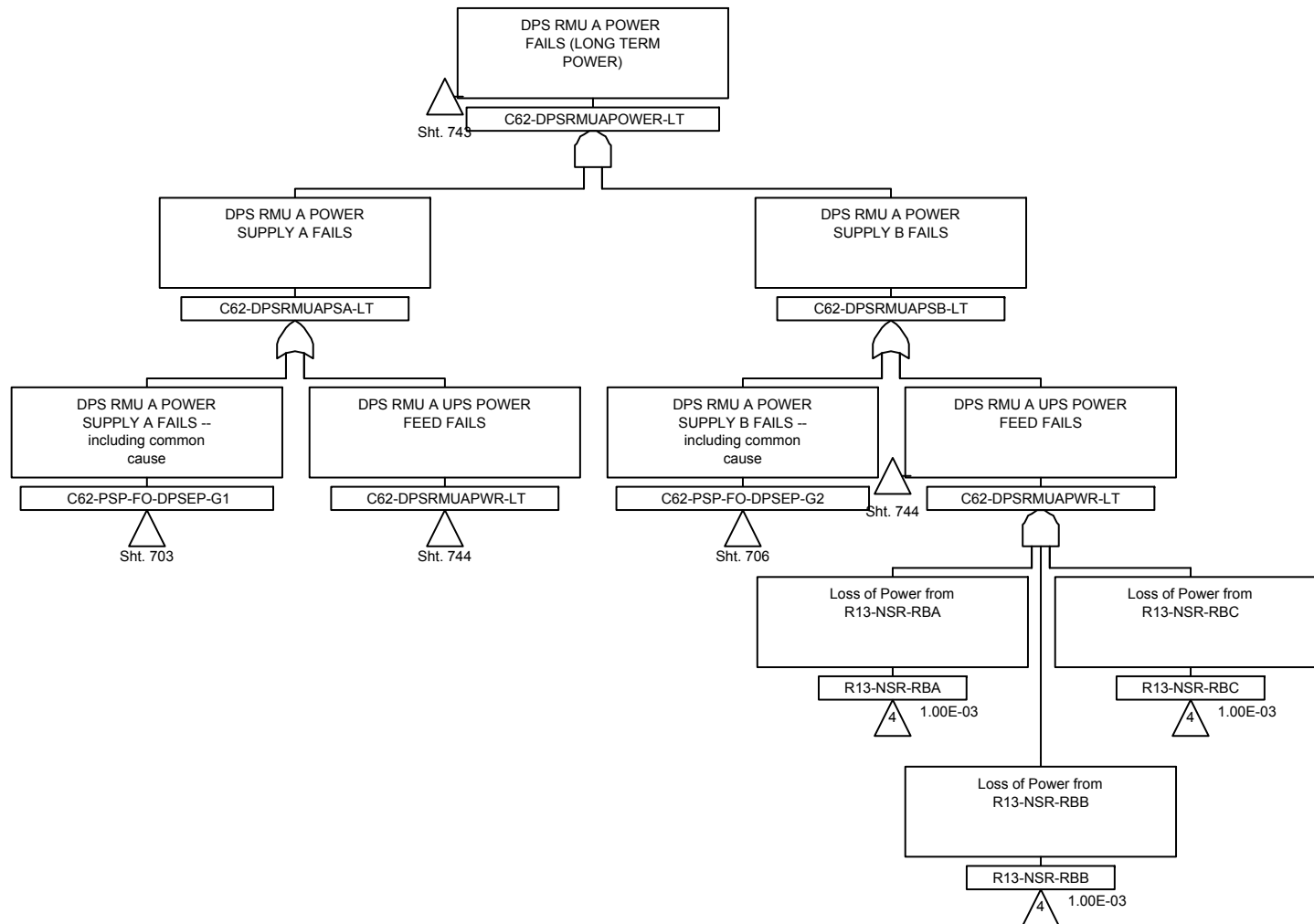


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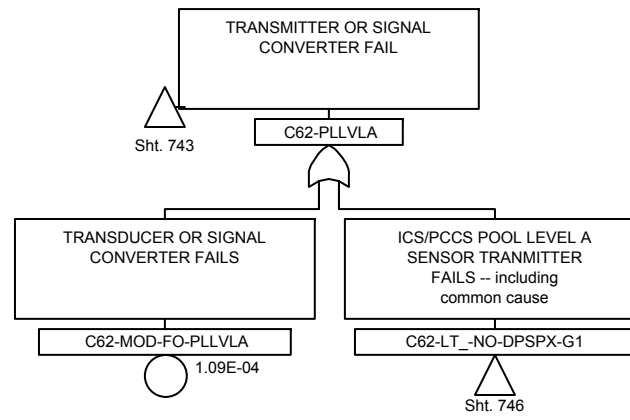


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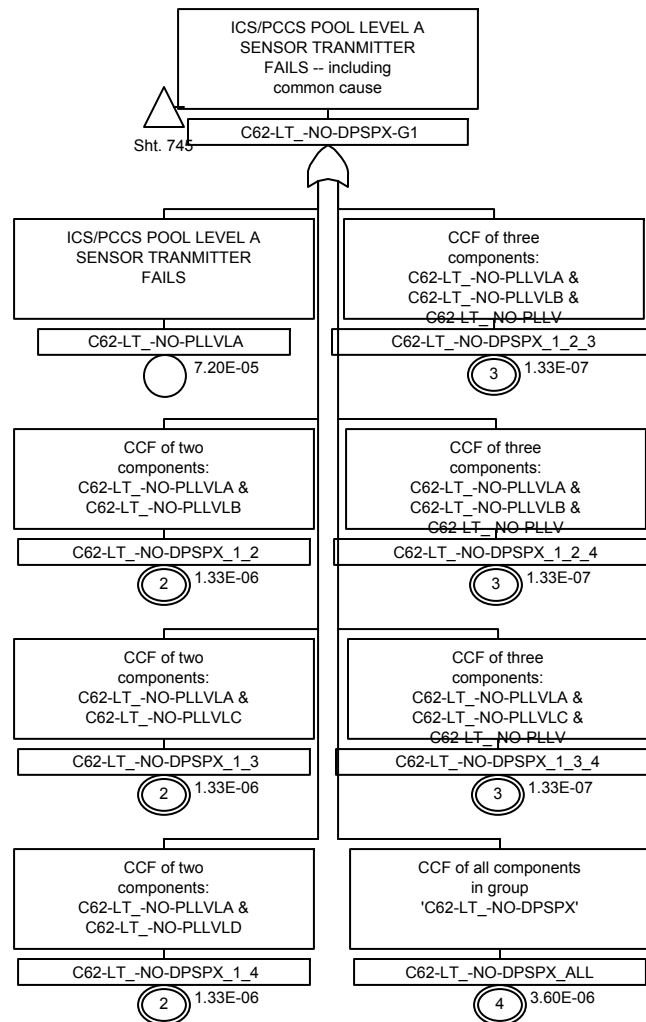


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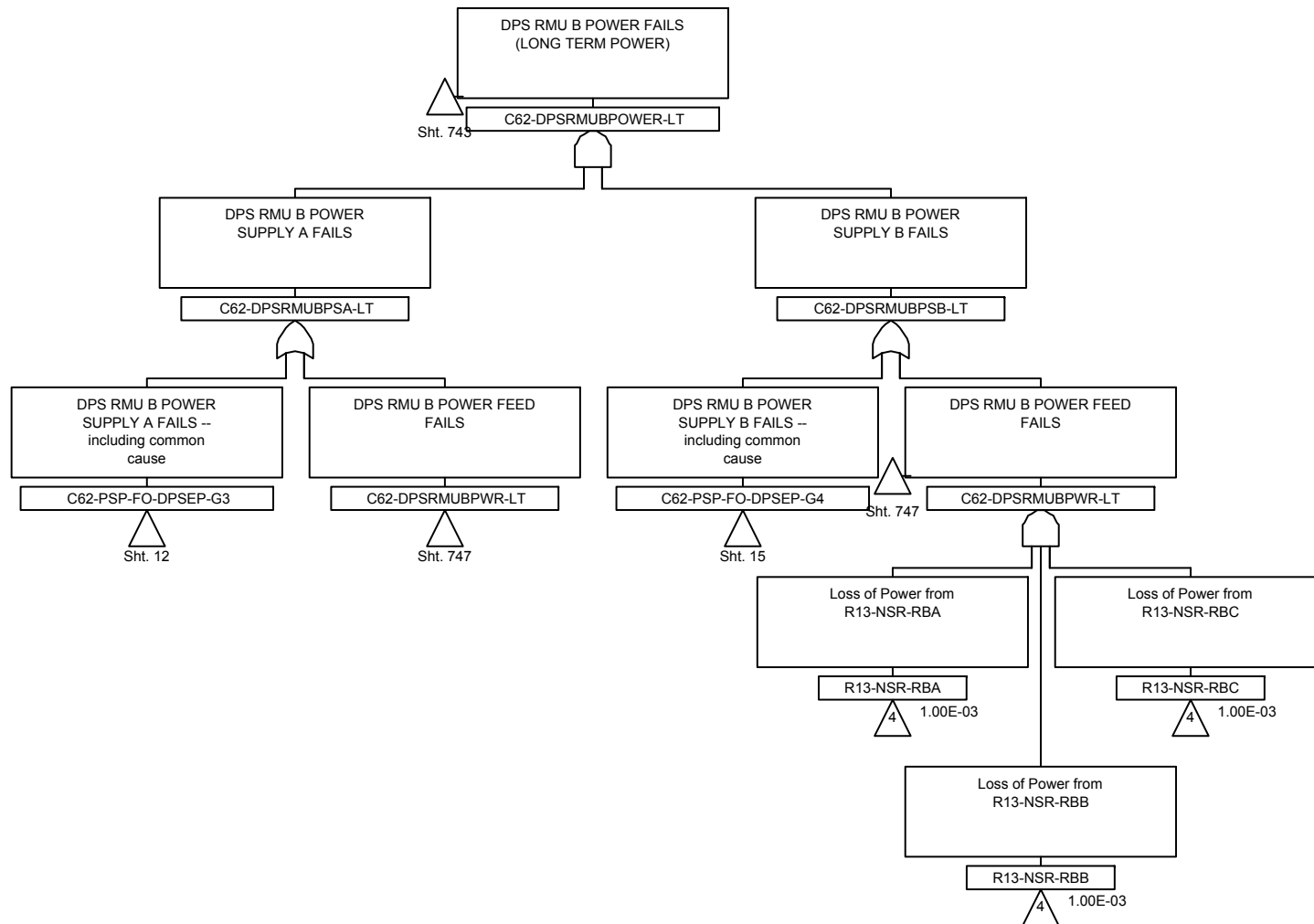


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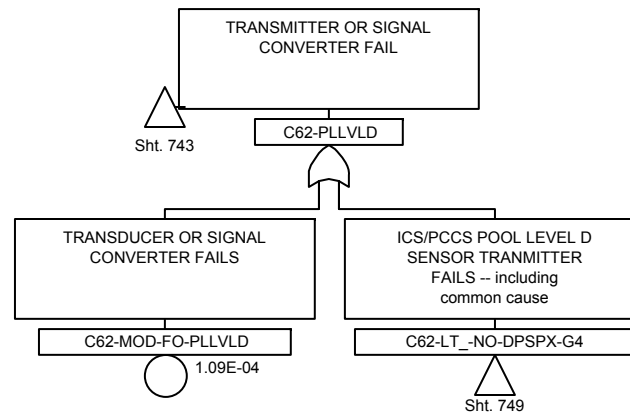


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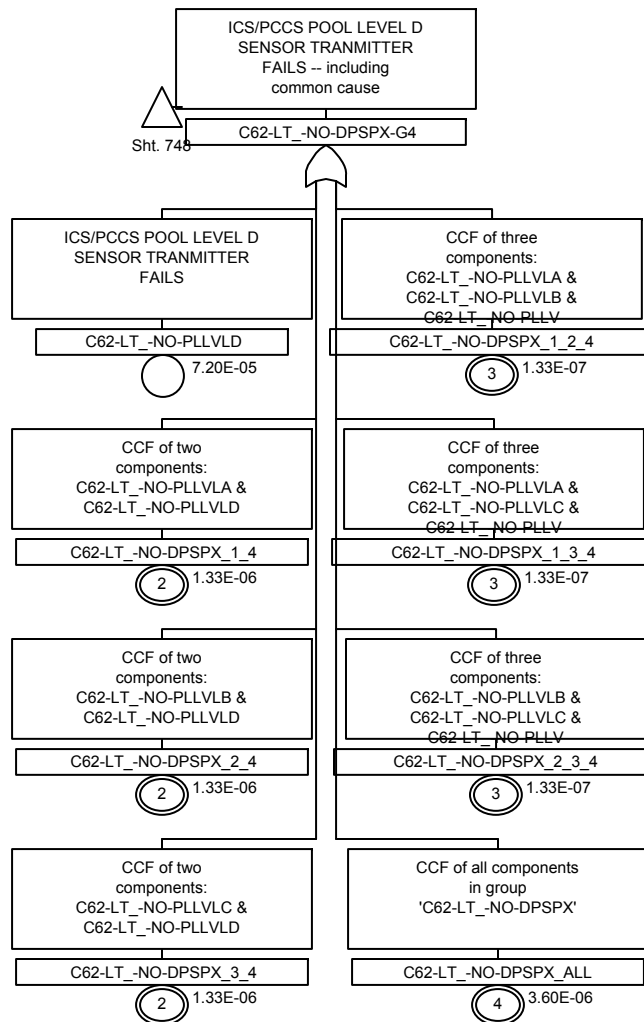


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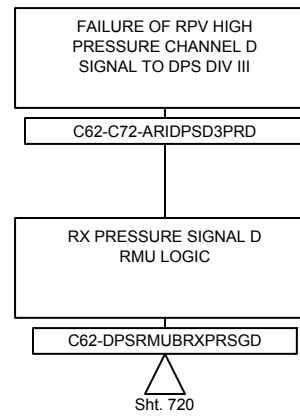


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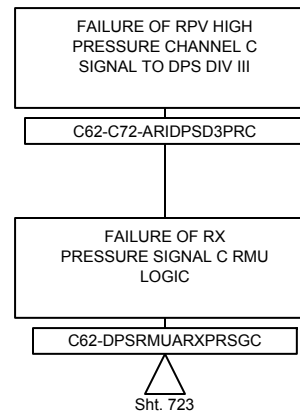


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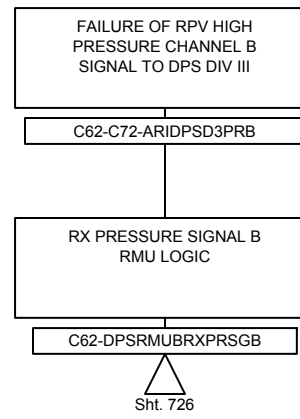


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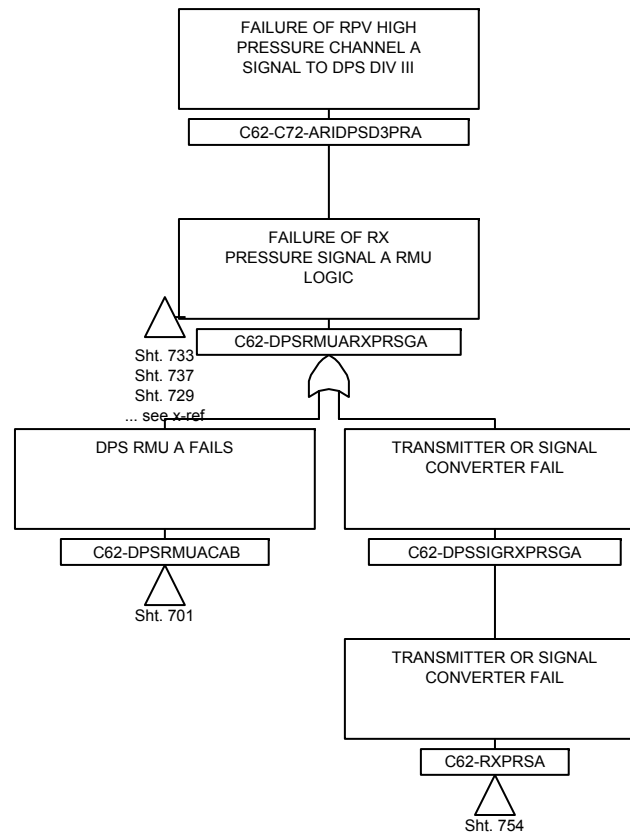


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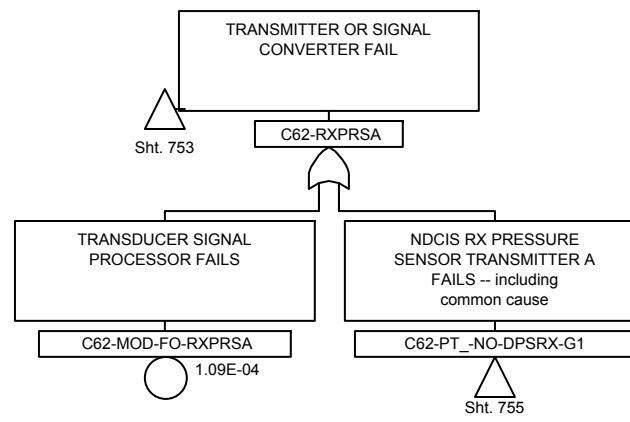


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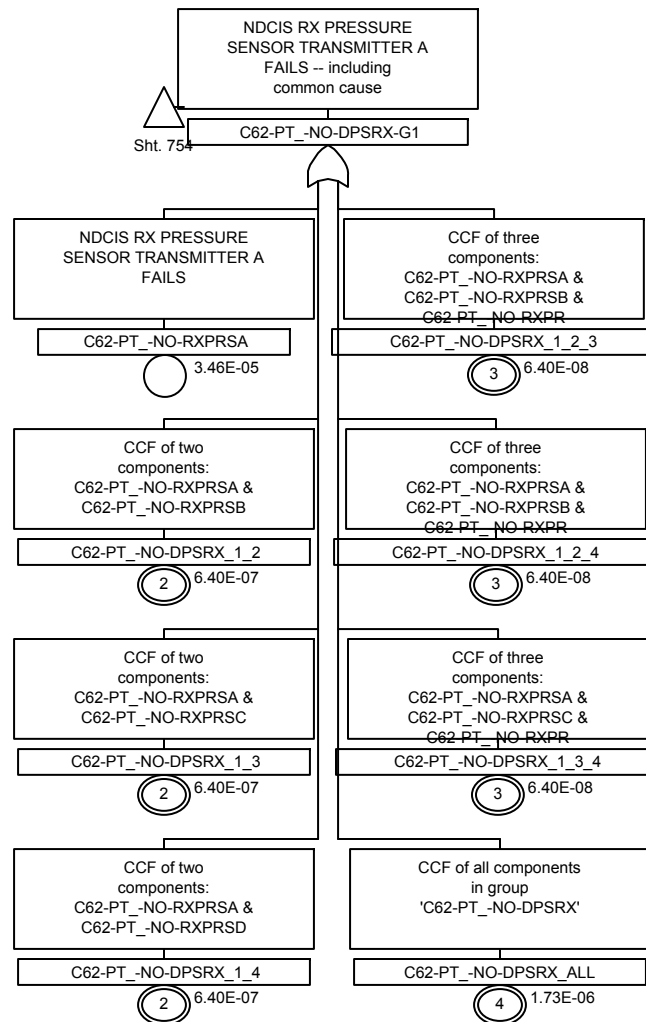


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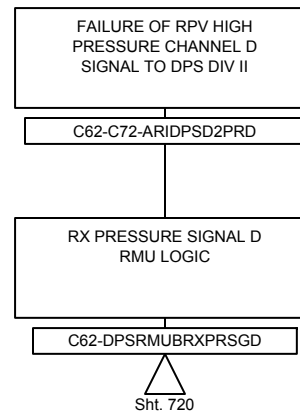


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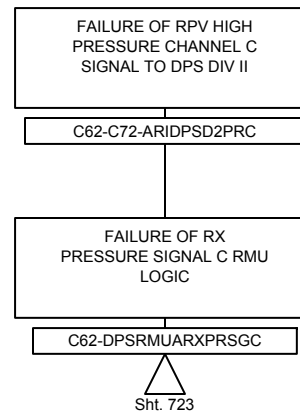


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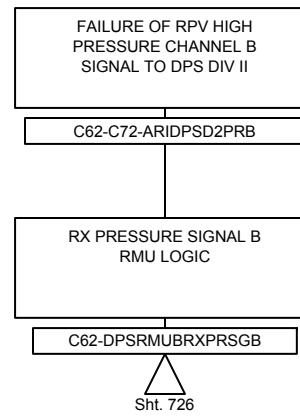


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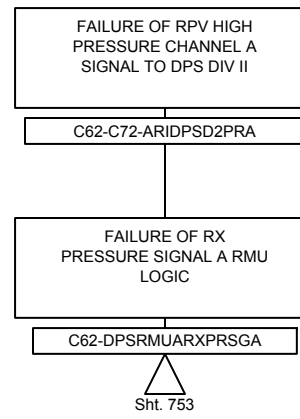


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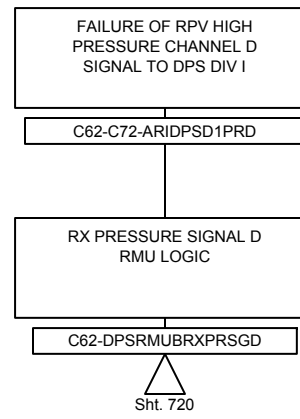


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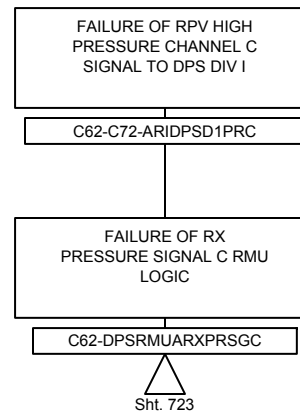


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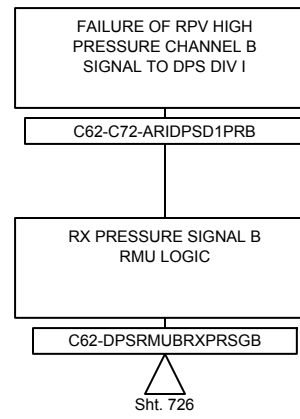


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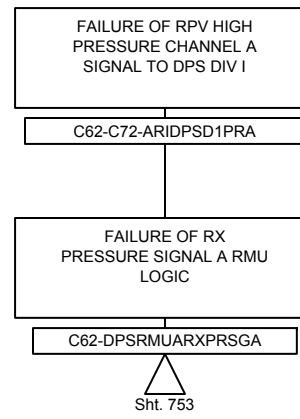


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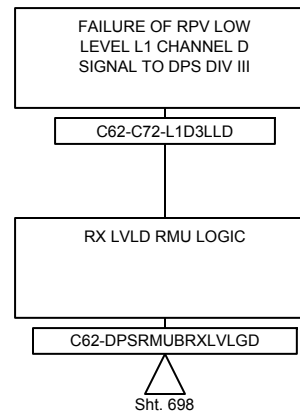


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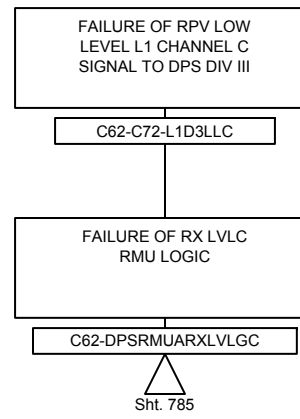


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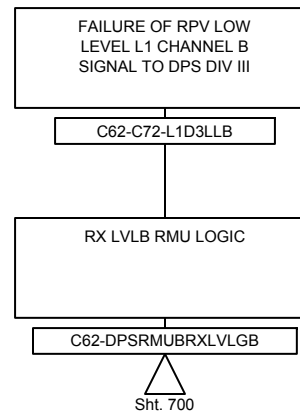


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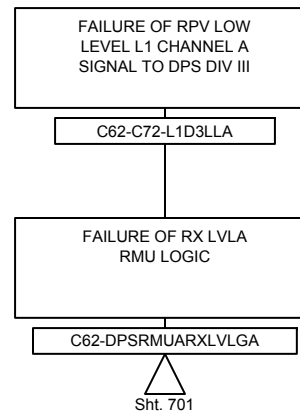


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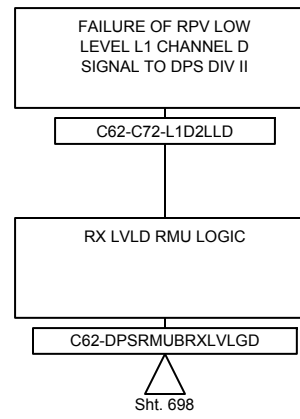


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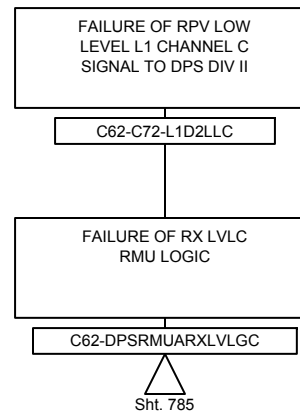


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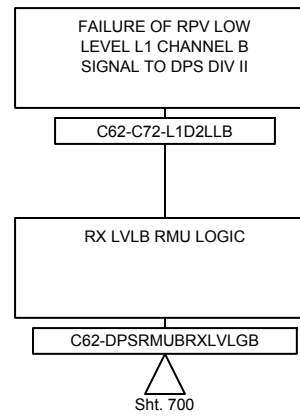


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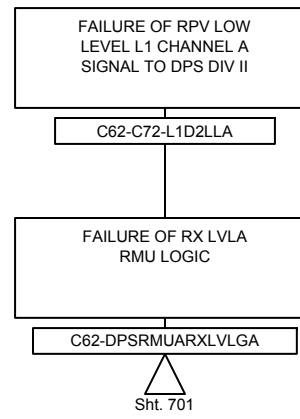


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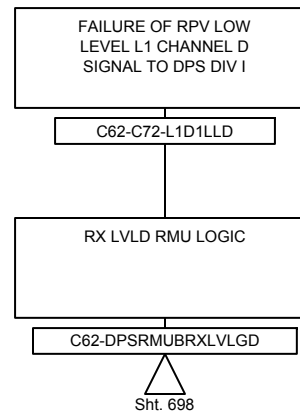


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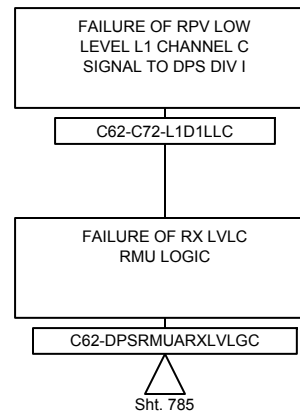


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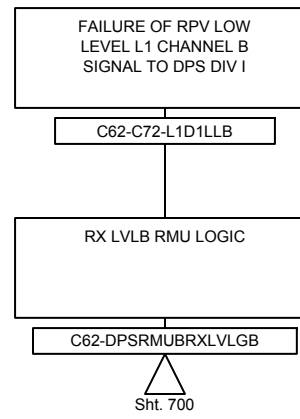


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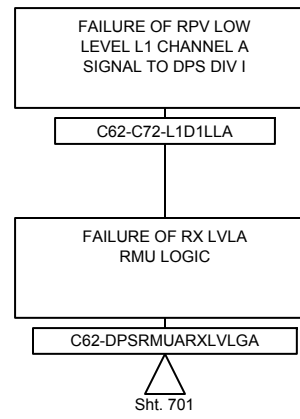


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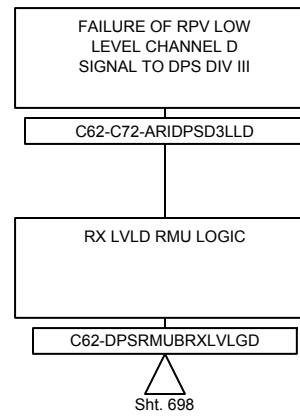


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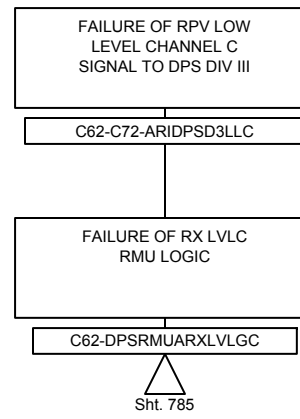


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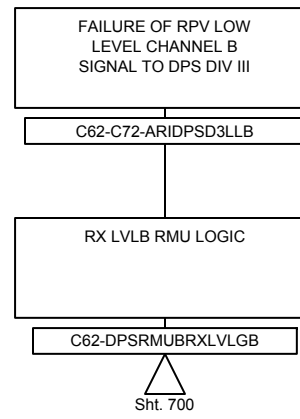


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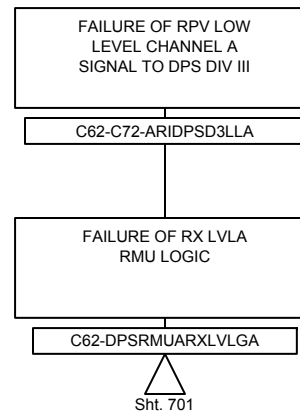


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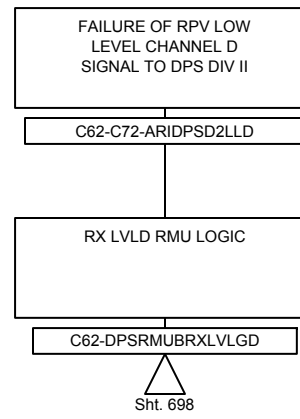


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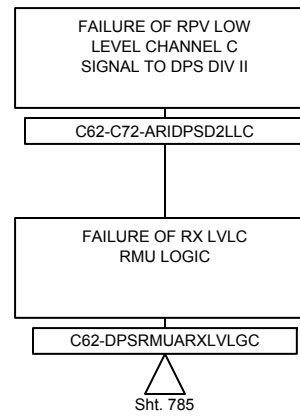


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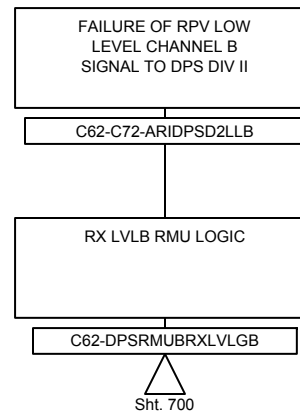


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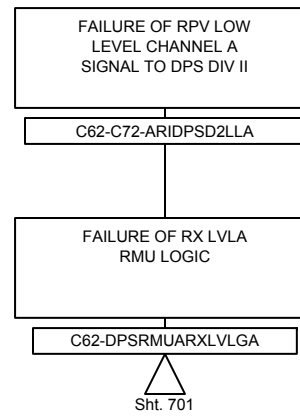


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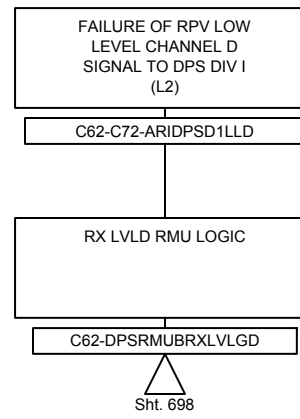


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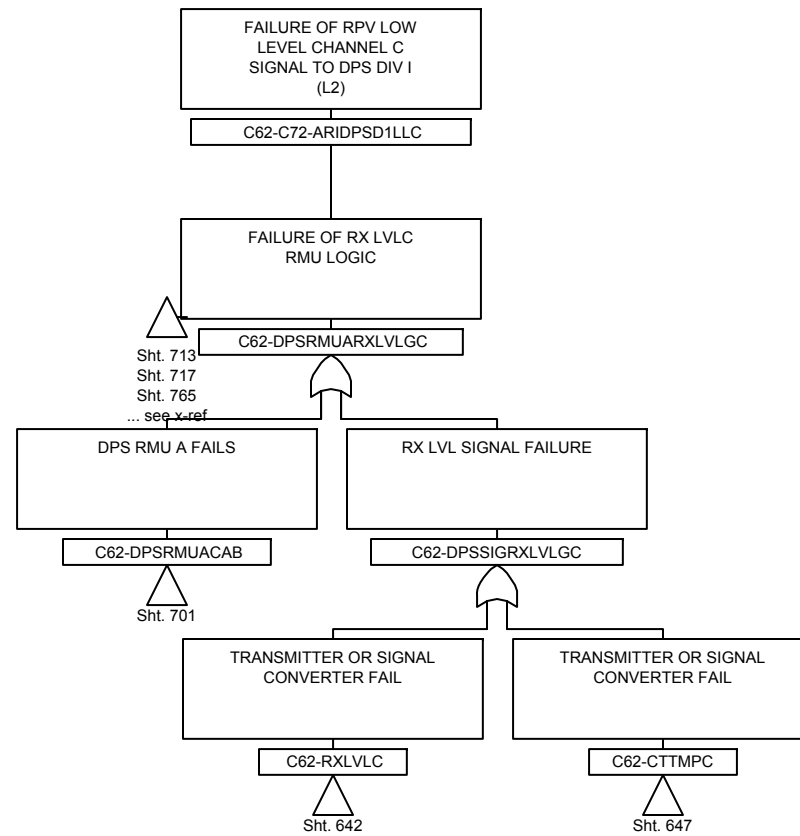


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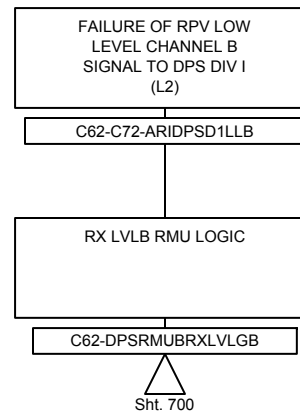


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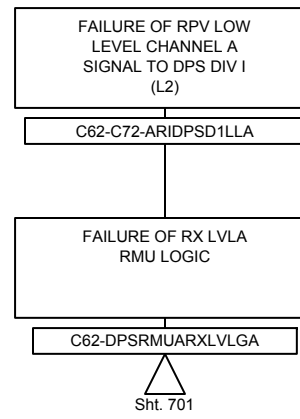


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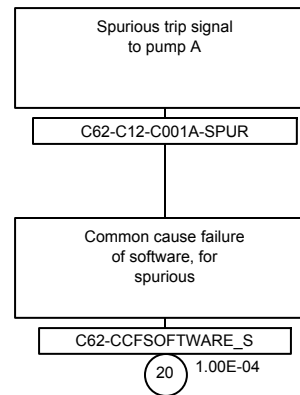
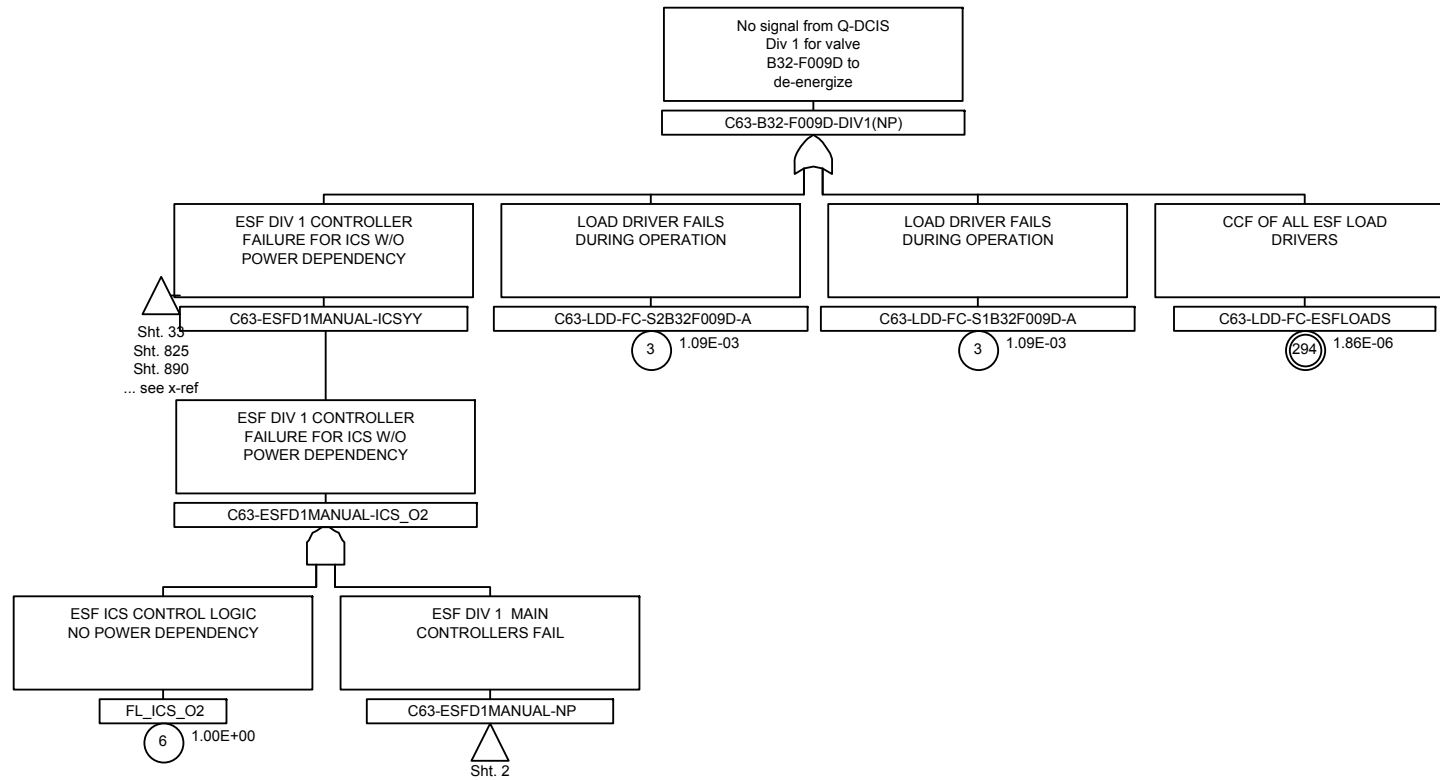


Figure 4.5-3a. Sheet 788 N-DCIS Non Safety Control System





**Figure 4.5-3b. Q-DCIS Safety-Related Control System**  
Sheet 1

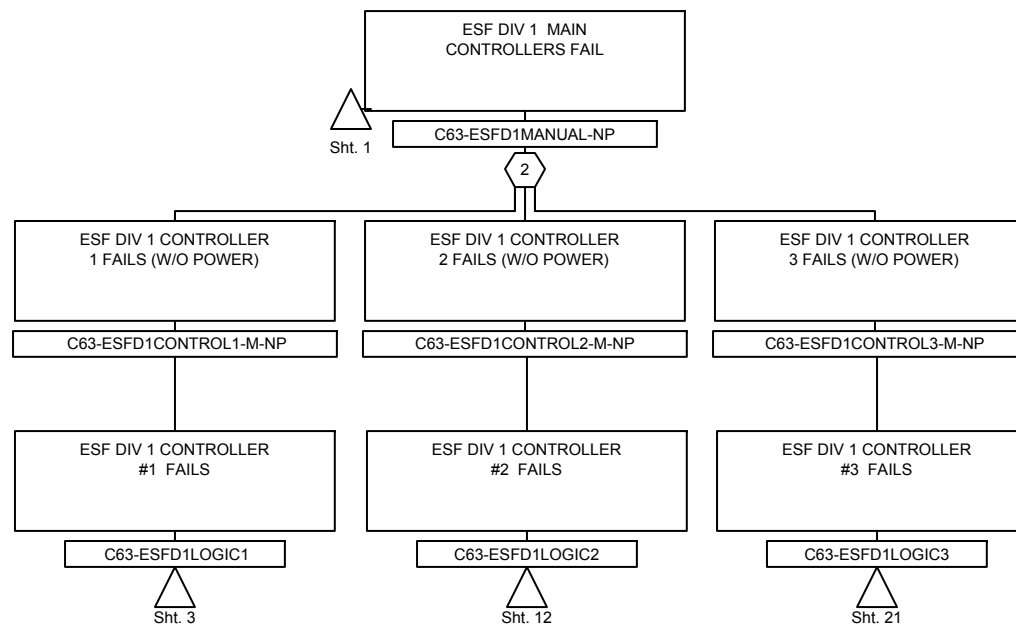


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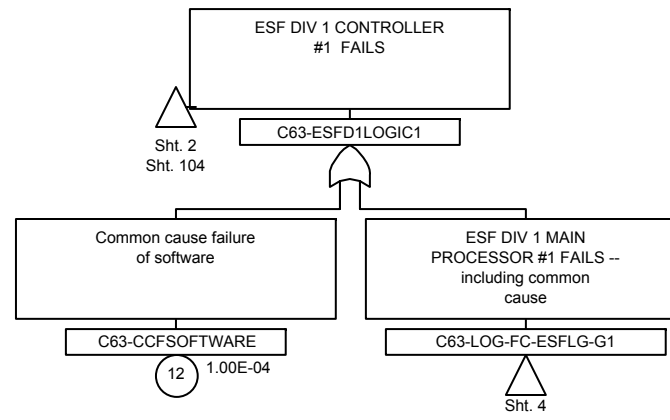


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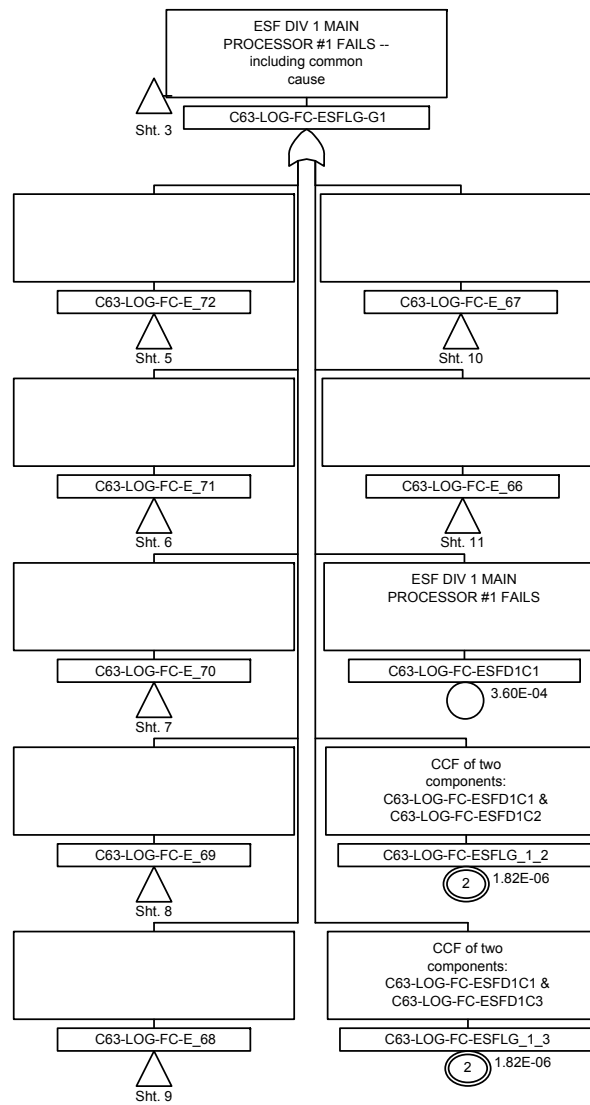


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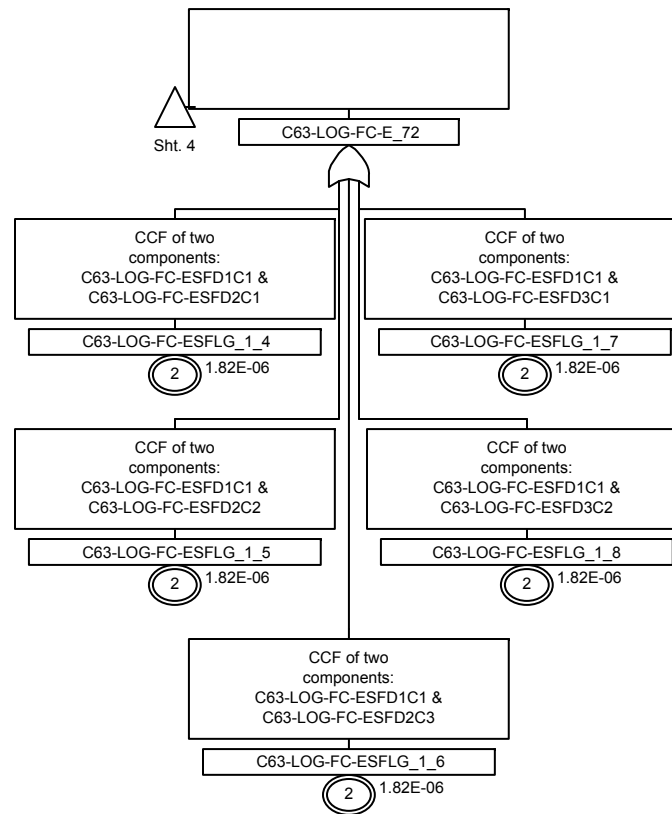


Figure 4.5-3b. Sheet 5 Q-DCIS Safety Related Control System

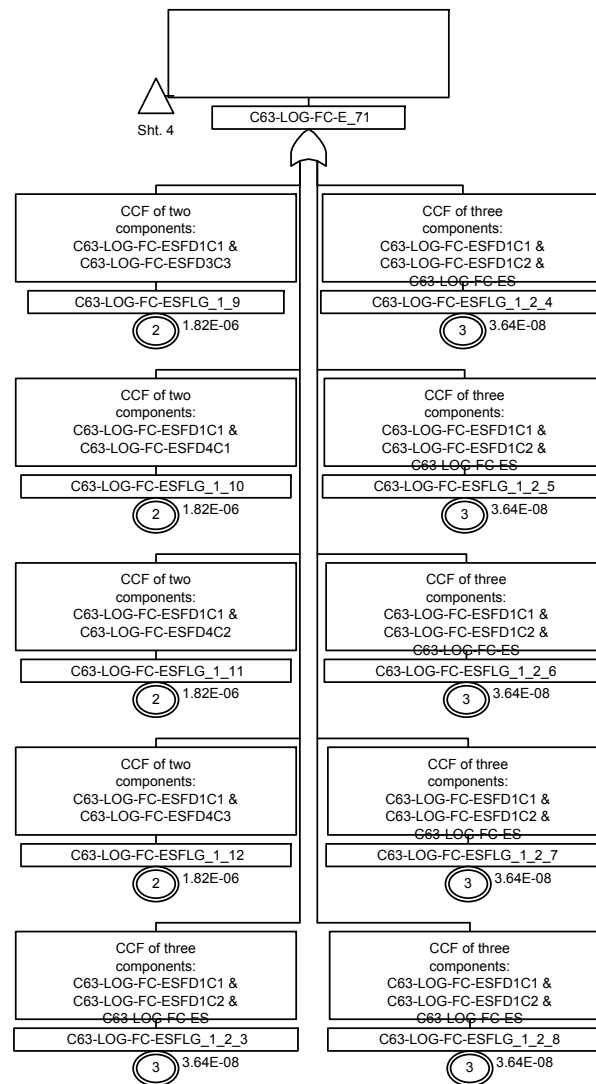


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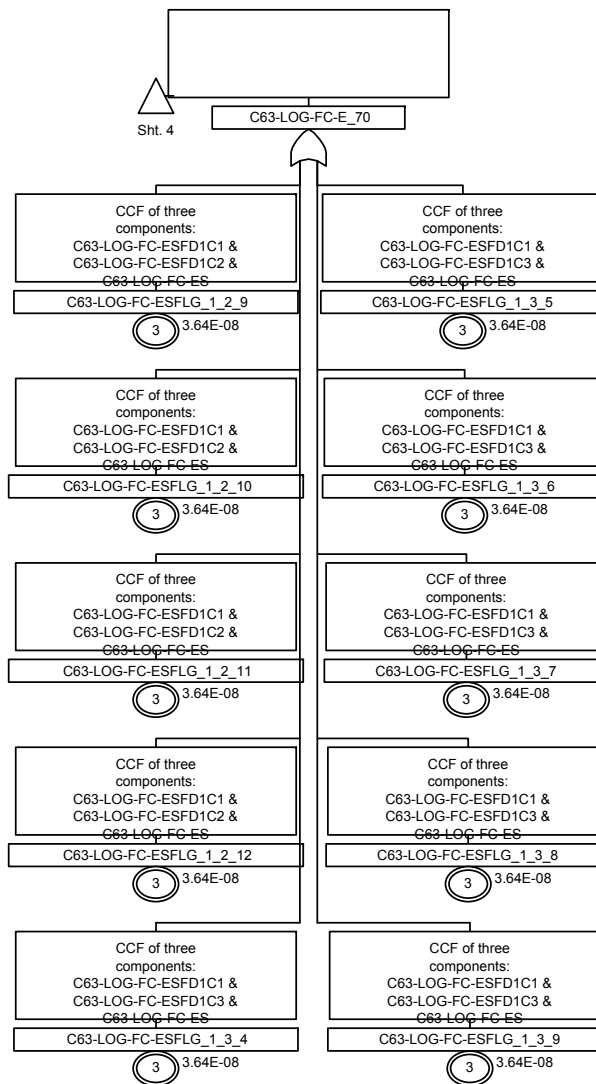


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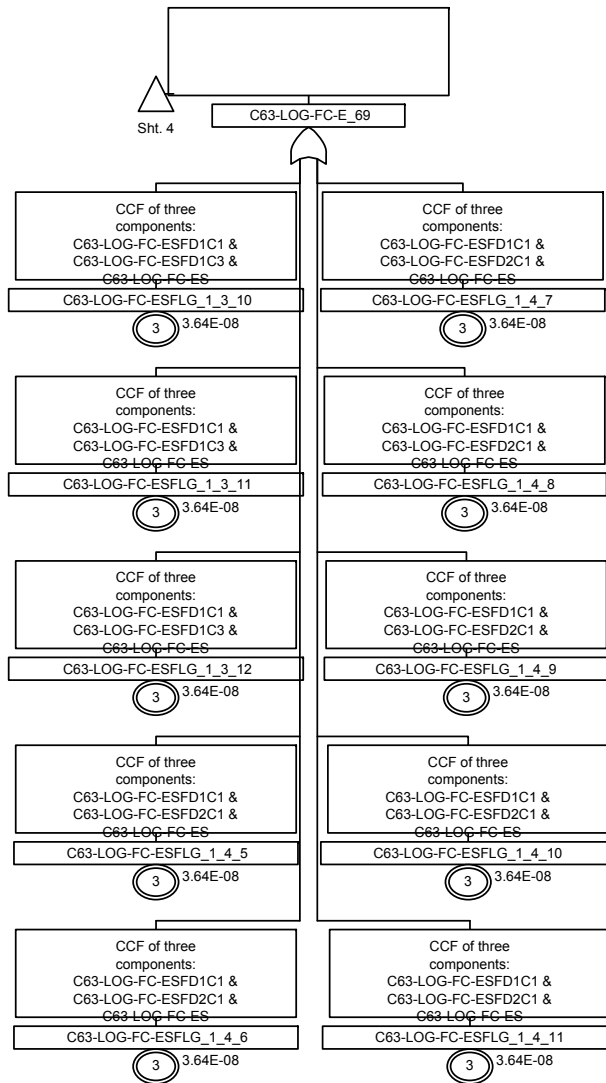


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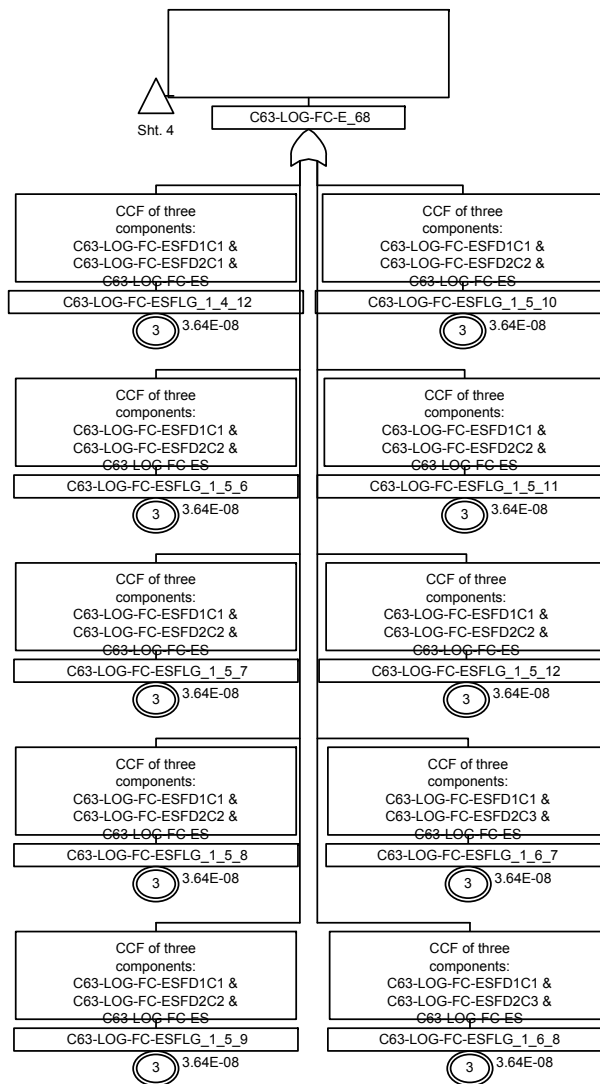


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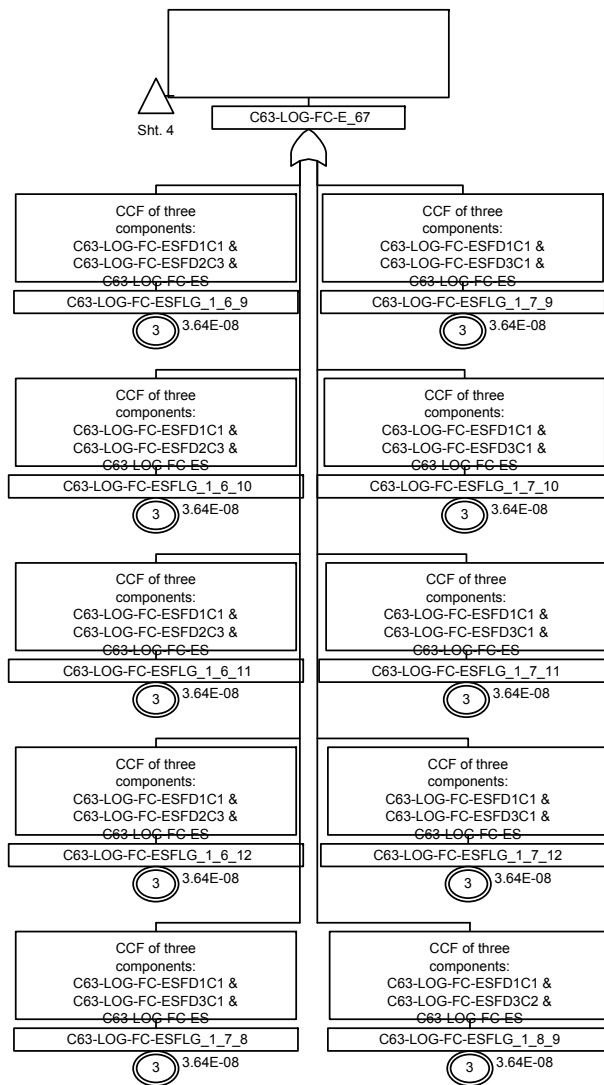


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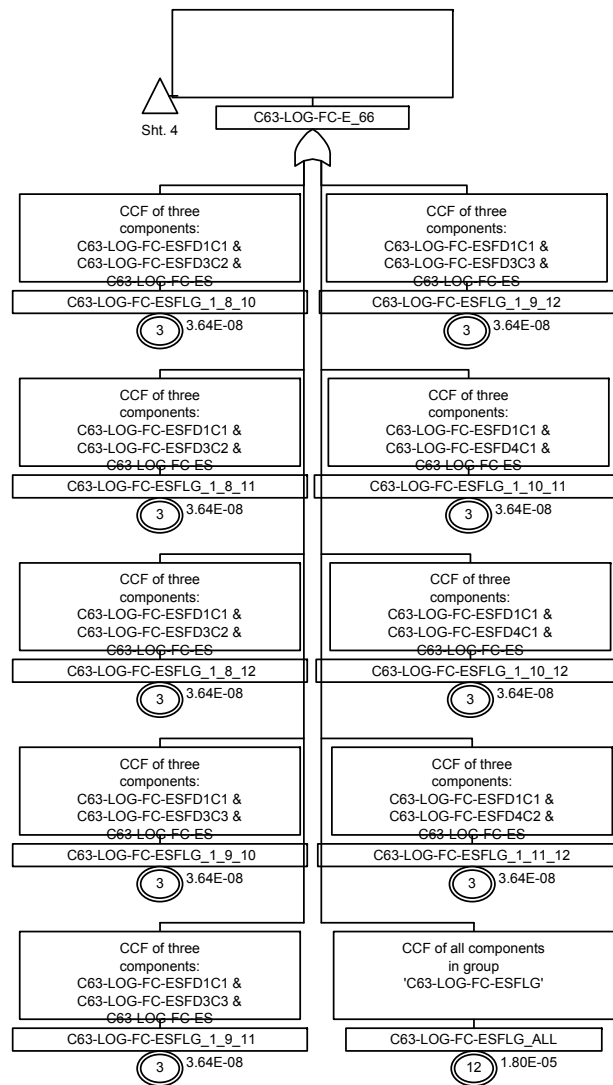


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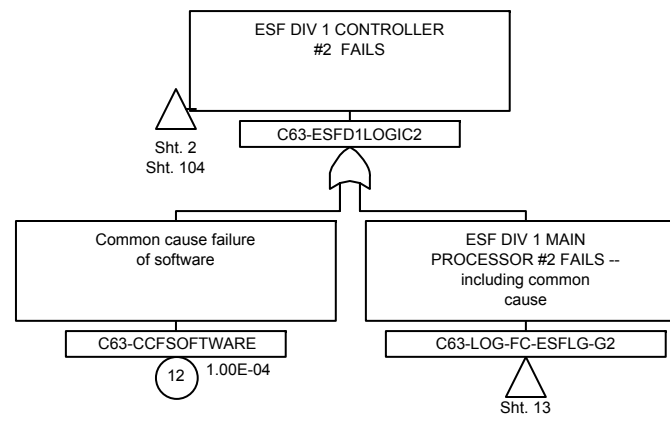


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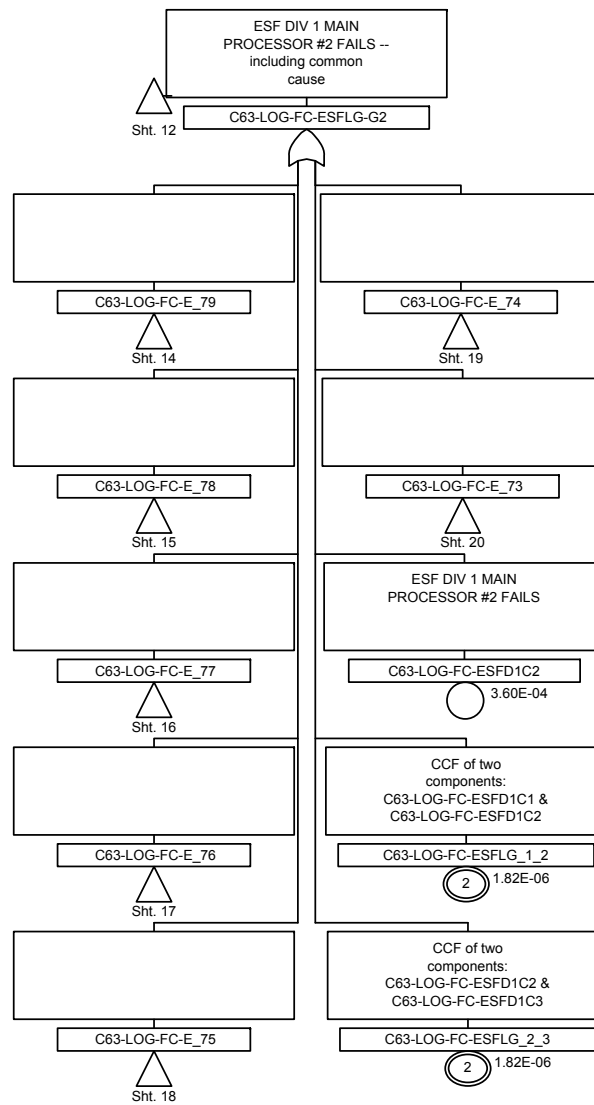


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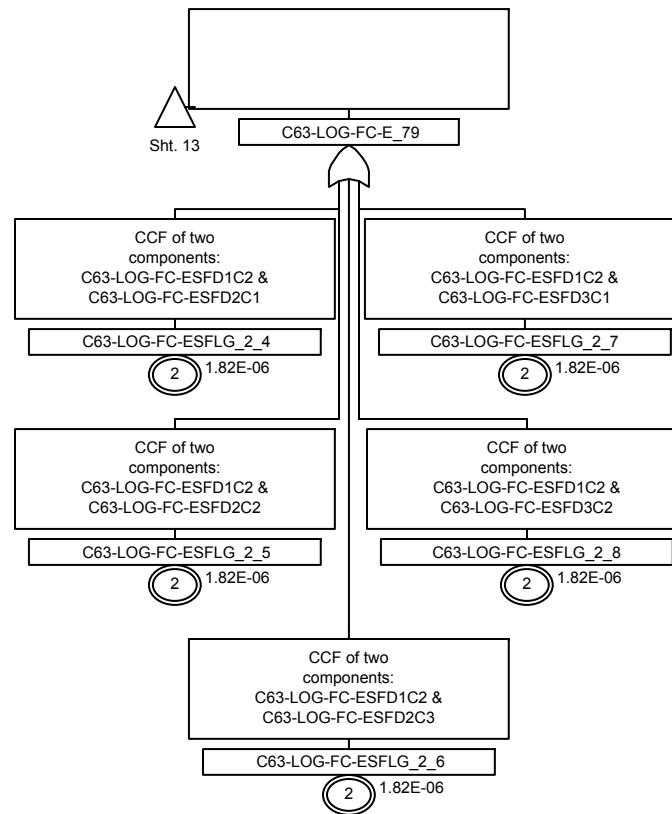


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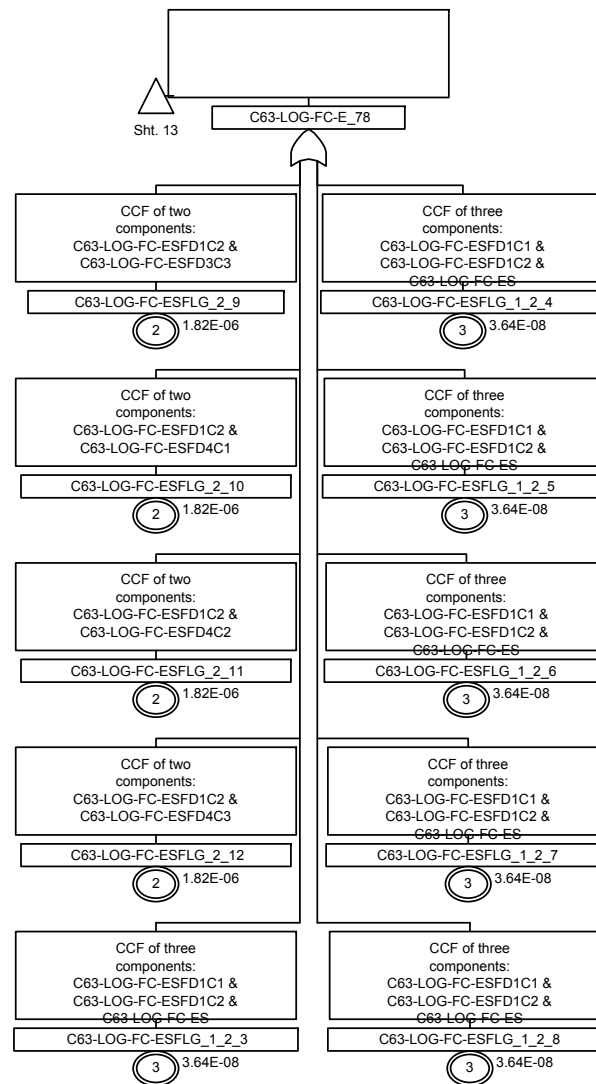


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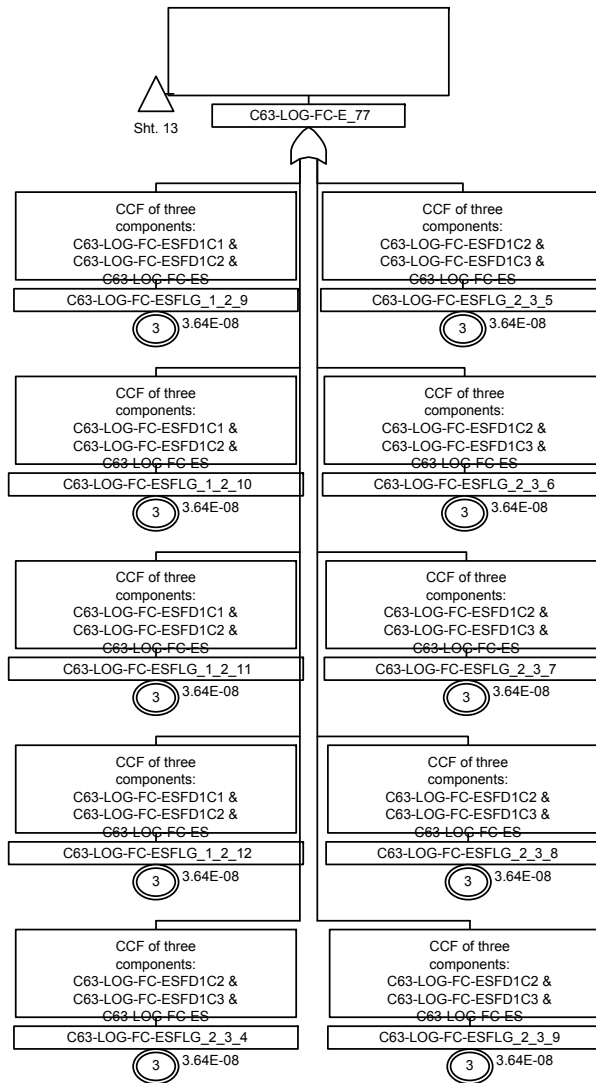


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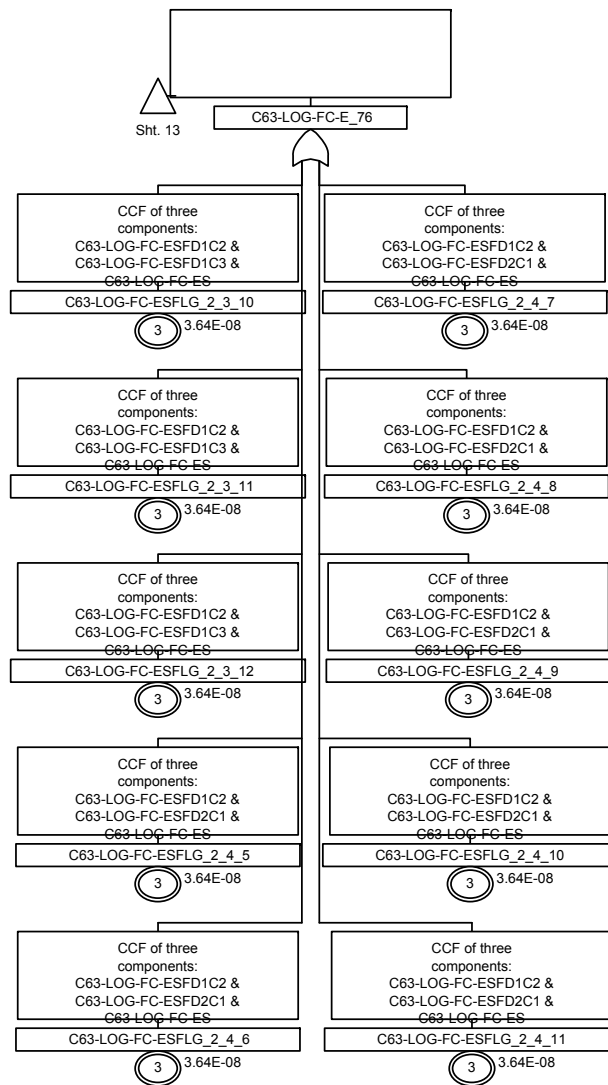


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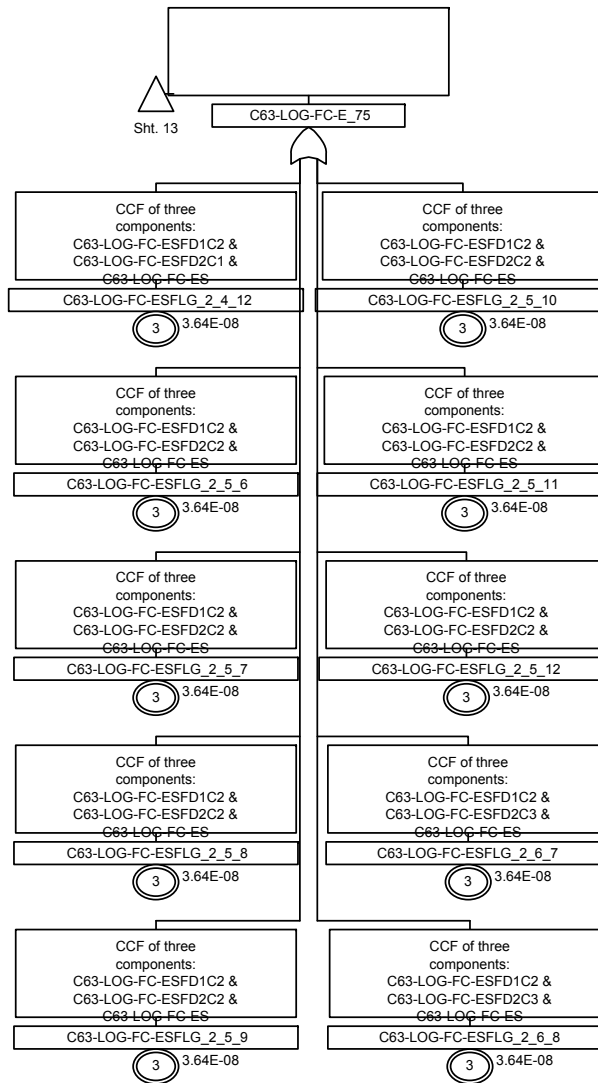


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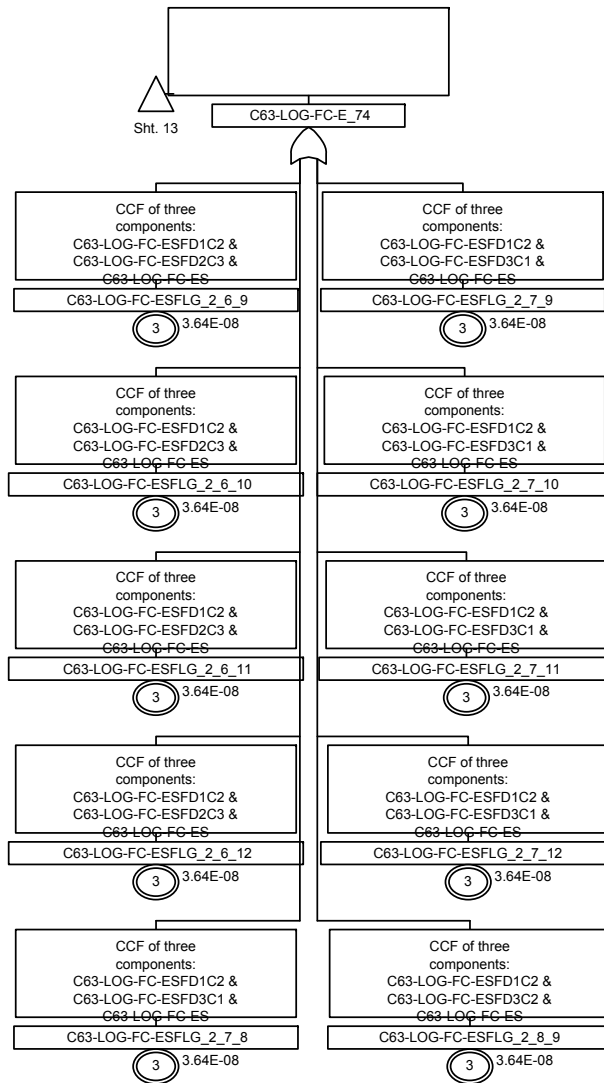


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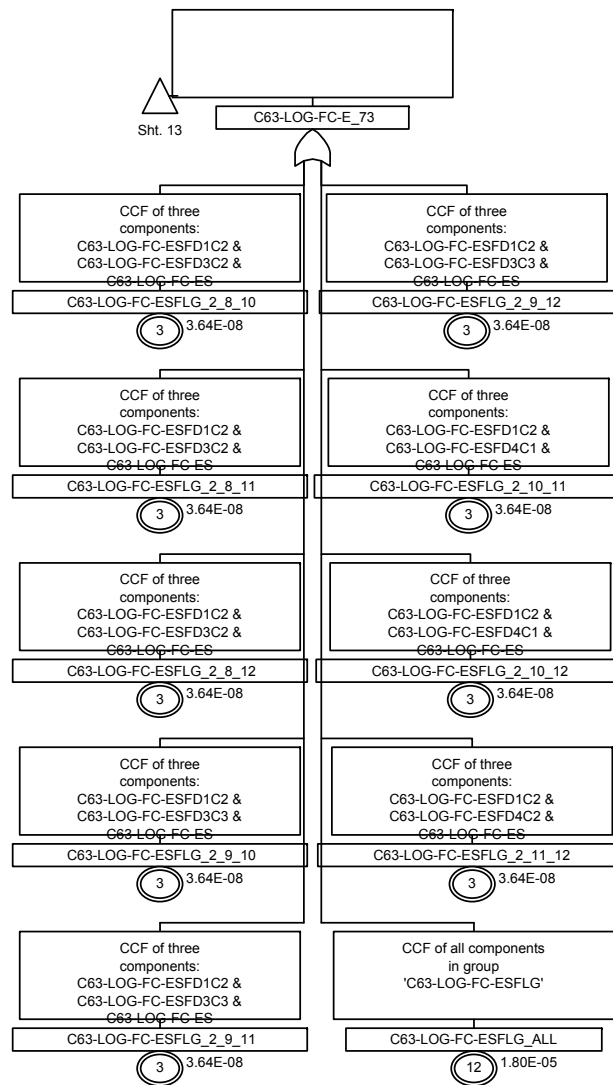


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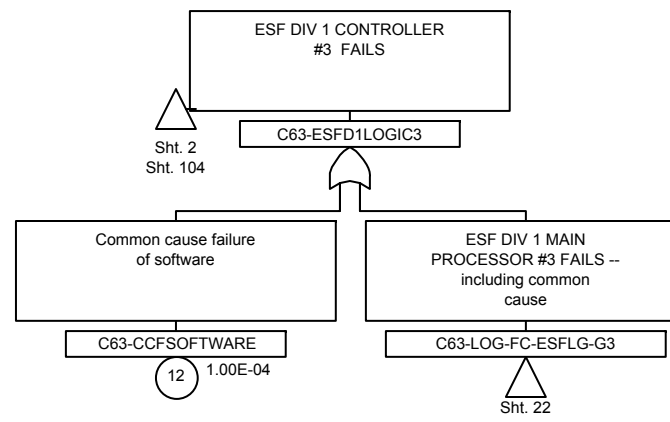


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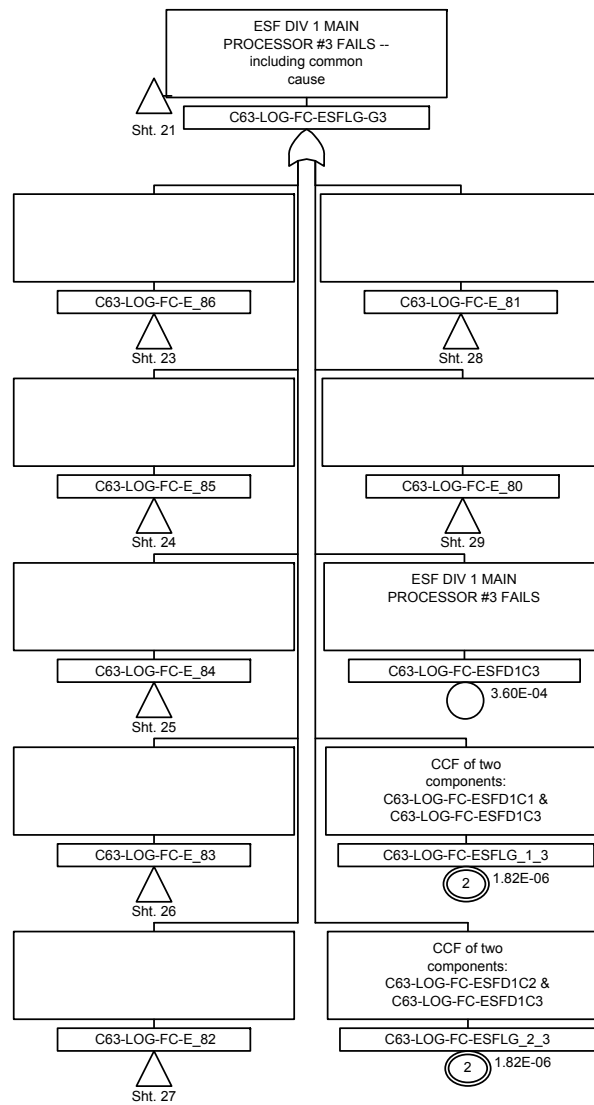


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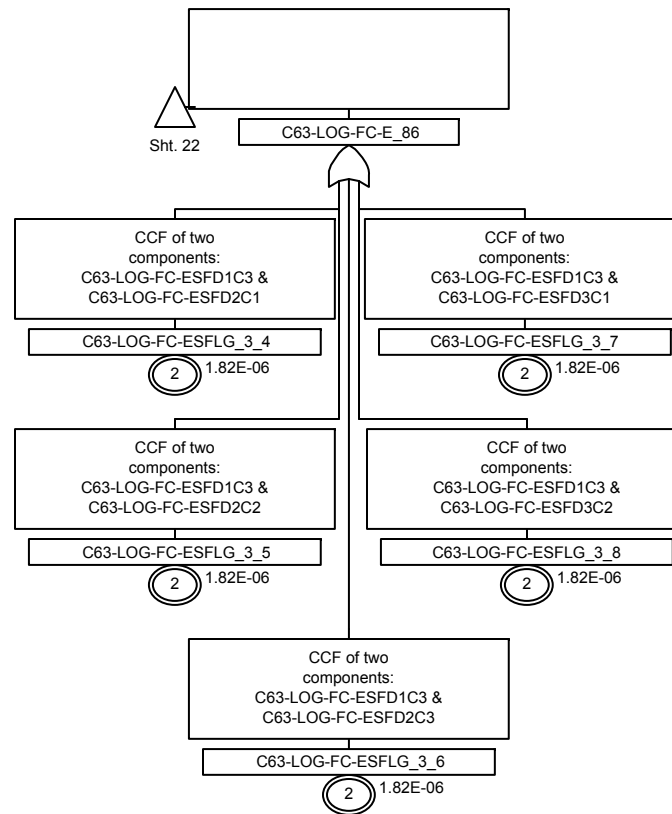


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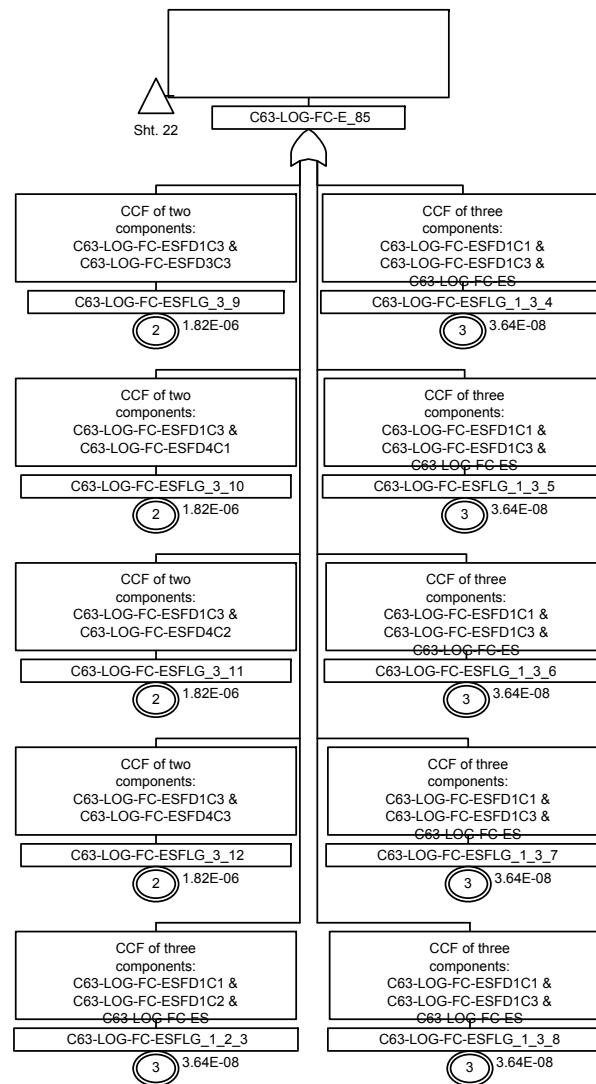


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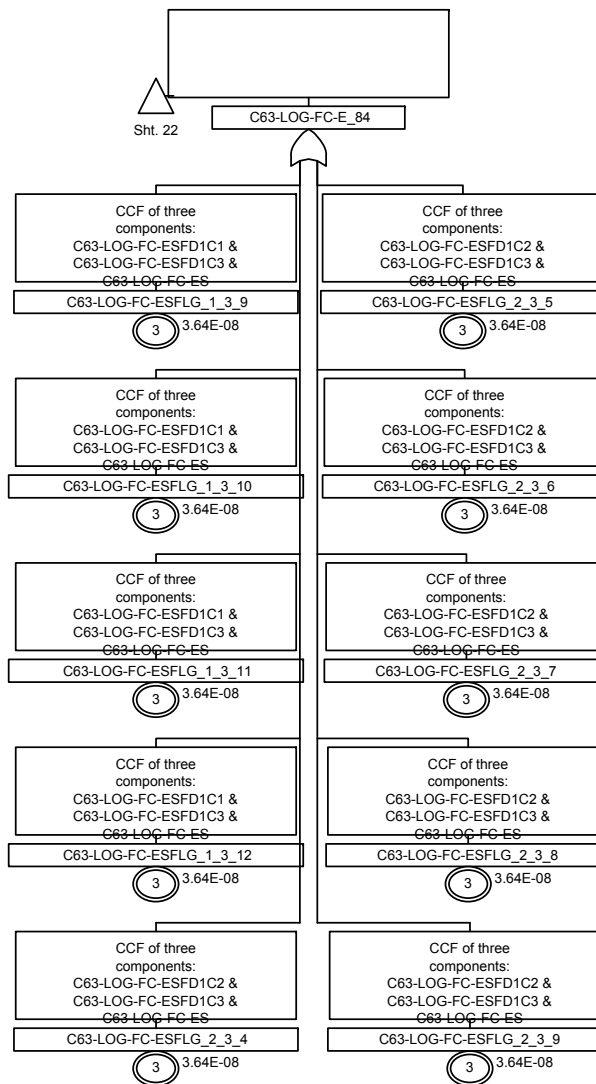


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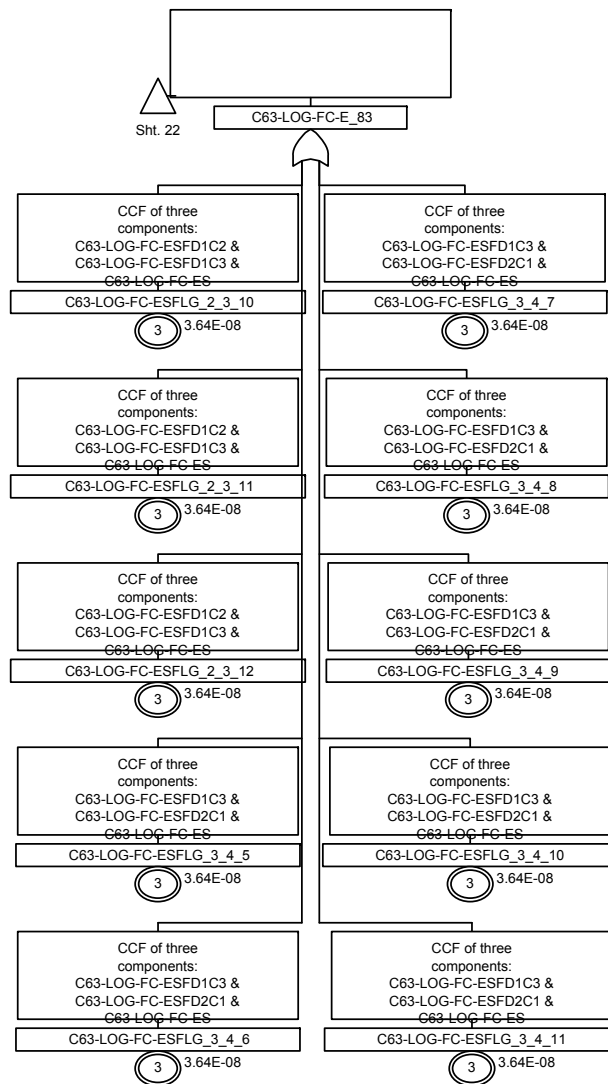


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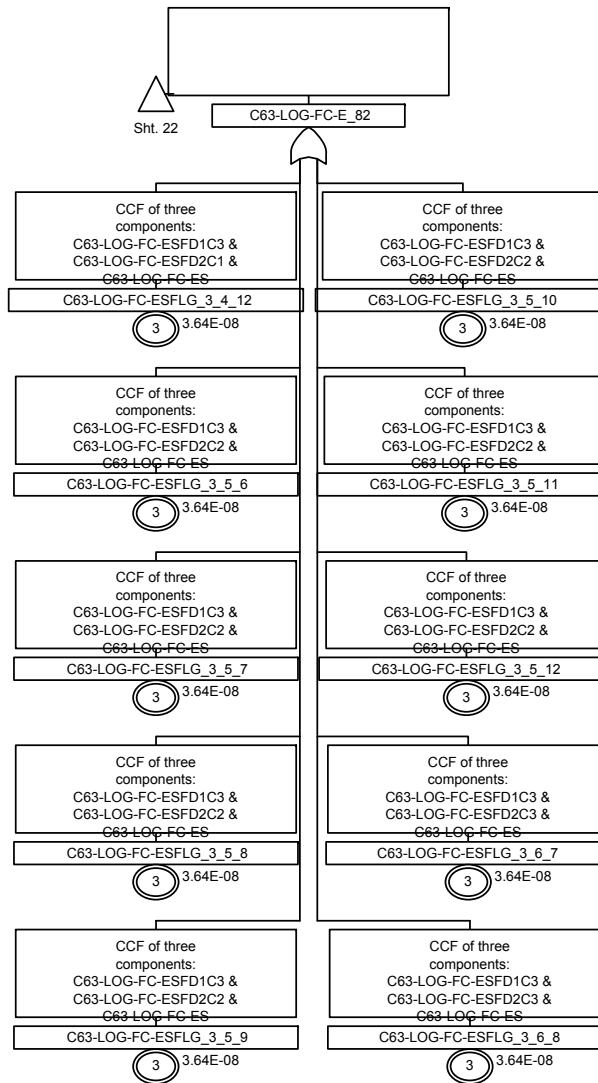


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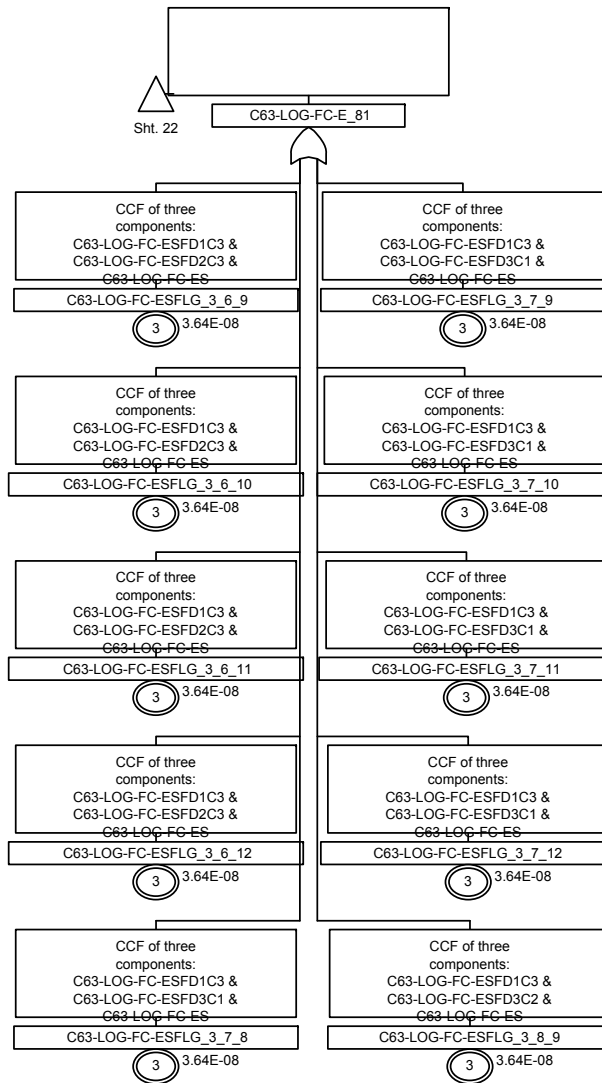


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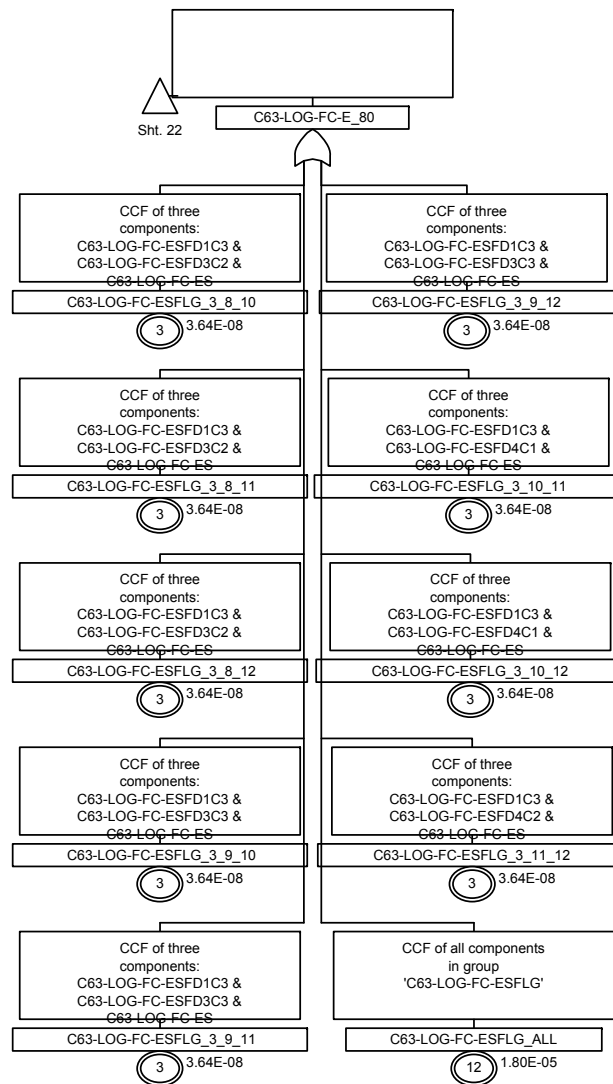


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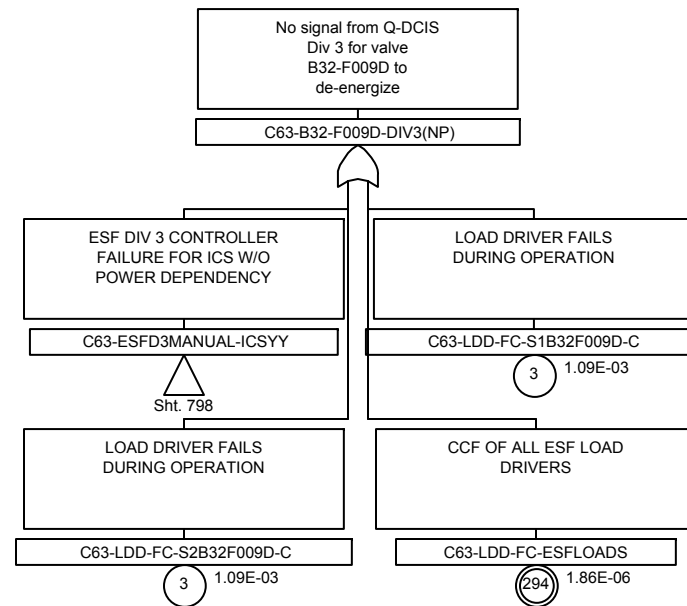


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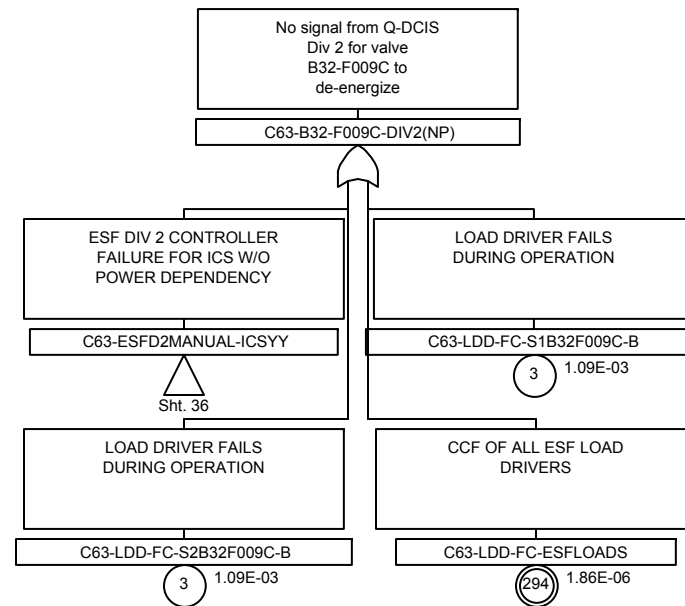


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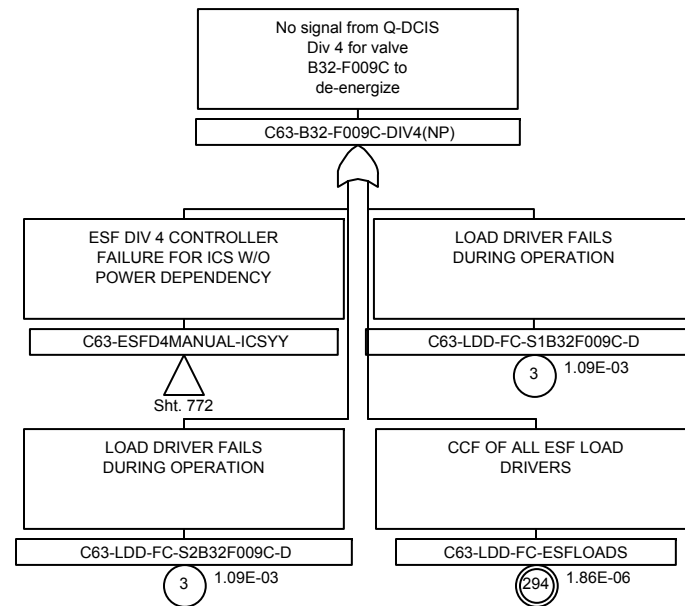


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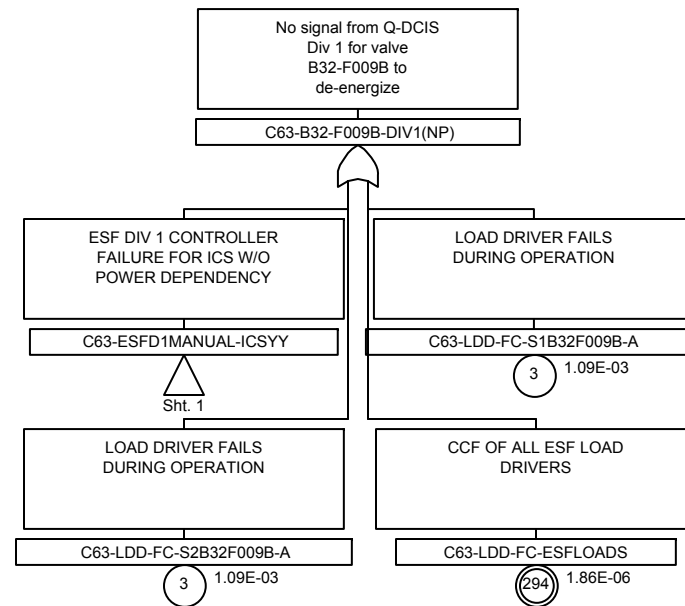


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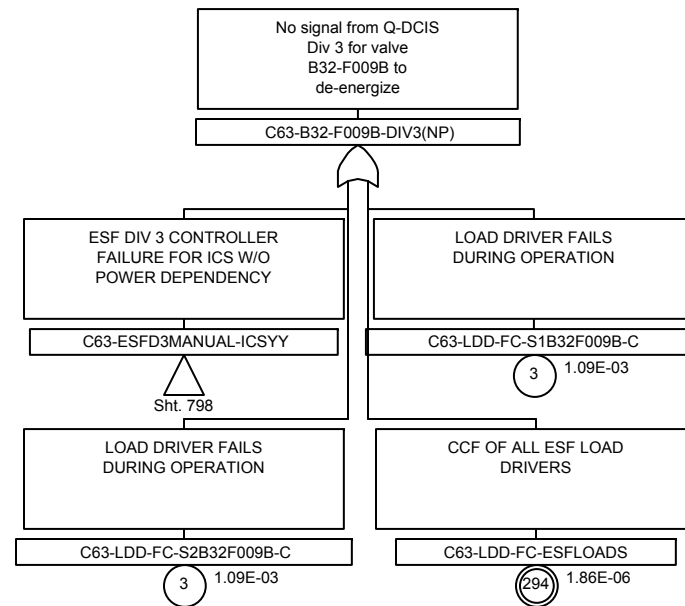


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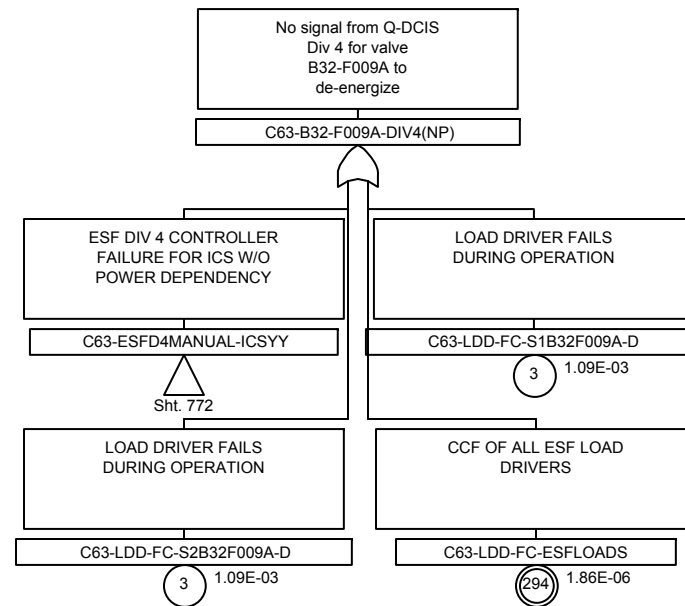


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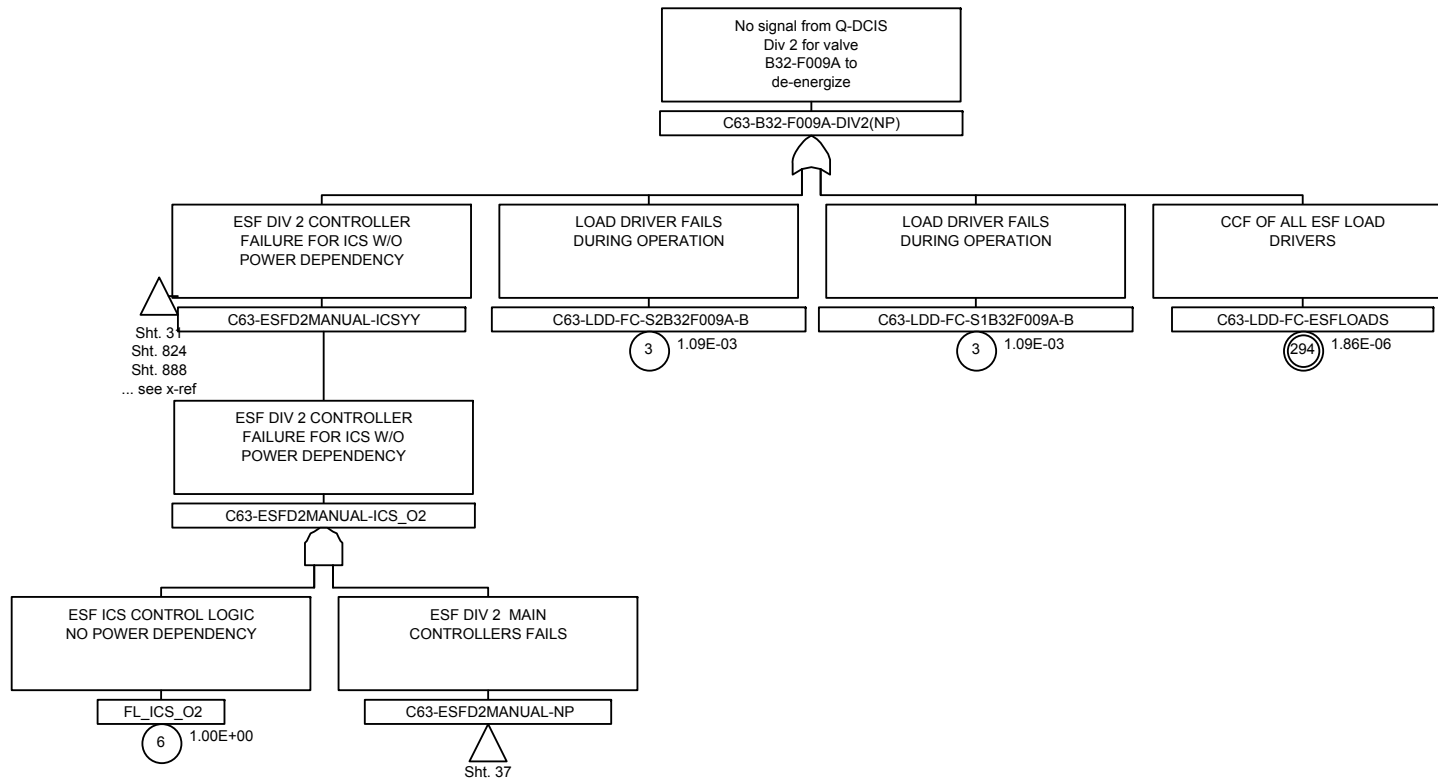


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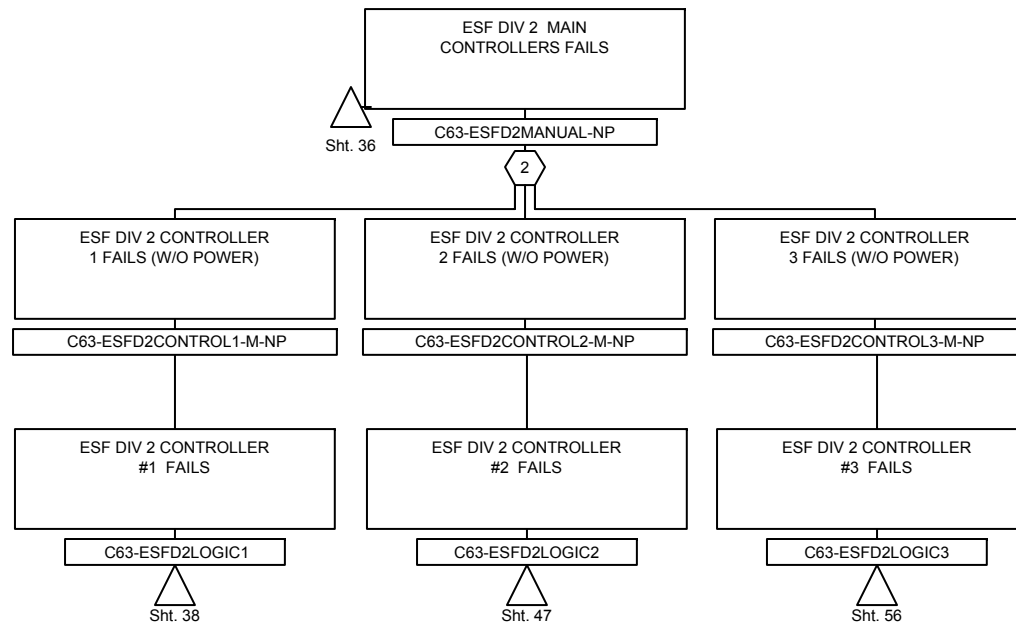


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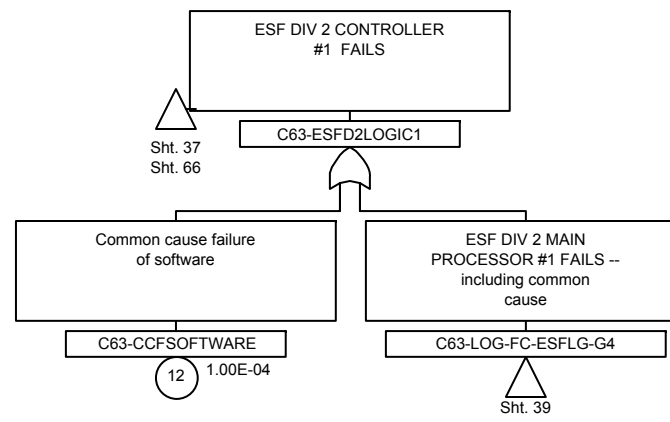


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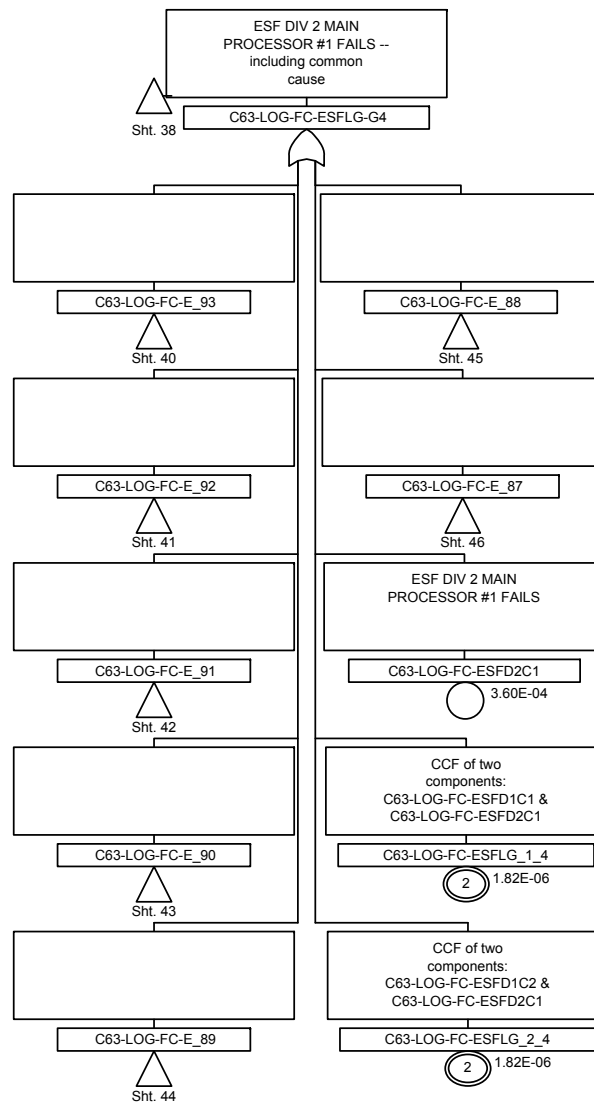


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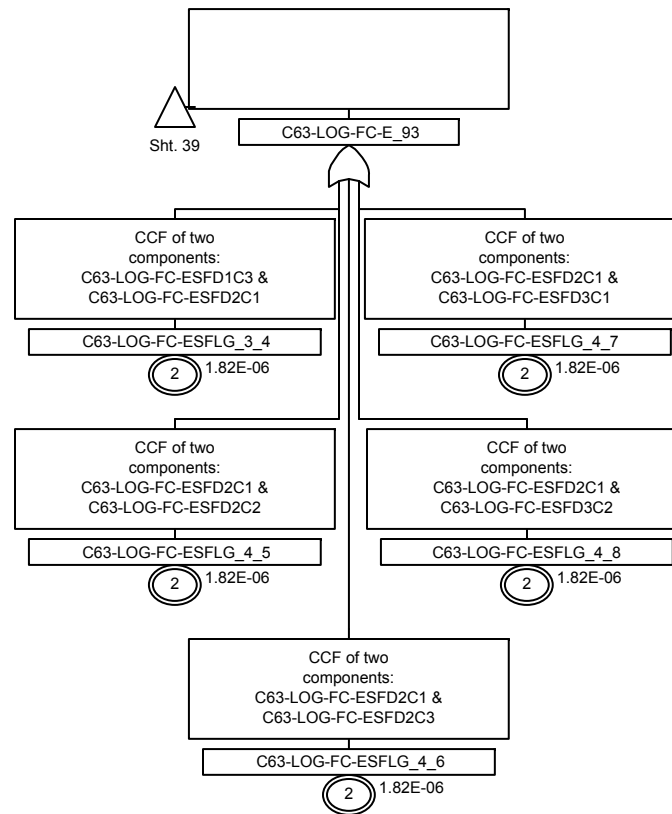


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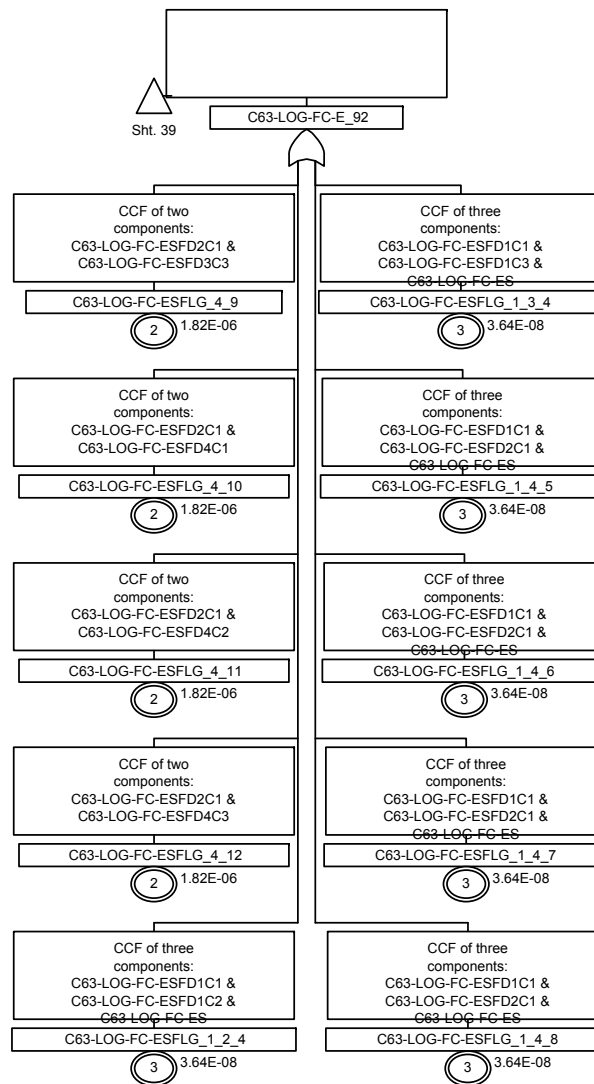


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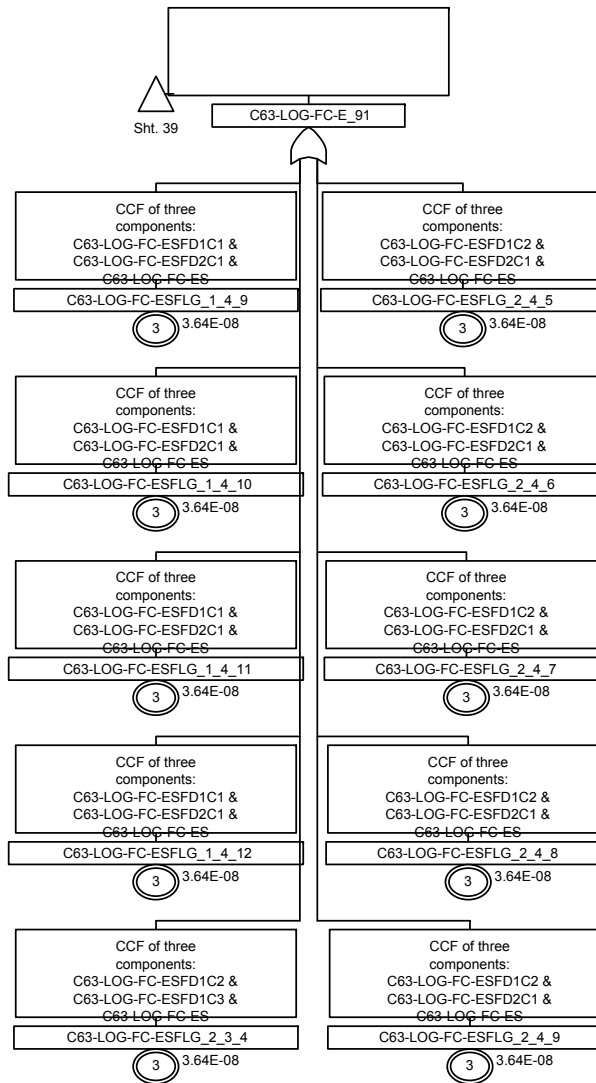


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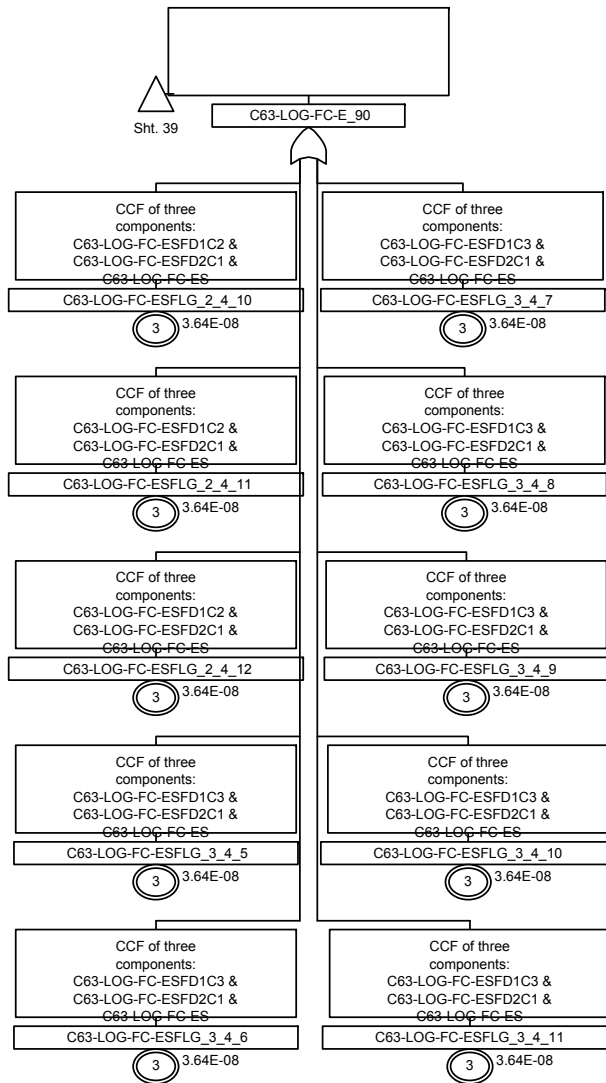


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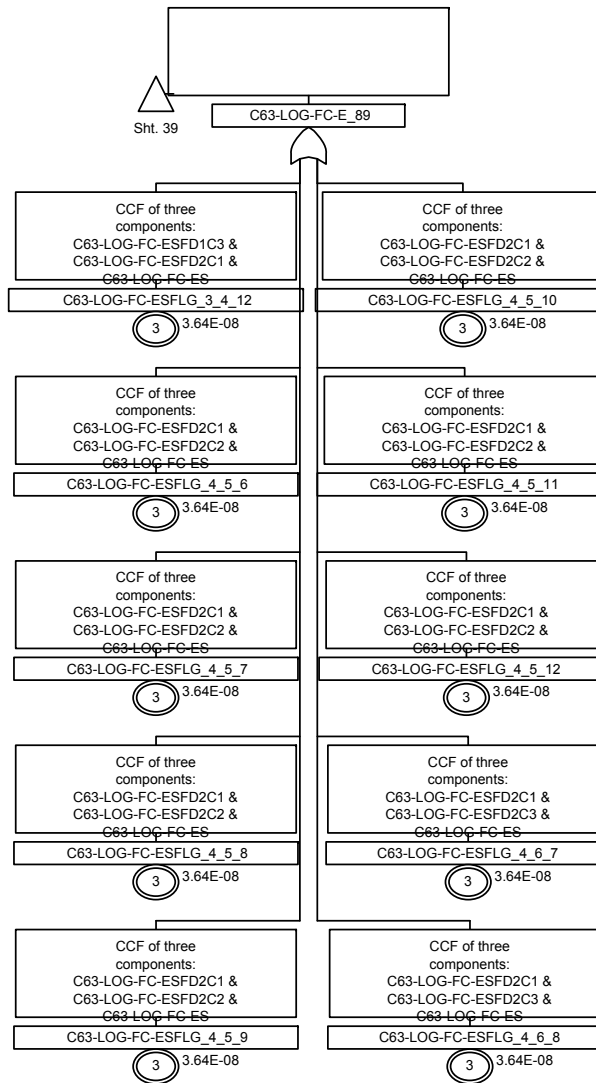


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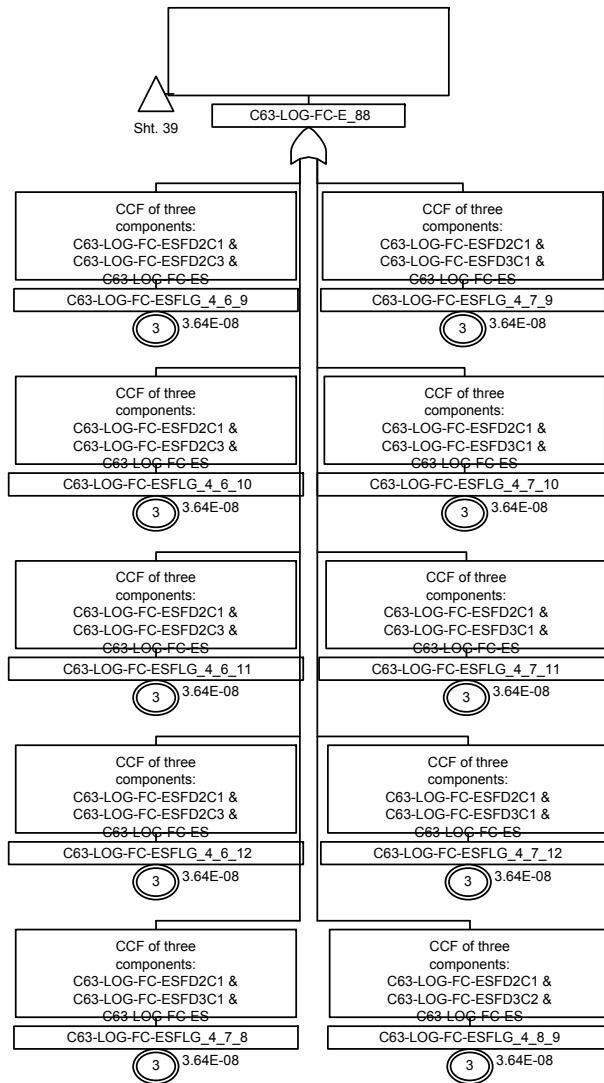


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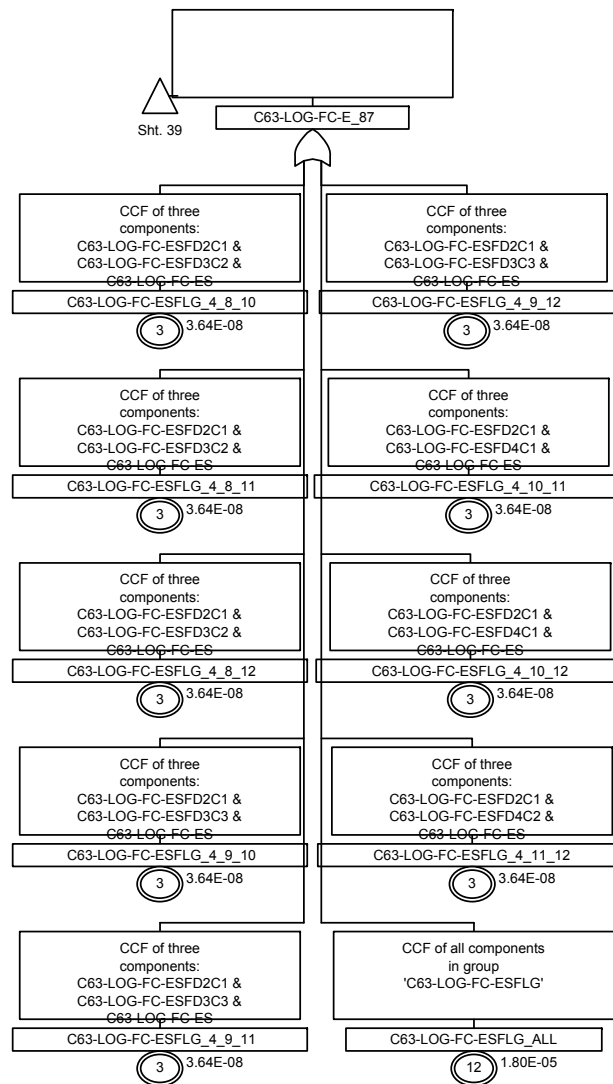


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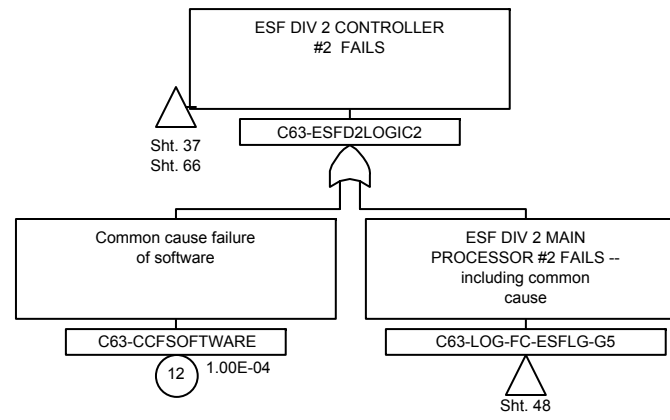


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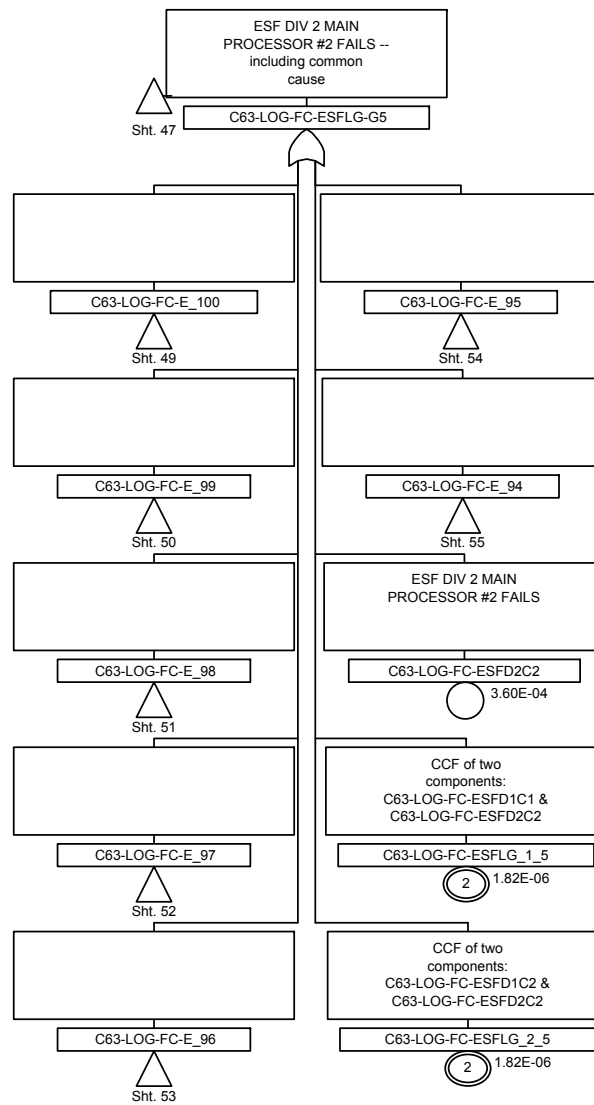


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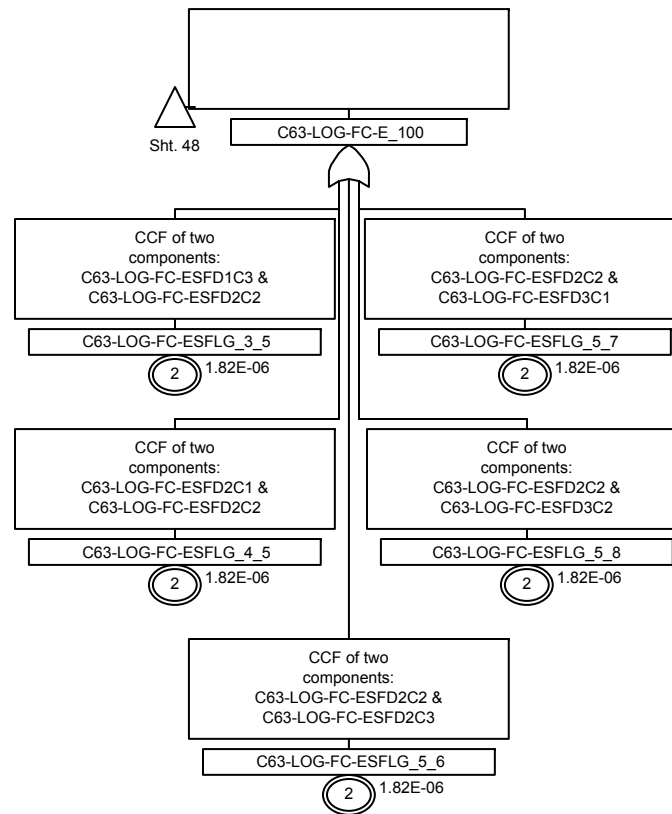


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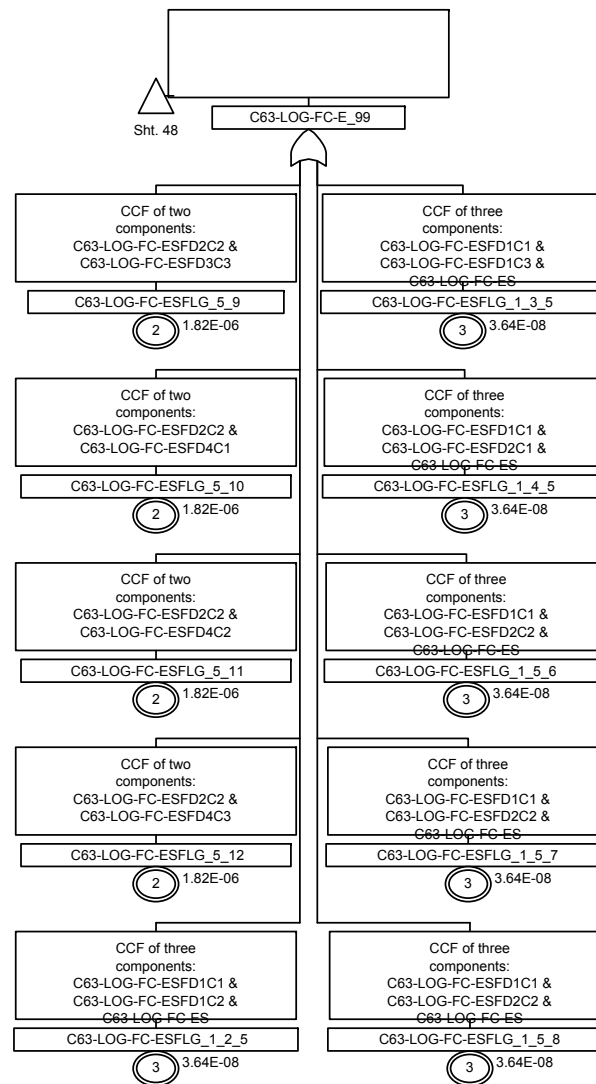


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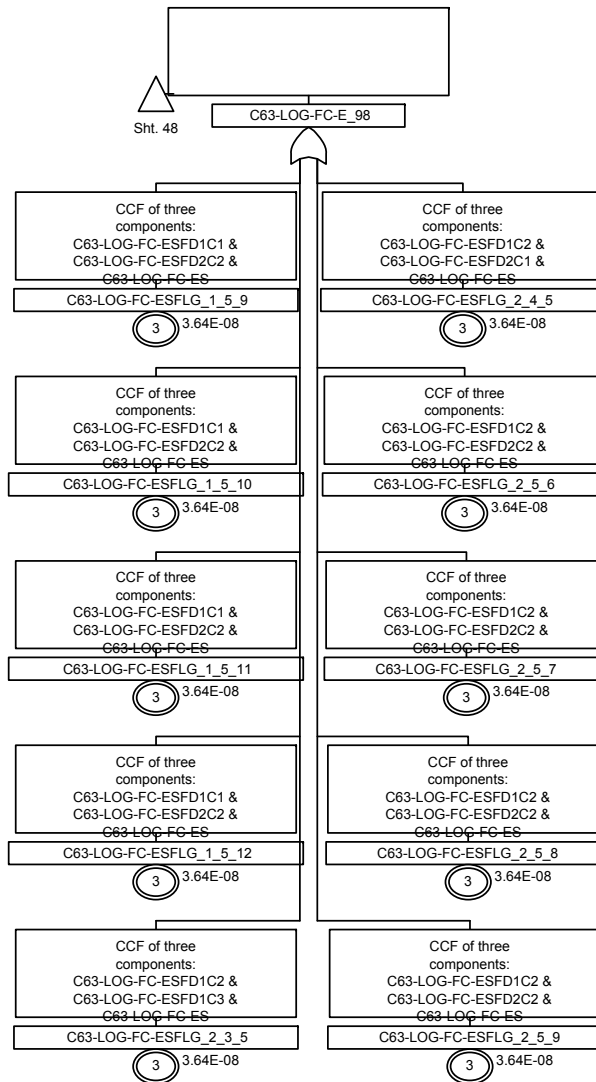


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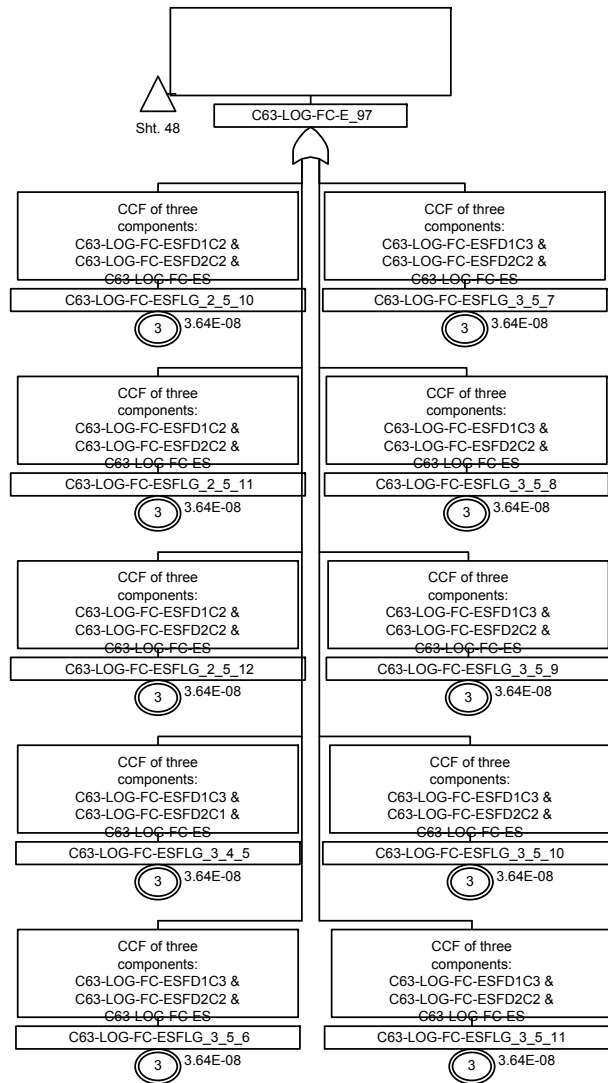


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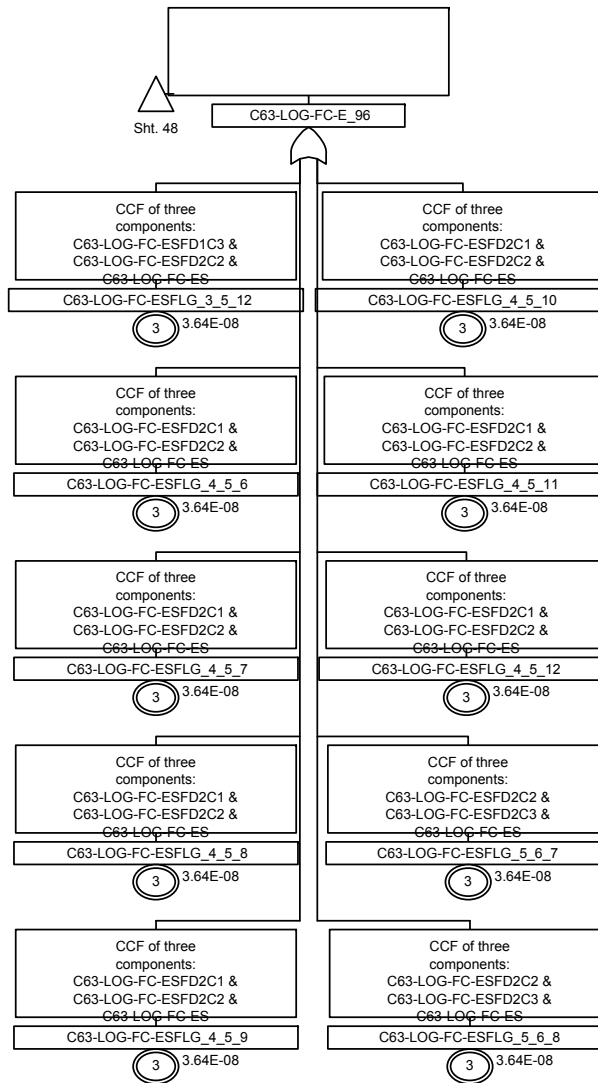


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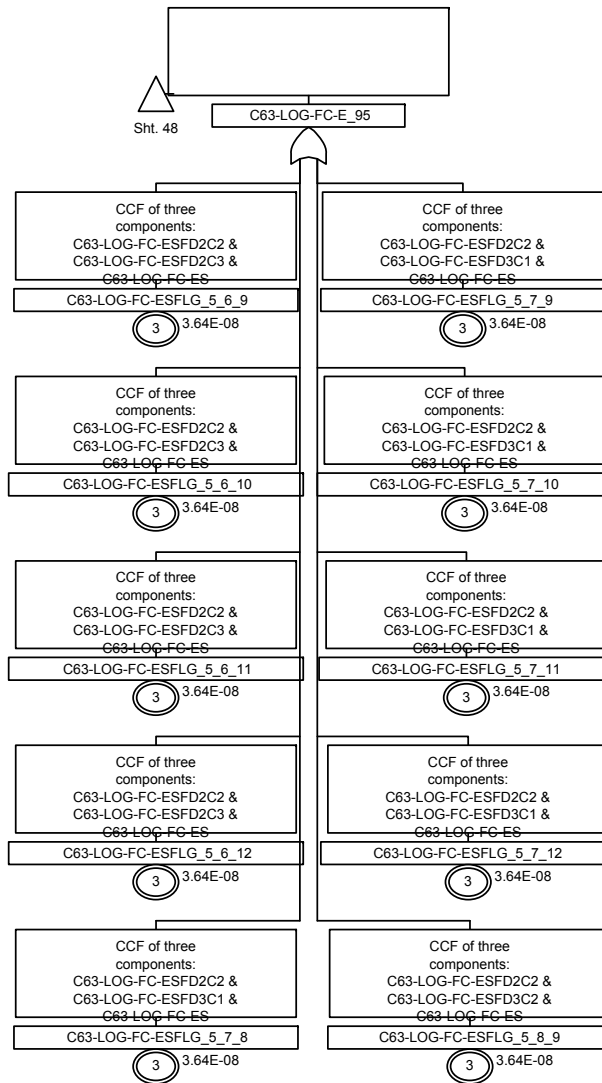


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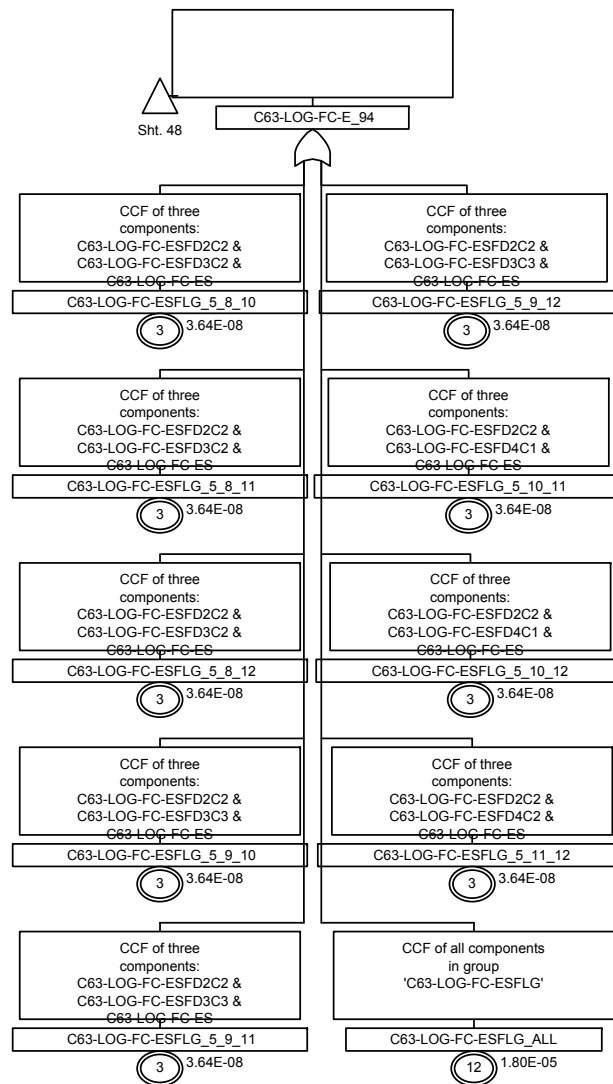


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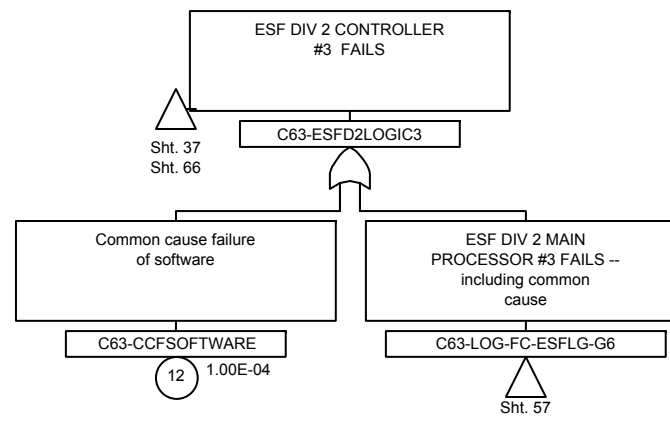


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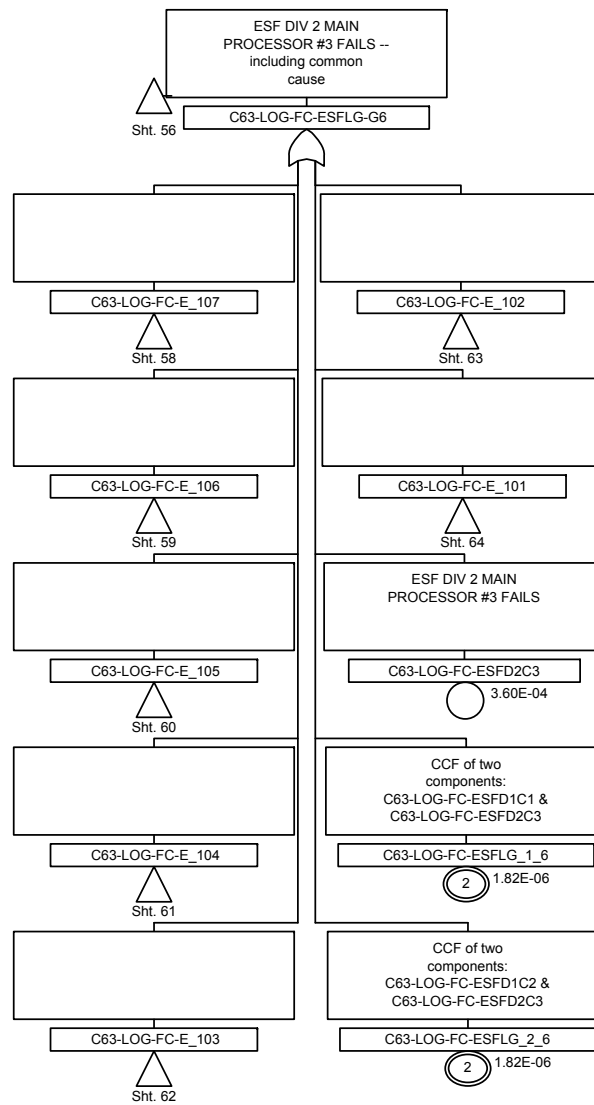


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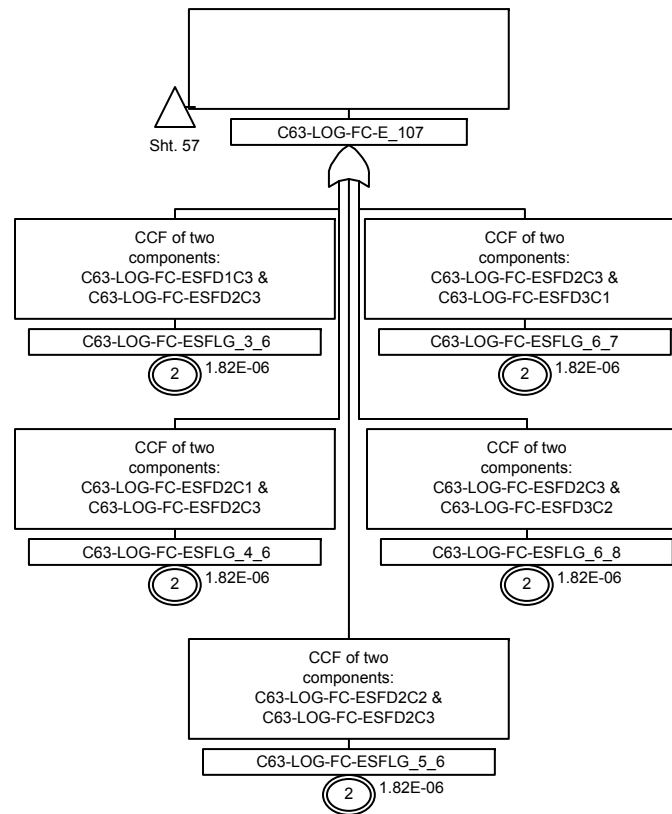


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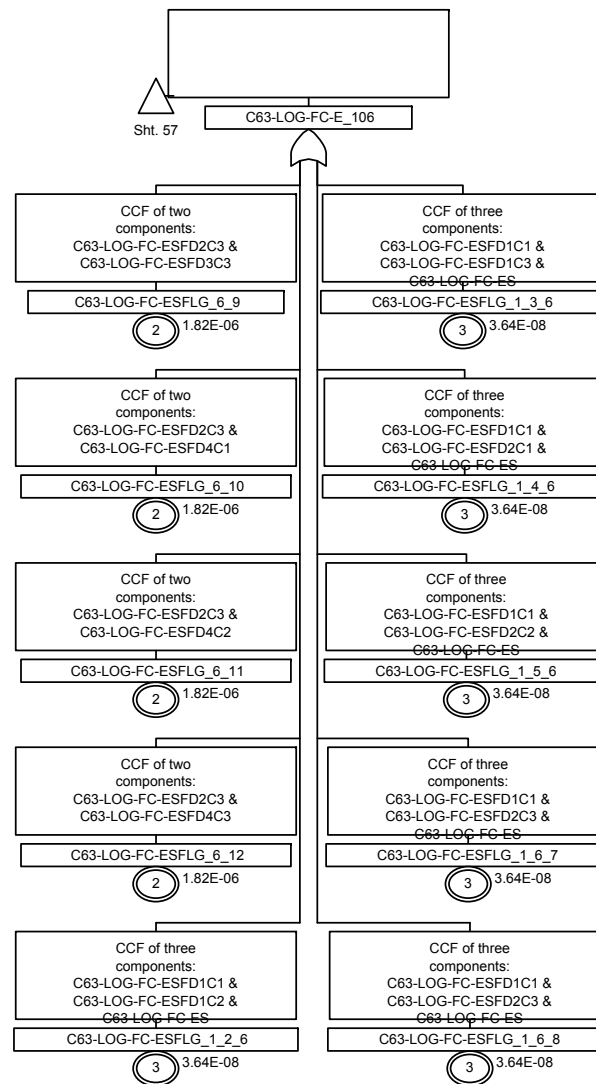


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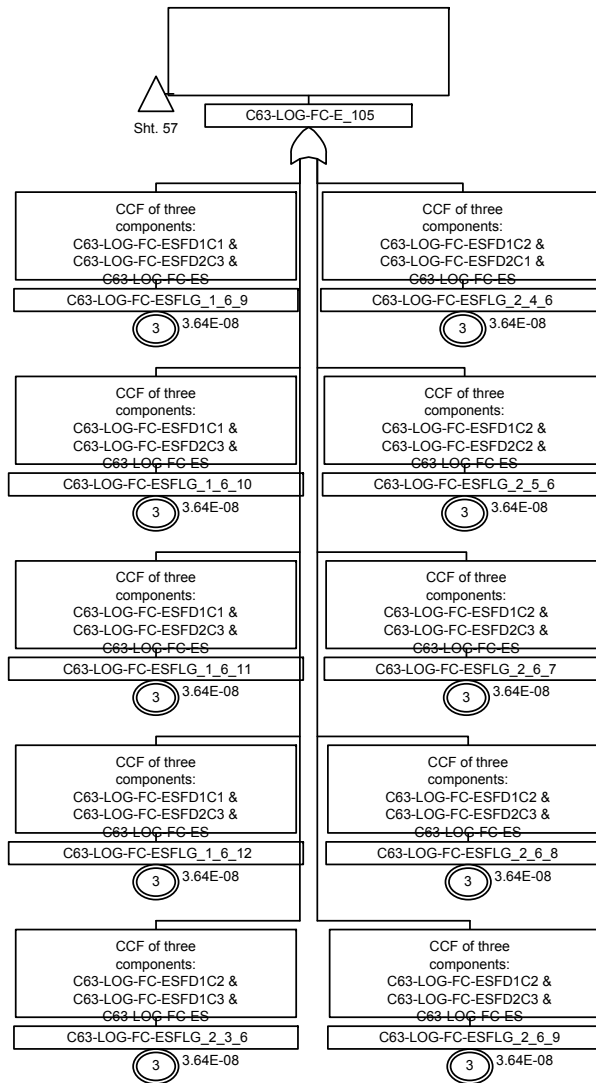


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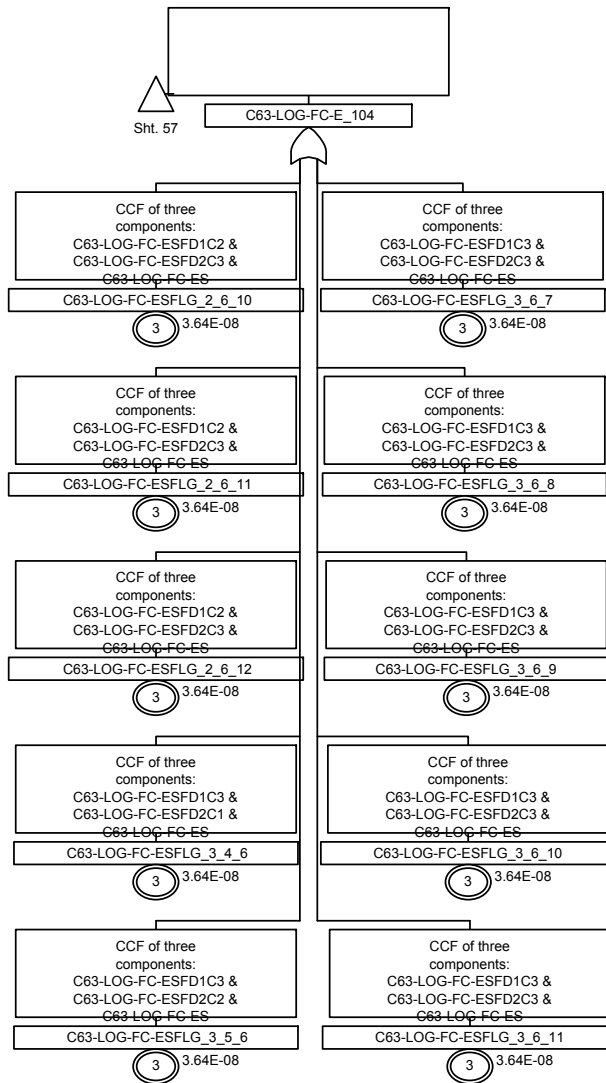


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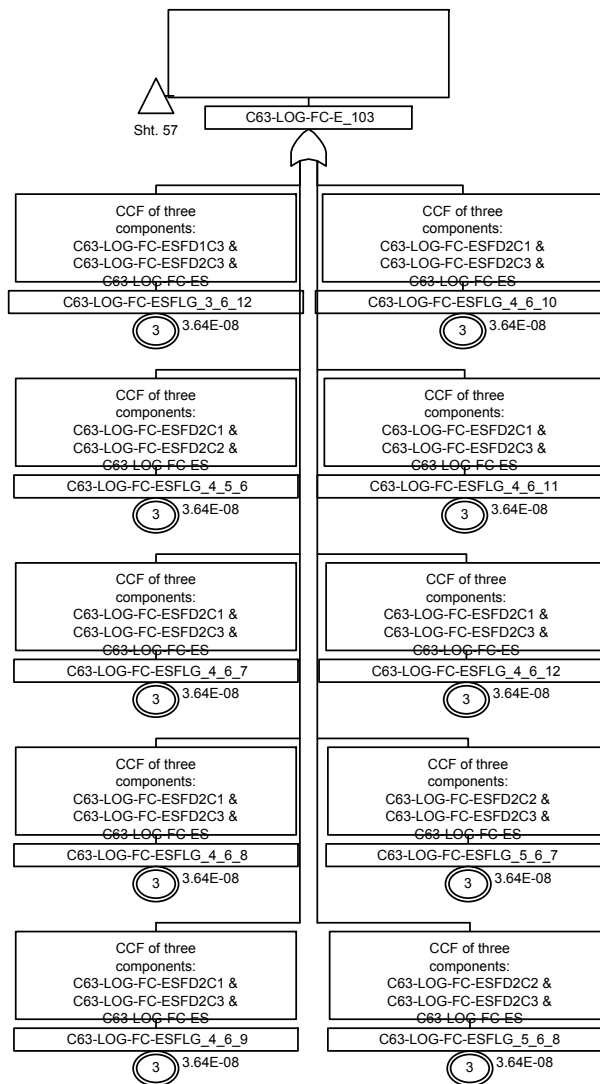


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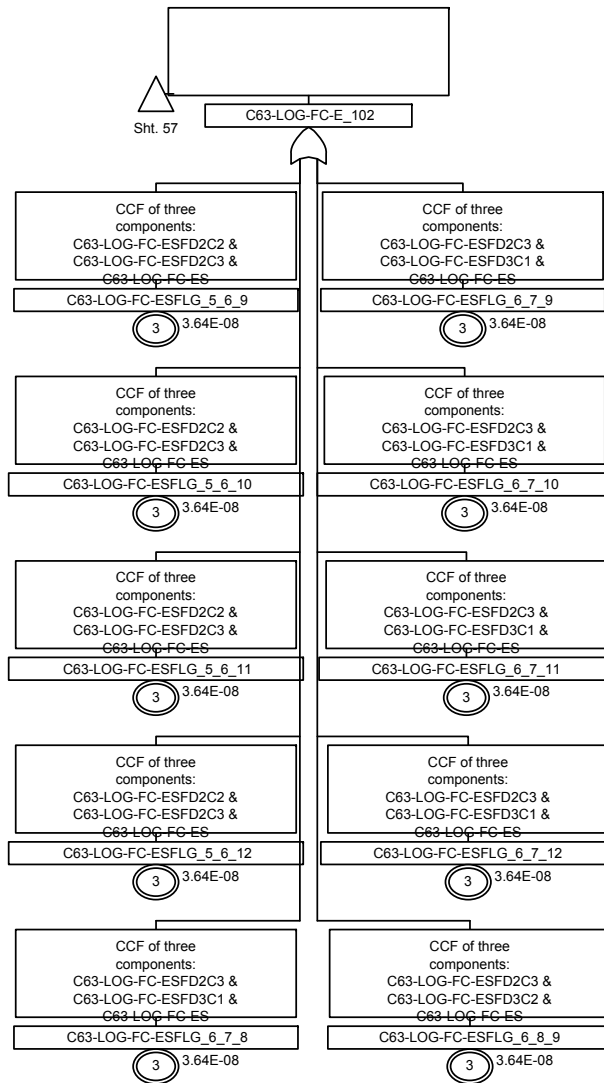


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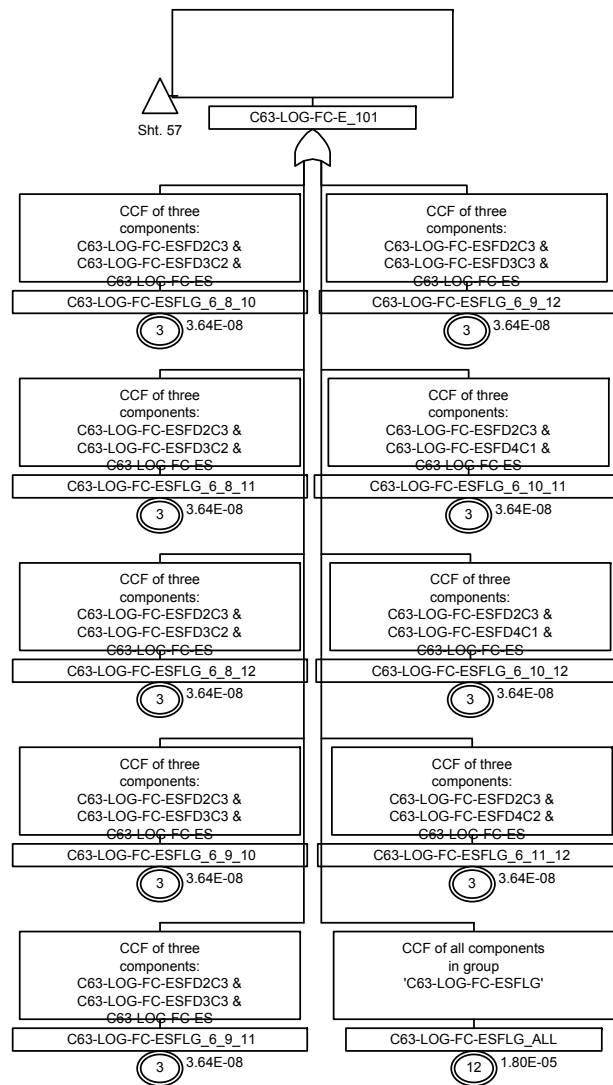


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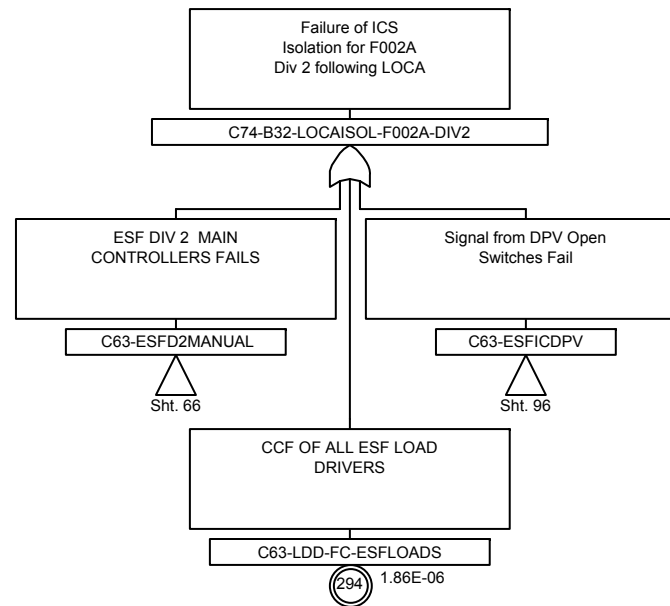


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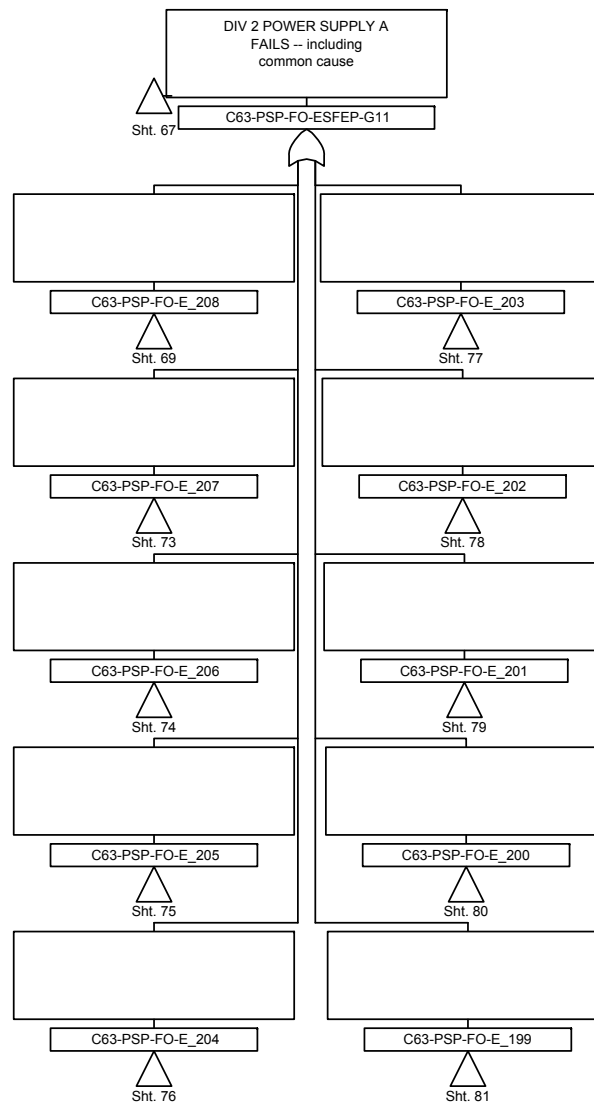


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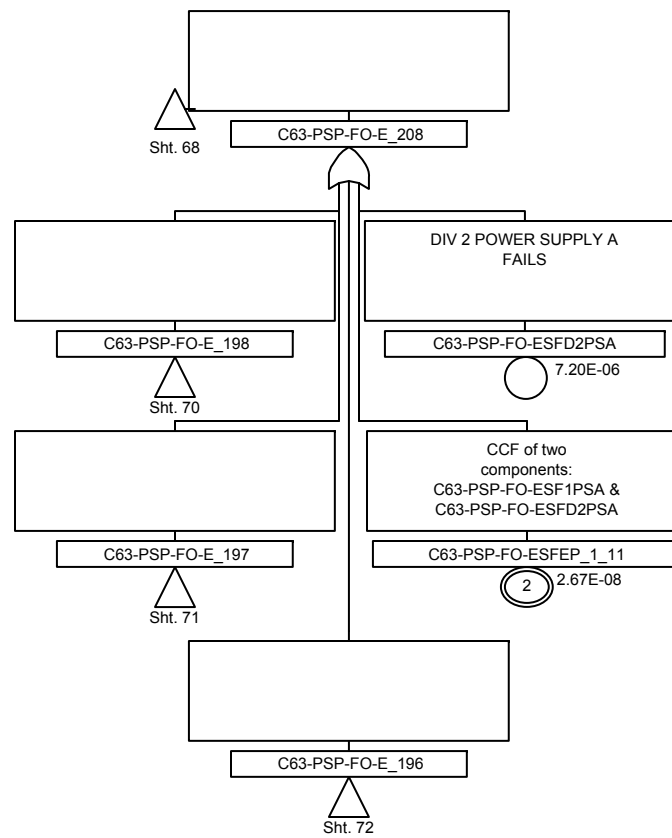


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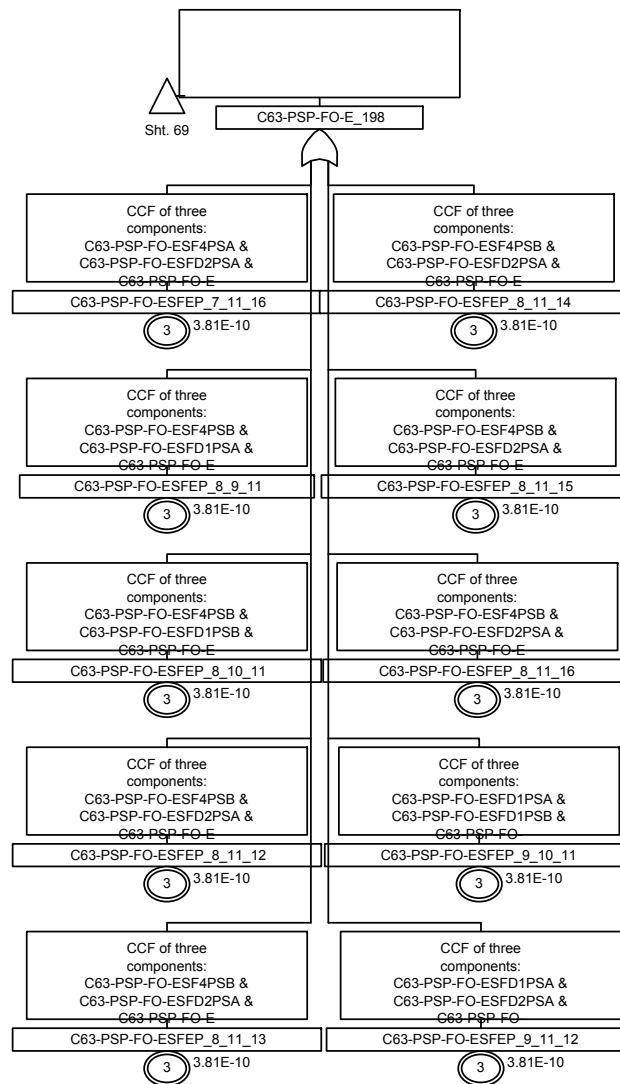


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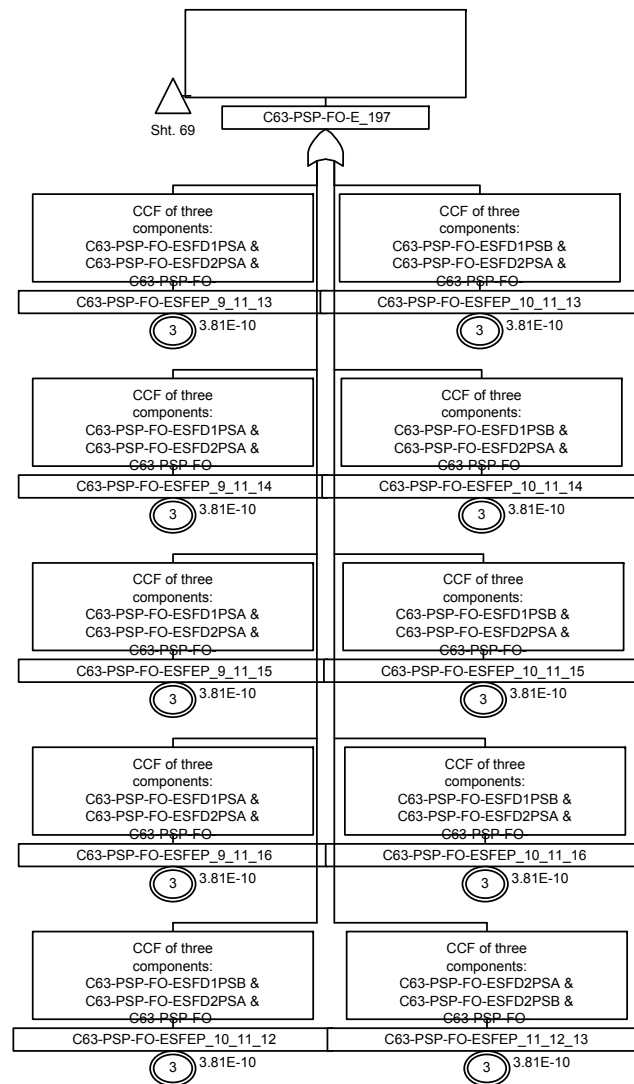


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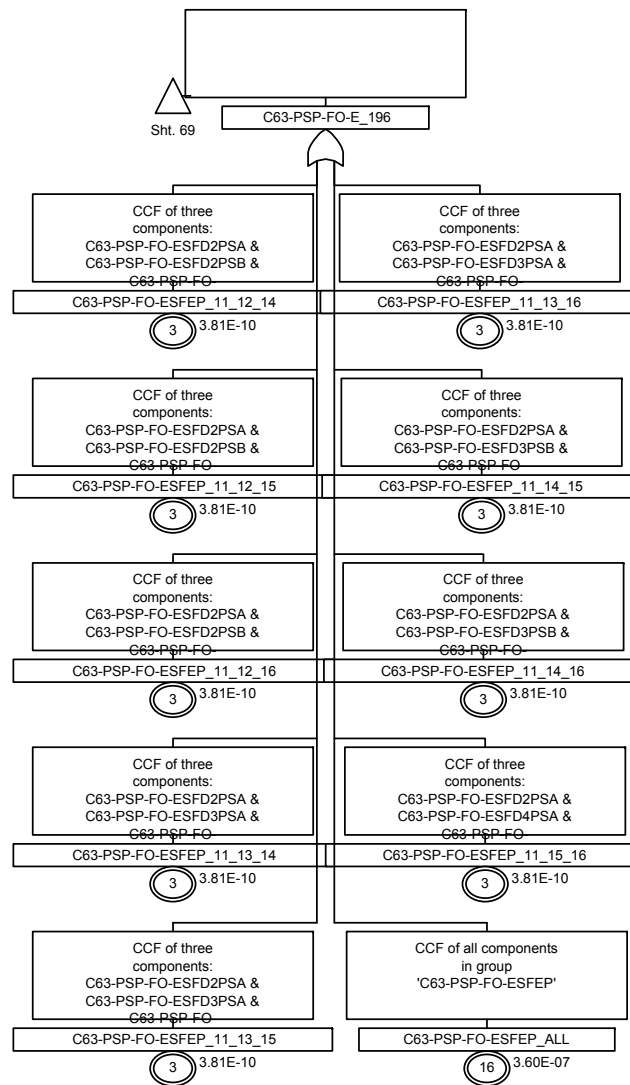


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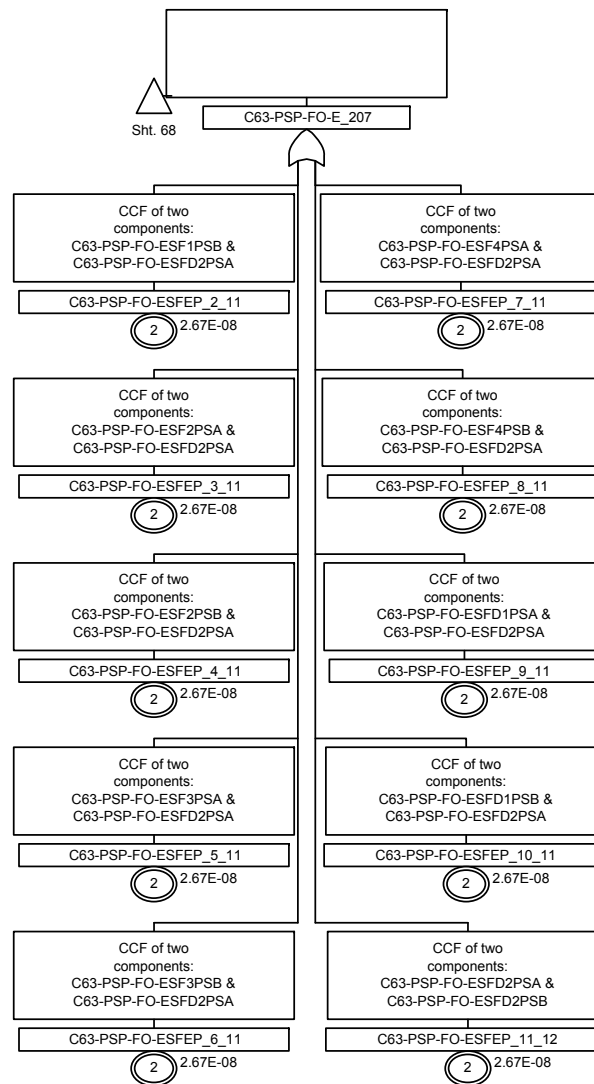


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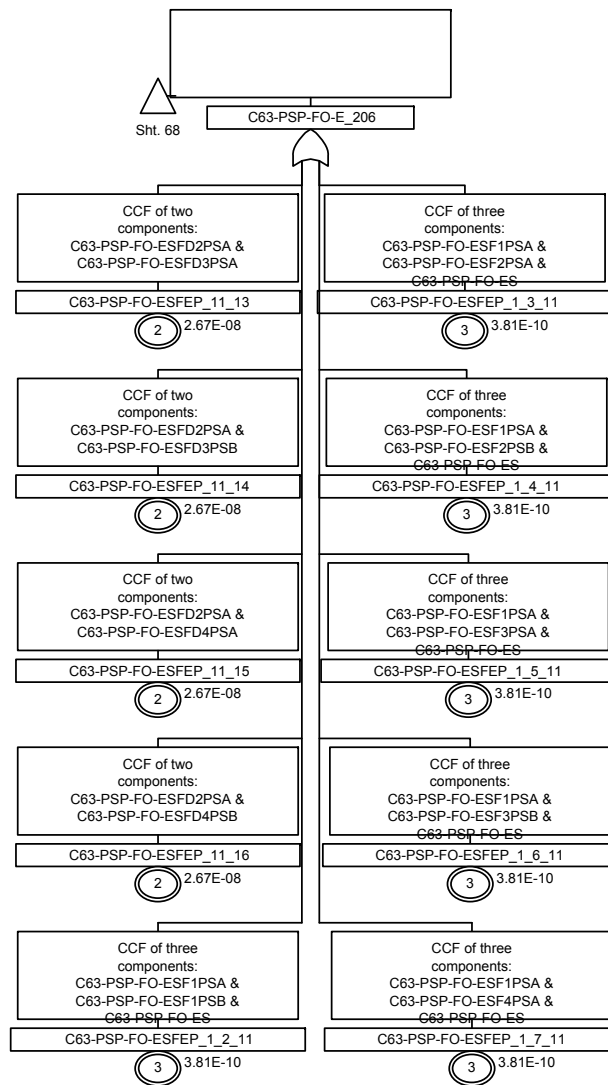


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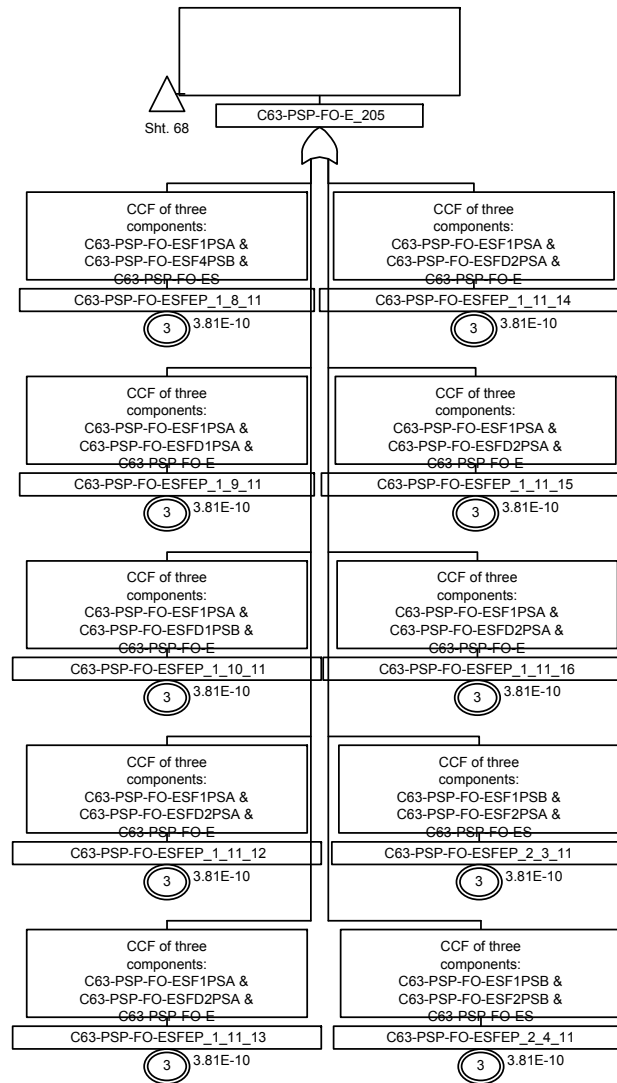


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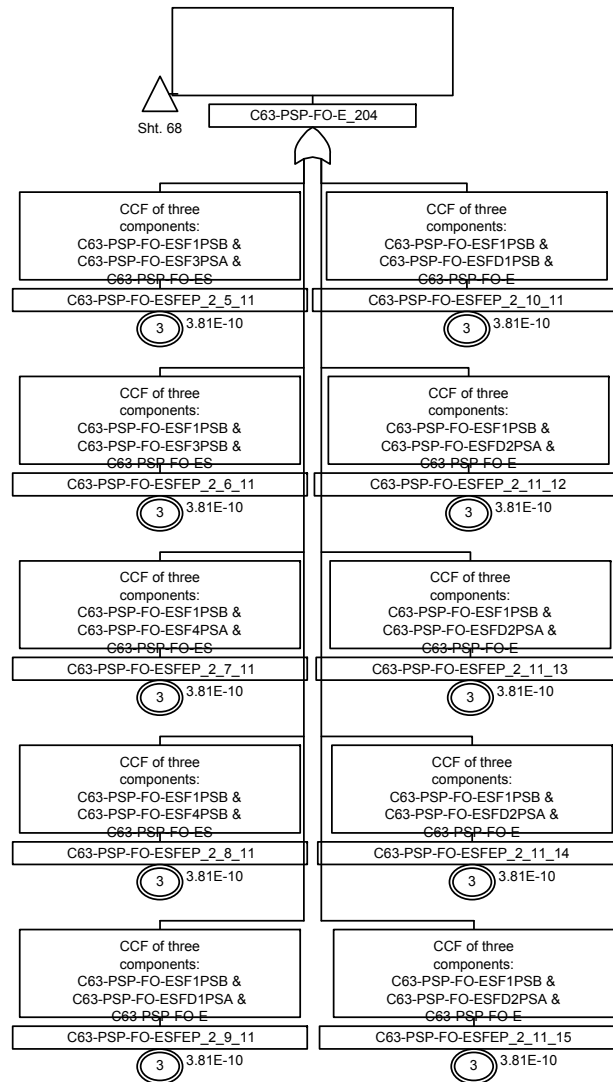


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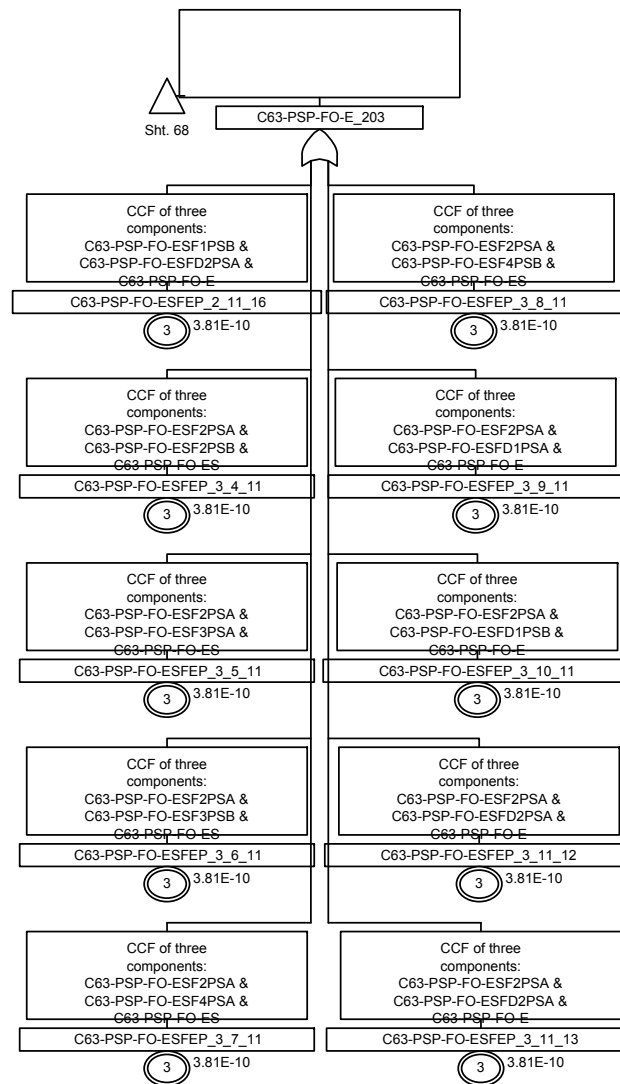


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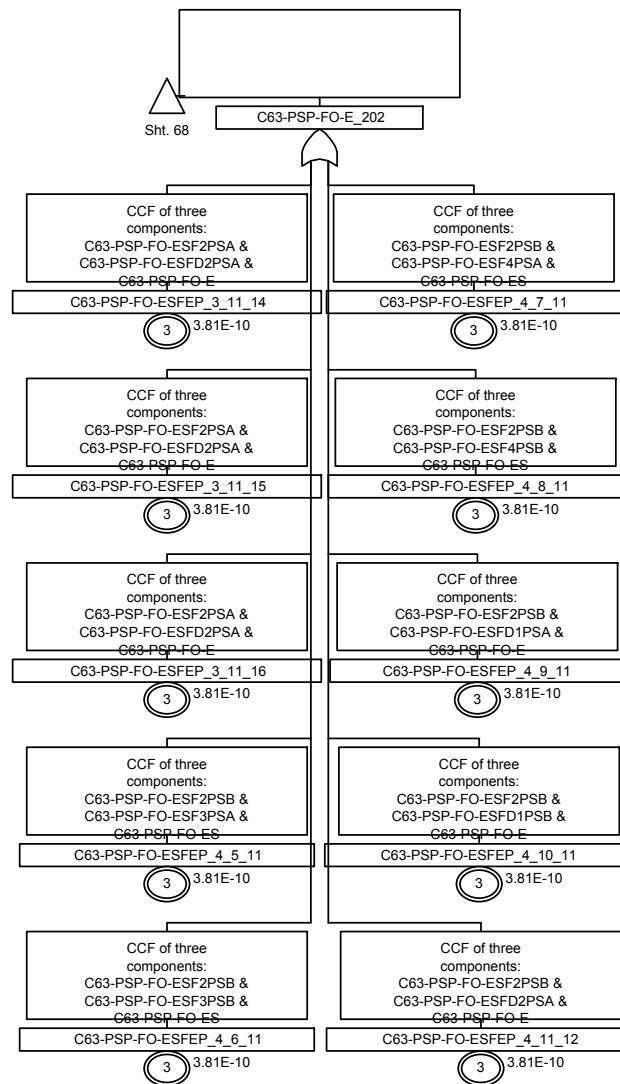


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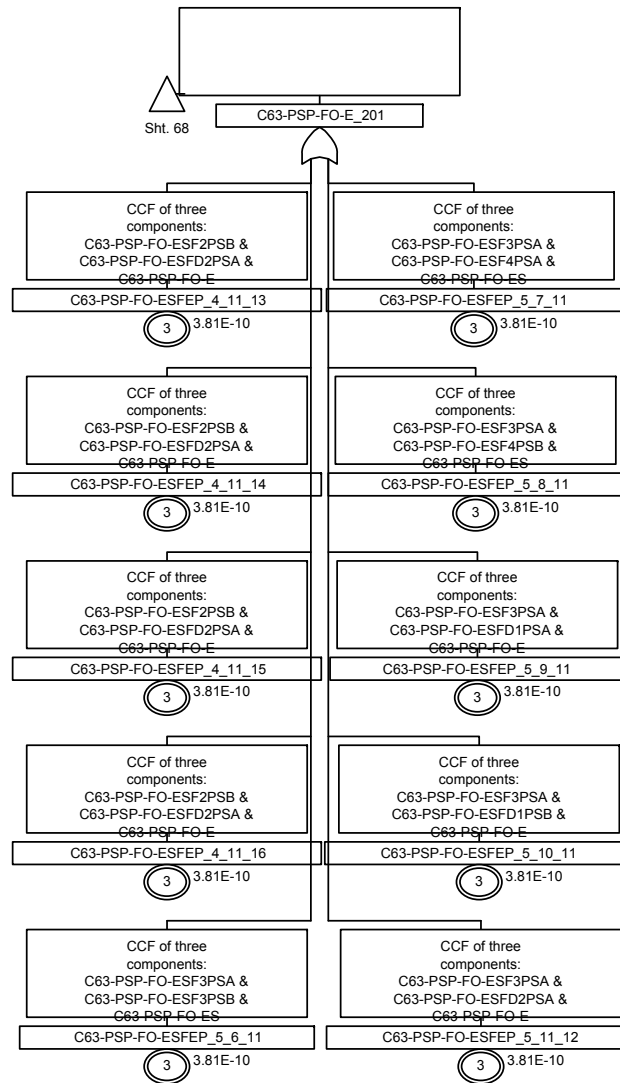


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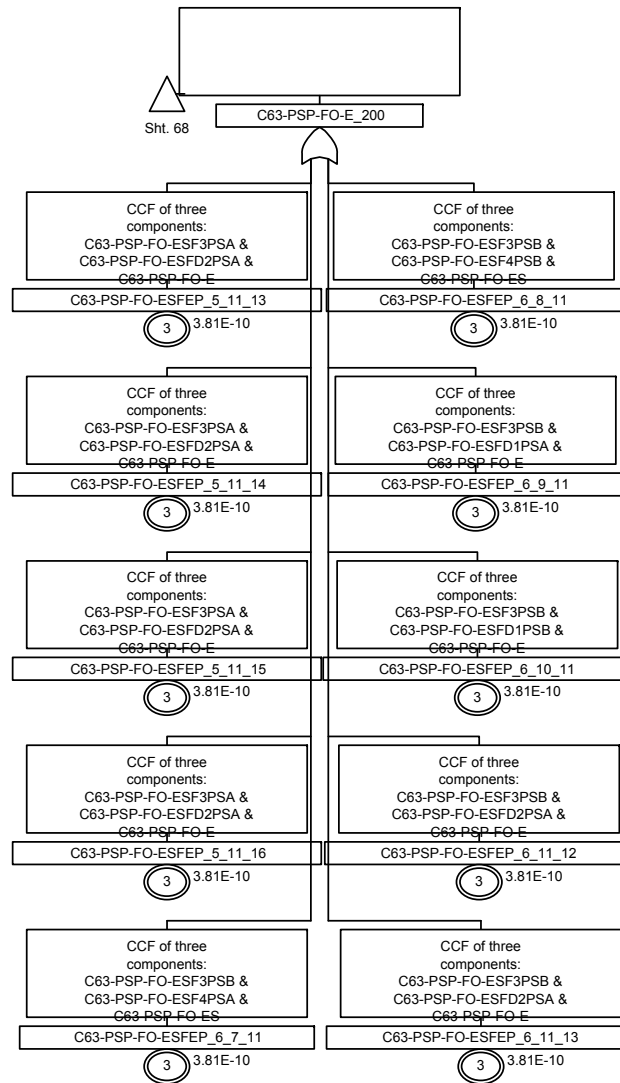


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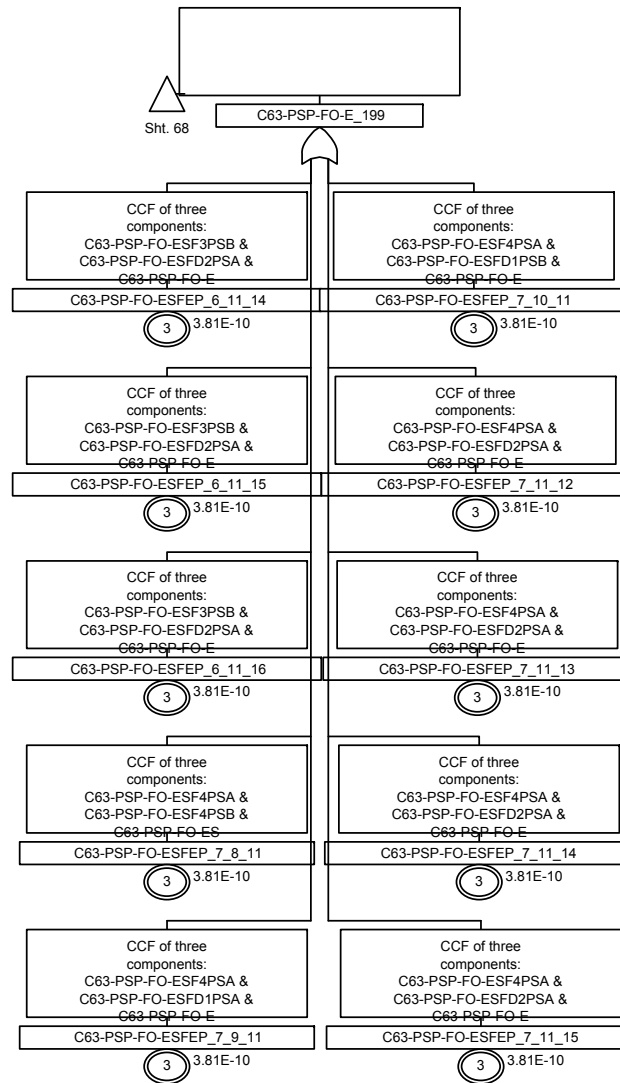


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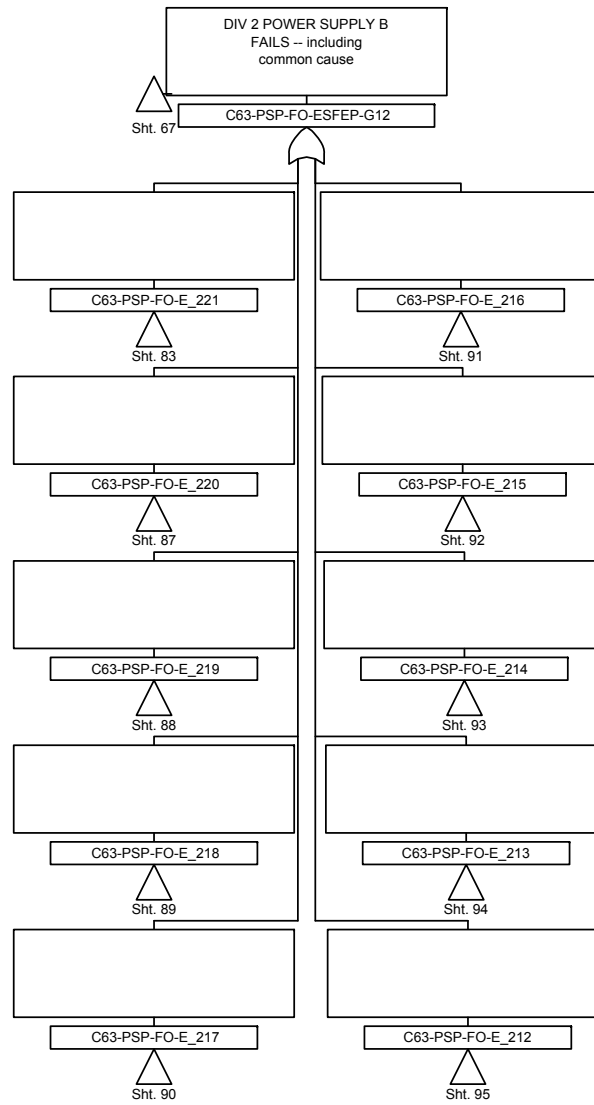


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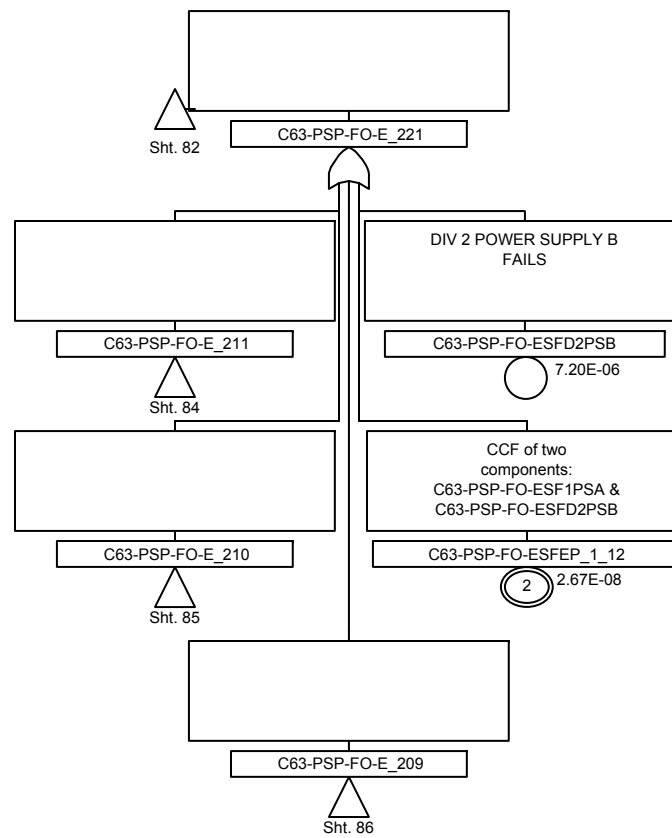


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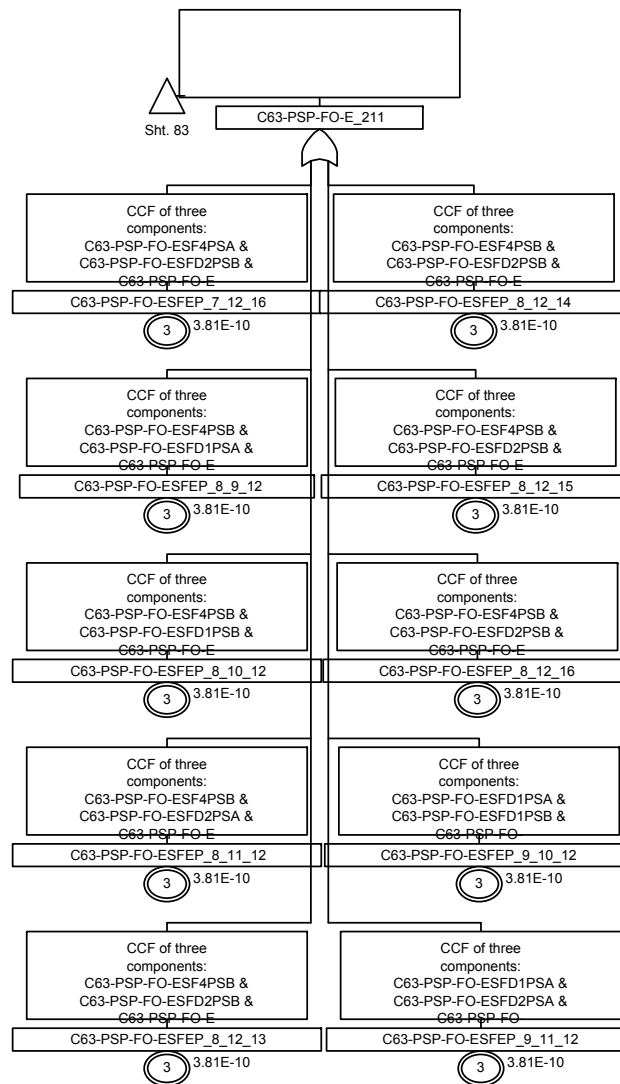


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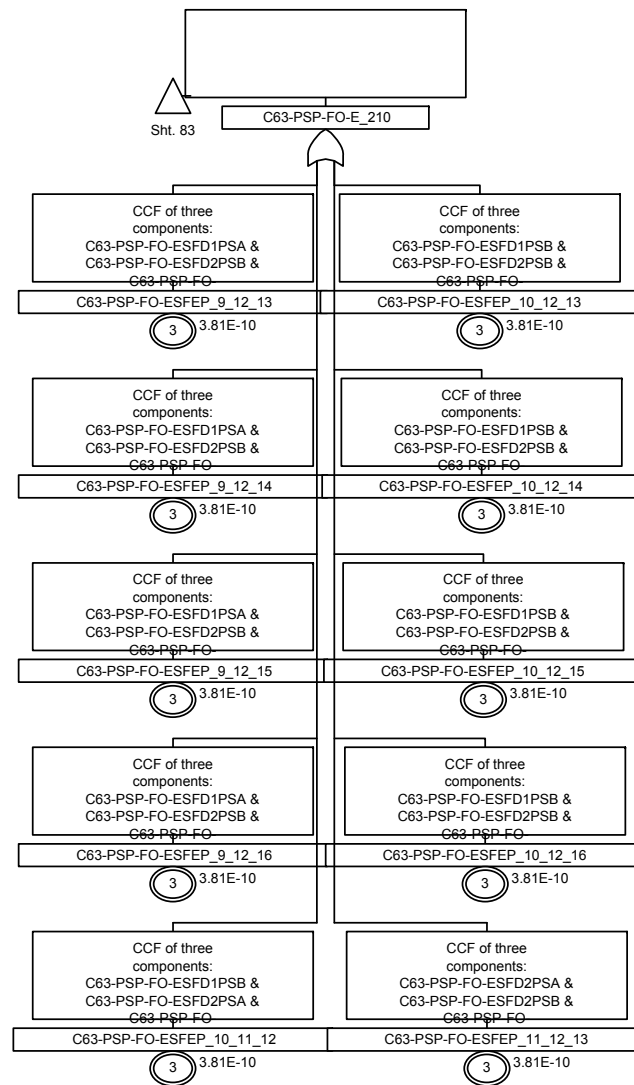


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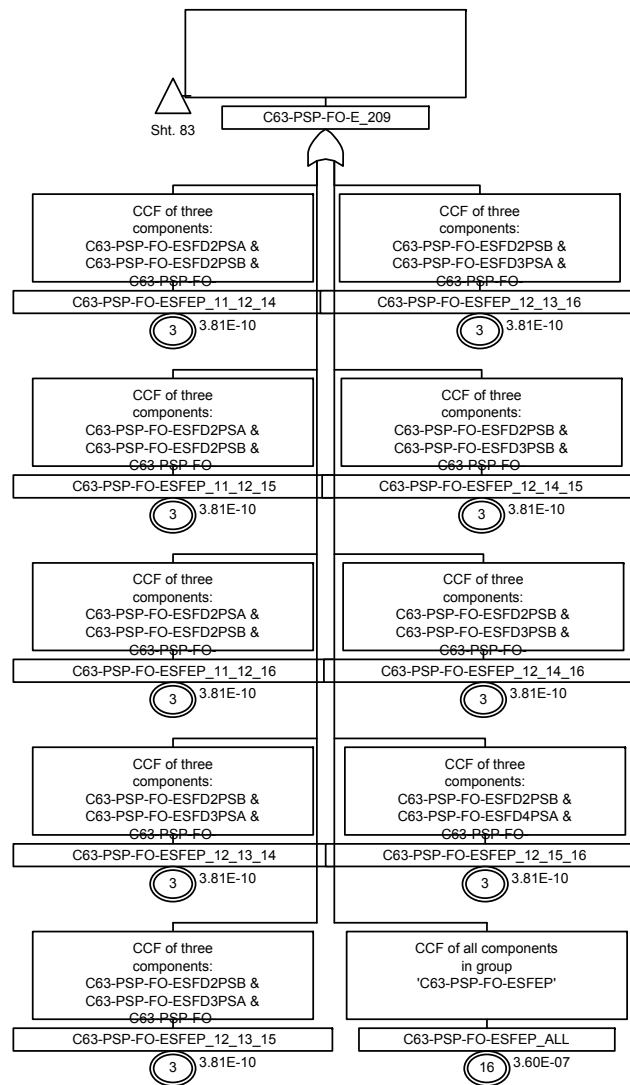


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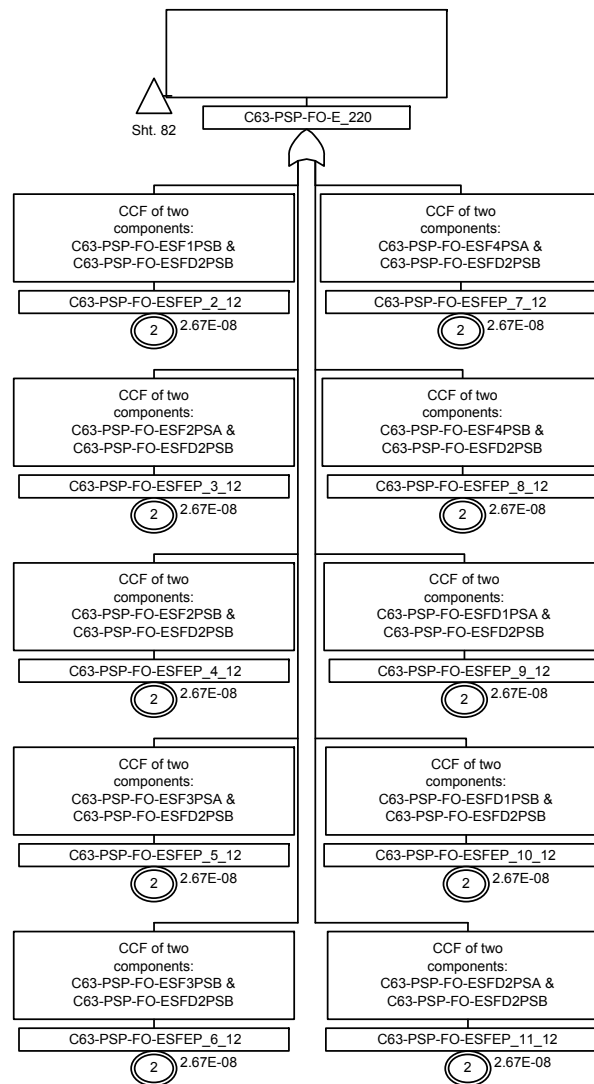


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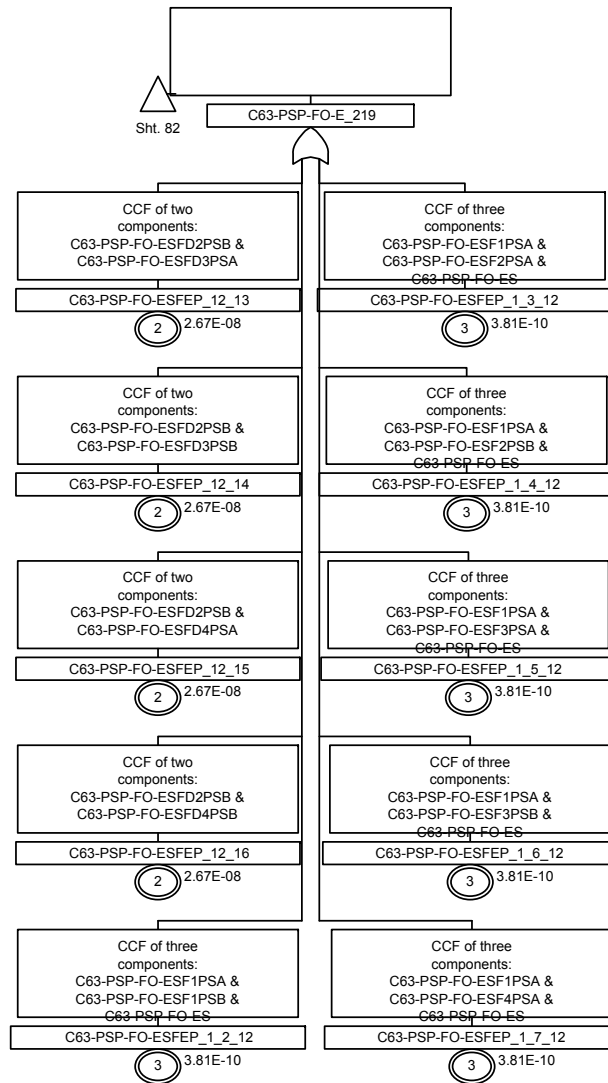


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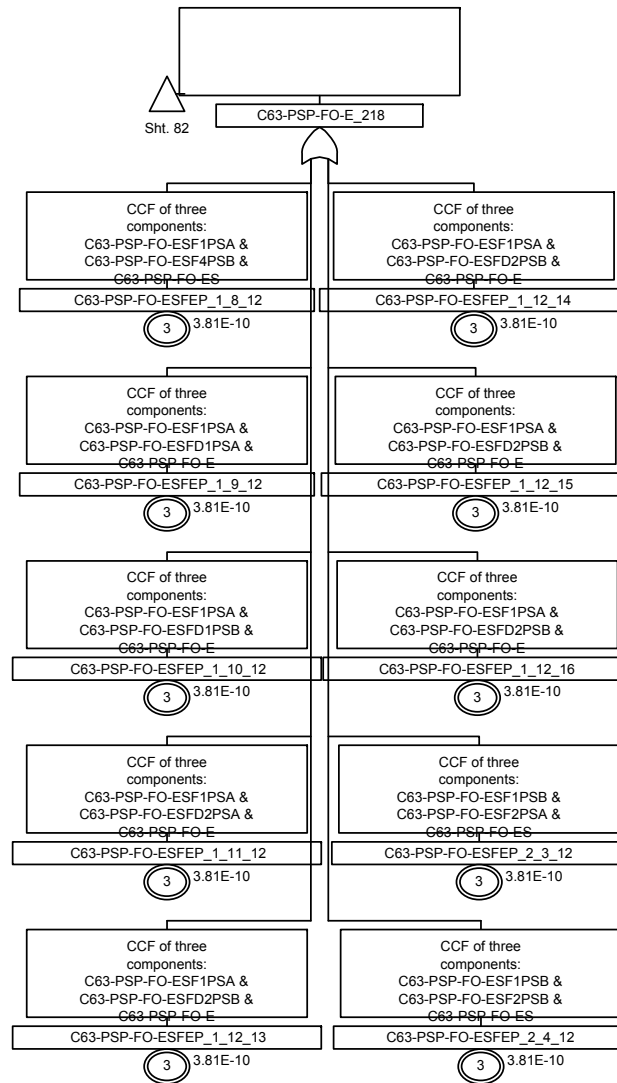


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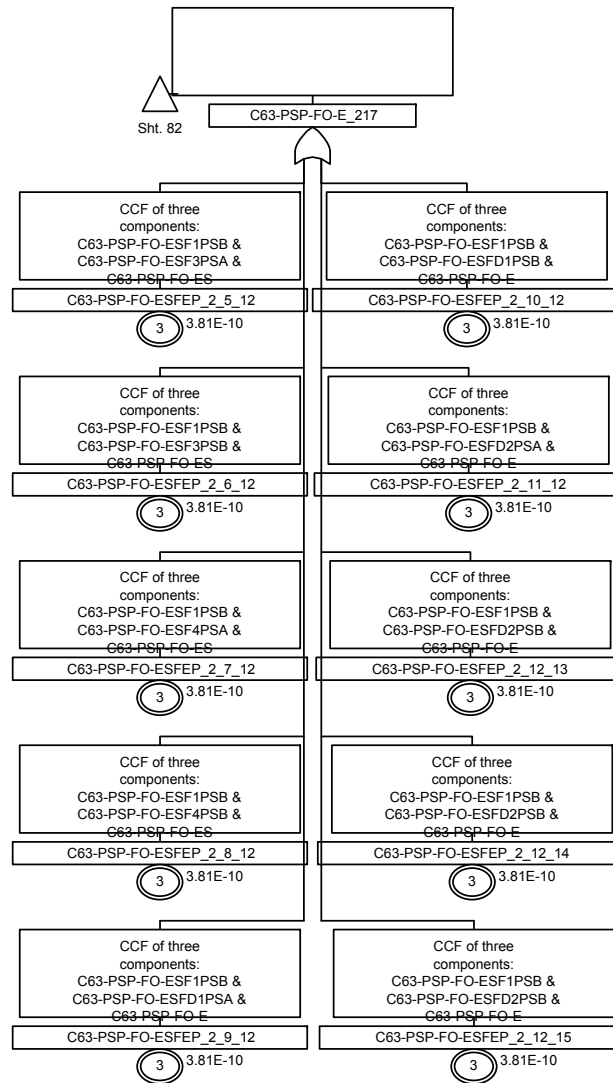


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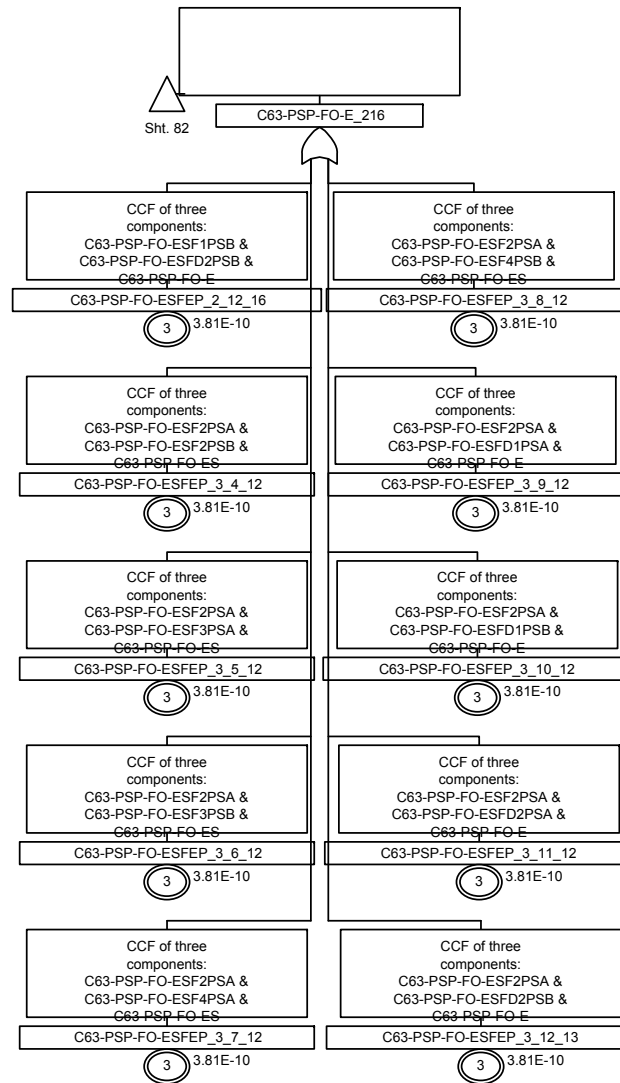


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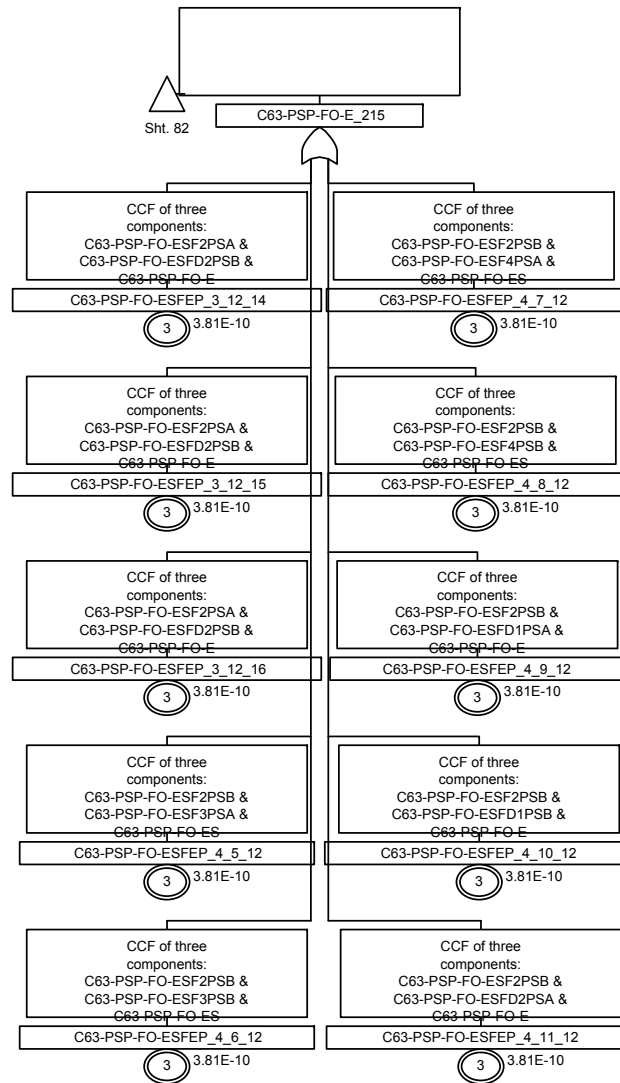


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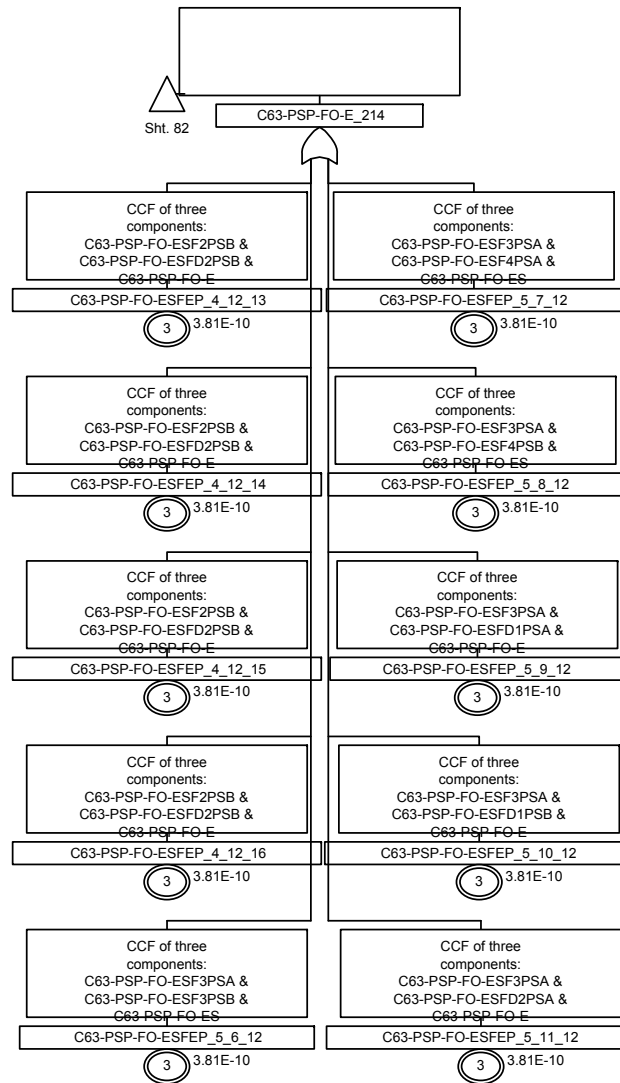


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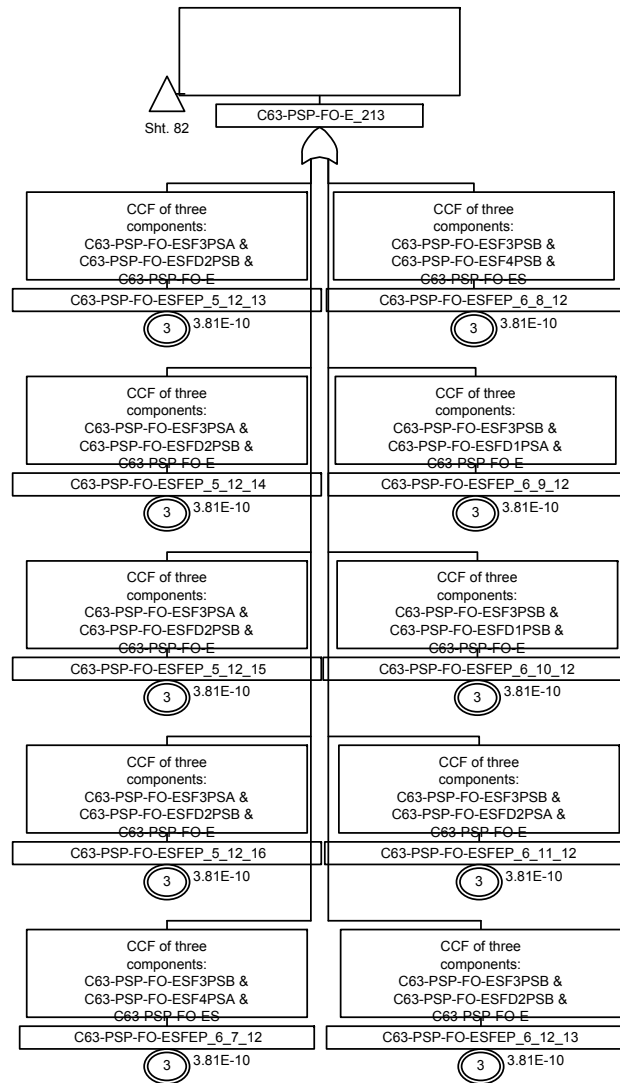


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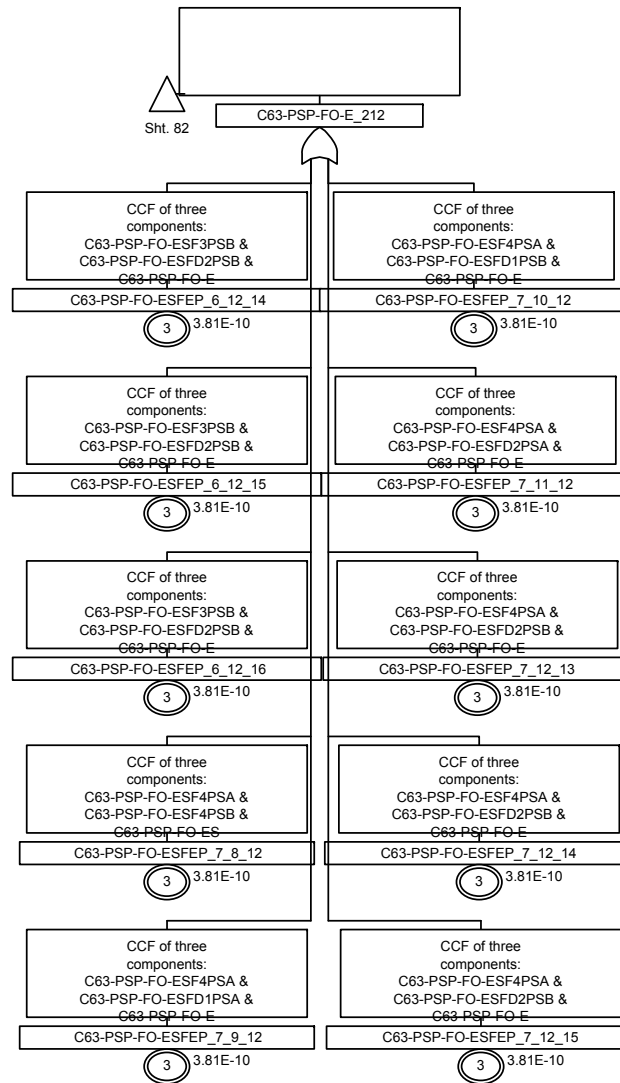


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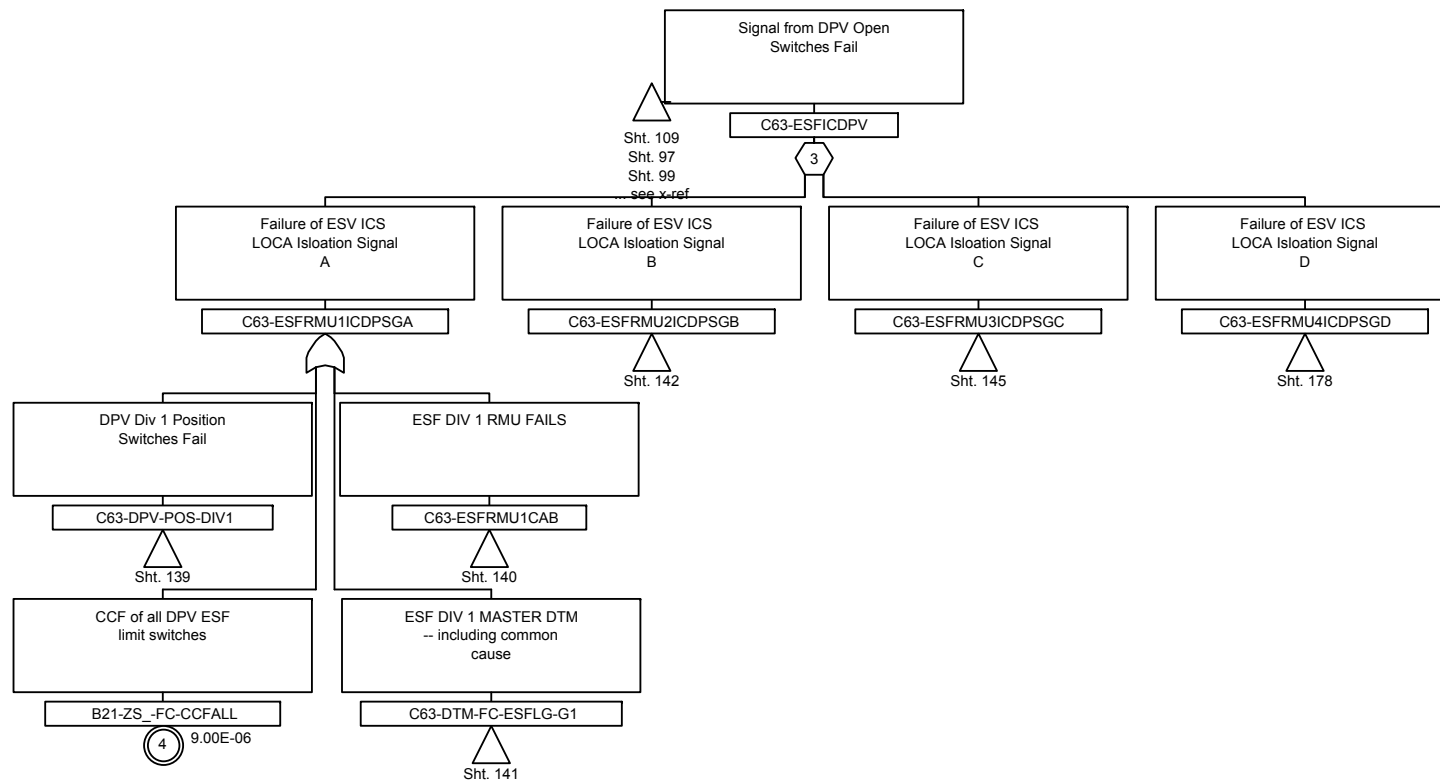


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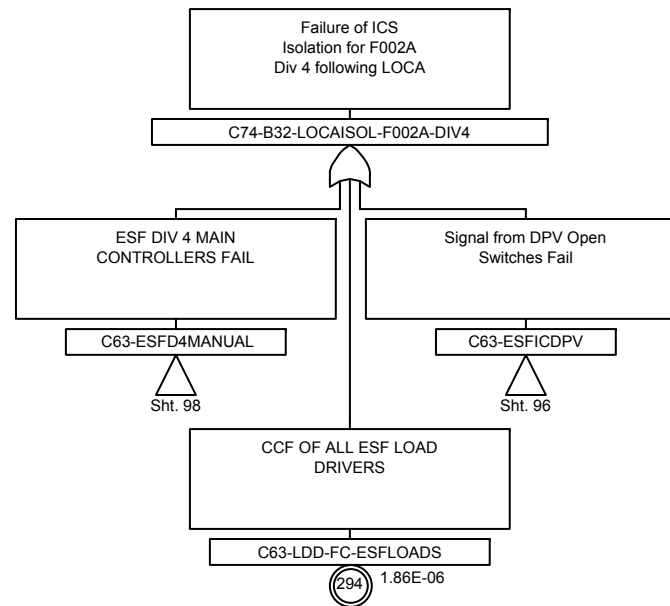


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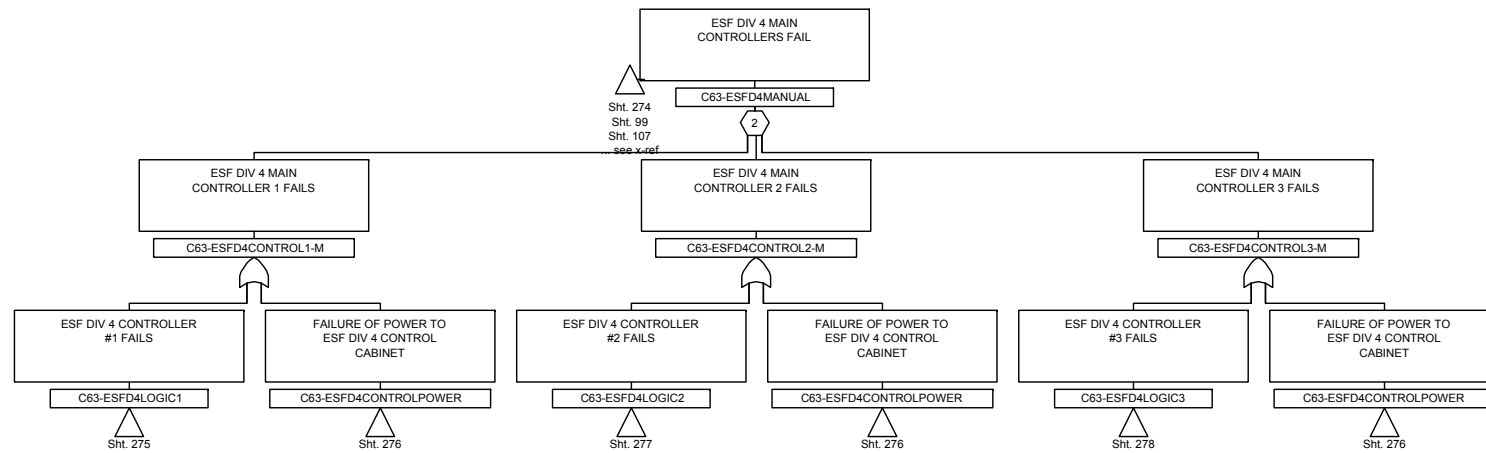


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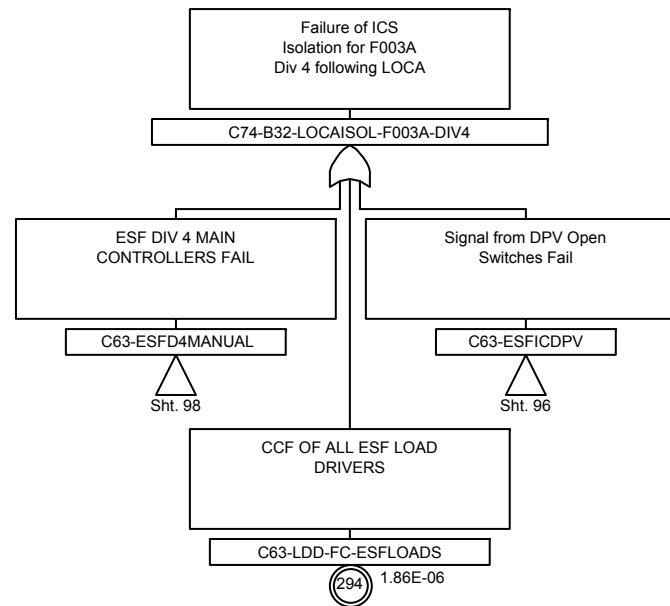


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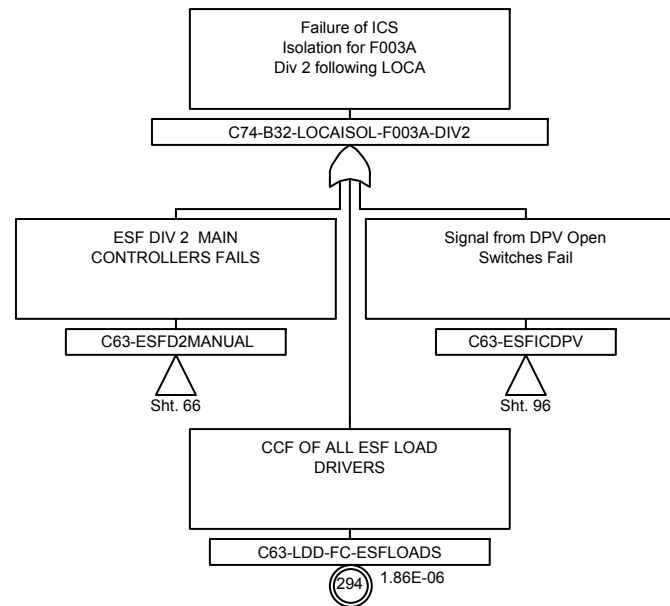


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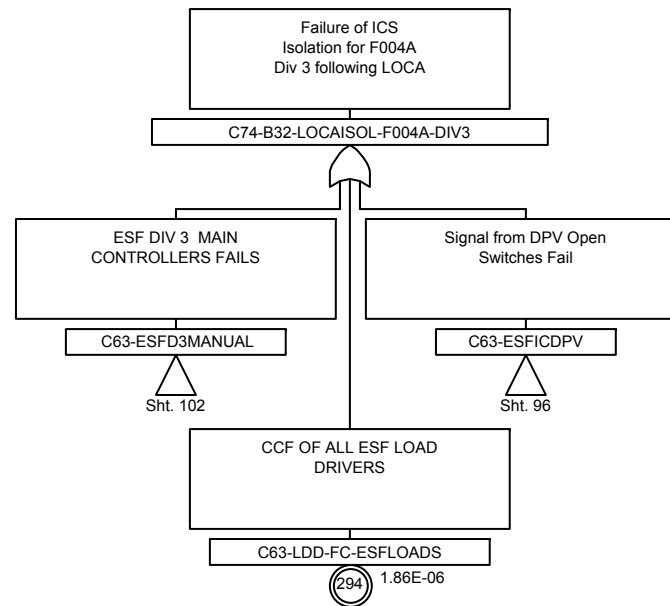


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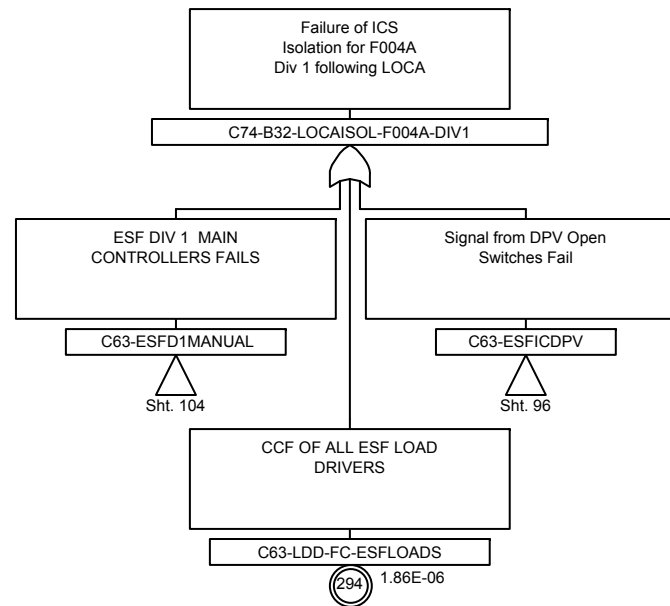


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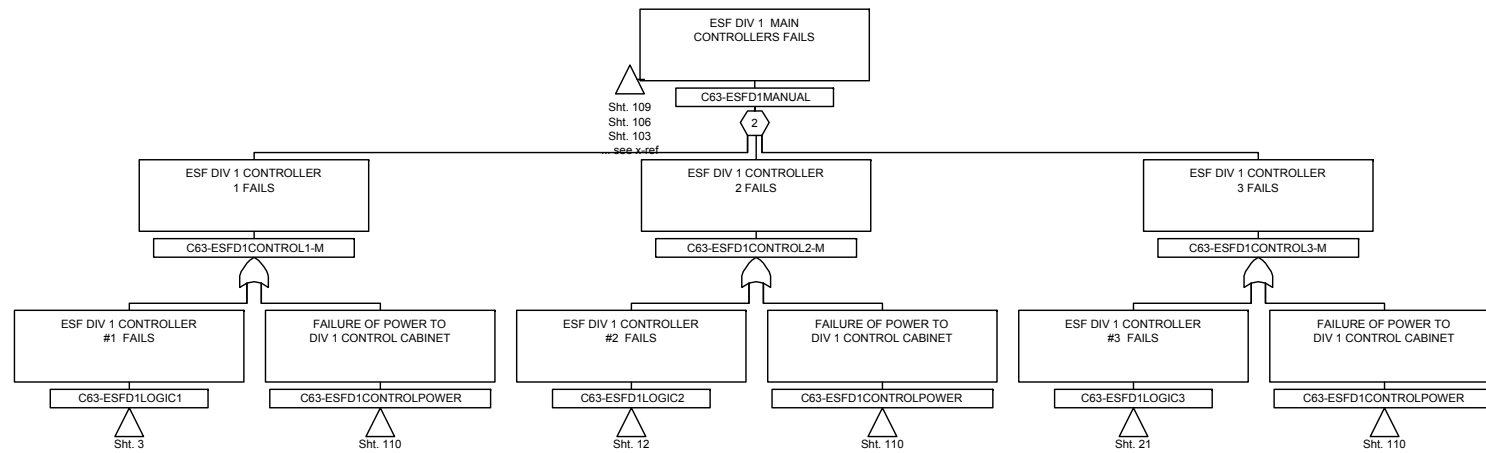


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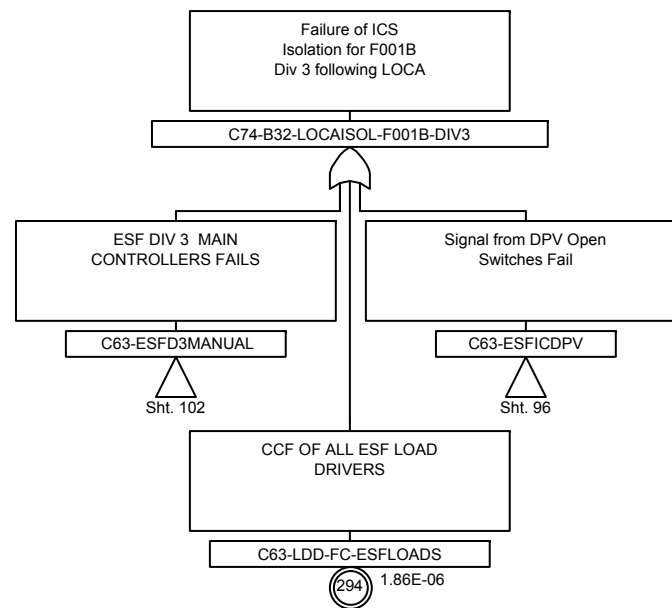


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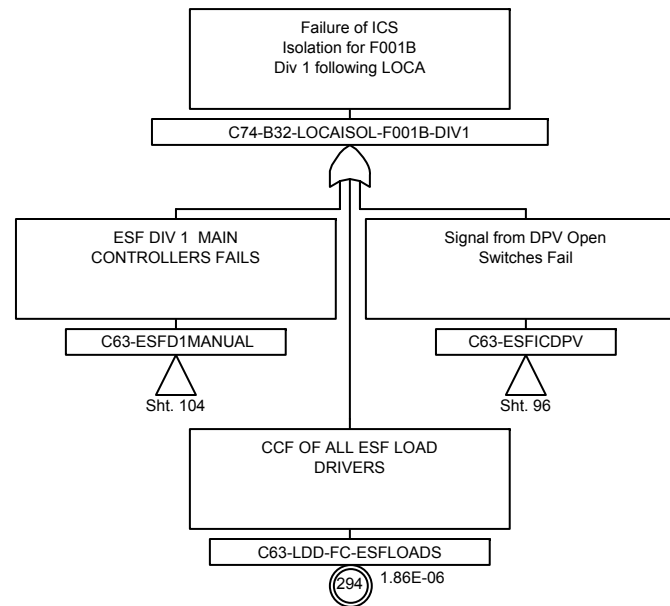


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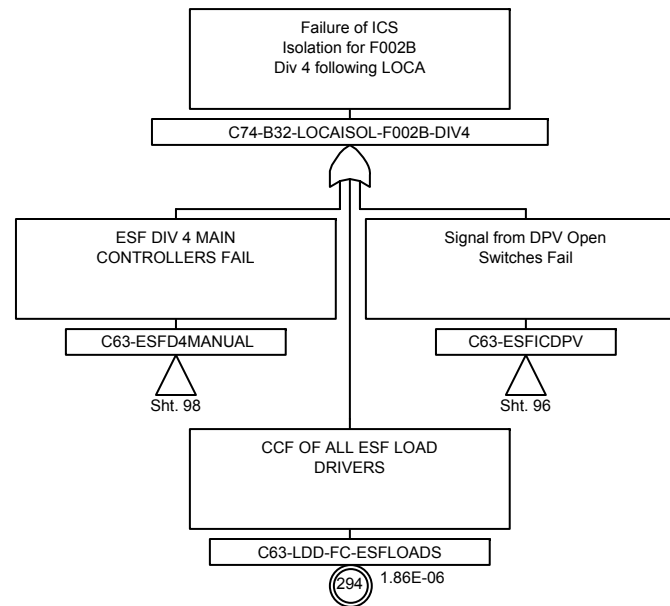


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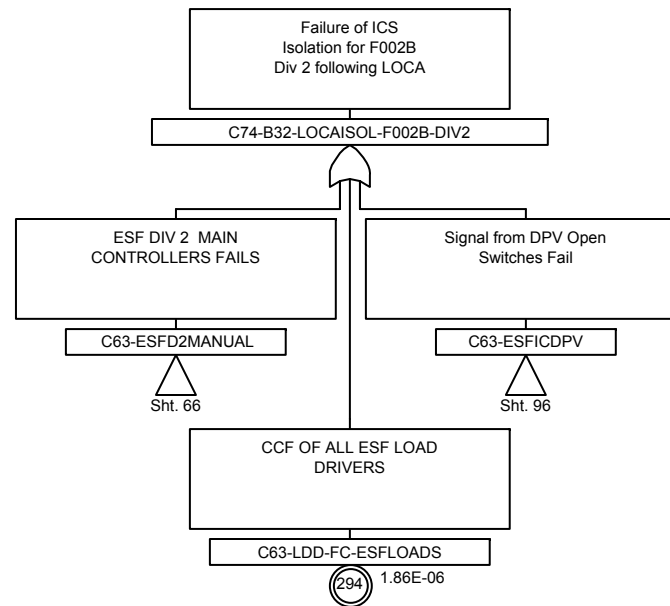


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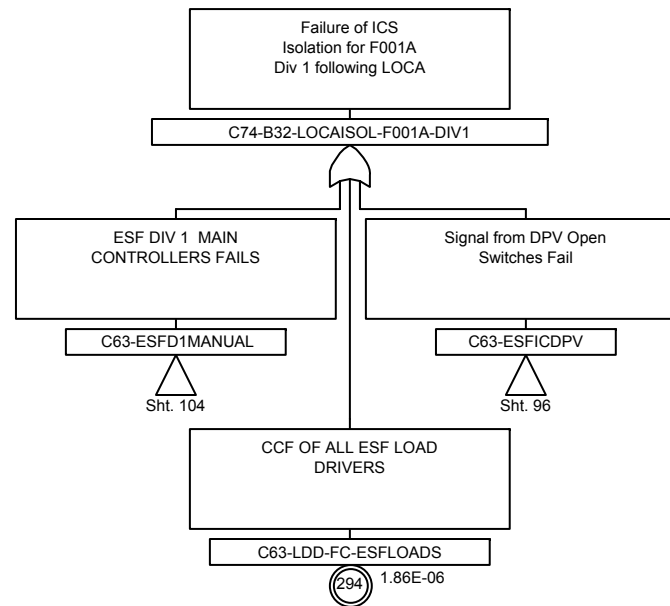


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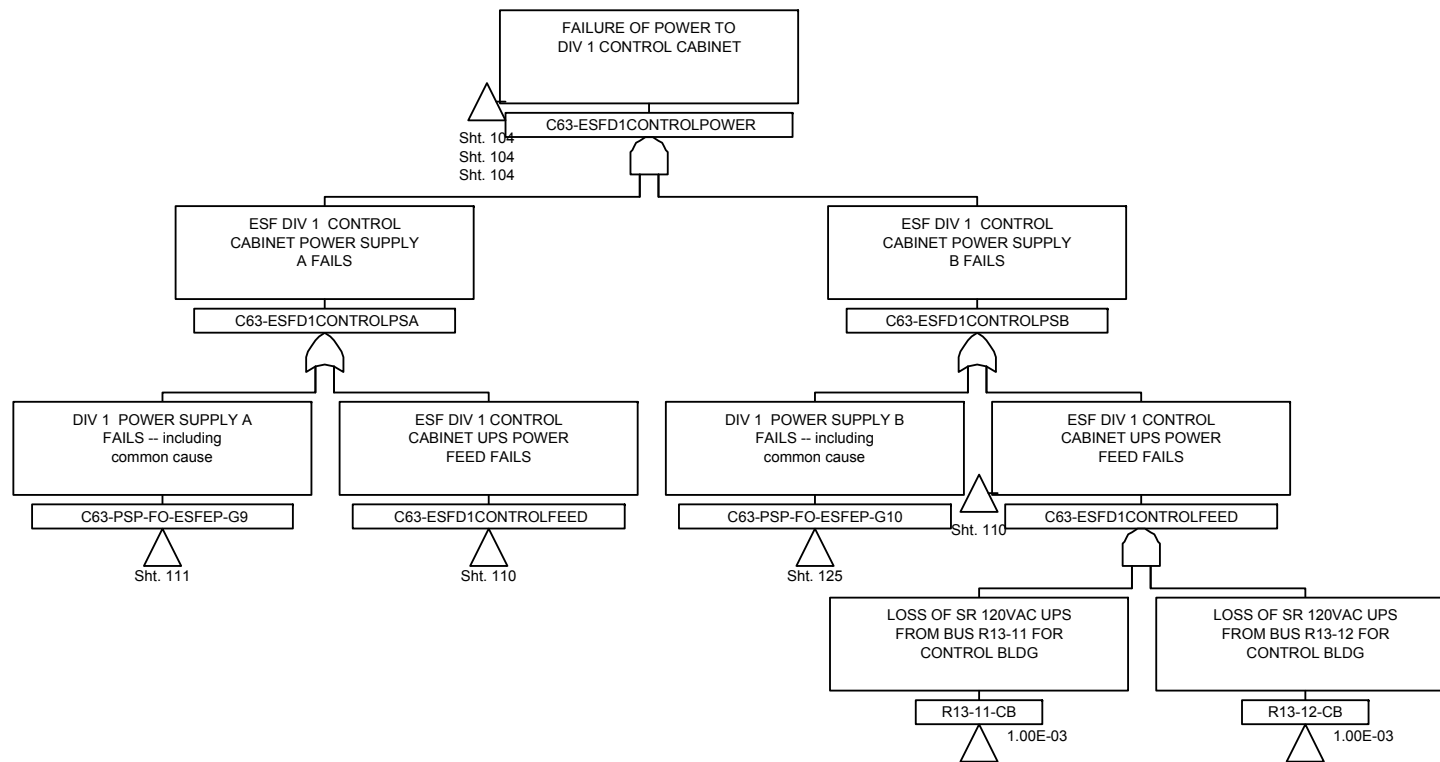


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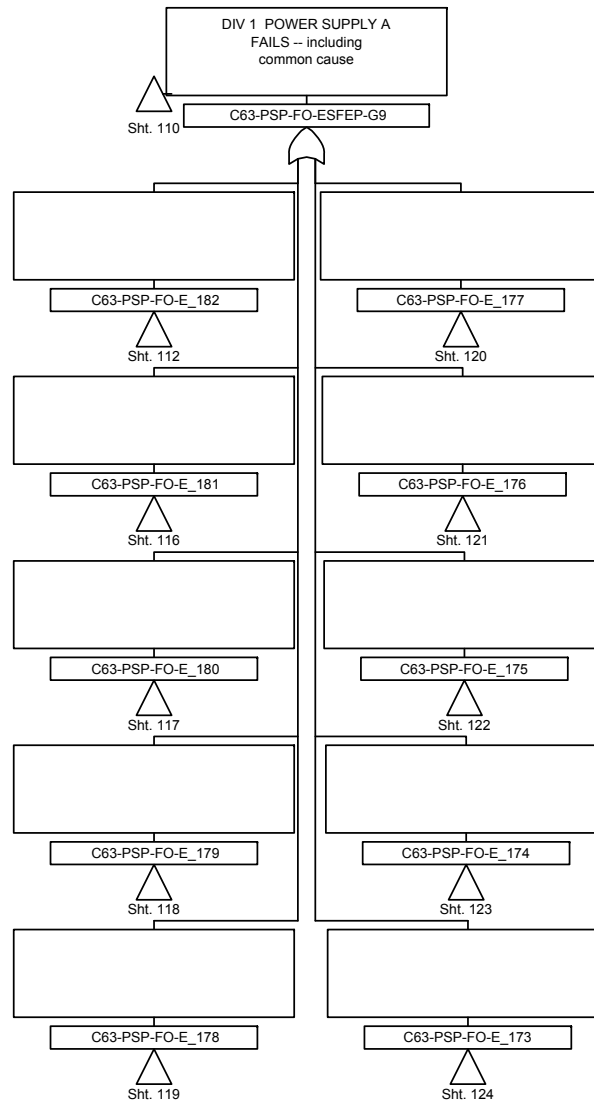


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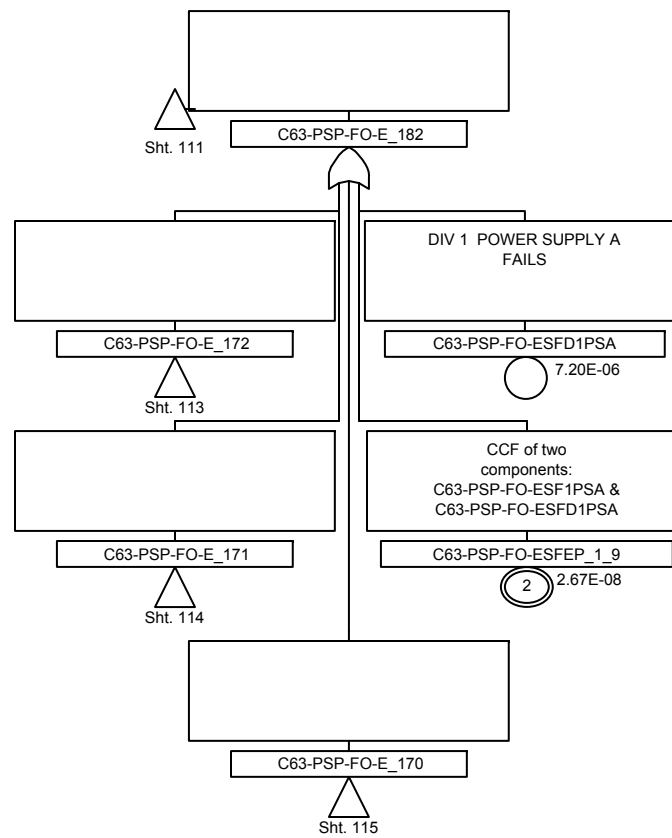


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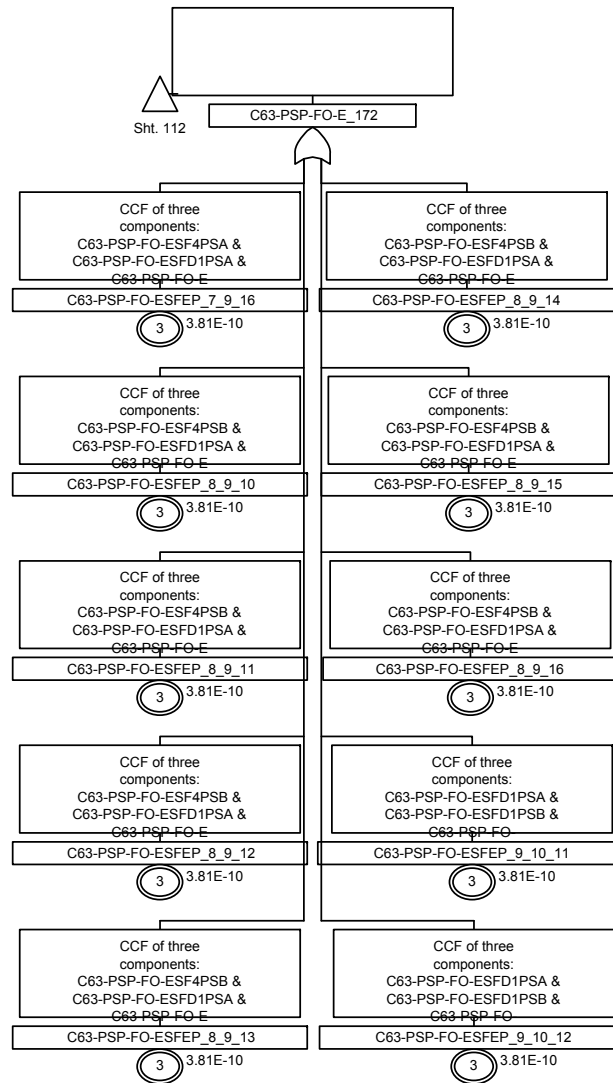


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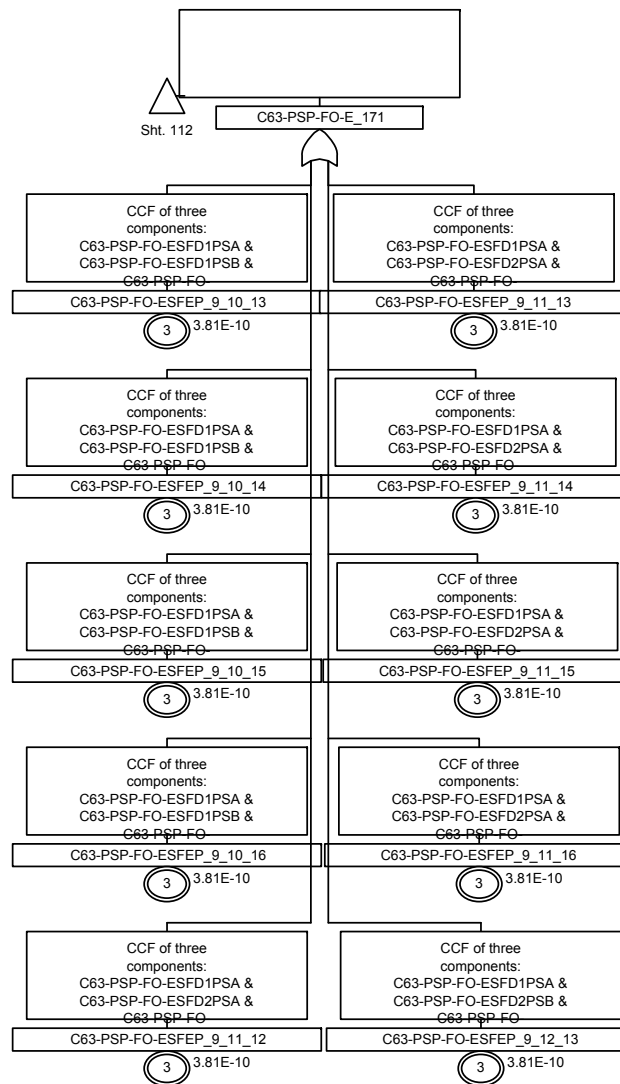


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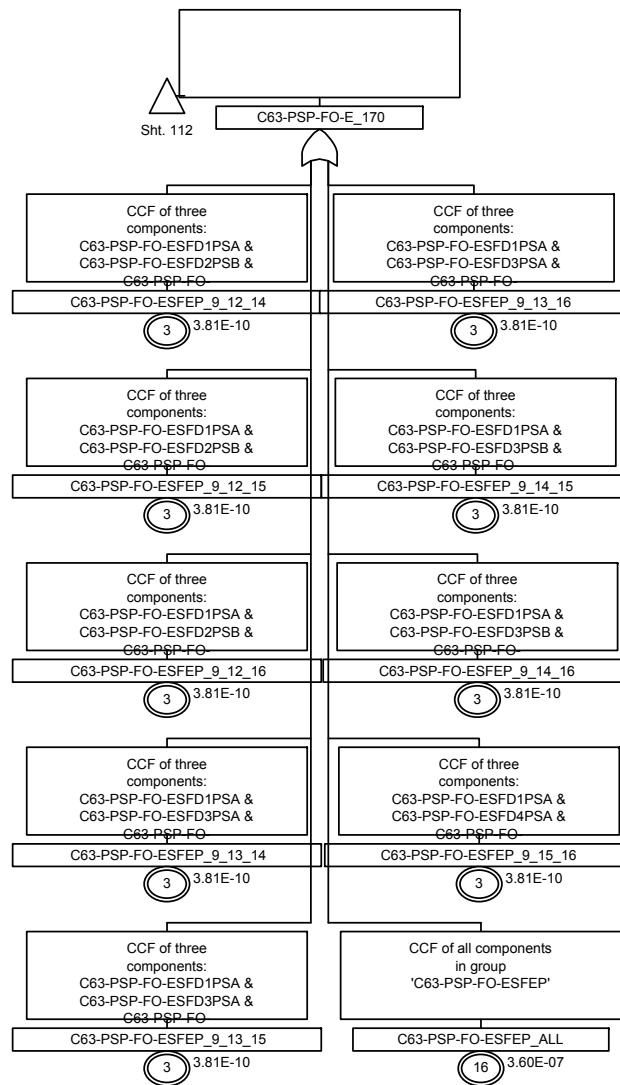


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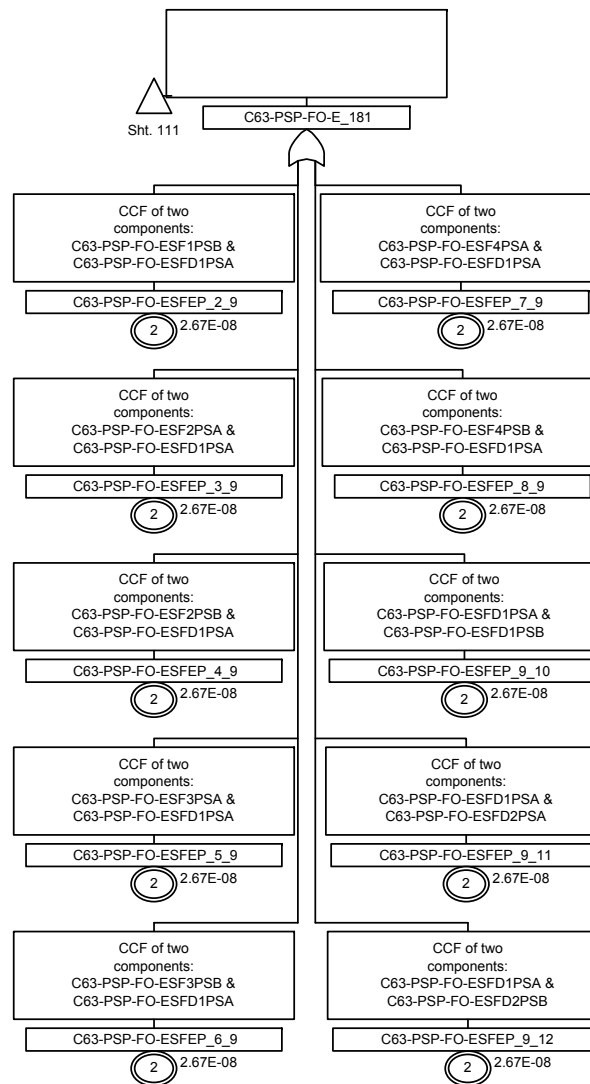


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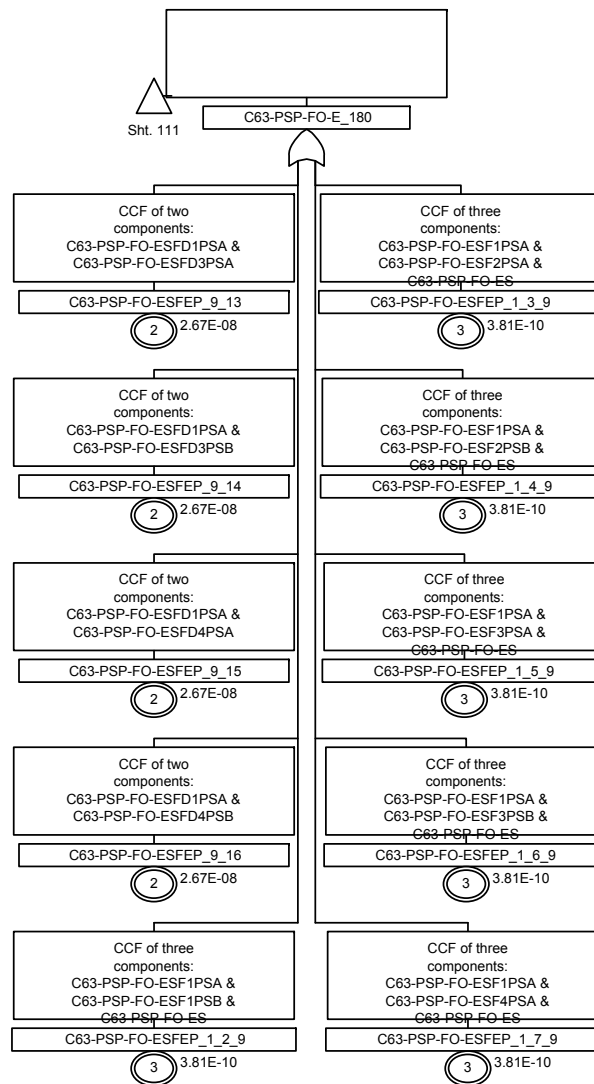


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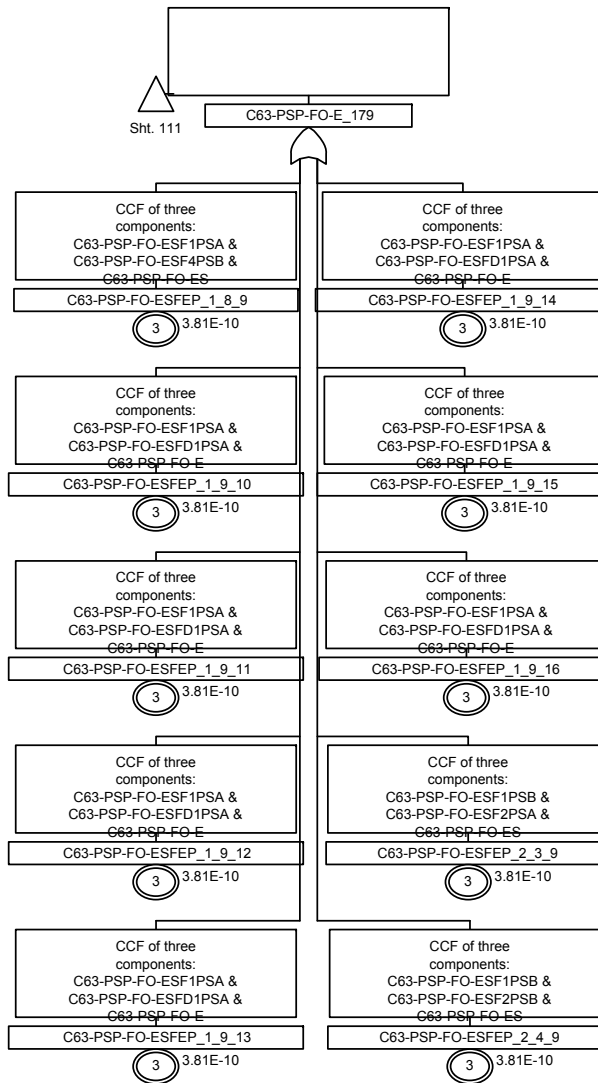


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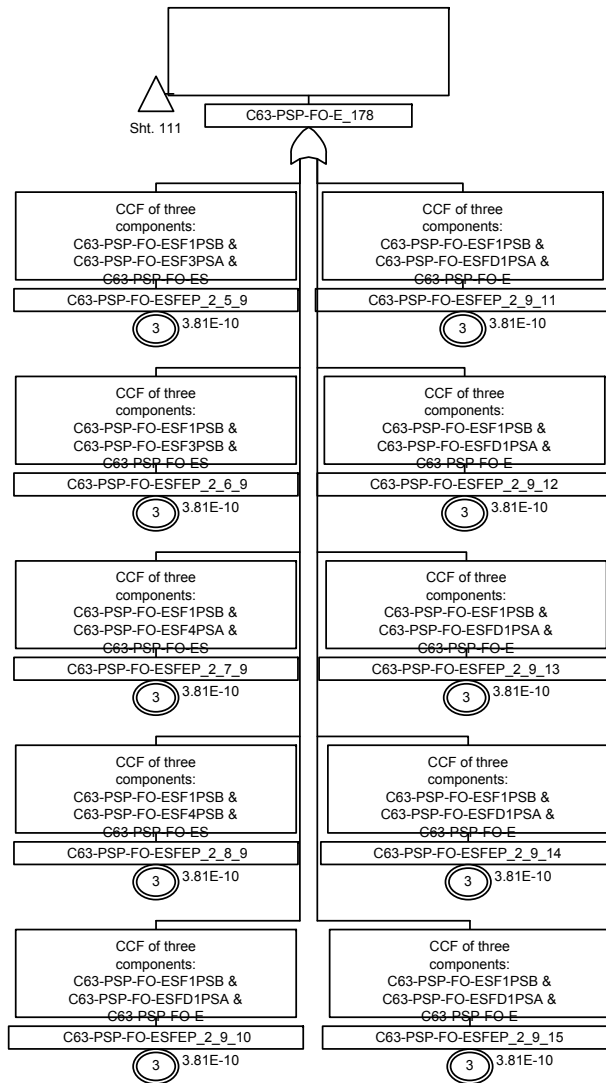


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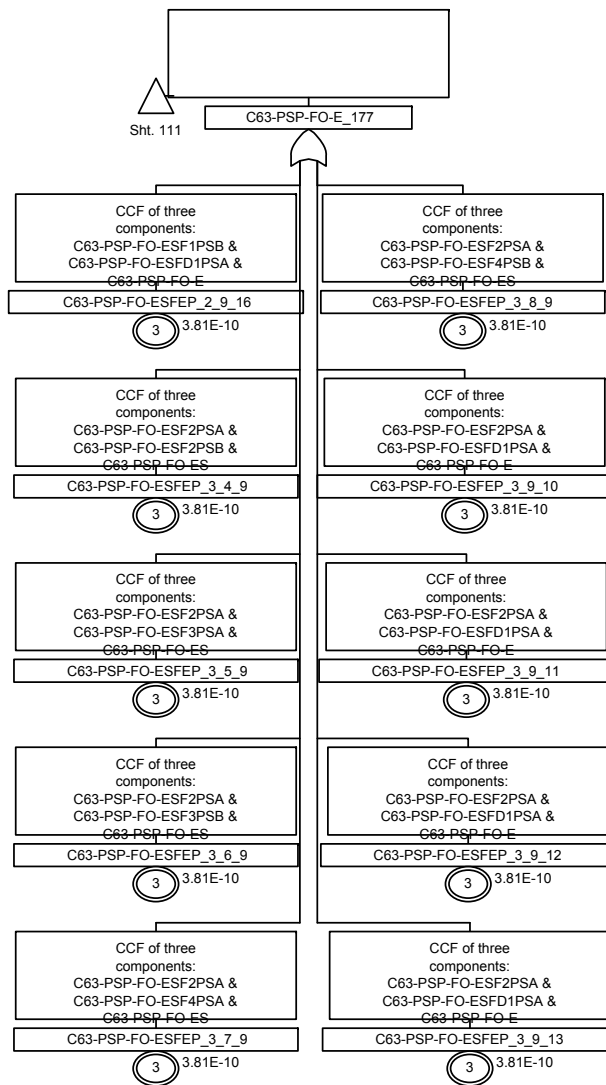


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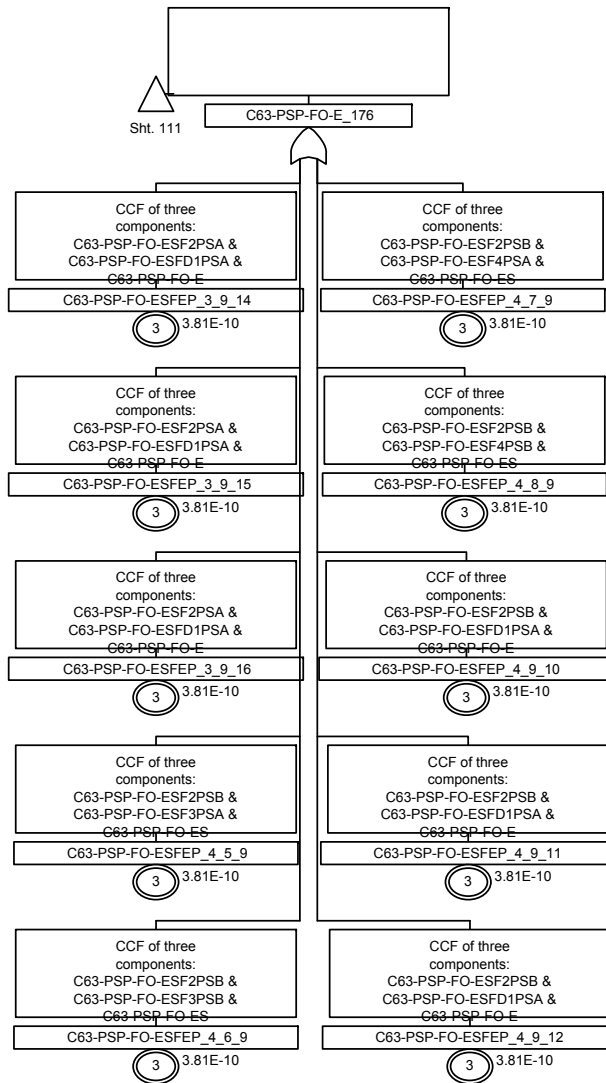


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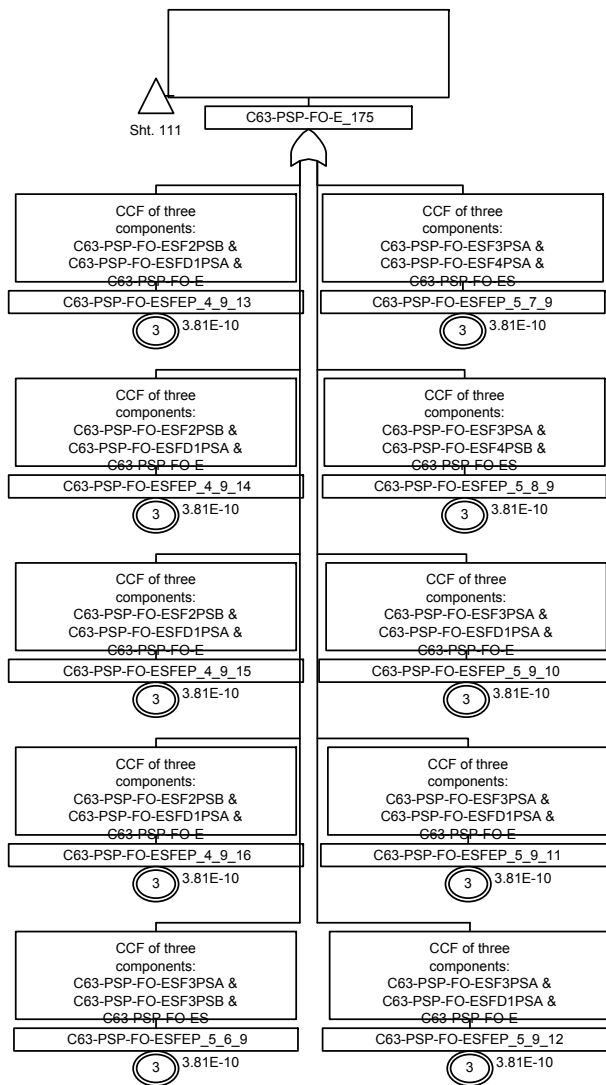


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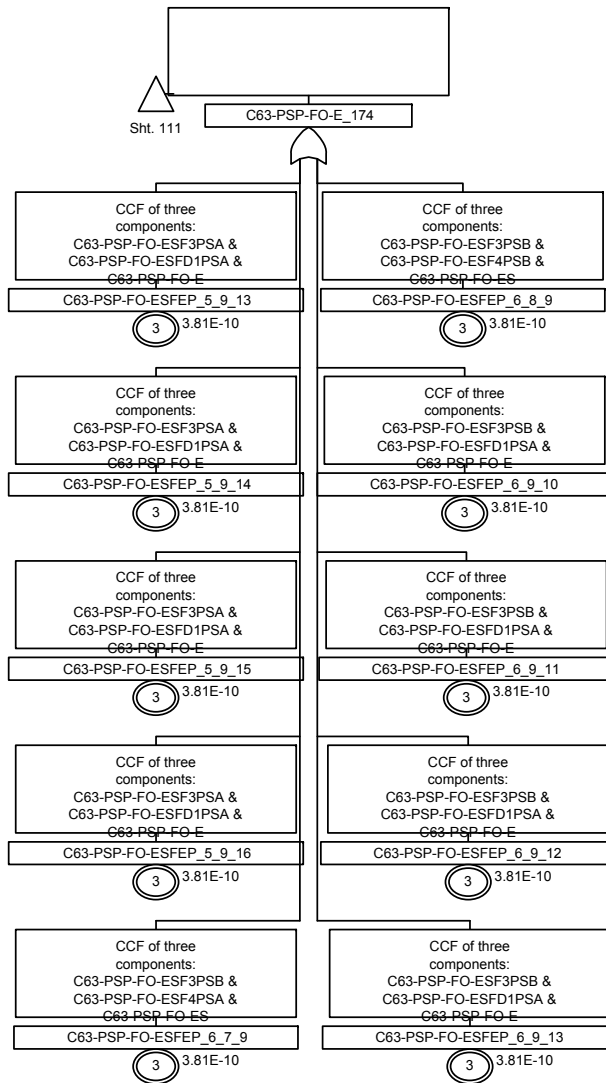


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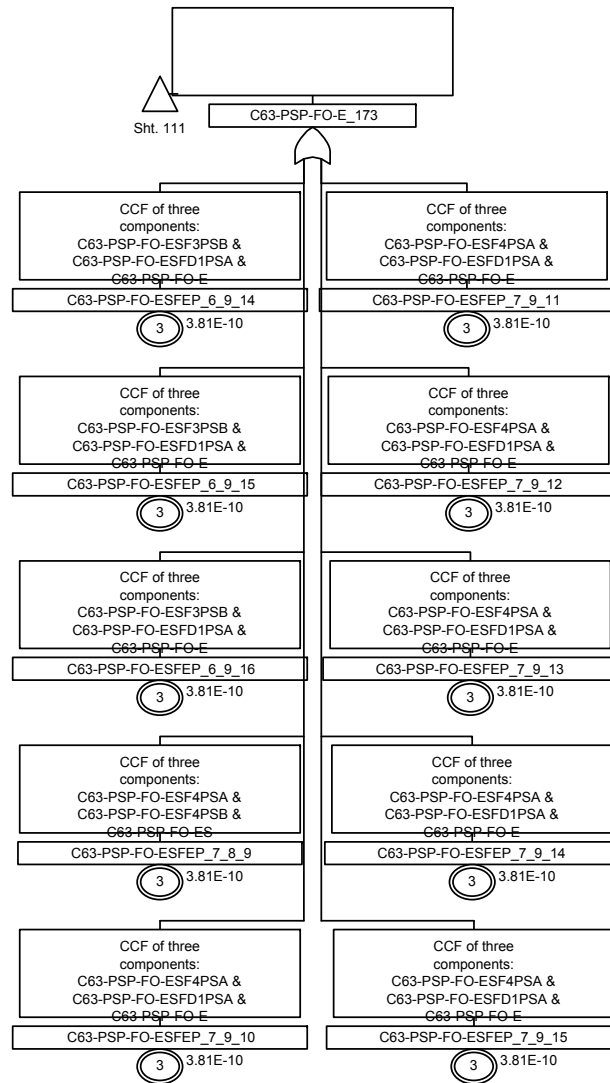


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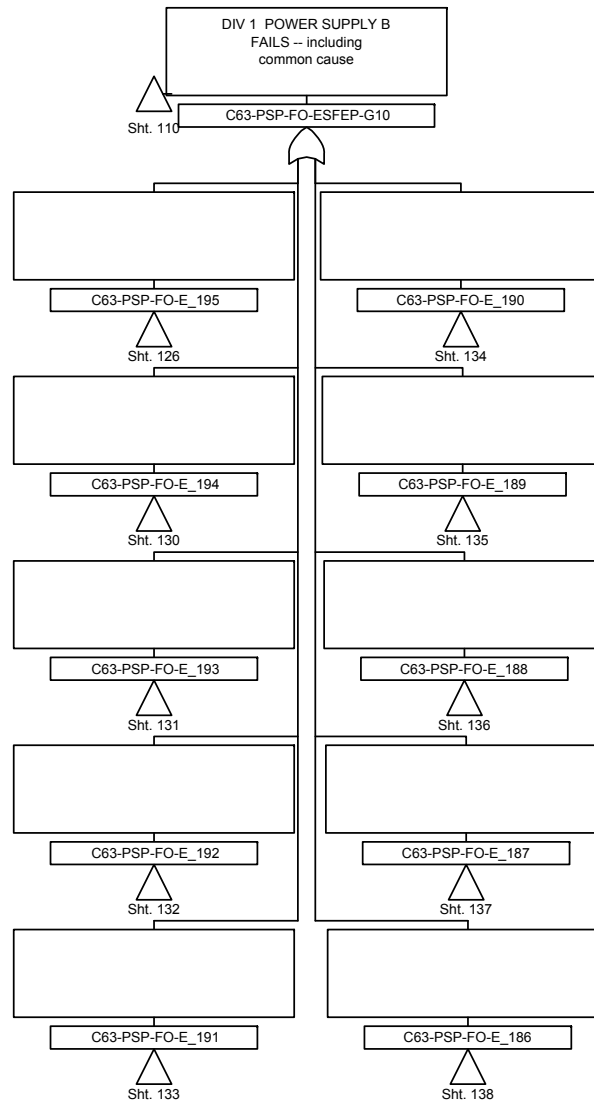


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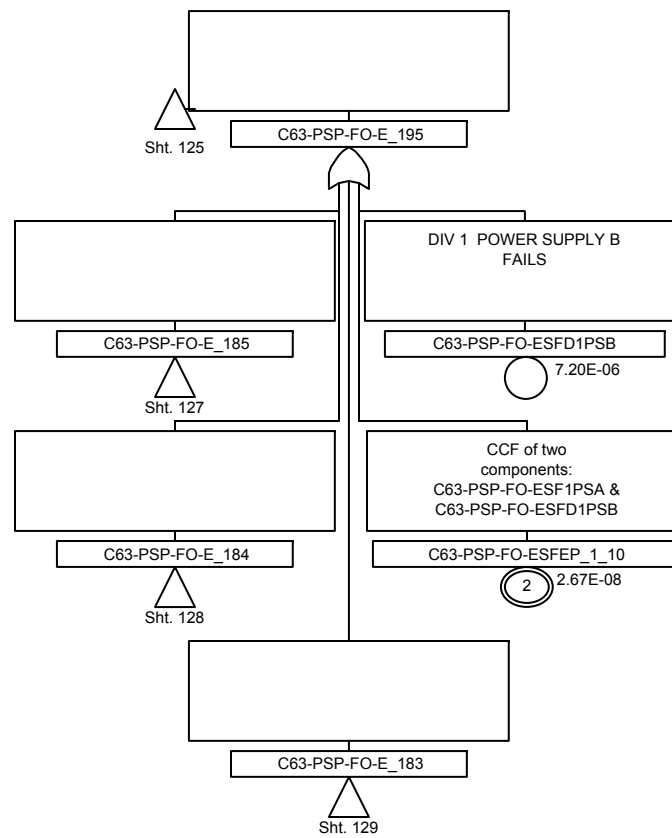


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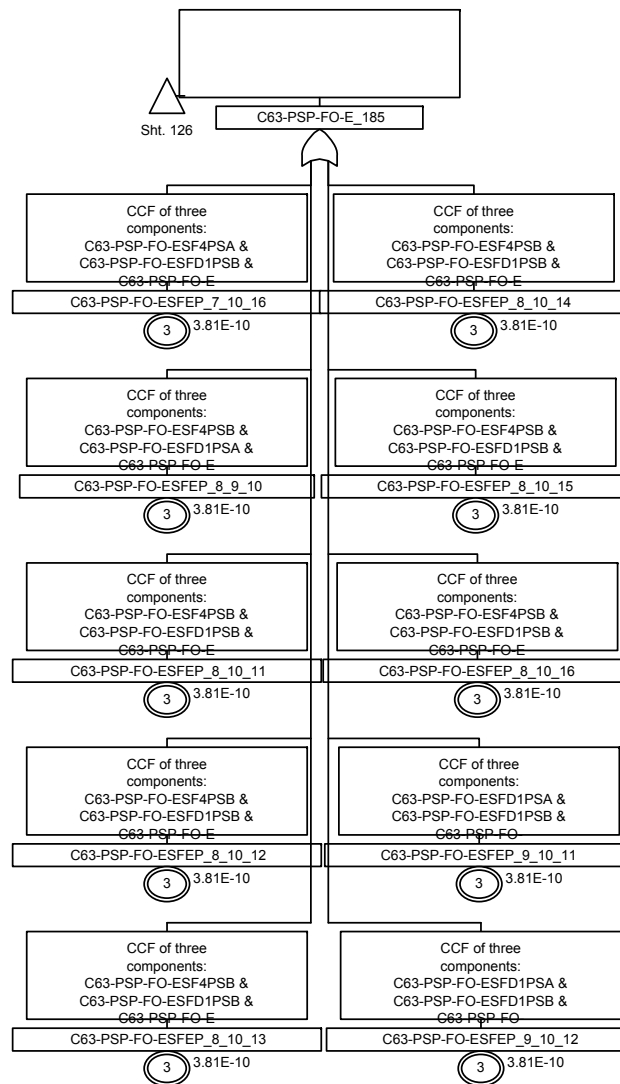


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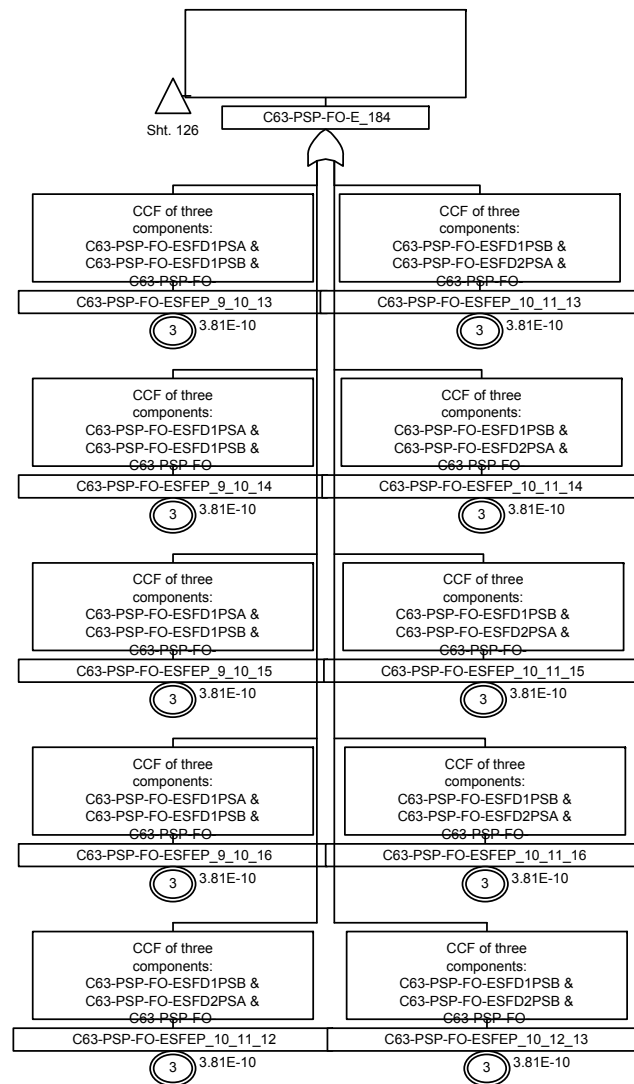


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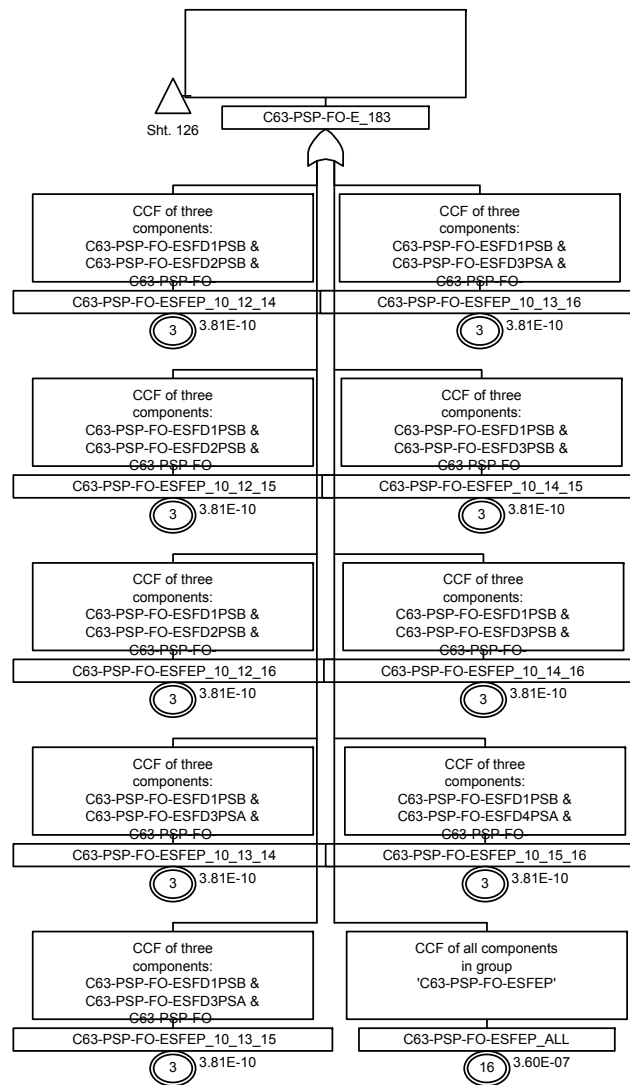


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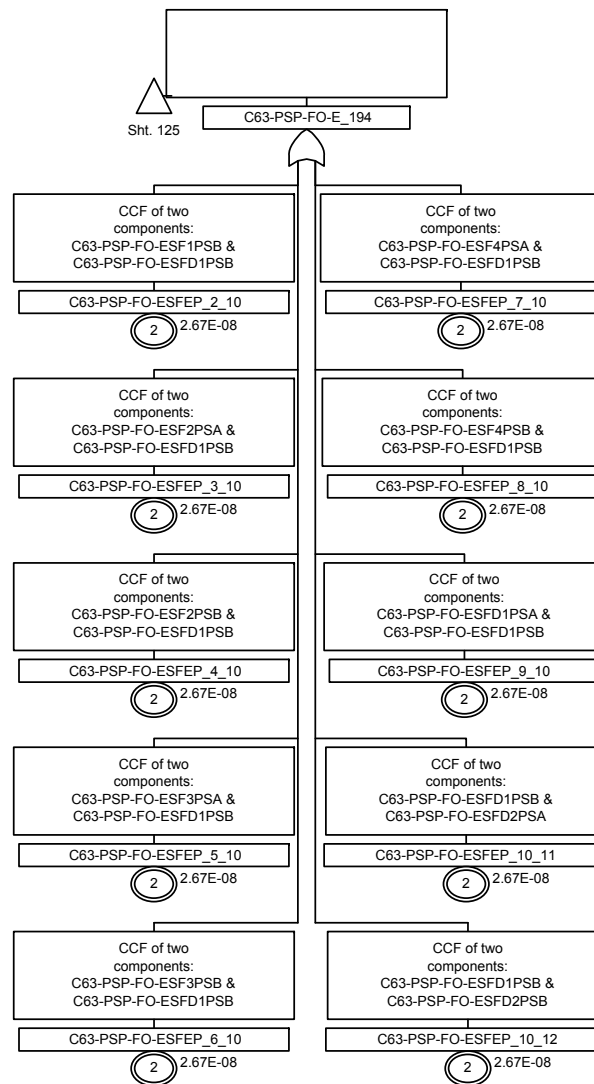


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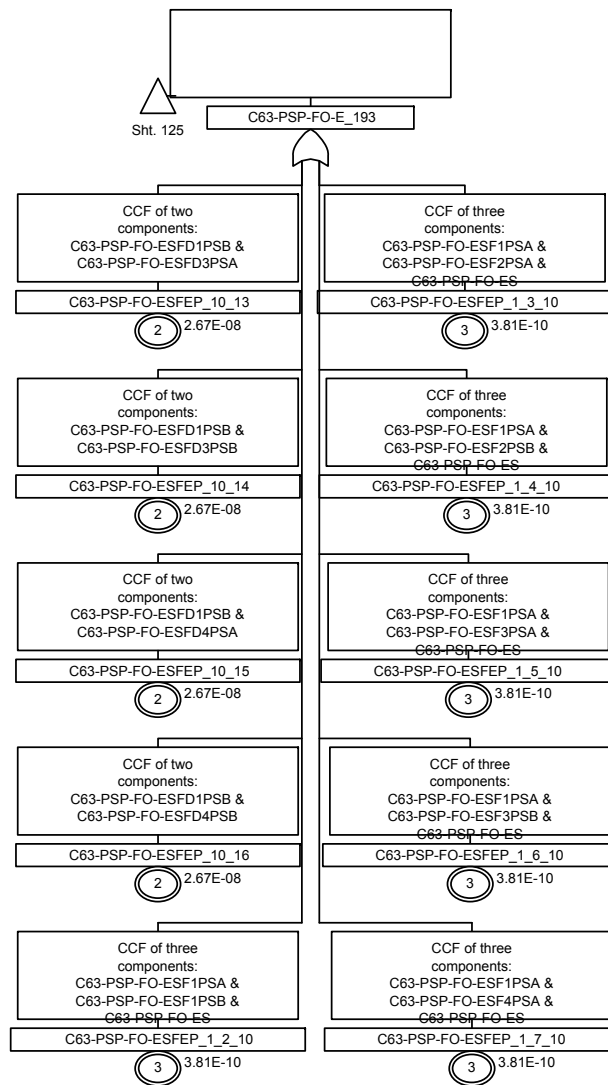


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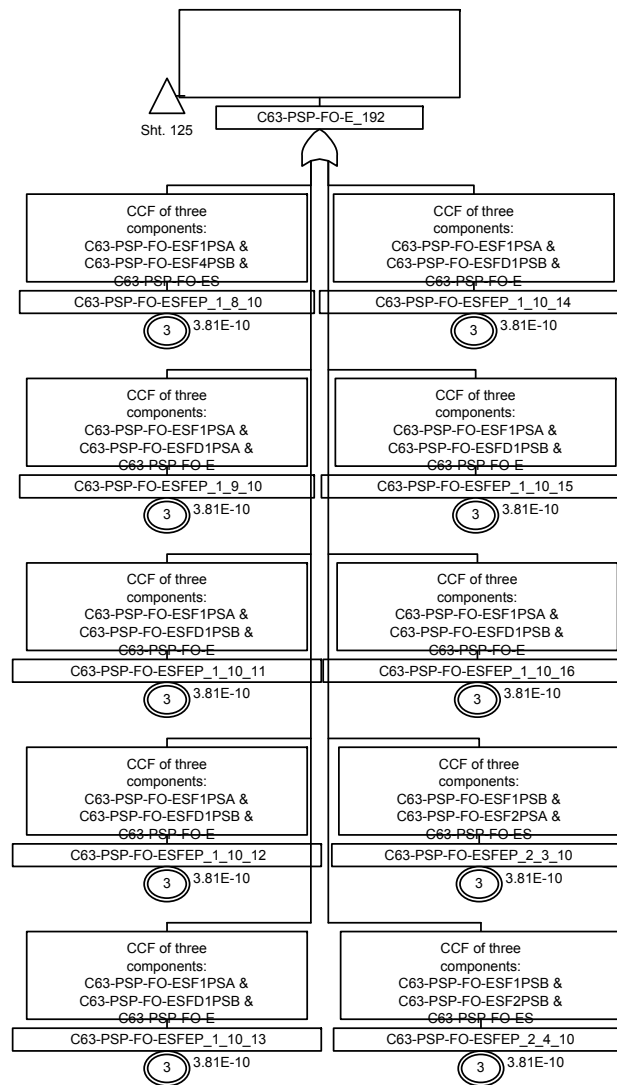


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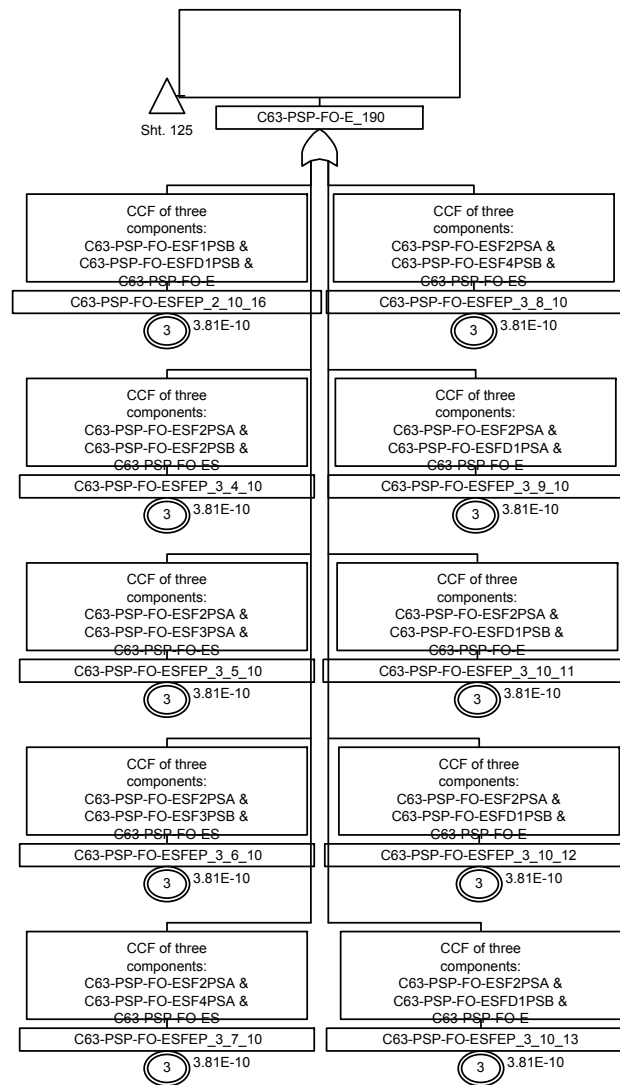


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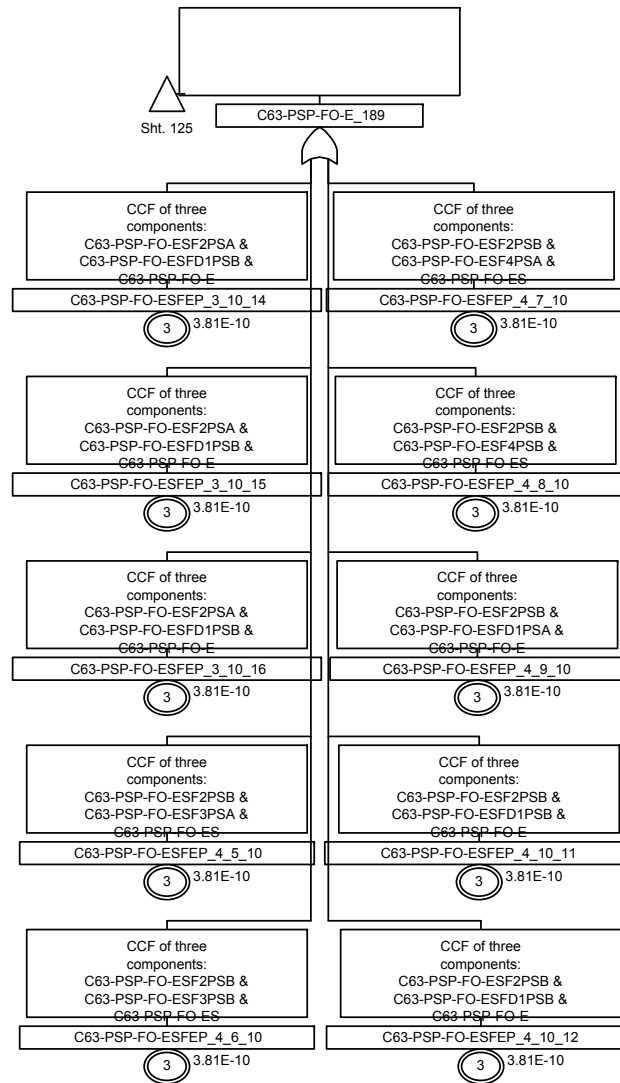


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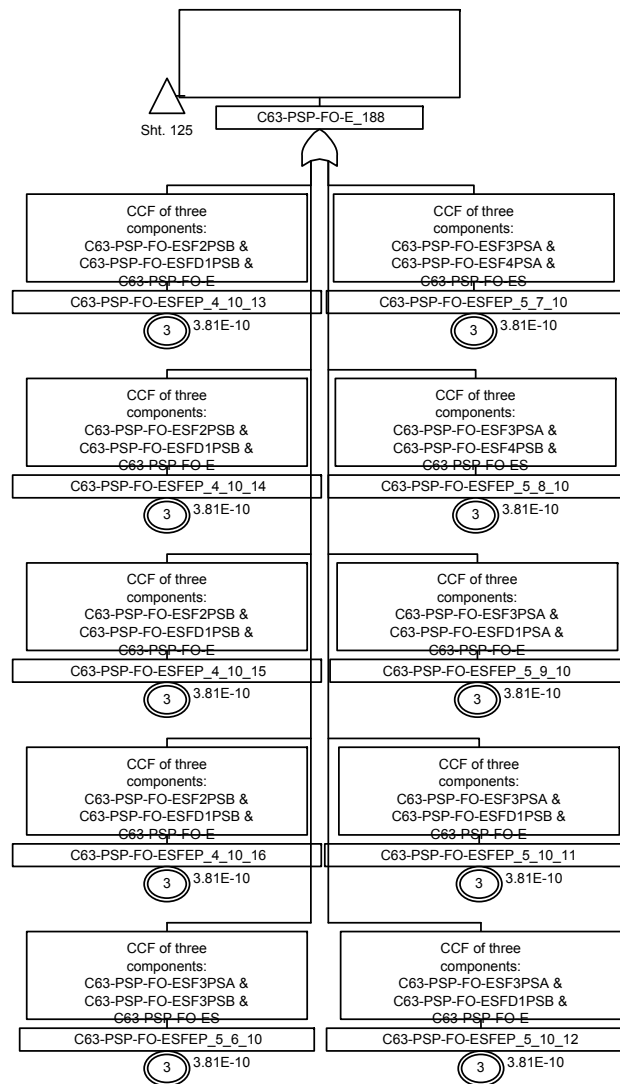


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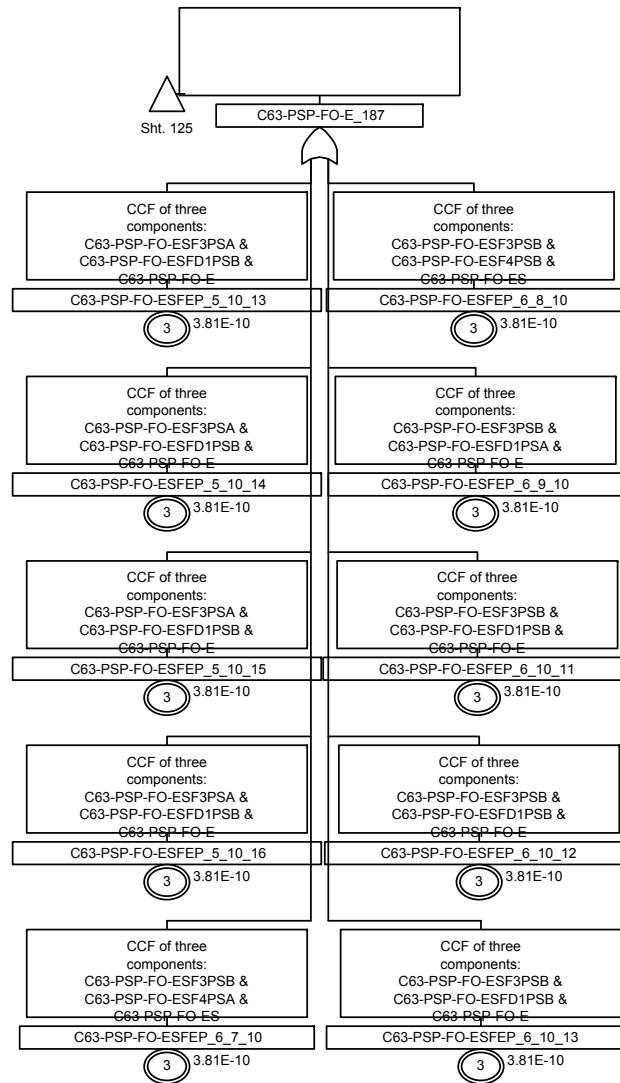


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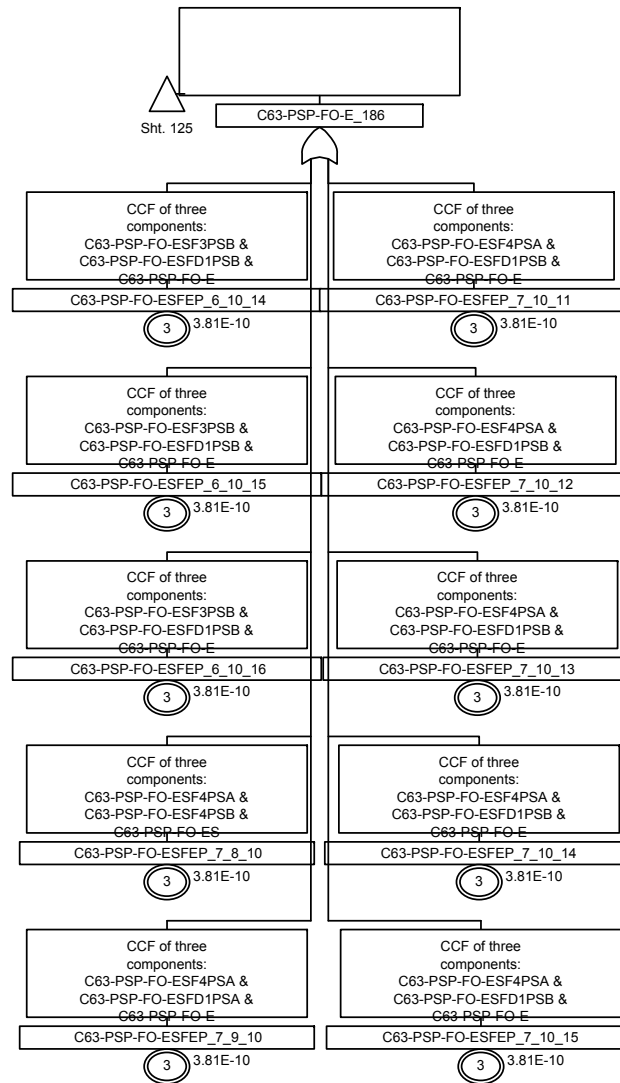


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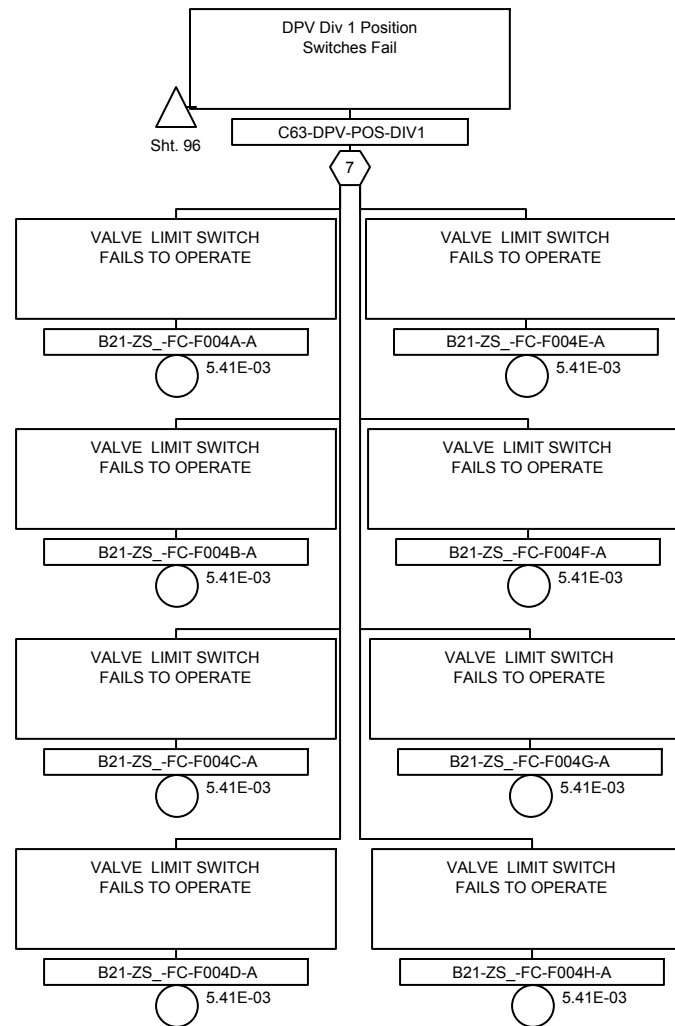


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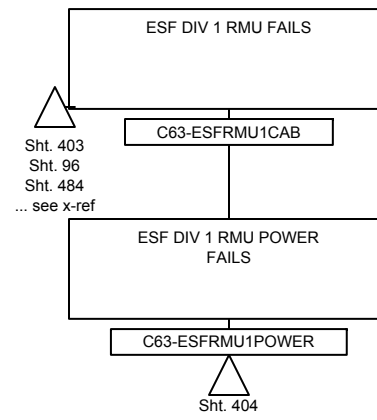


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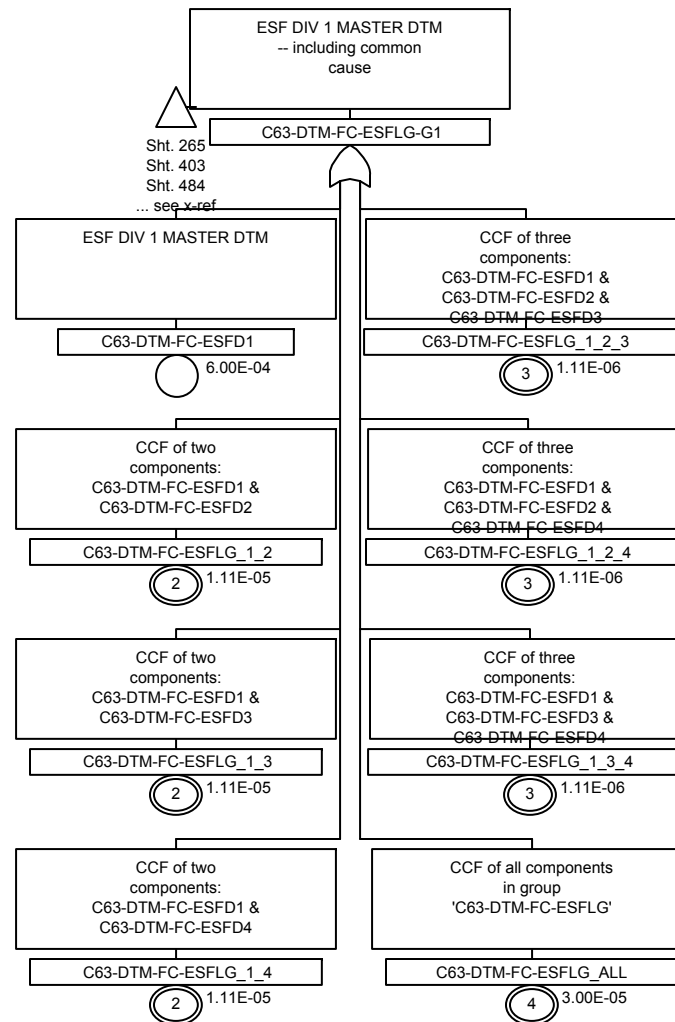


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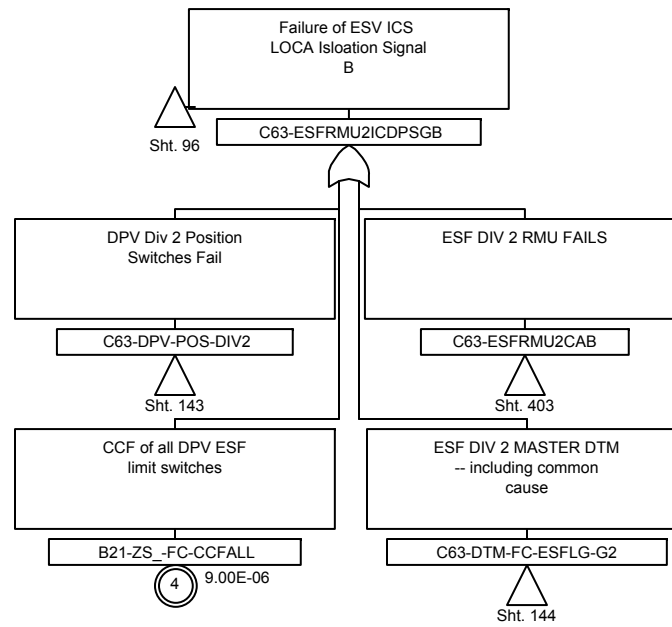


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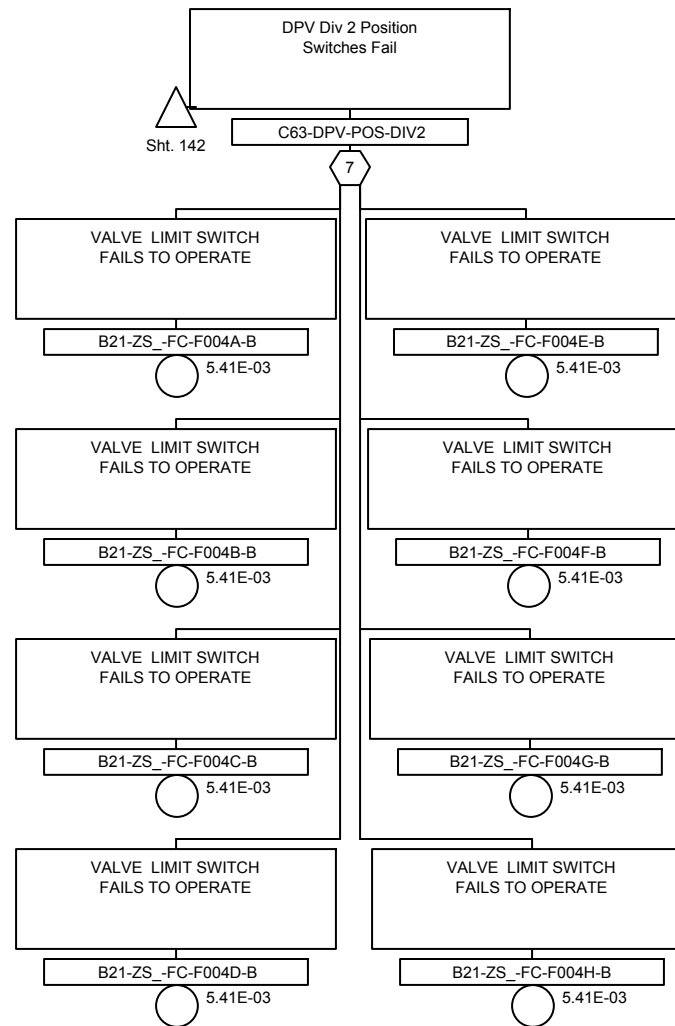


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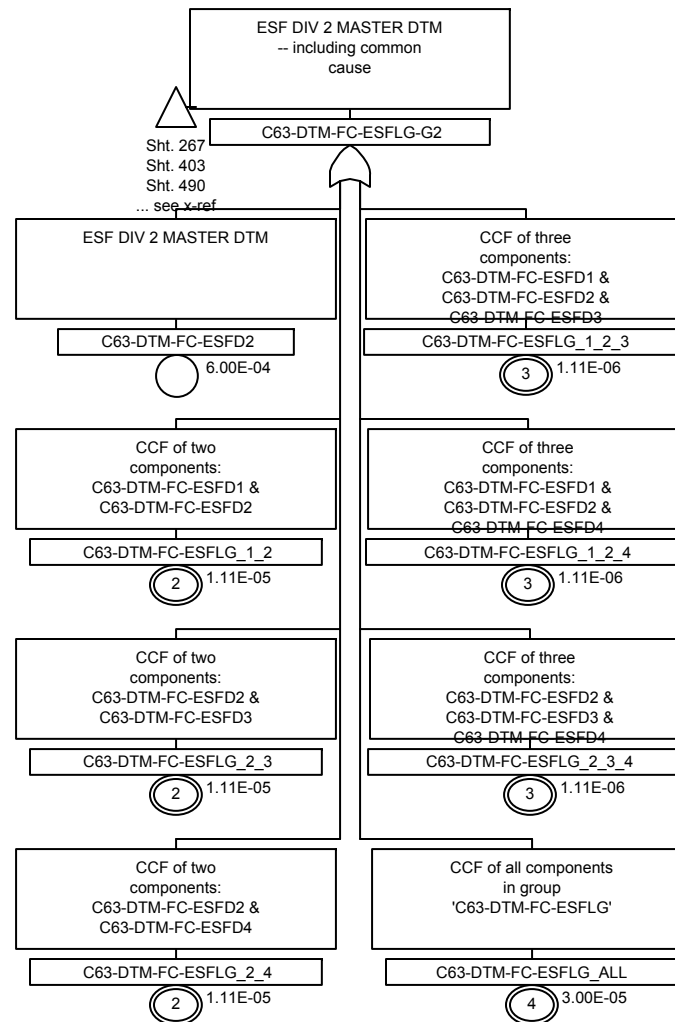


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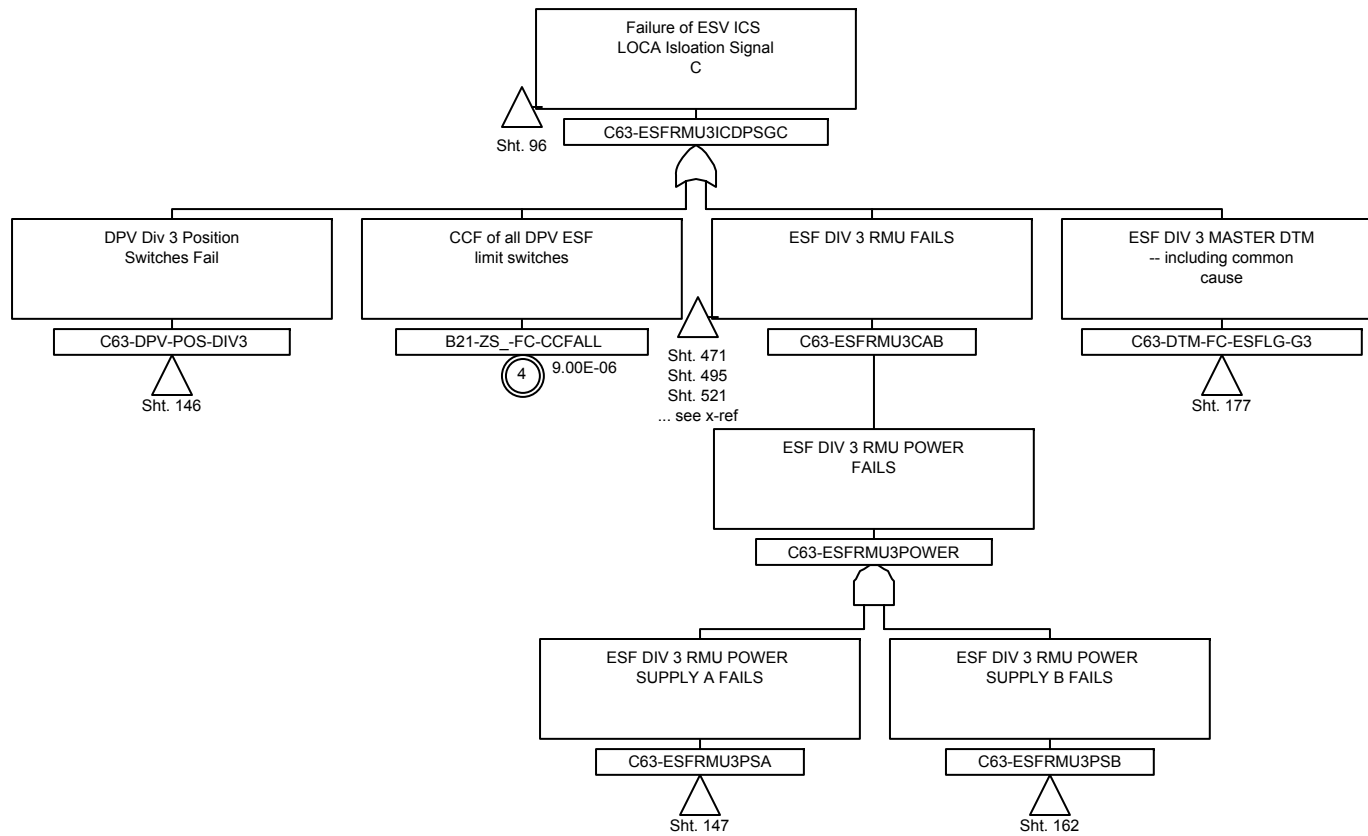


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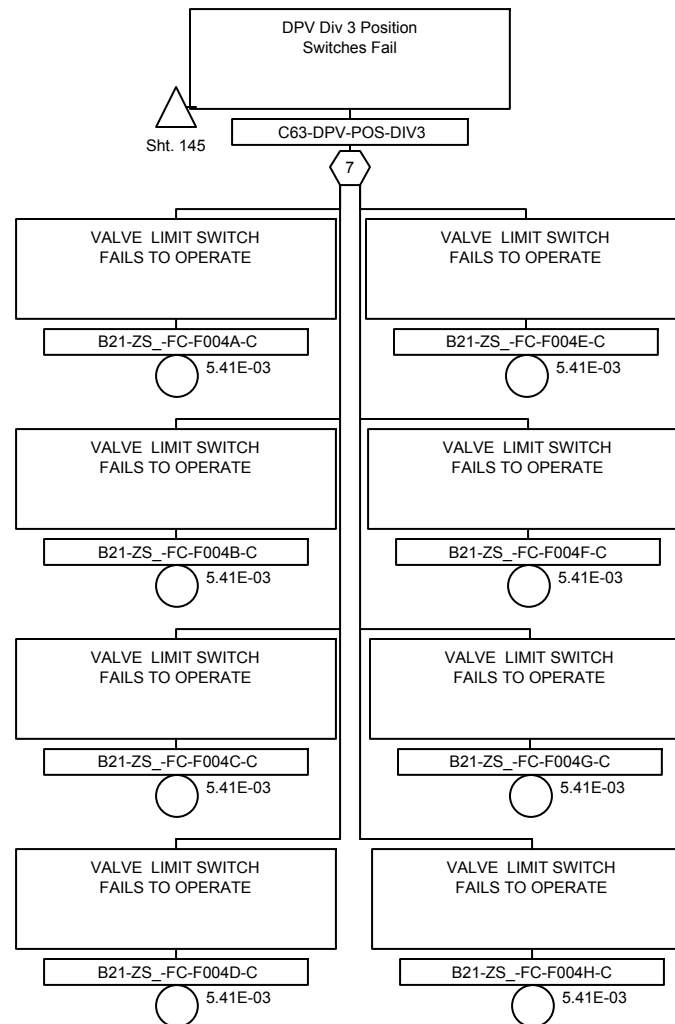


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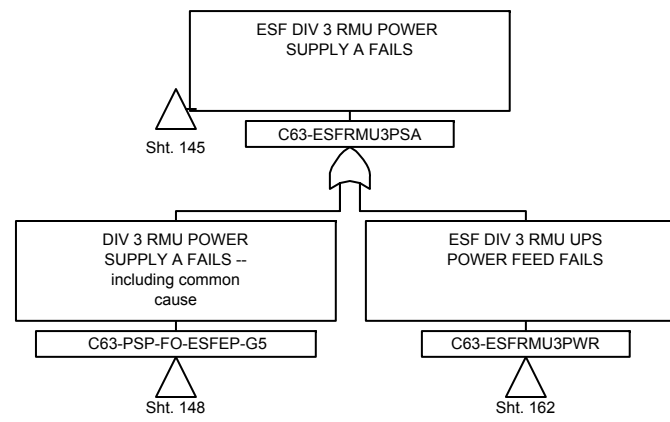


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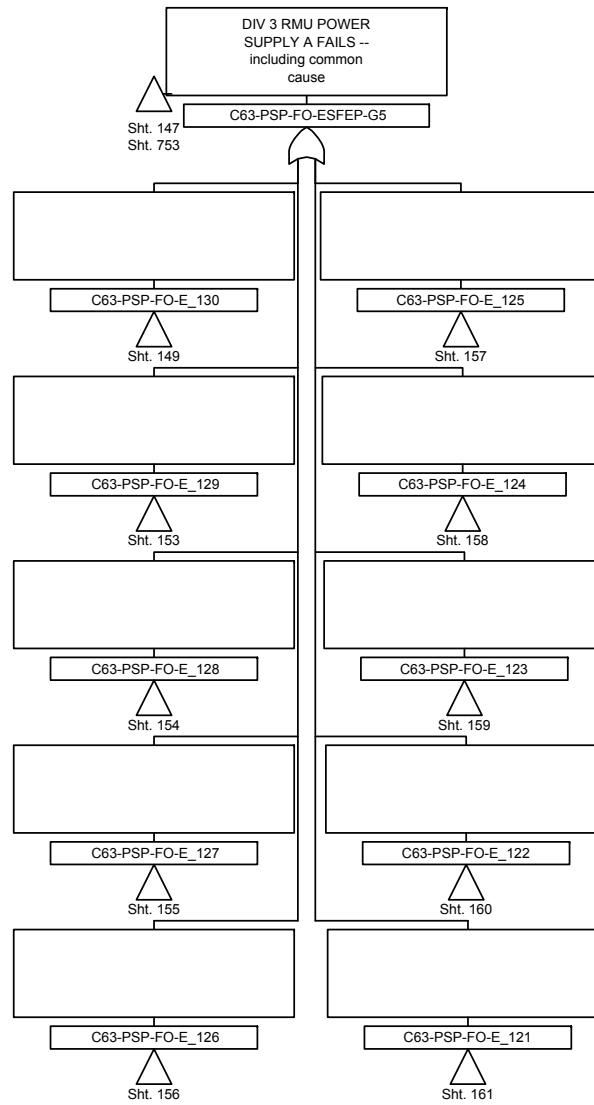


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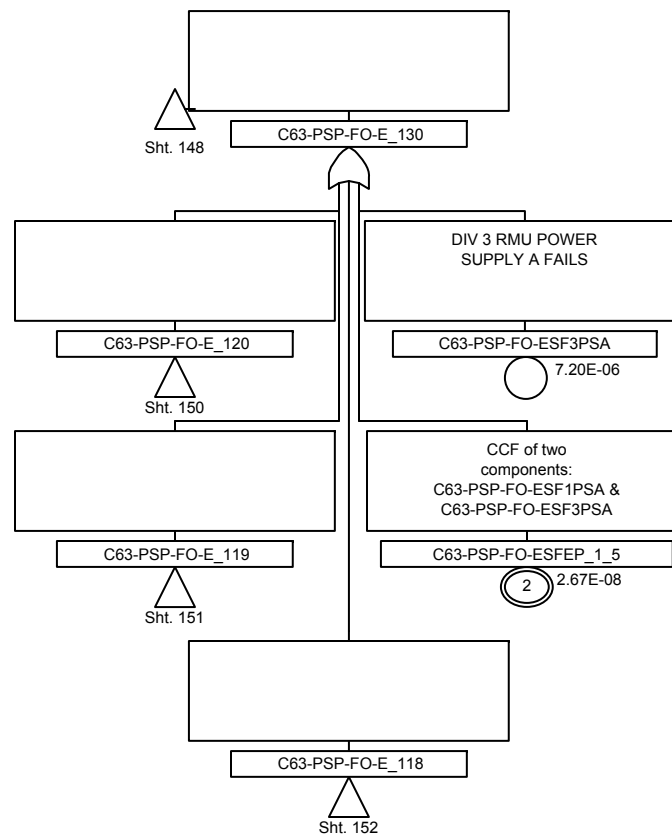


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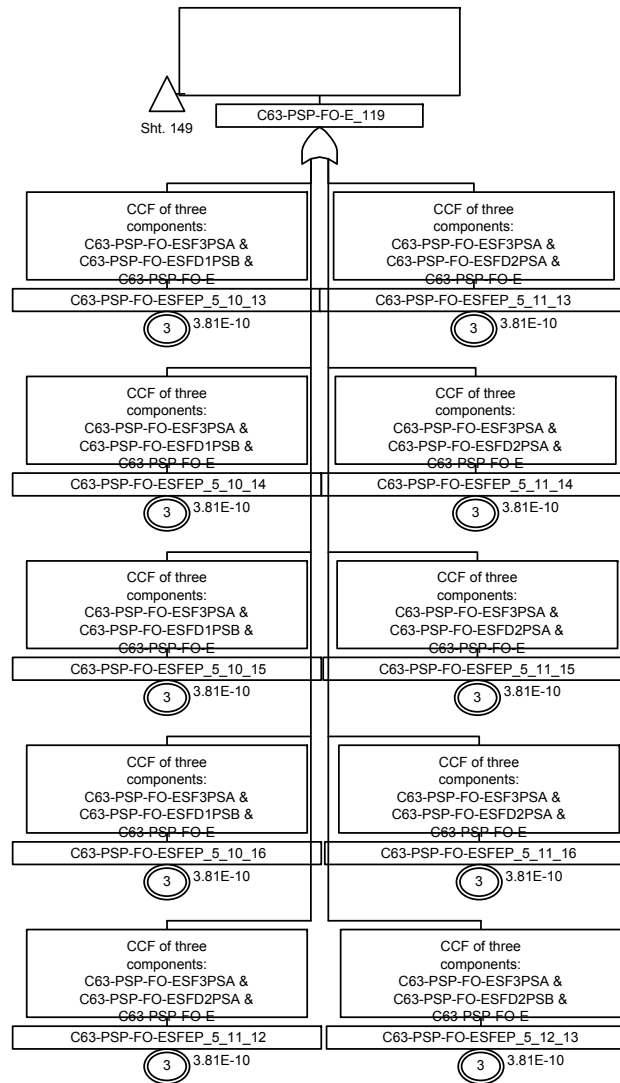


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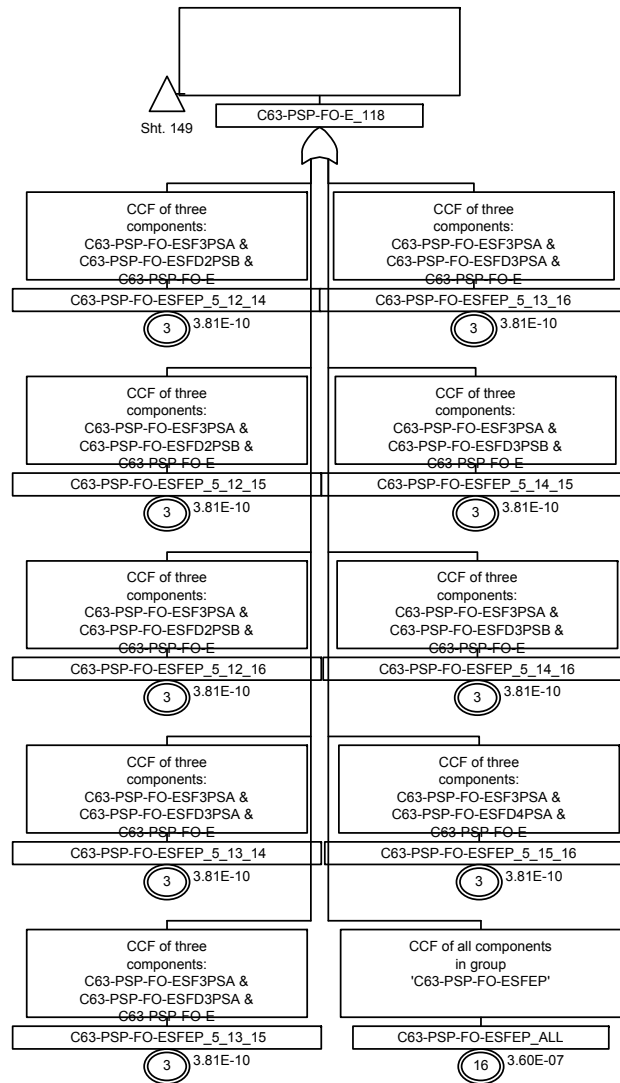


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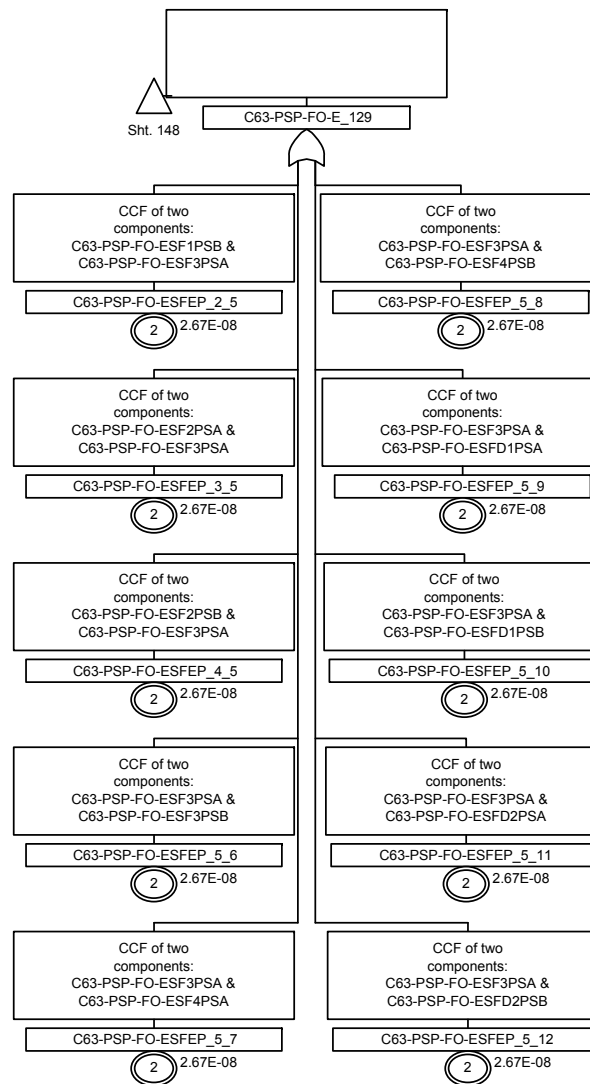


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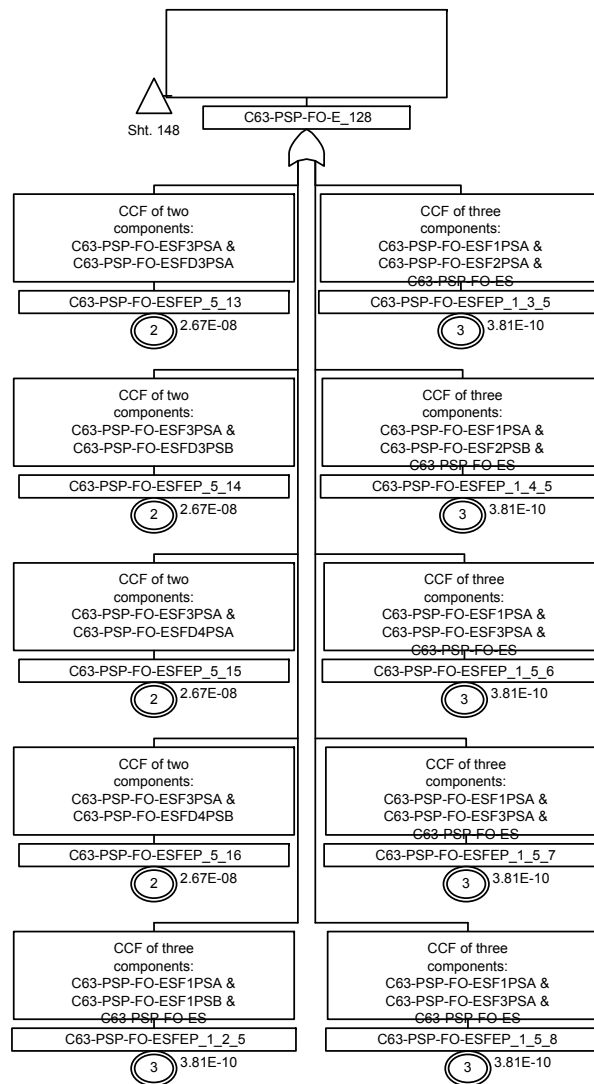


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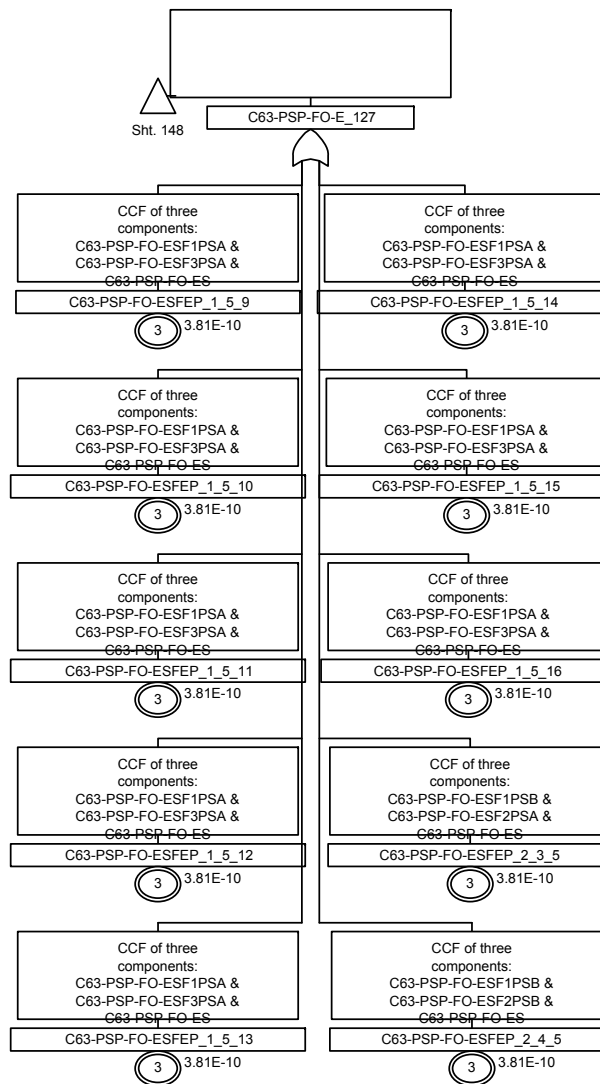


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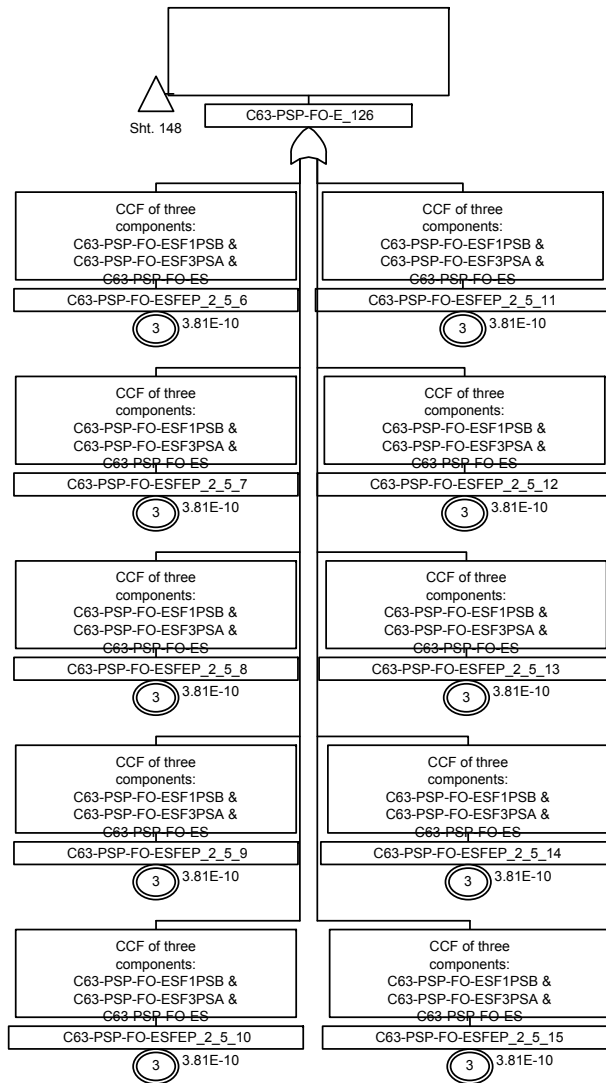


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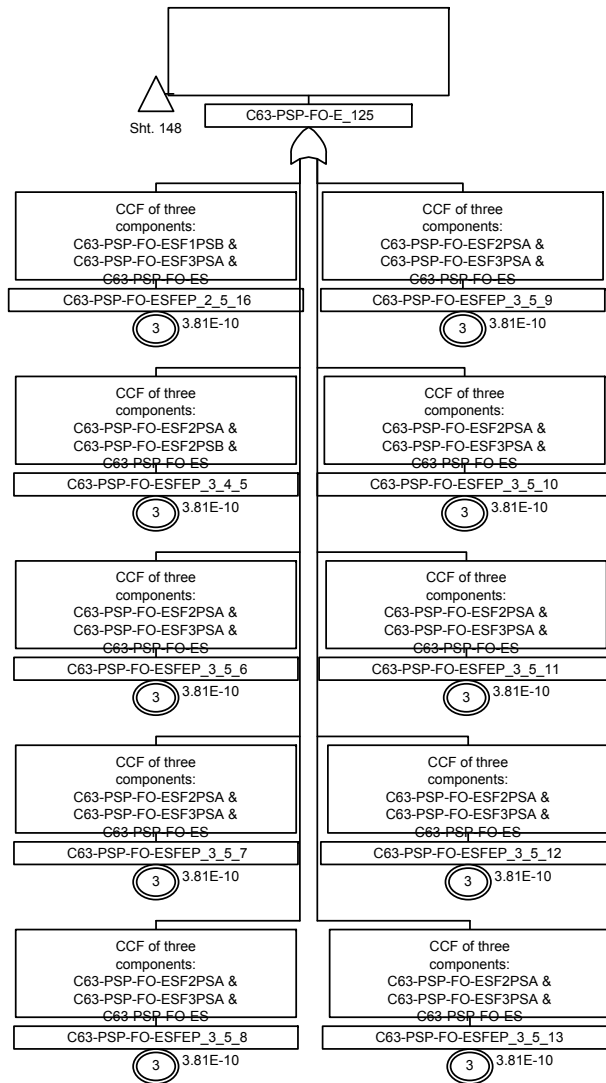


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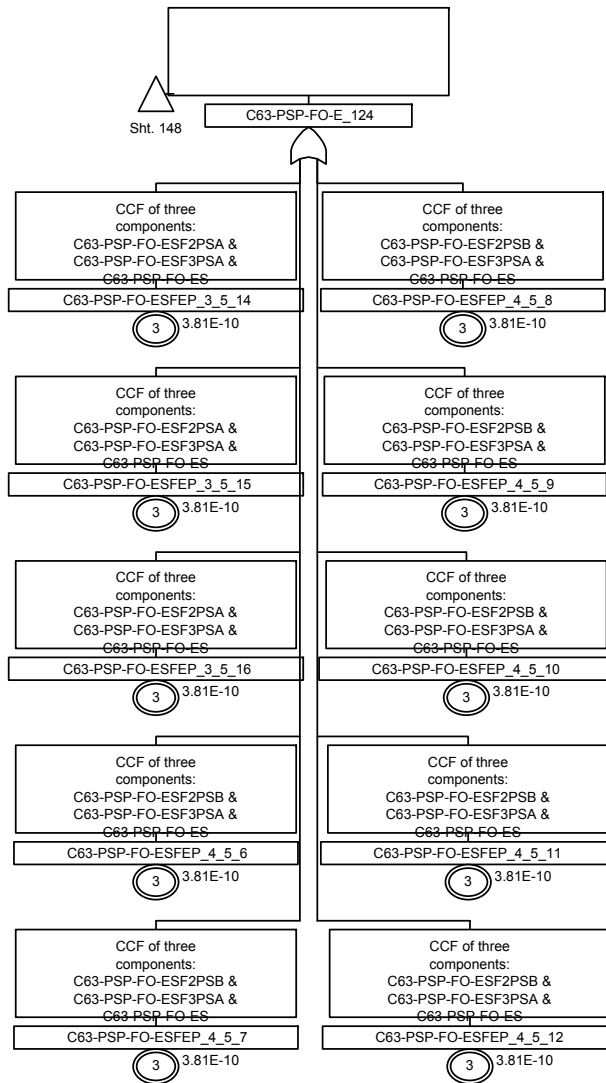


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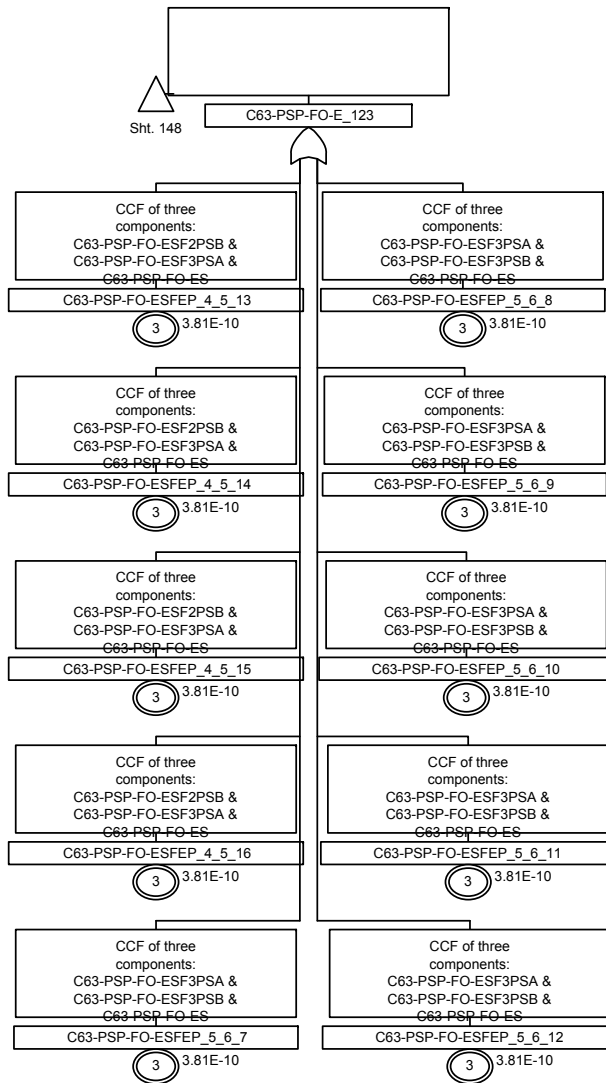


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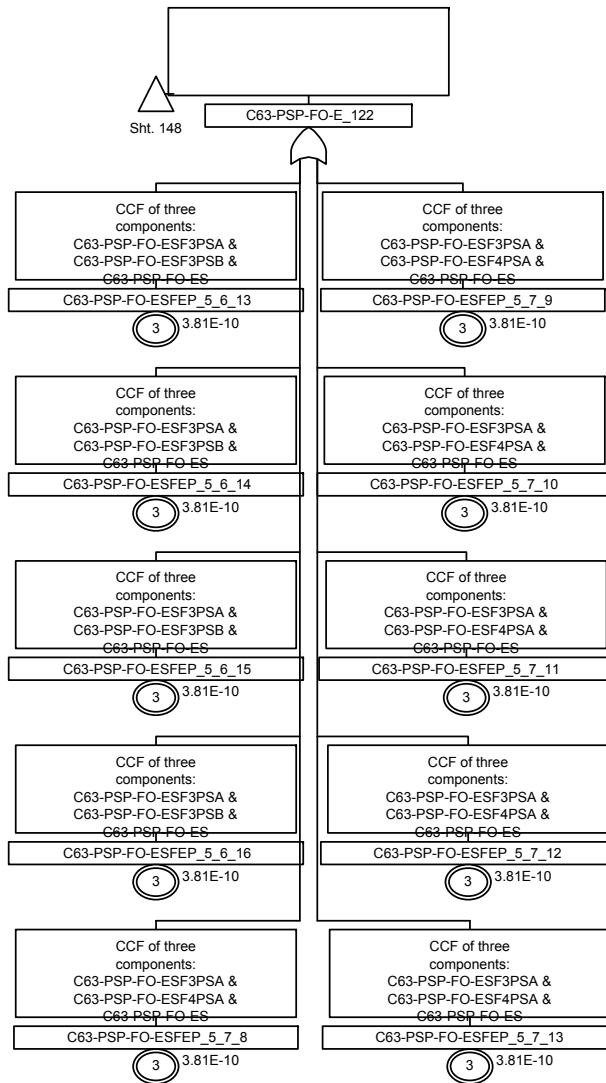


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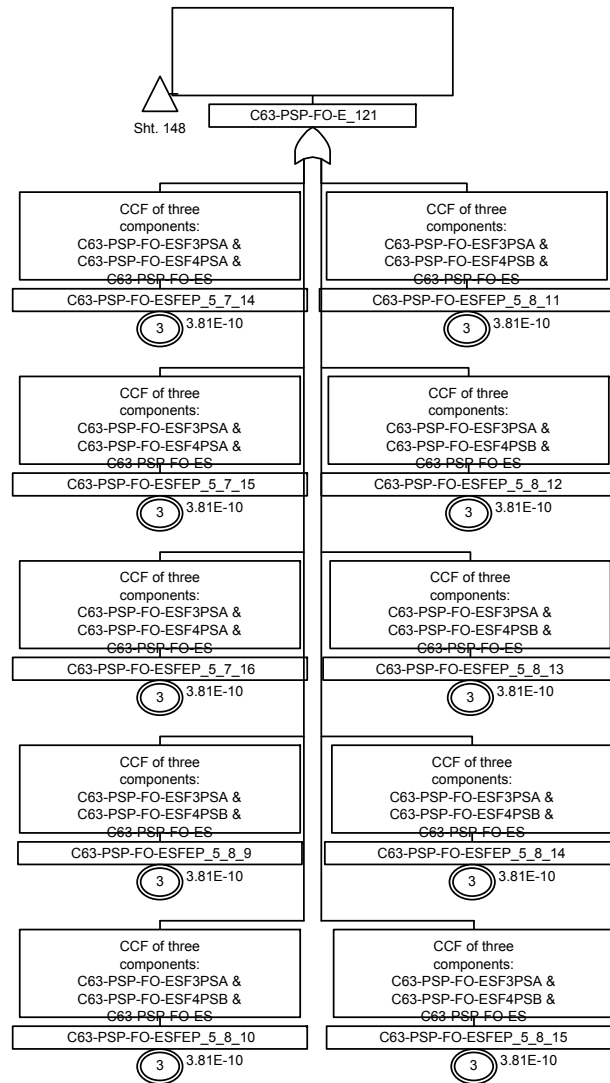


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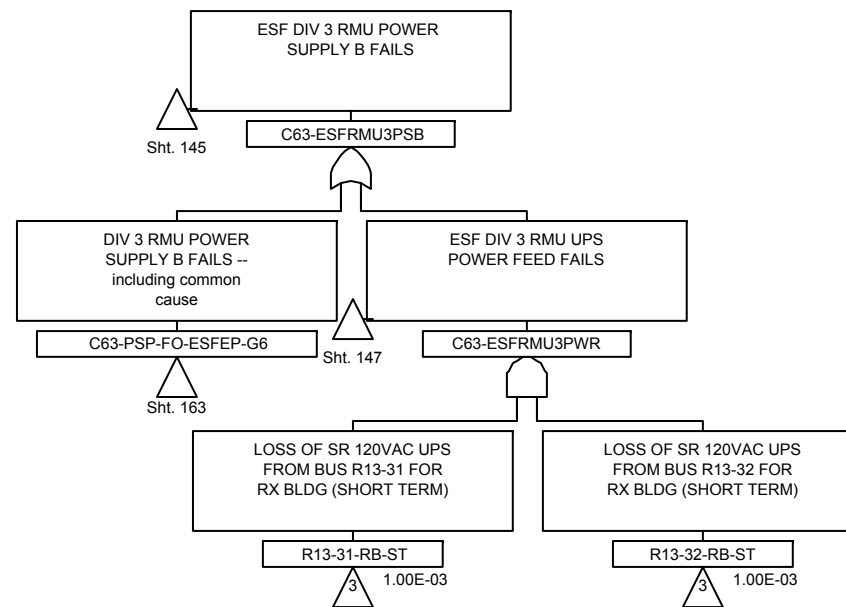


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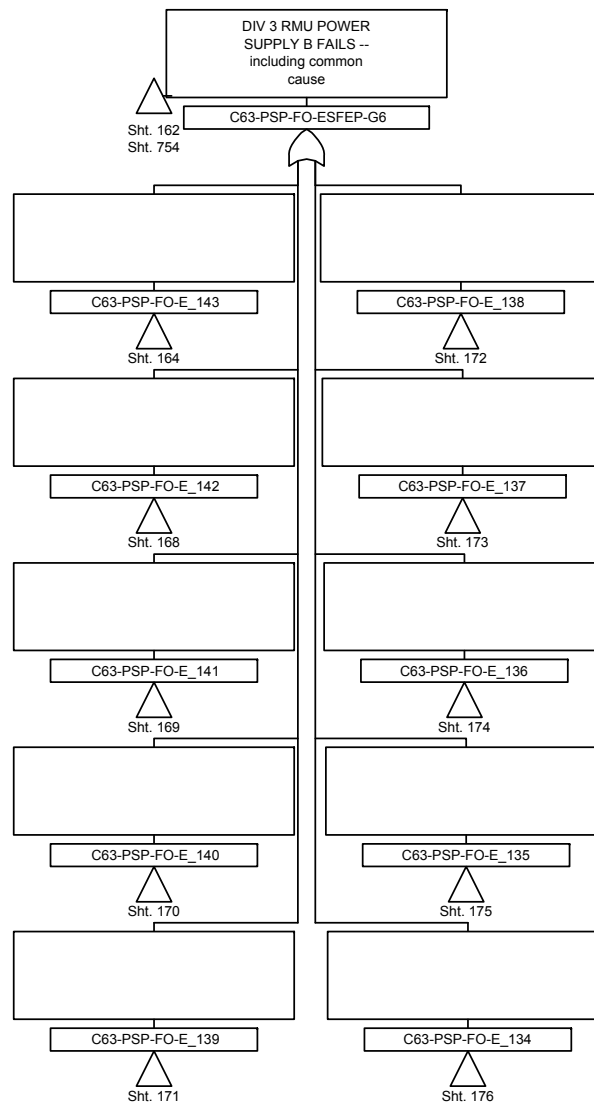


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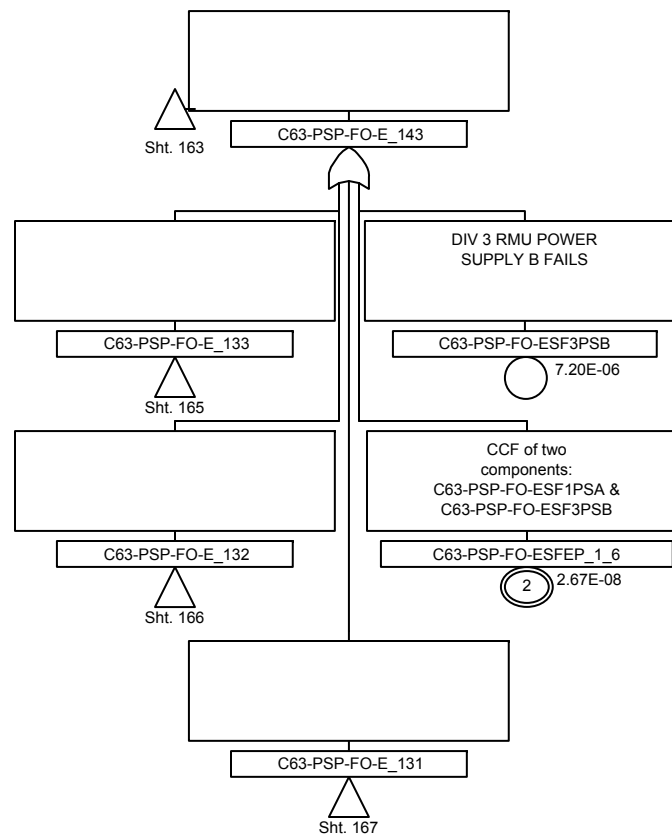


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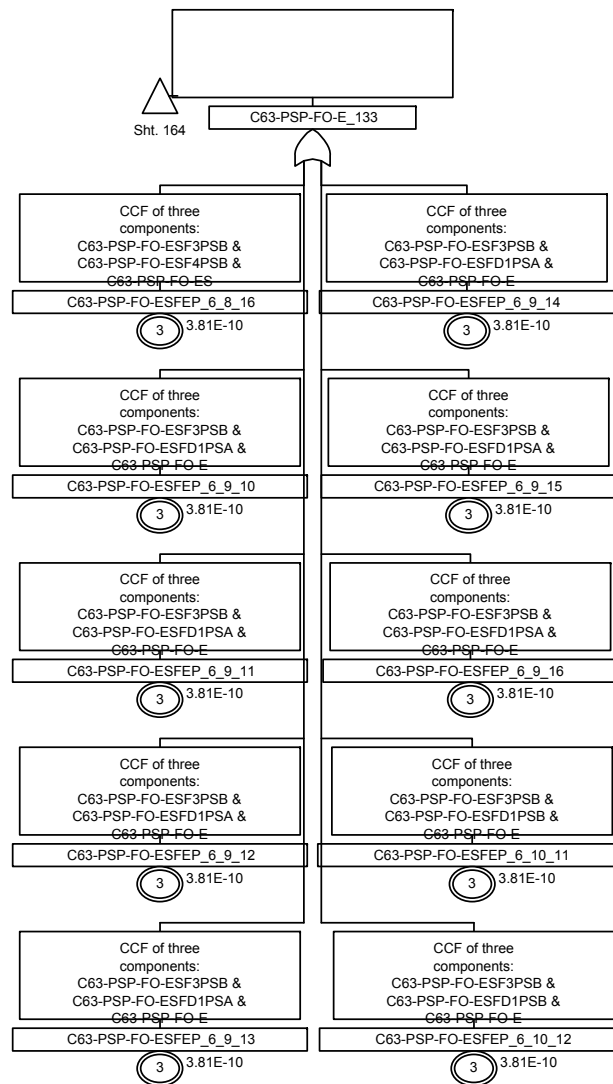


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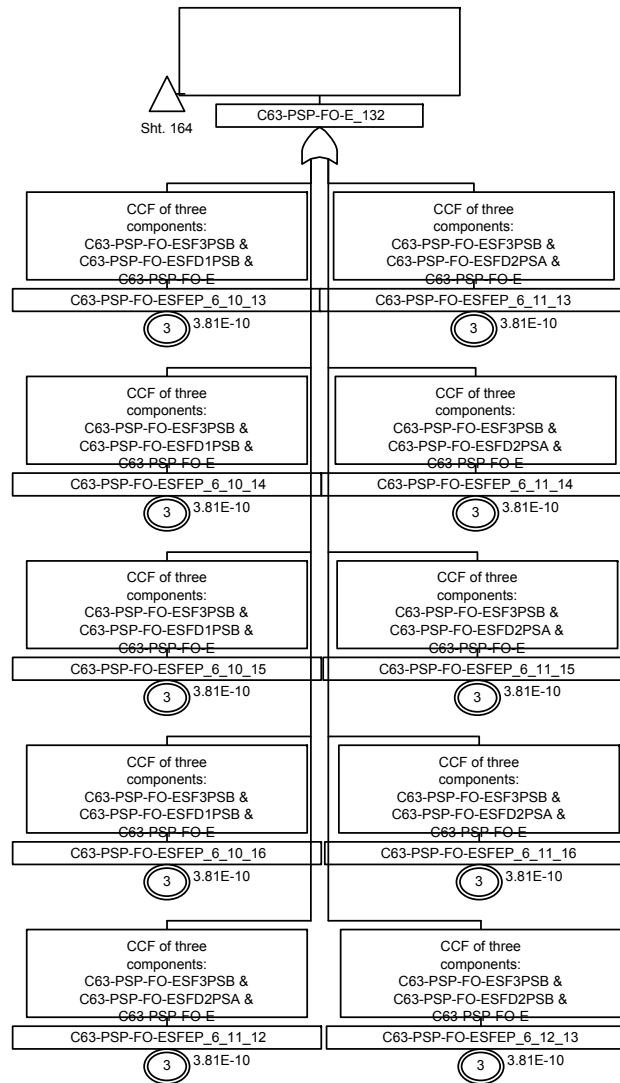


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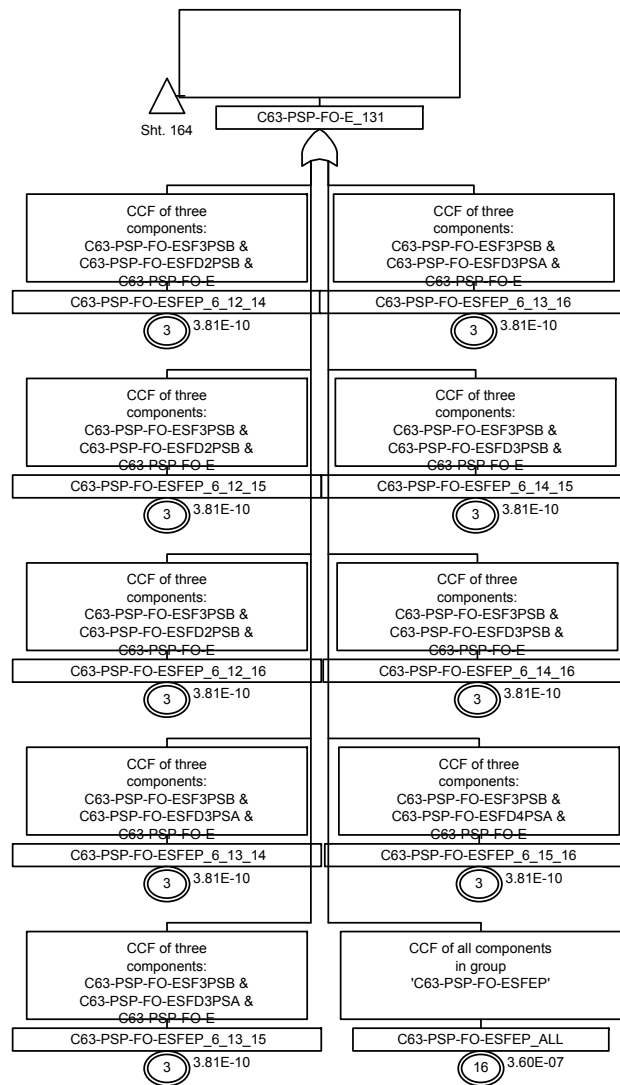


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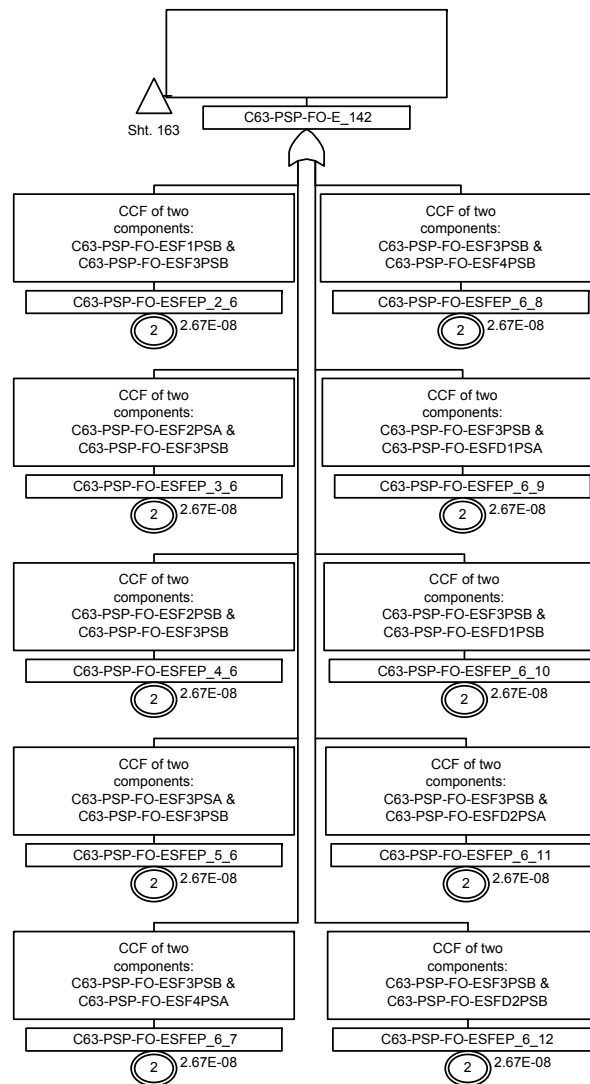


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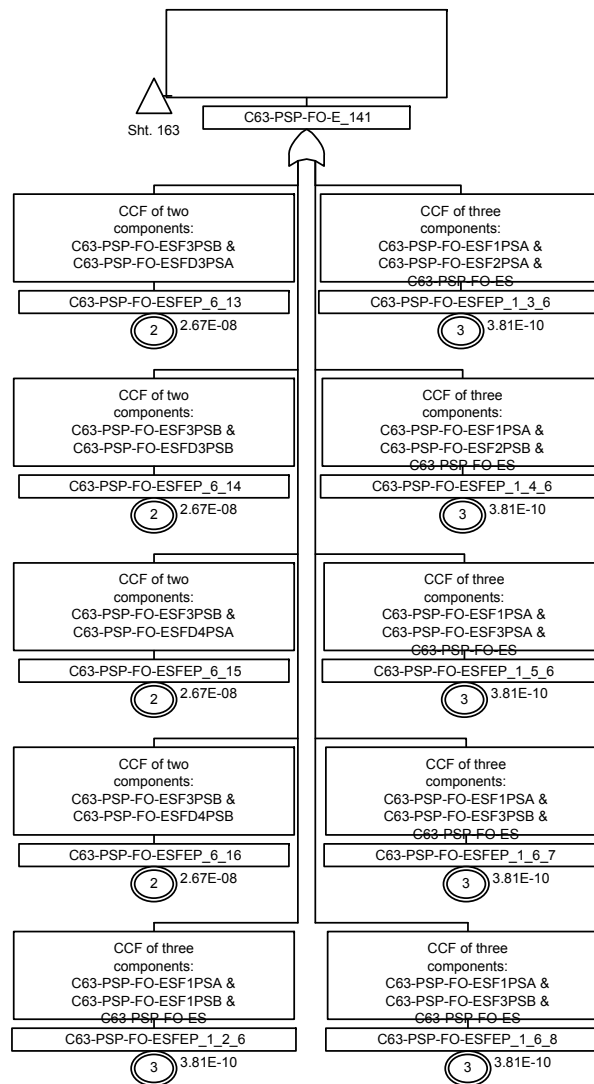


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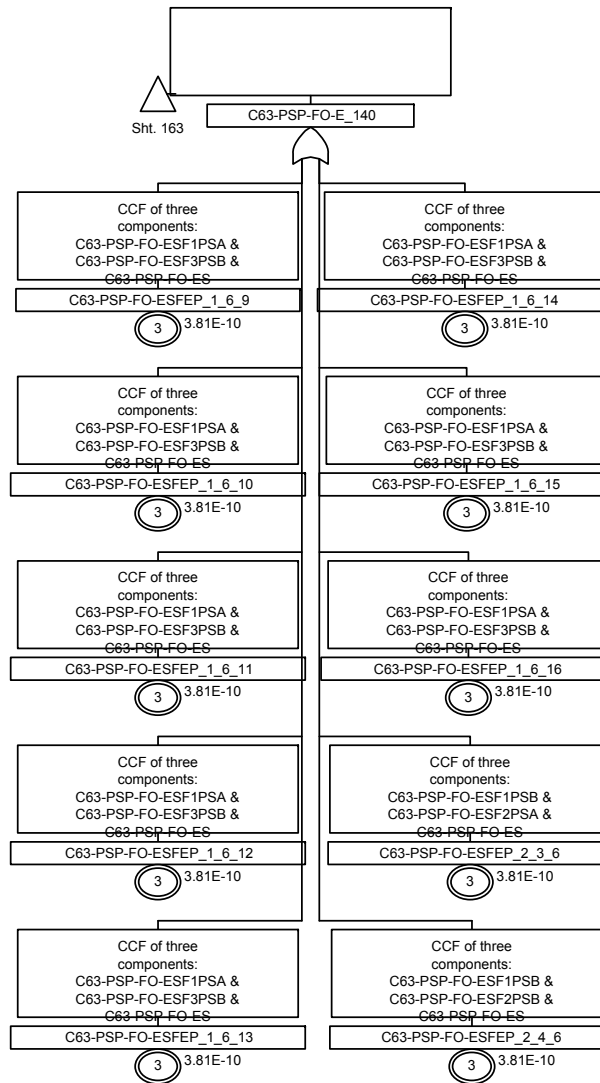


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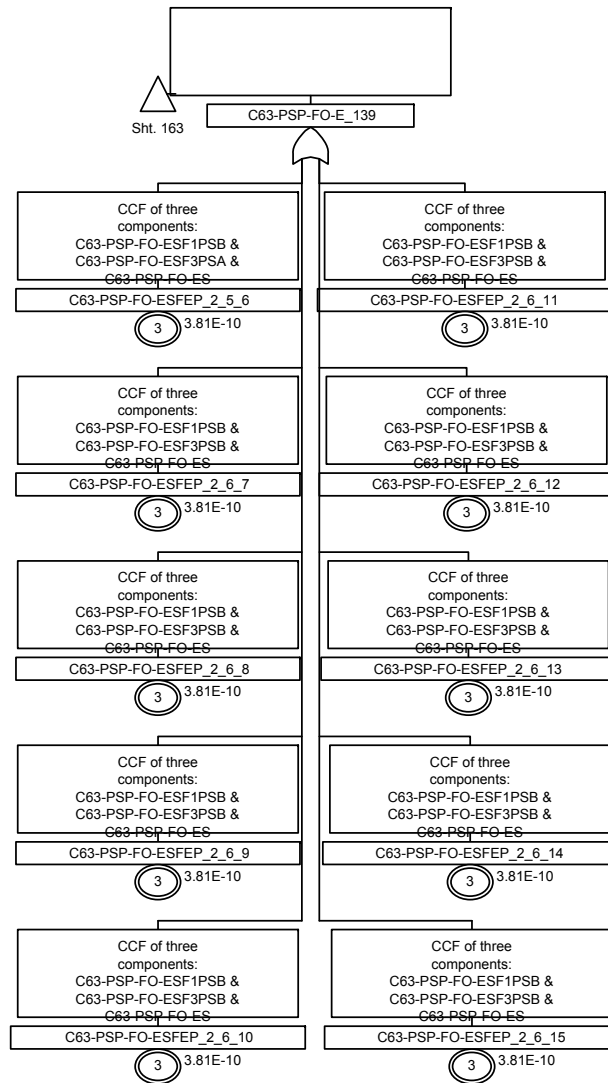


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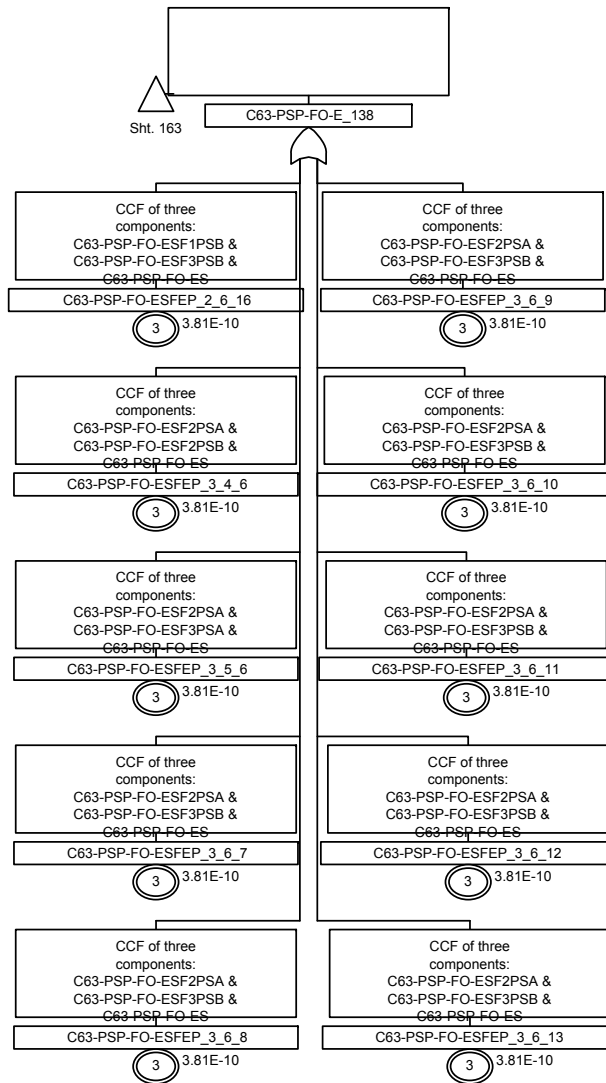


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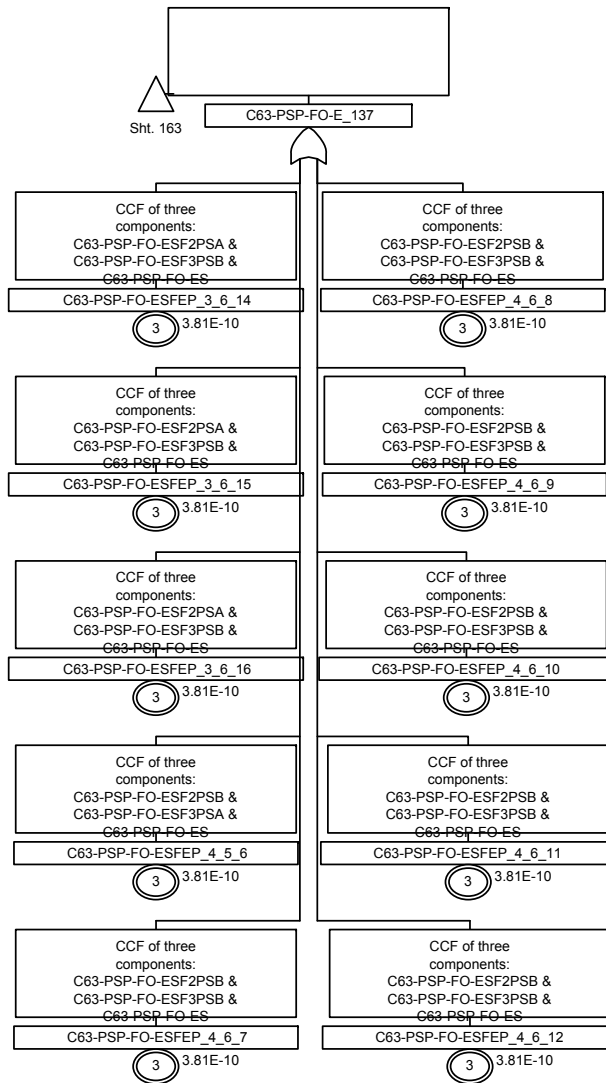


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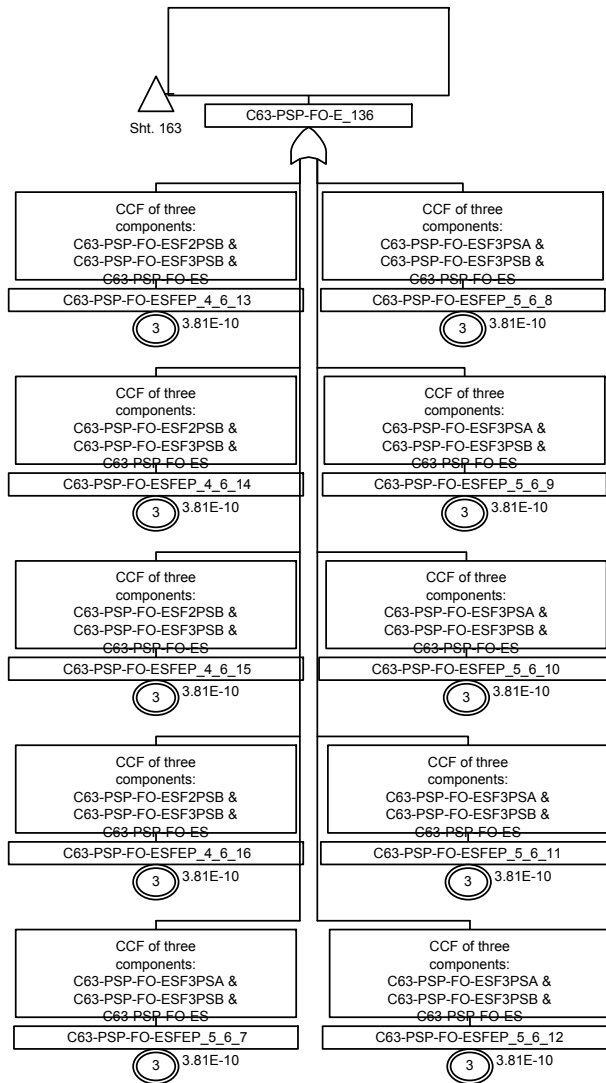


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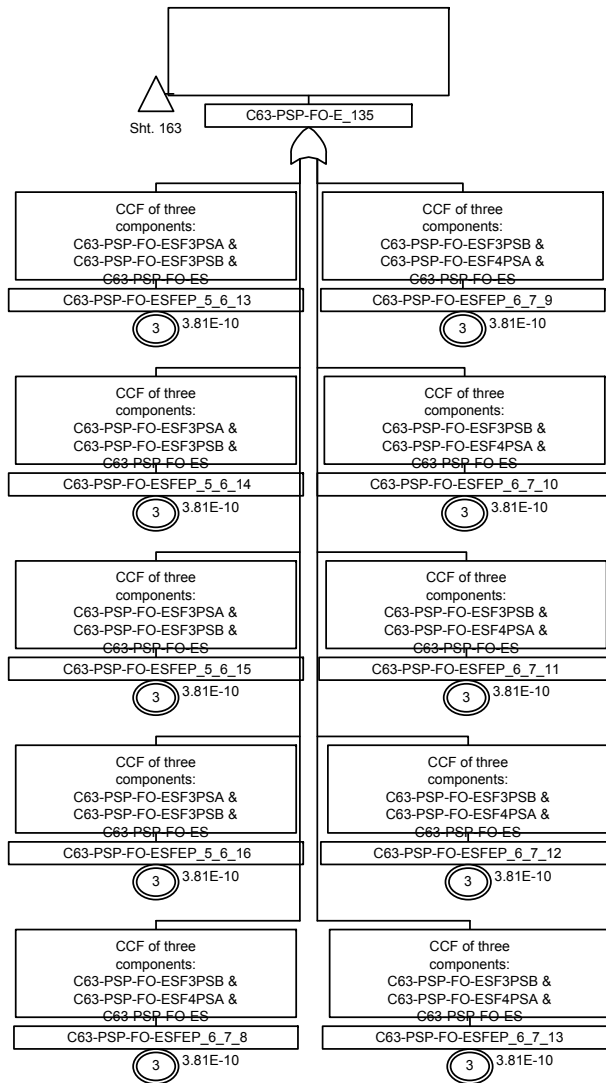


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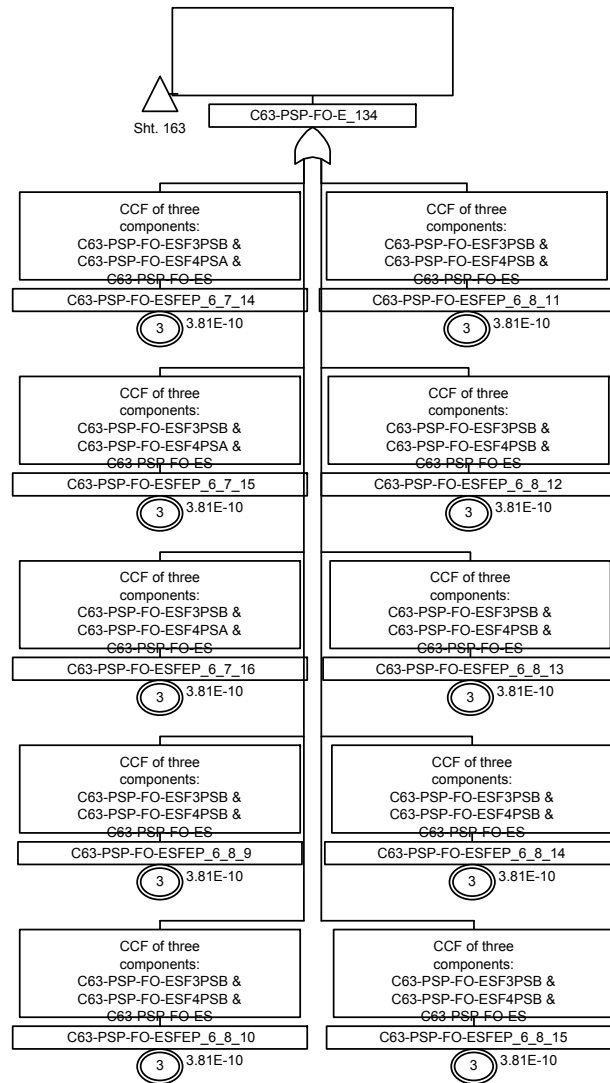


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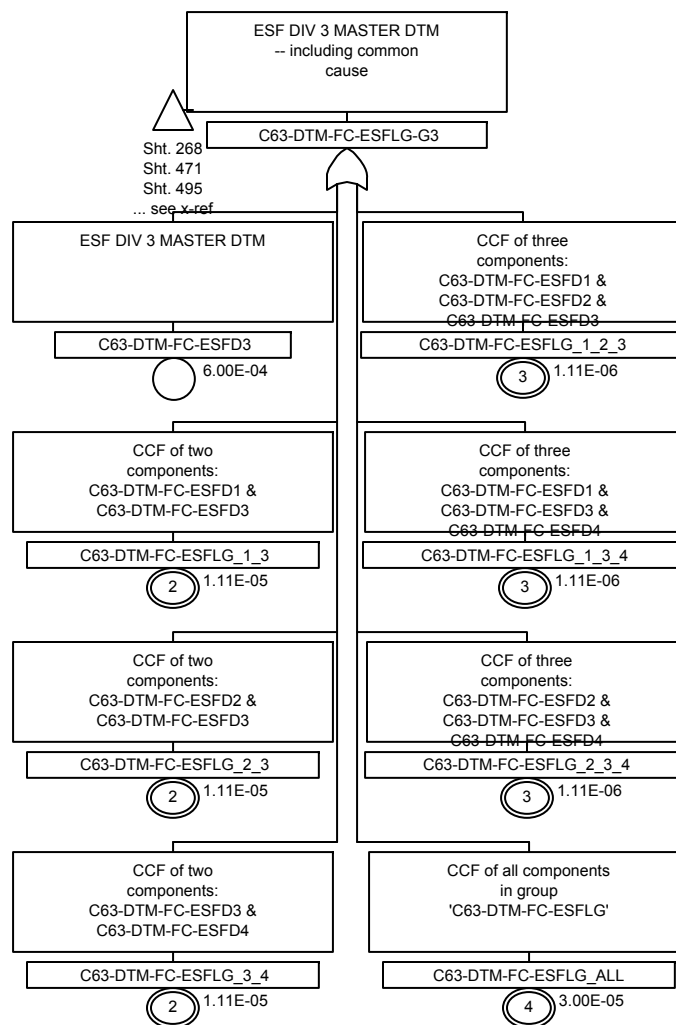


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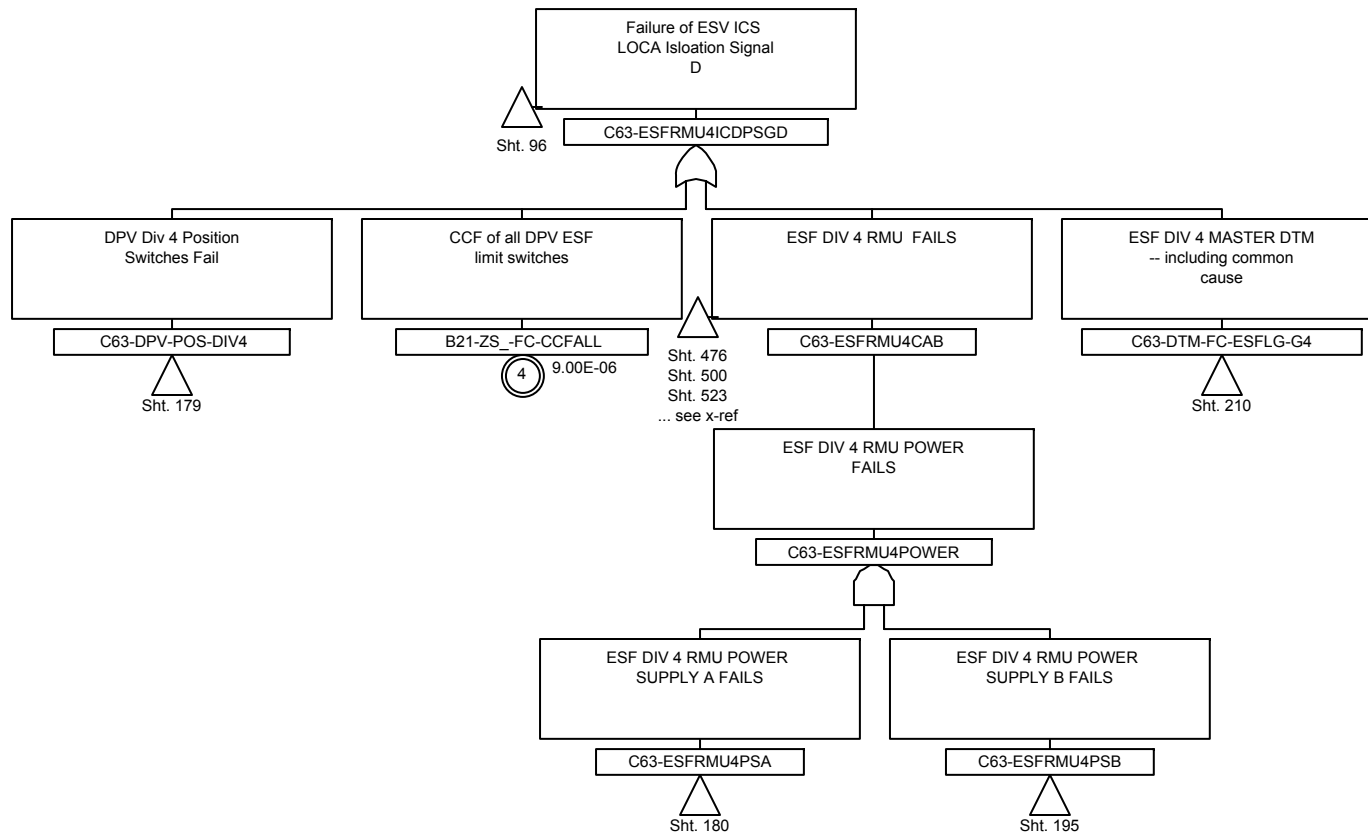


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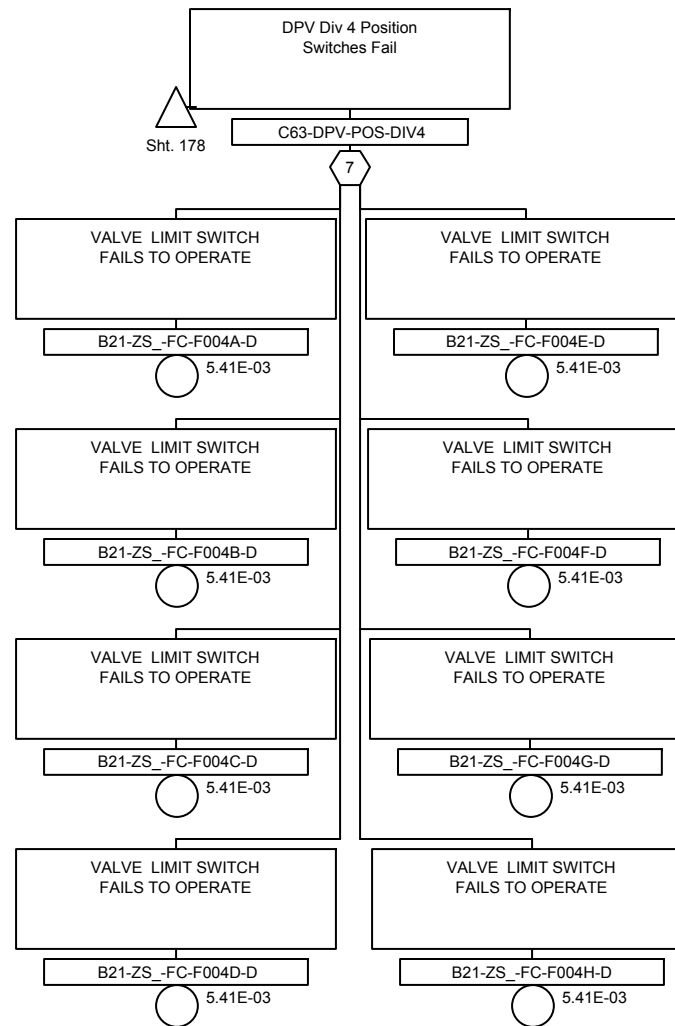


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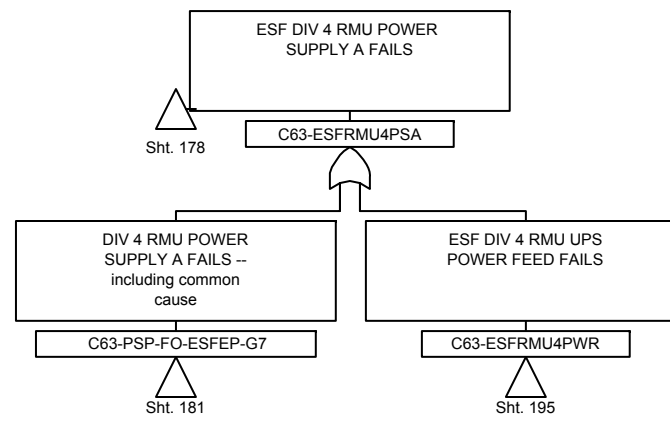


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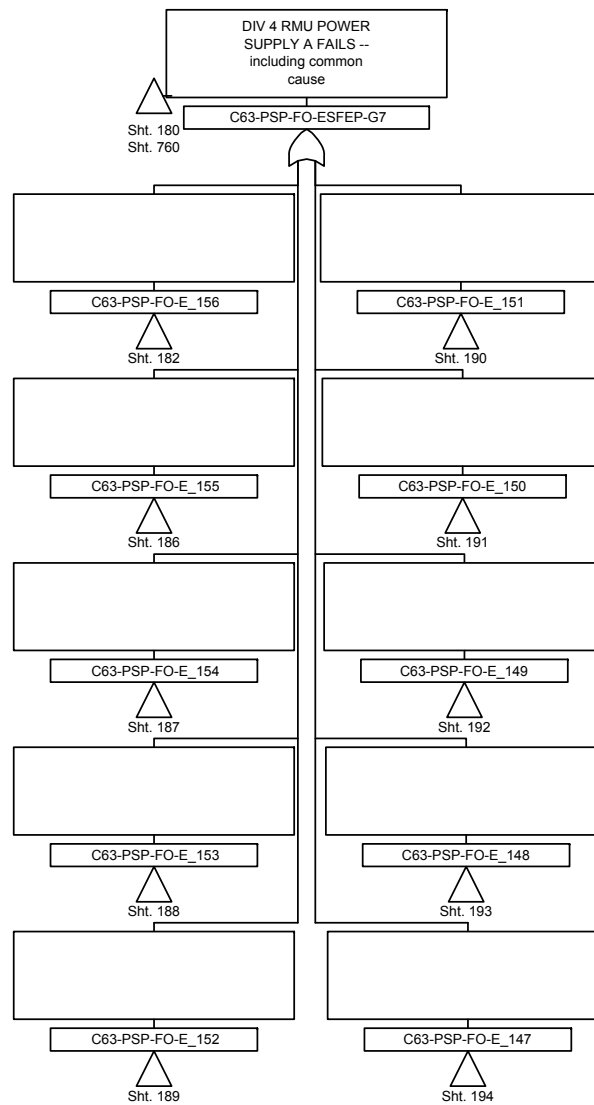


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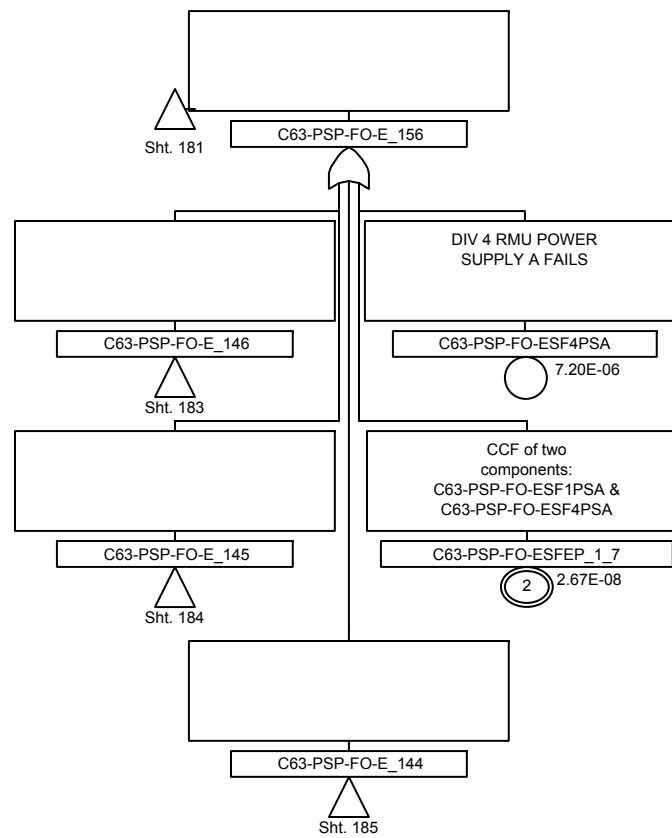


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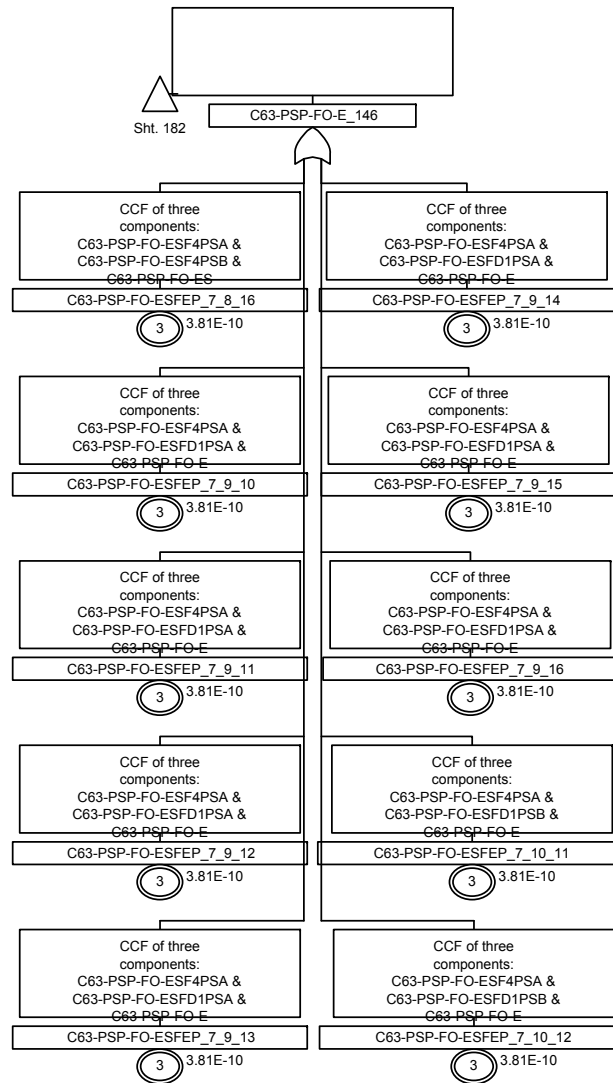


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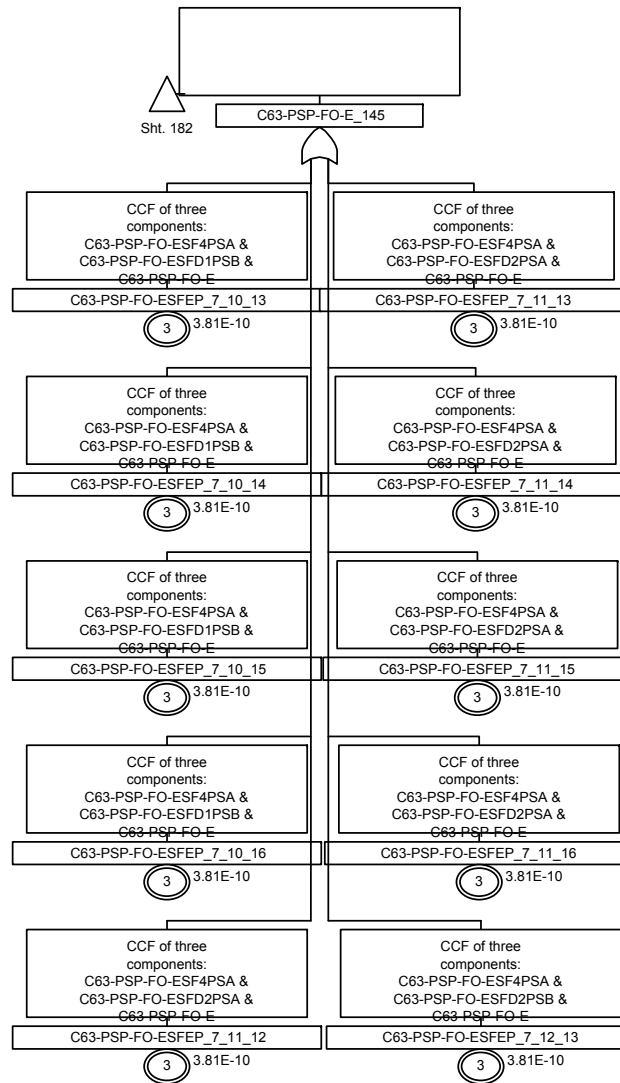


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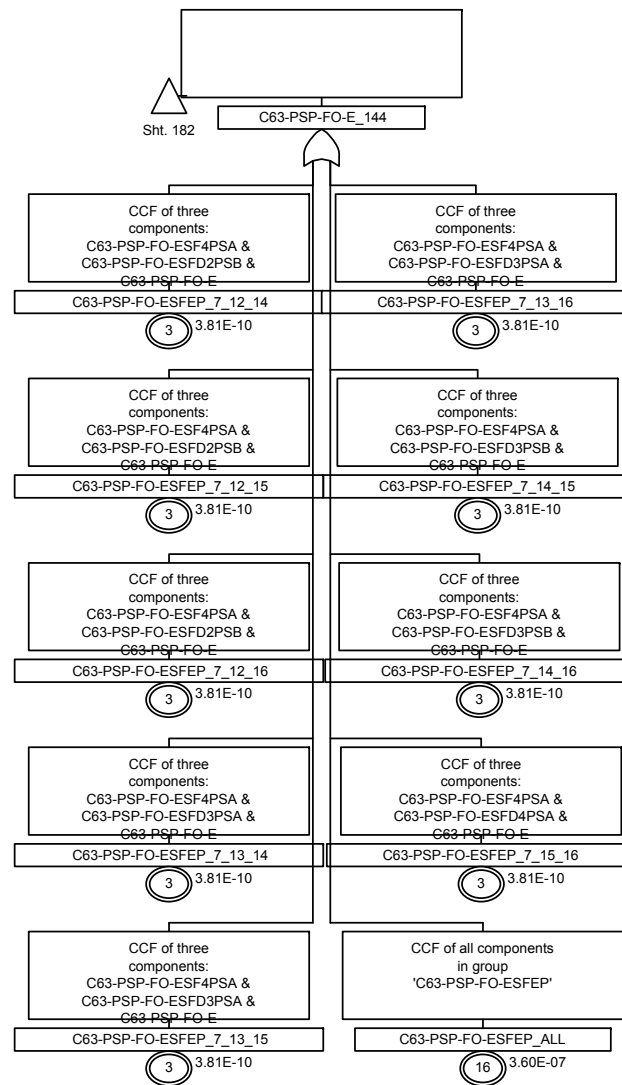


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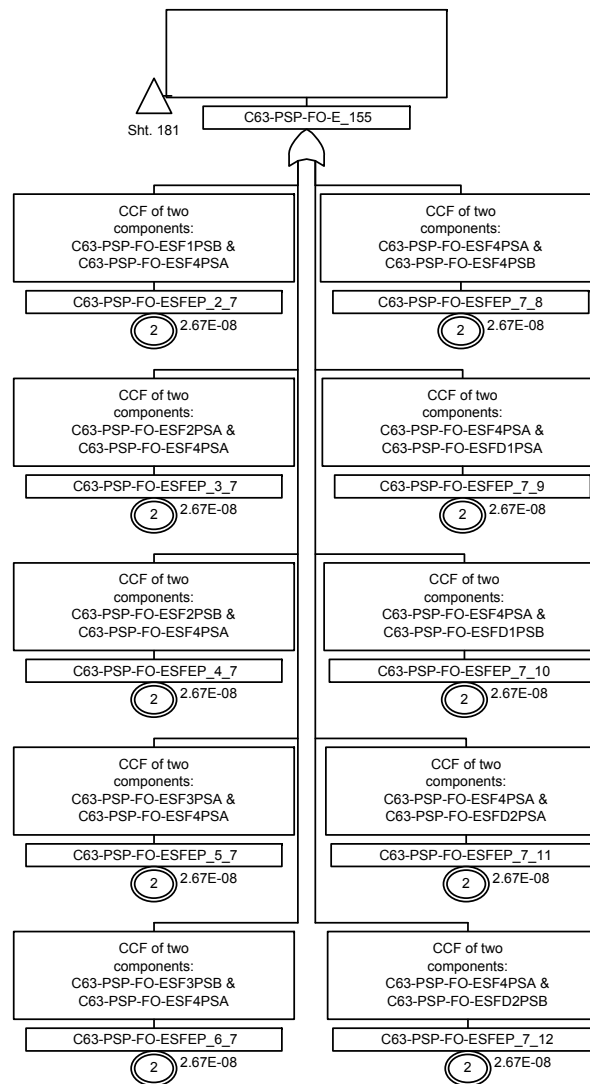


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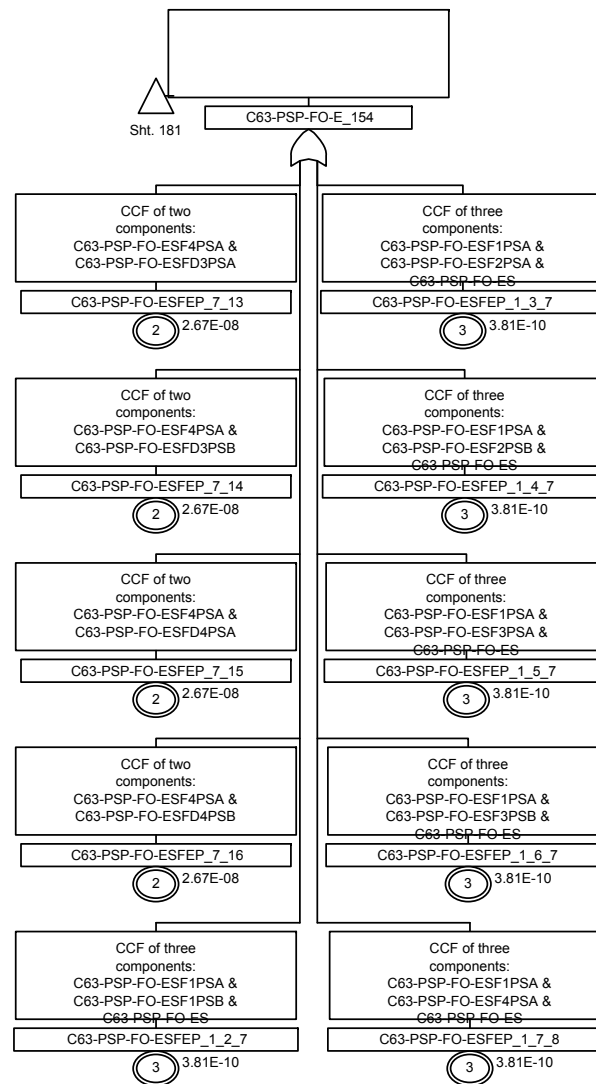


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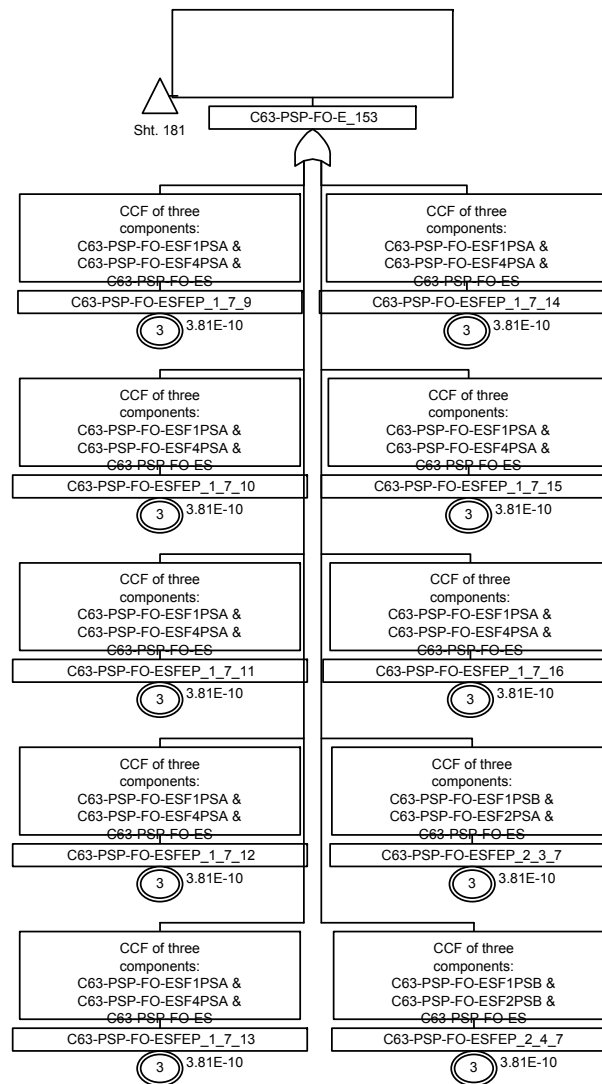


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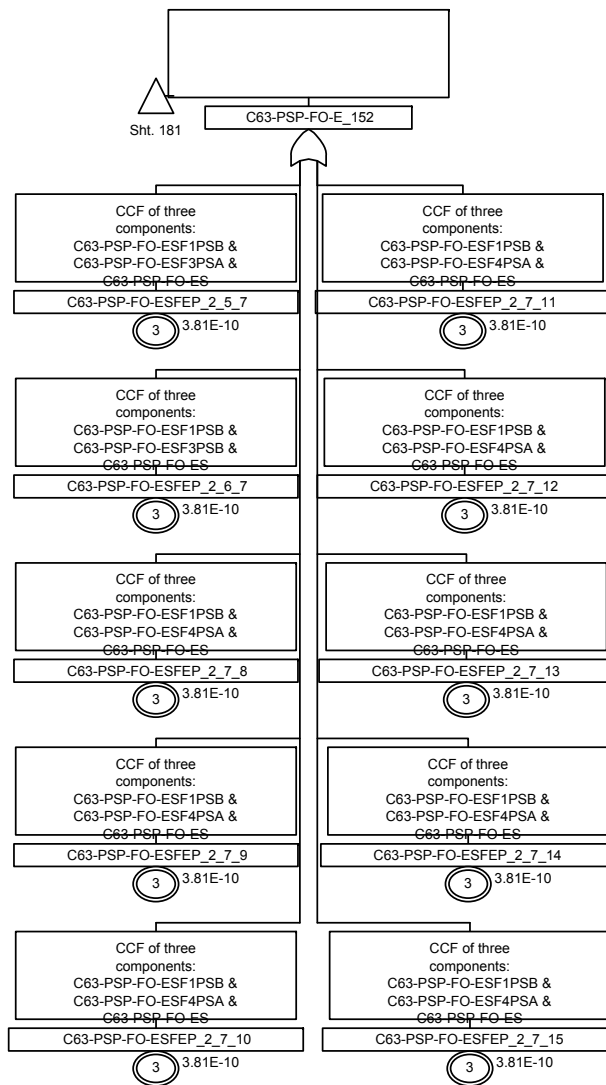


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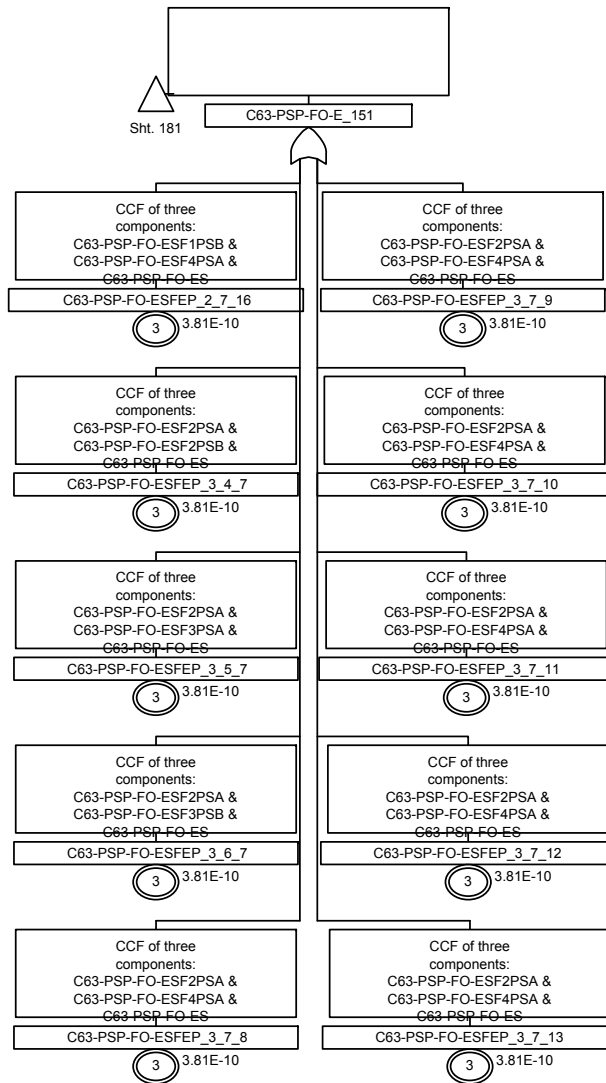


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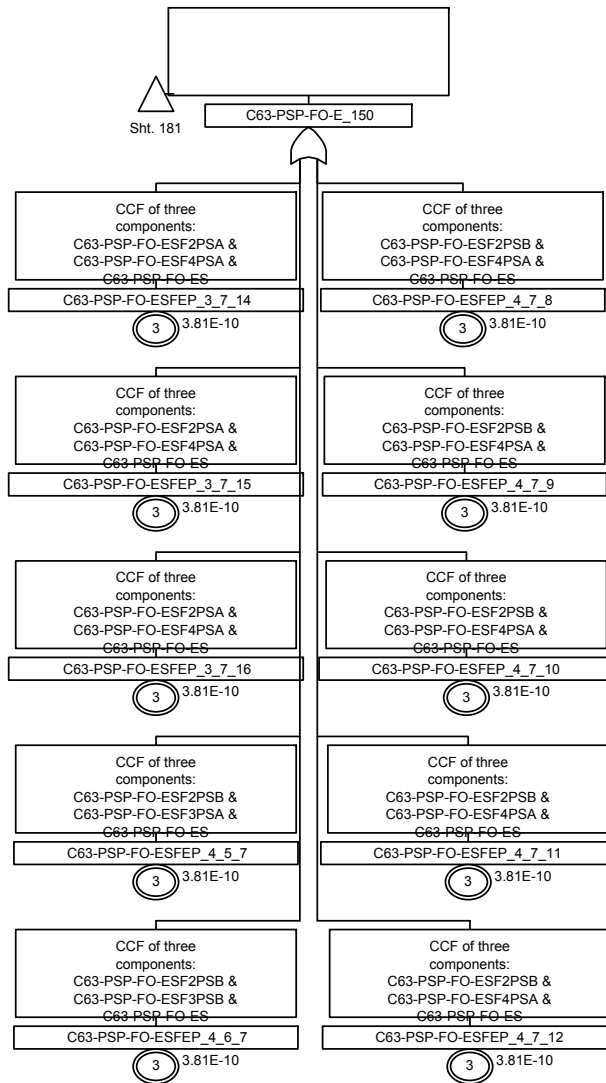


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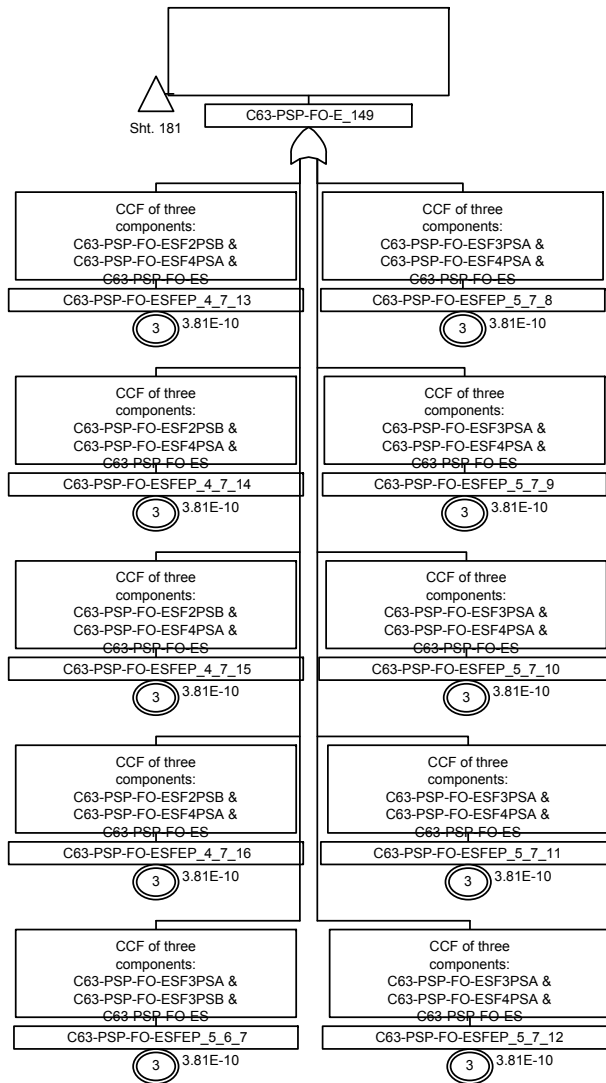


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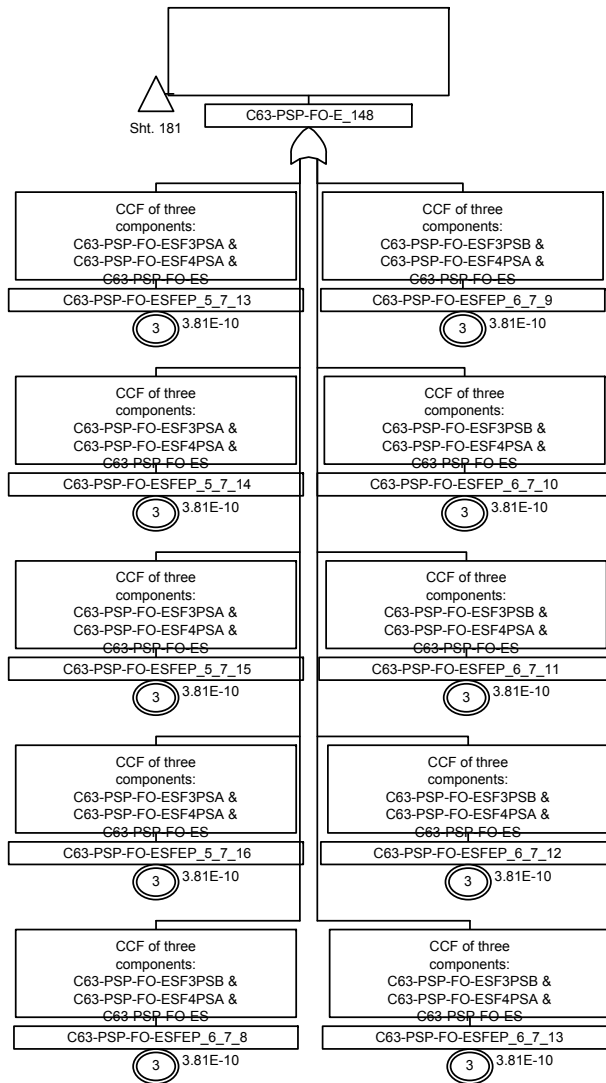


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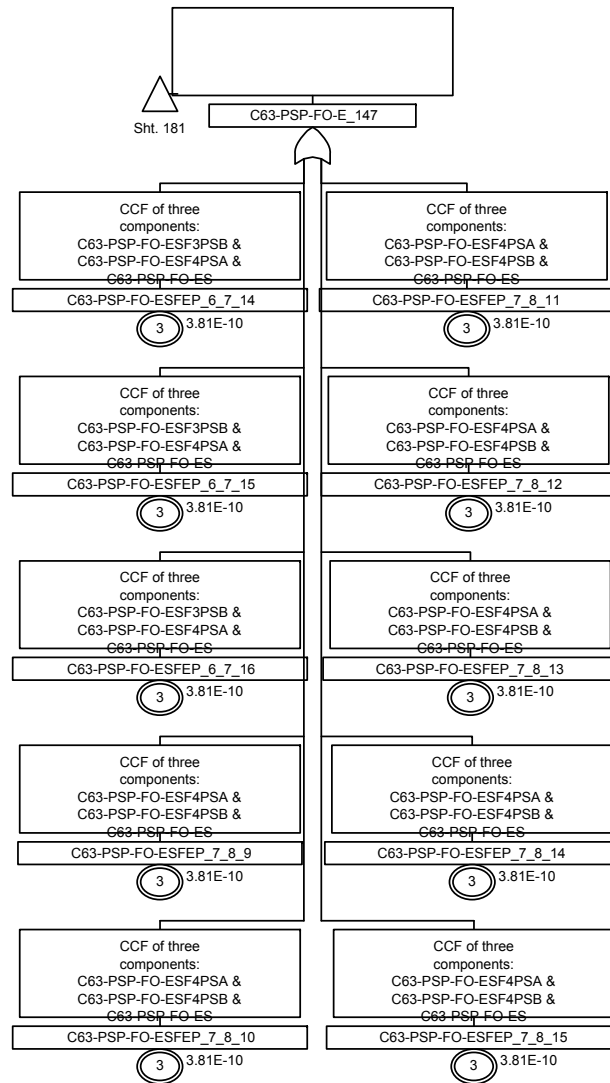


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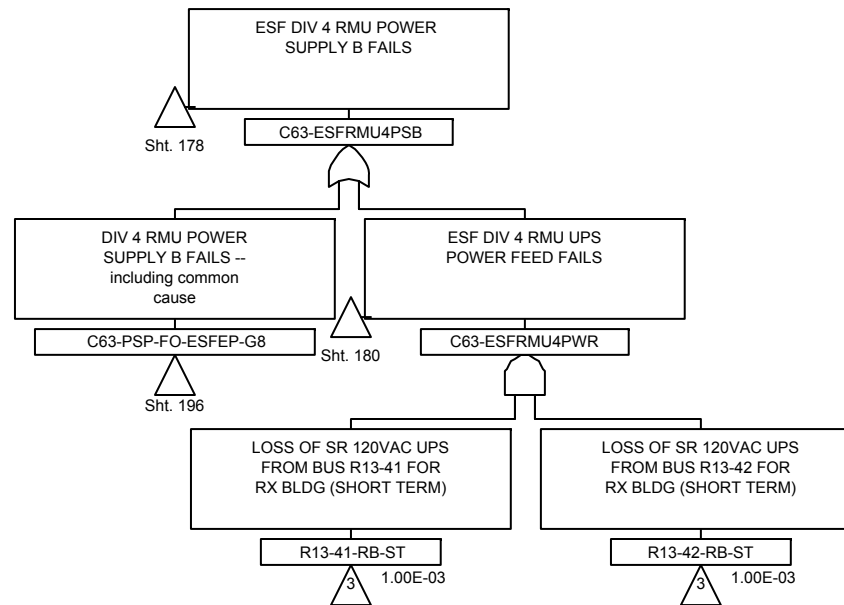


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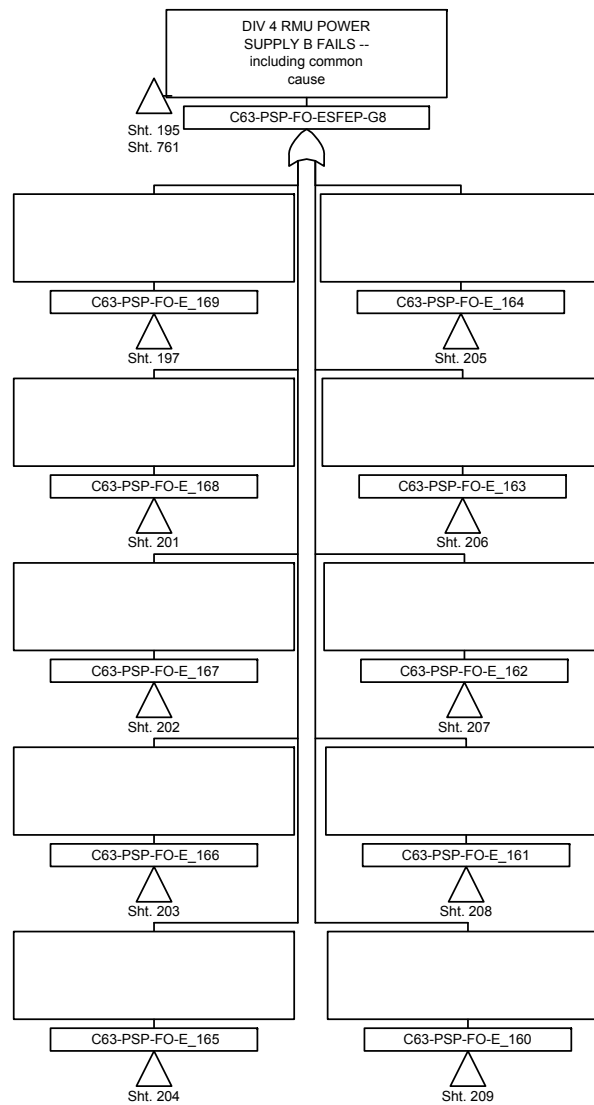


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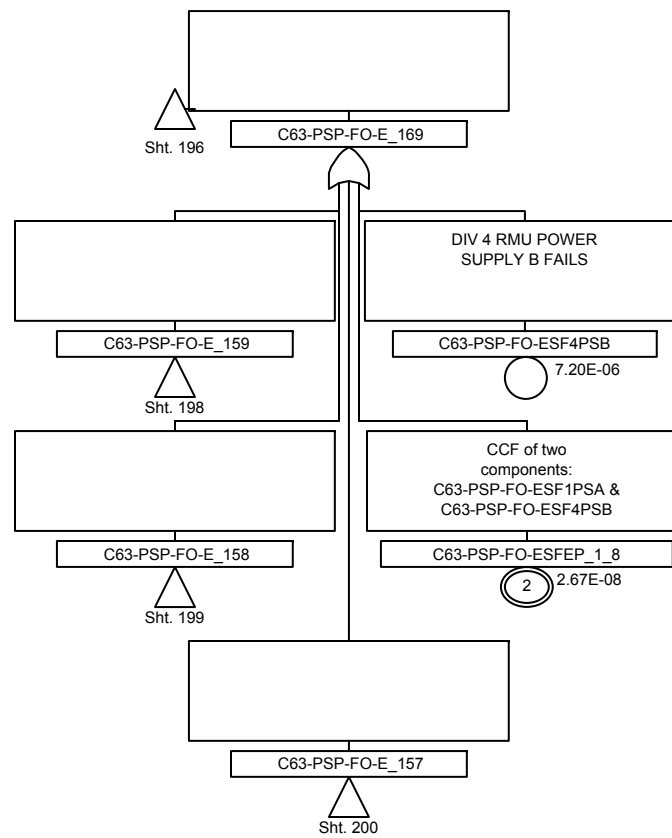


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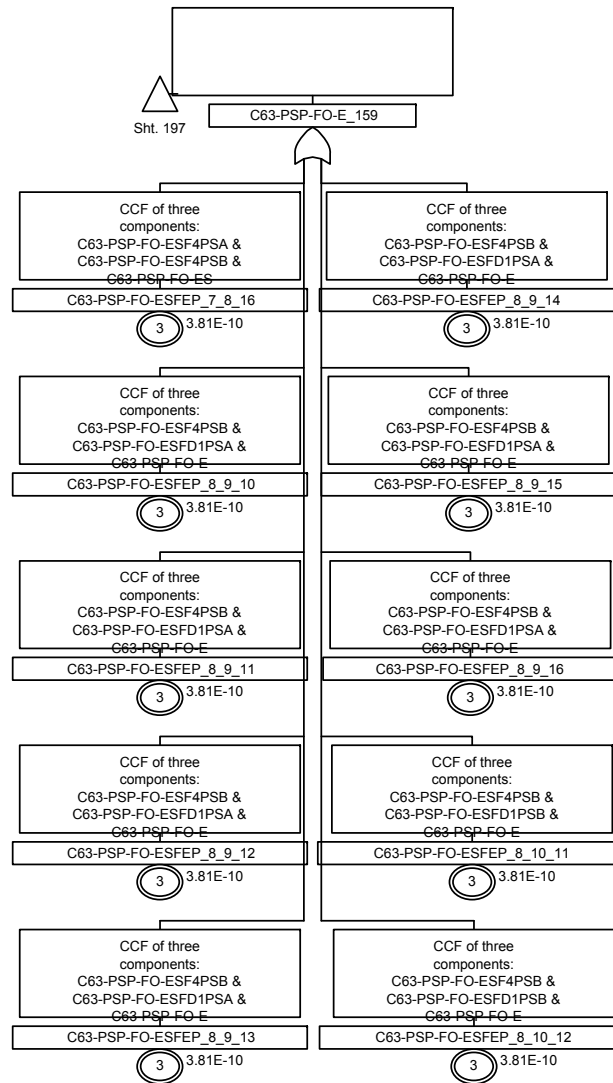


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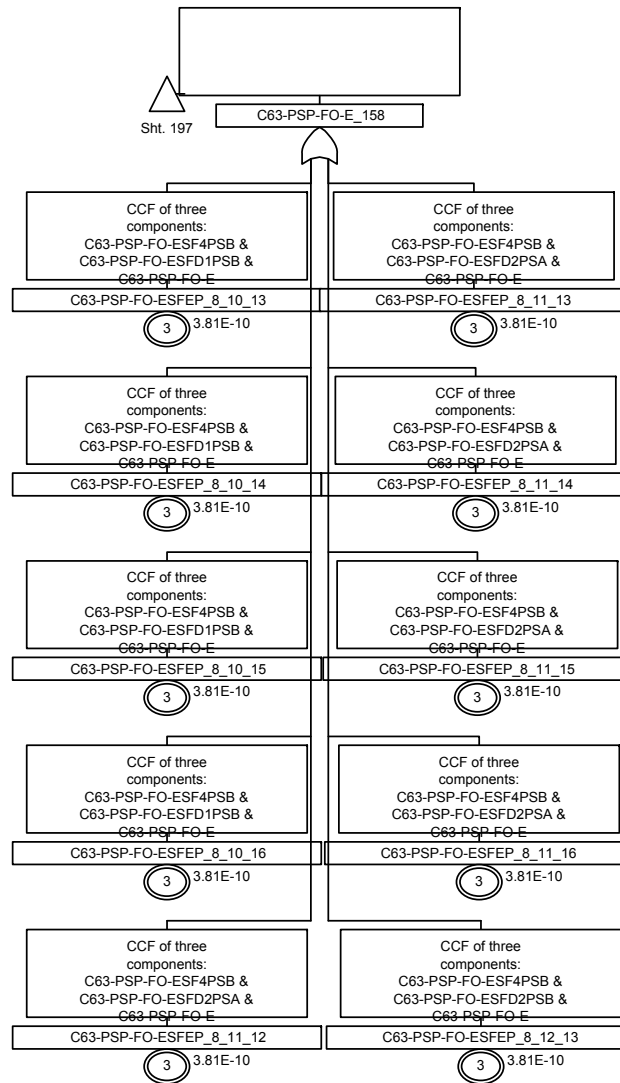


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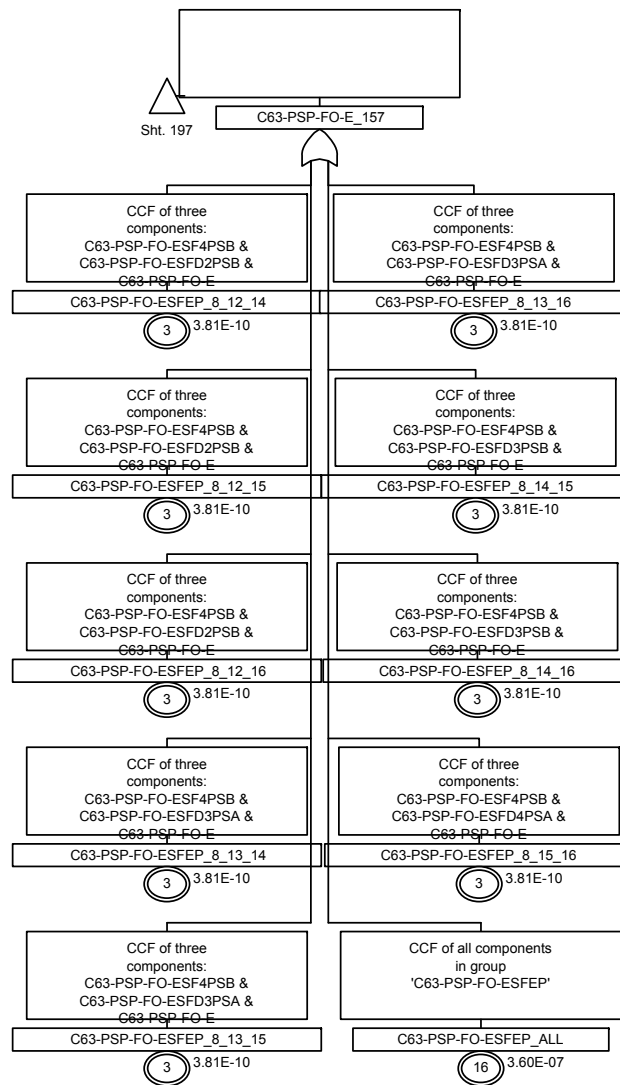


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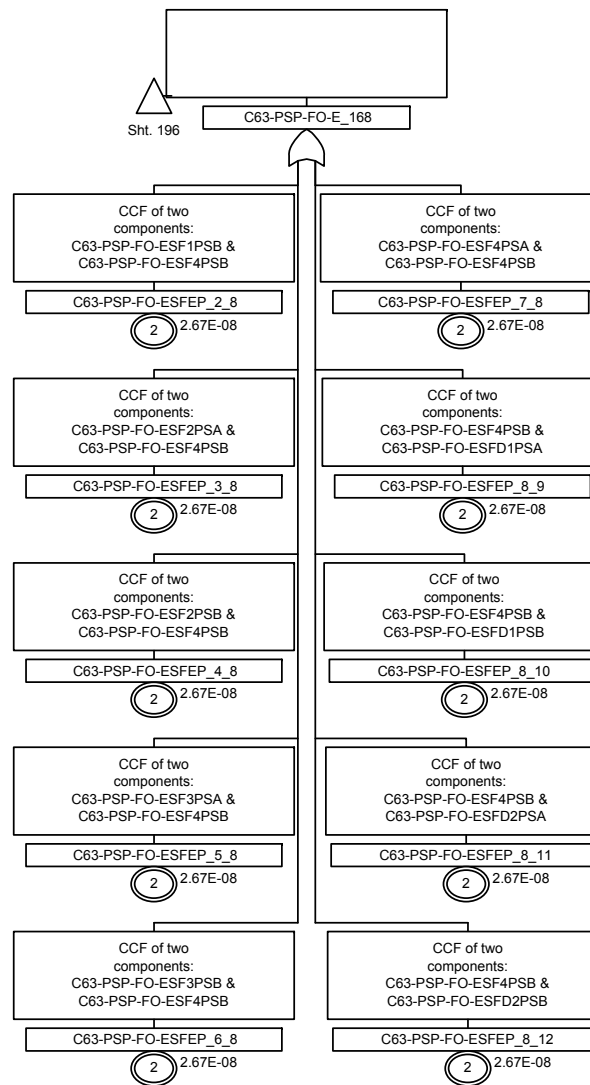


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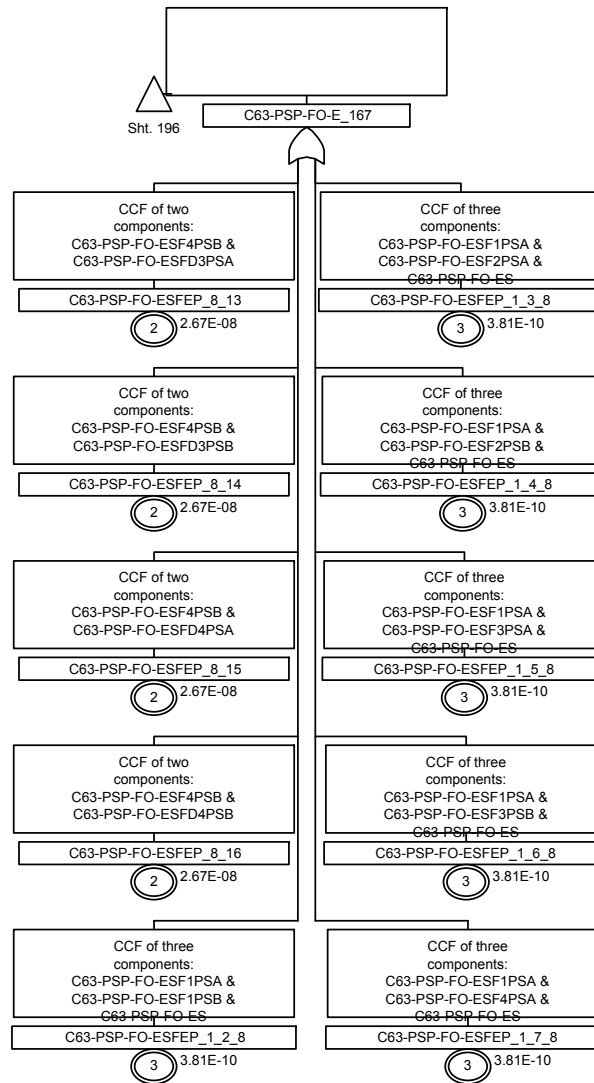


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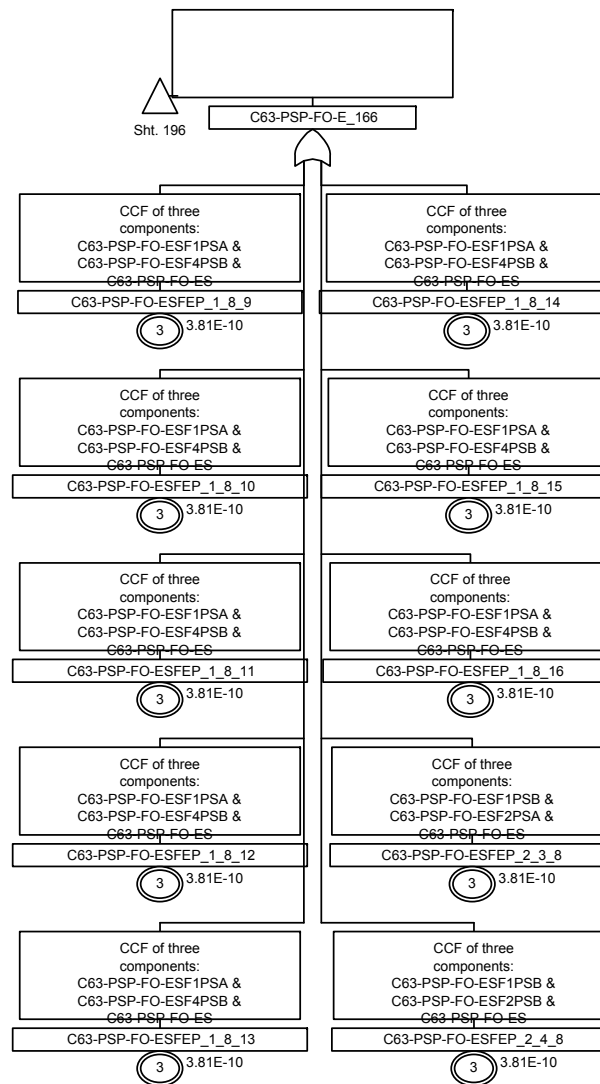


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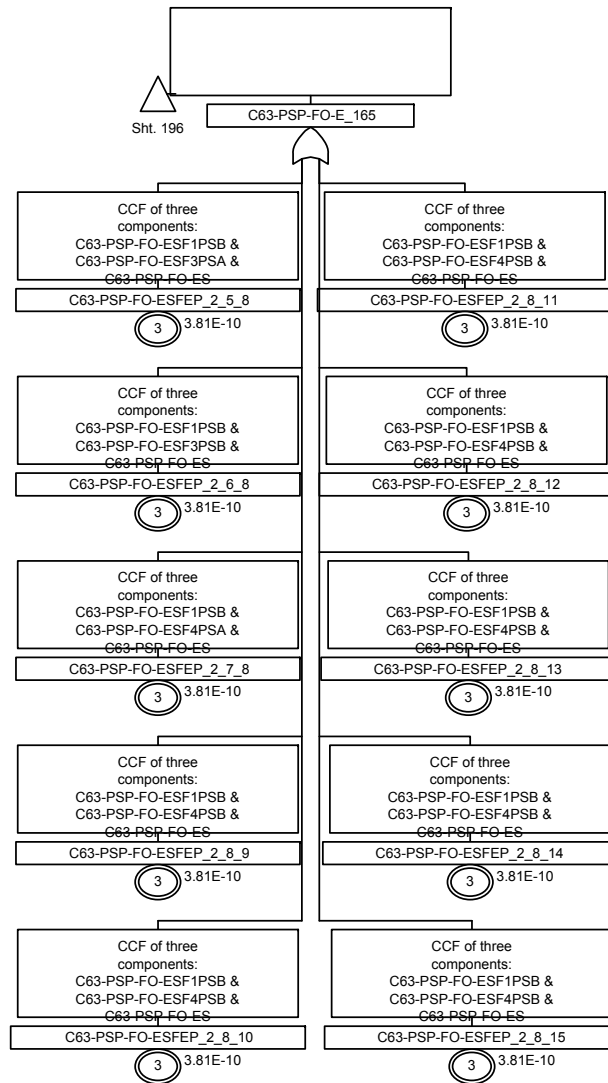


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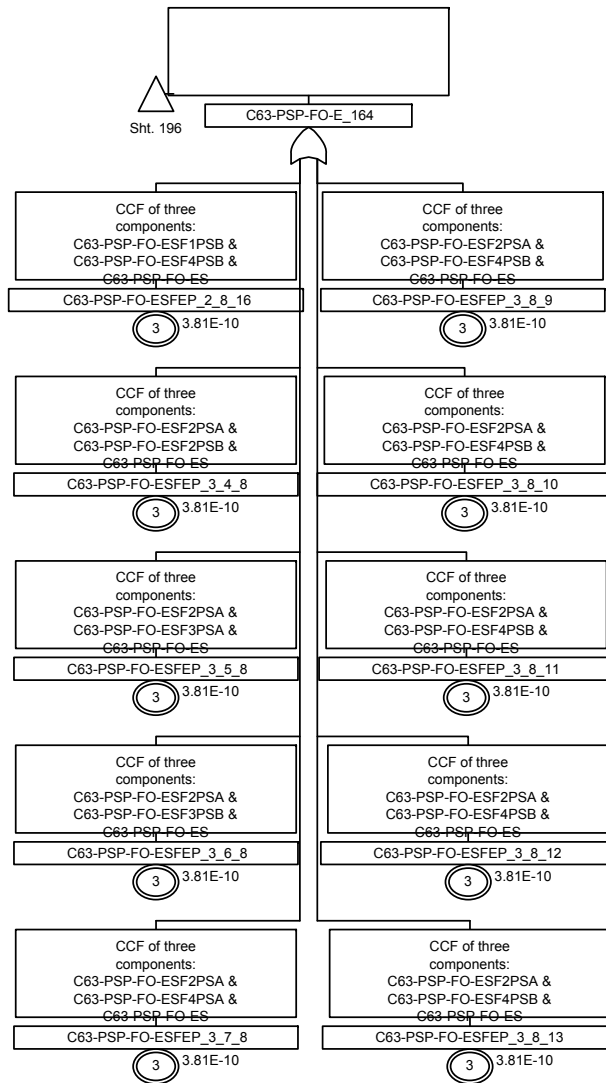


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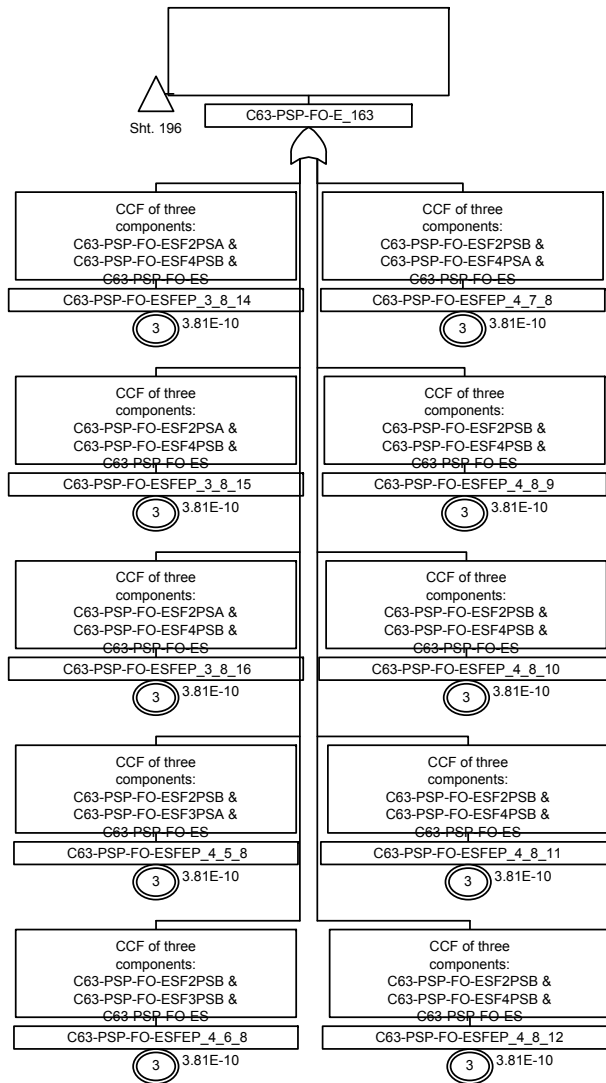


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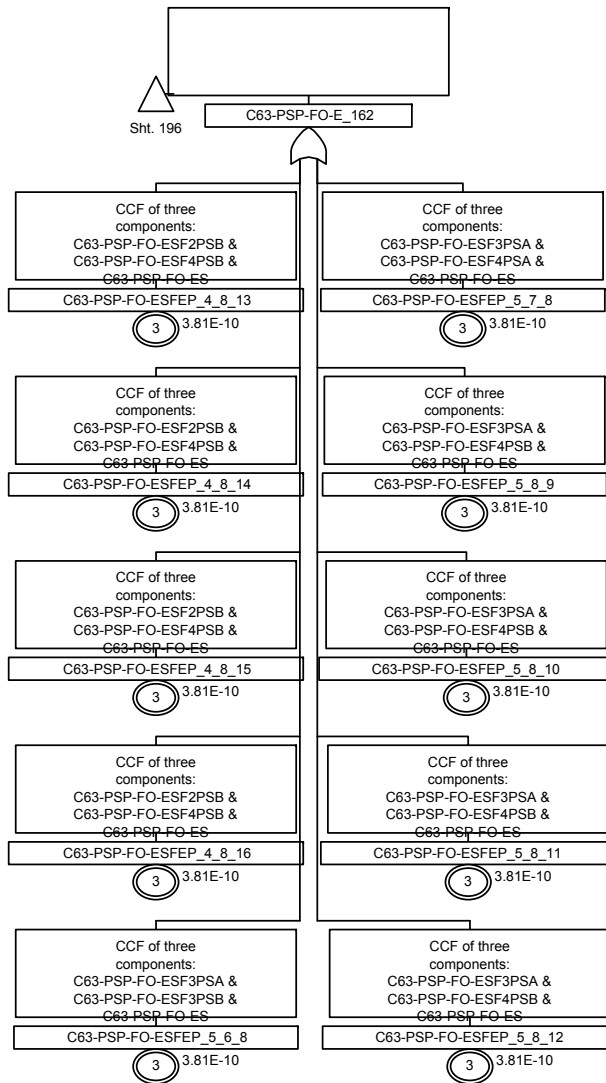


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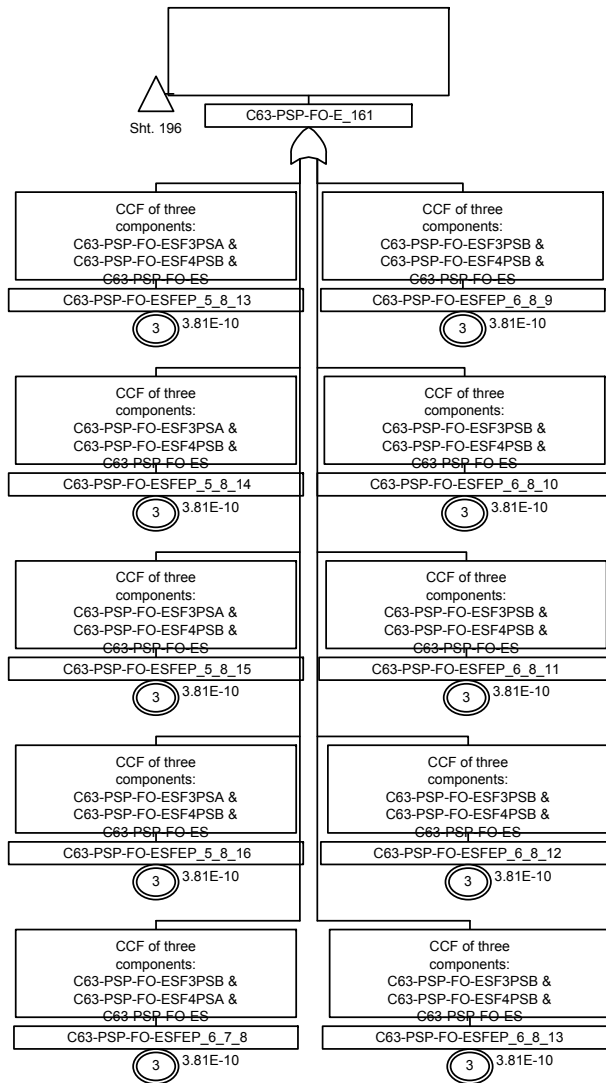


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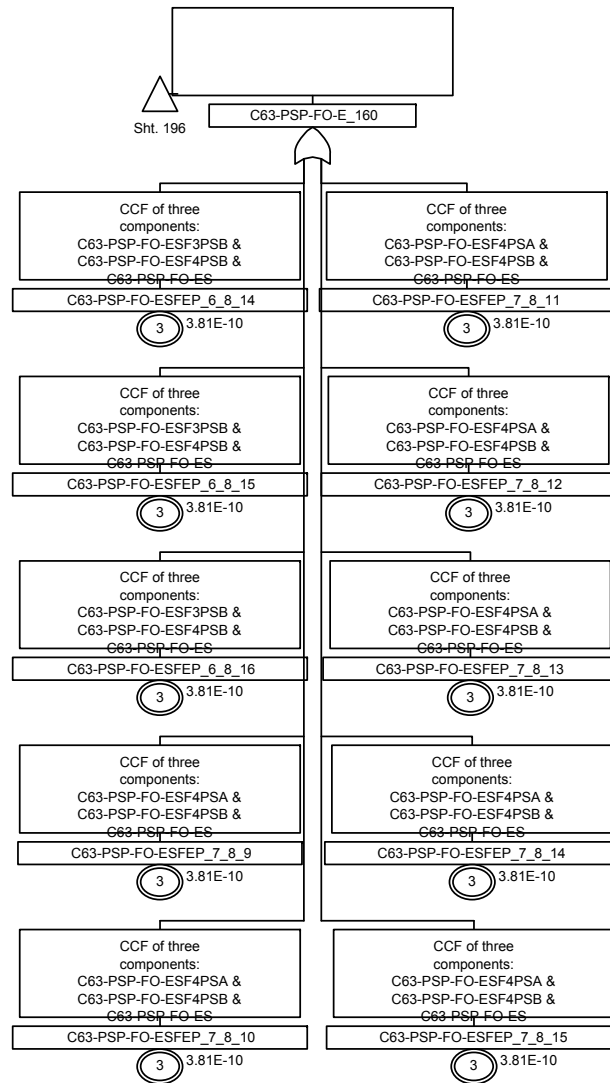


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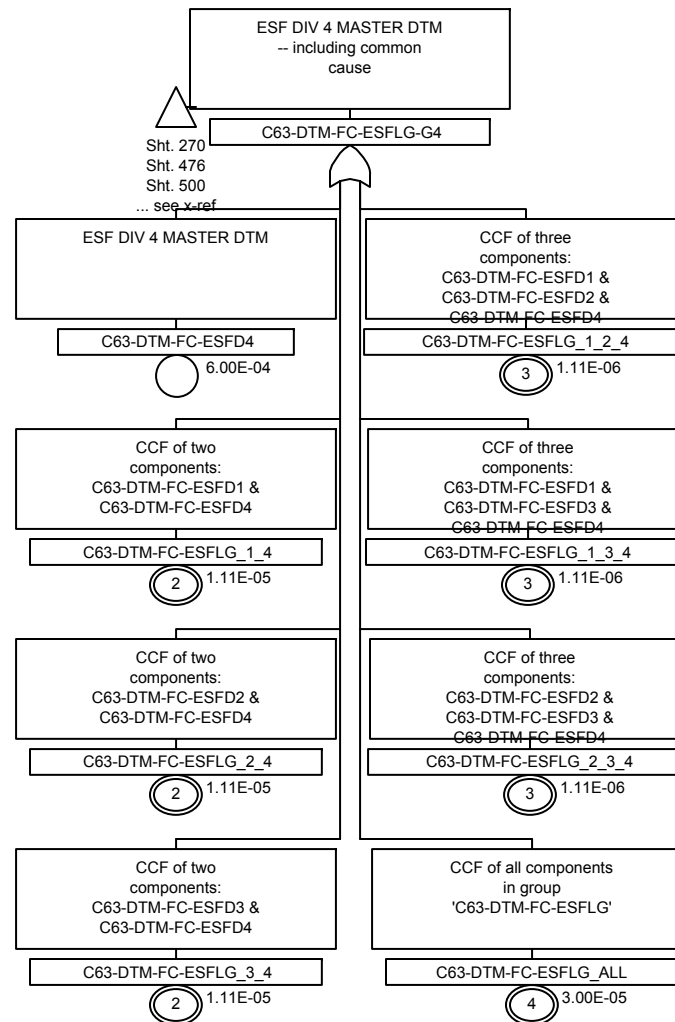


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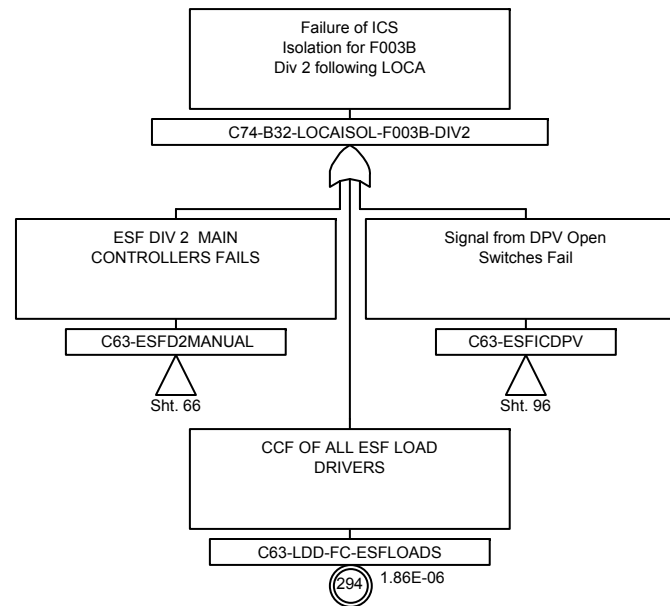


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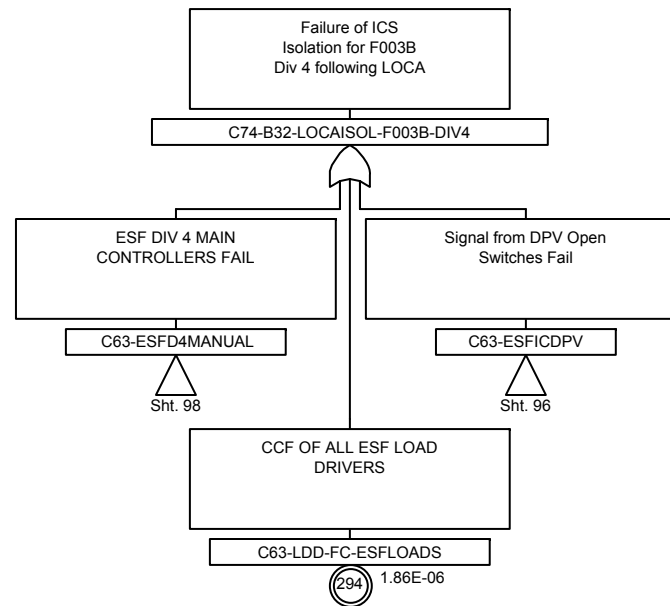


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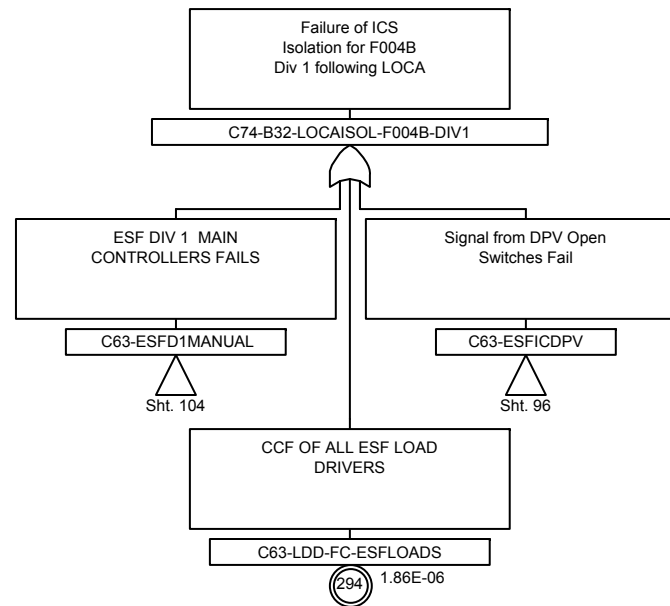


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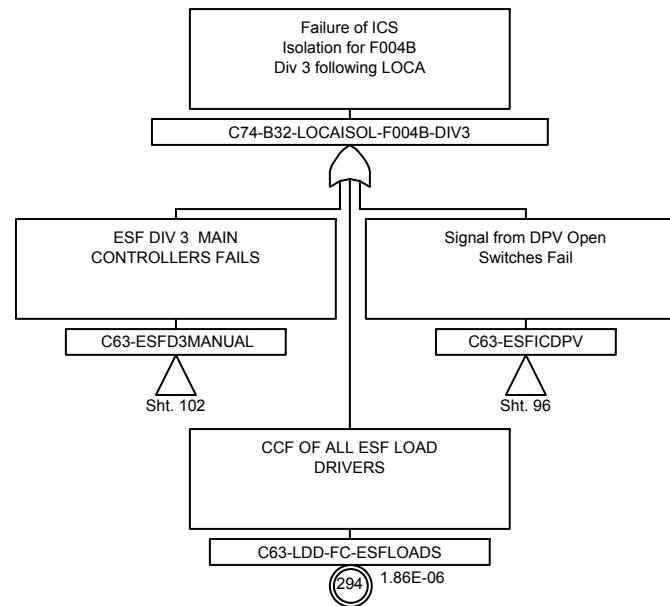


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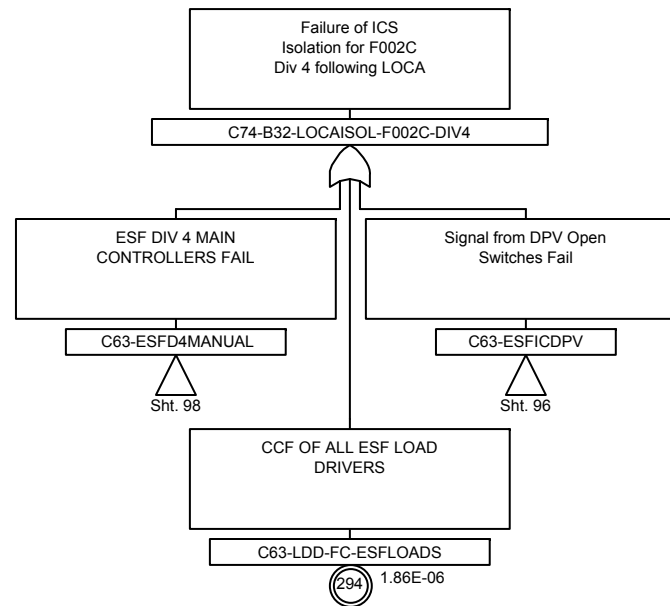


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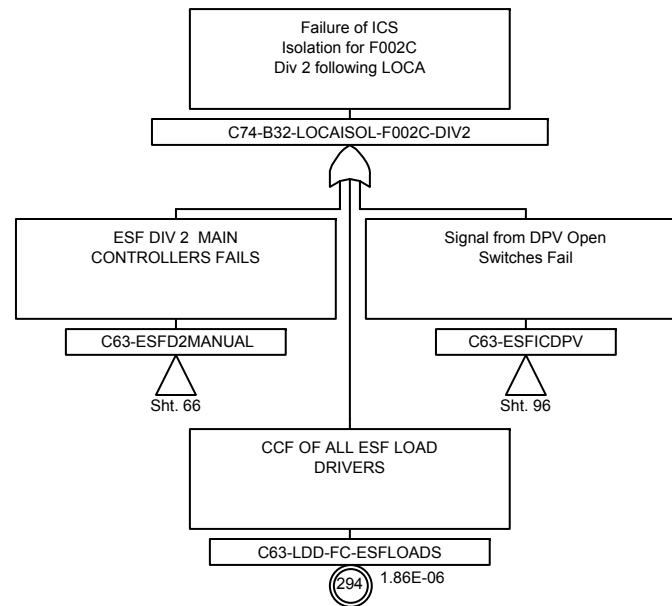


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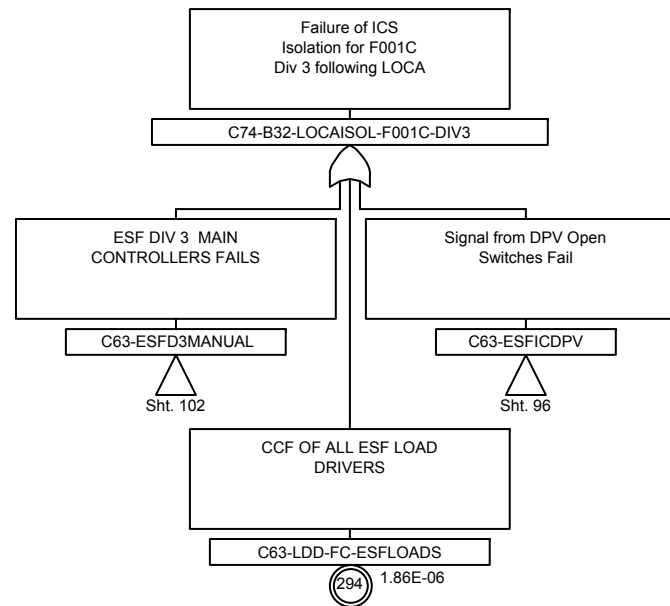


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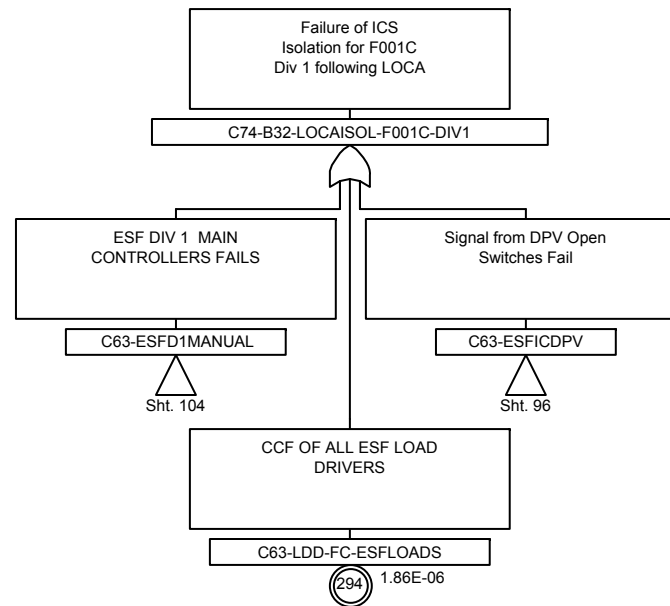


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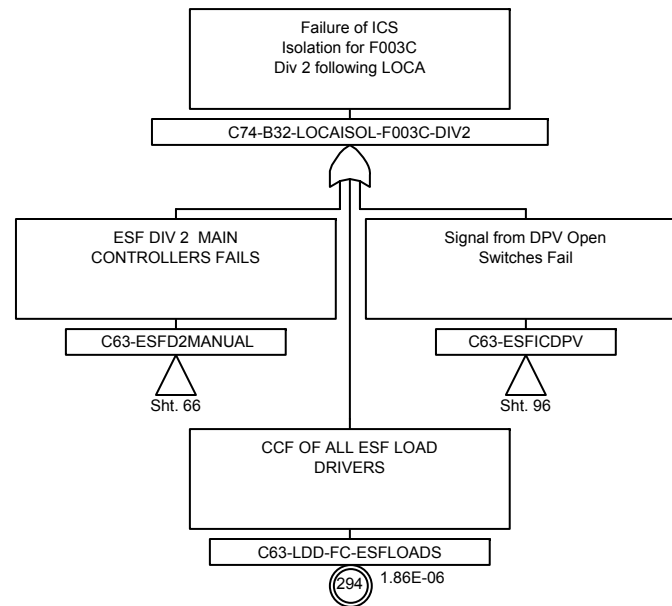


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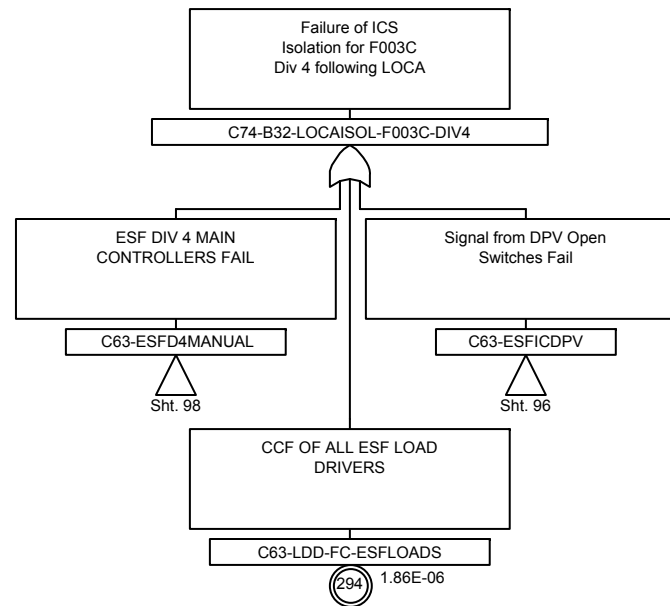


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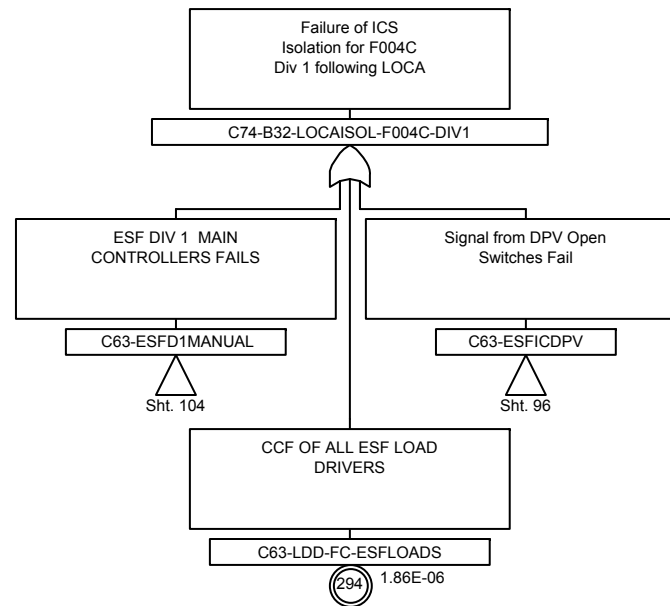


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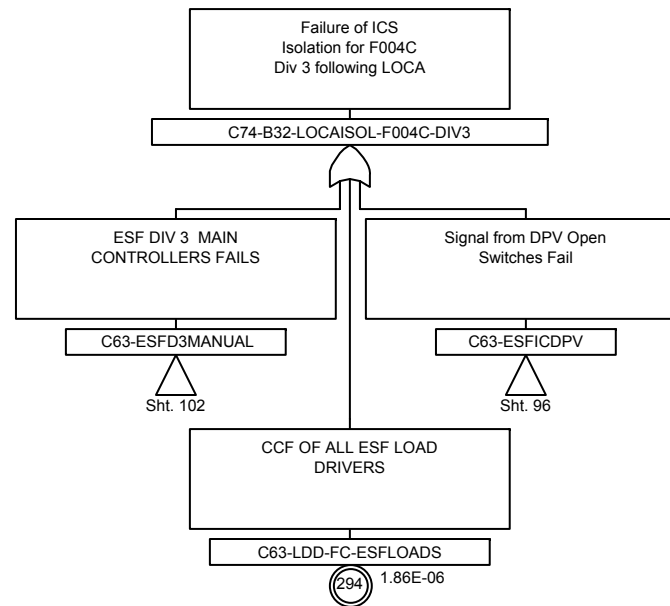


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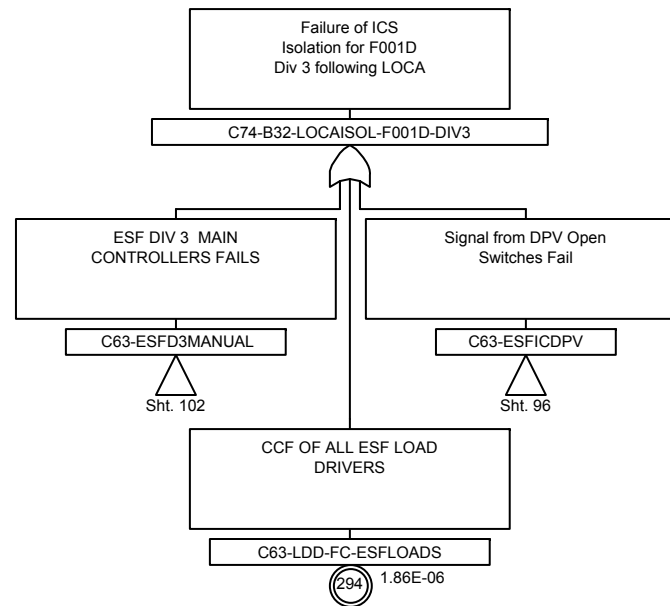


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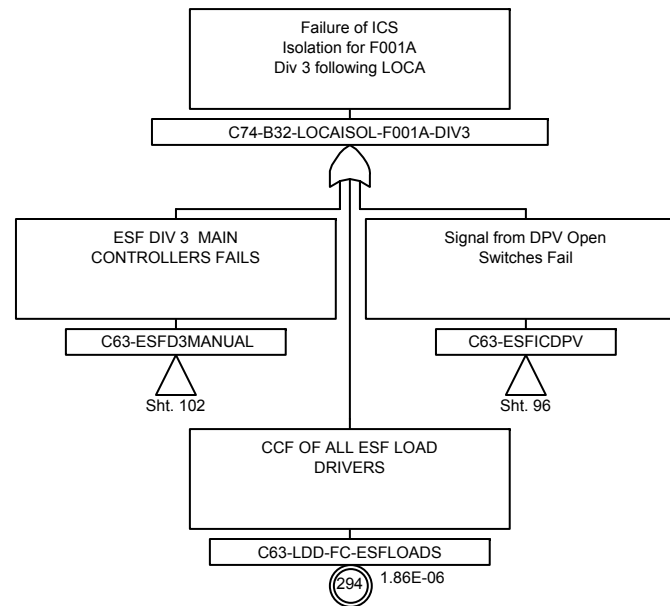


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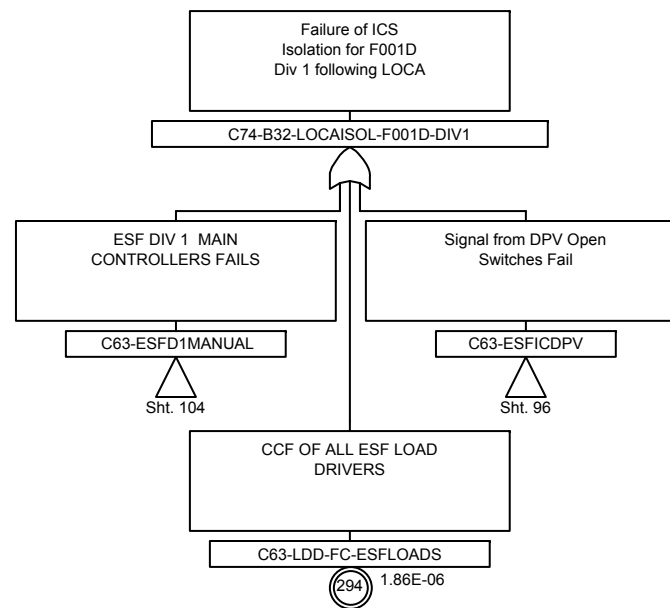


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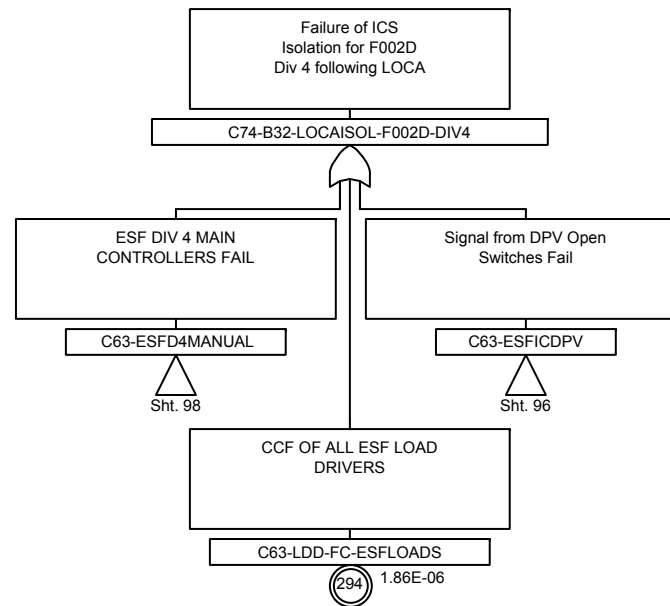


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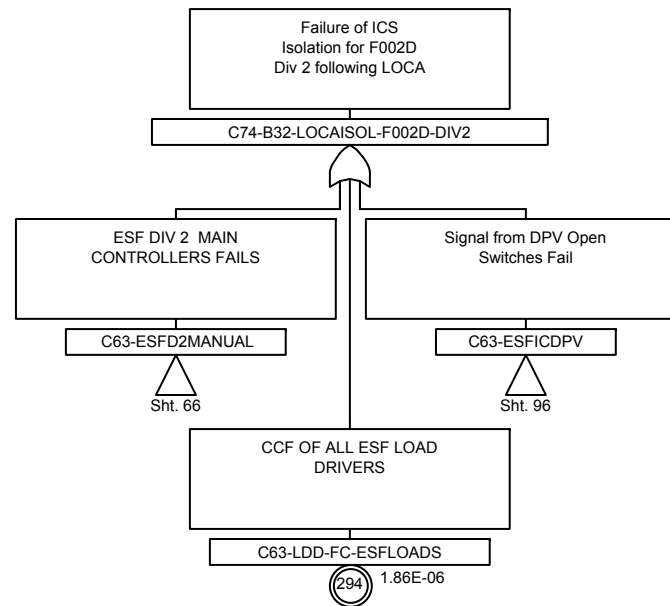


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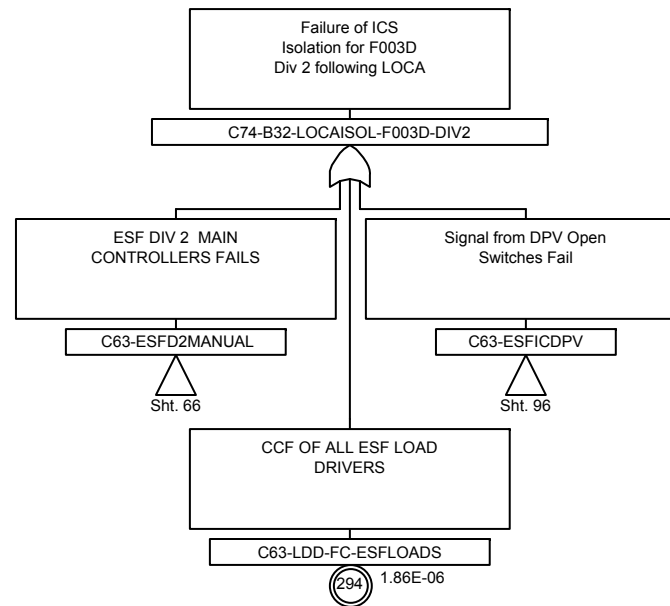


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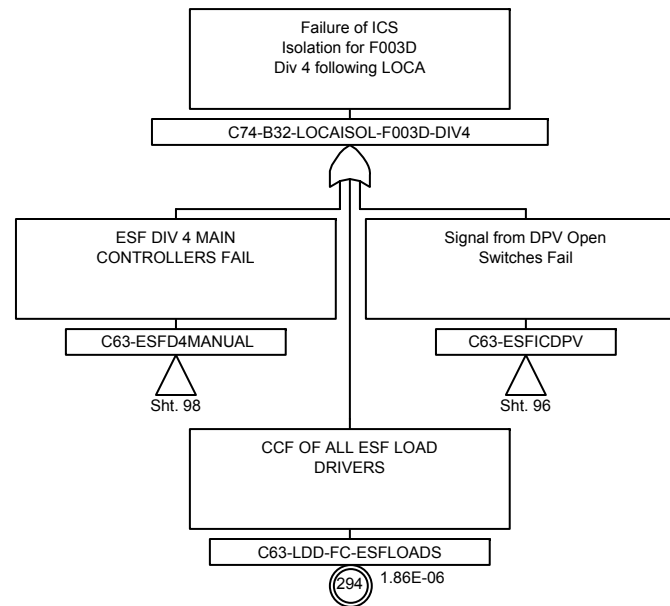


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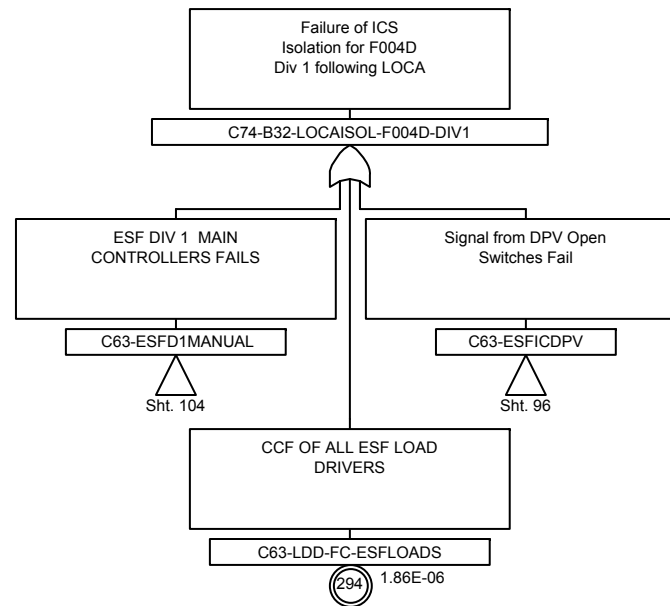


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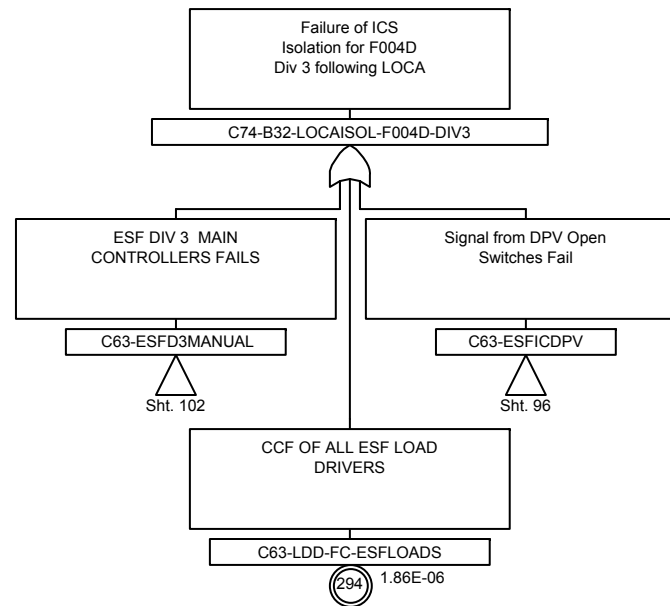


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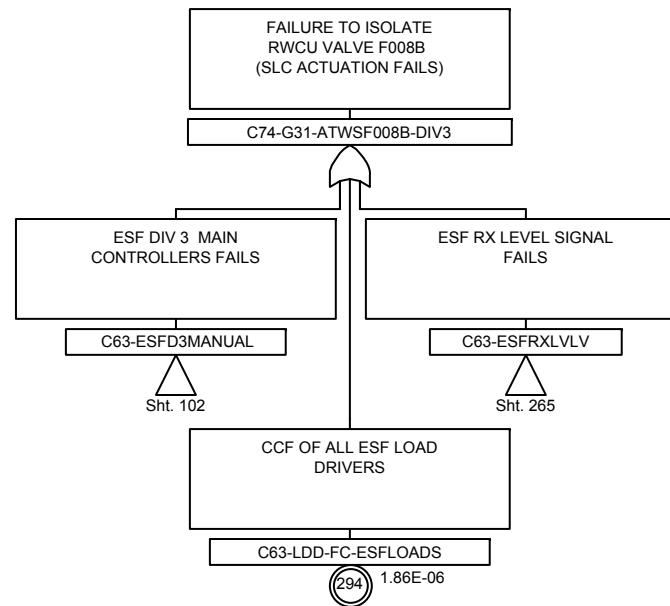


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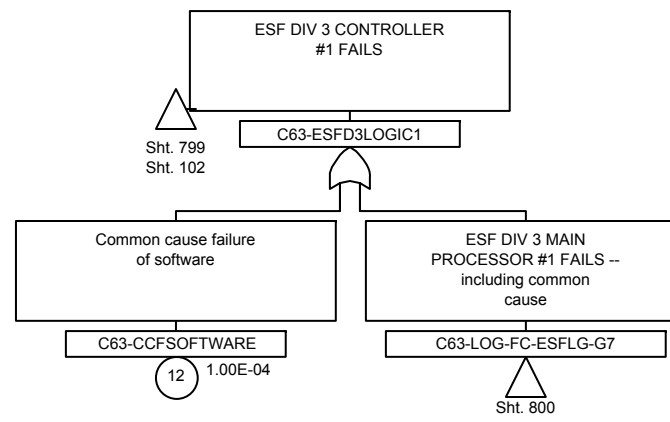


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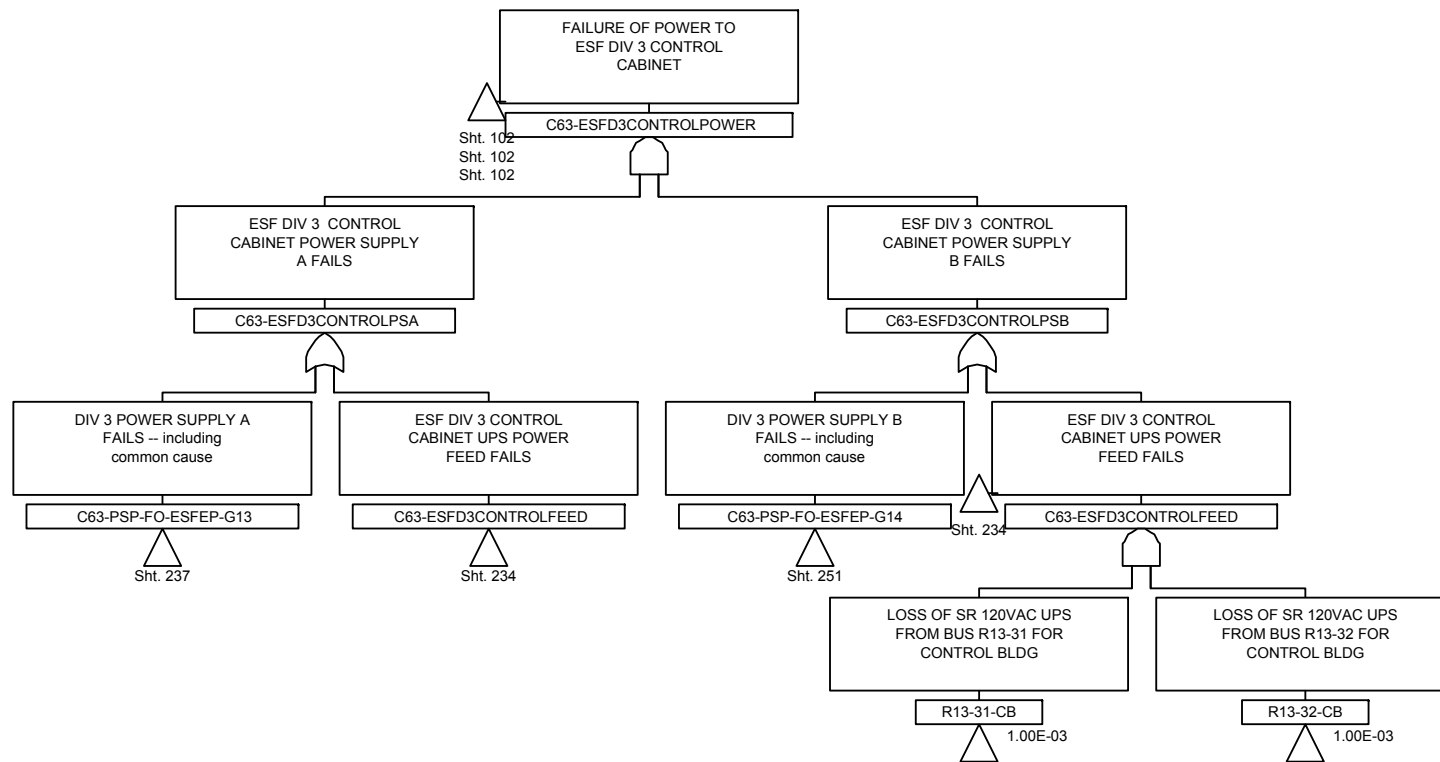


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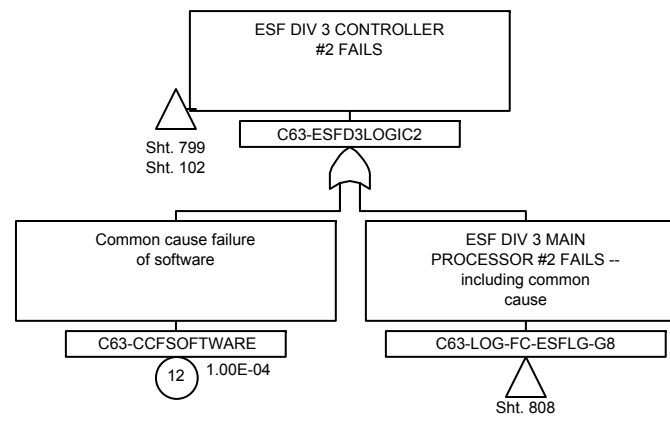


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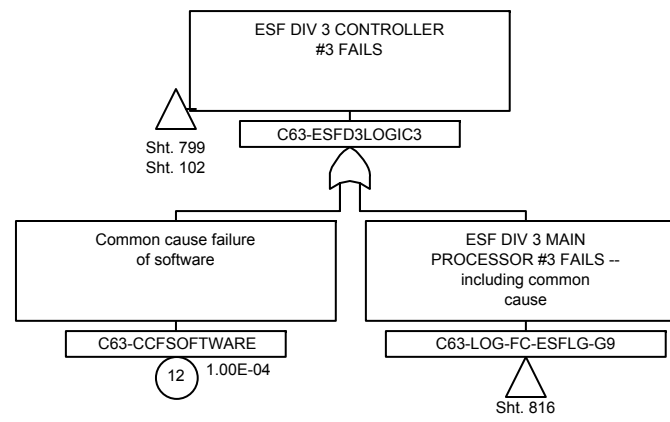


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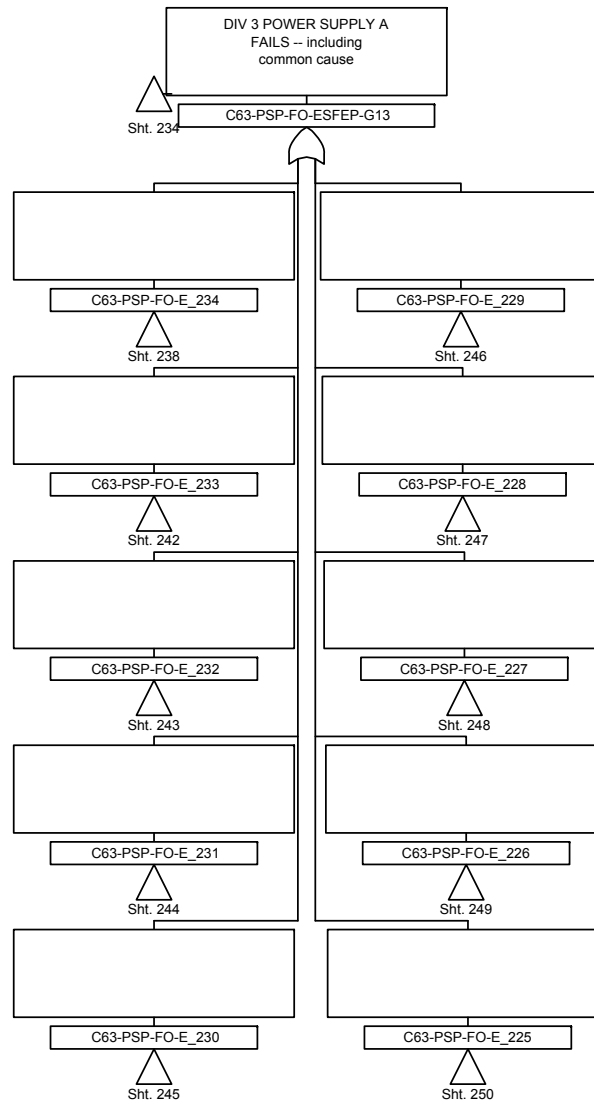


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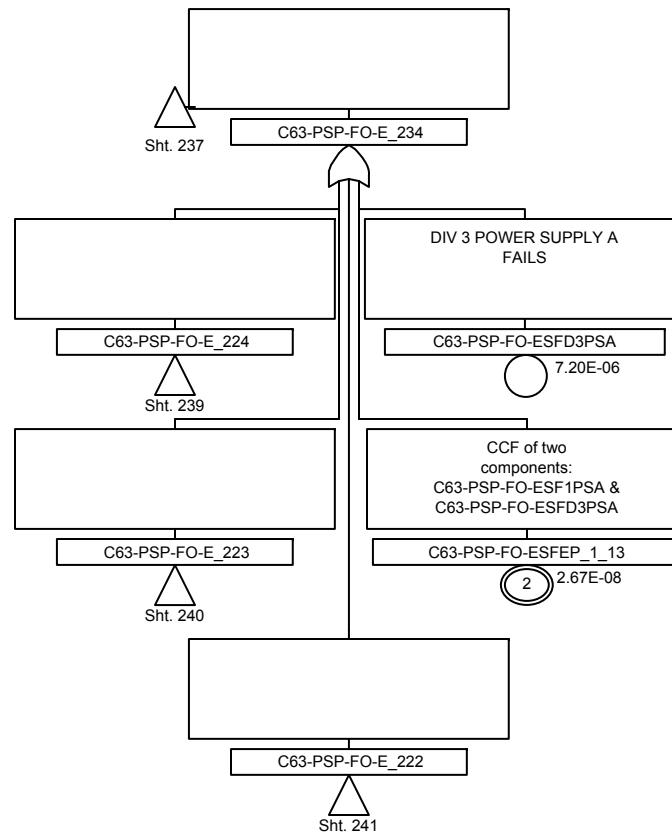


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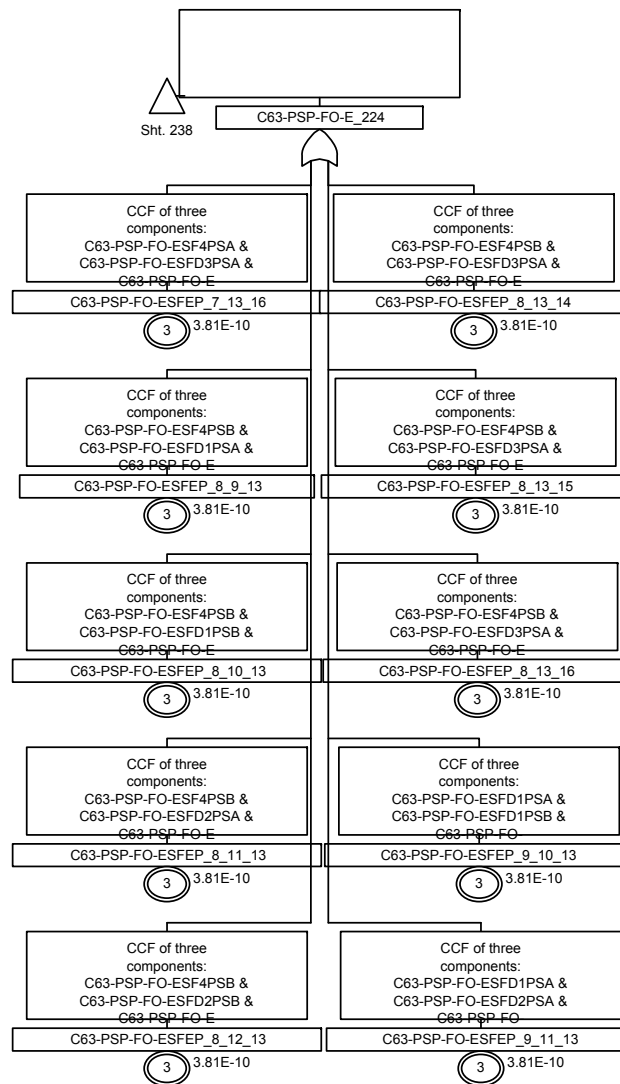


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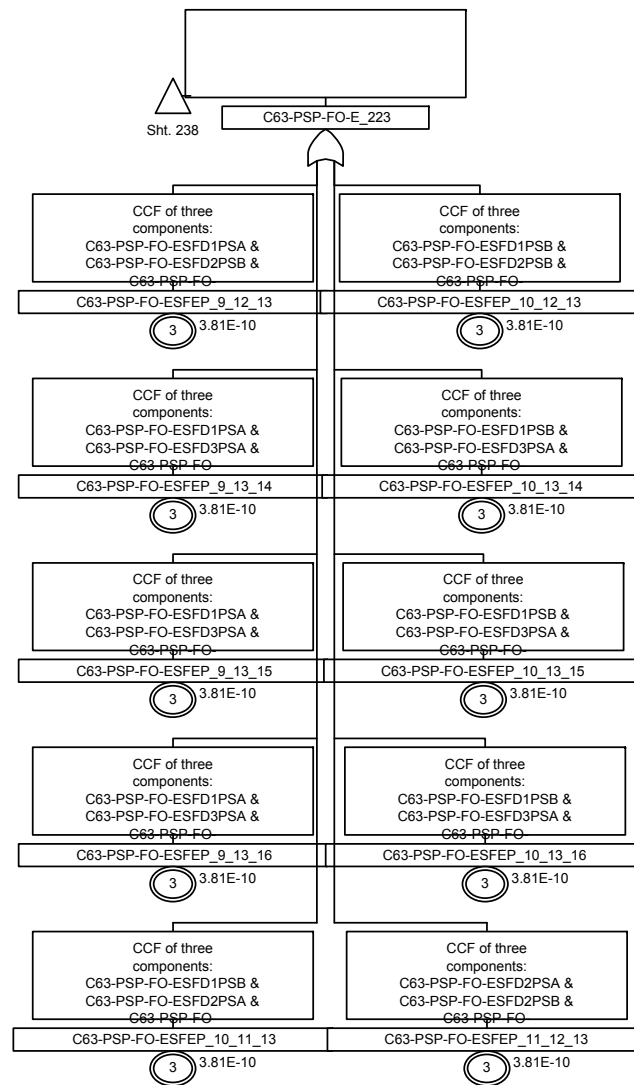


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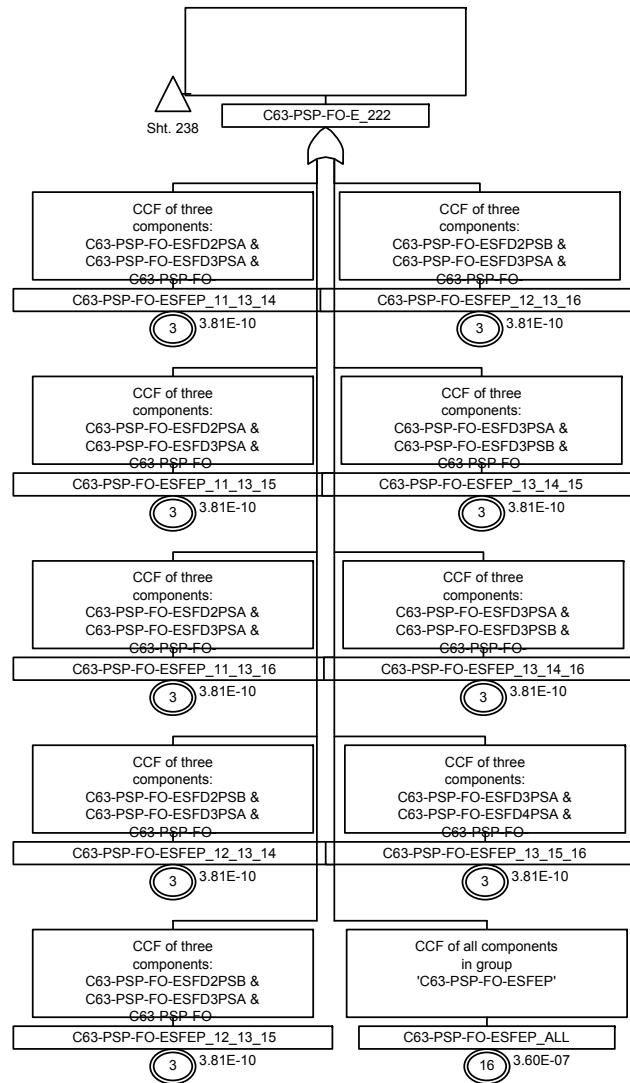


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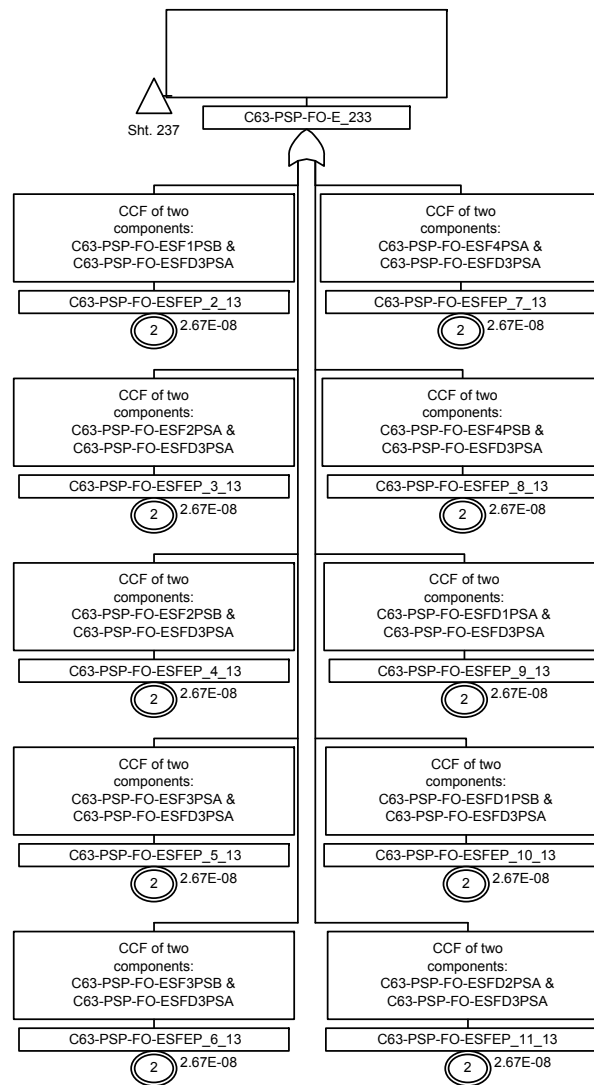


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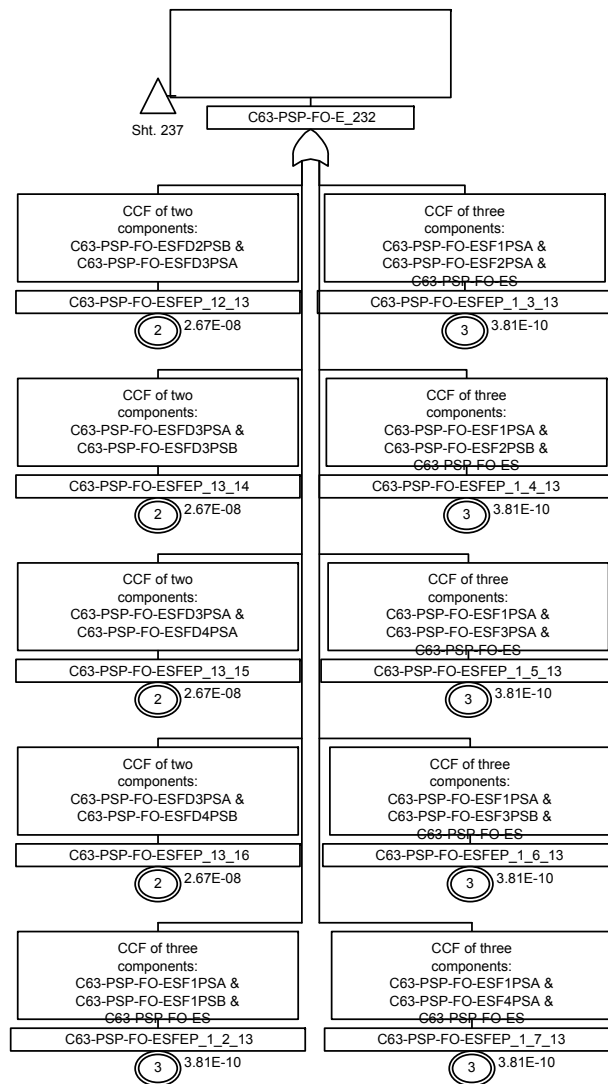


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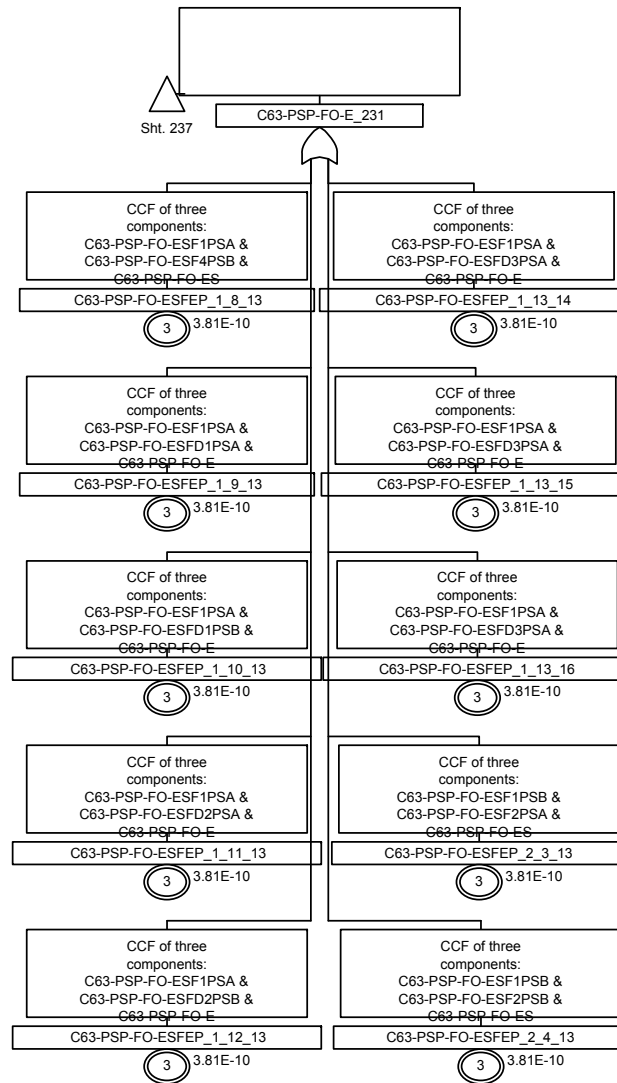


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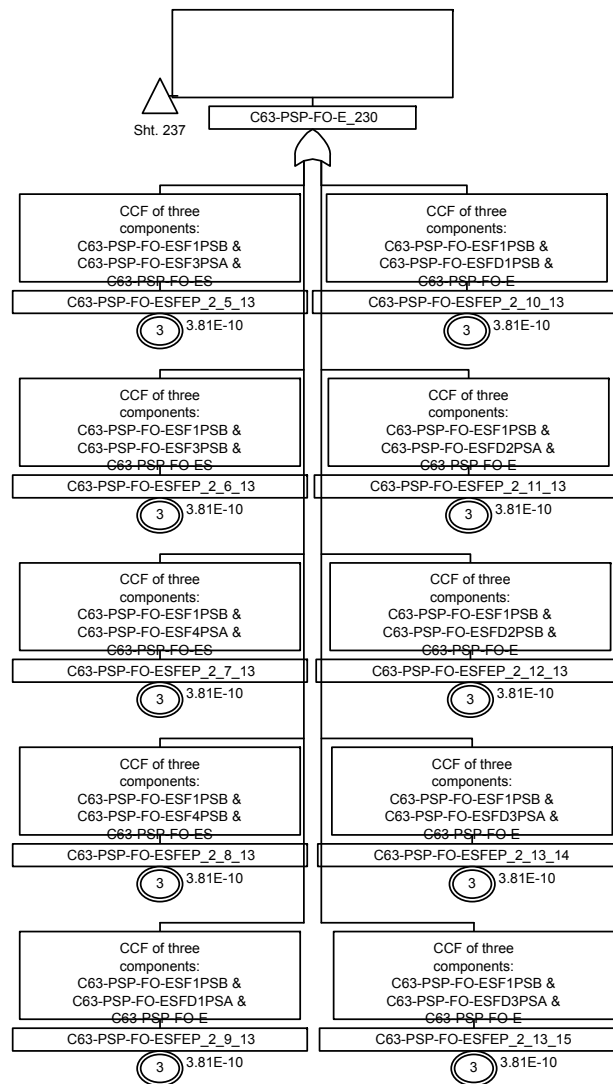


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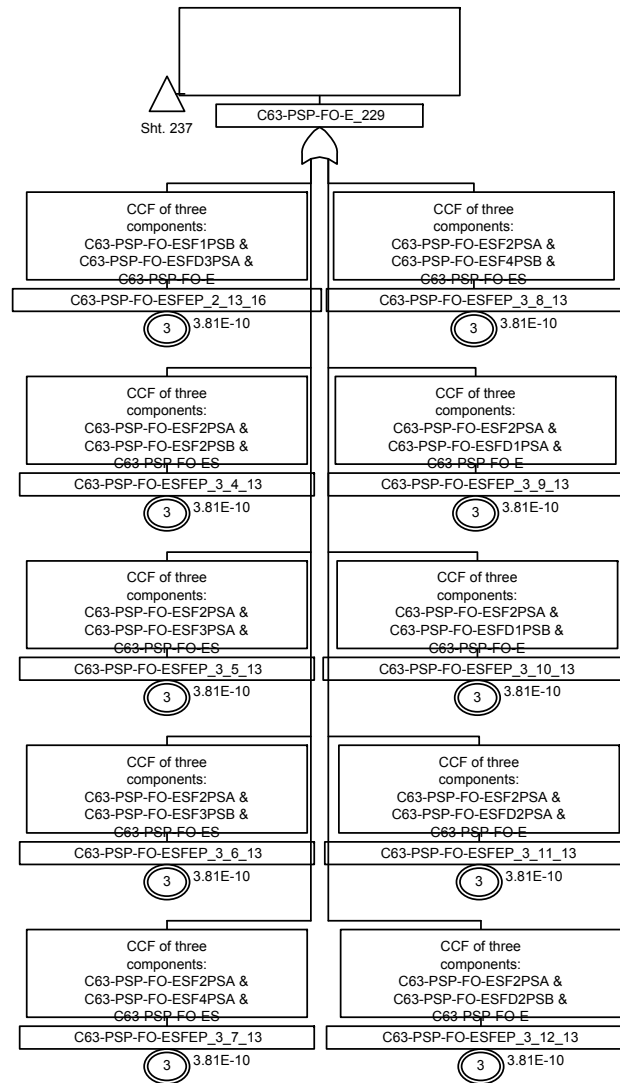


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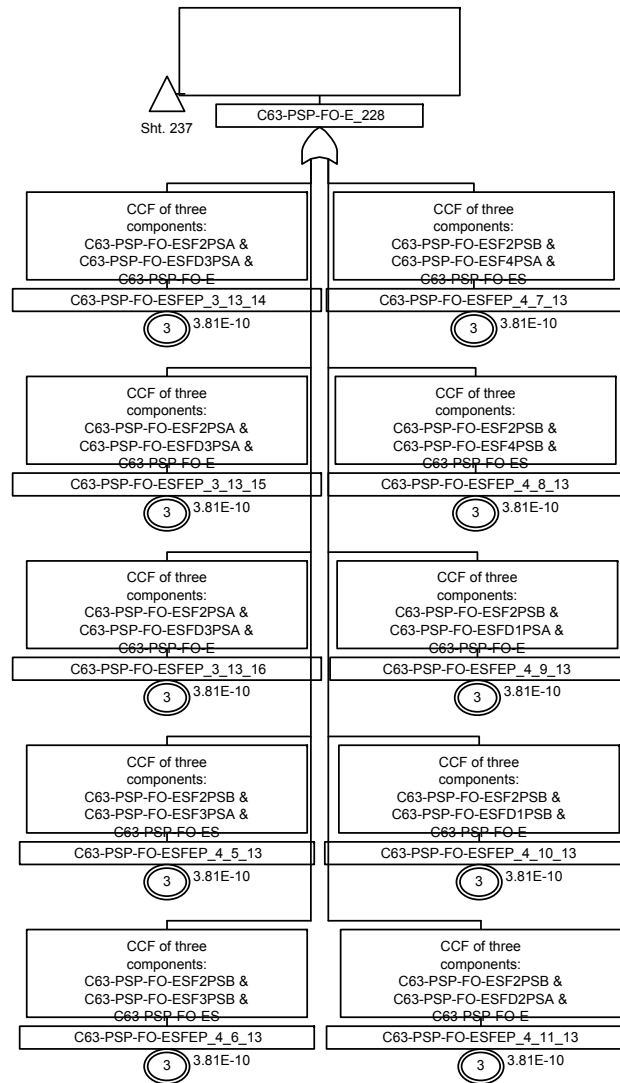


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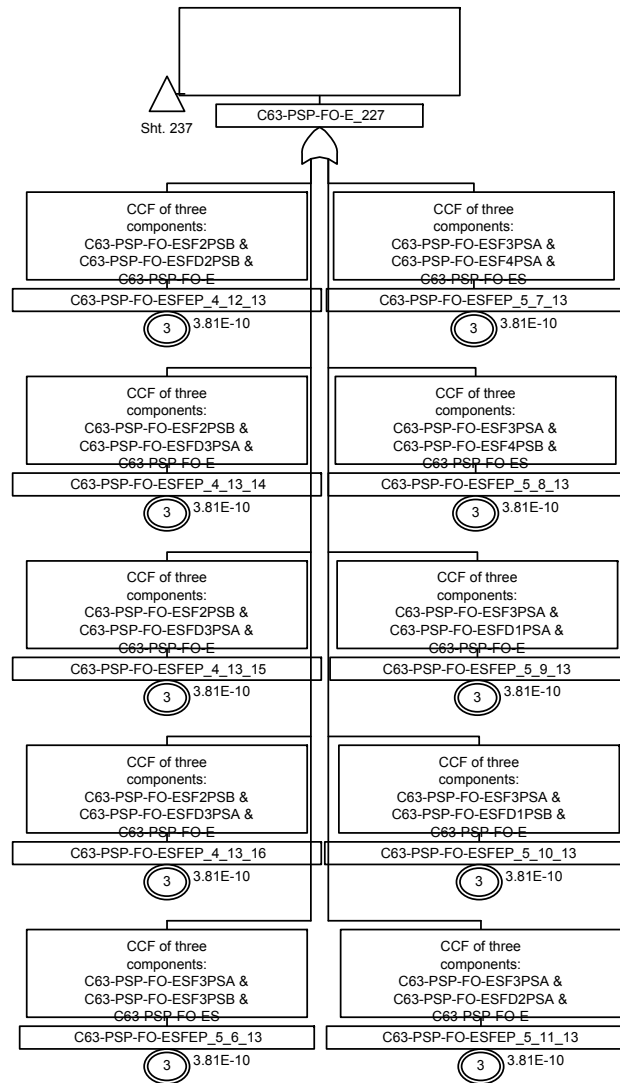


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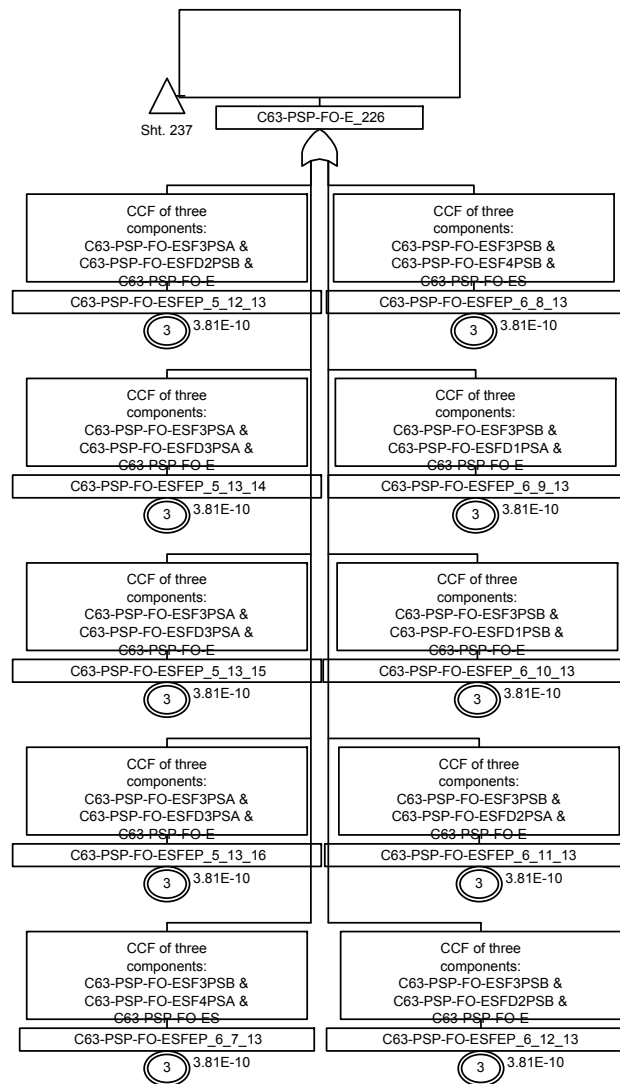


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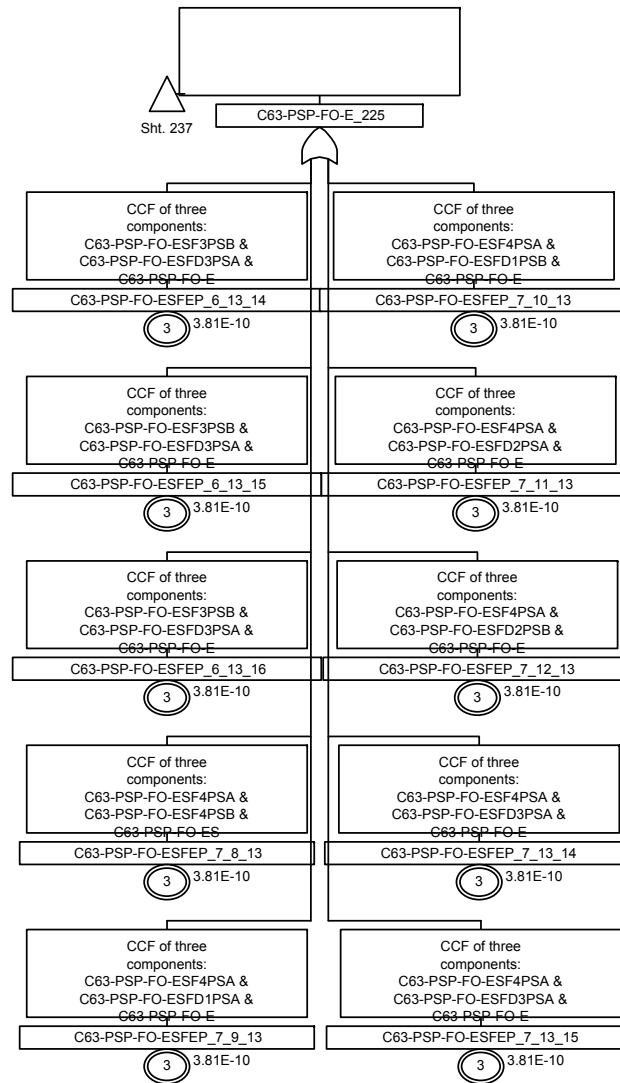


Figure 4.5-3b. Sheet 250 Q-DCIS Safety Related Control System

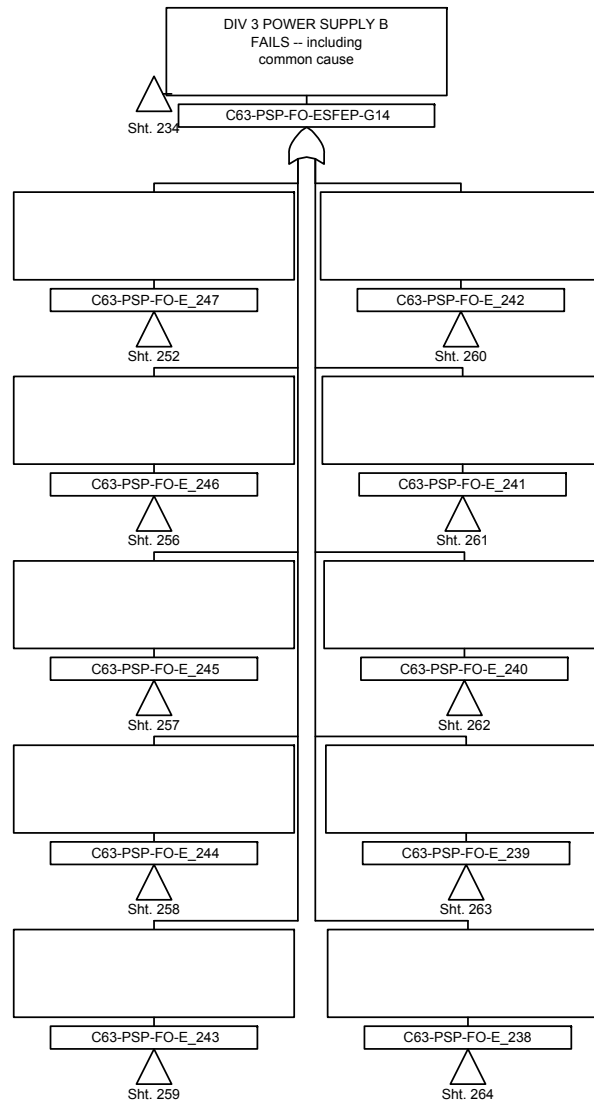


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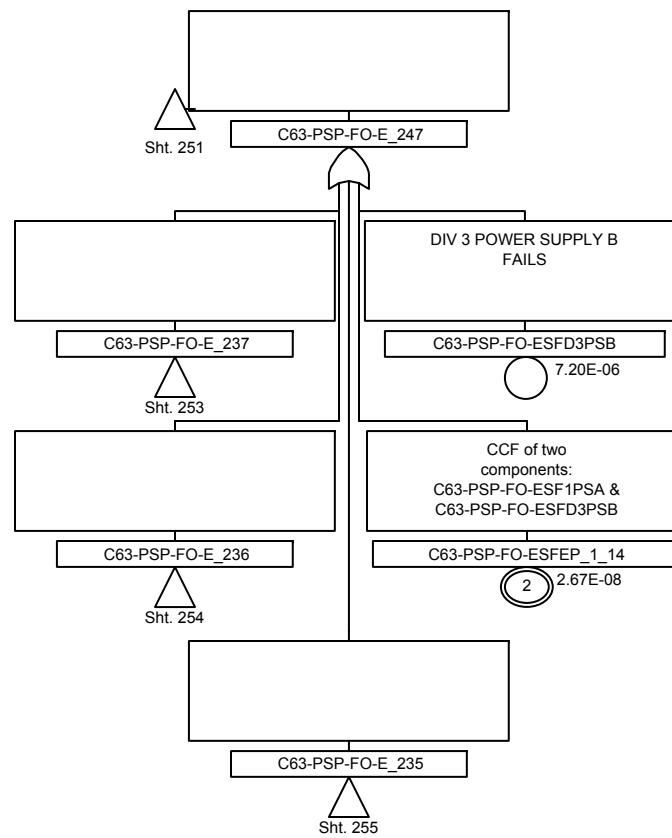


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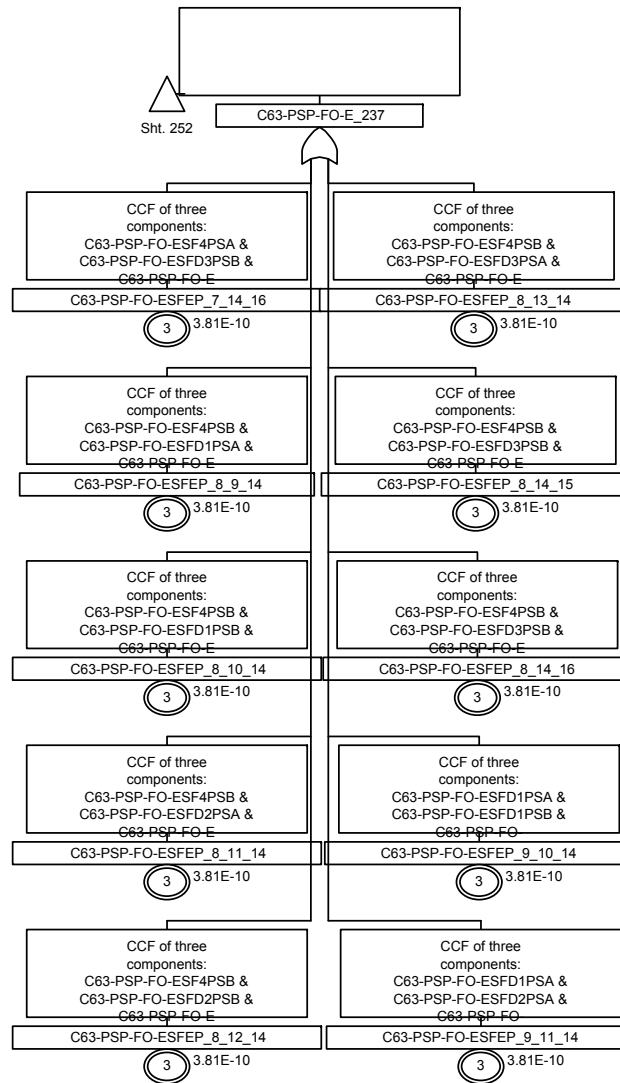


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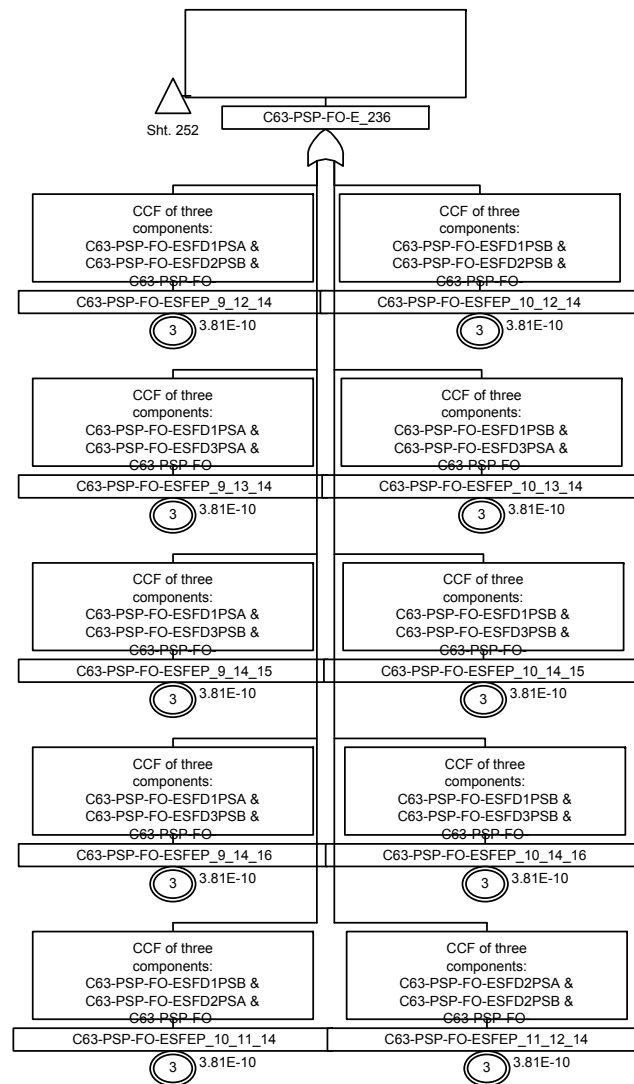


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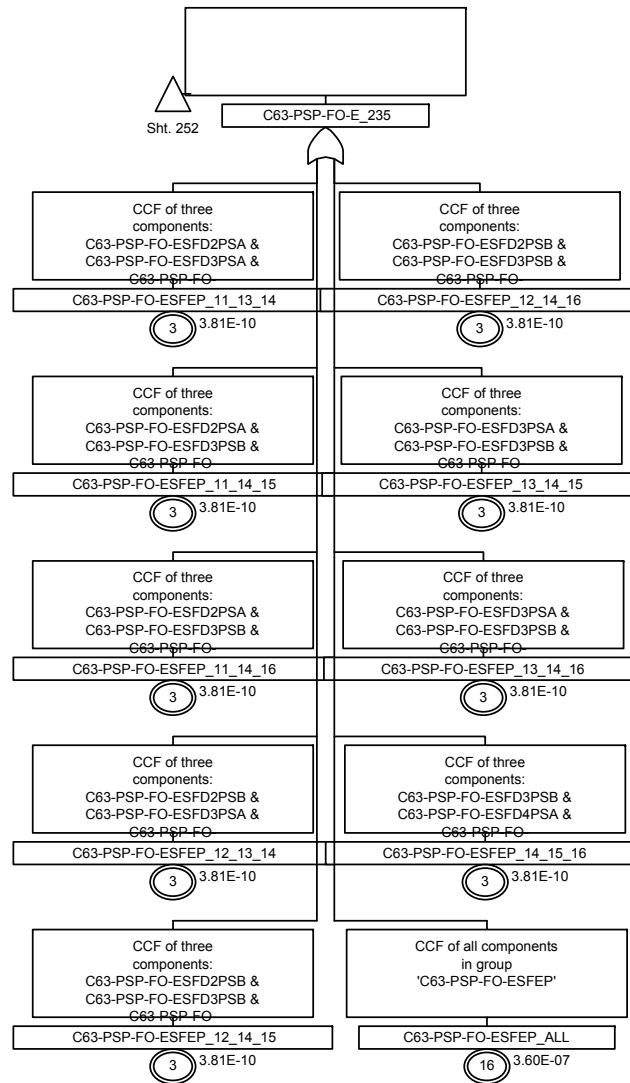


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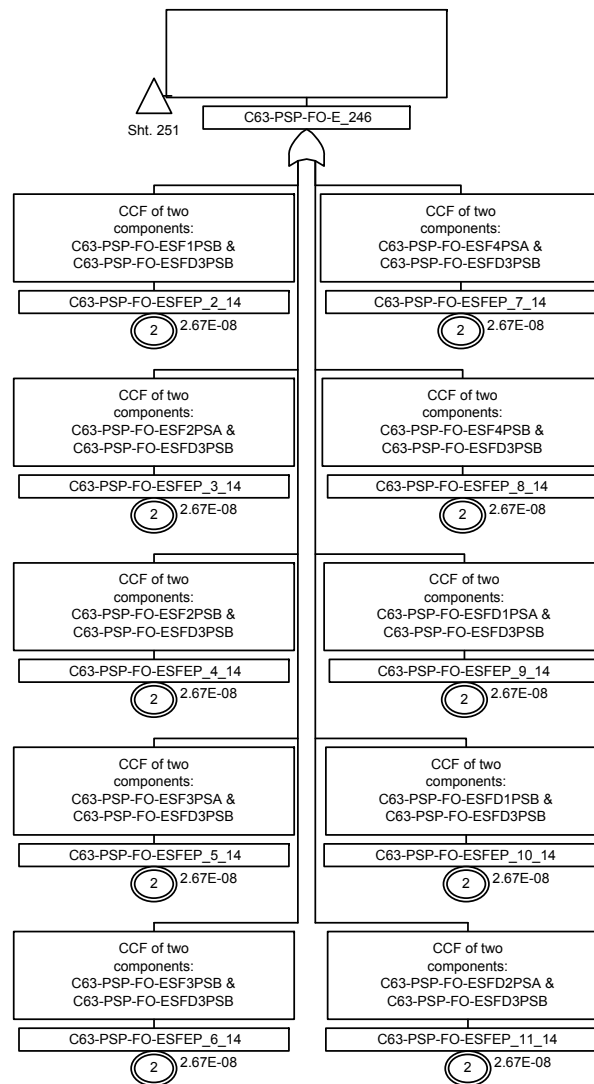


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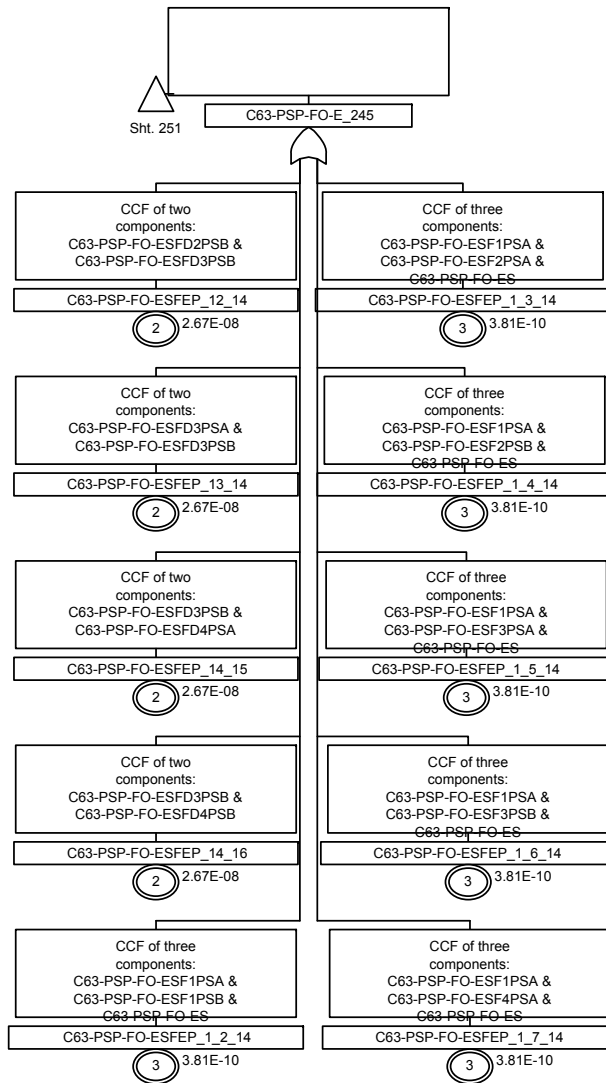


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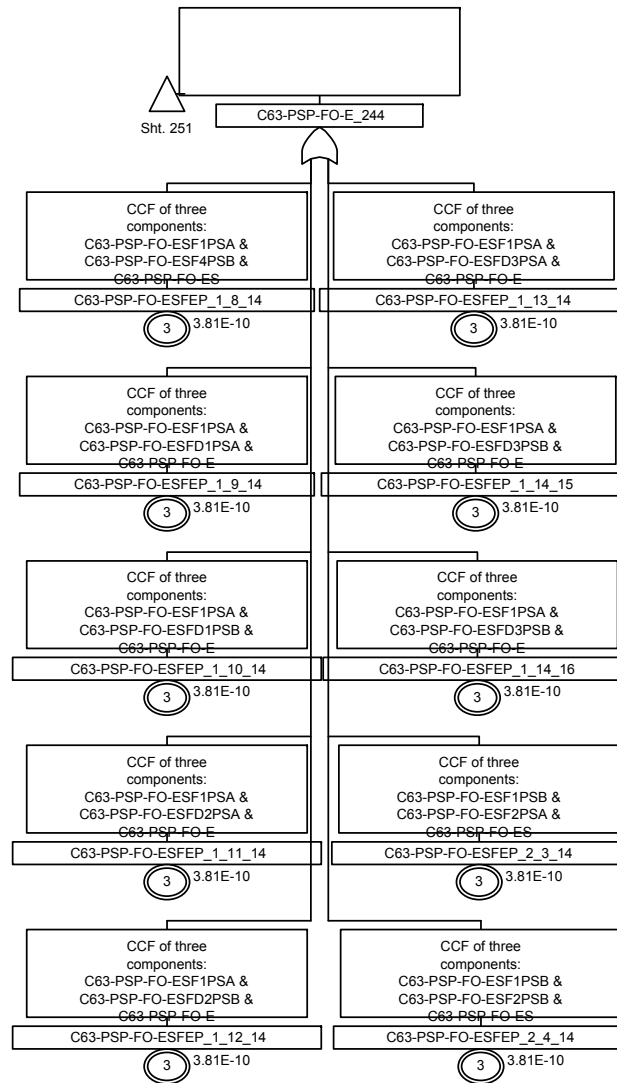


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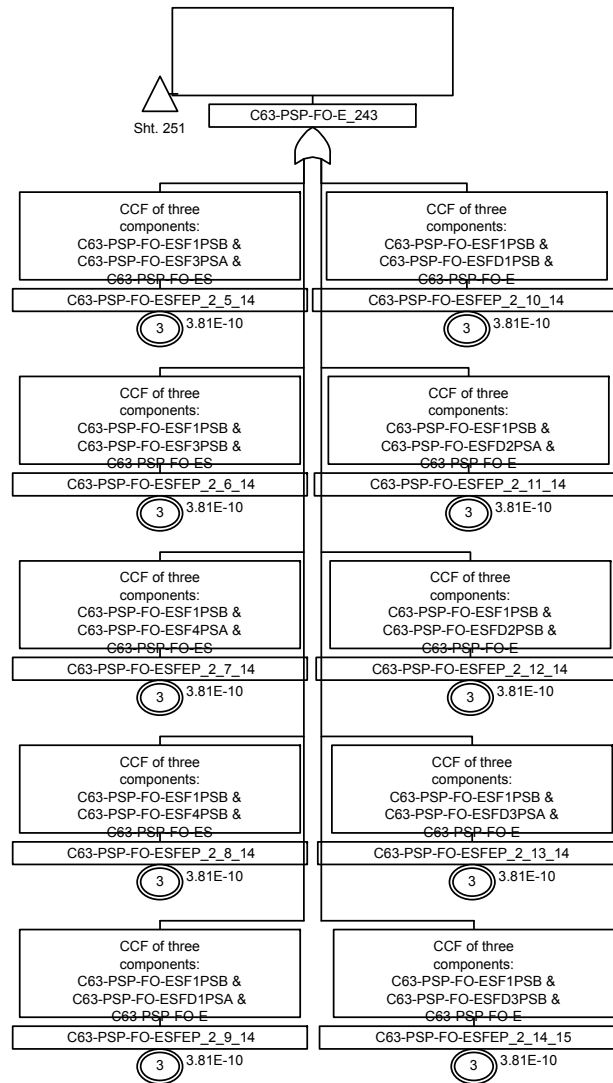


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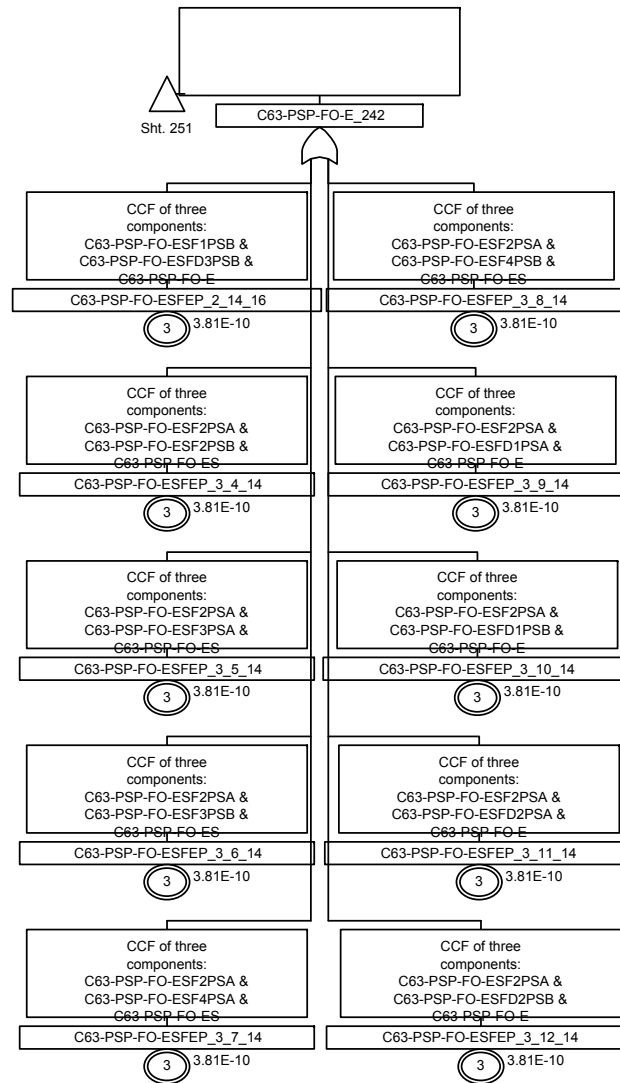


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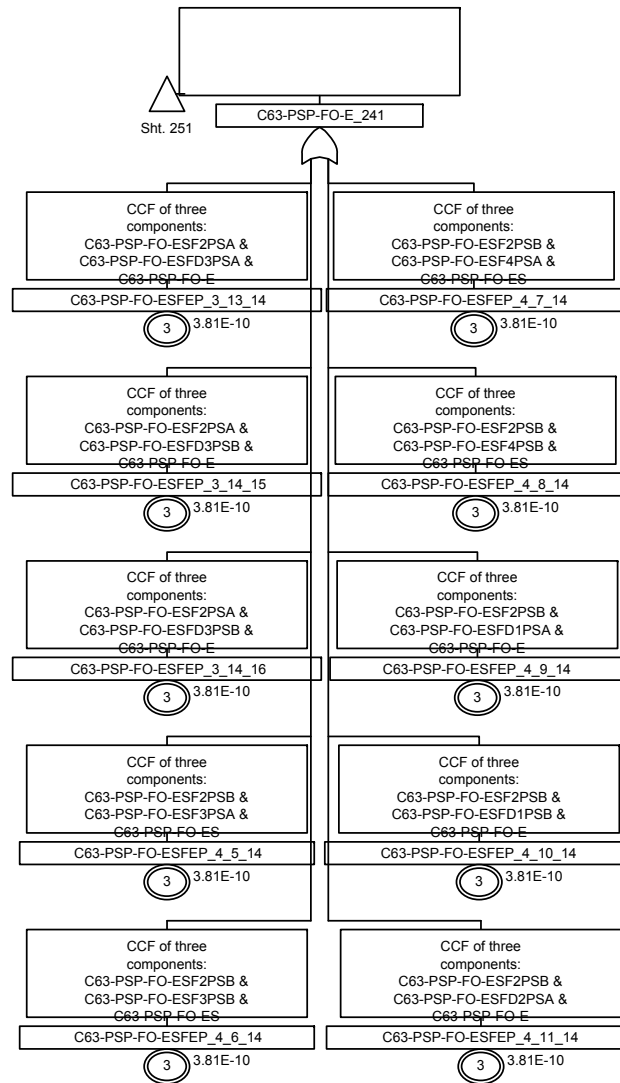


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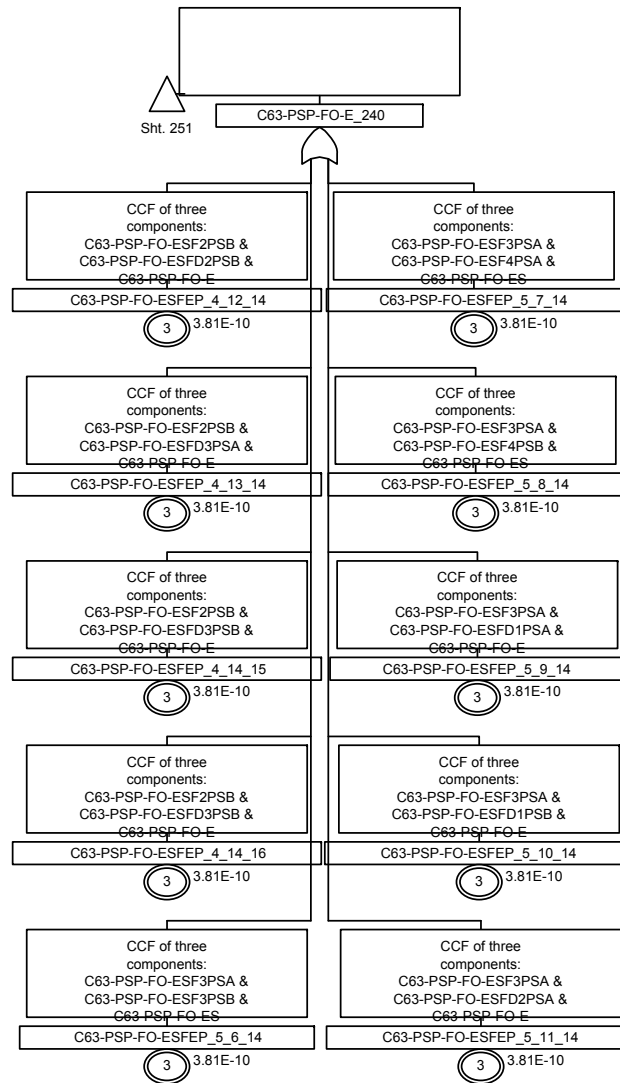


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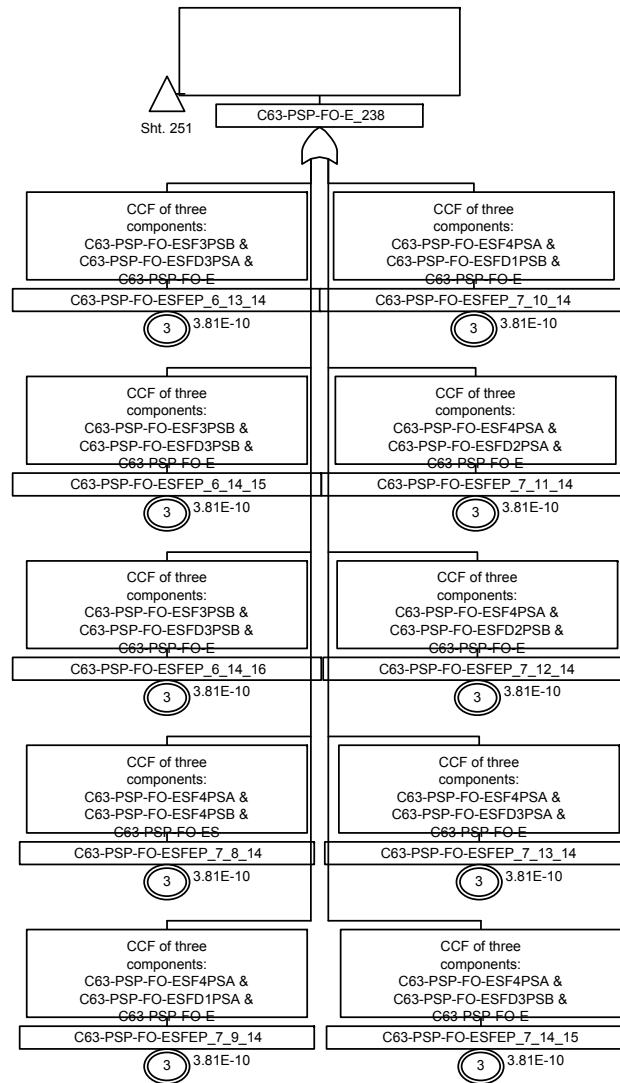


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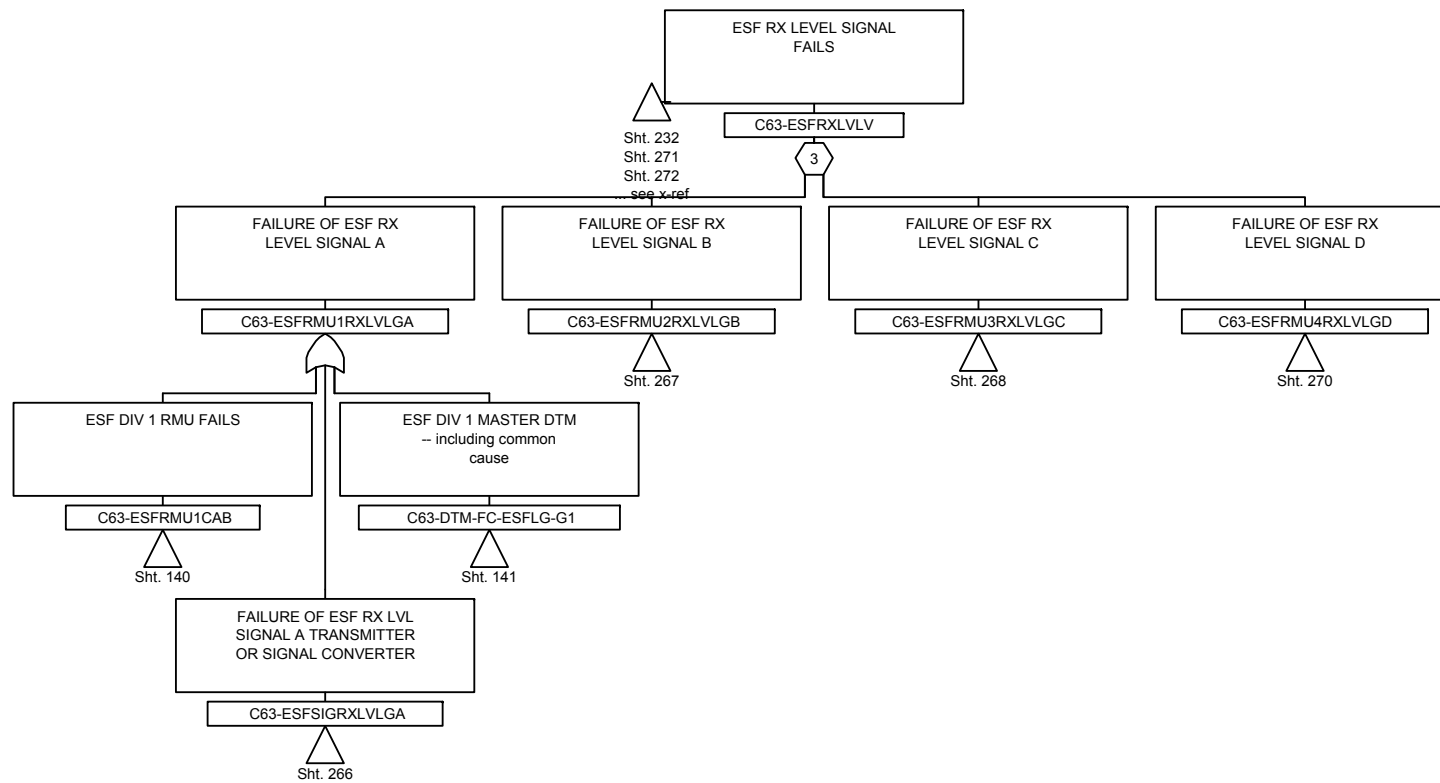


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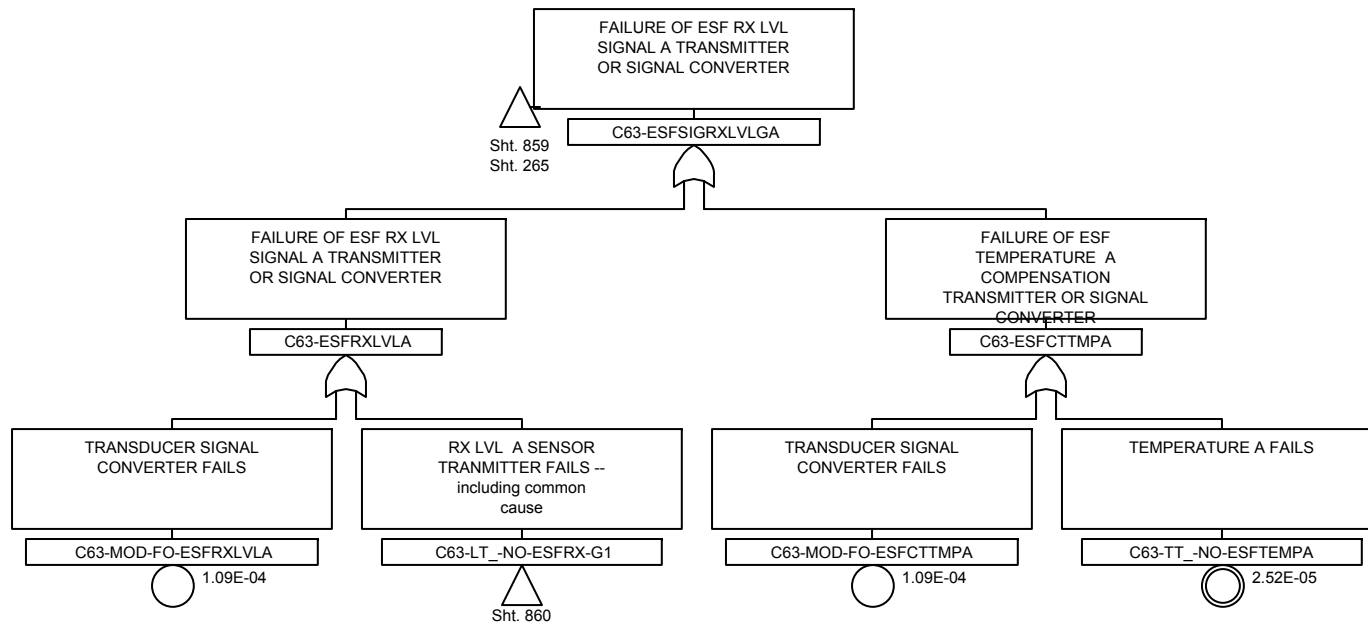


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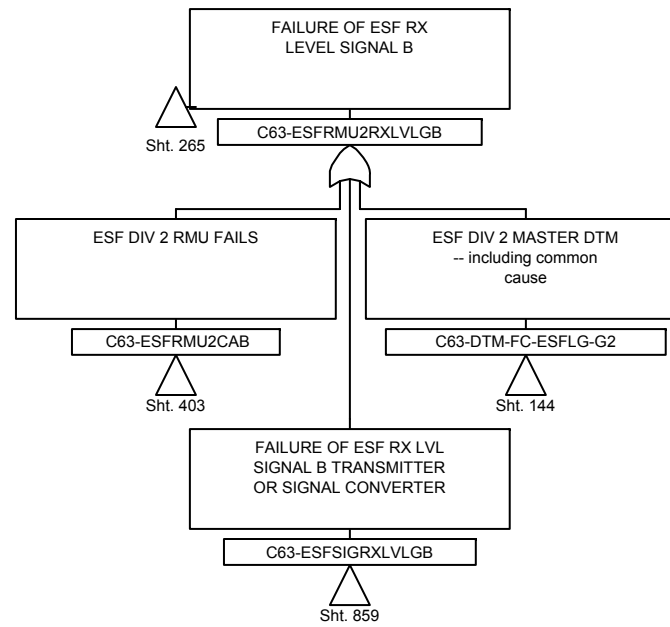


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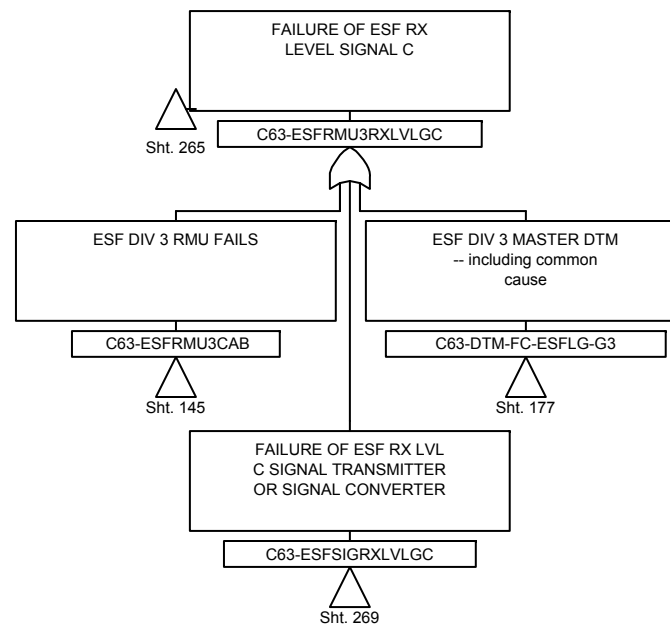


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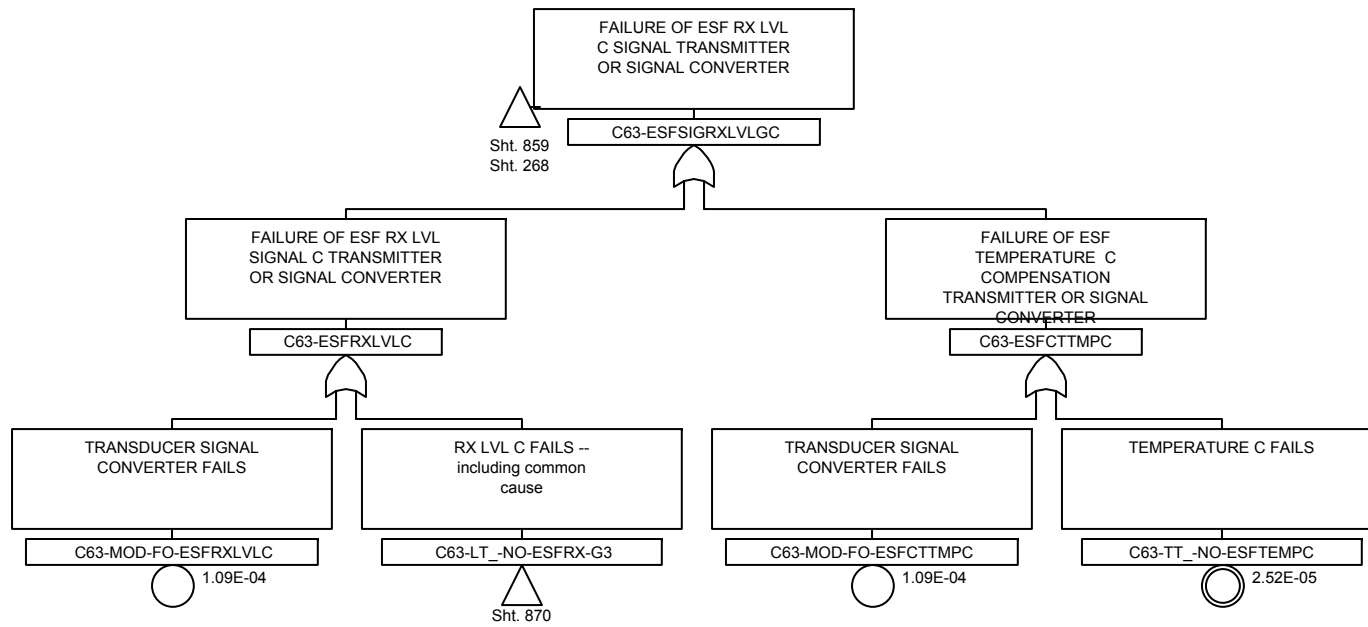


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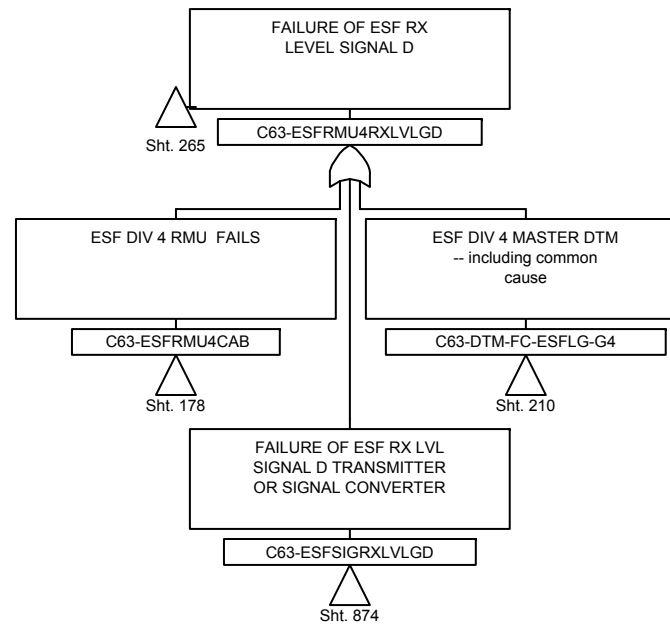


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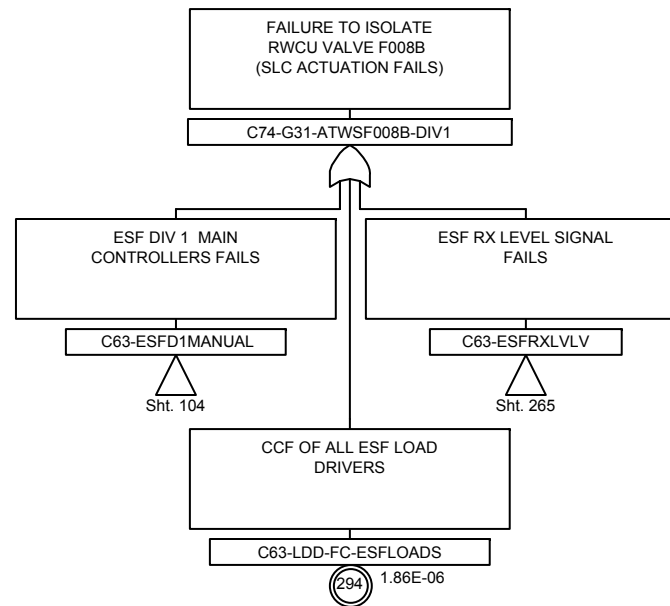


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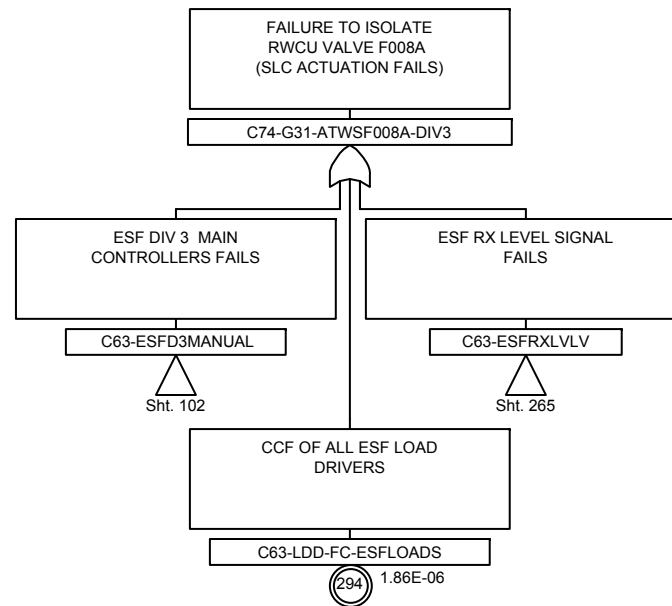


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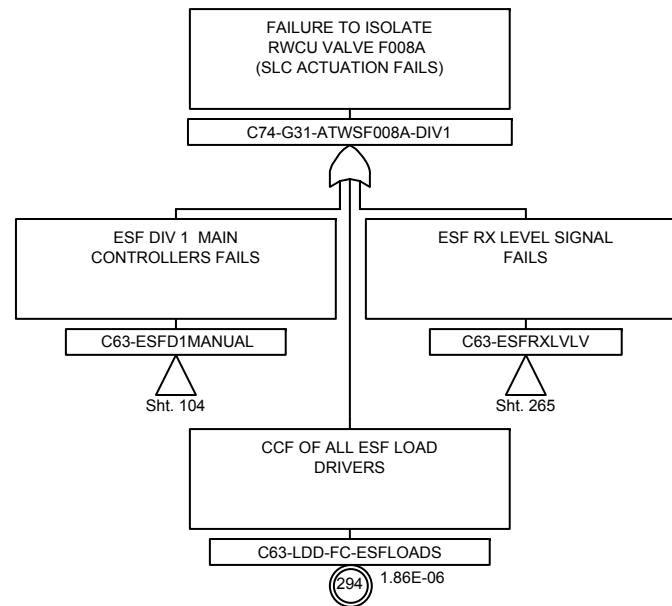


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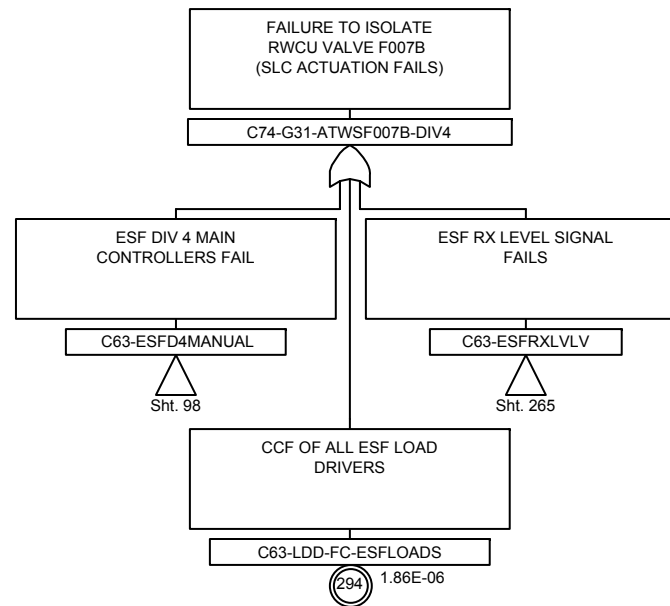


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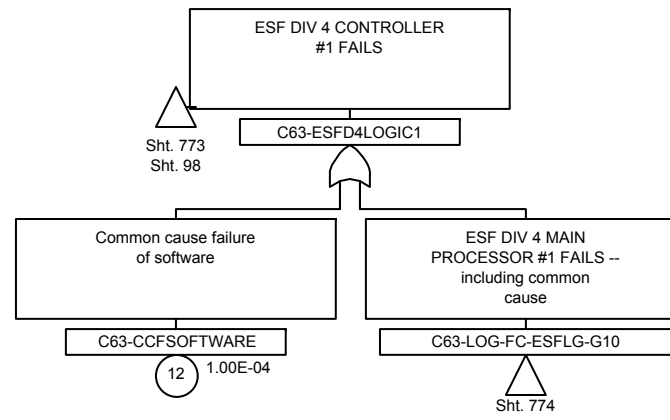


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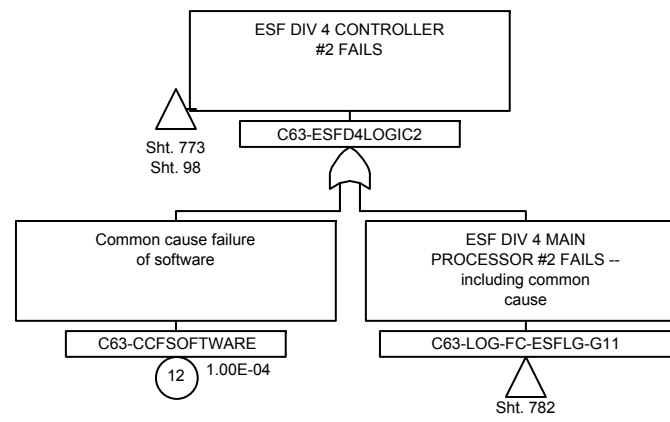


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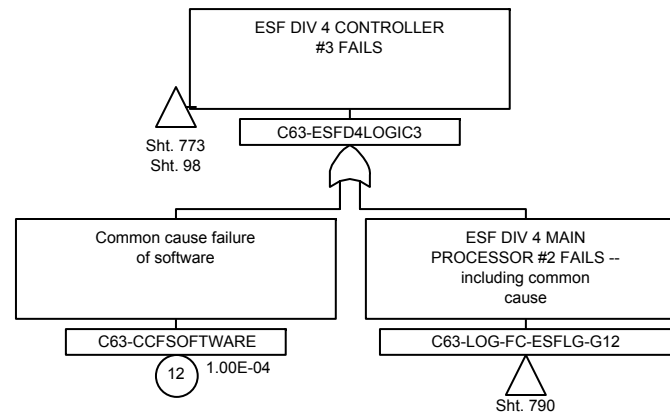


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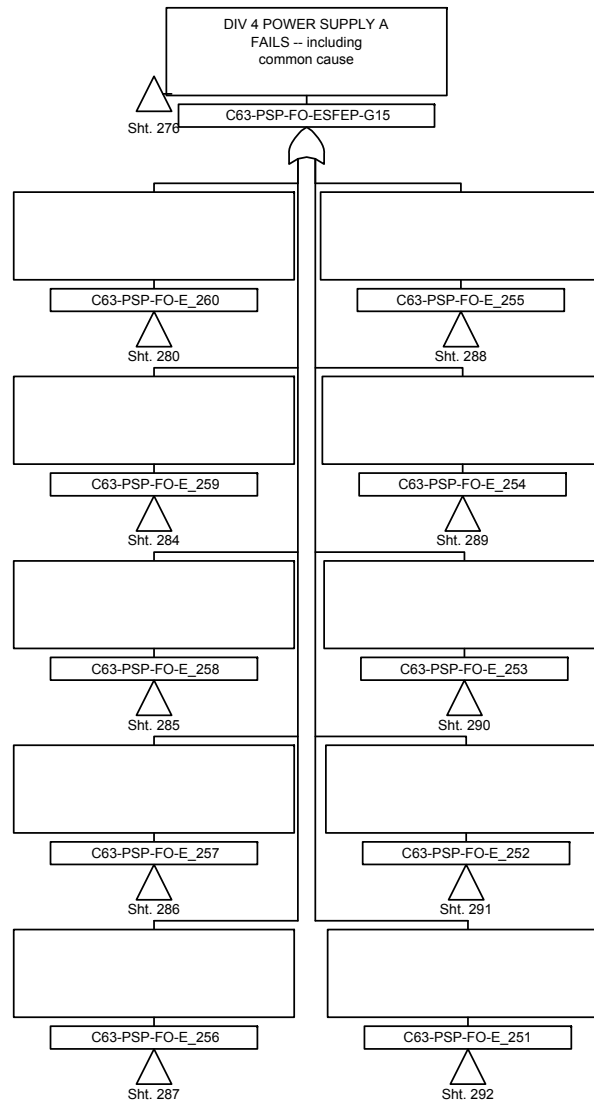


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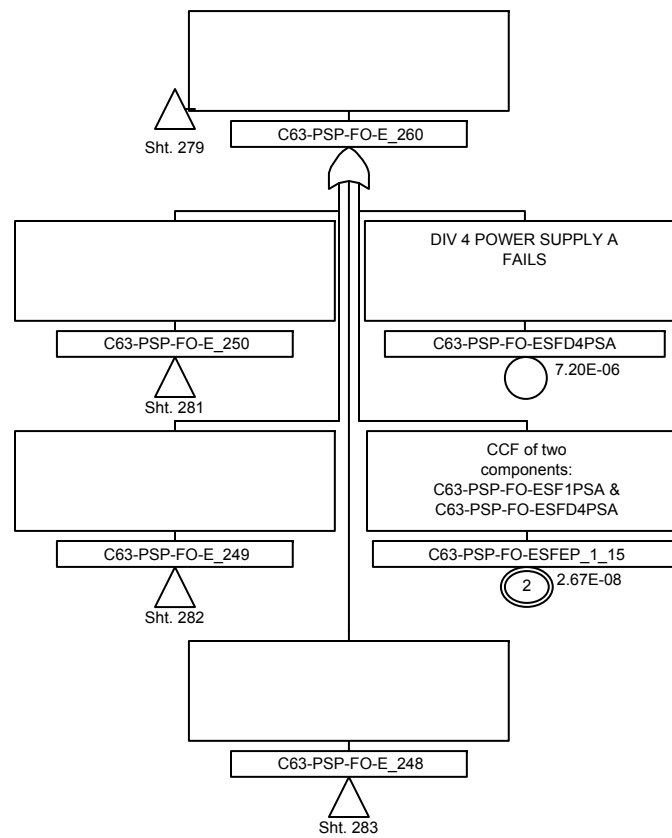


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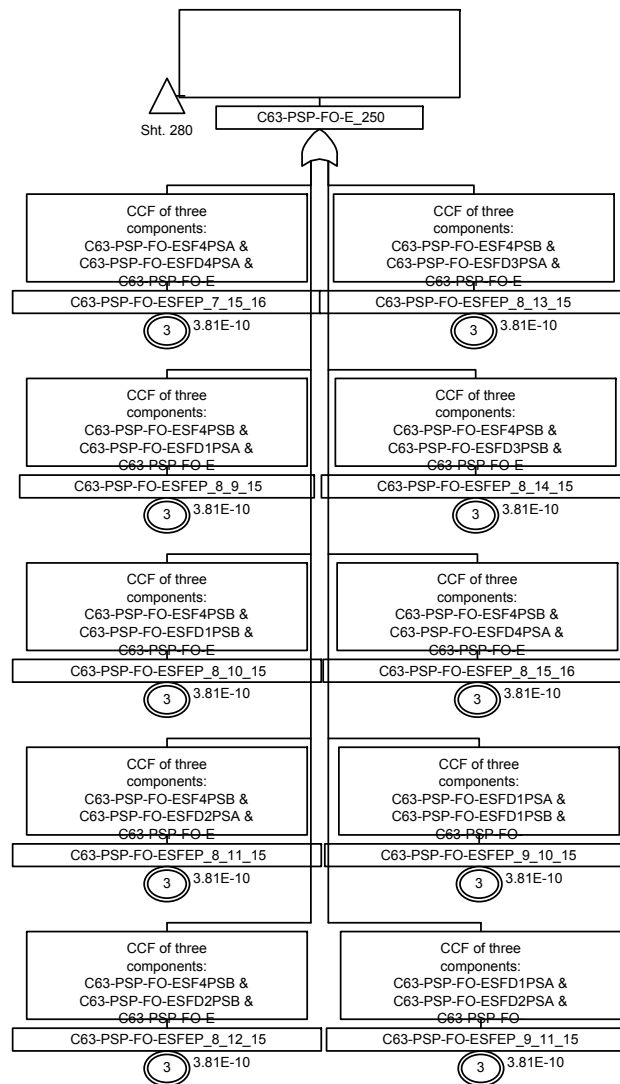


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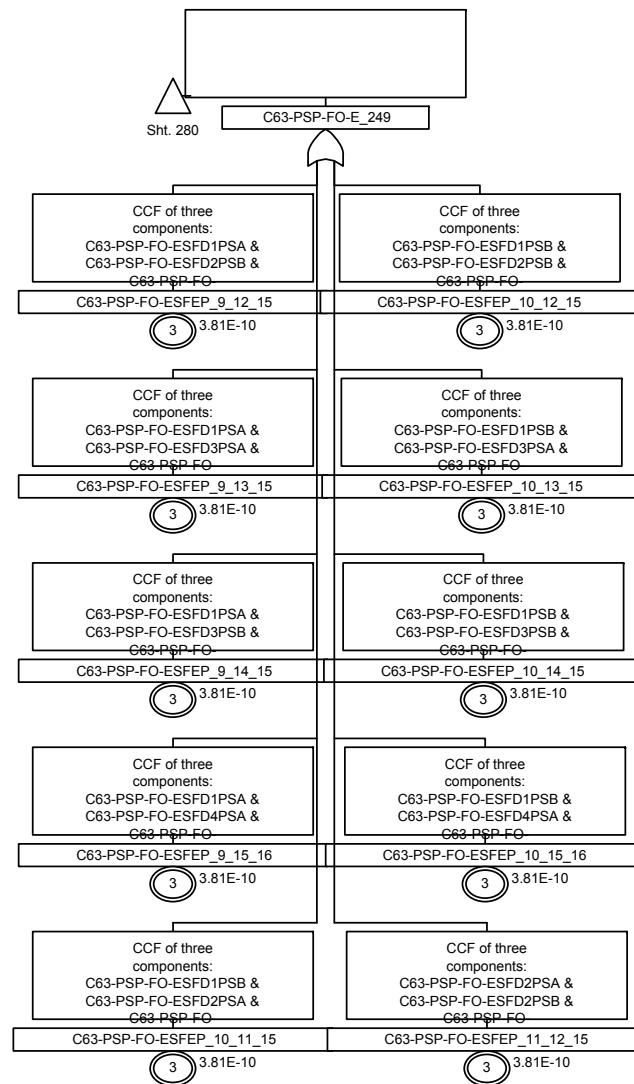


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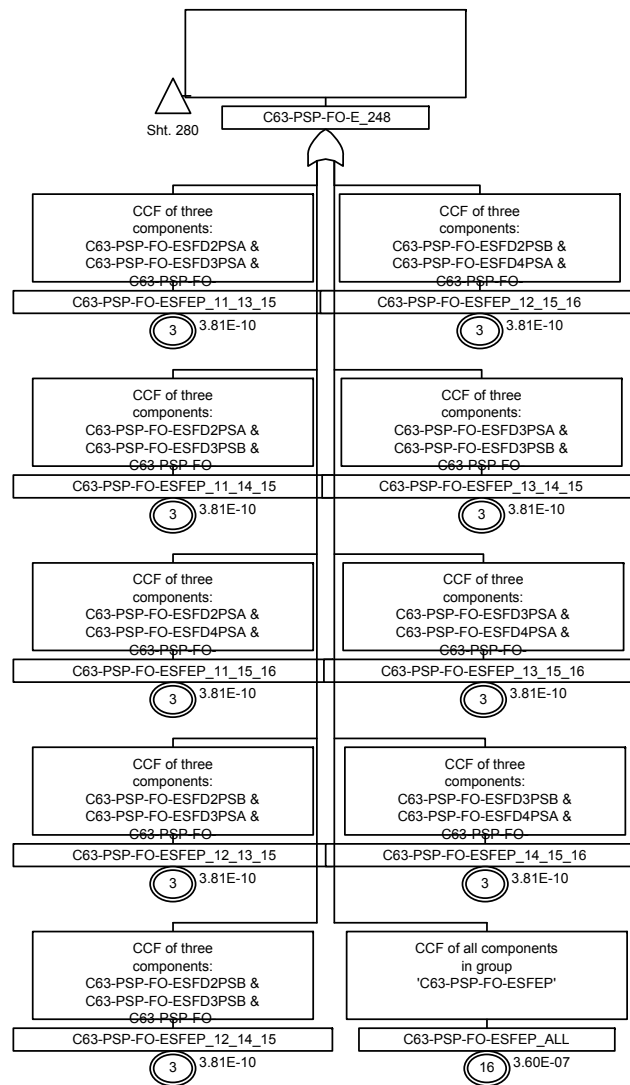


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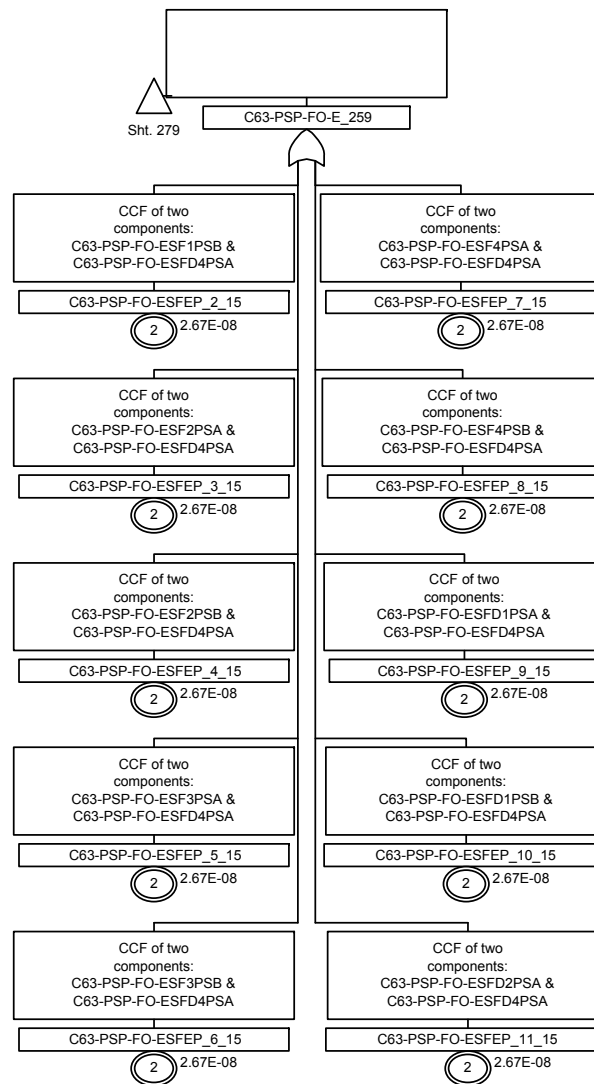


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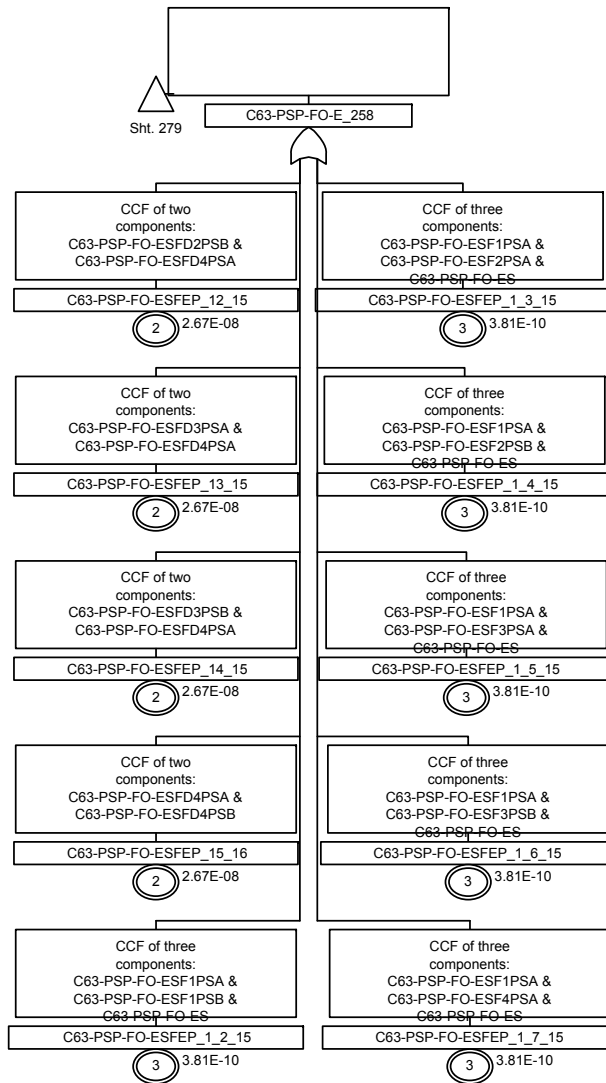


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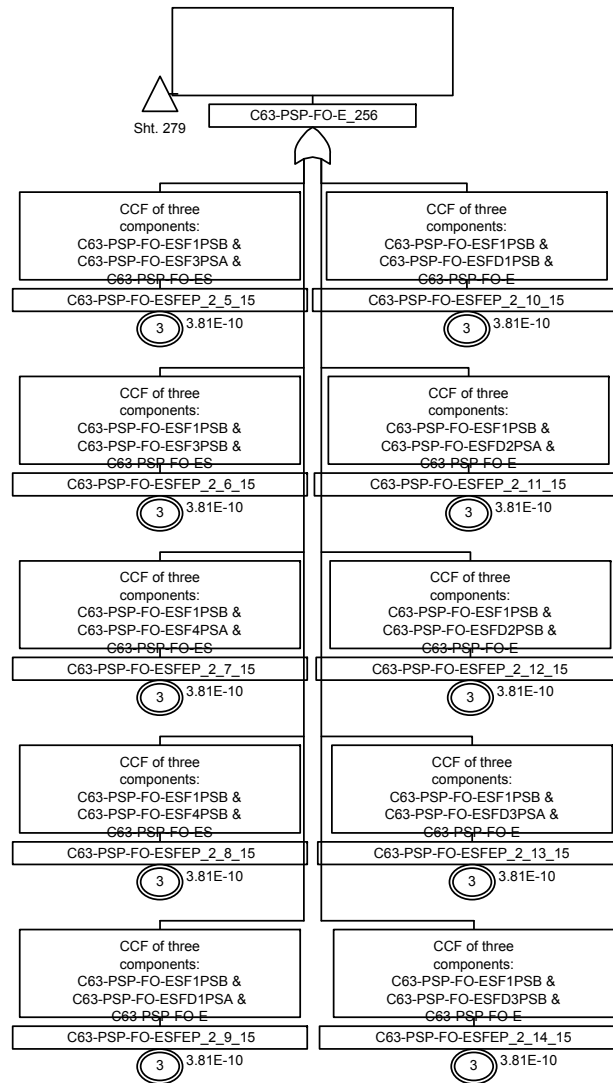


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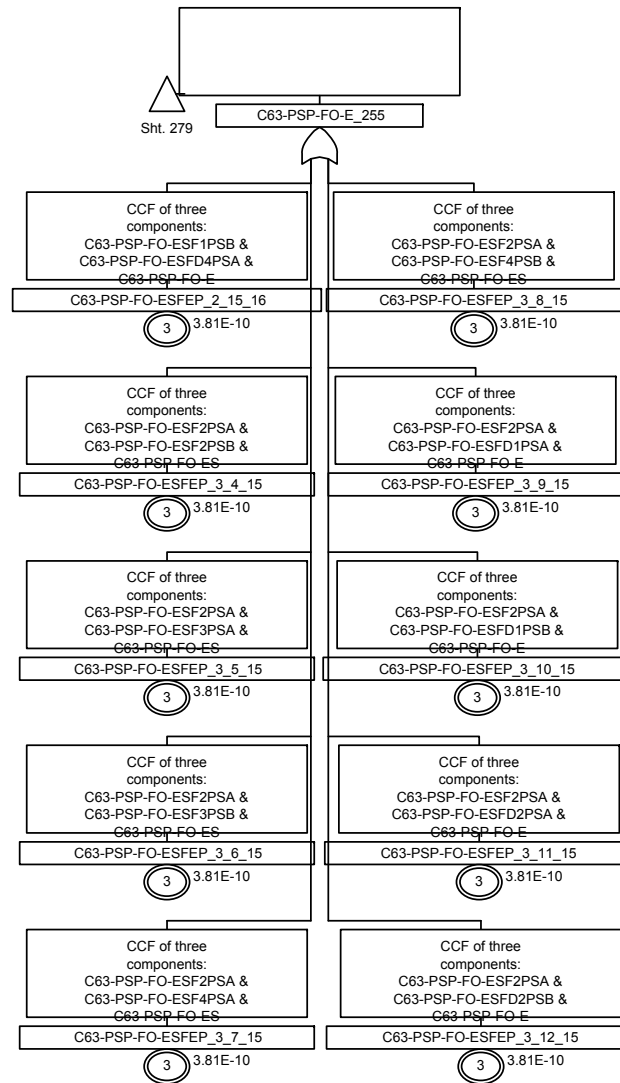


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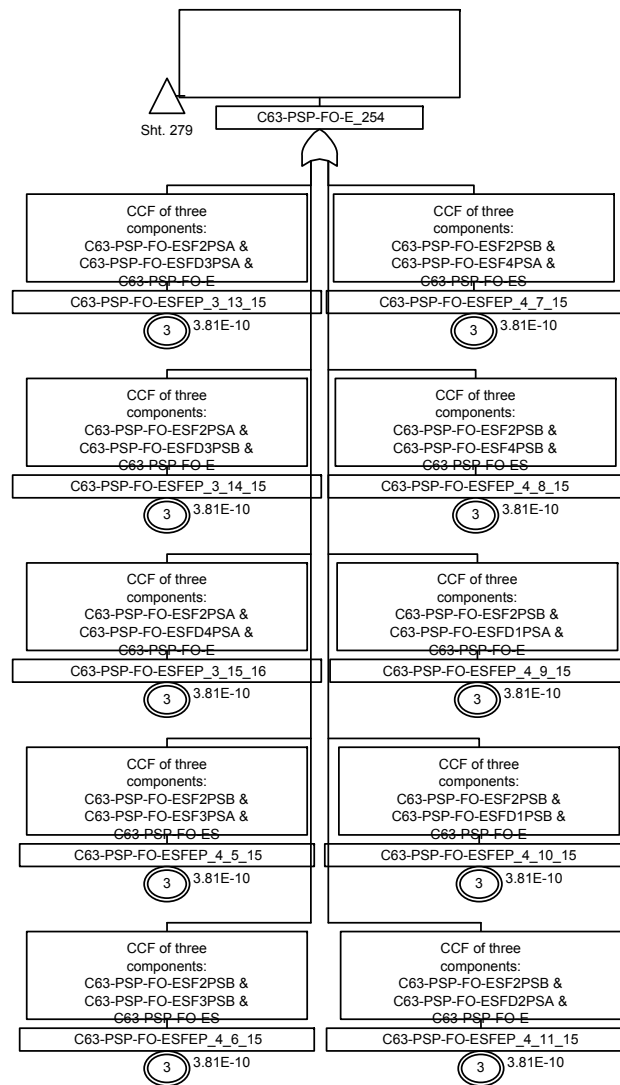


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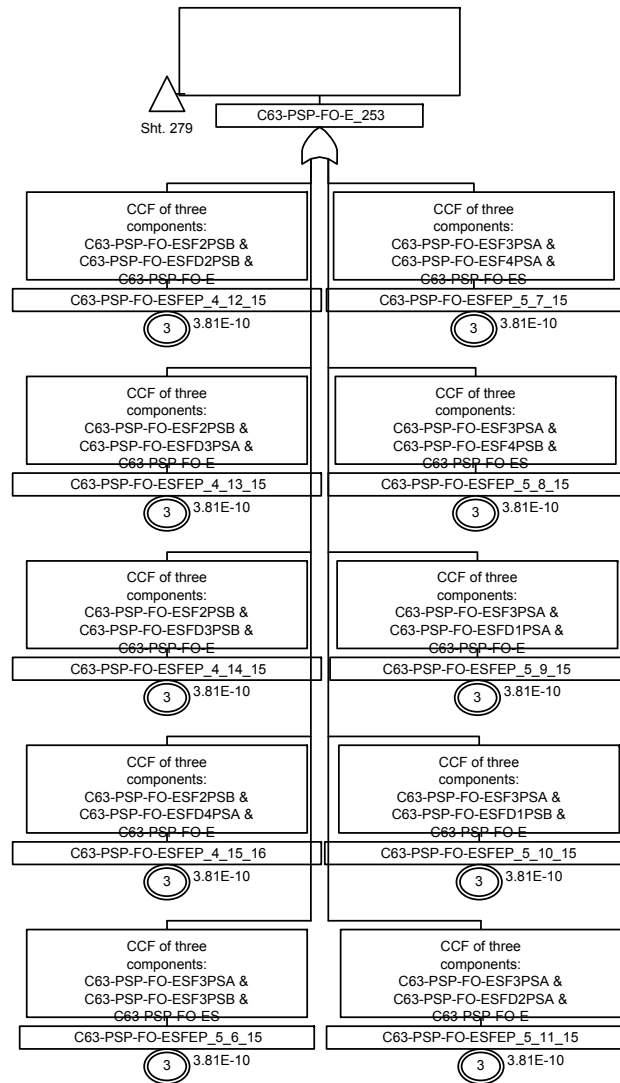


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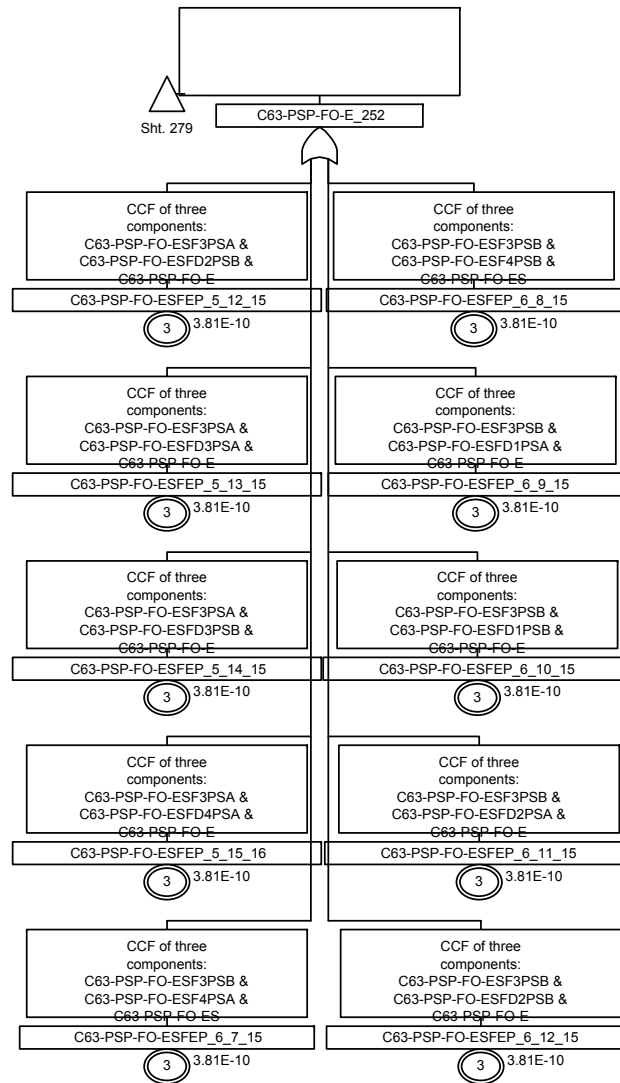


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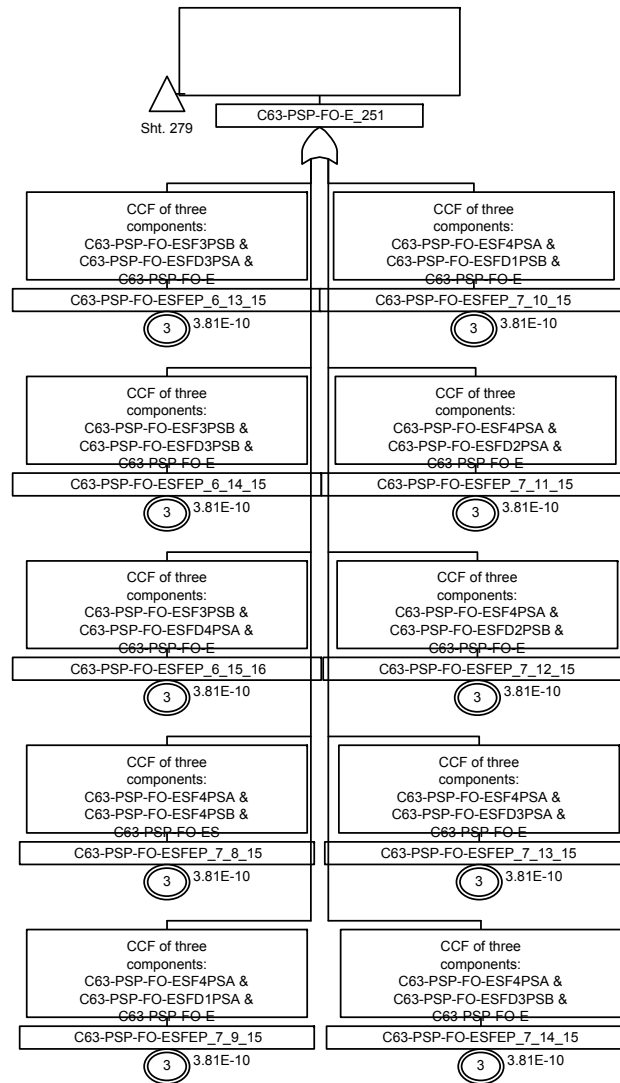


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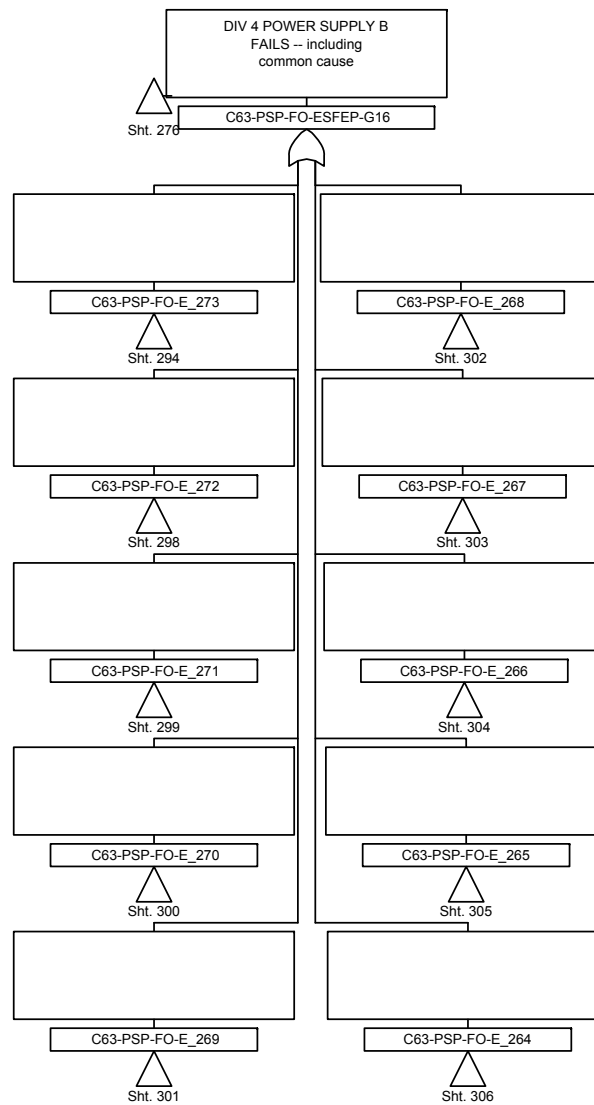


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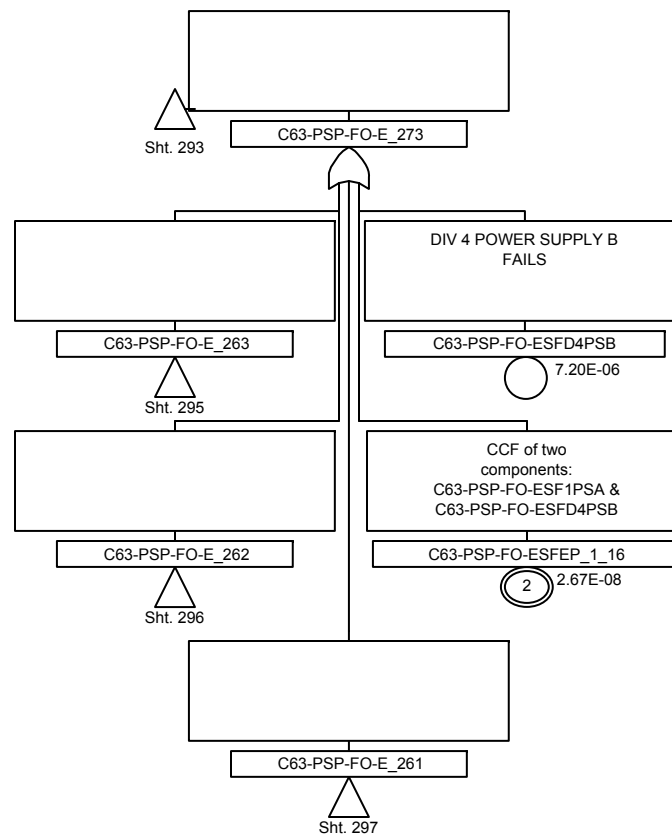


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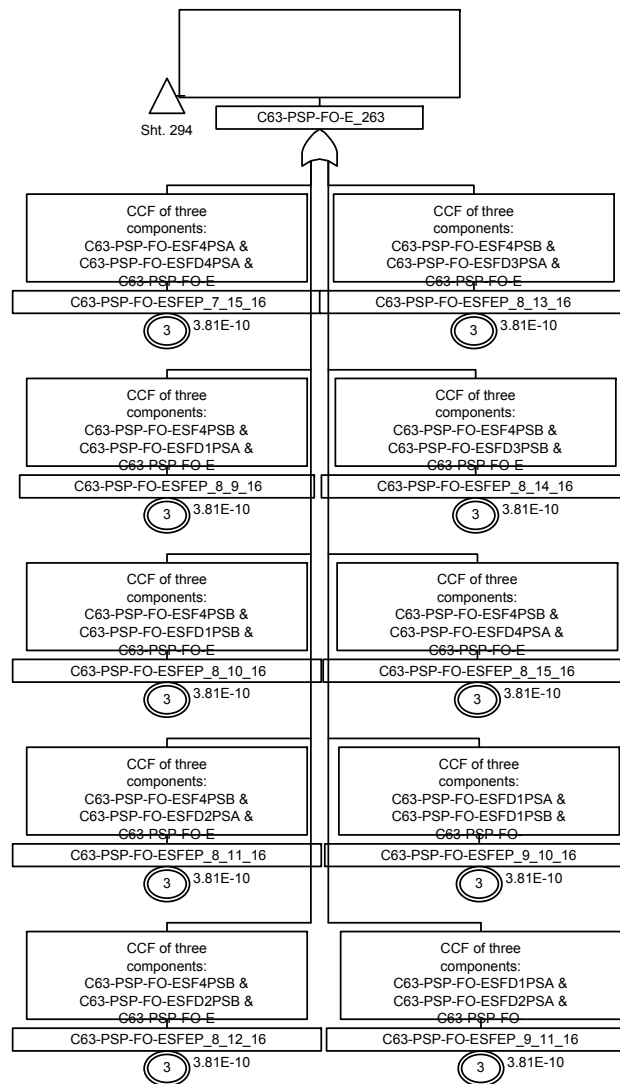


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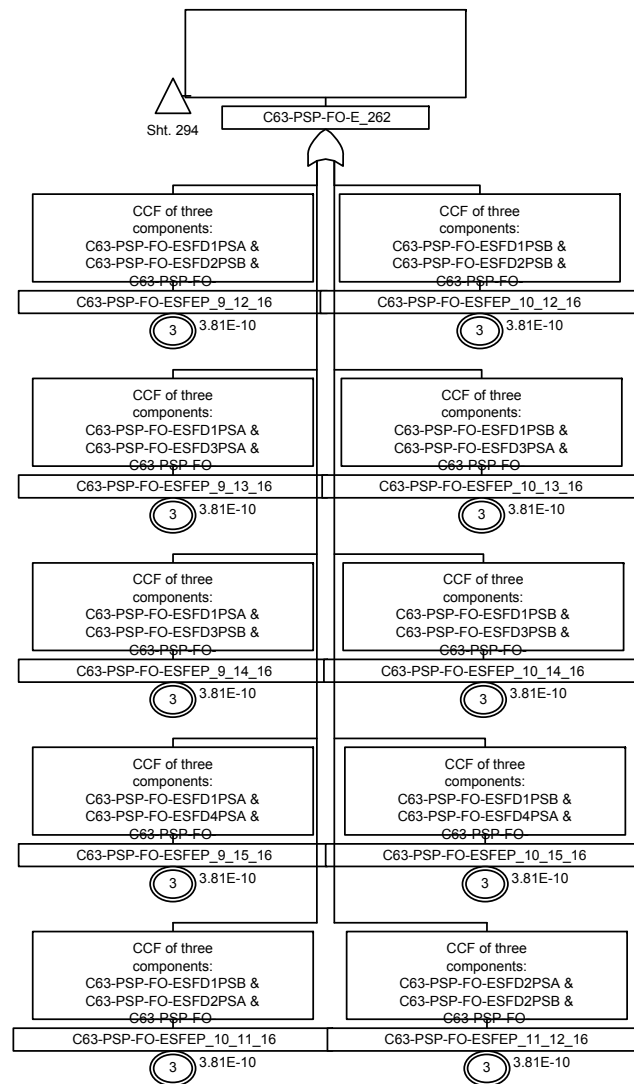


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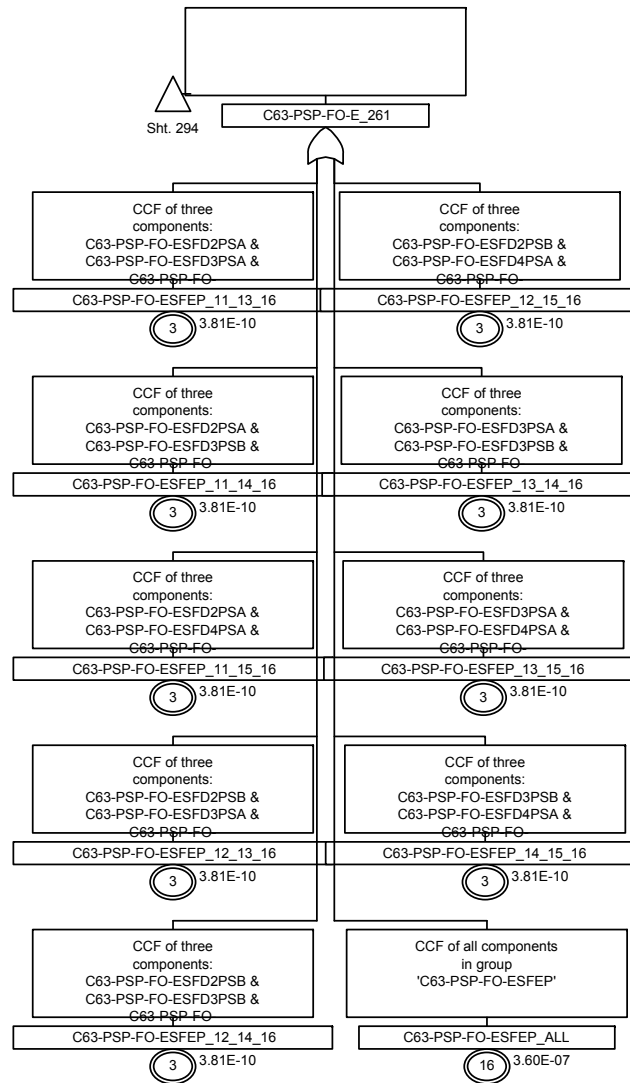


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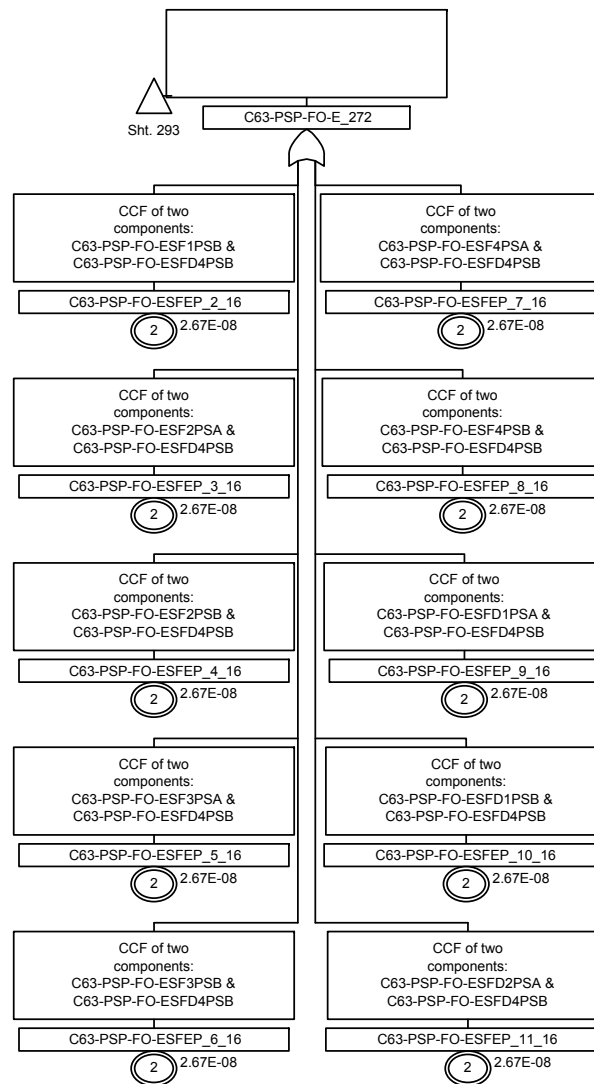


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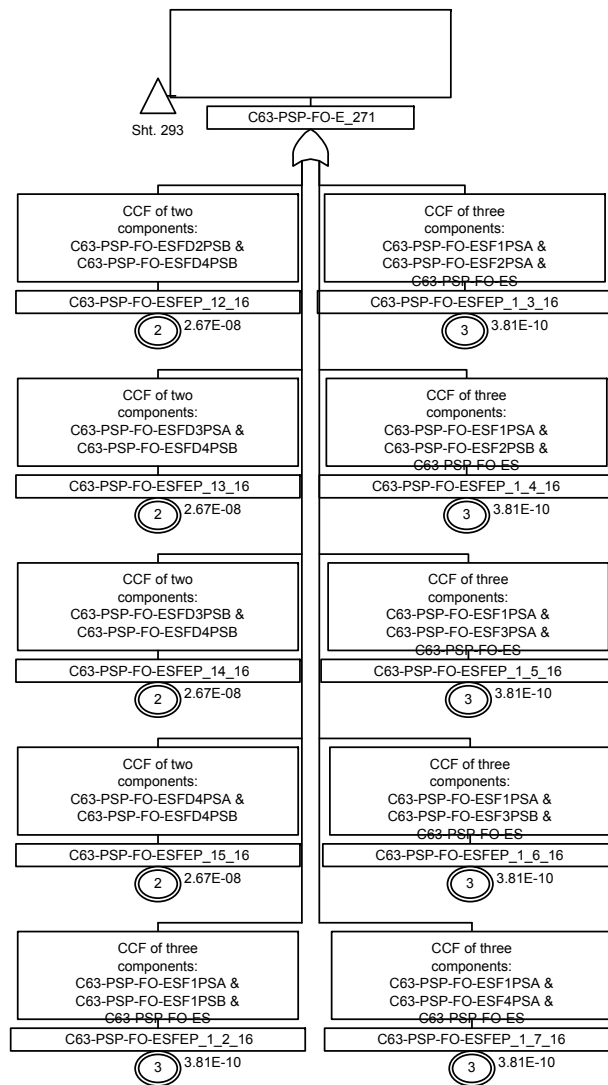


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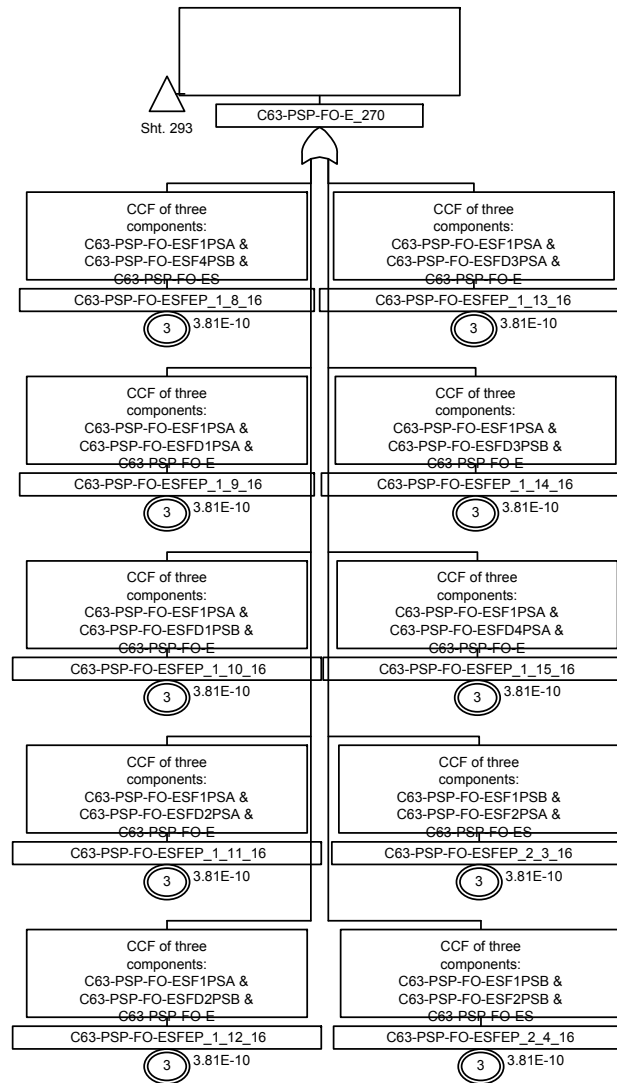


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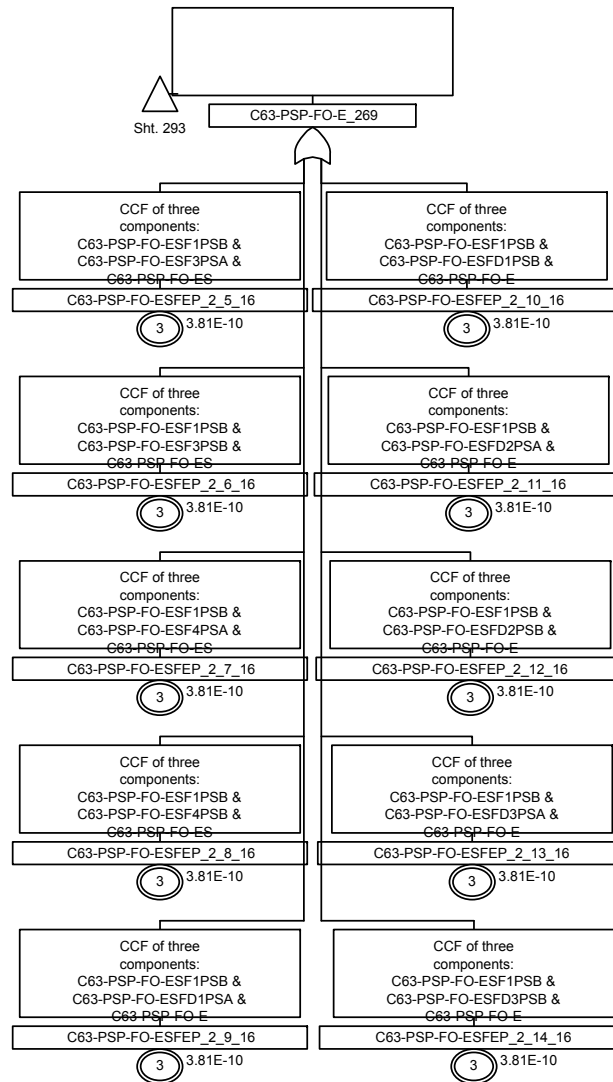


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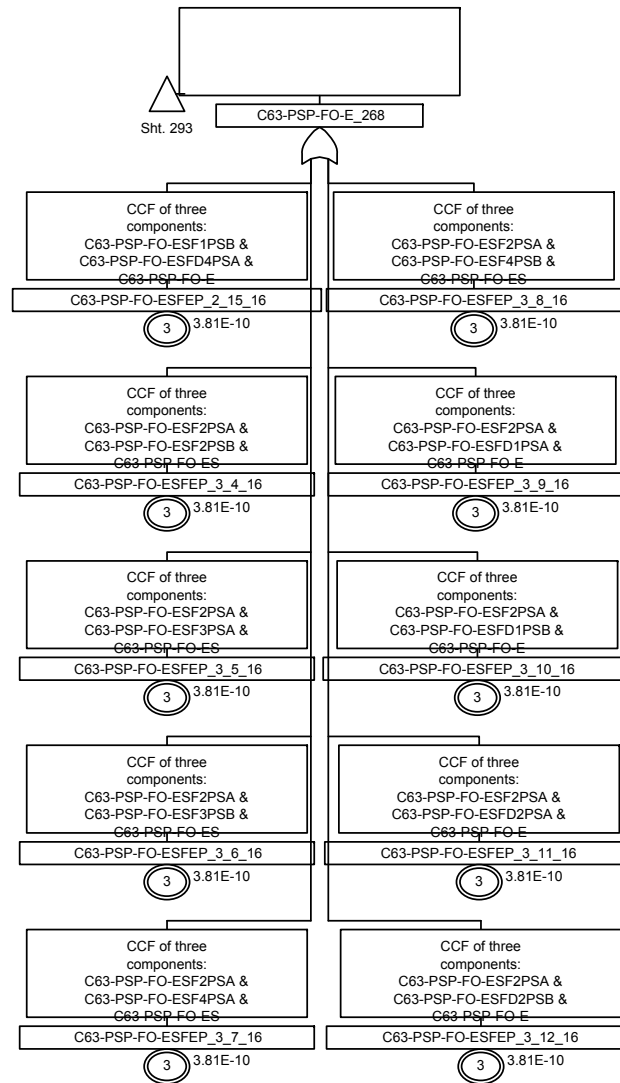


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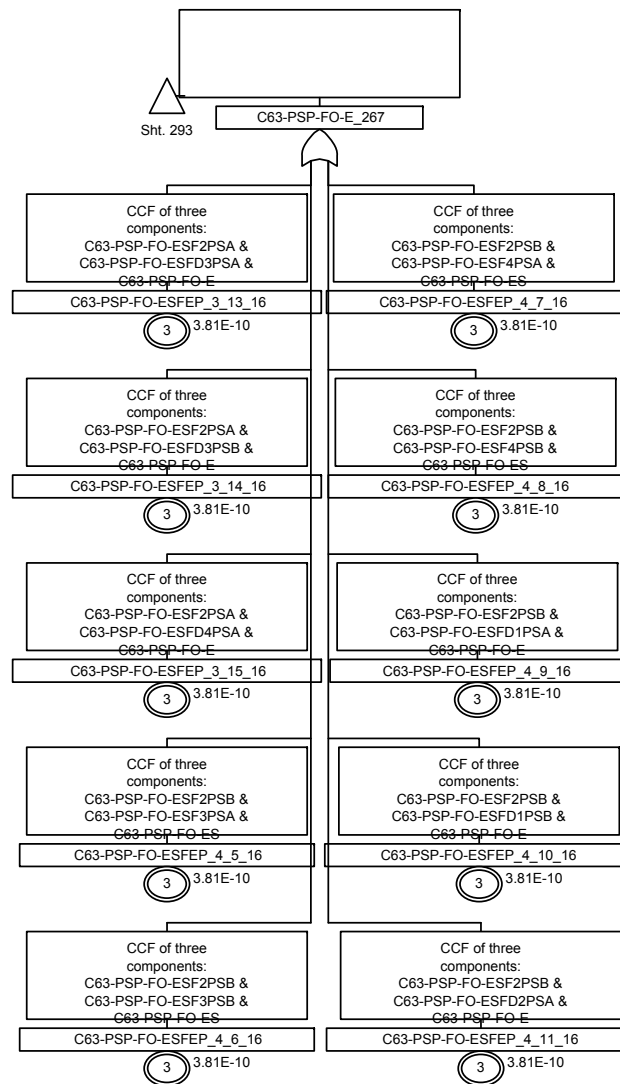


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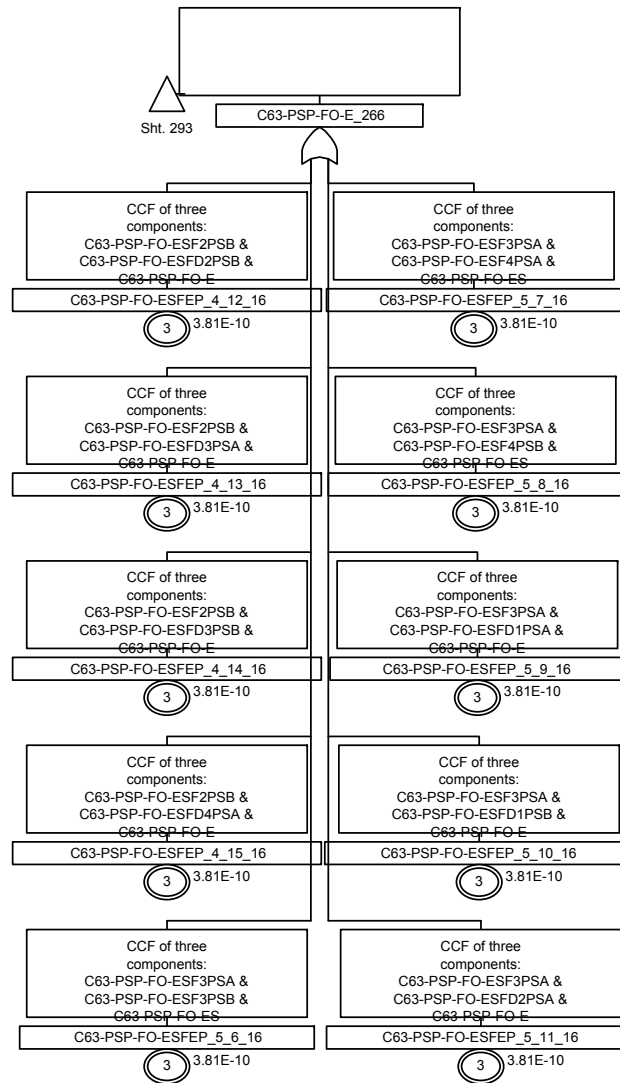


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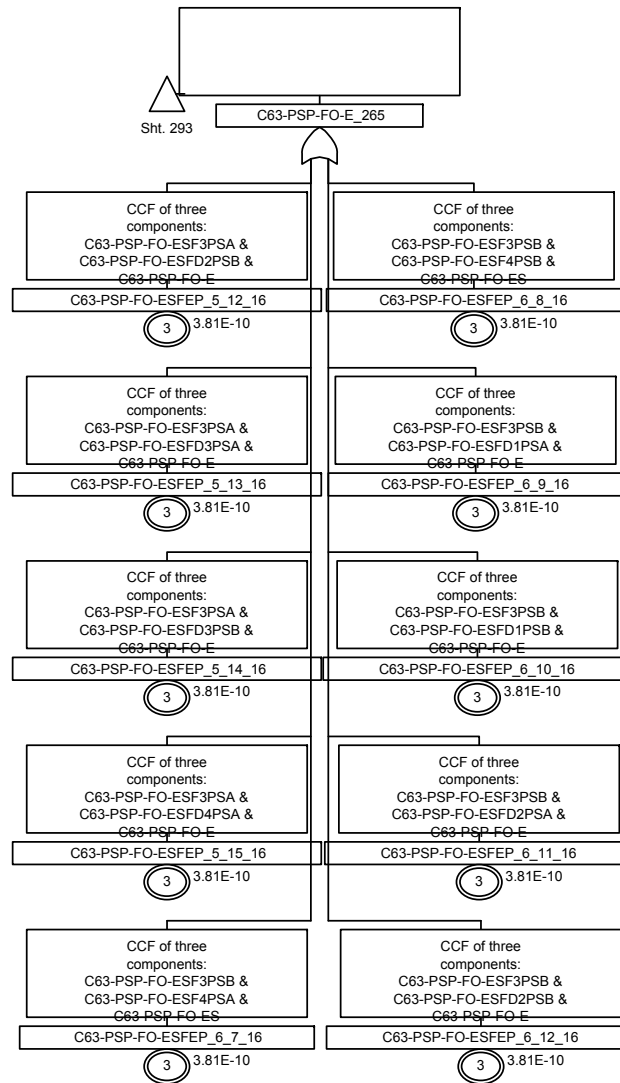


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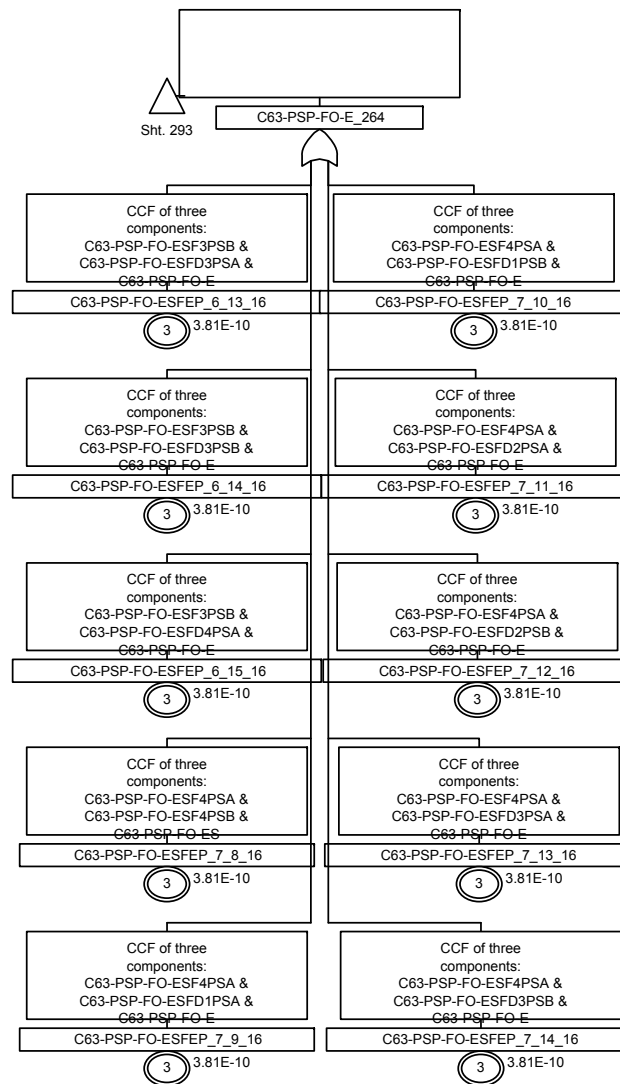


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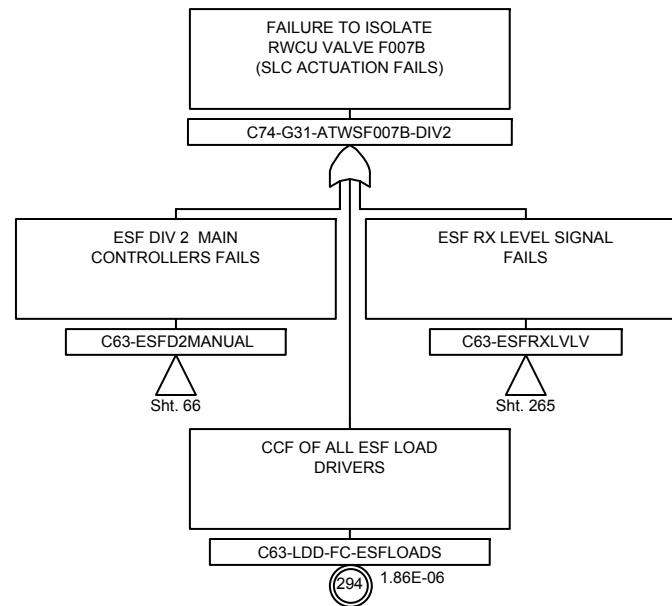


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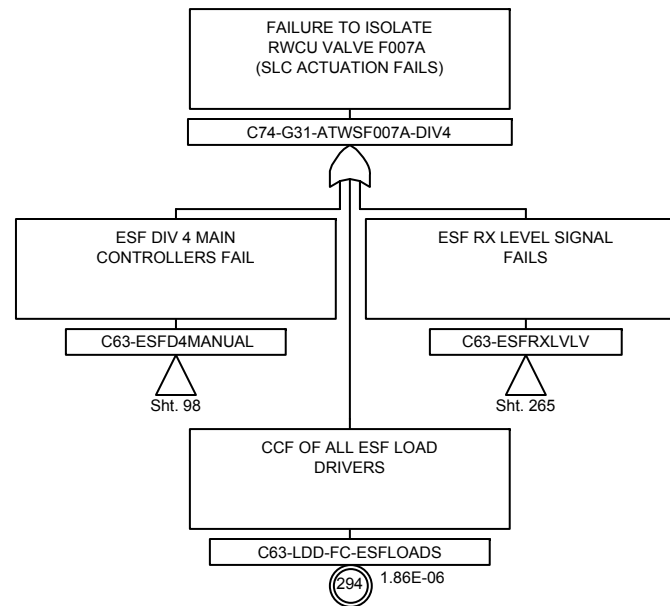


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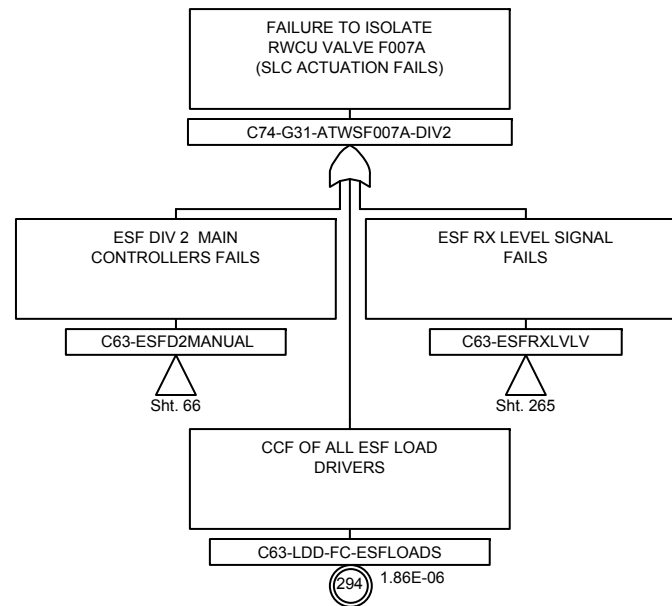


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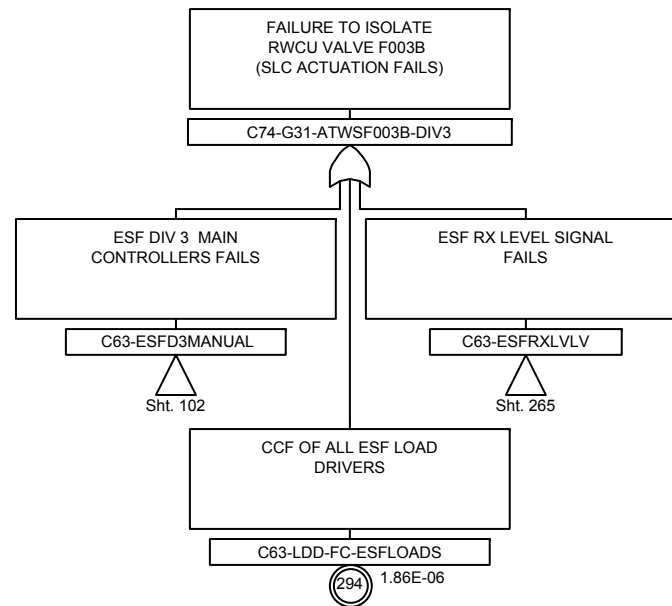


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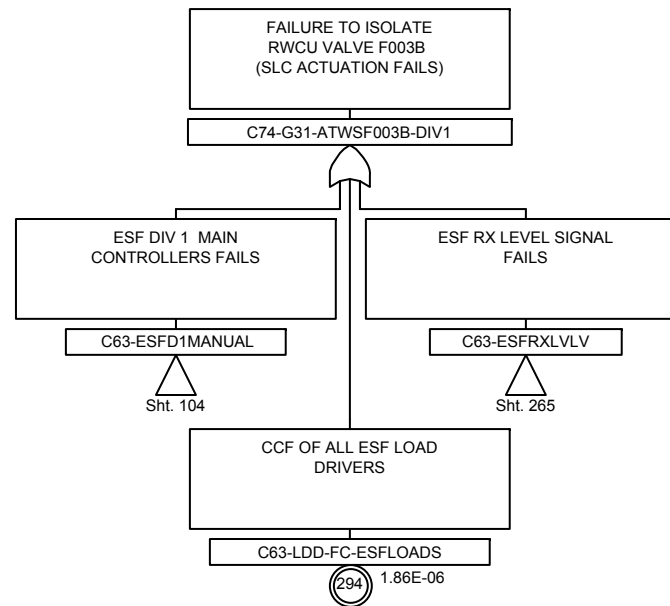


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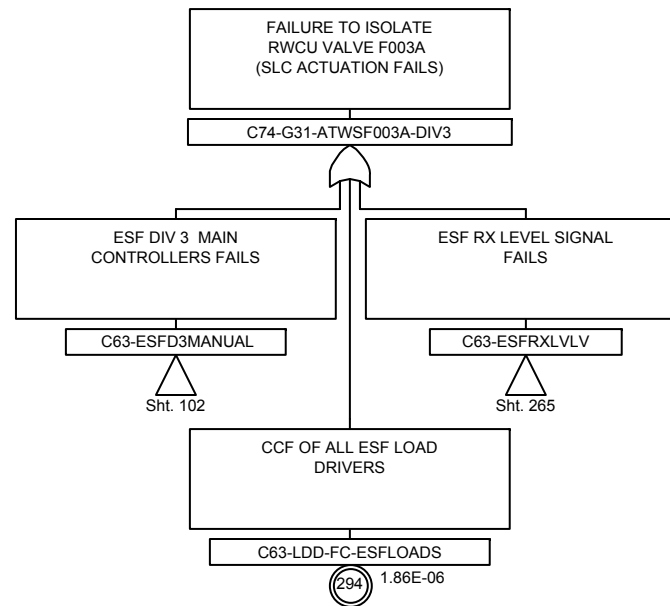


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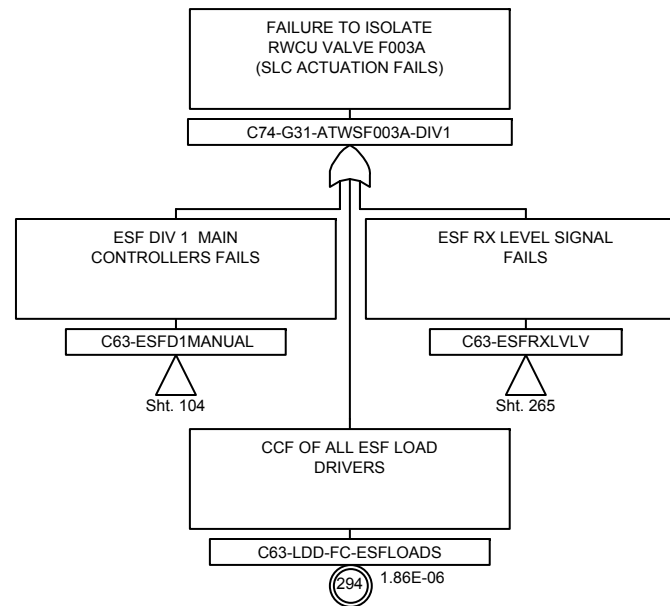


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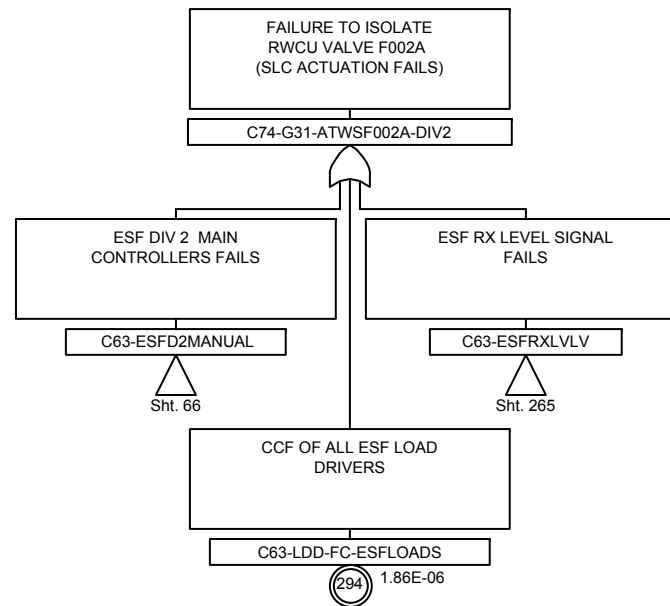


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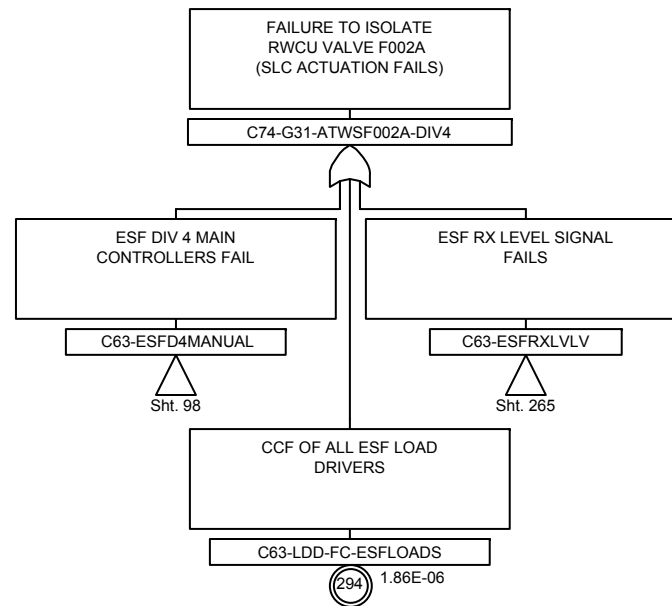


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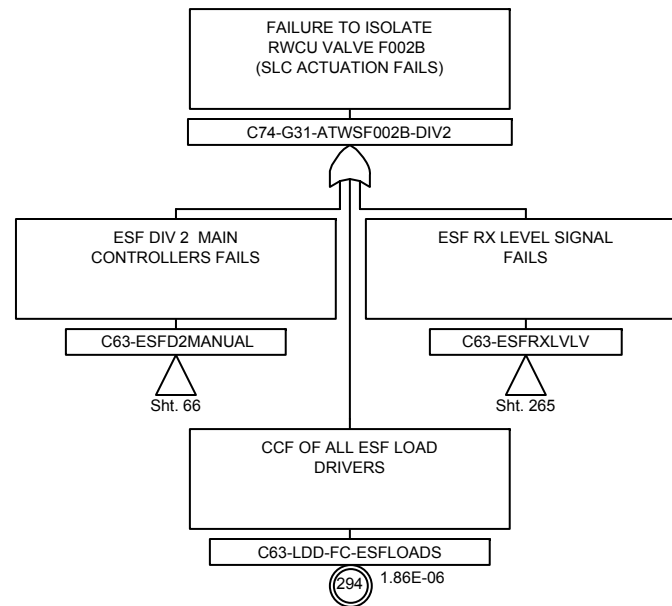


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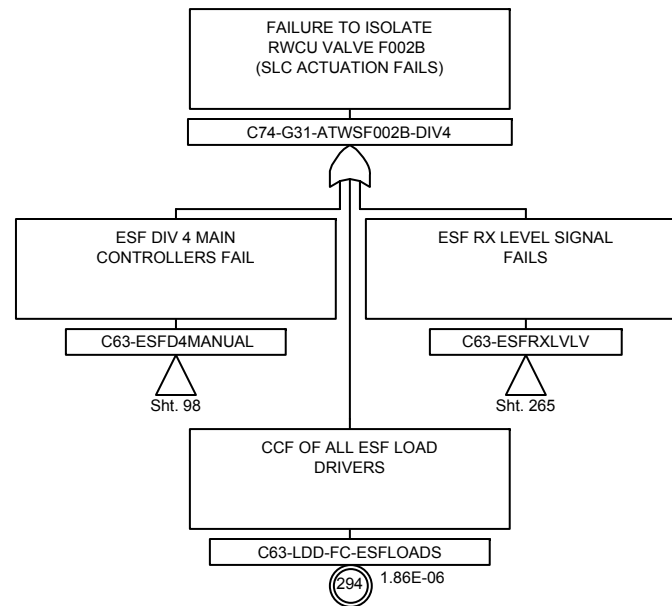


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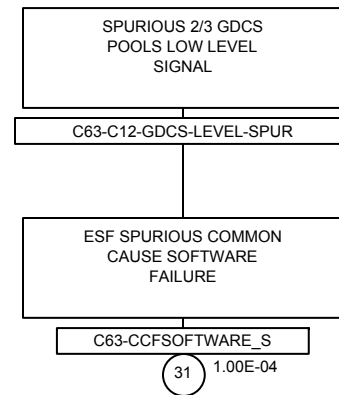


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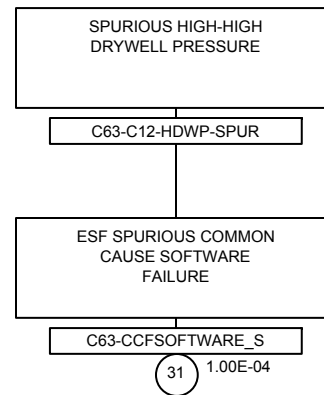


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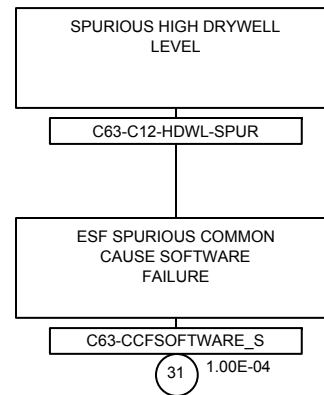


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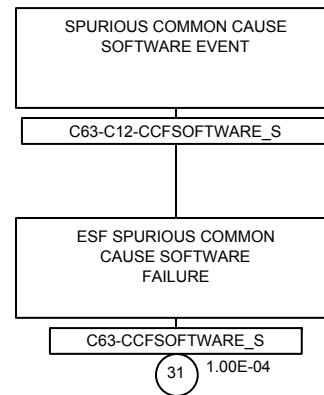


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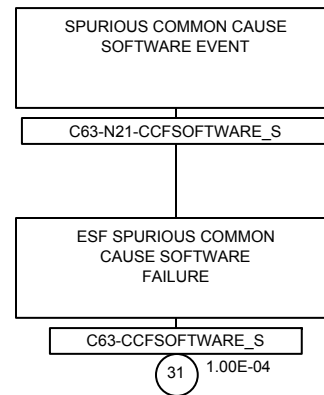


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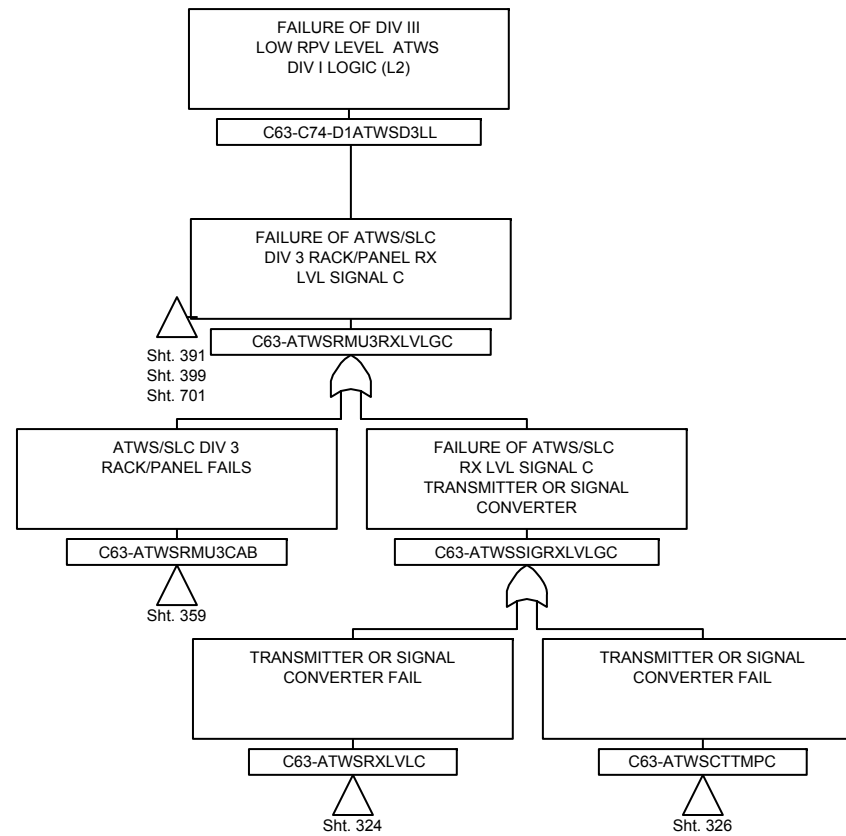


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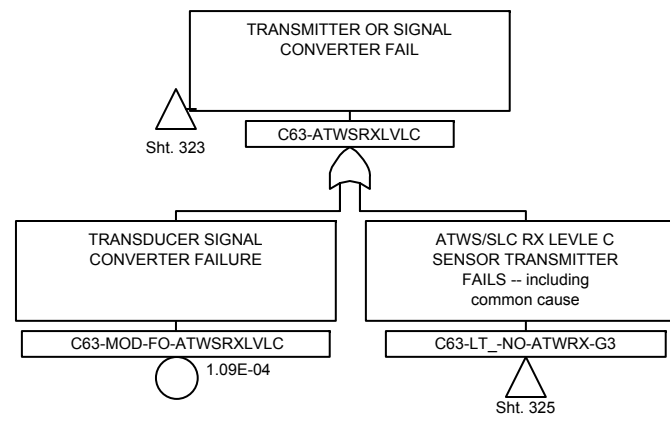


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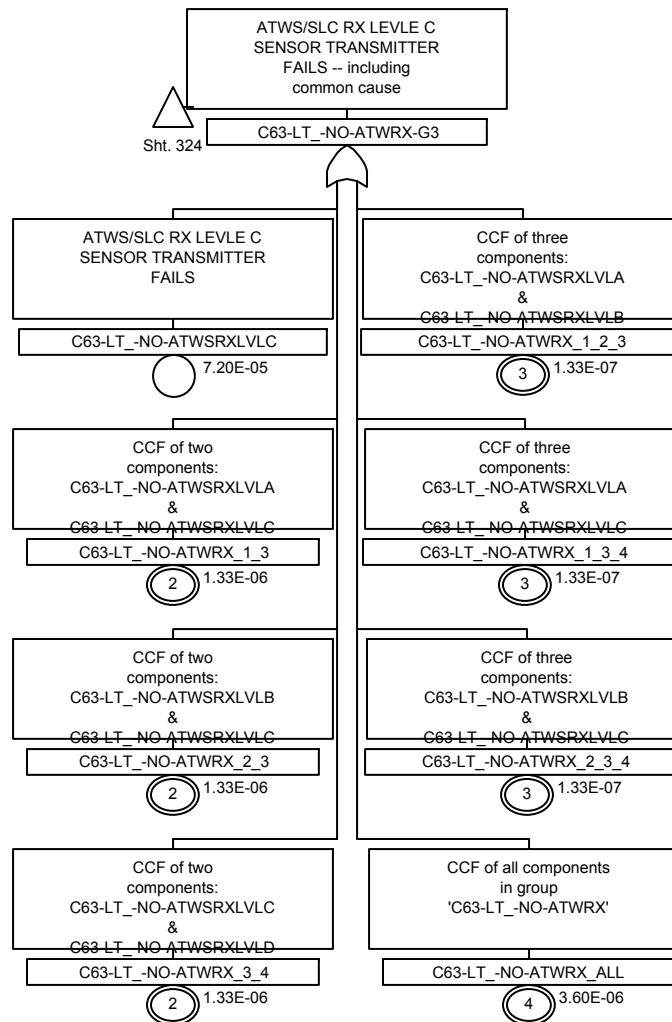


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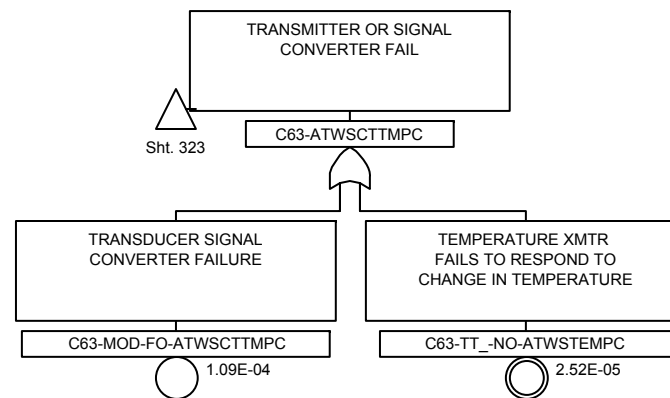


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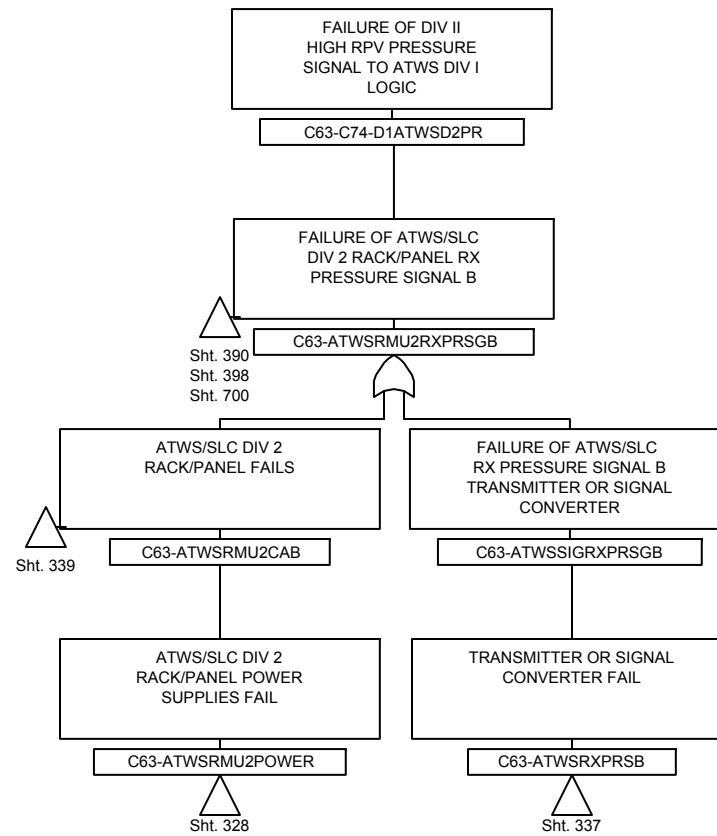


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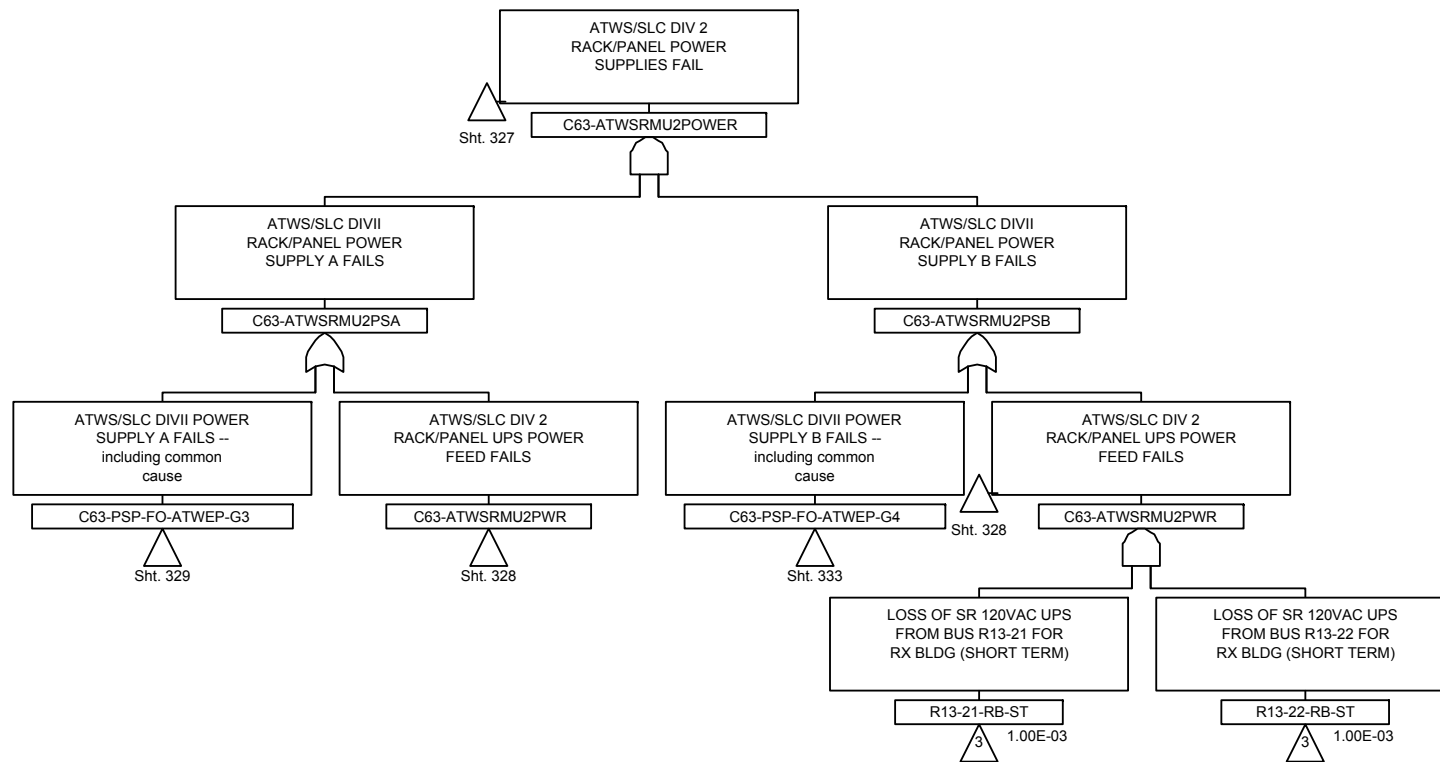


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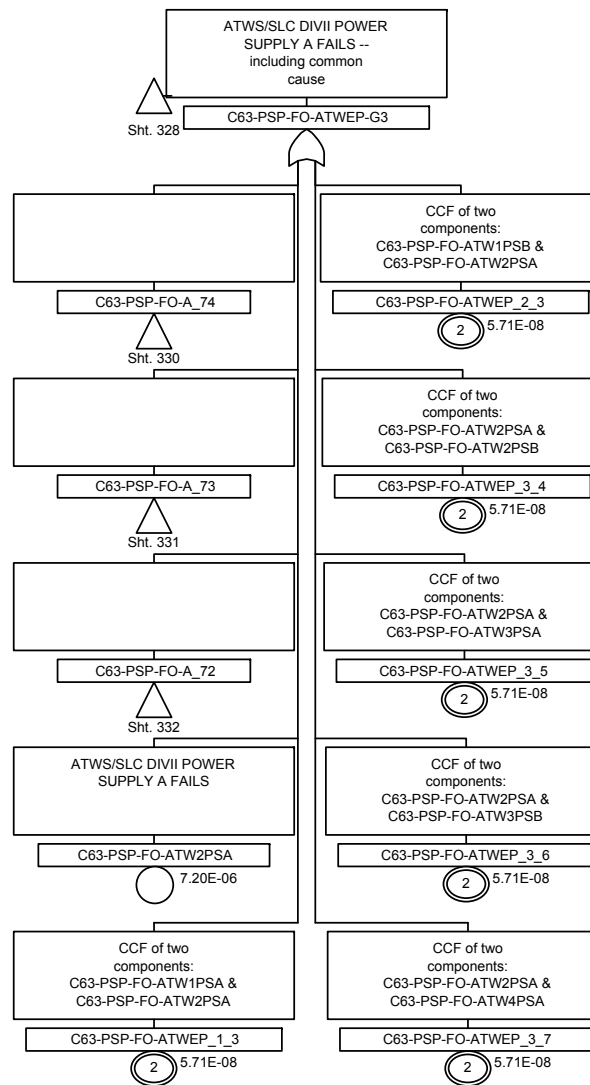


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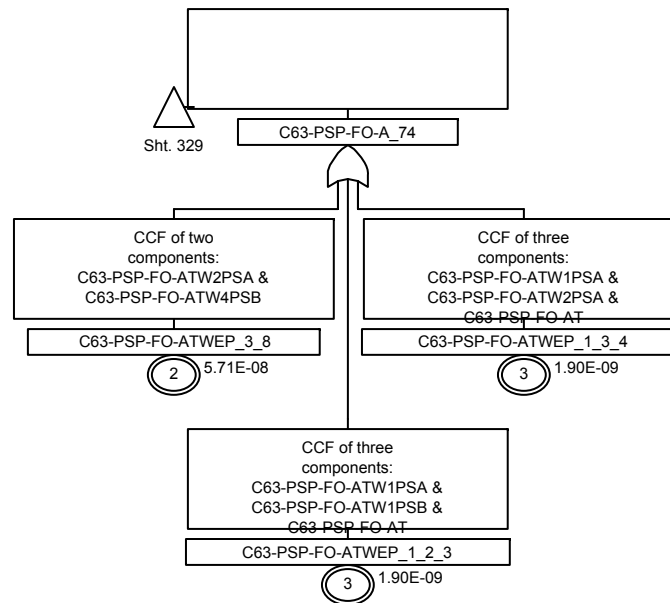


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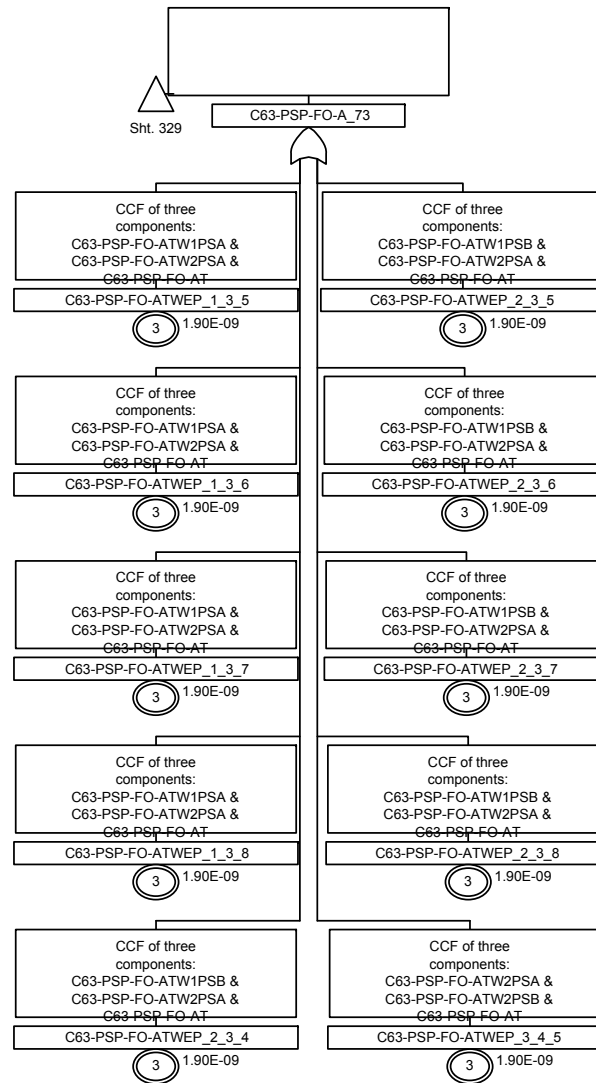


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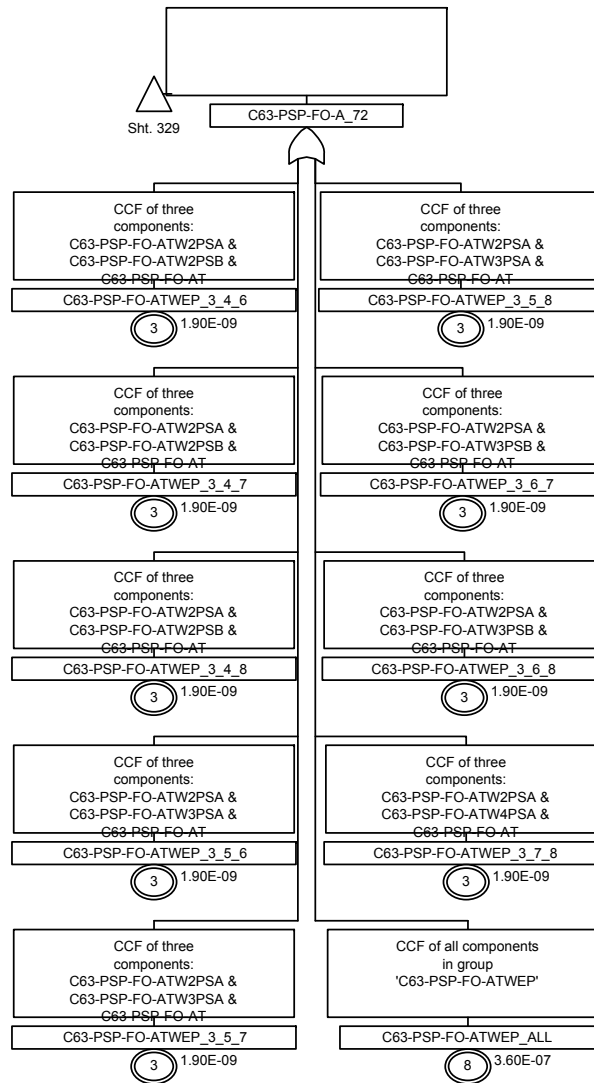


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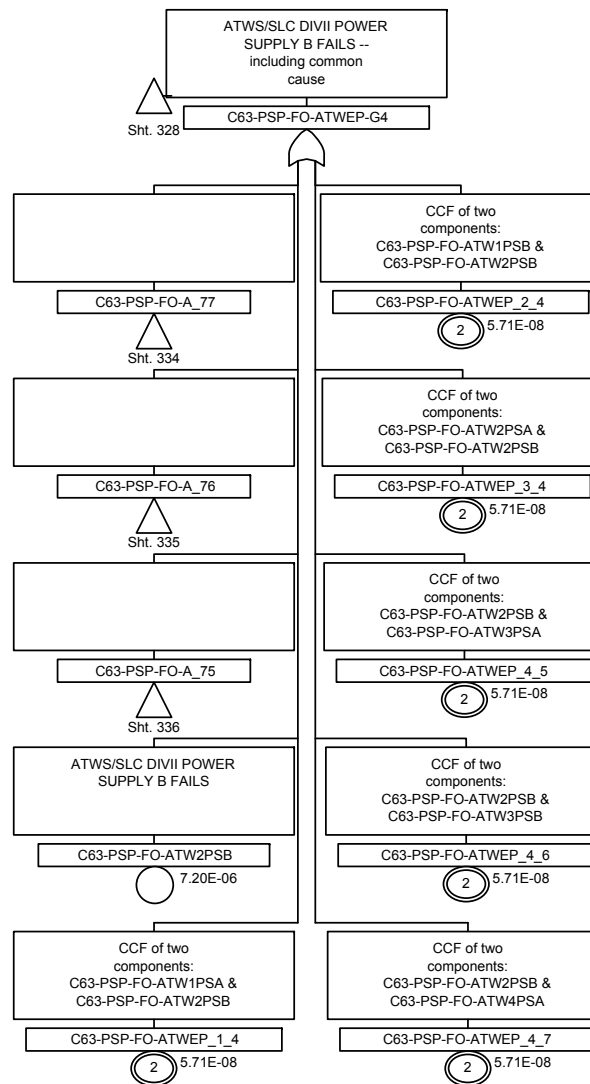


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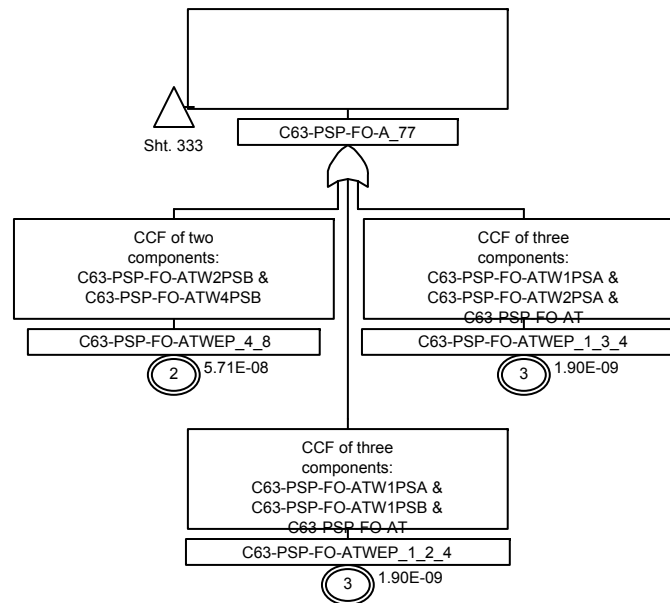


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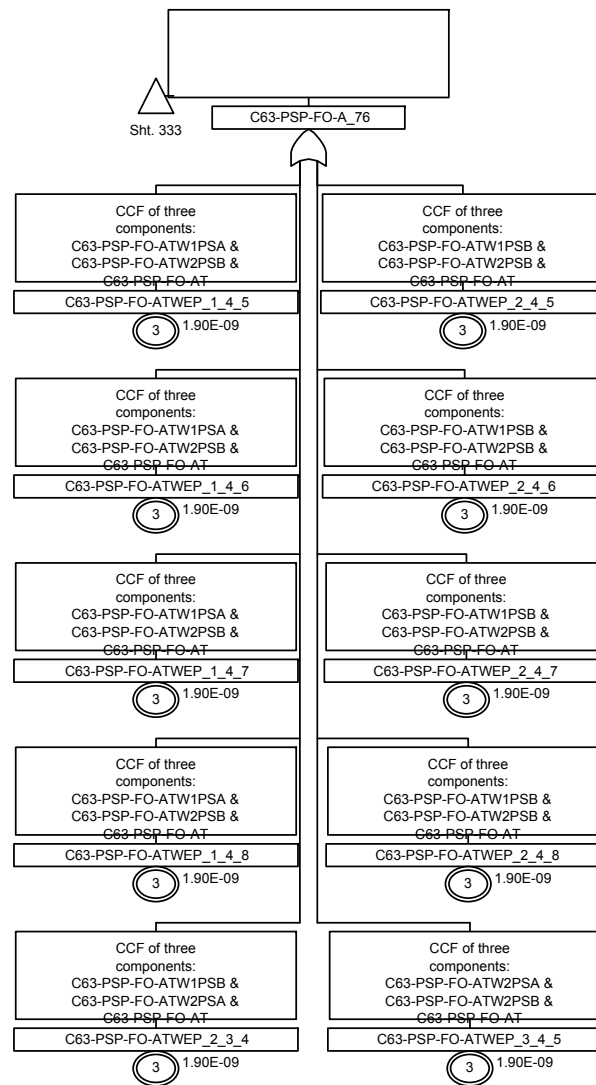


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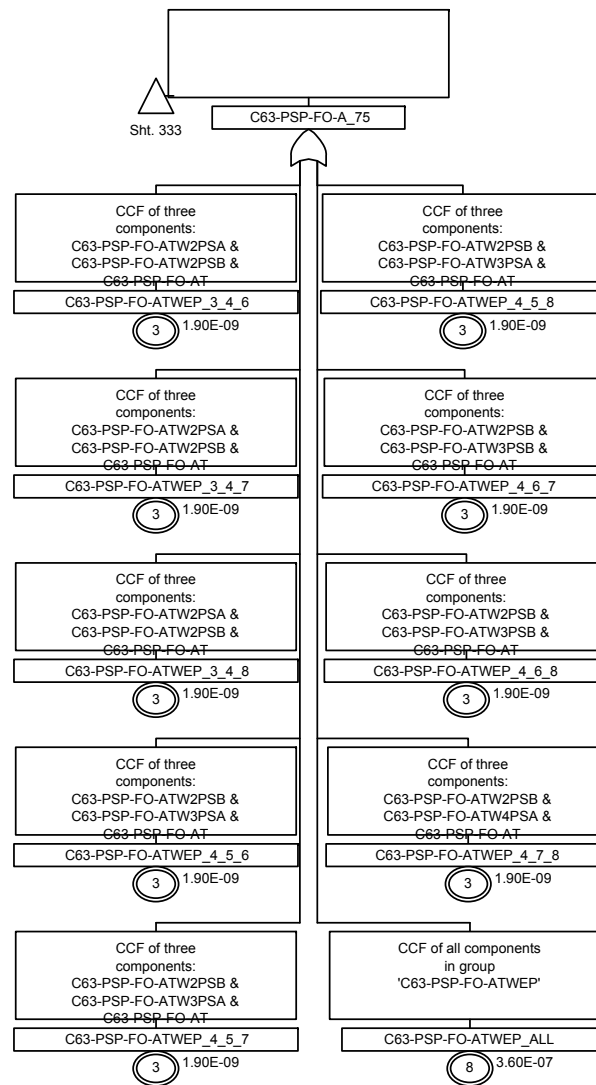


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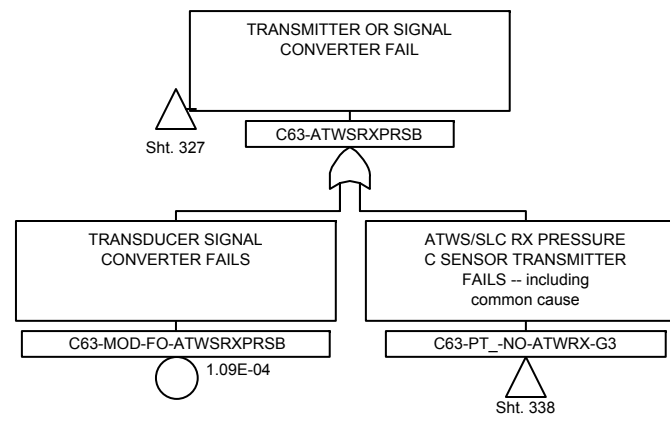


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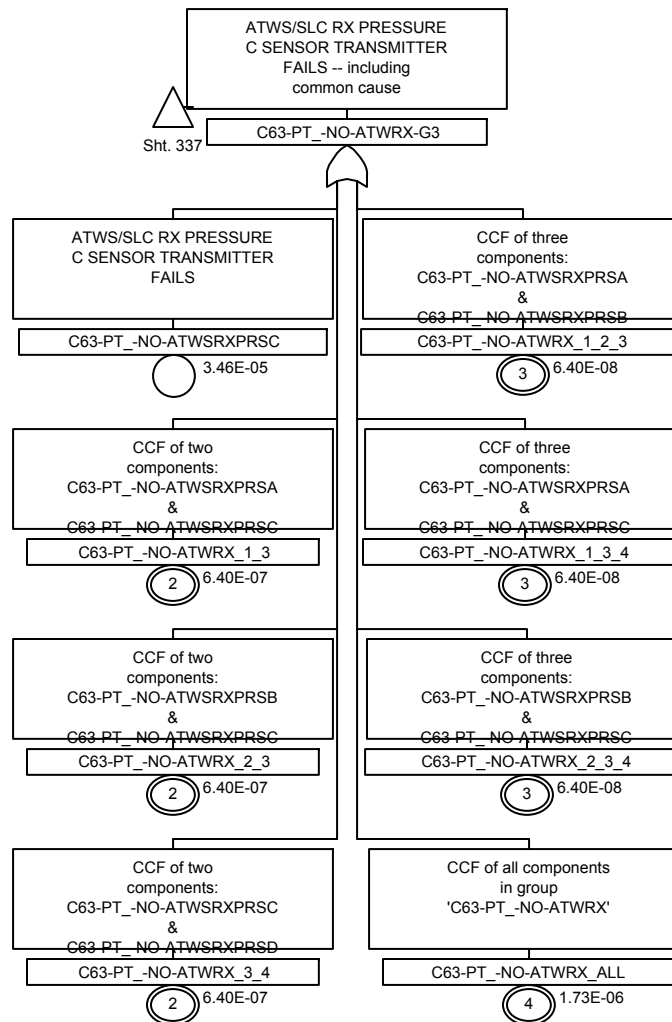


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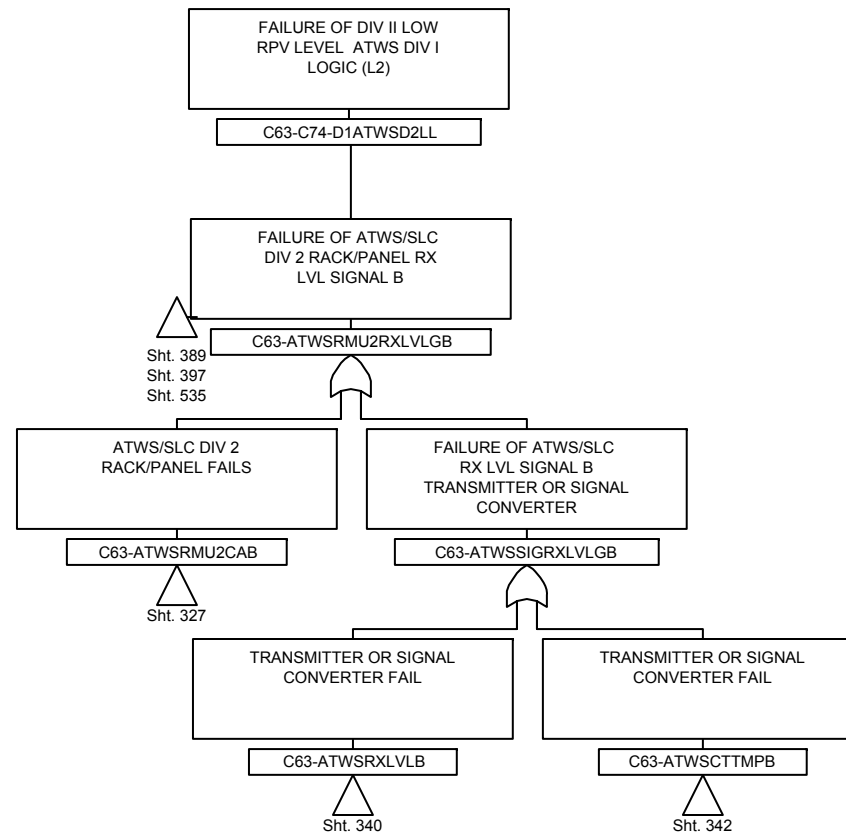


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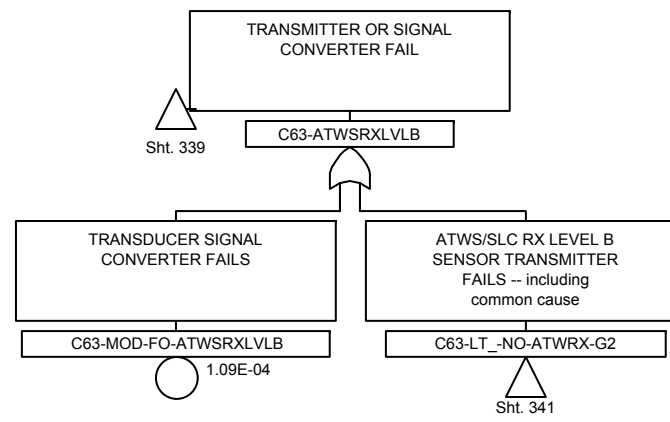


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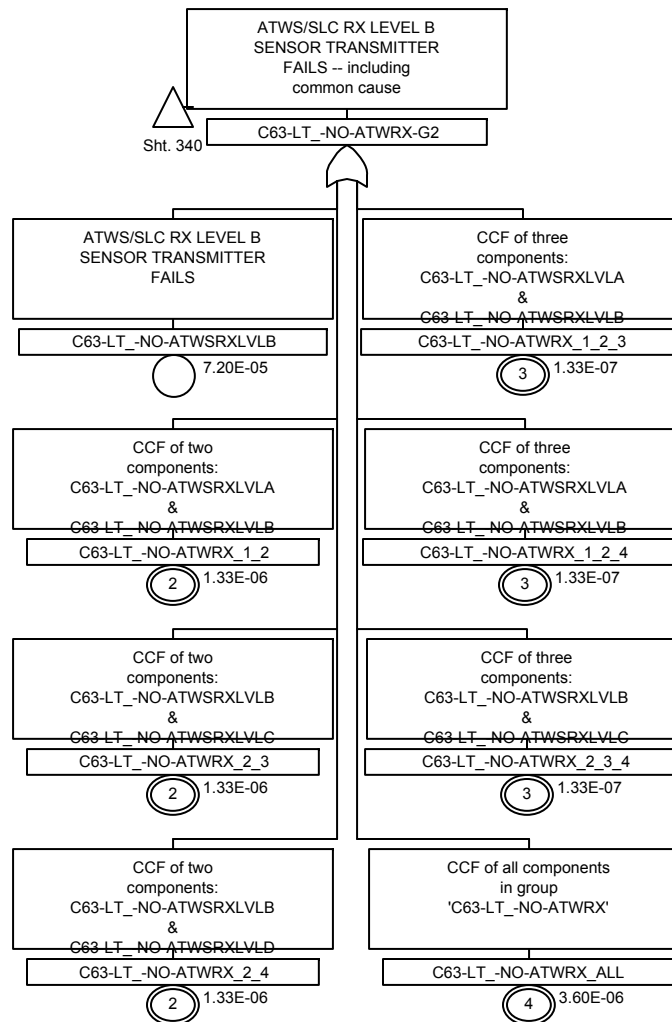


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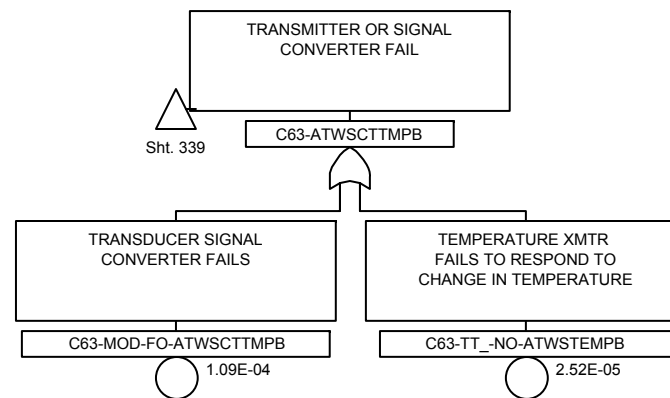


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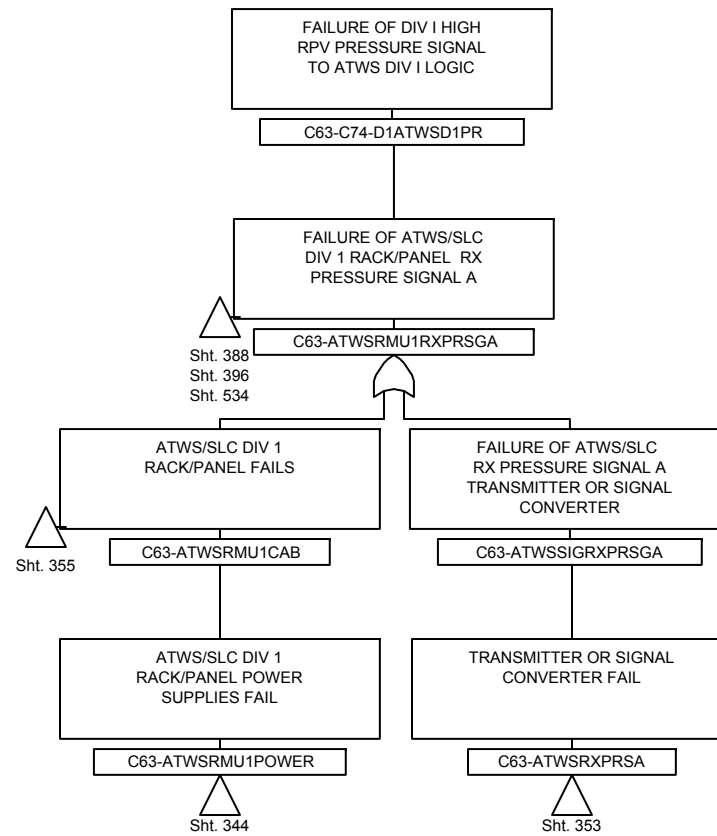


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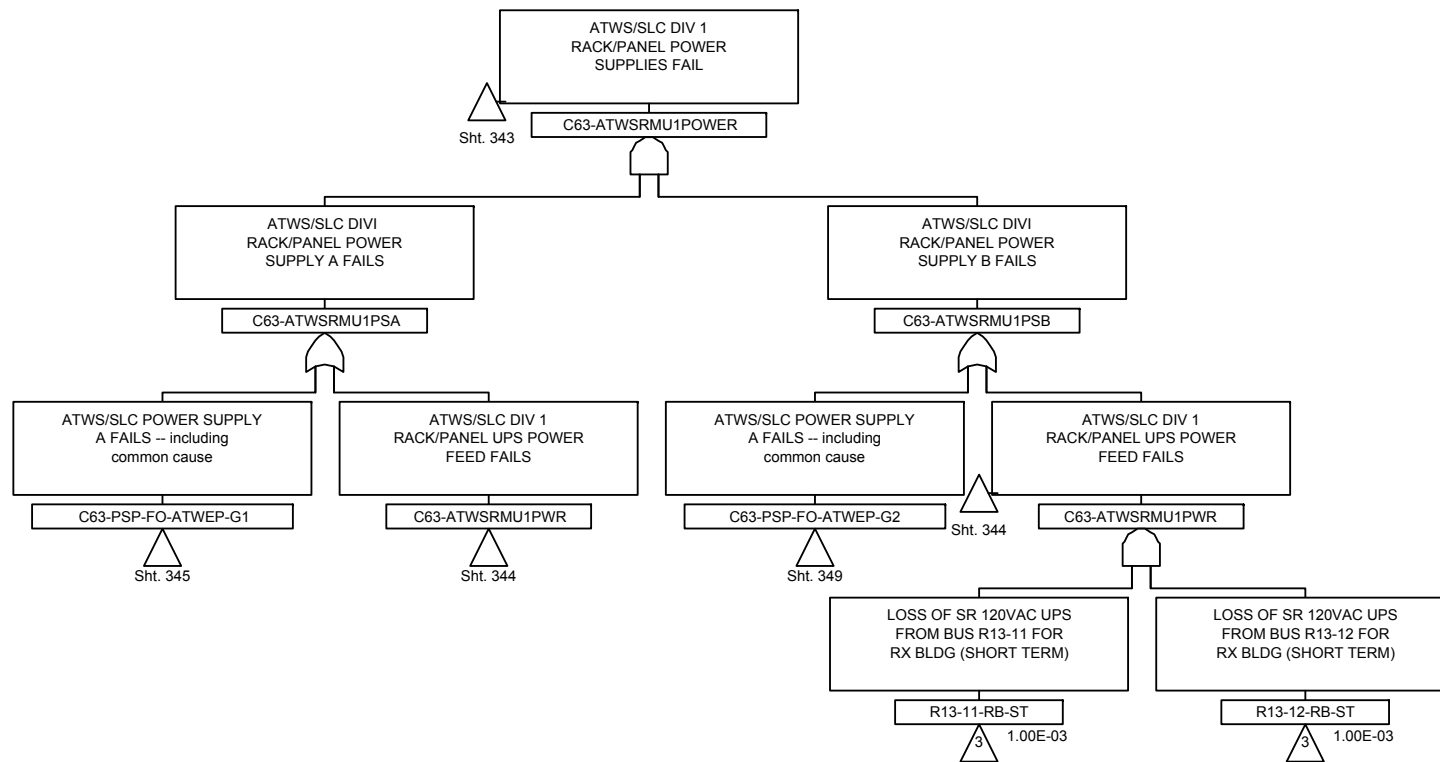


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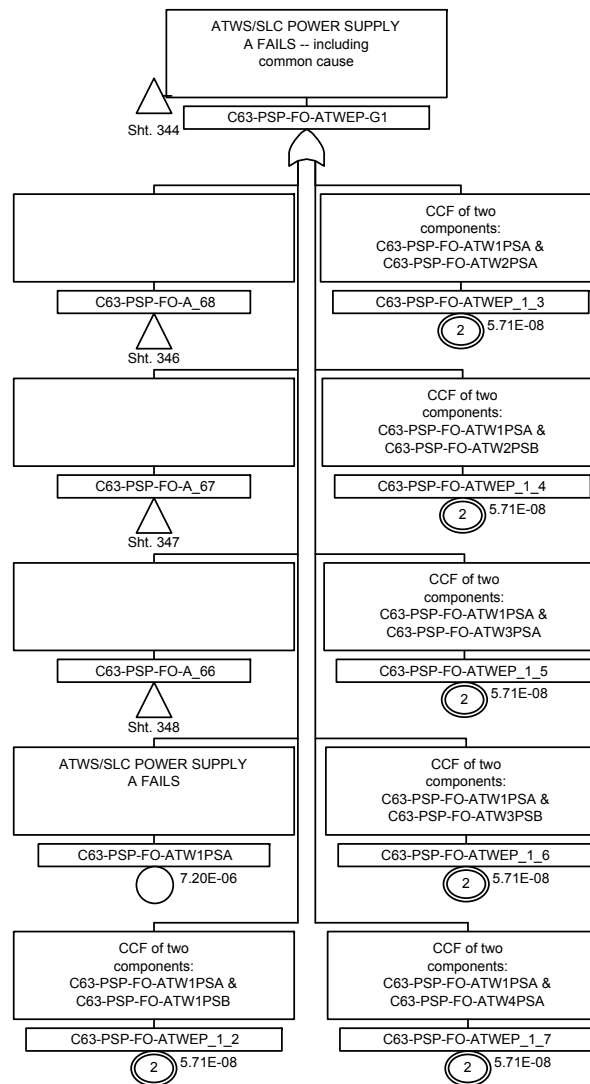


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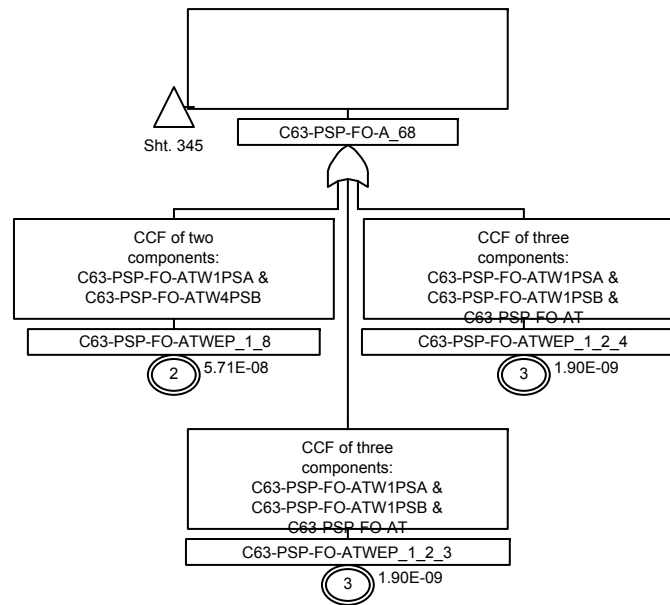


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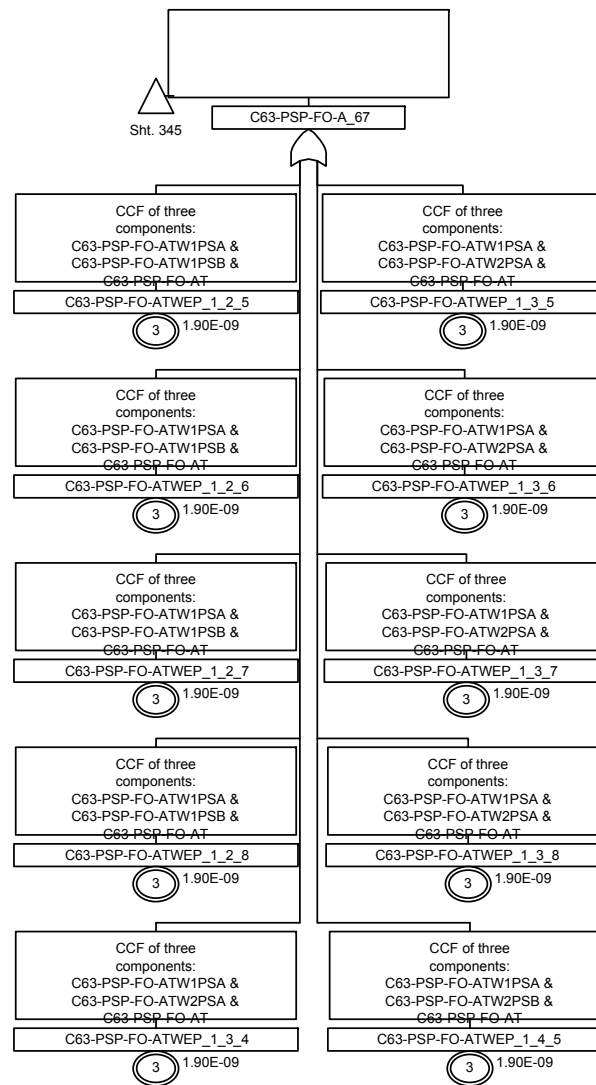


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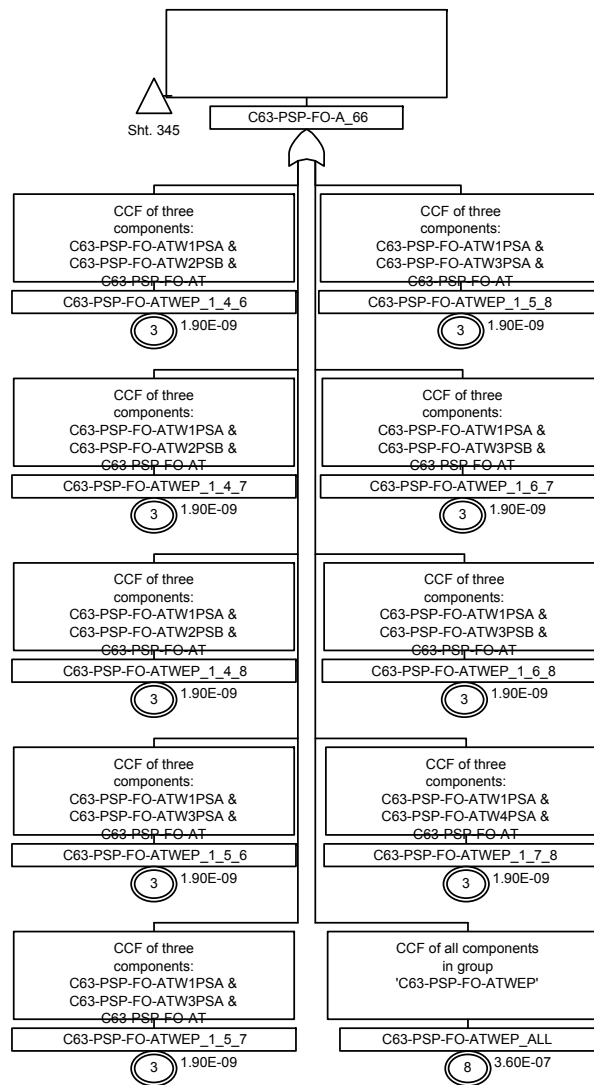


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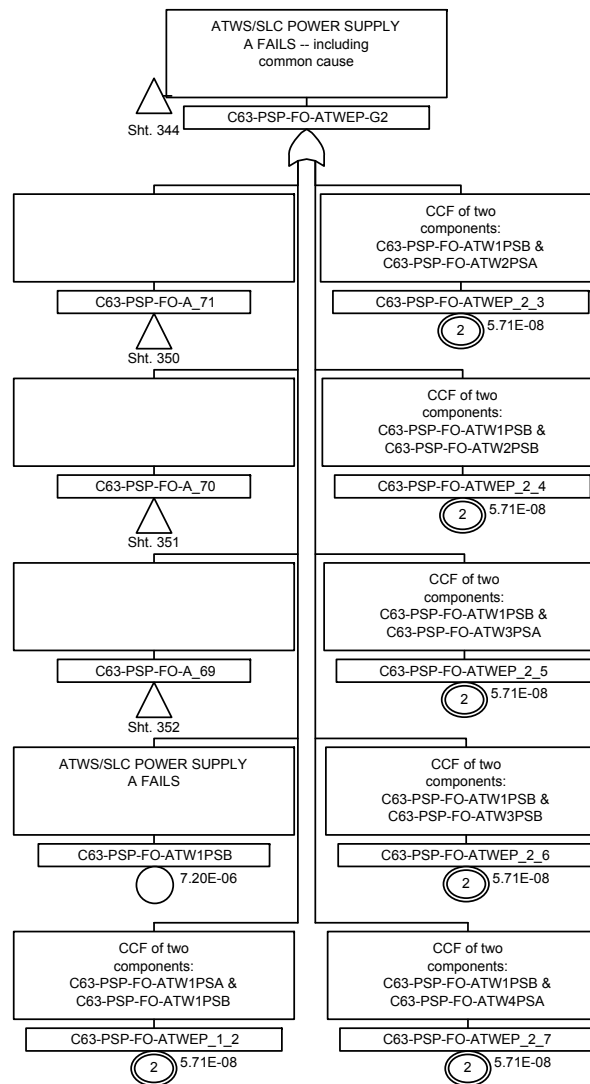


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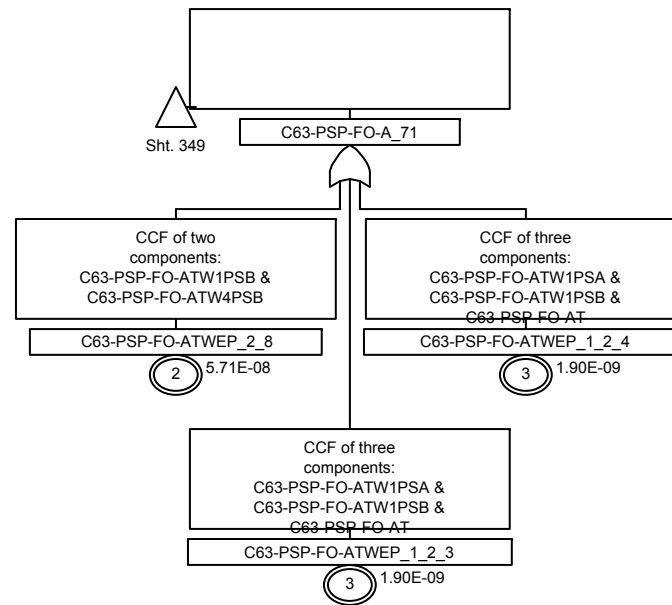


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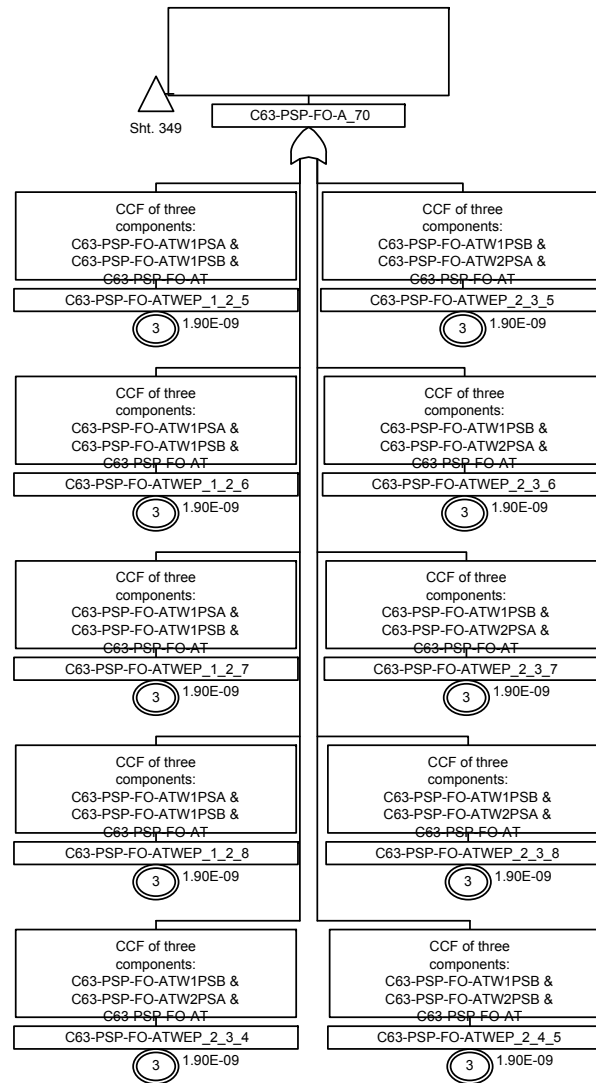


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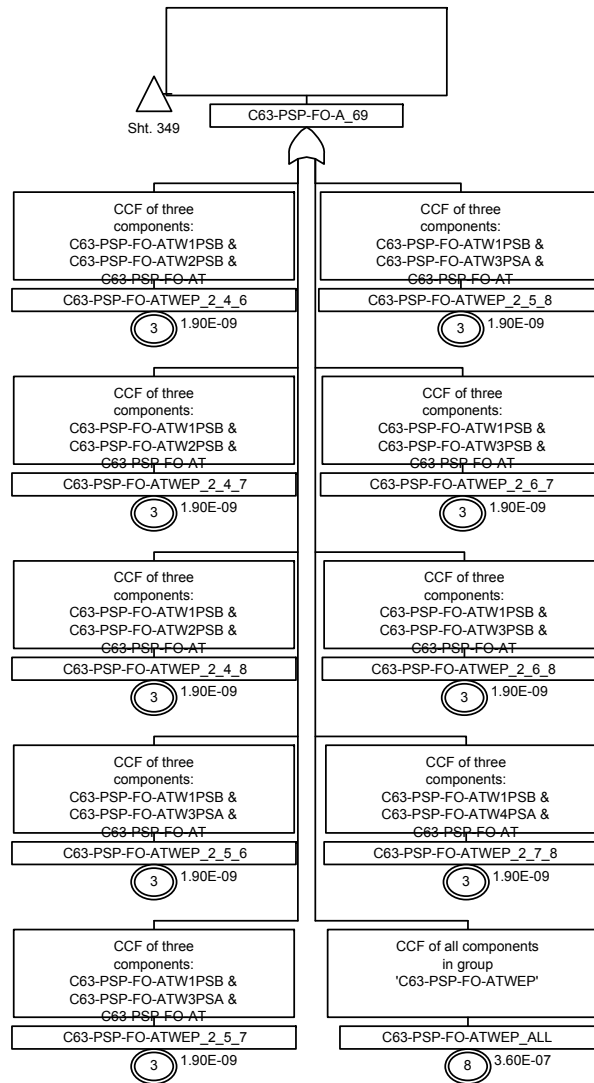


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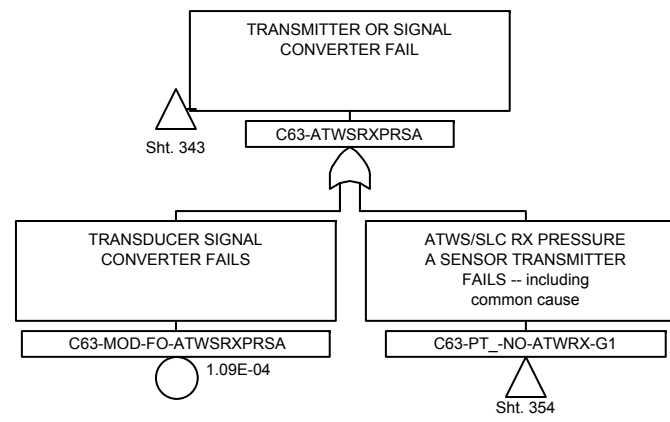


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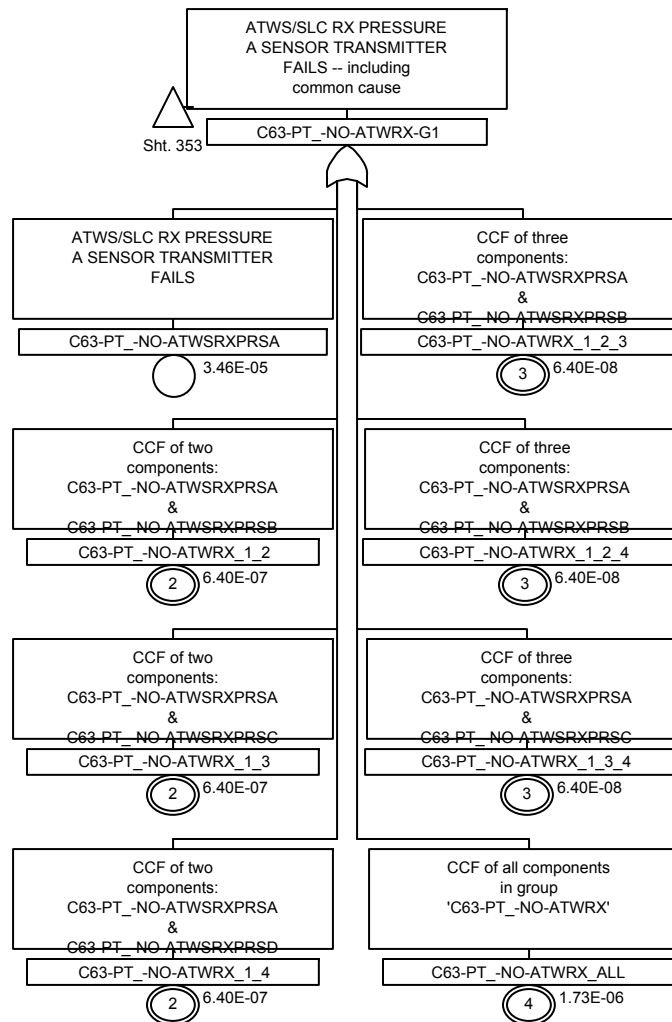


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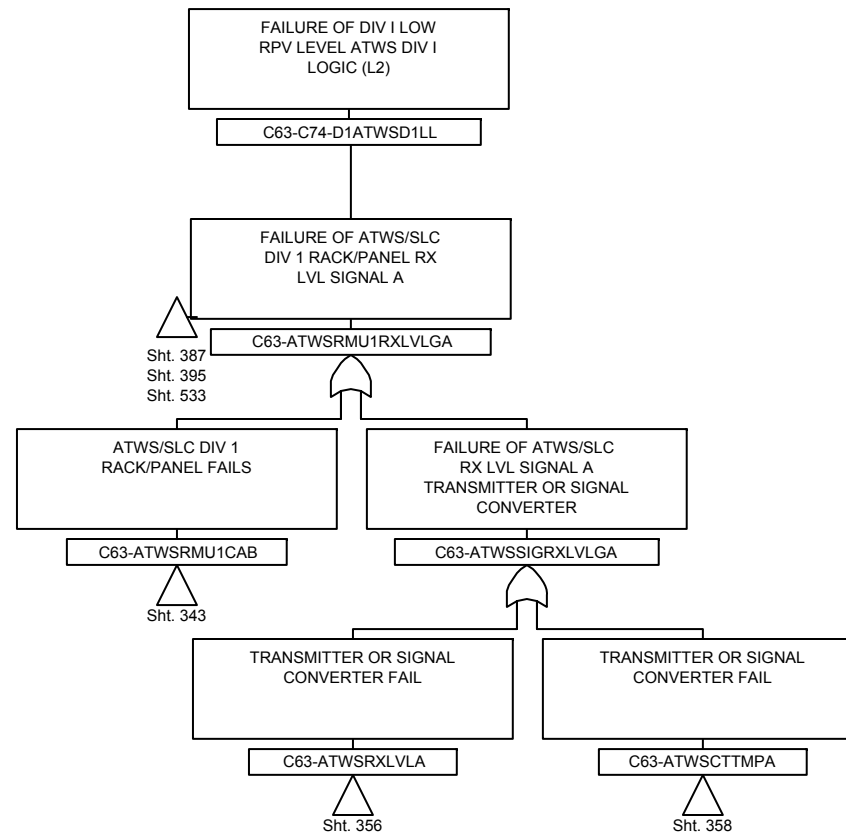


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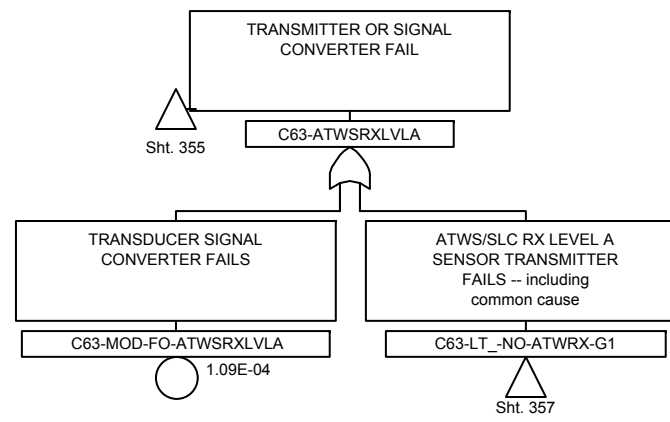


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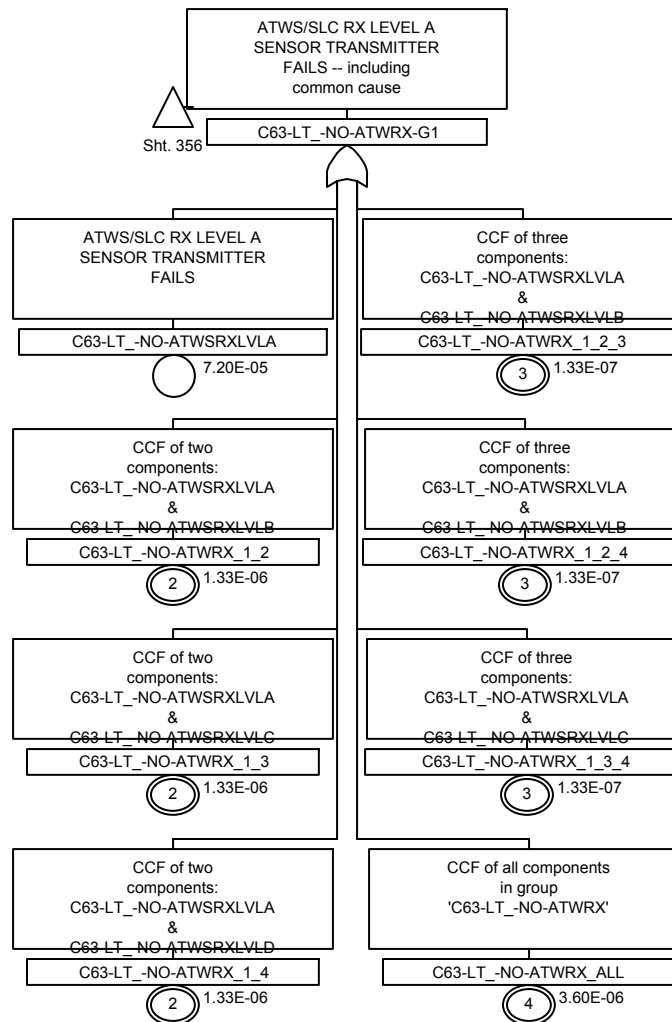


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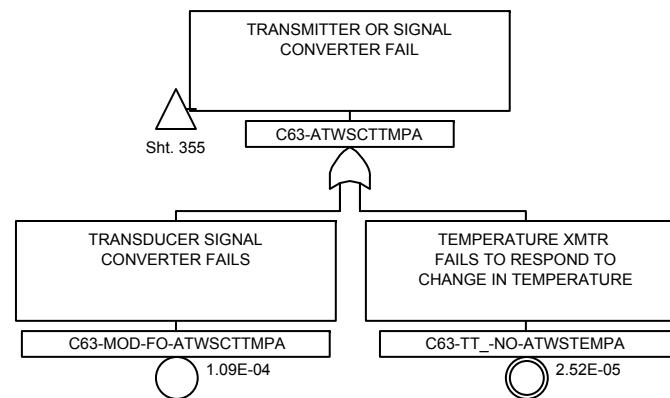


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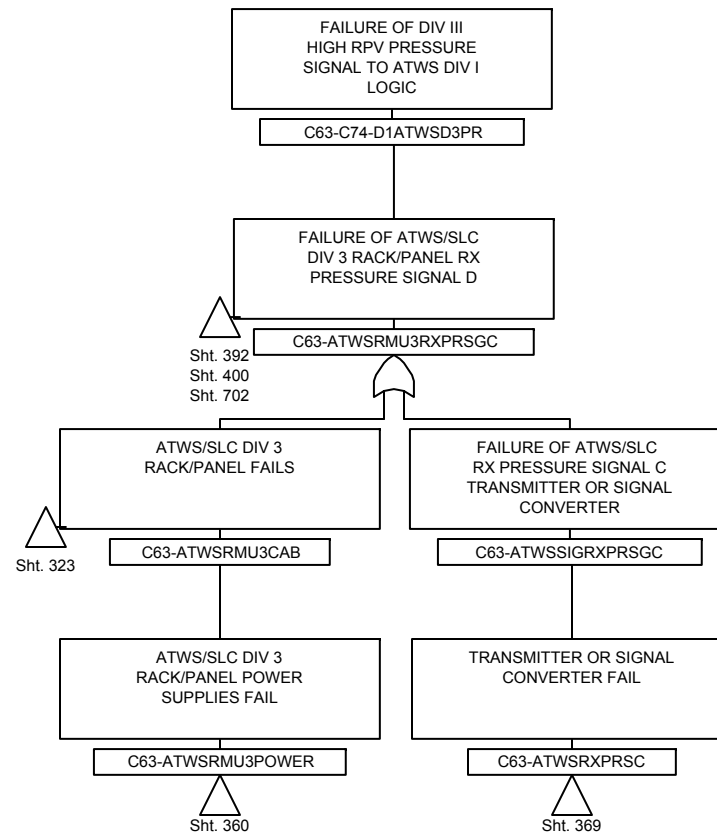


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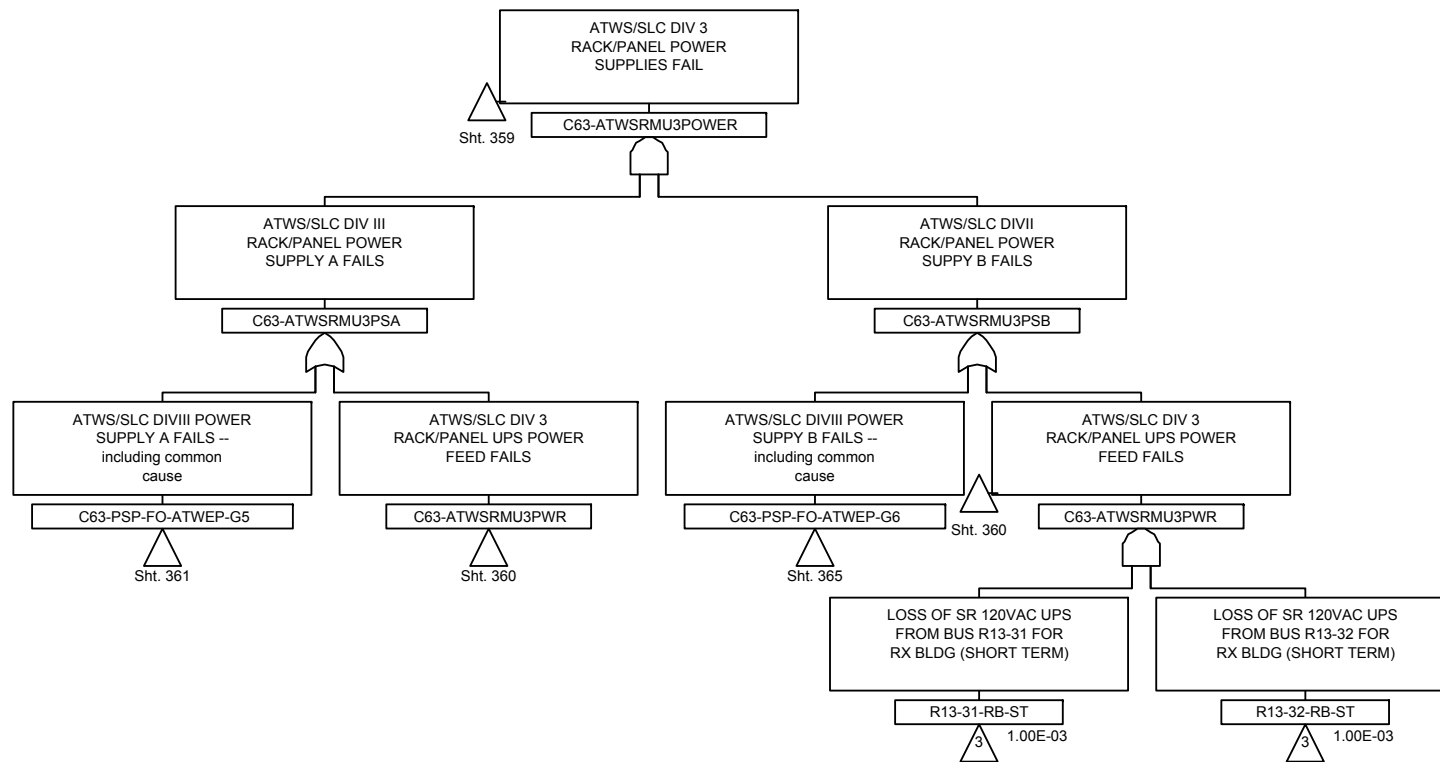


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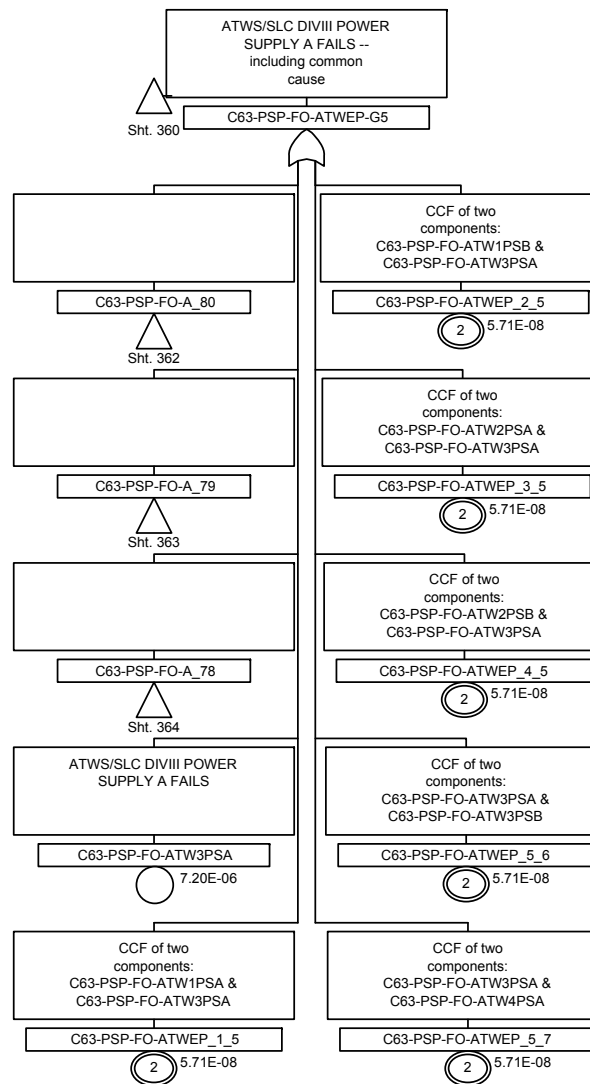


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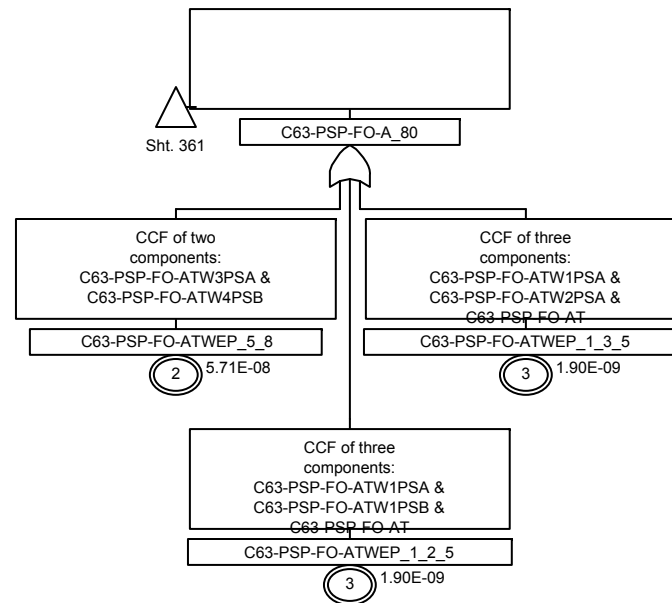


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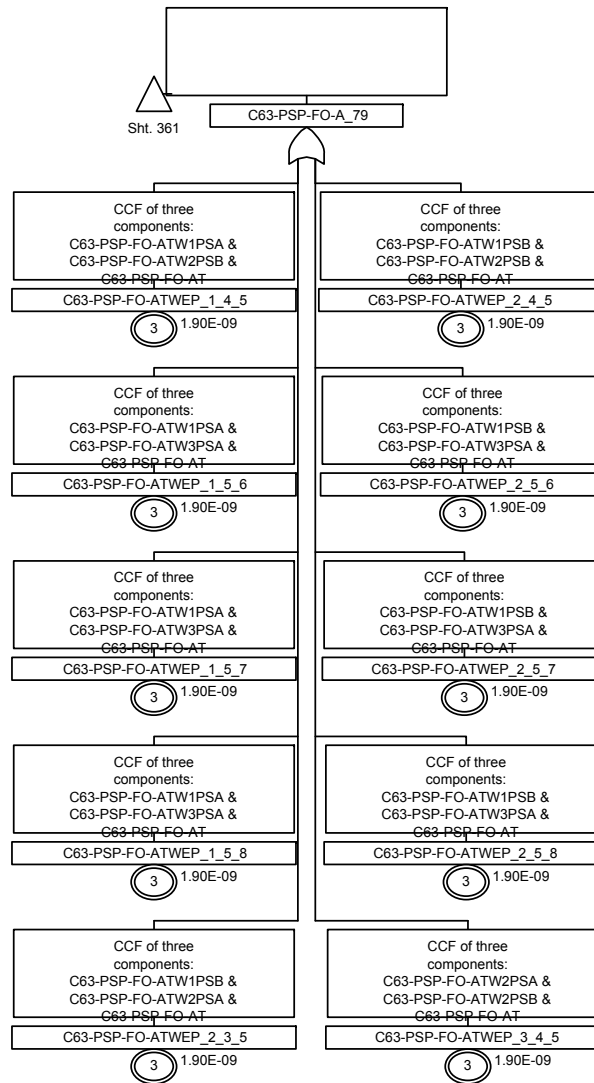


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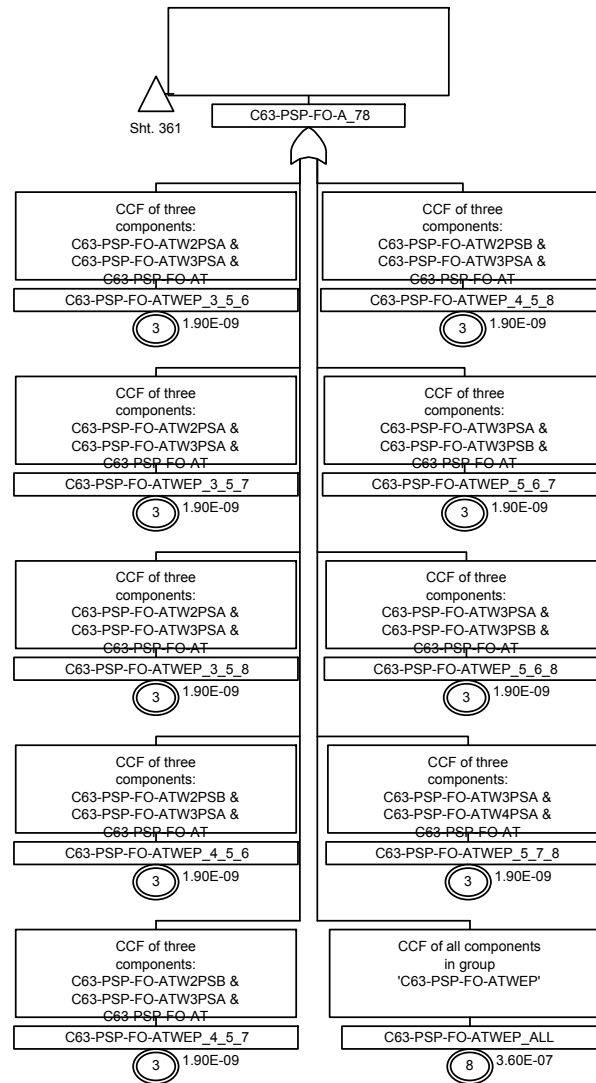


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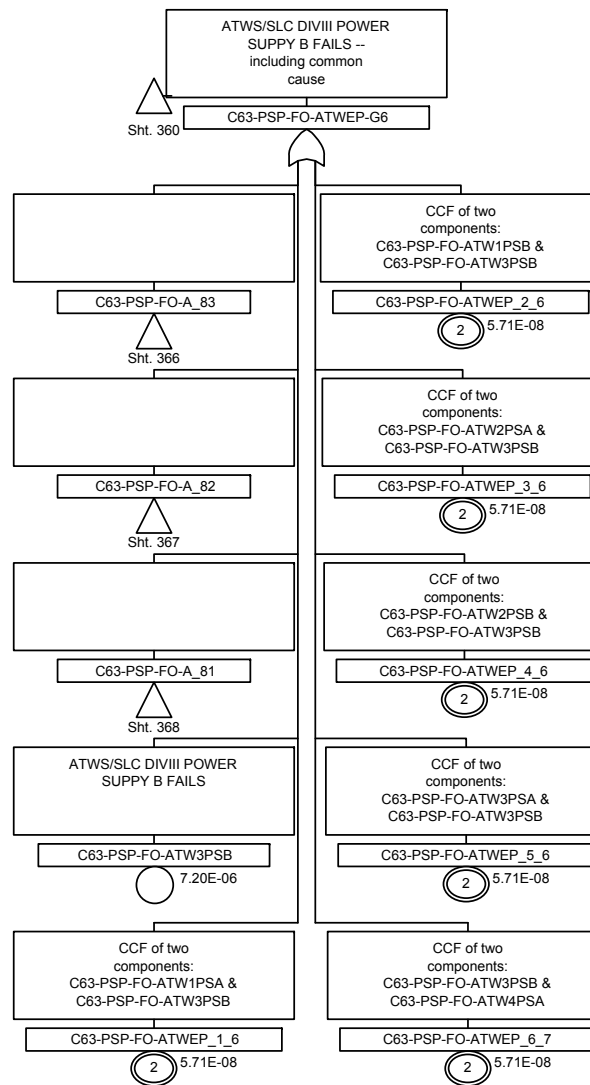


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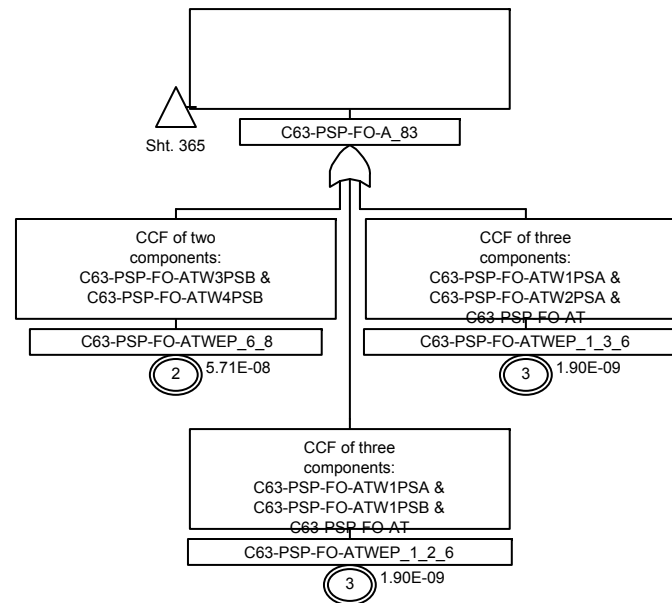


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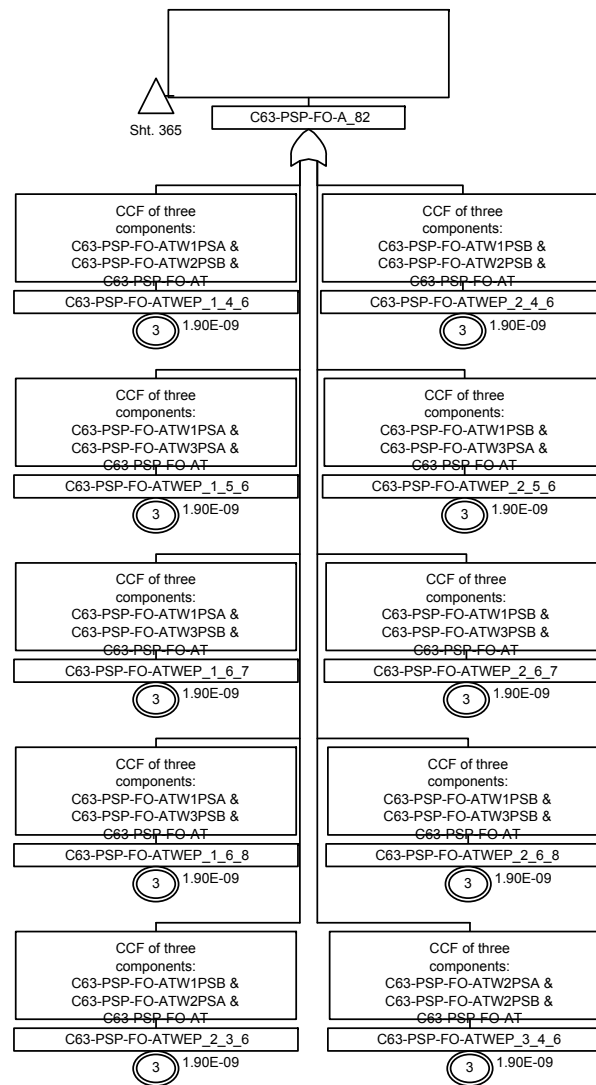


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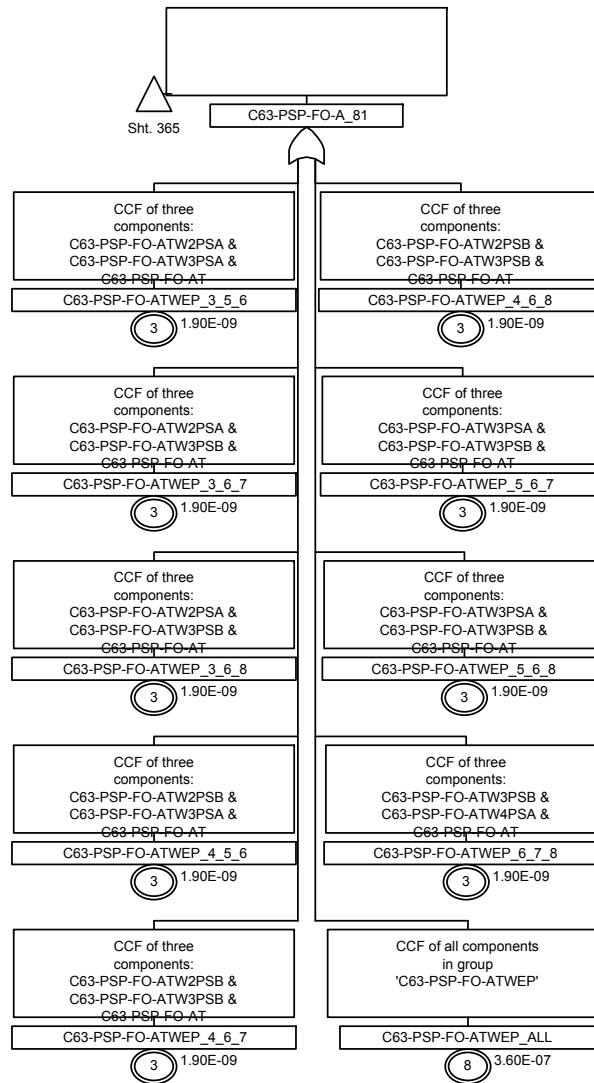


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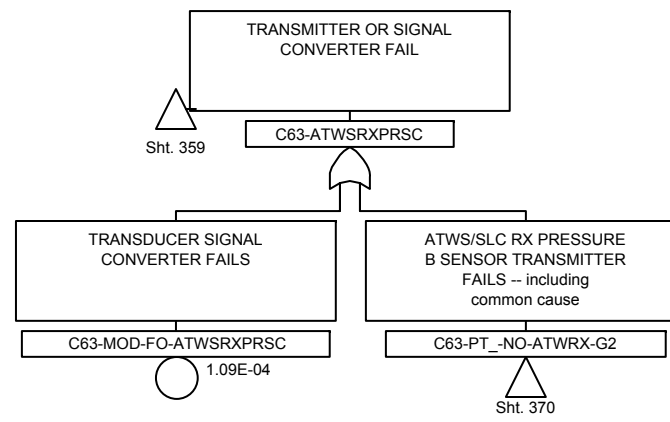


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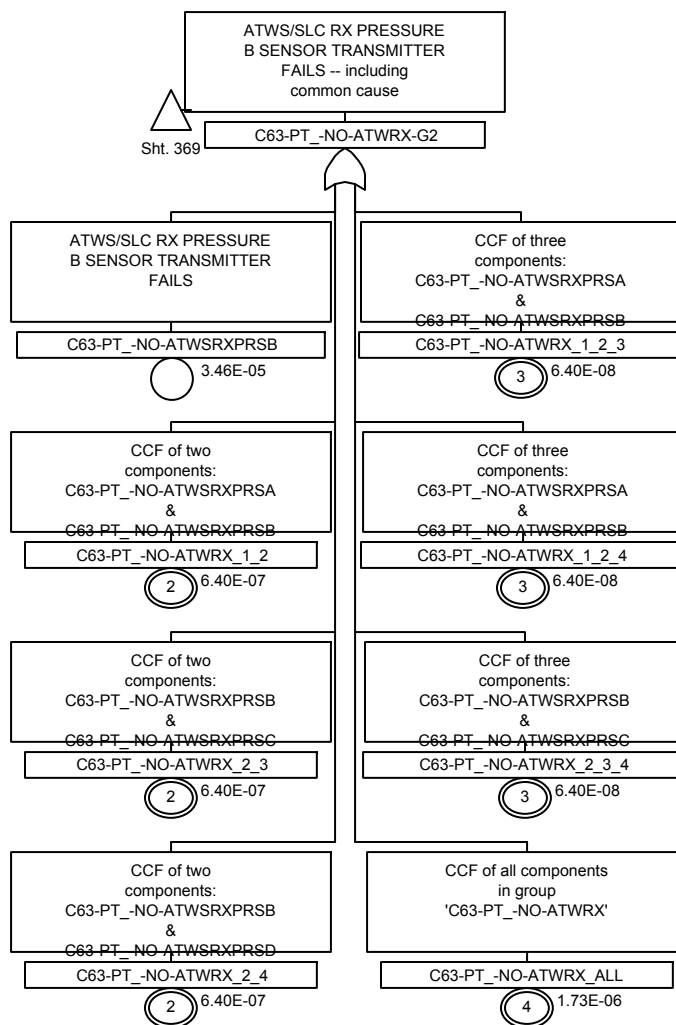


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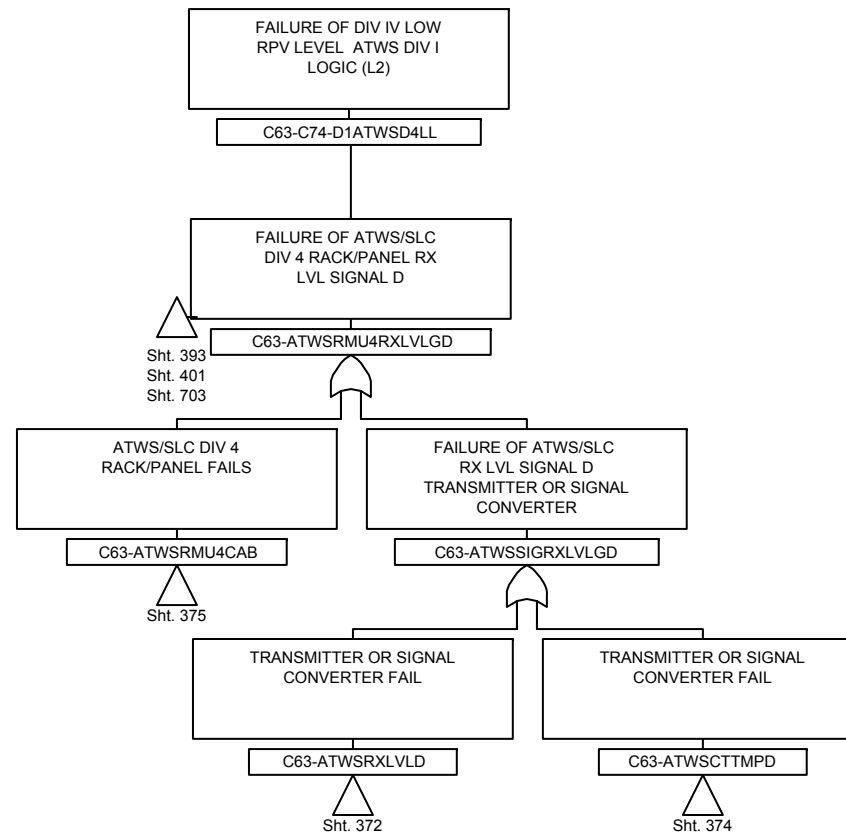


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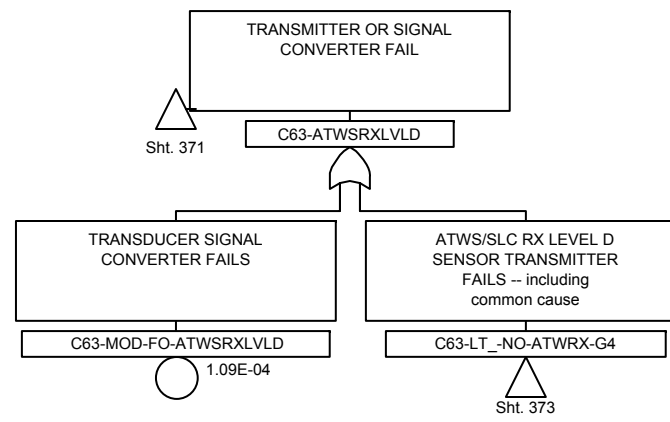


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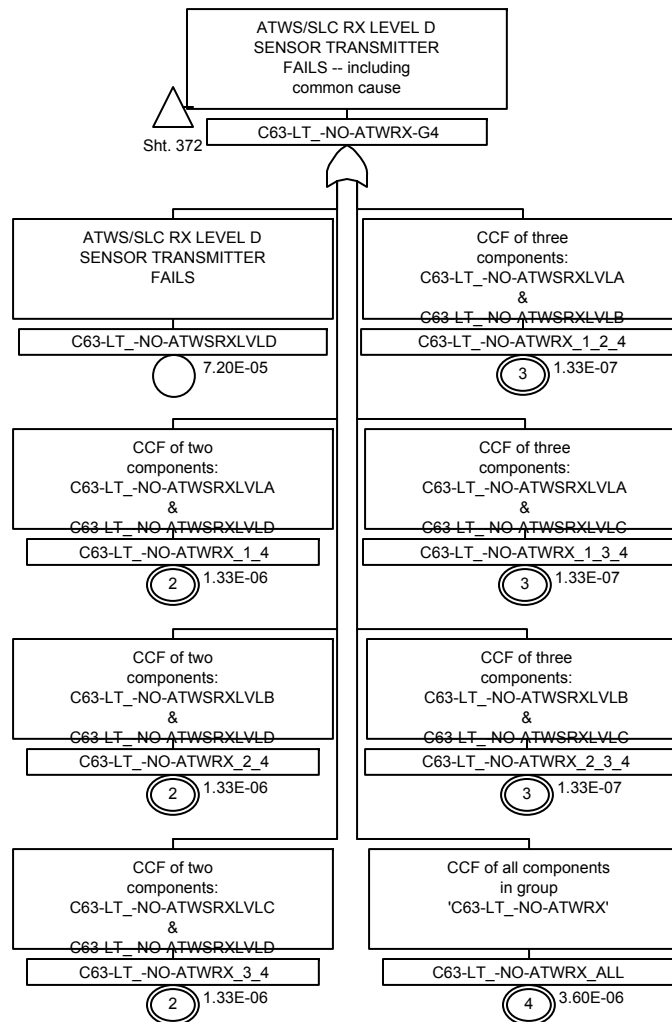


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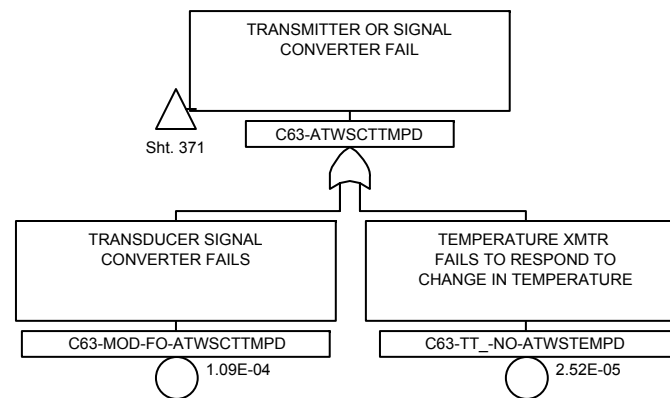


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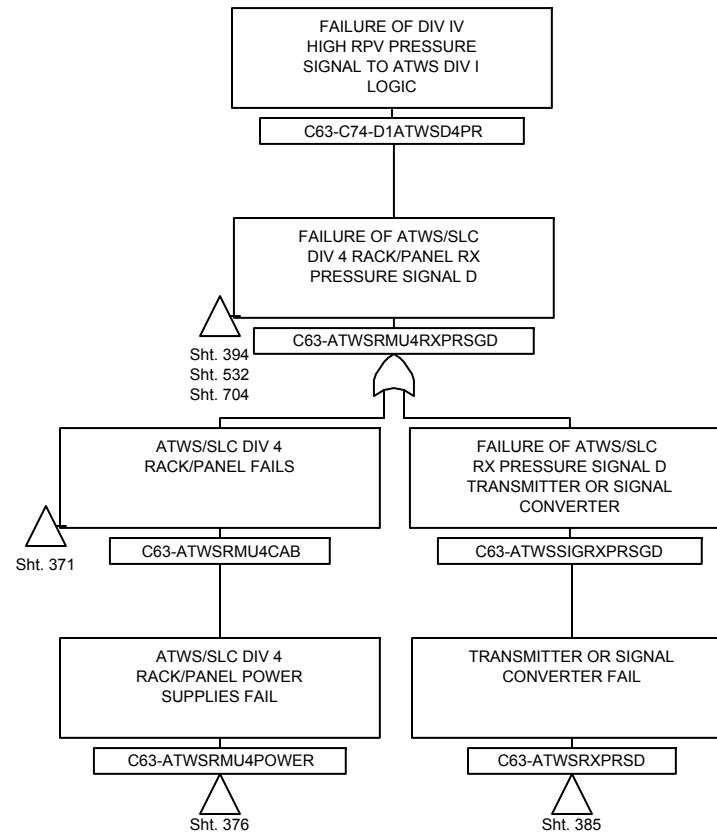


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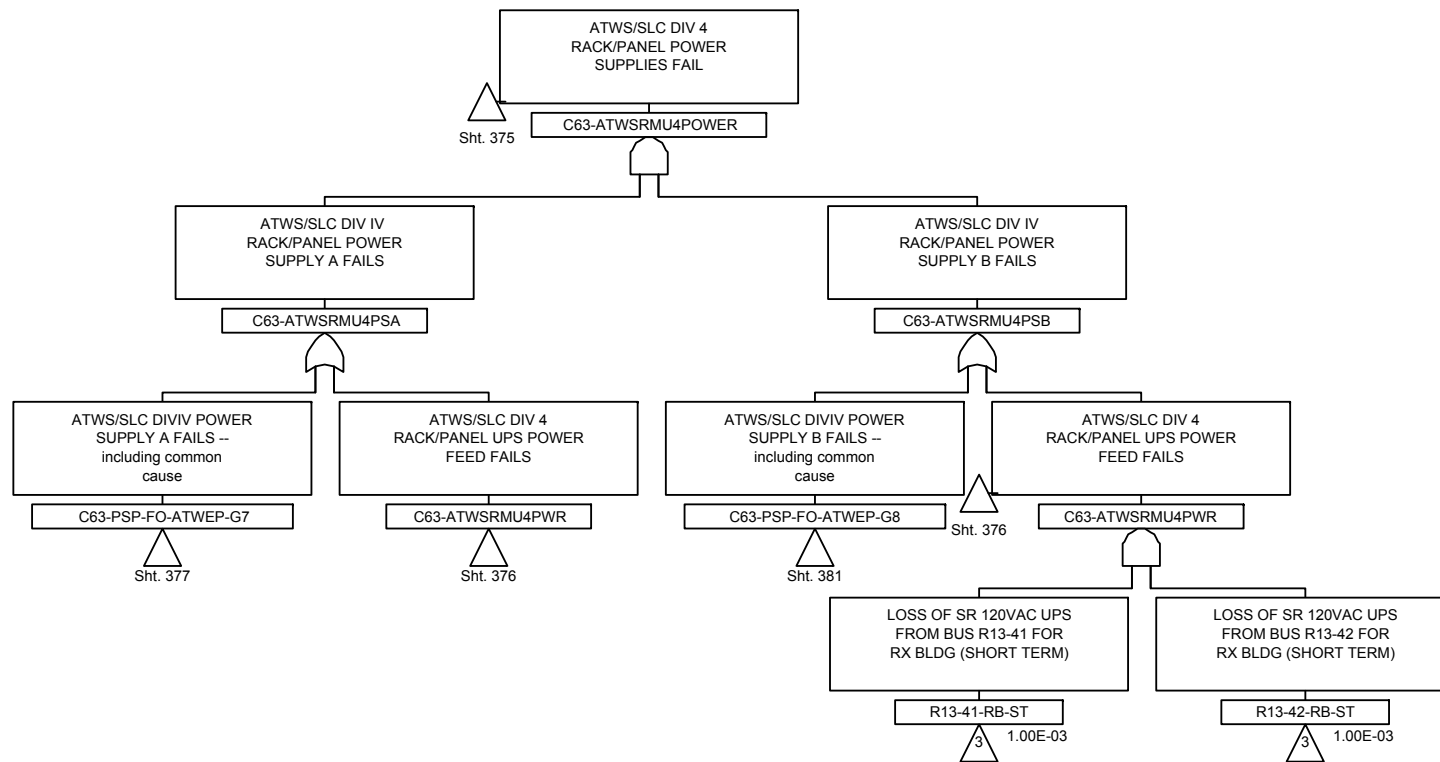


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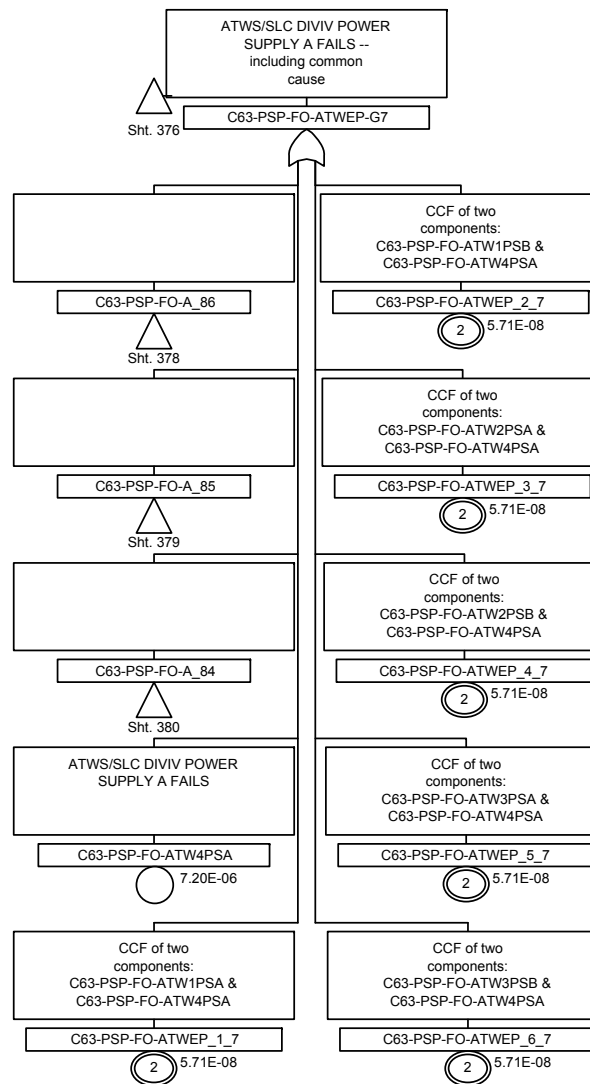


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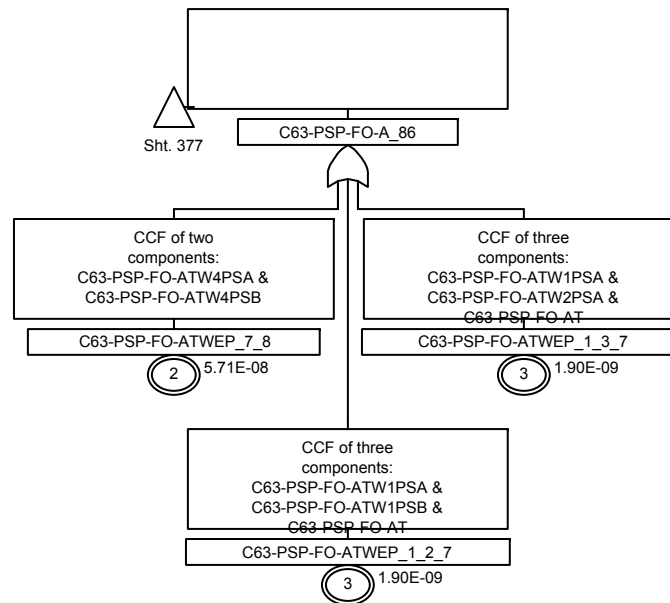


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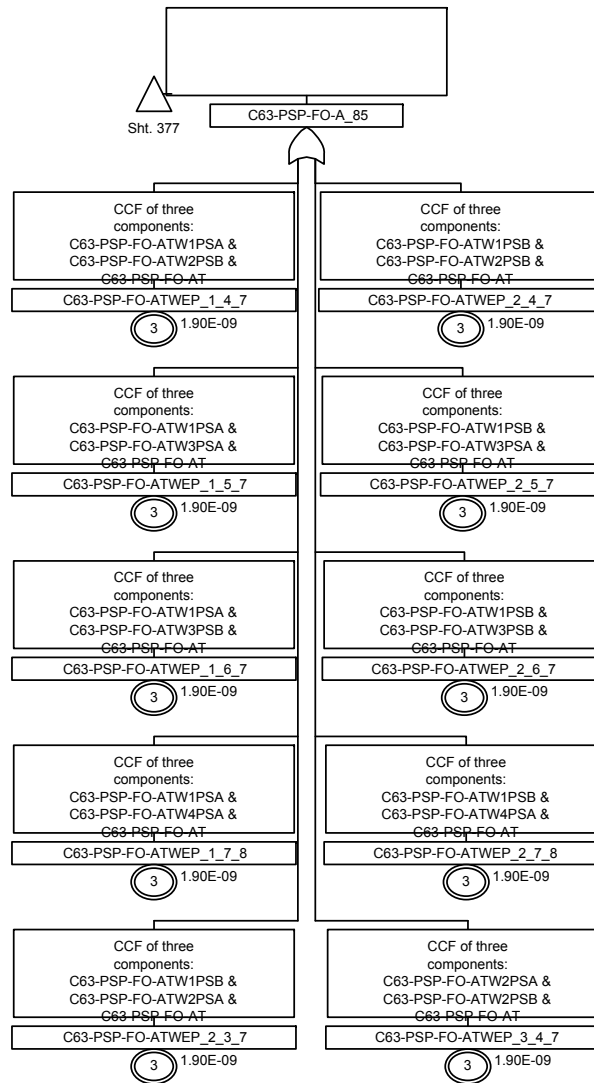


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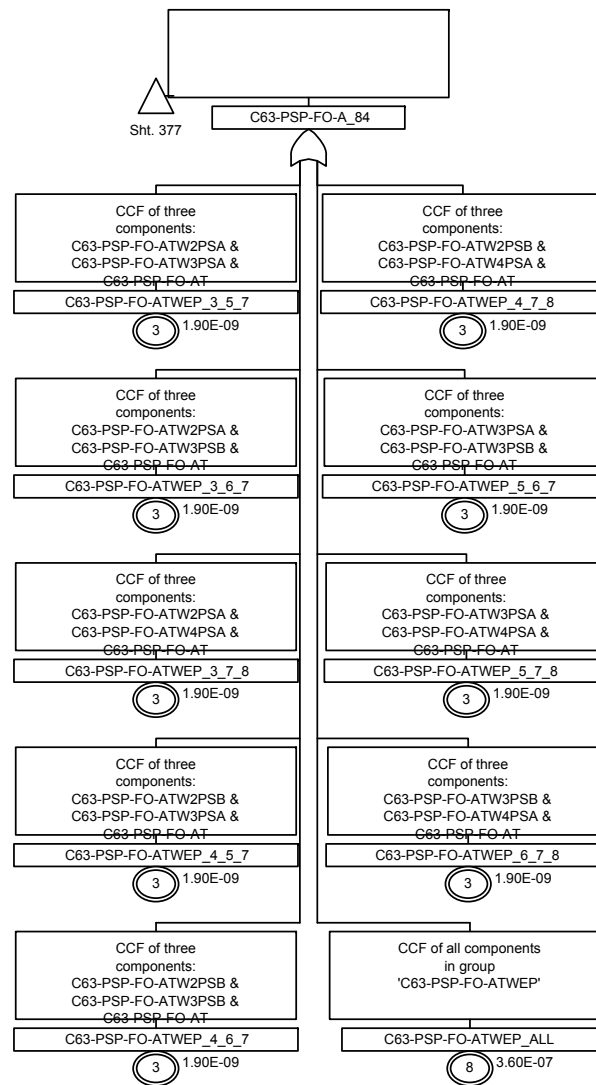


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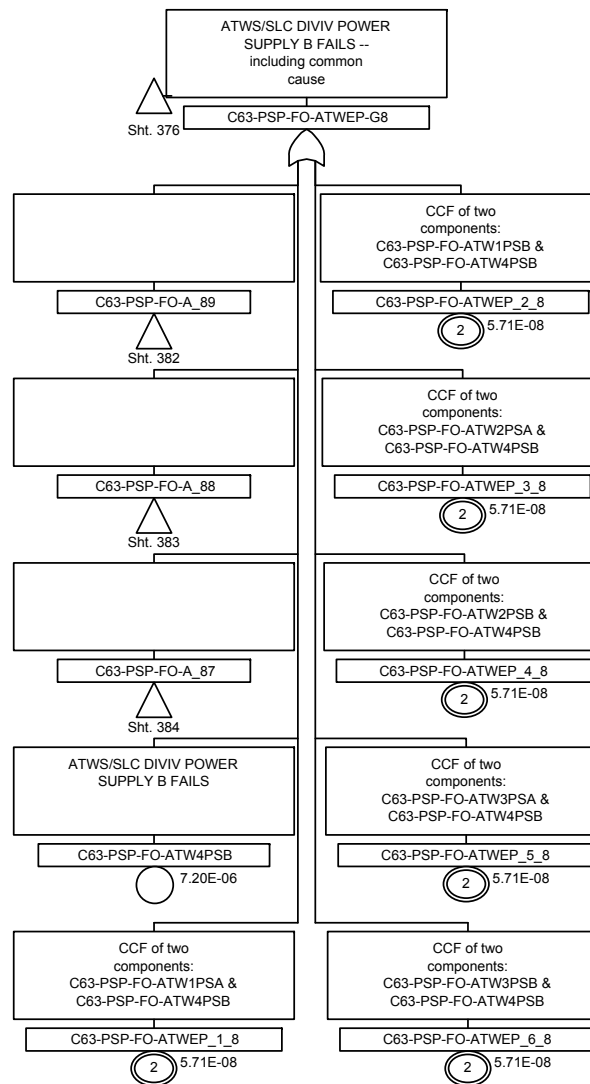


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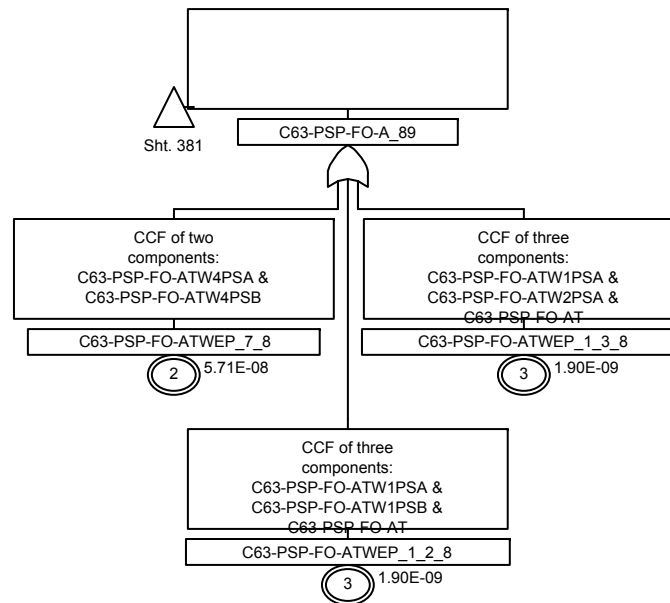


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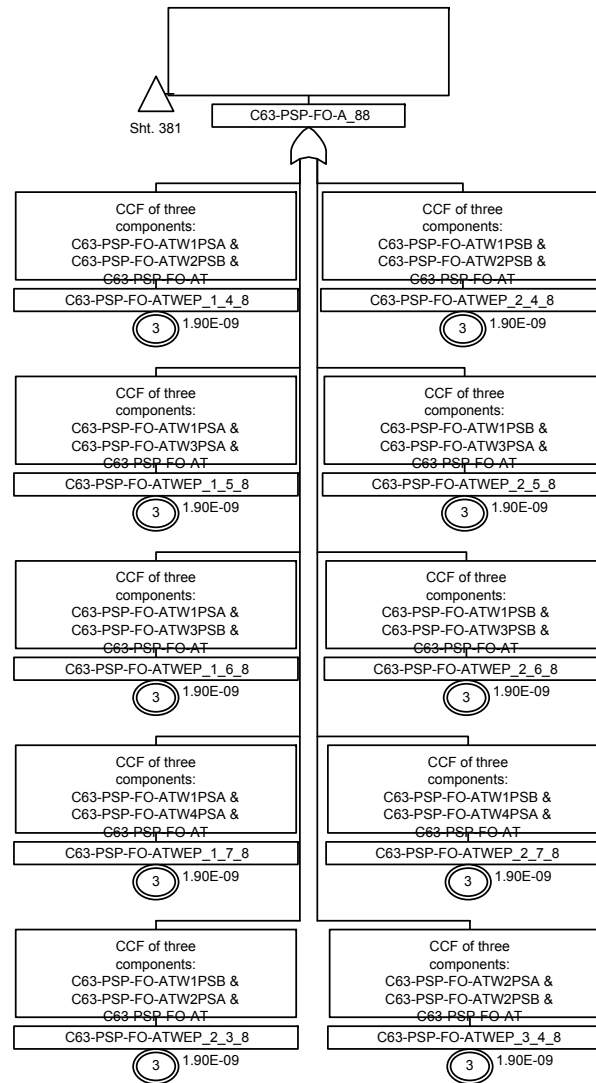


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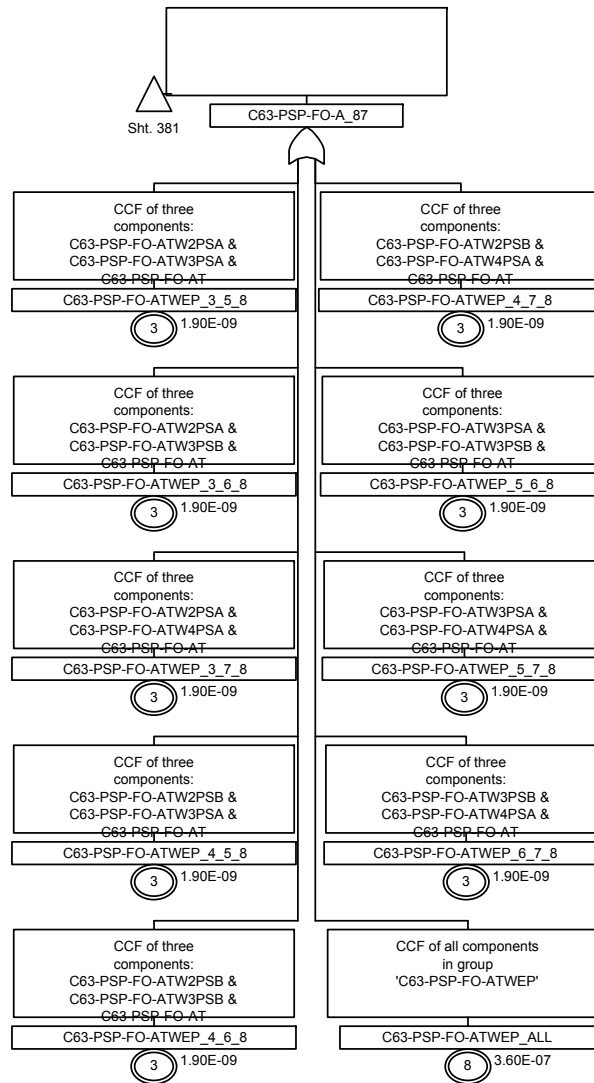


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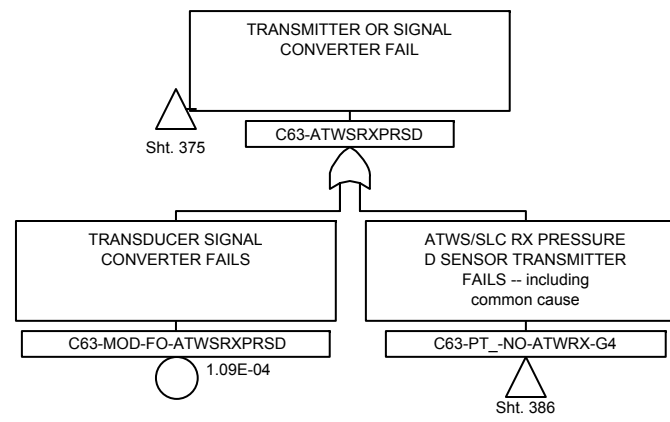


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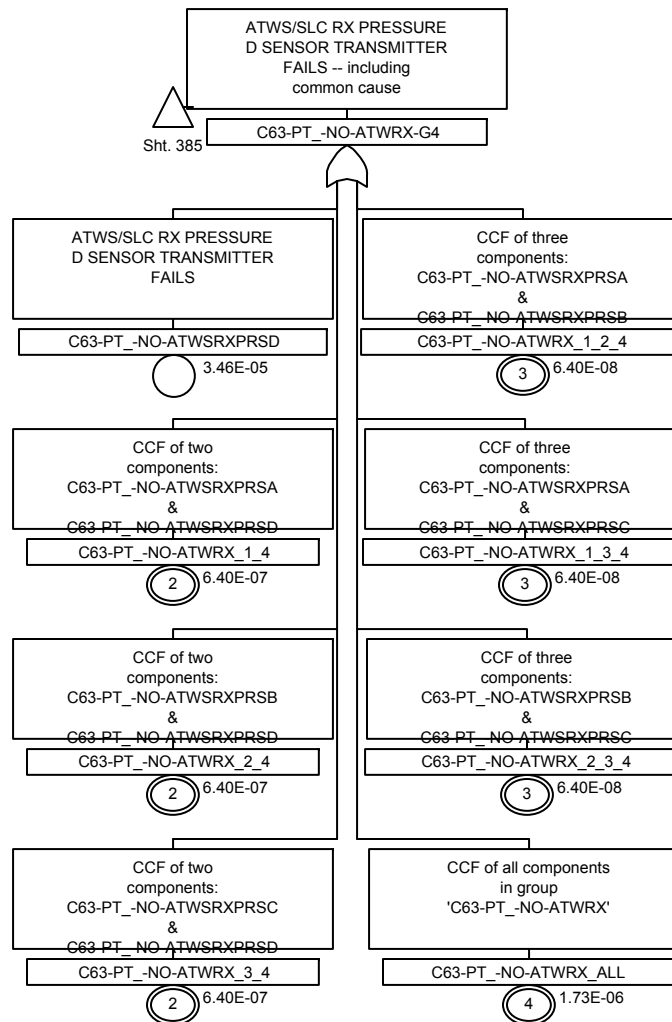


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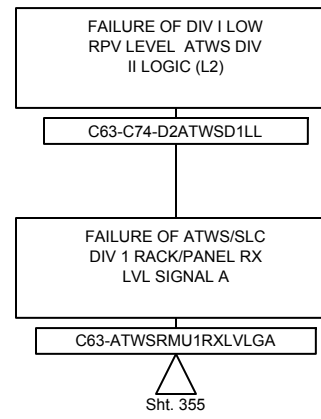


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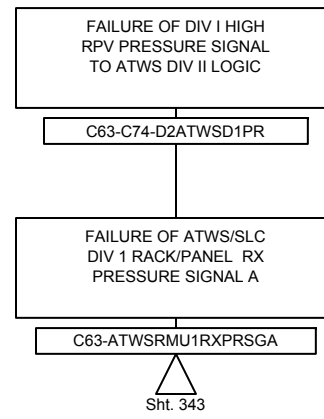


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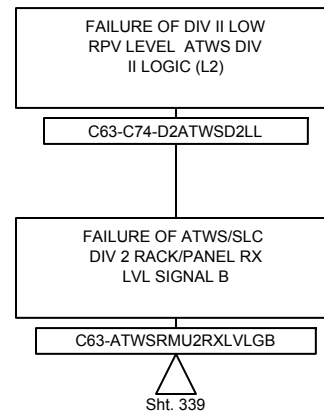


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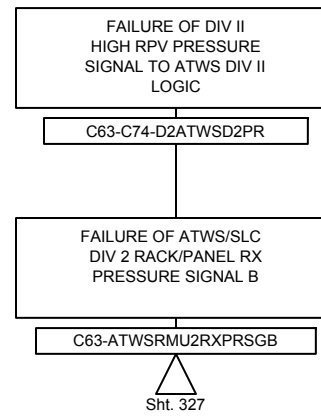


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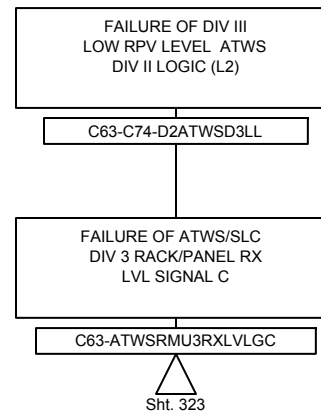


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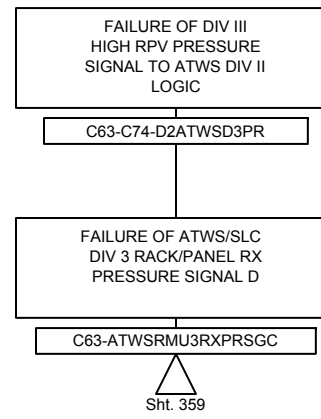


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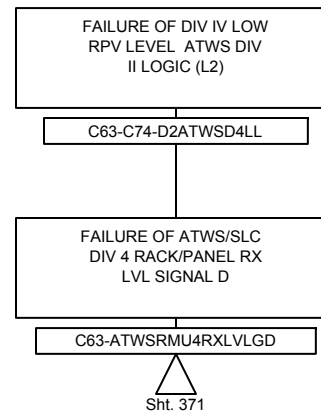


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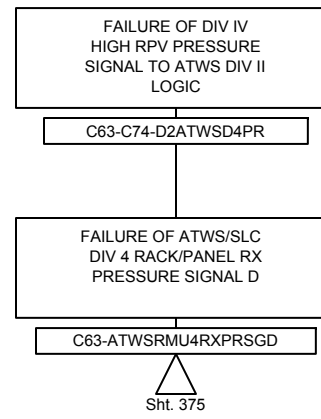


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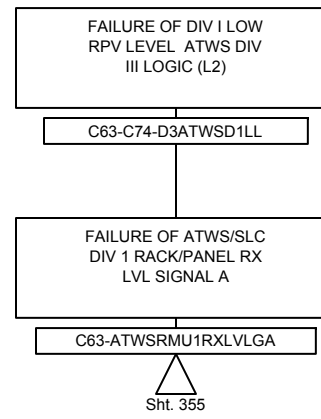


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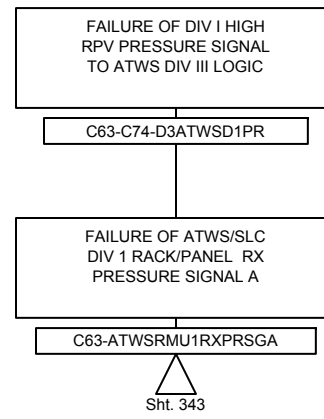


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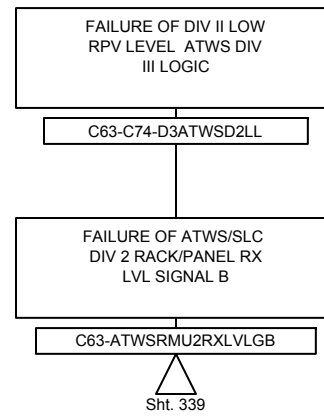


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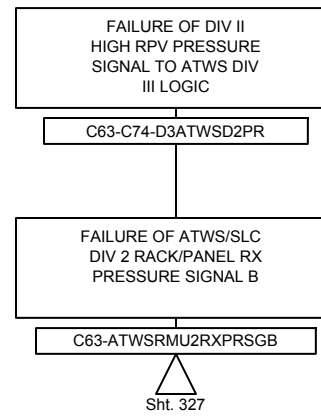


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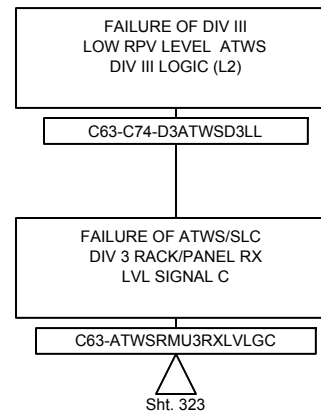


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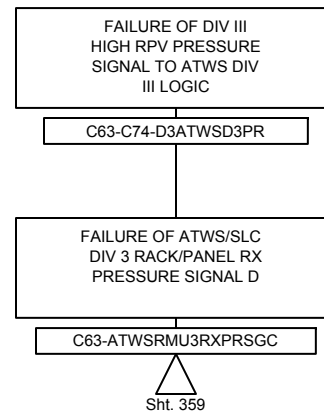


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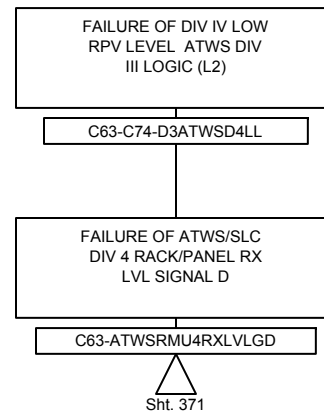


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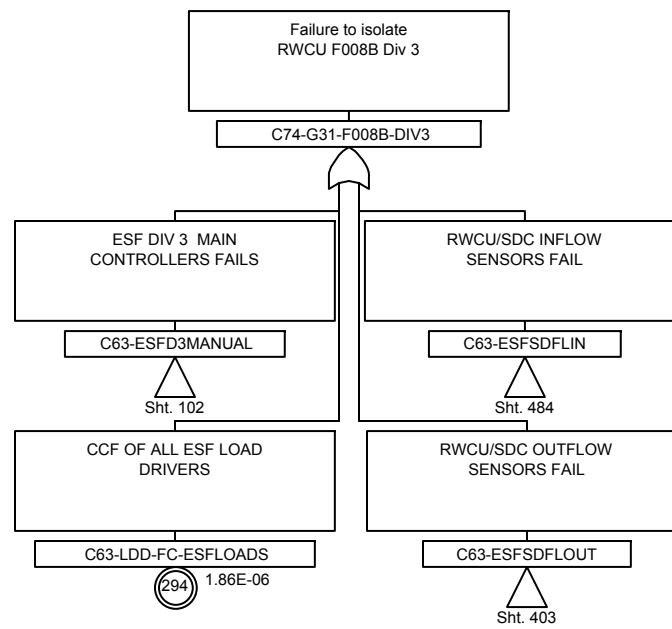


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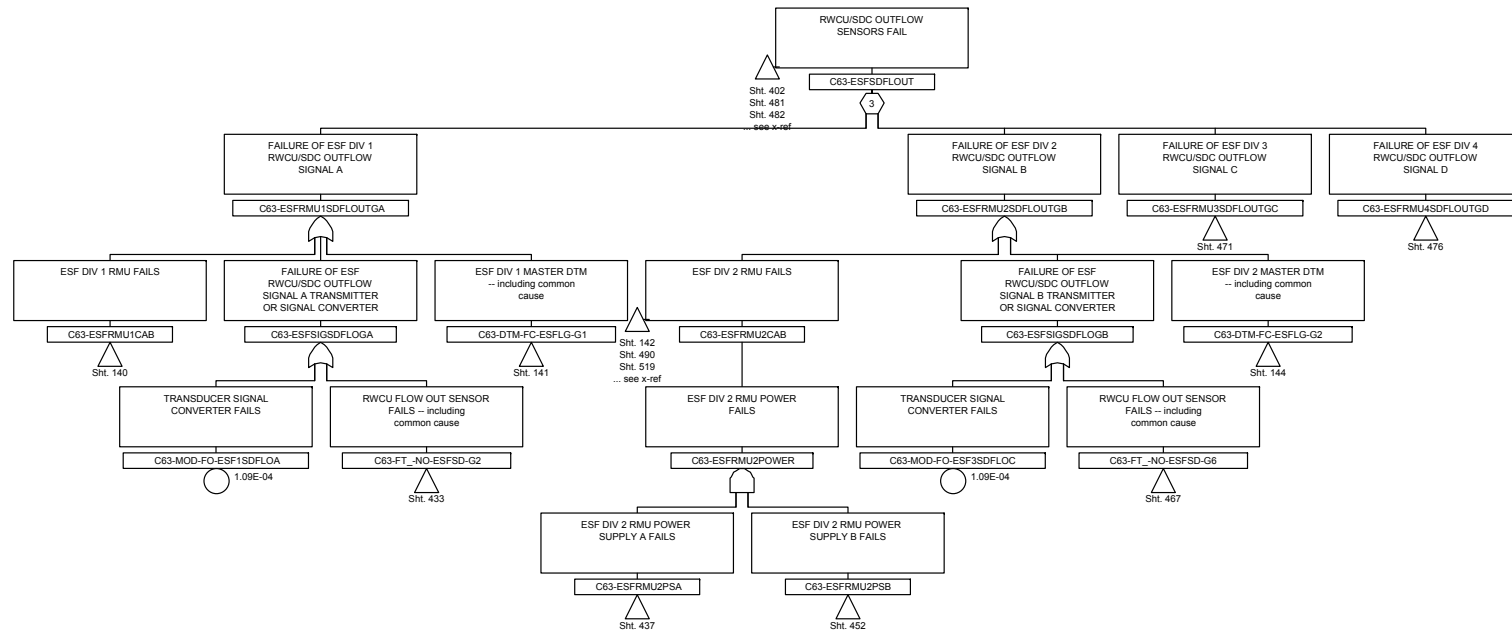


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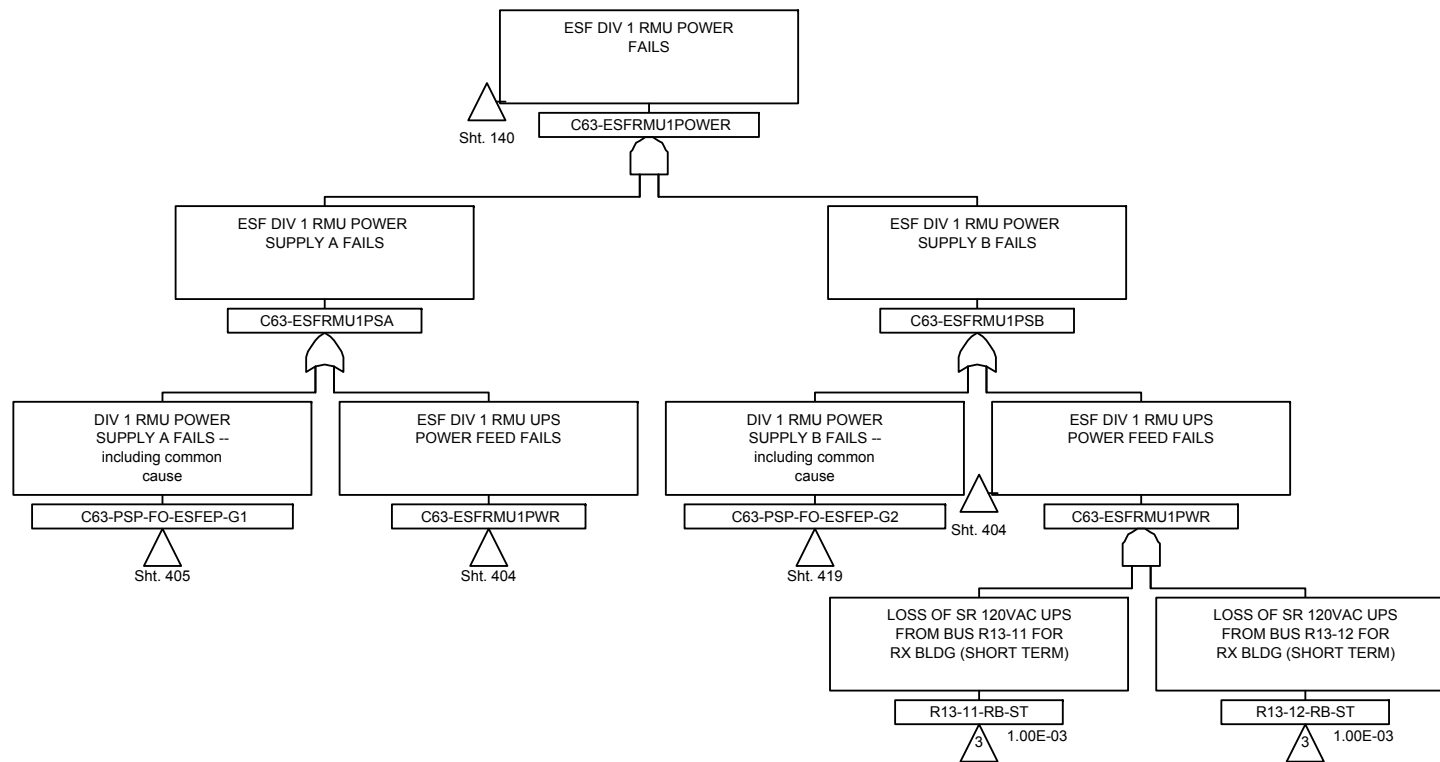


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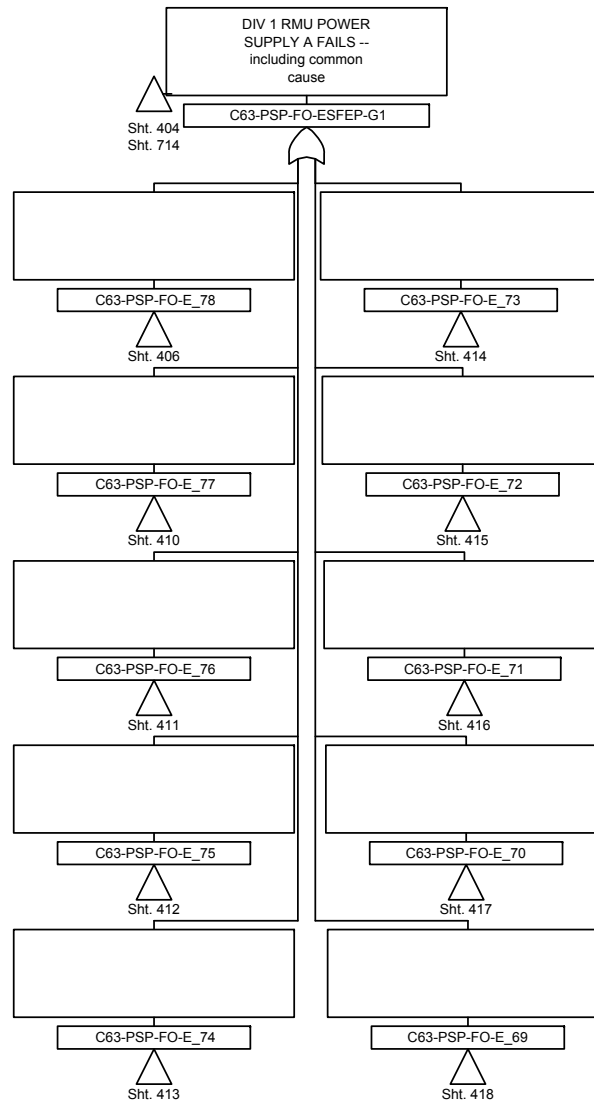


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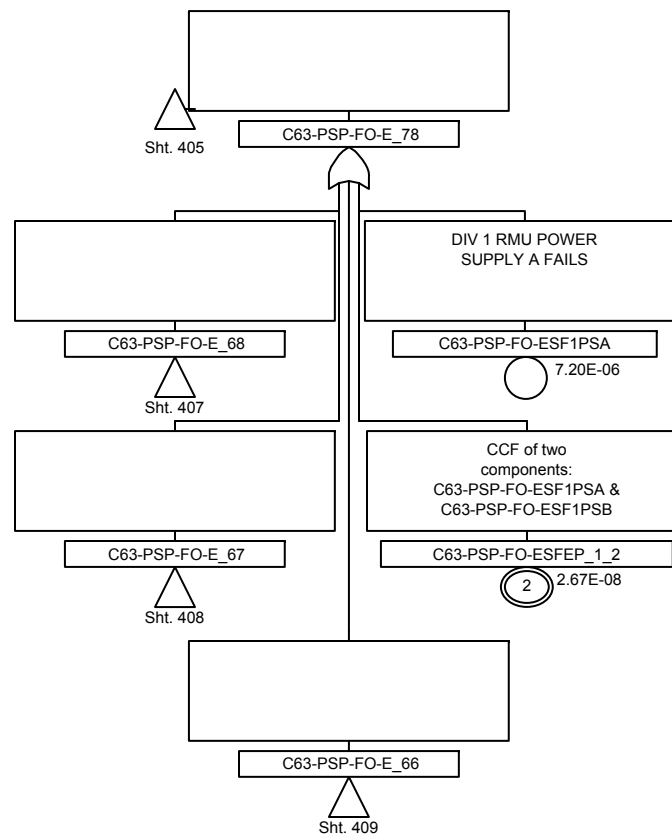


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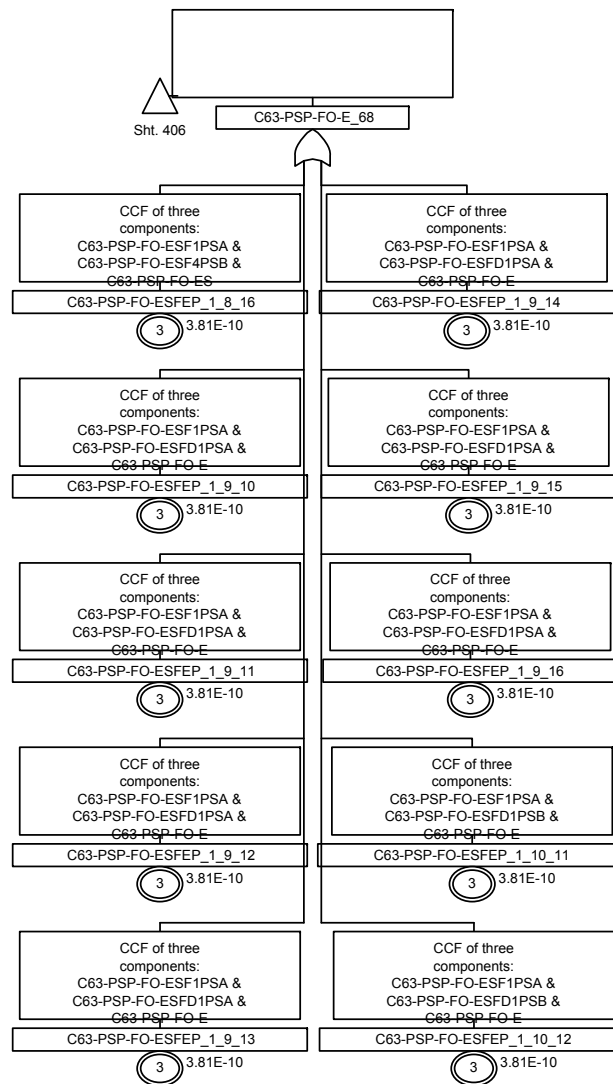


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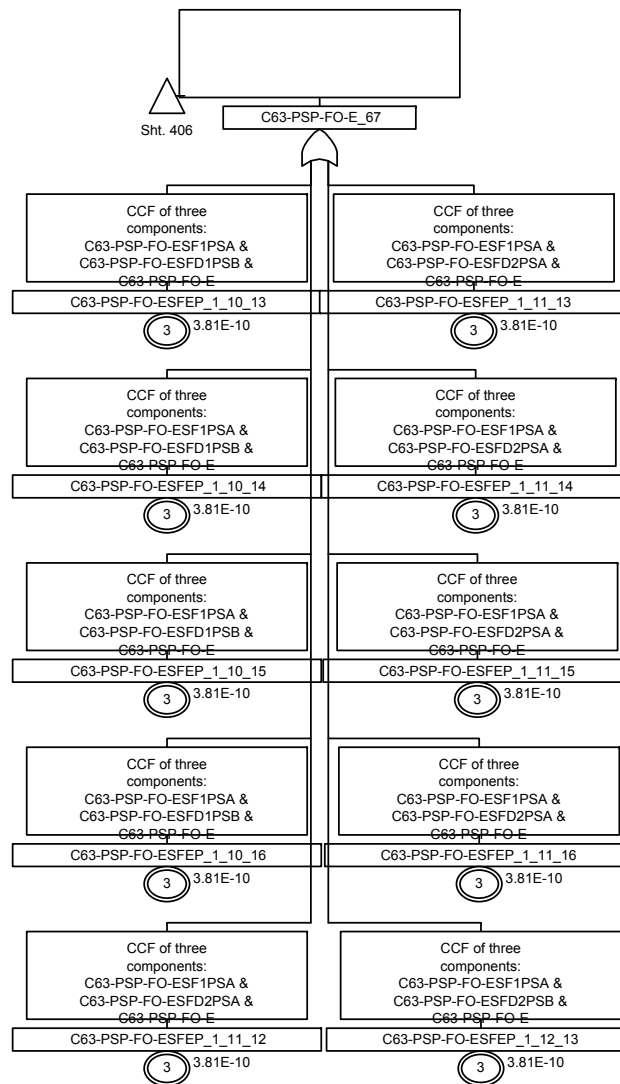


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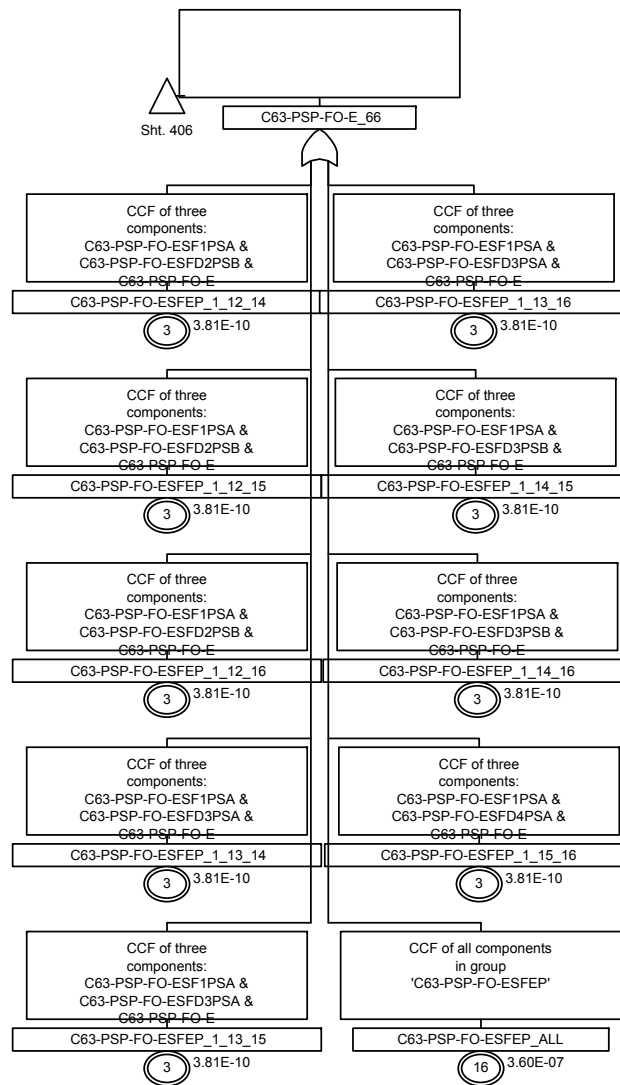


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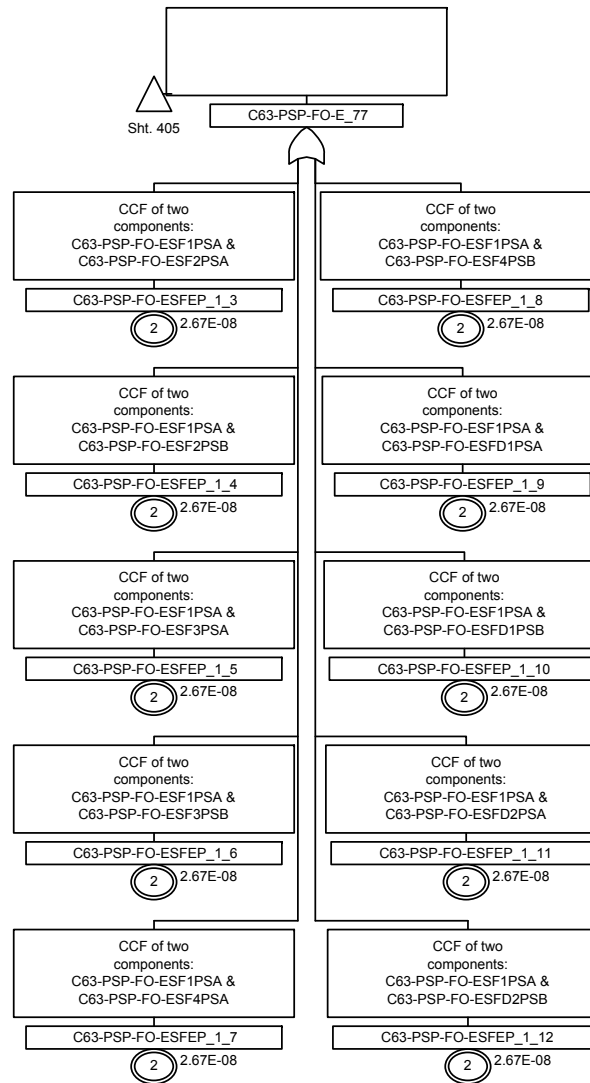


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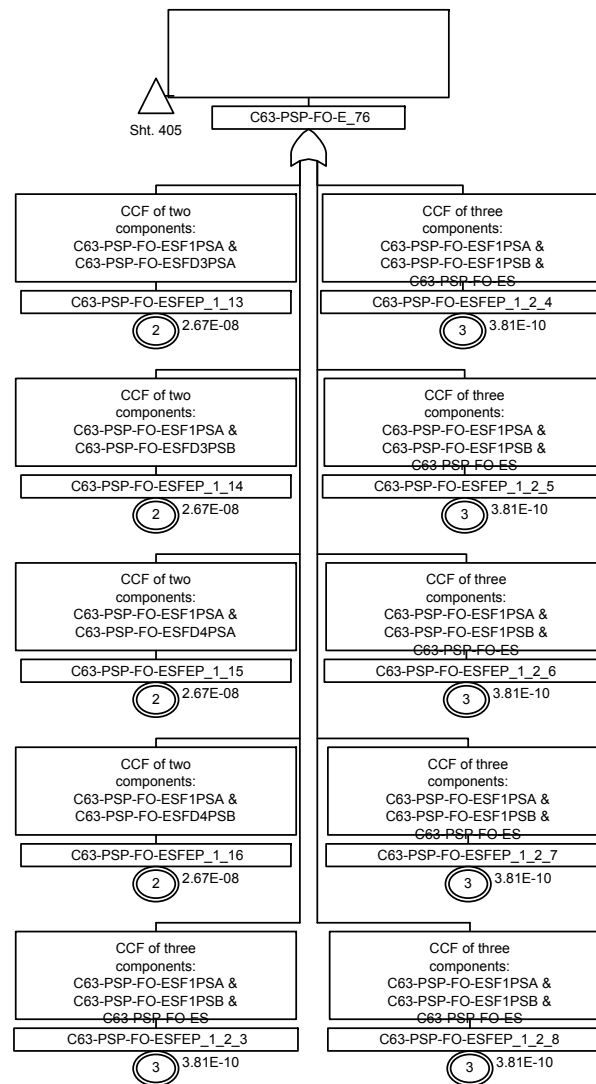


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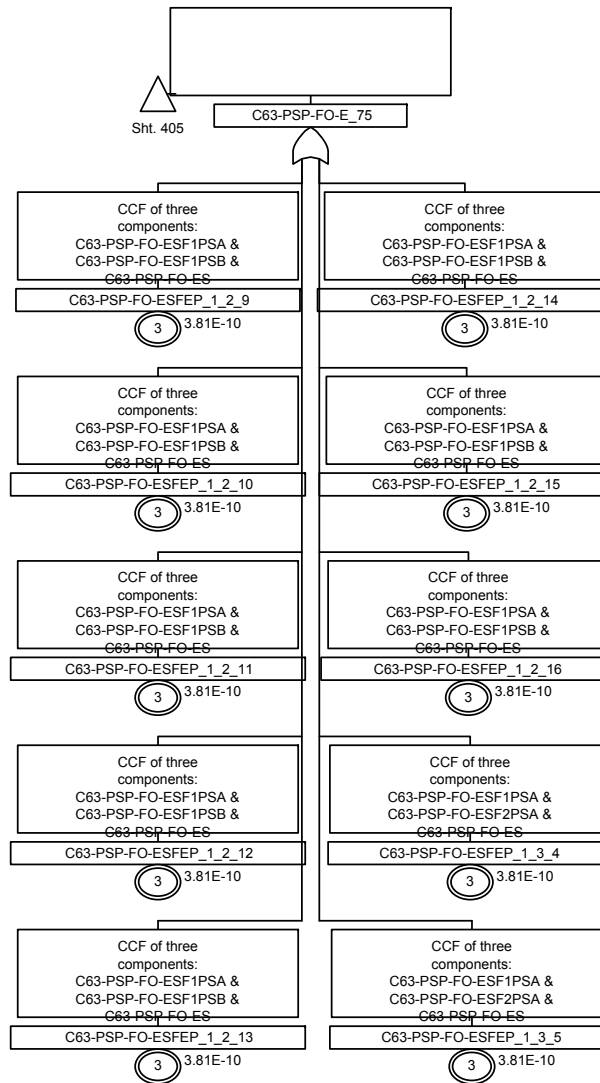


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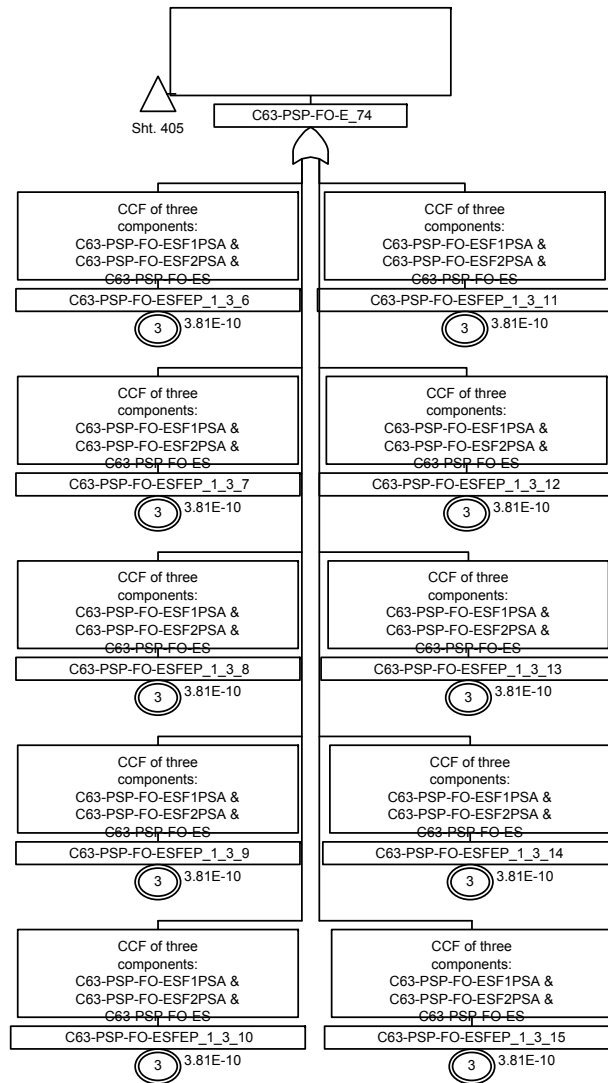


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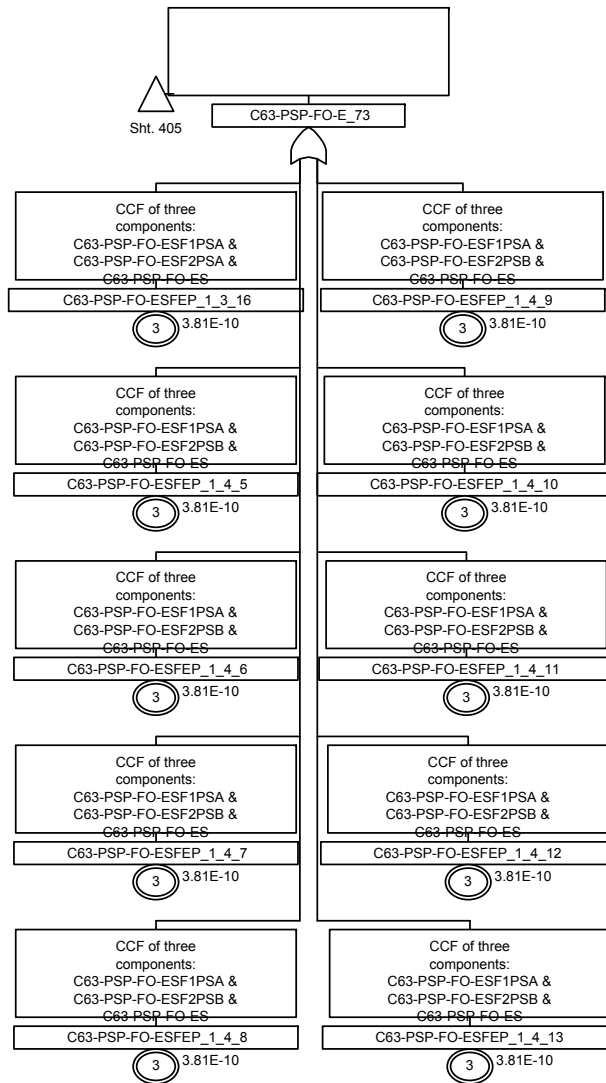


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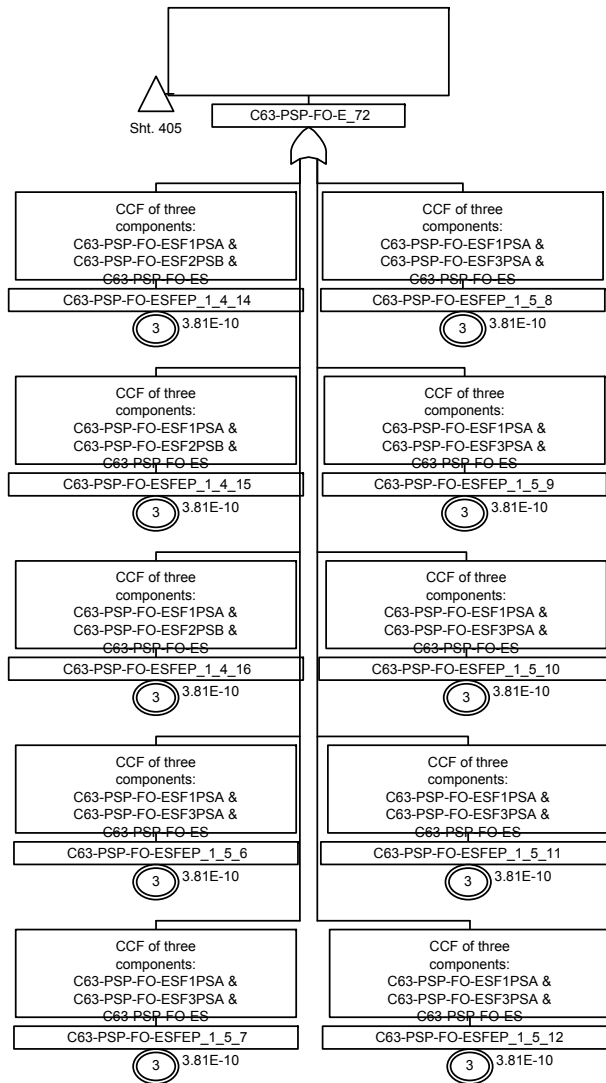


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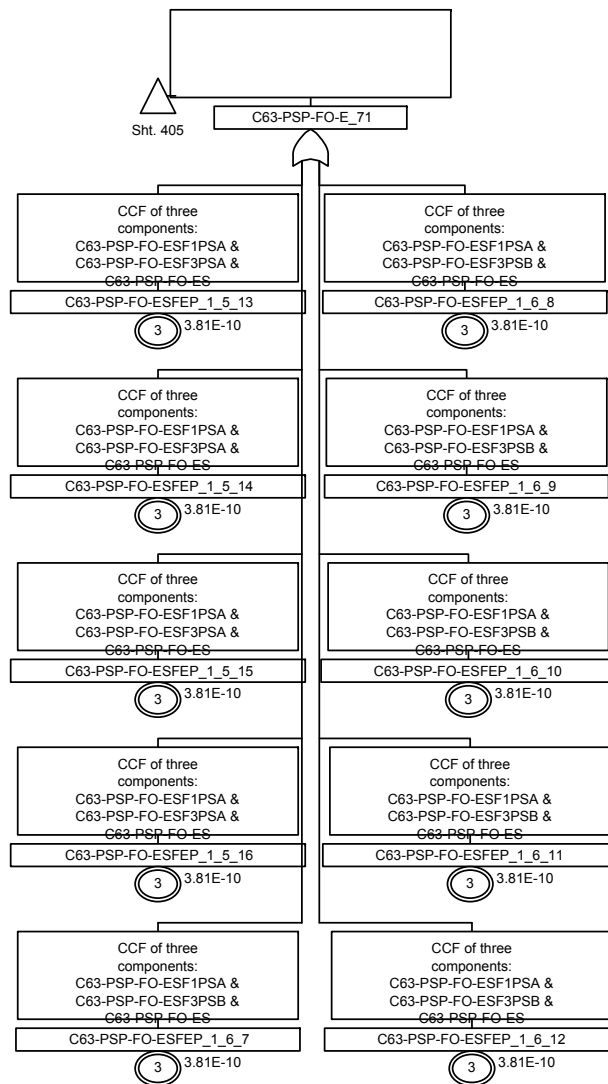


Figure 4.5-3b. Sheet 416 Q-DCIS Safety Related Control System



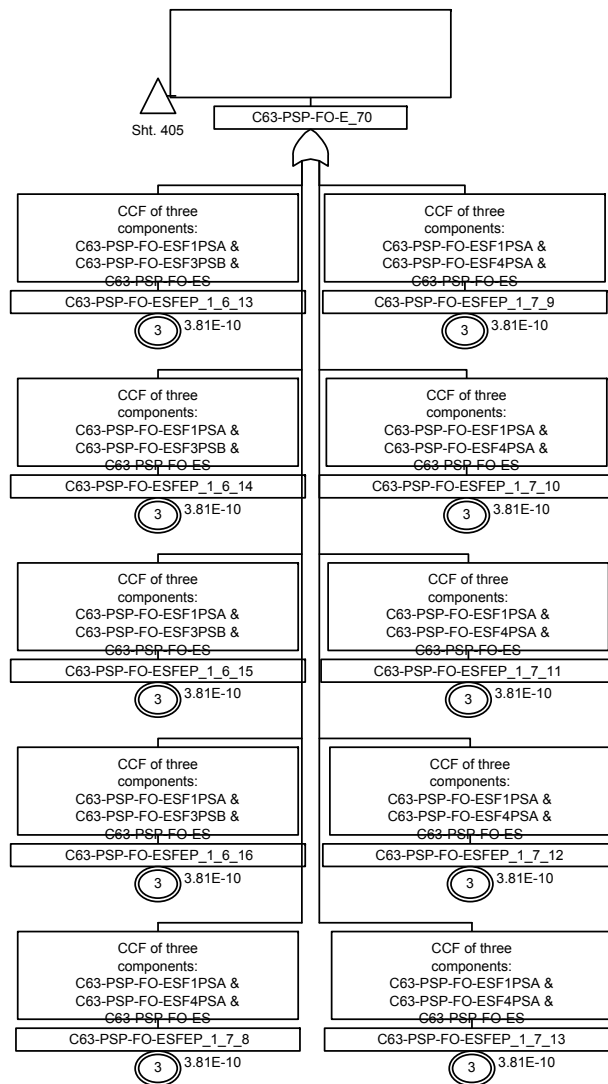


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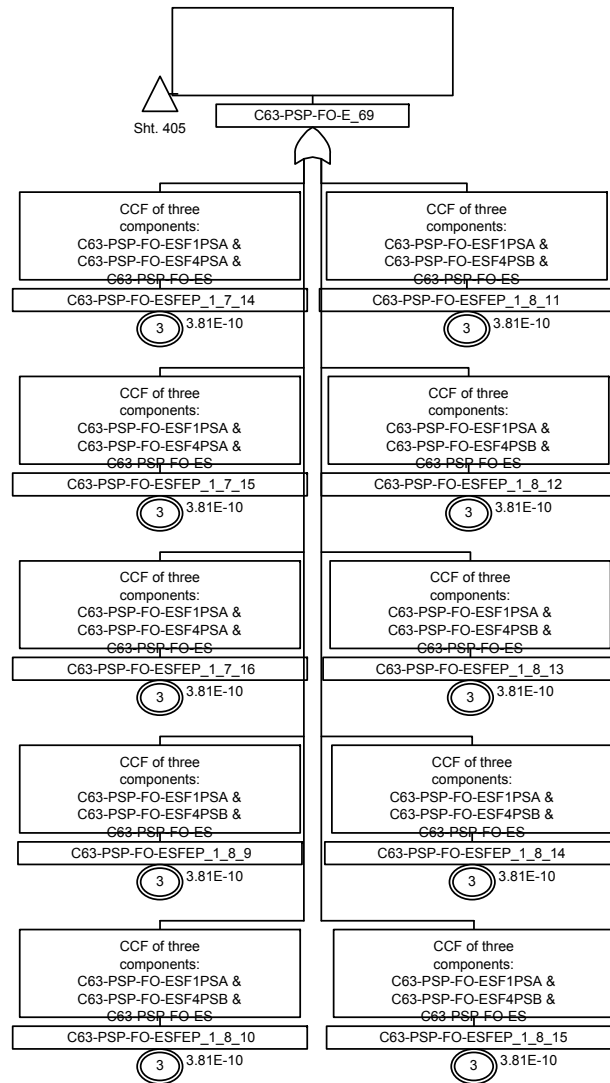


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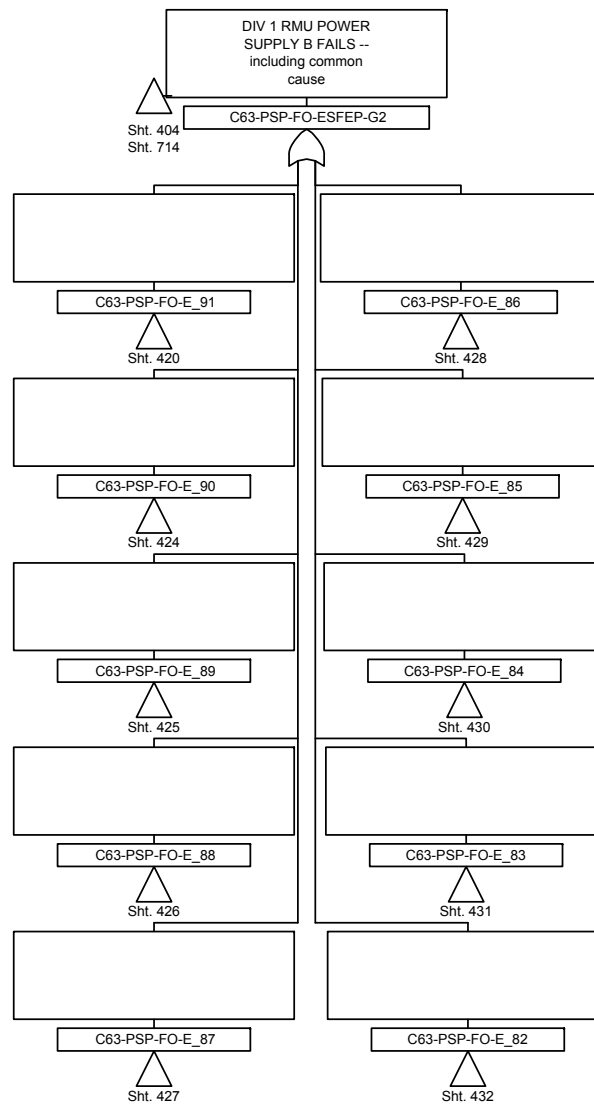


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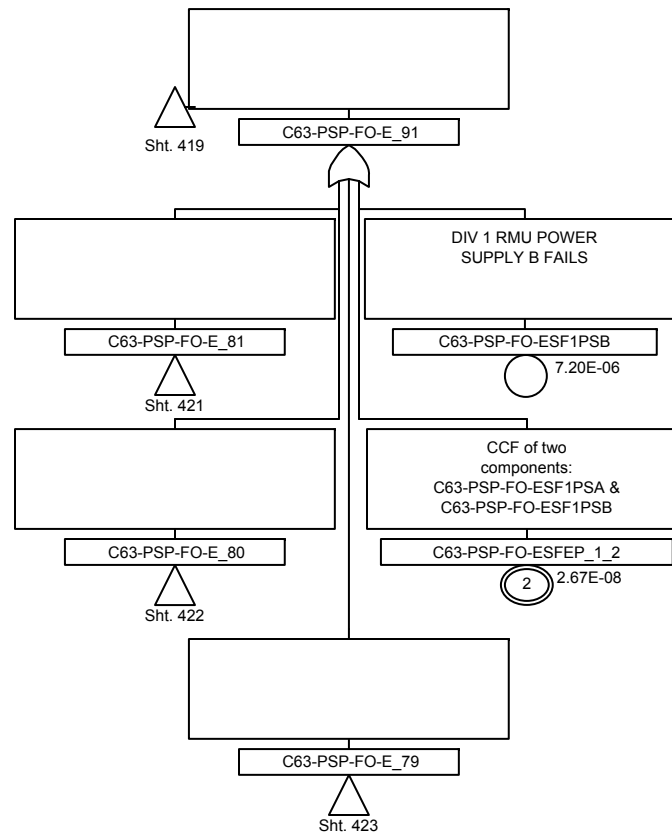


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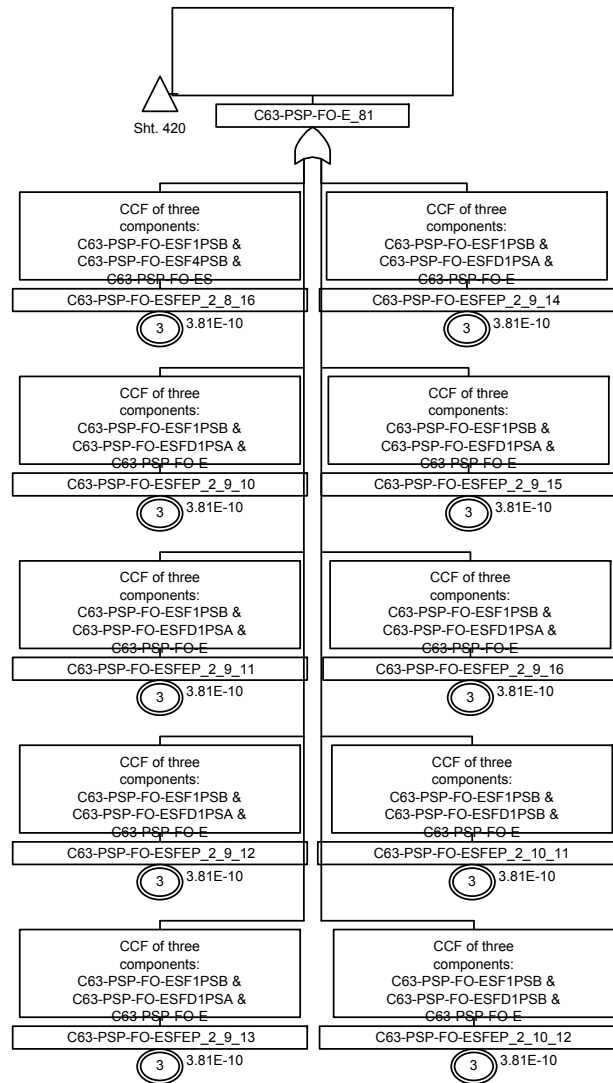


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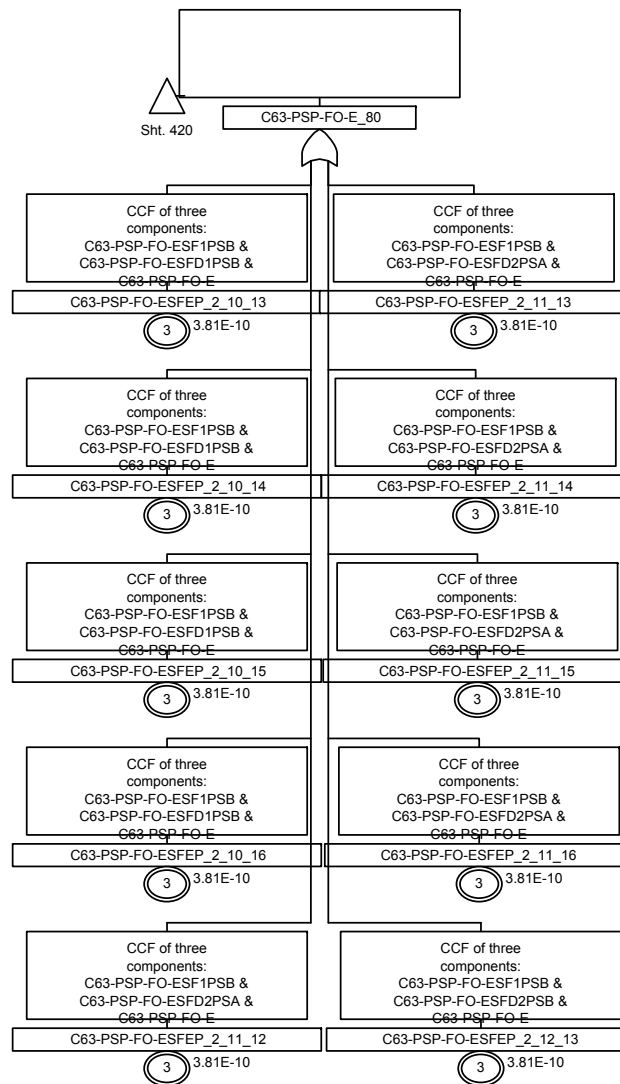


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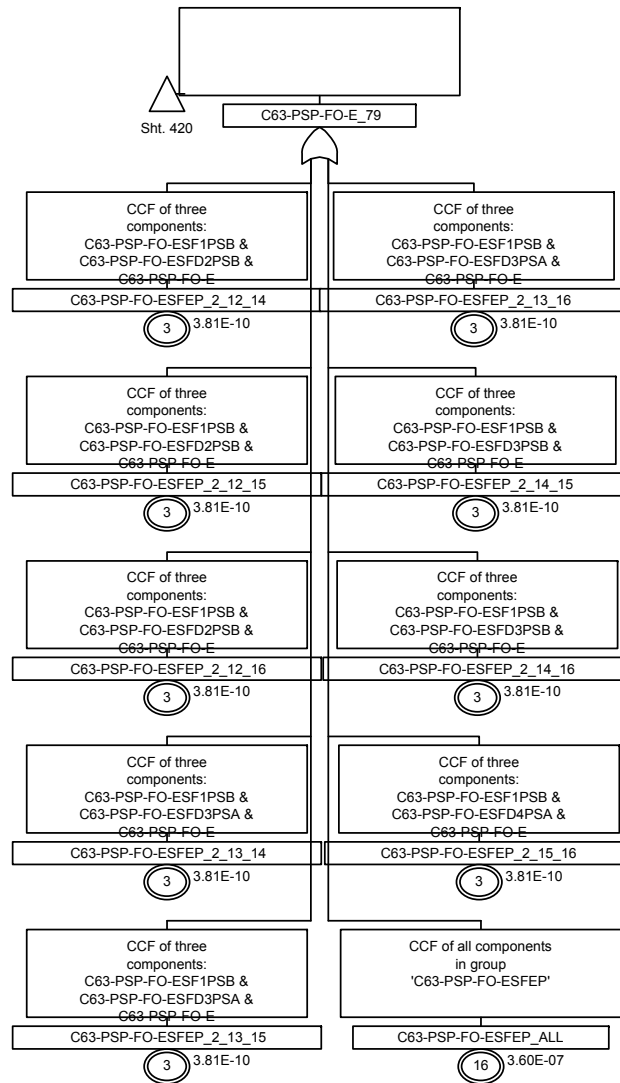


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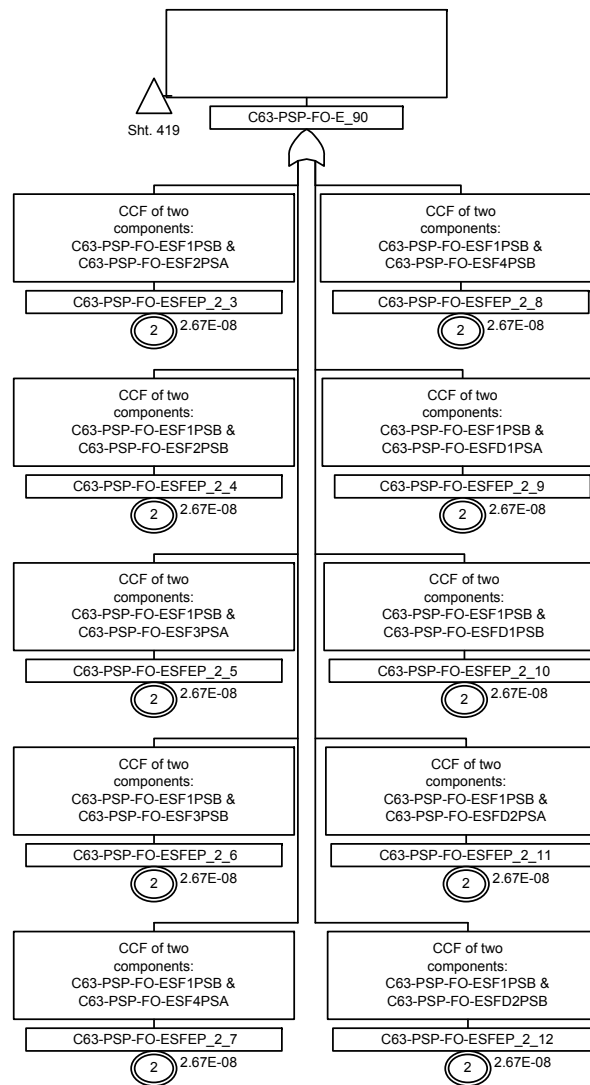


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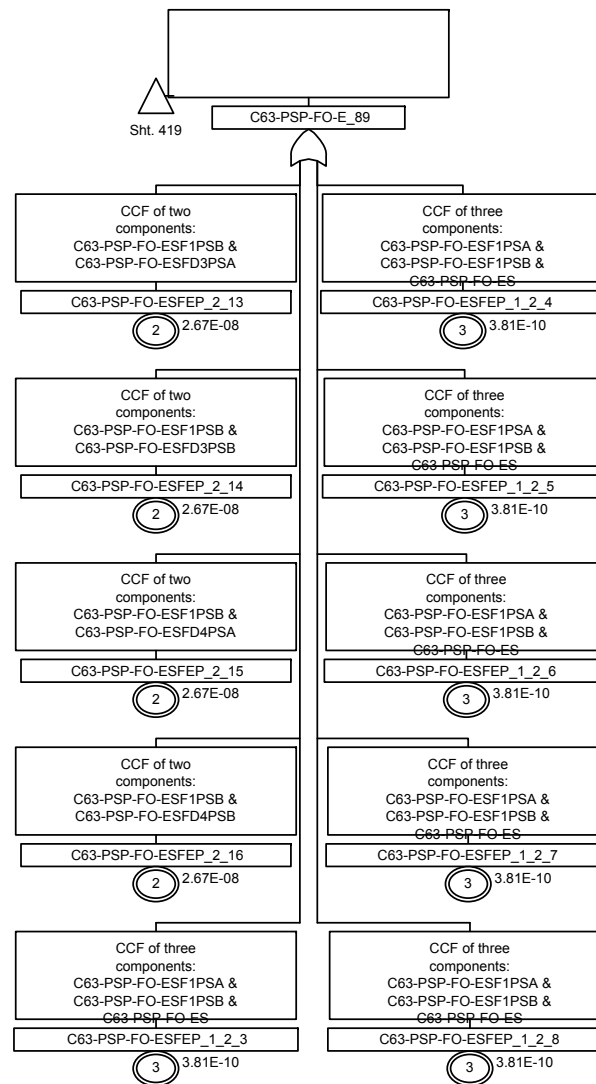


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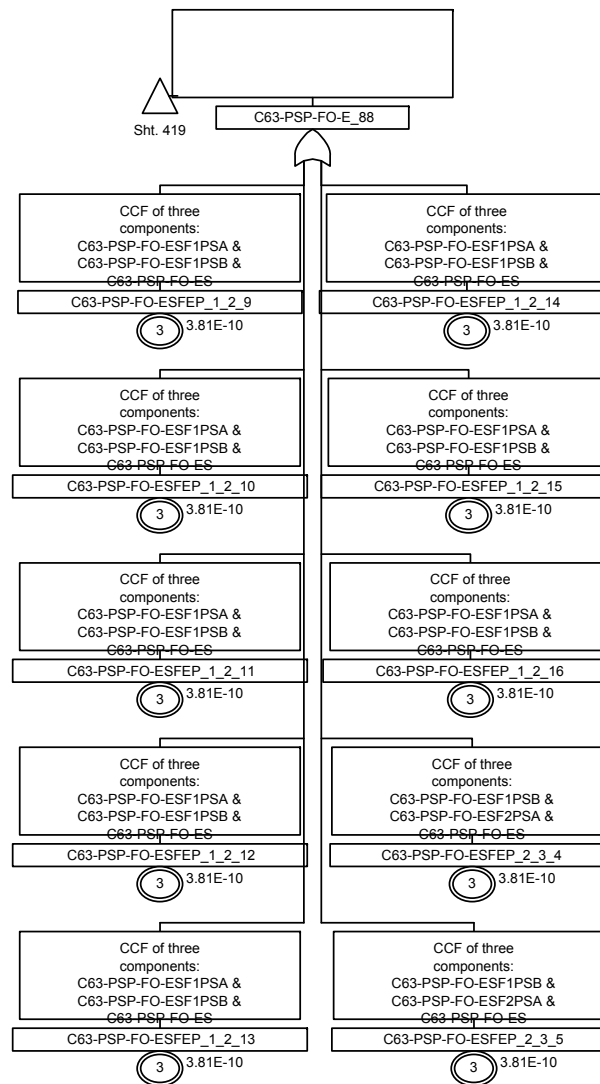


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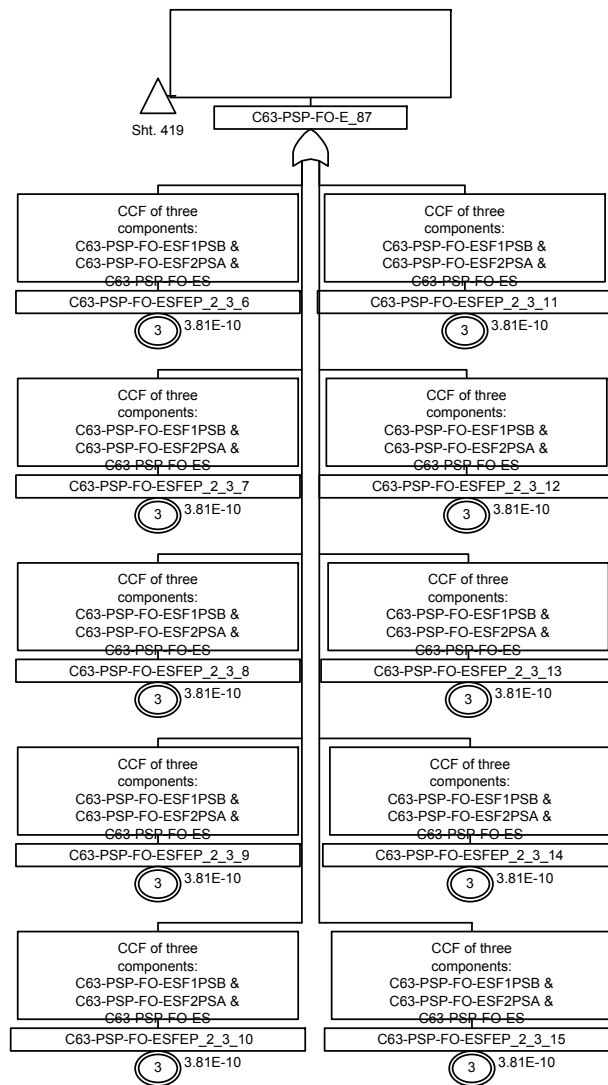


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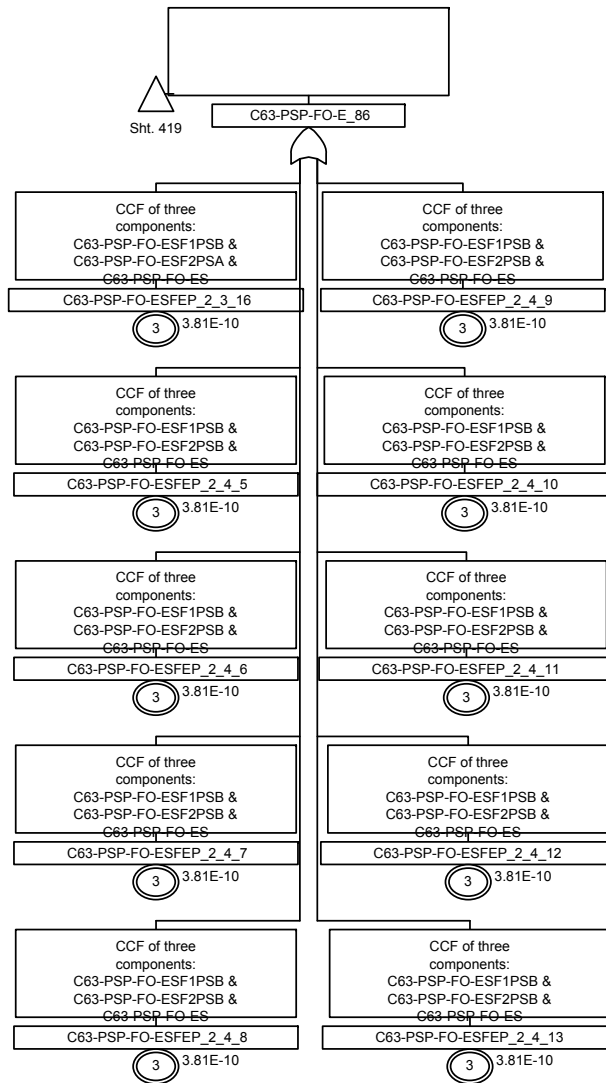


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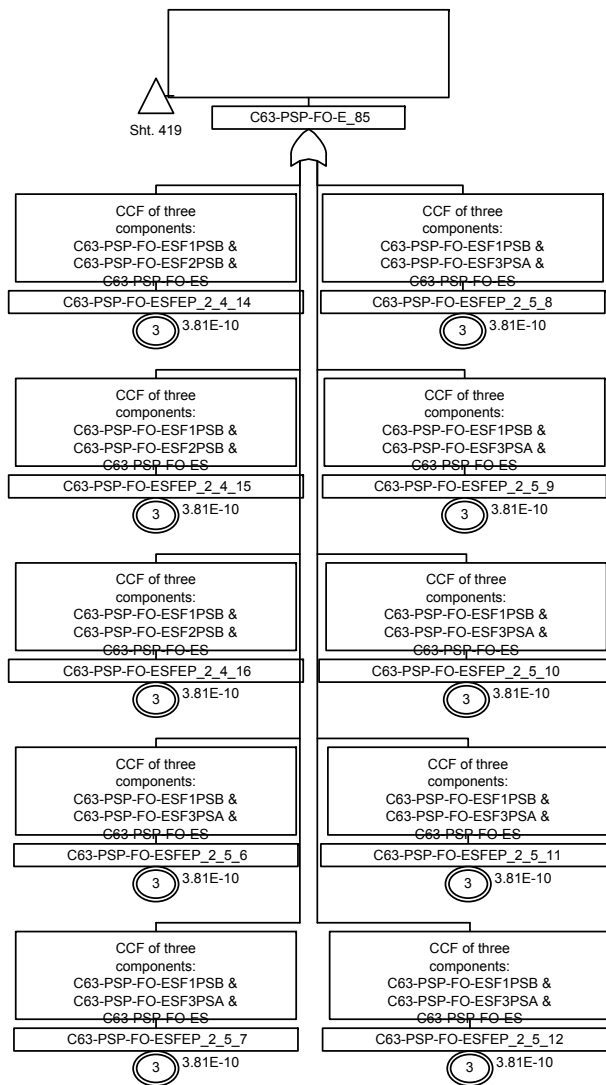


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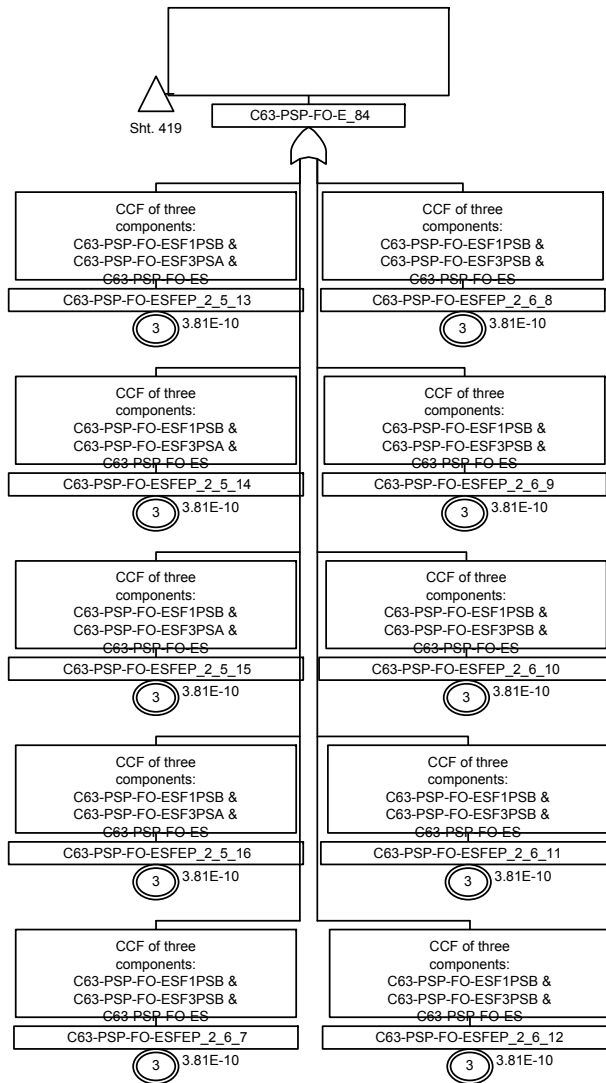


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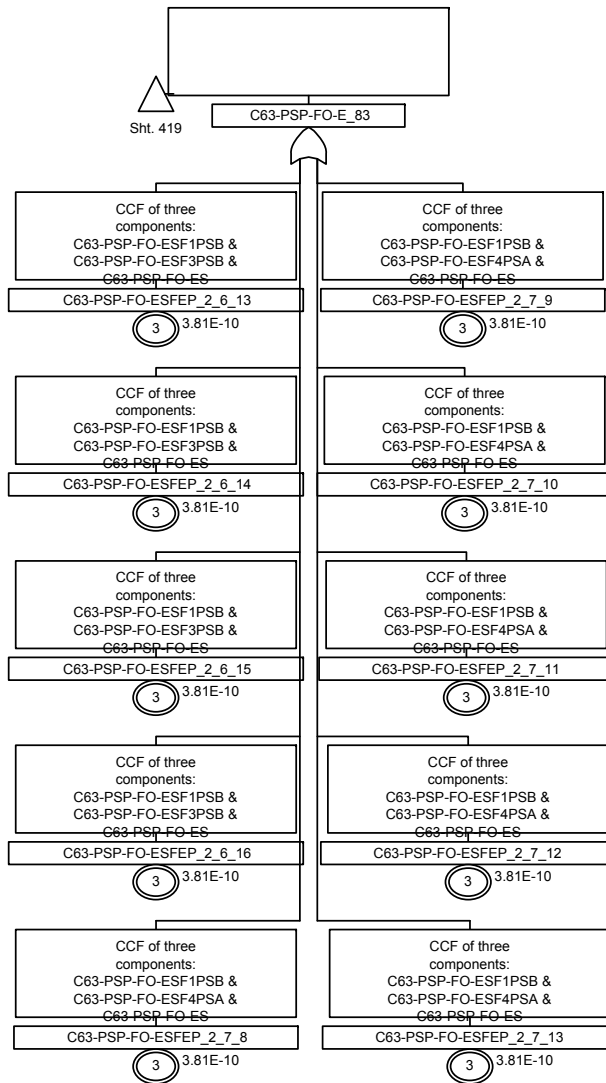


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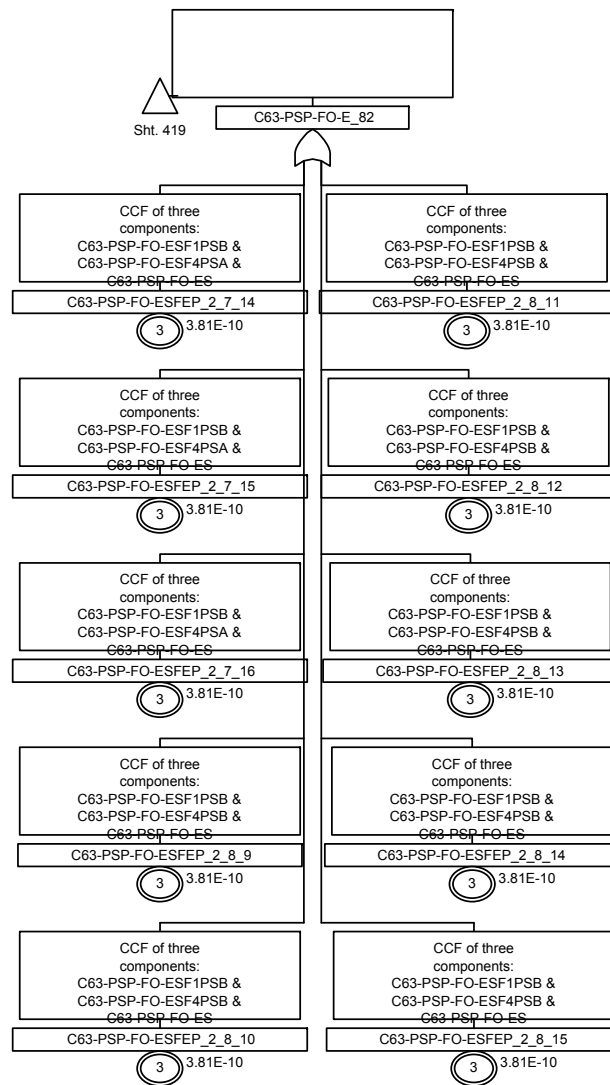


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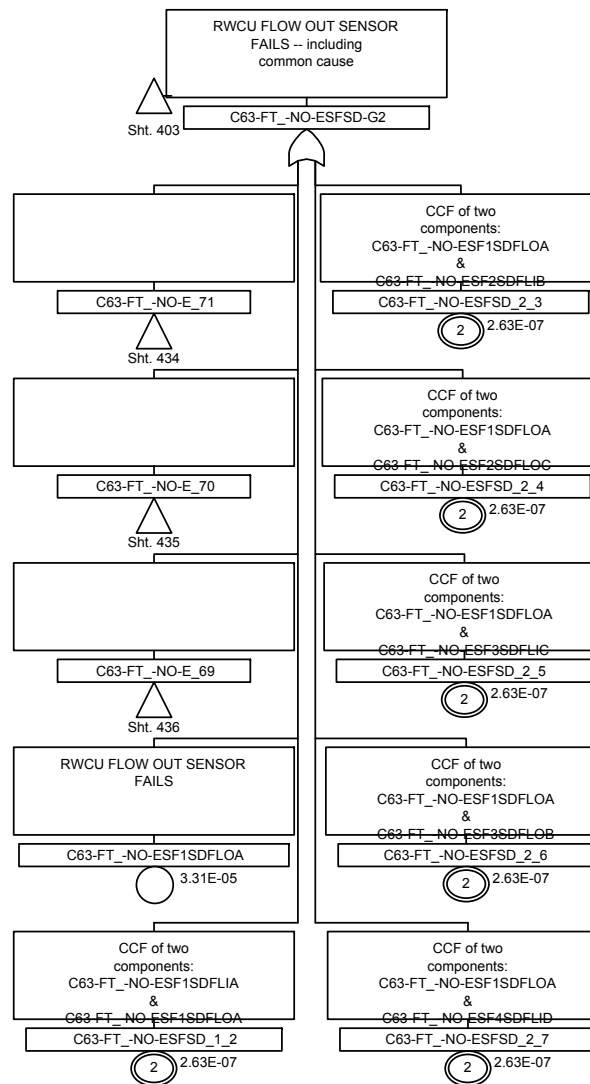


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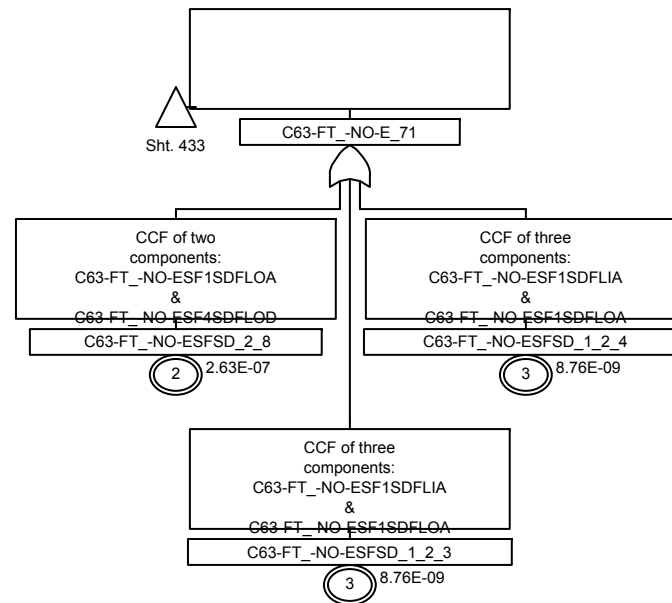


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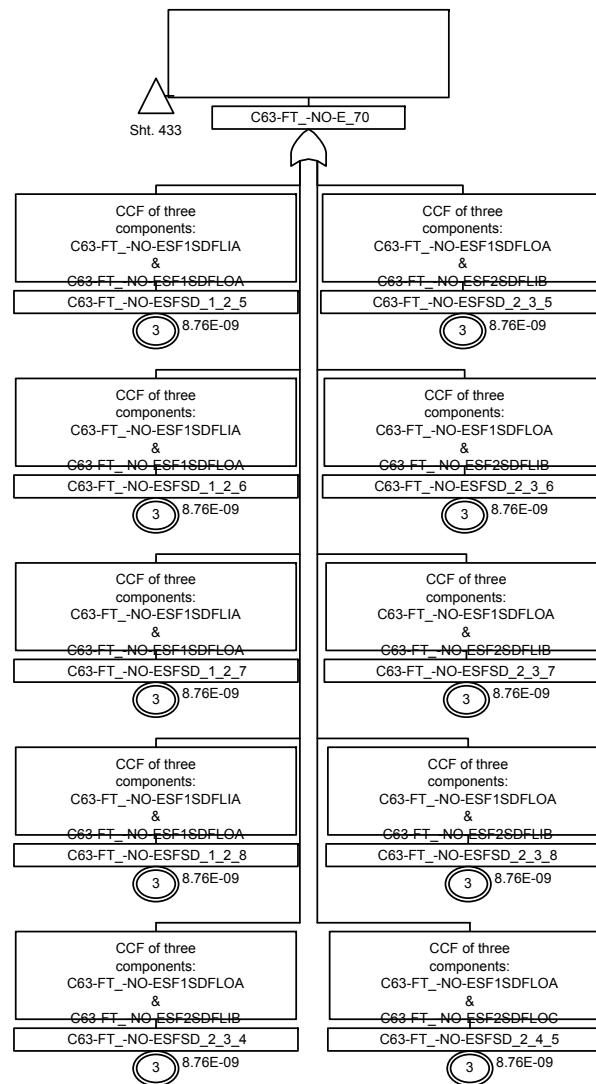


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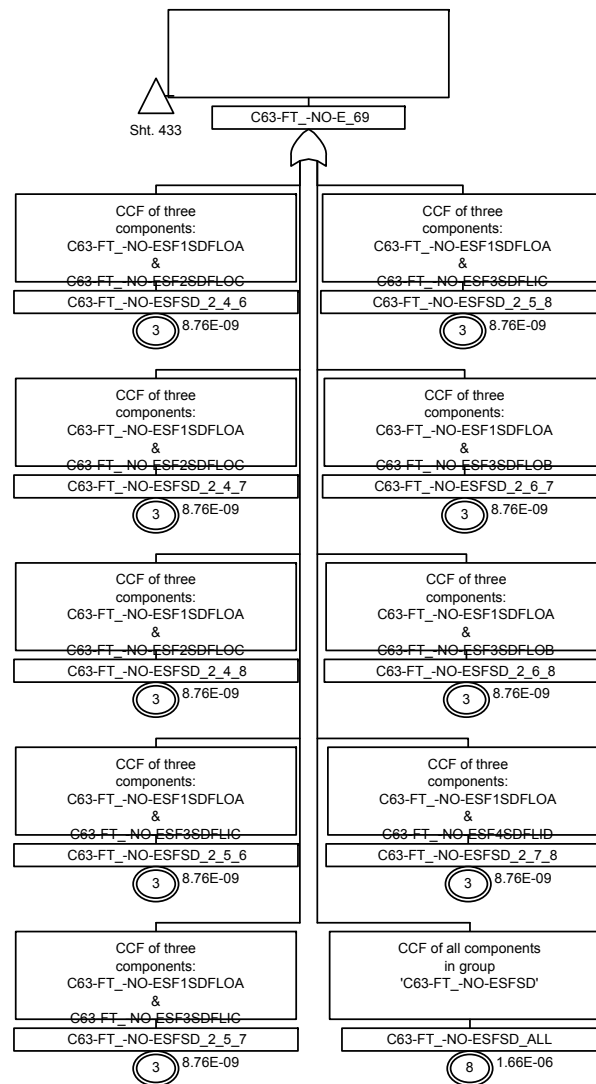


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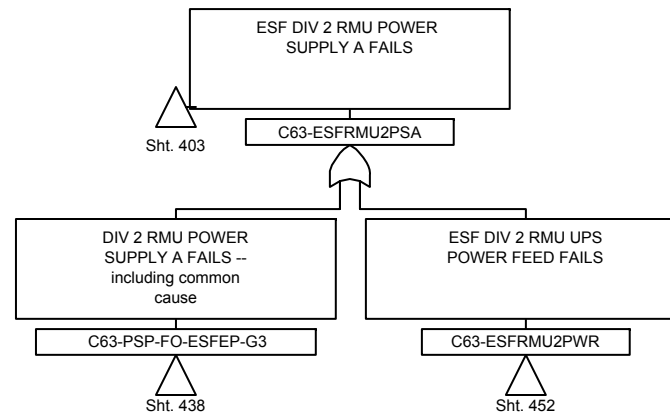


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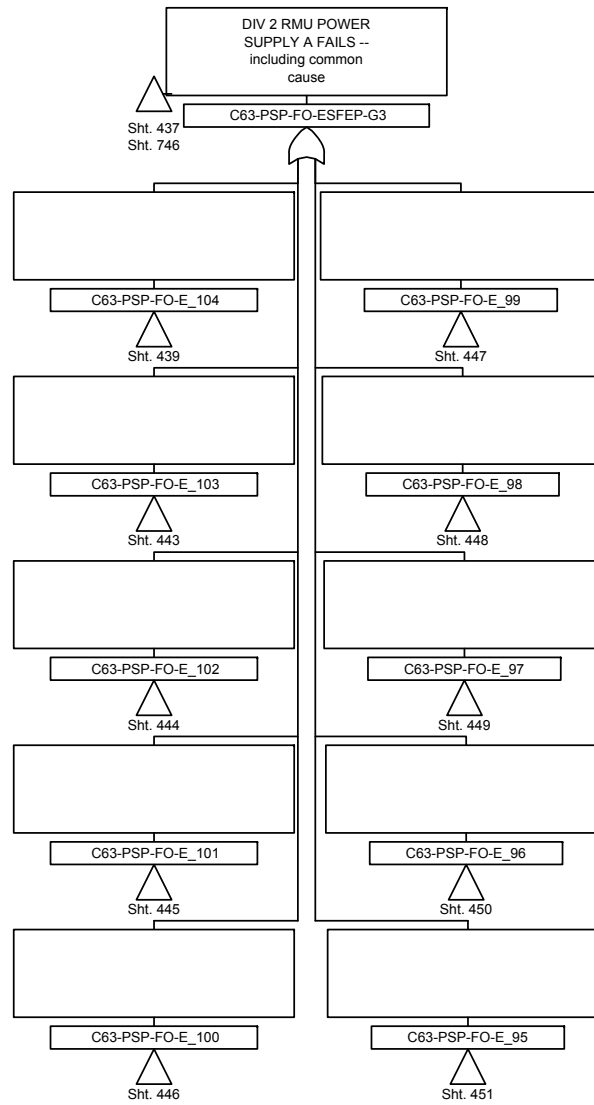


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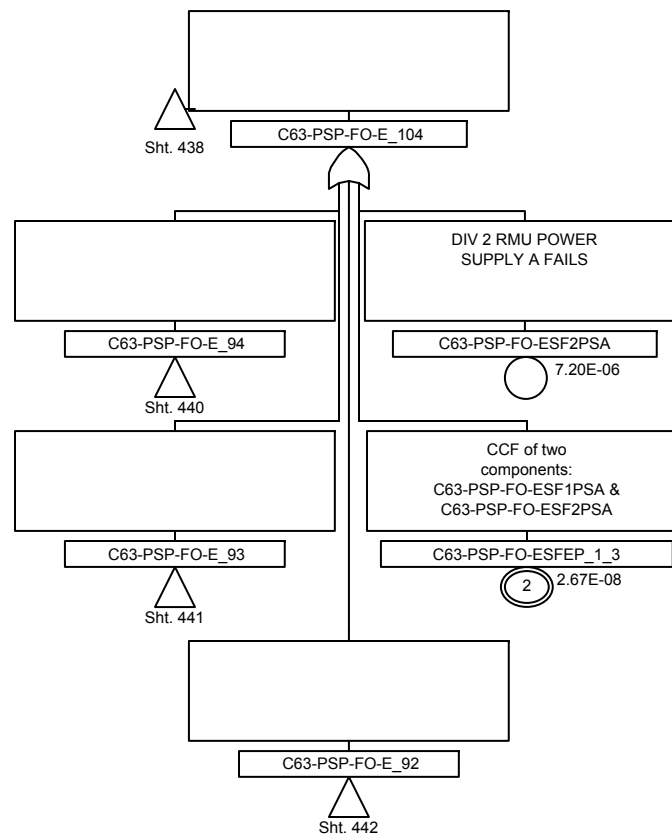


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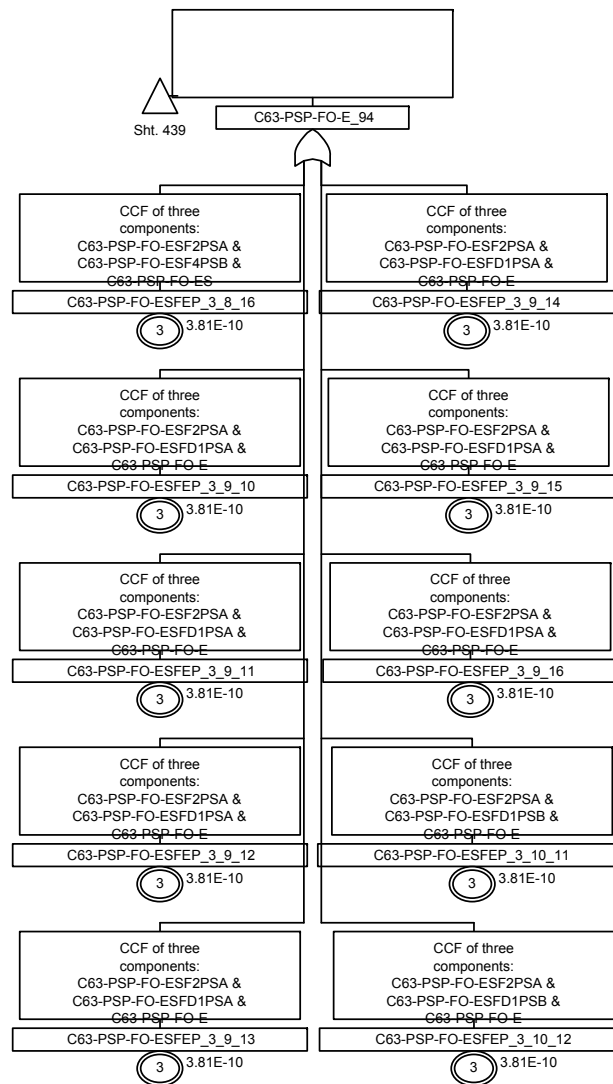


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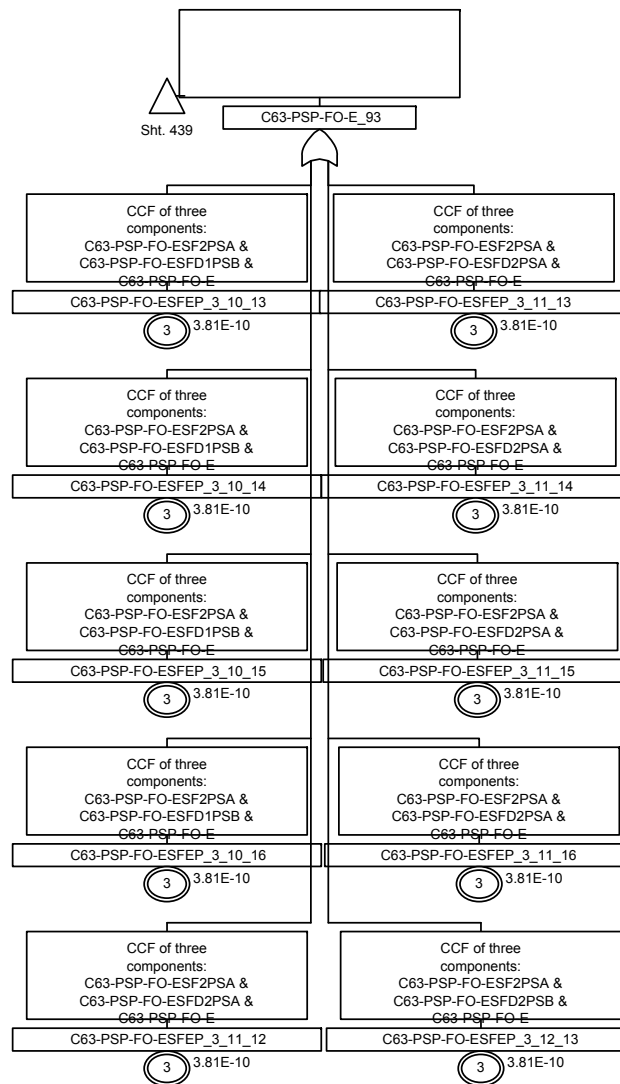


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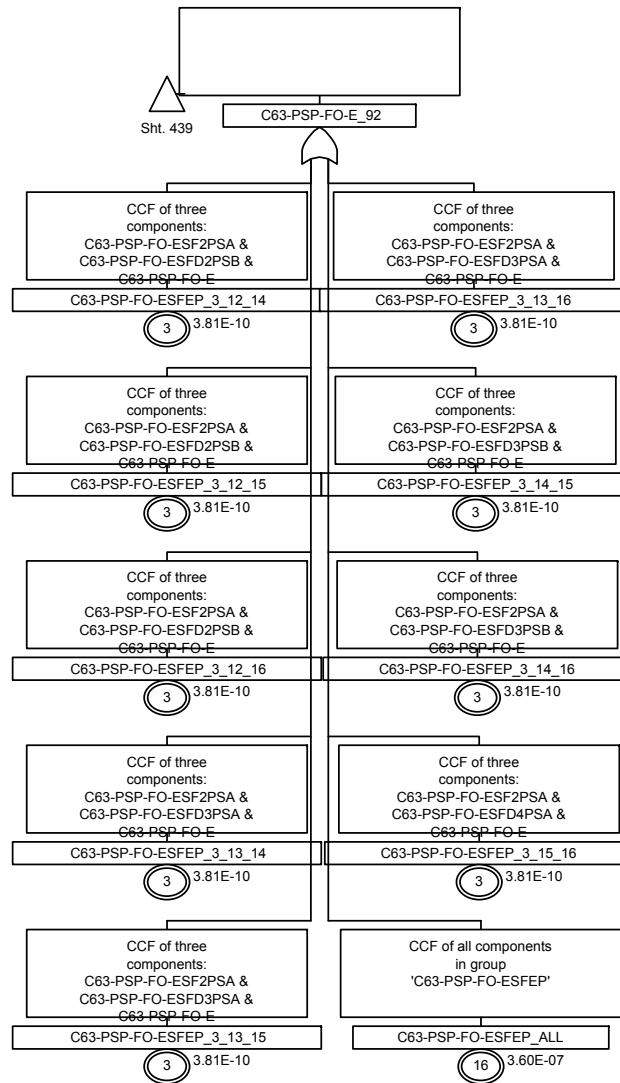


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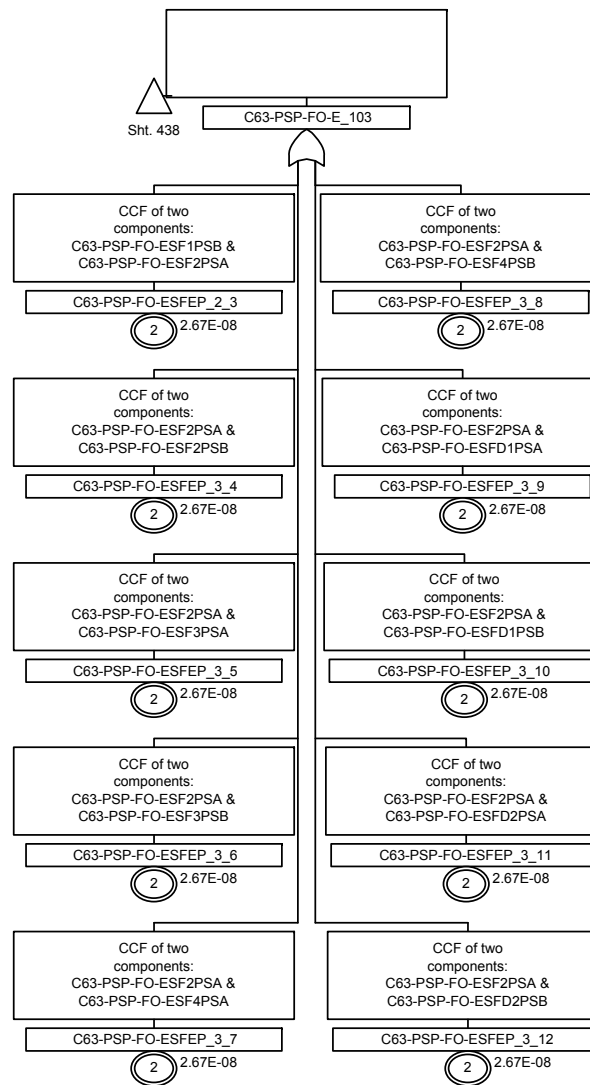


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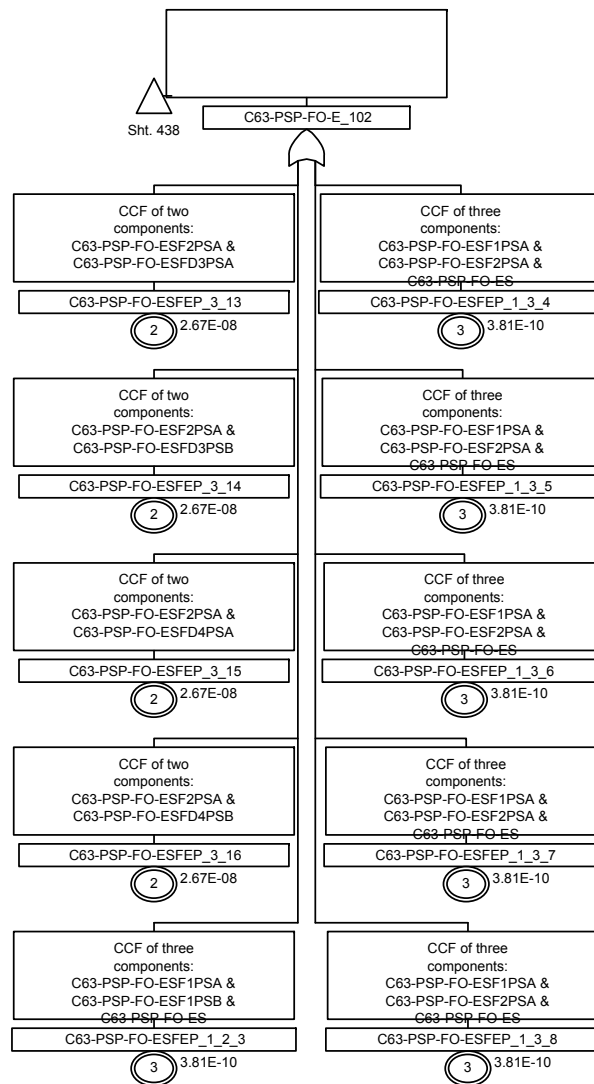


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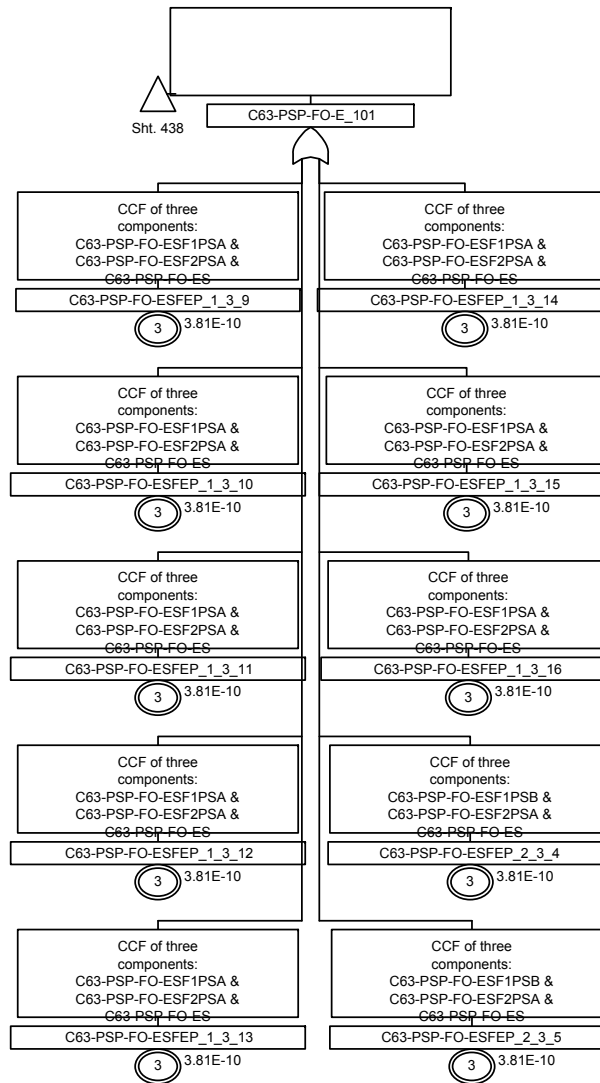


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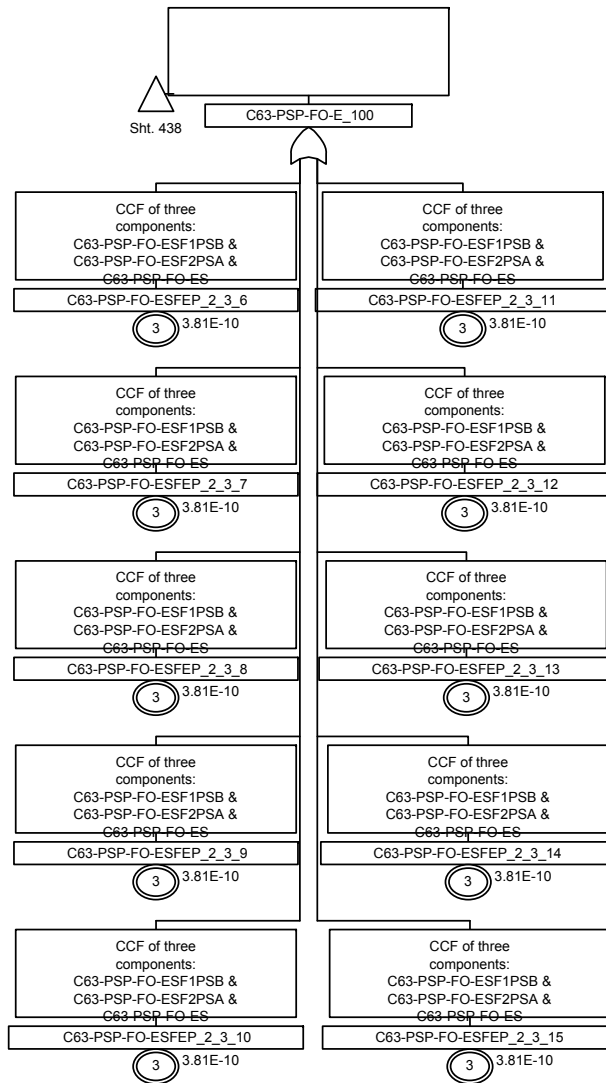


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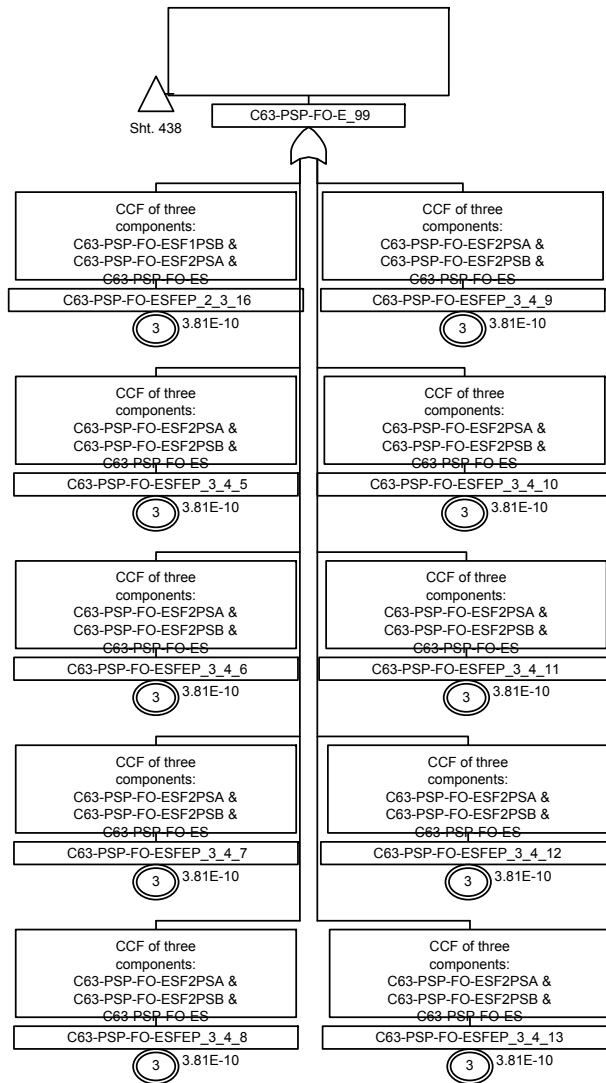


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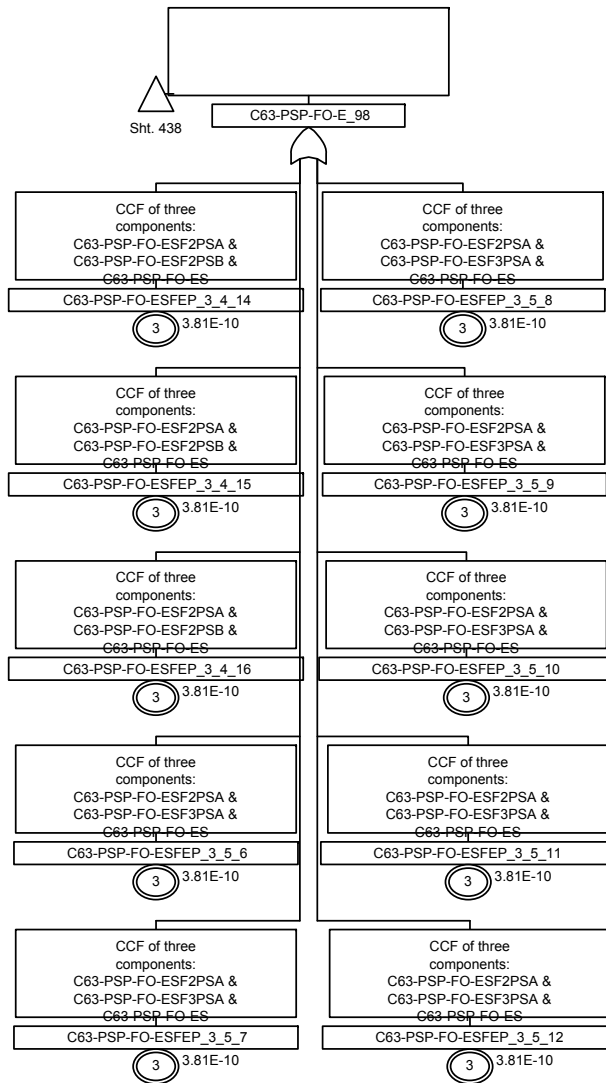


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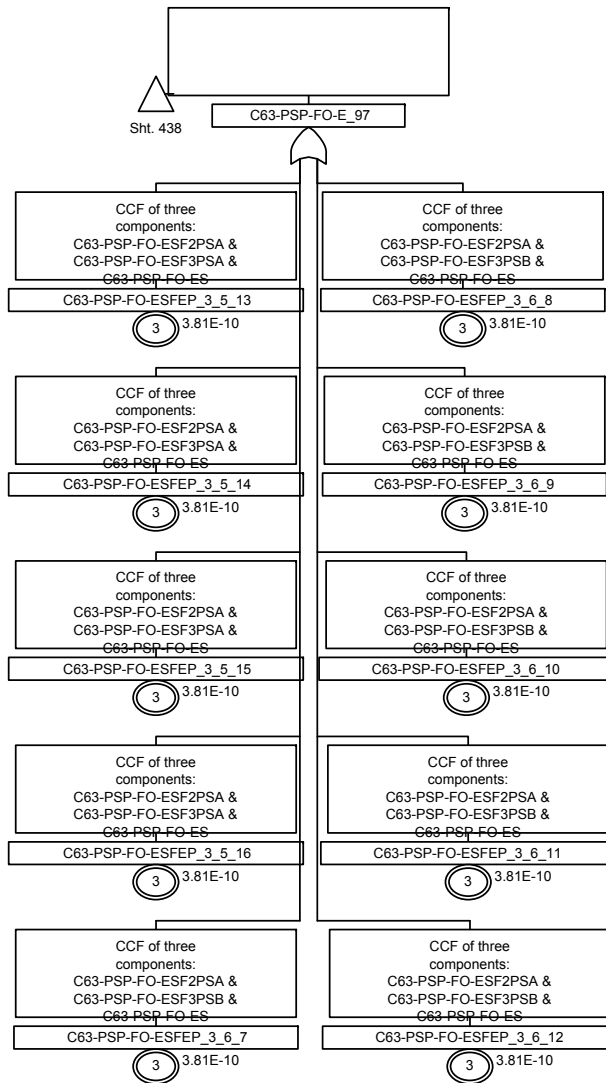


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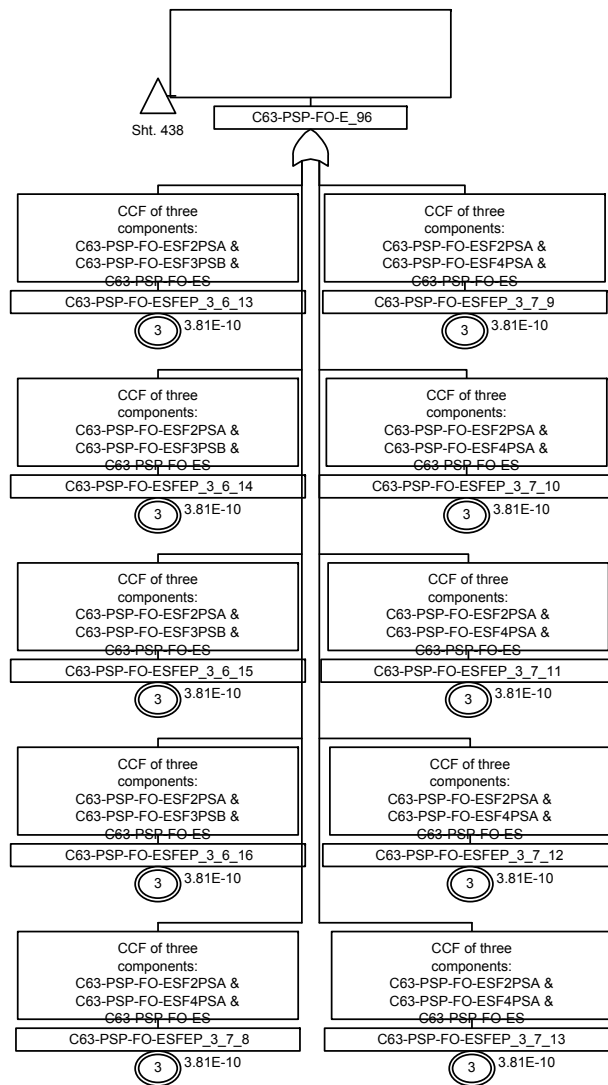


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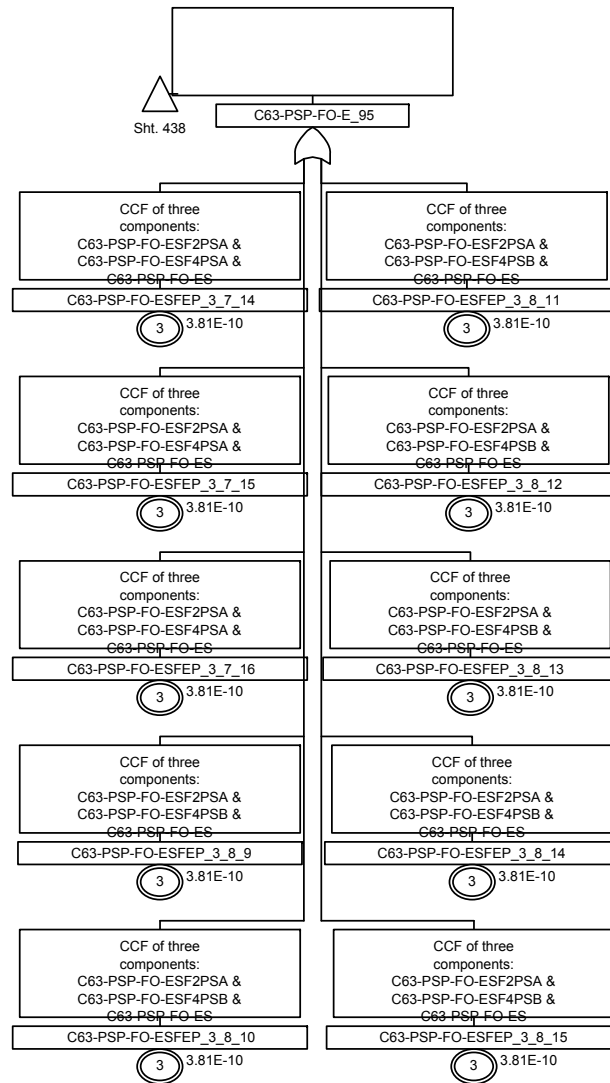


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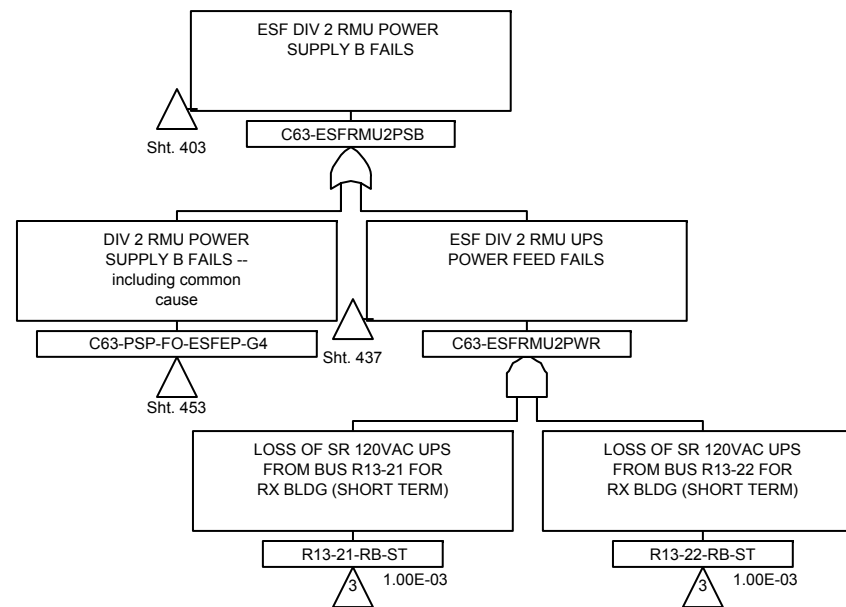


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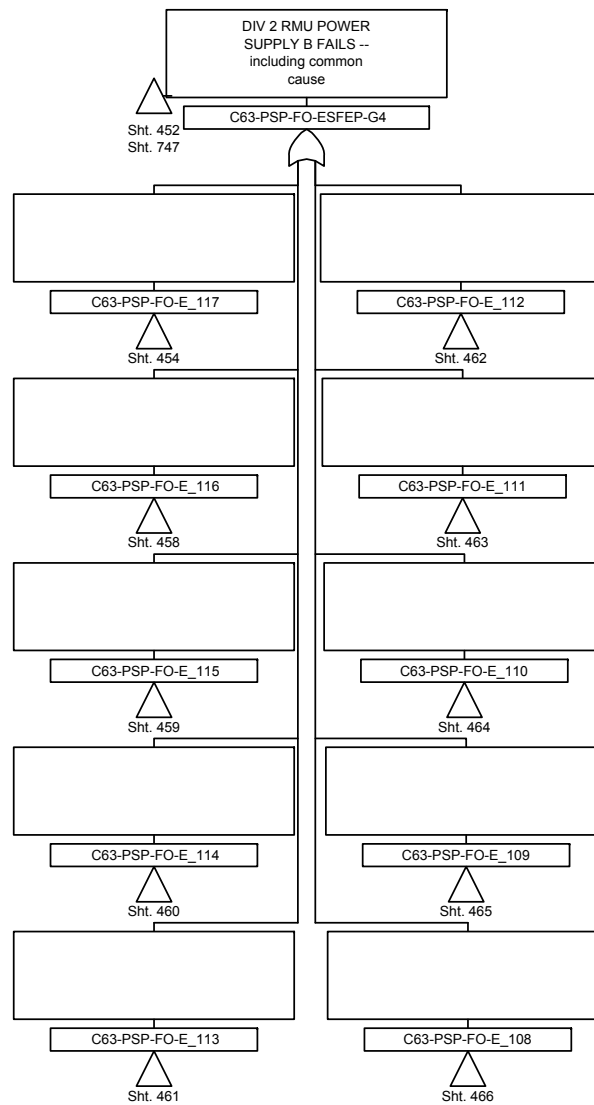


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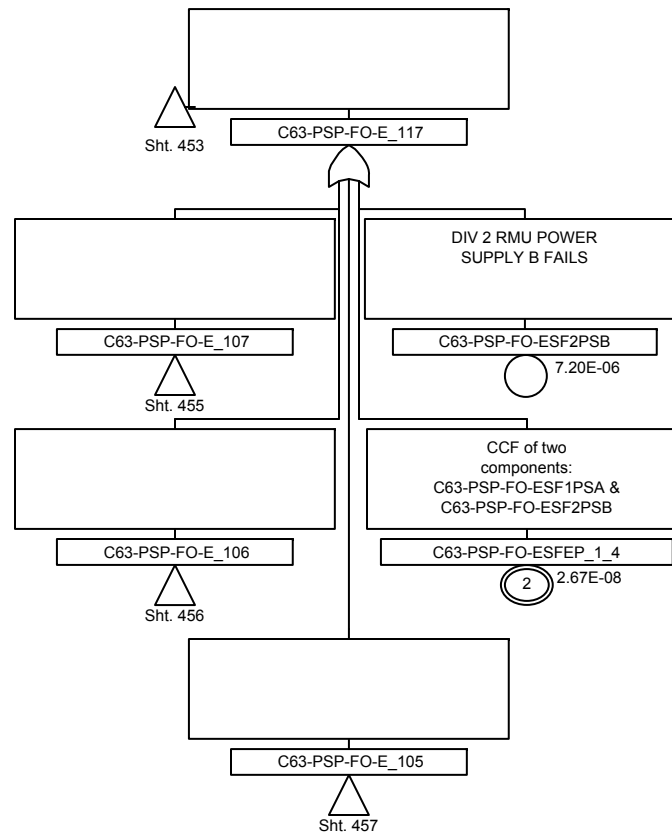


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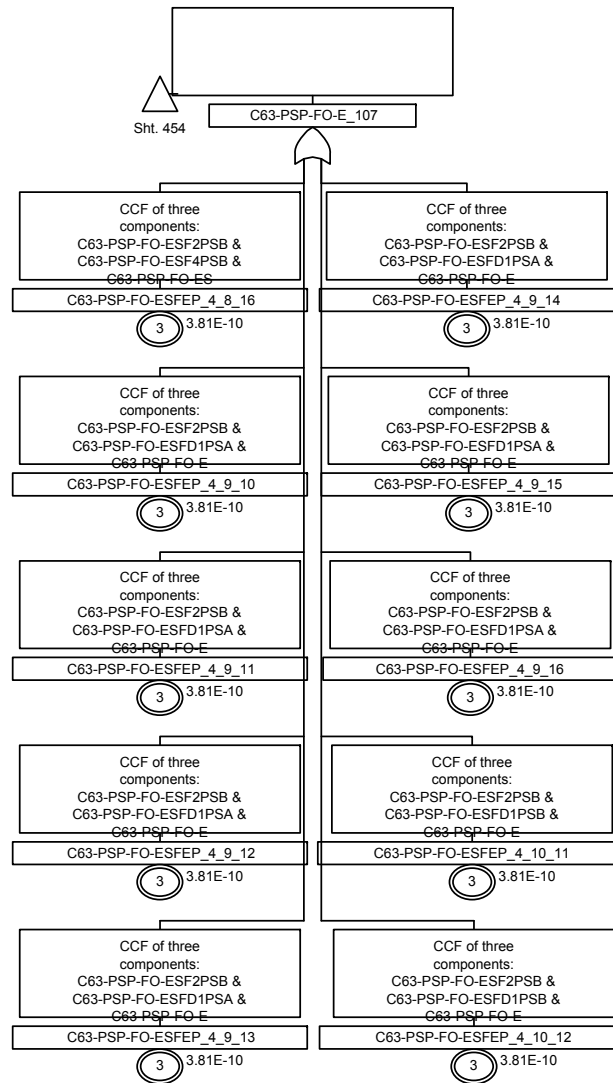


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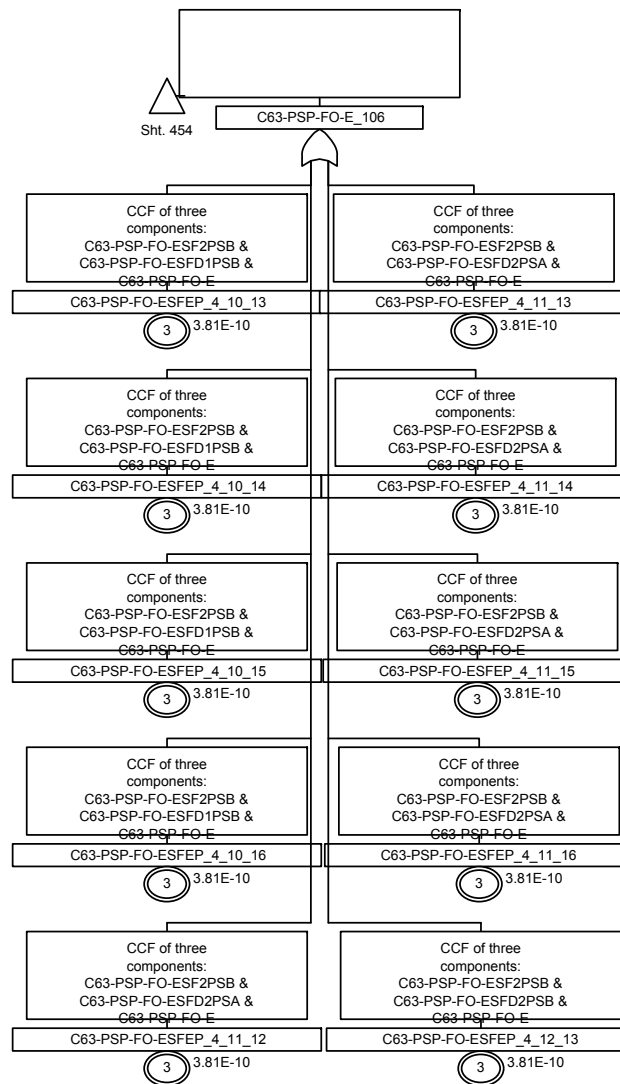


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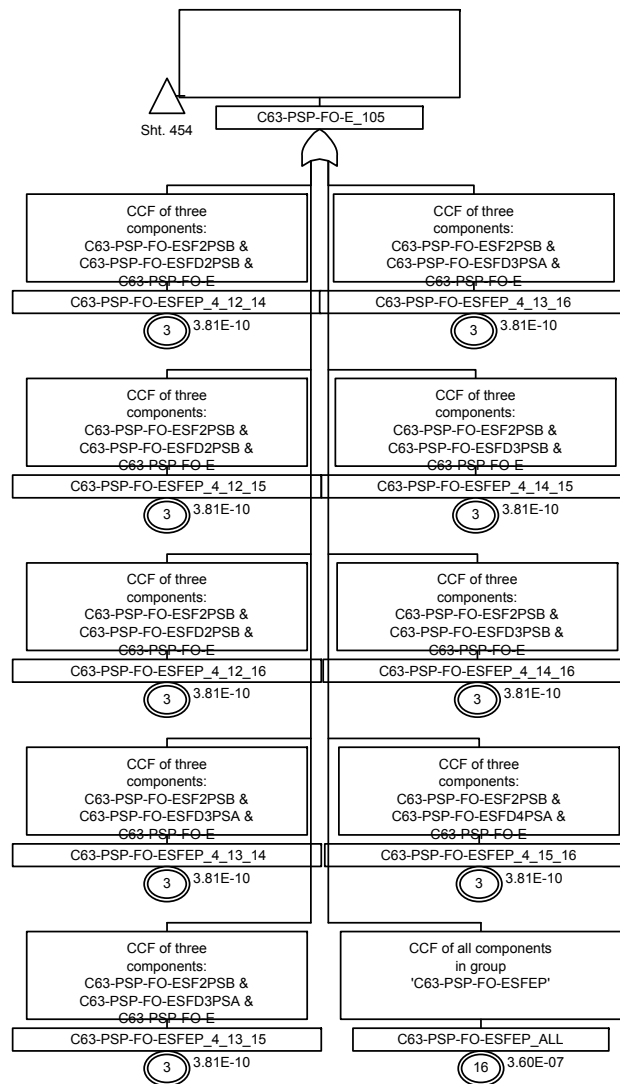


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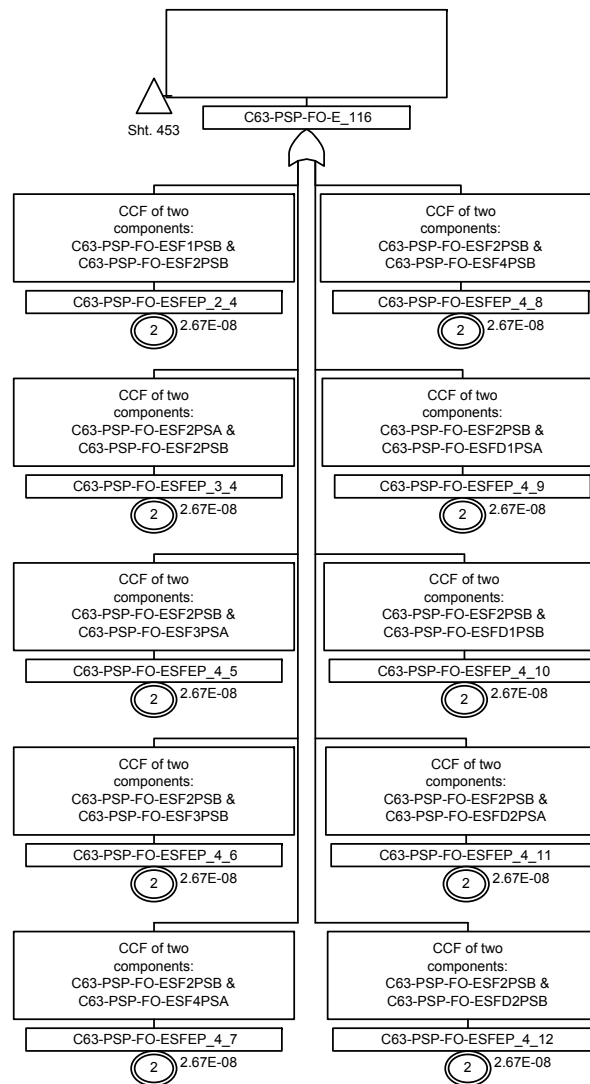


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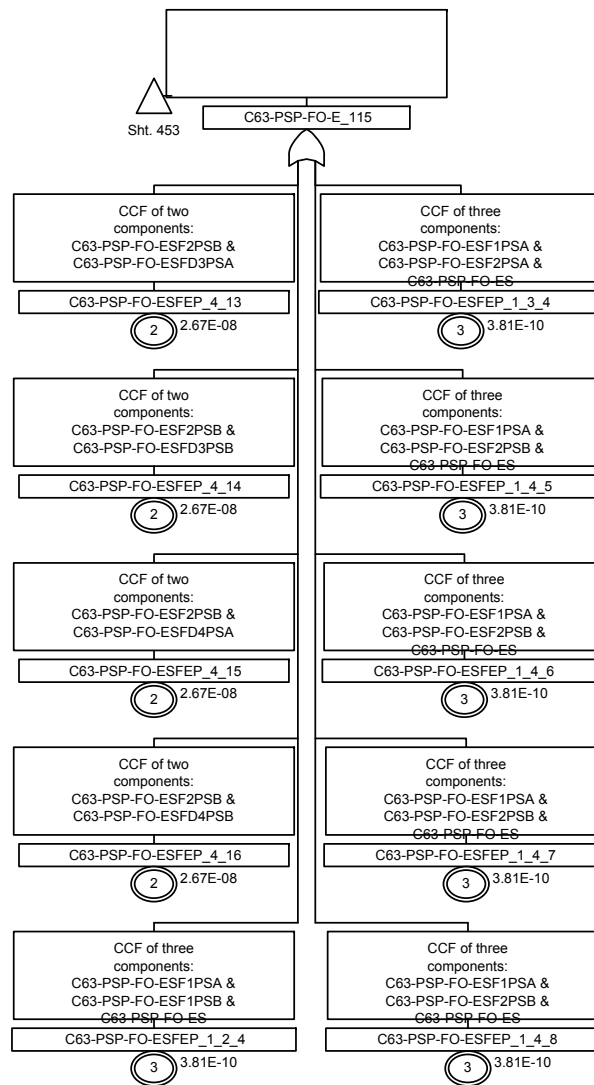


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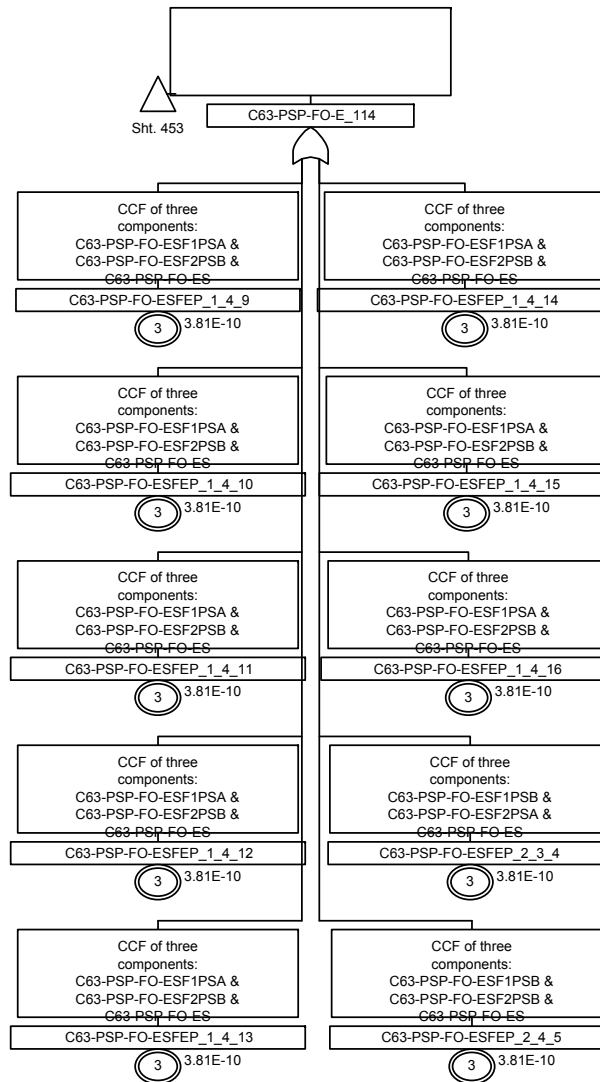


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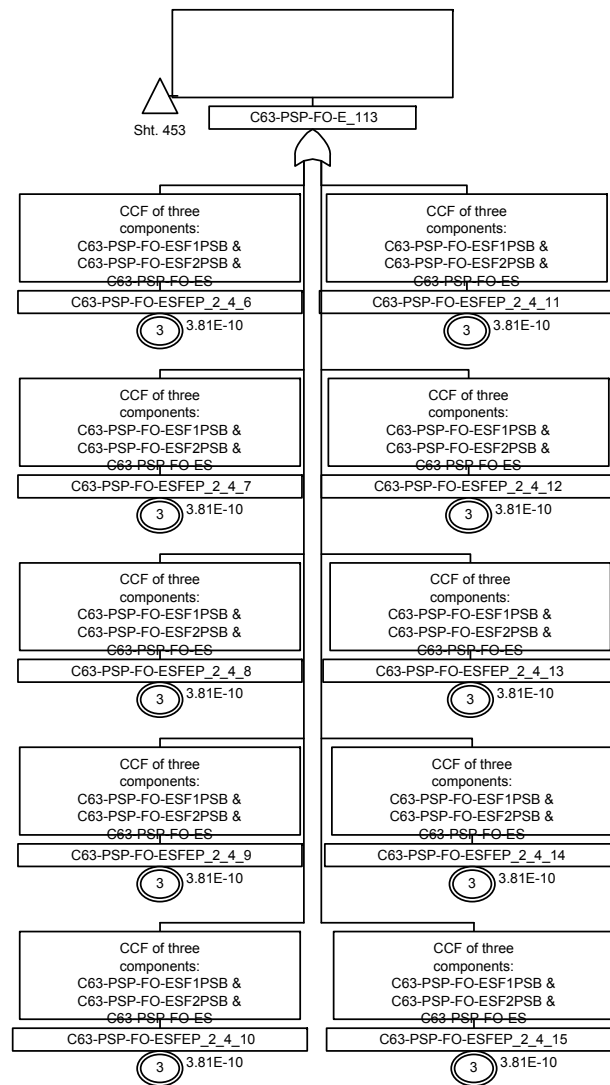


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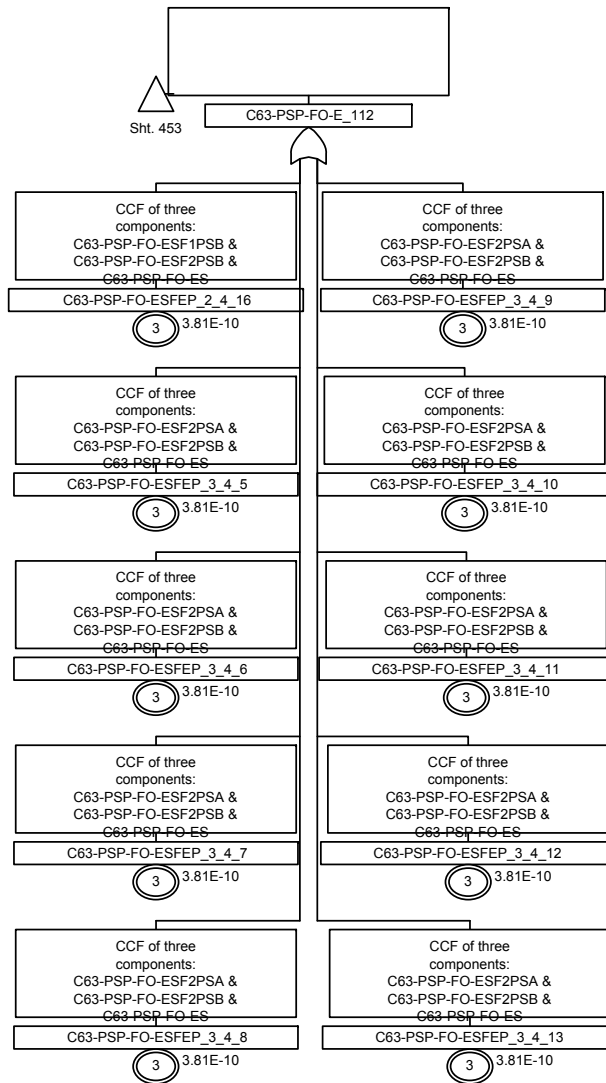


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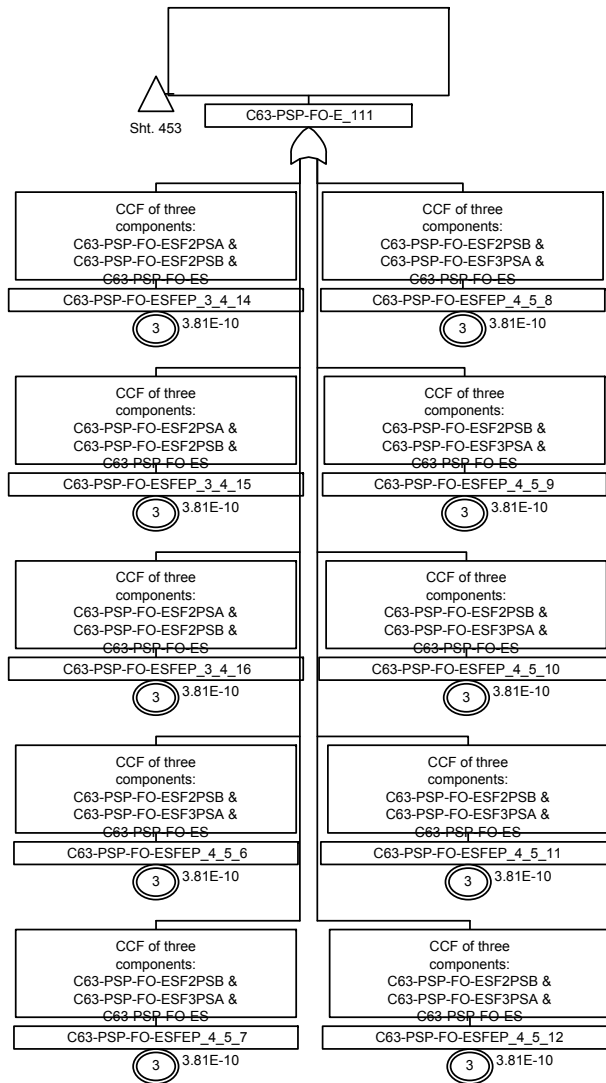


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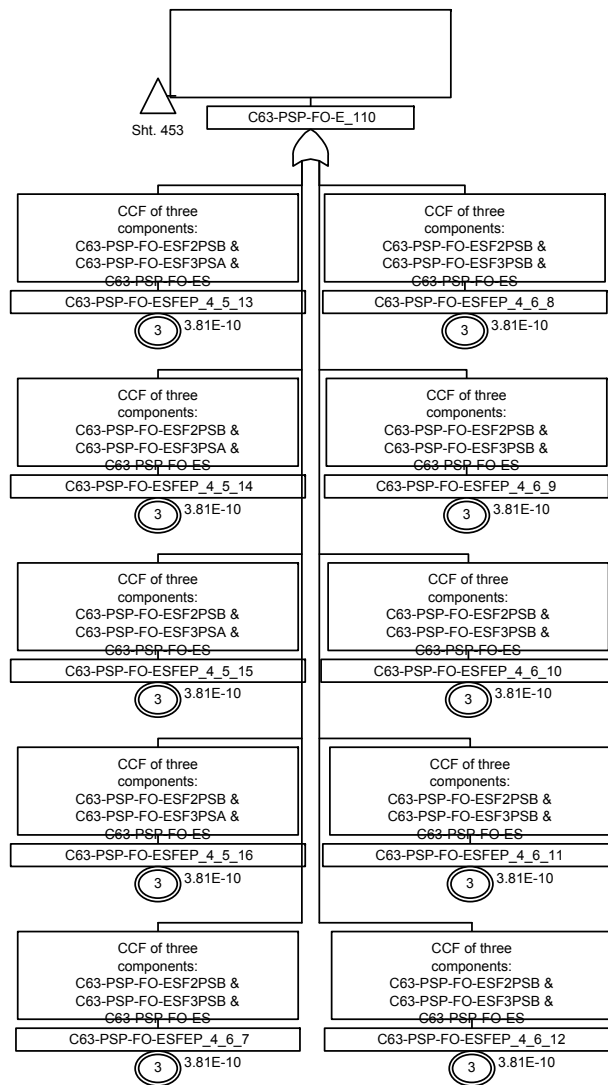


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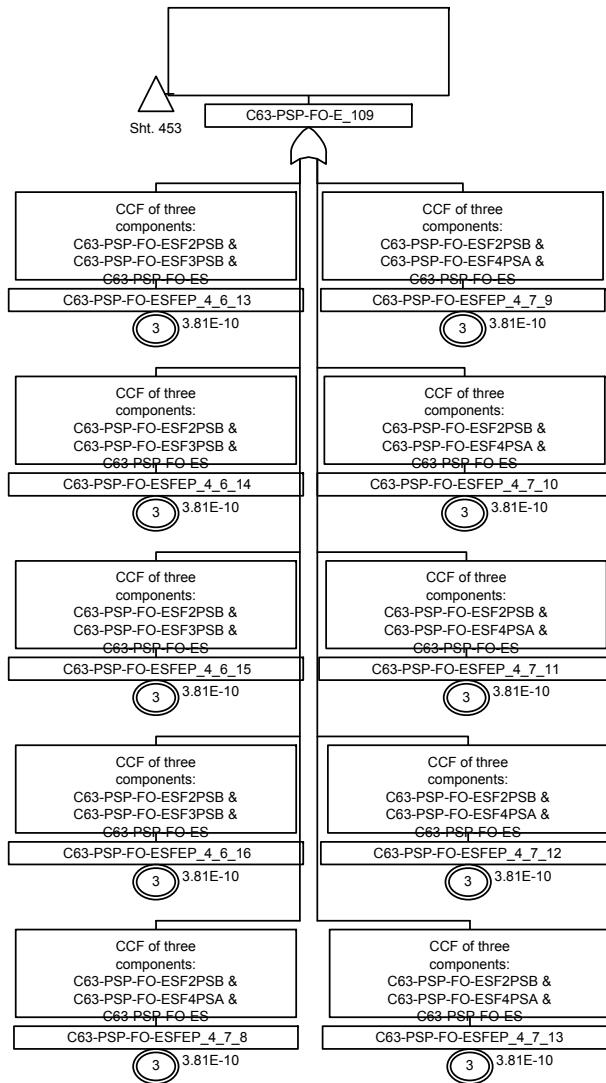


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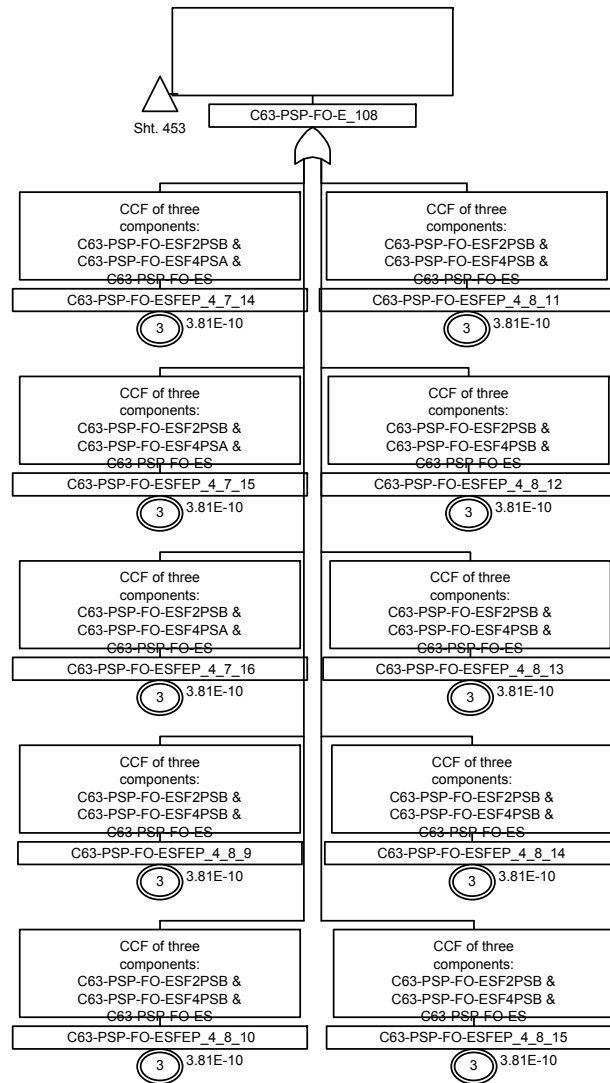


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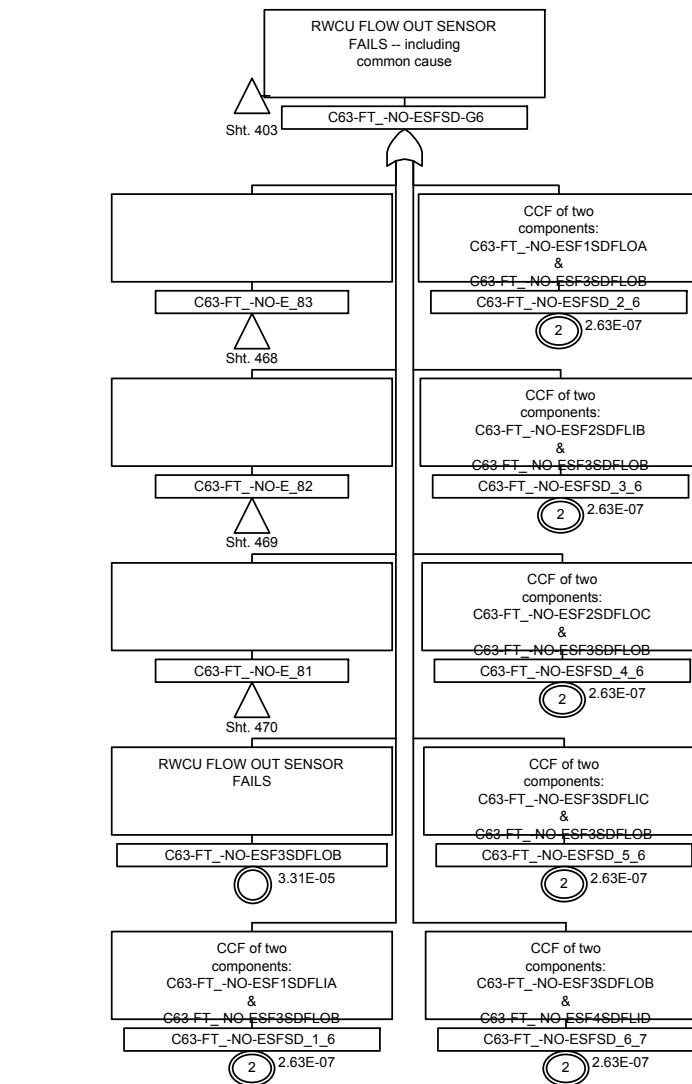


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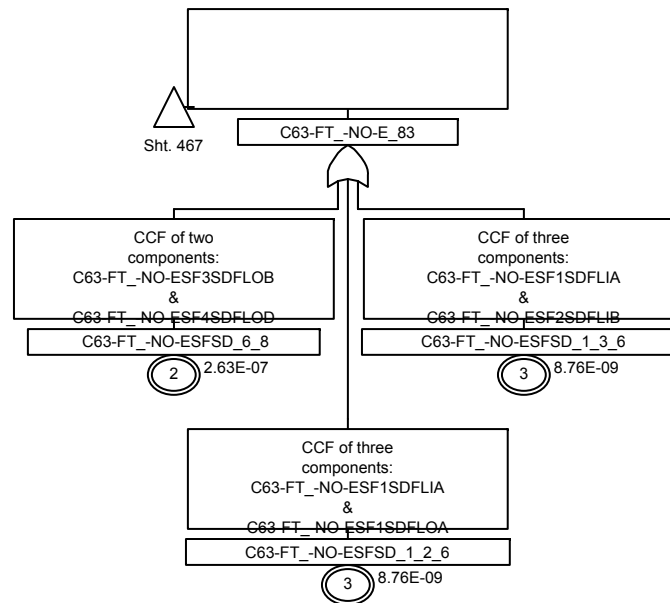


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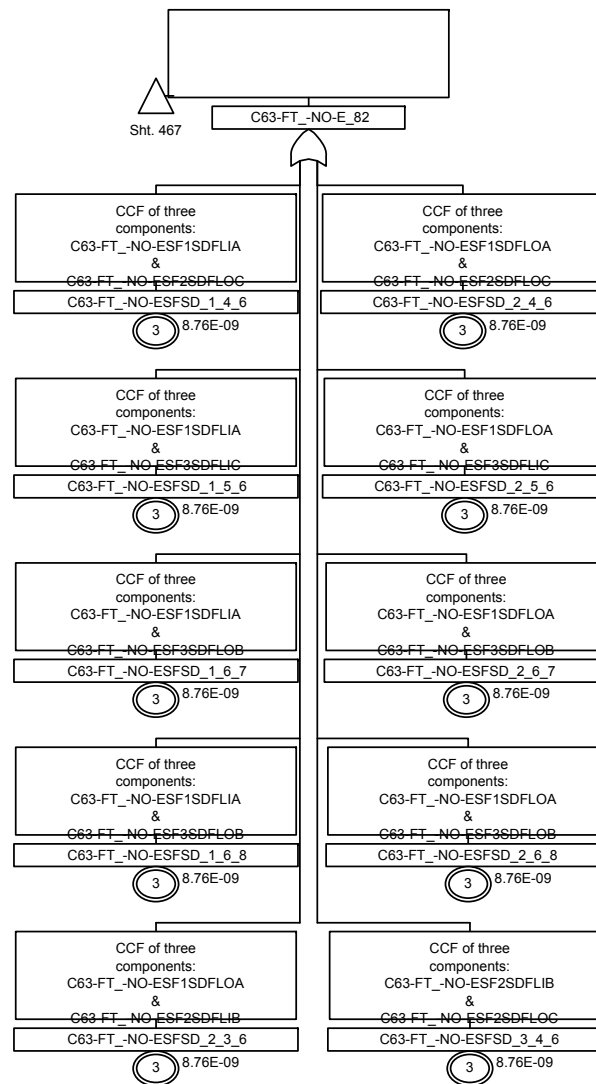


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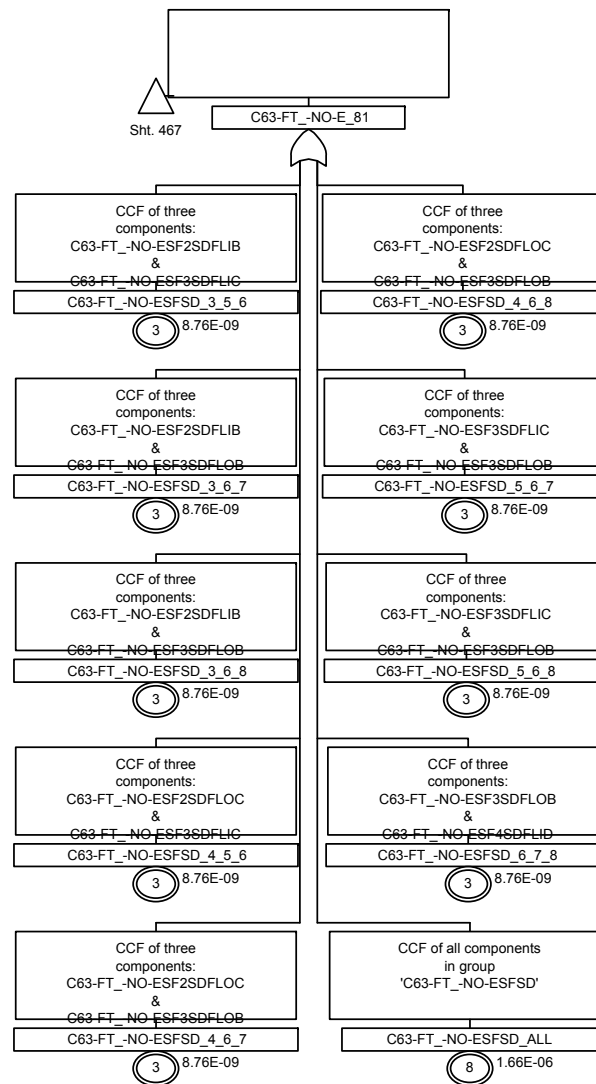


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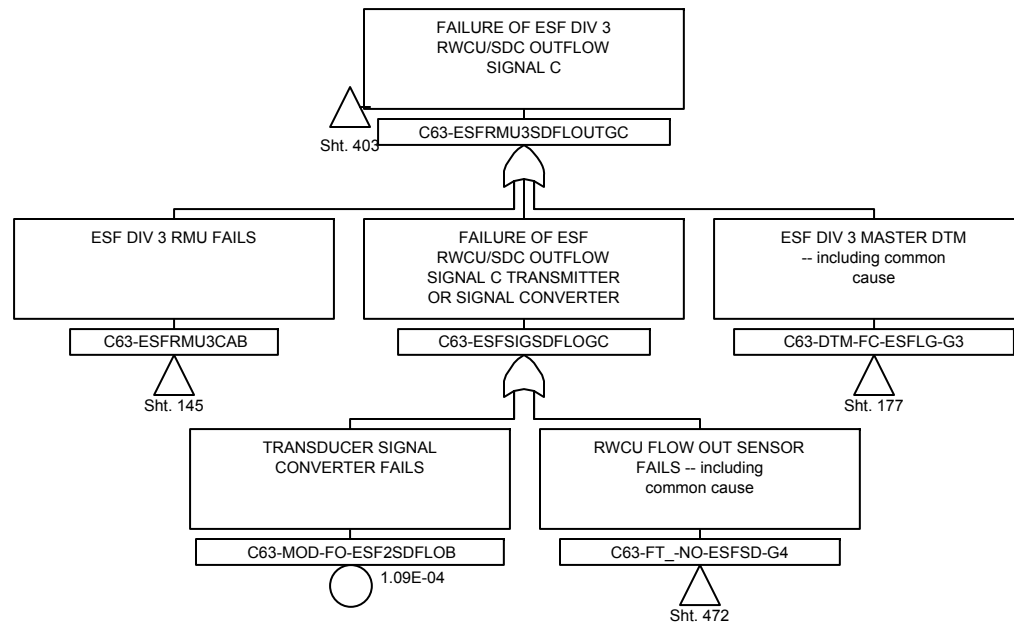


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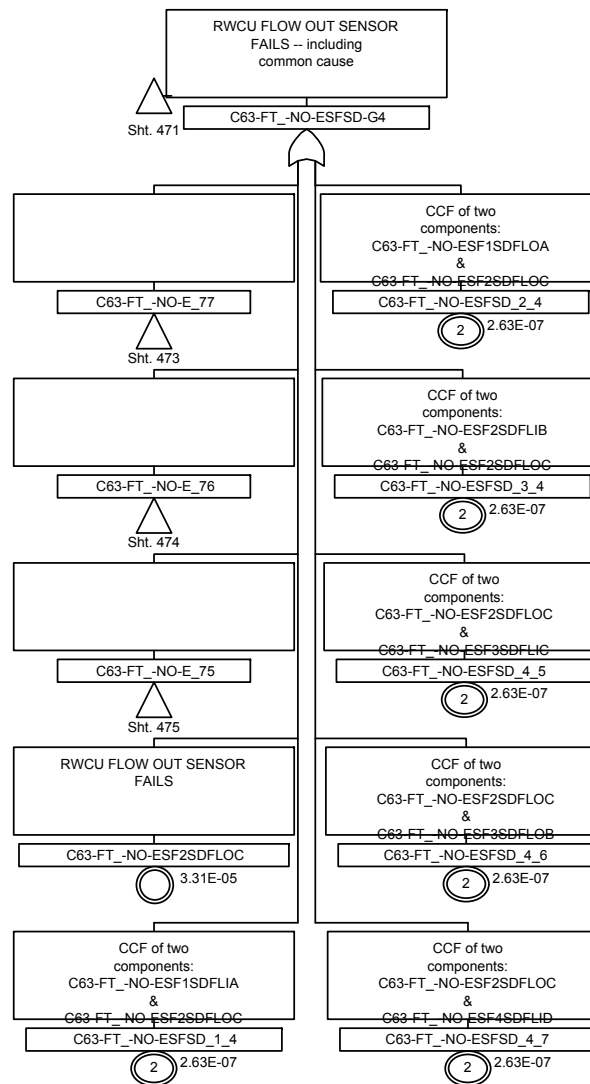


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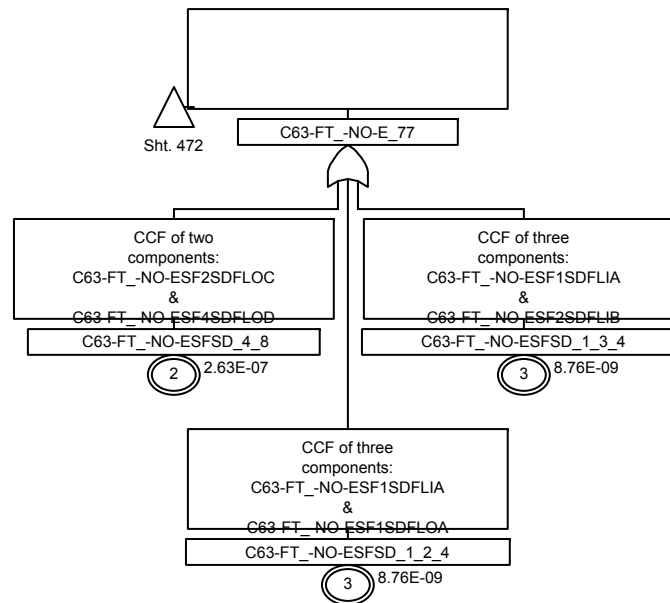


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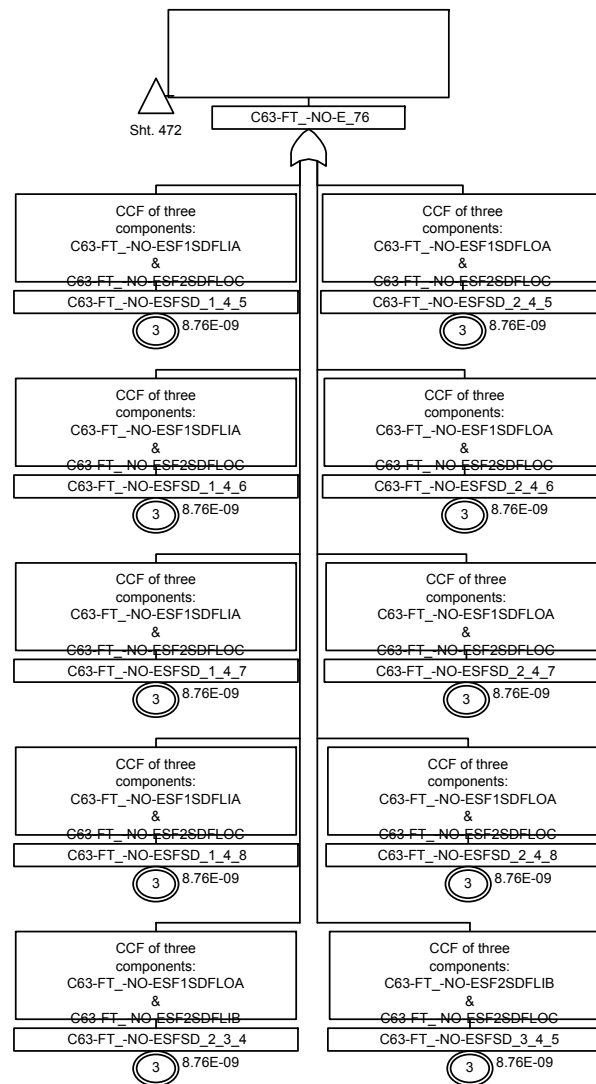


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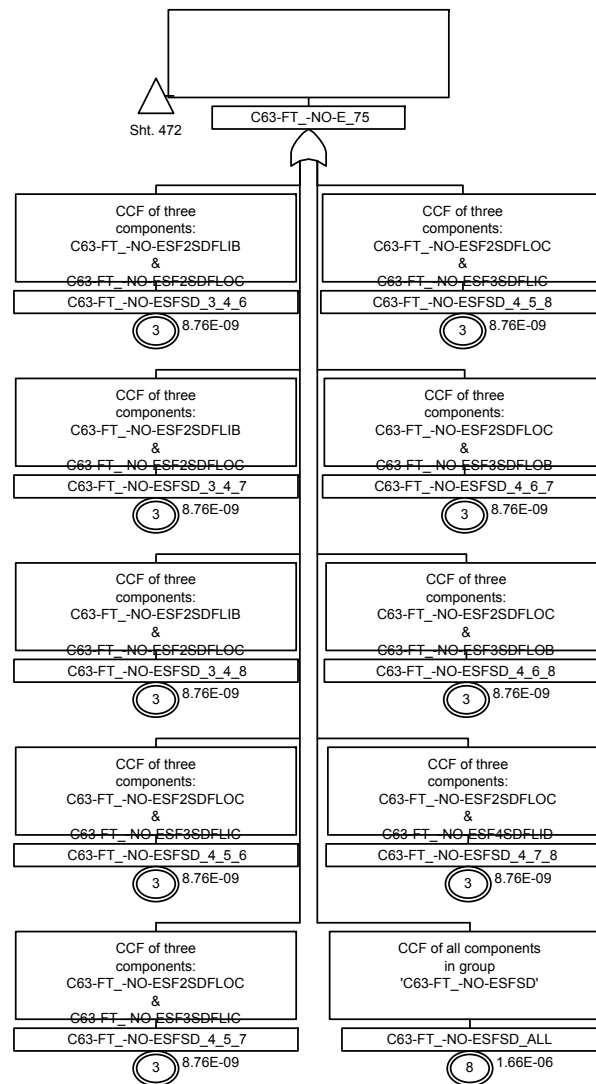


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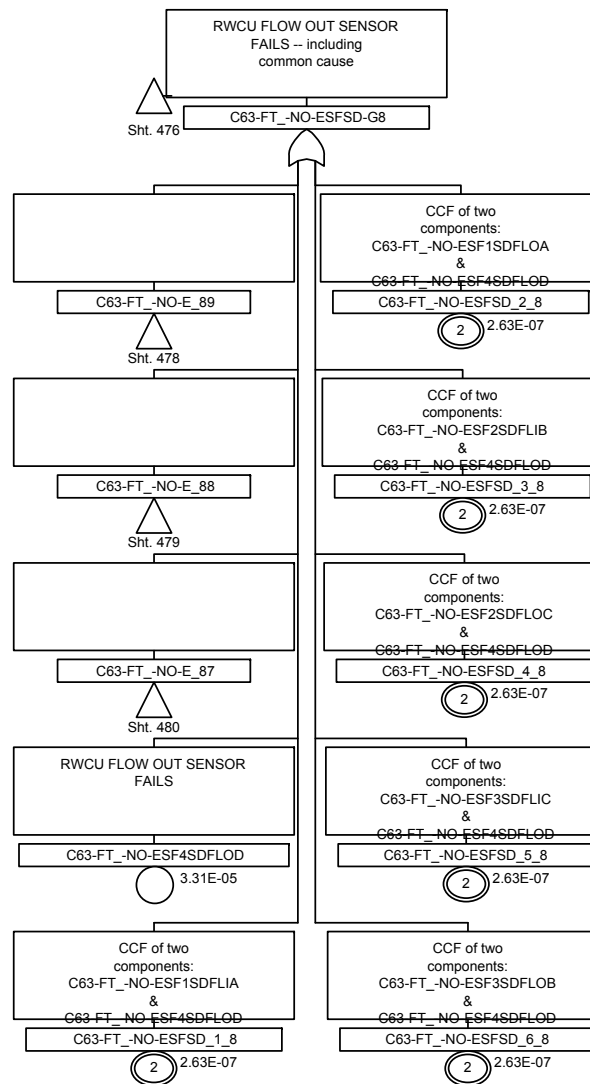


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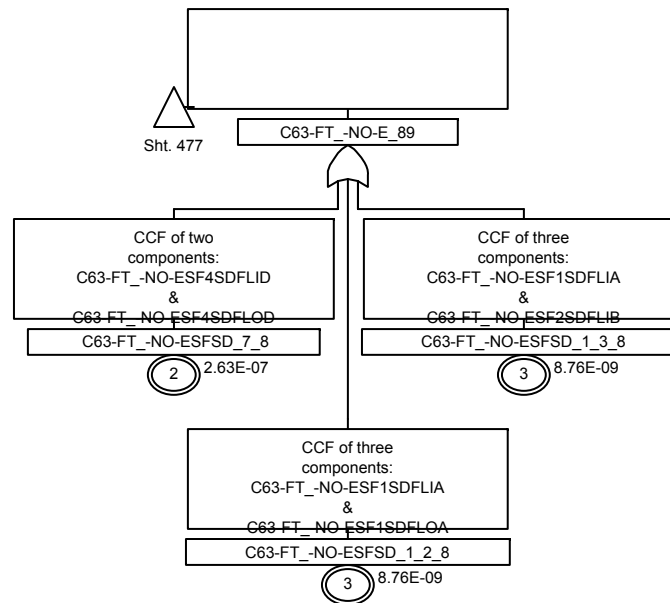


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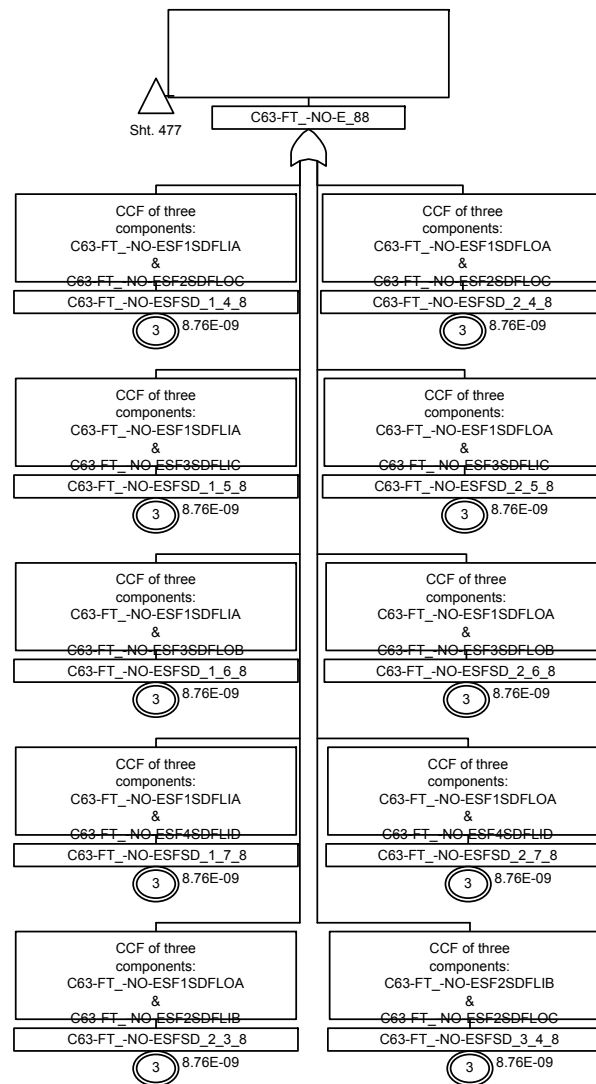


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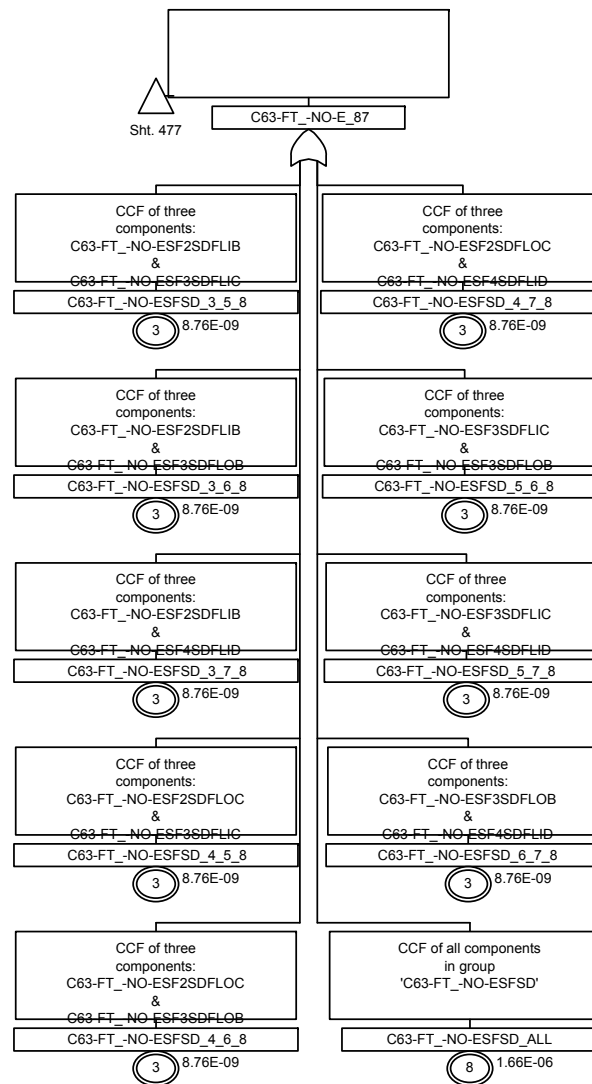


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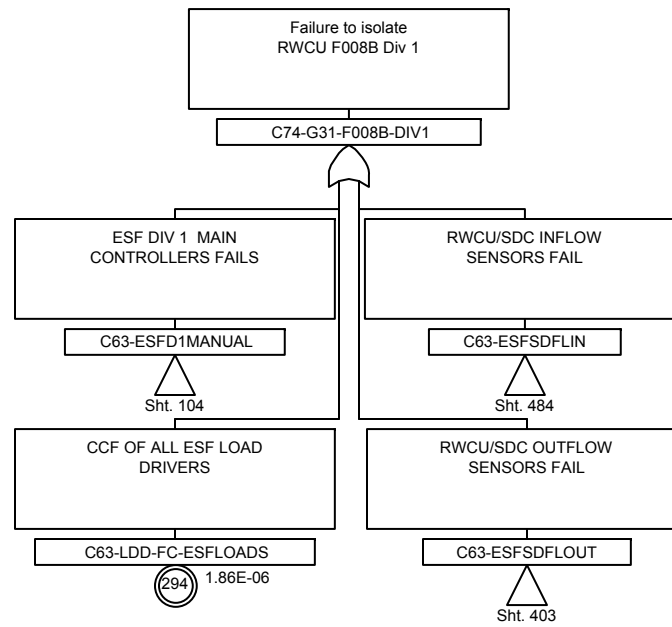


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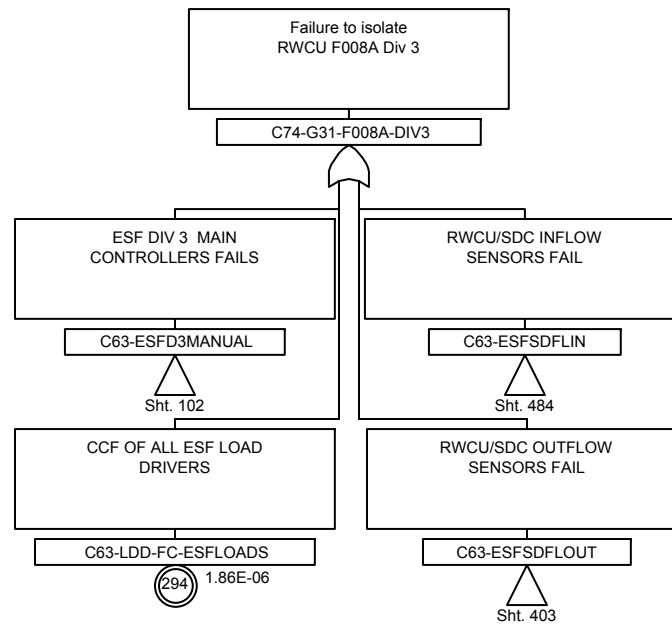


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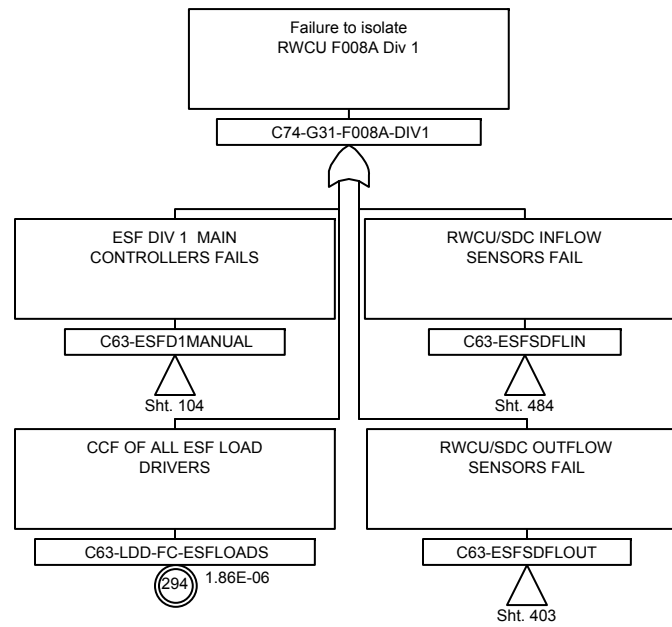


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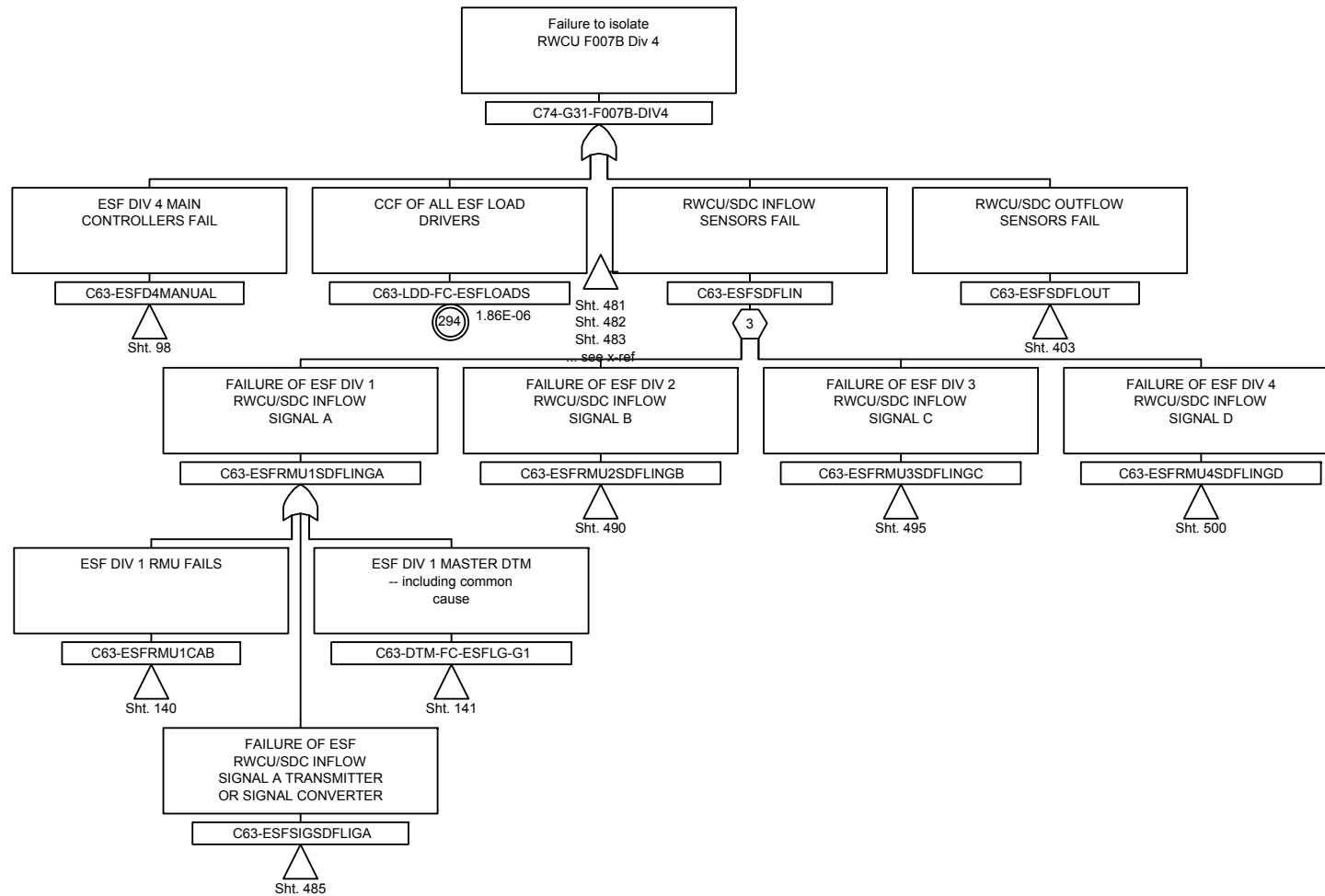


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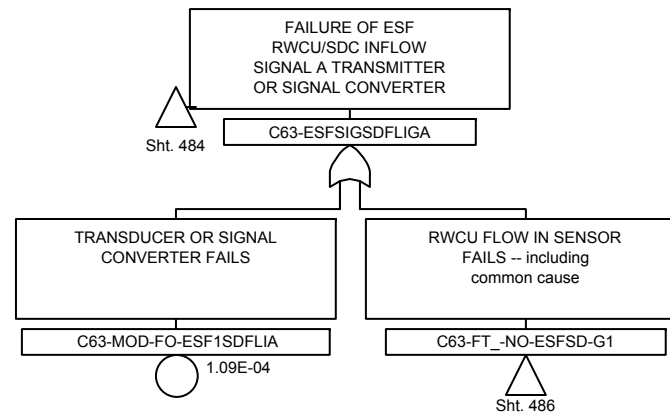


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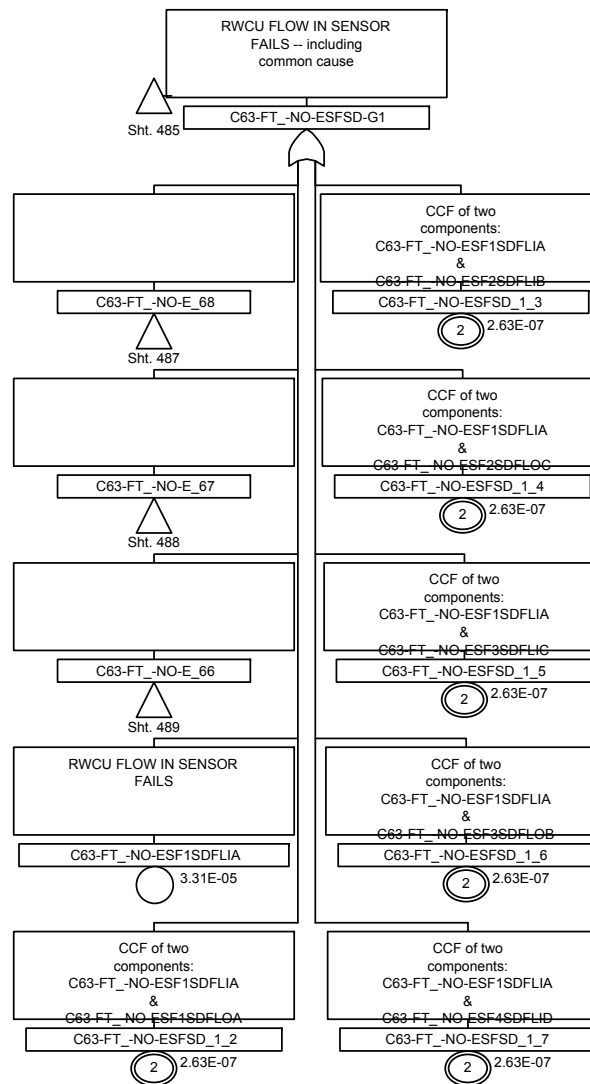


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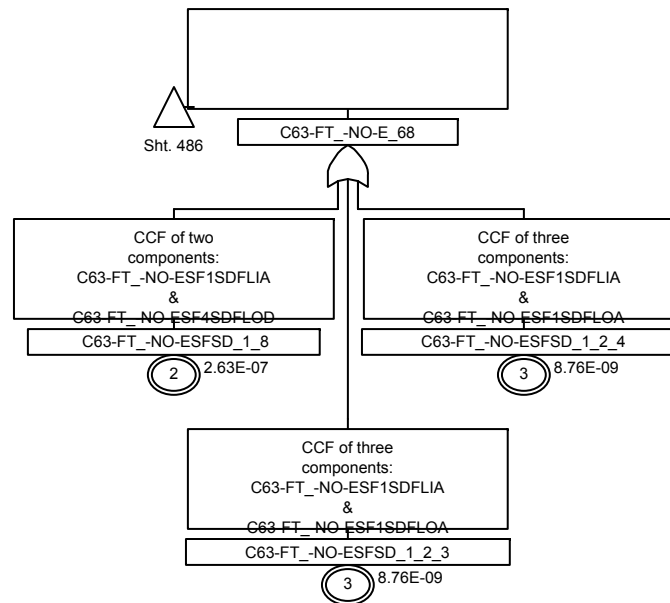


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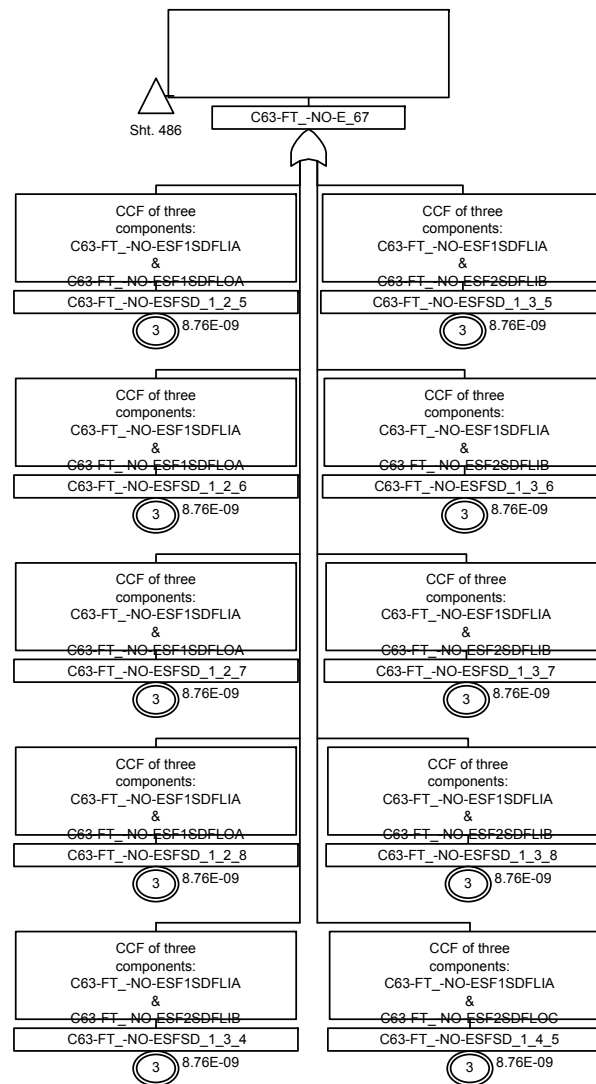


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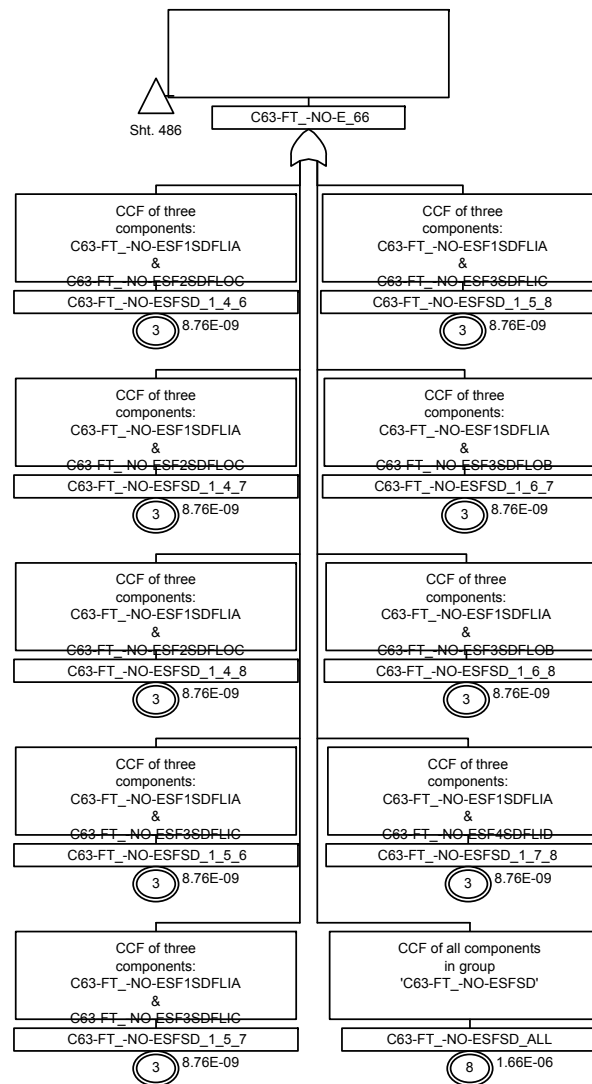


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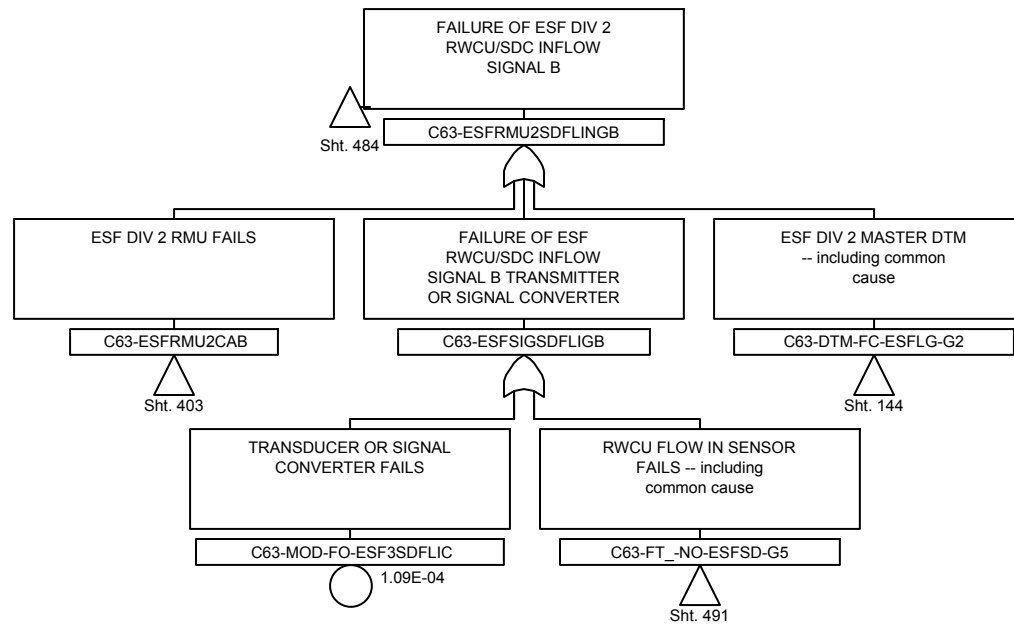


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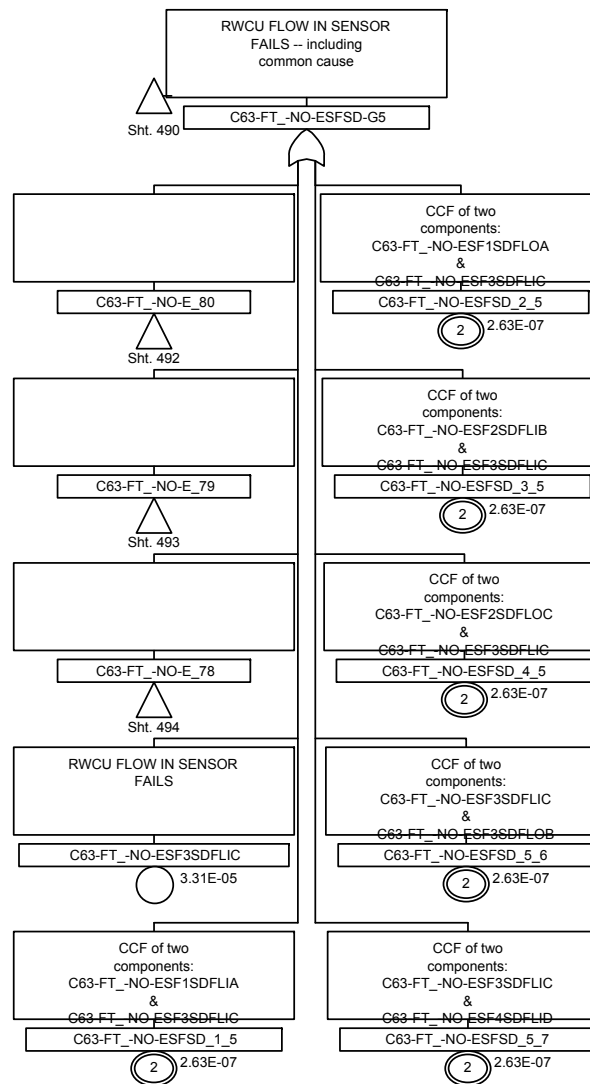


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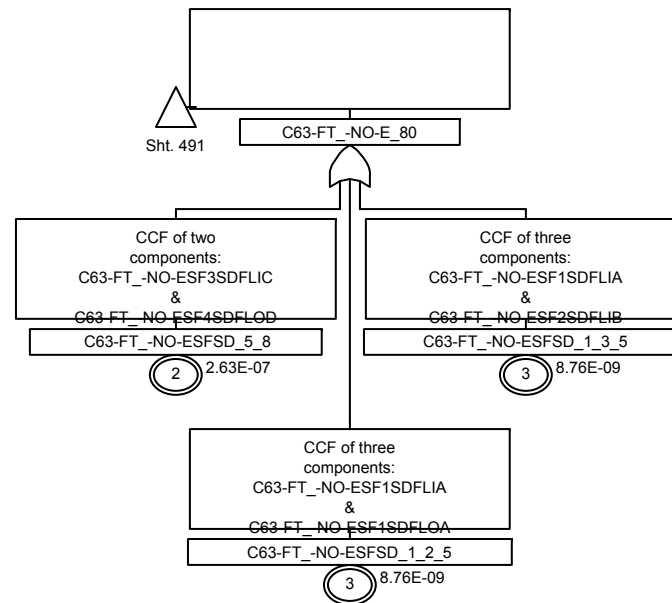


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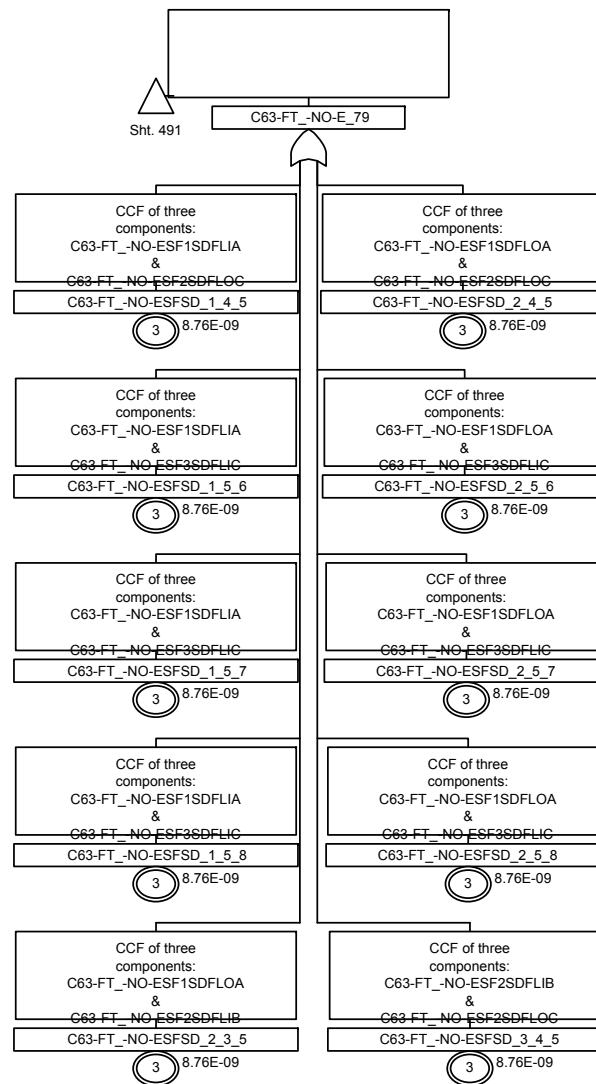


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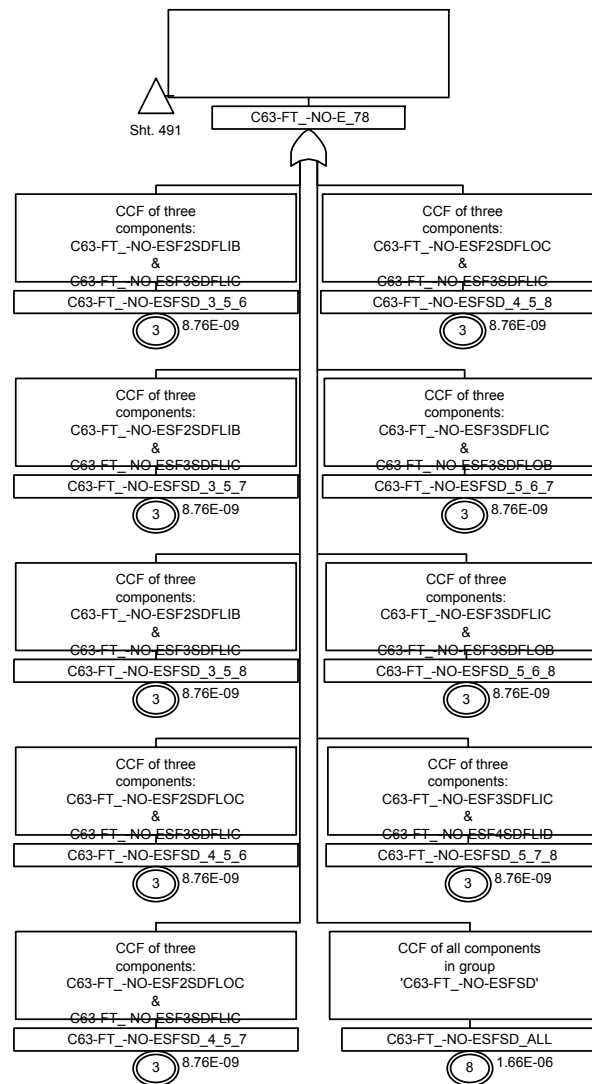


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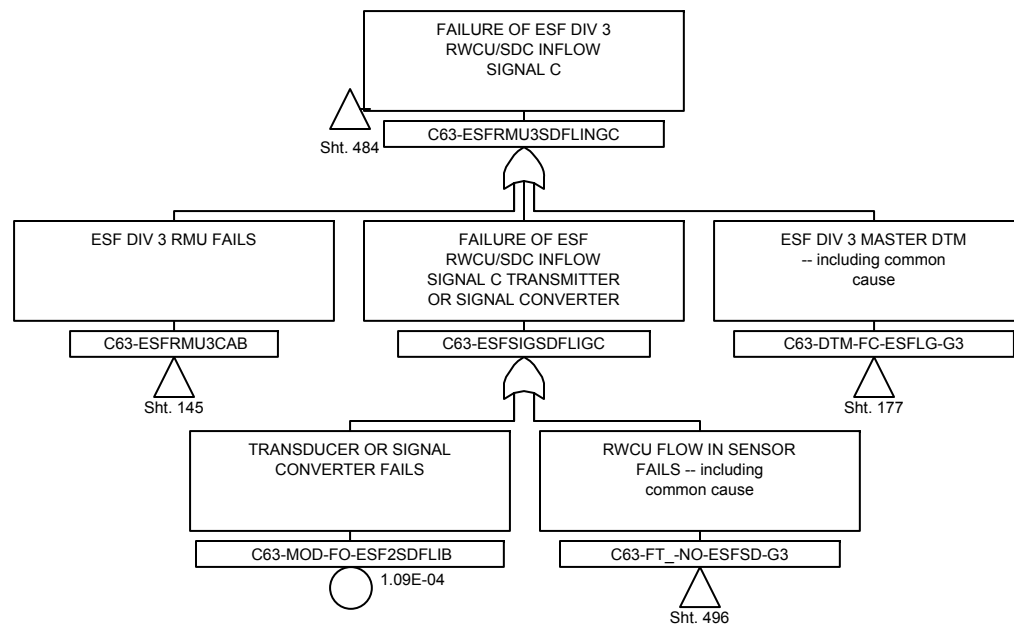


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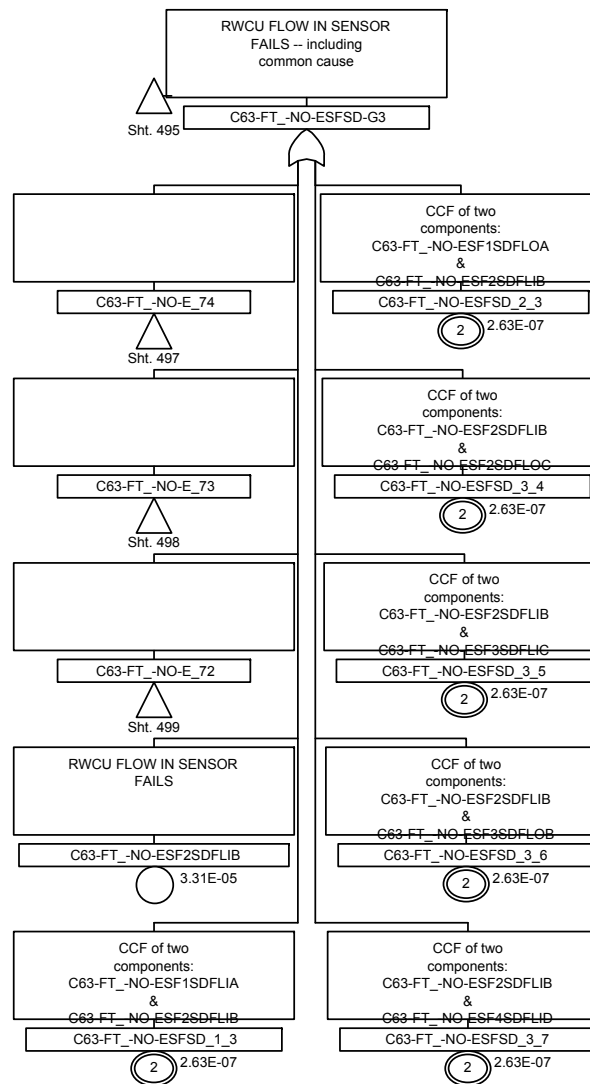


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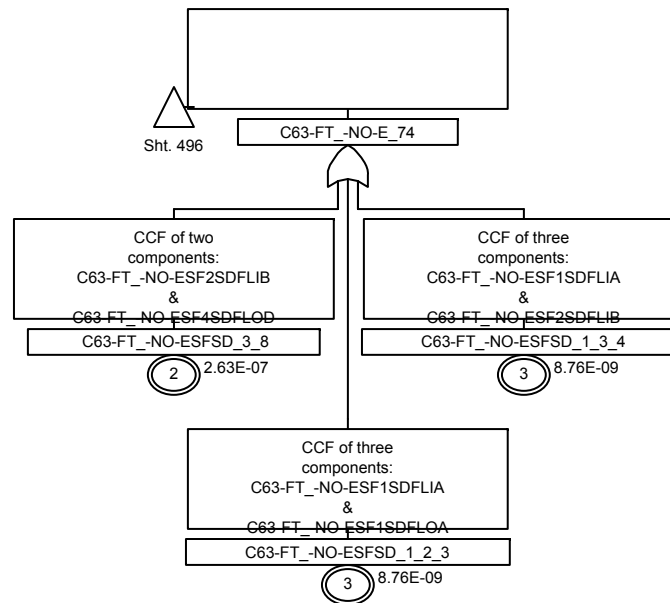


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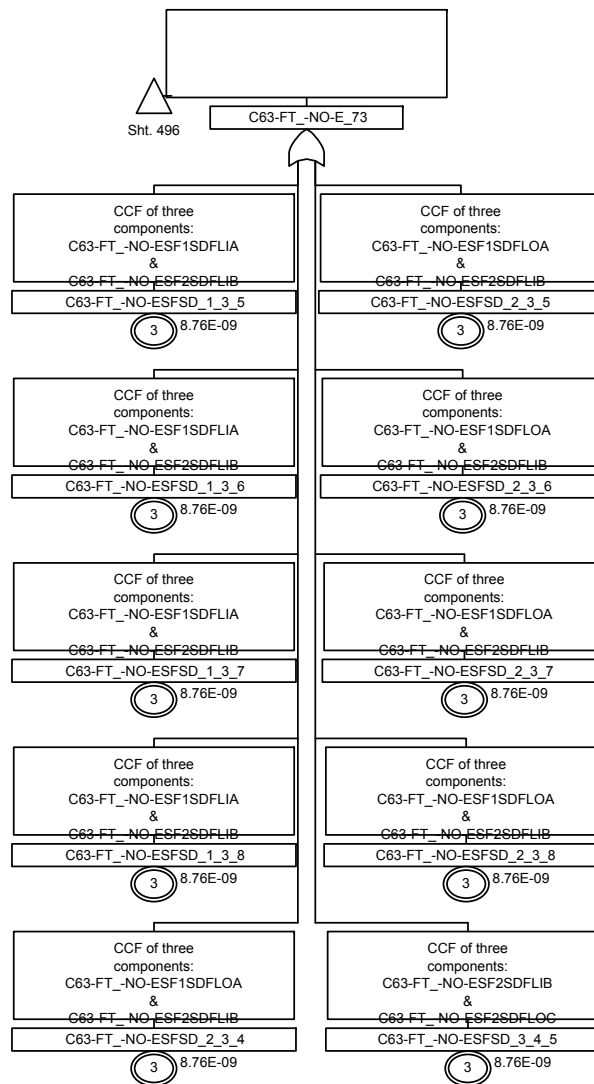


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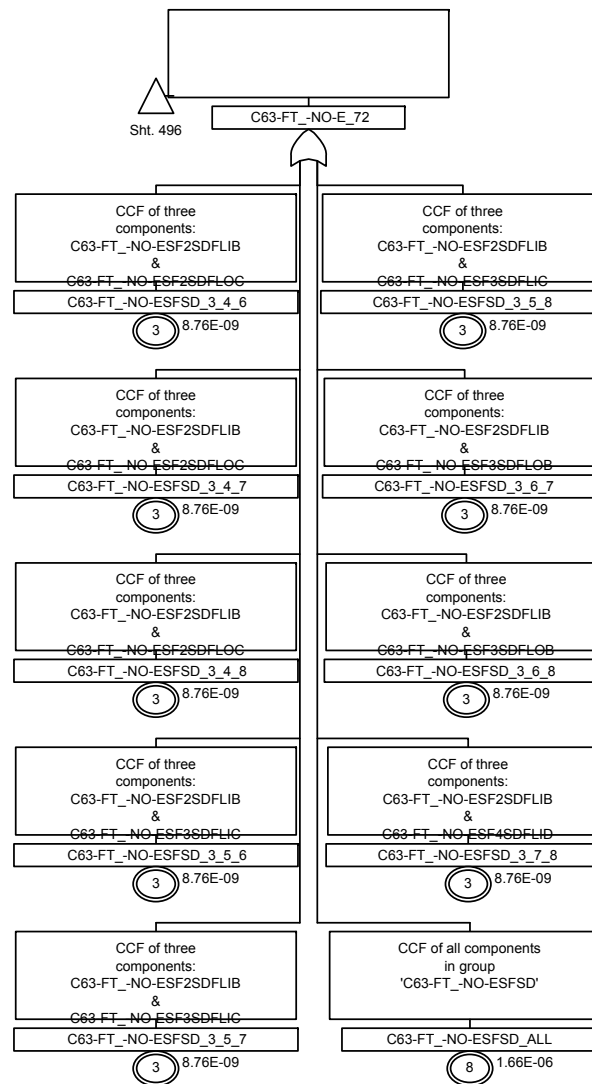


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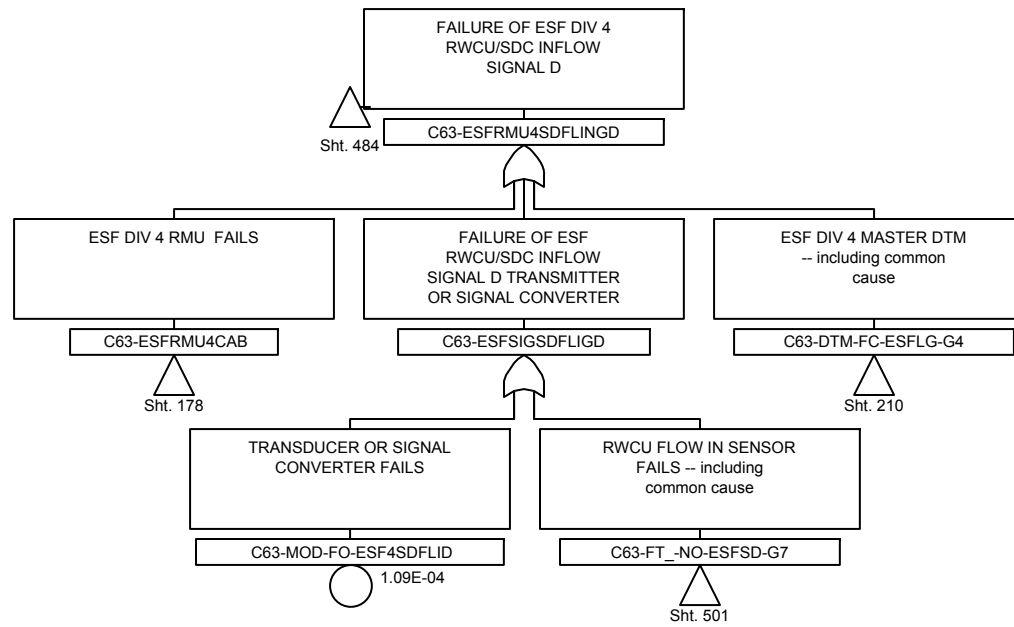


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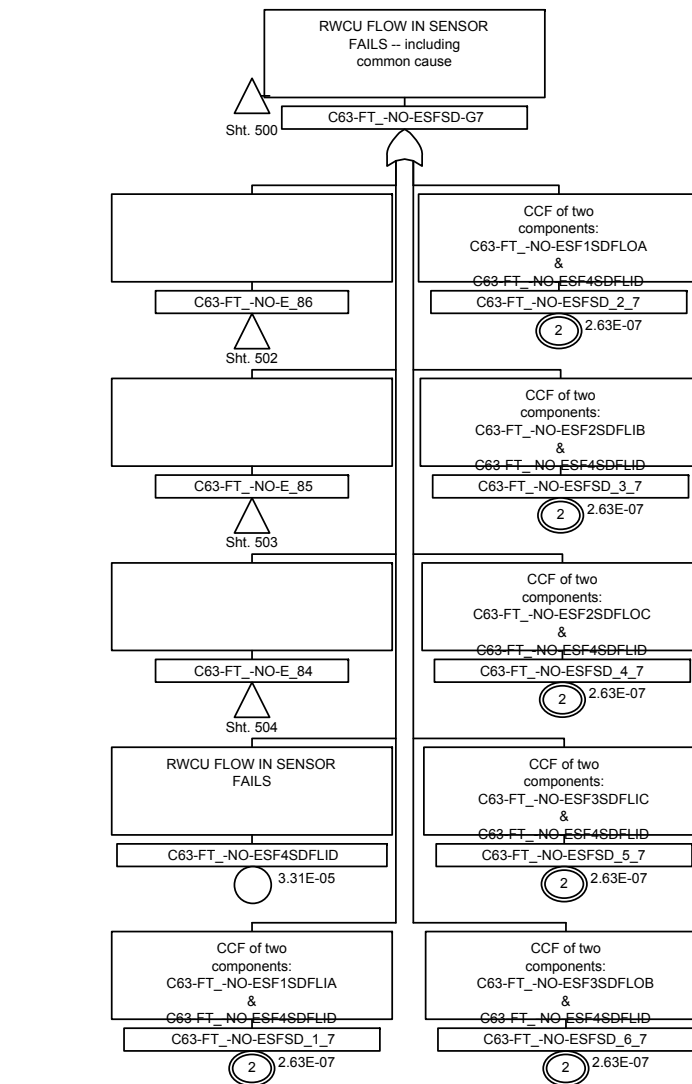


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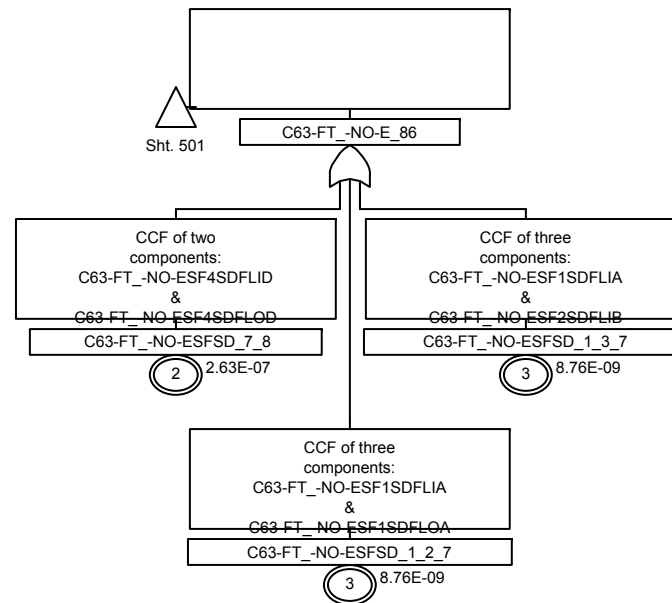


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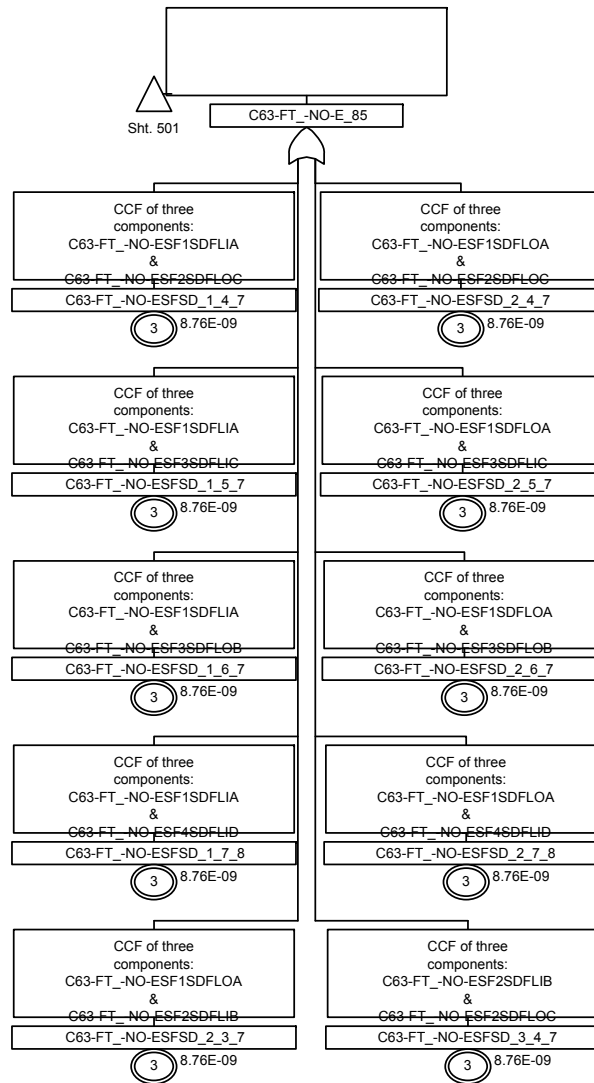


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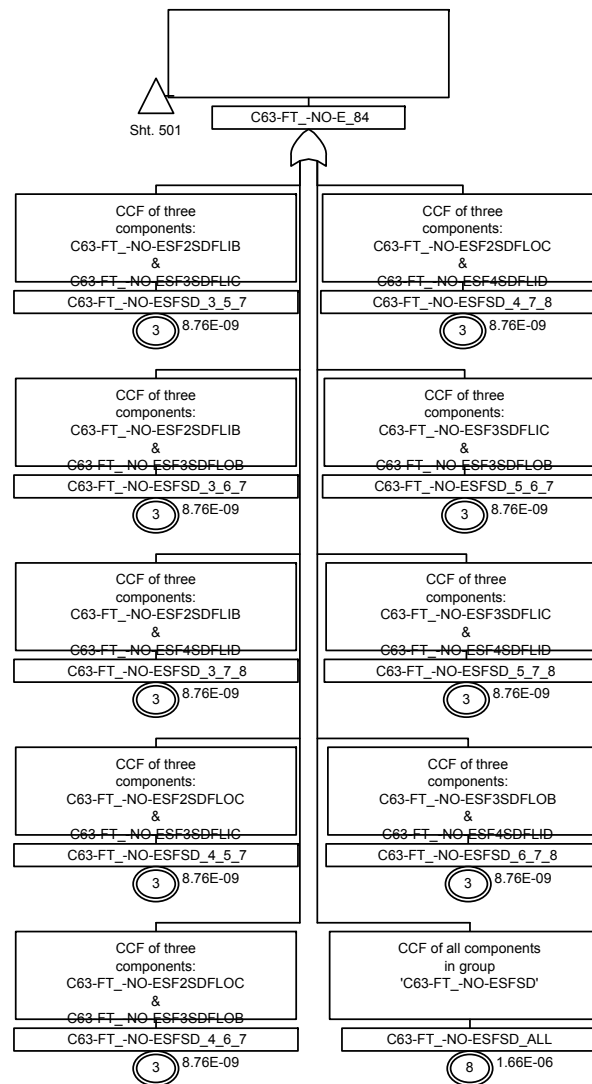


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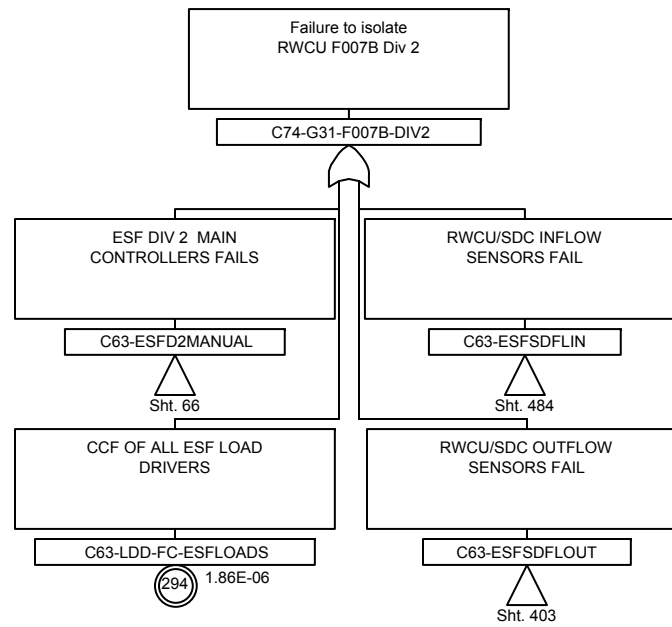


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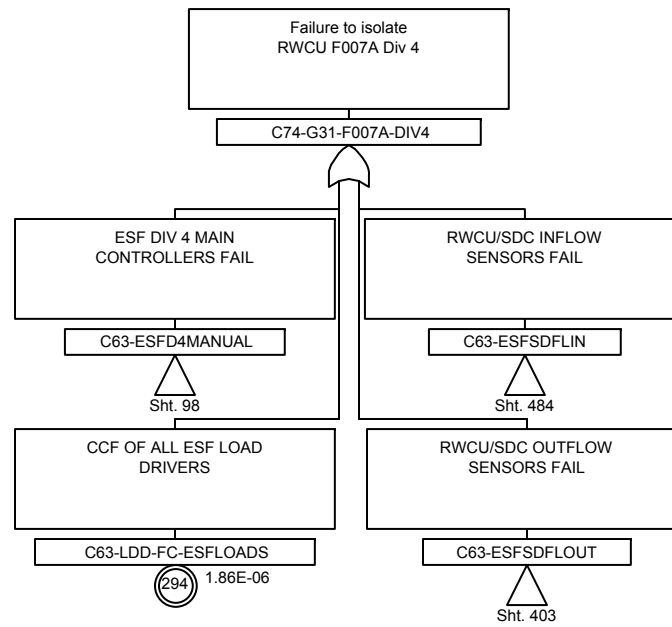


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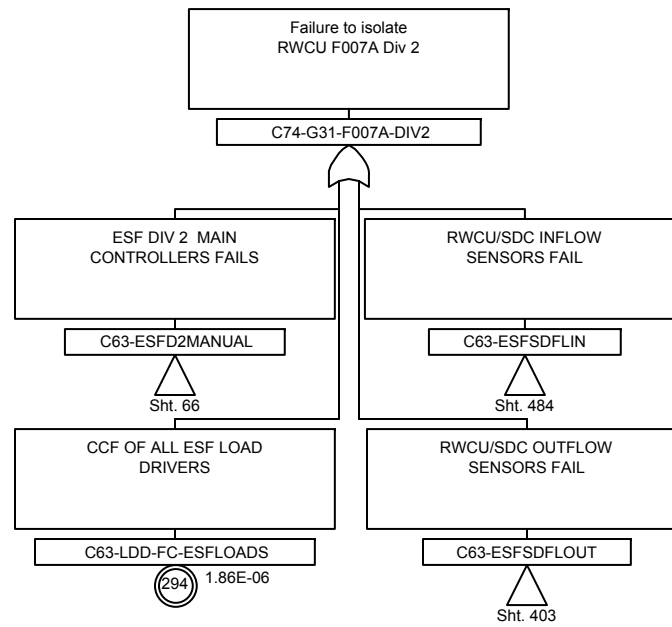


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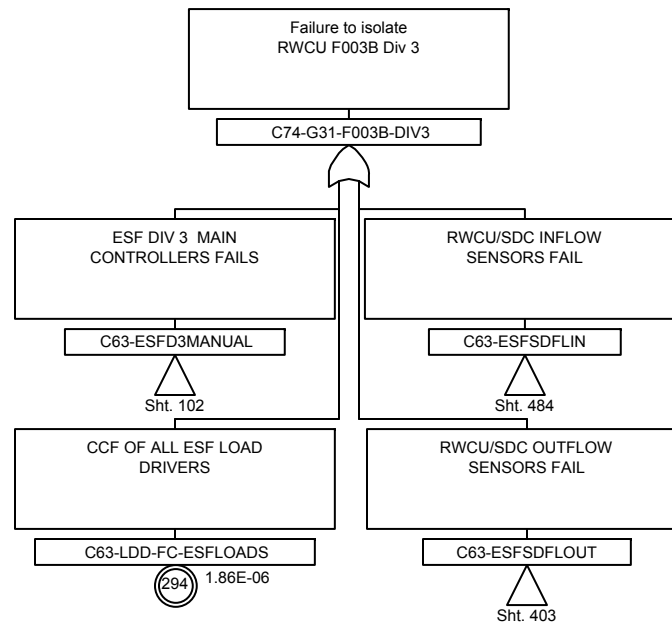


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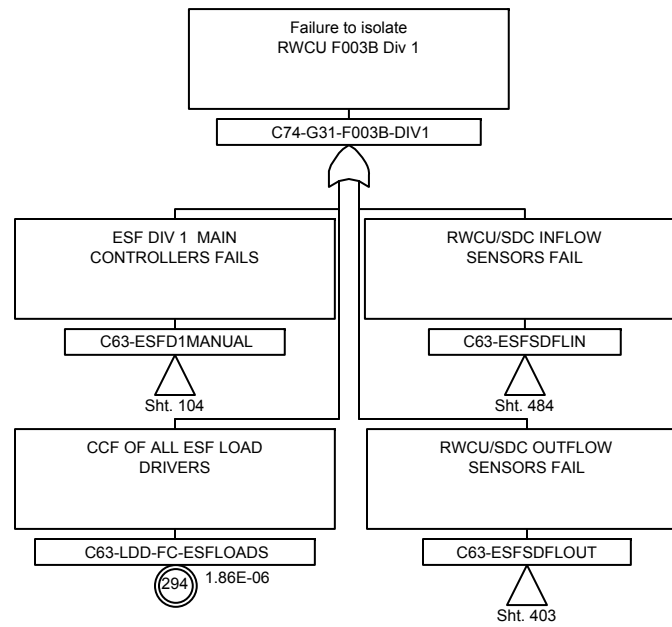


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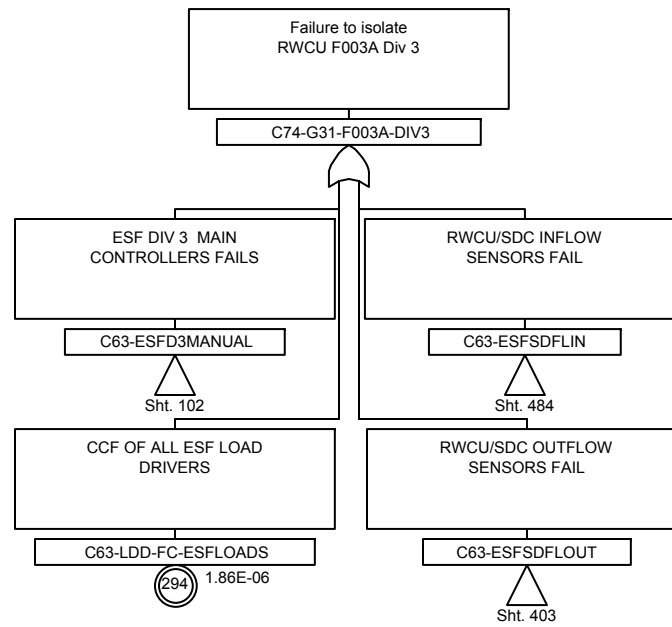


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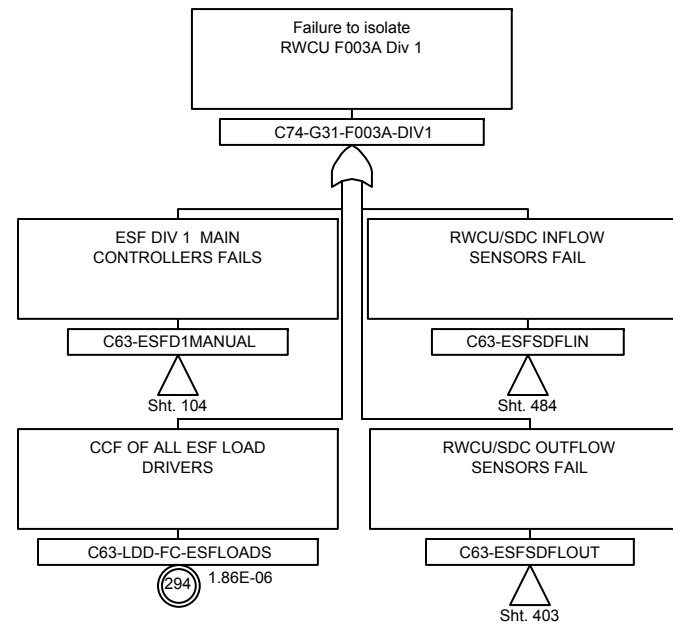


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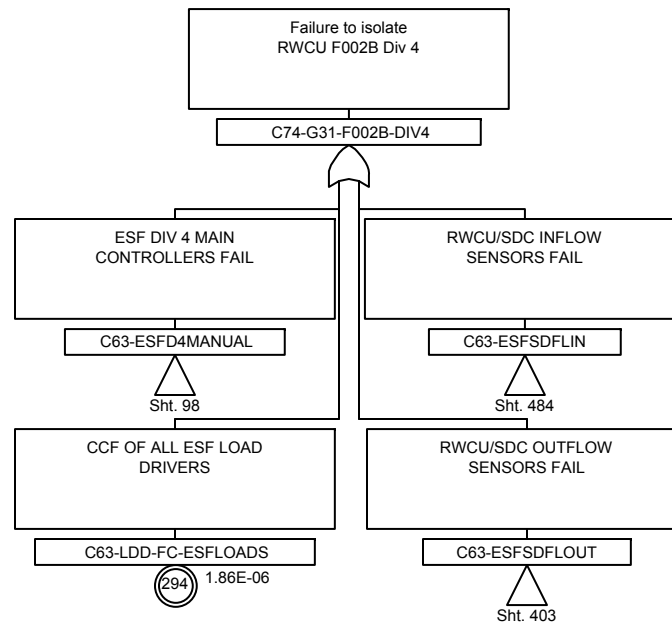


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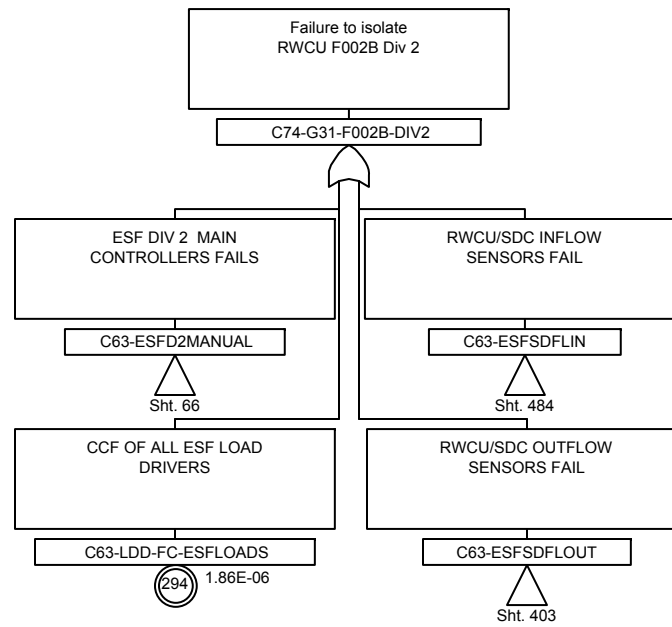


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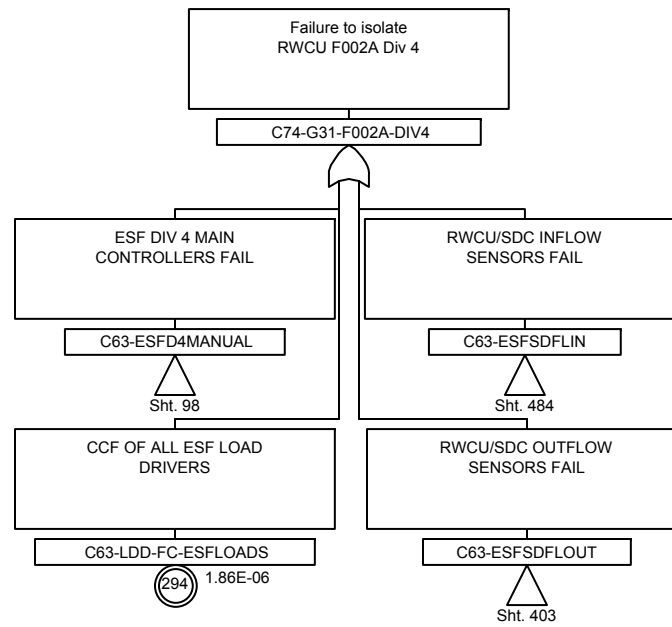


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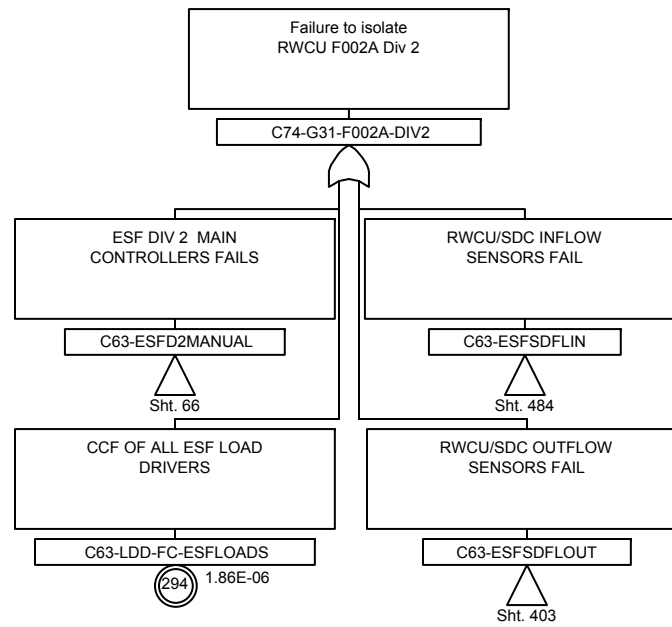


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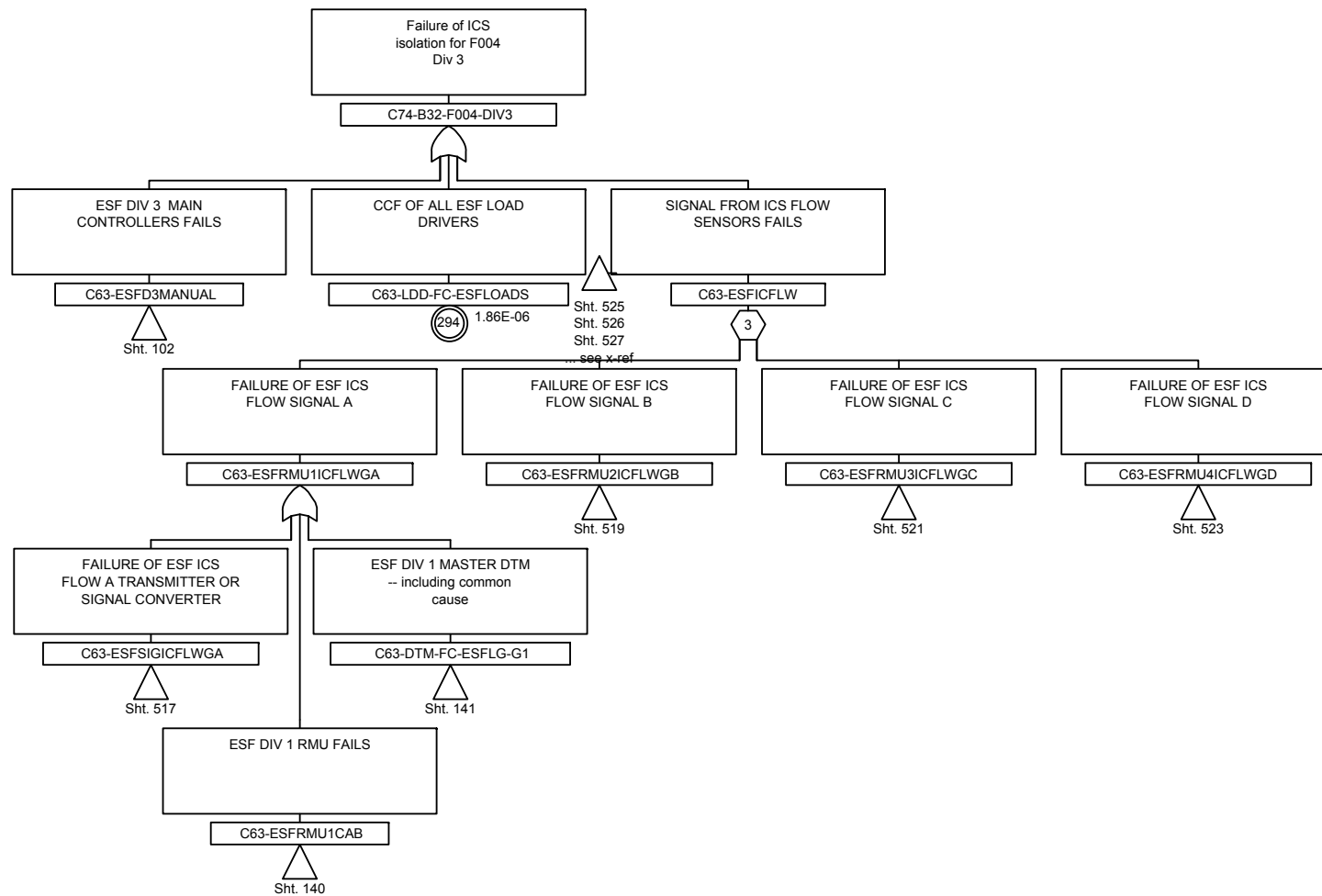


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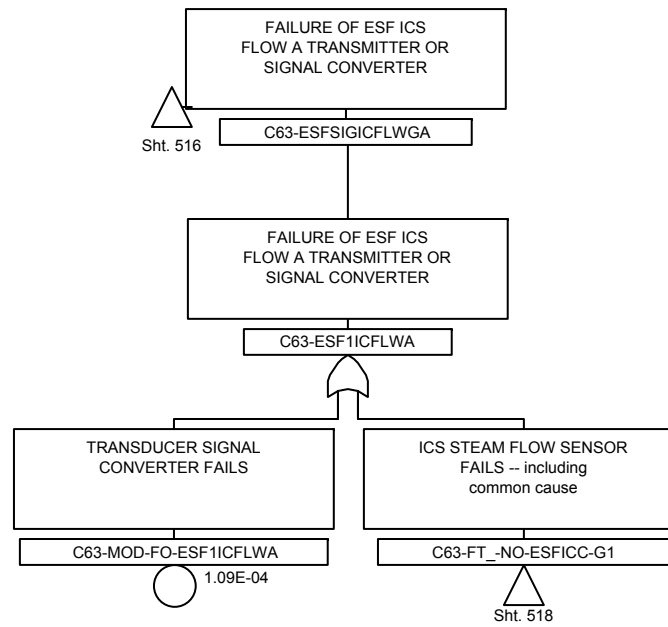


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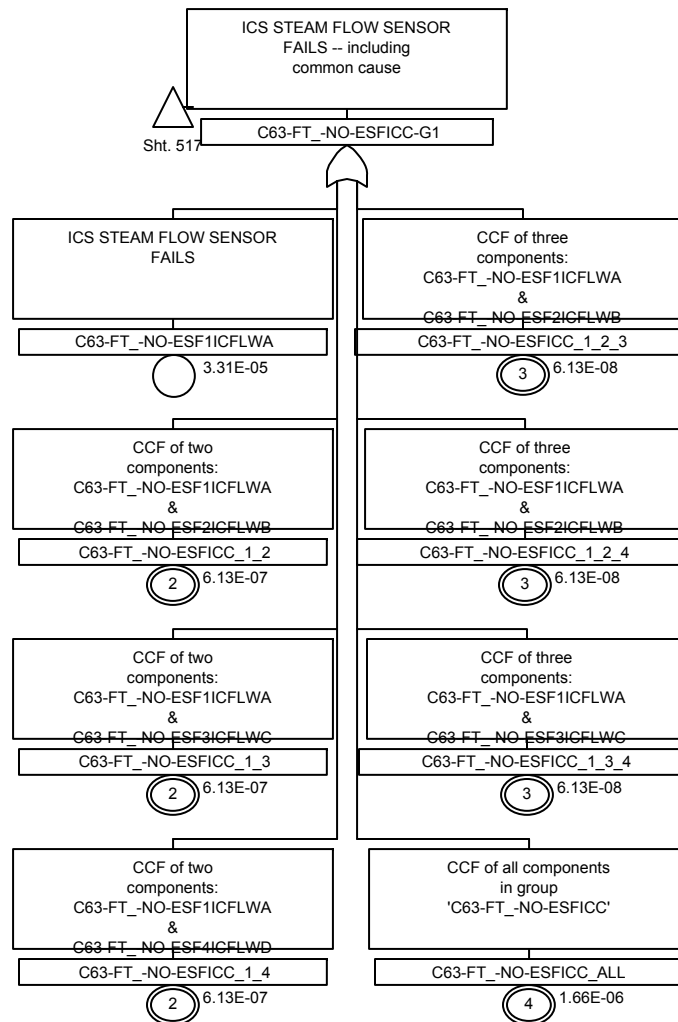


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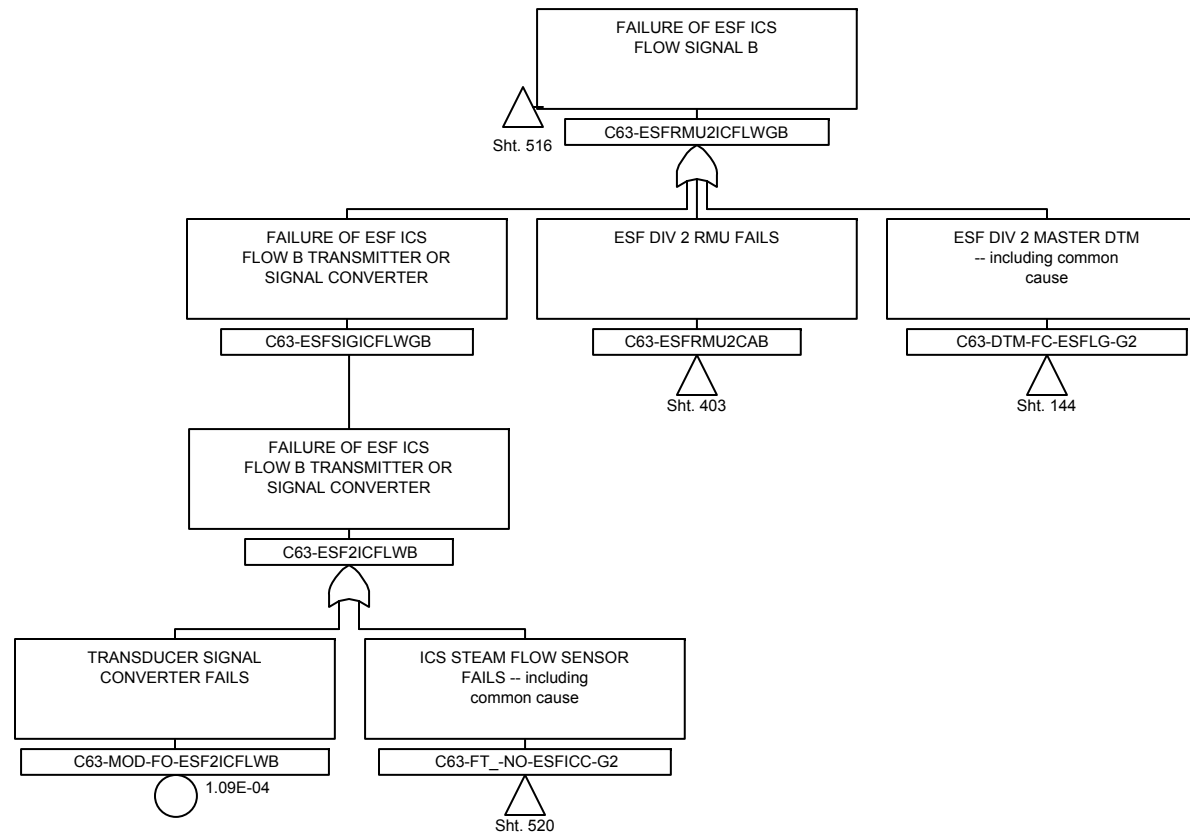


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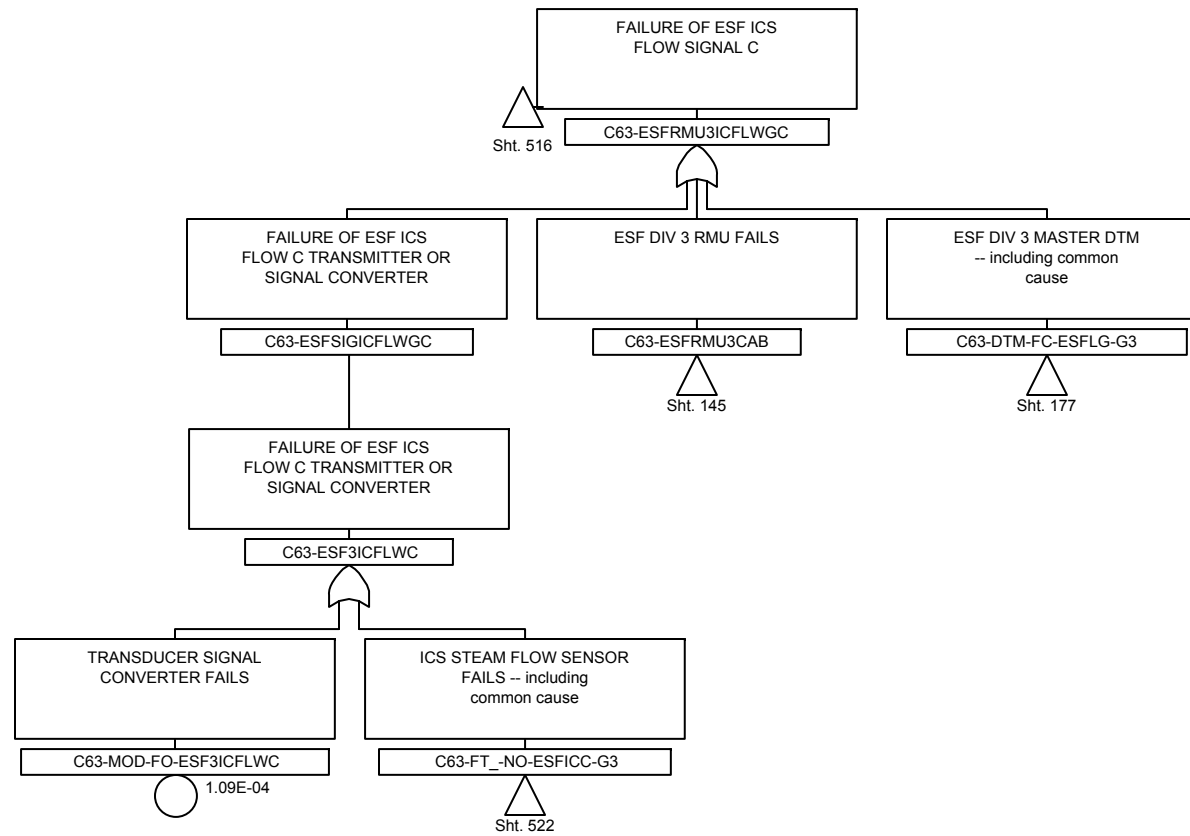


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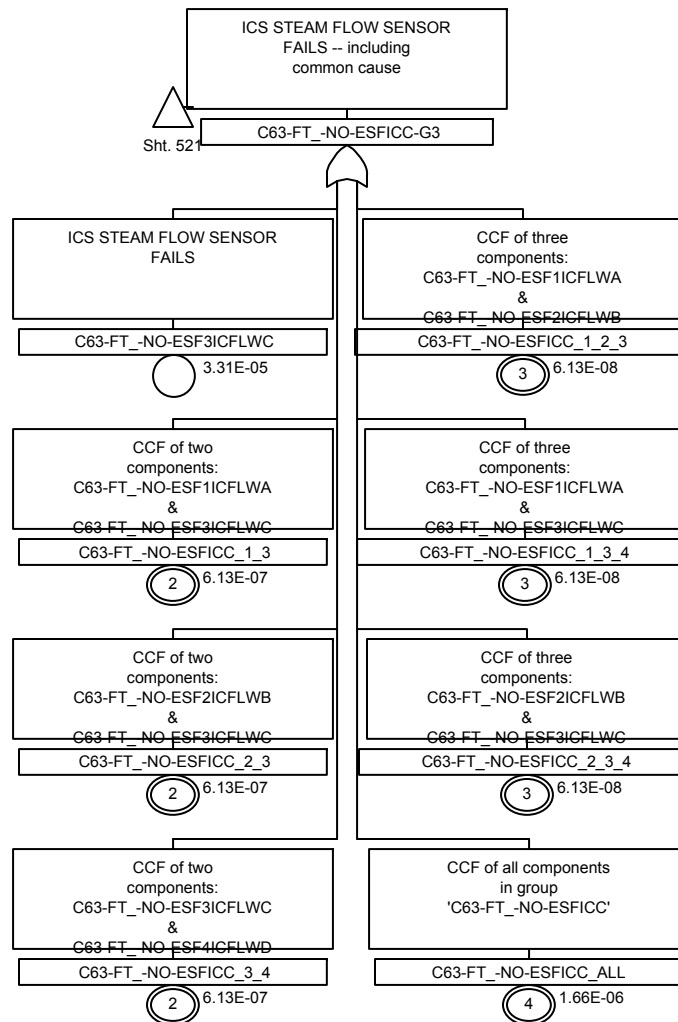


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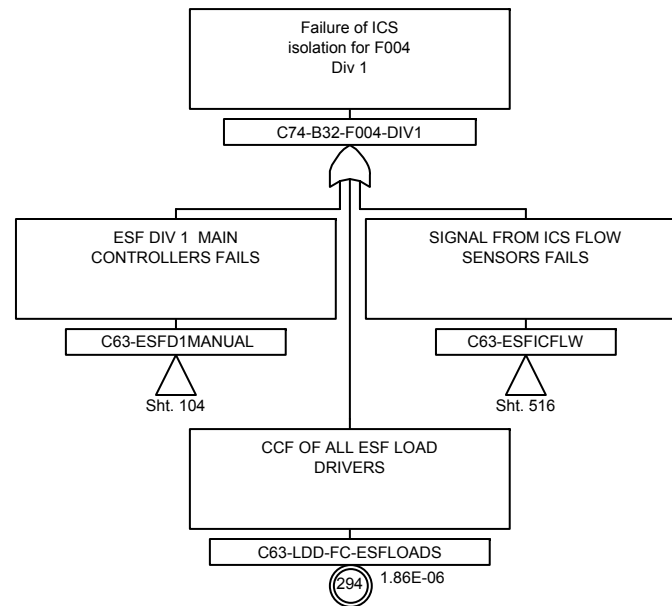


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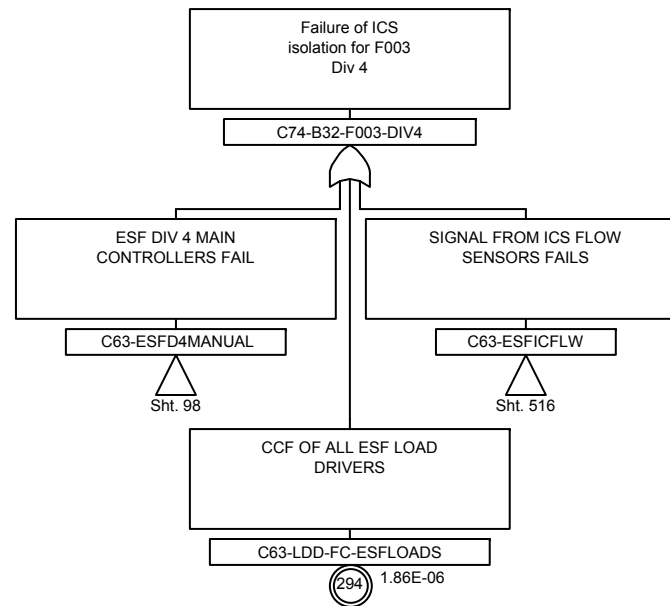


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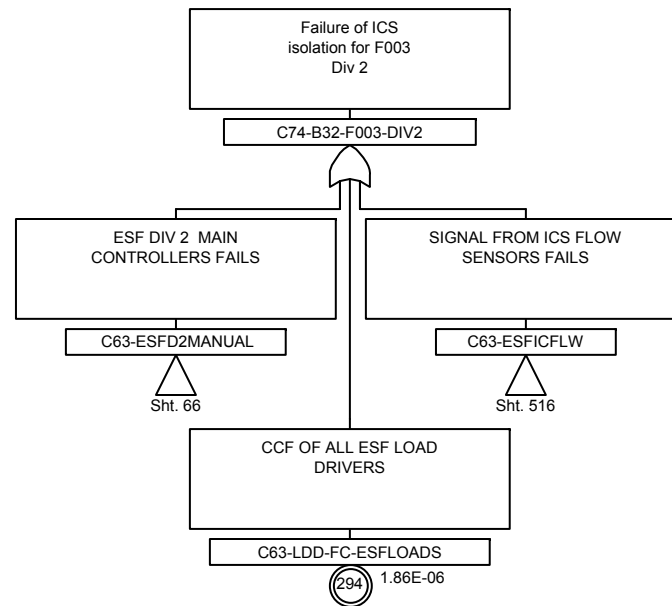


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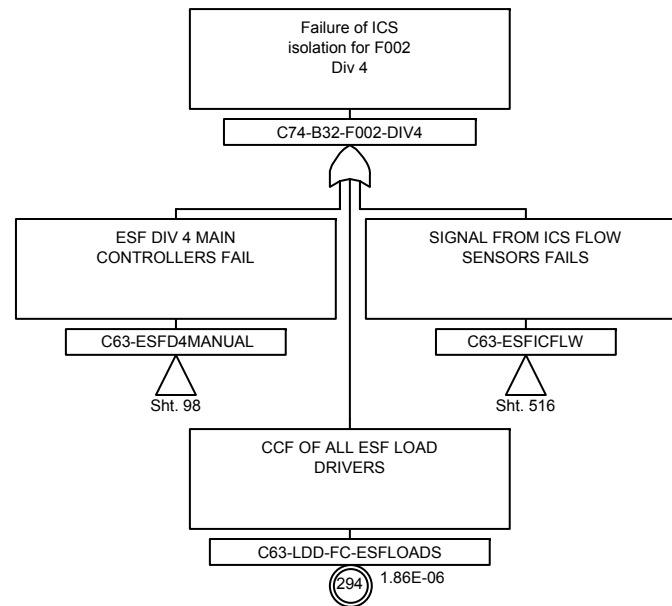


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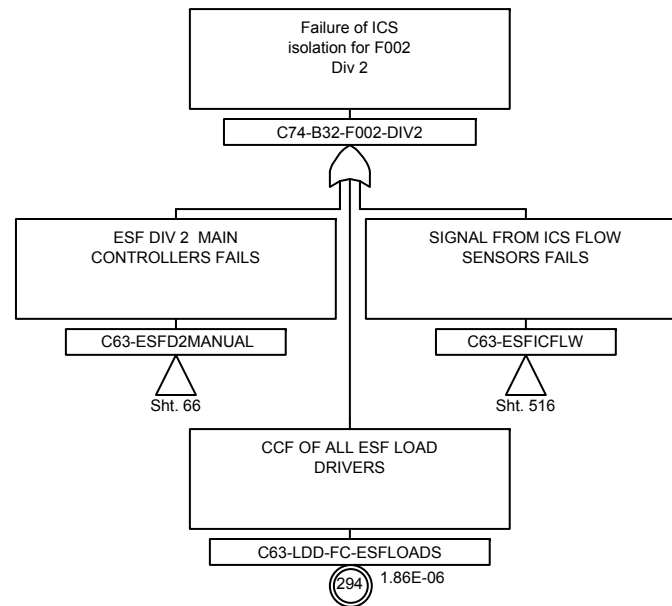


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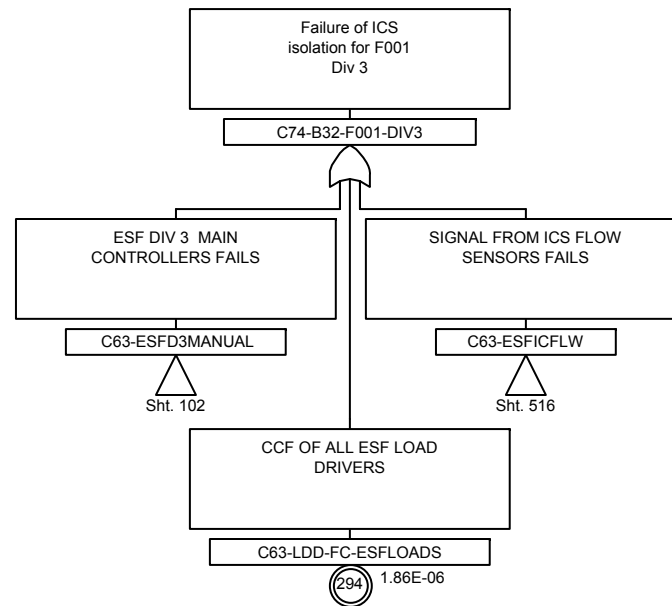


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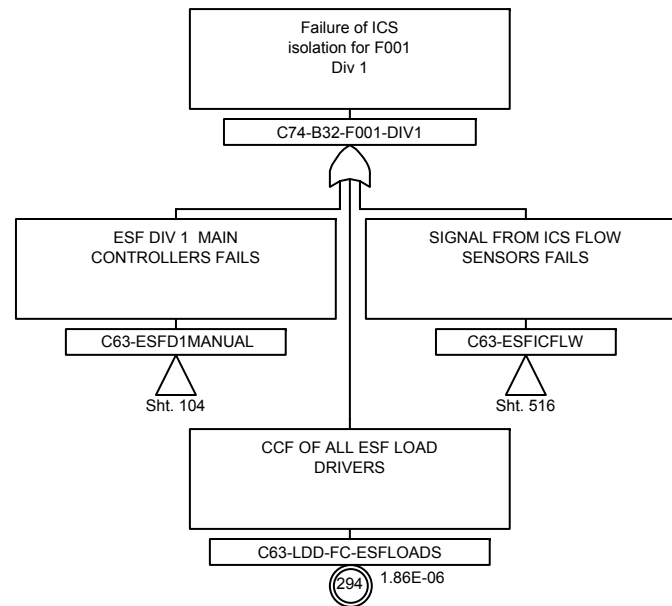


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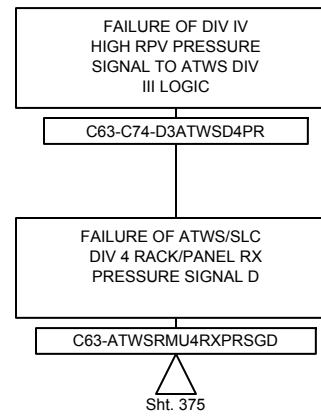


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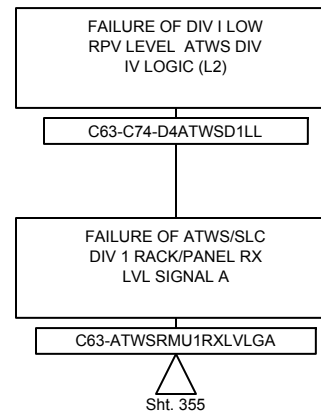


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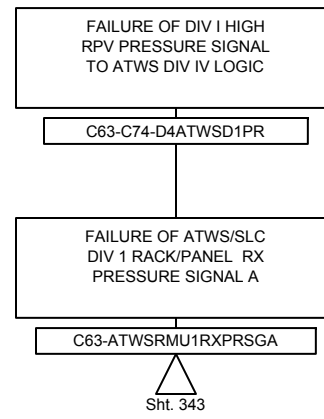


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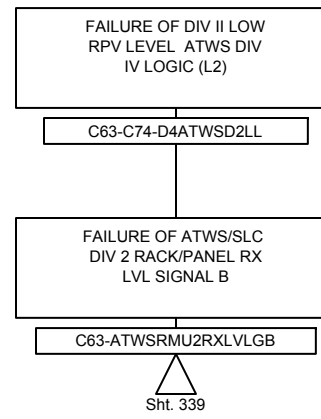


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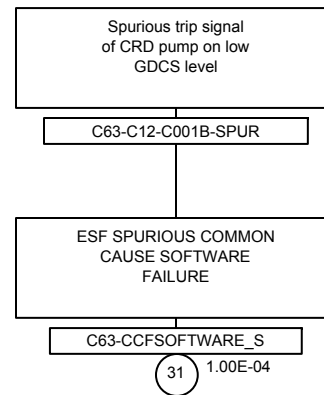


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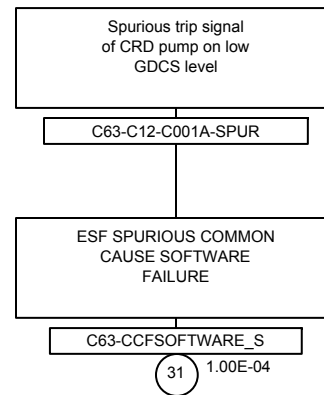


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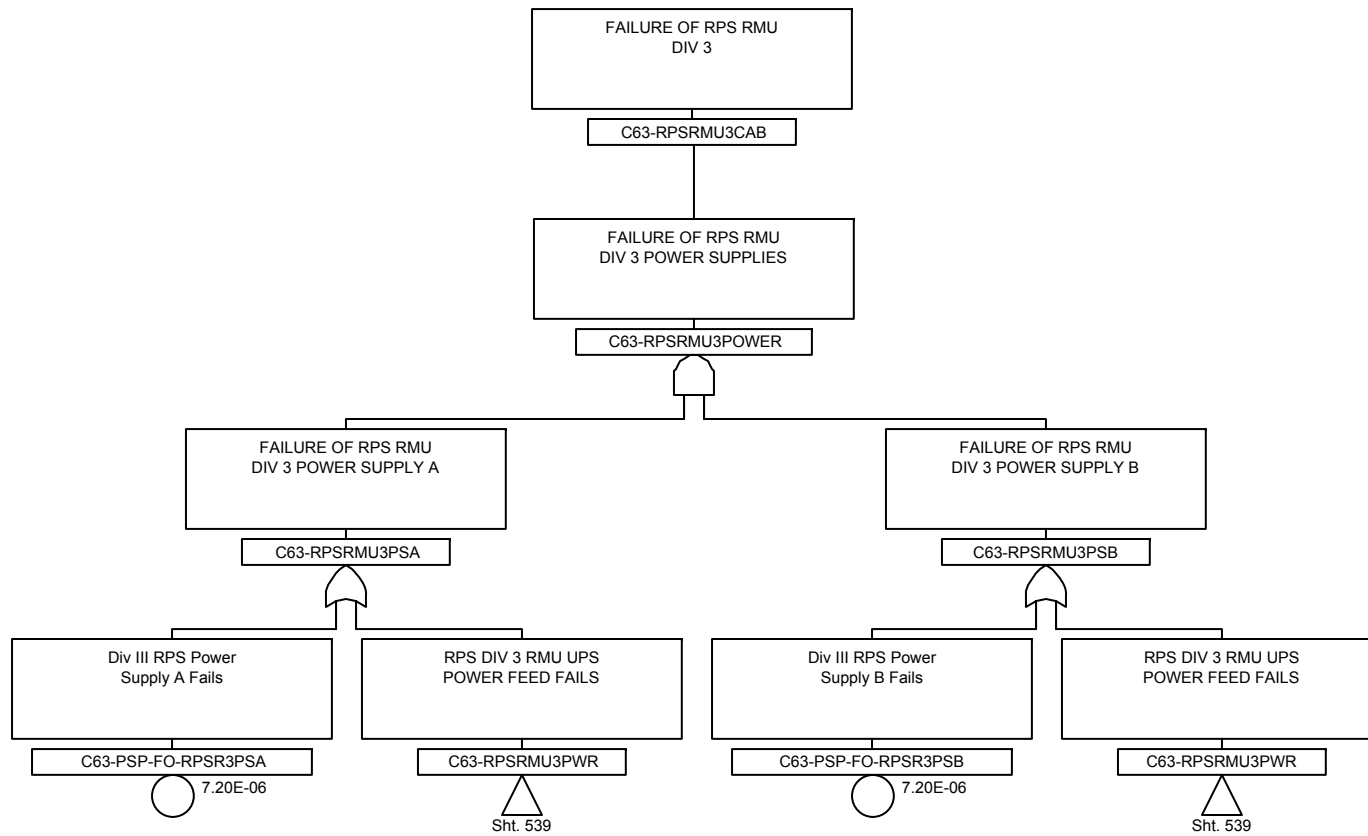


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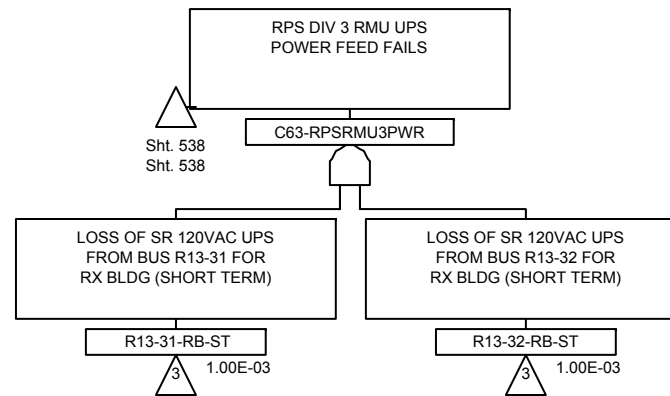


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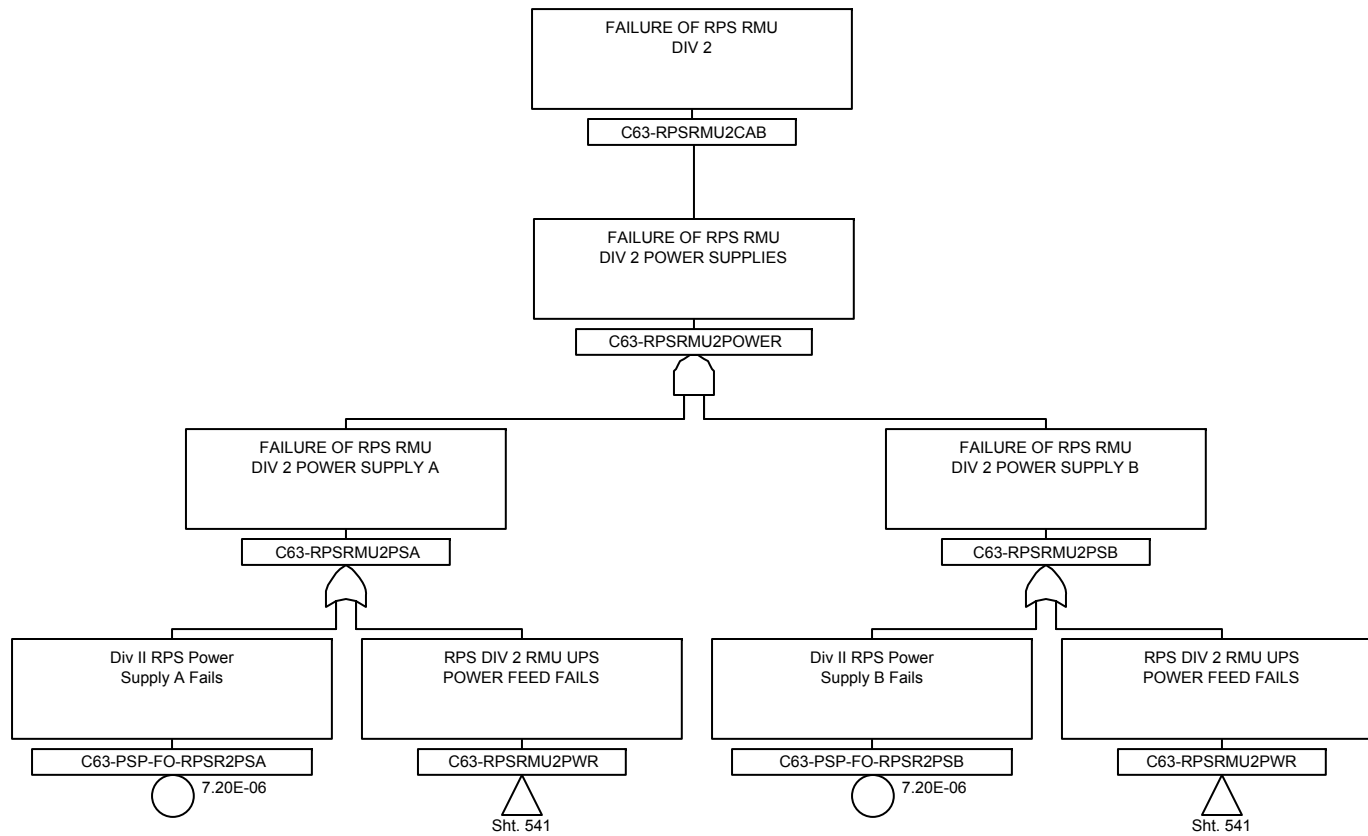


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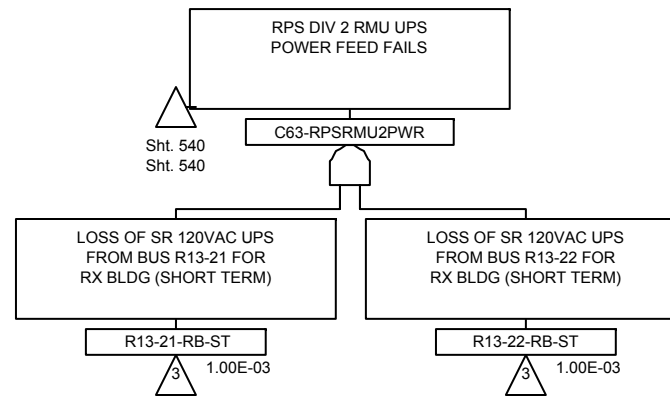


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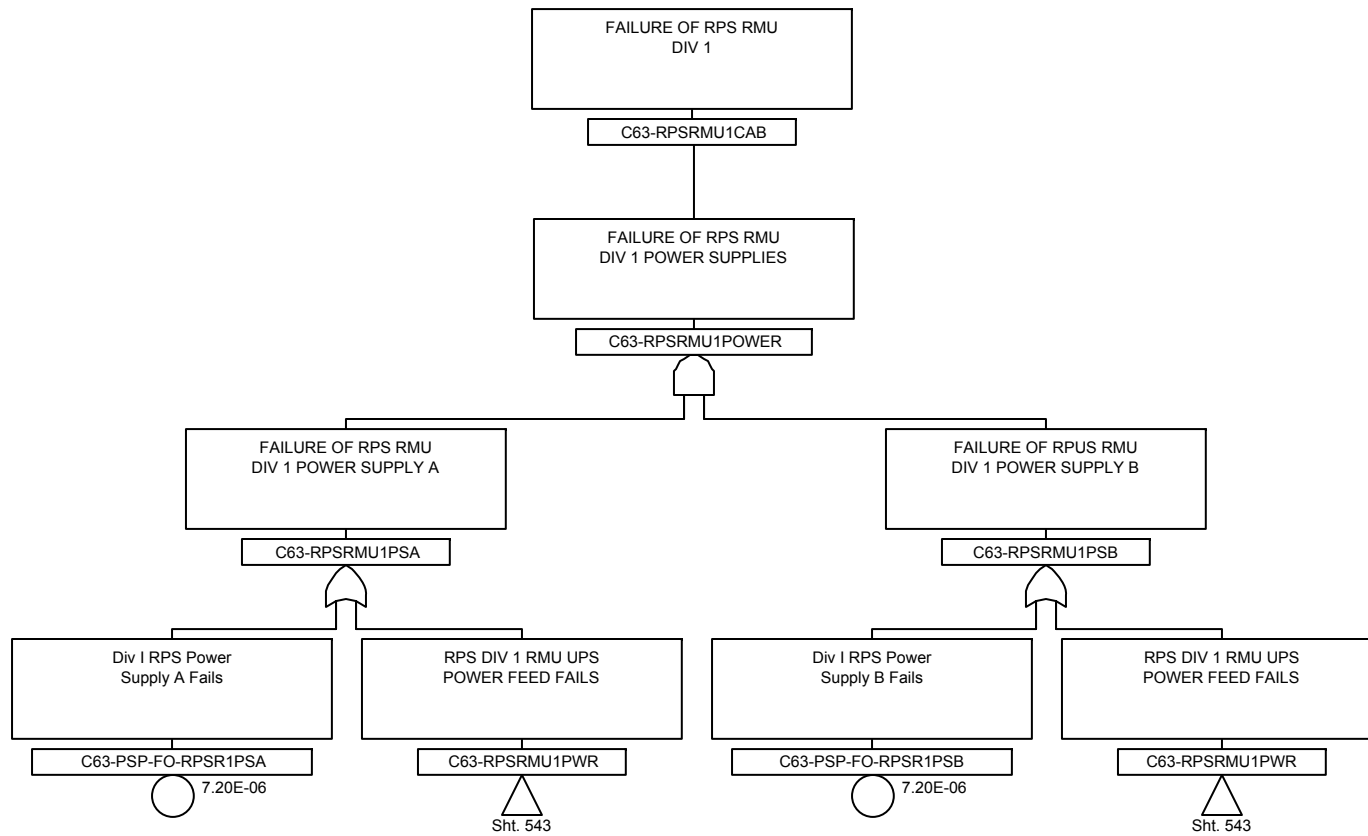


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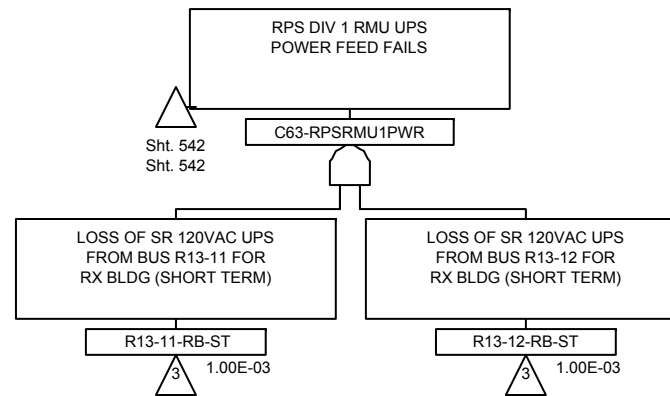


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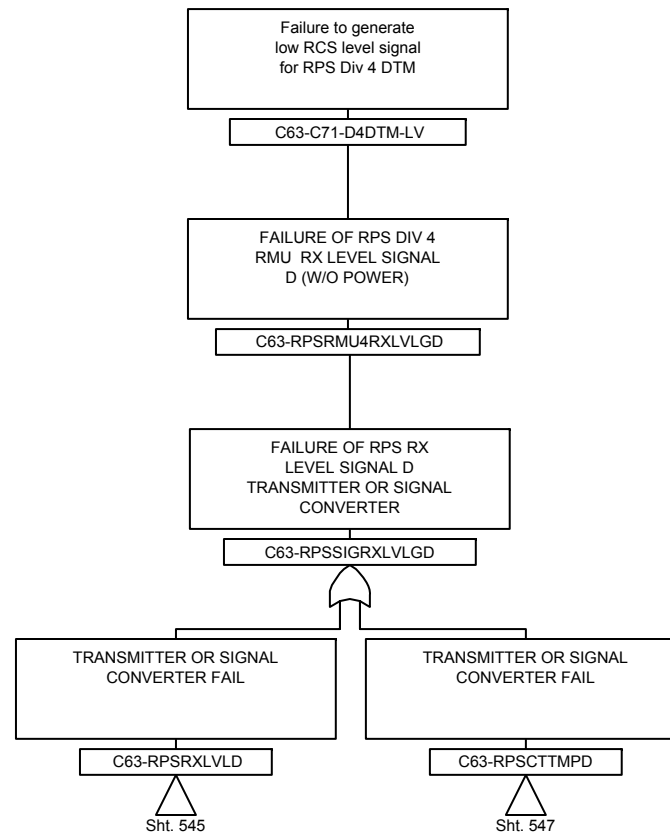


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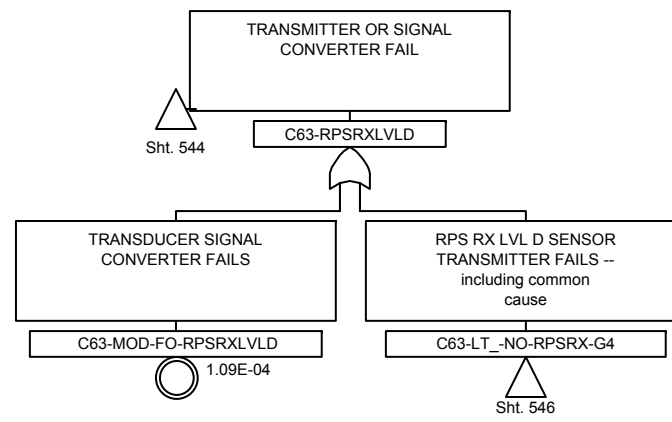


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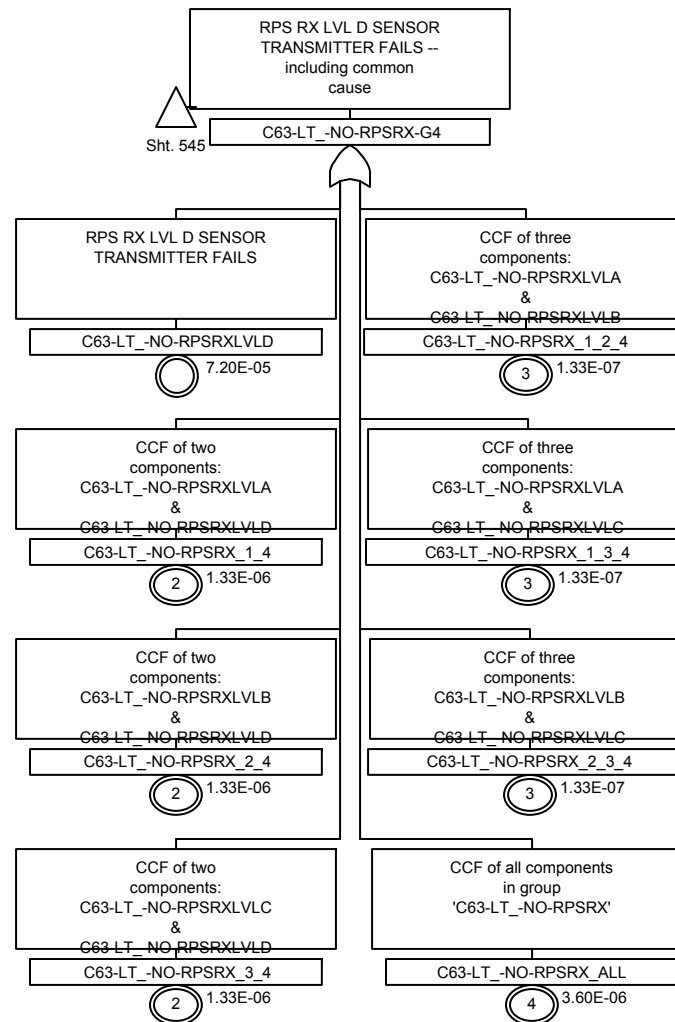


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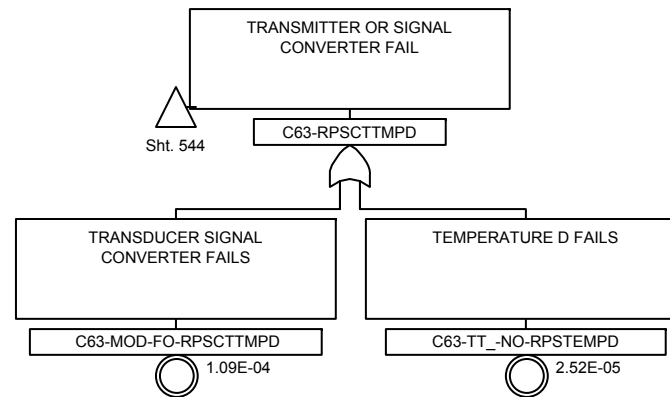


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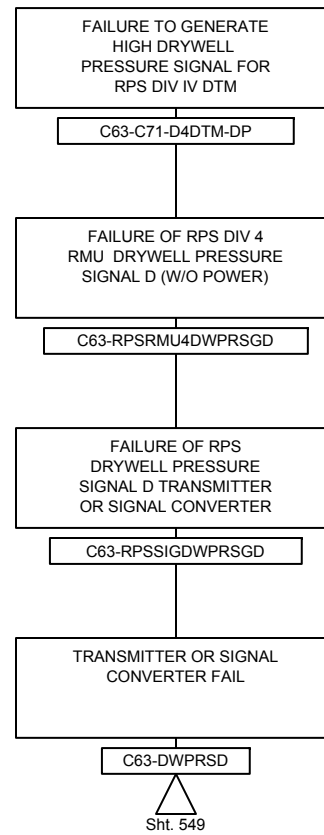


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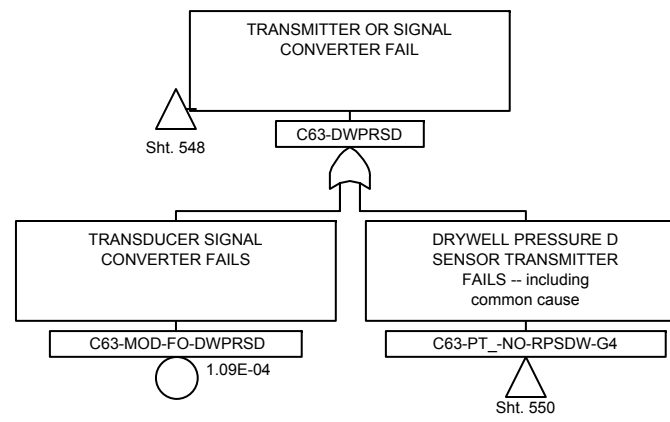


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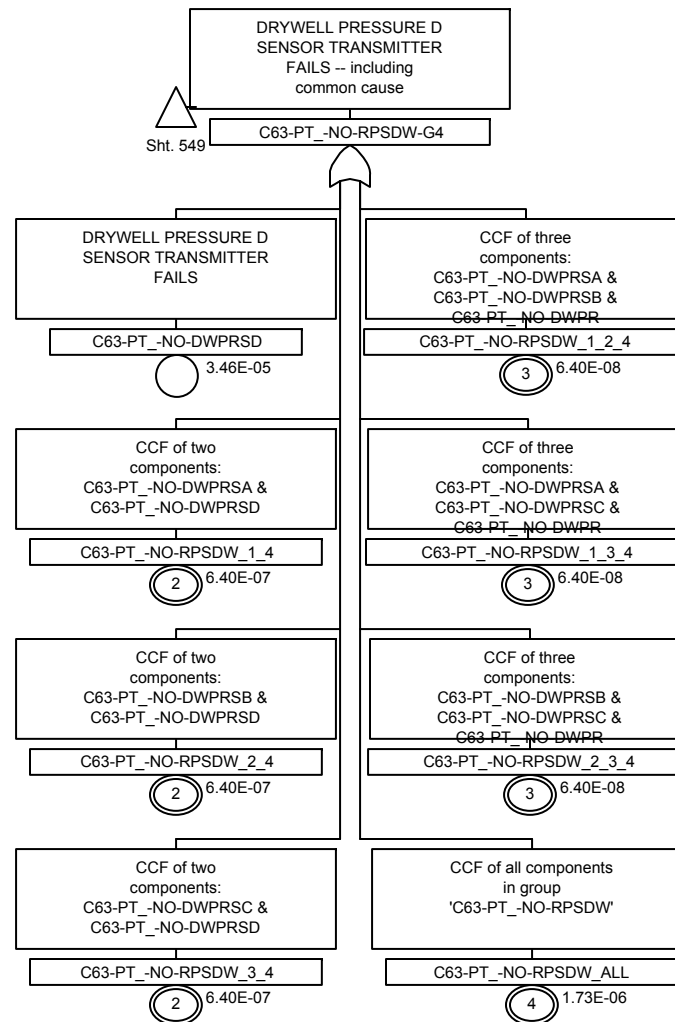


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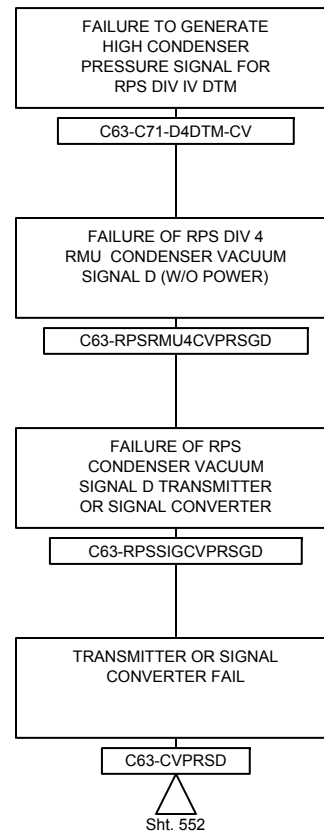


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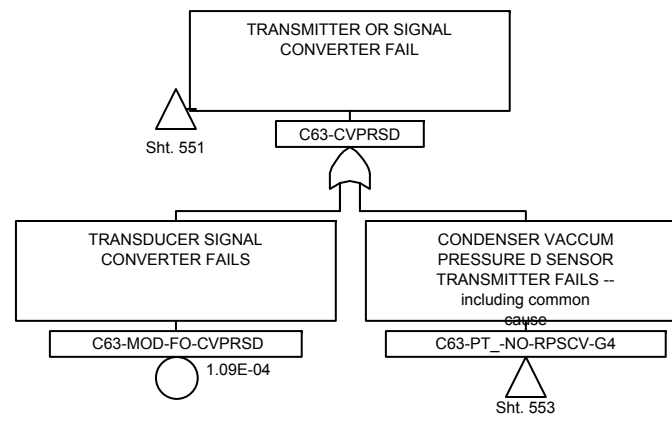


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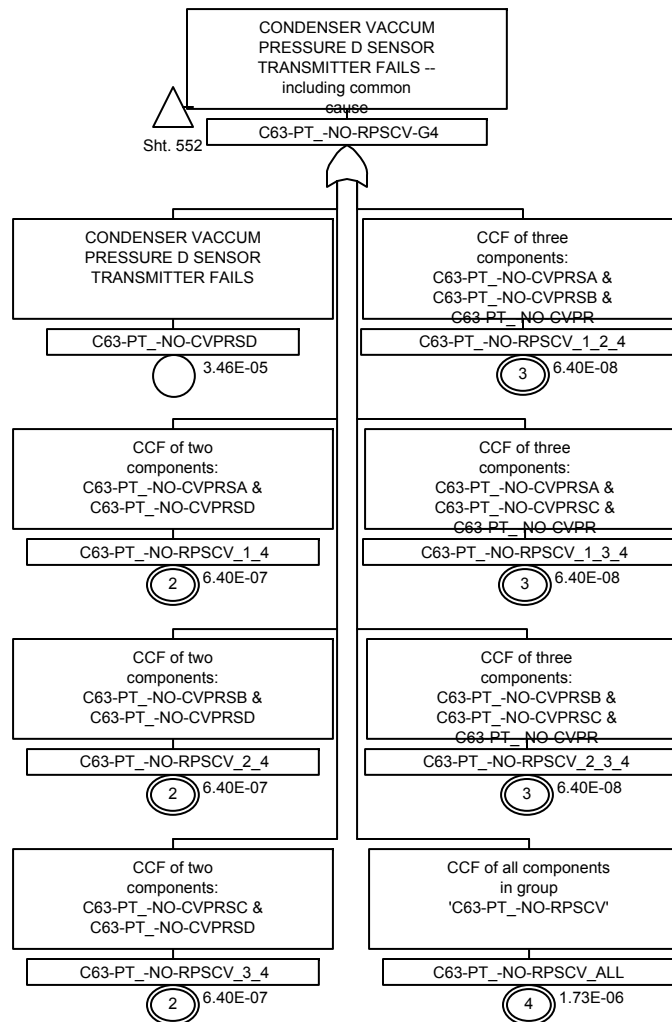


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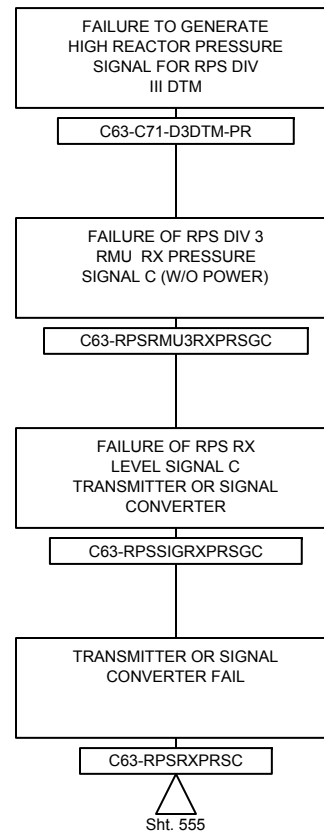


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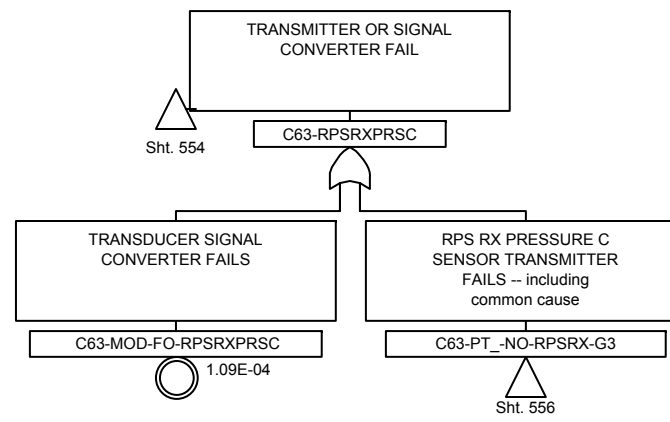


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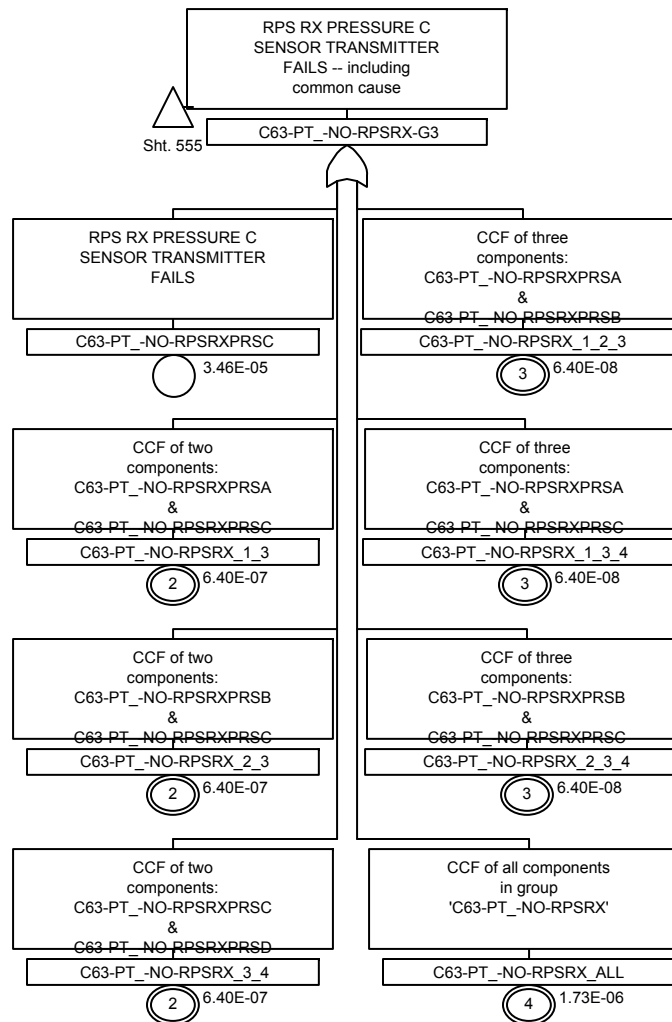


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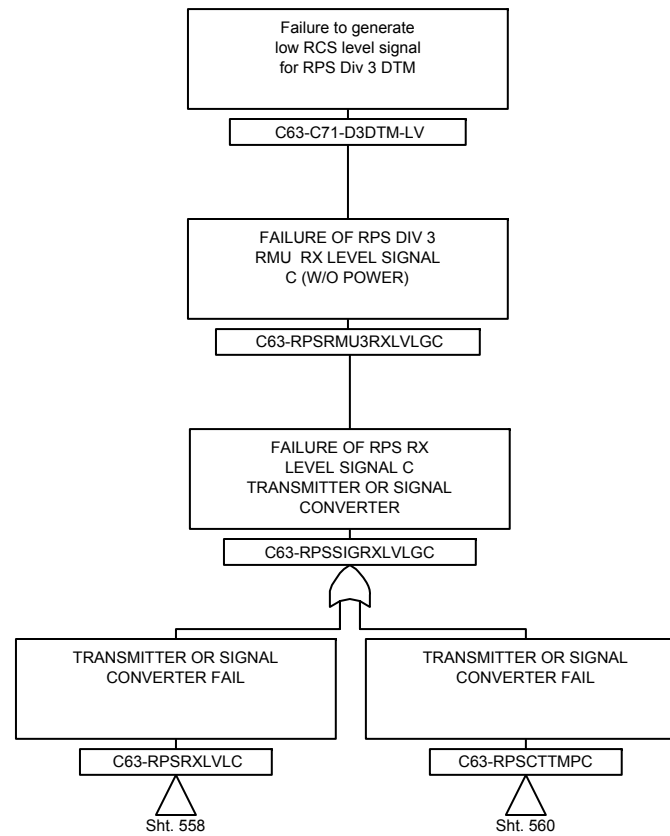


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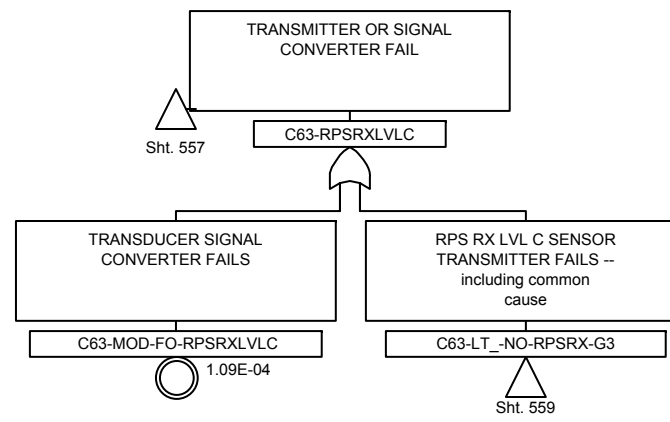


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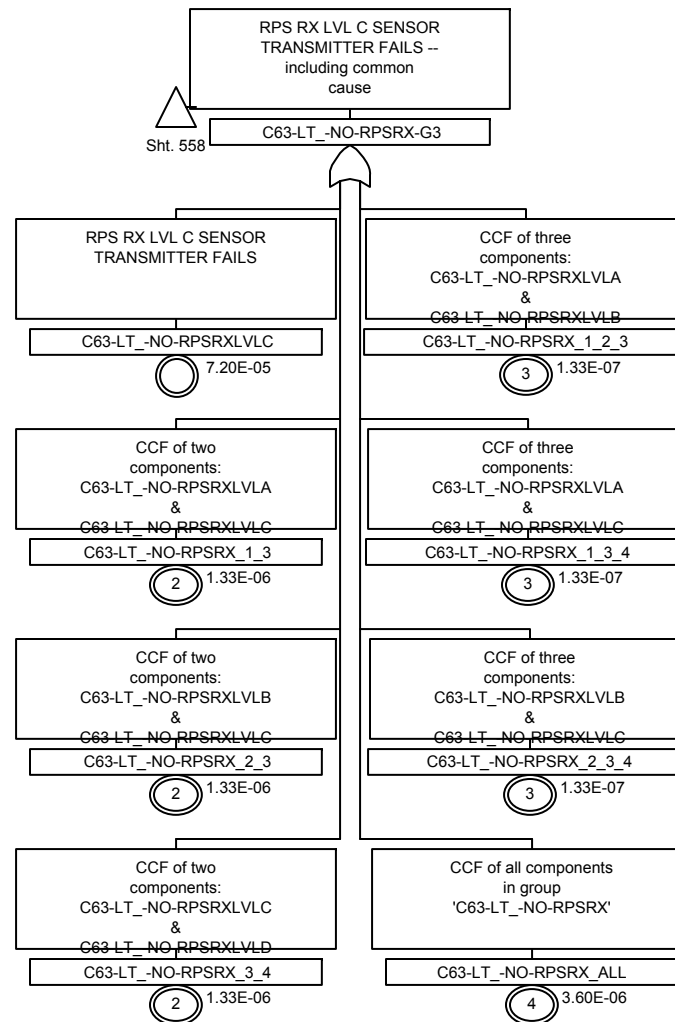


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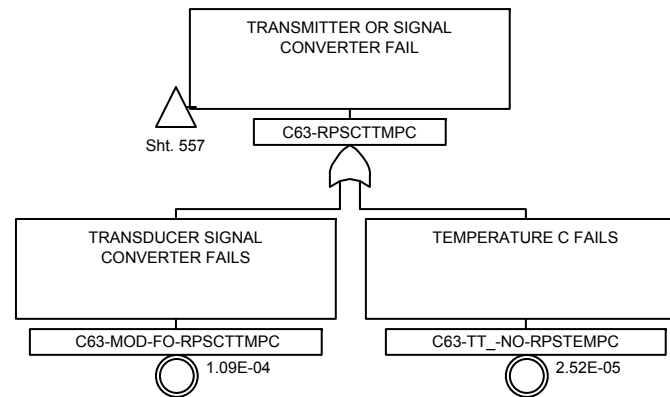


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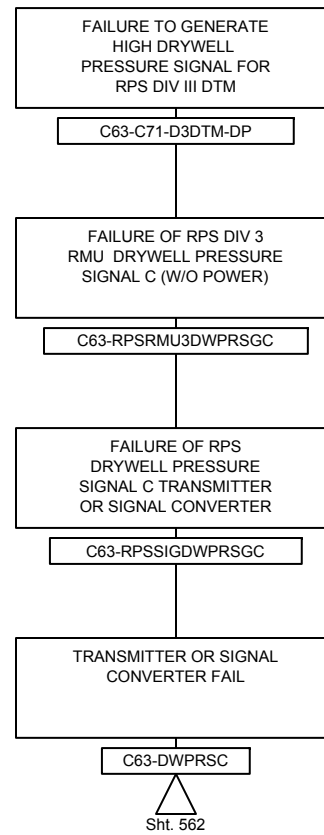


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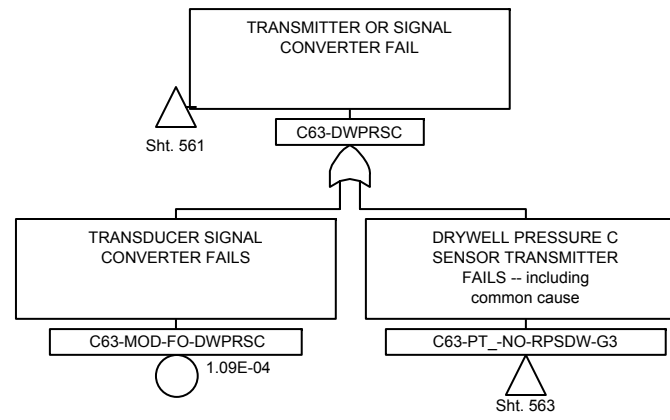


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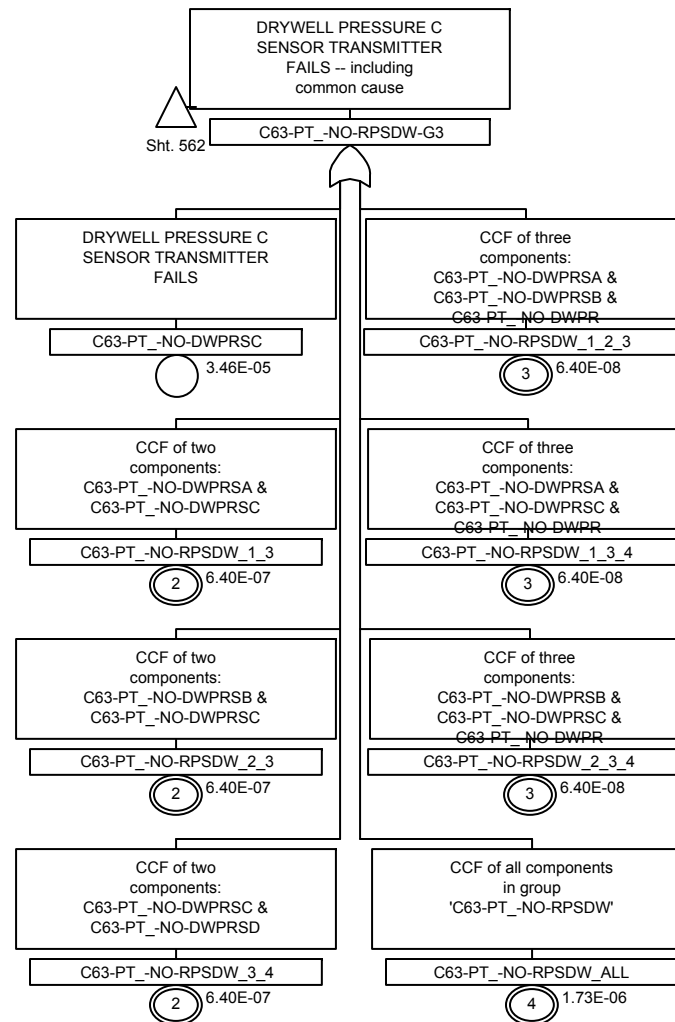


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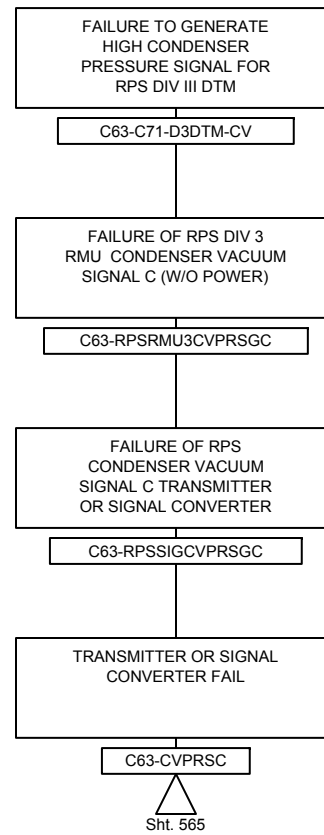


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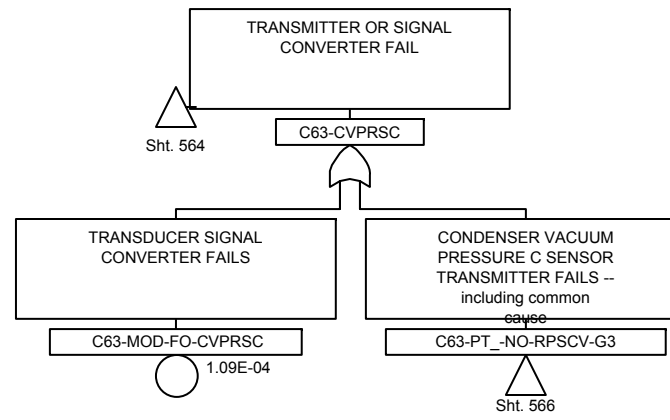


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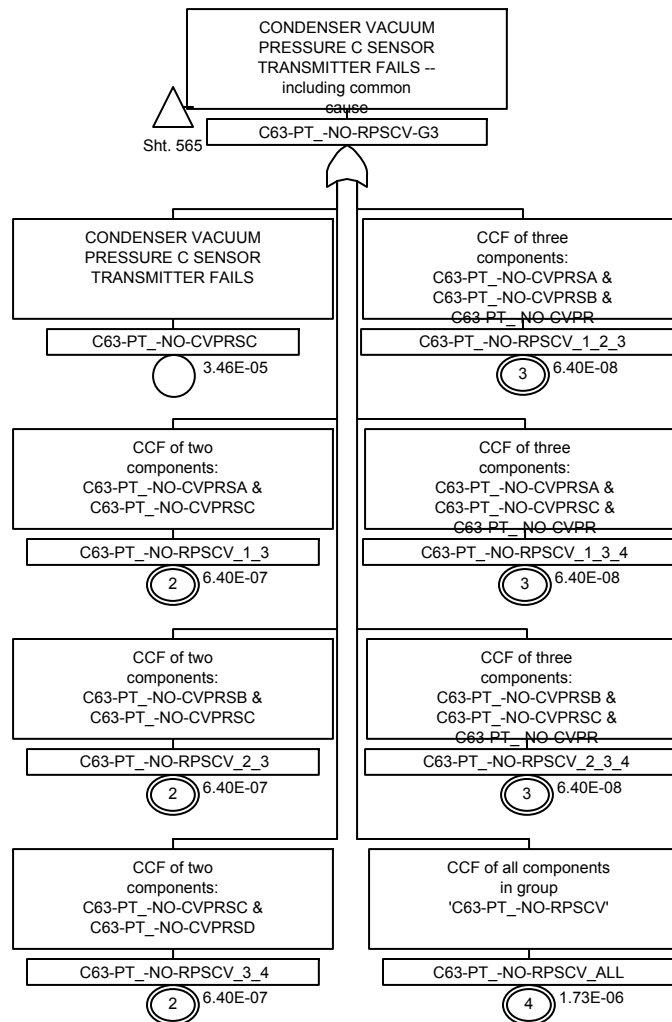


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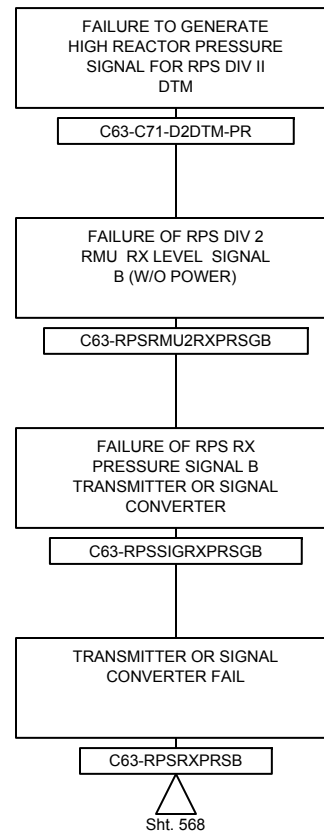


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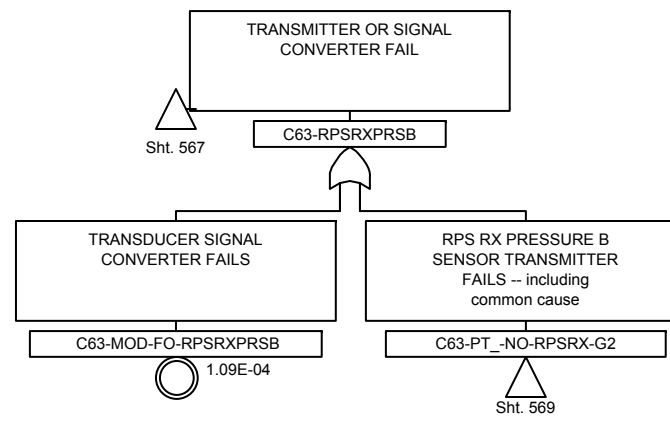


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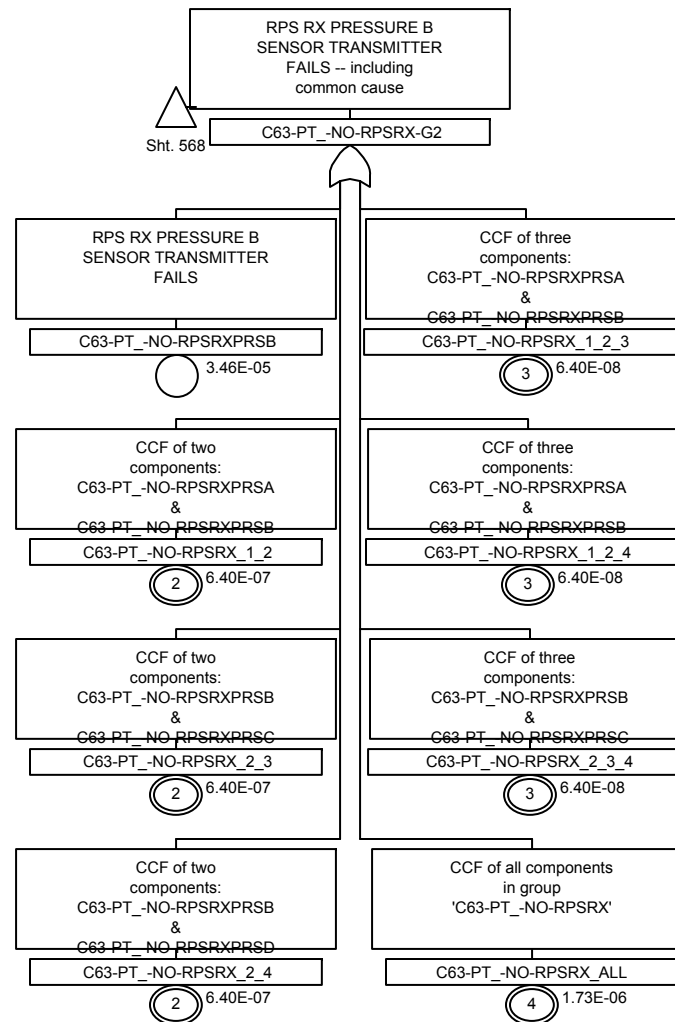


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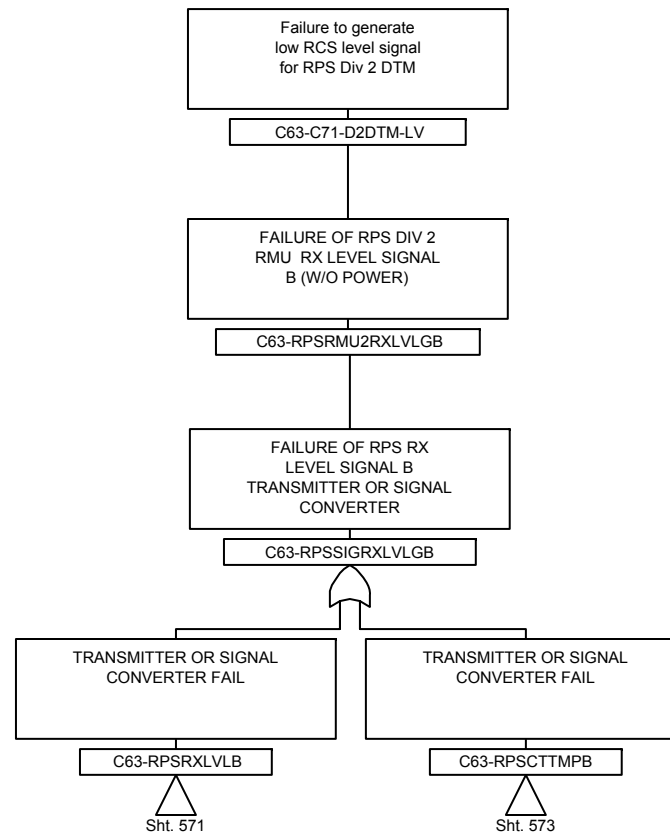


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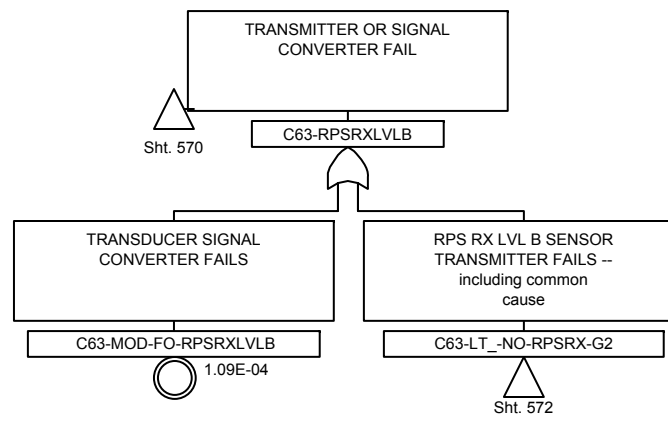


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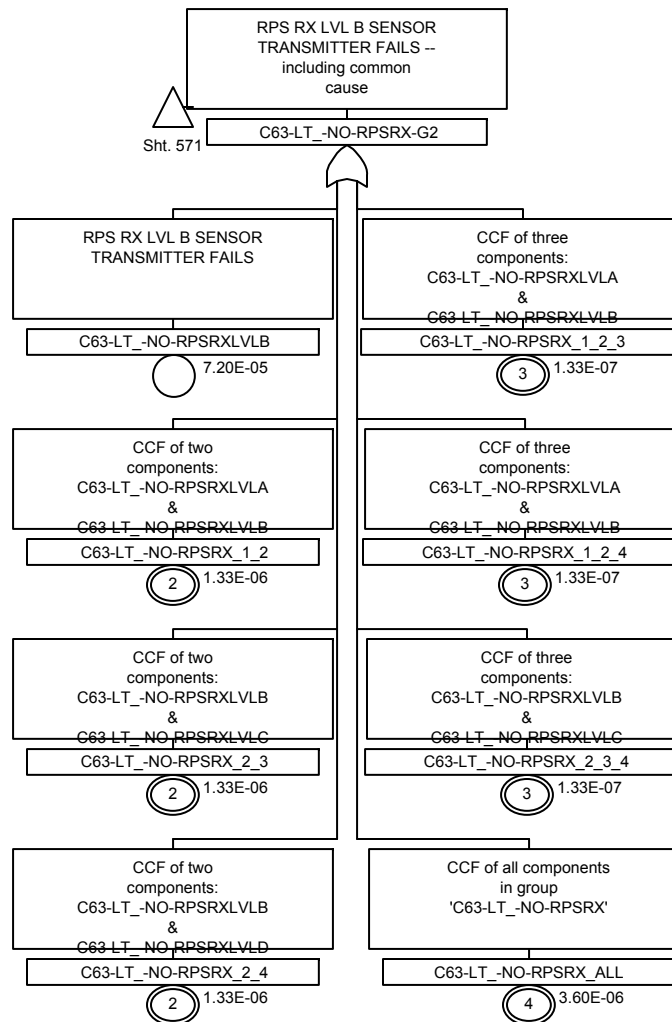


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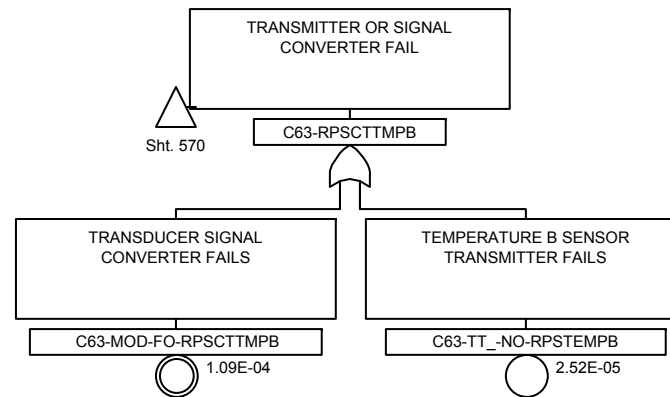


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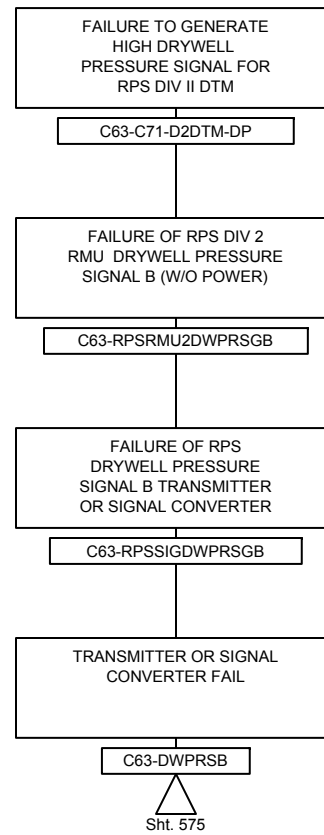


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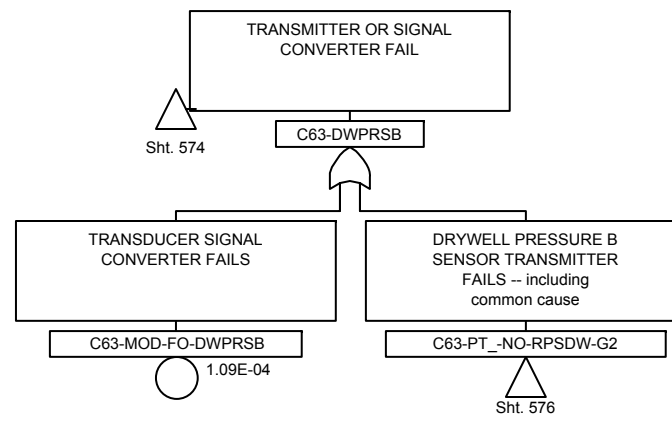


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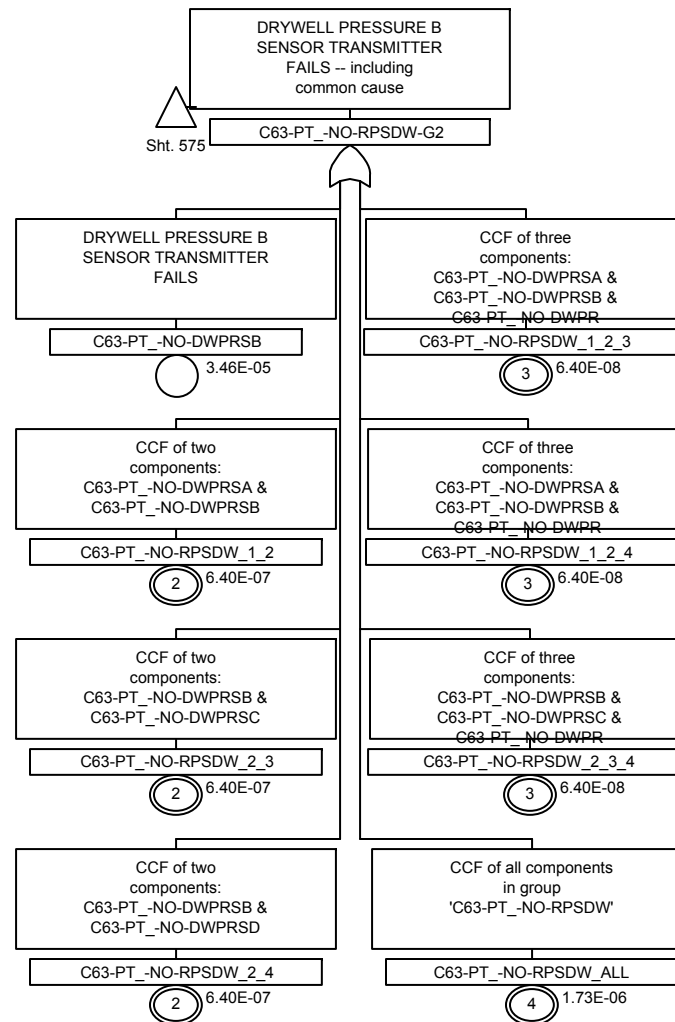


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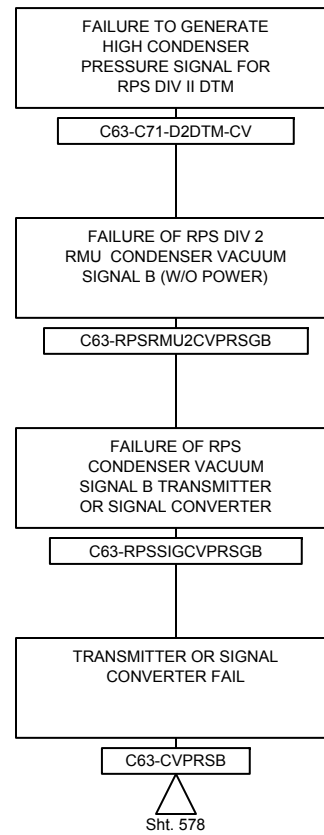


Figure 4.5-3b. Sheet 577 Q-DCIS Safety Related Control System

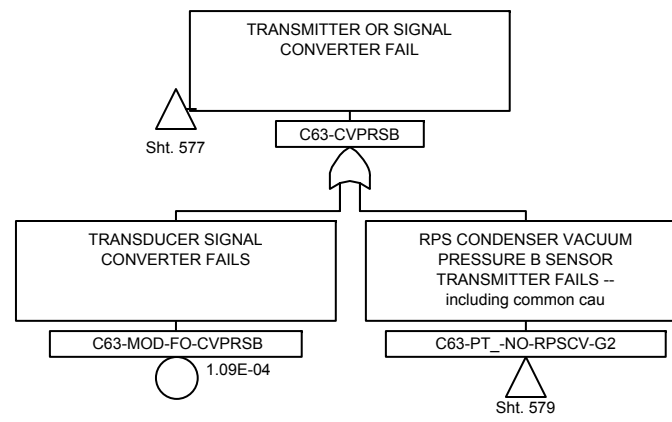


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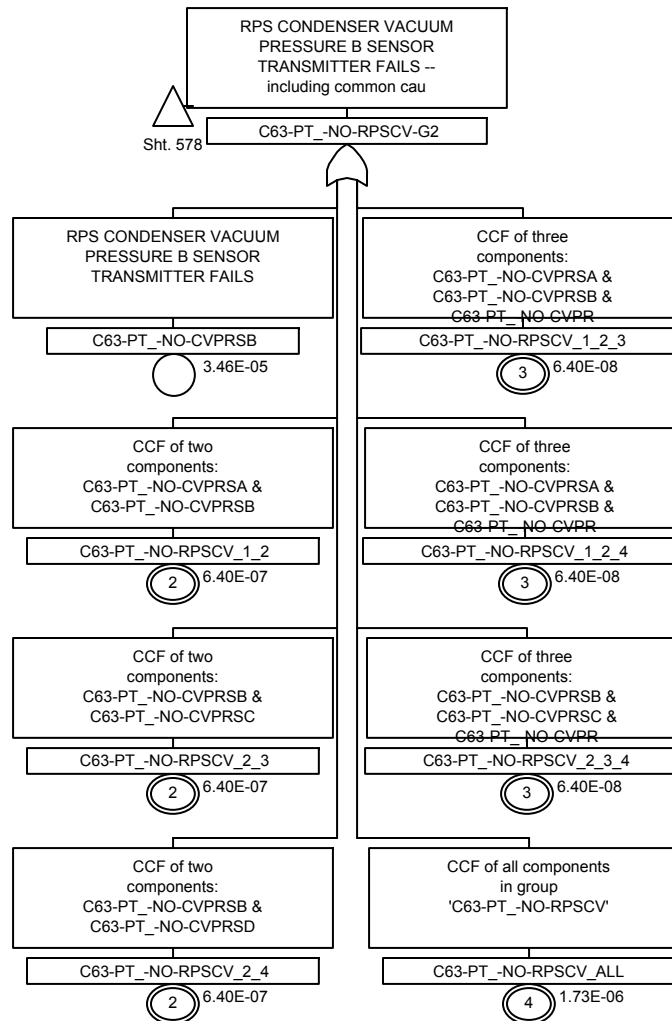


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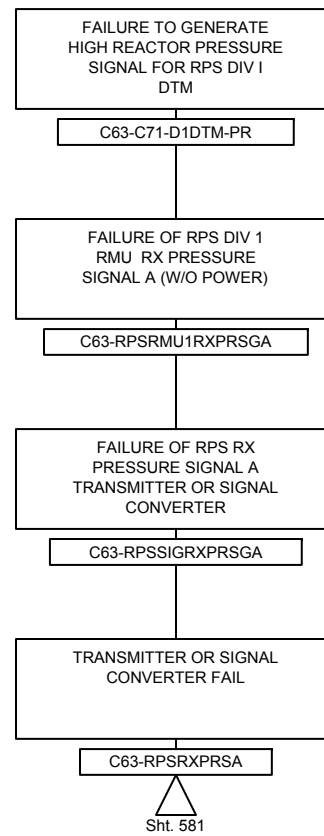


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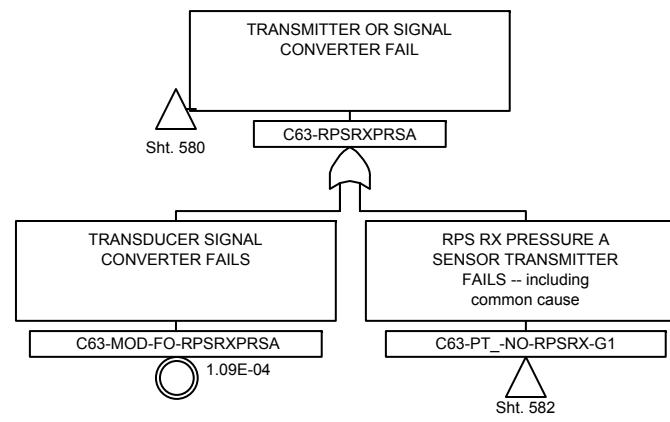


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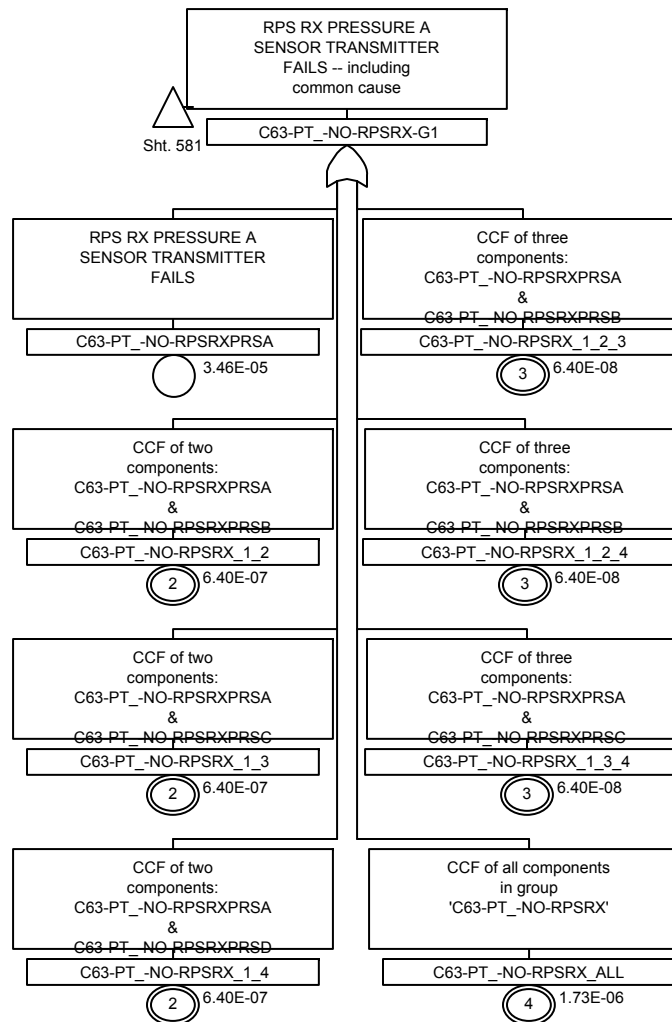


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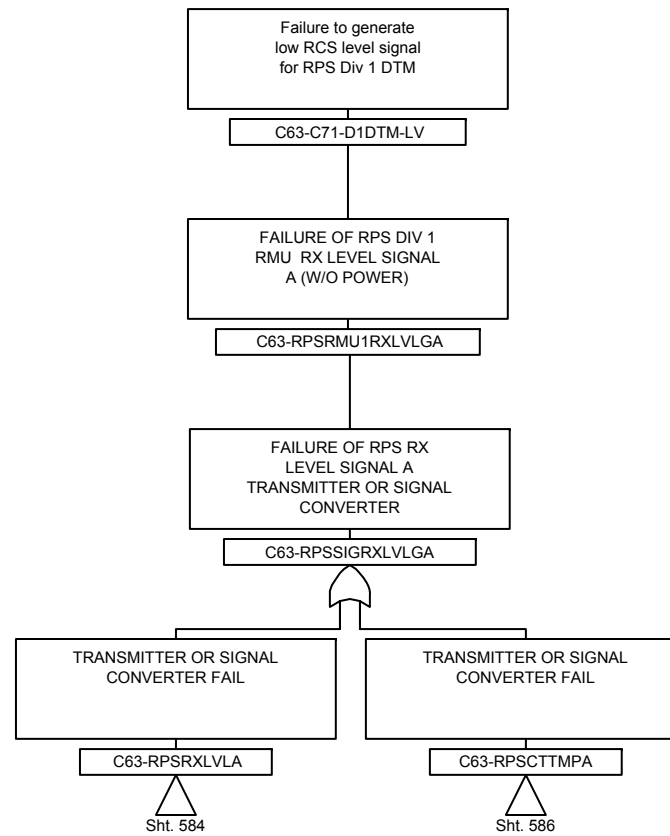


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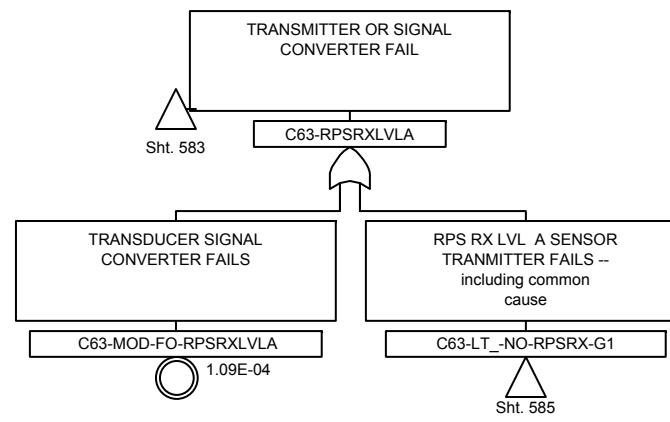


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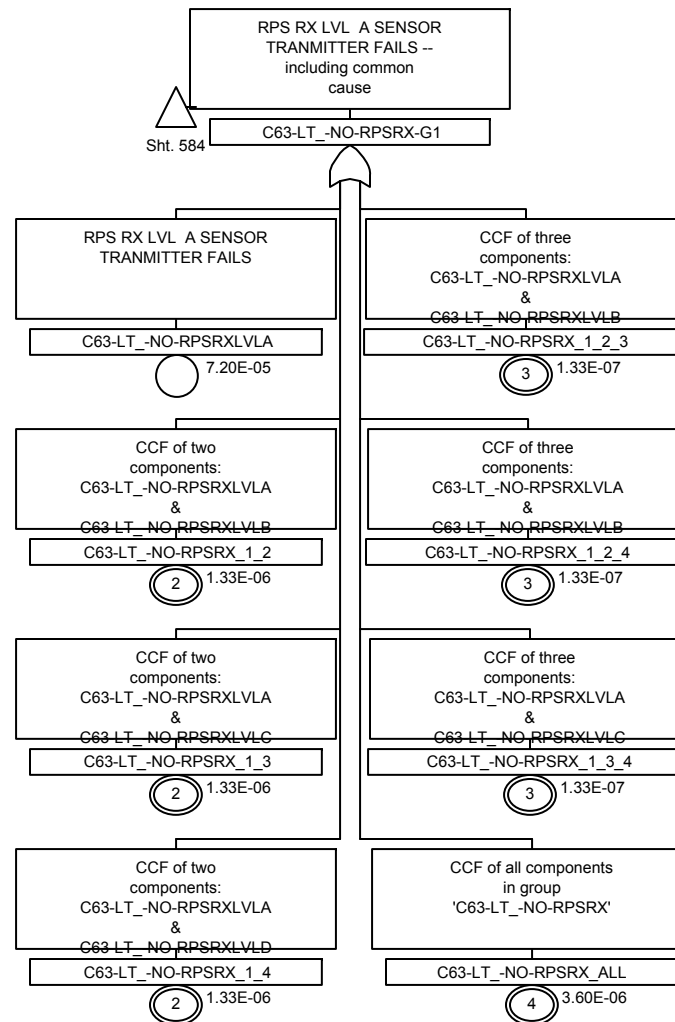


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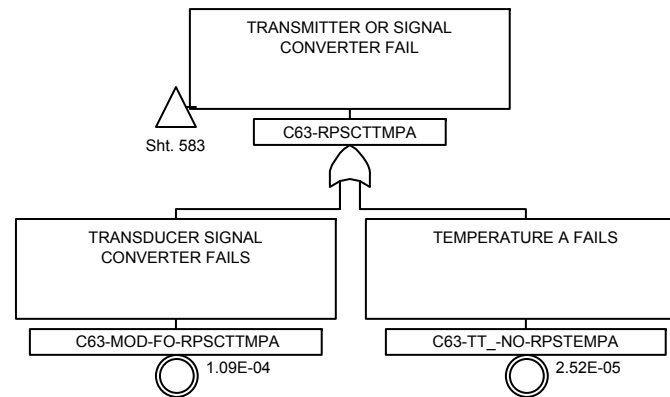


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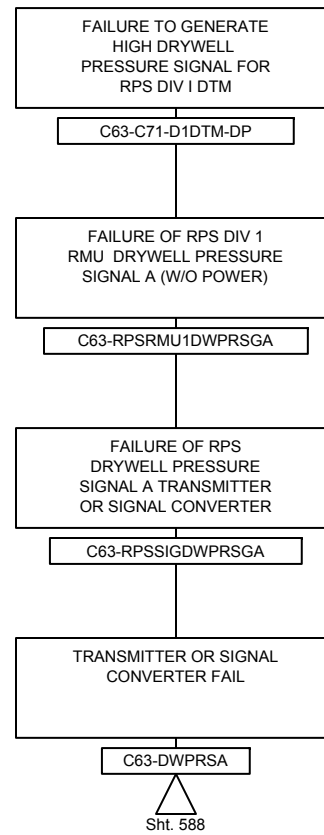


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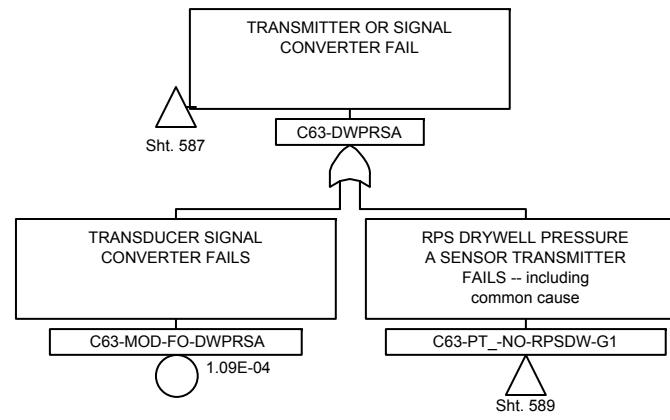


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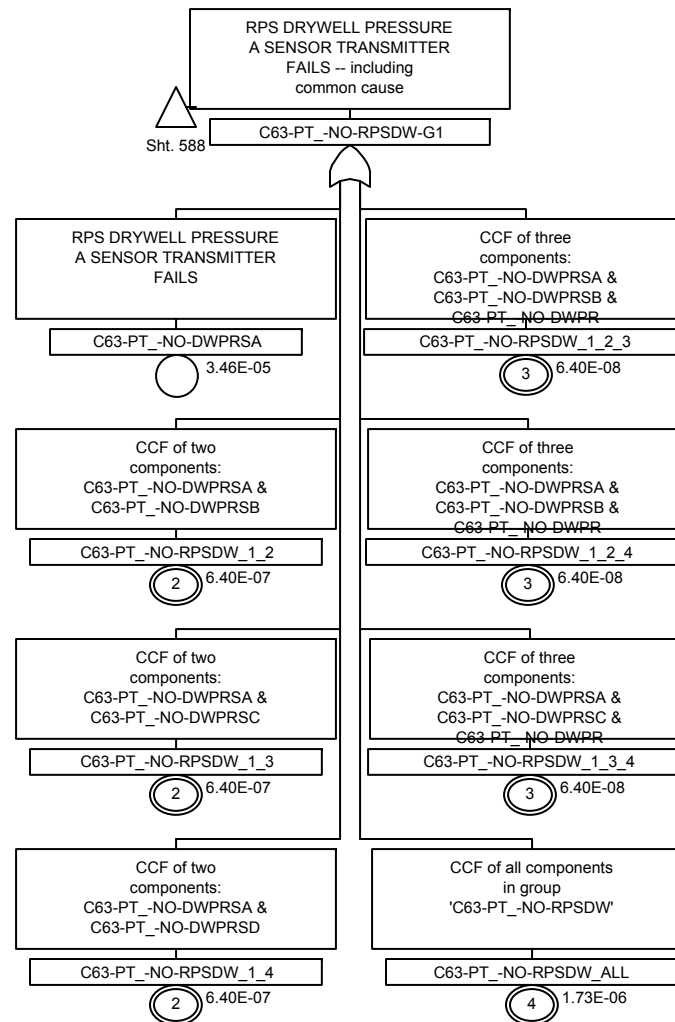


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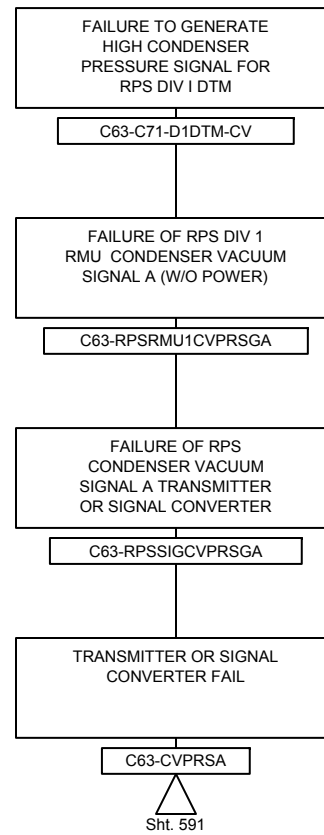


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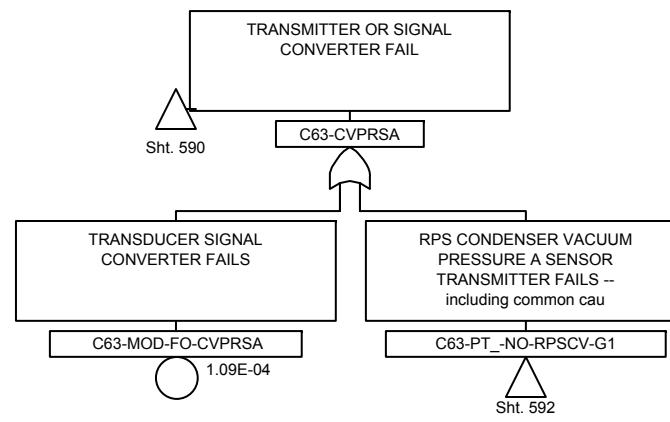


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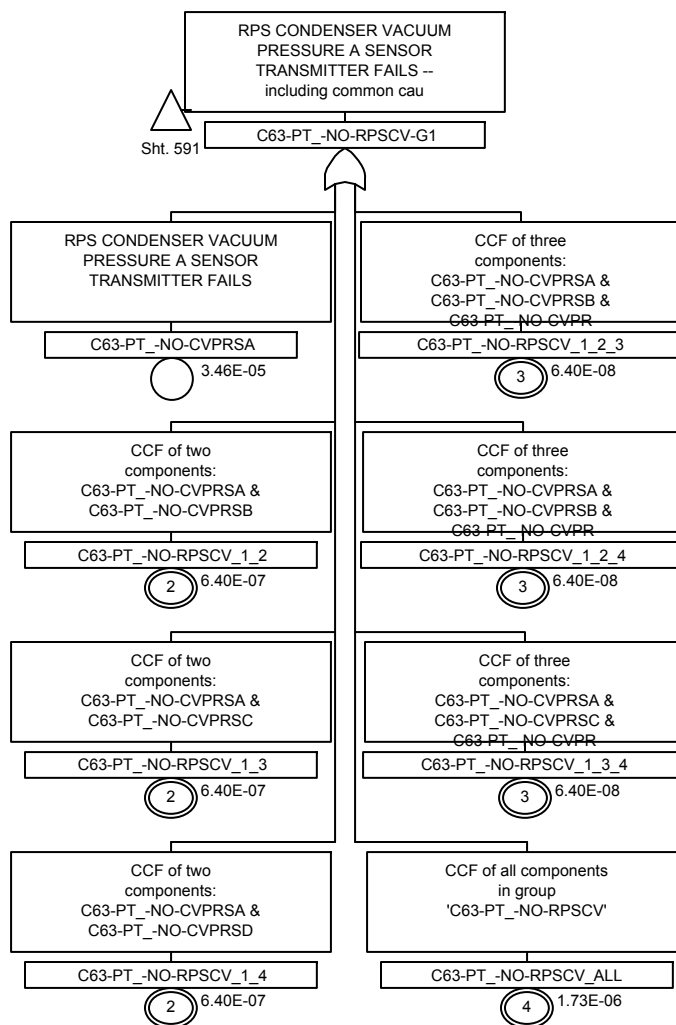


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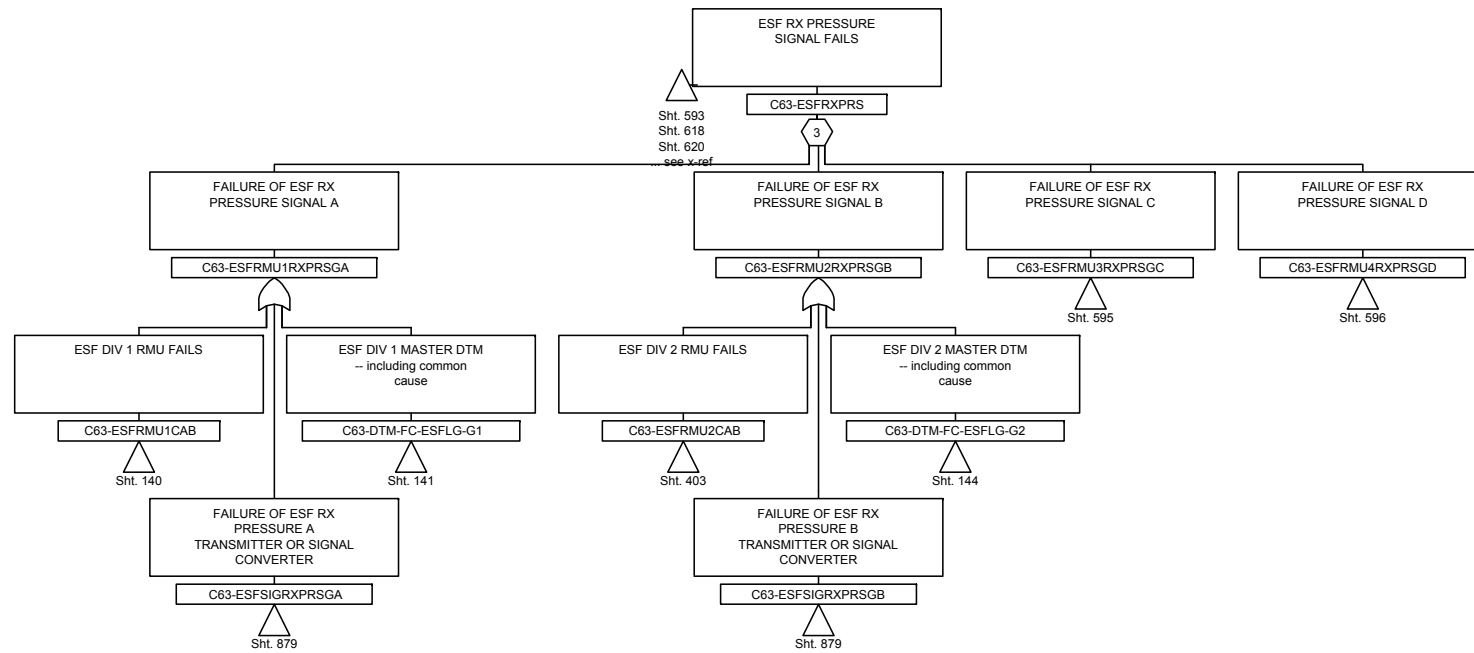


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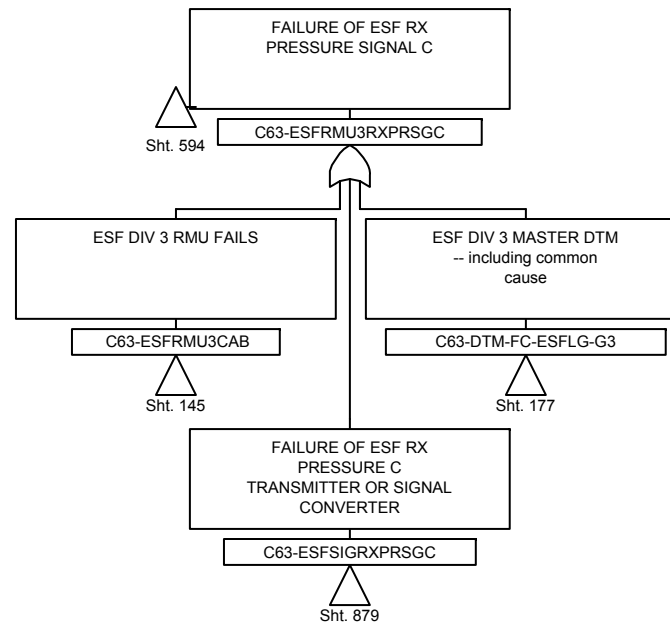


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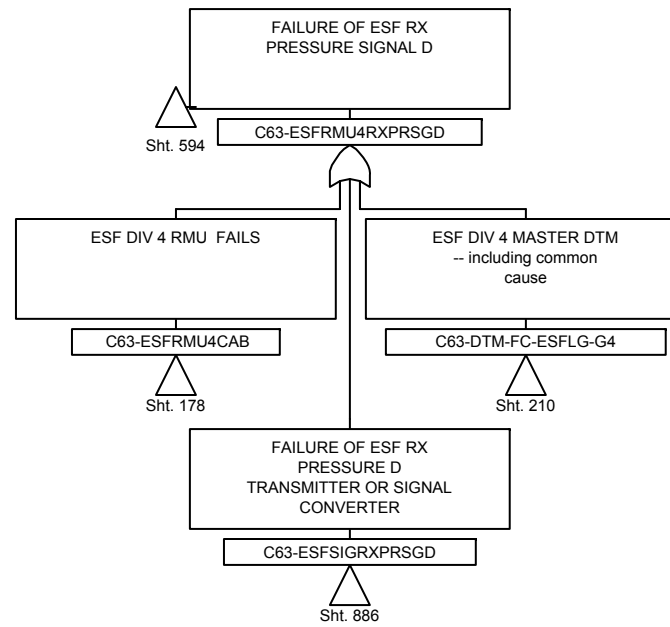


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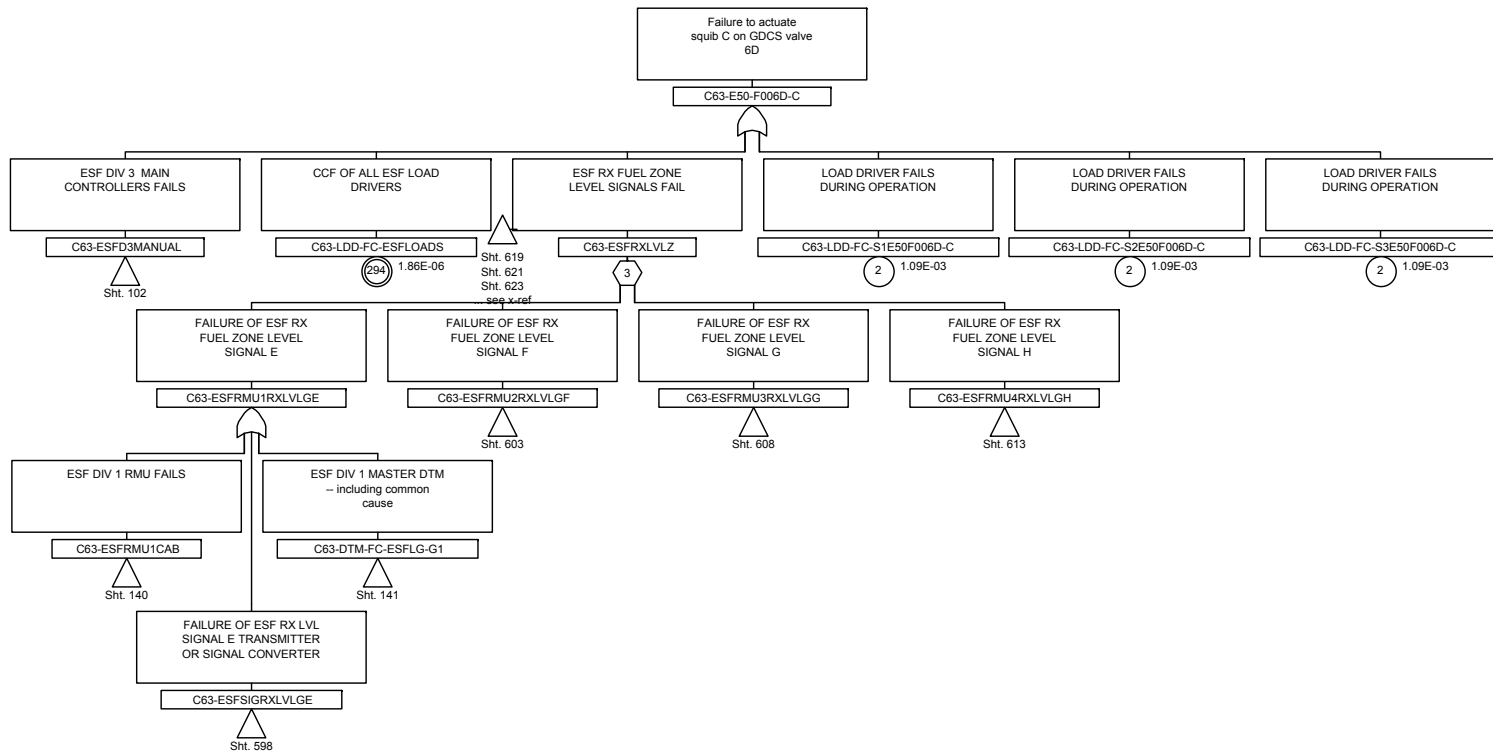


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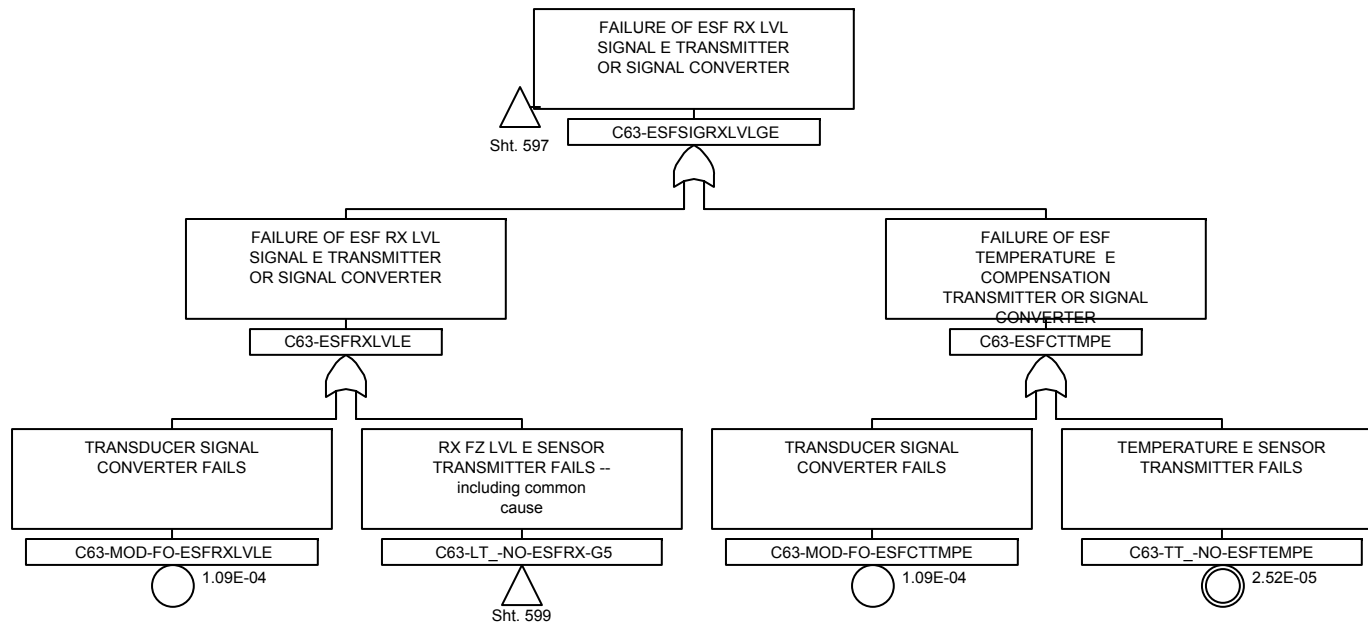


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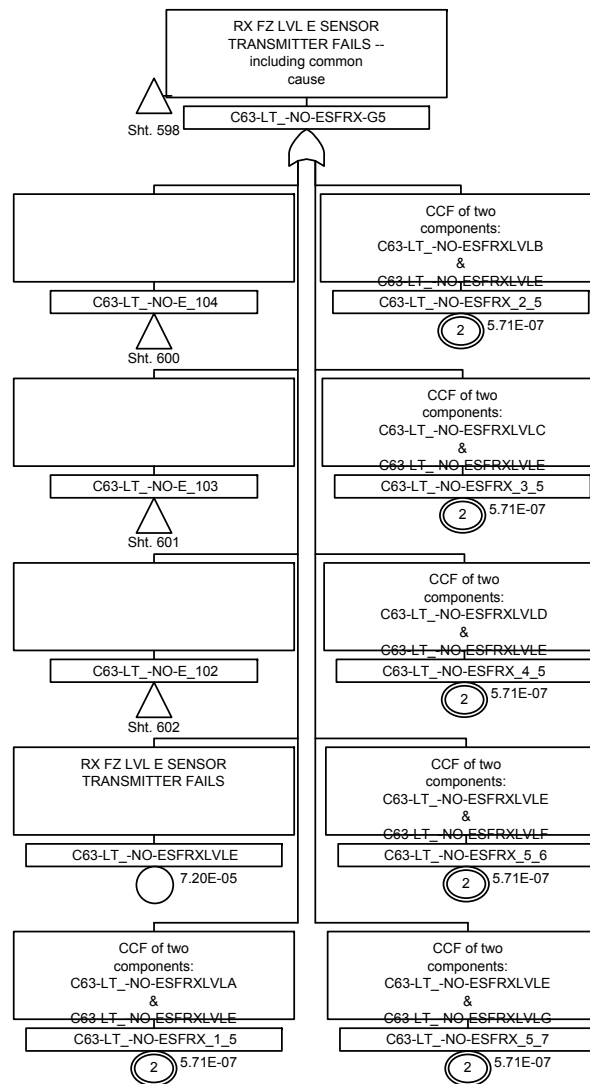


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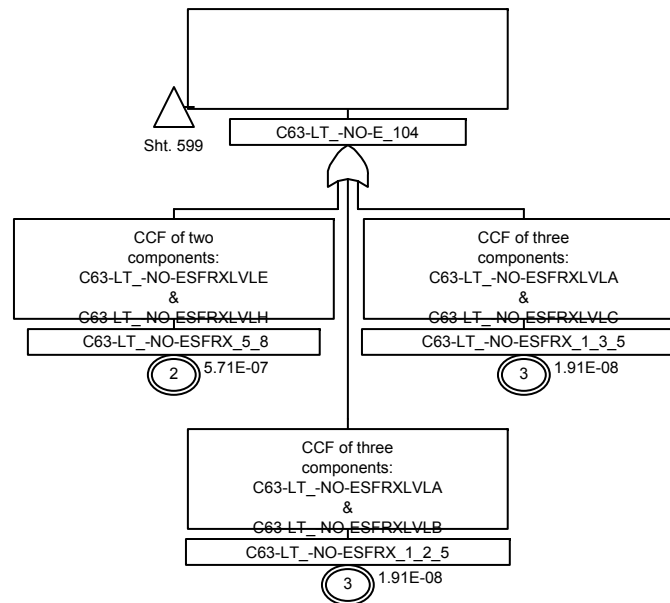


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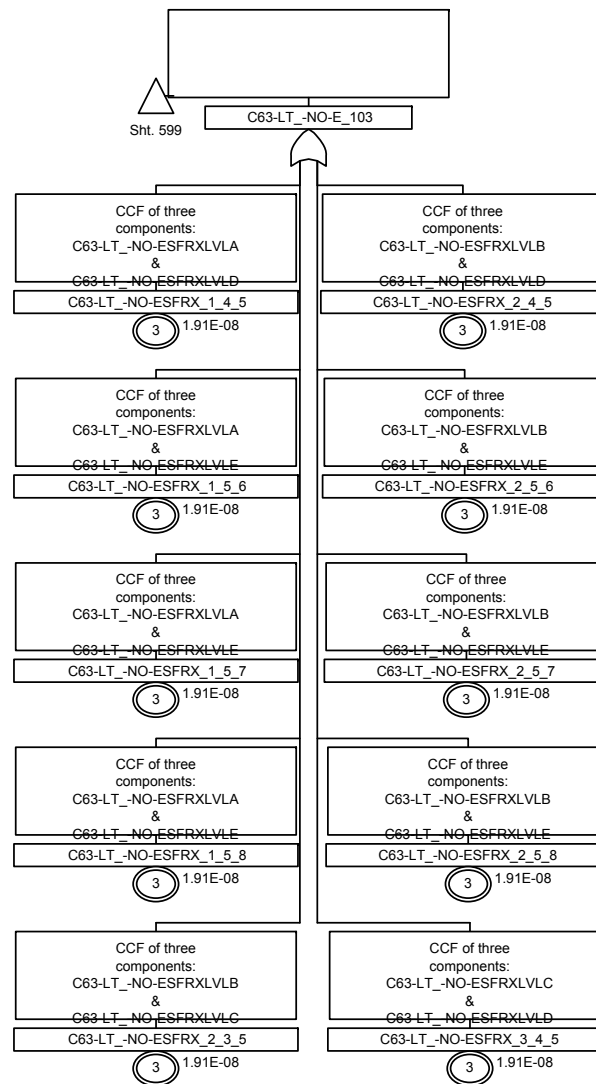


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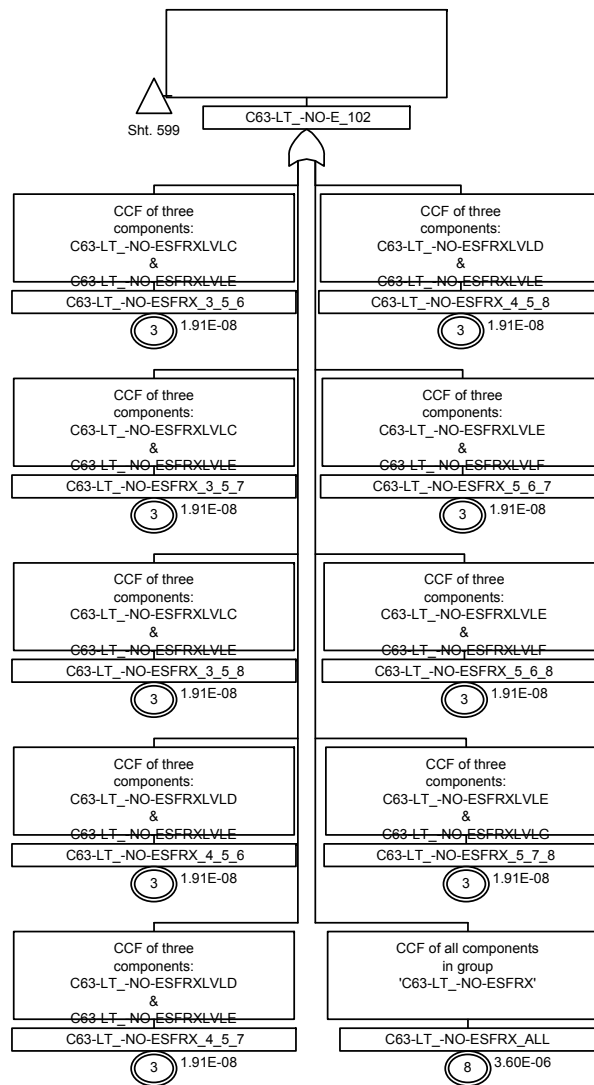


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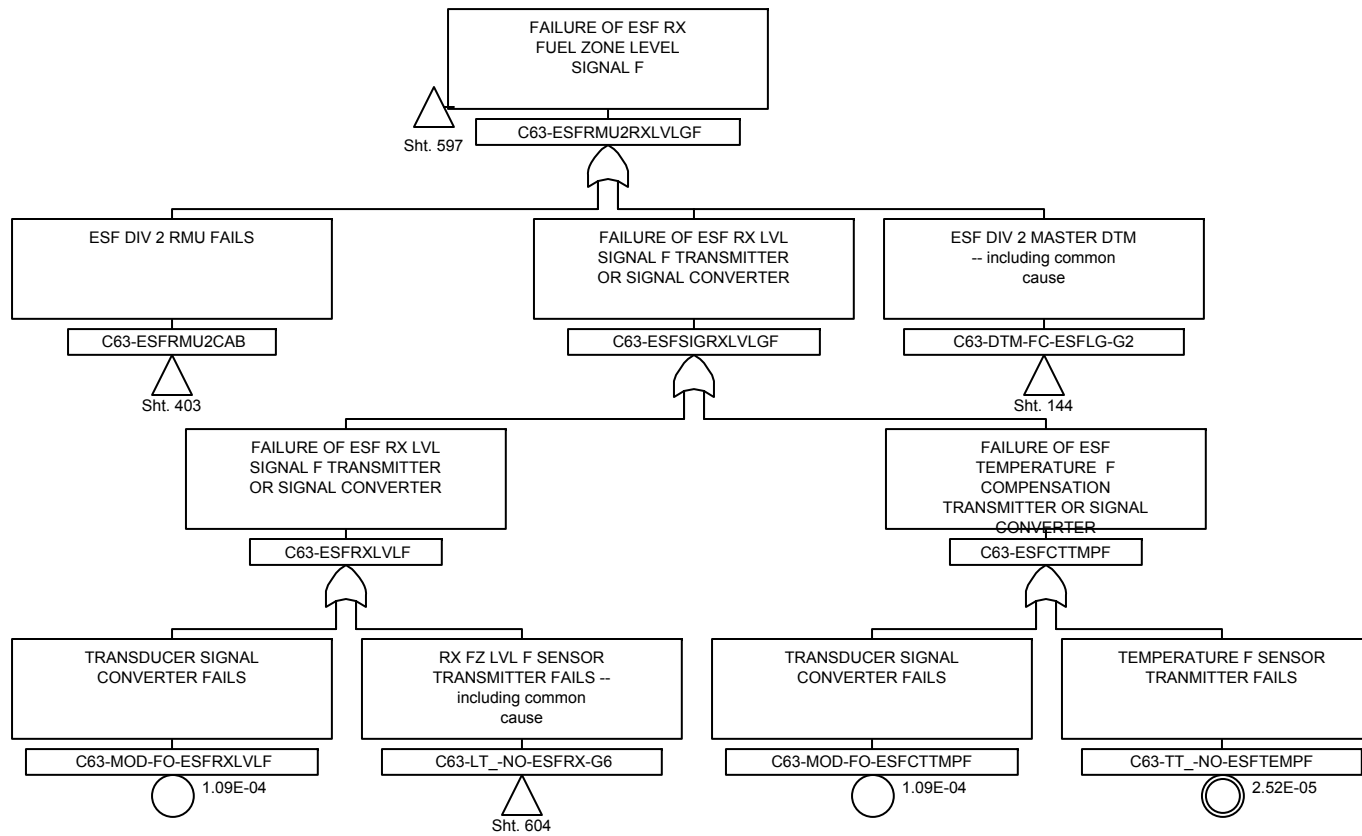


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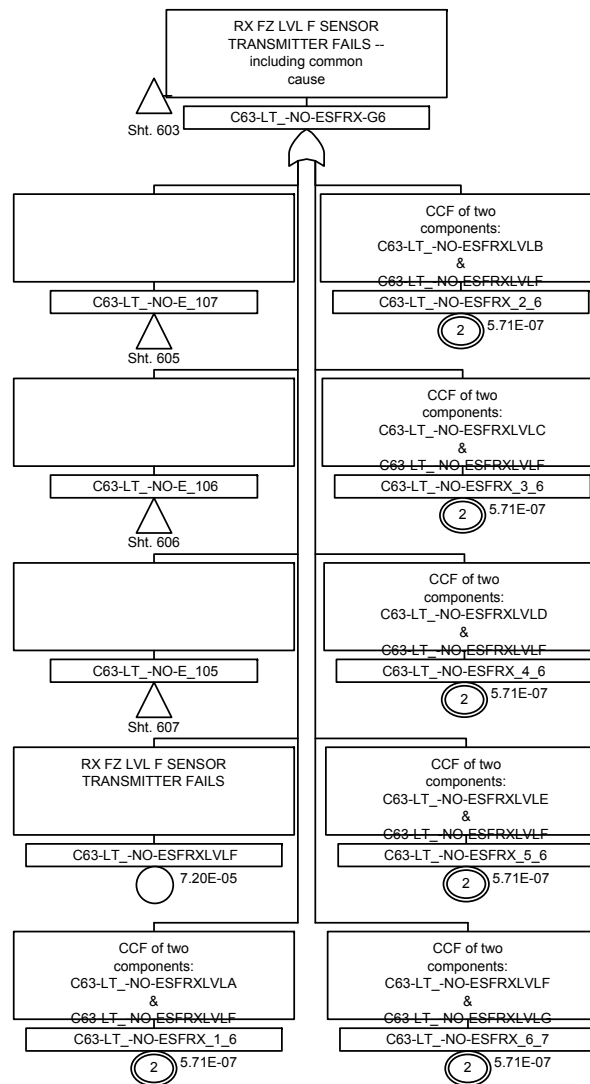


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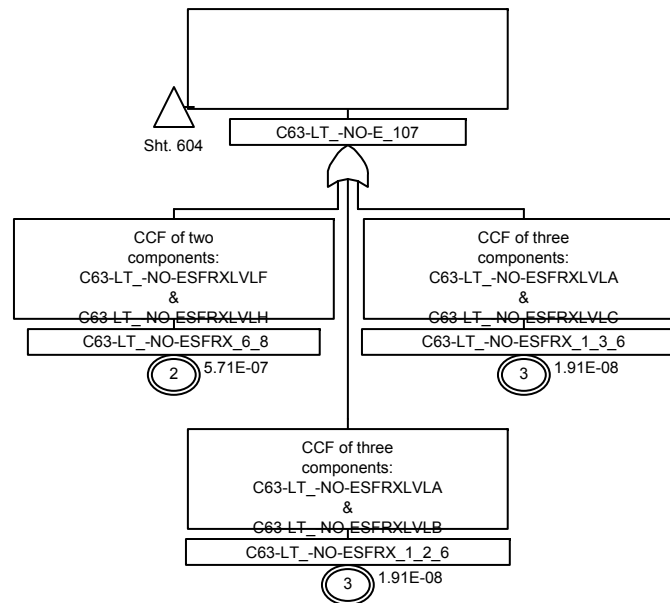


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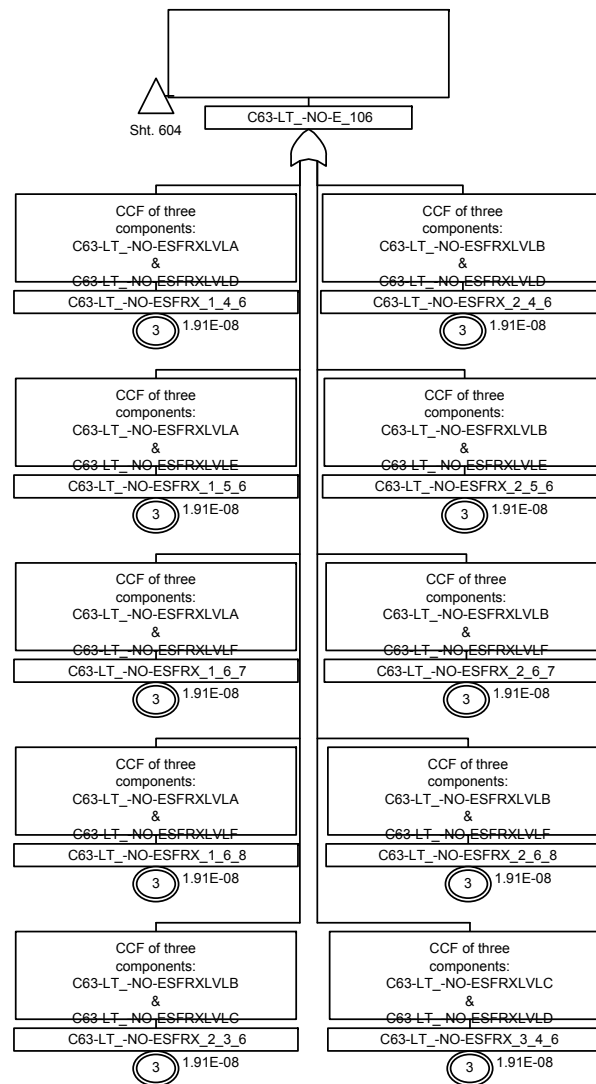


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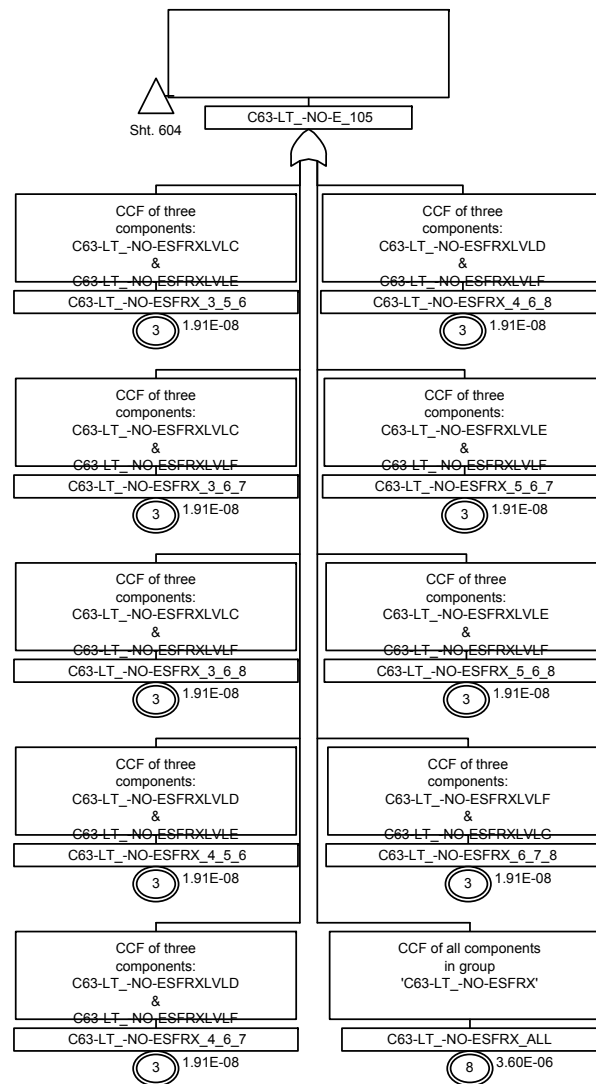


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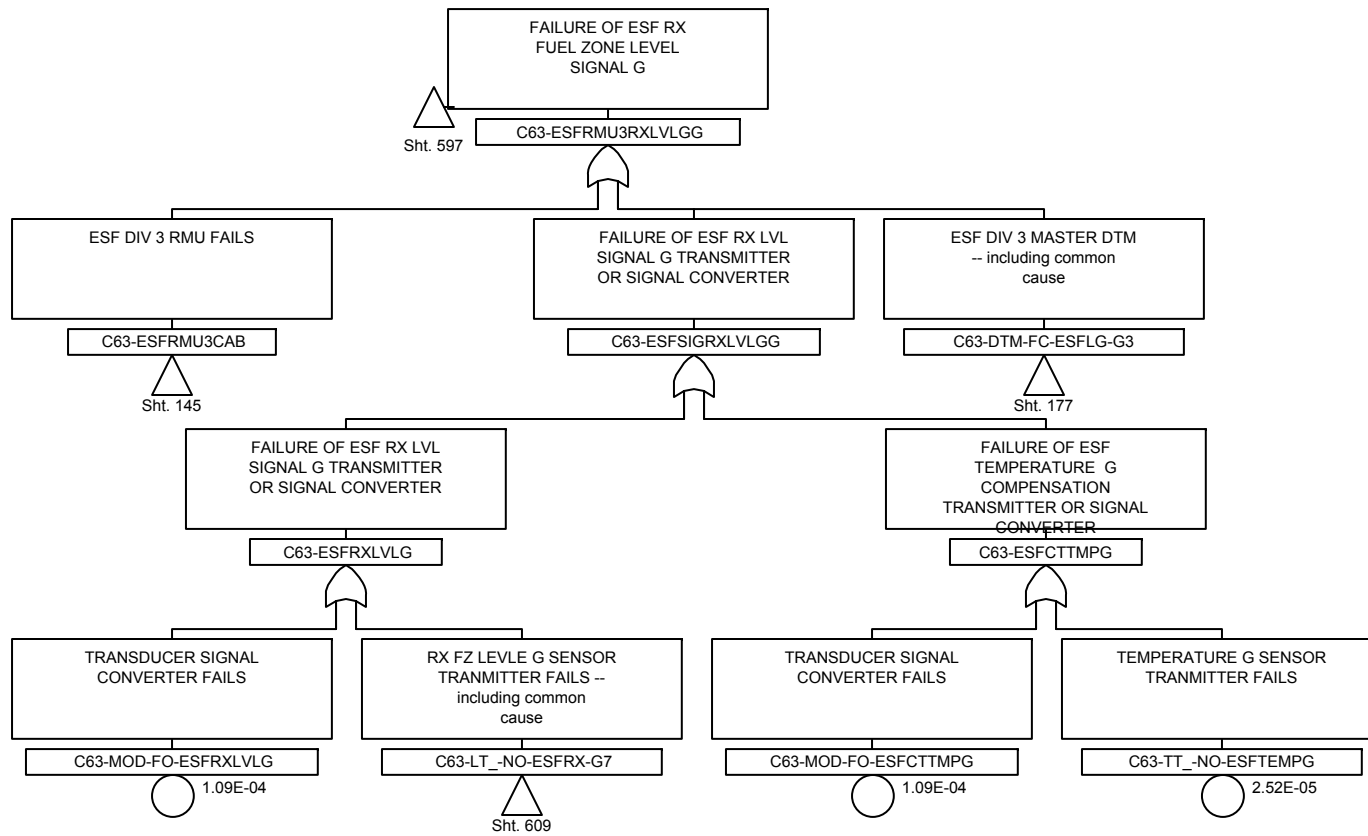


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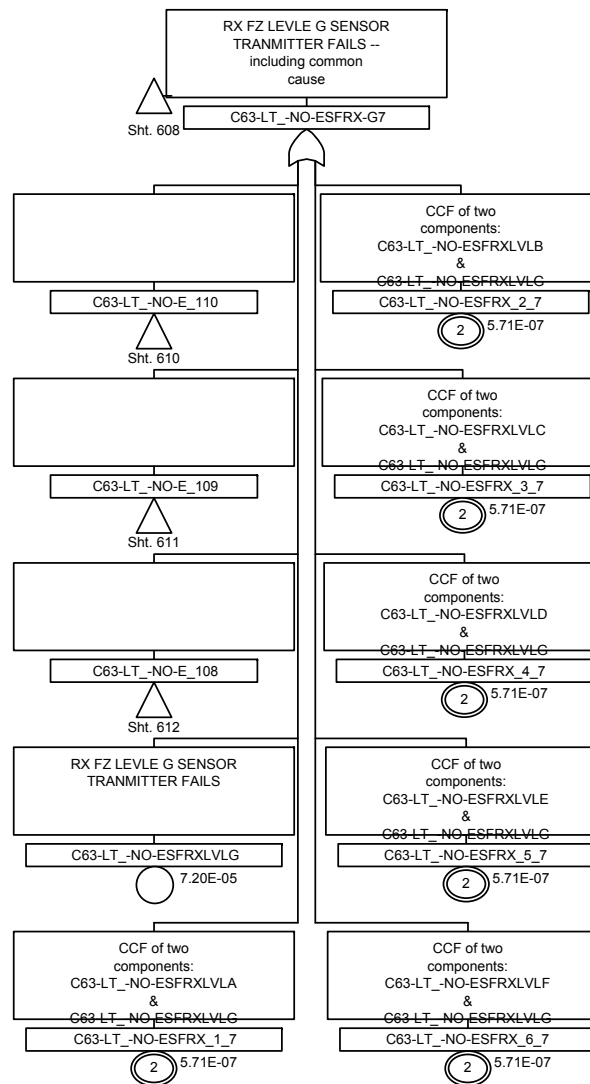


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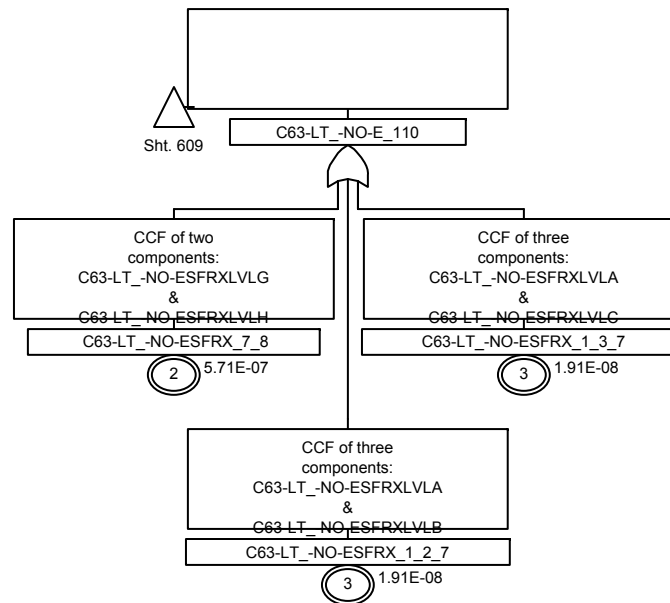


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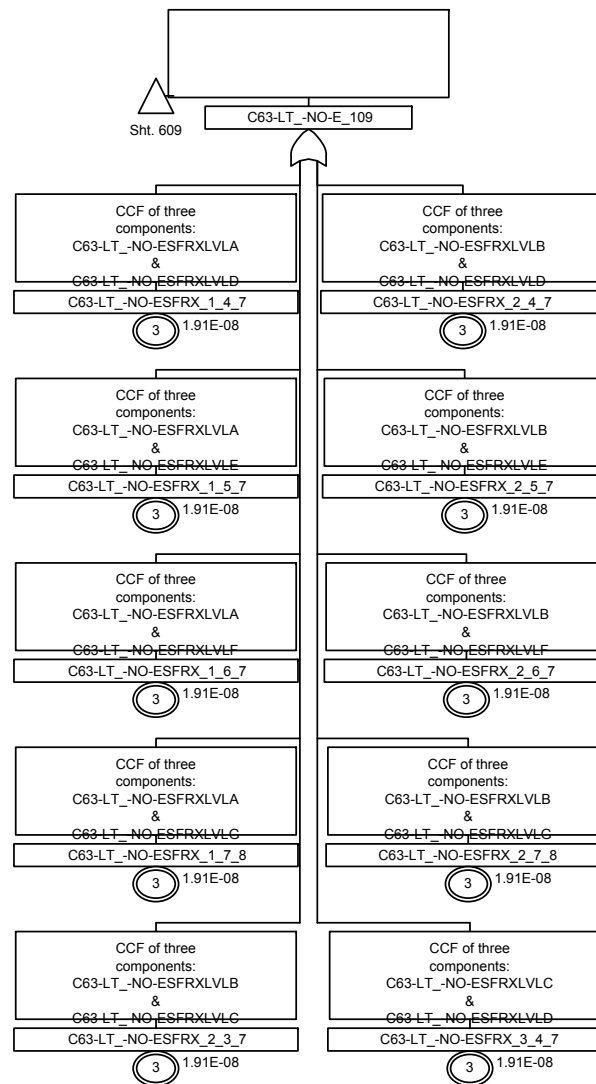


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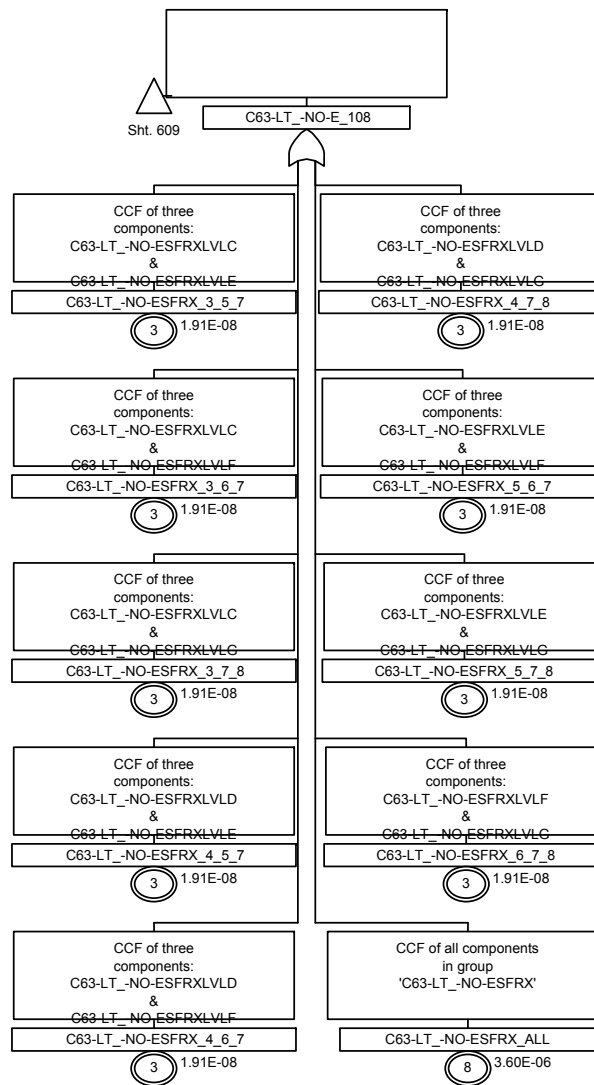


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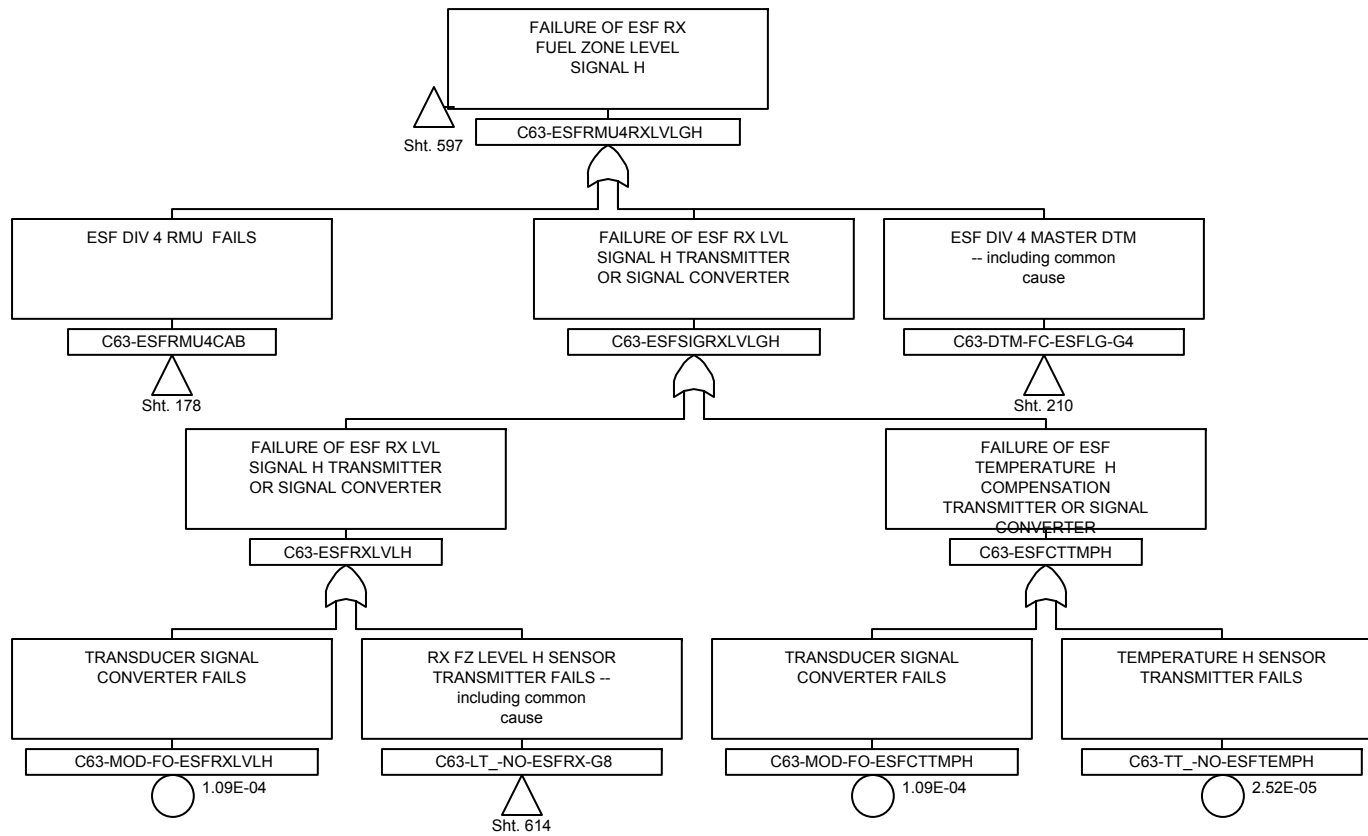


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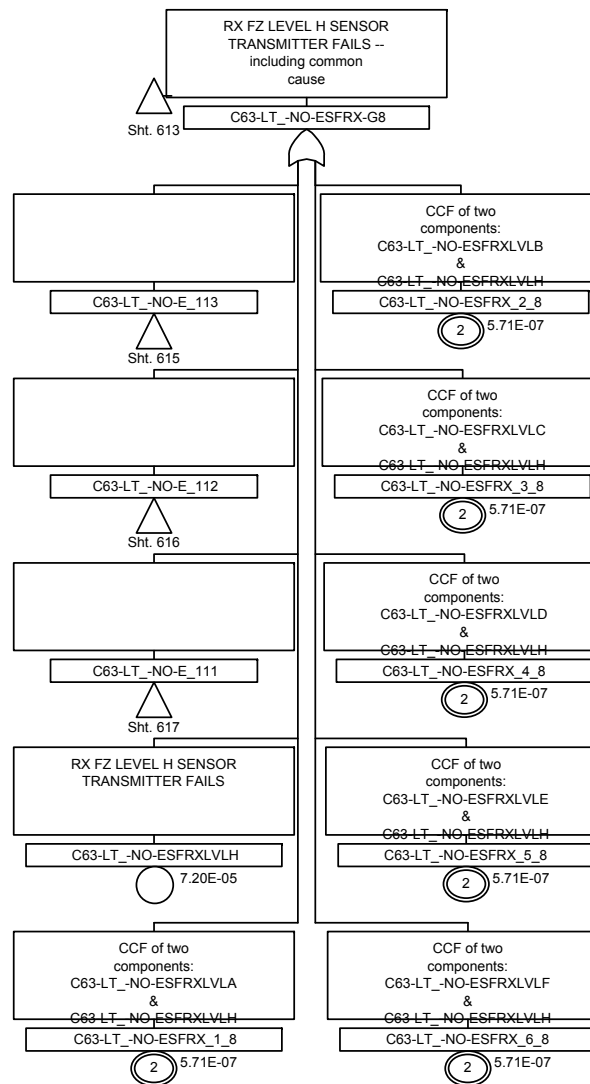


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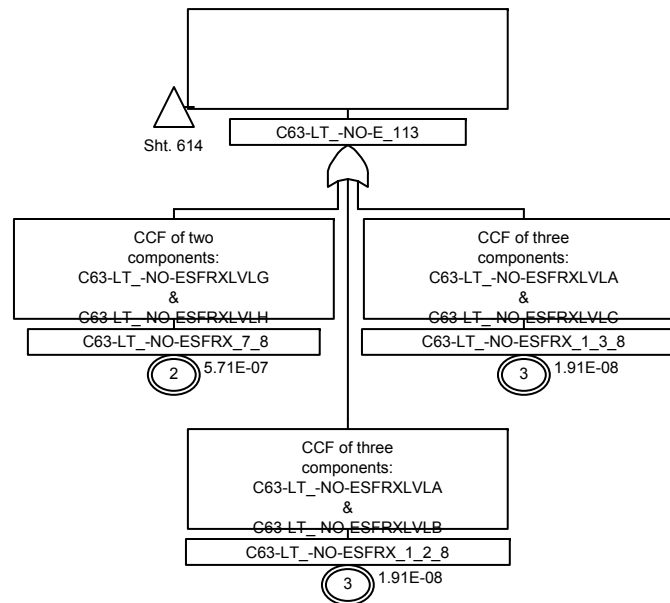


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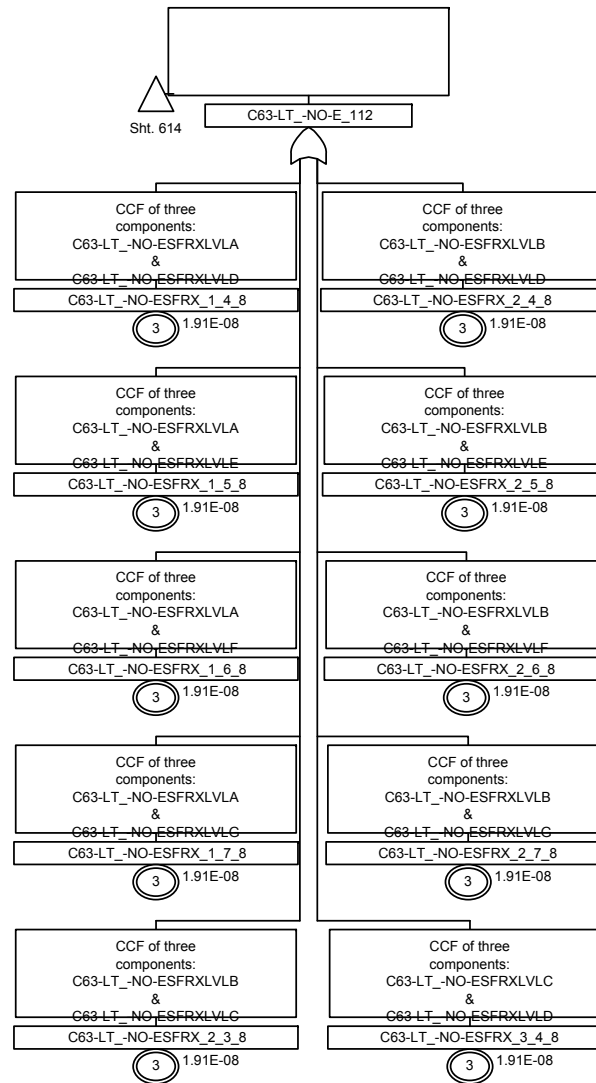


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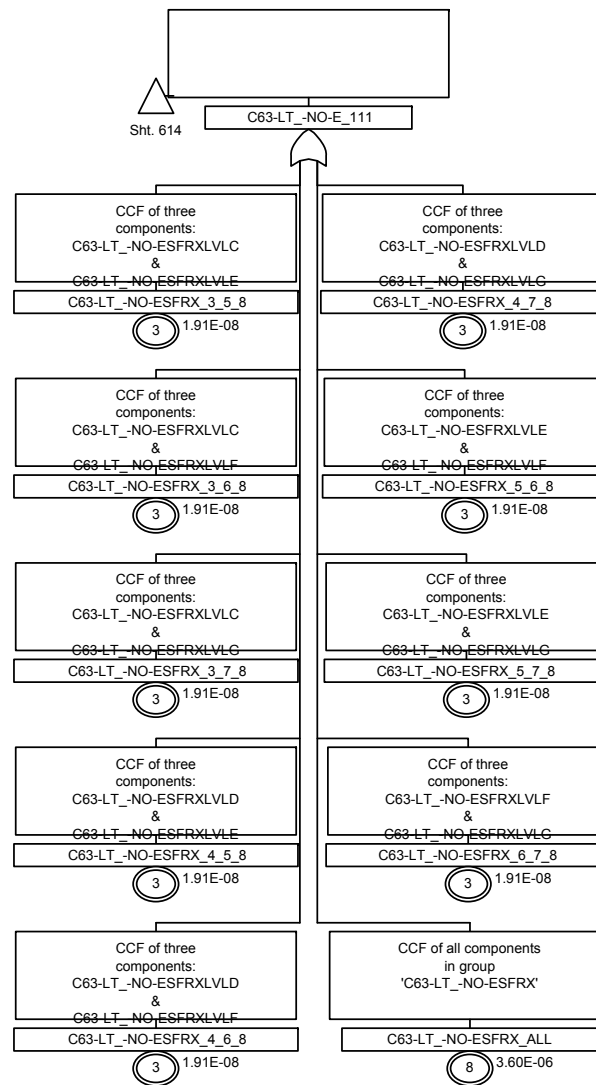


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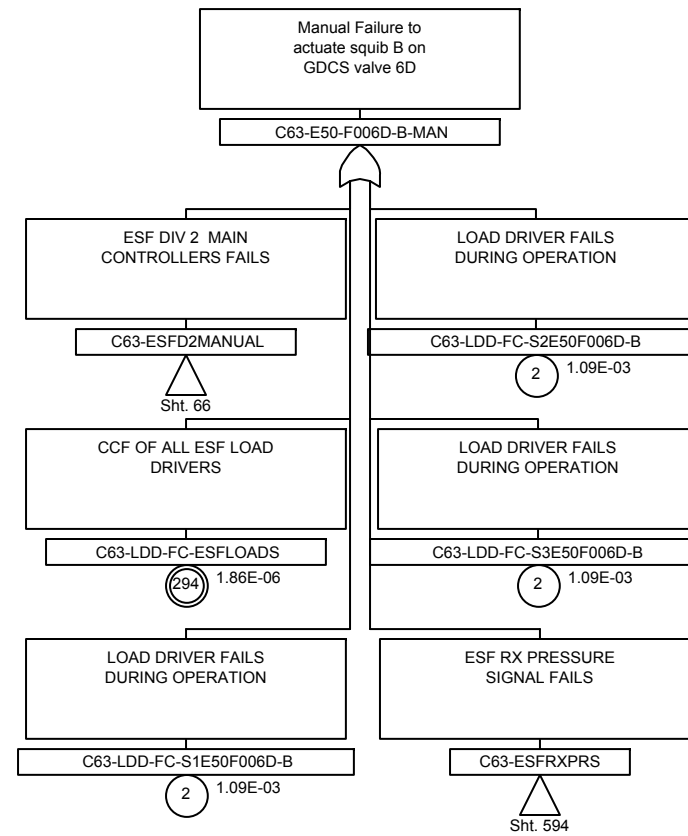


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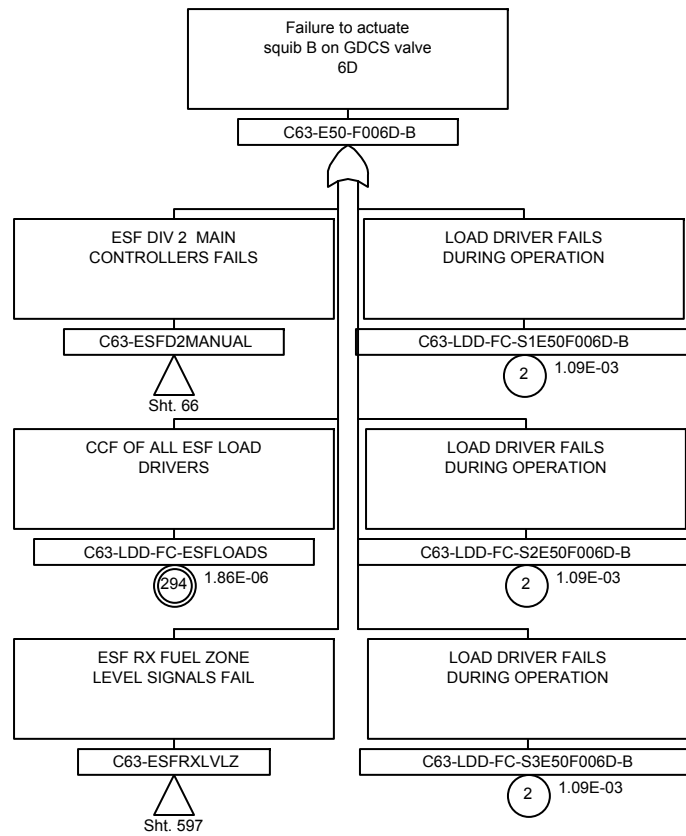


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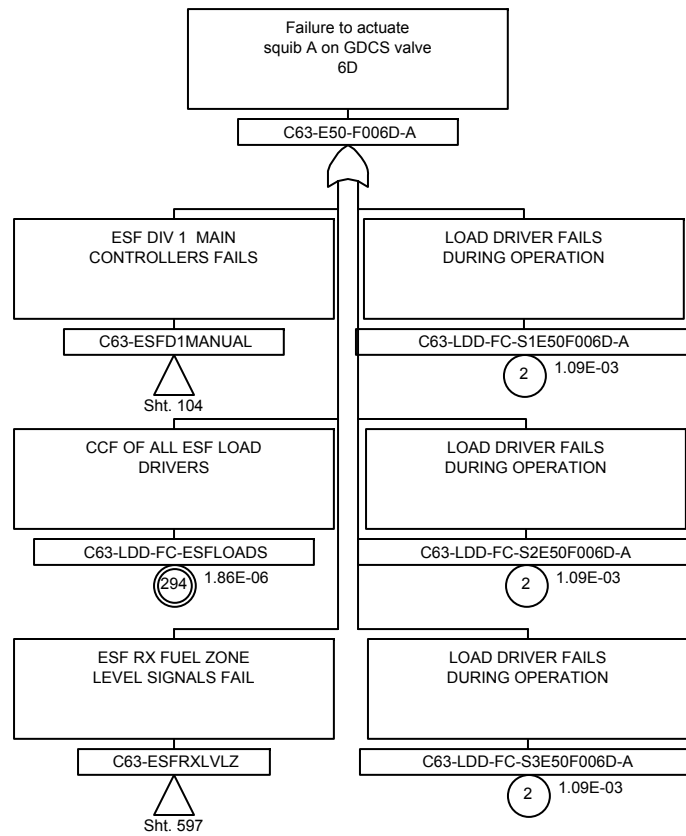


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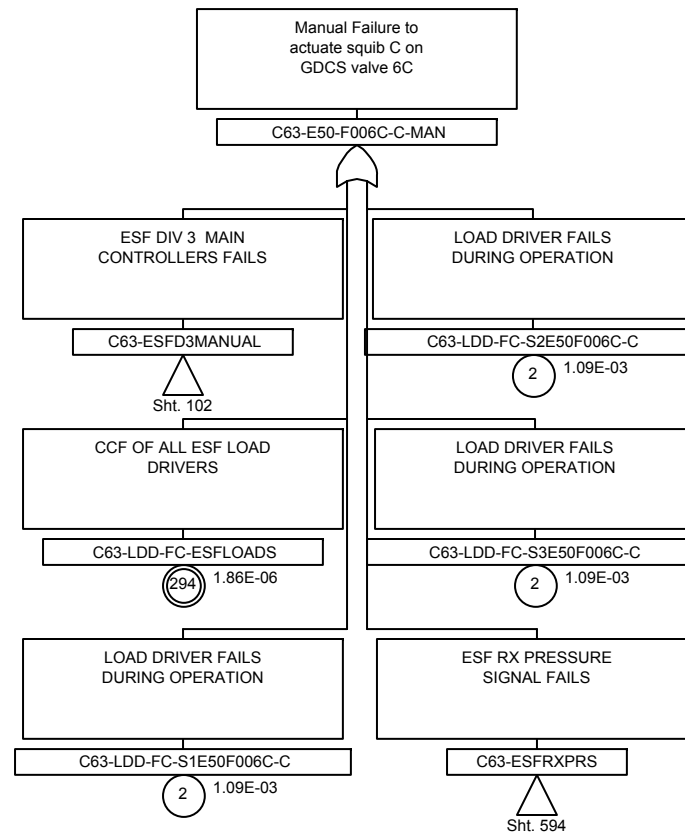


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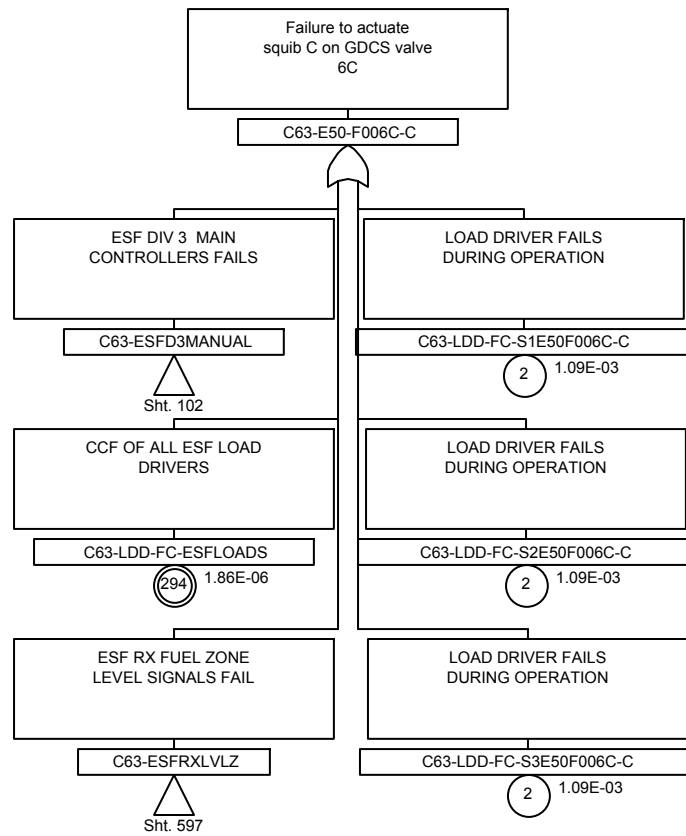


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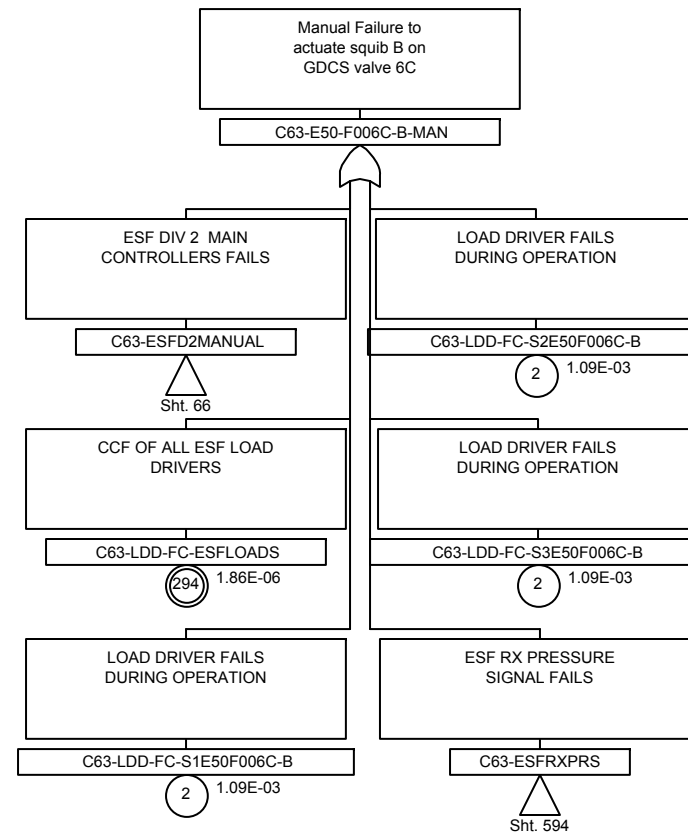


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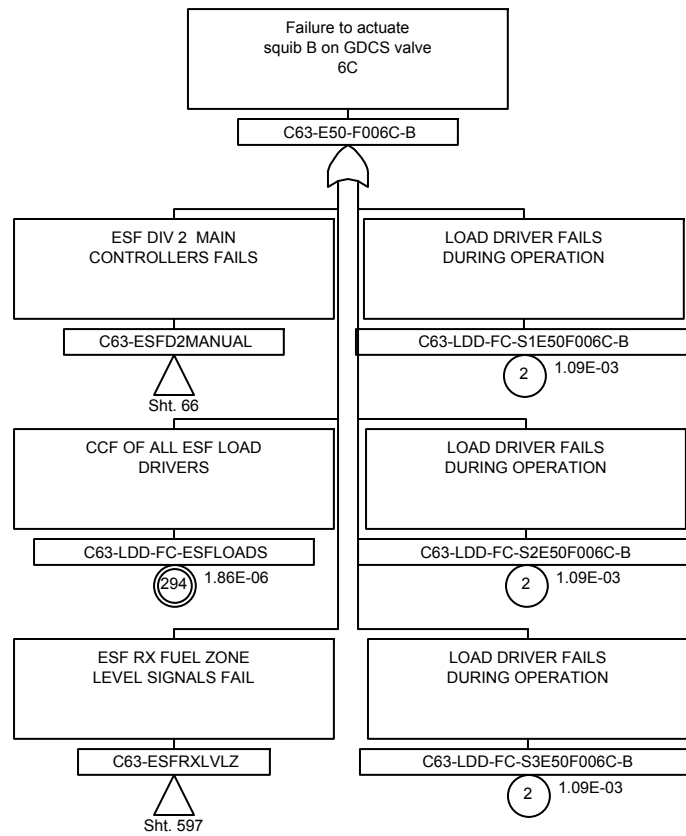


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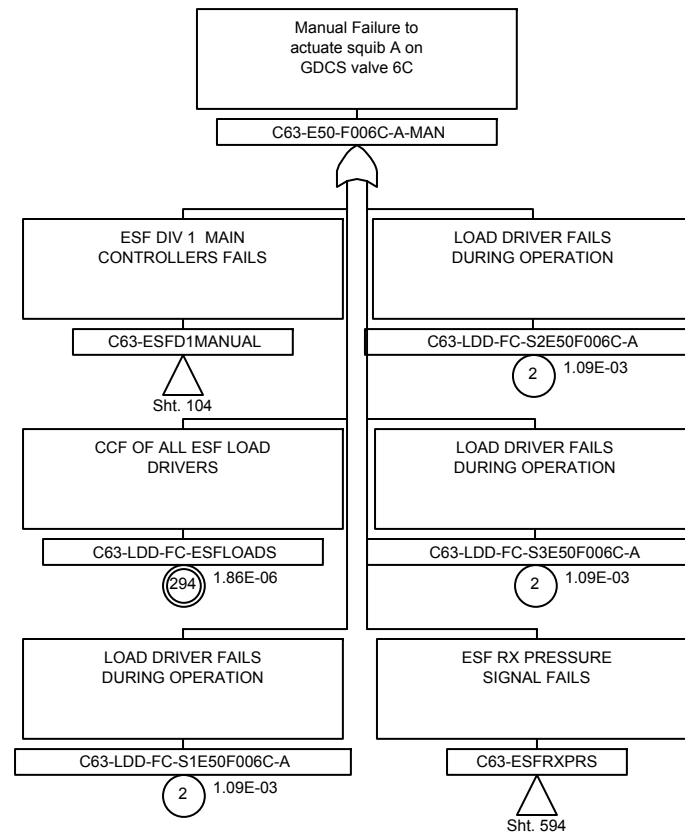


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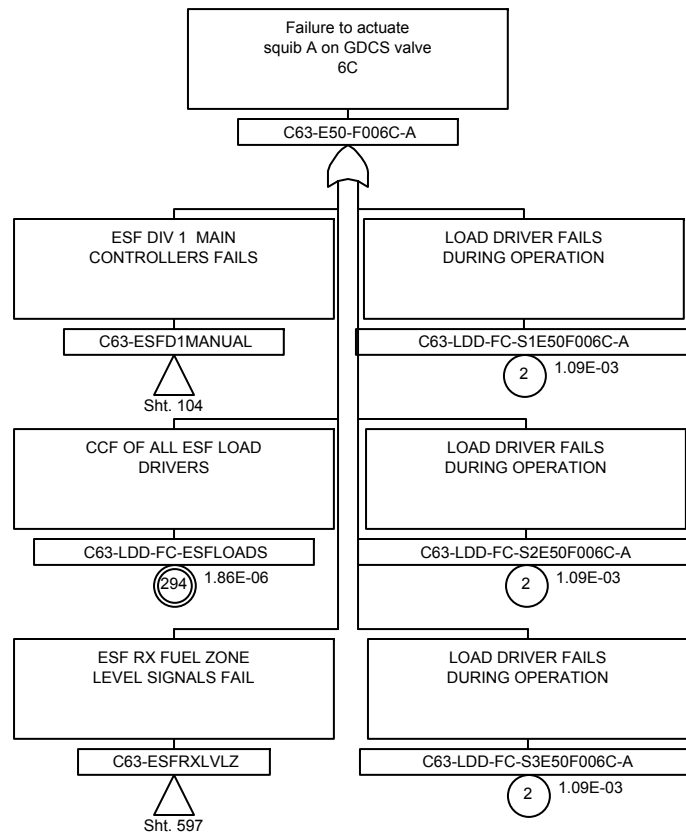


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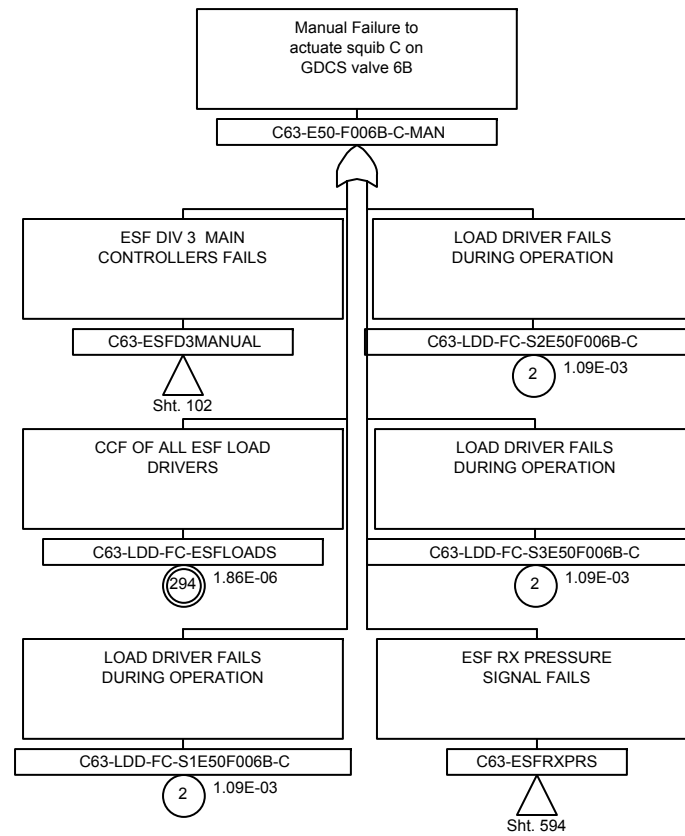


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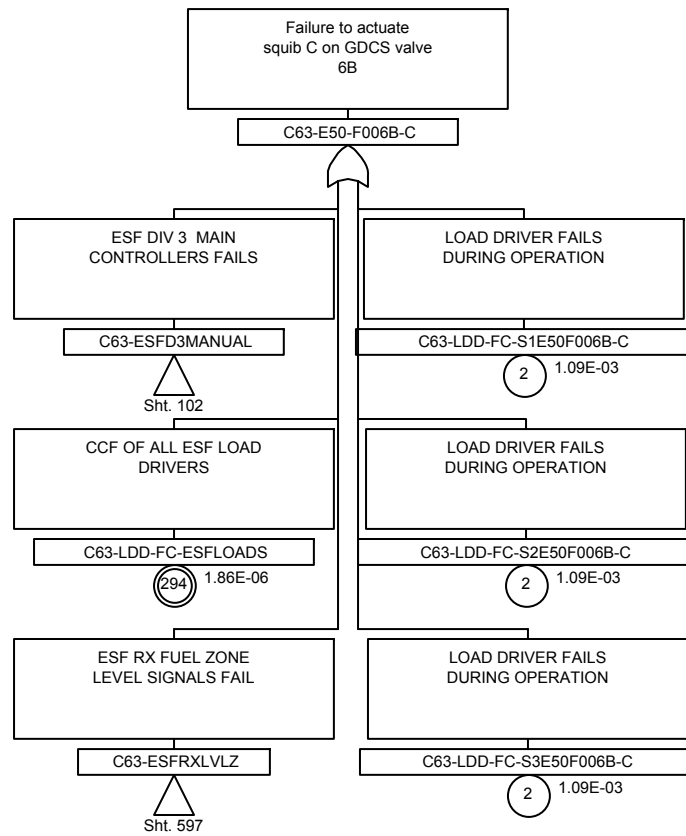


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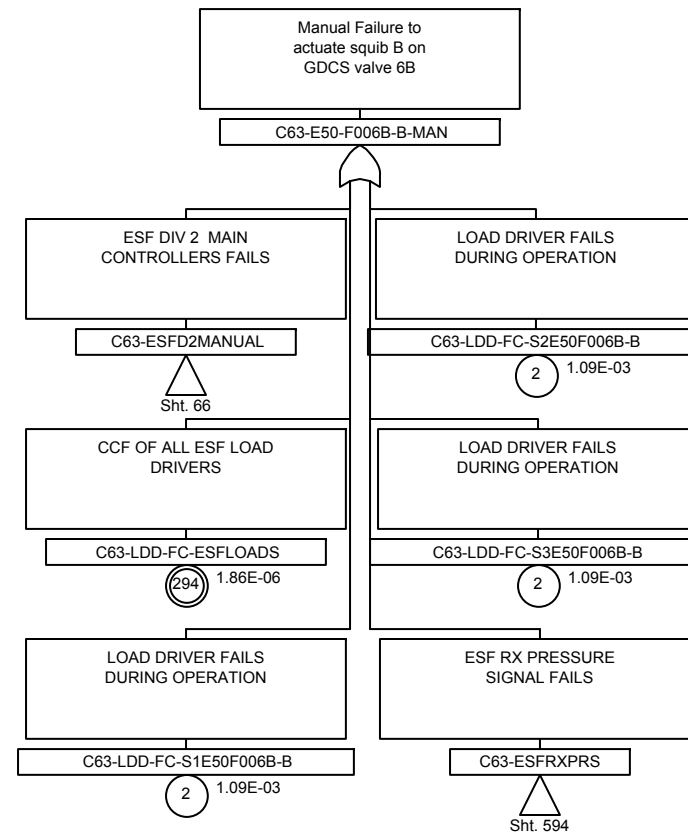


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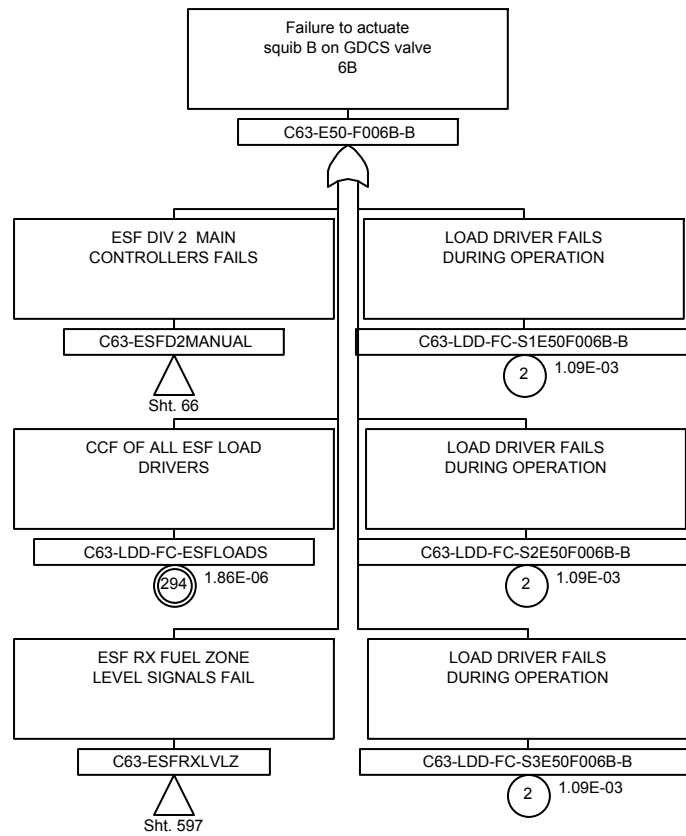


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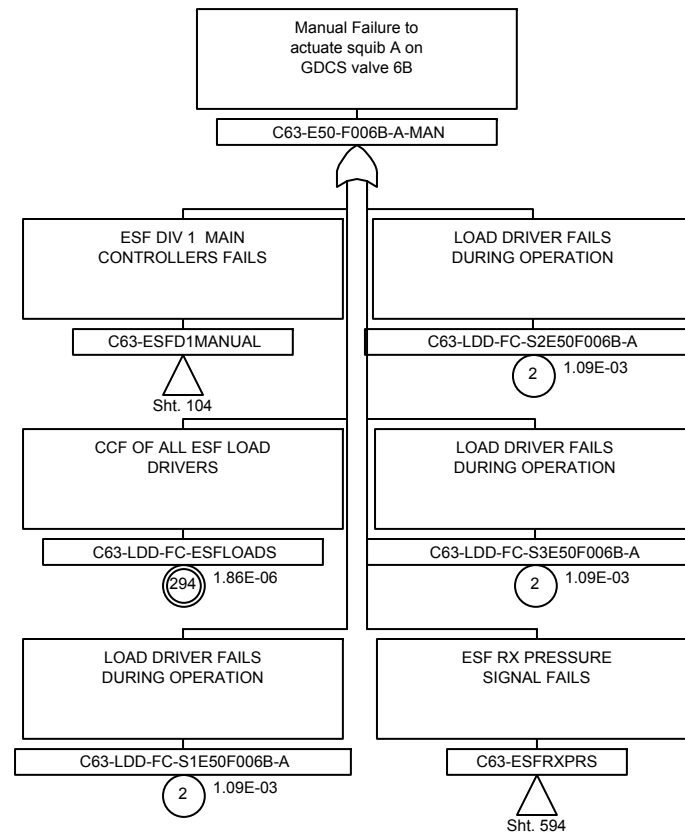


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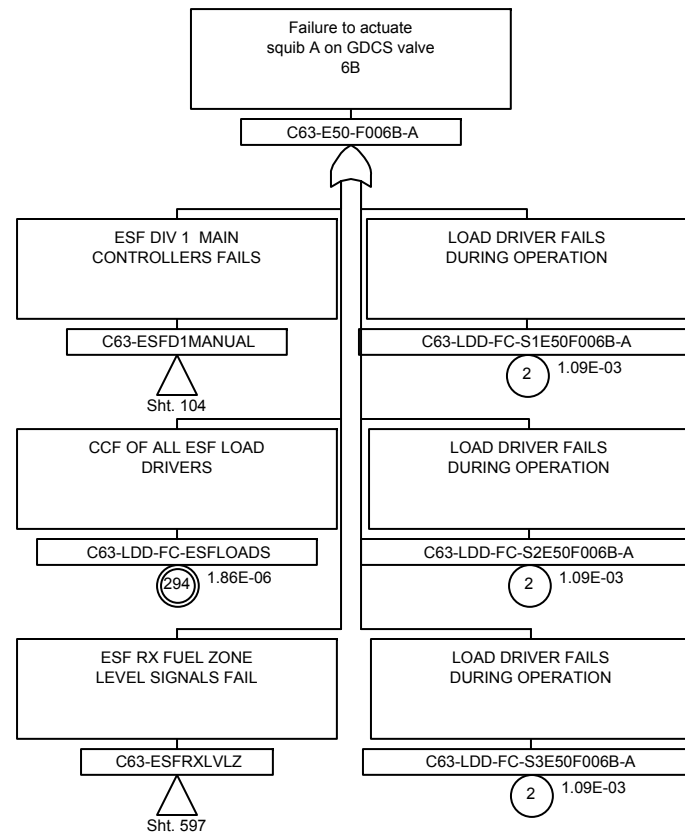


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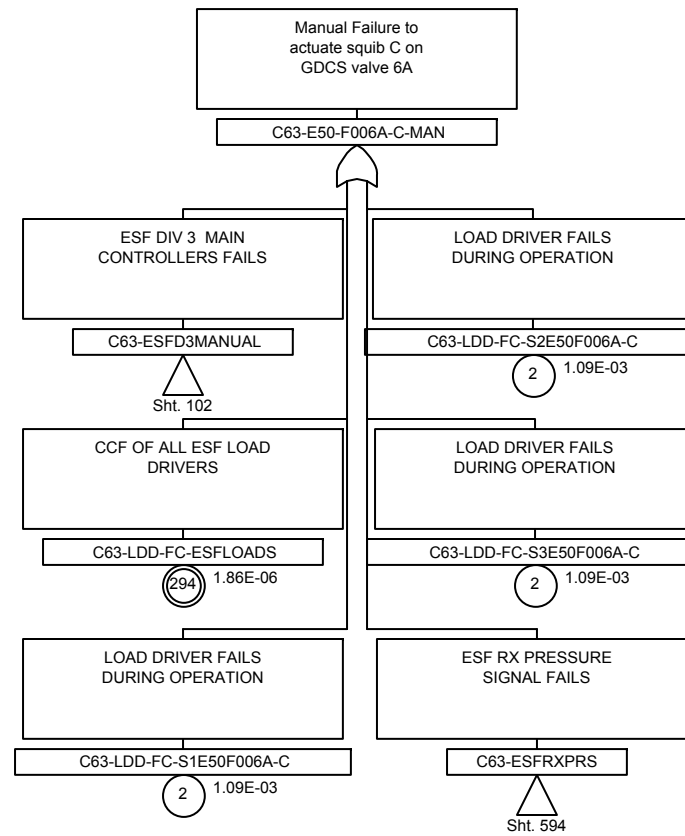


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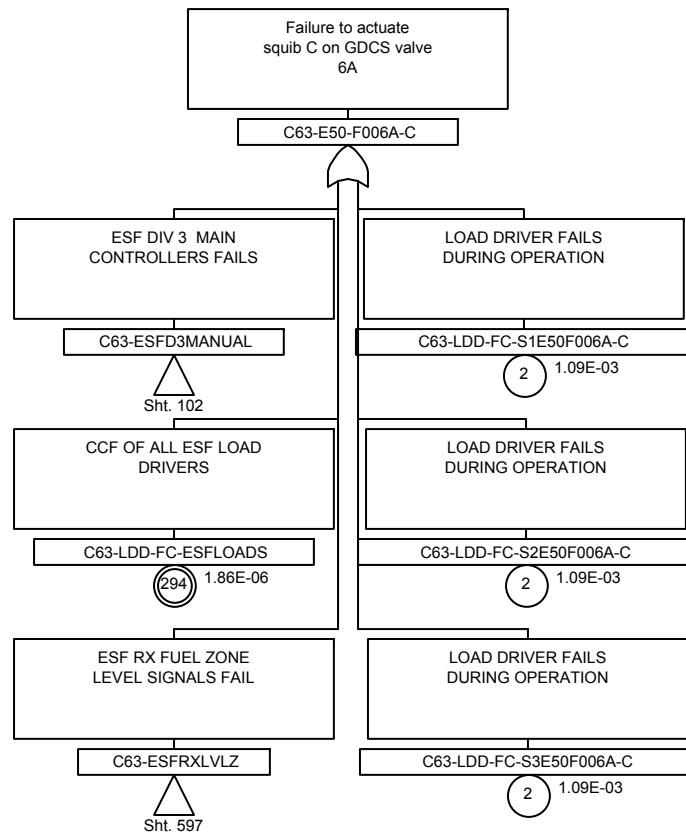


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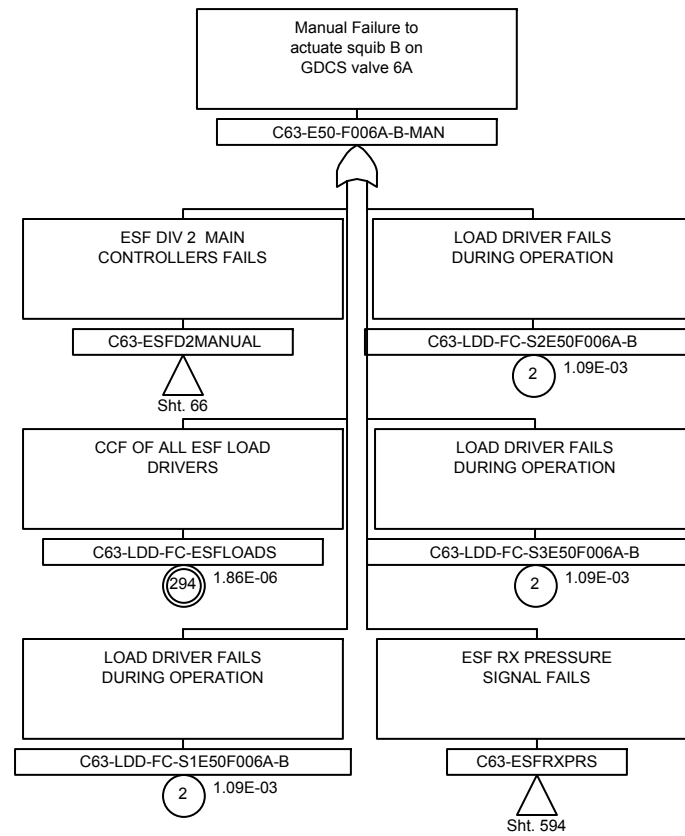


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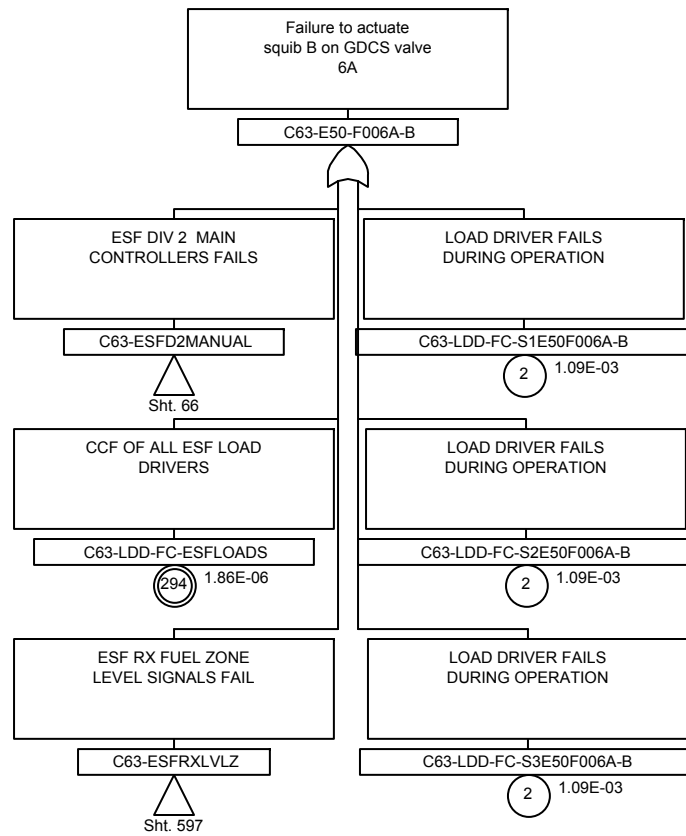


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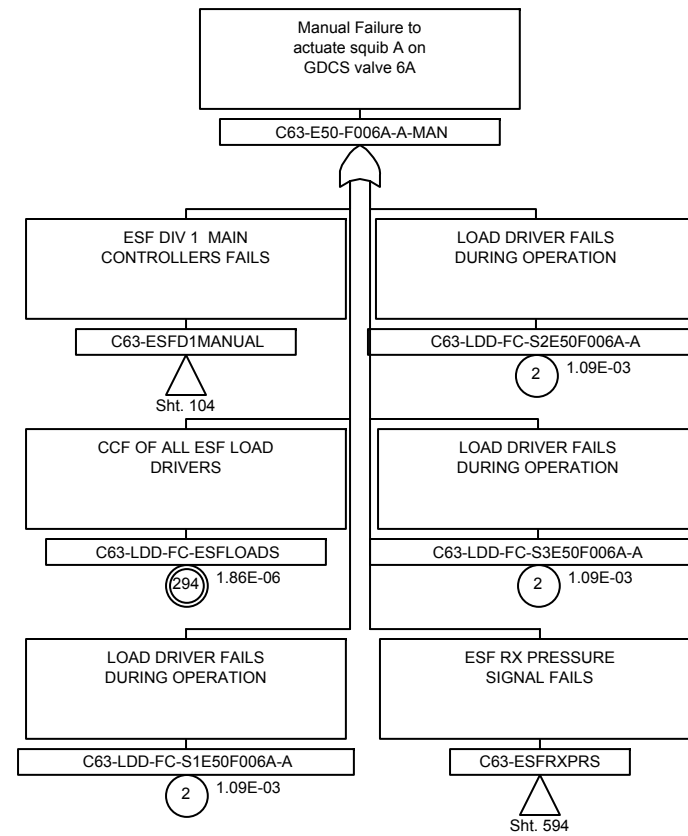


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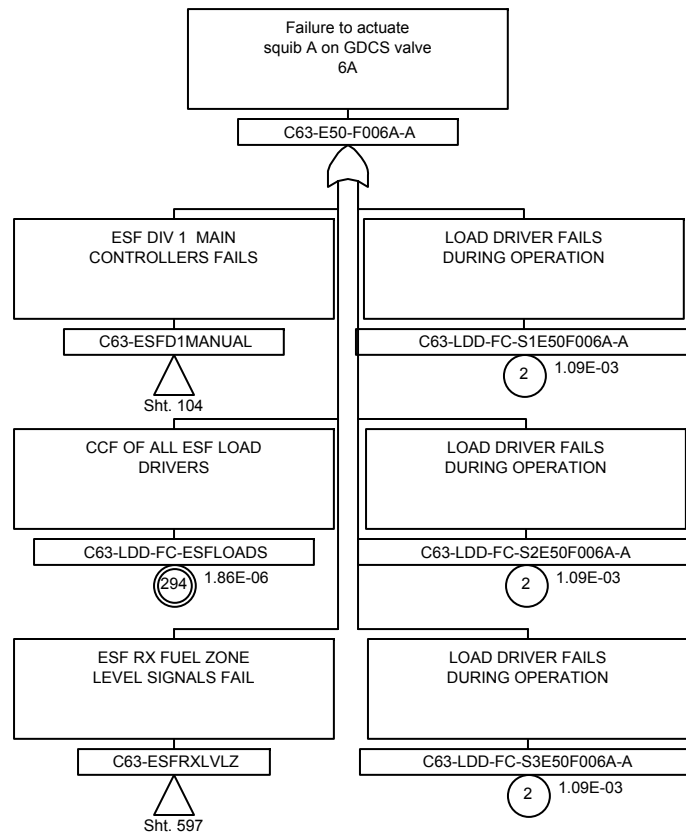


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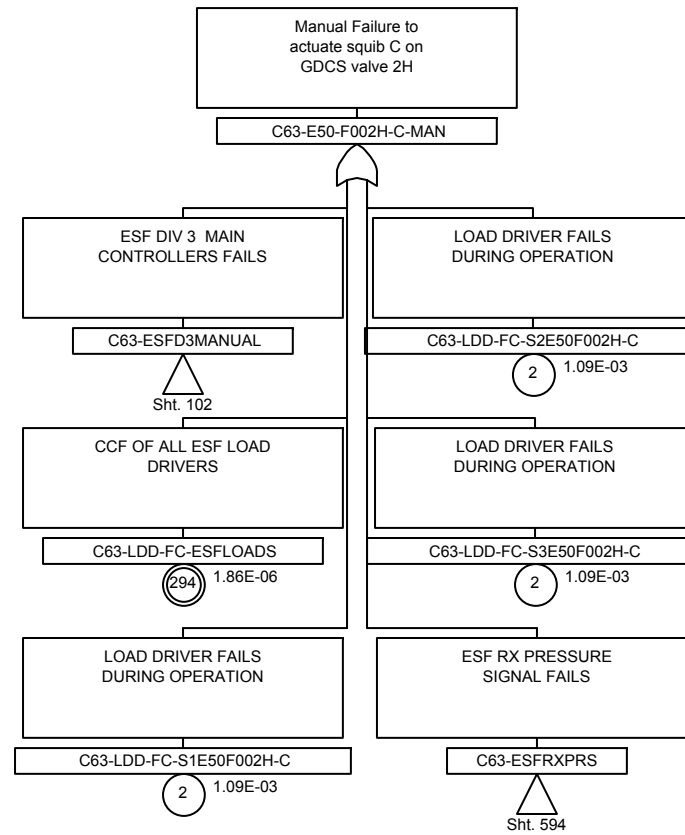


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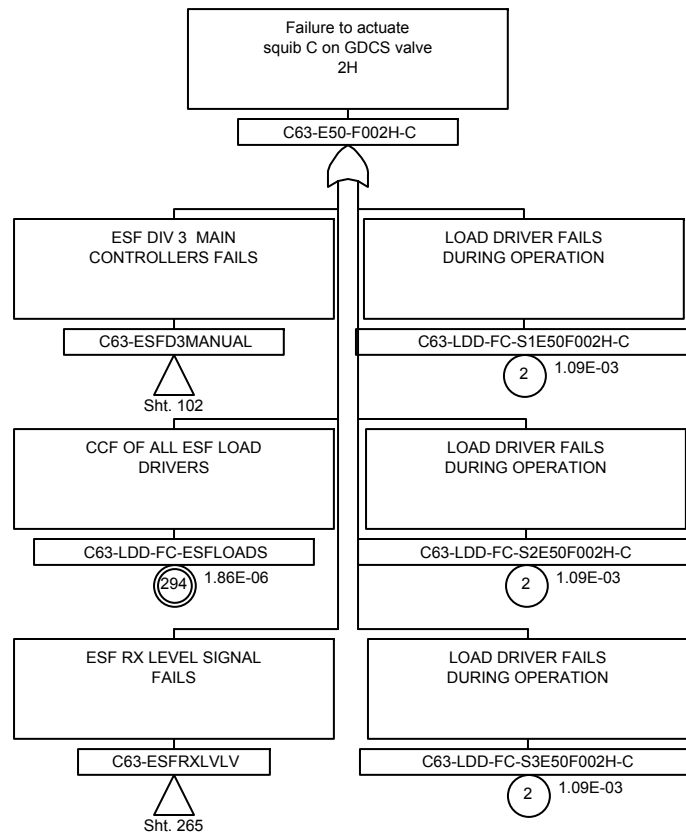


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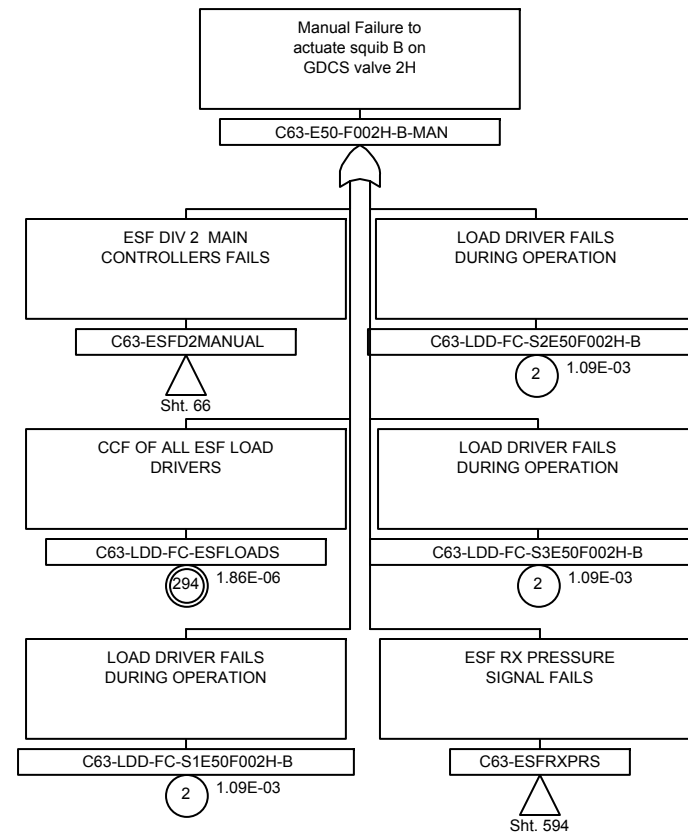


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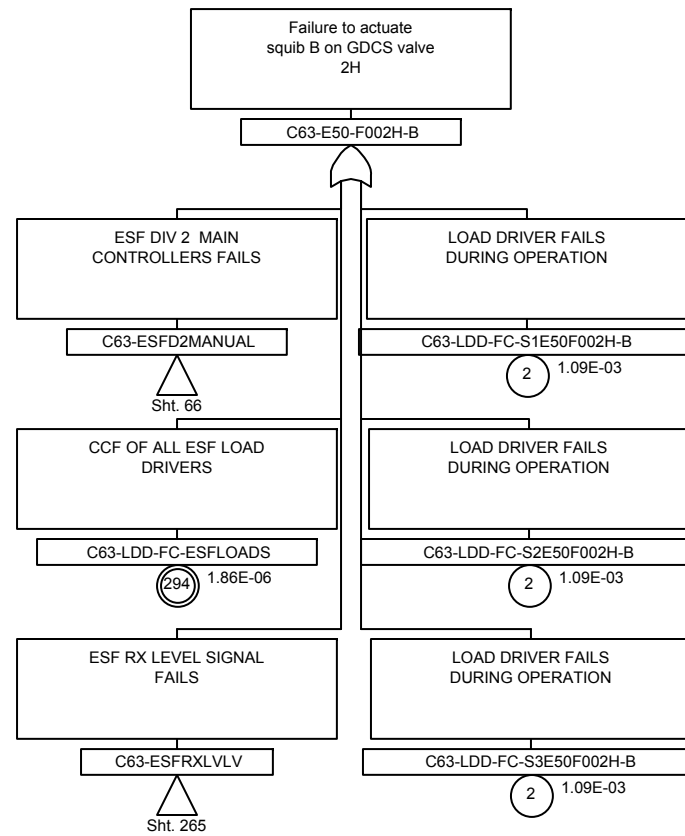


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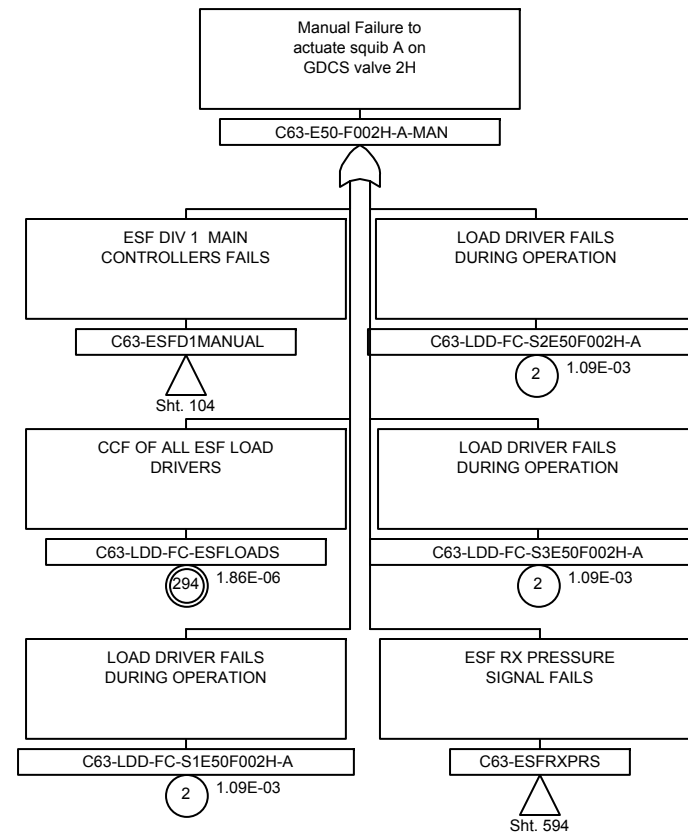


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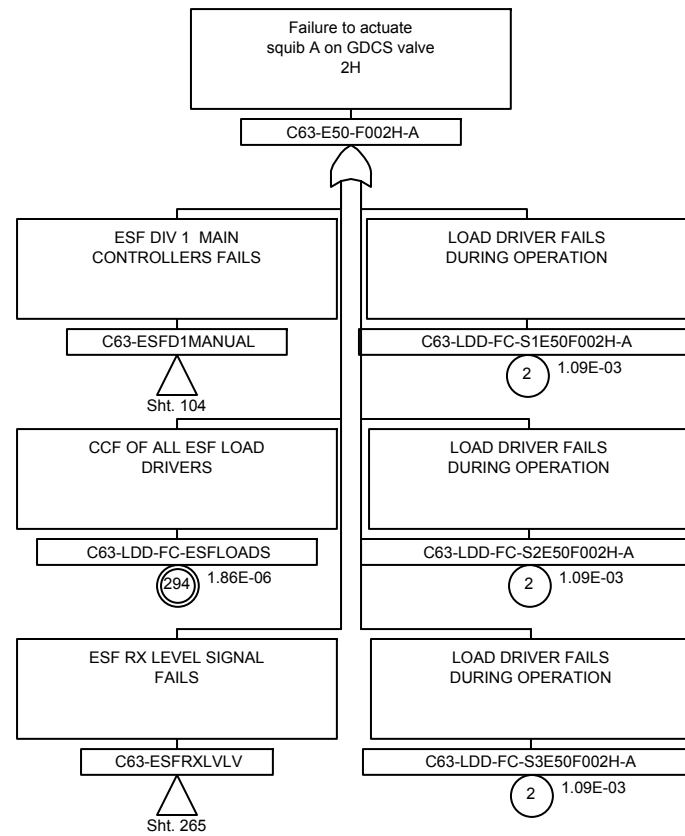


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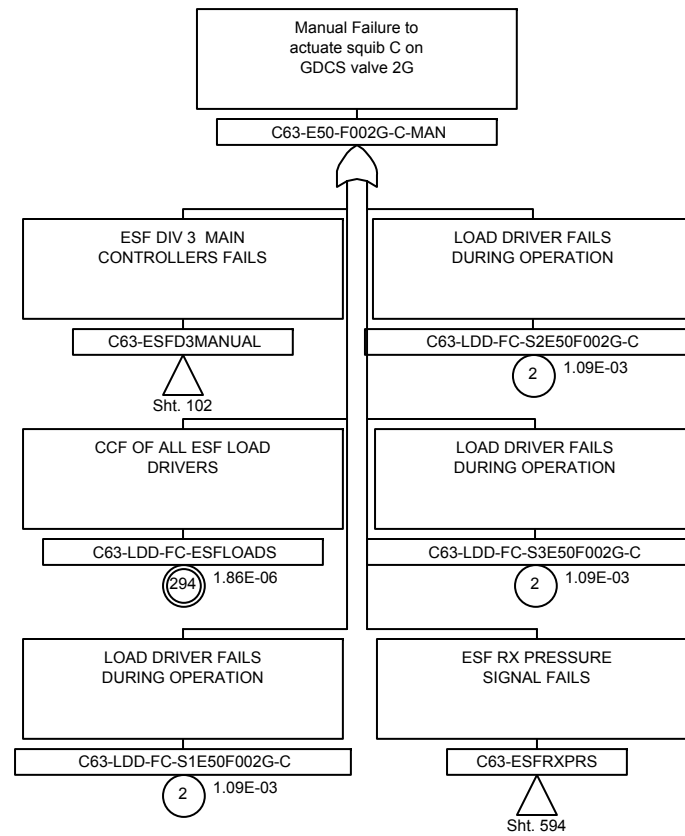


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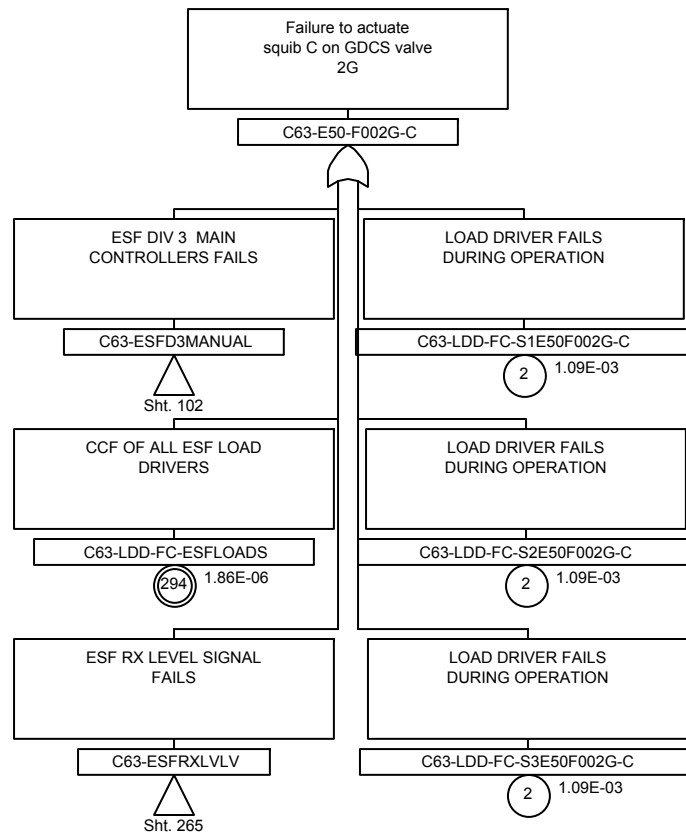


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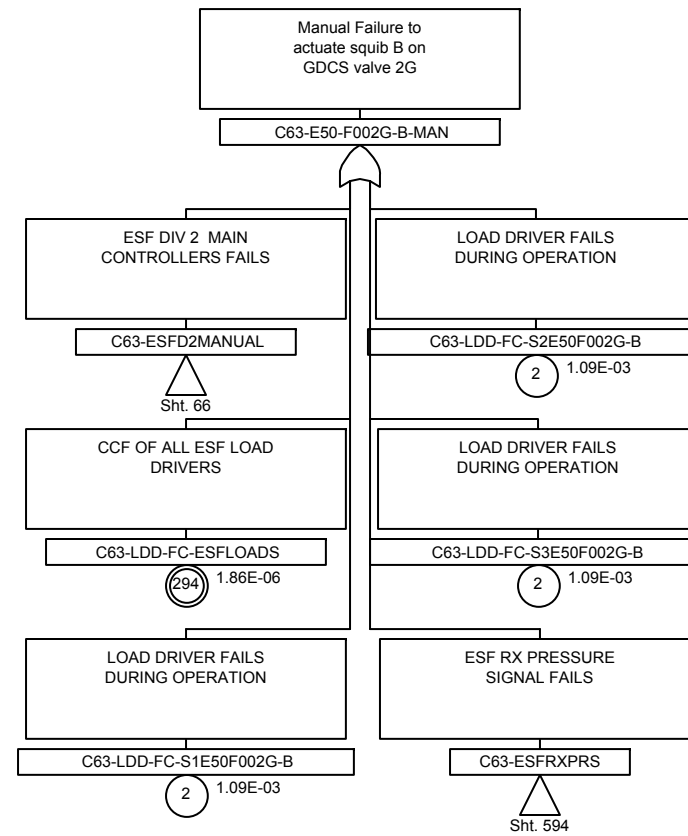


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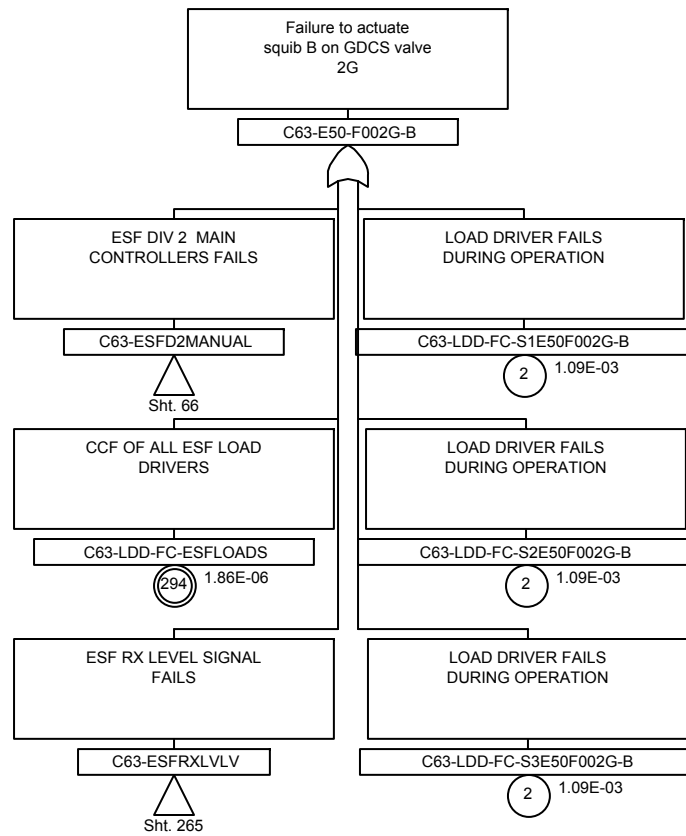


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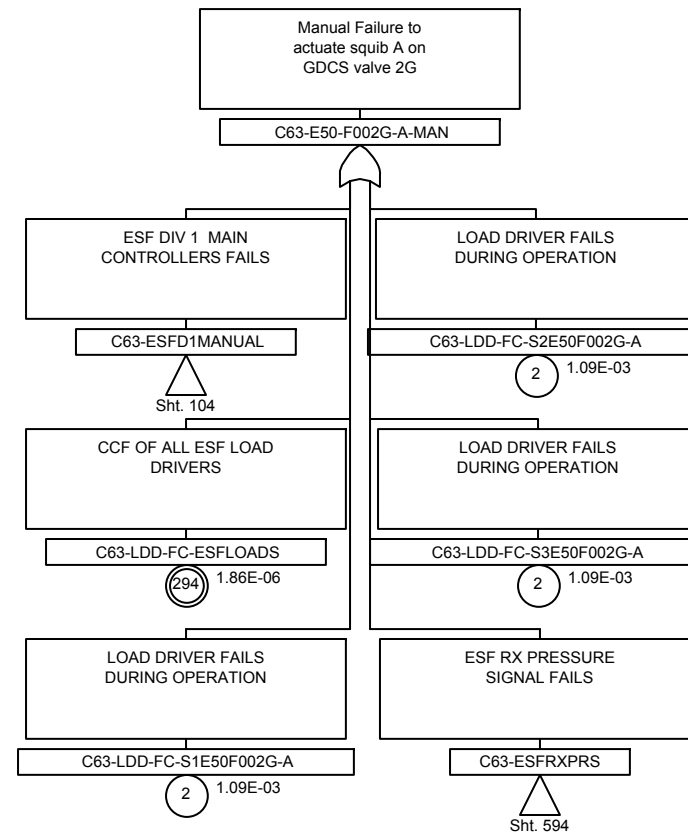


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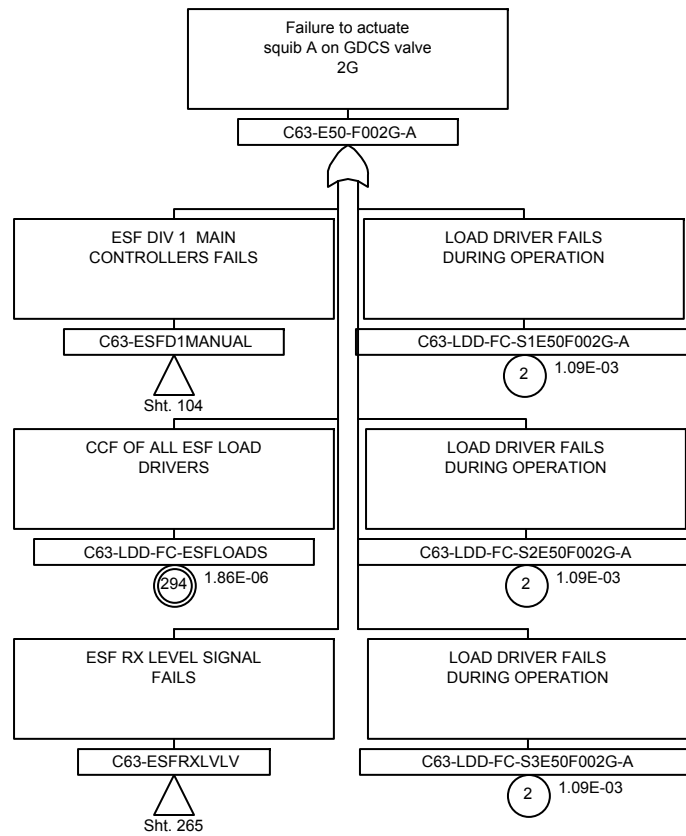


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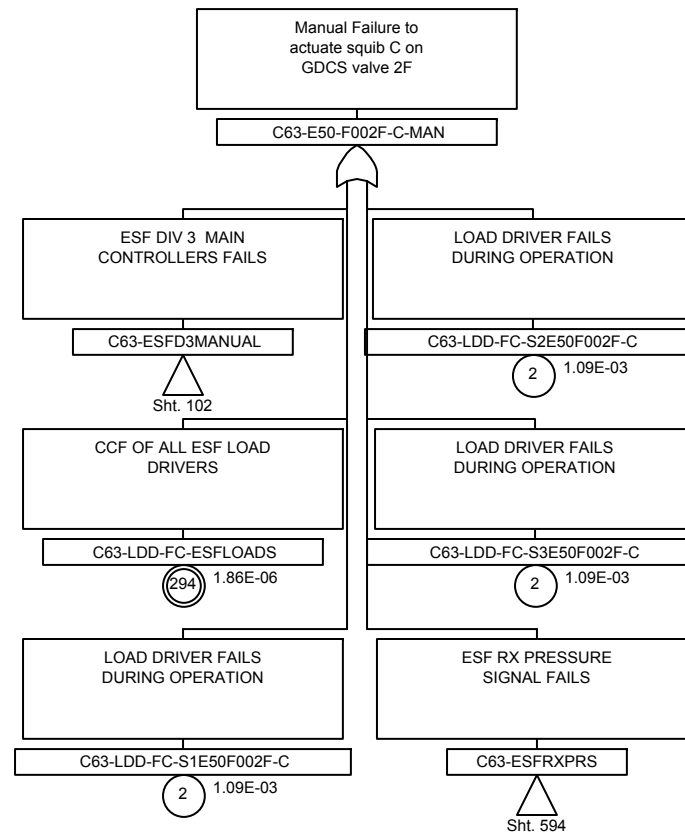


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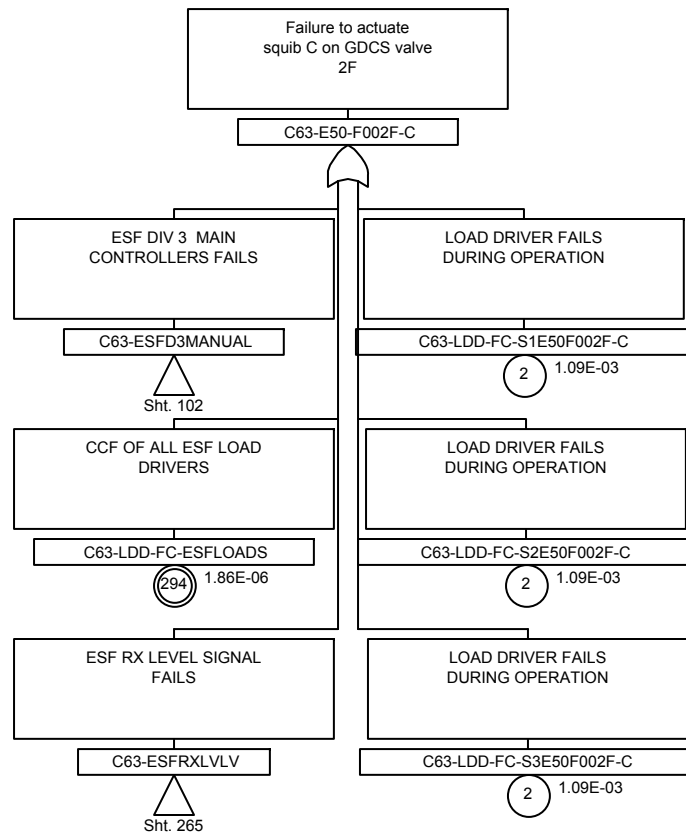


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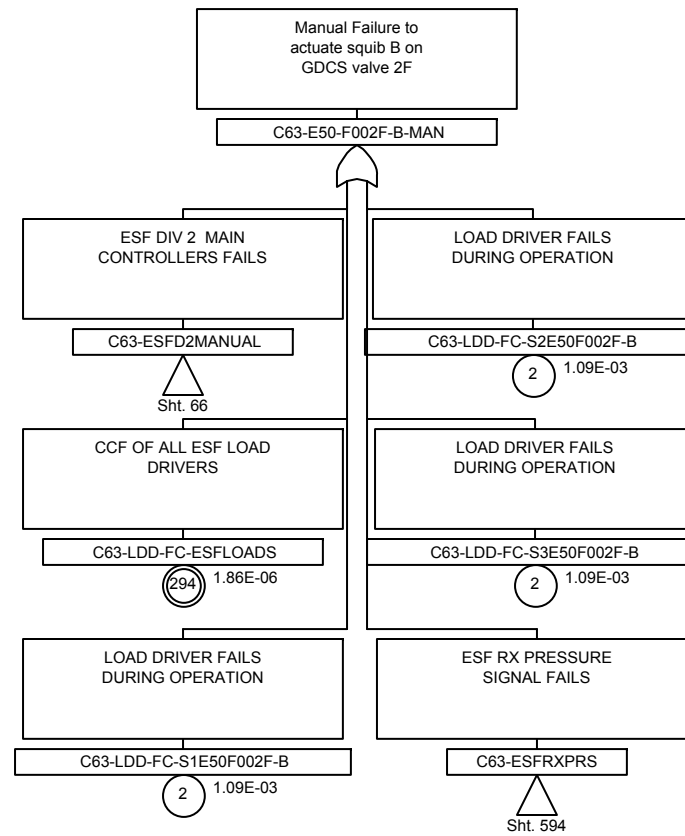


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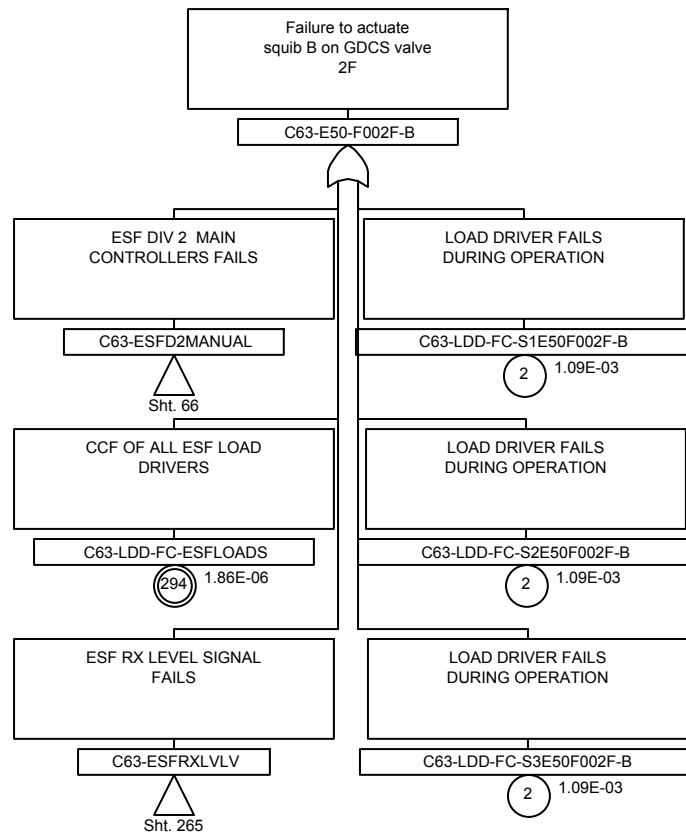


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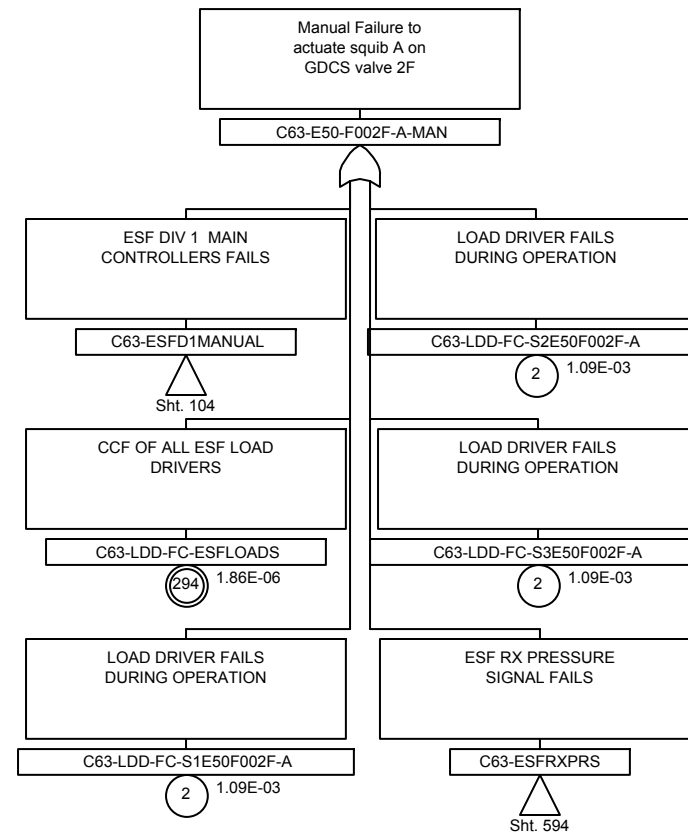


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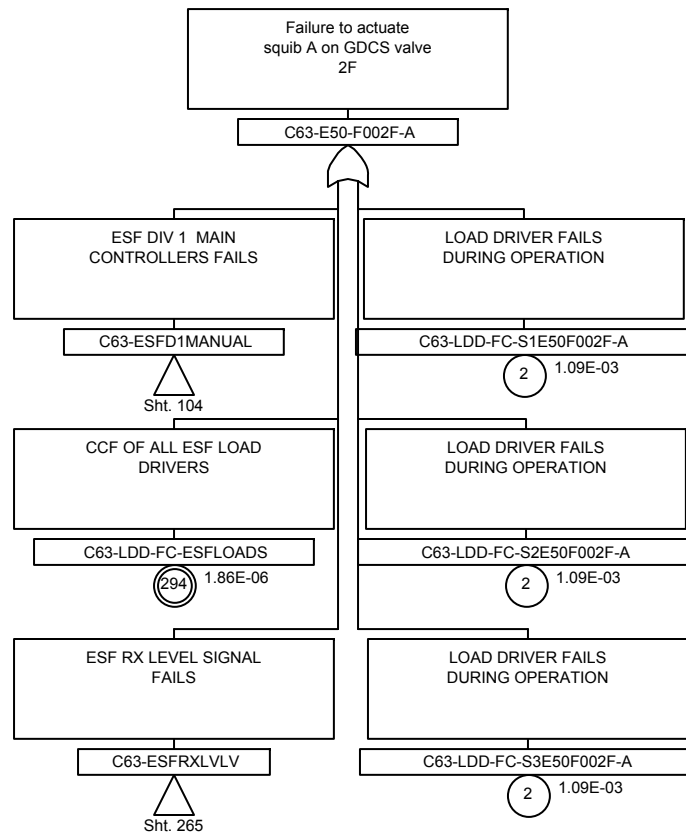


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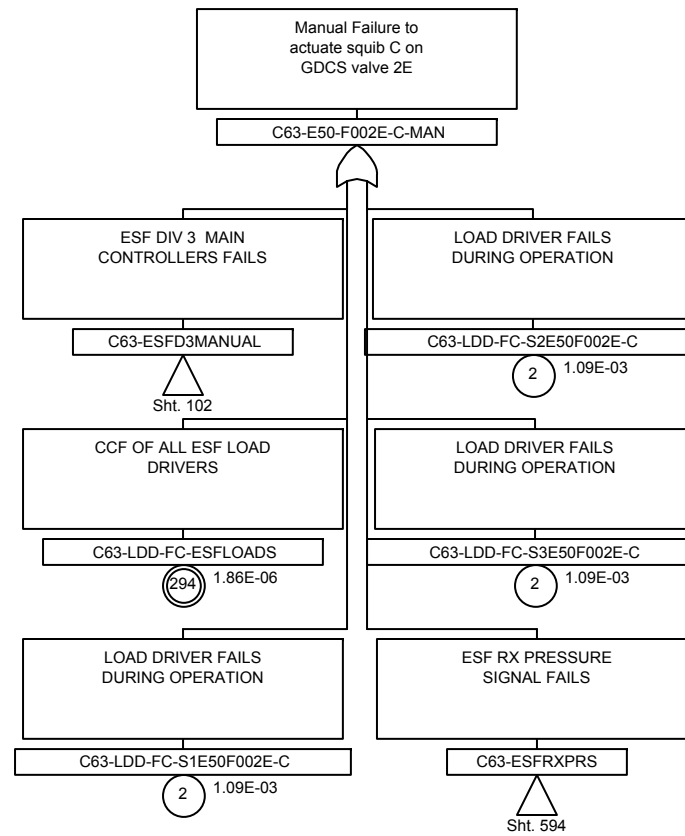


Figure 4.5-3b. Sheet 658 Q-DCIS Safety Related Control System

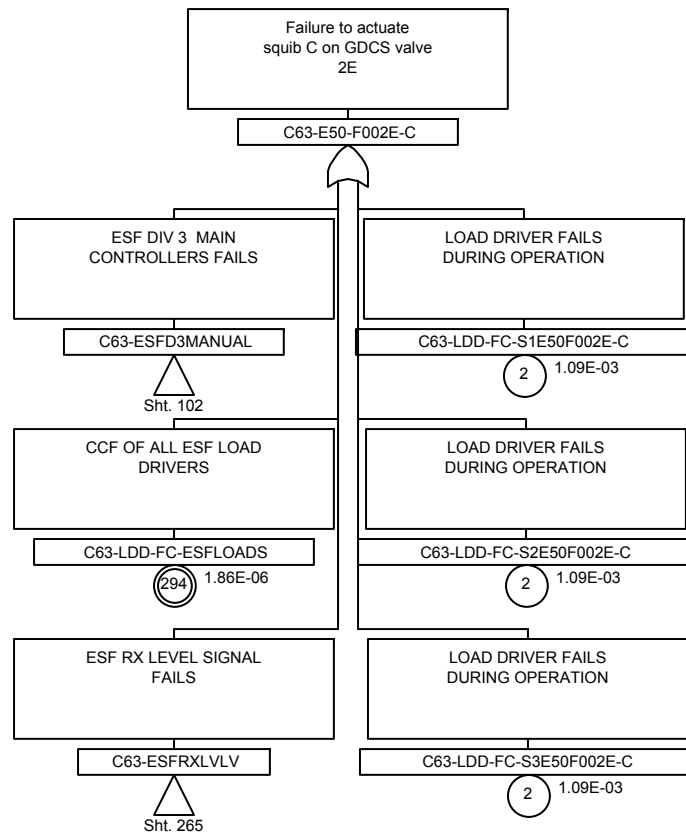


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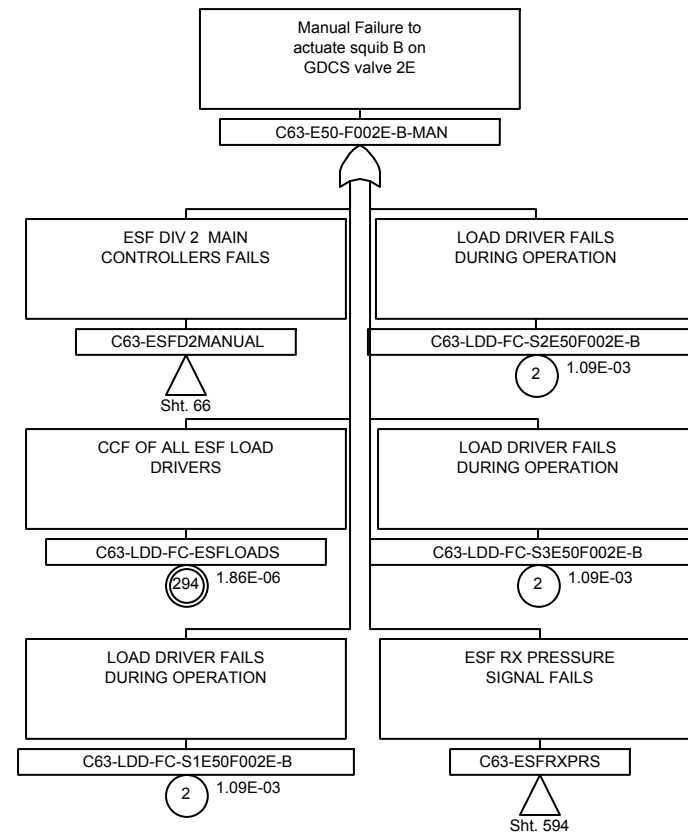


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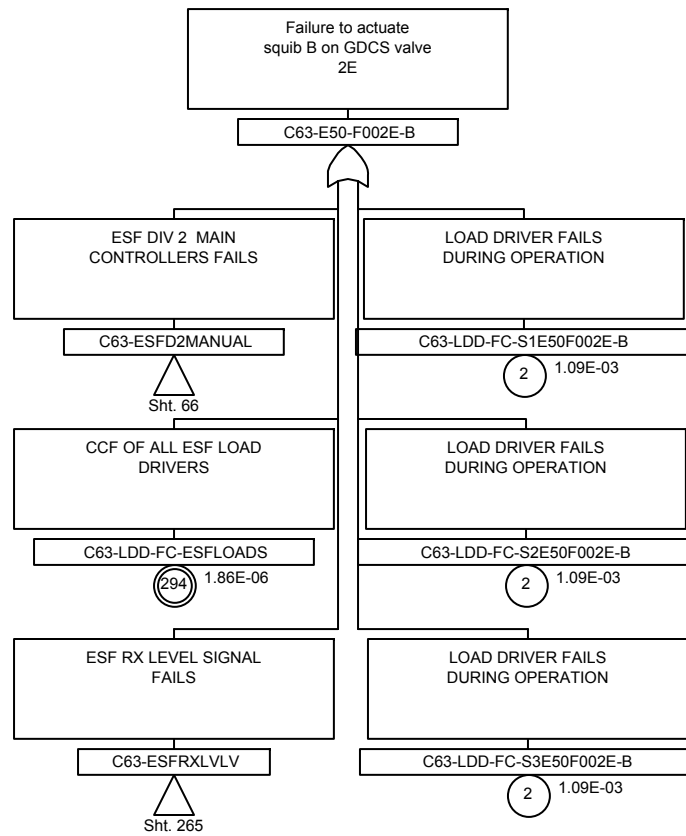


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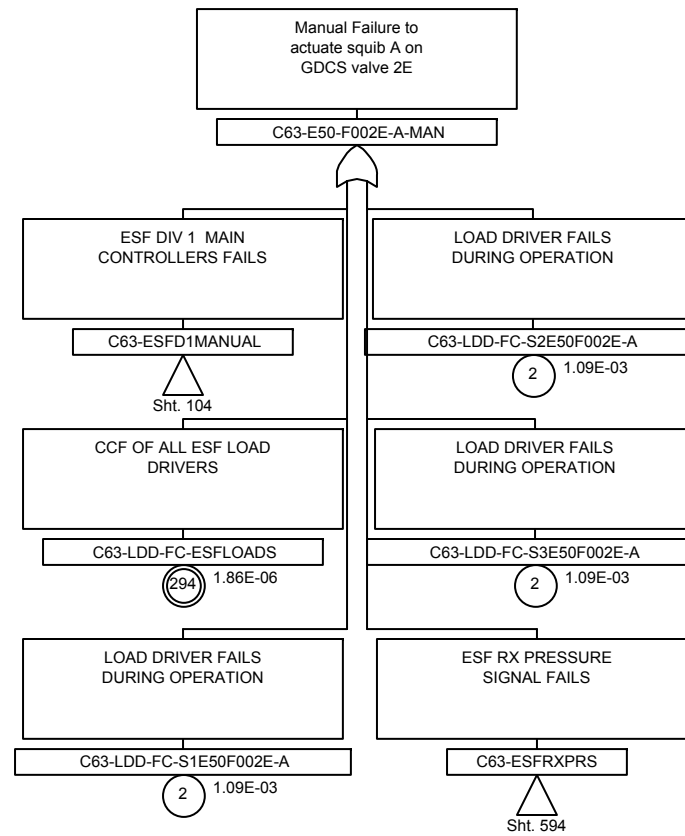


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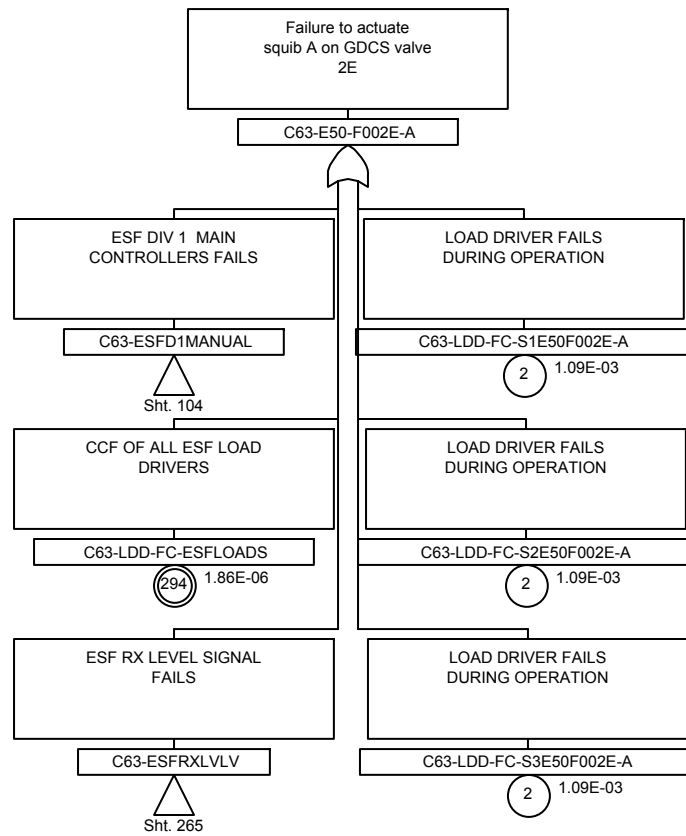


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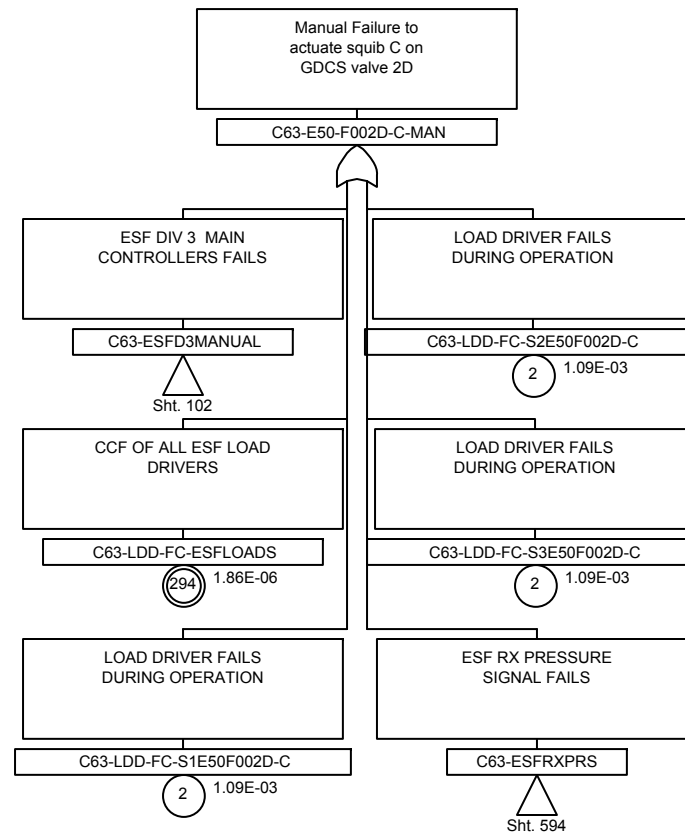


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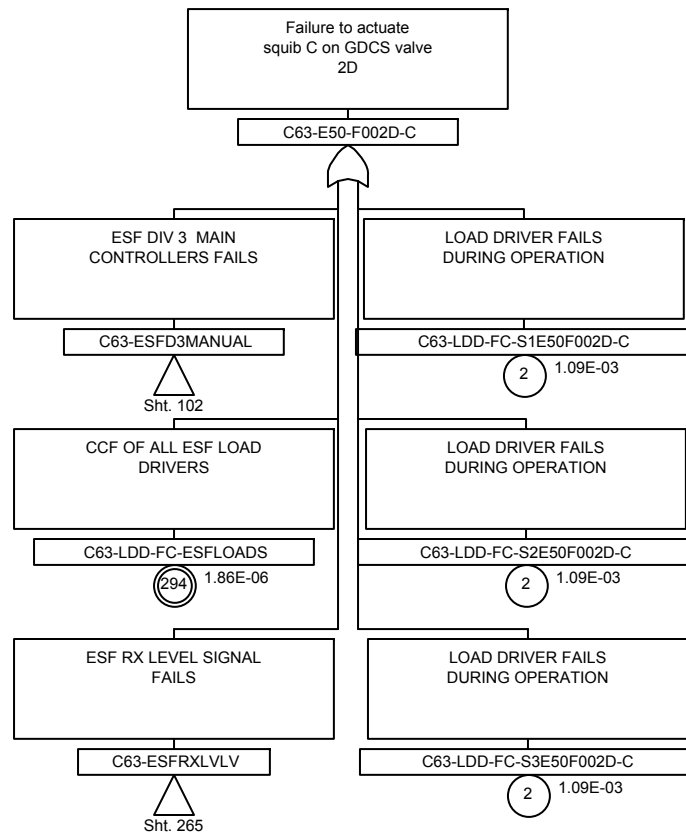


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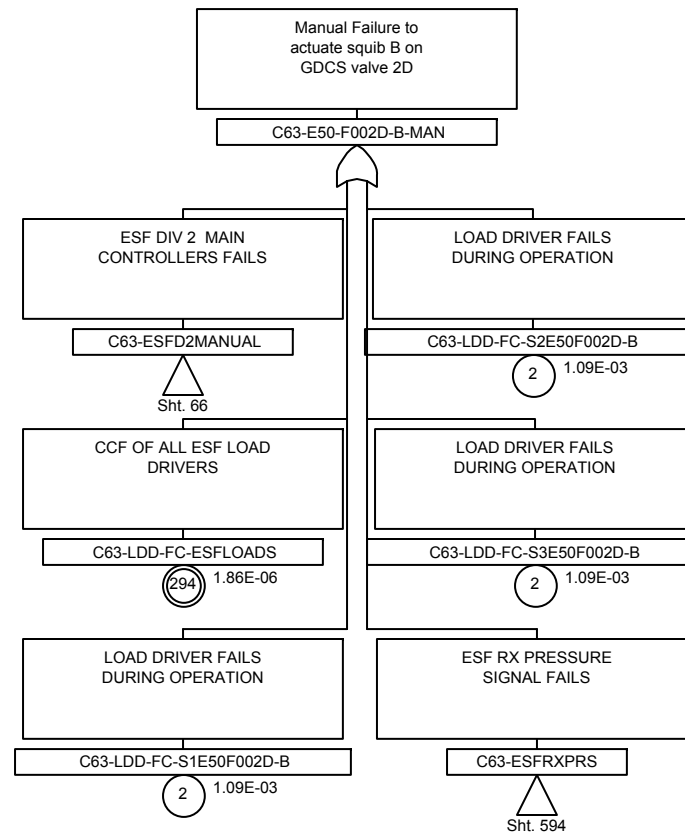


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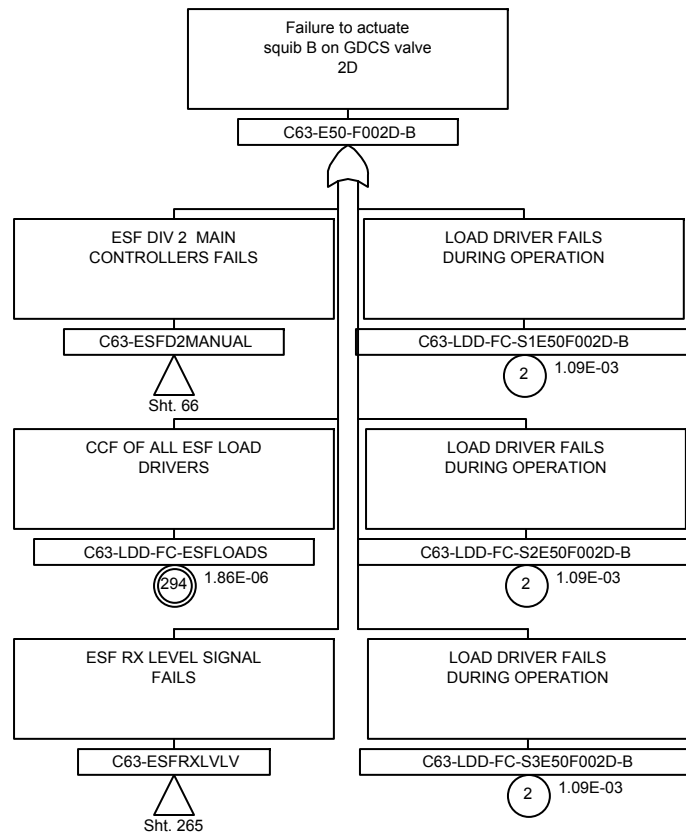


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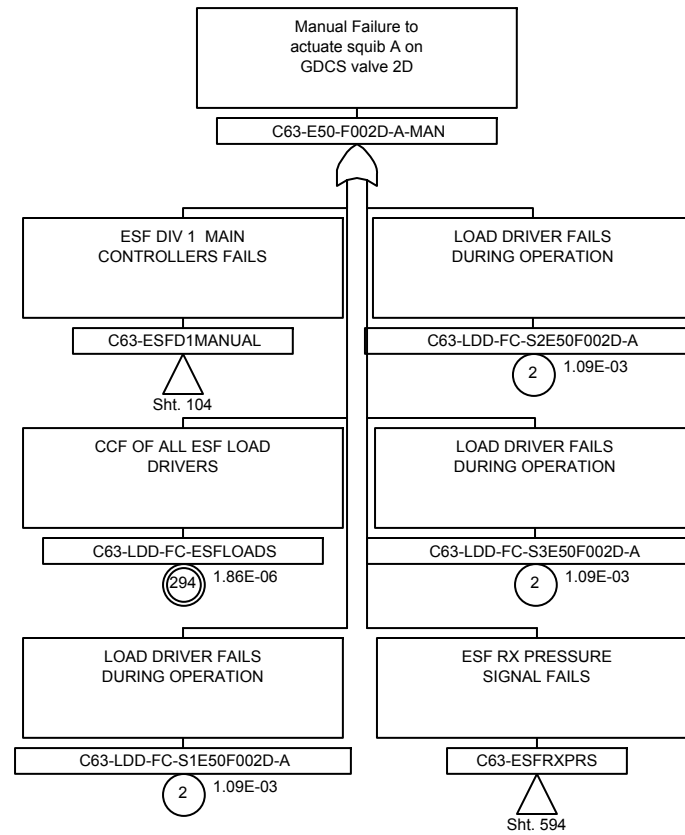


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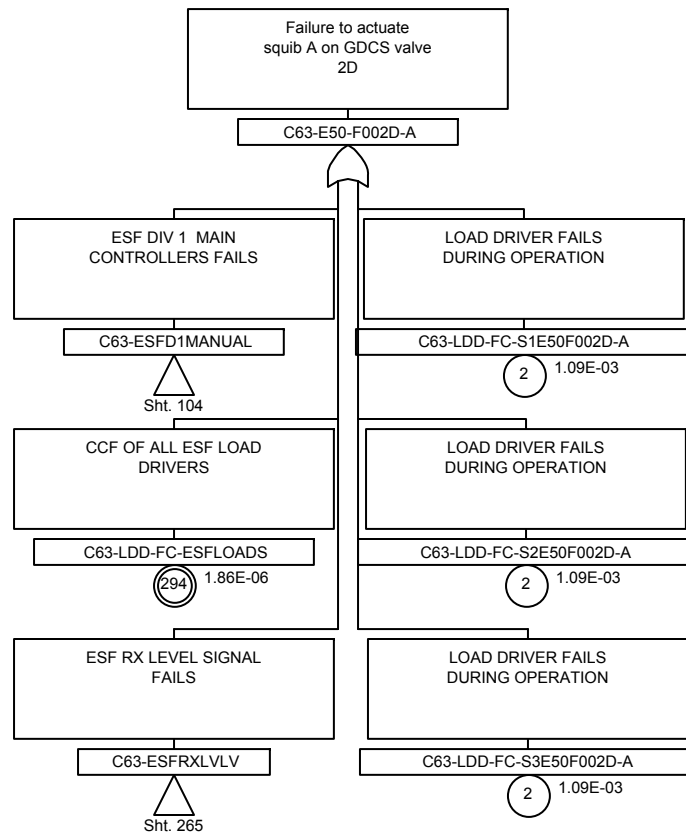


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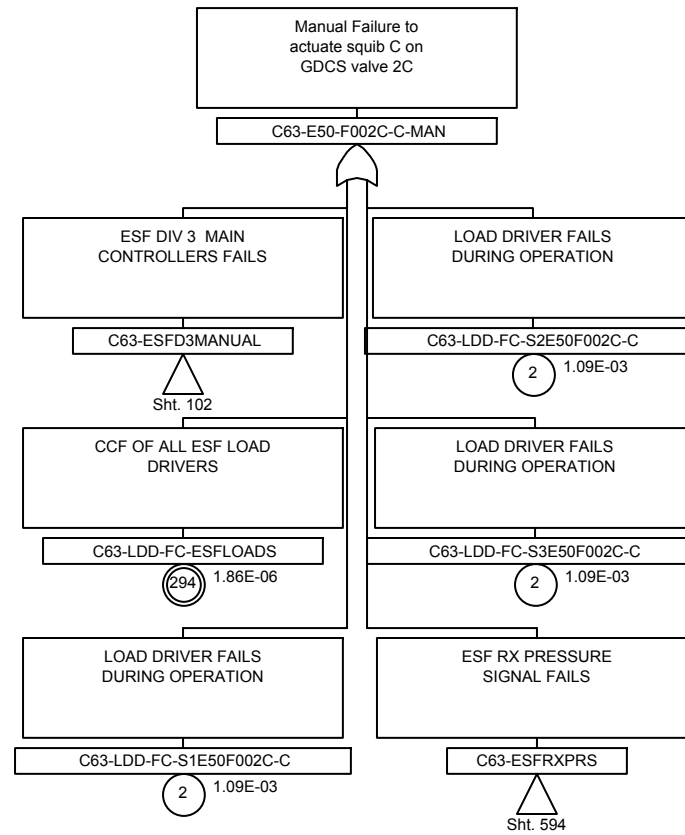


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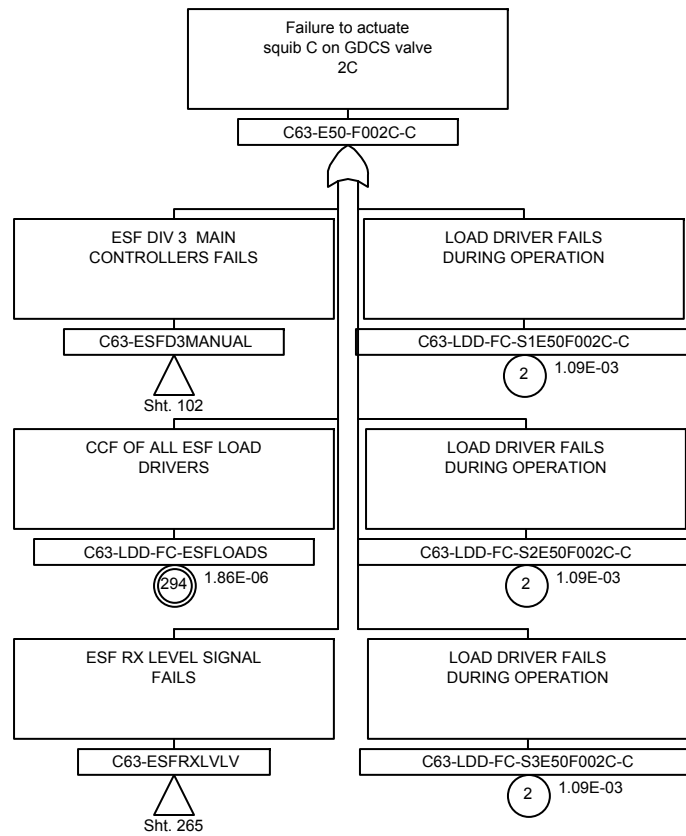


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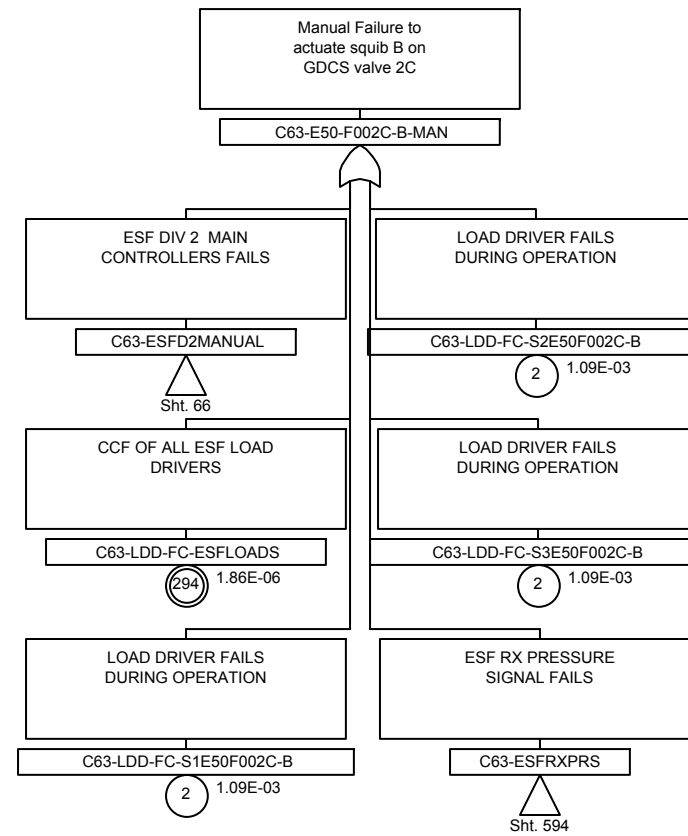


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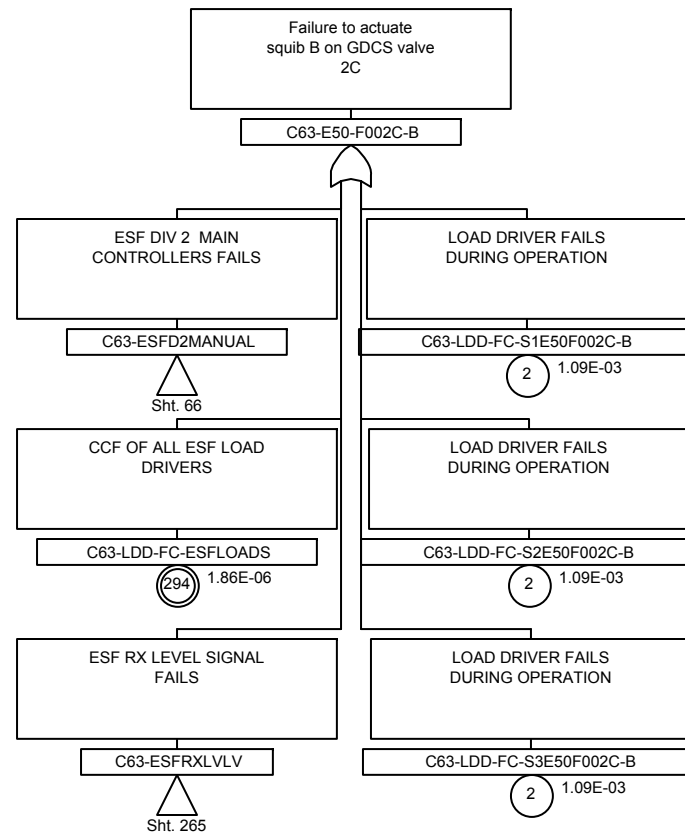


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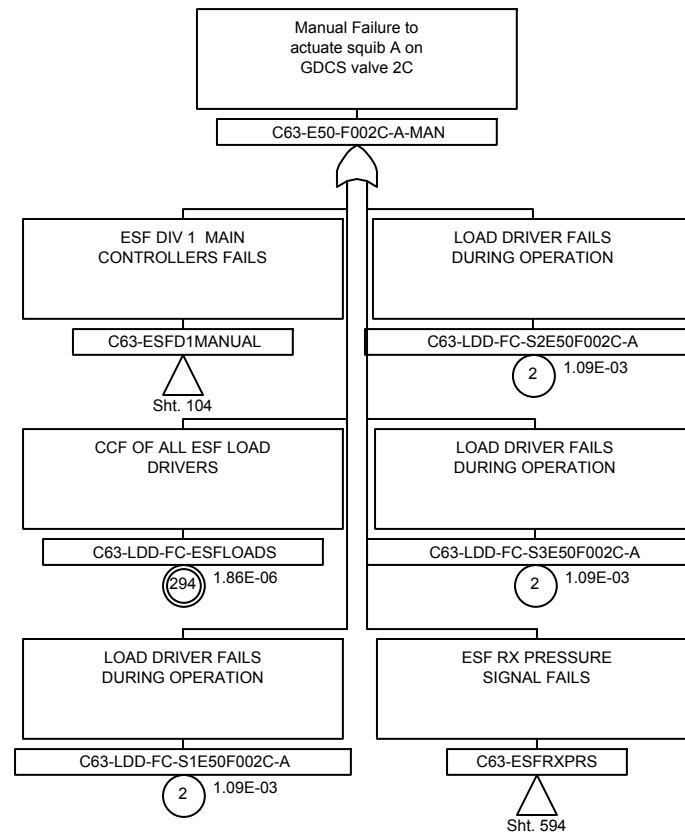


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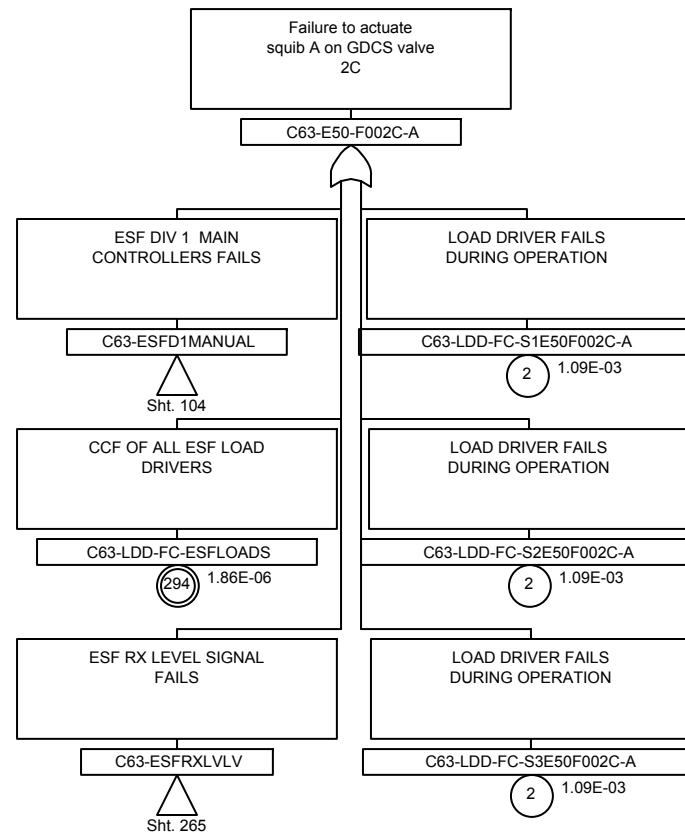


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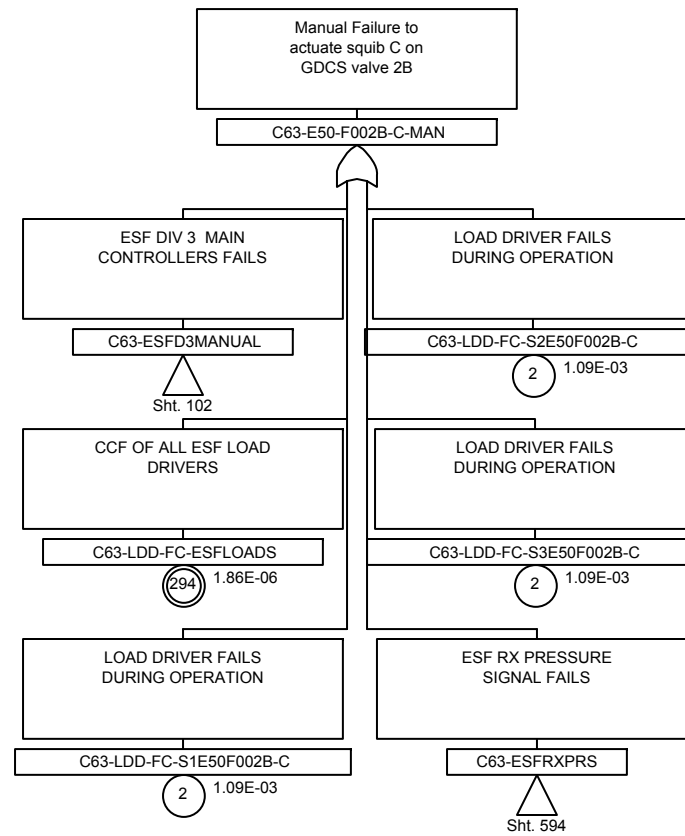


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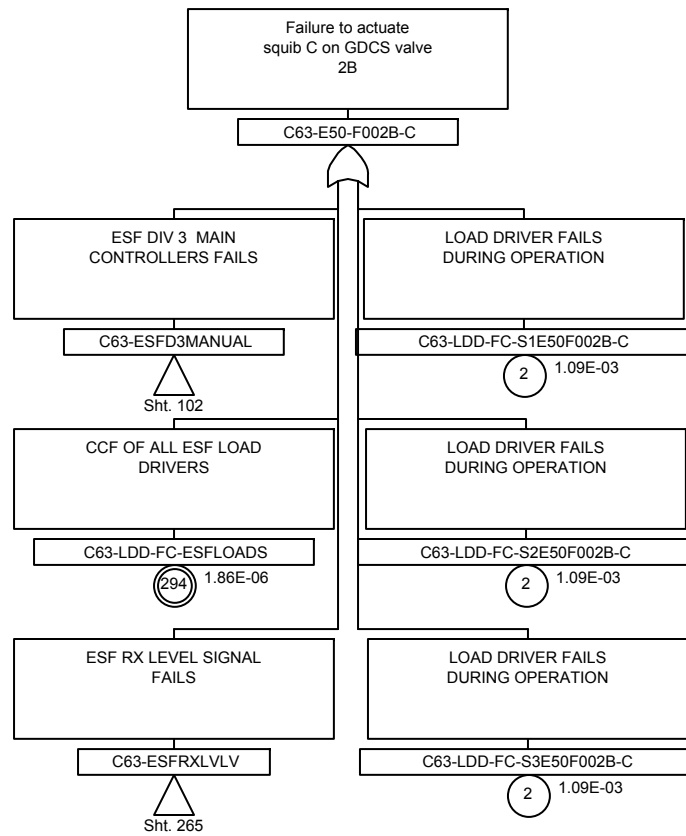


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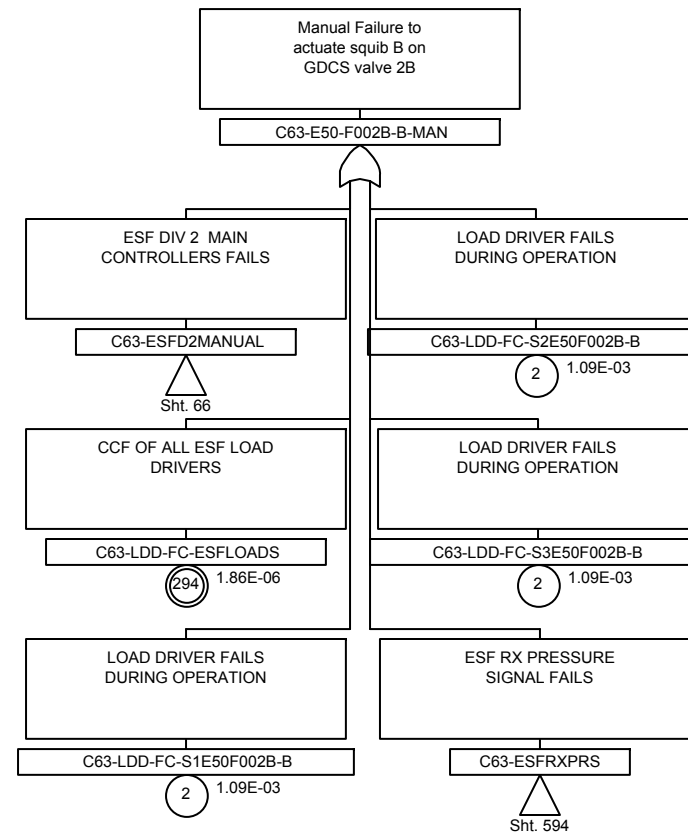


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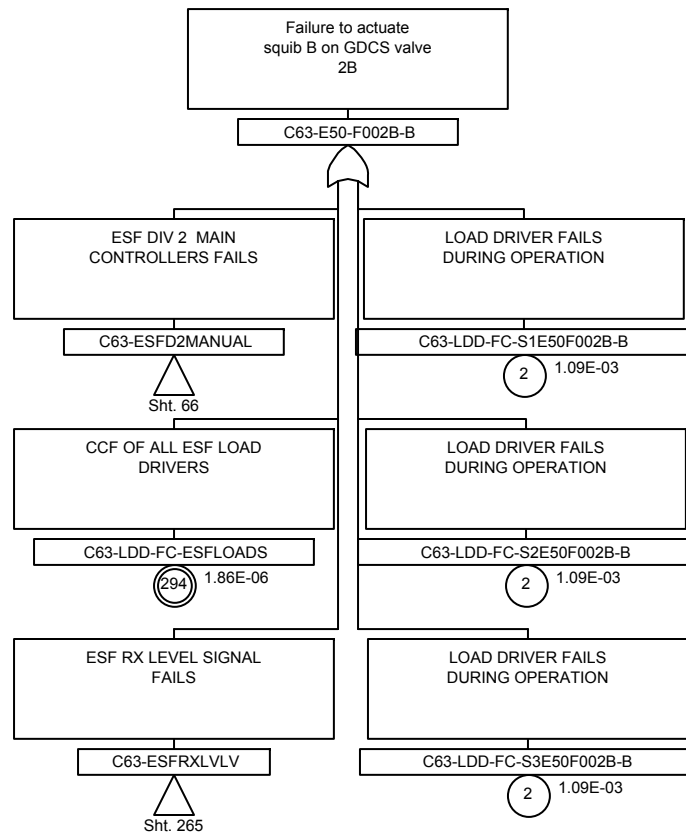


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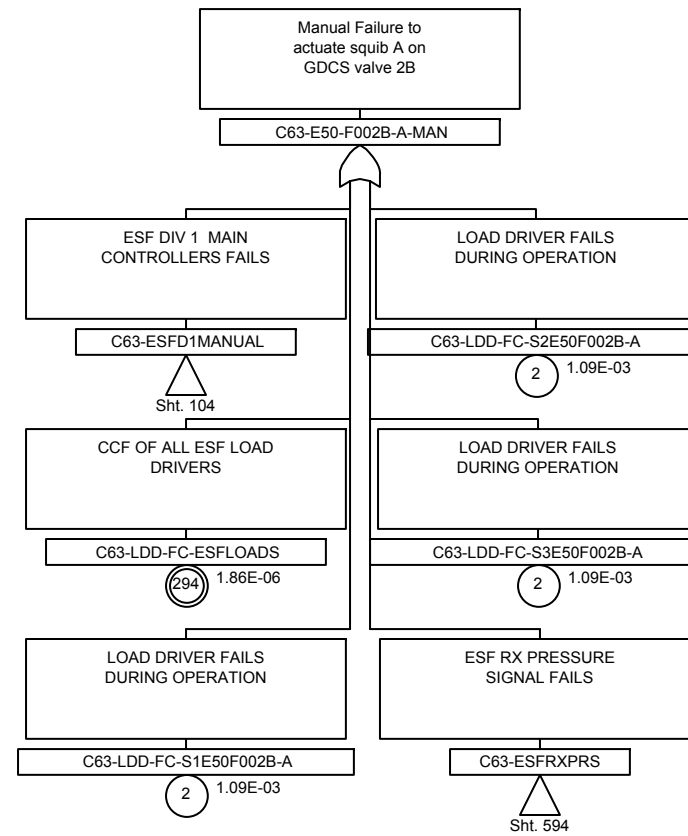


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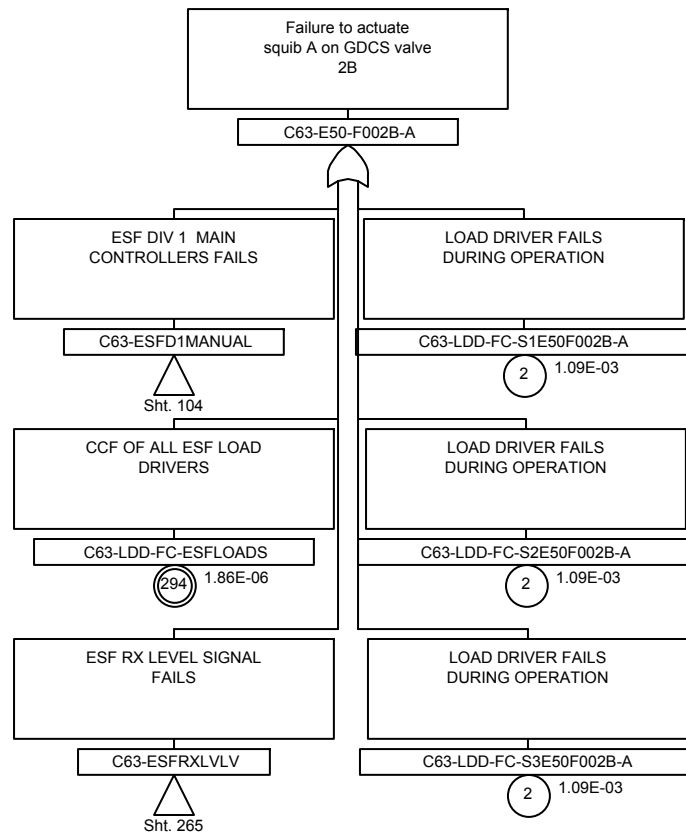


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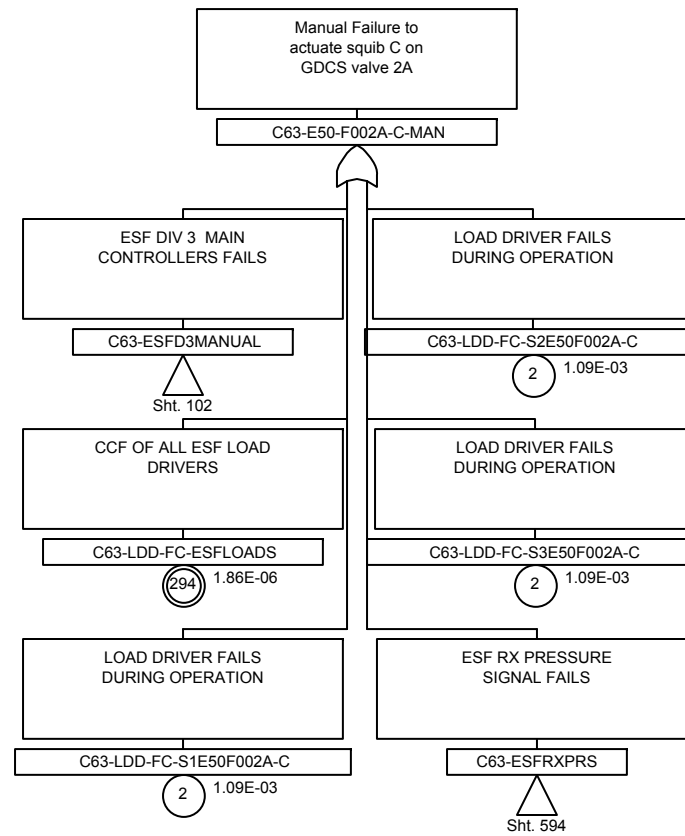


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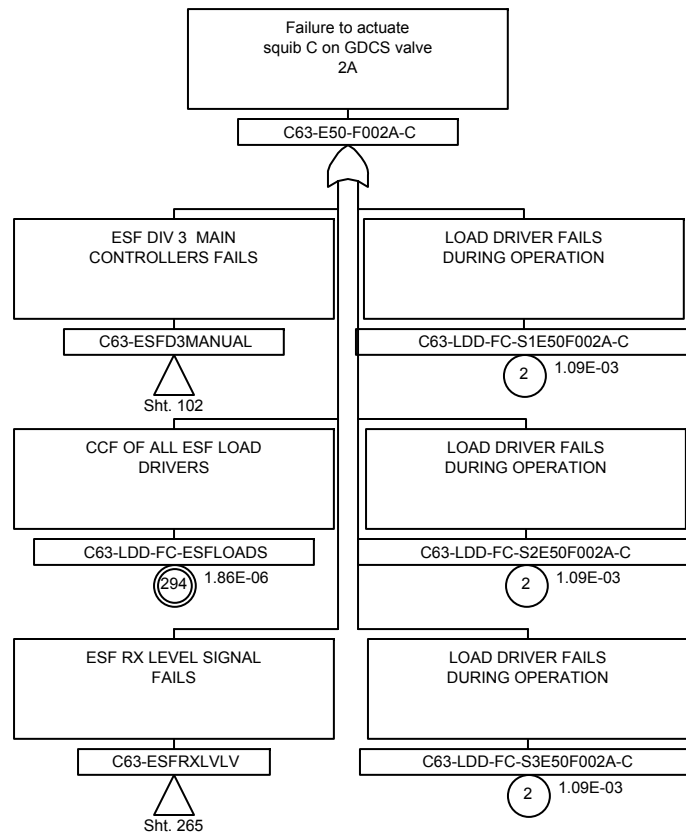


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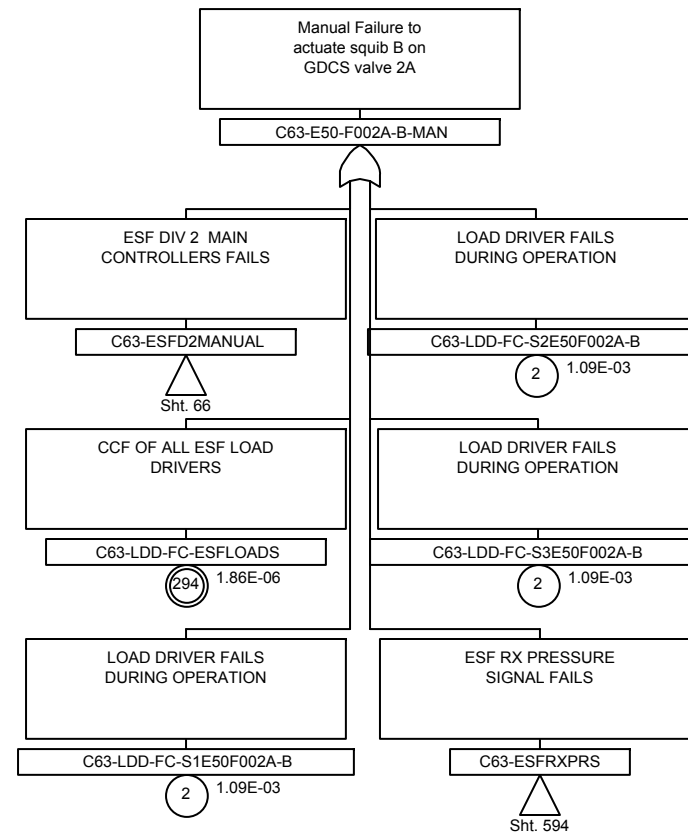


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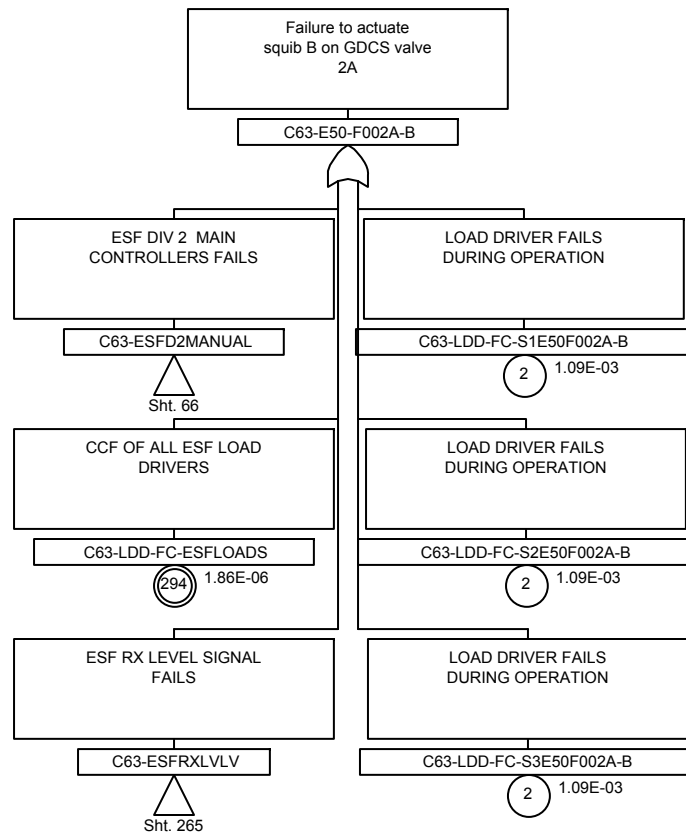


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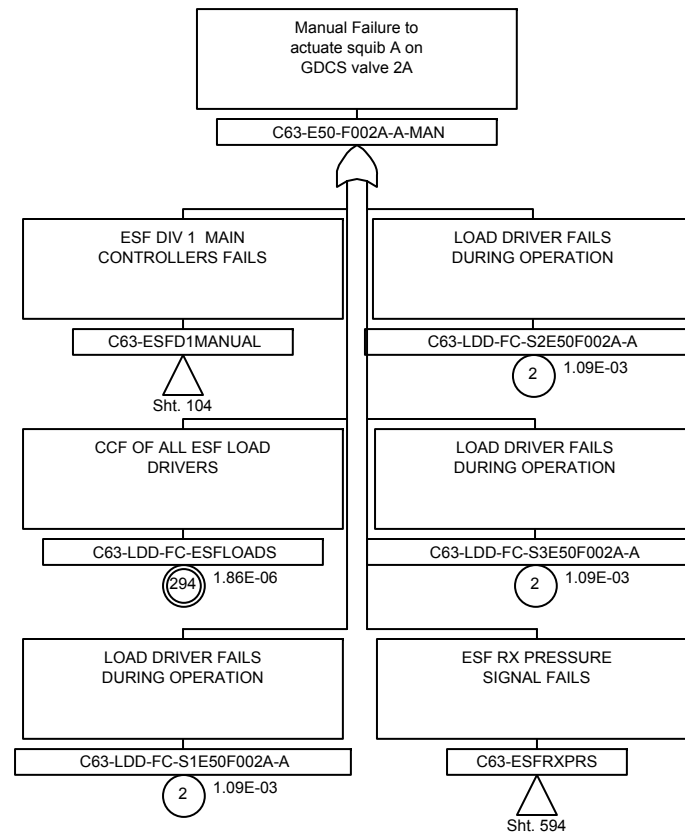


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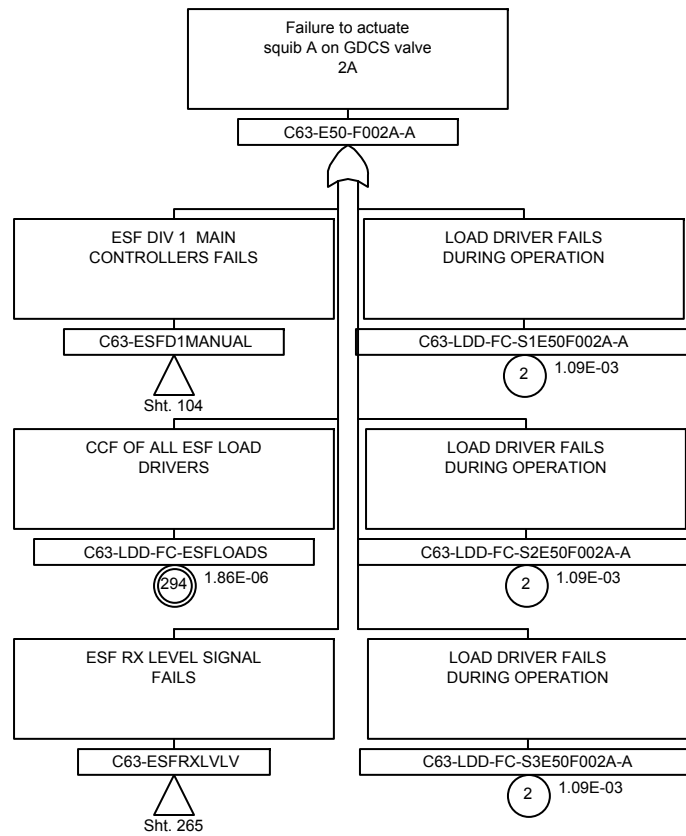


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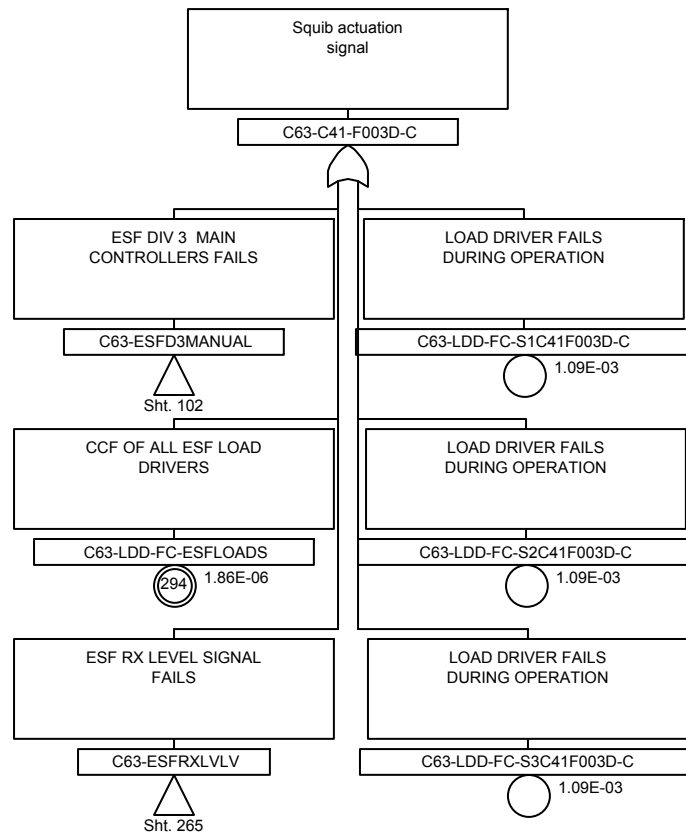


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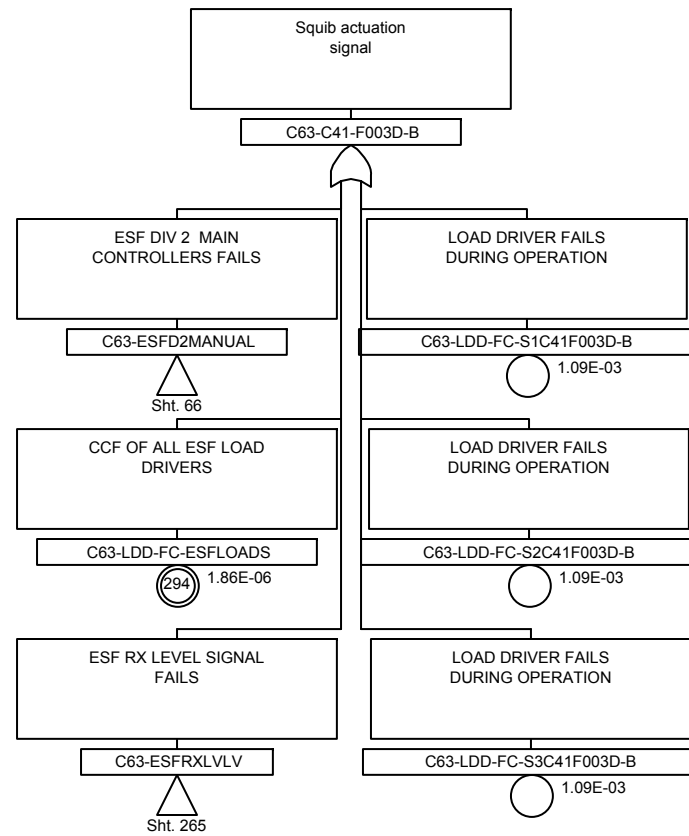


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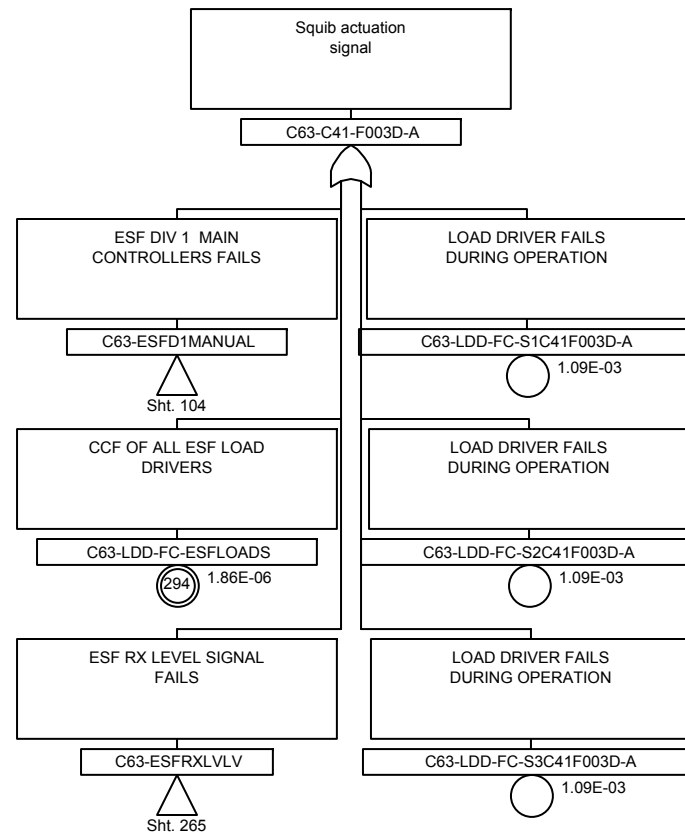


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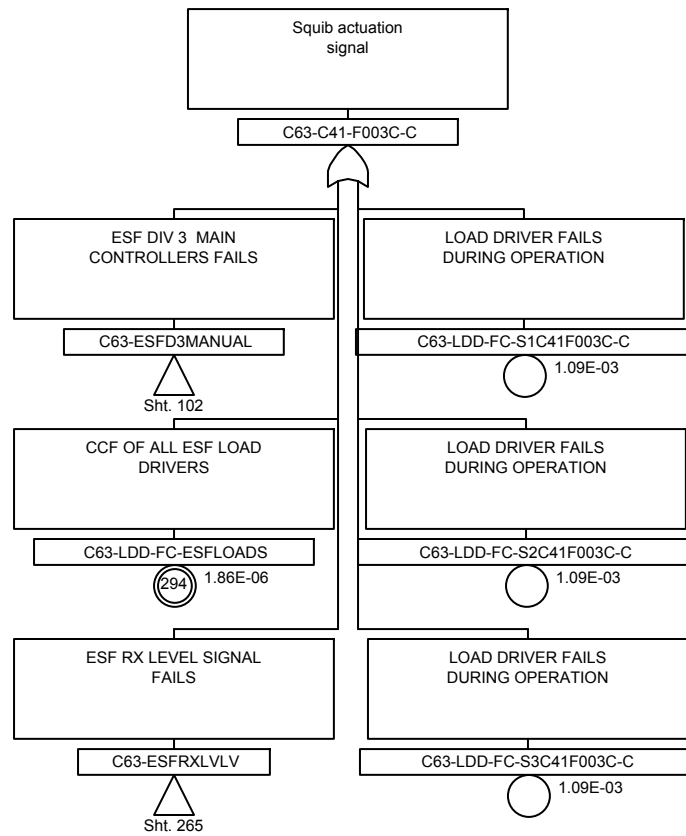


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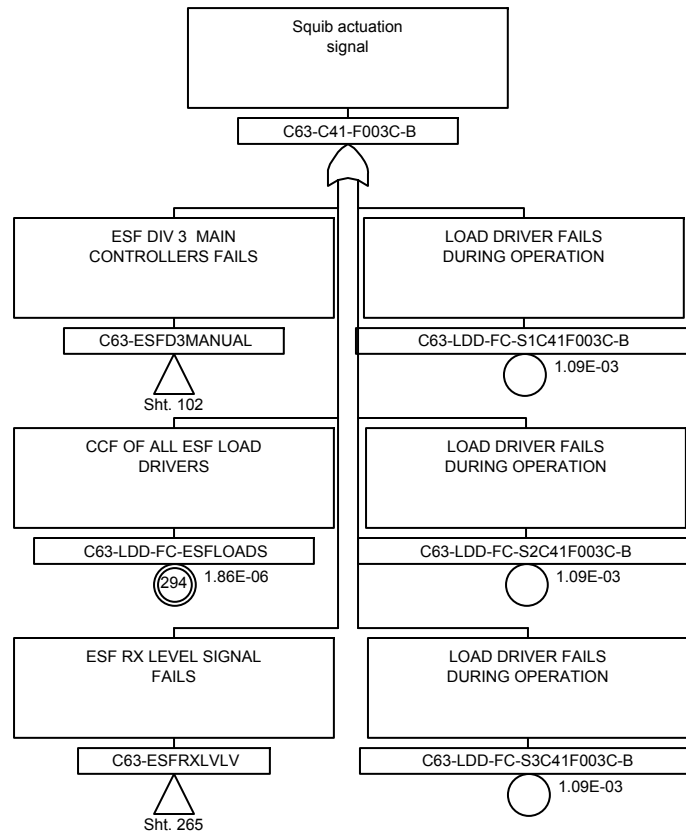


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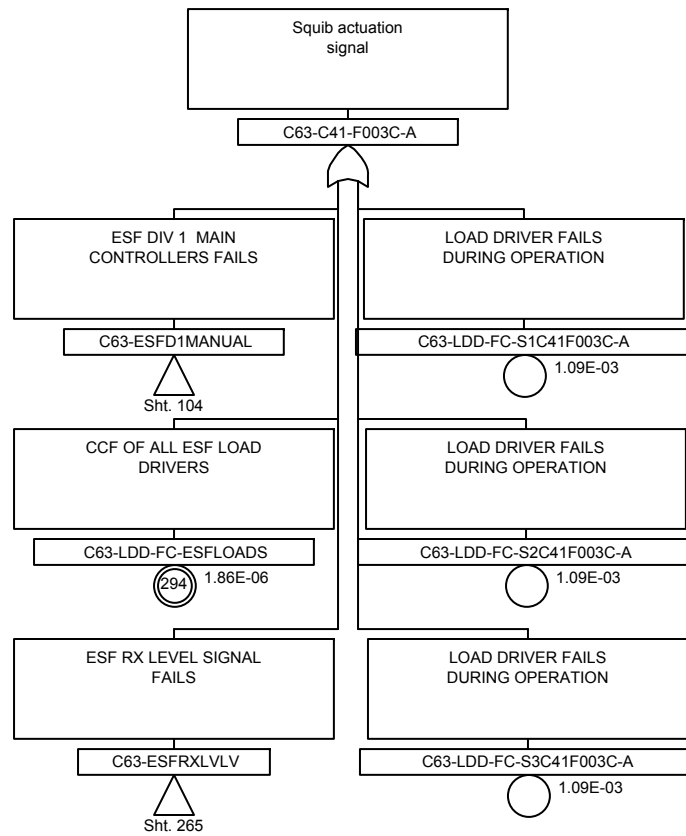


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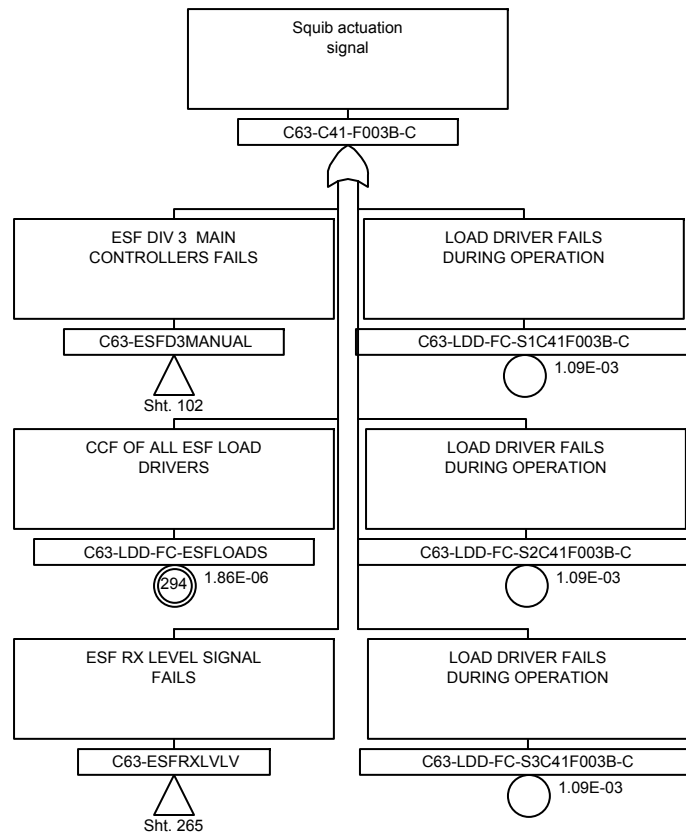


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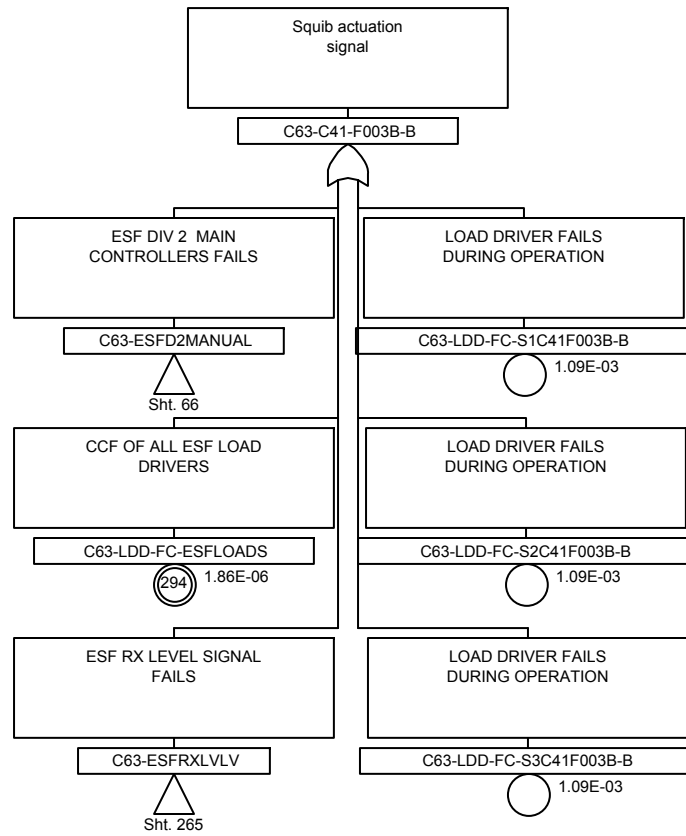


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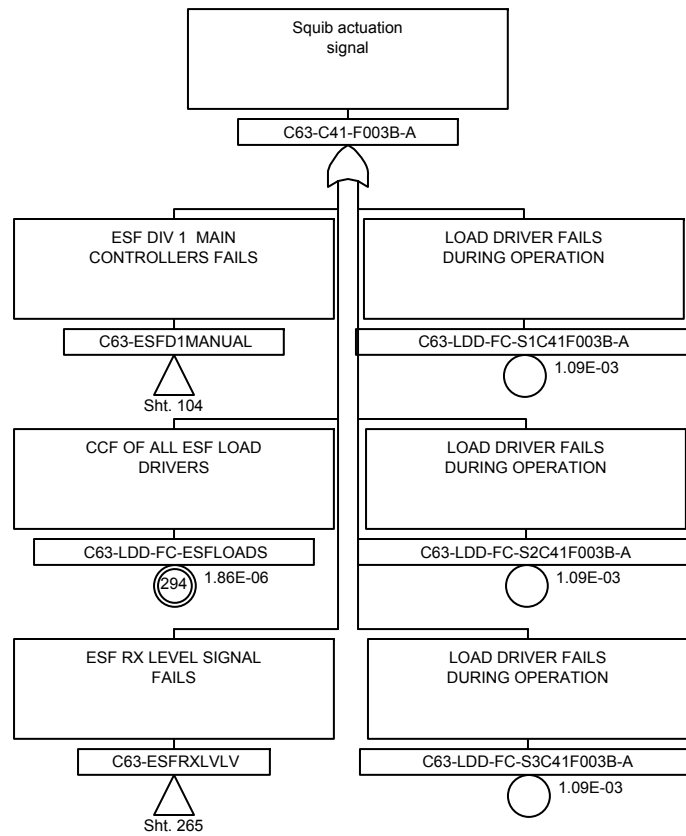


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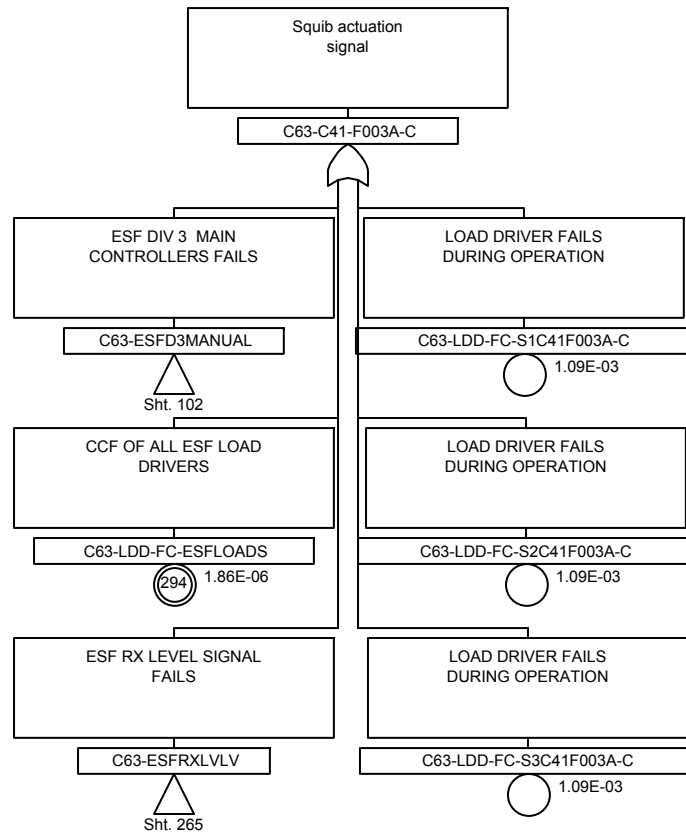


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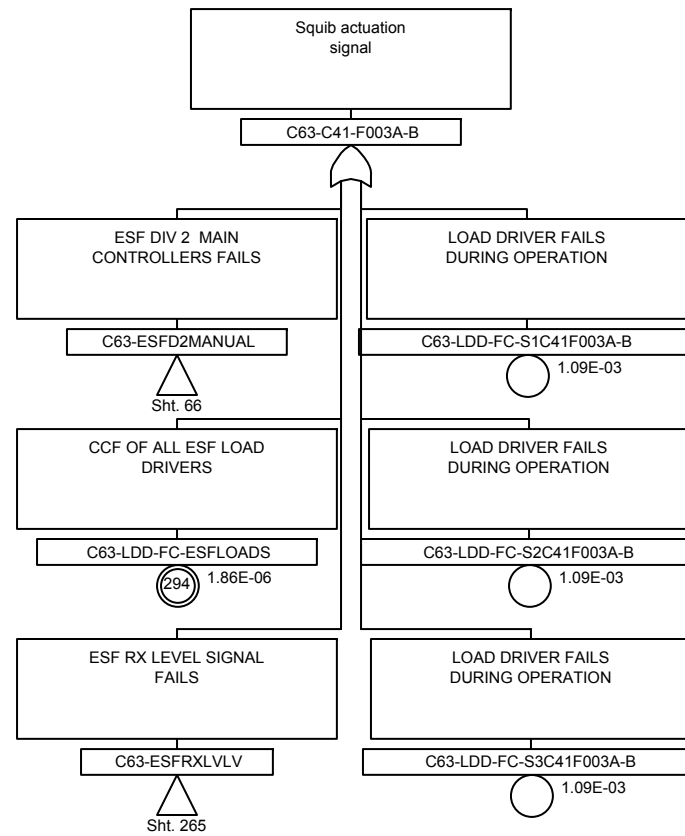


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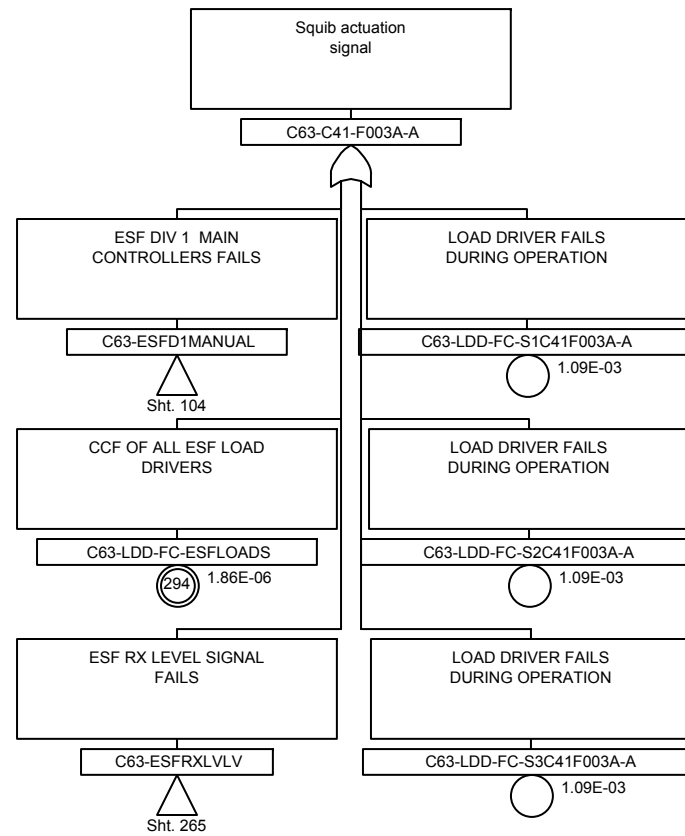


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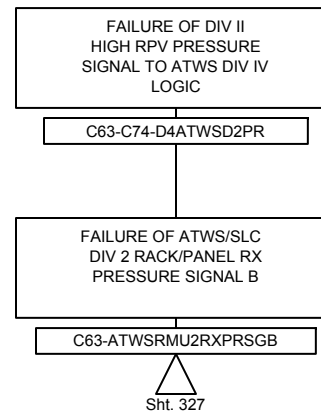


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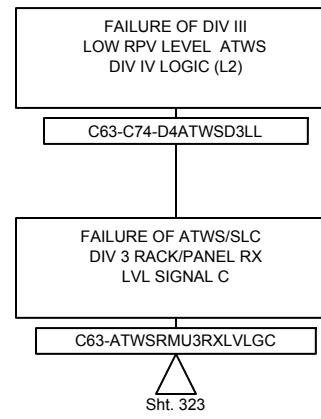


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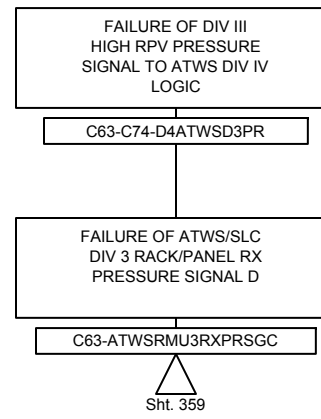


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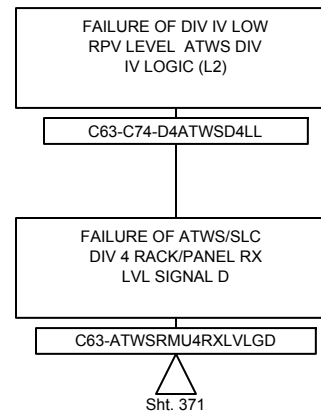


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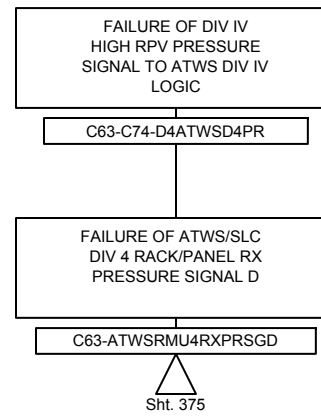


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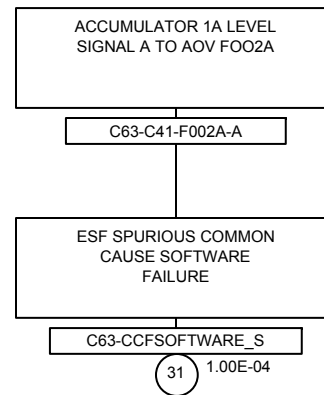


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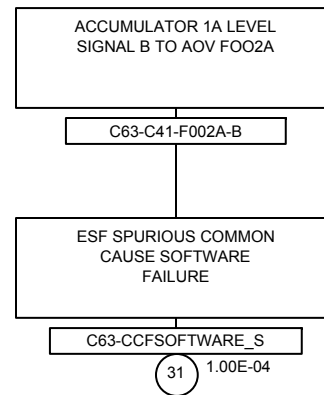


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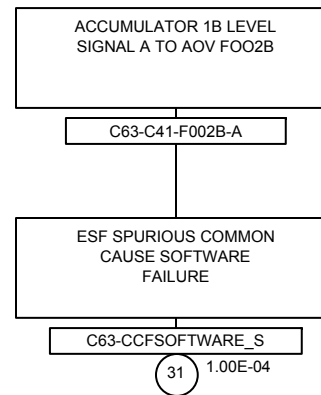


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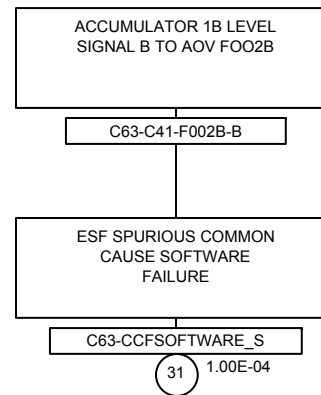


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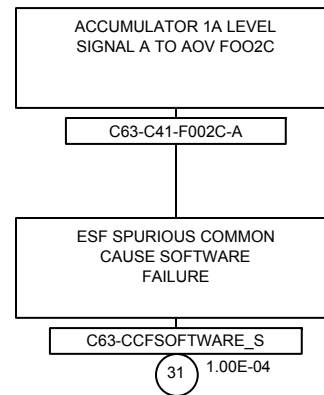


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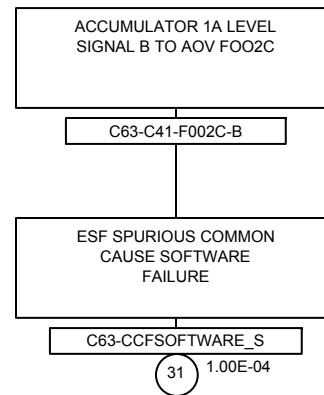


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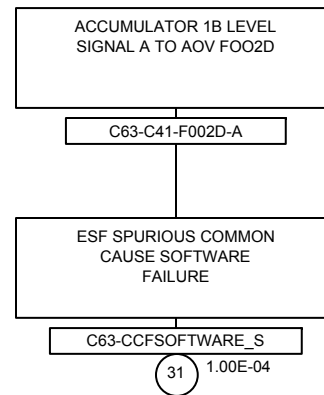


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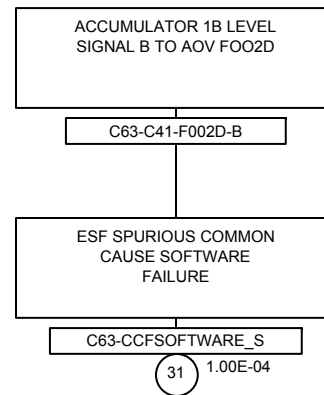


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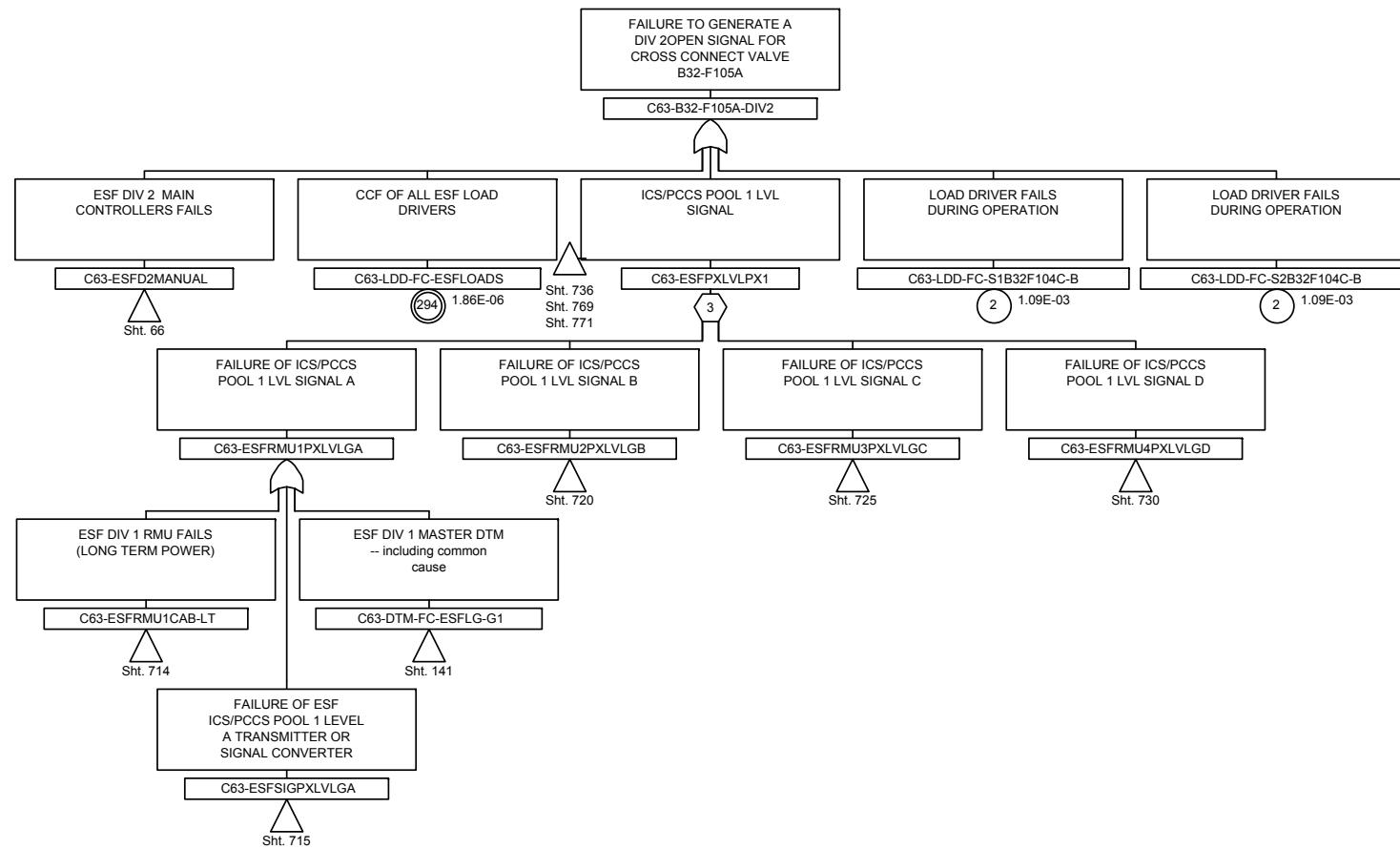


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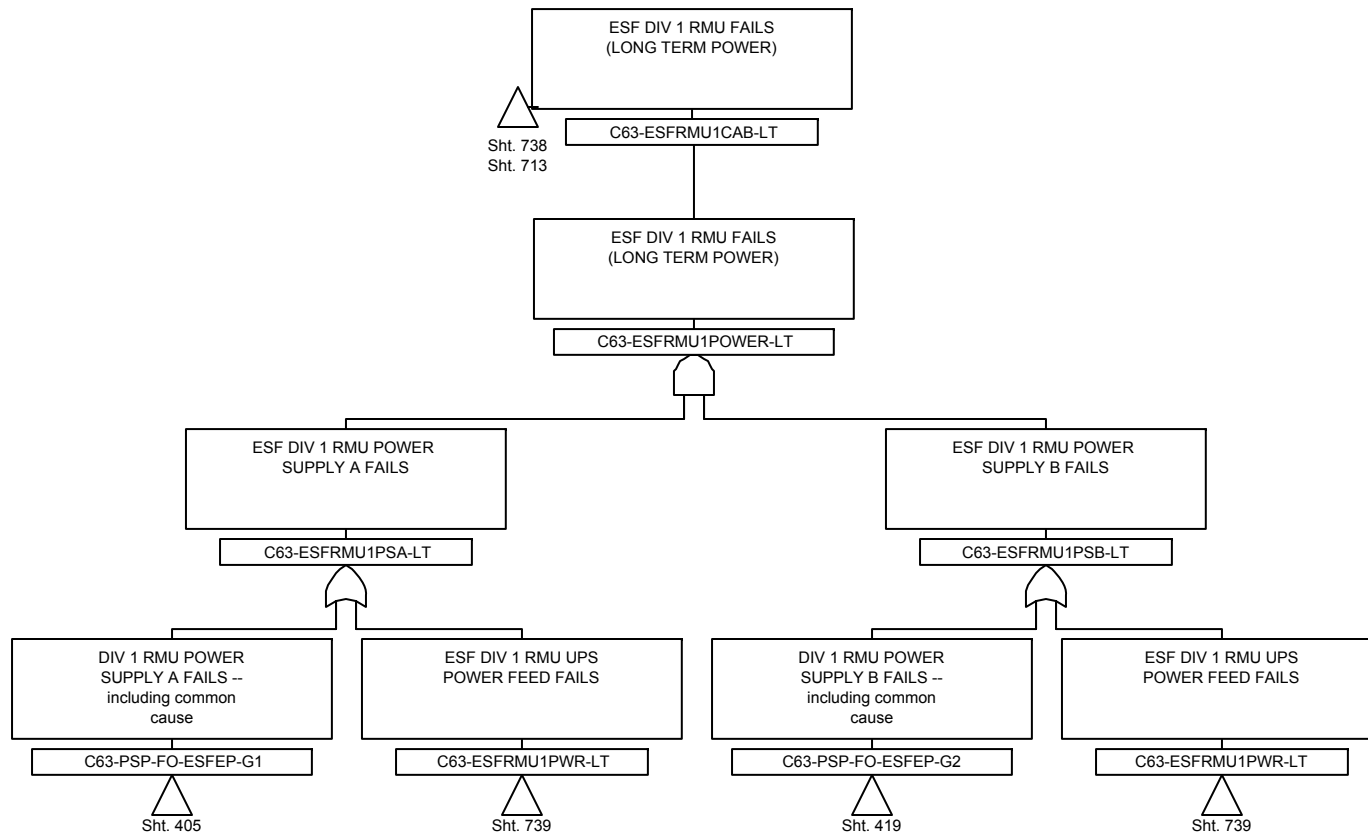


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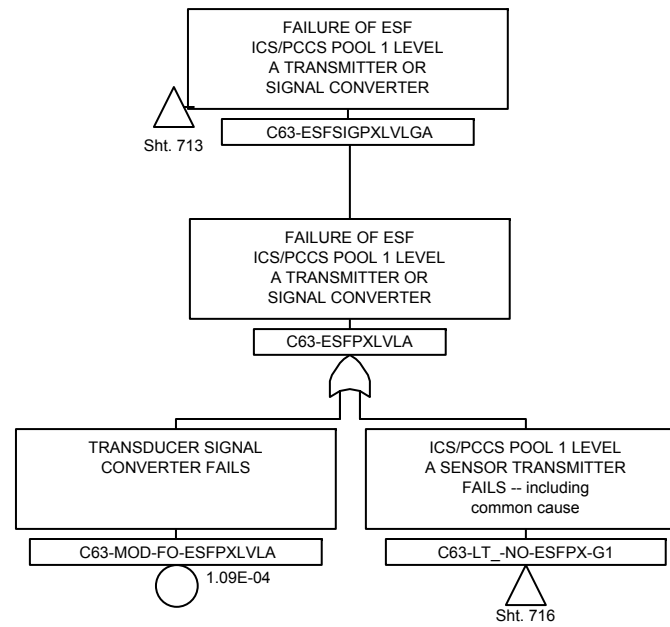


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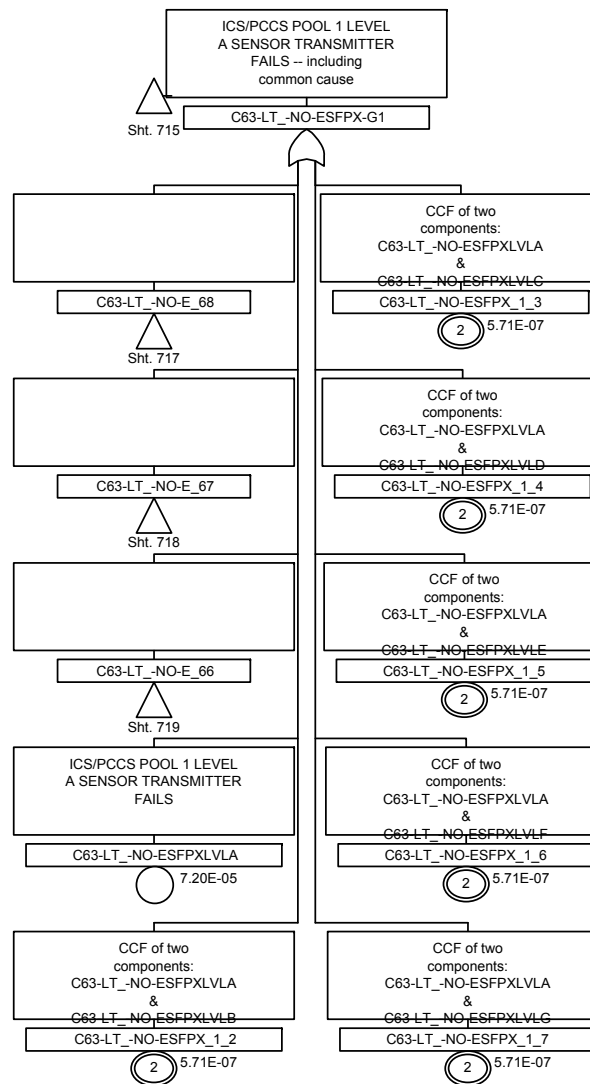


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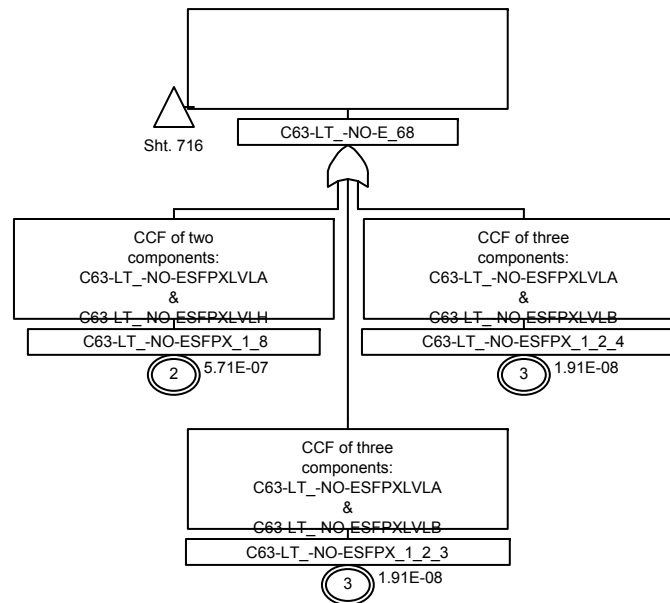


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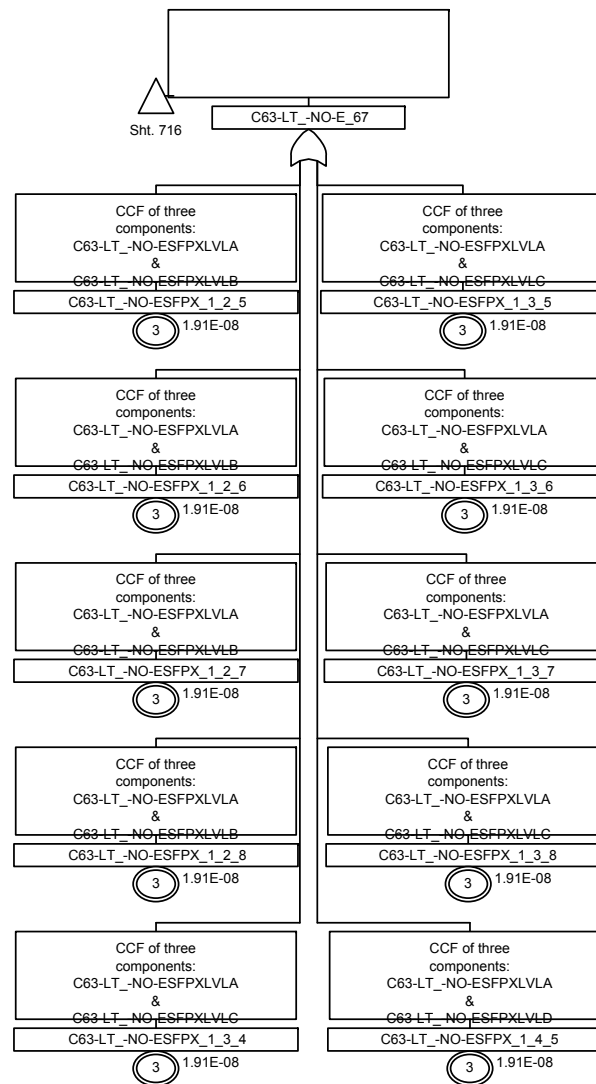


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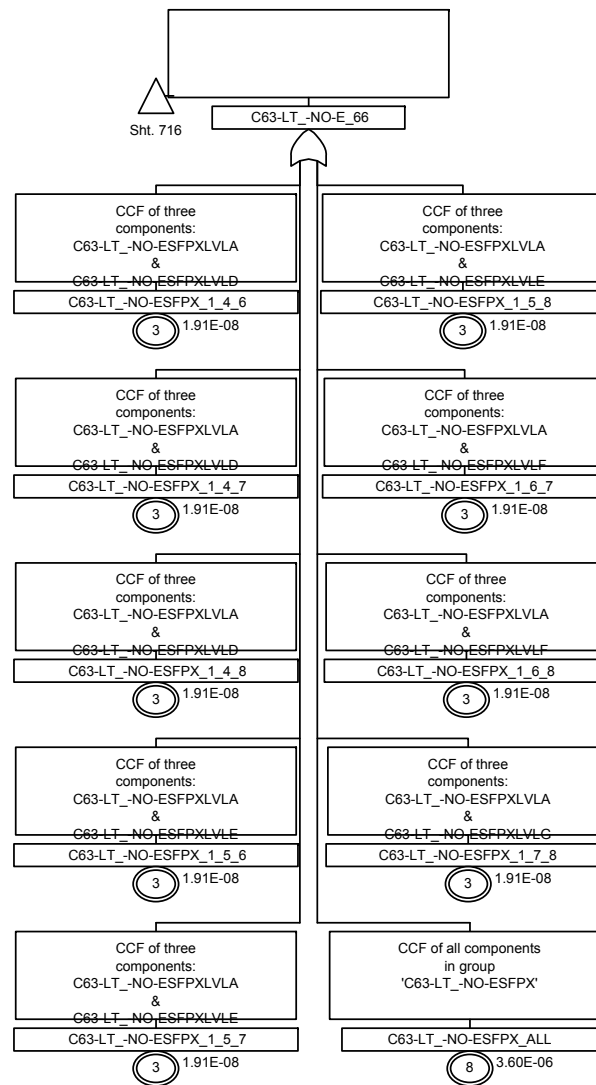


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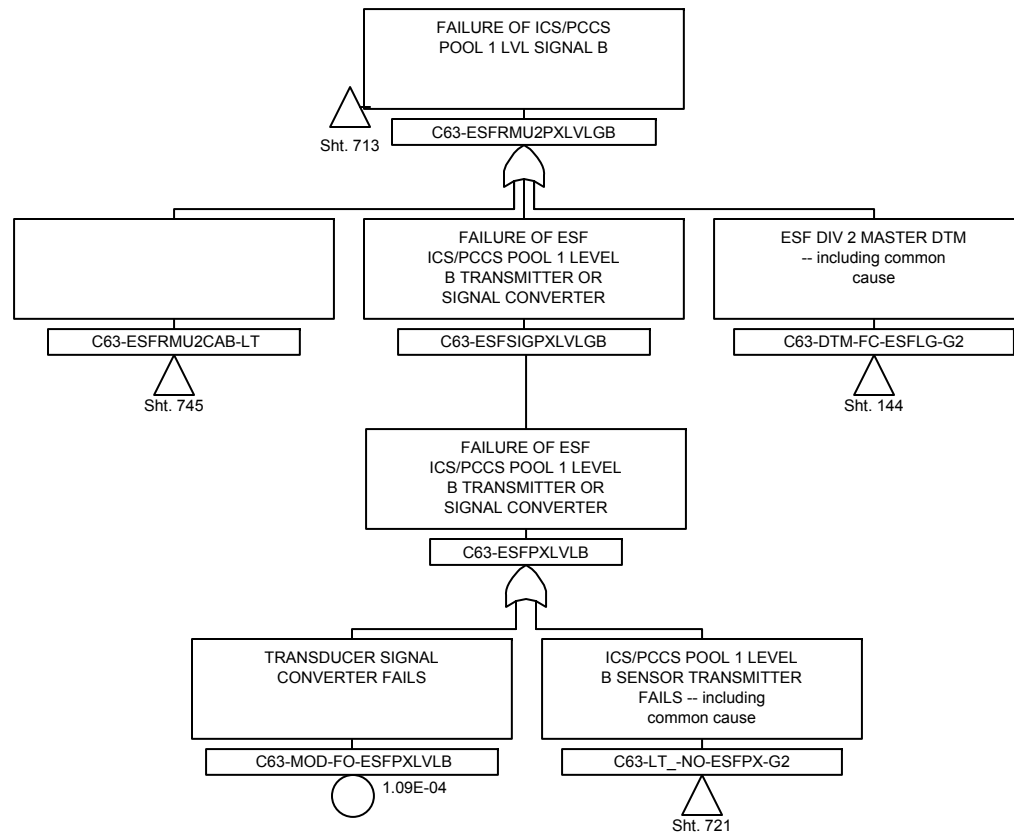


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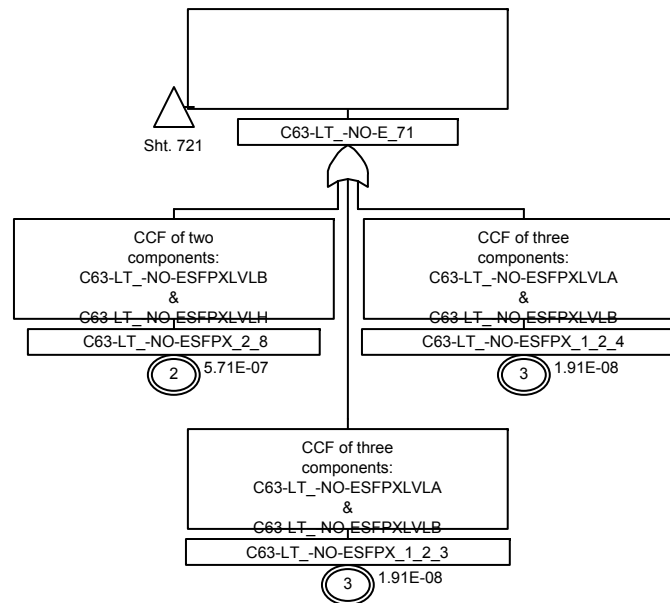


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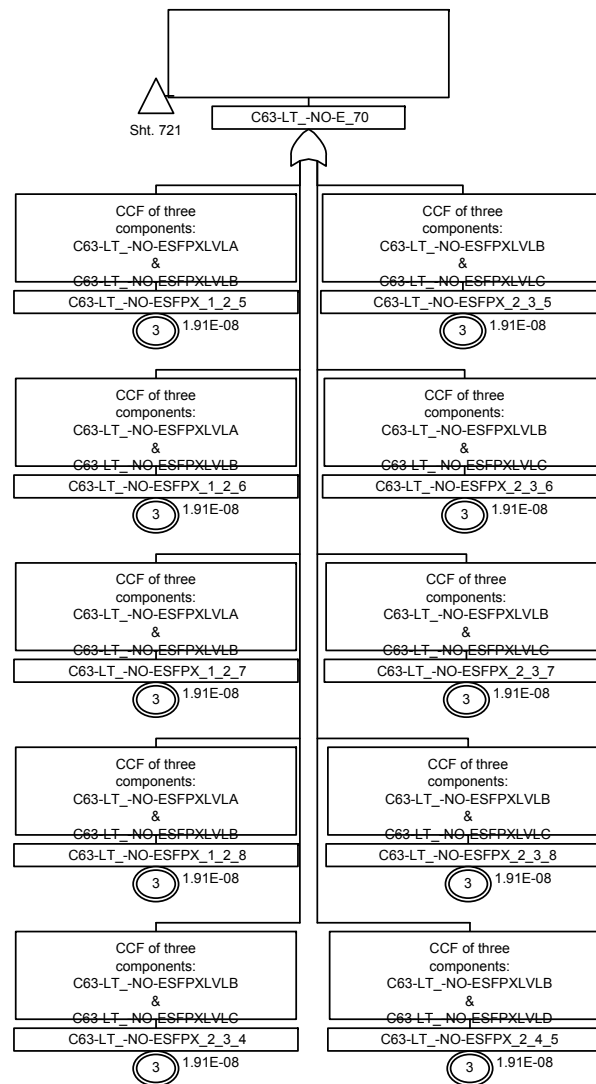


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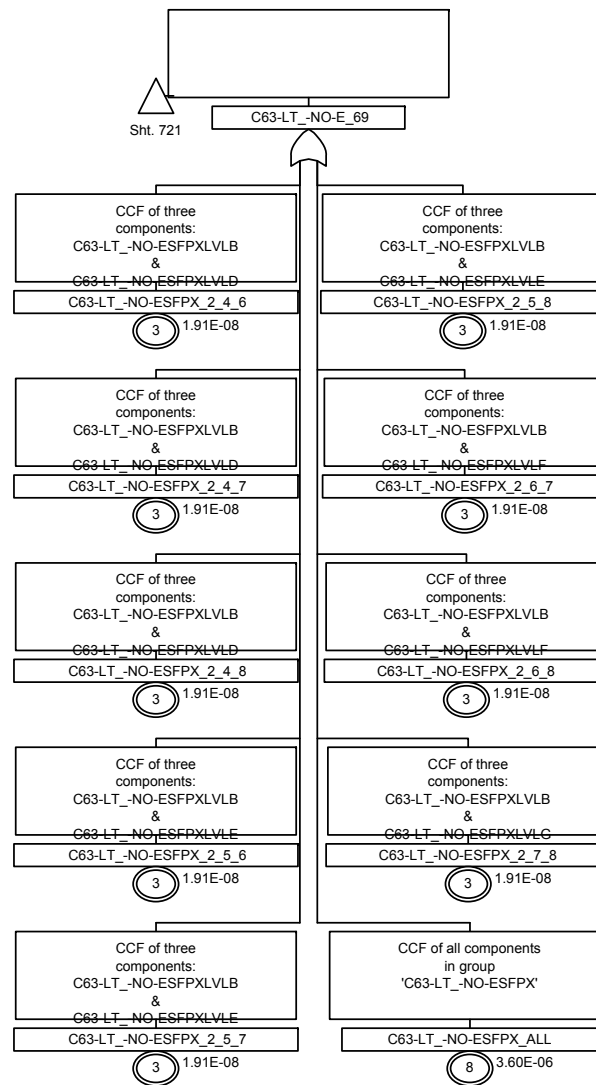


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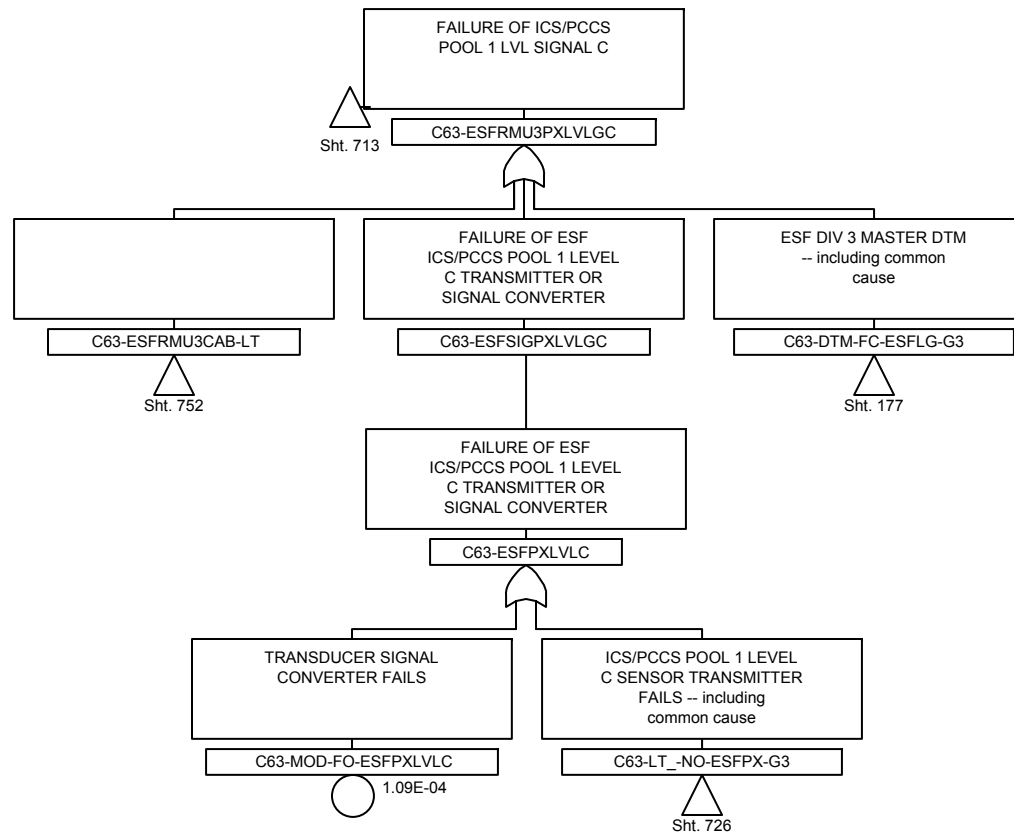


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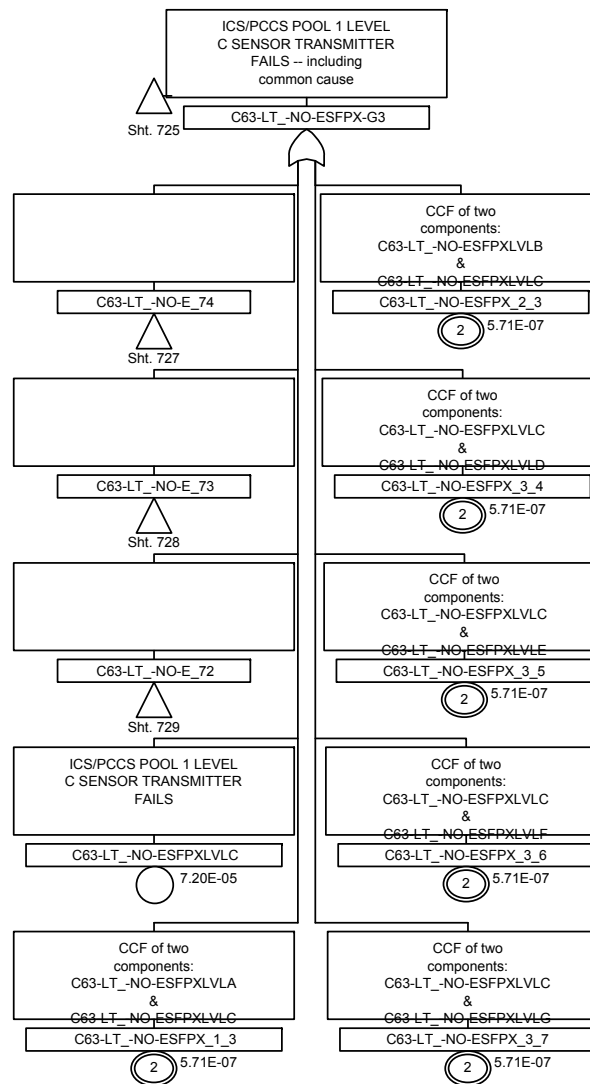


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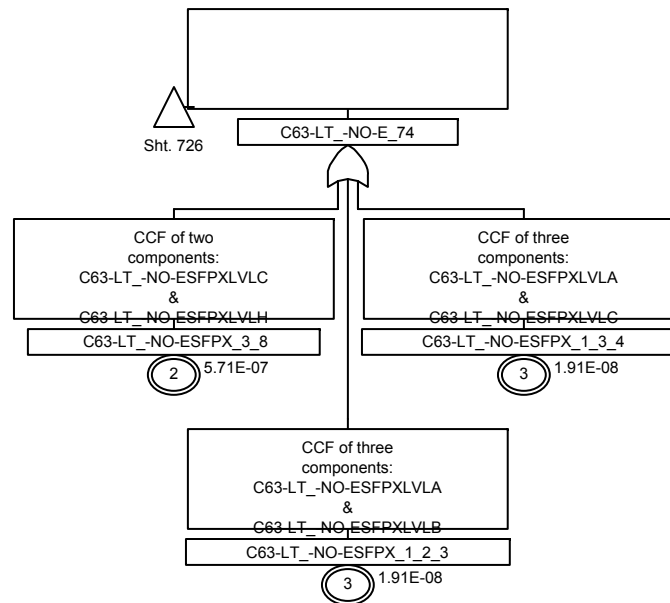


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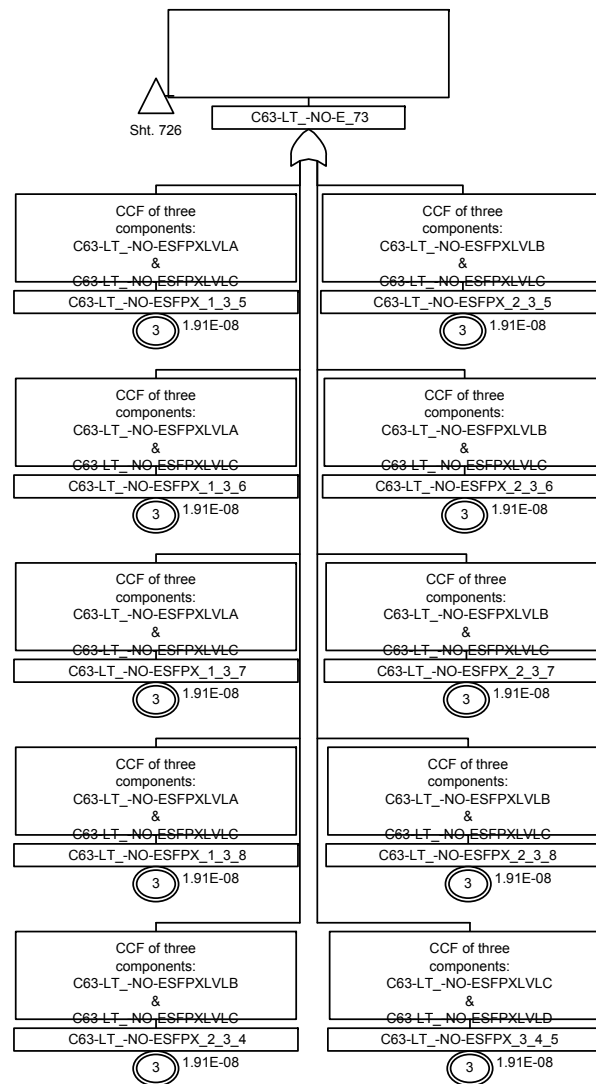


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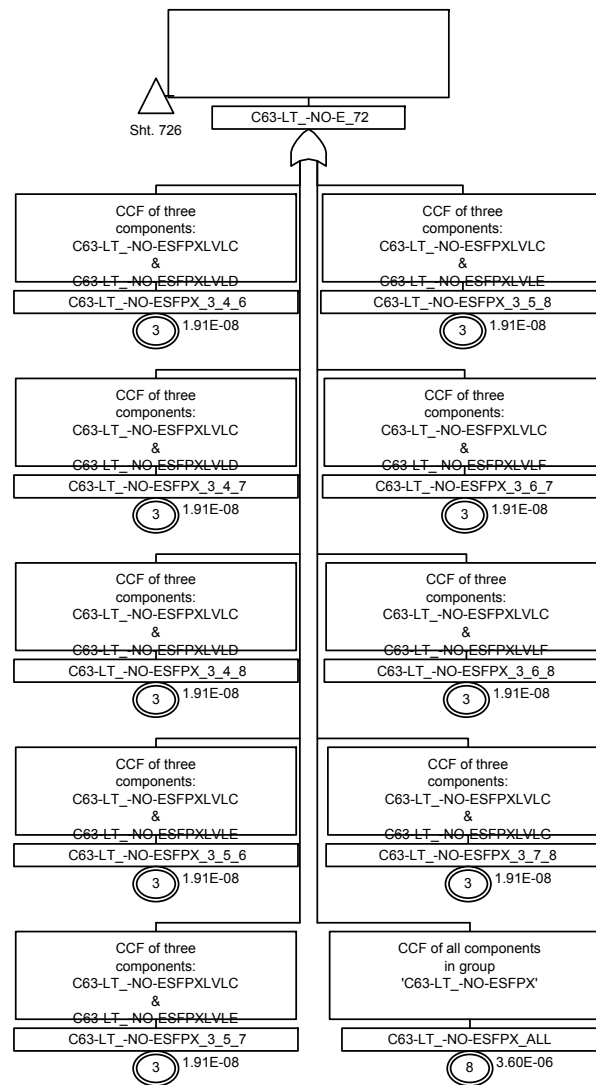


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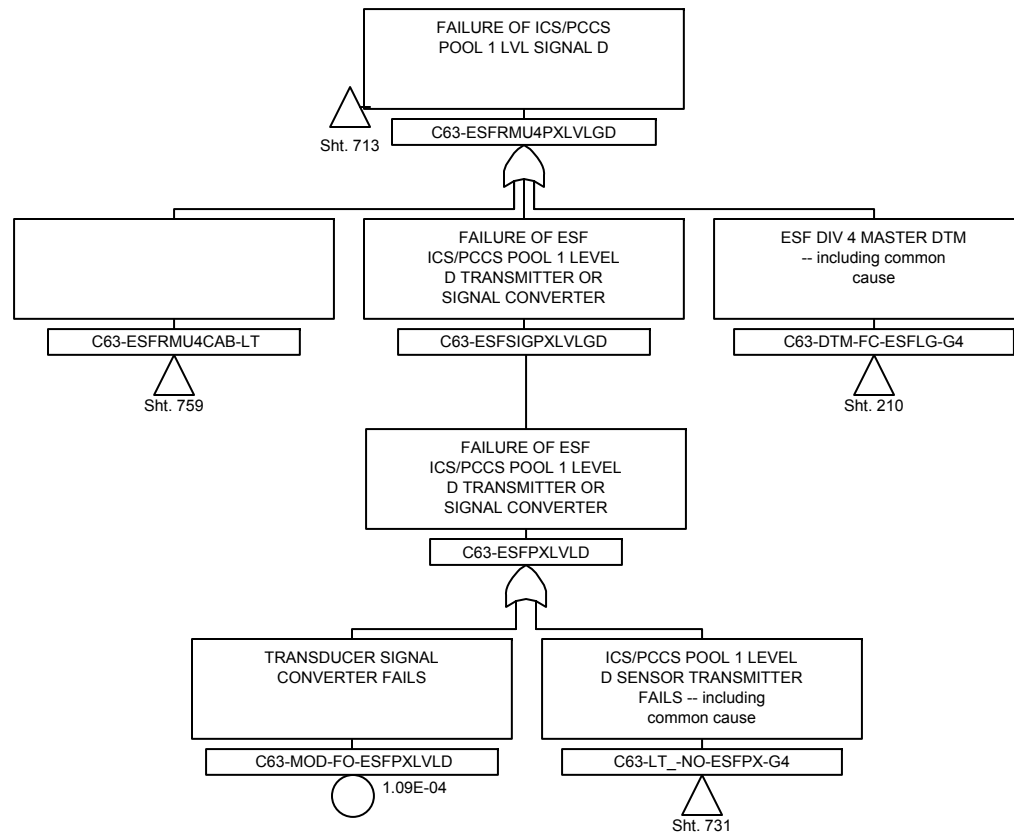


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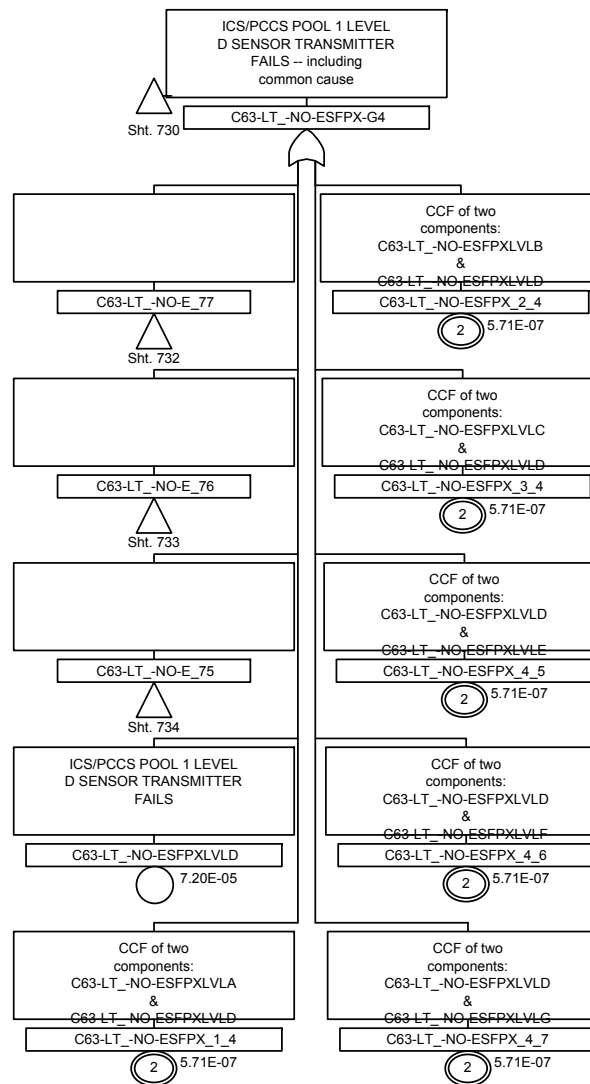


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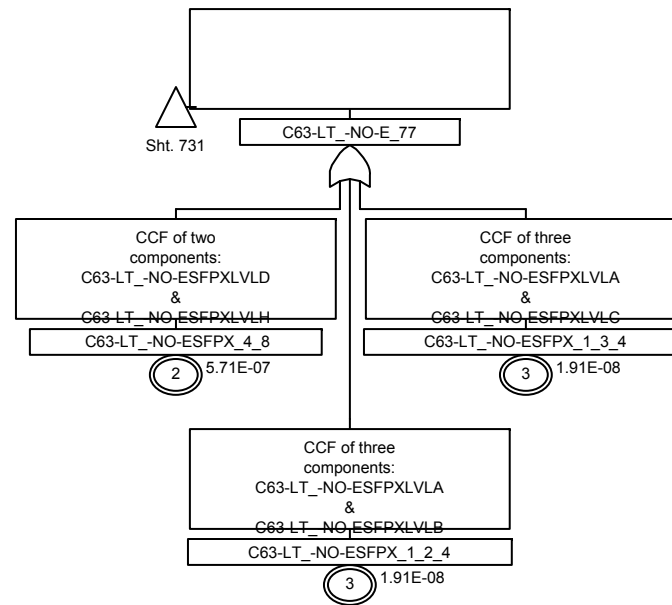


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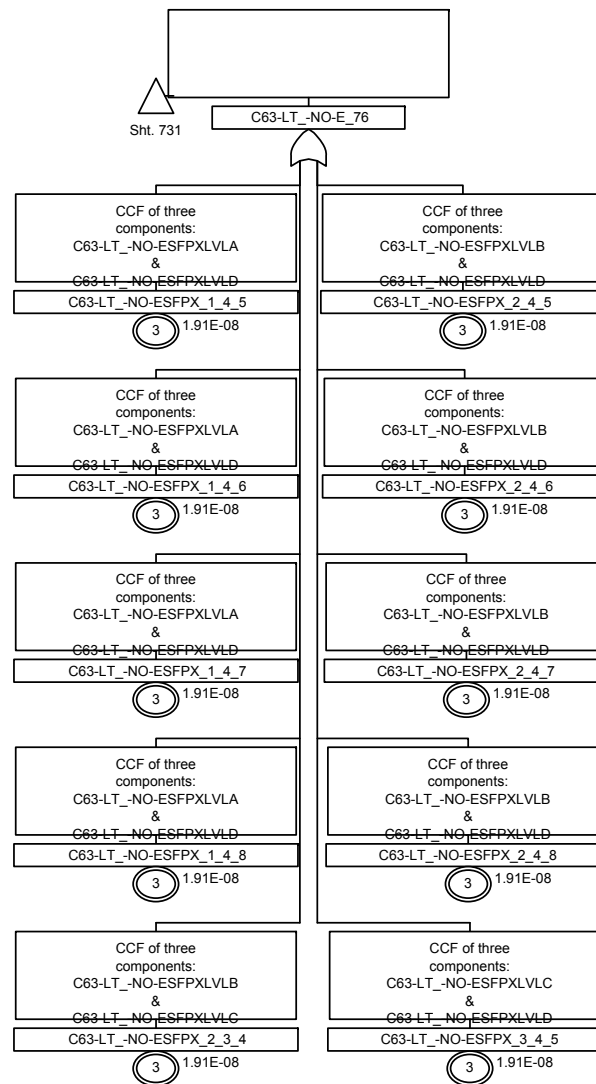


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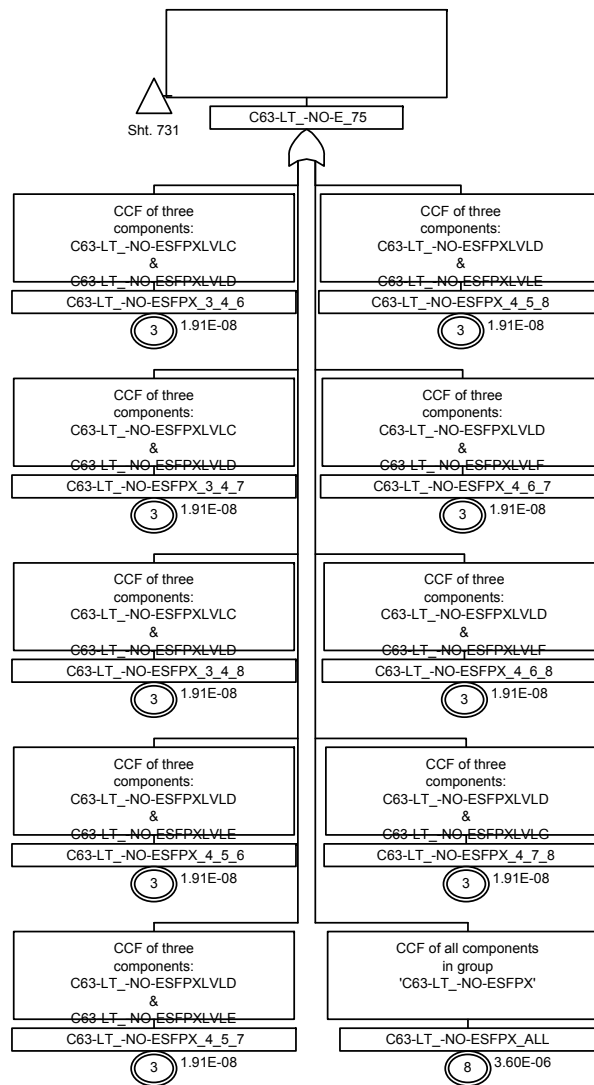


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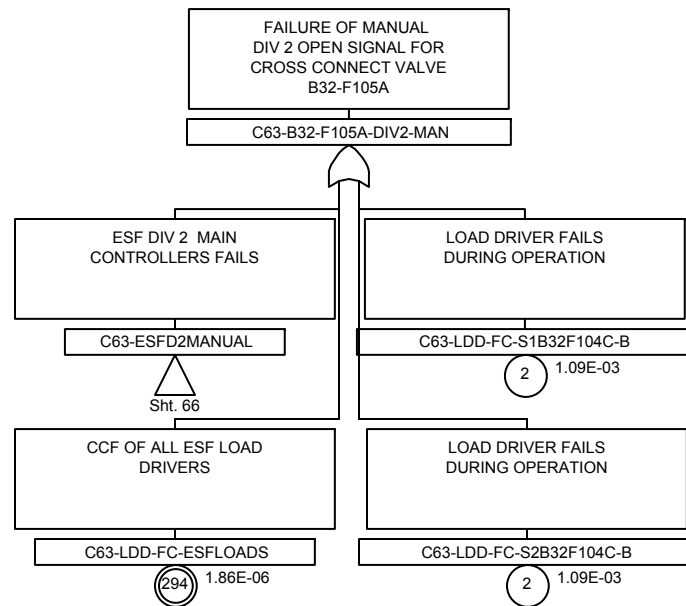


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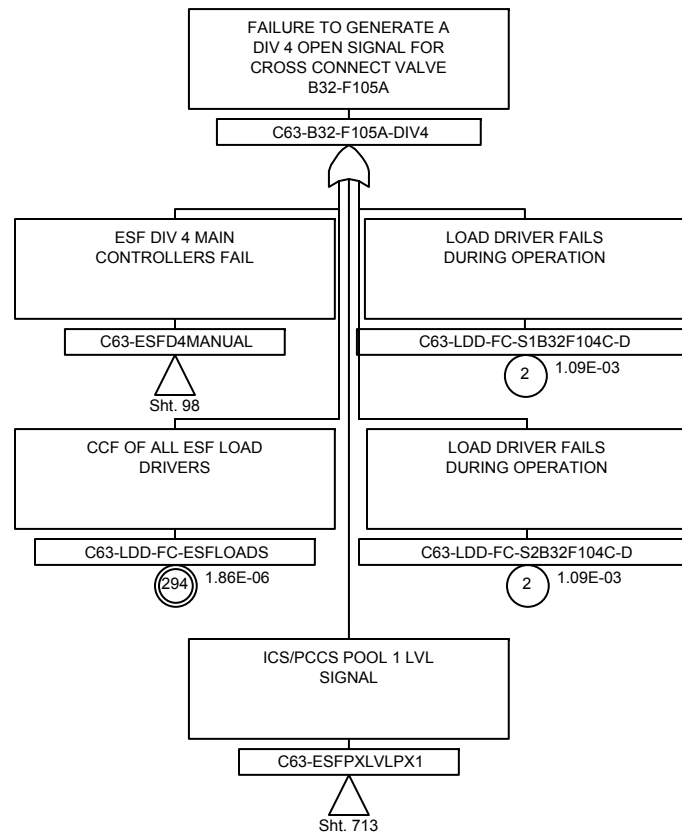


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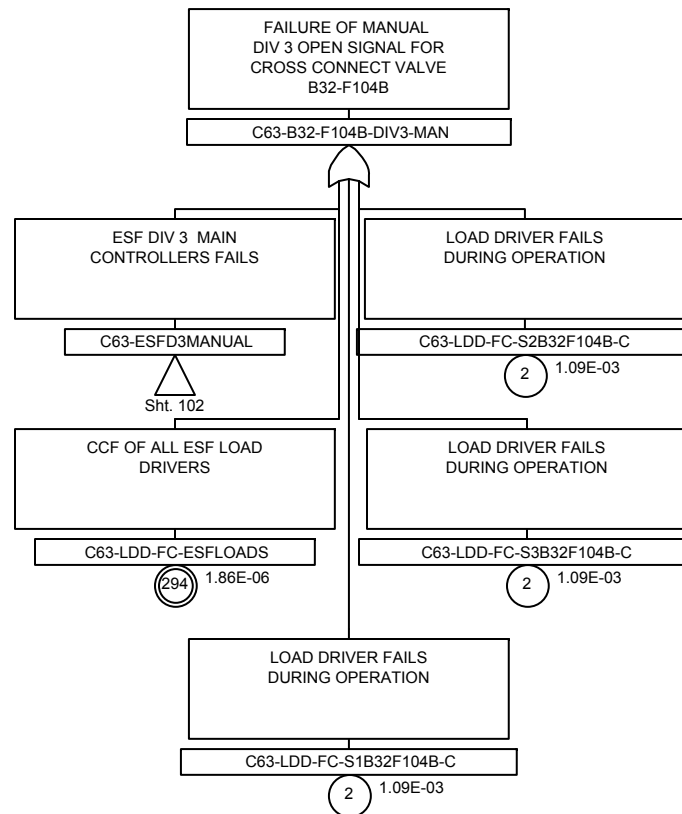


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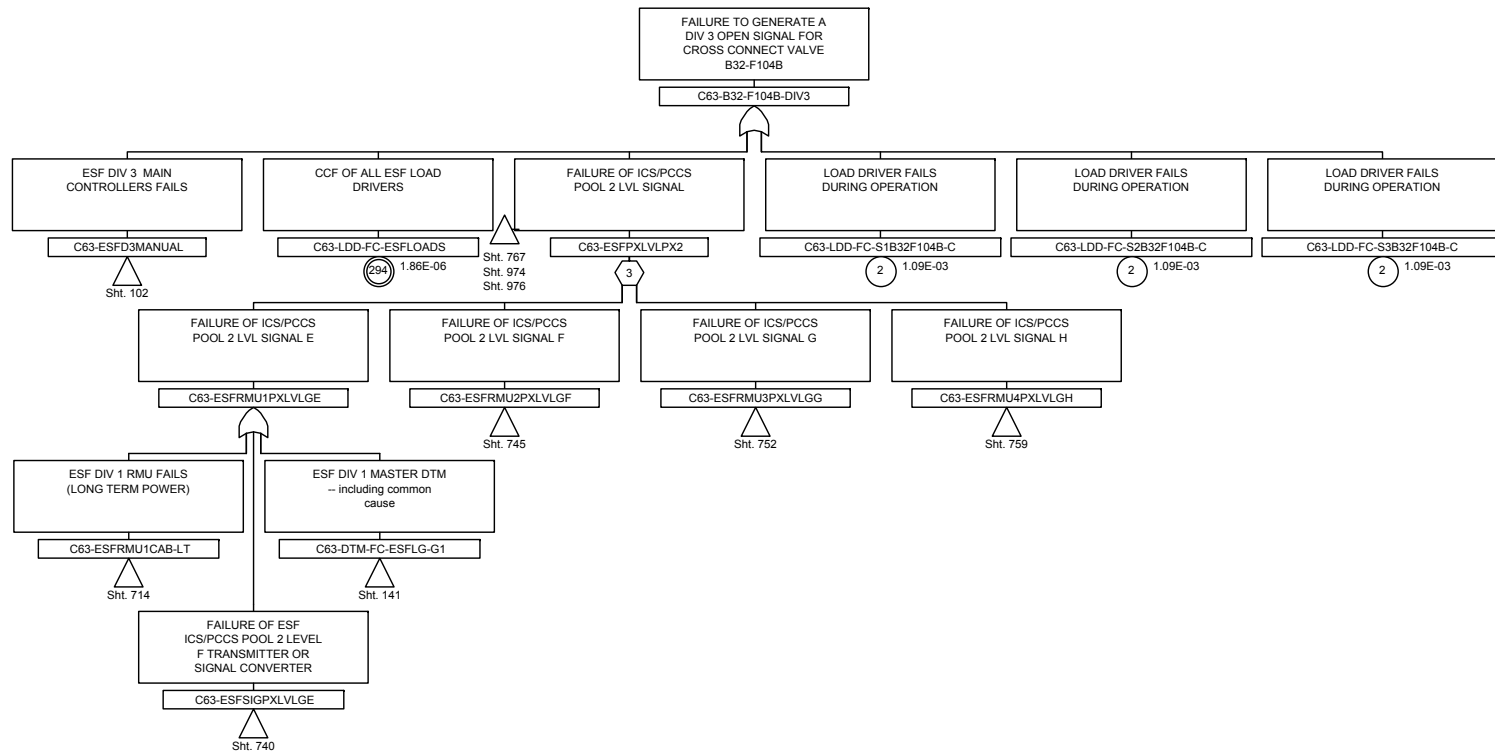


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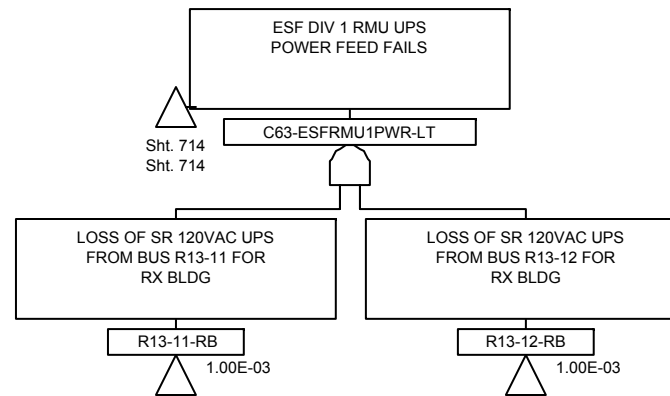


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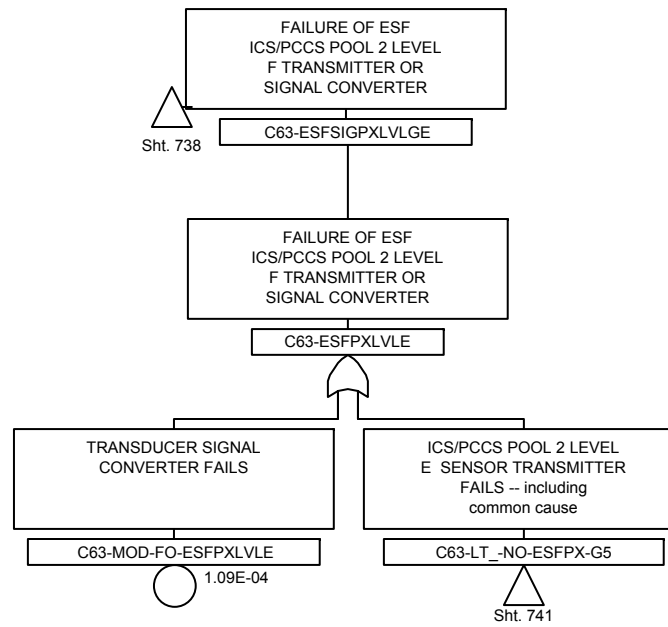


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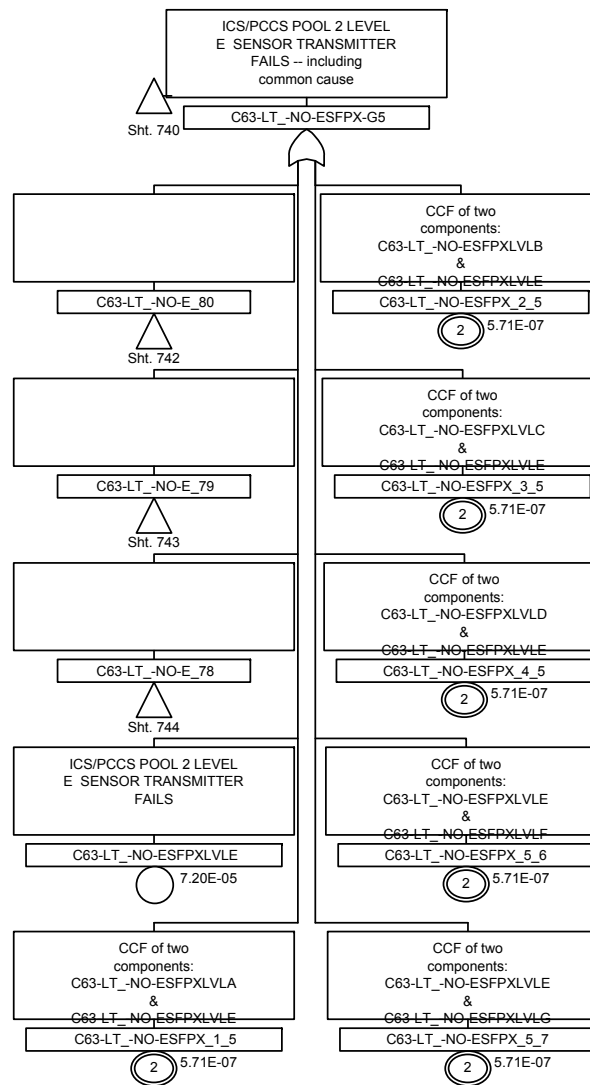


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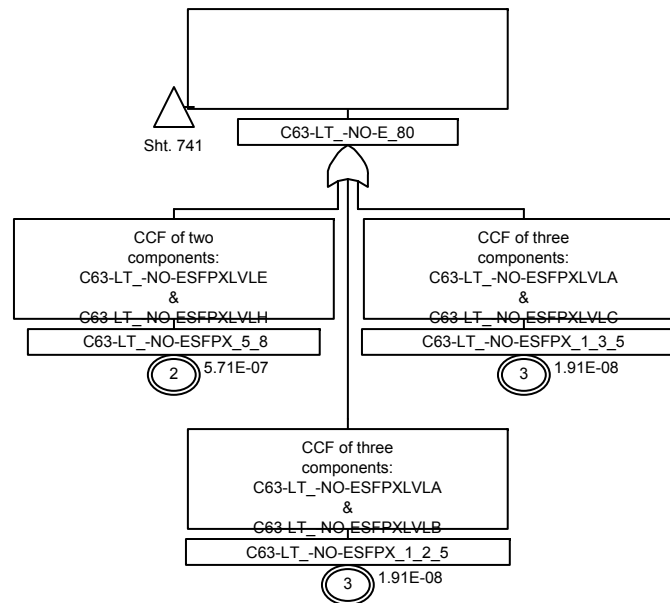


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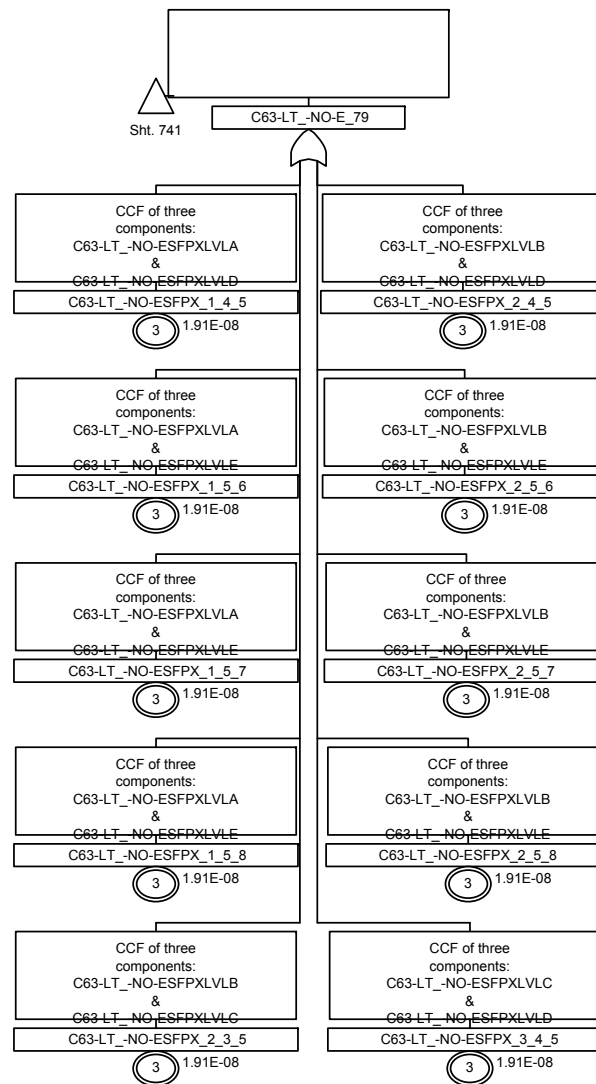


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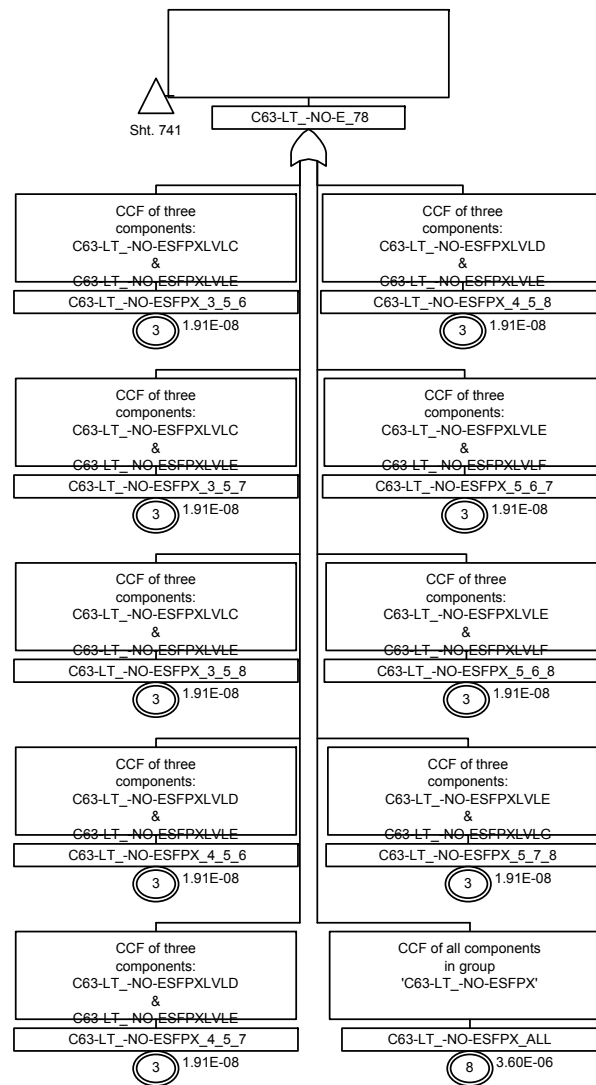


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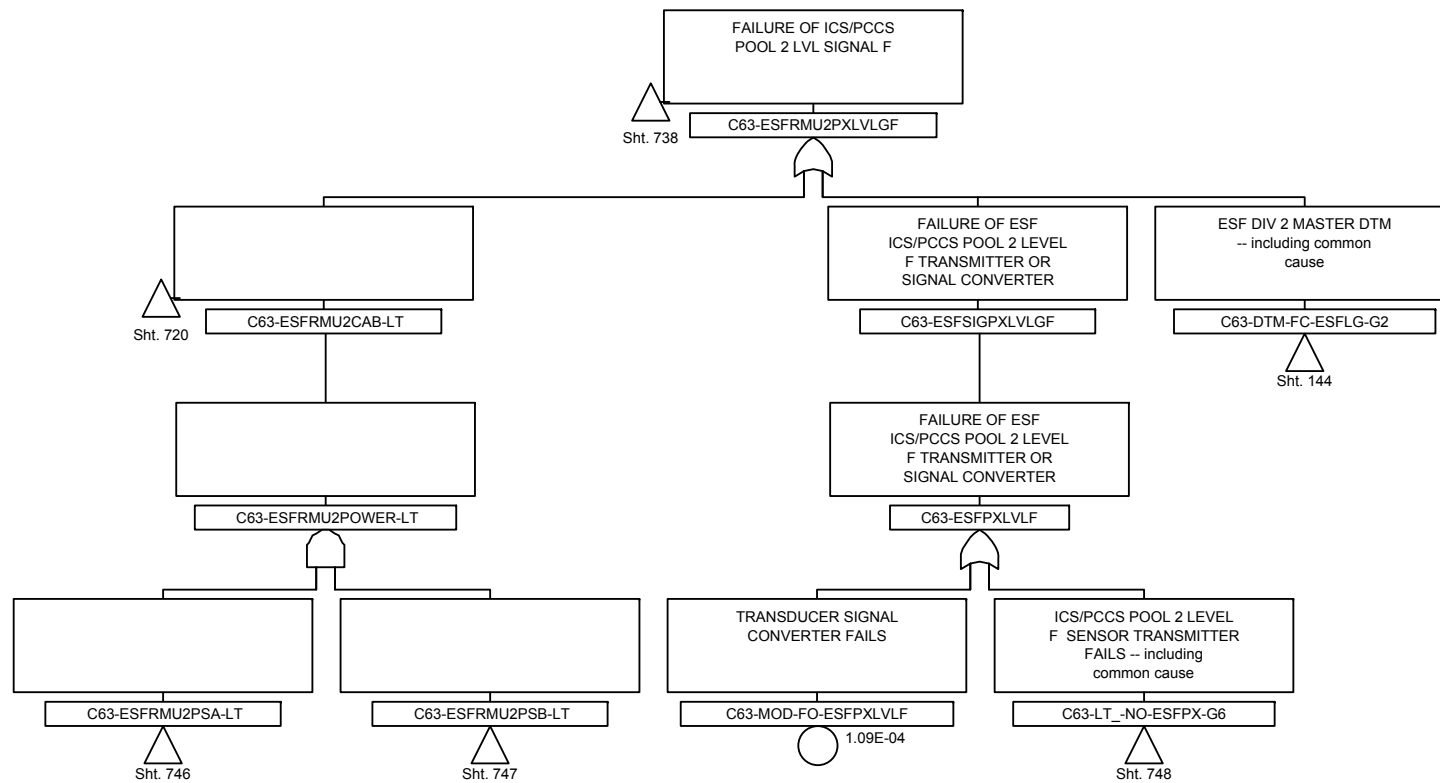


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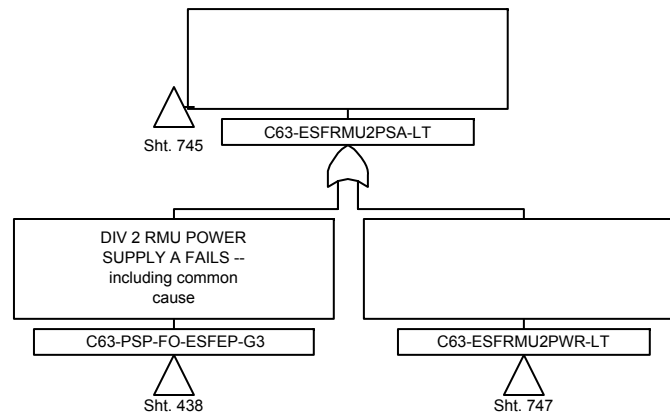


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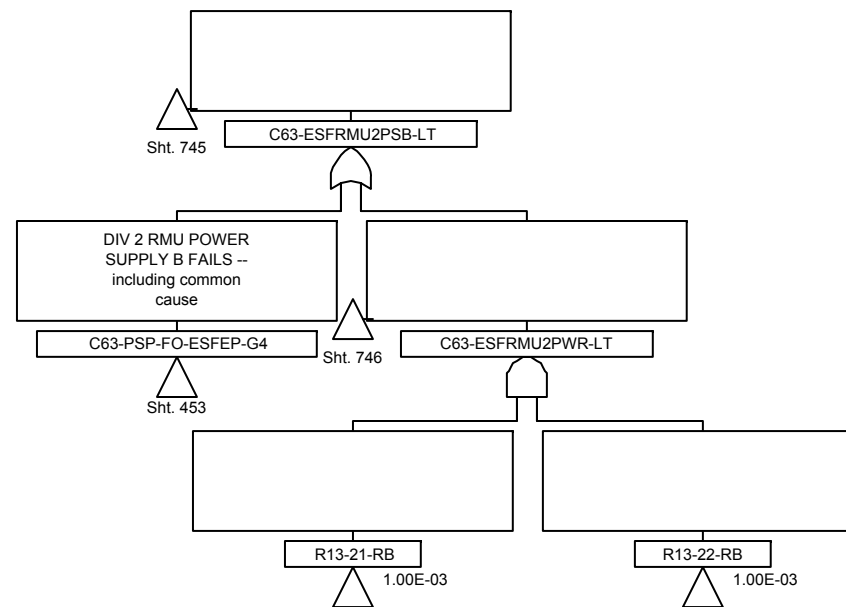


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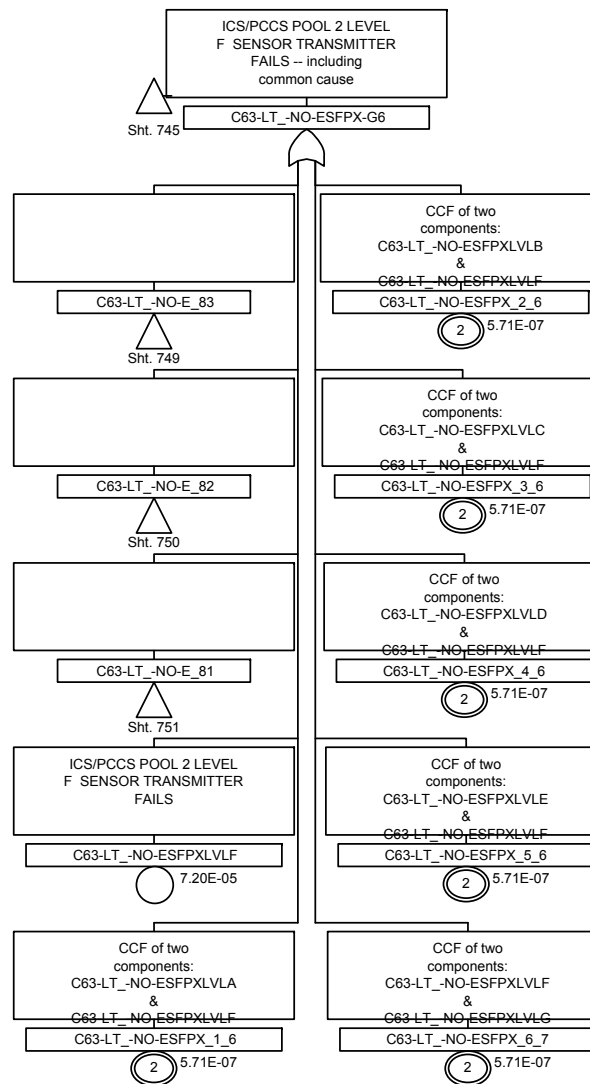


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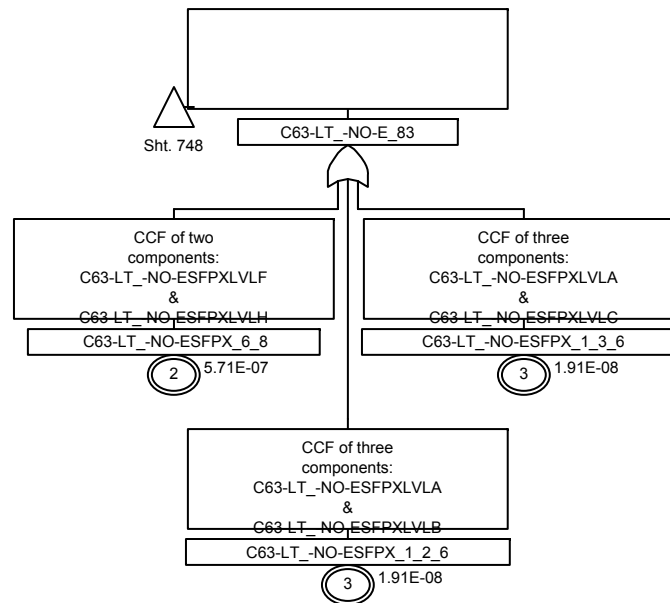


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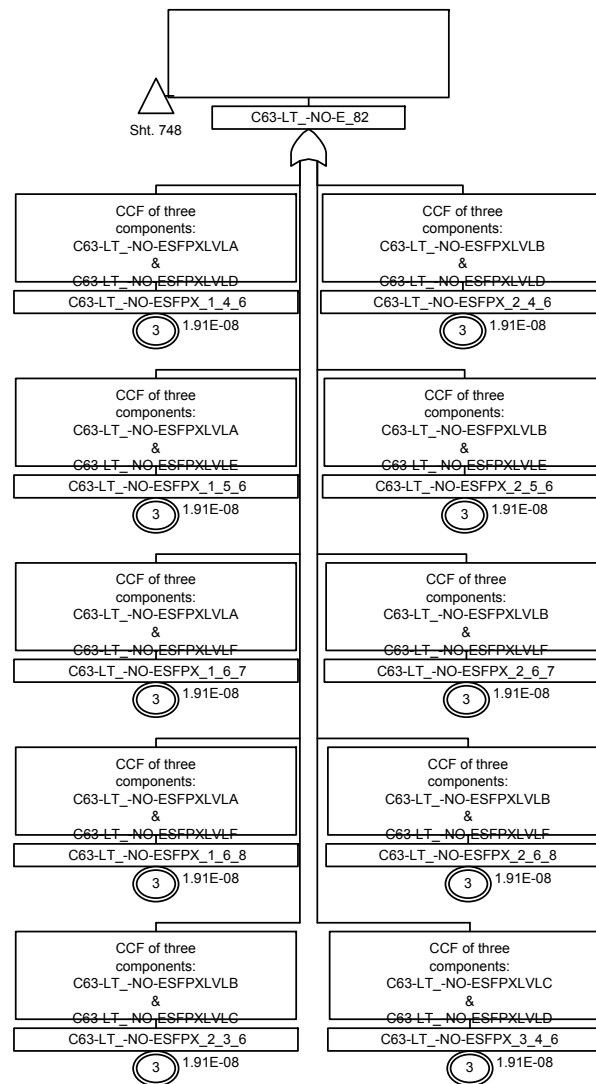


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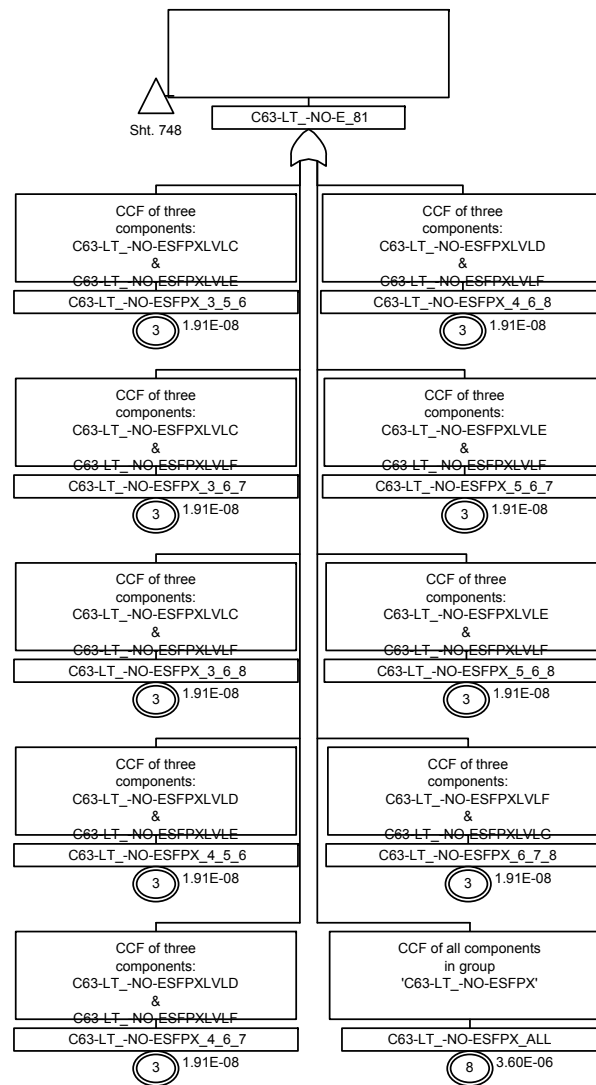


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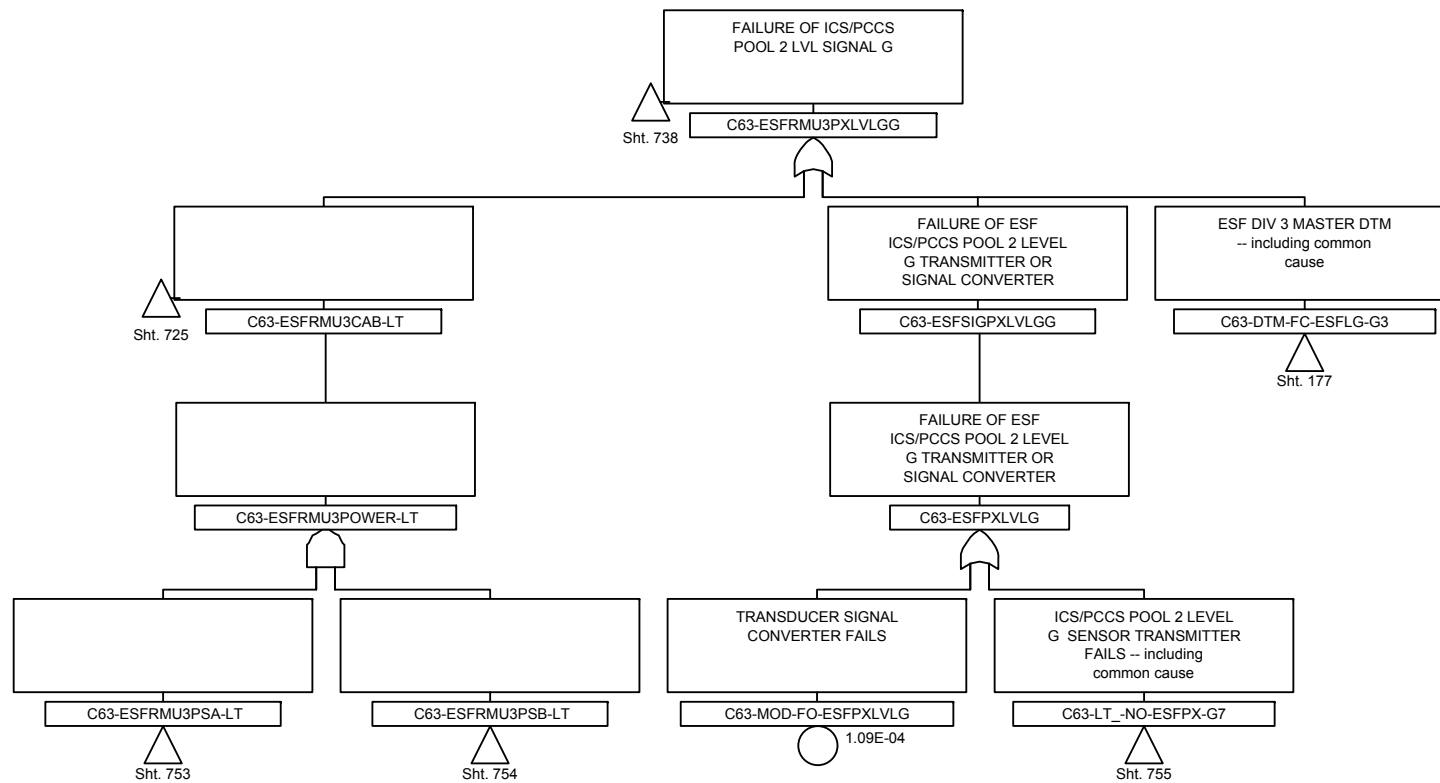


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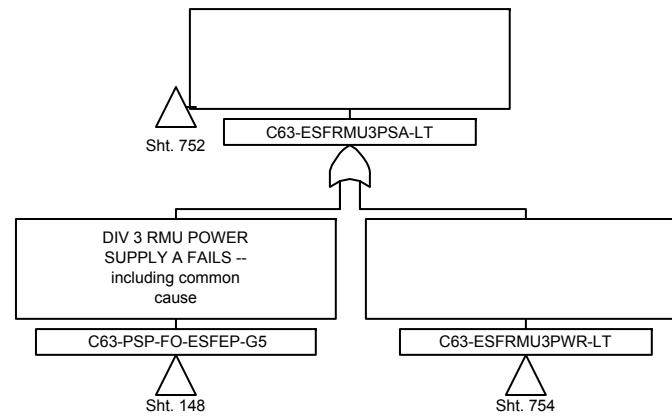


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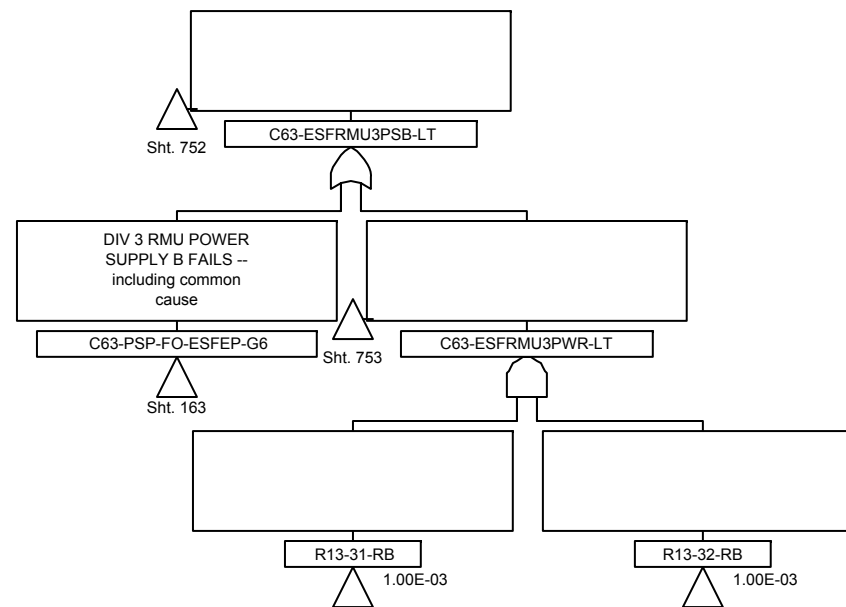


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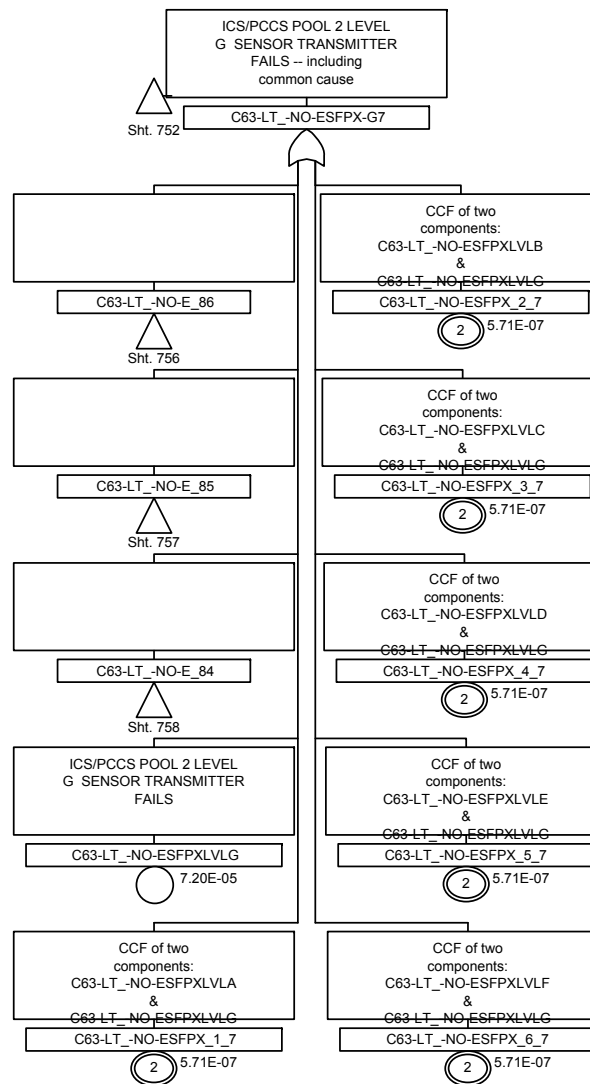


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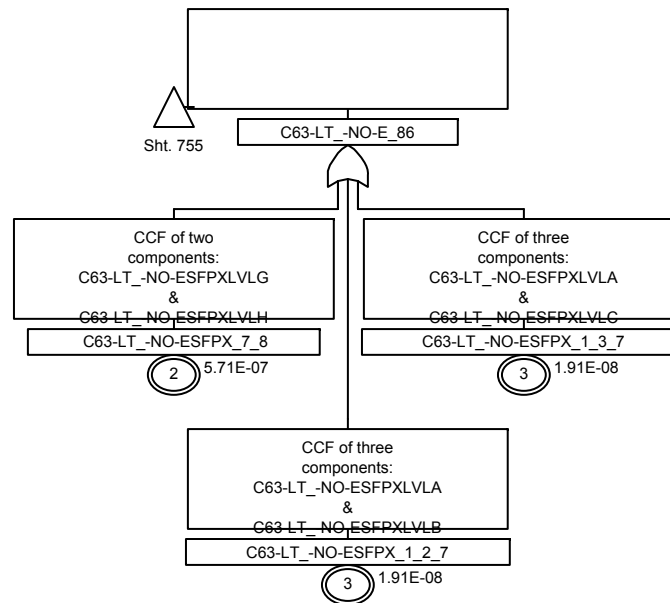


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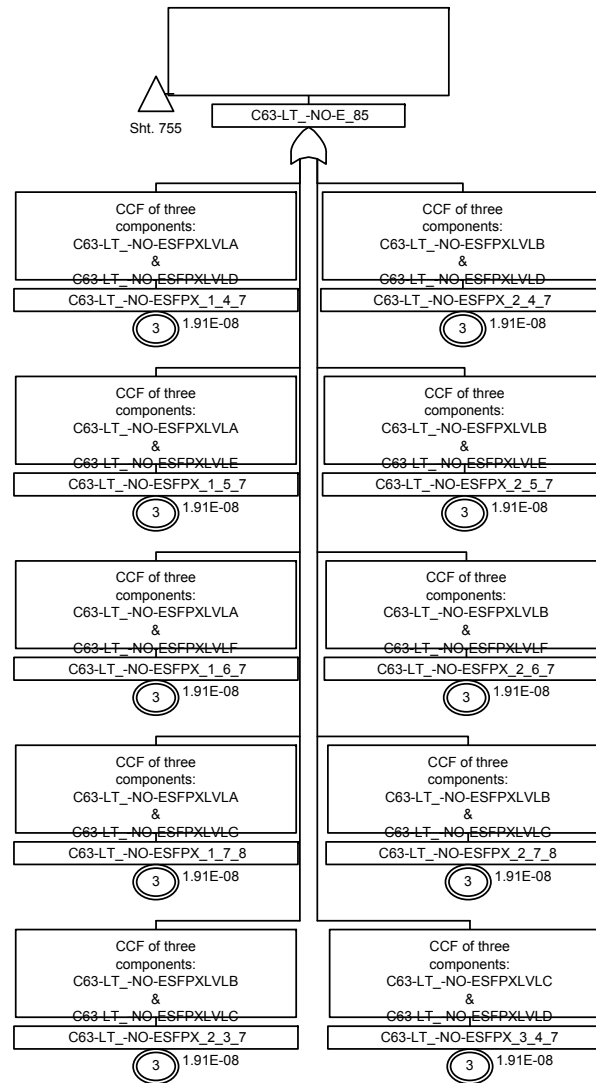


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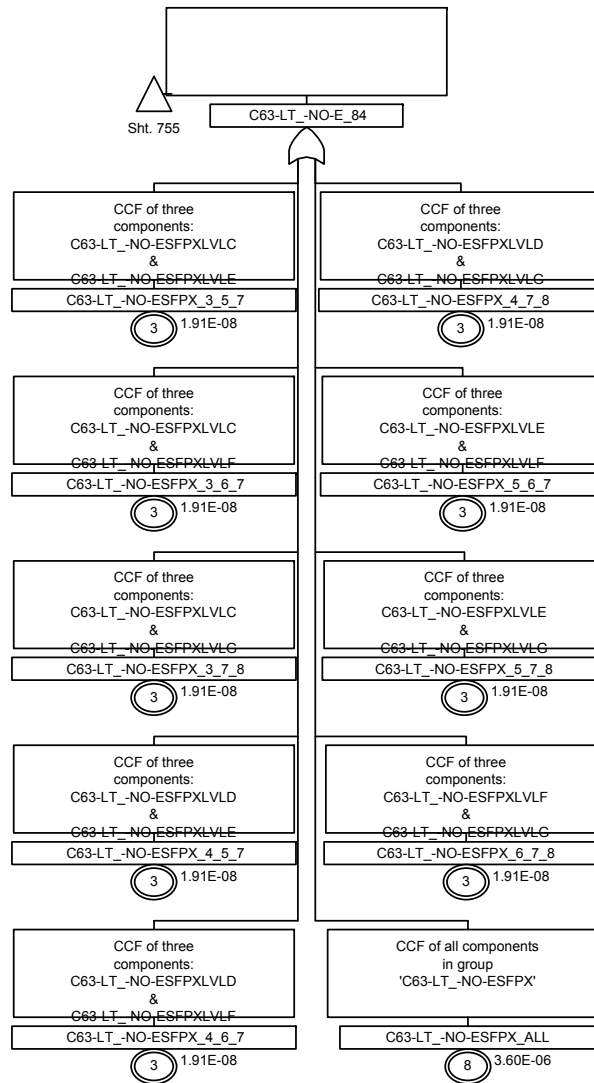


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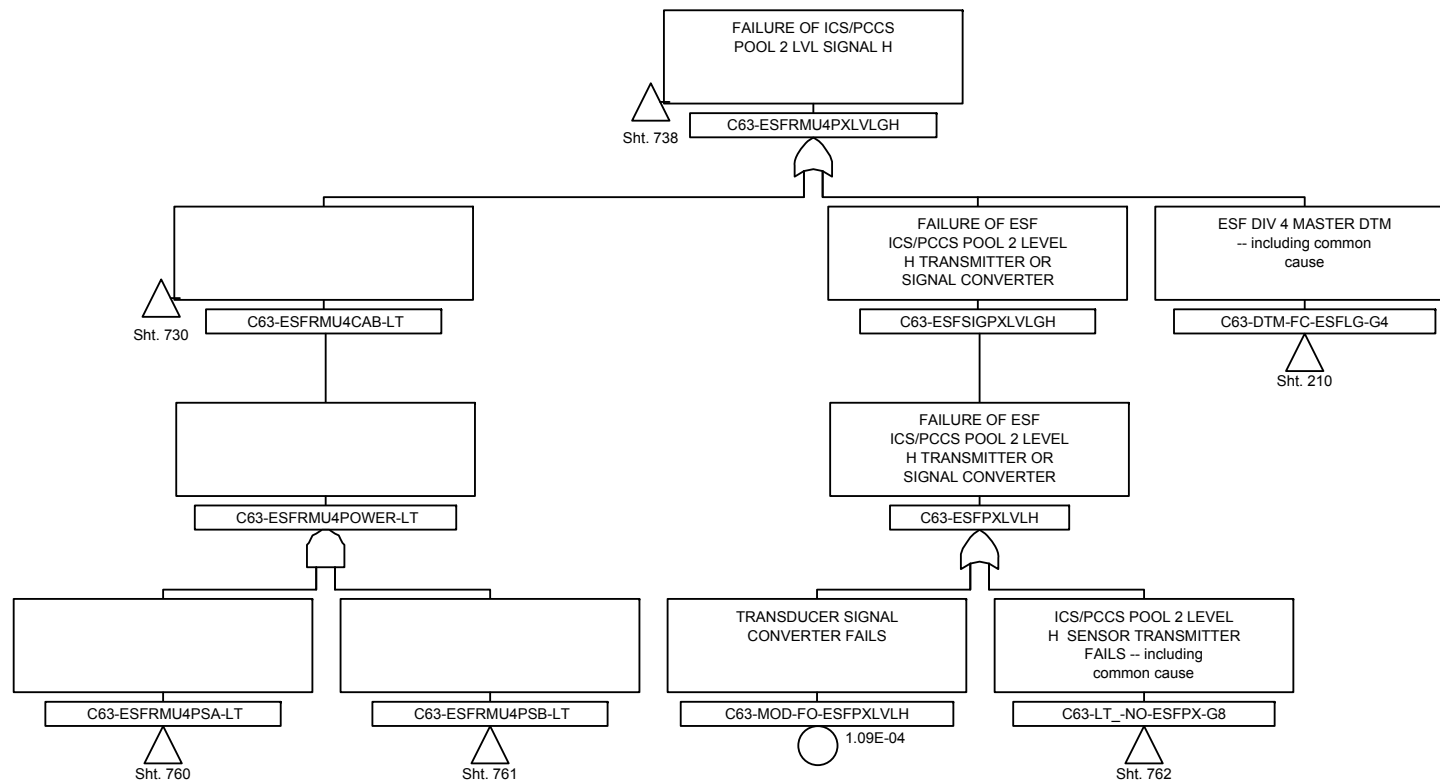


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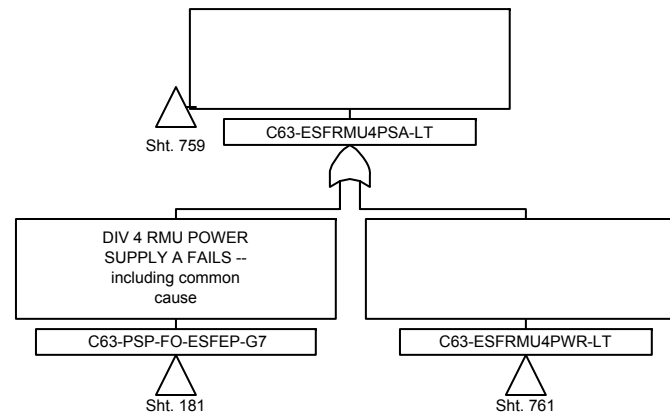


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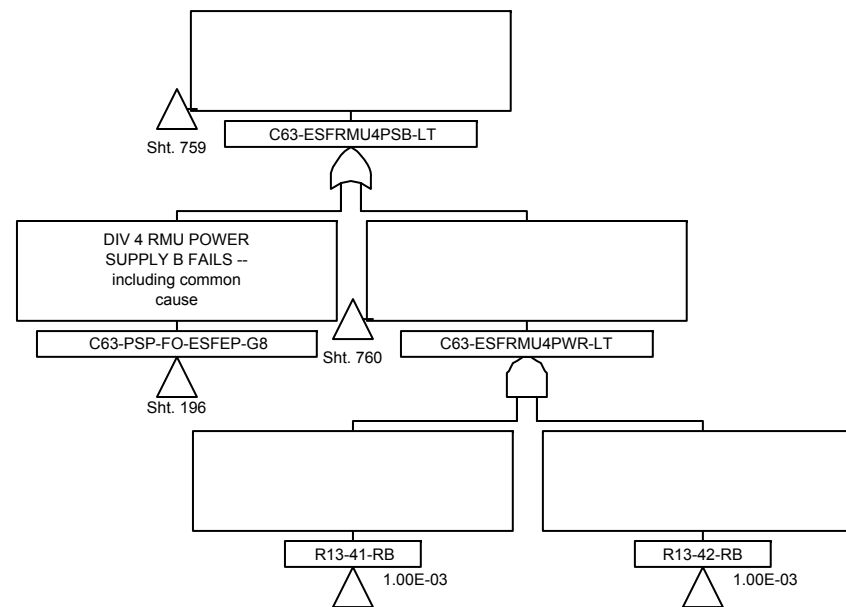


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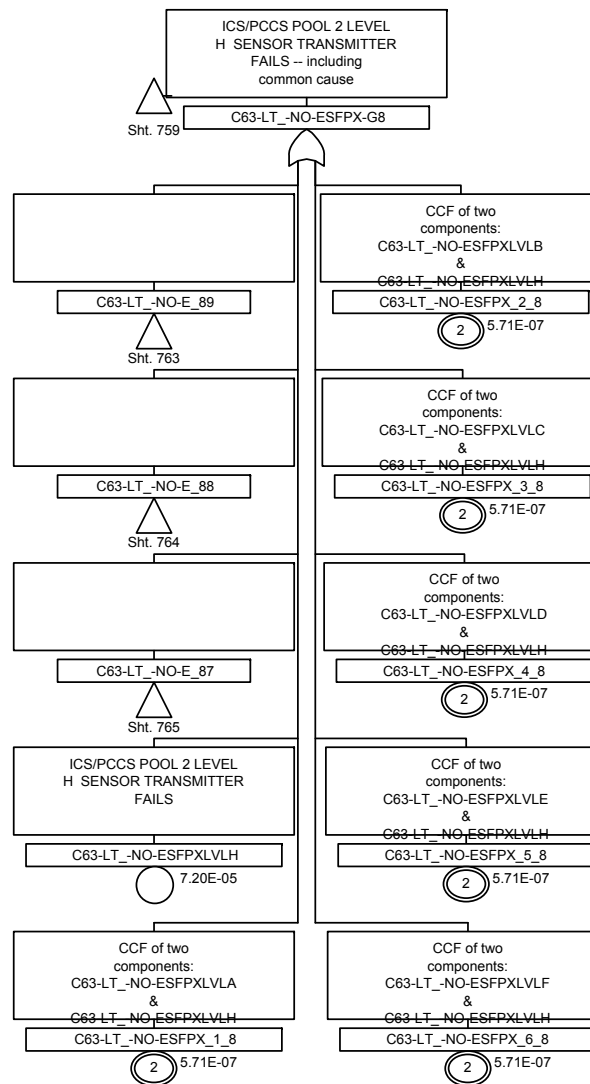


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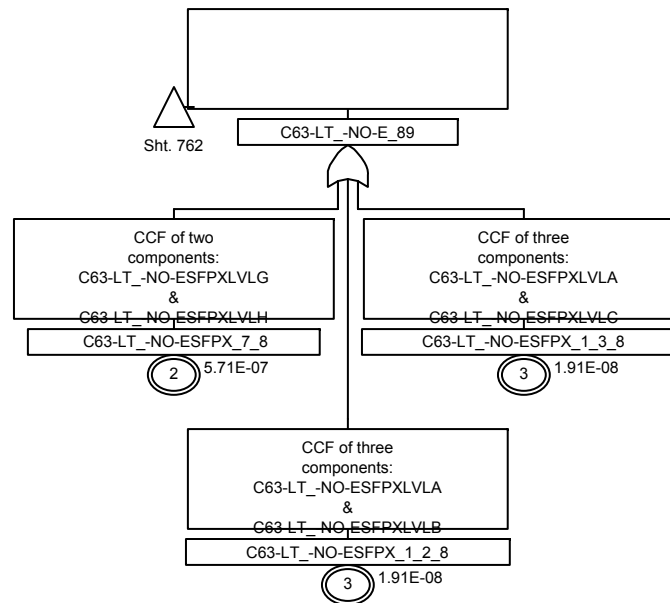


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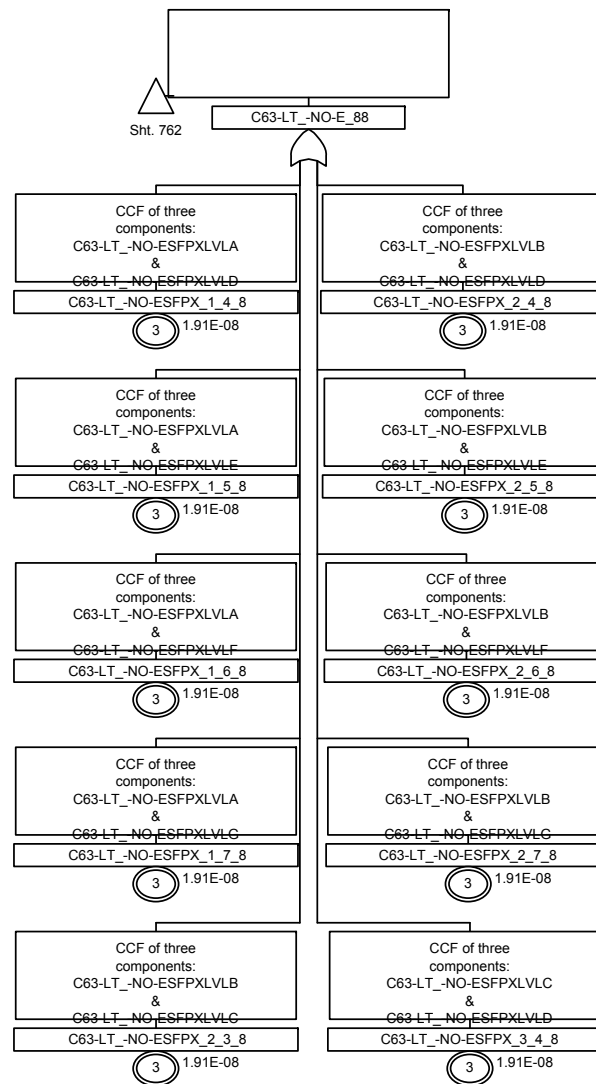


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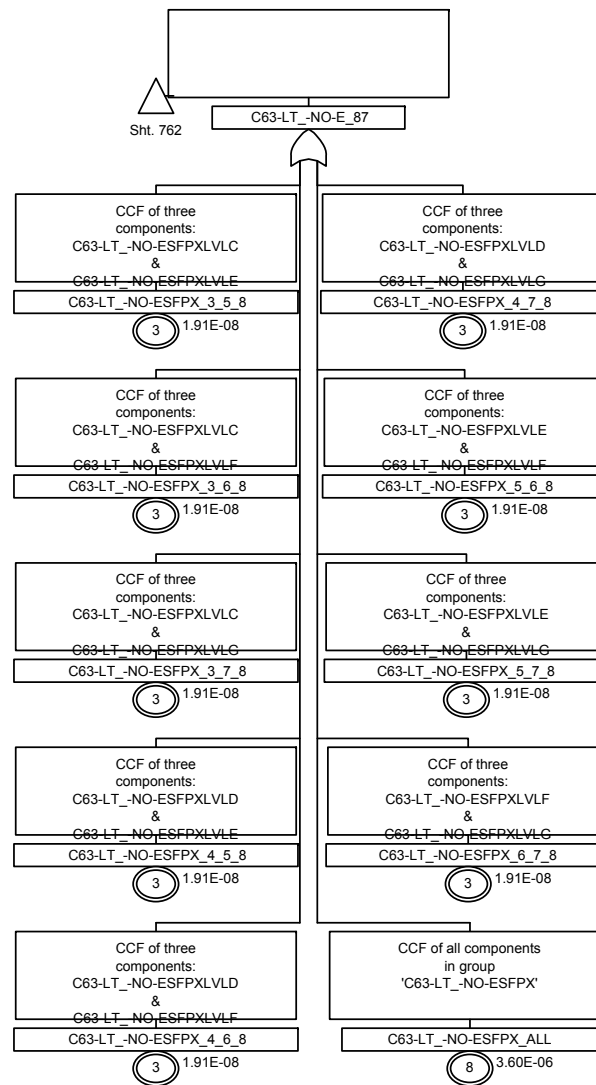


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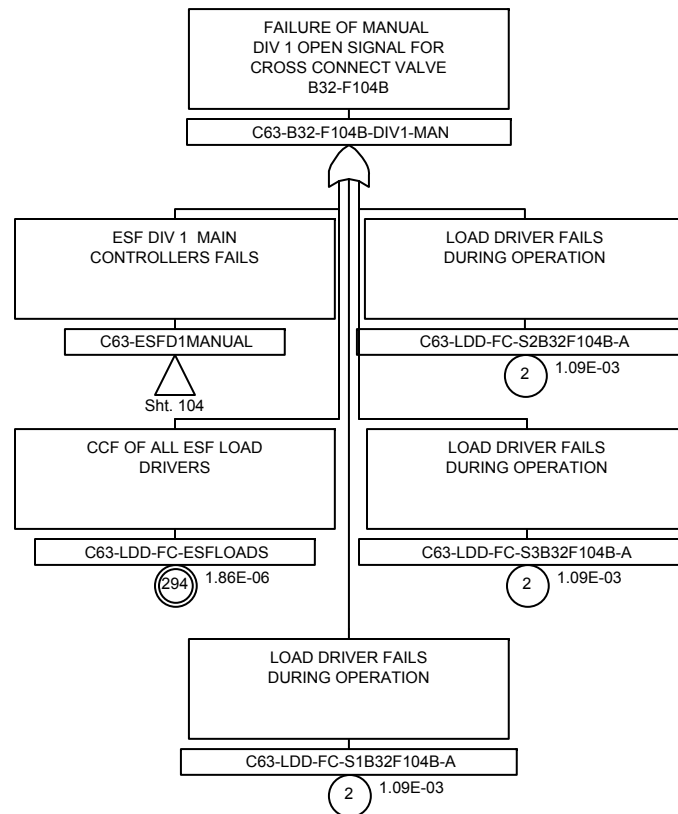


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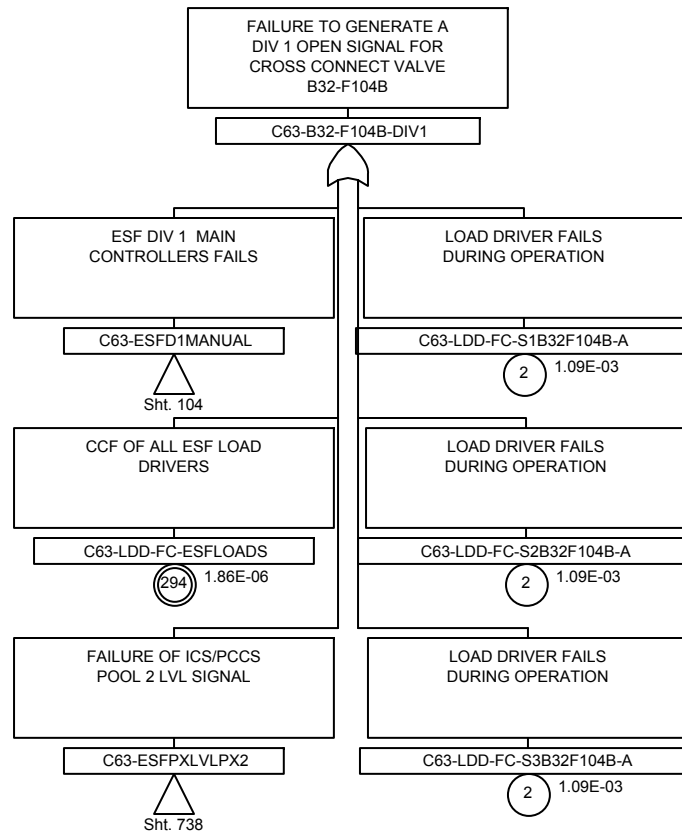


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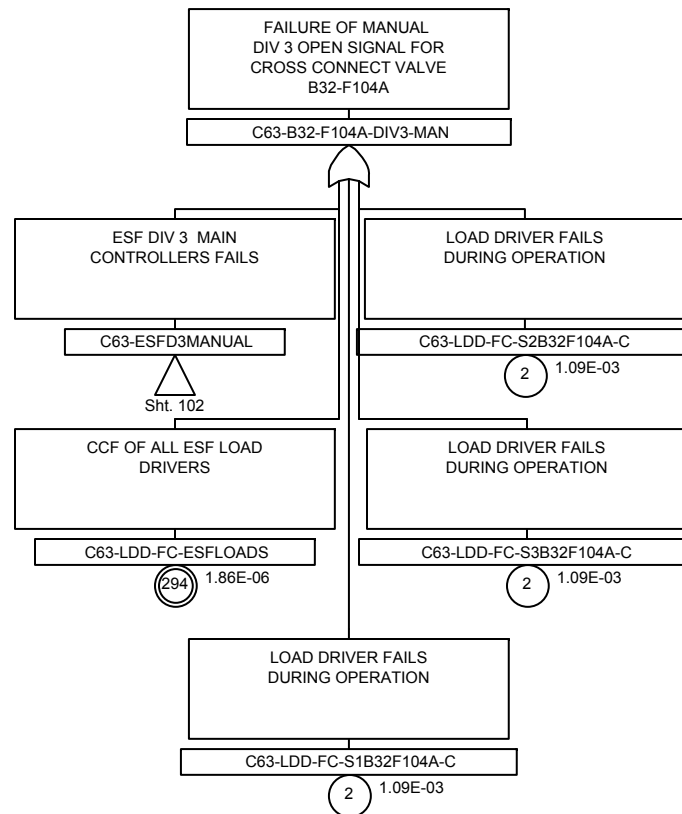


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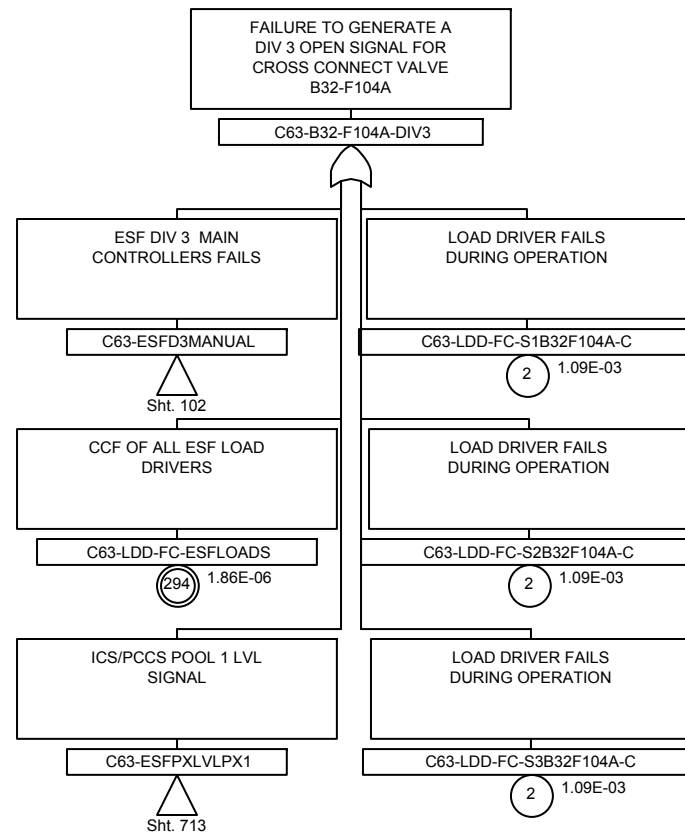


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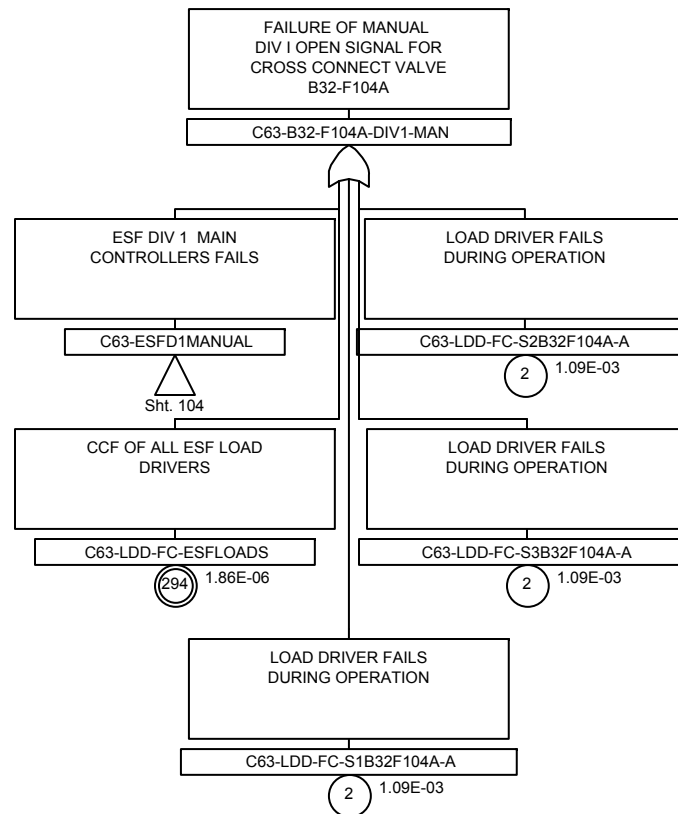


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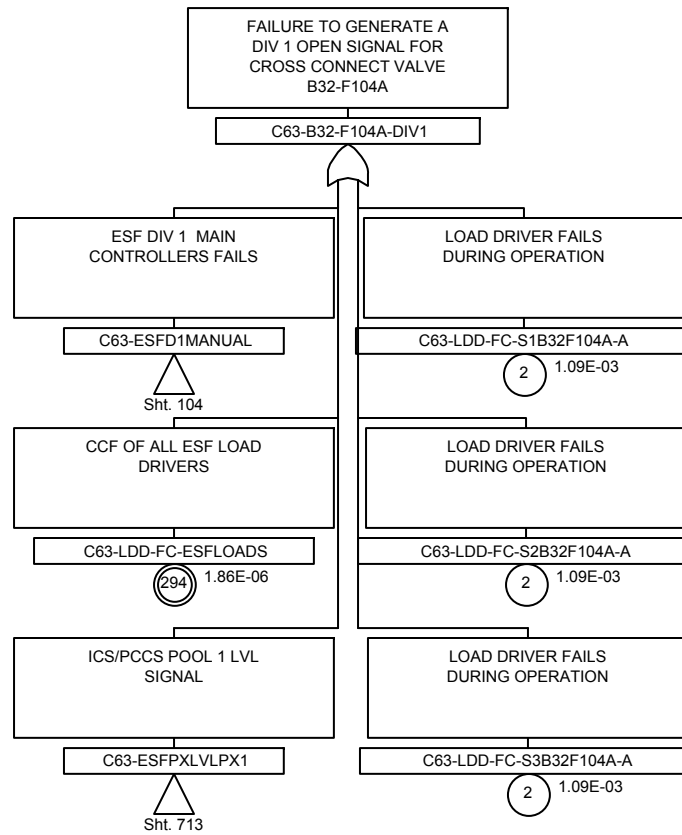


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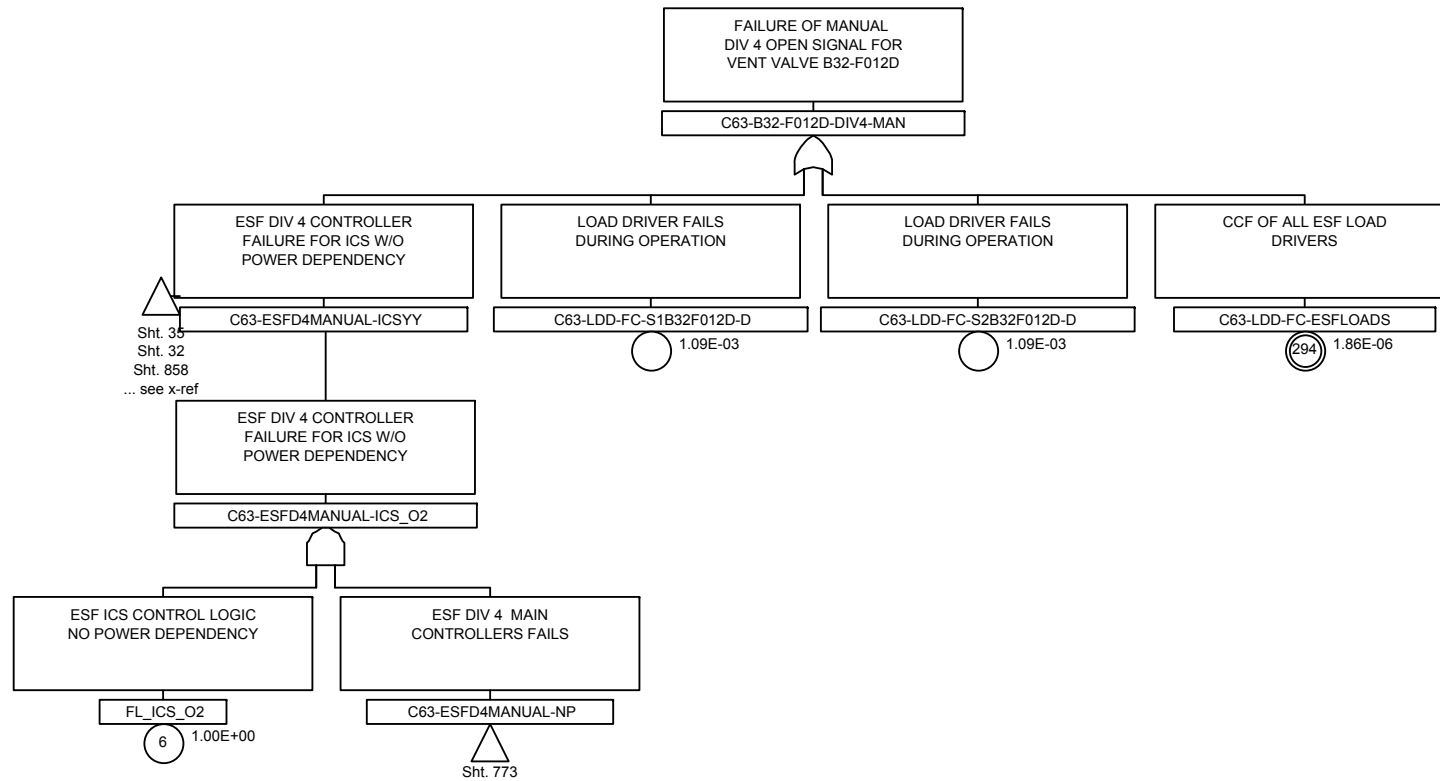


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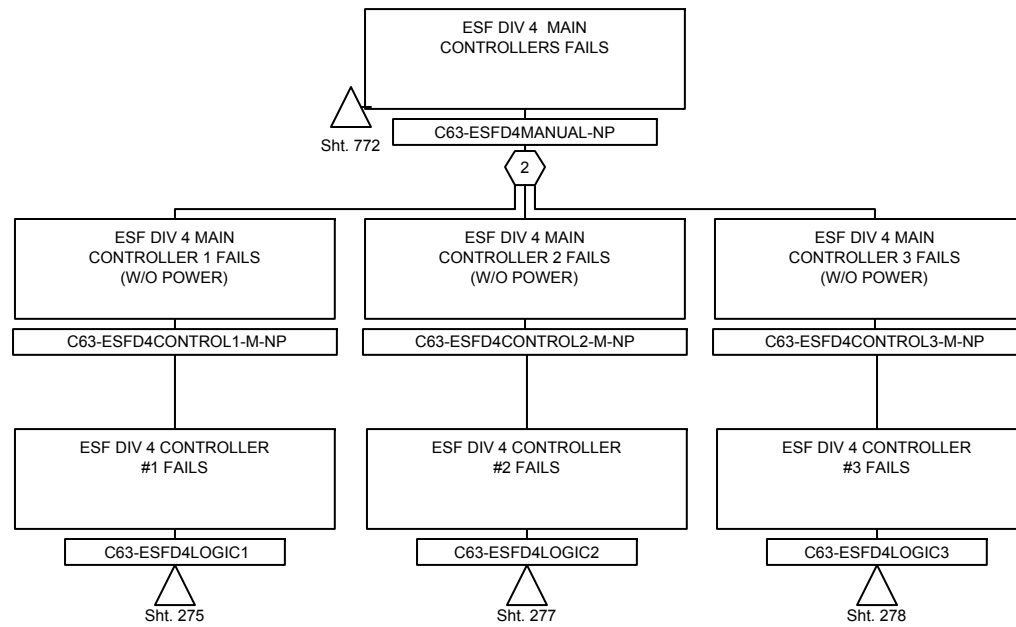


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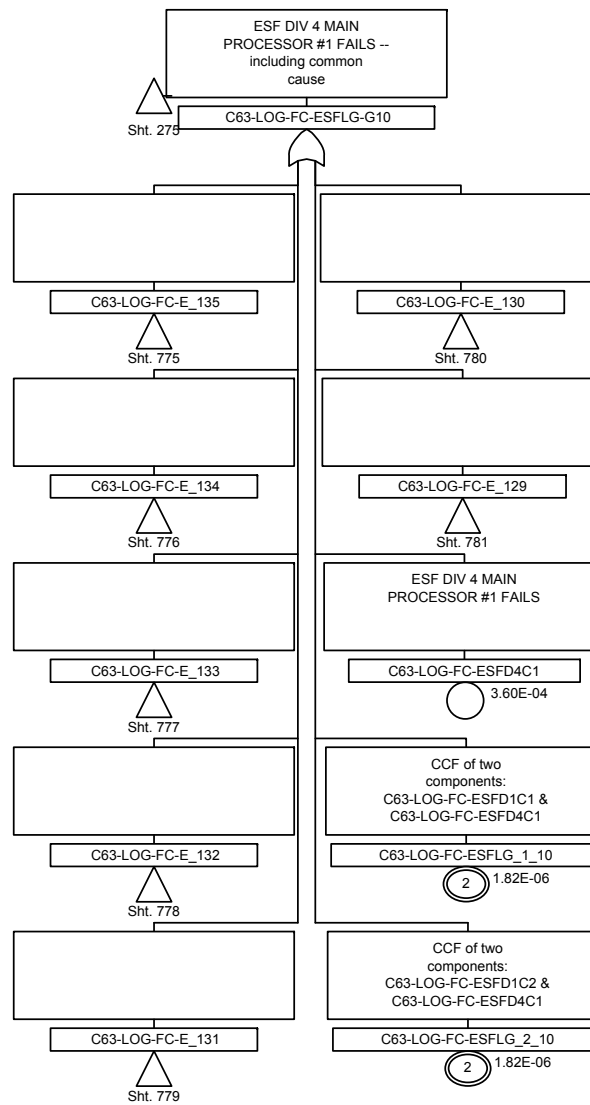


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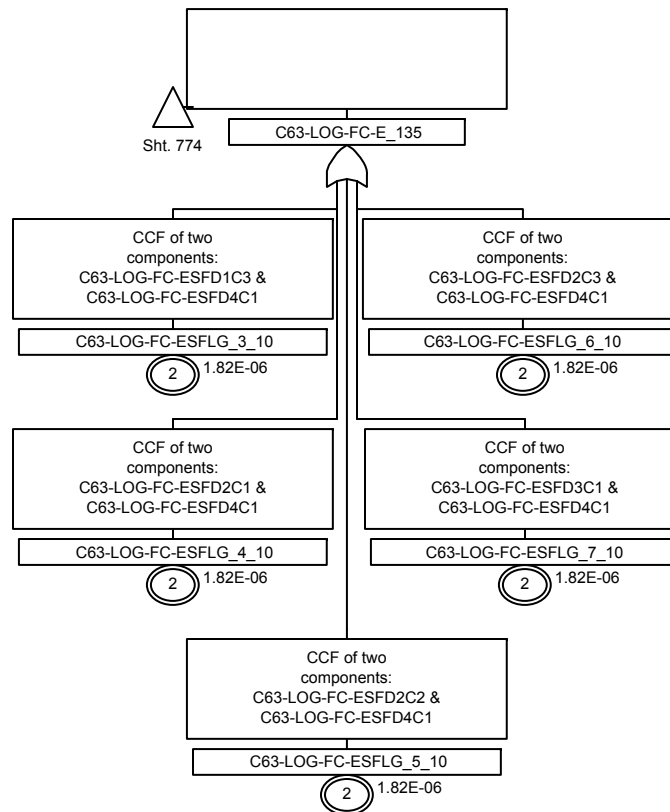


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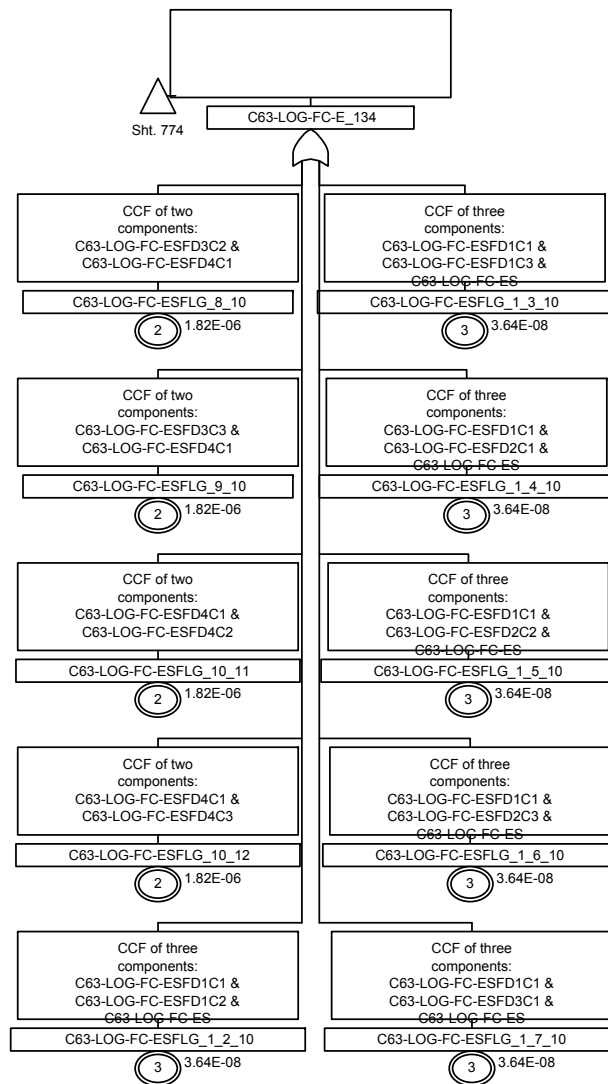


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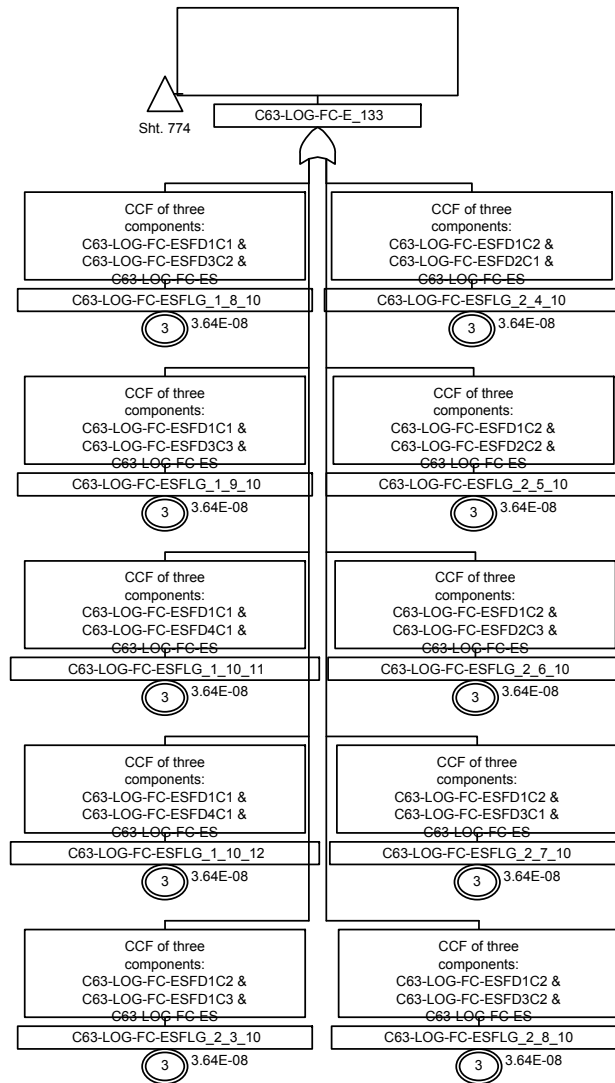


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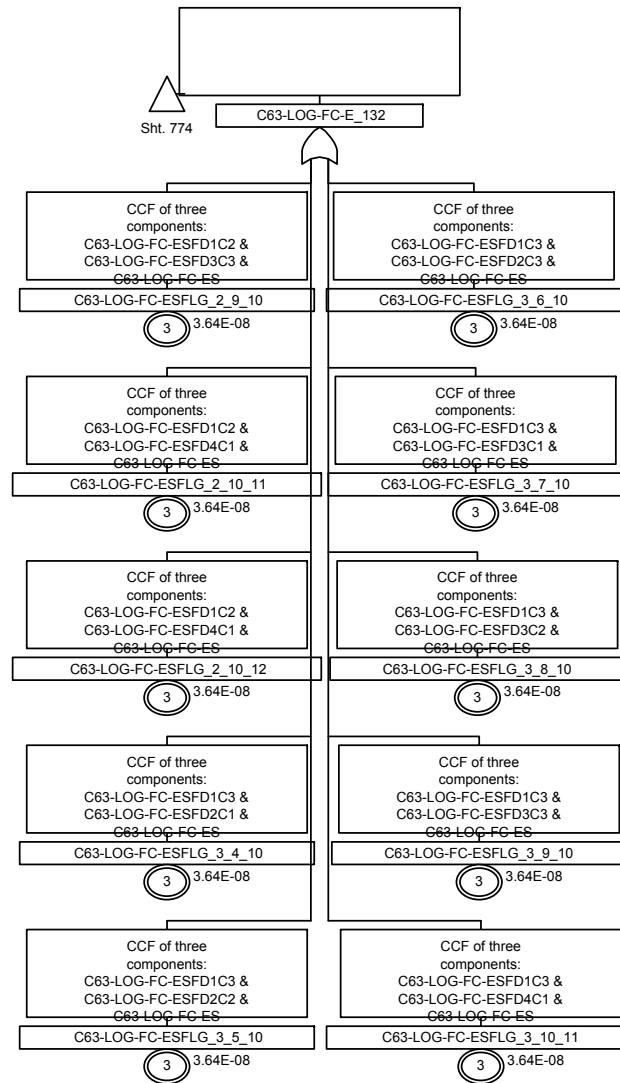


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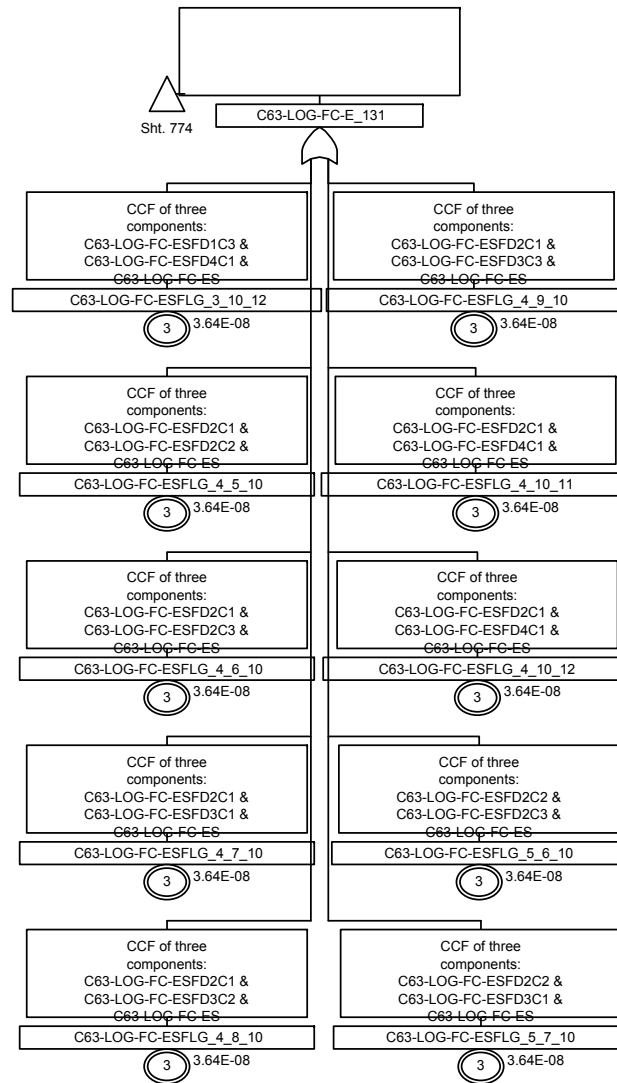


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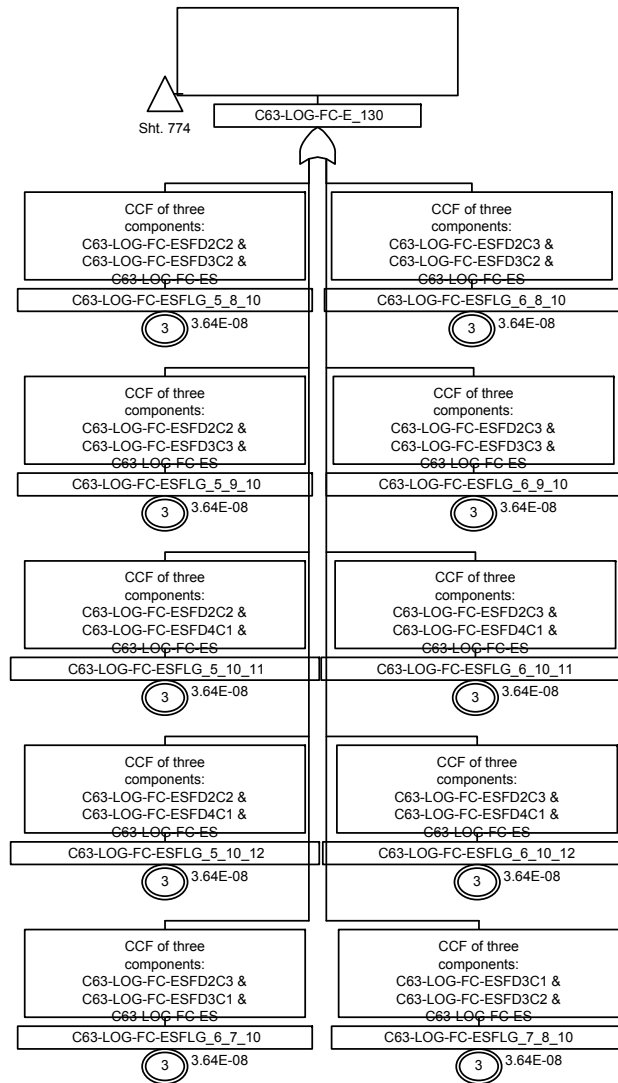


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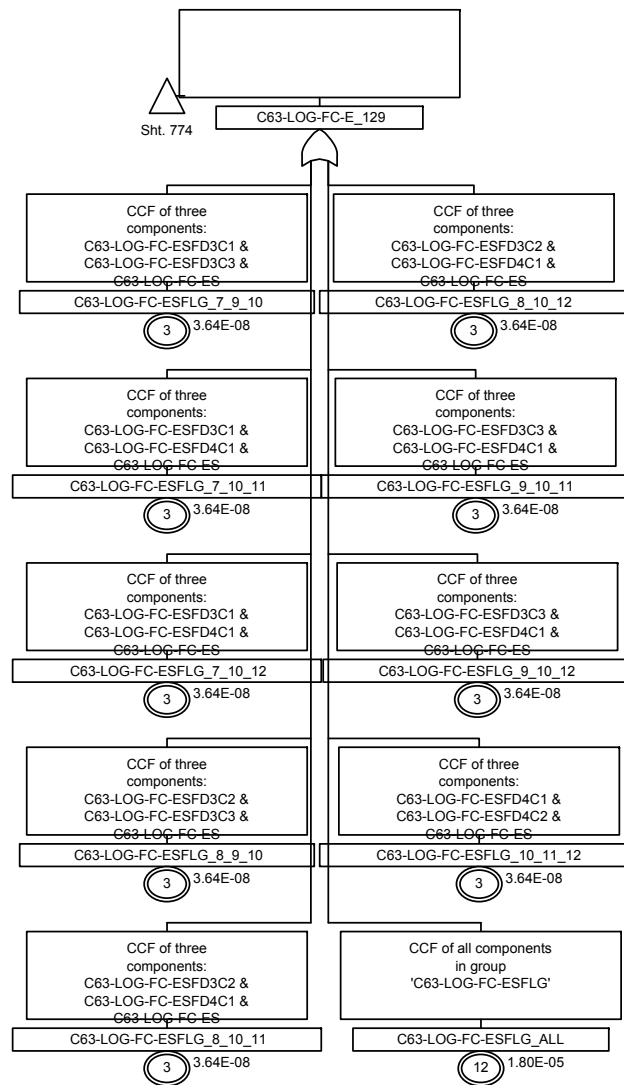


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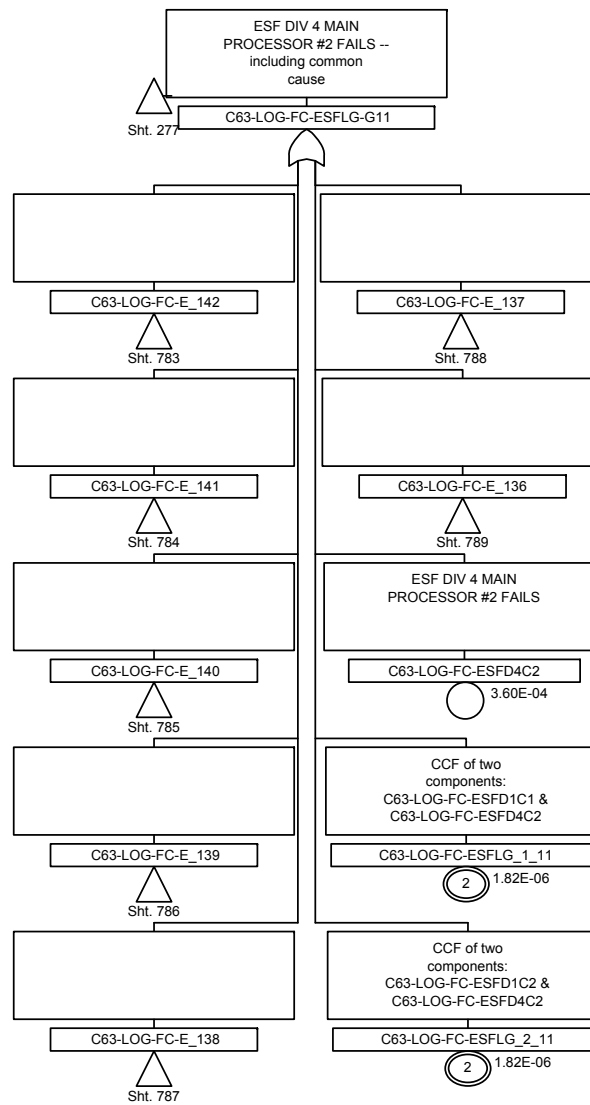


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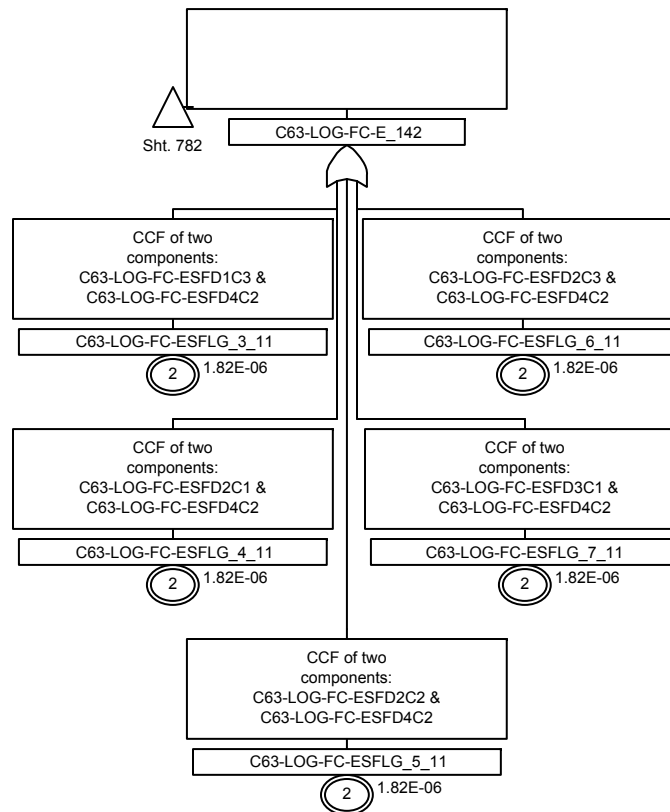


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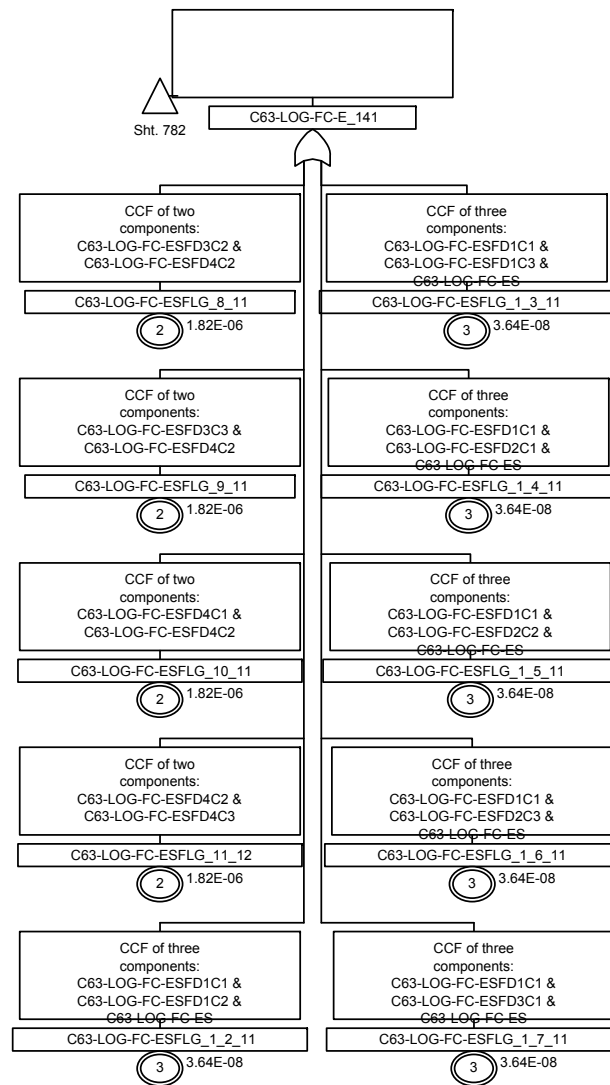


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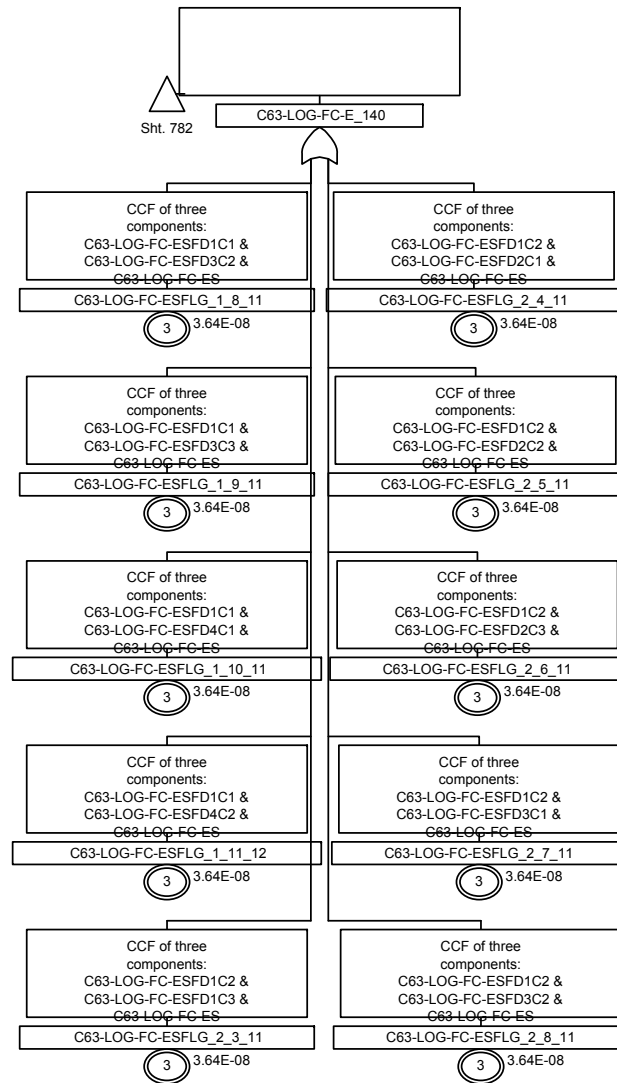


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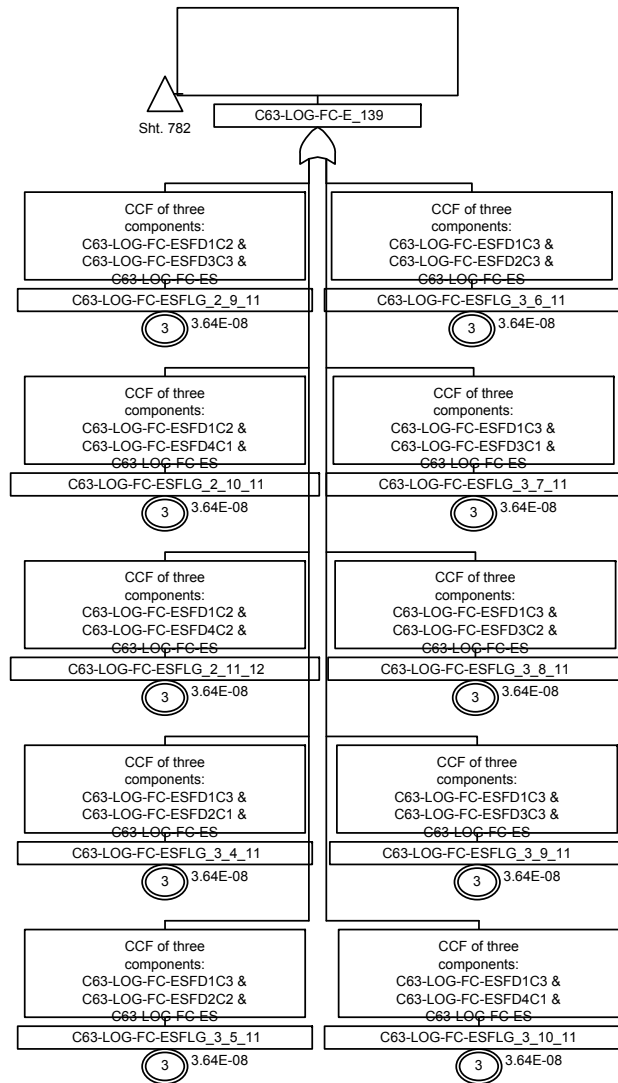


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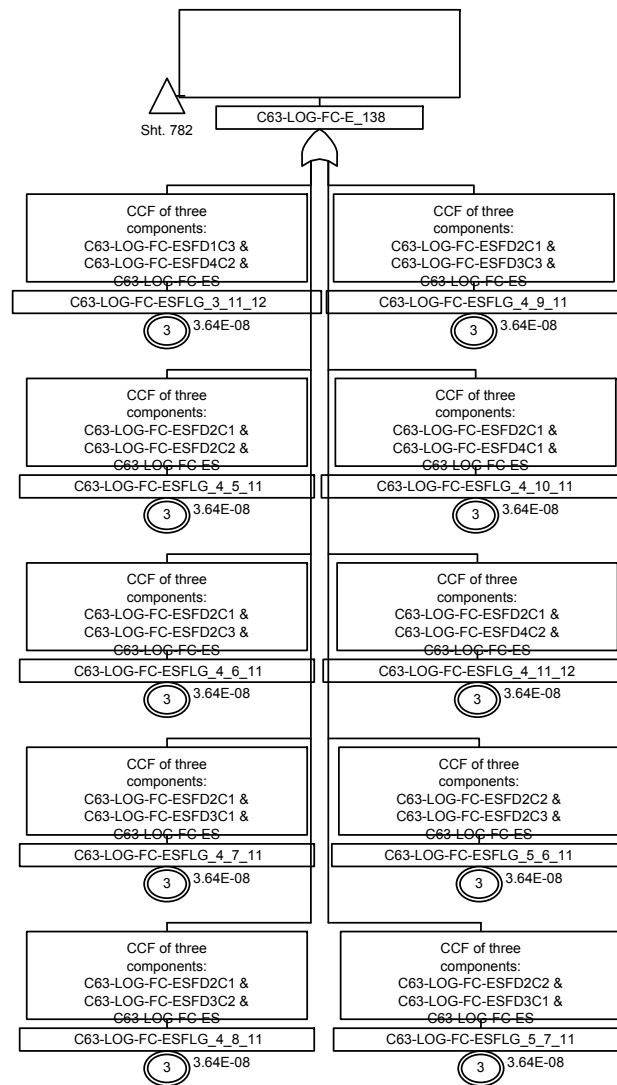


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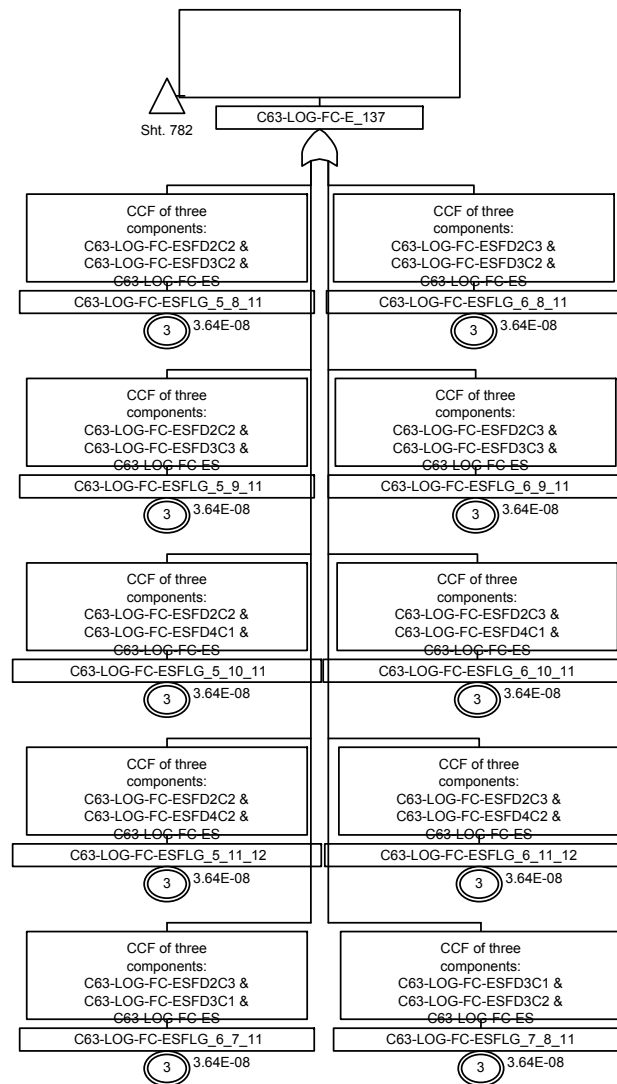


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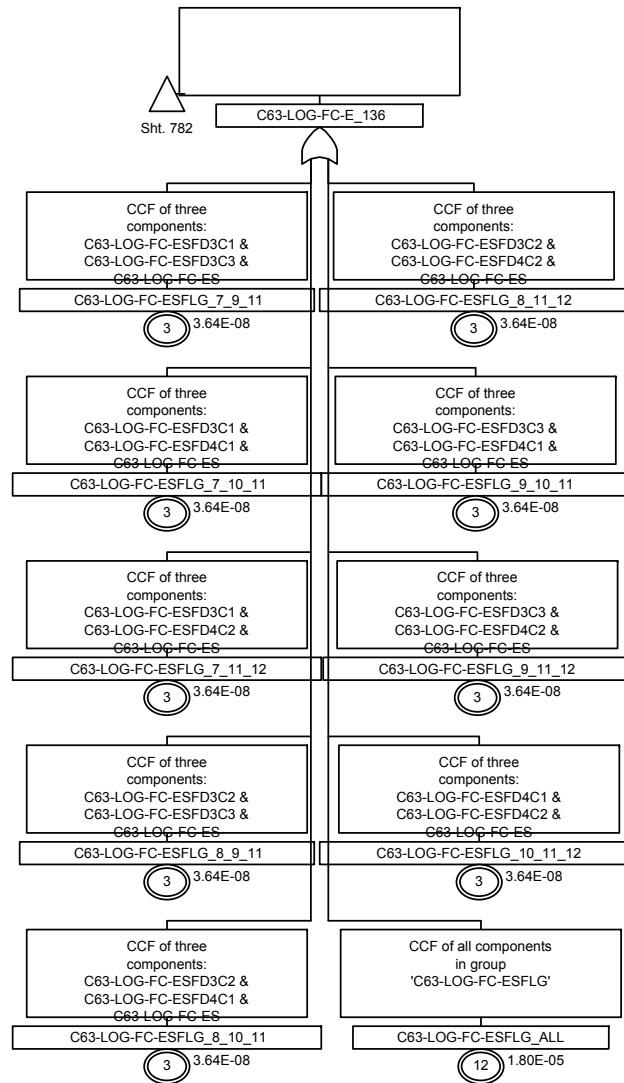


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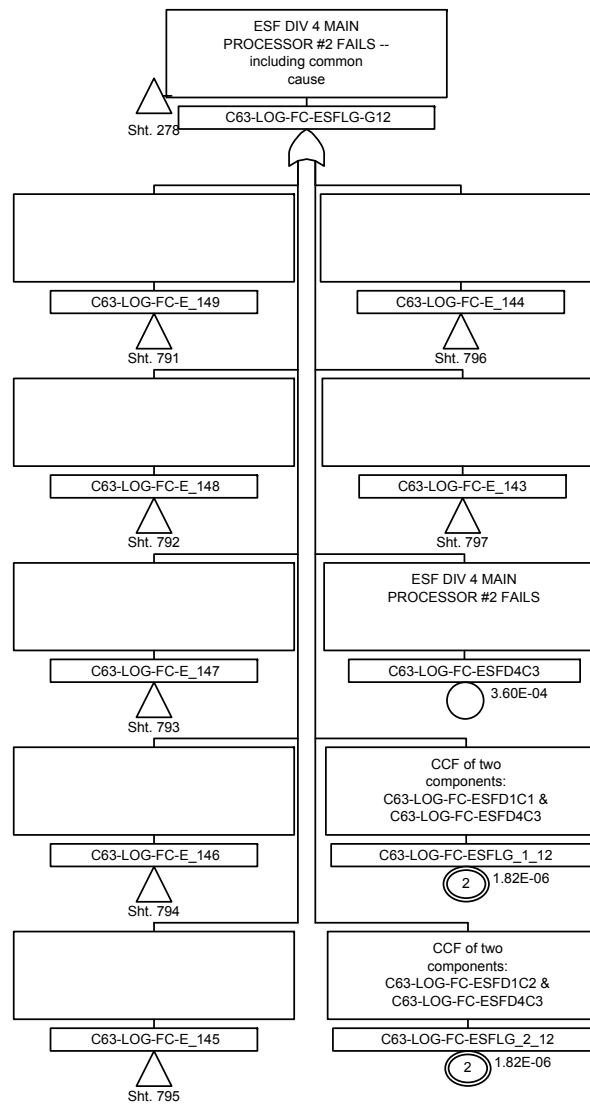


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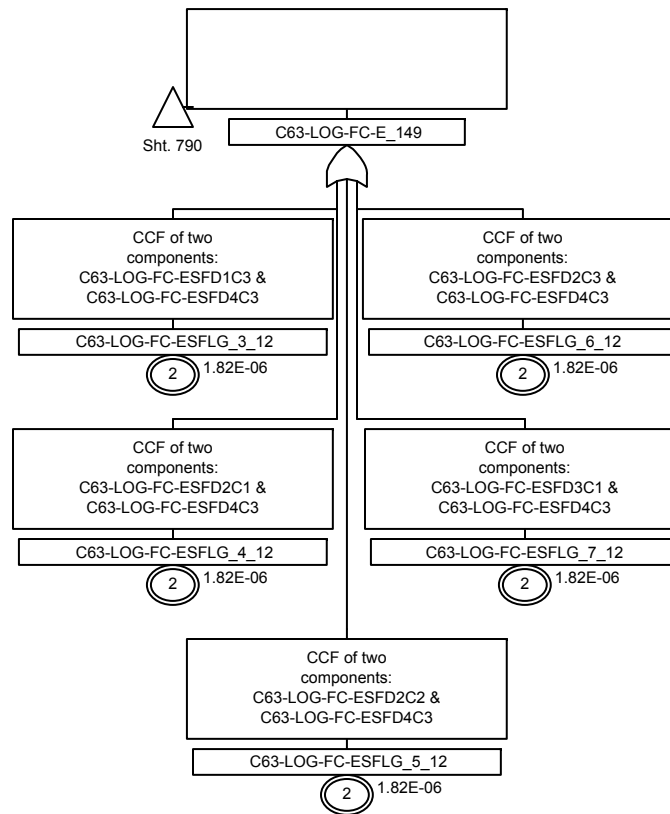


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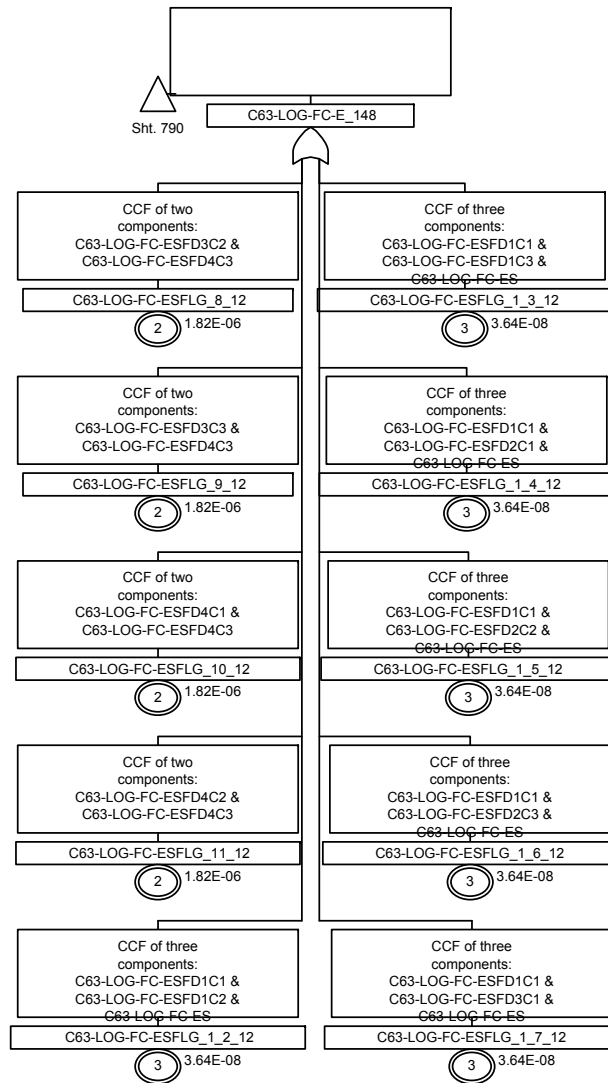


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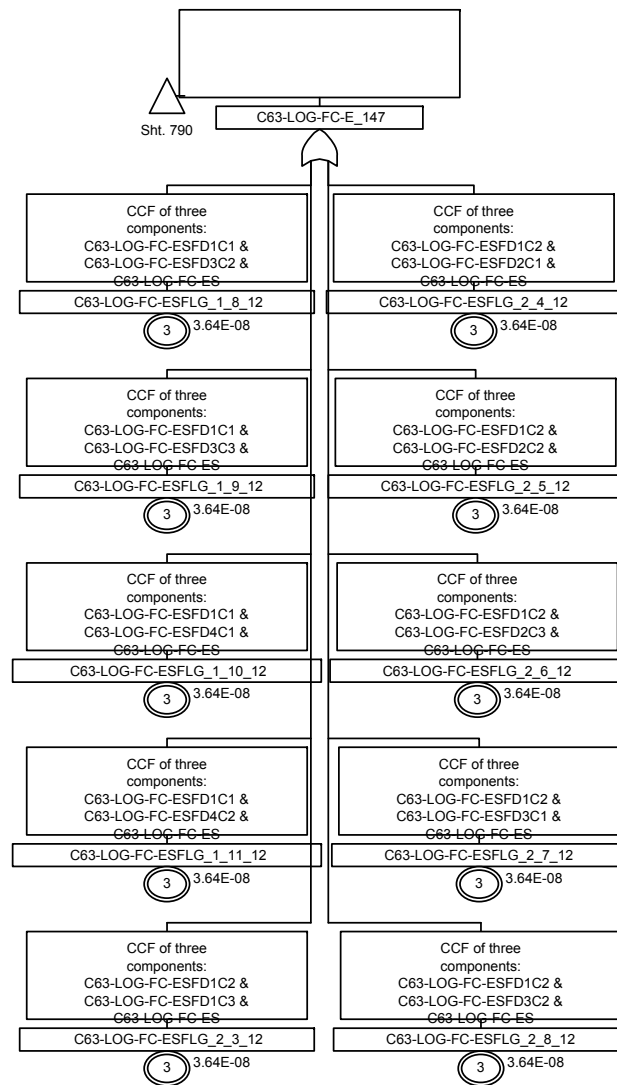


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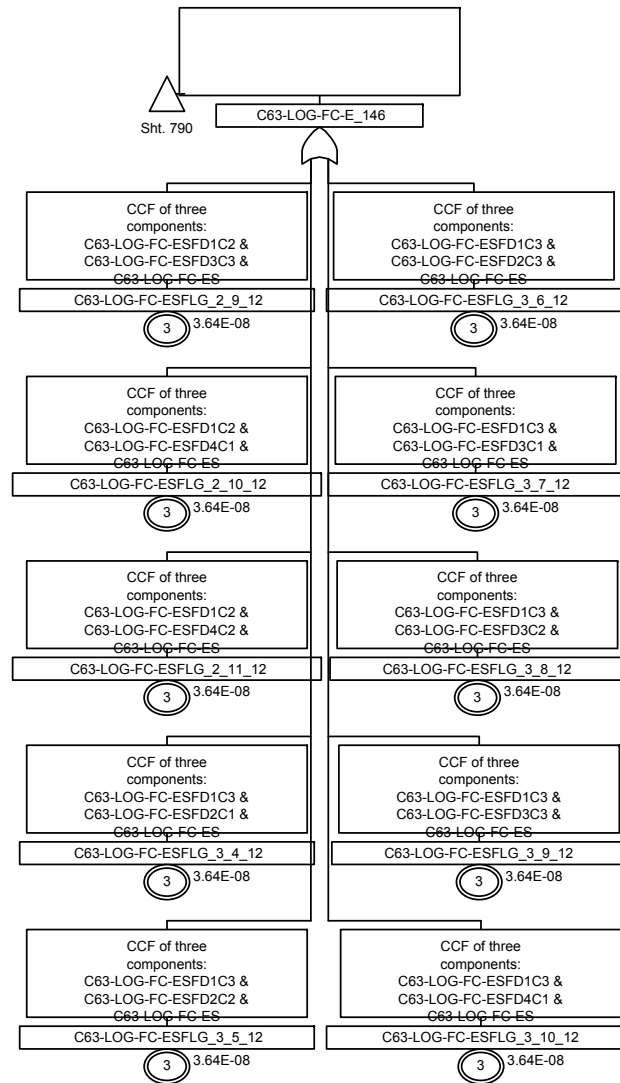


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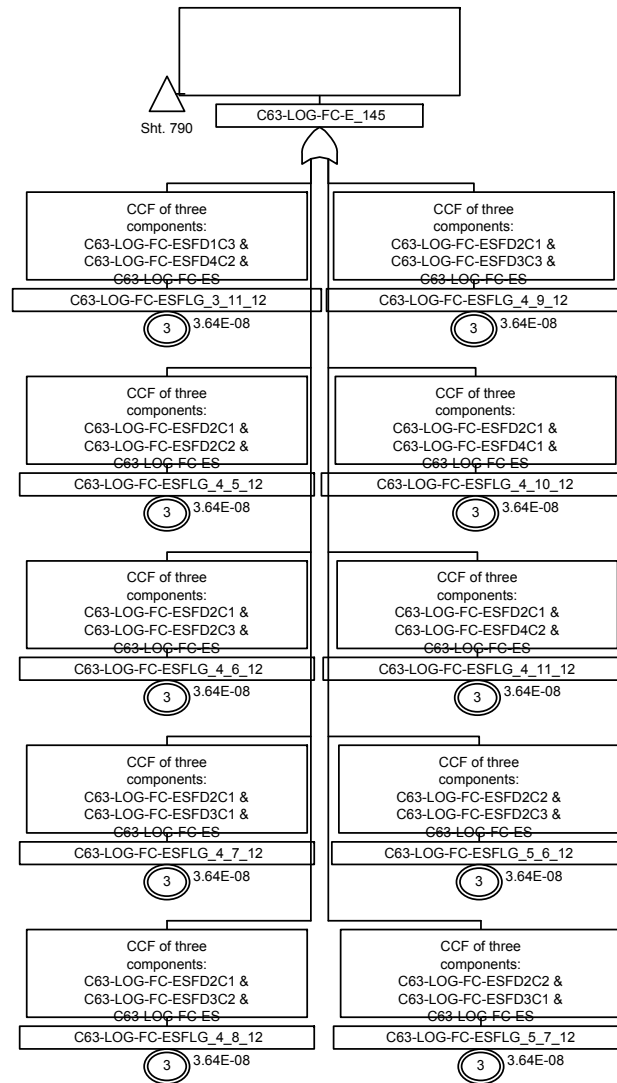


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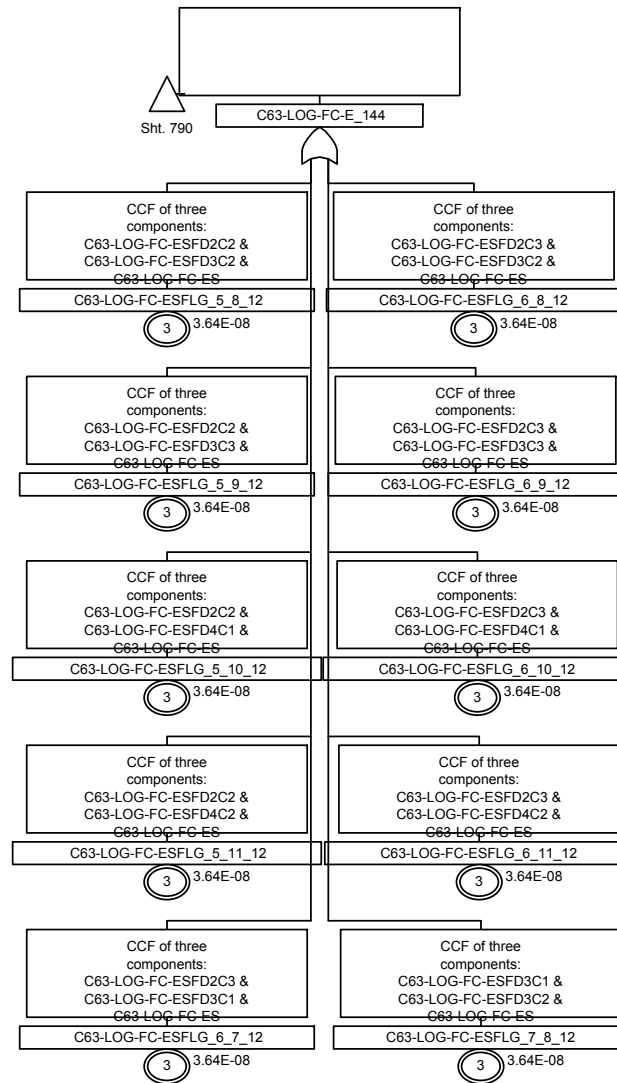


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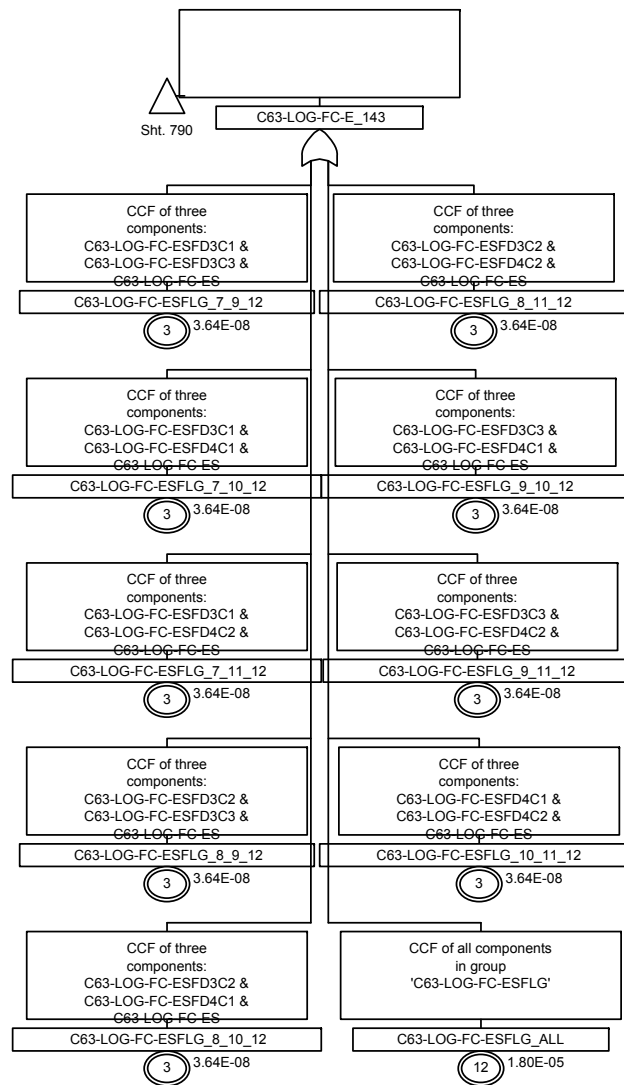


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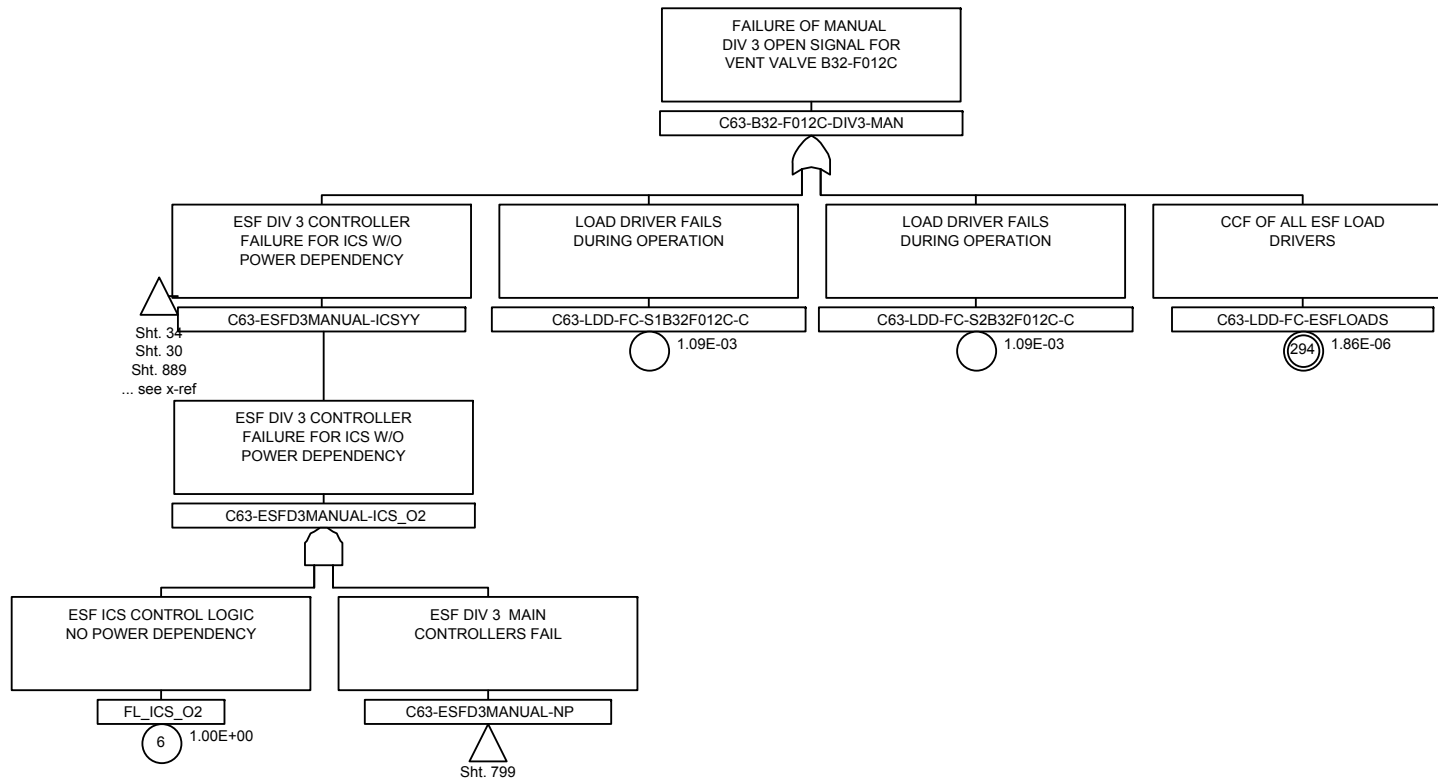


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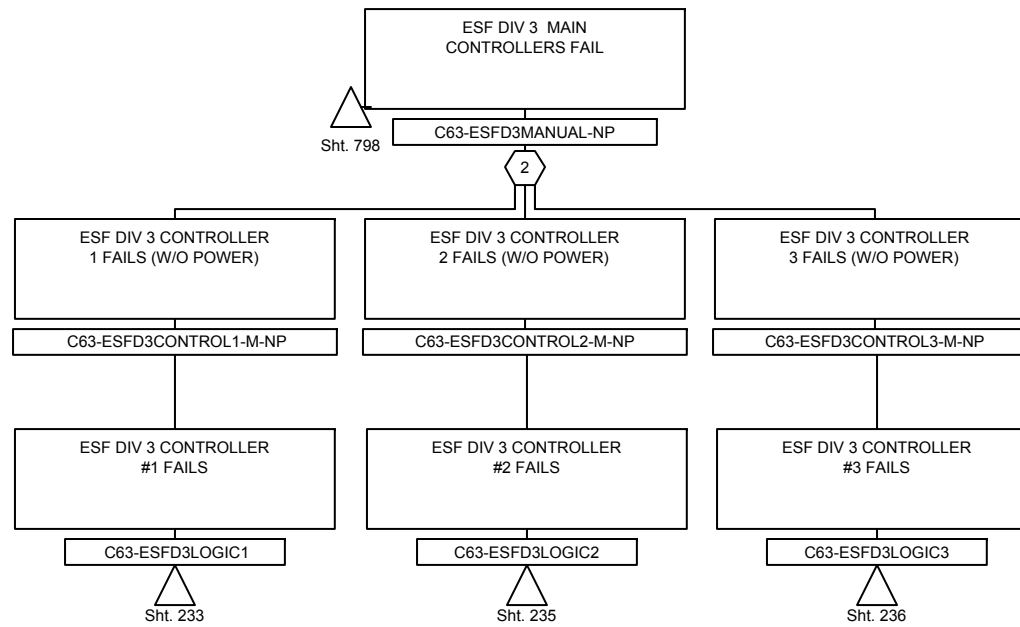


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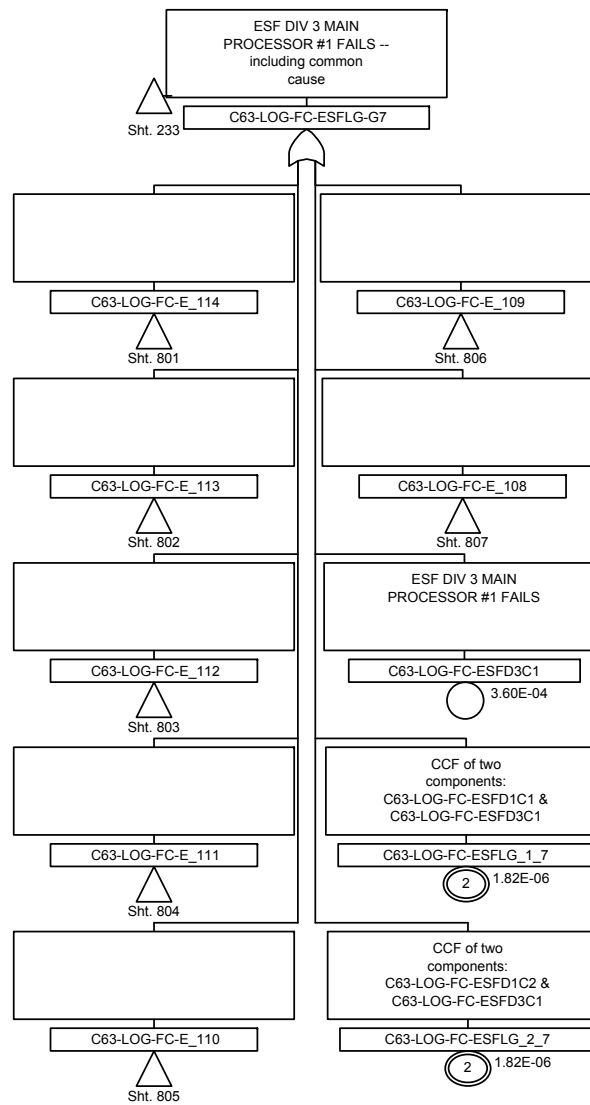


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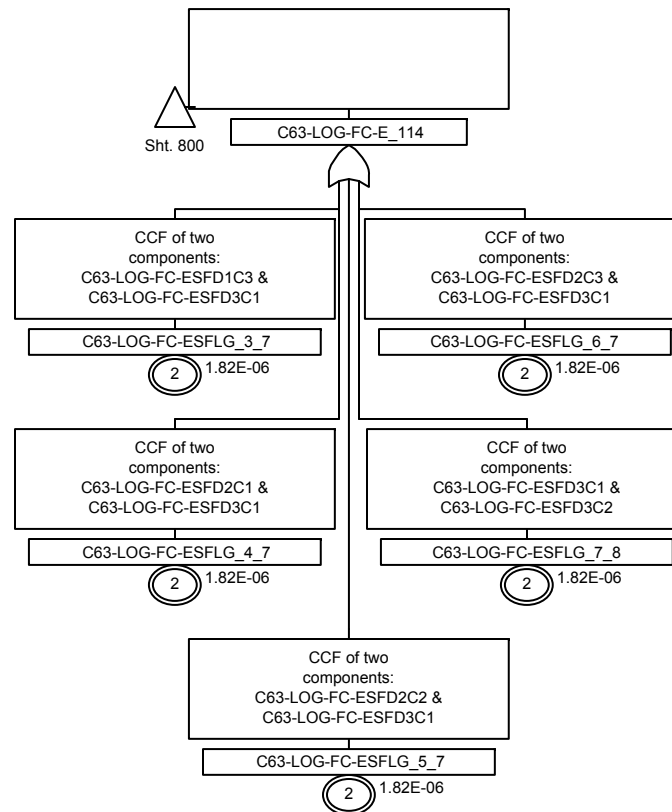


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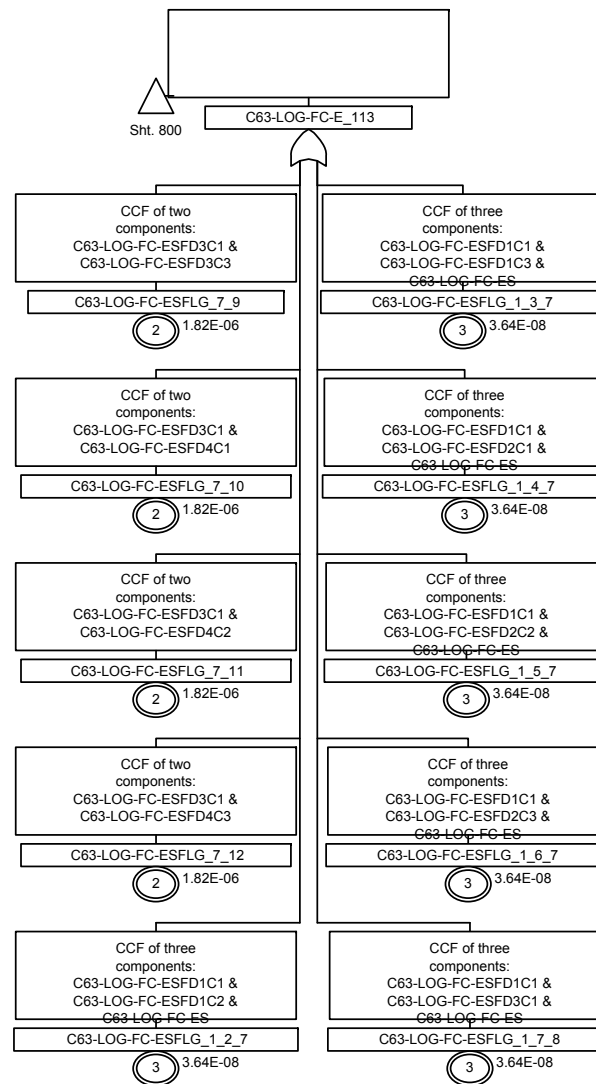


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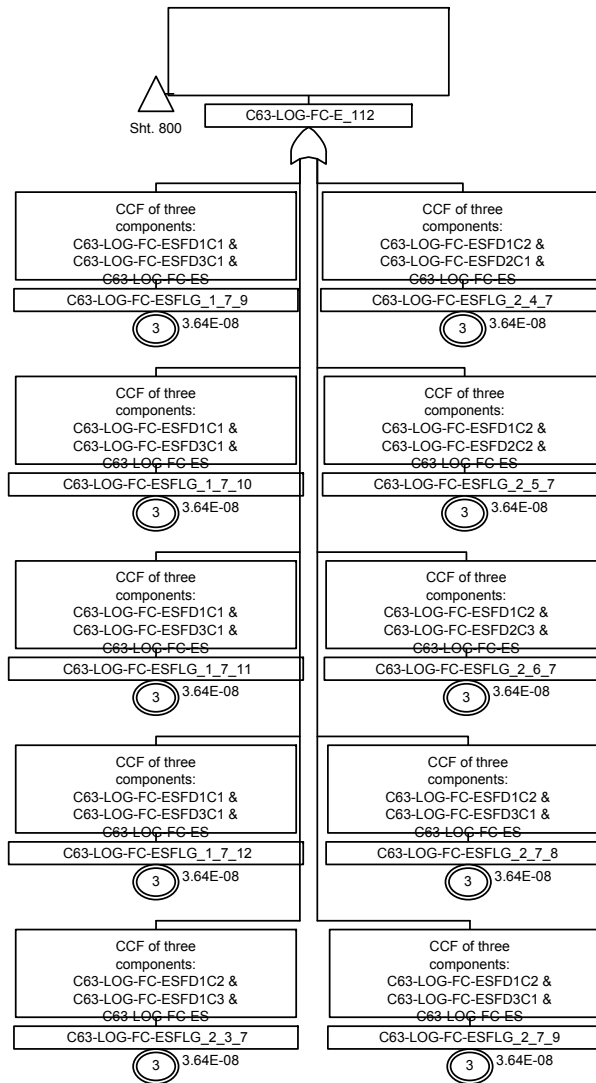


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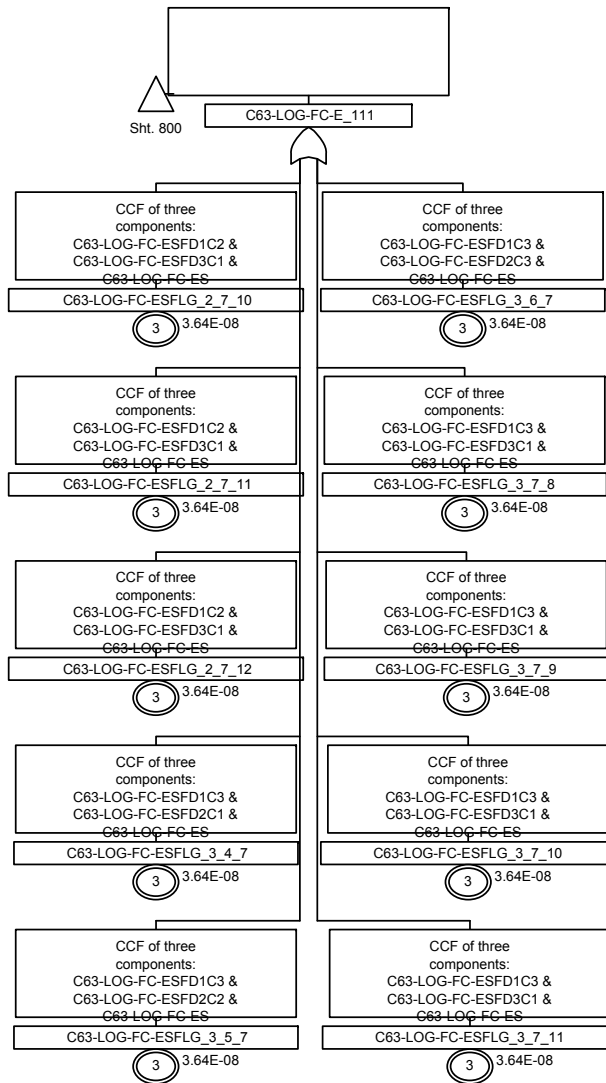


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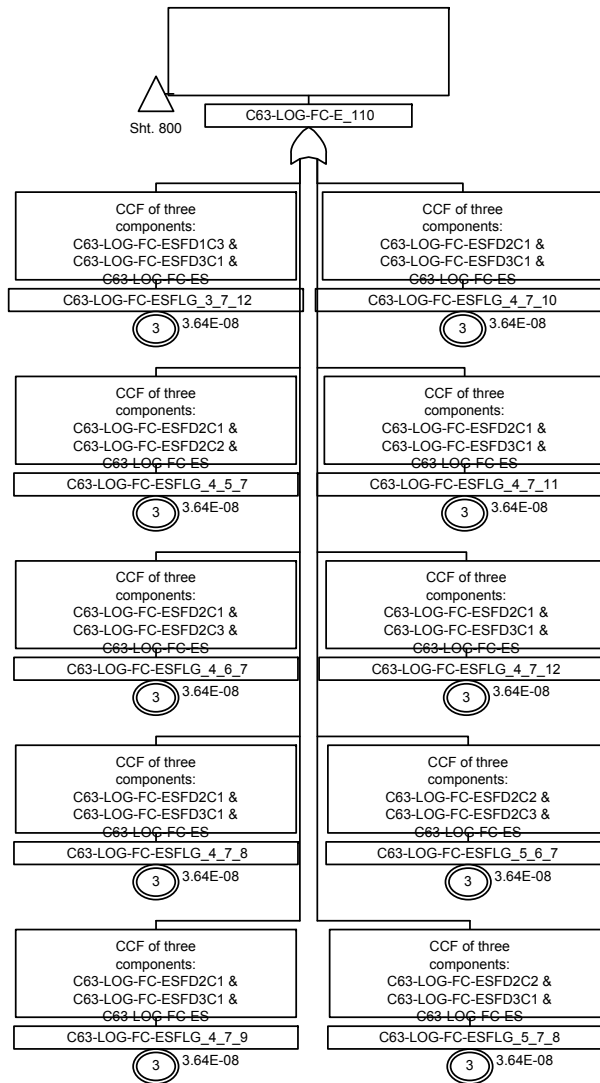


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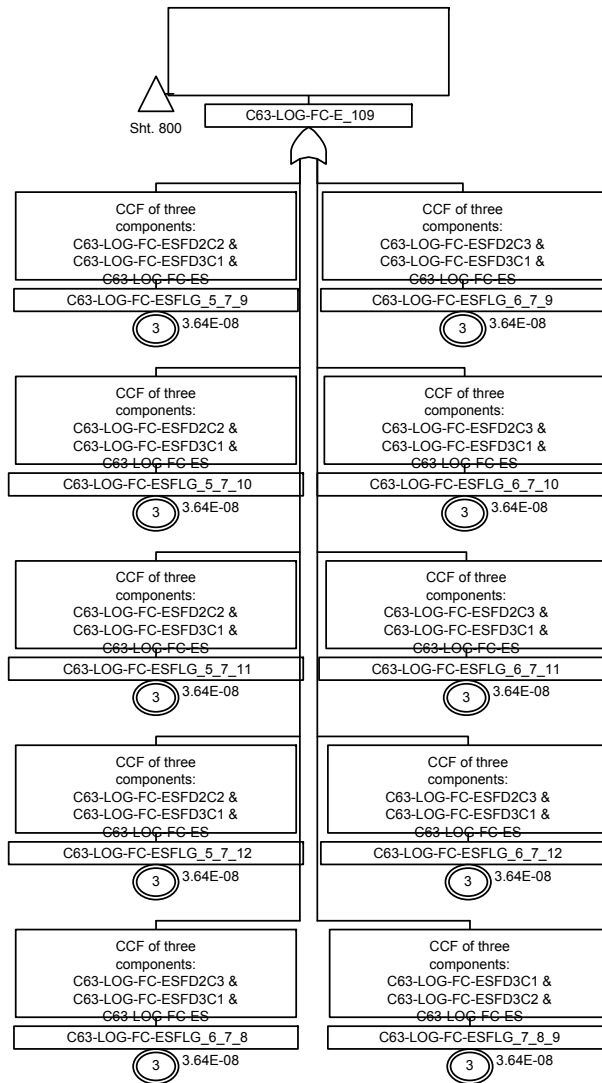


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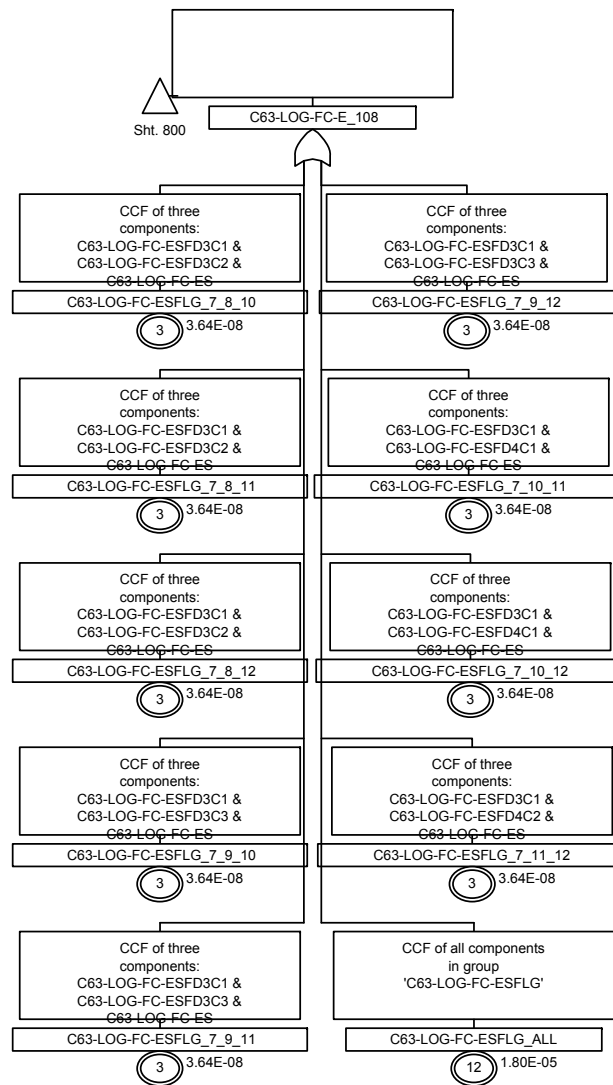


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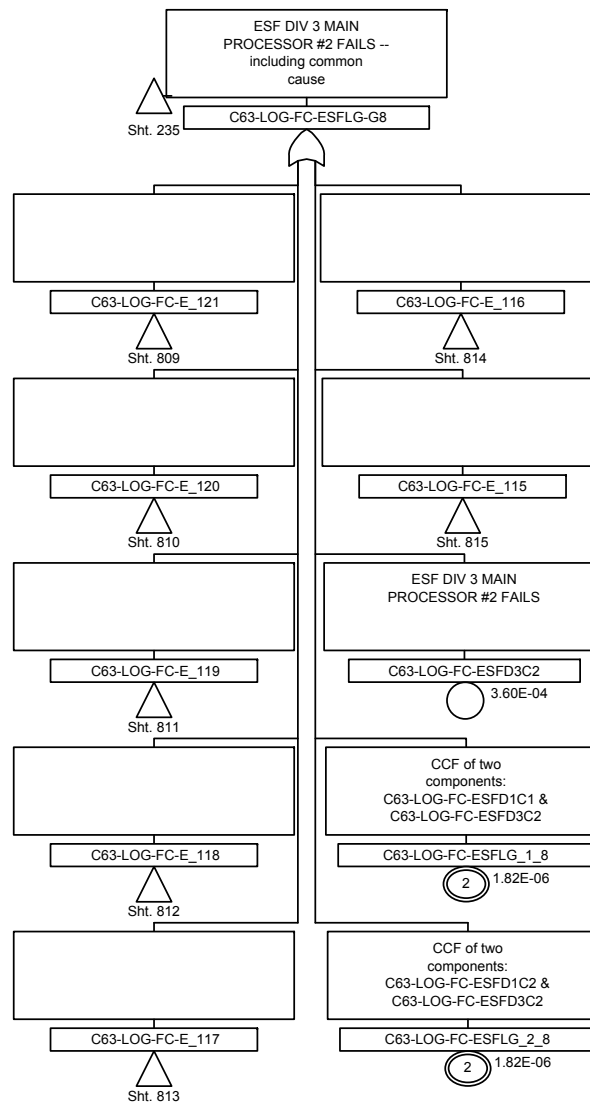


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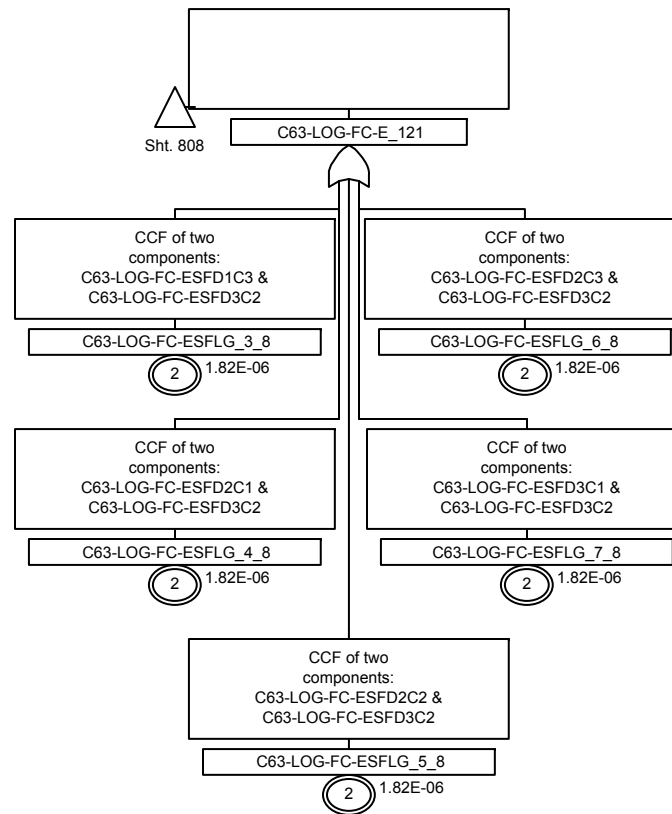


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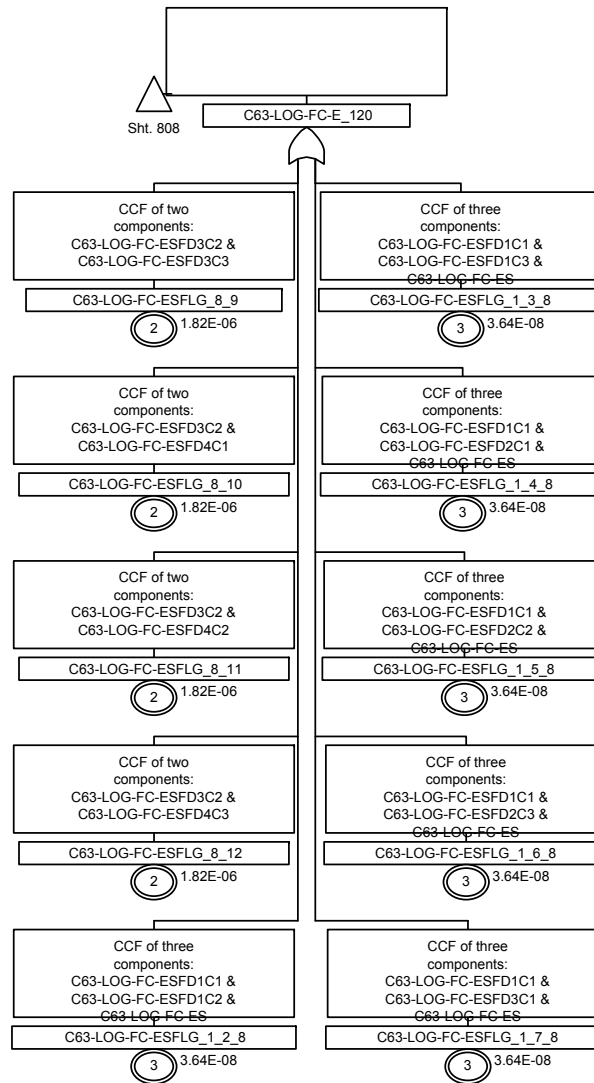


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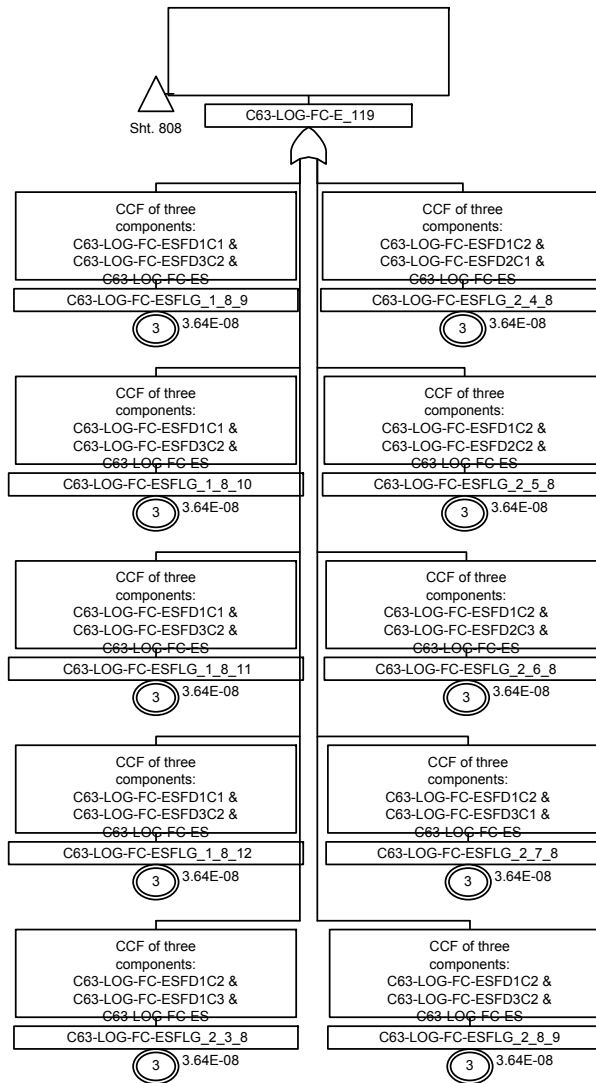


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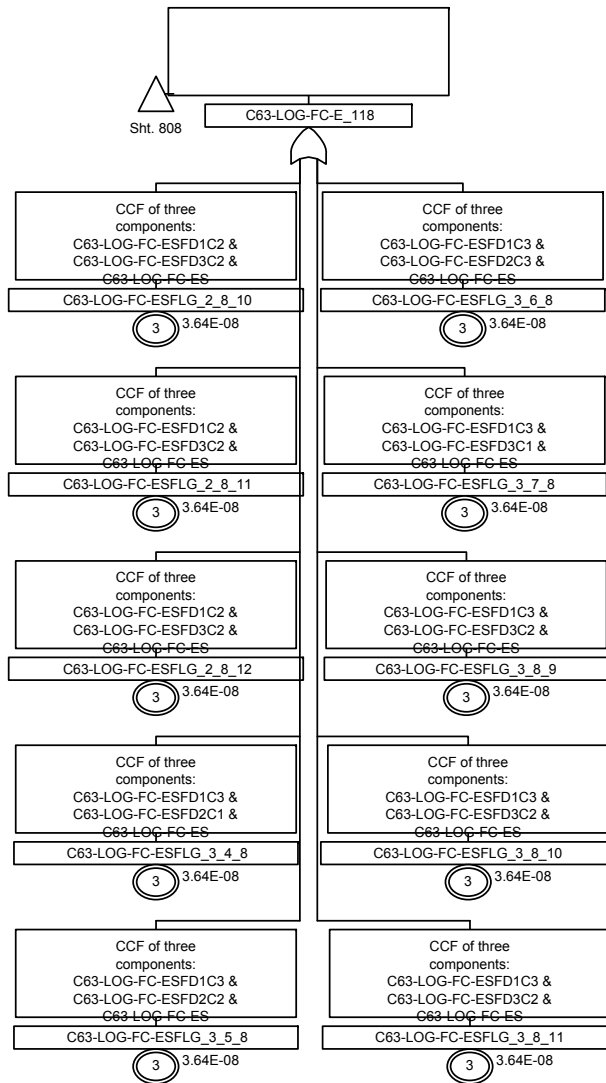


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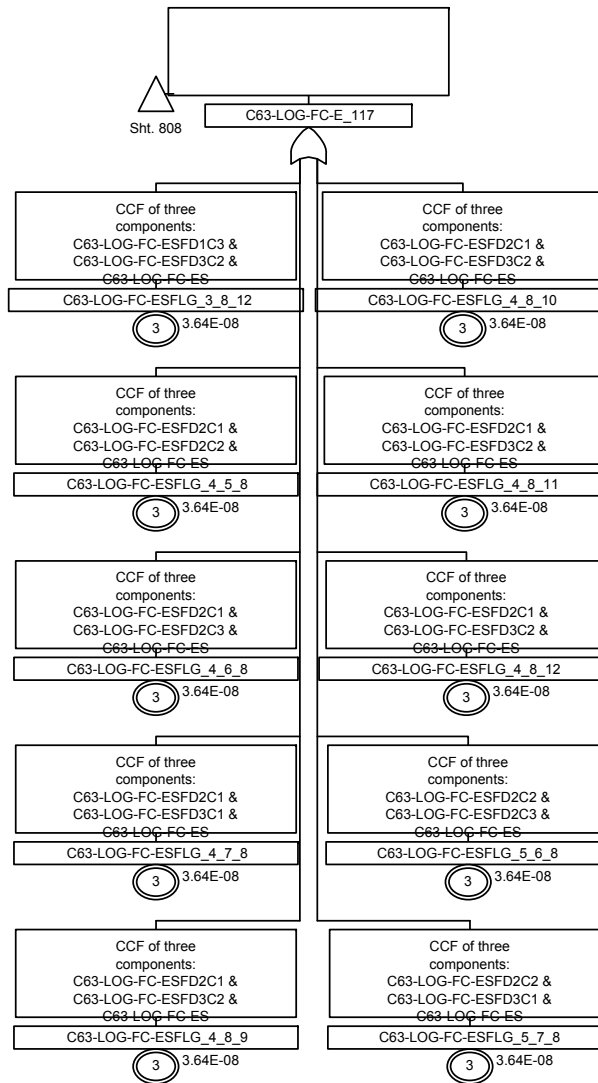


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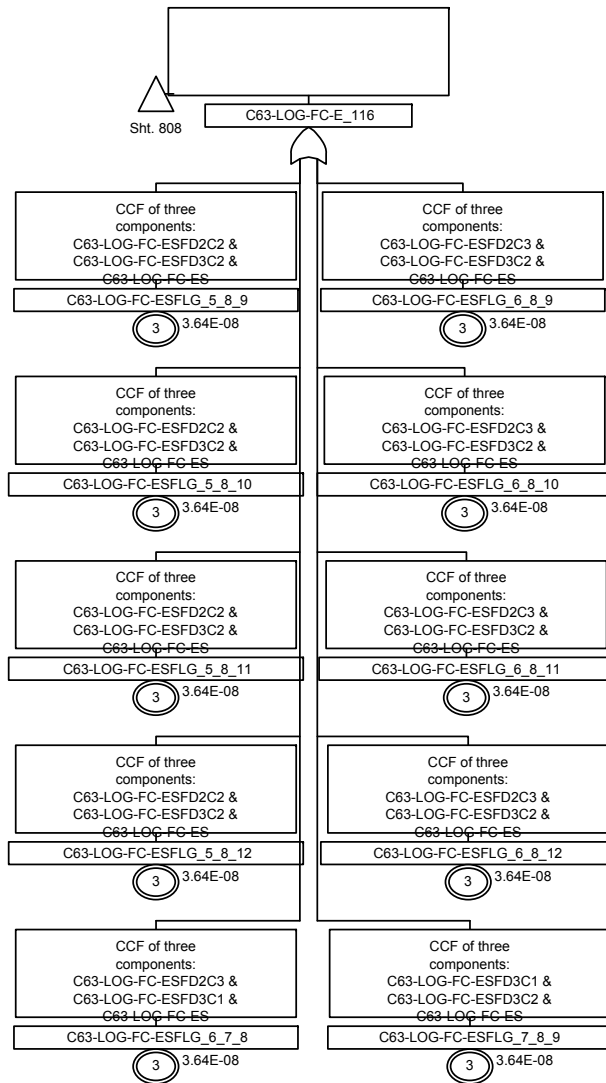


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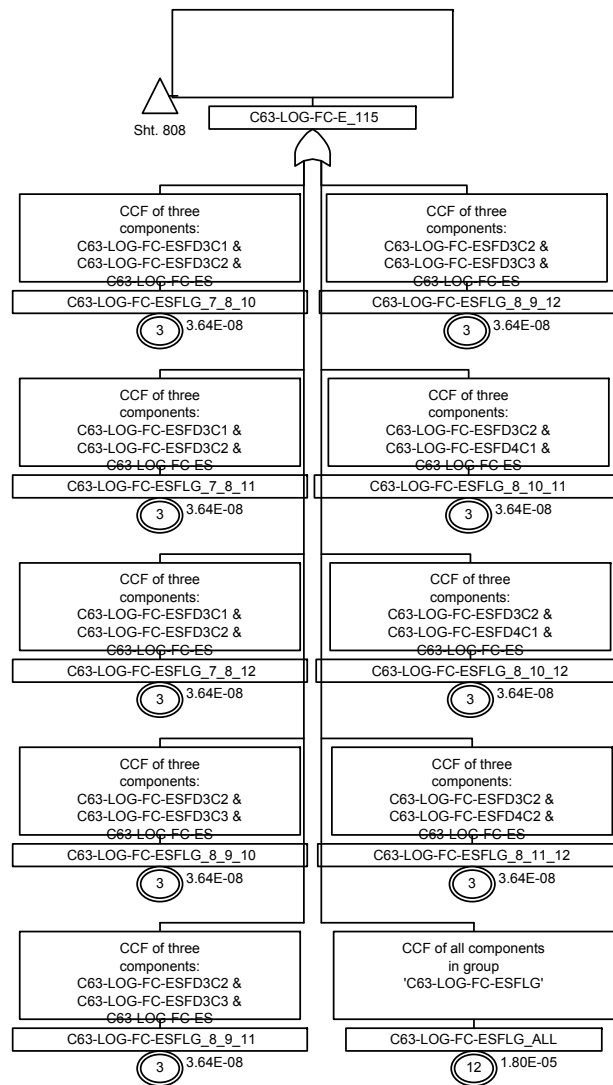


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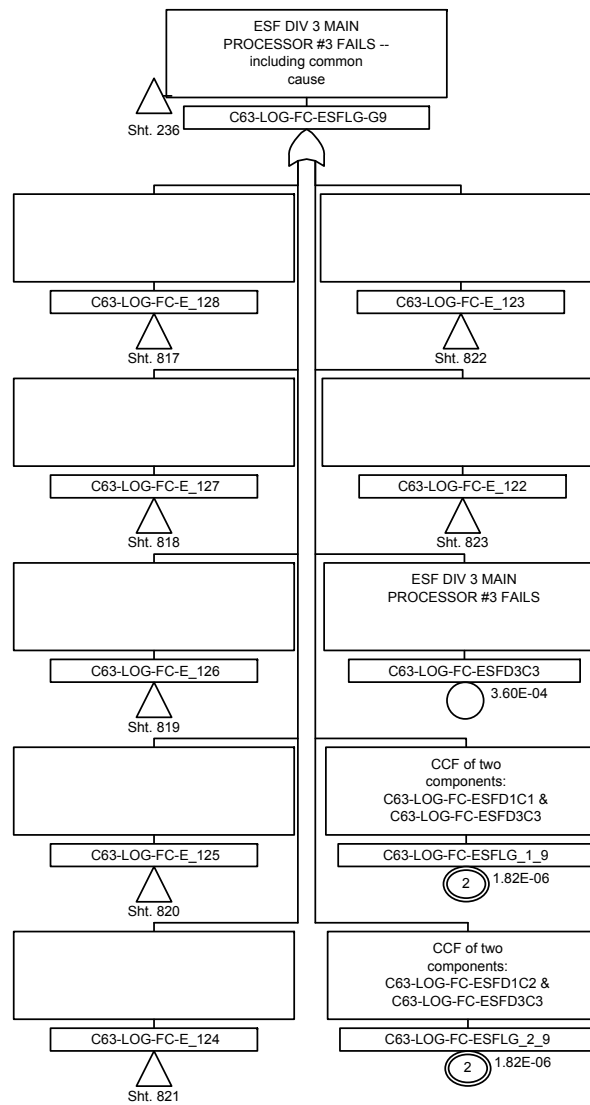


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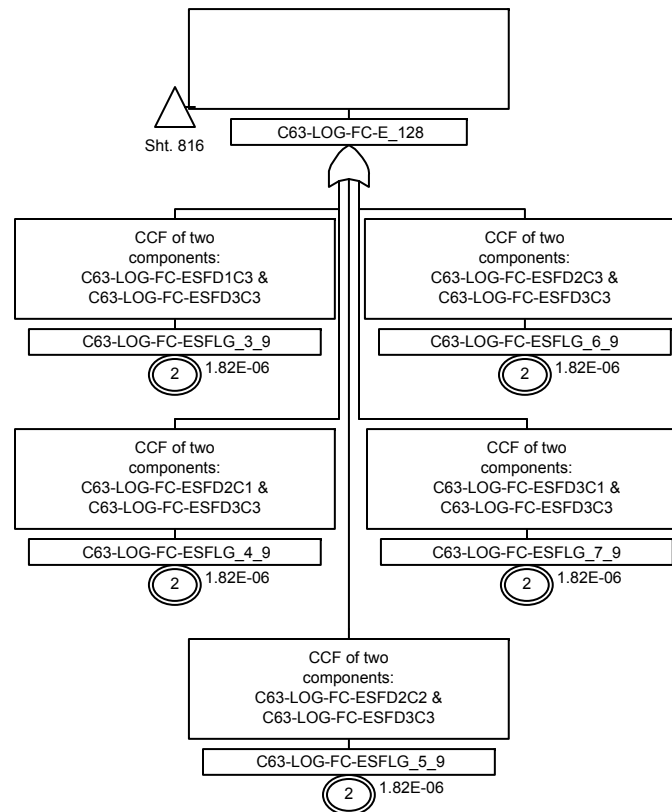


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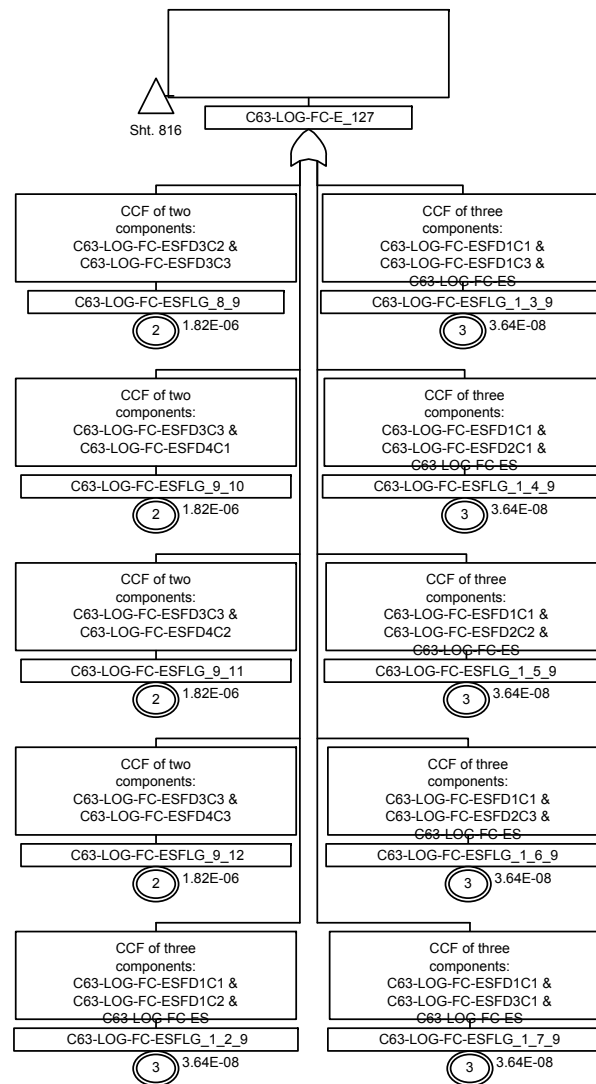


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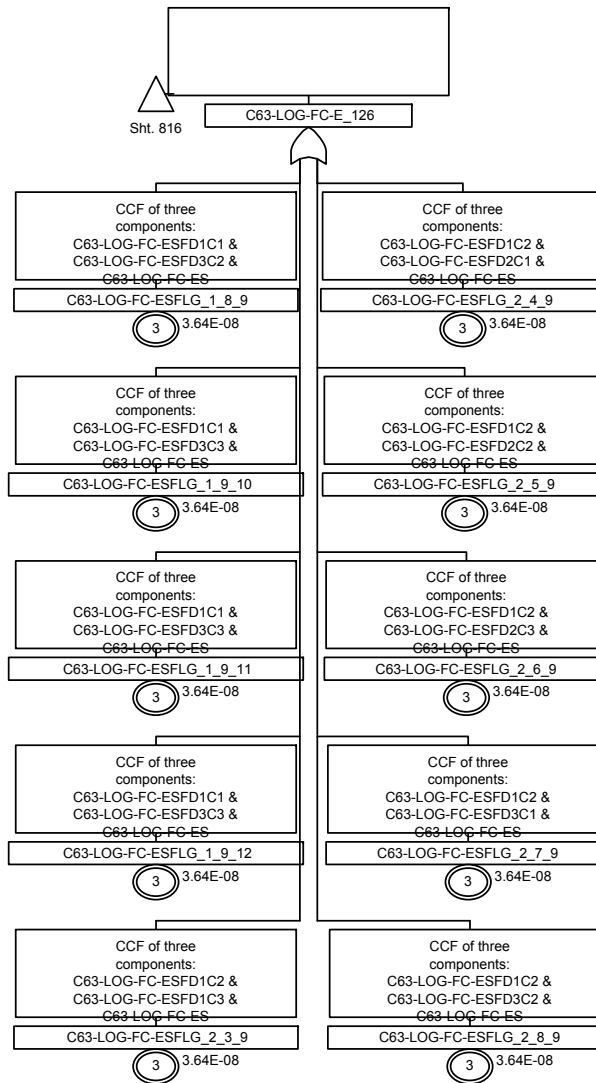


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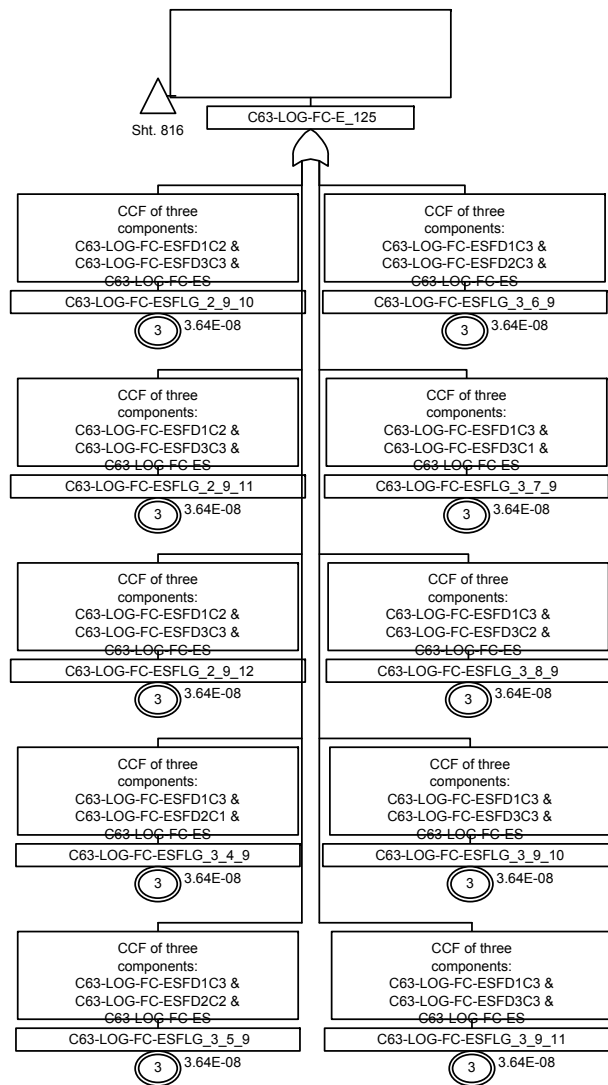


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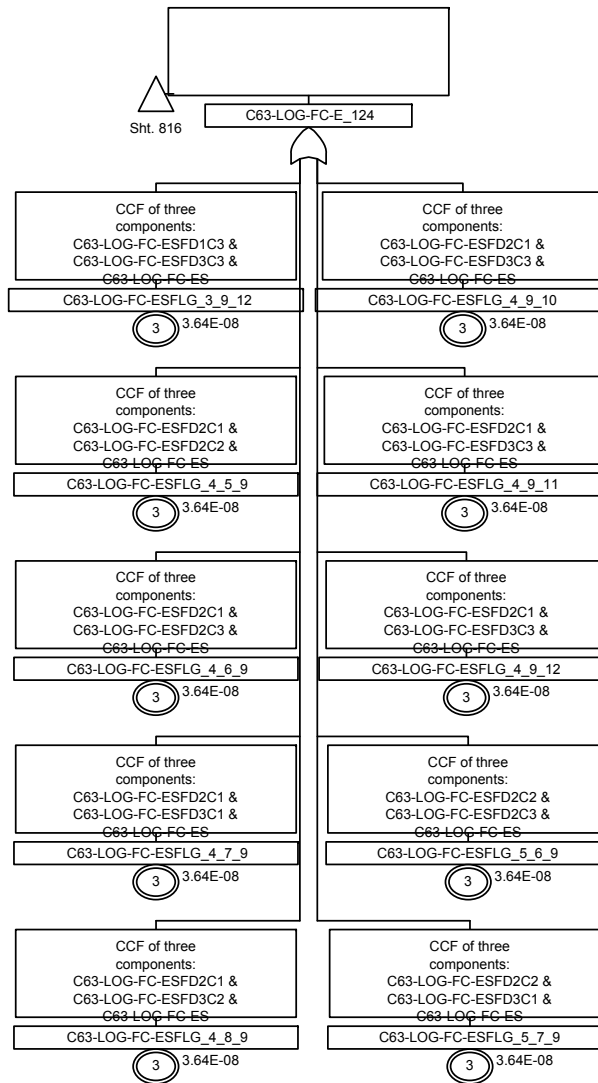


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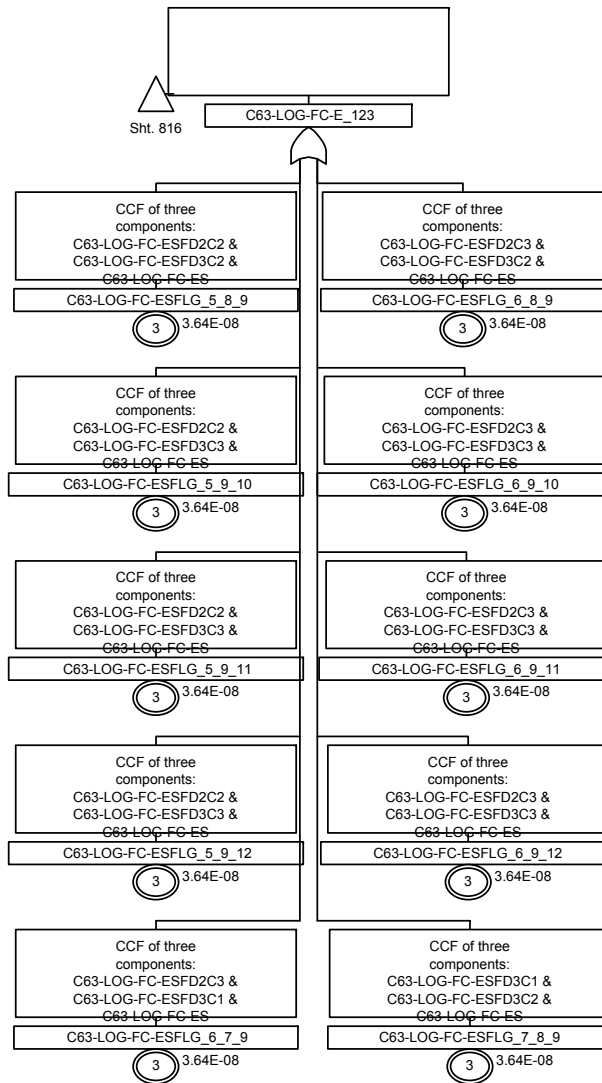


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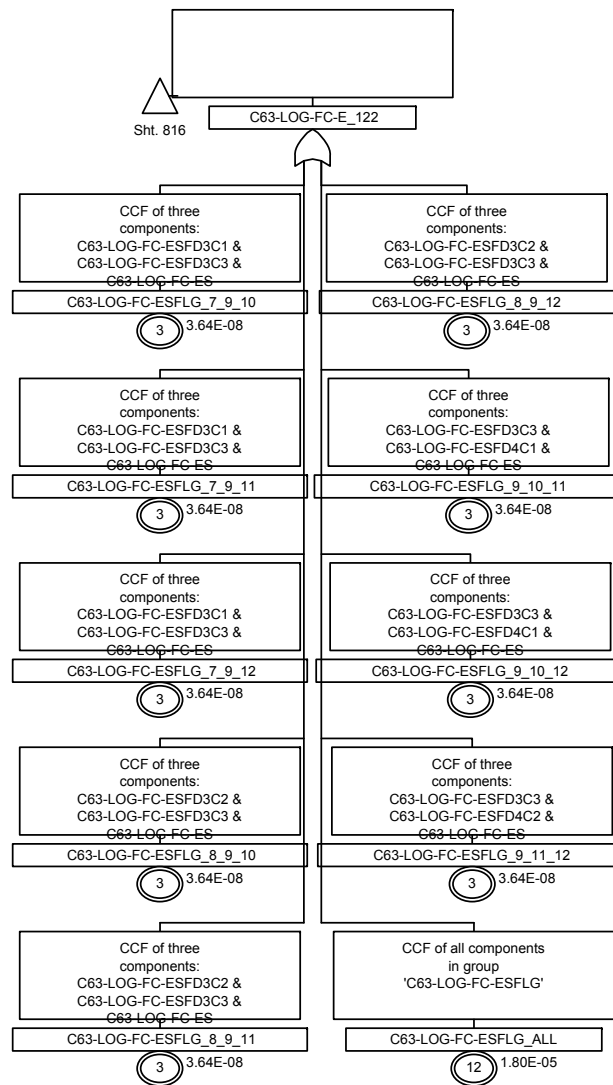


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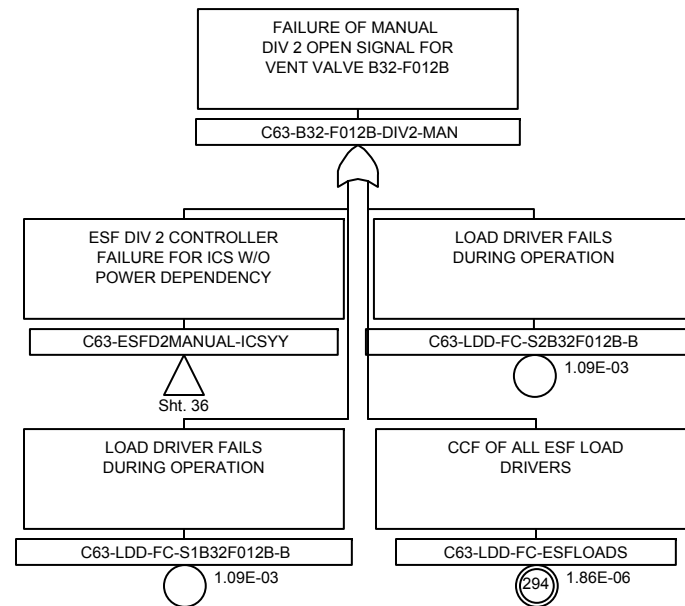


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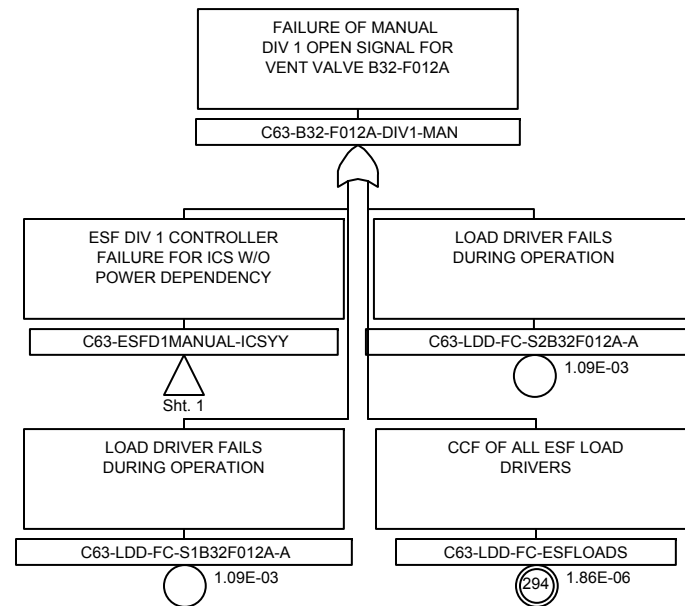


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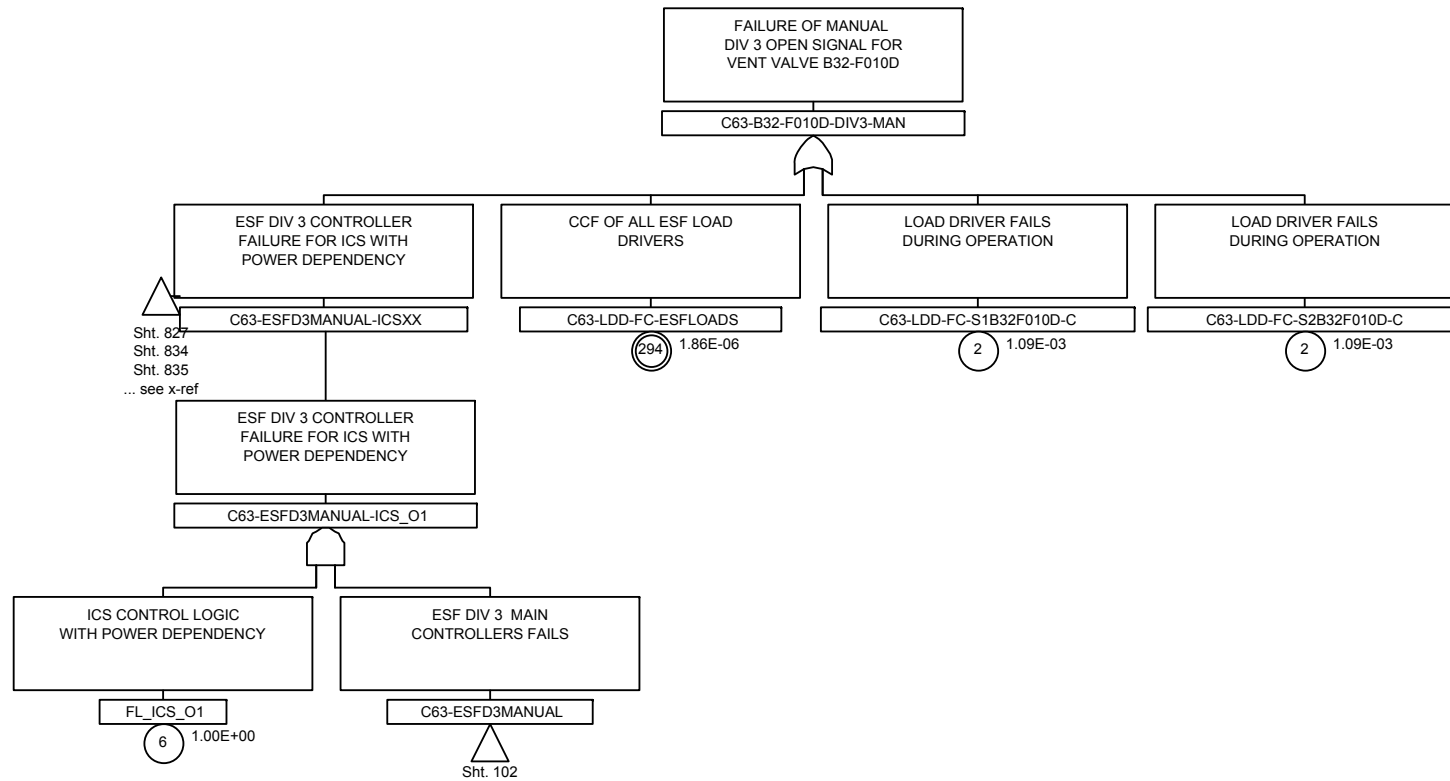


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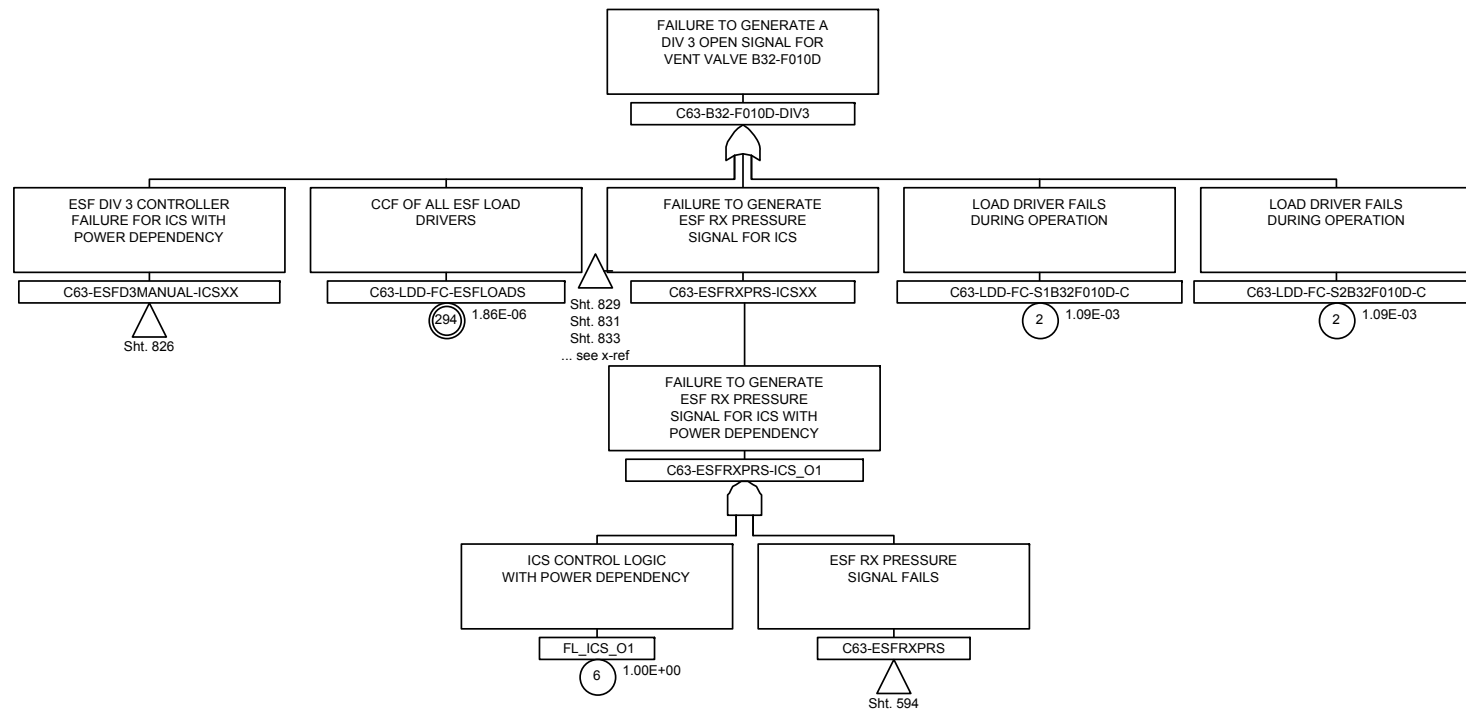


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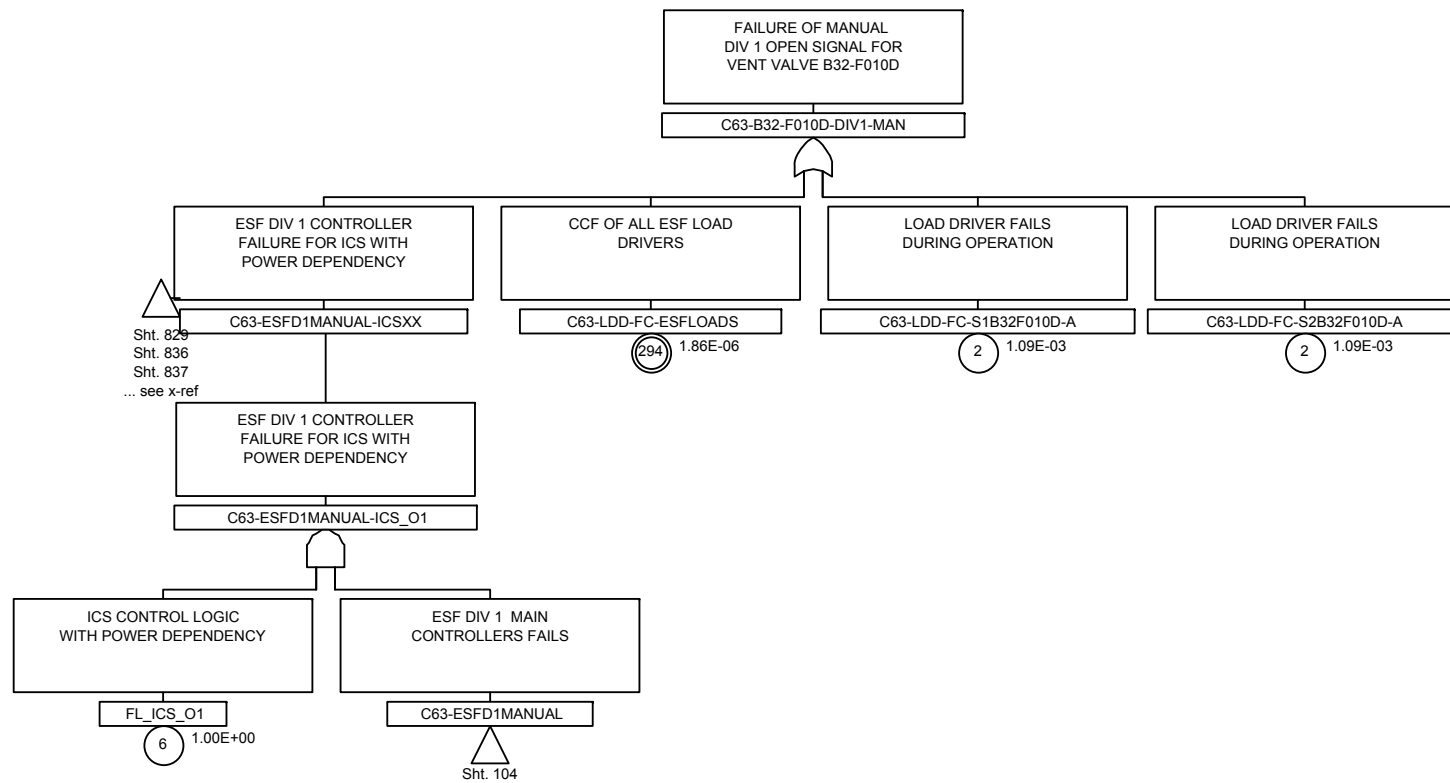


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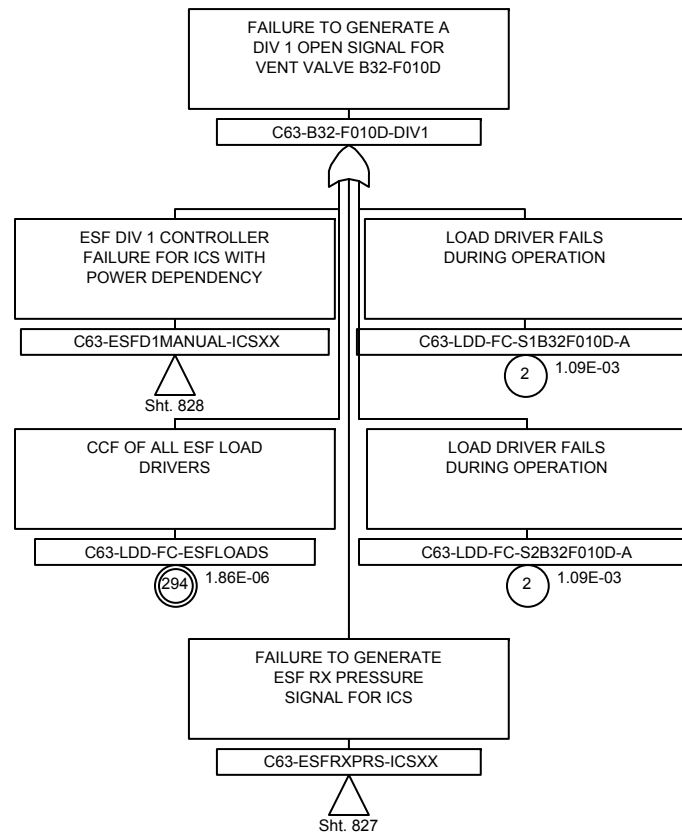


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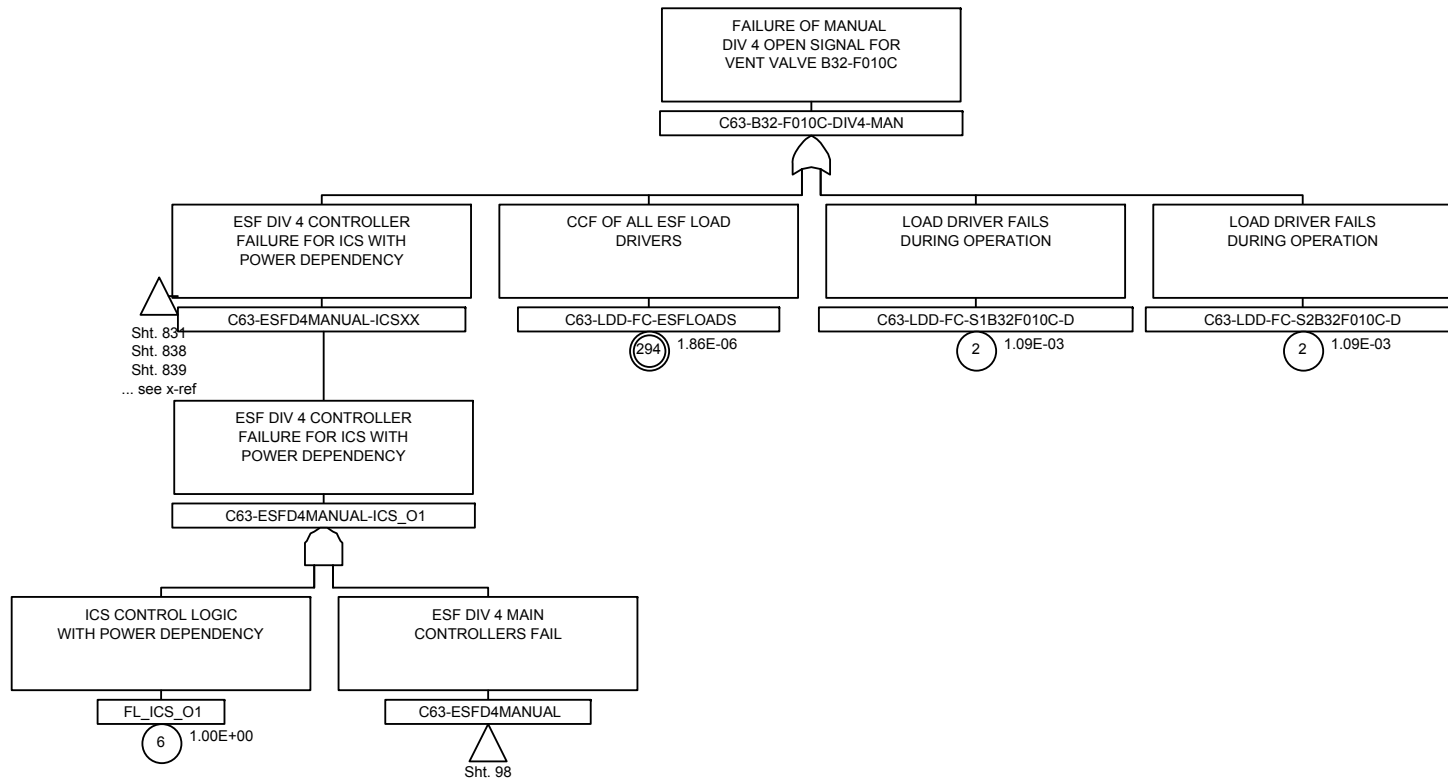


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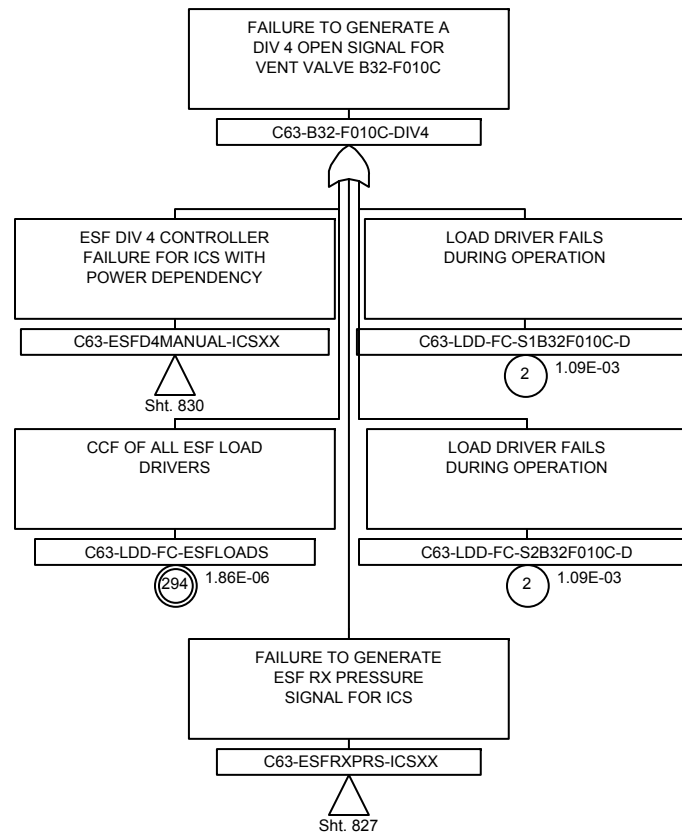


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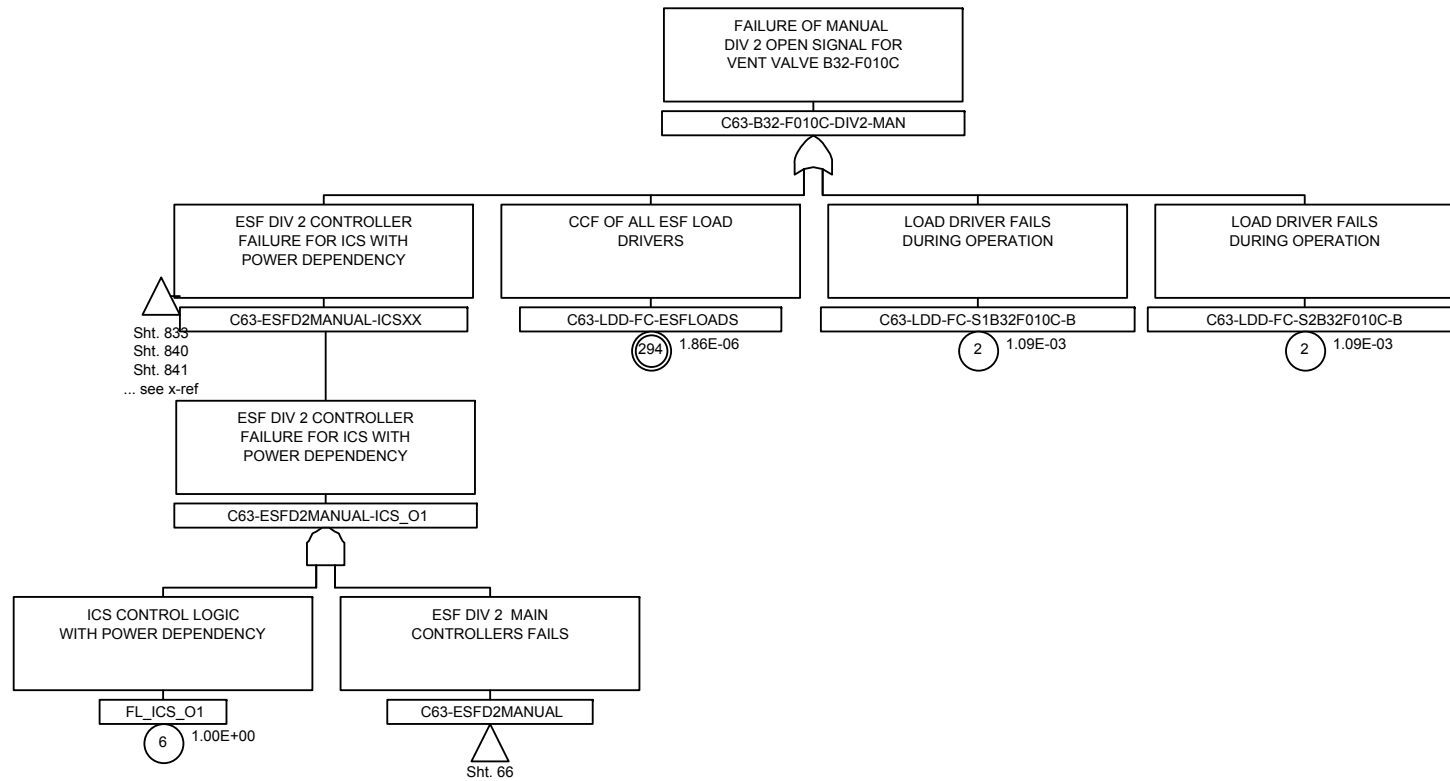


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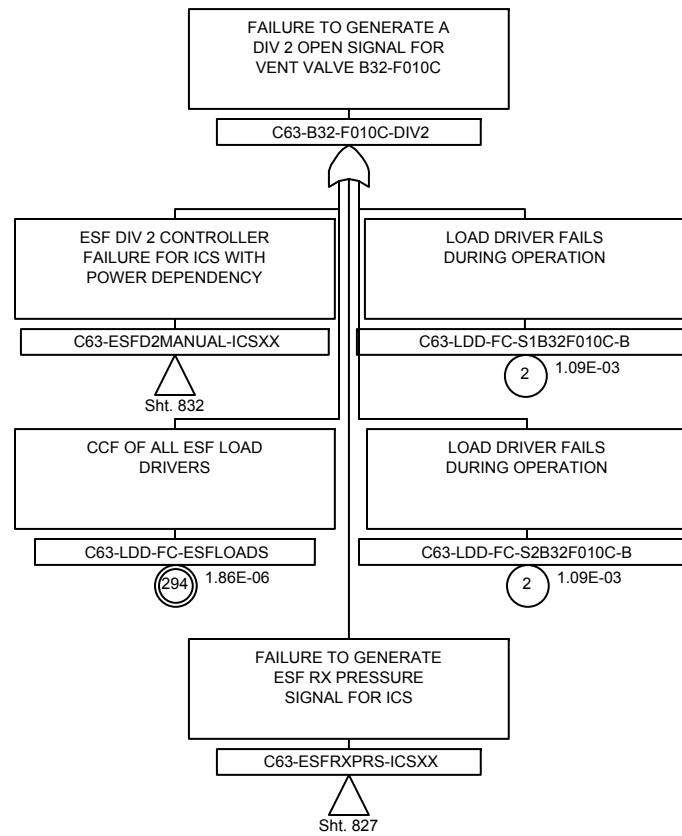


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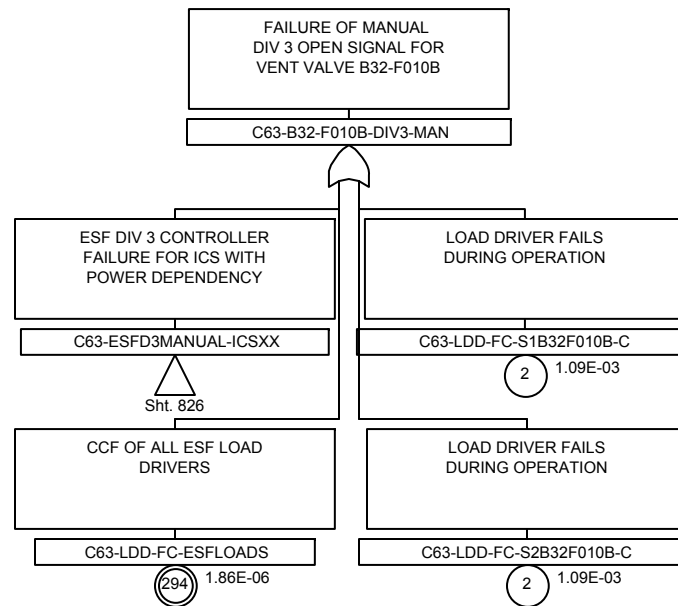


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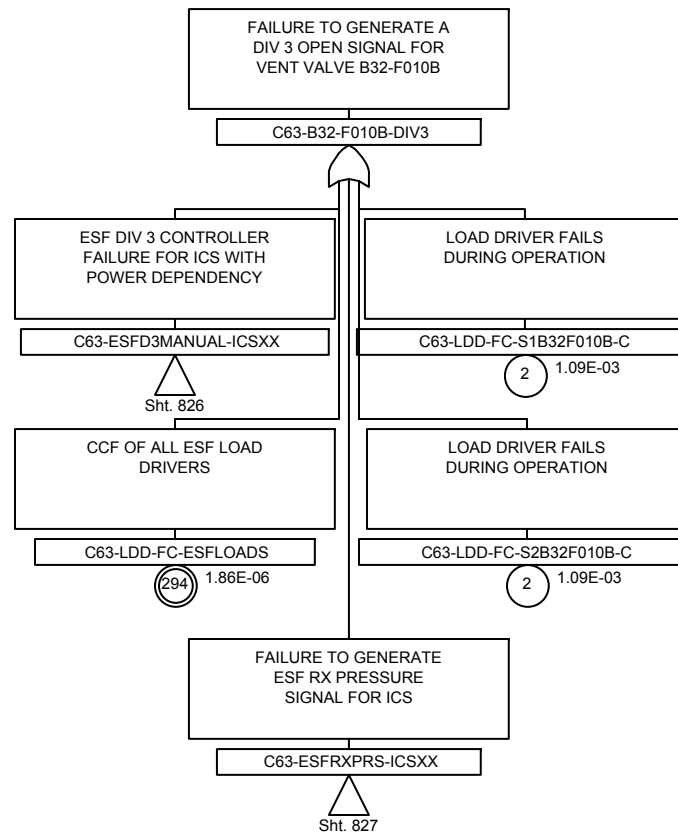


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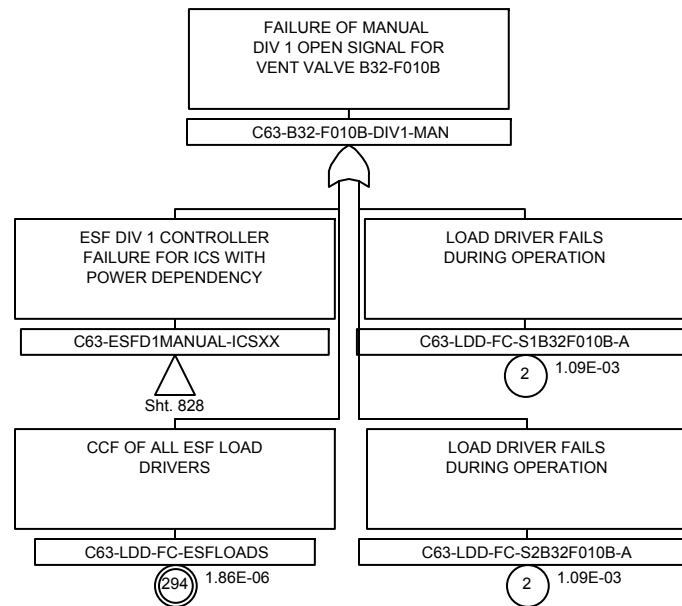


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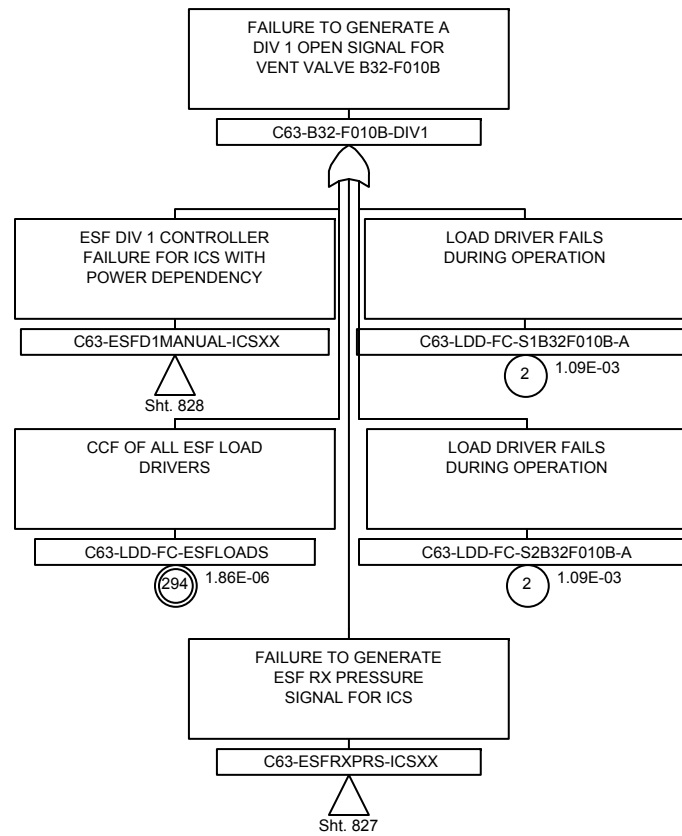


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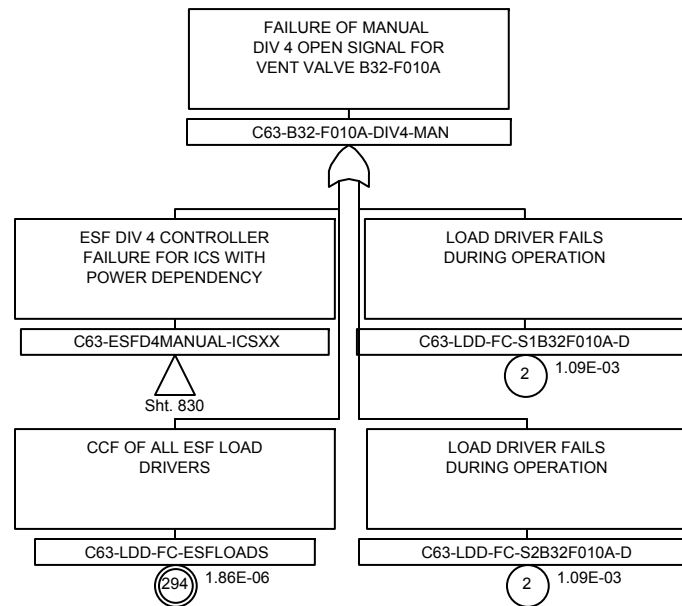


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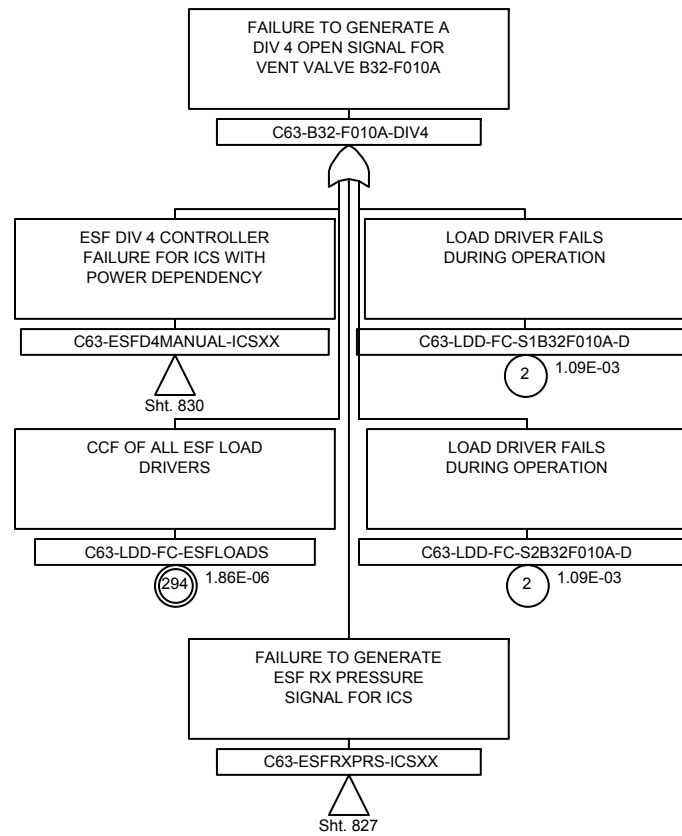


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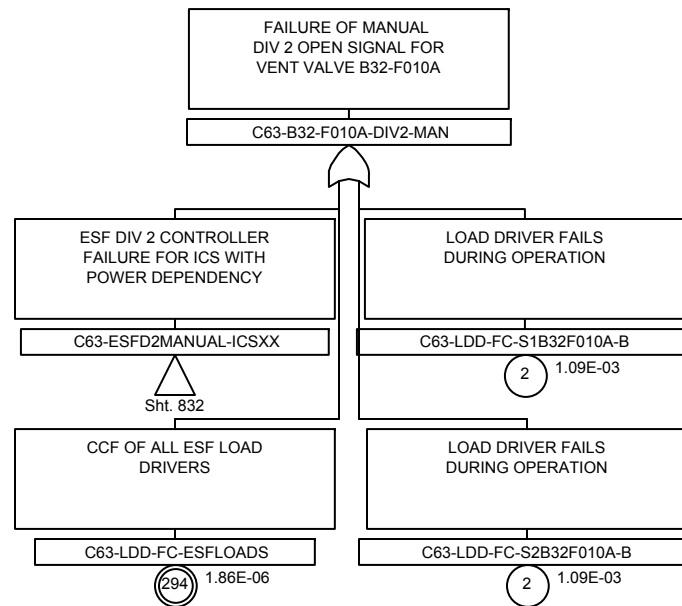


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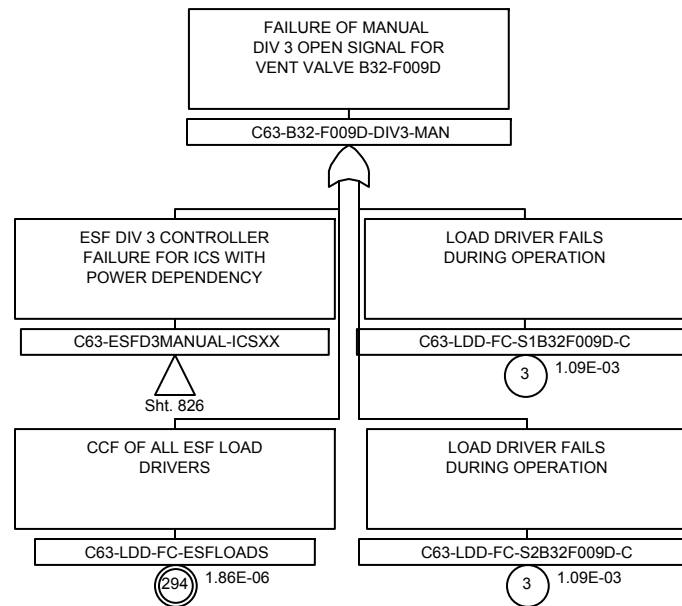


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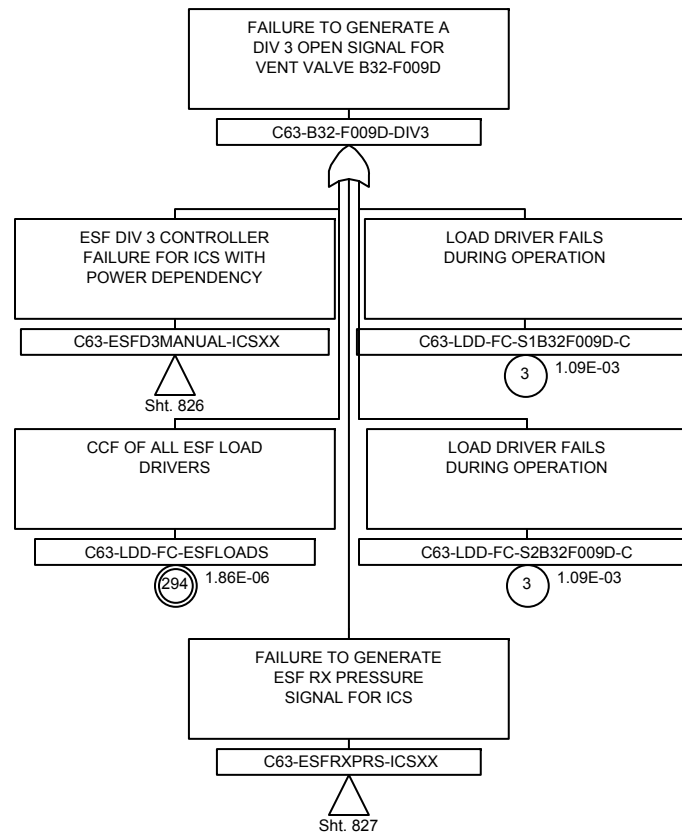


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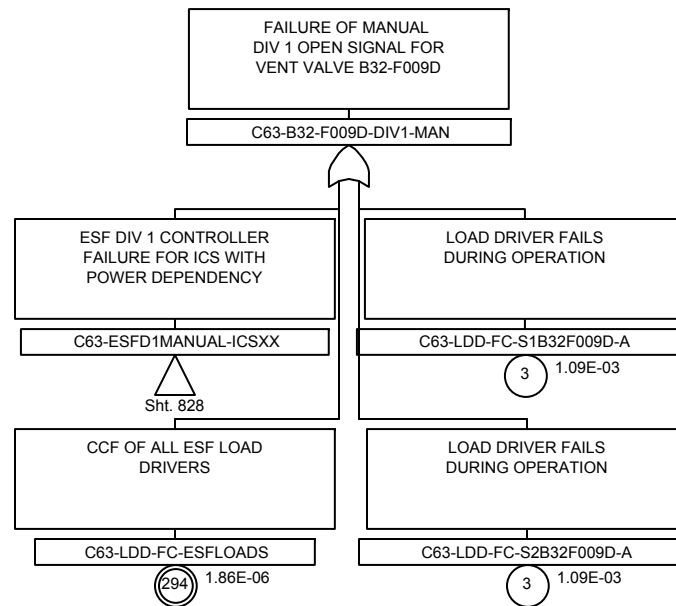


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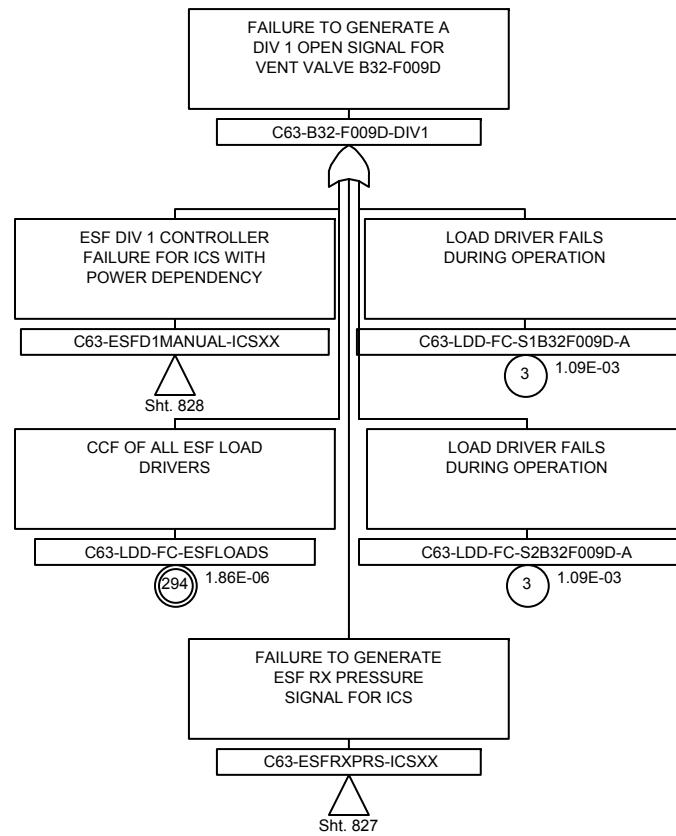


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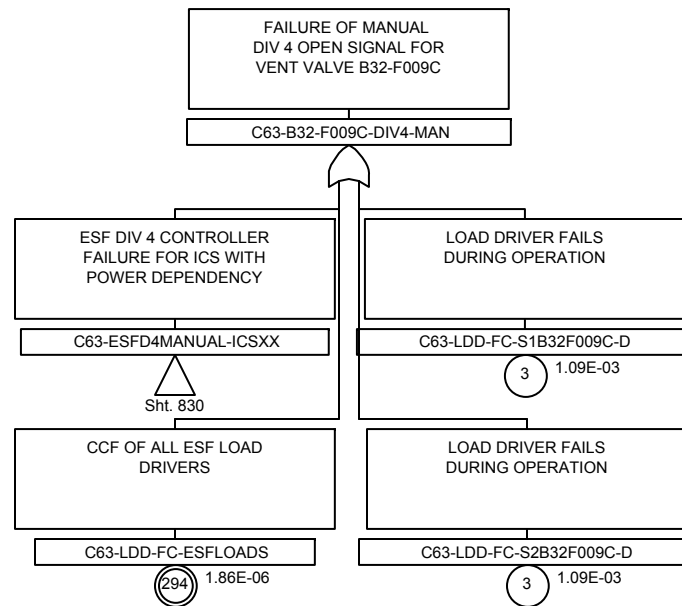


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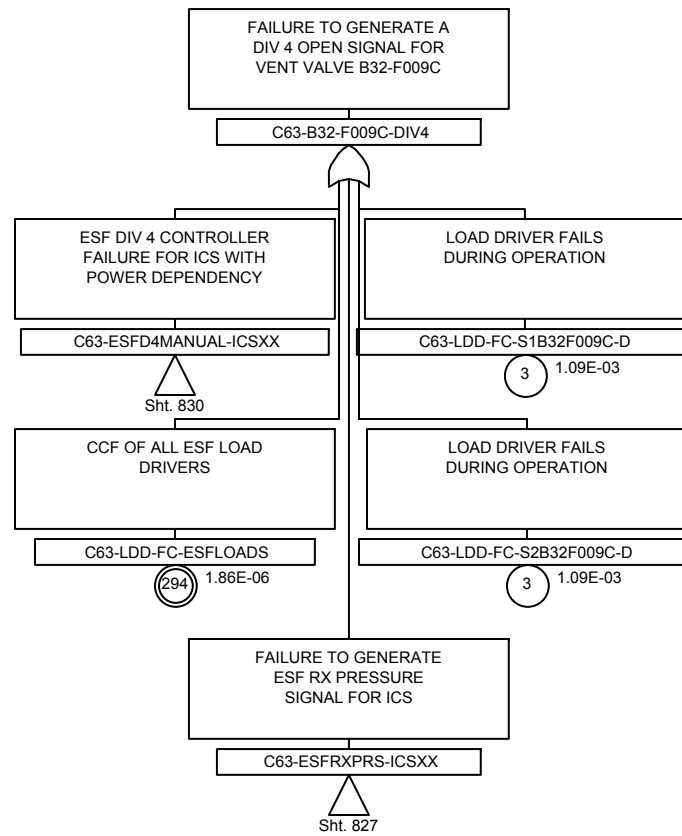


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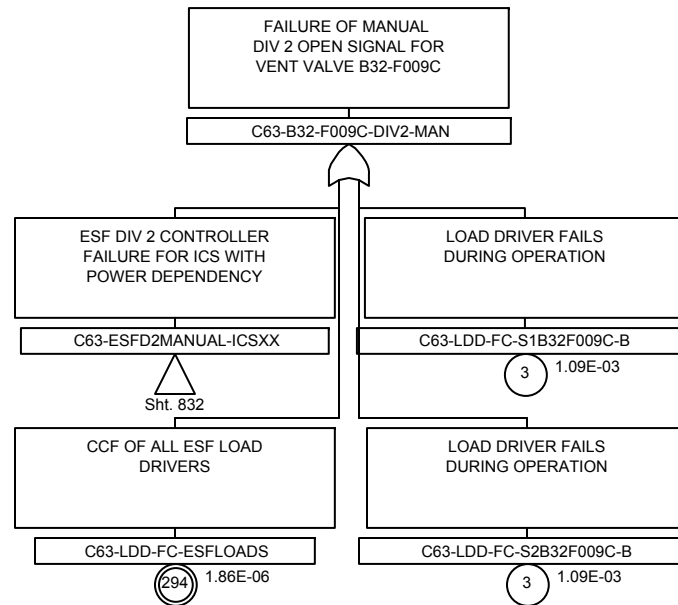


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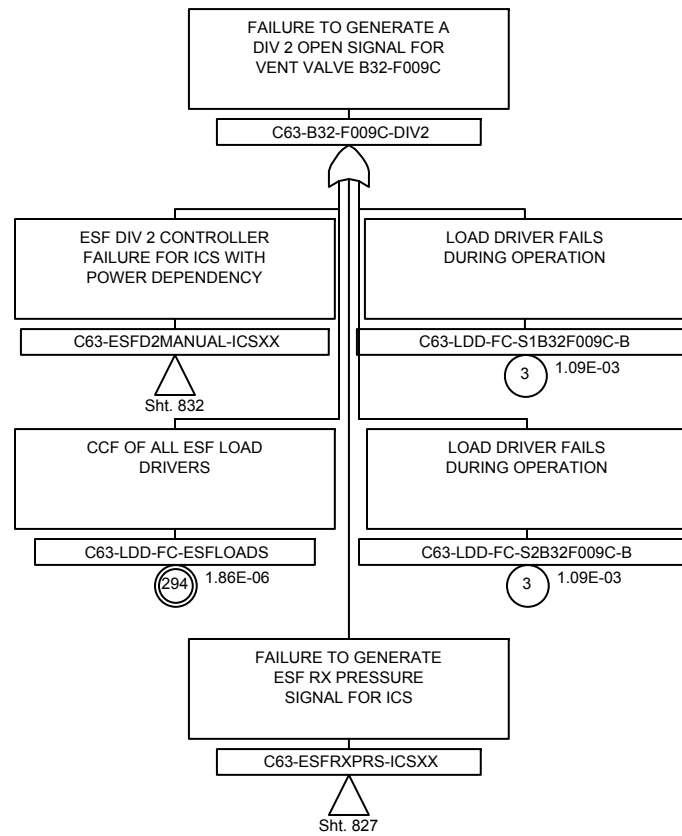


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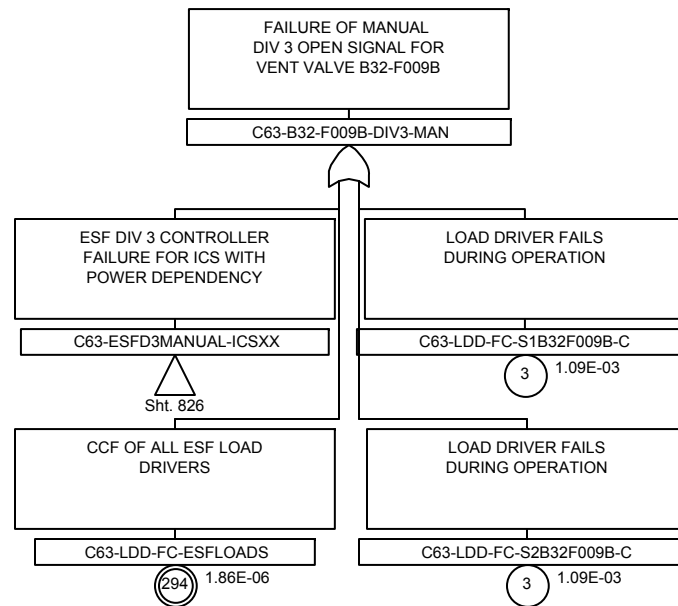


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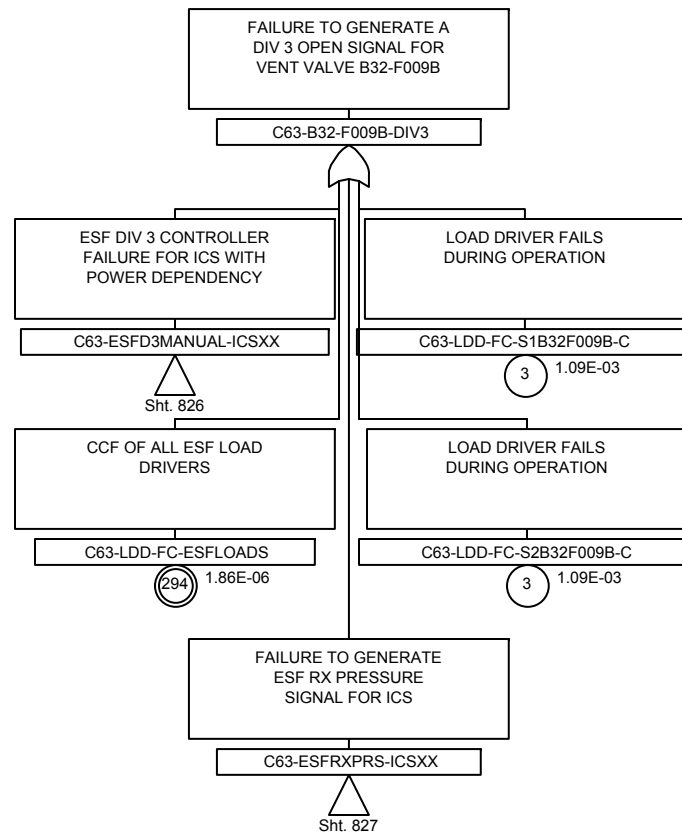


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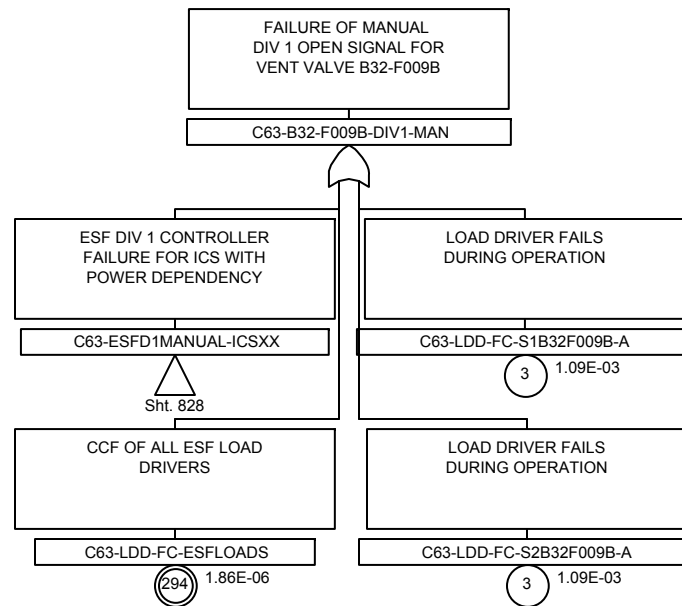


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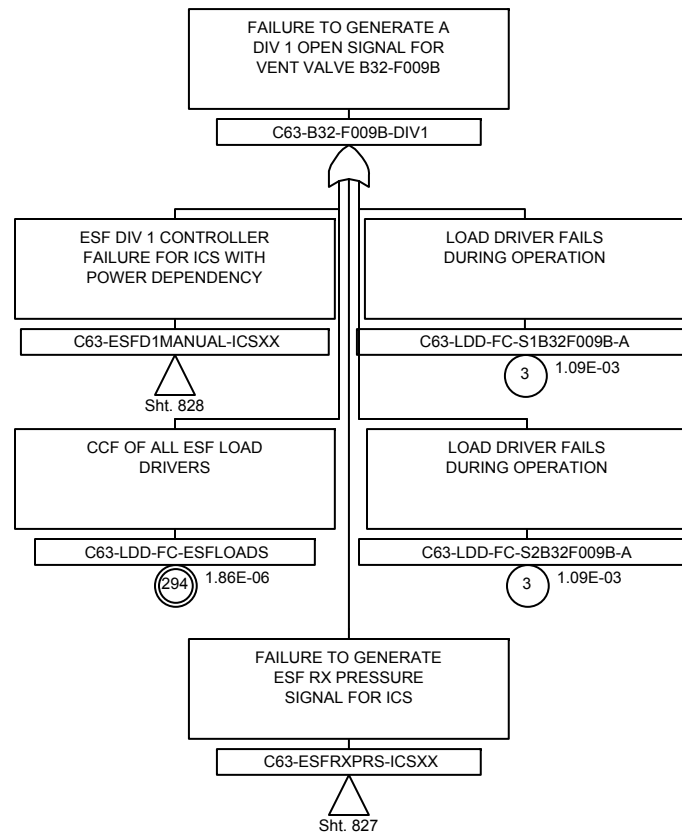


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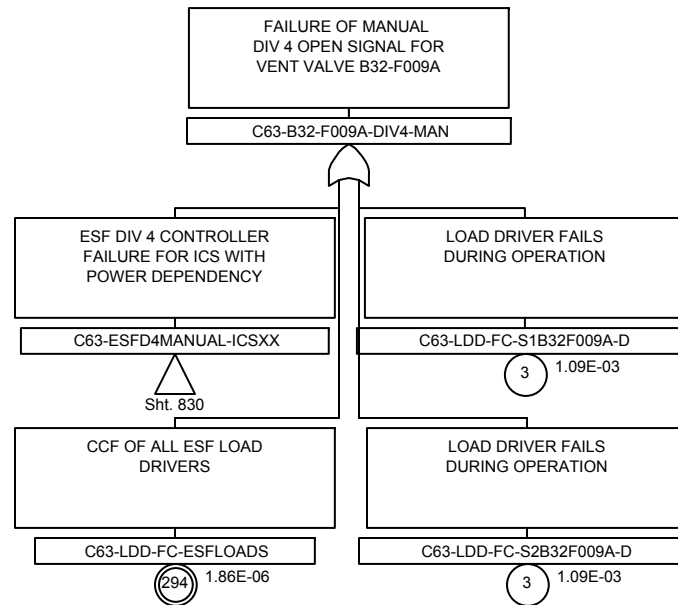


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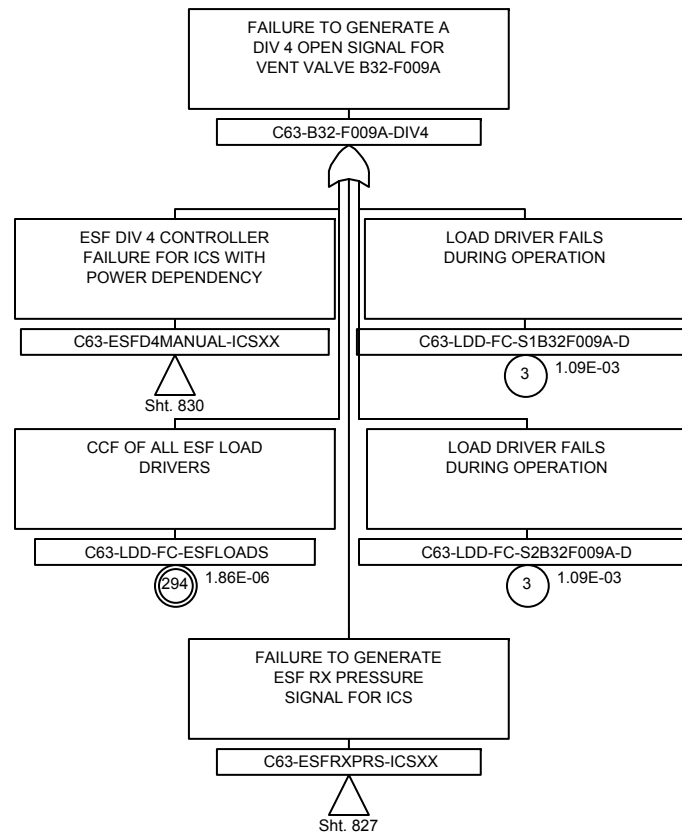


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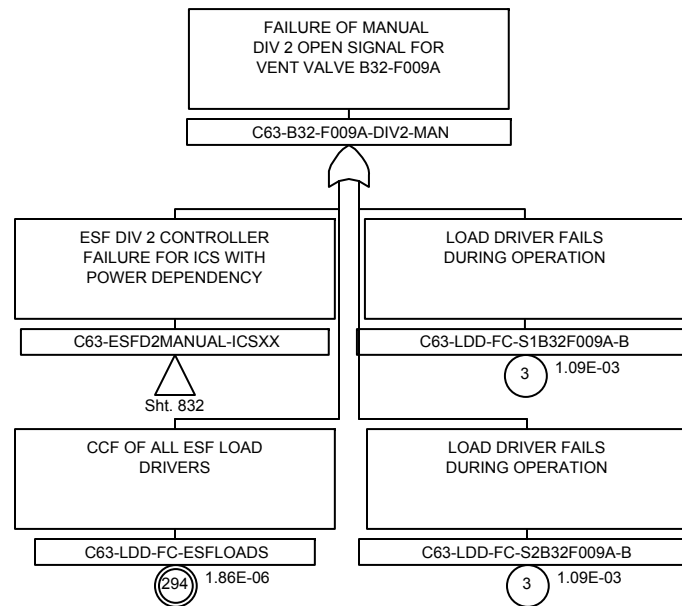


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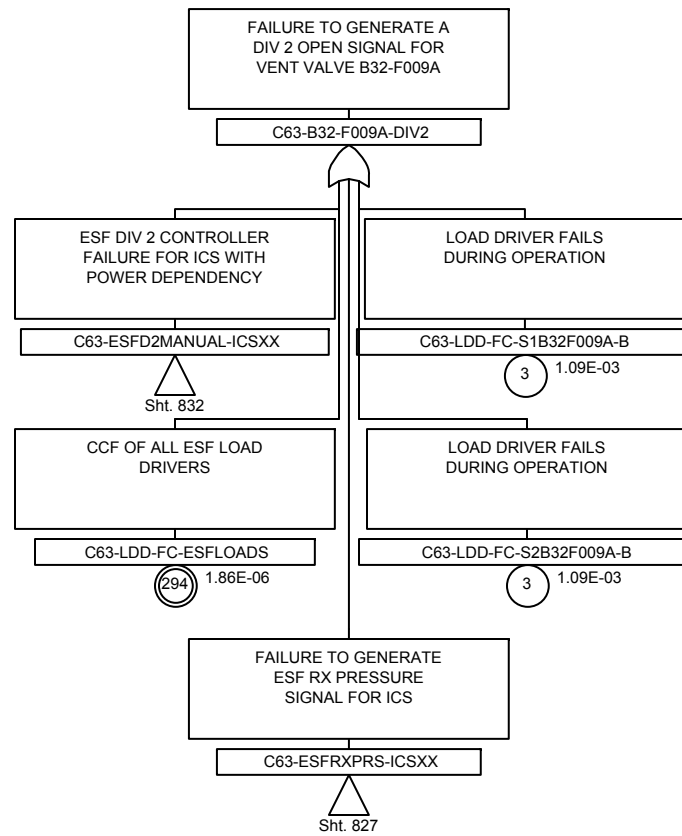


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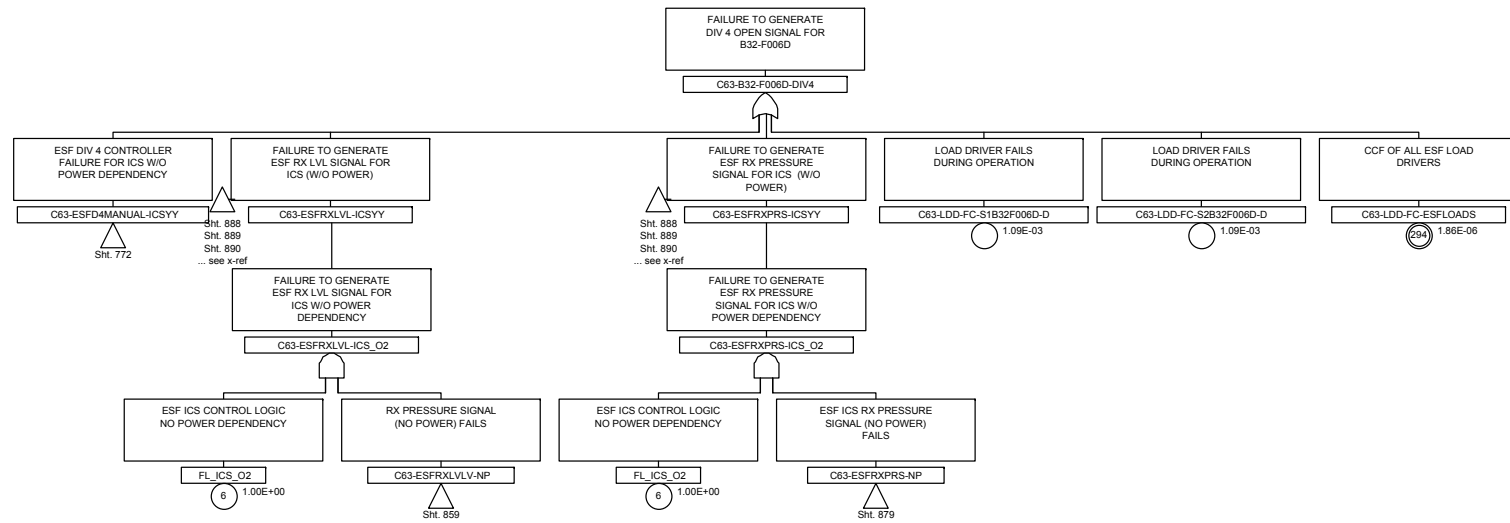


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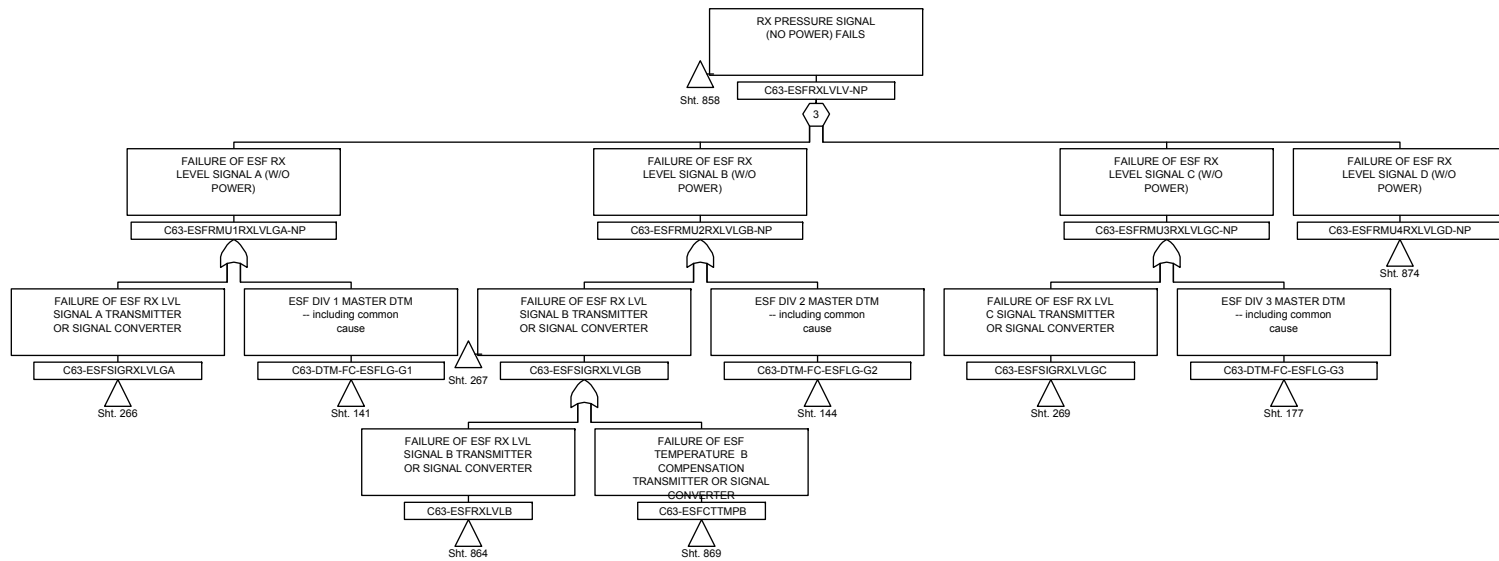


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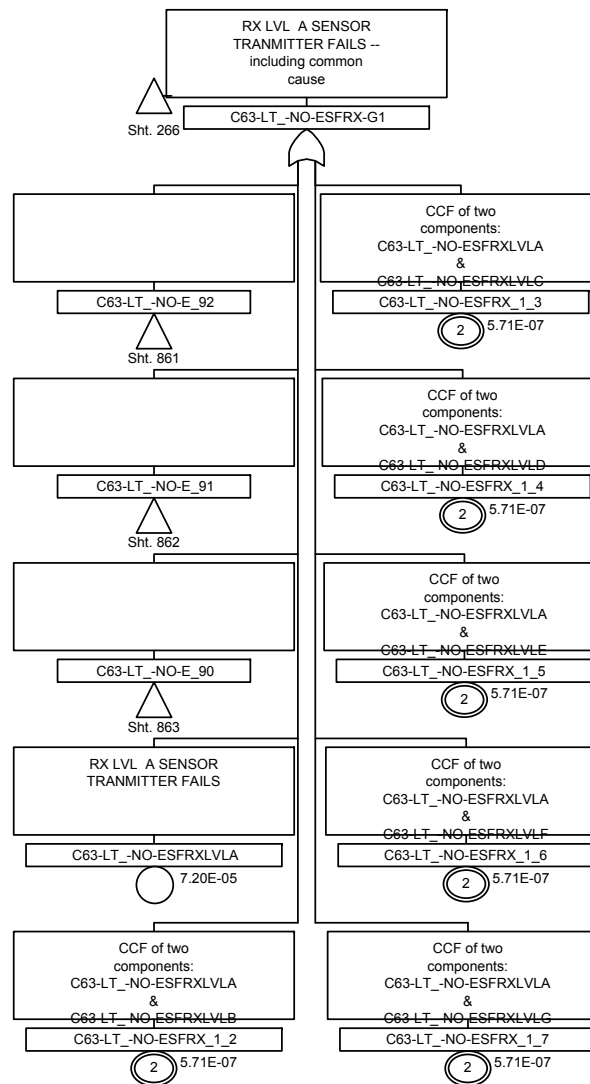


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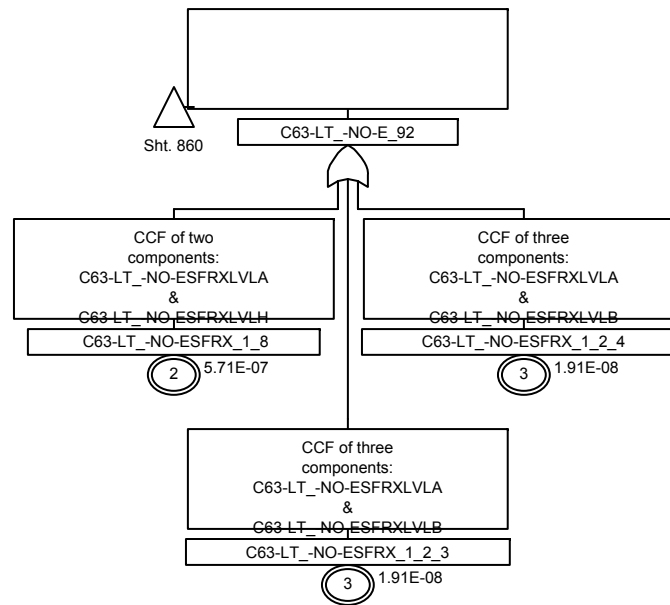


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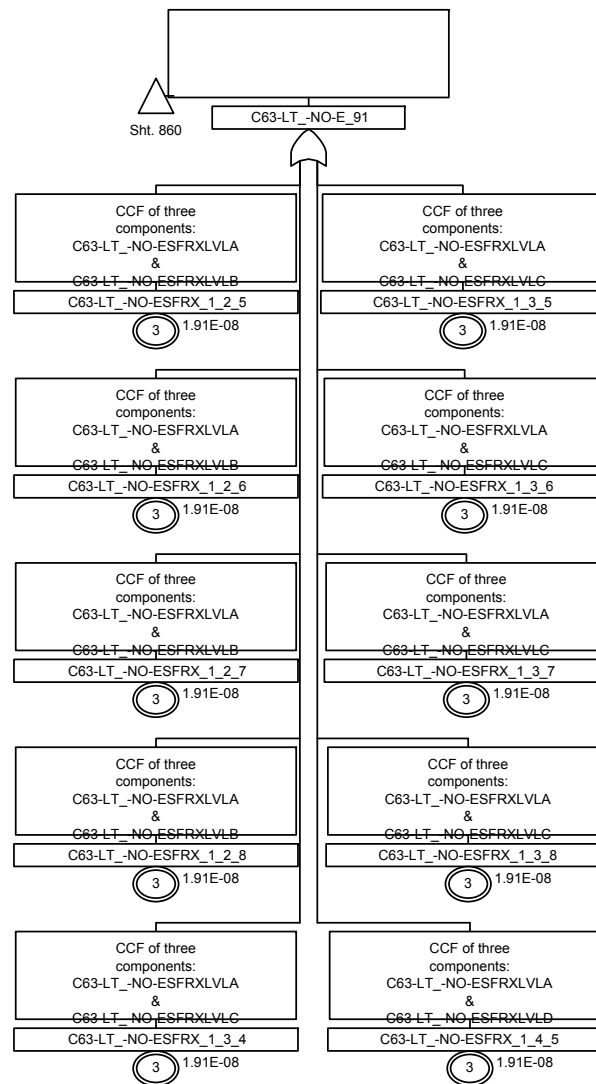


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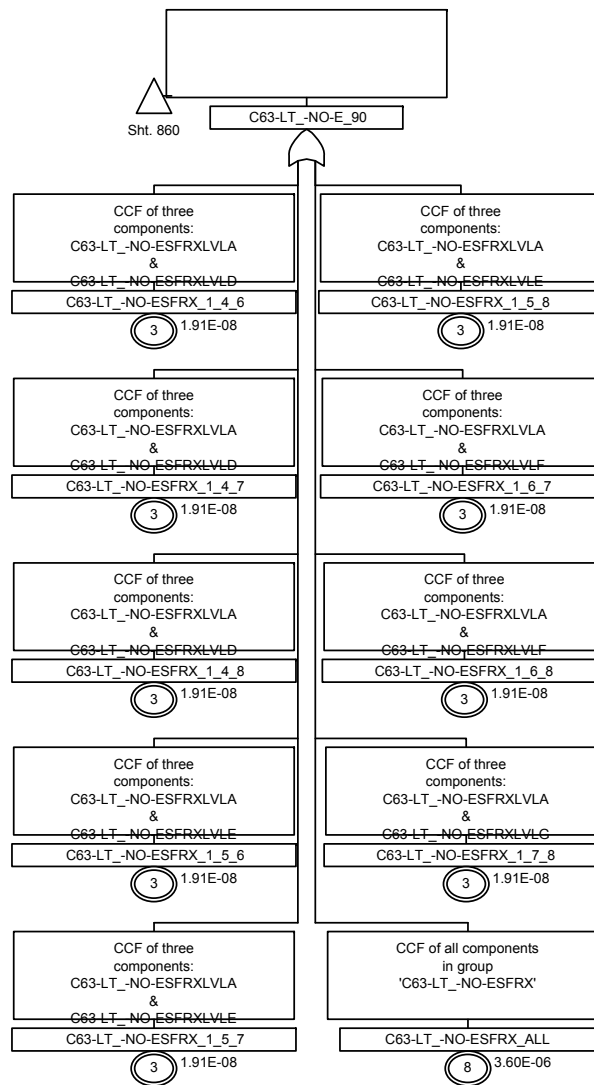


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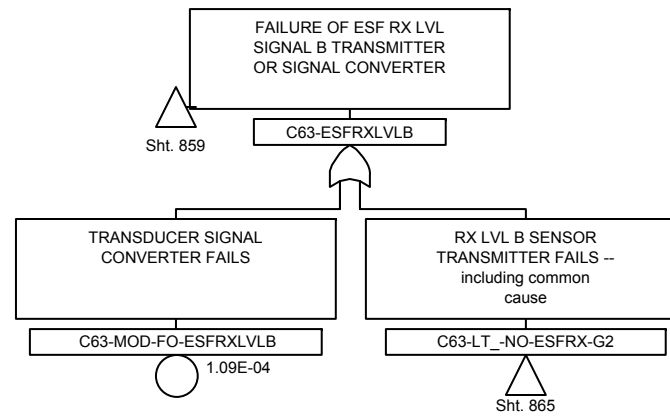


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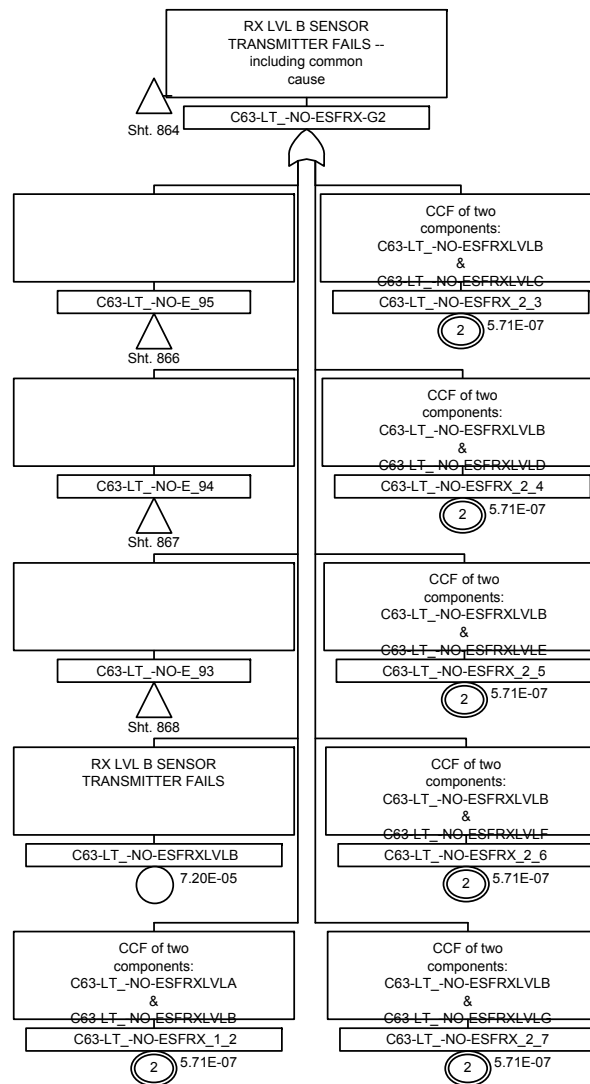


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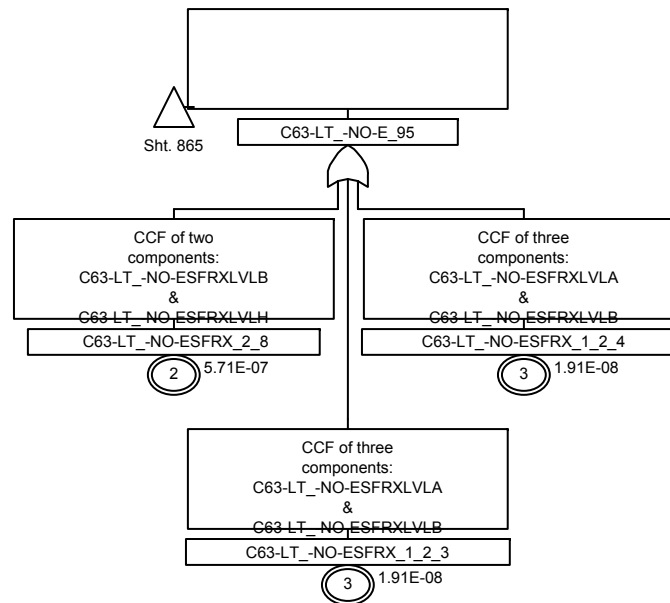


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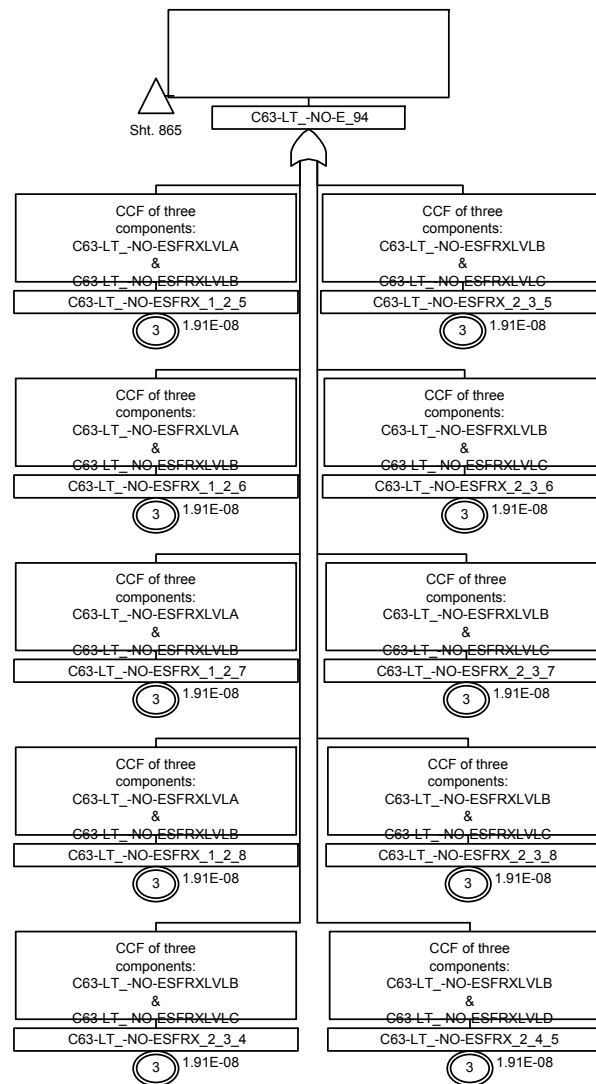


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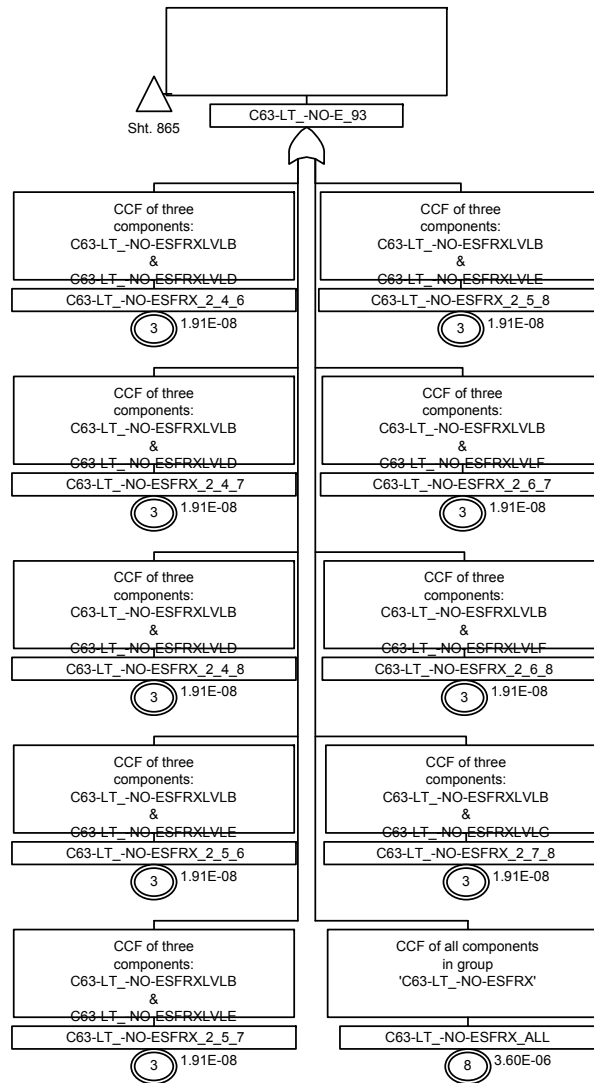


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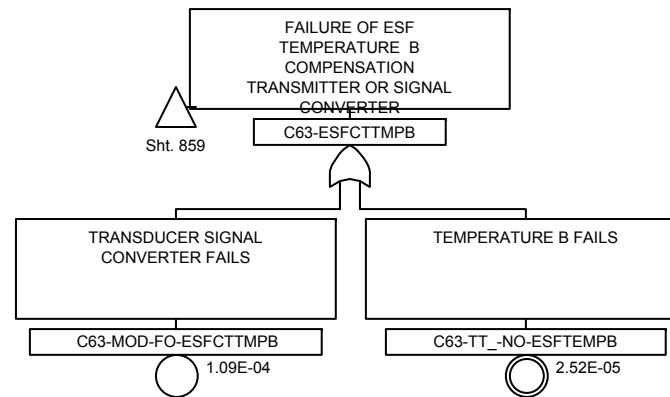


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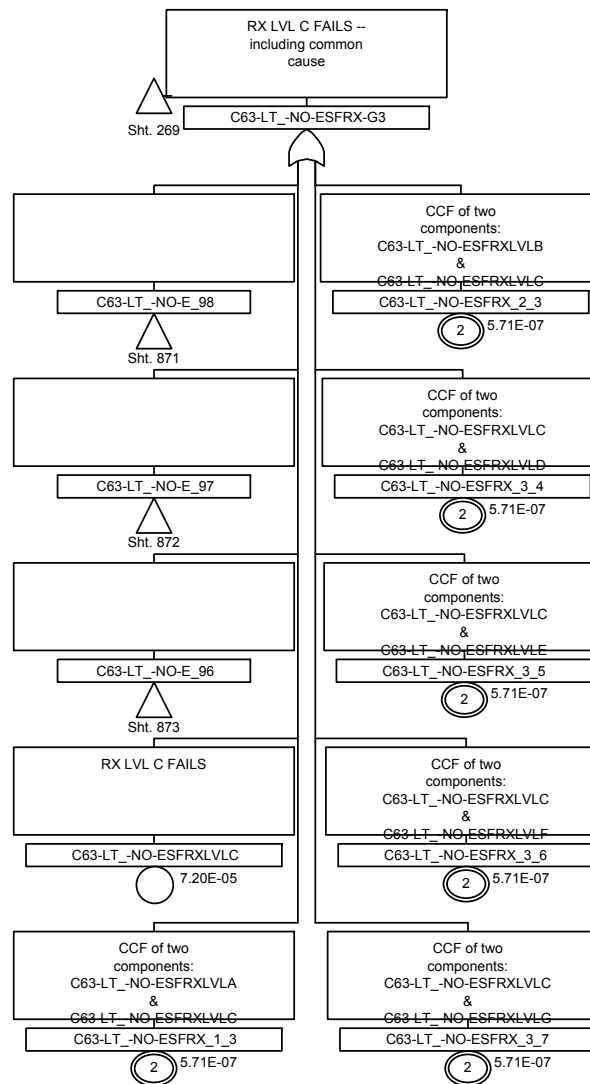


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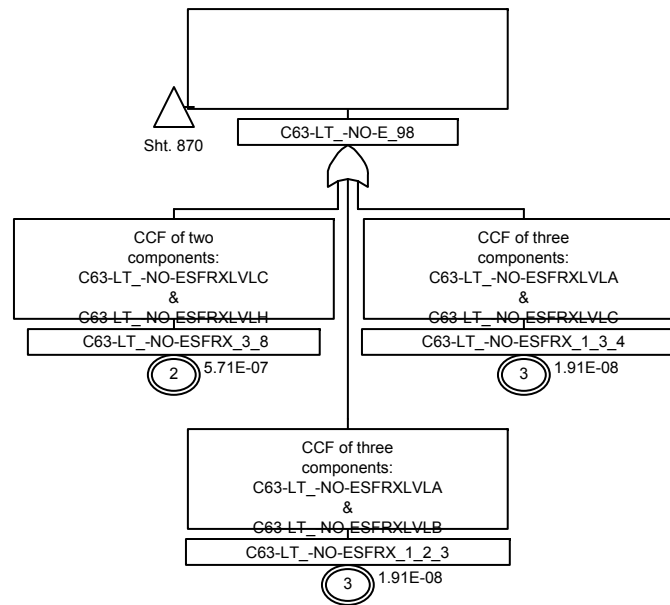


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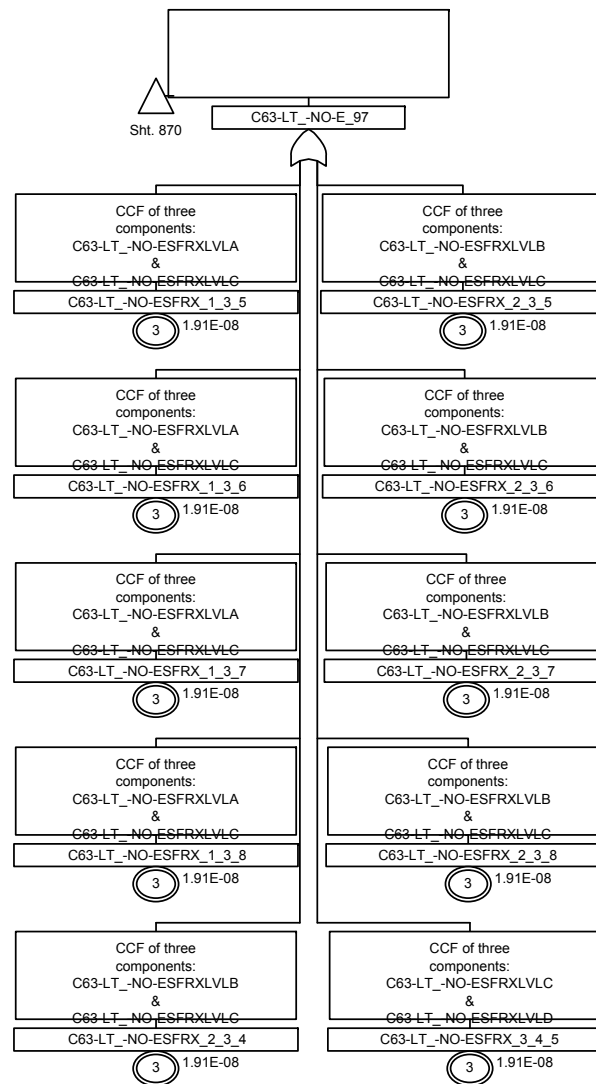


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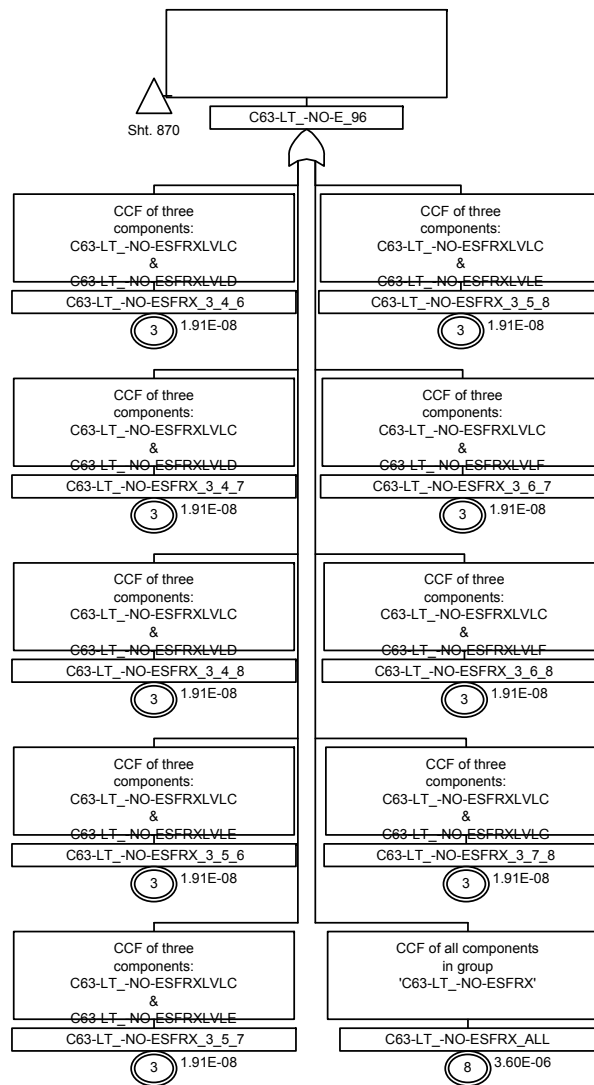


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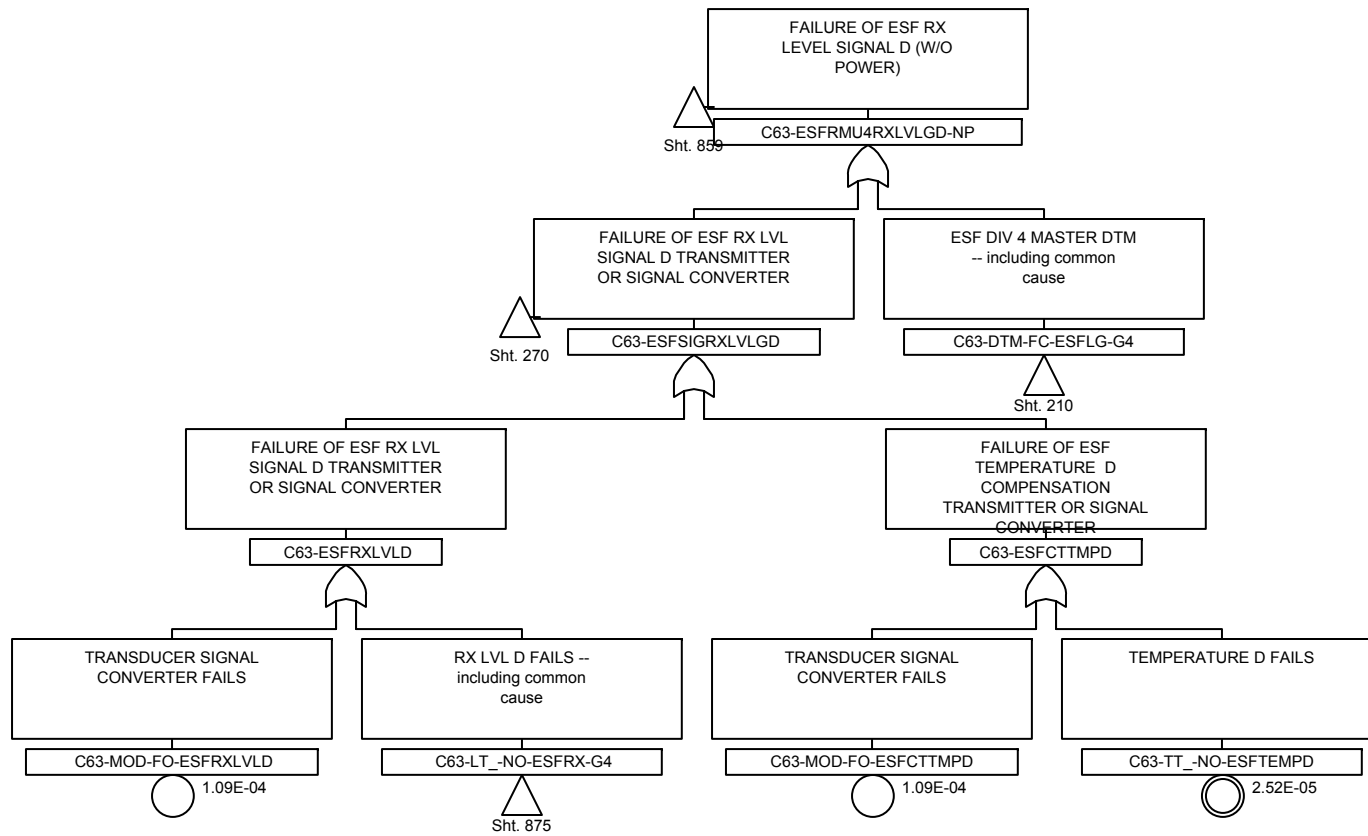


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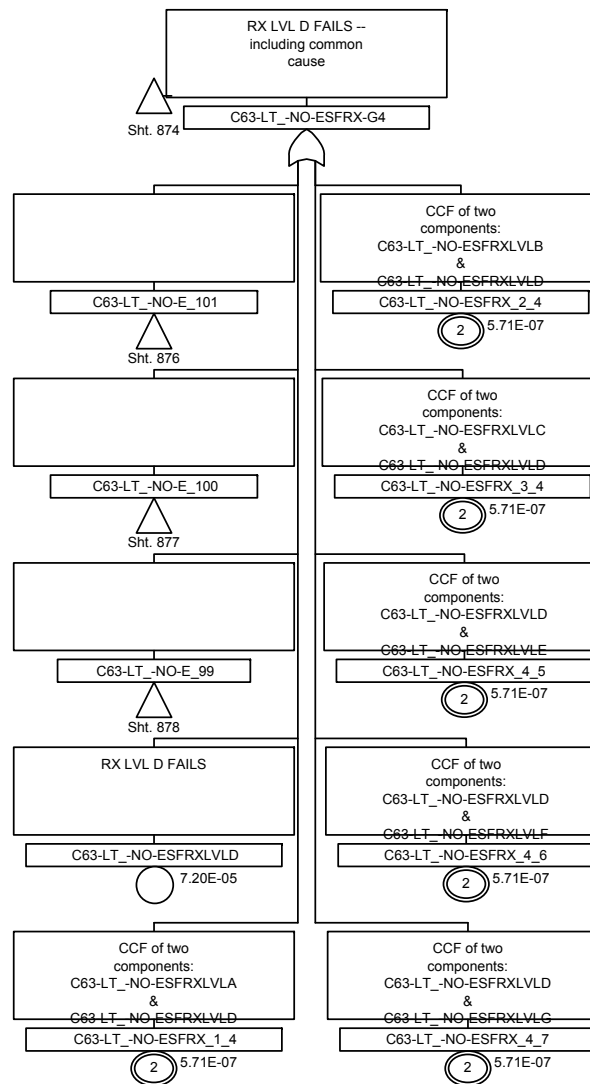


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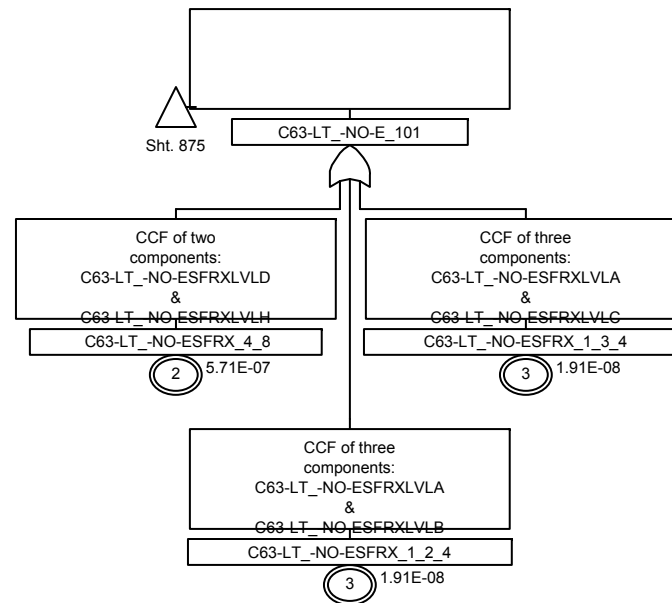


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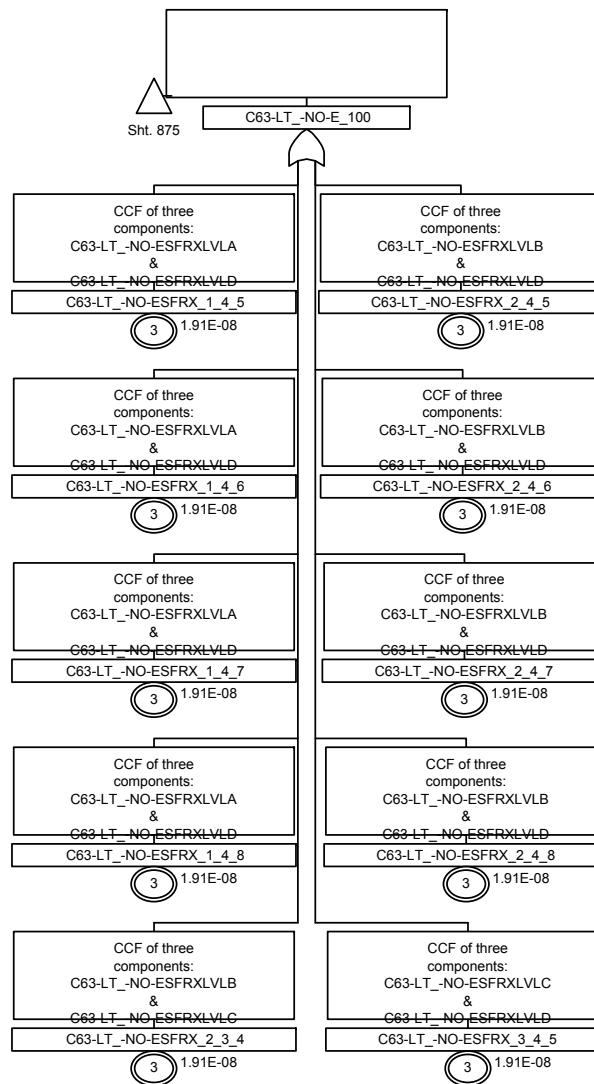


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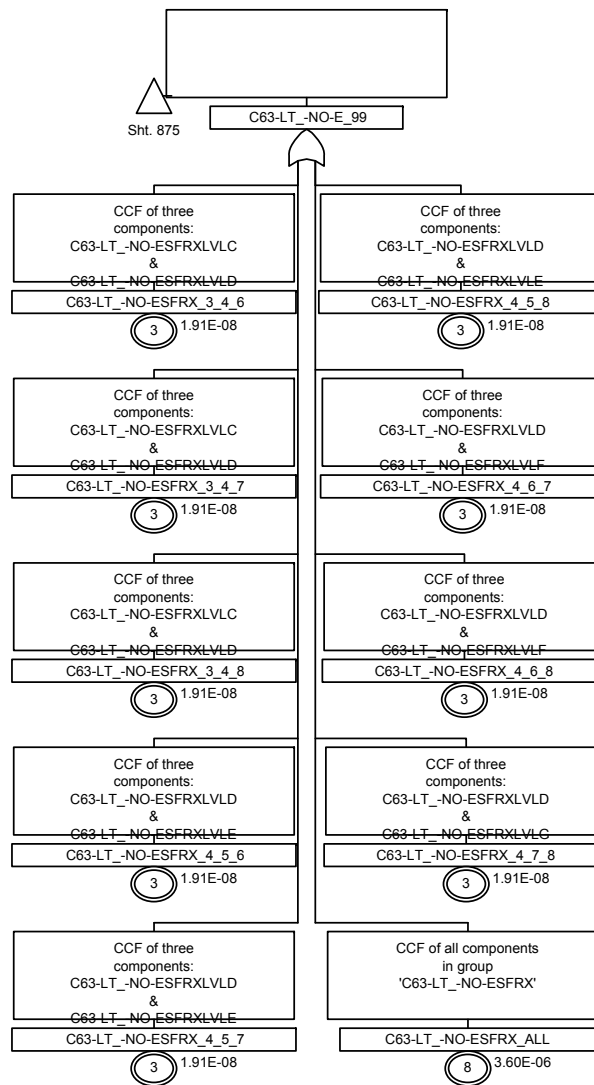


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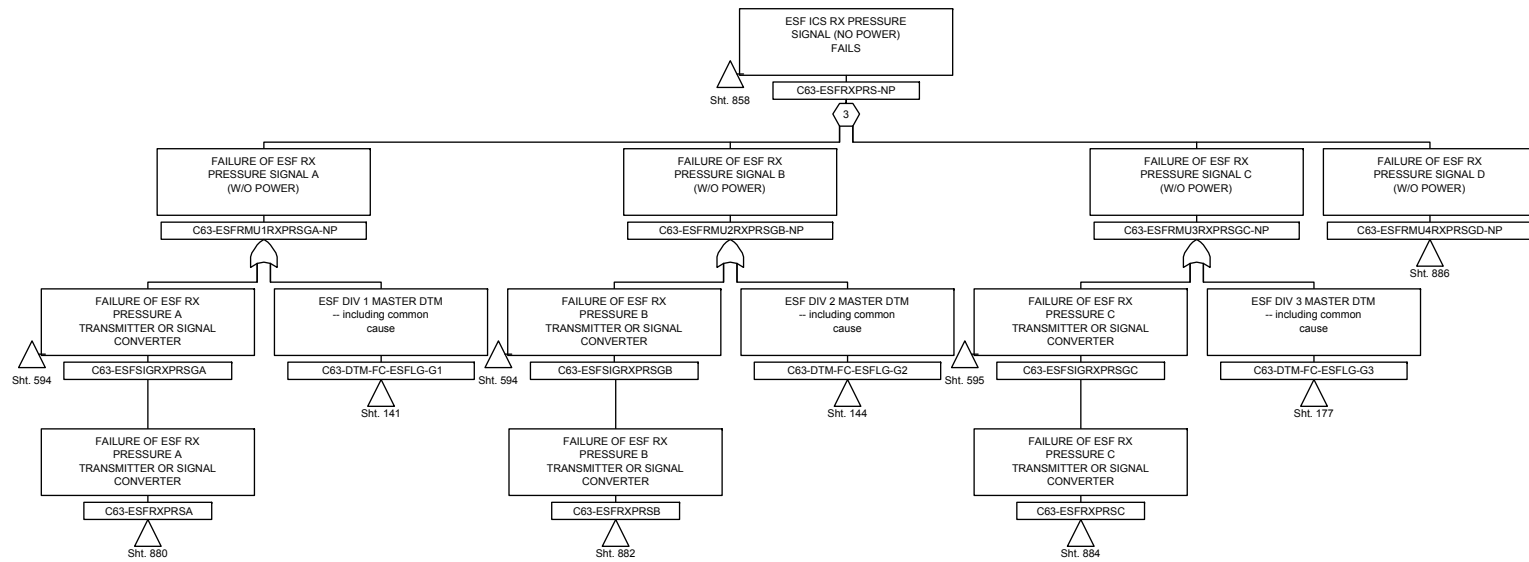


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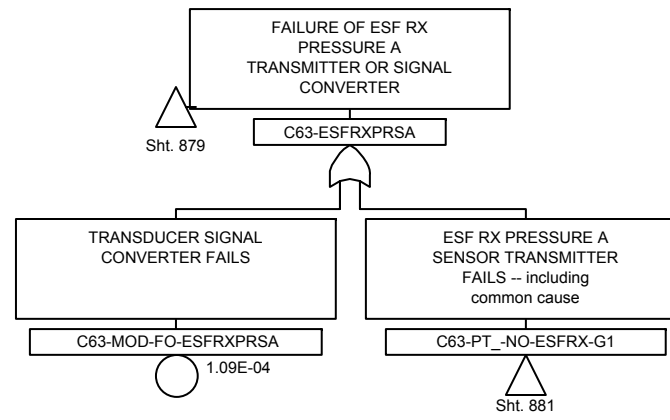


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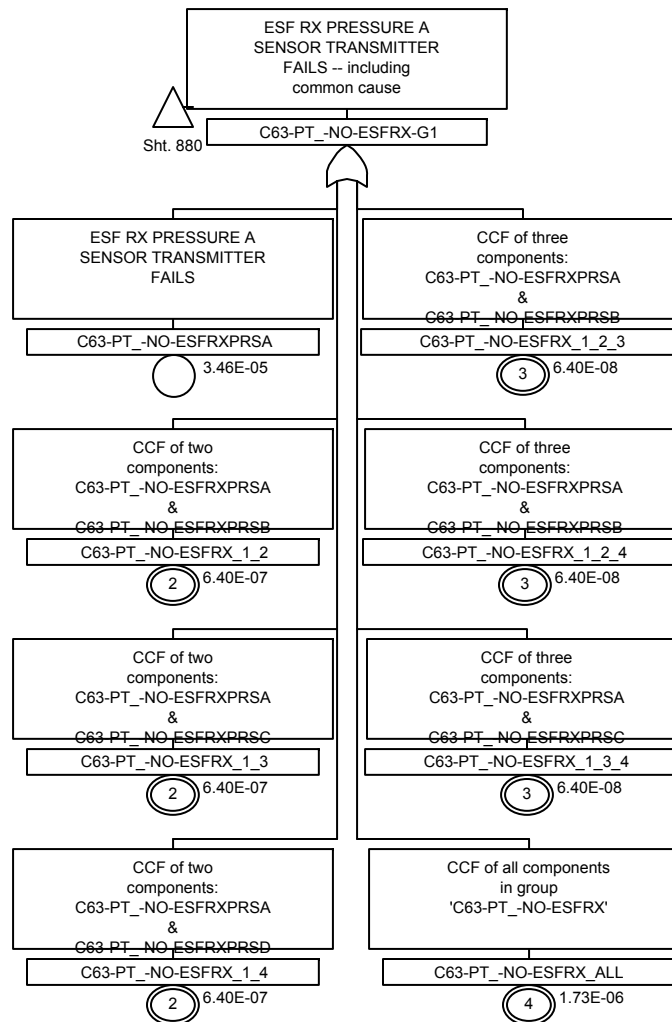


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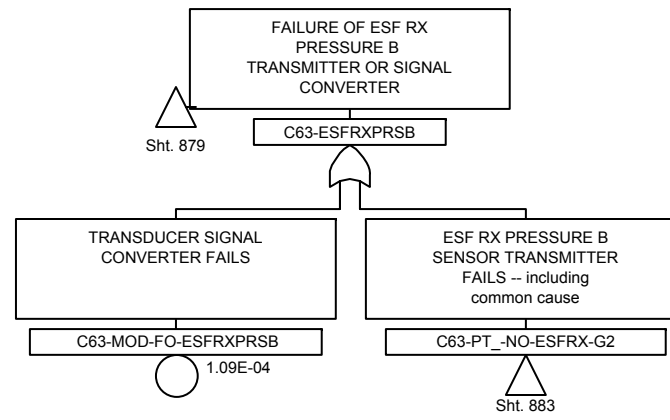


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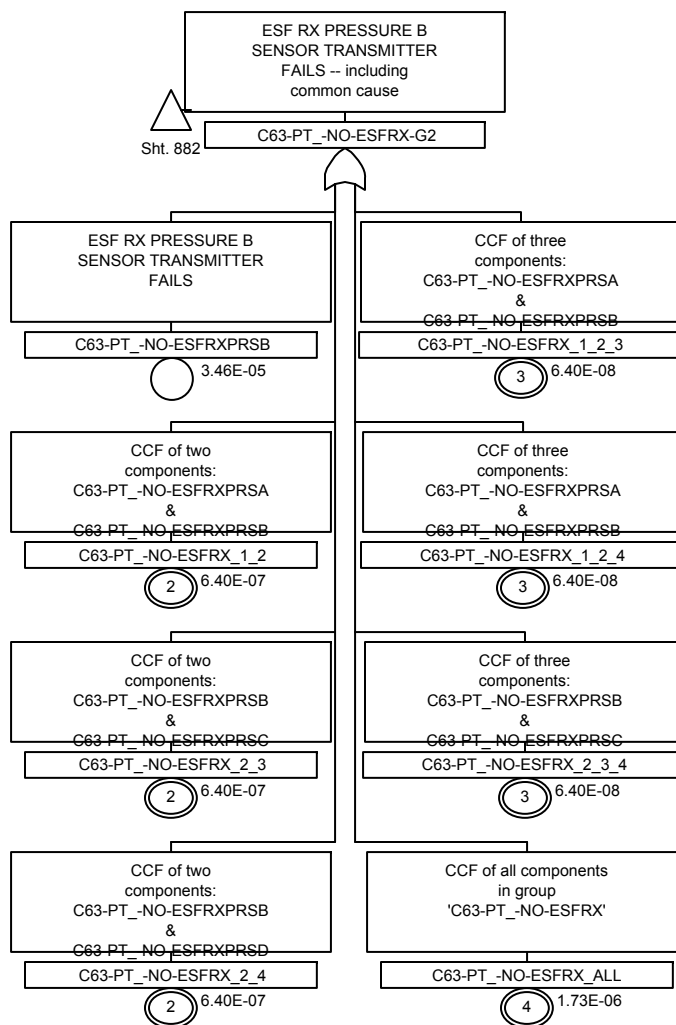


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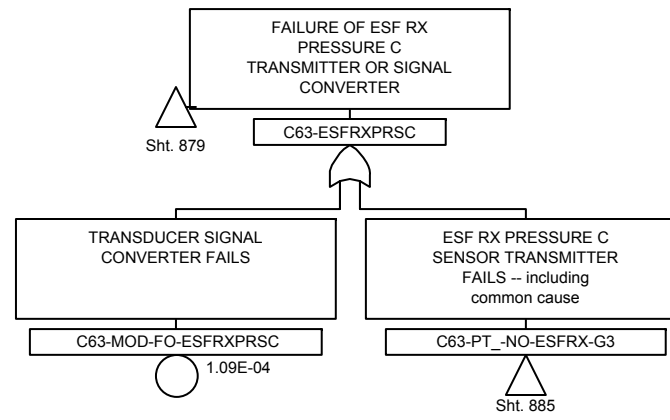


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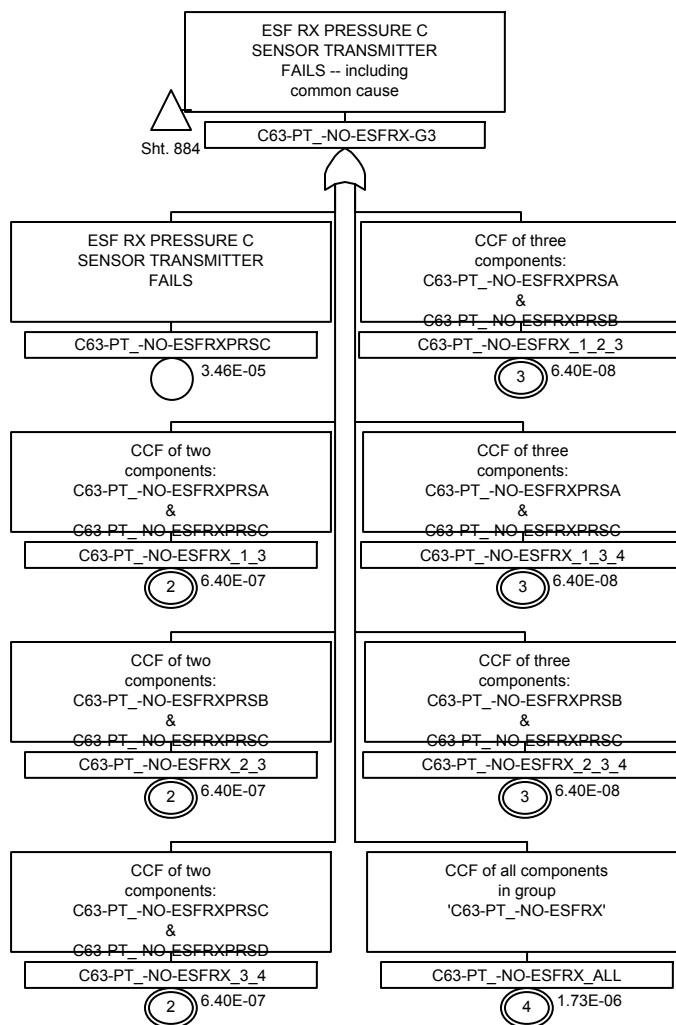


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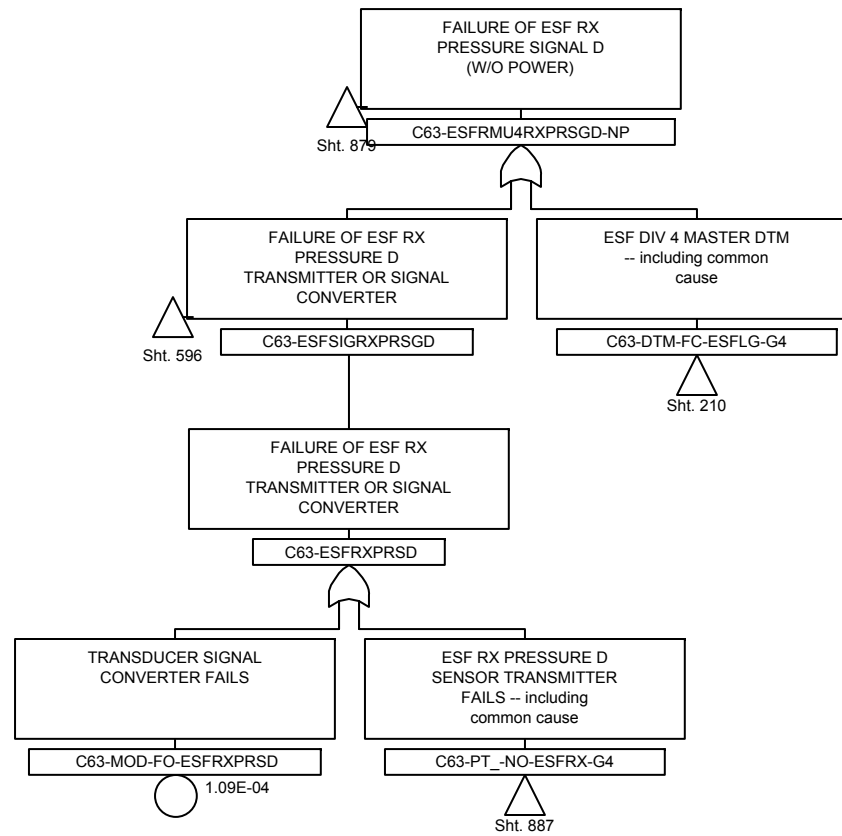


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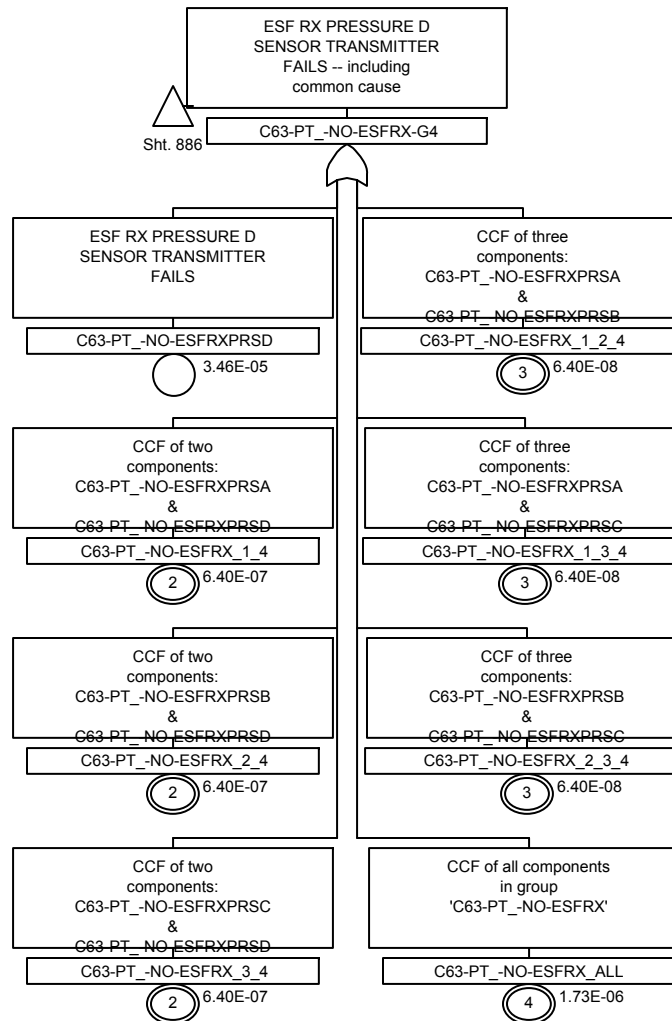


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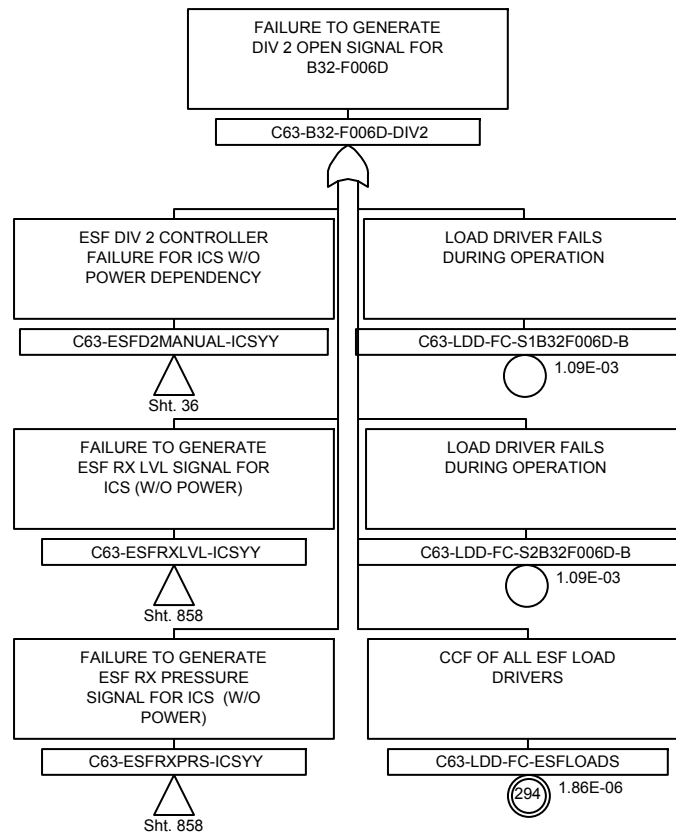


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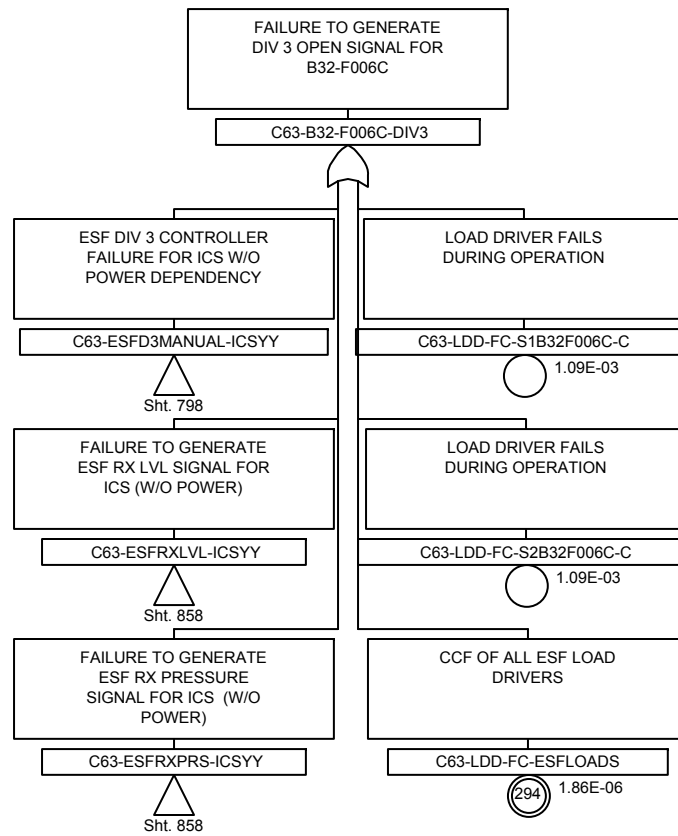


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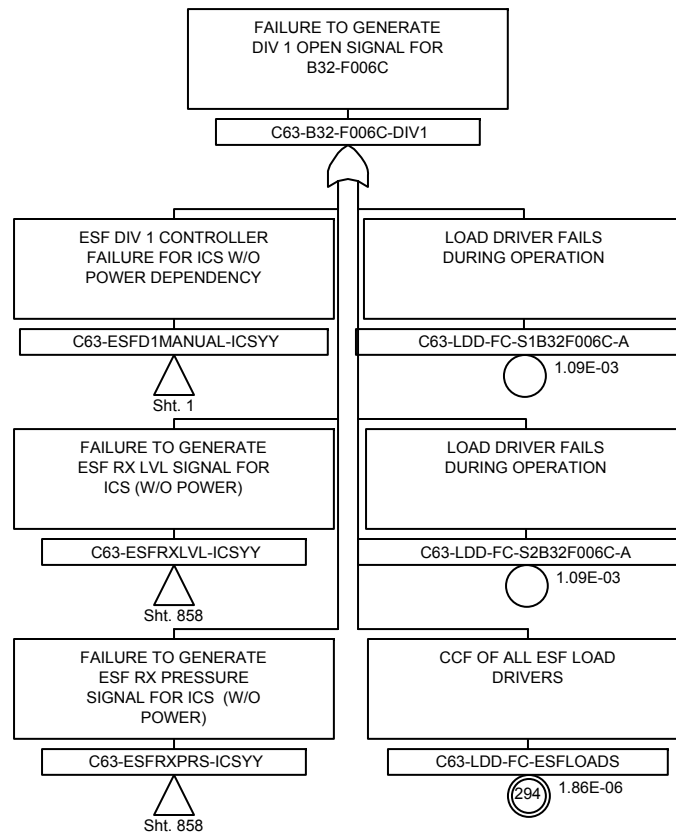


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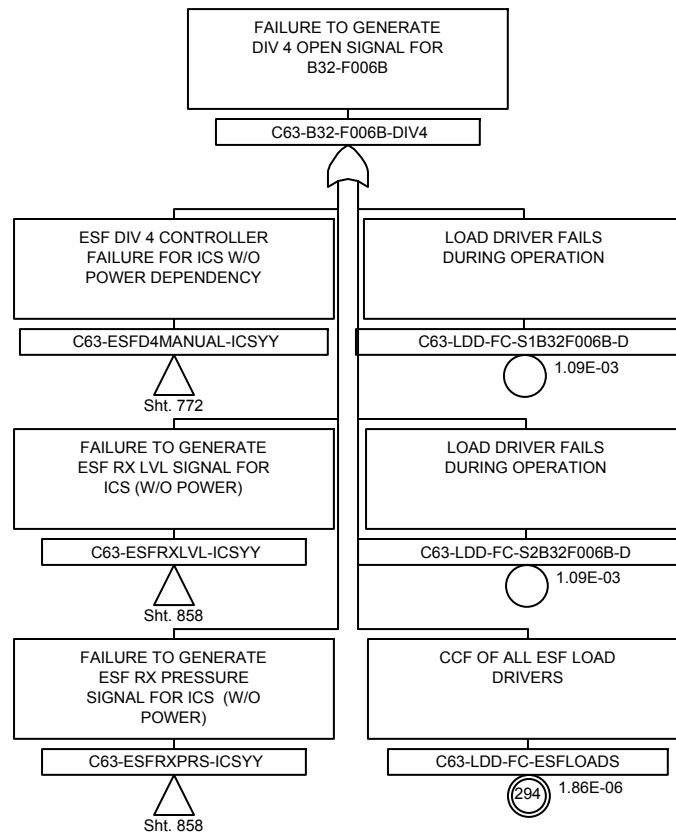


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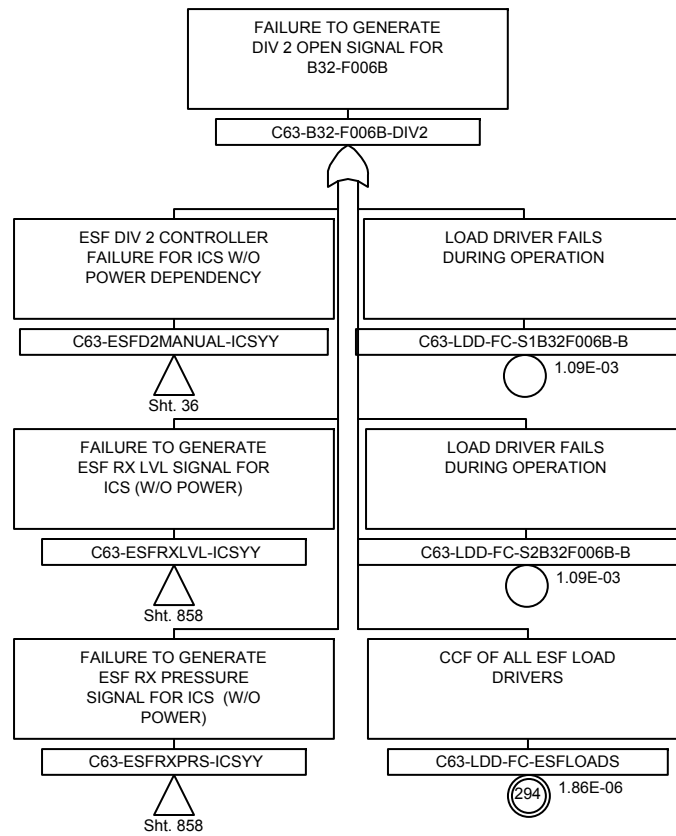


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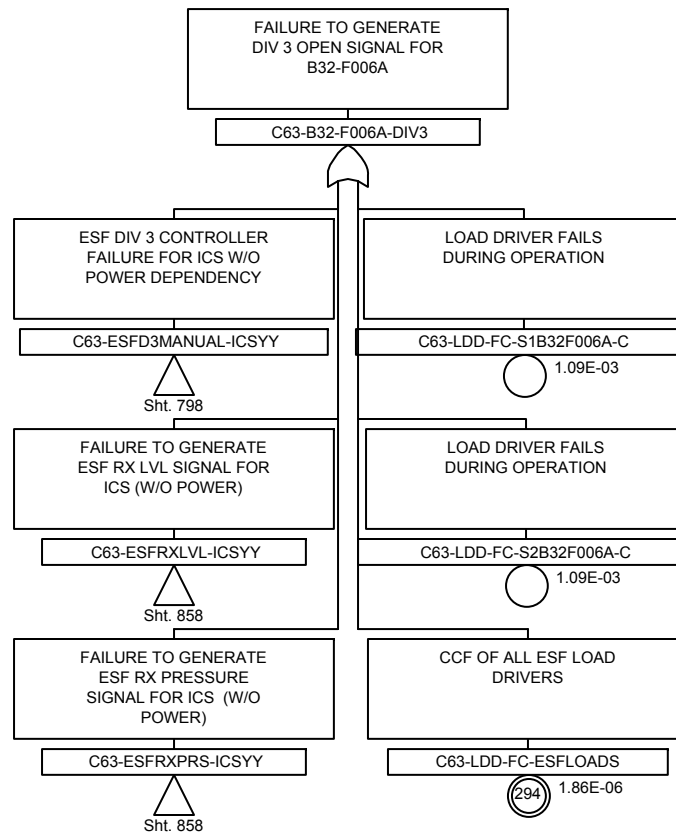


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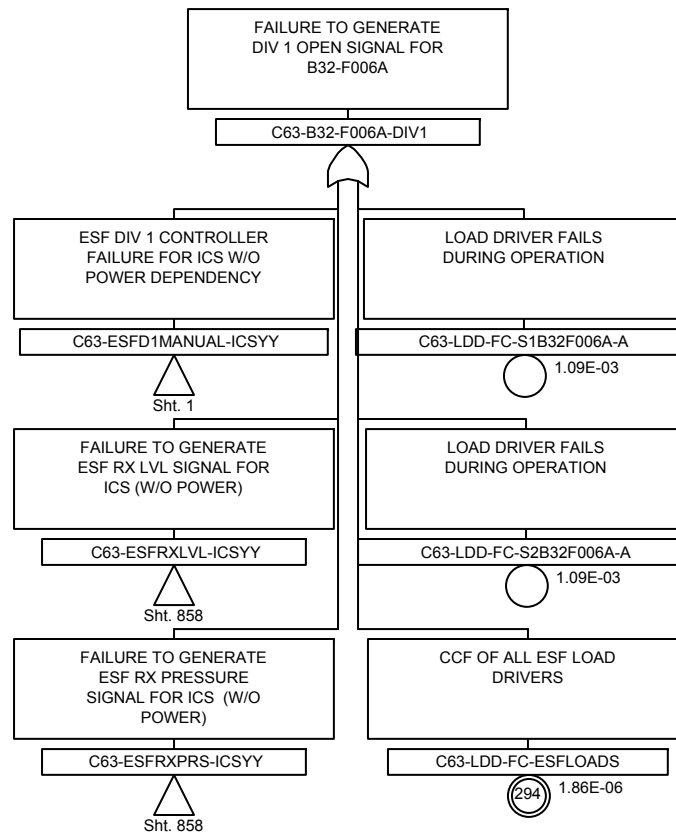


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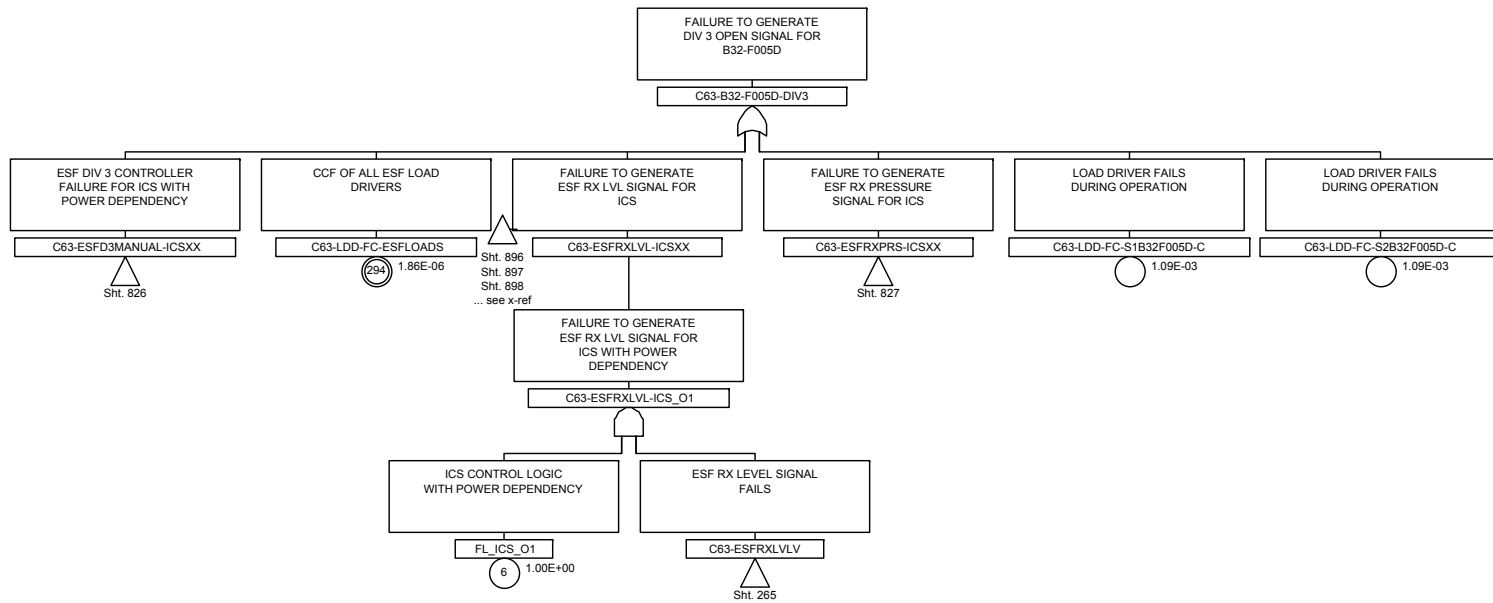


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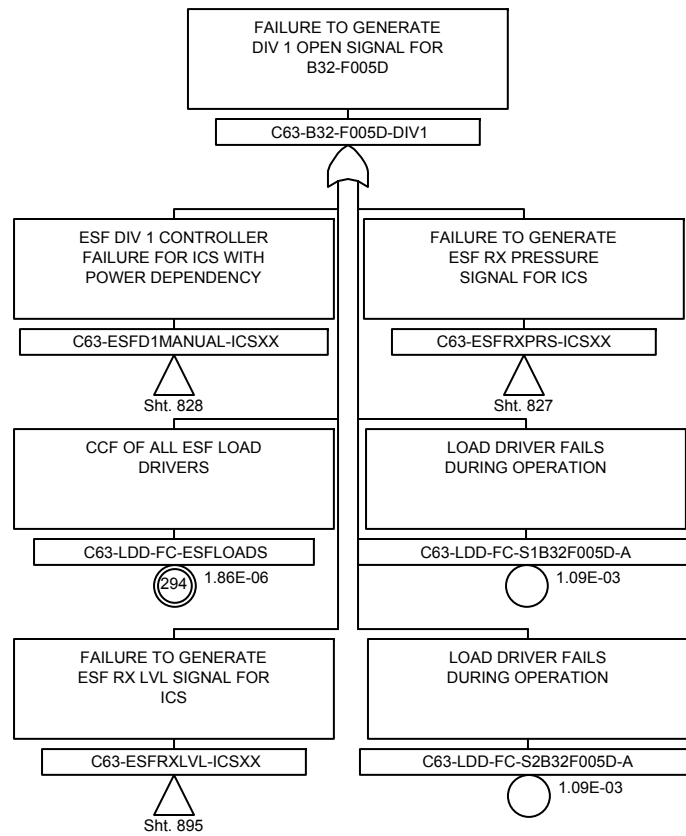


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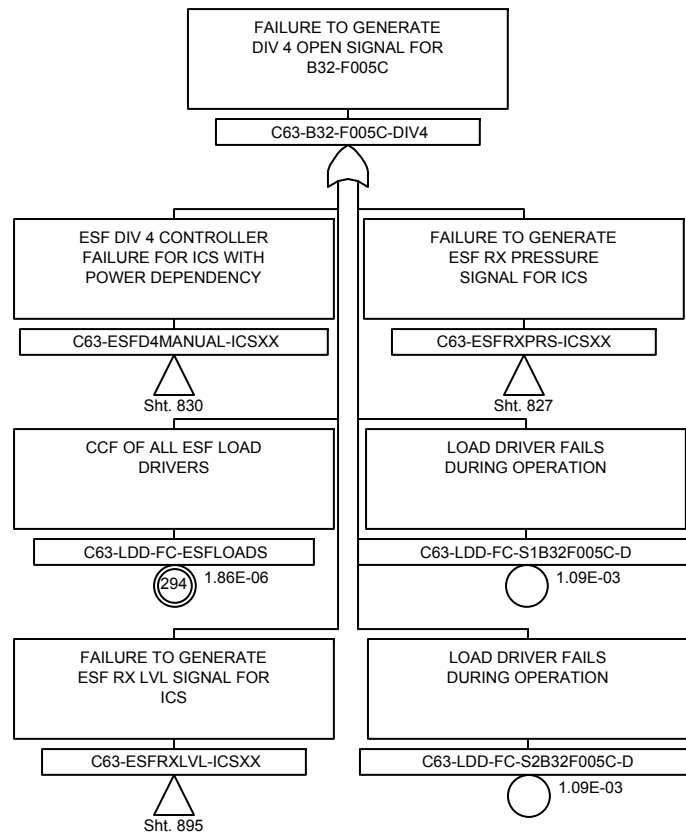


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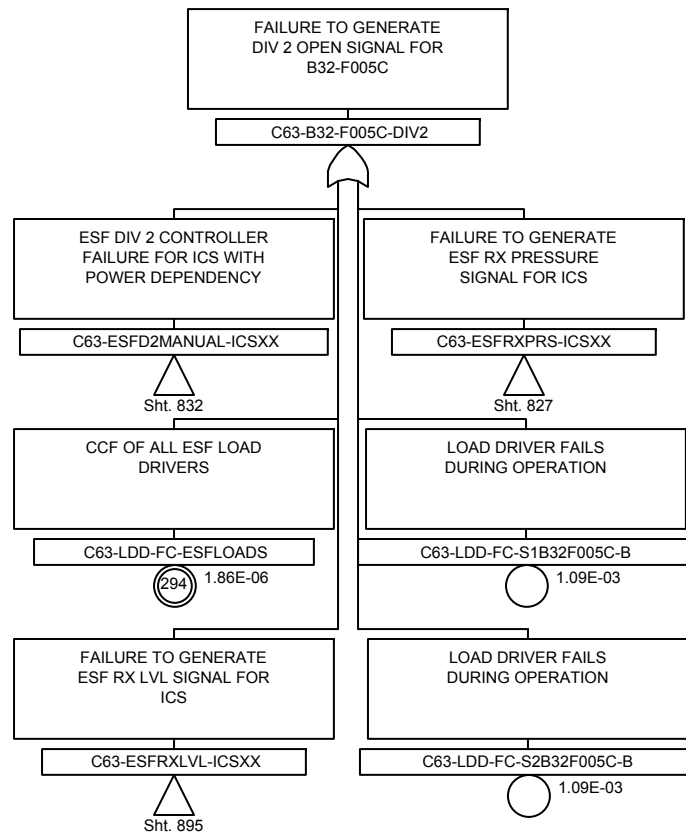


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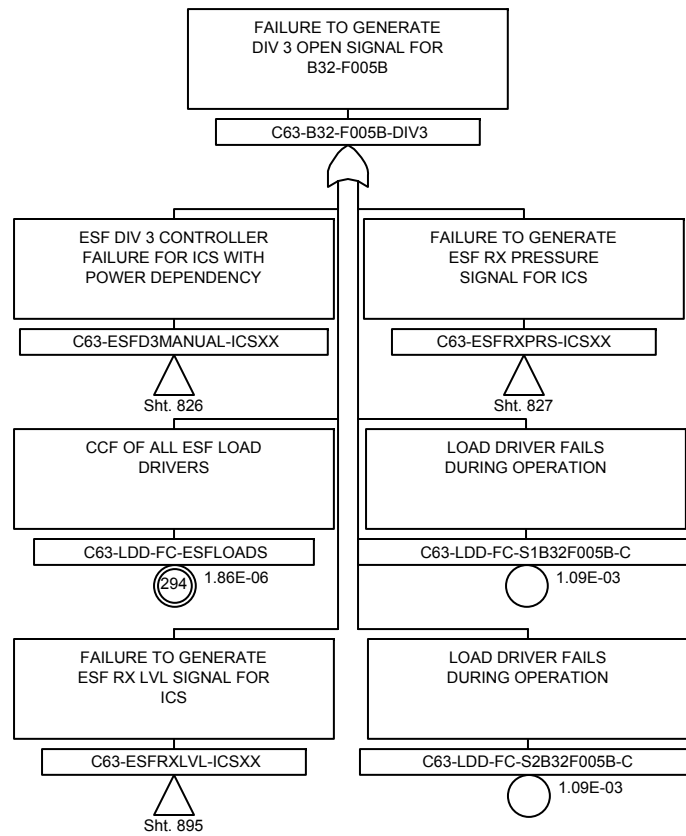


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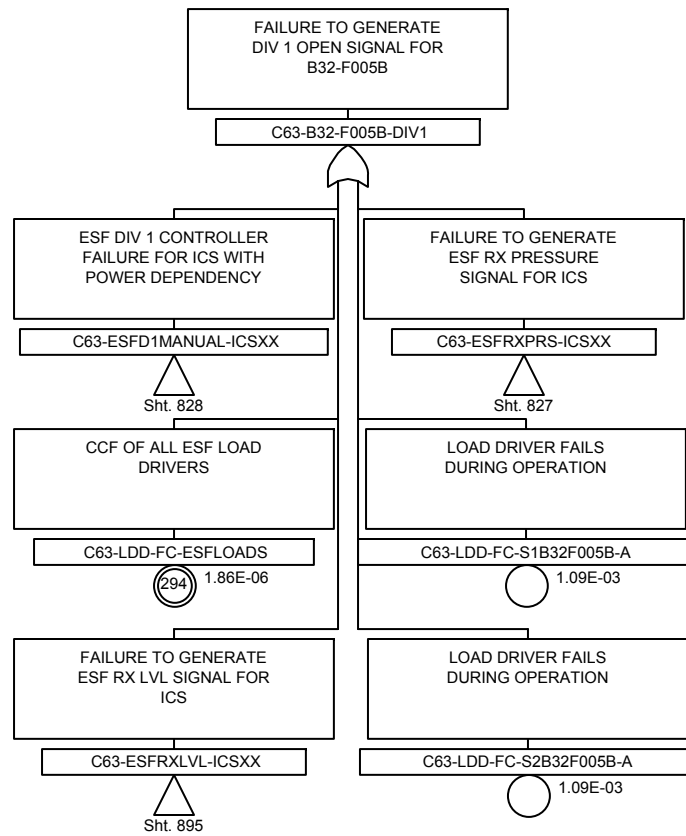


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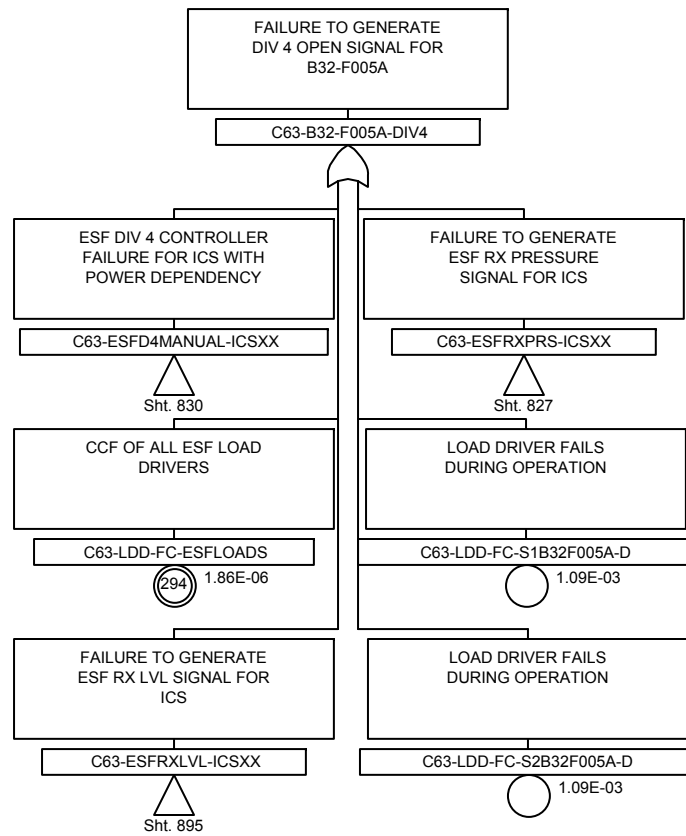


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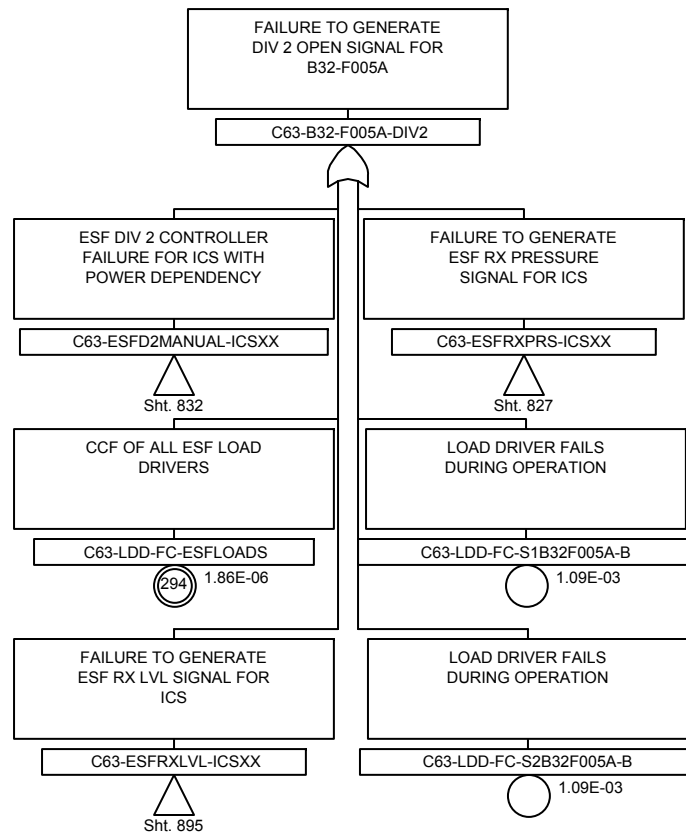


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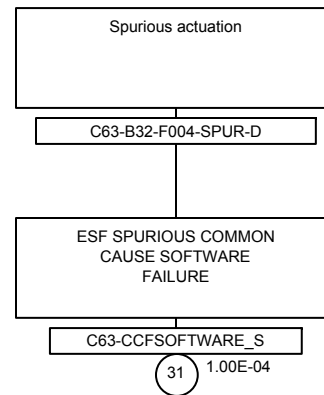


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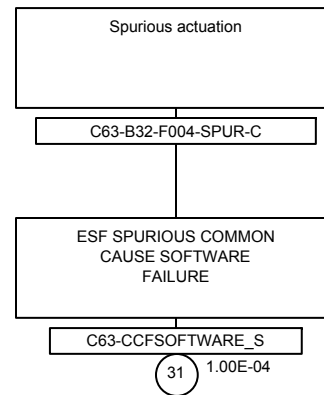


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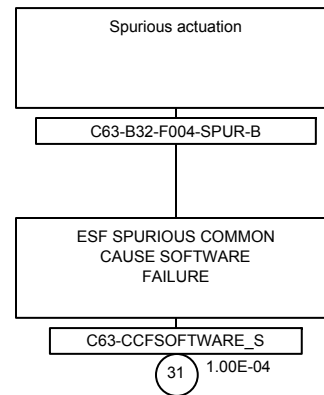


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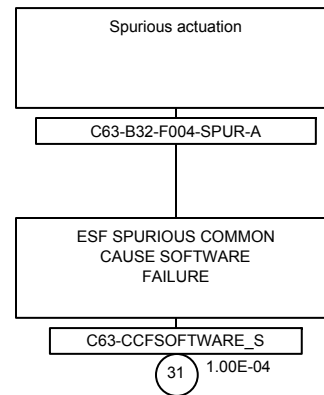


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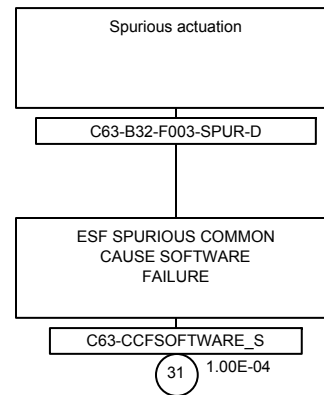


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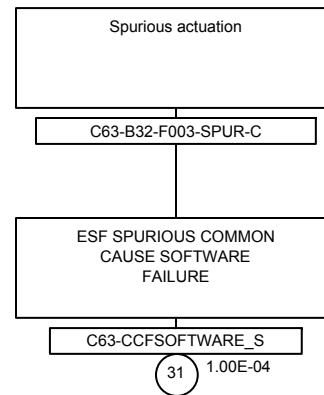


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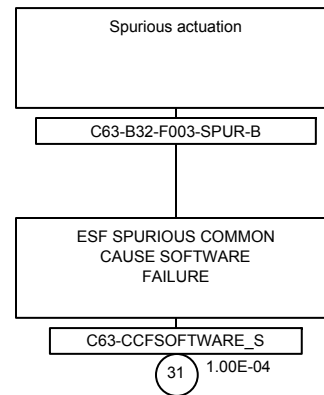


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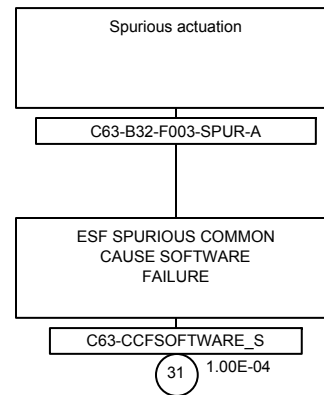


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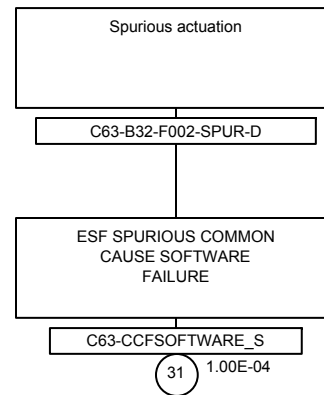


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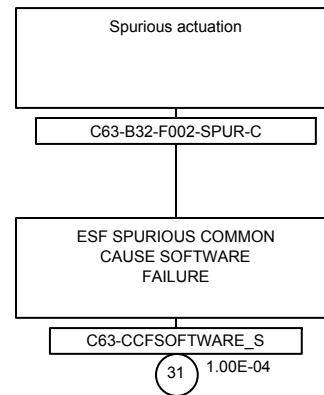


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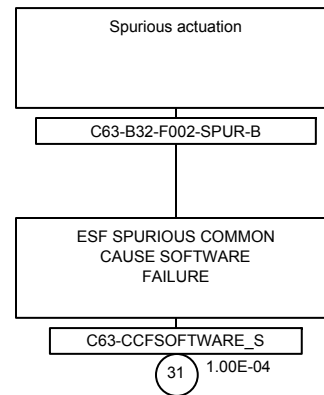


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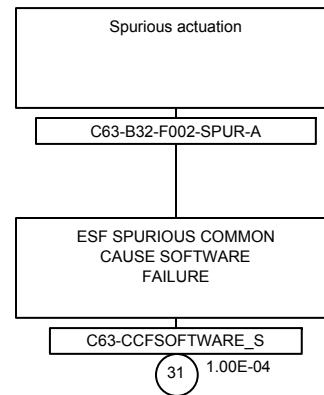


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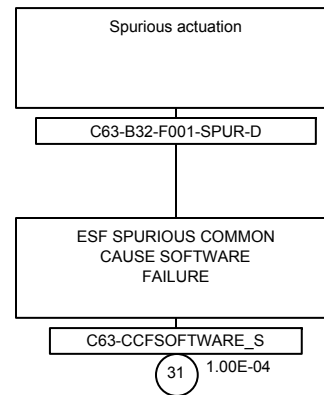


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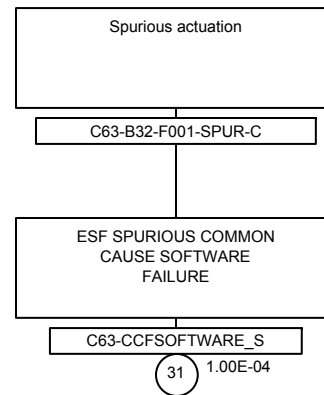


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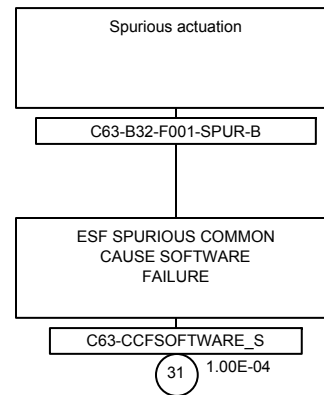


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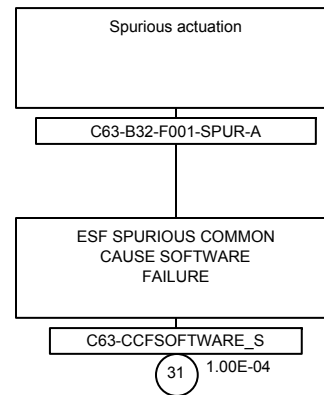


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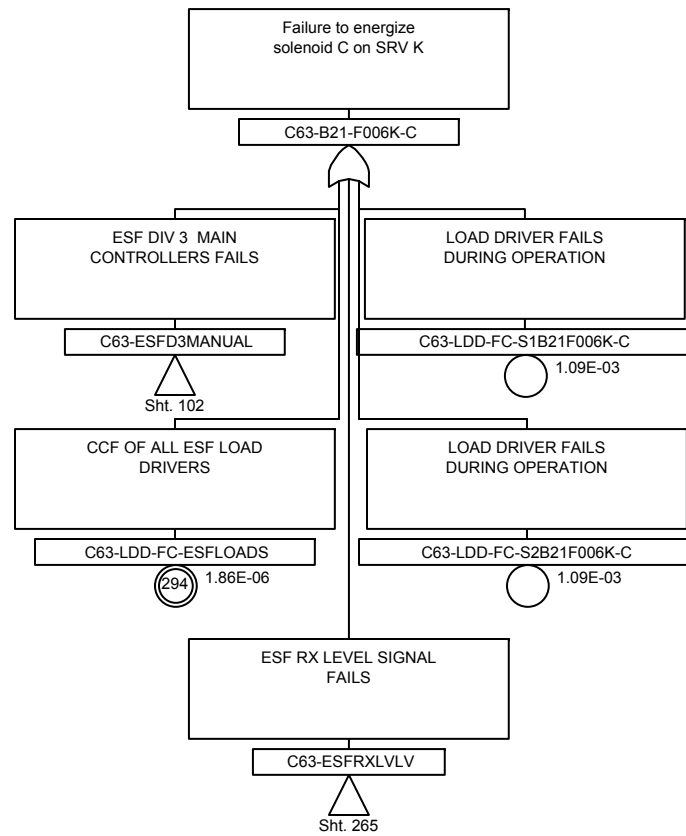


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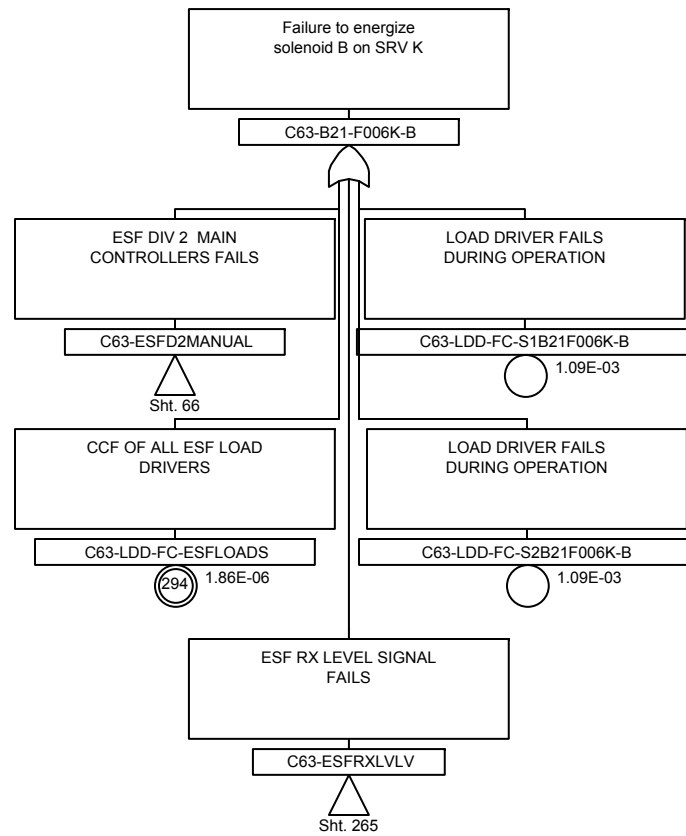


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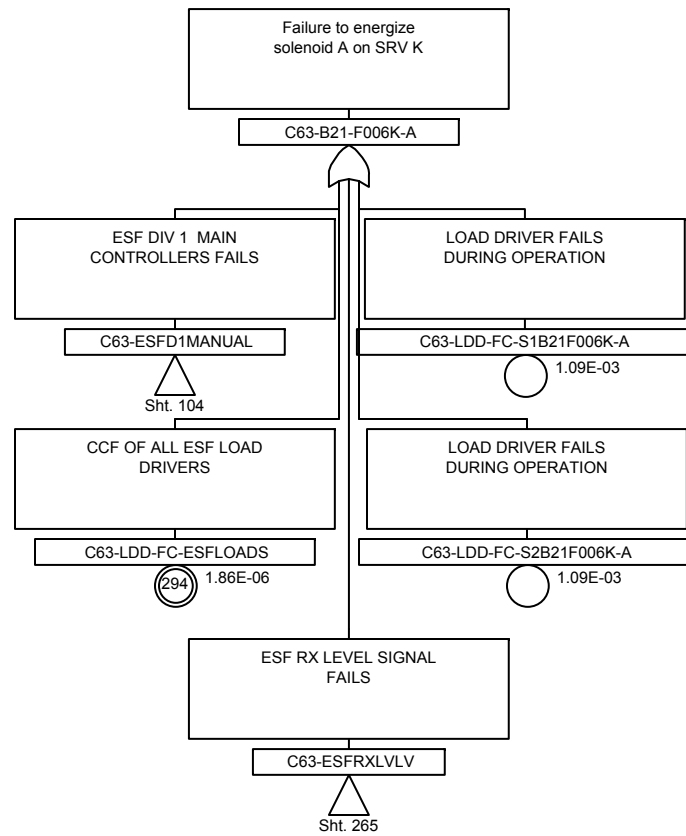


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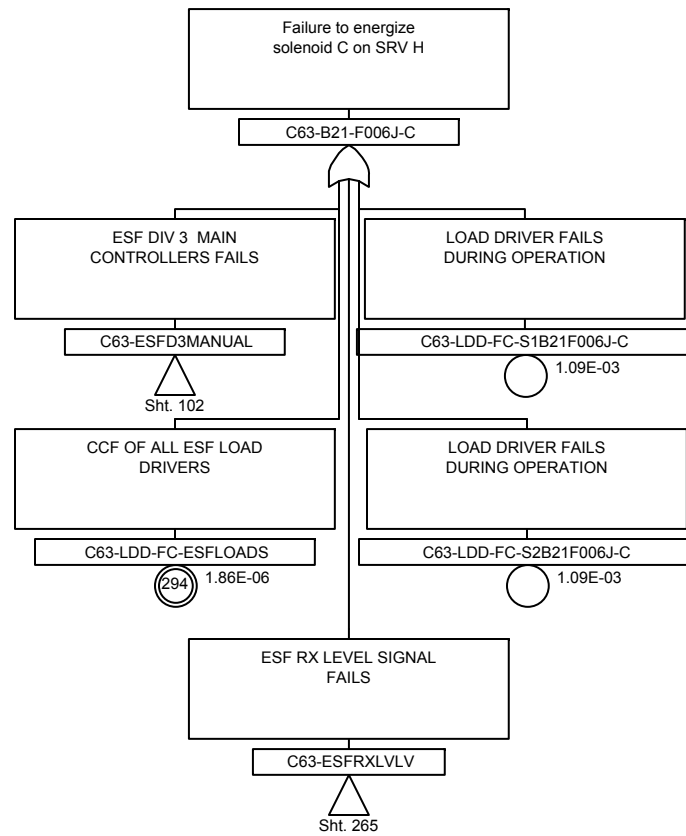


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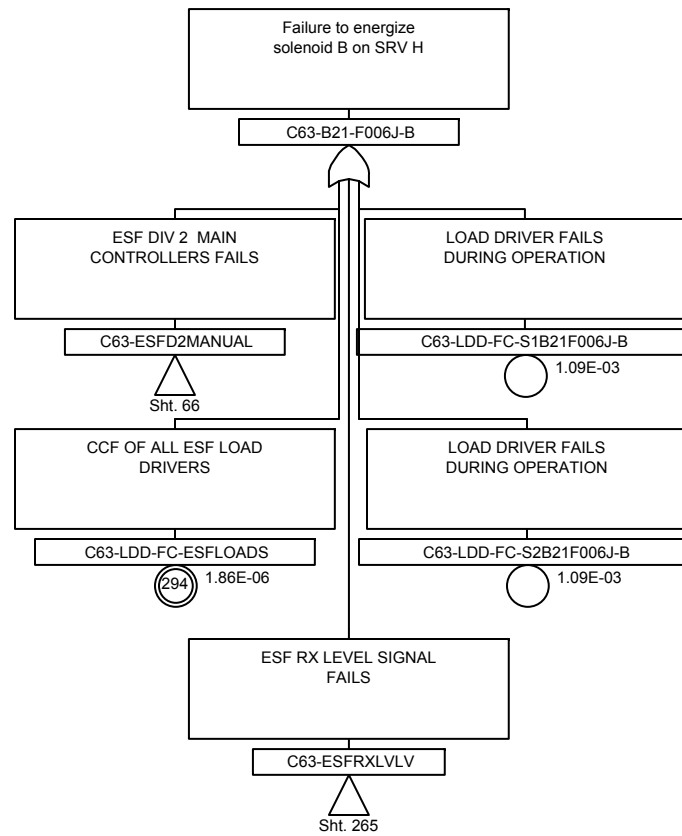


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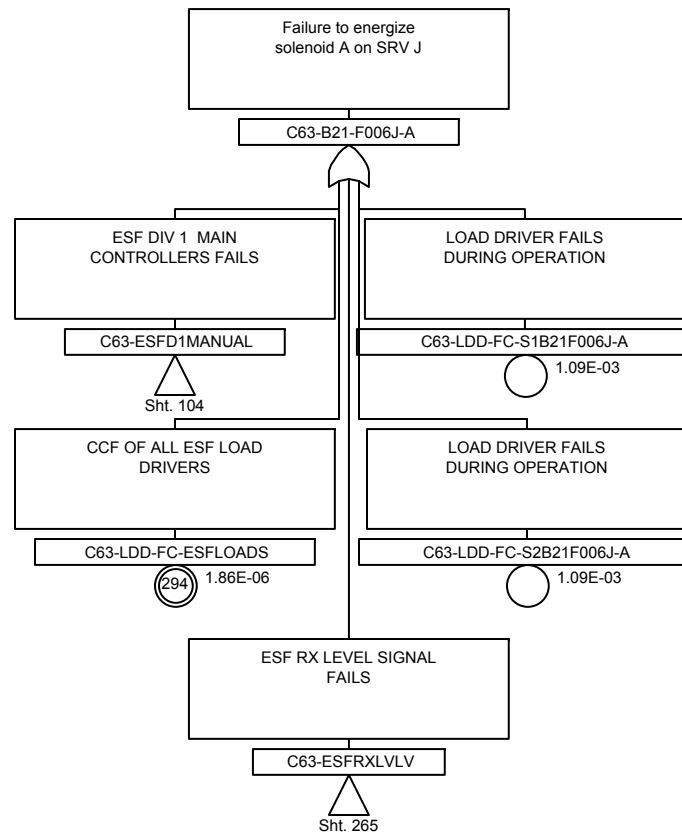


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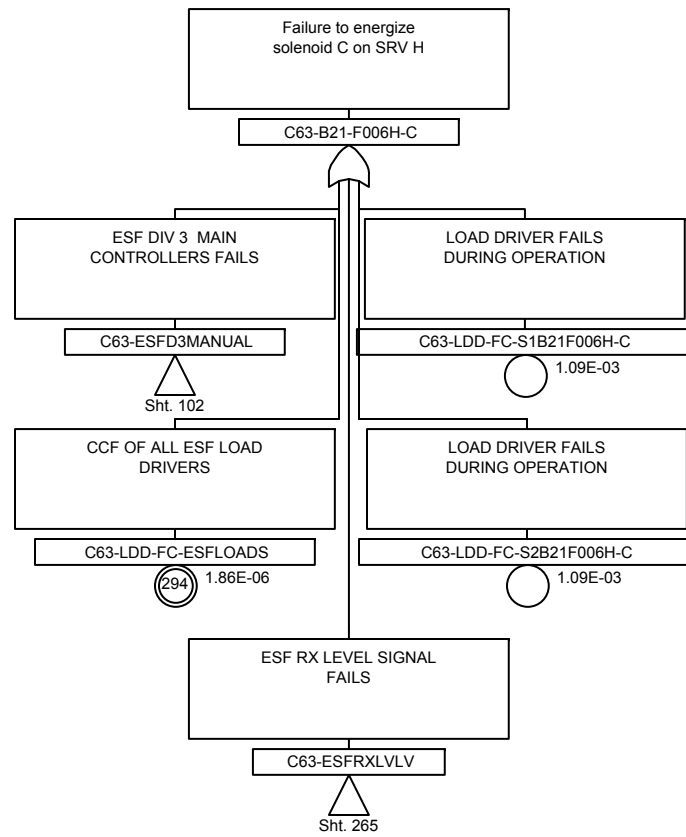


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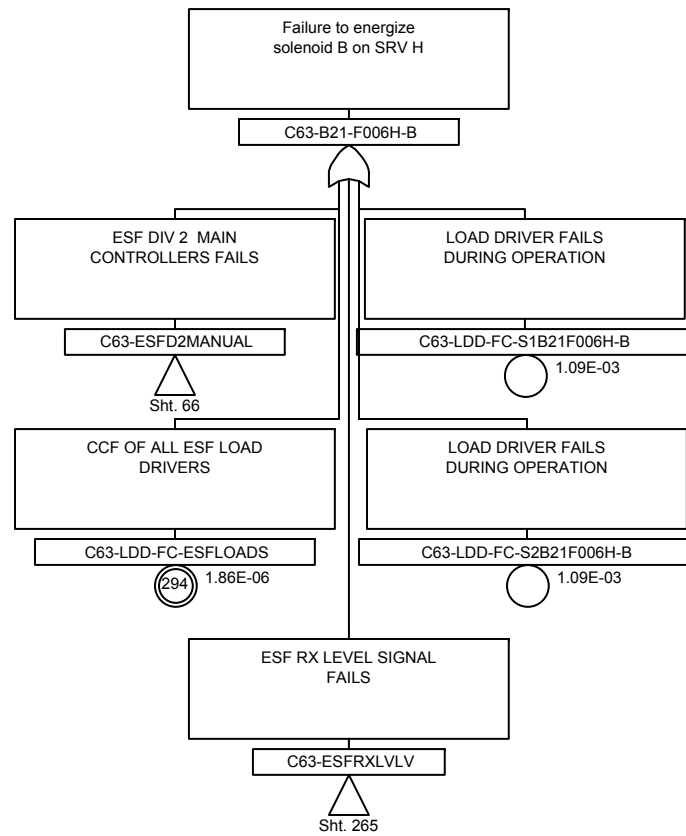


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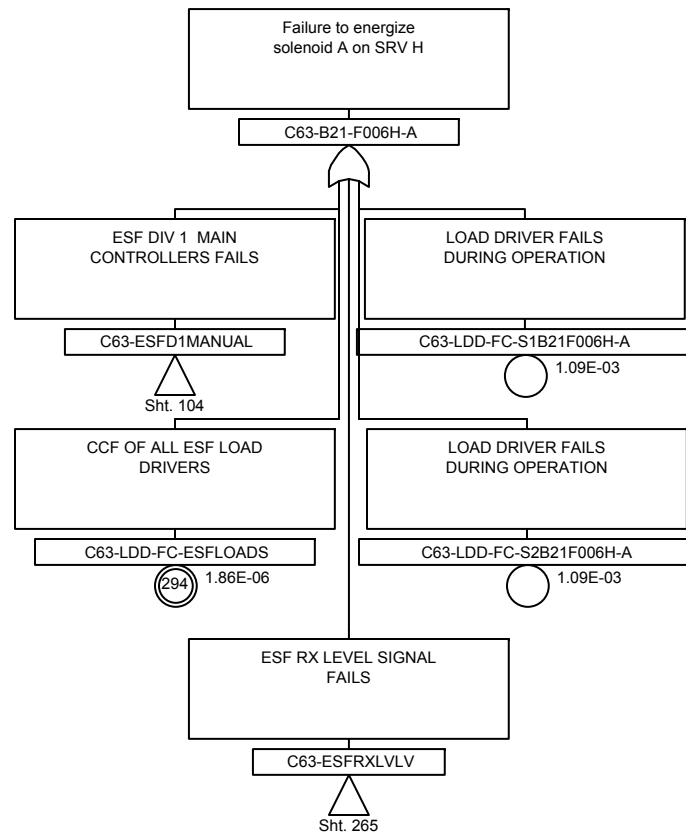


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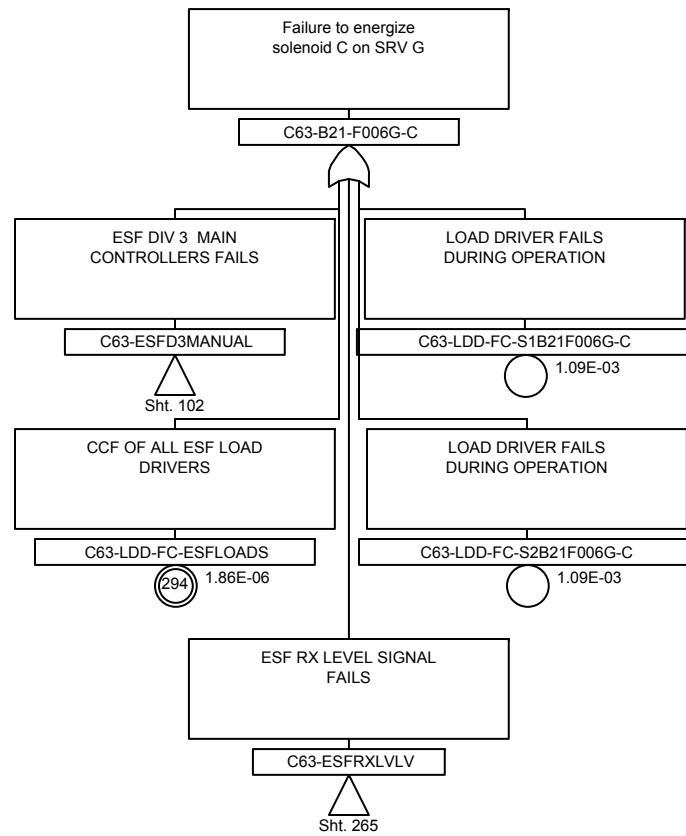


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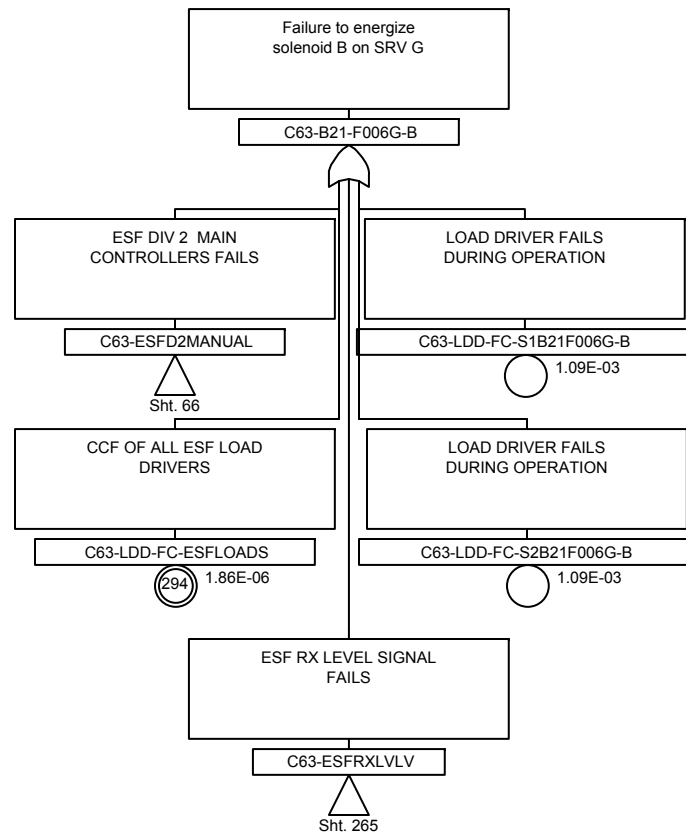


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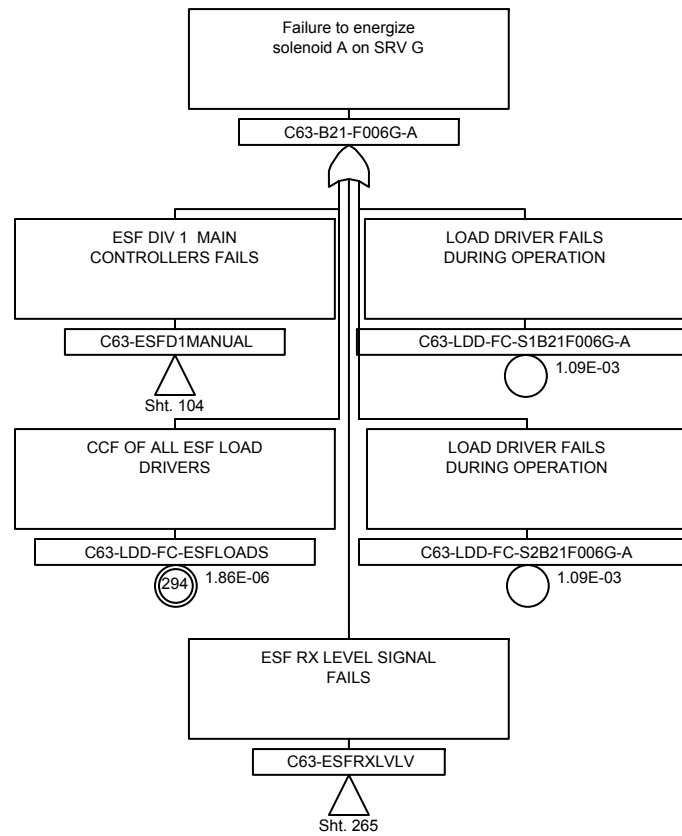


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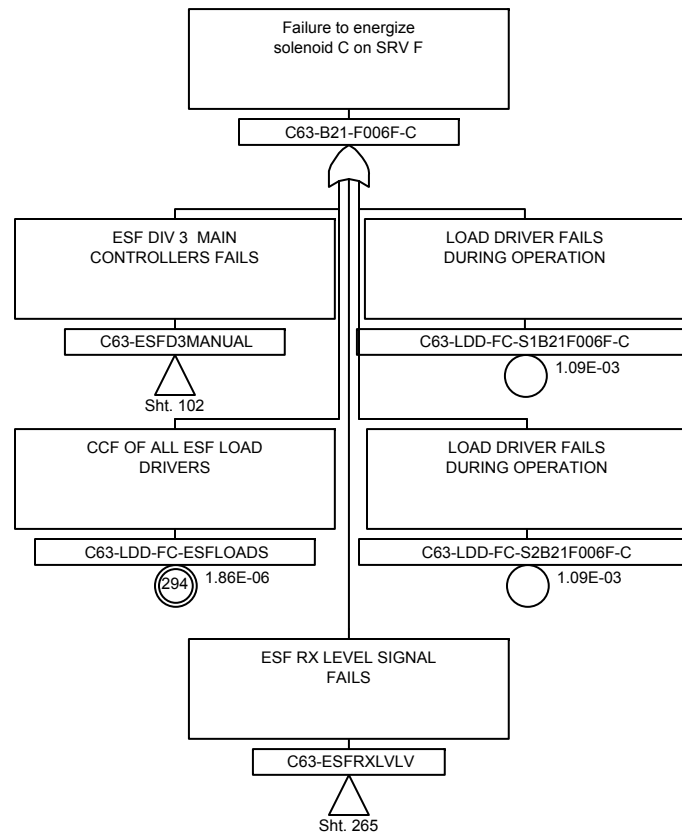


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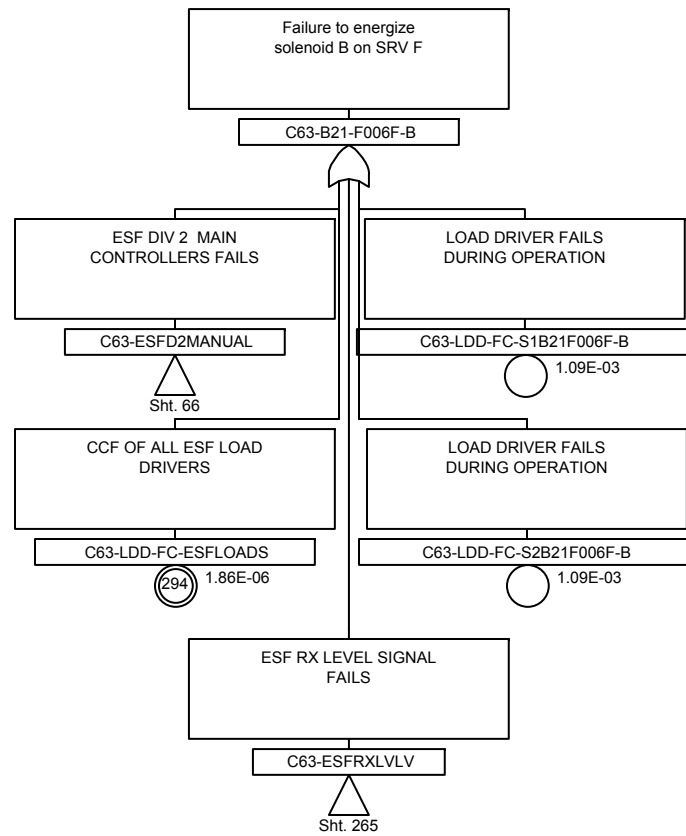


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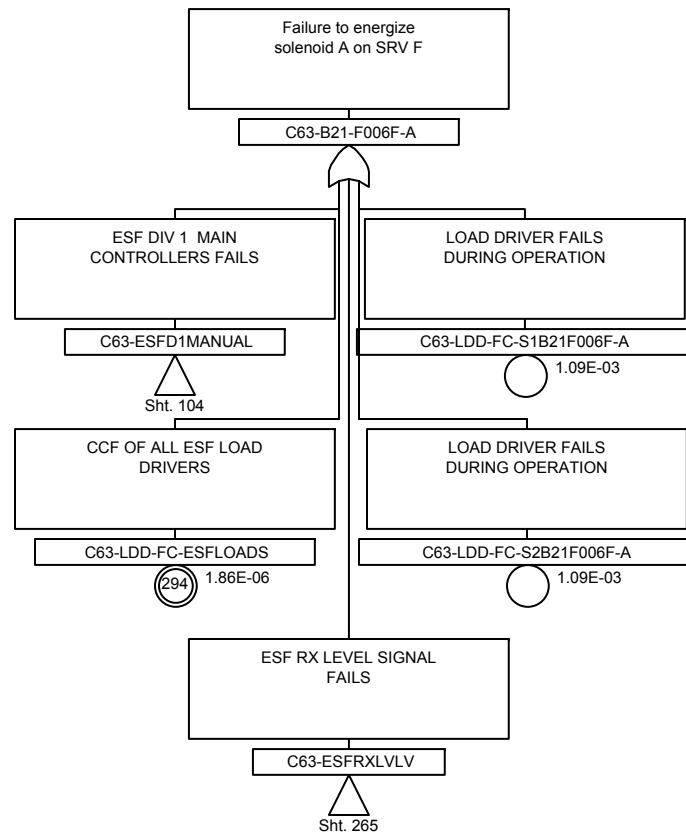


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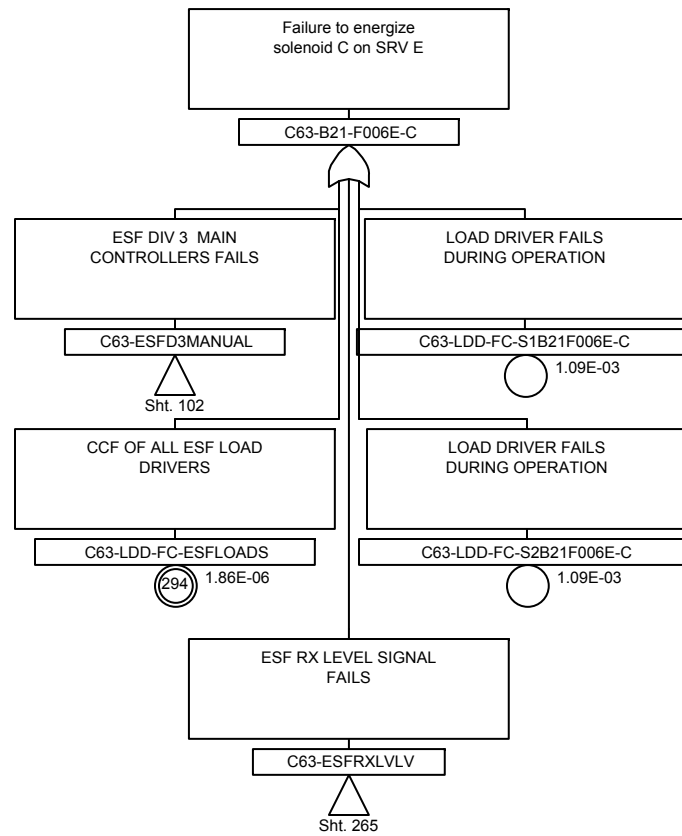


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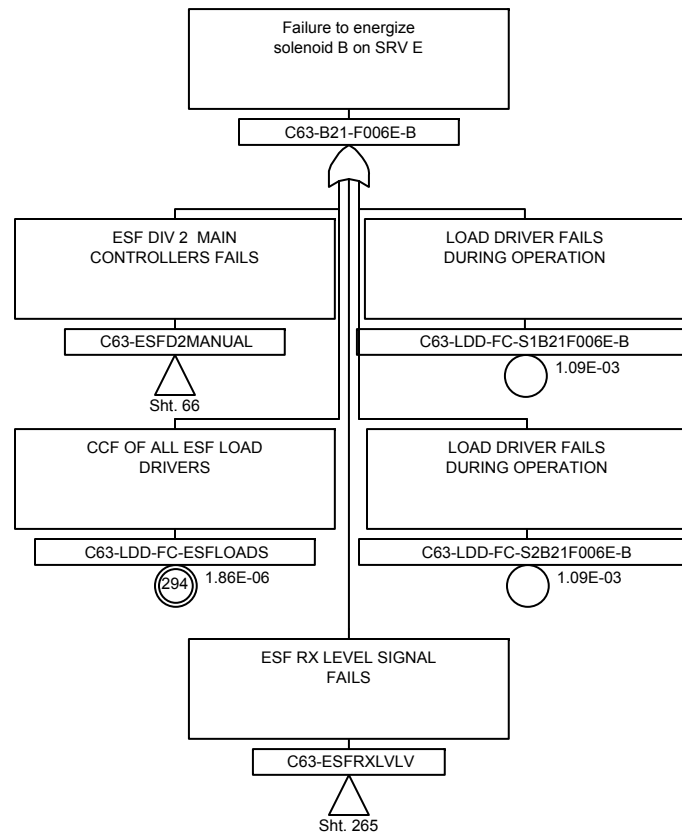


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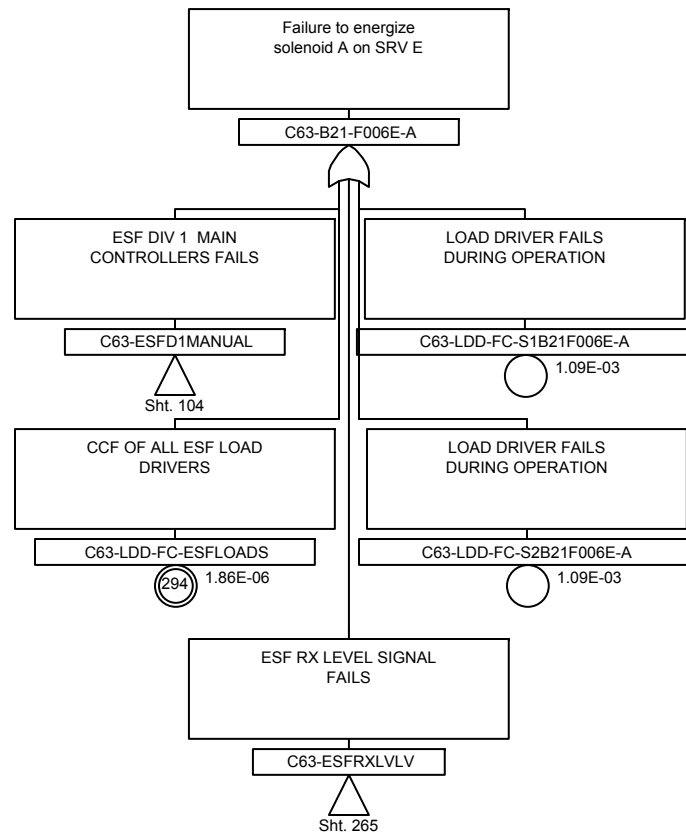


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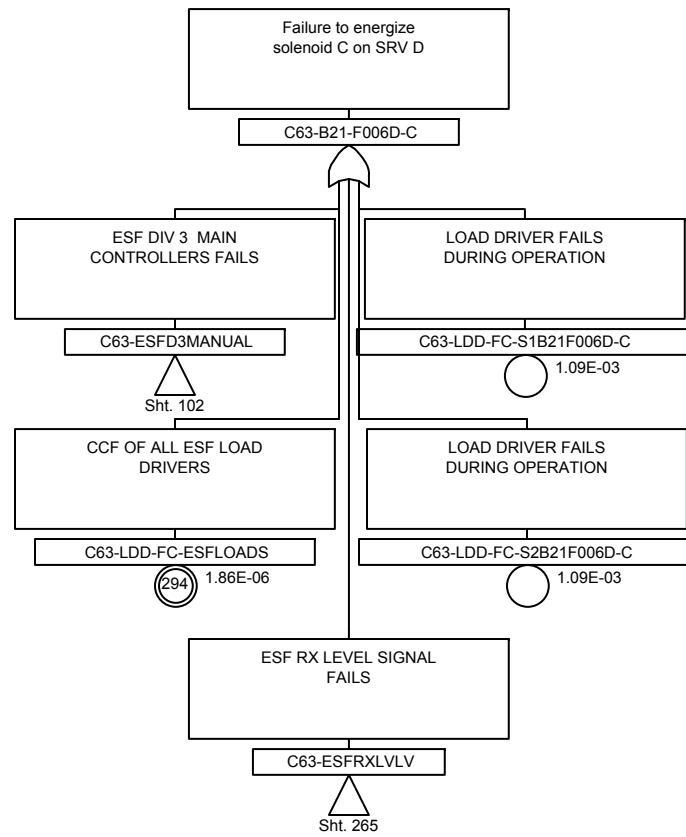


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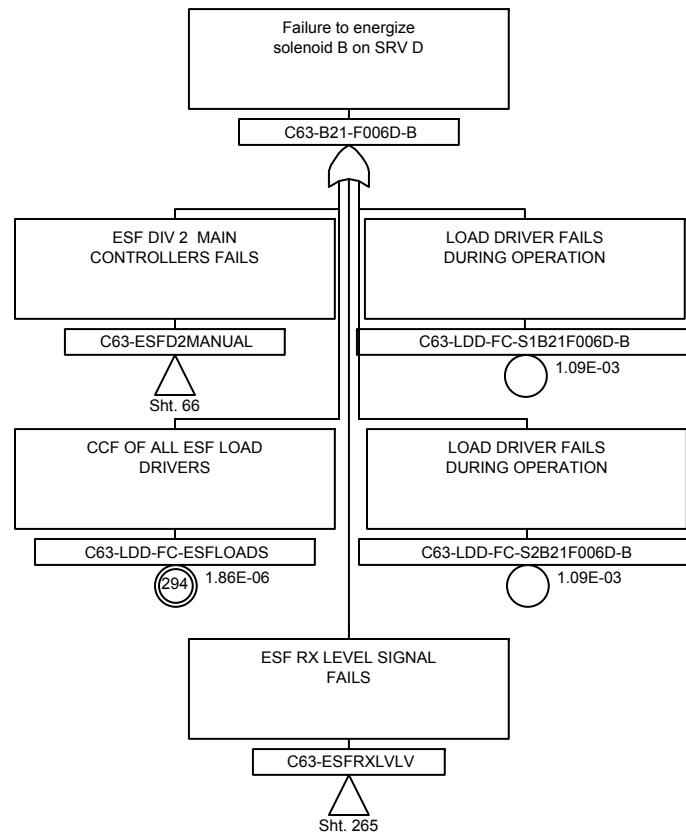


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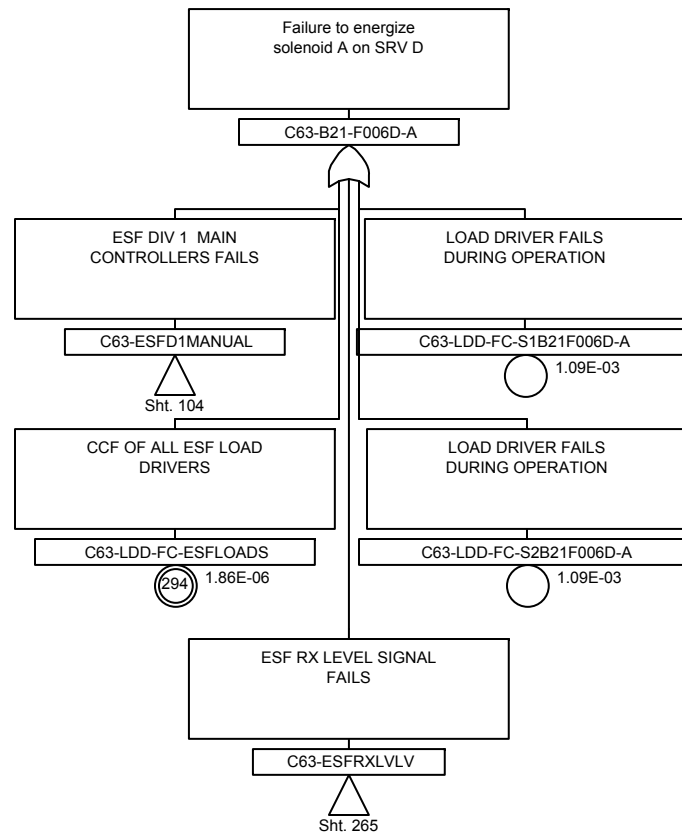


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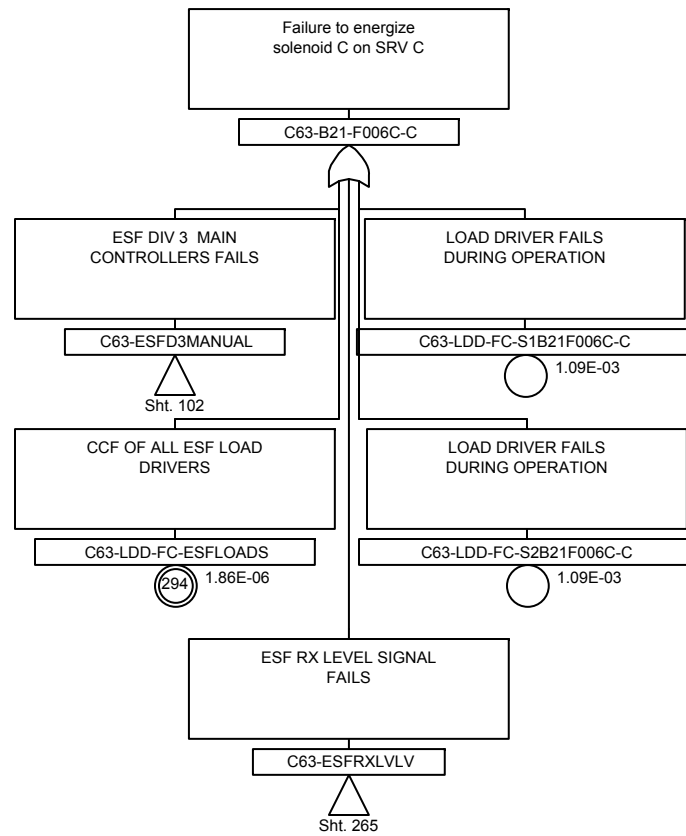


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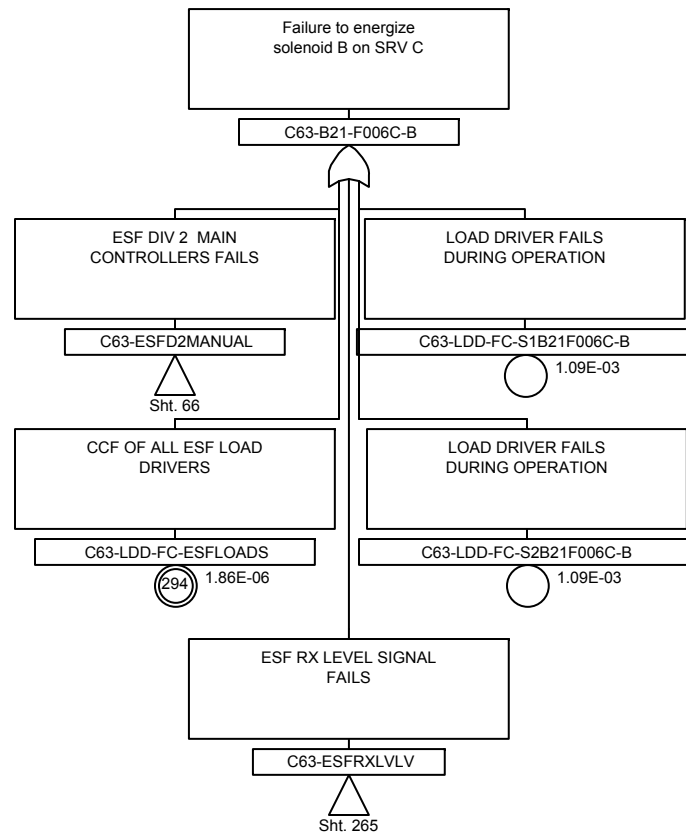


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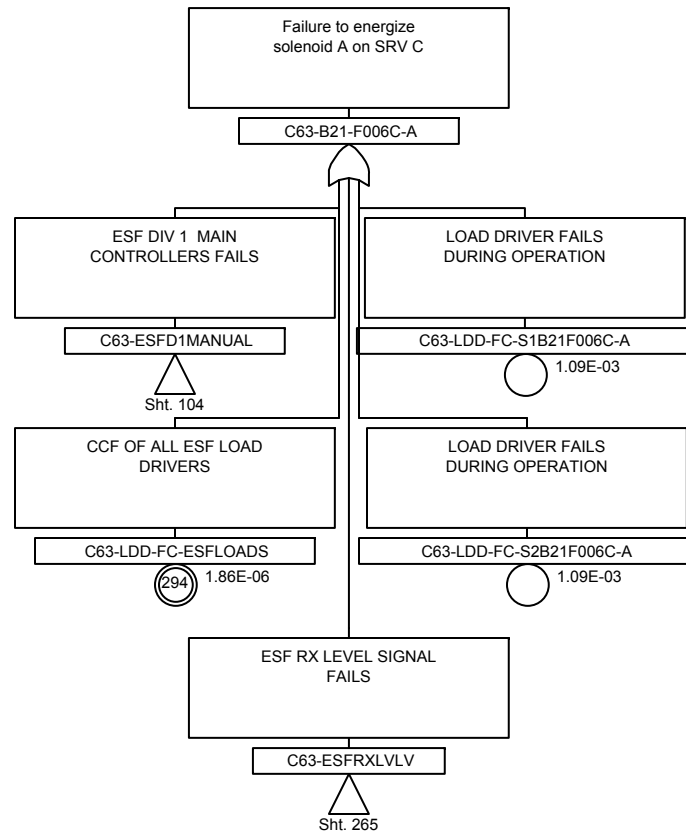


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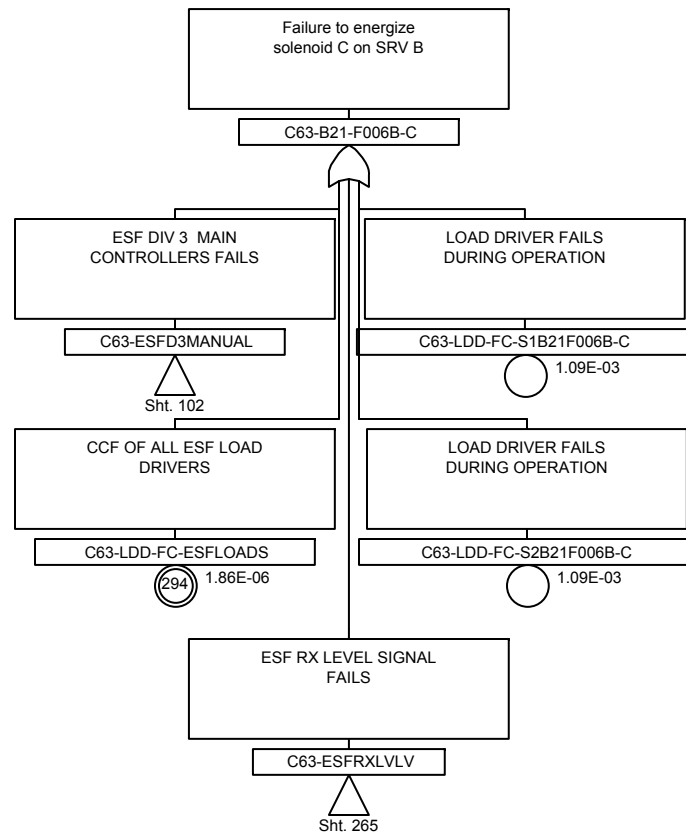


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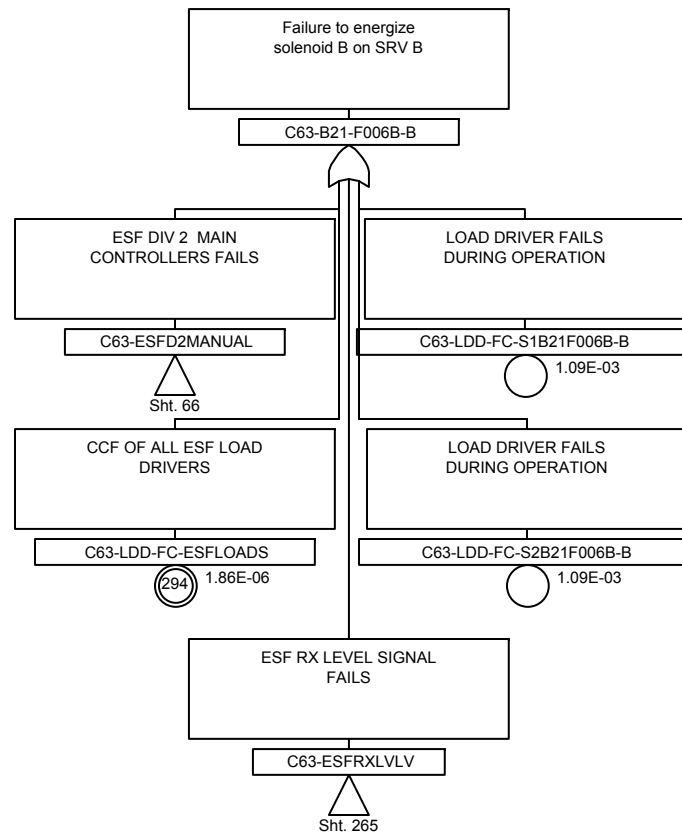


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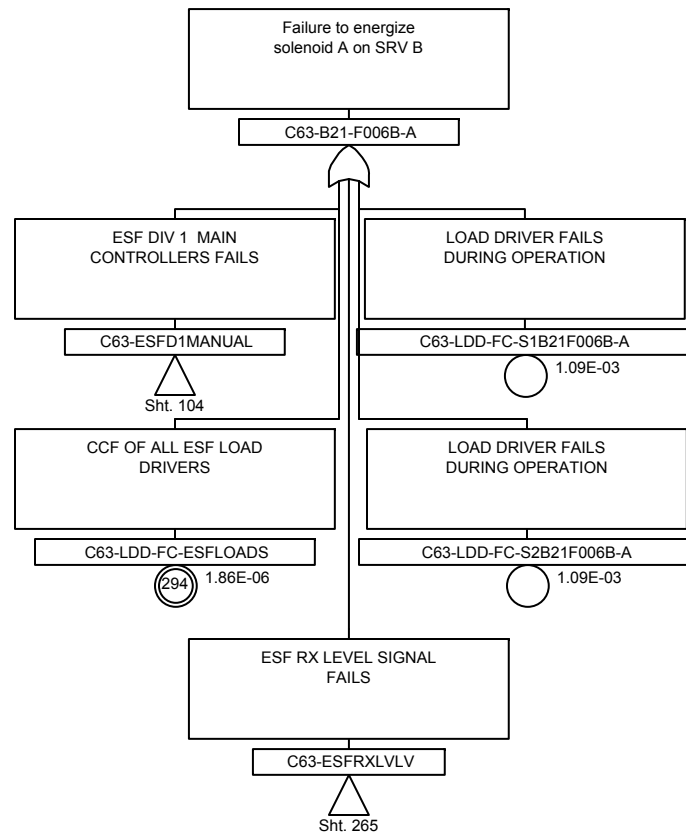


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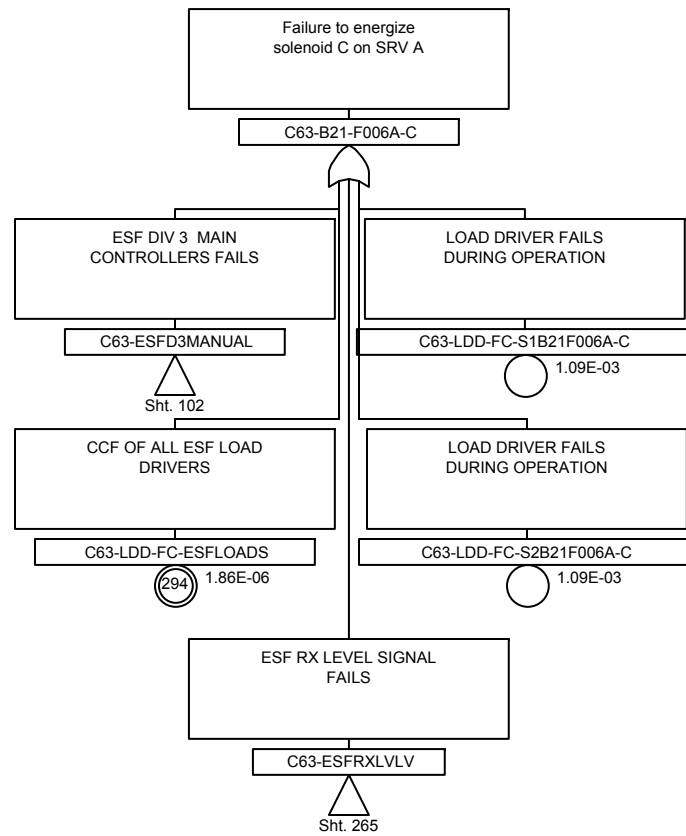


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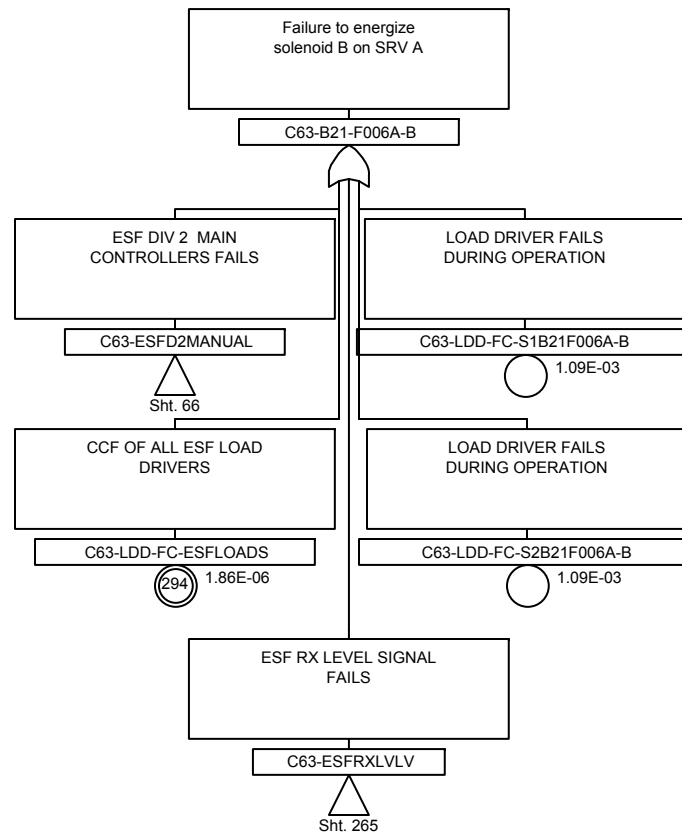


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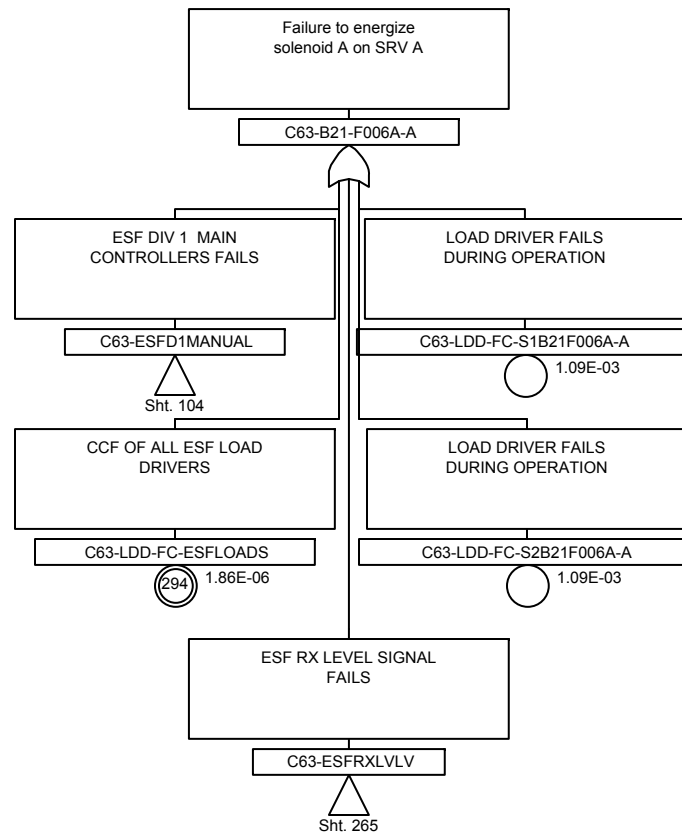


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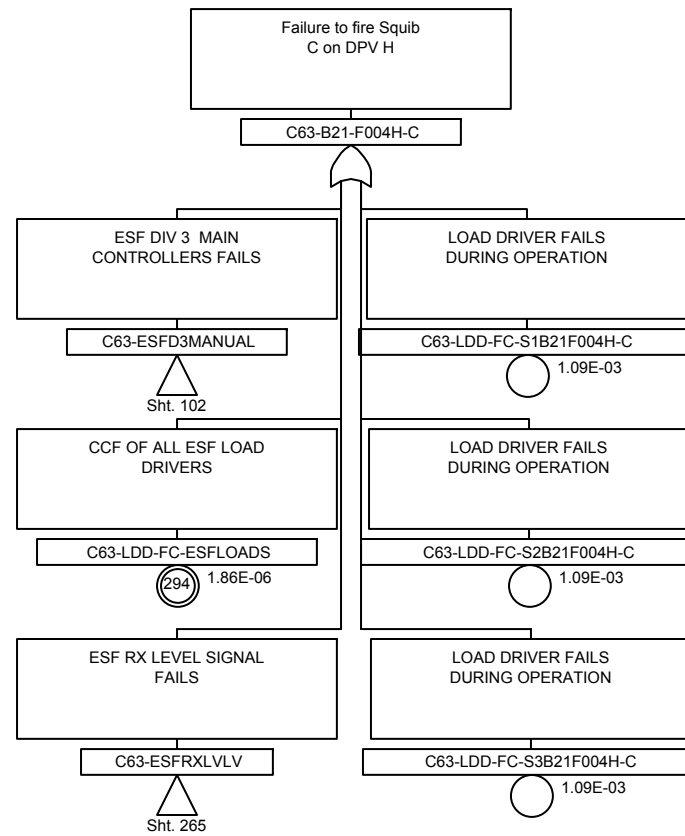


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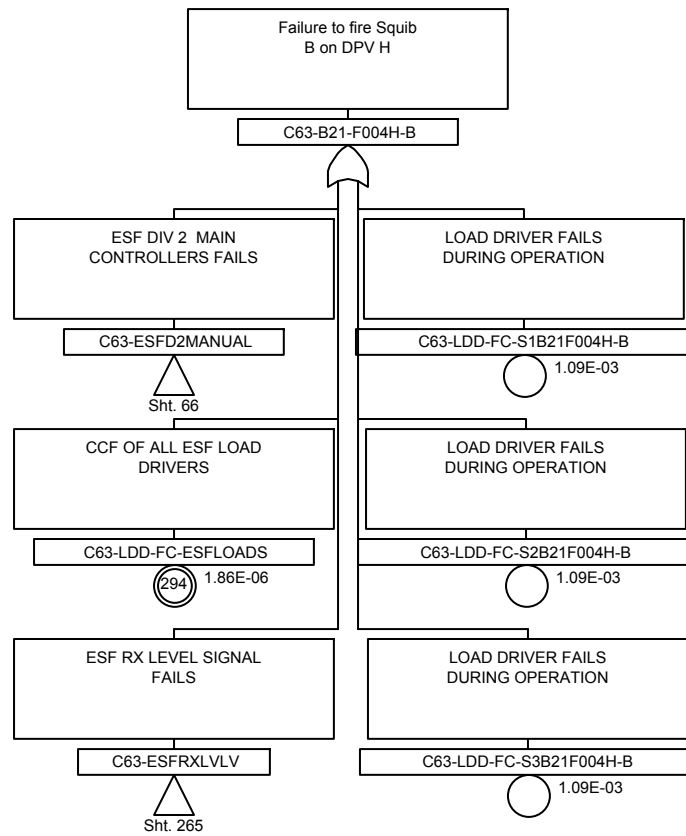


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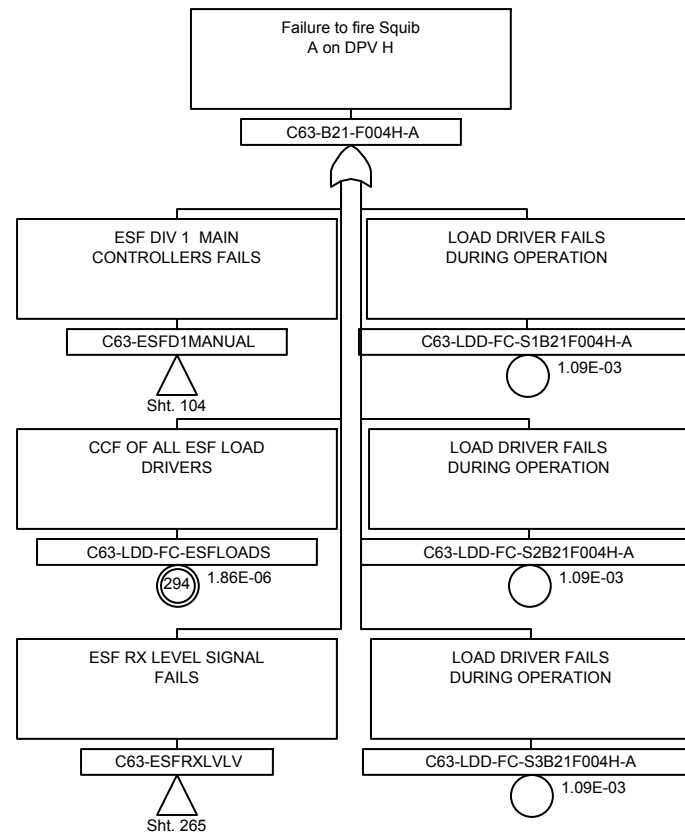


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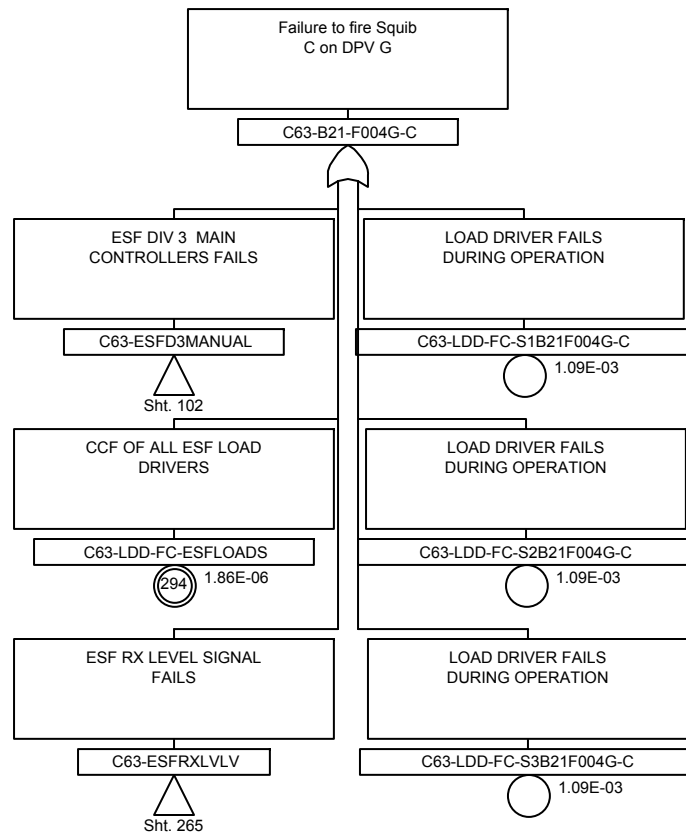


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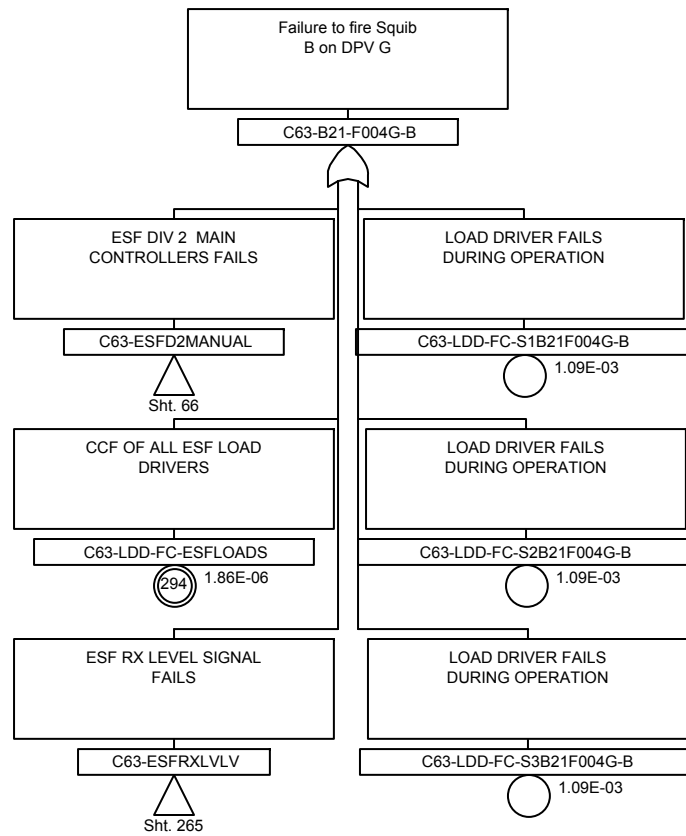


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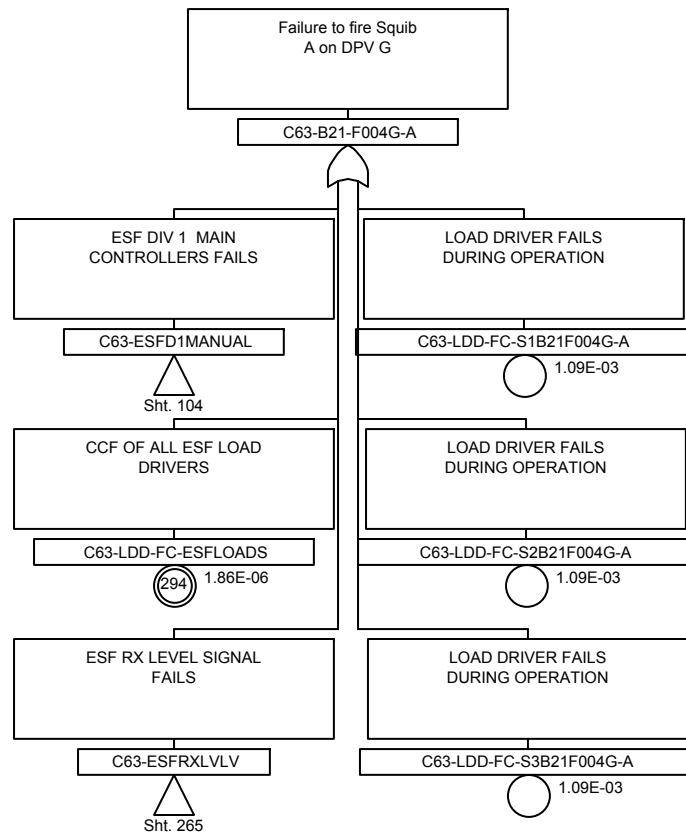


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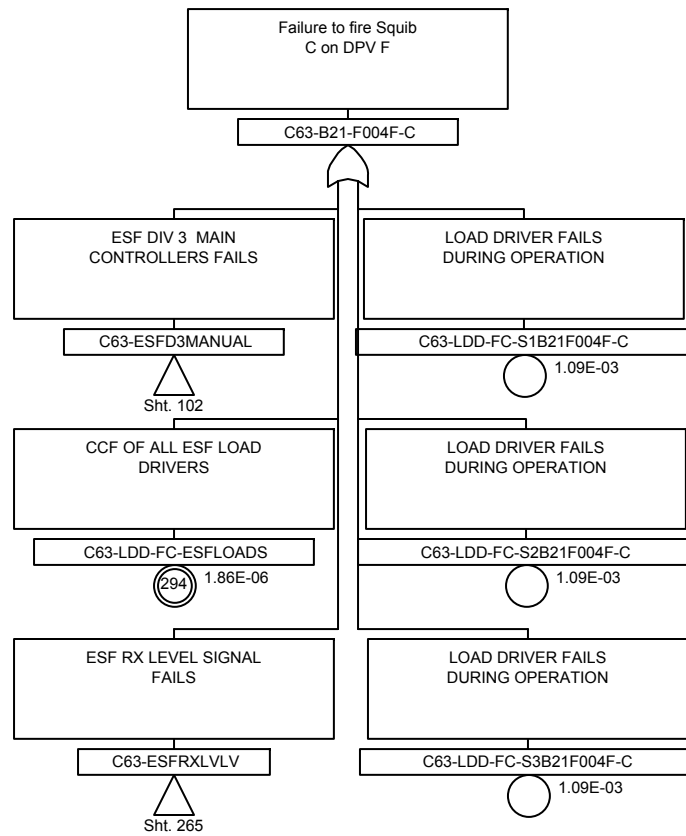


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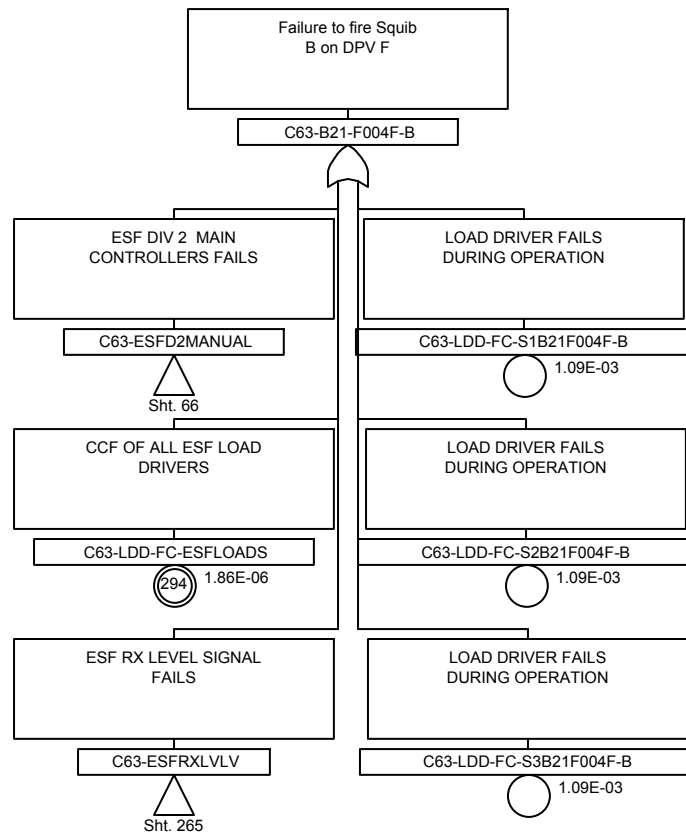


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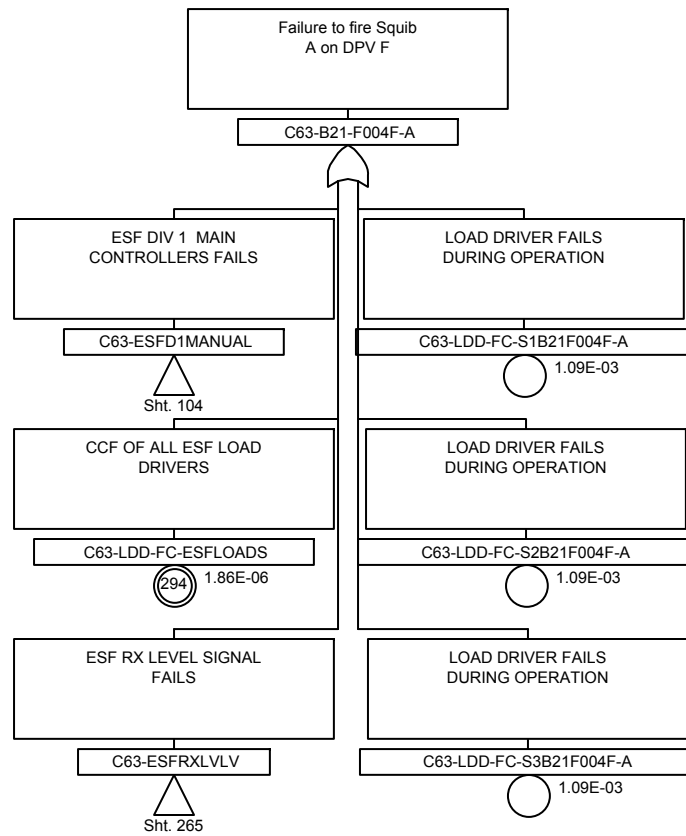


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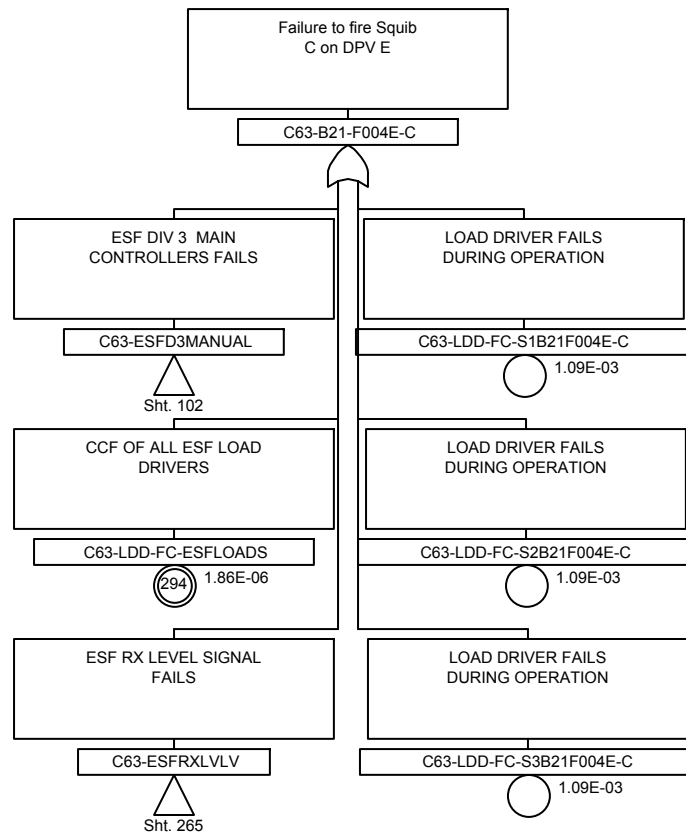


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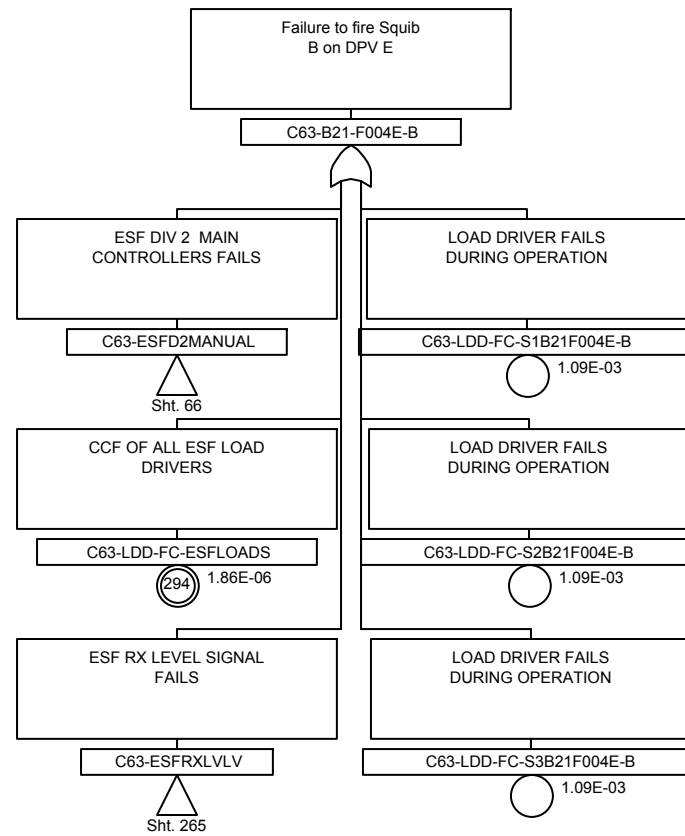


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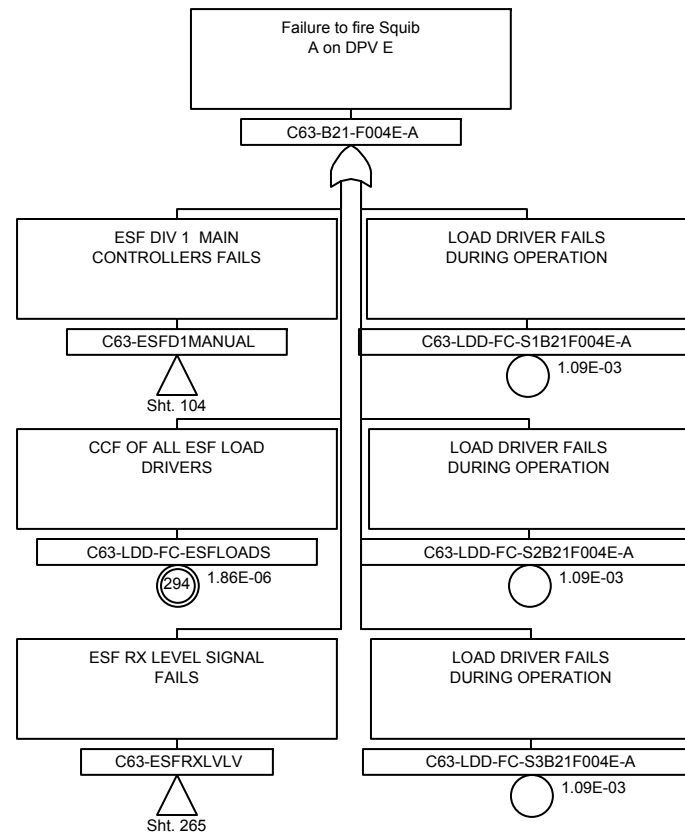


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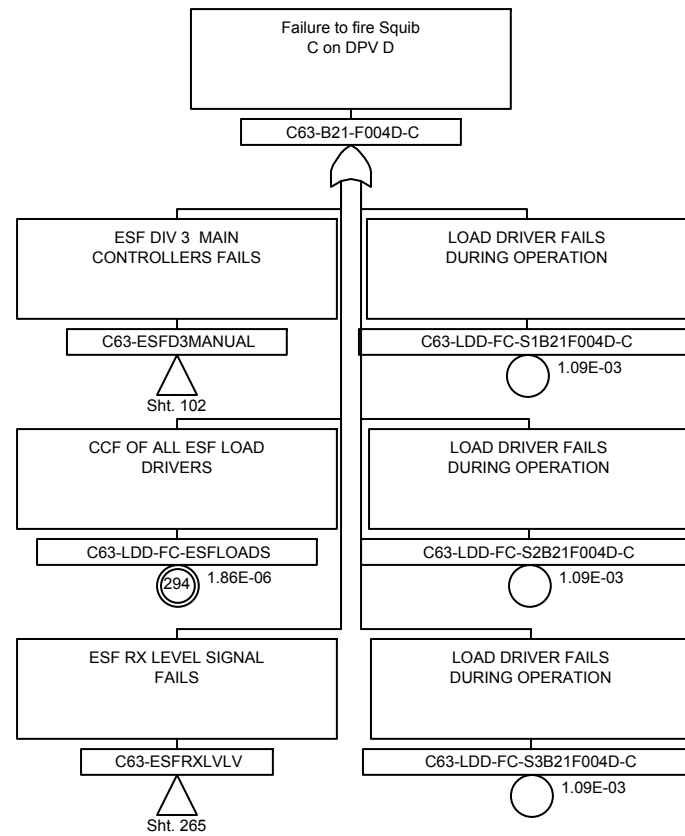


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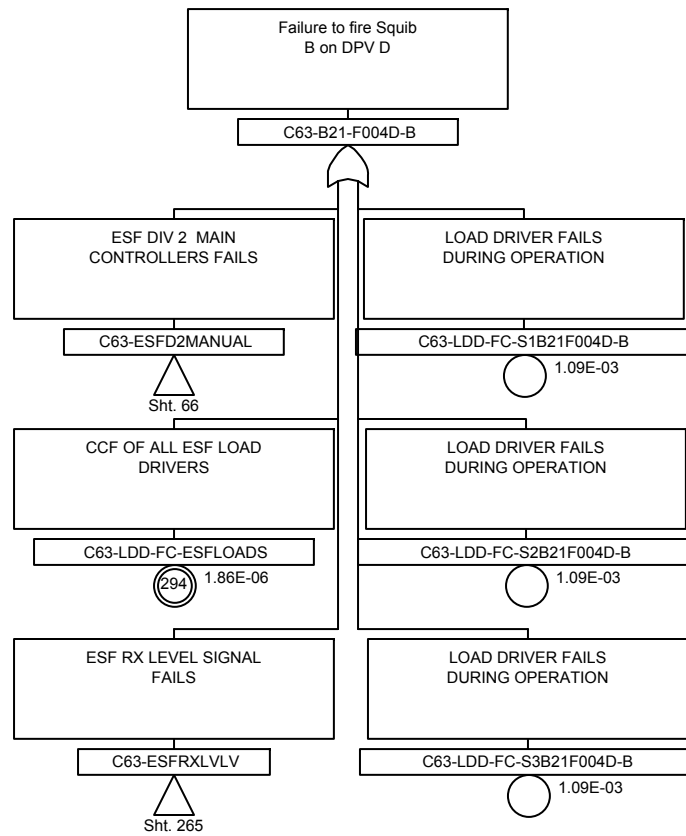


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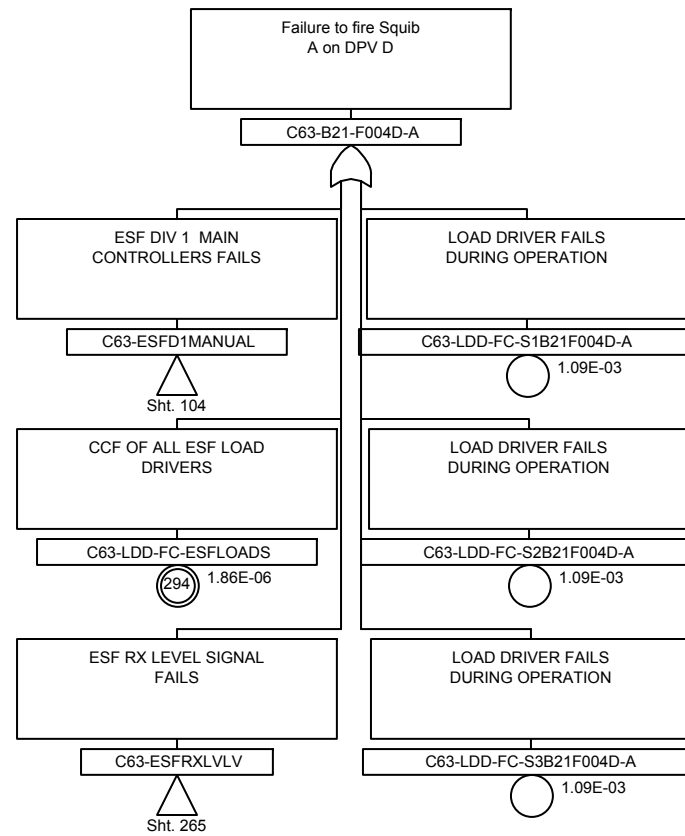


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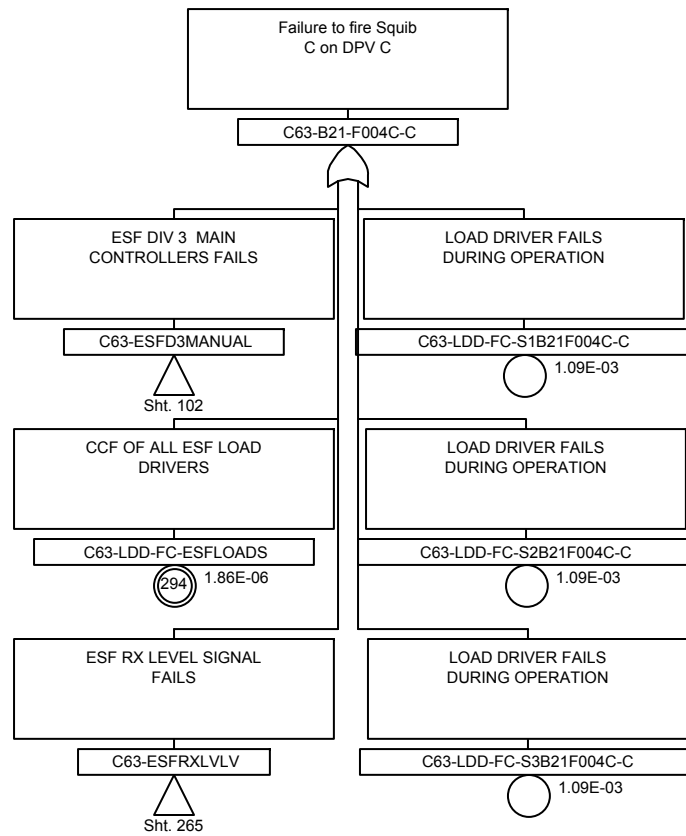


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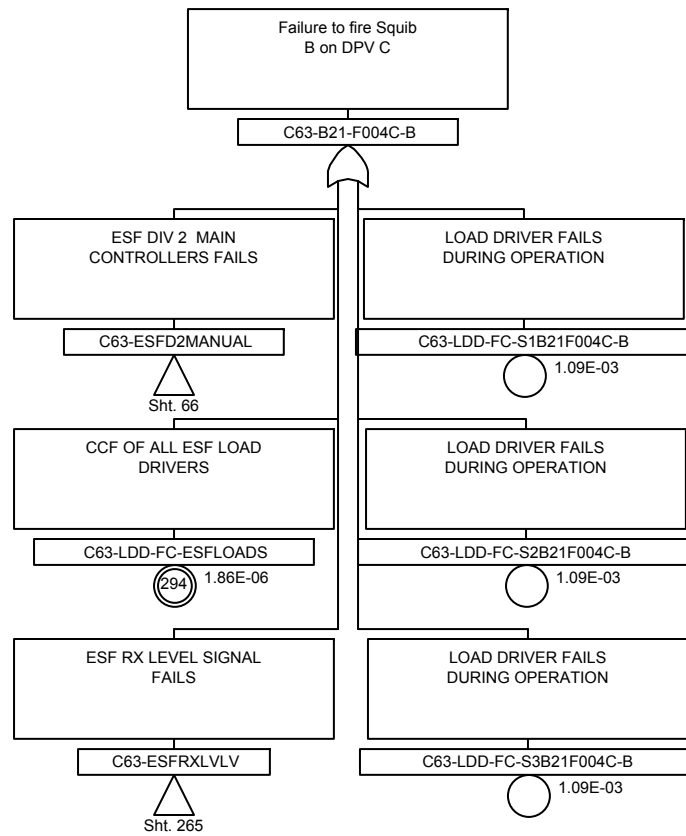


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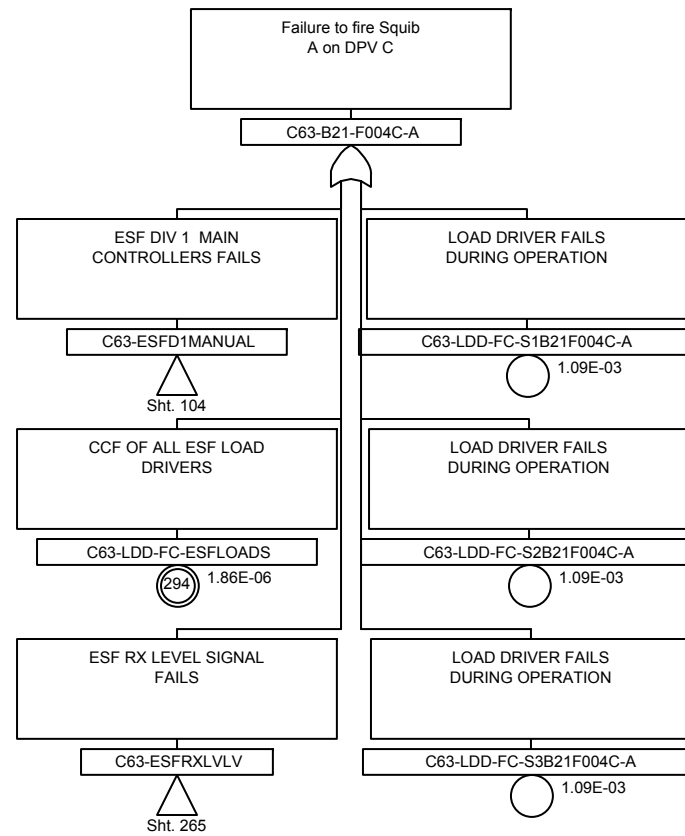


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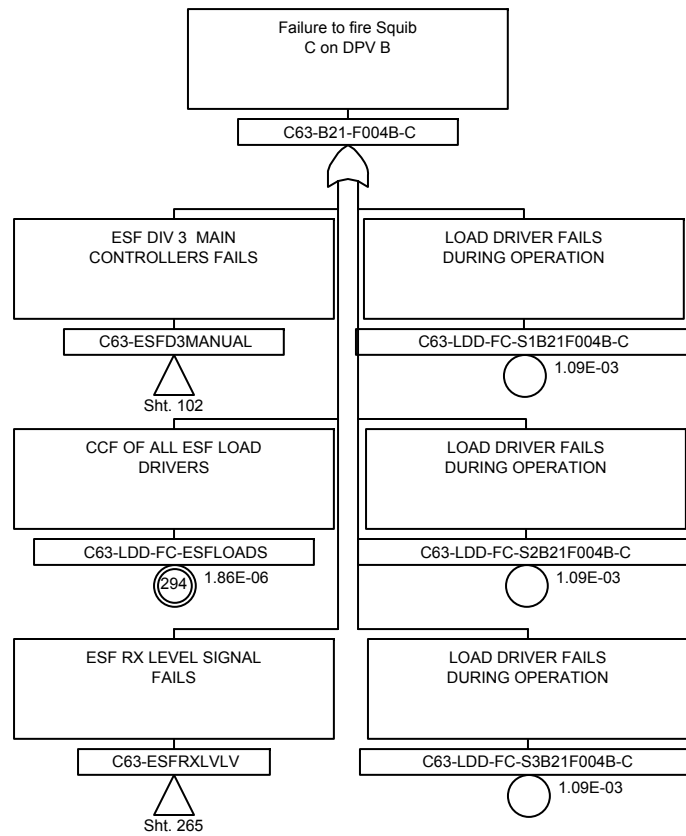


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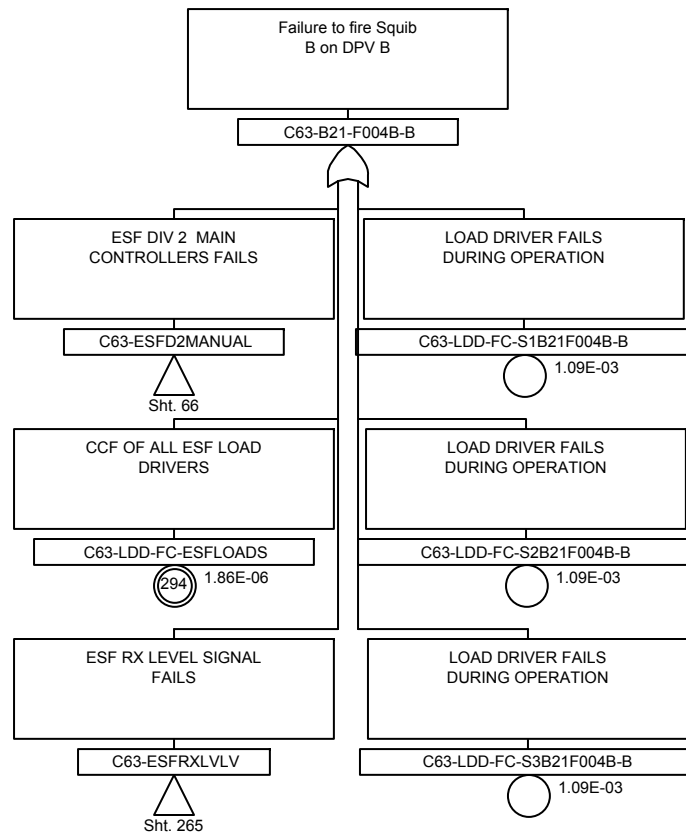


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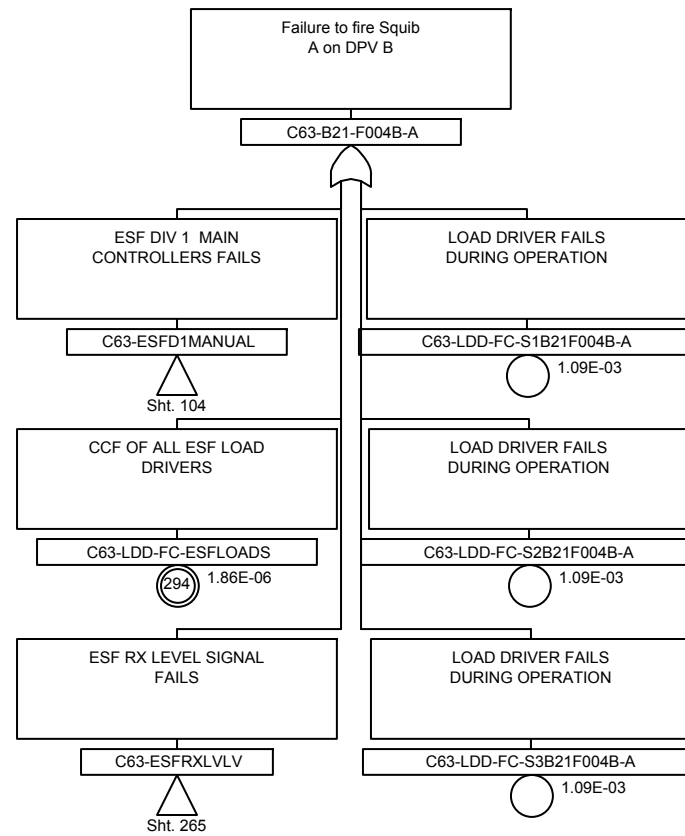


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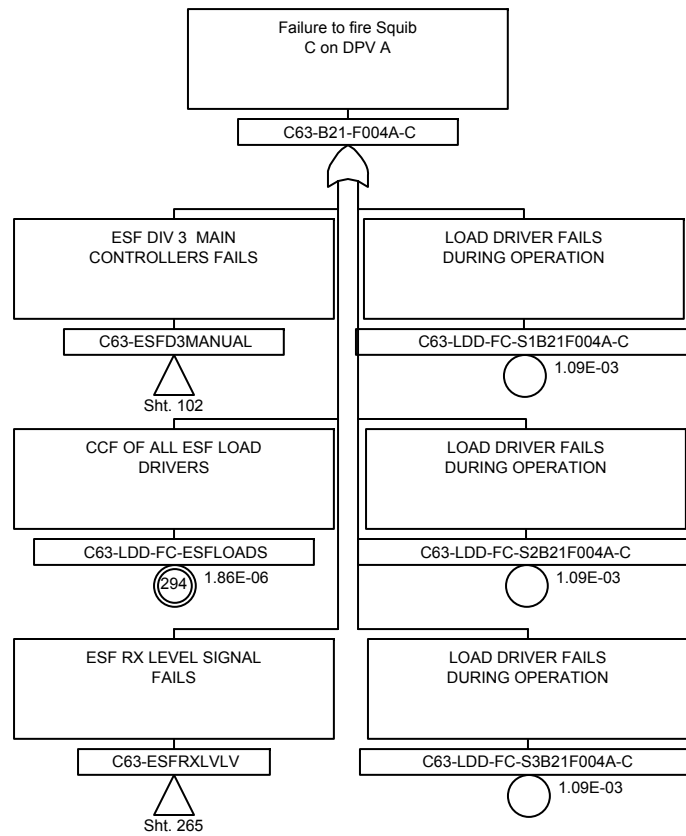


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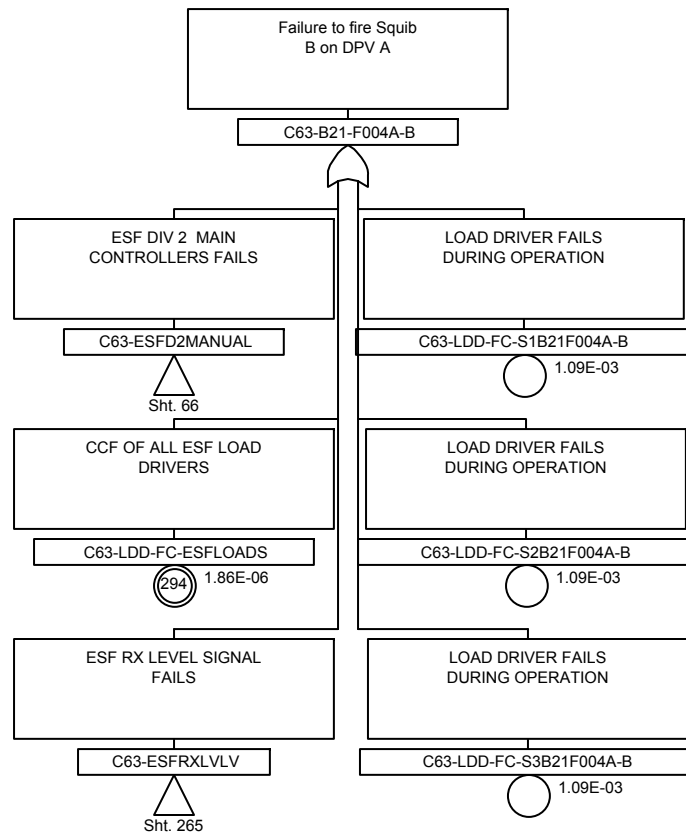


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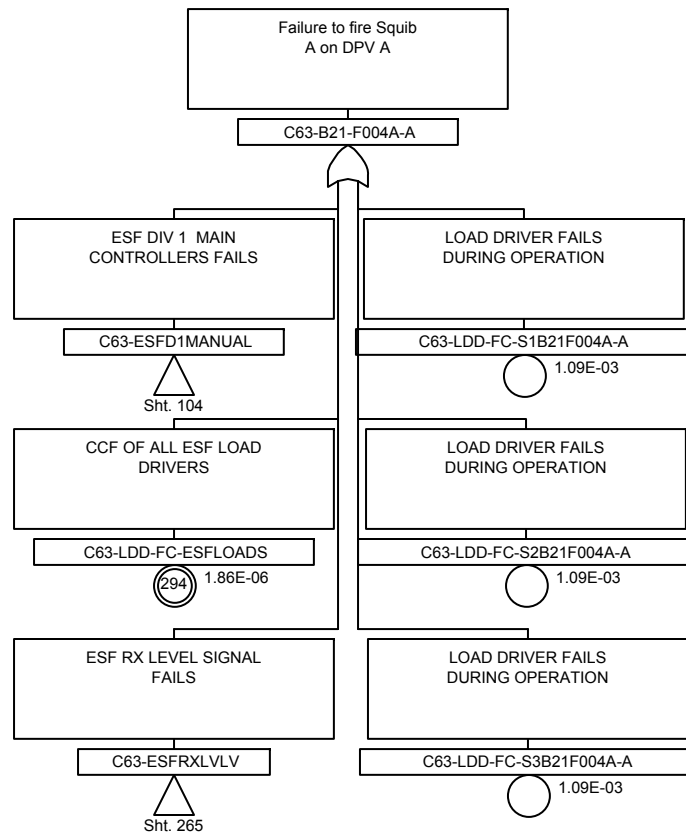


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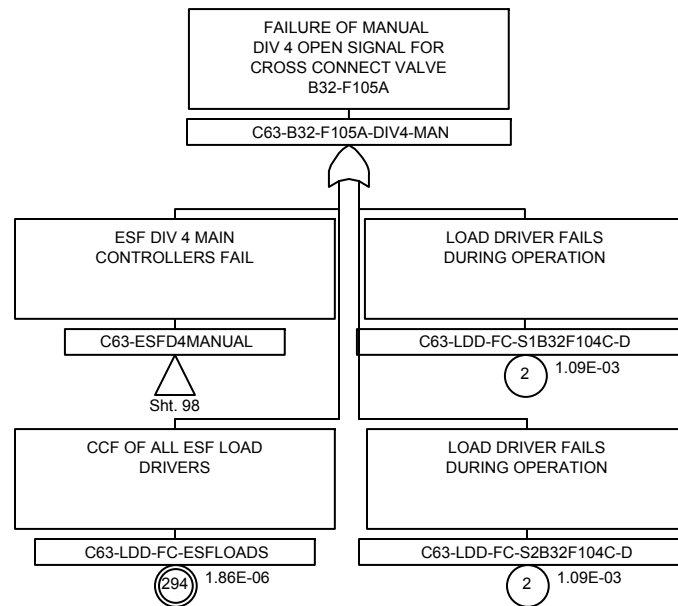


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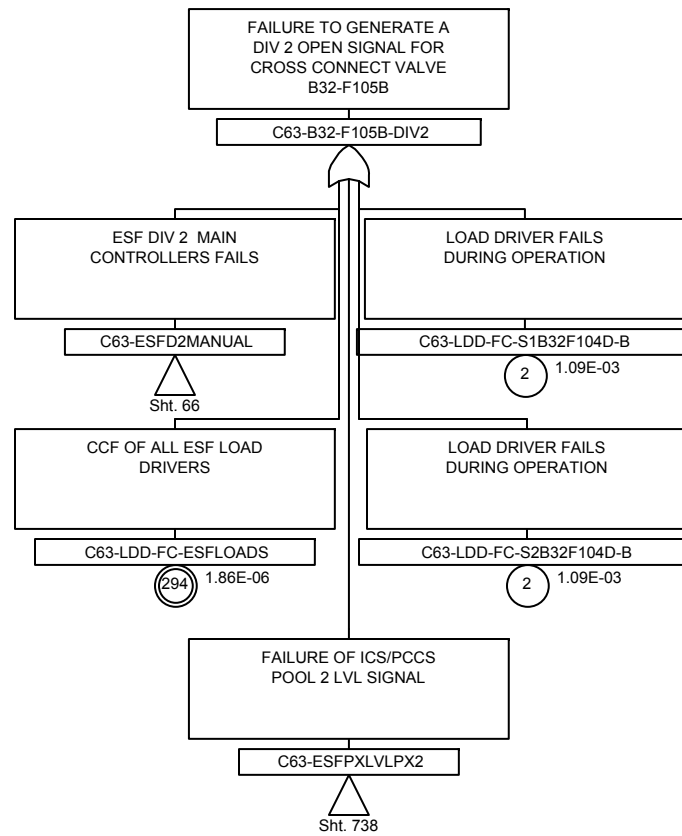


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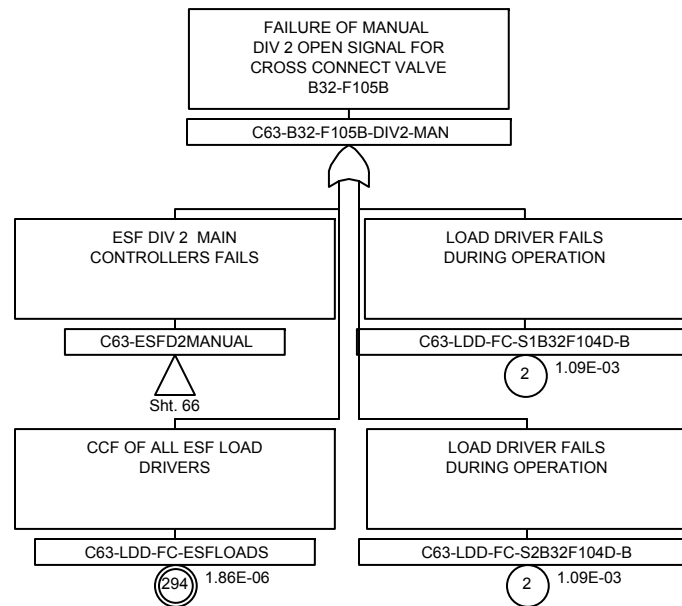


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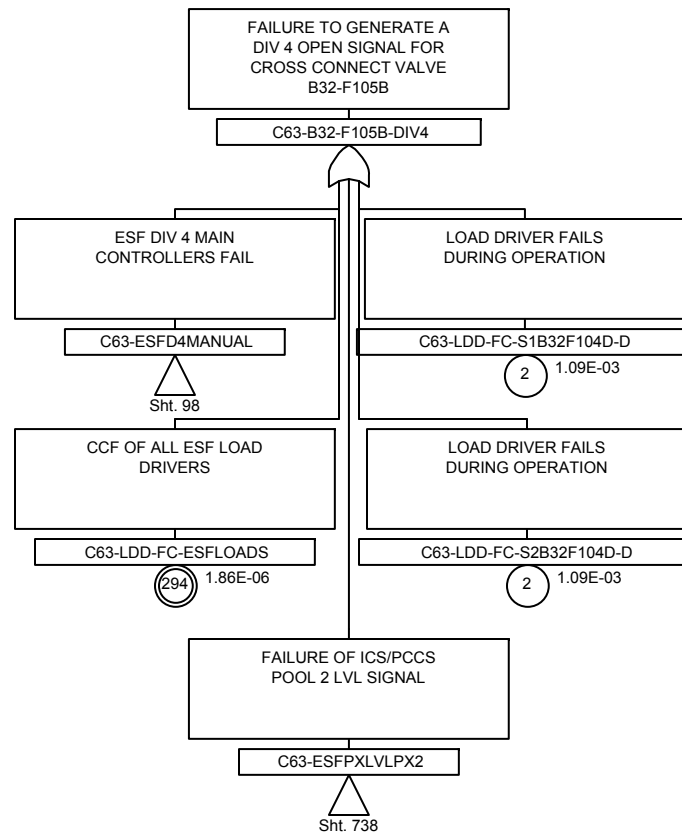


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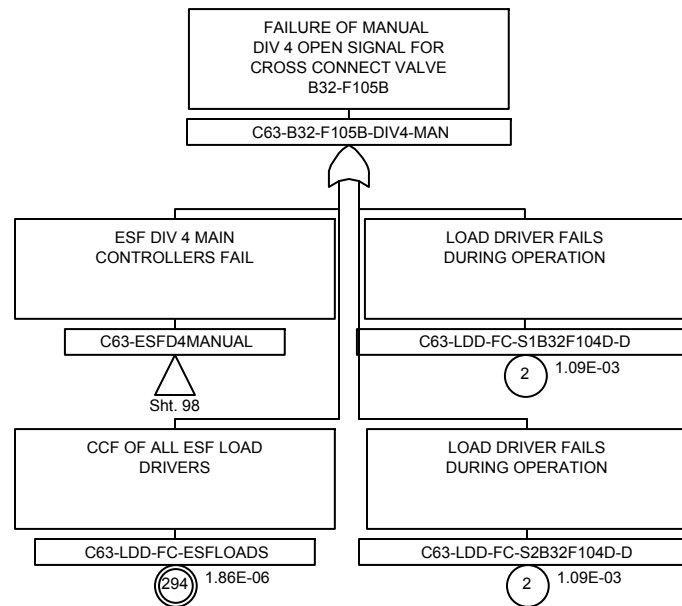


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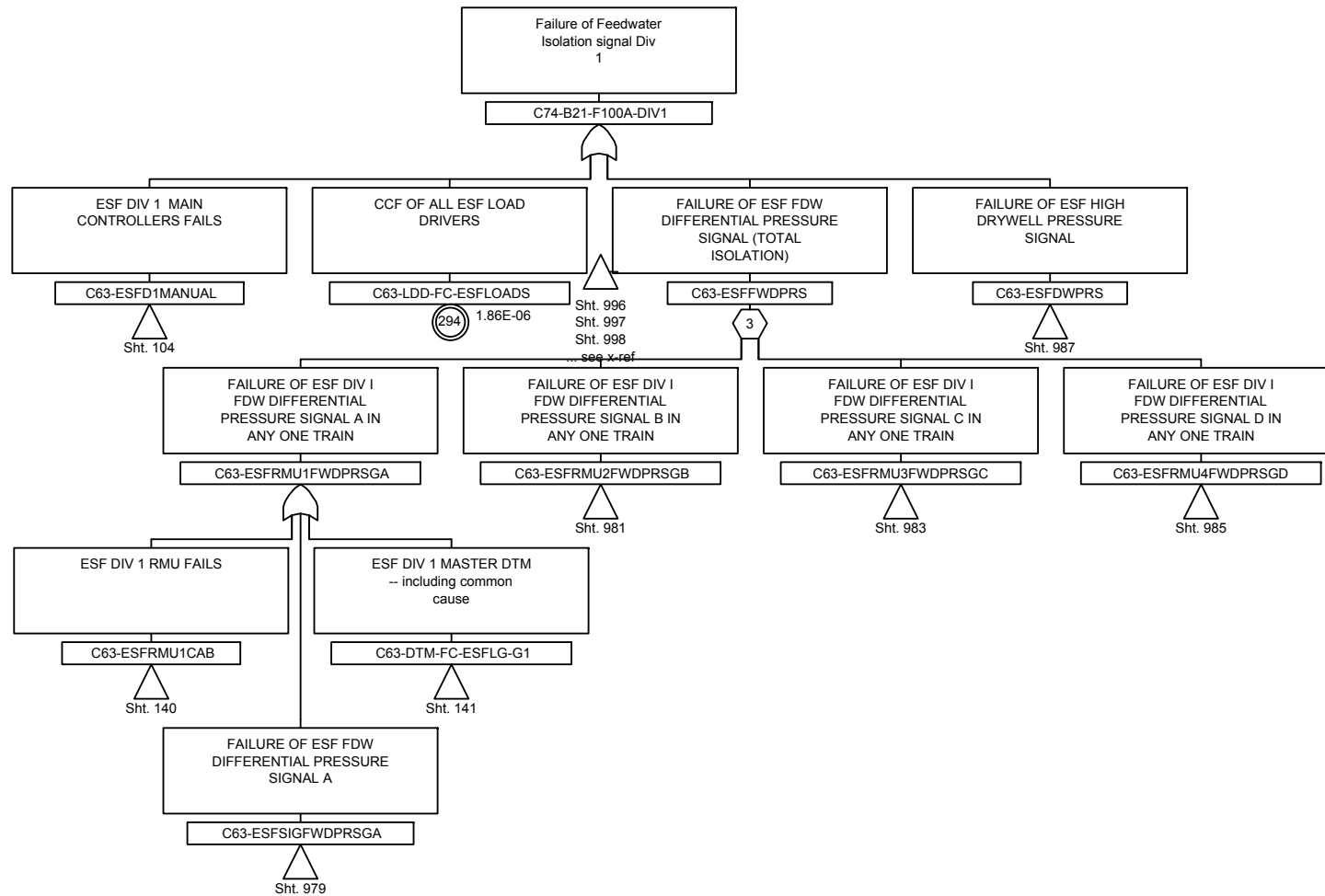


Figure 4.5-3b. Sheet 978 Q-DCIS Safety Related Control System

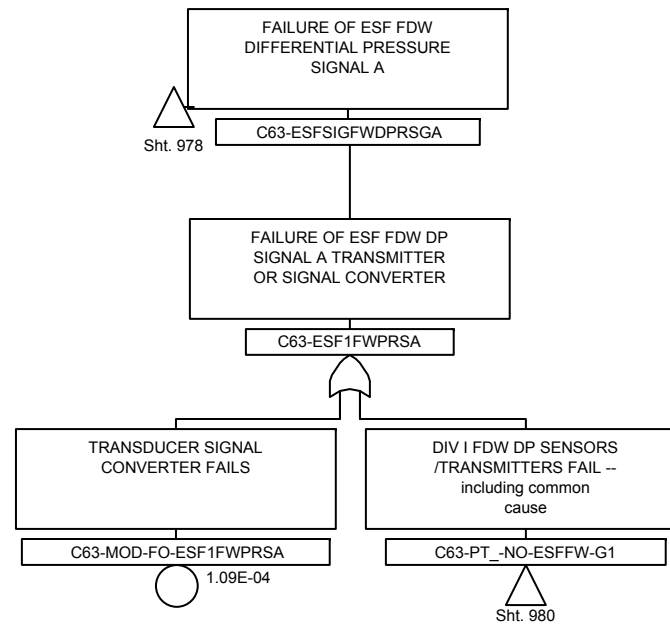


Figure 4.5-3b. Sheet 979 Q-DCIS Safety Related Control System

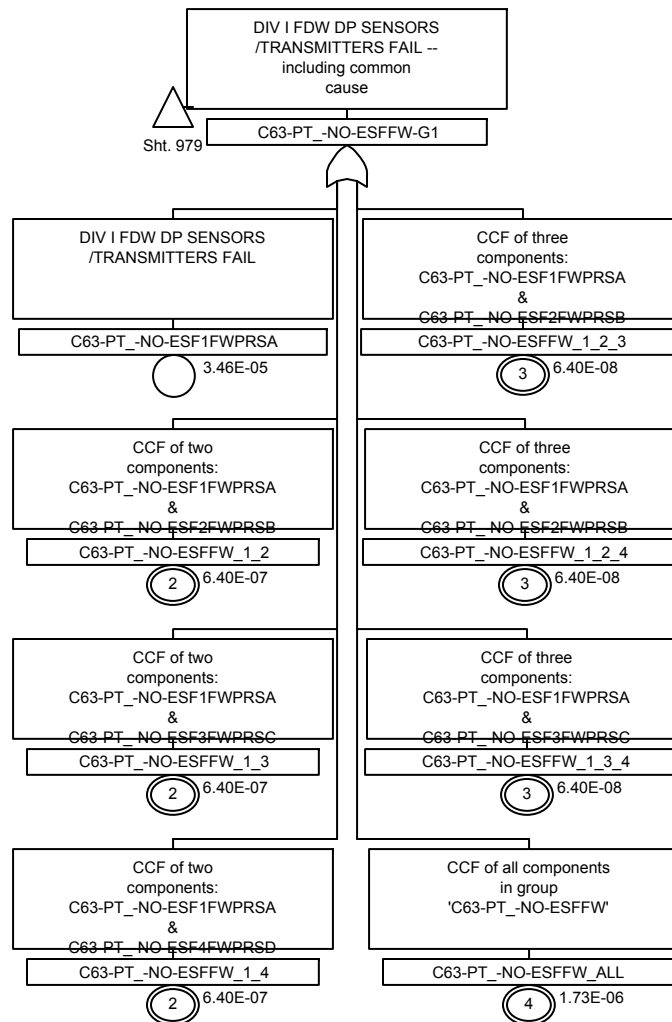


Figure 4.5-3b. Sheet 980 Q-DCIS Safety Related Control System

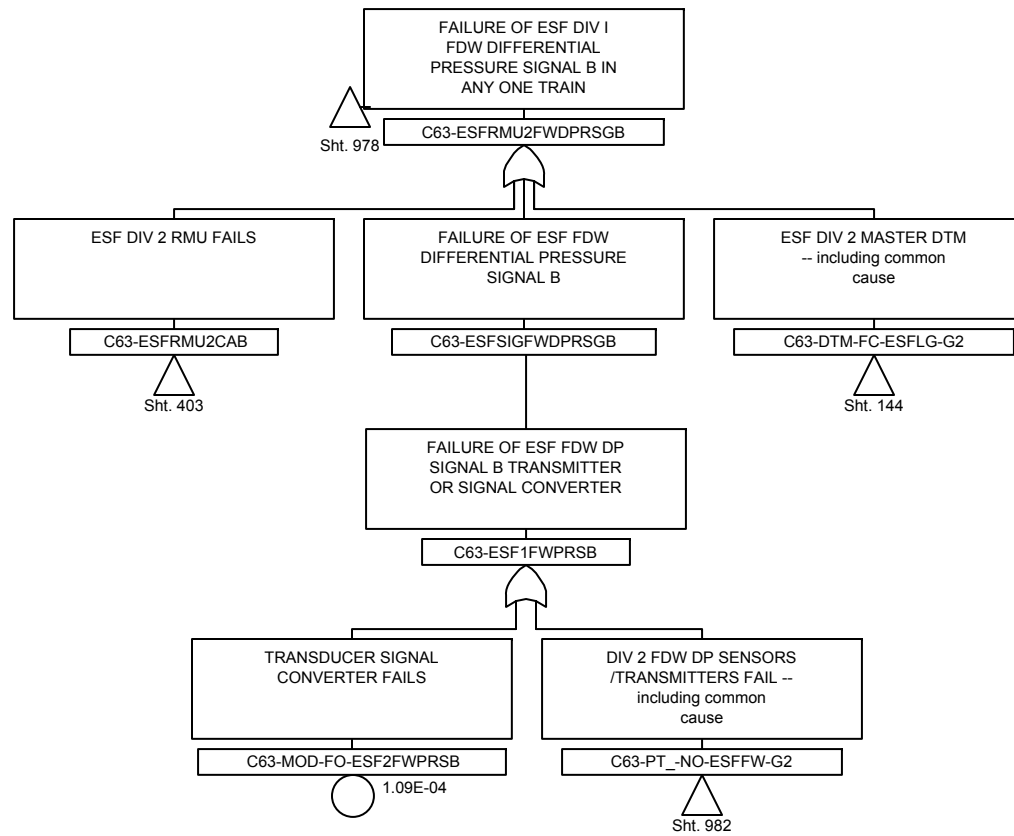


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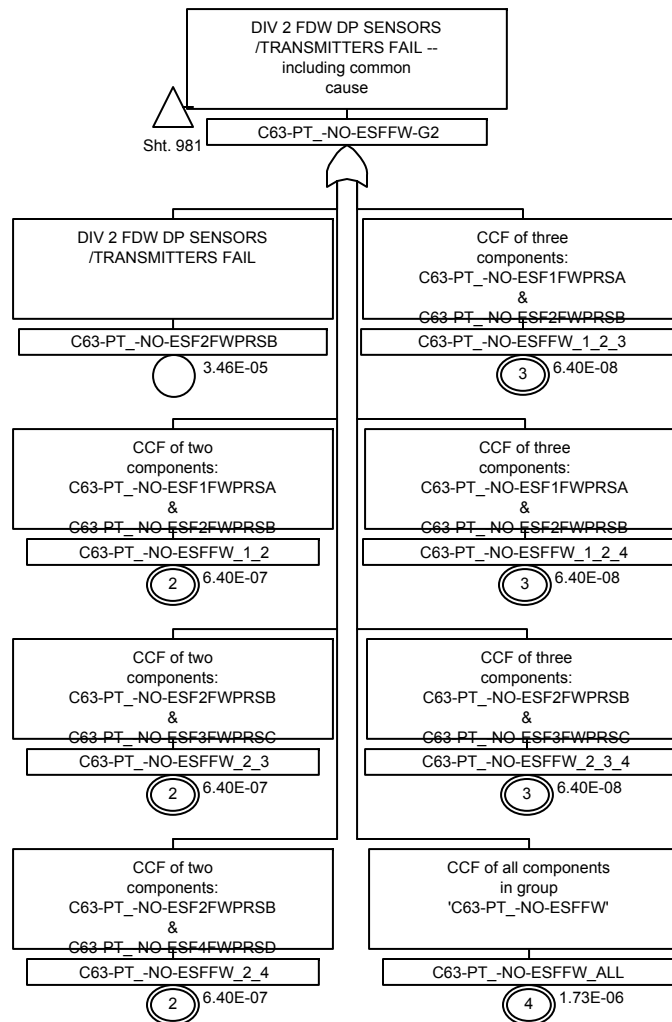


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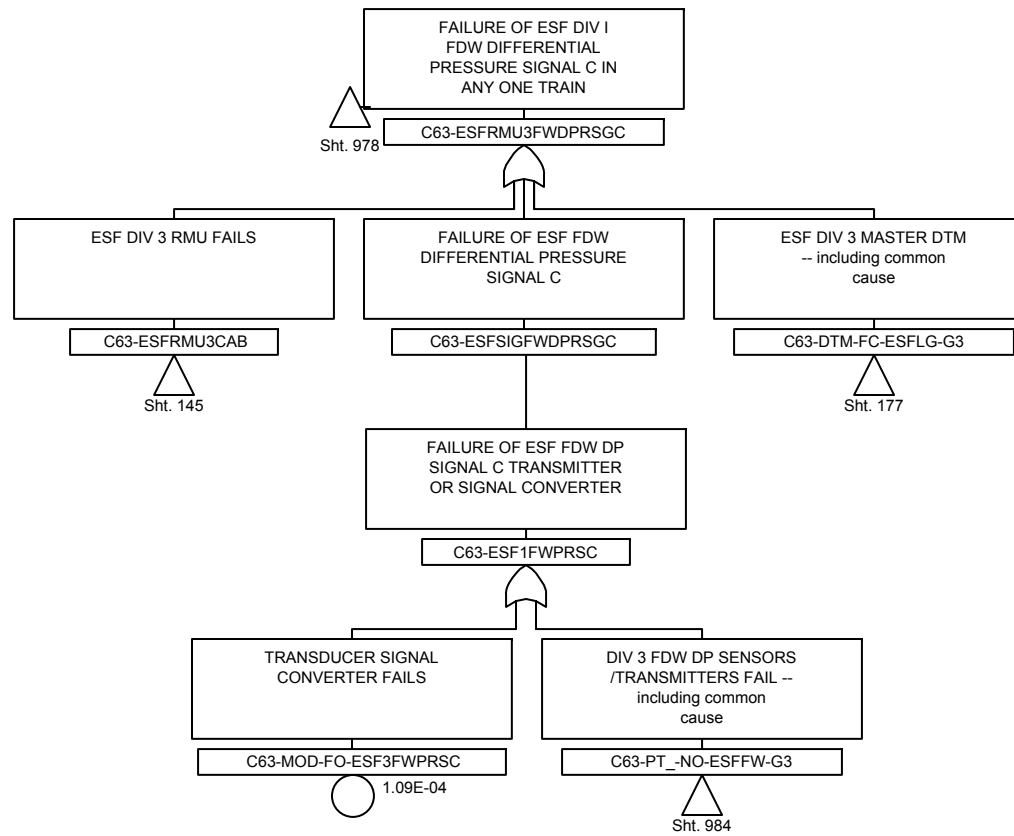


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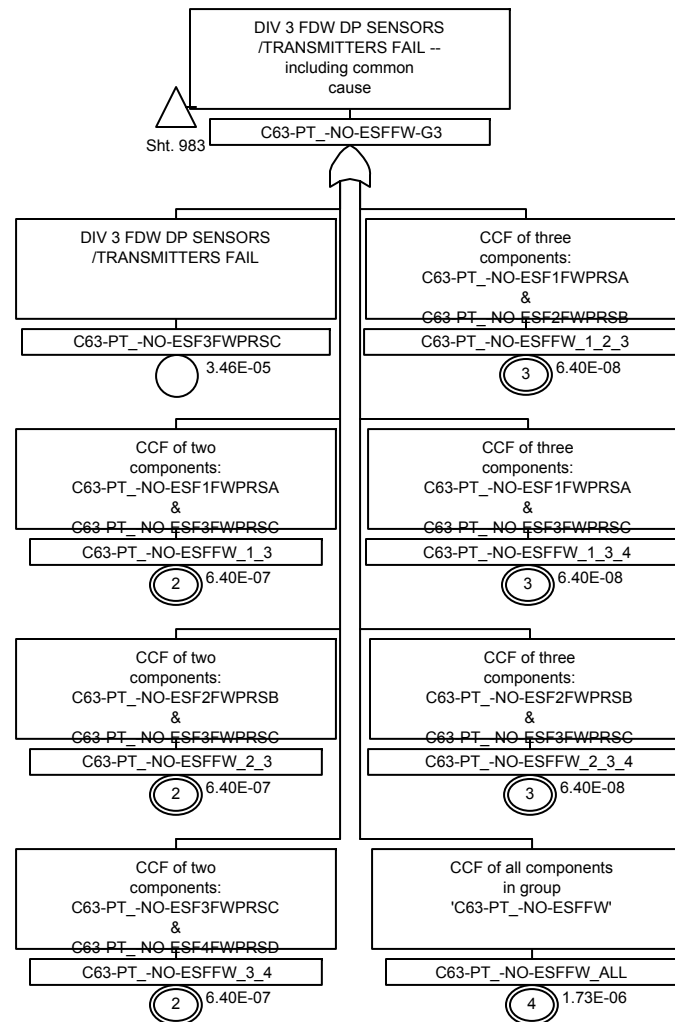


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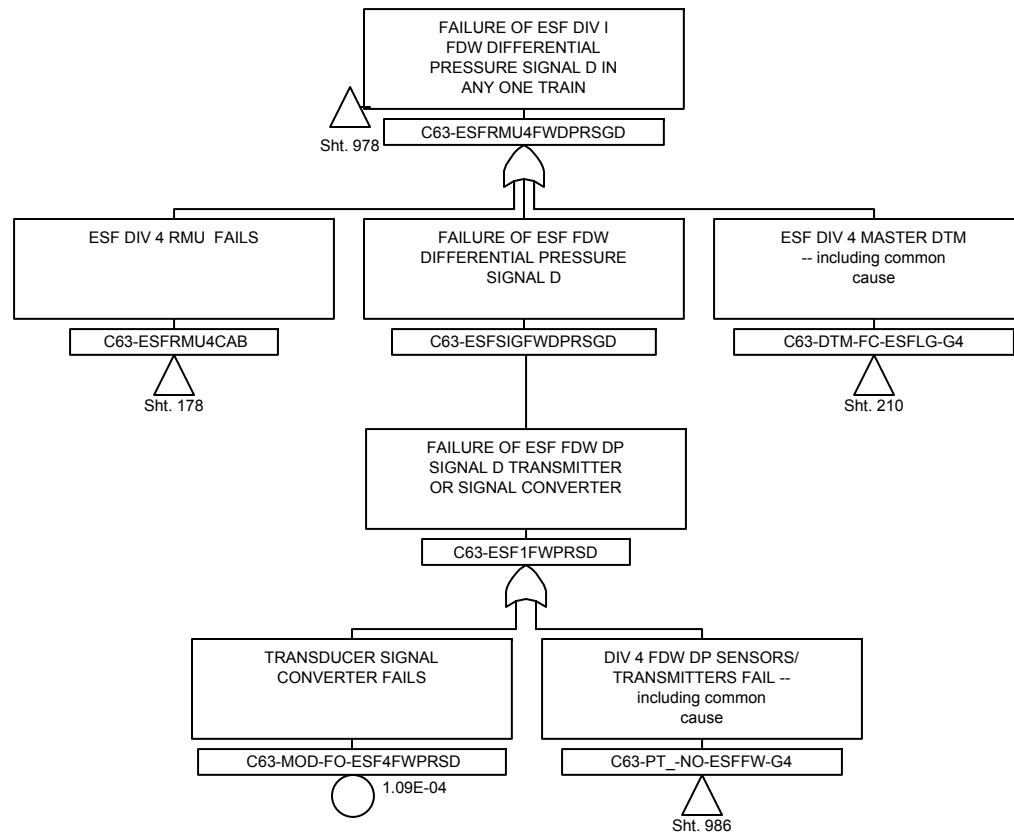


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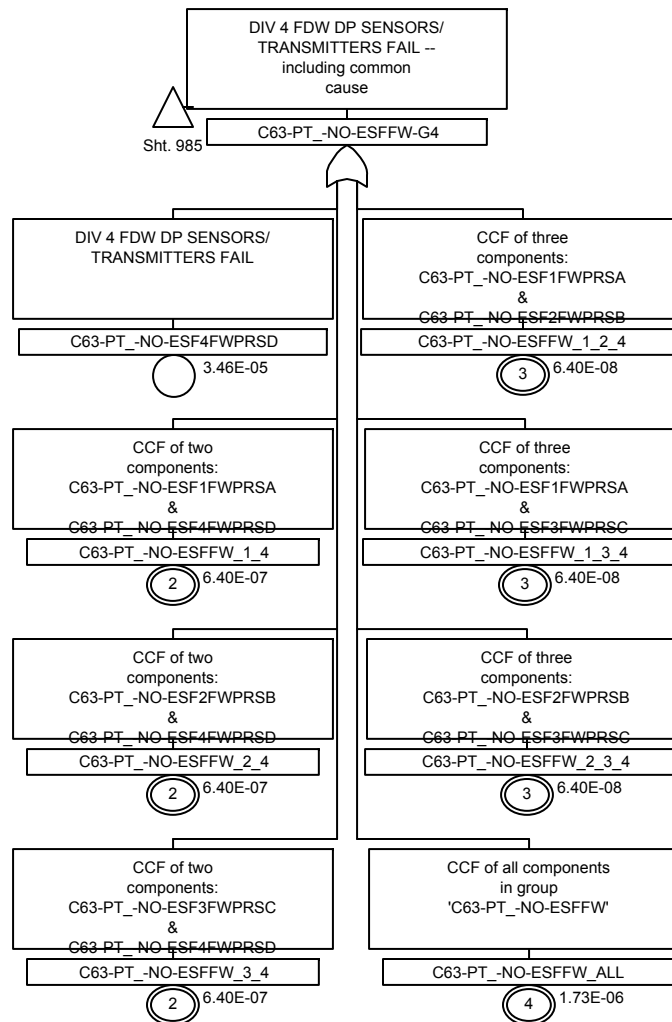


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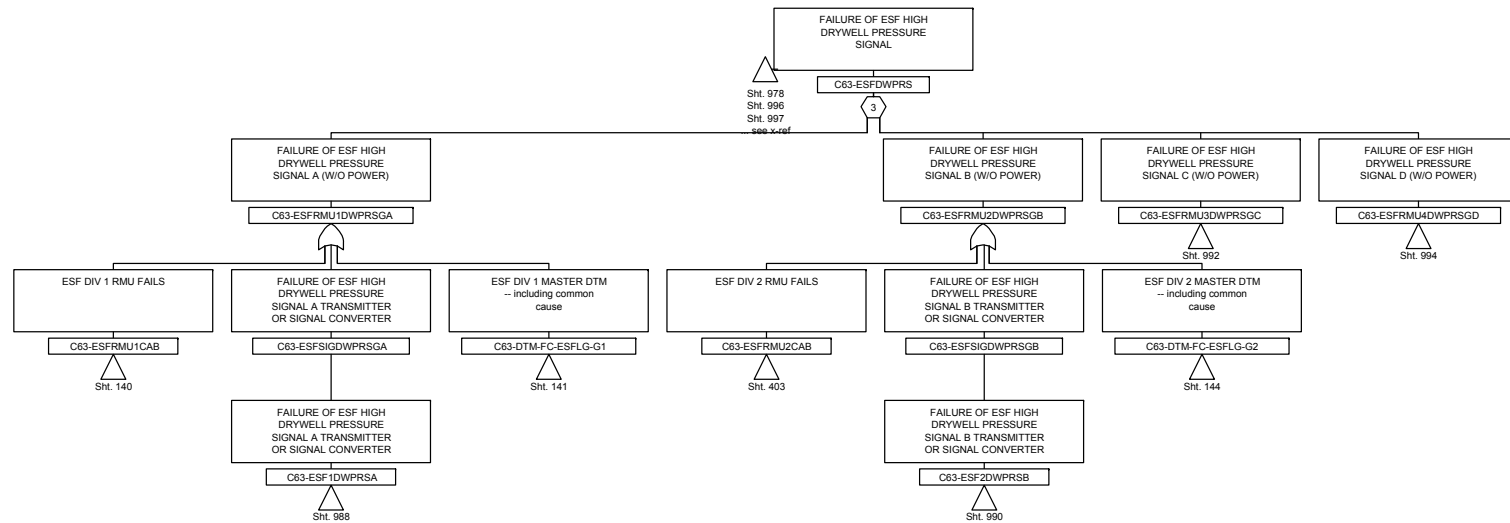


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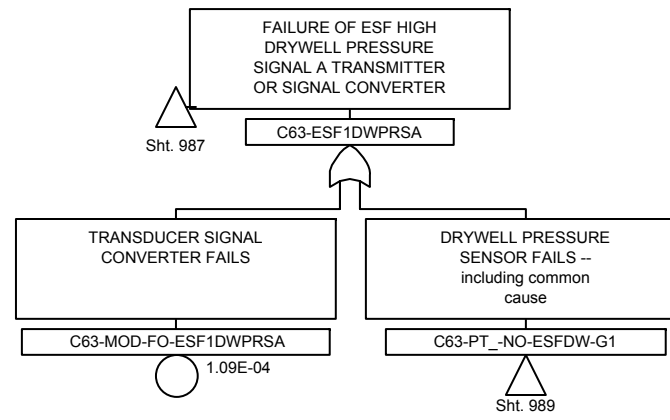


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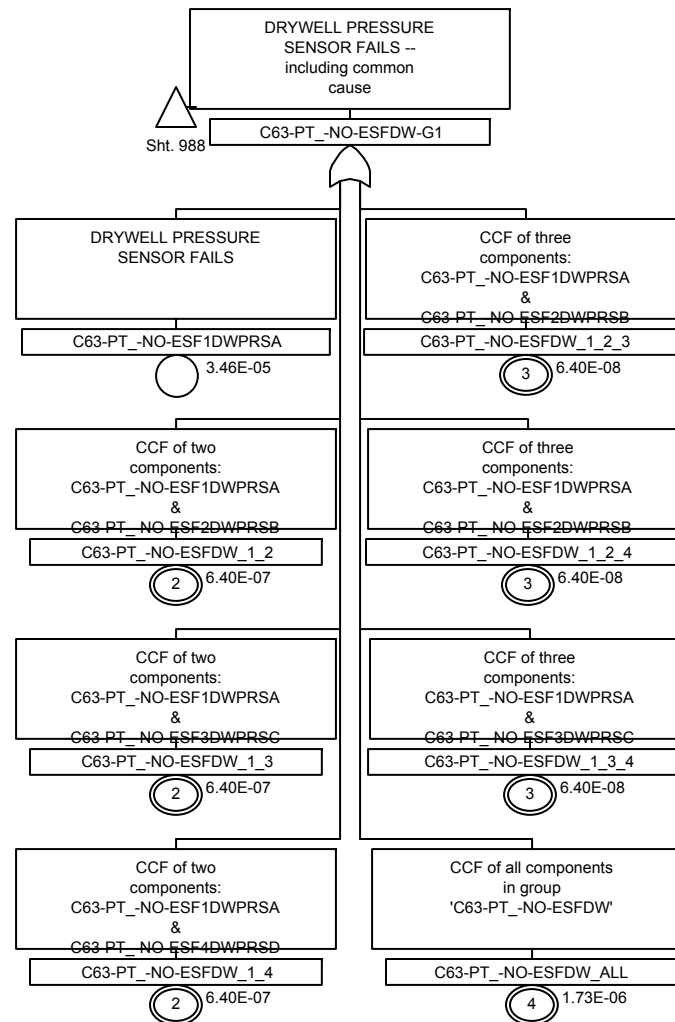


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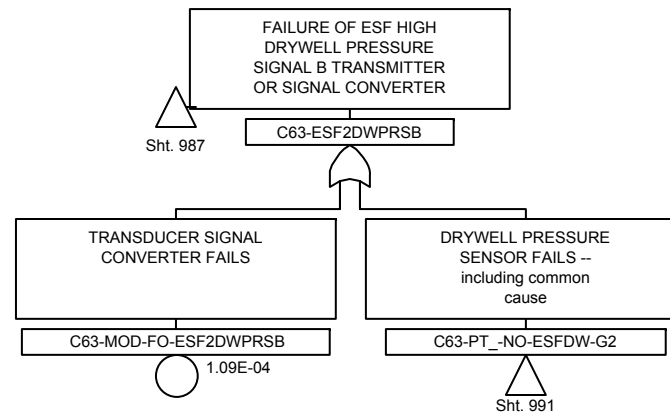


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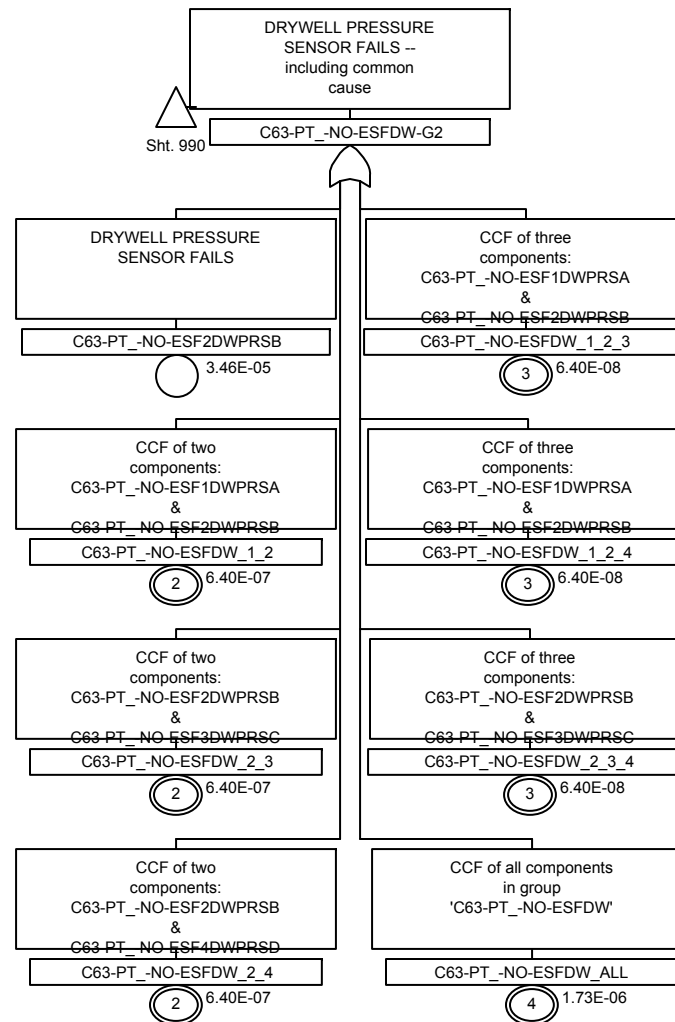


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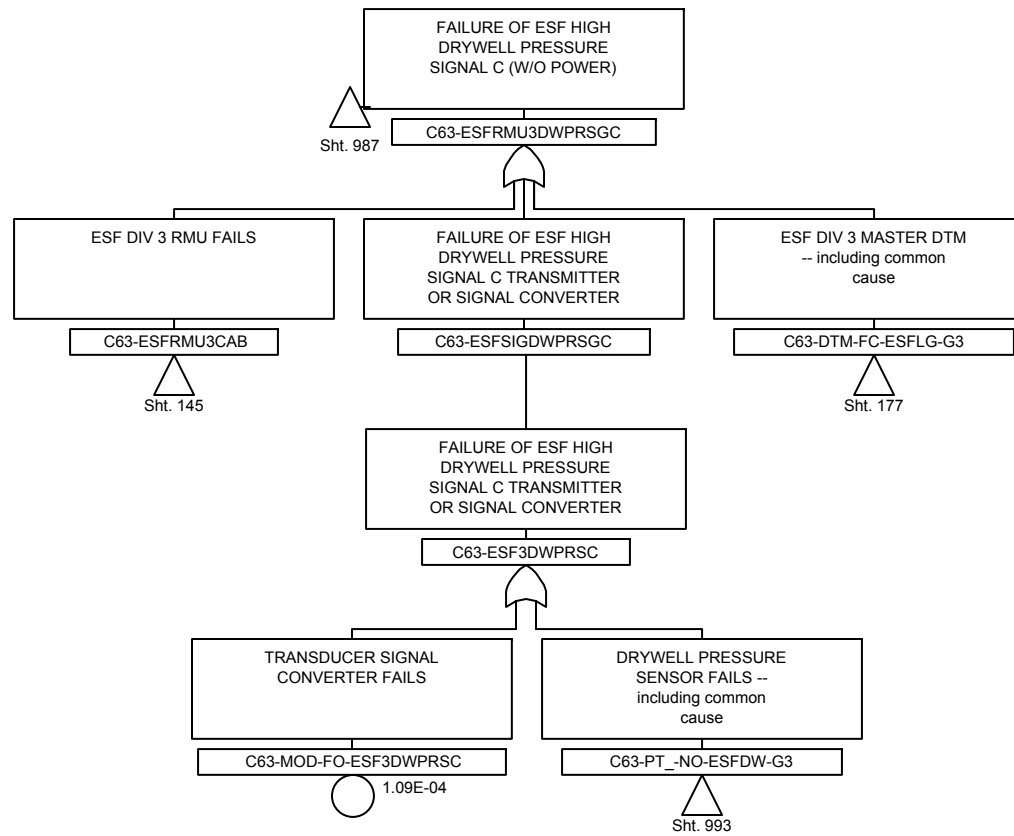


Figure 4.5-3b. Sheet 992 Q-DCIS Safety Related Control System



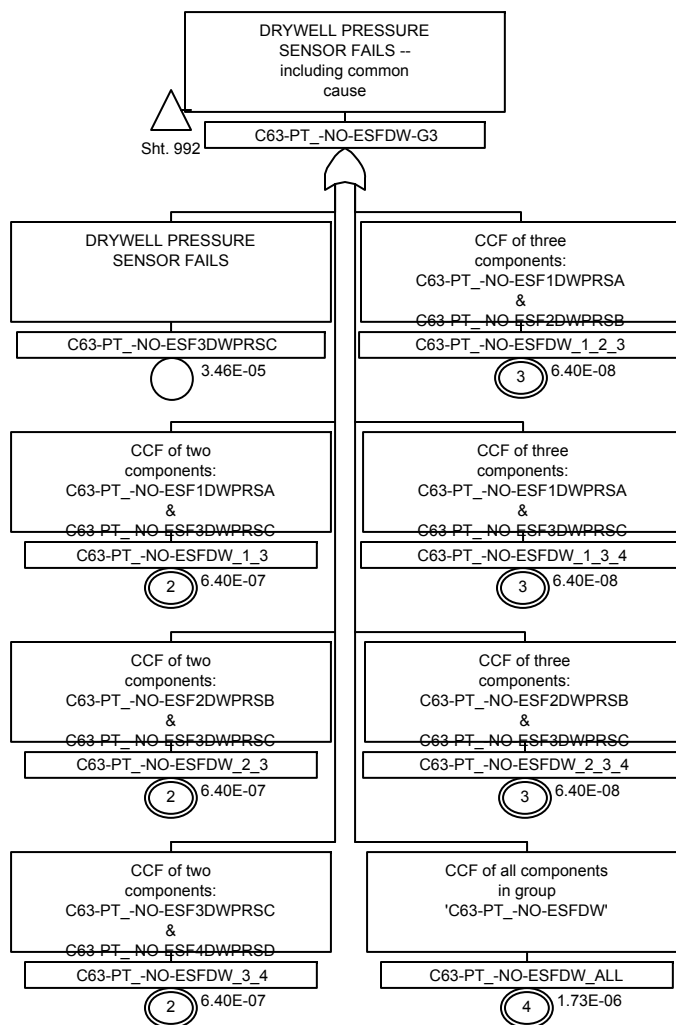


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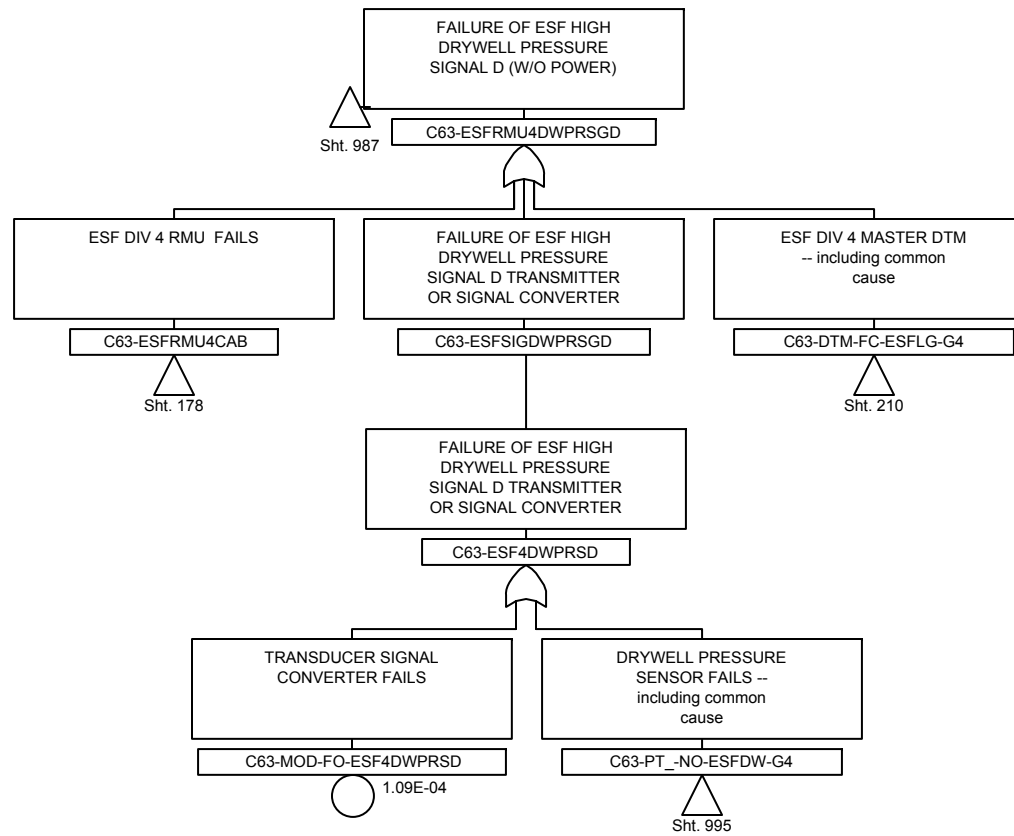


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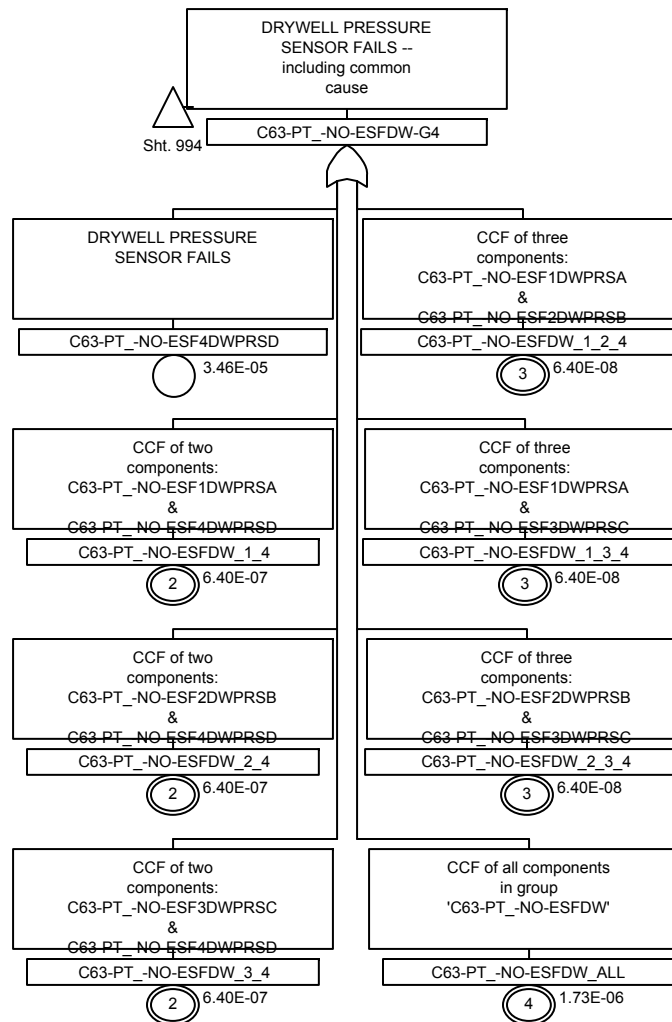


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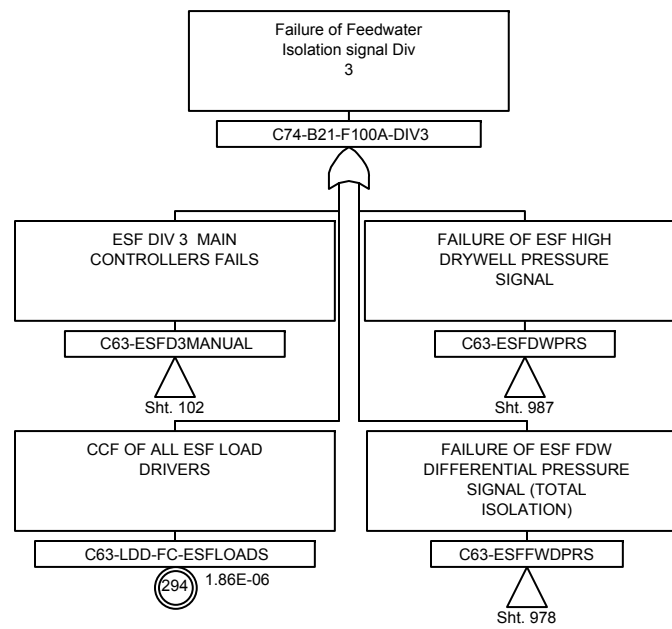


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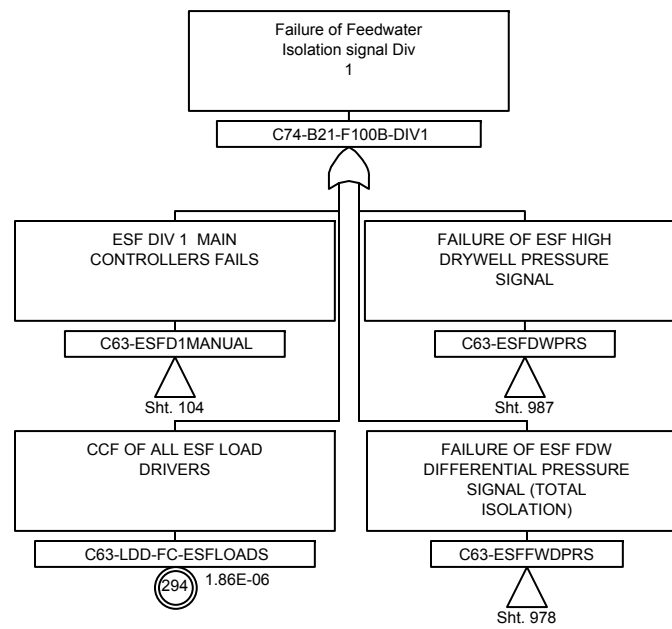


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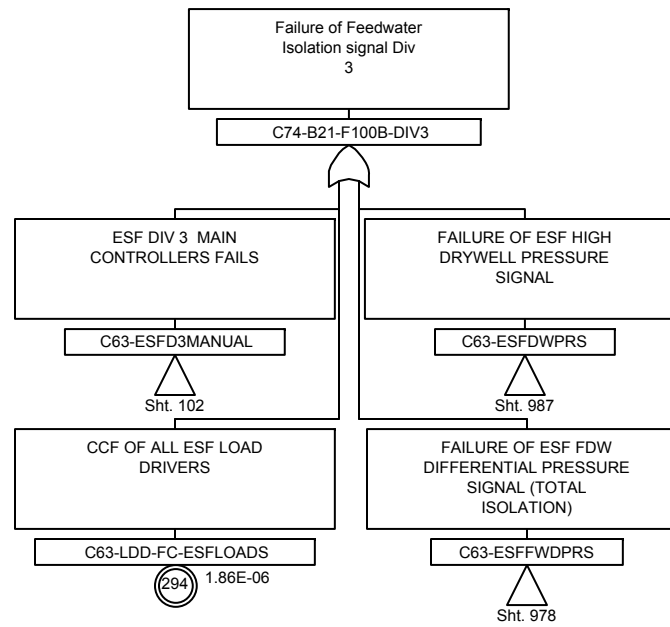


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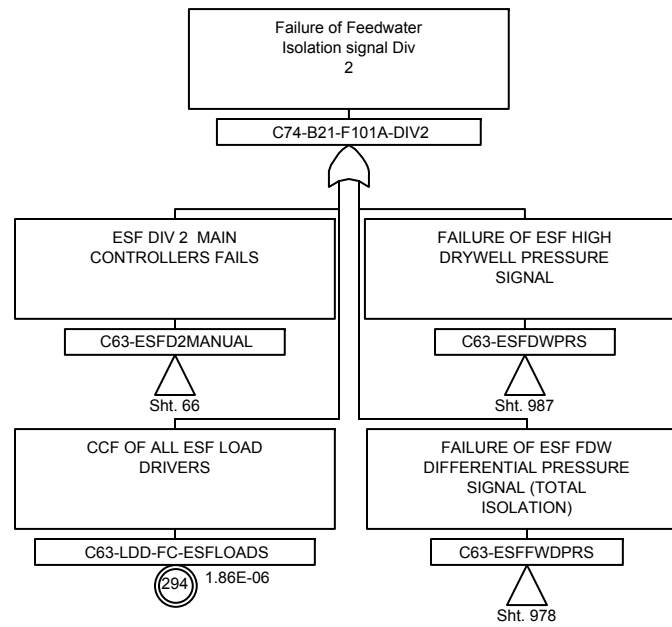


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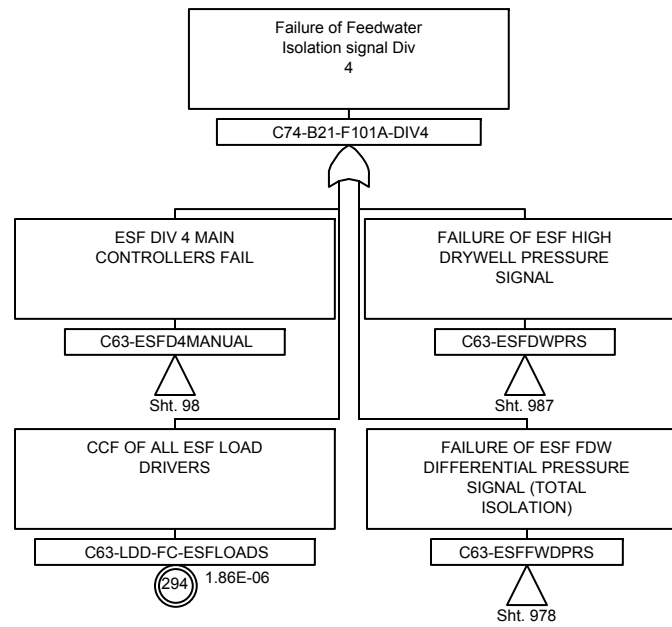


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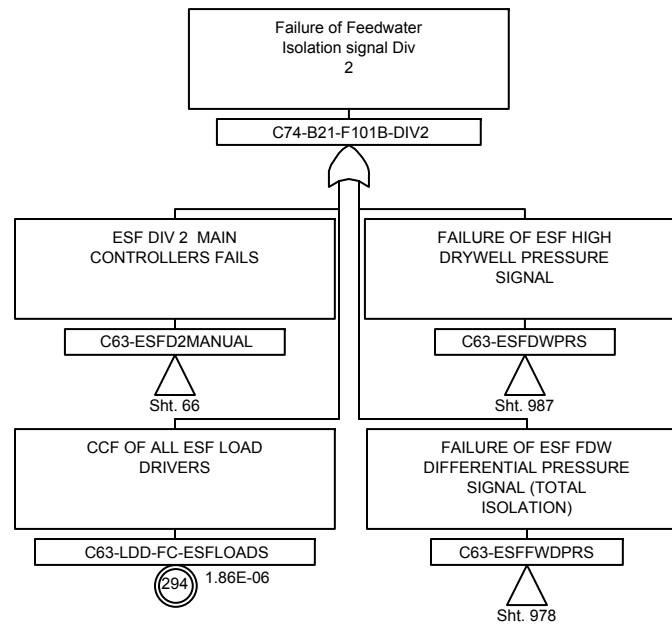


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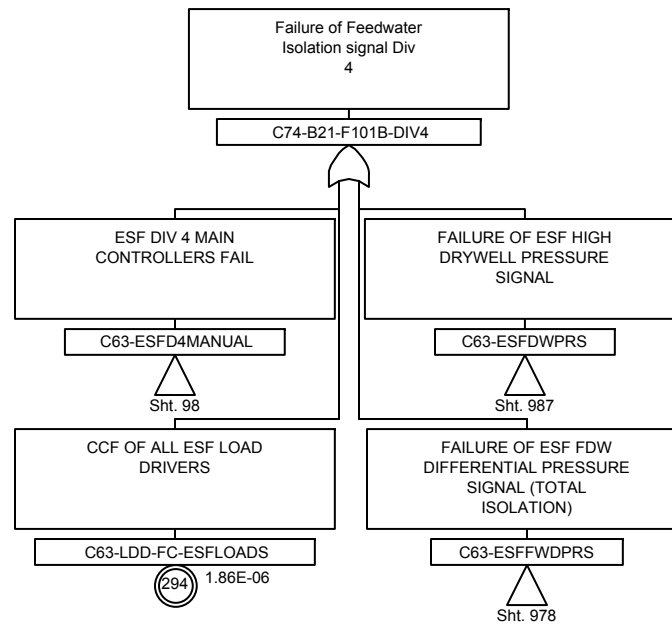


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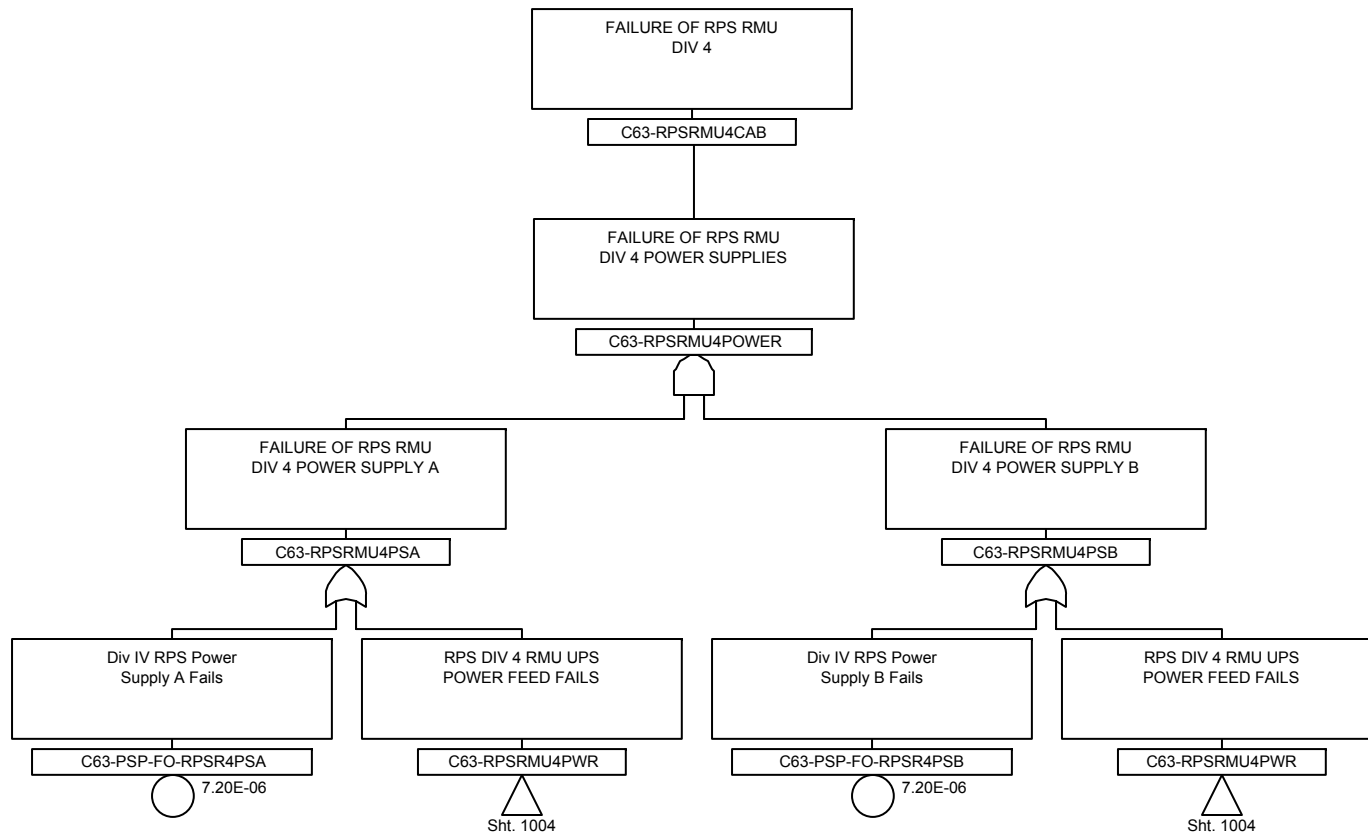


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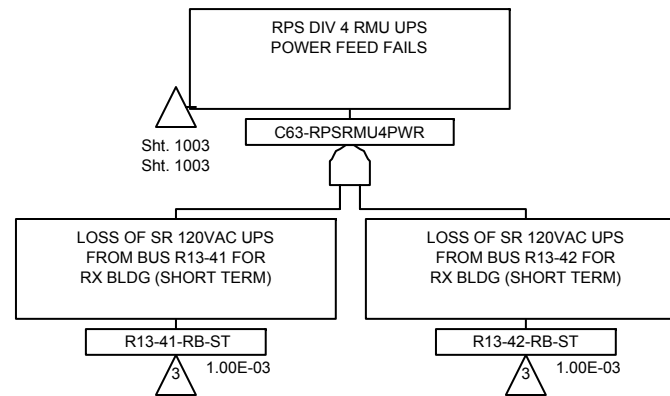


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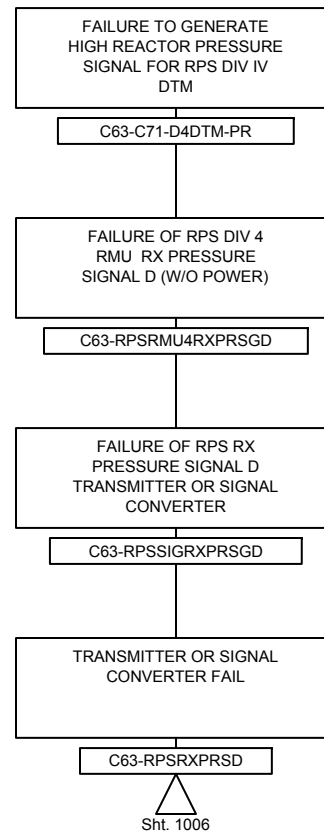


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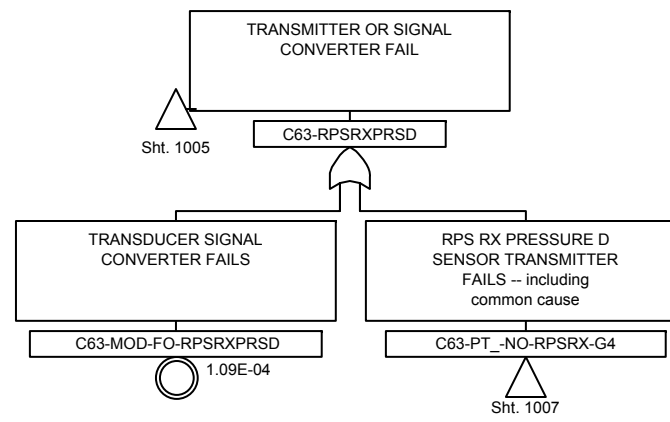


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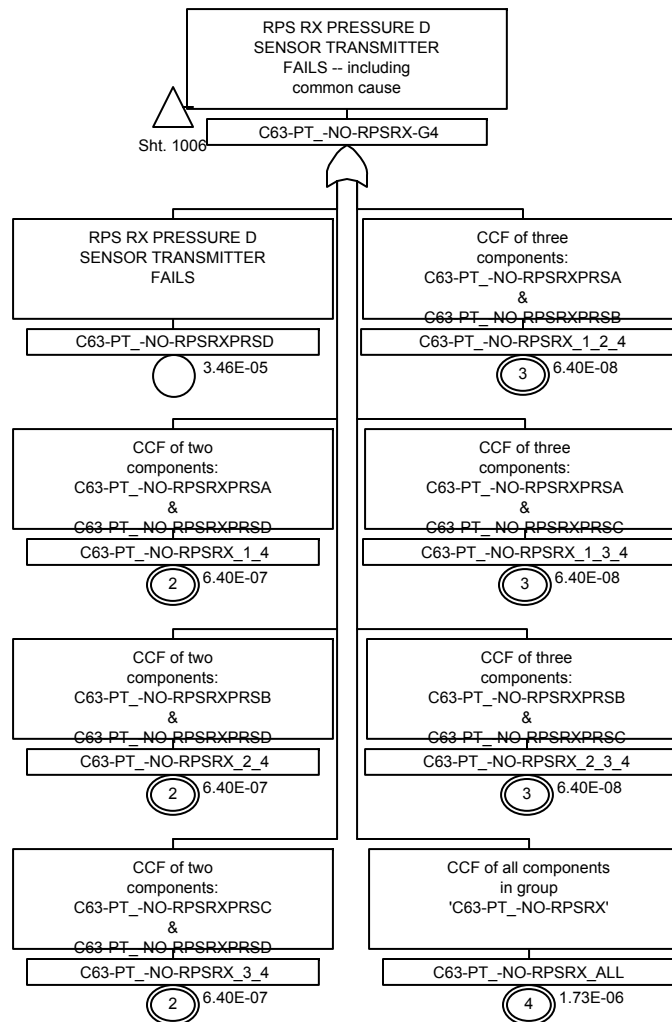


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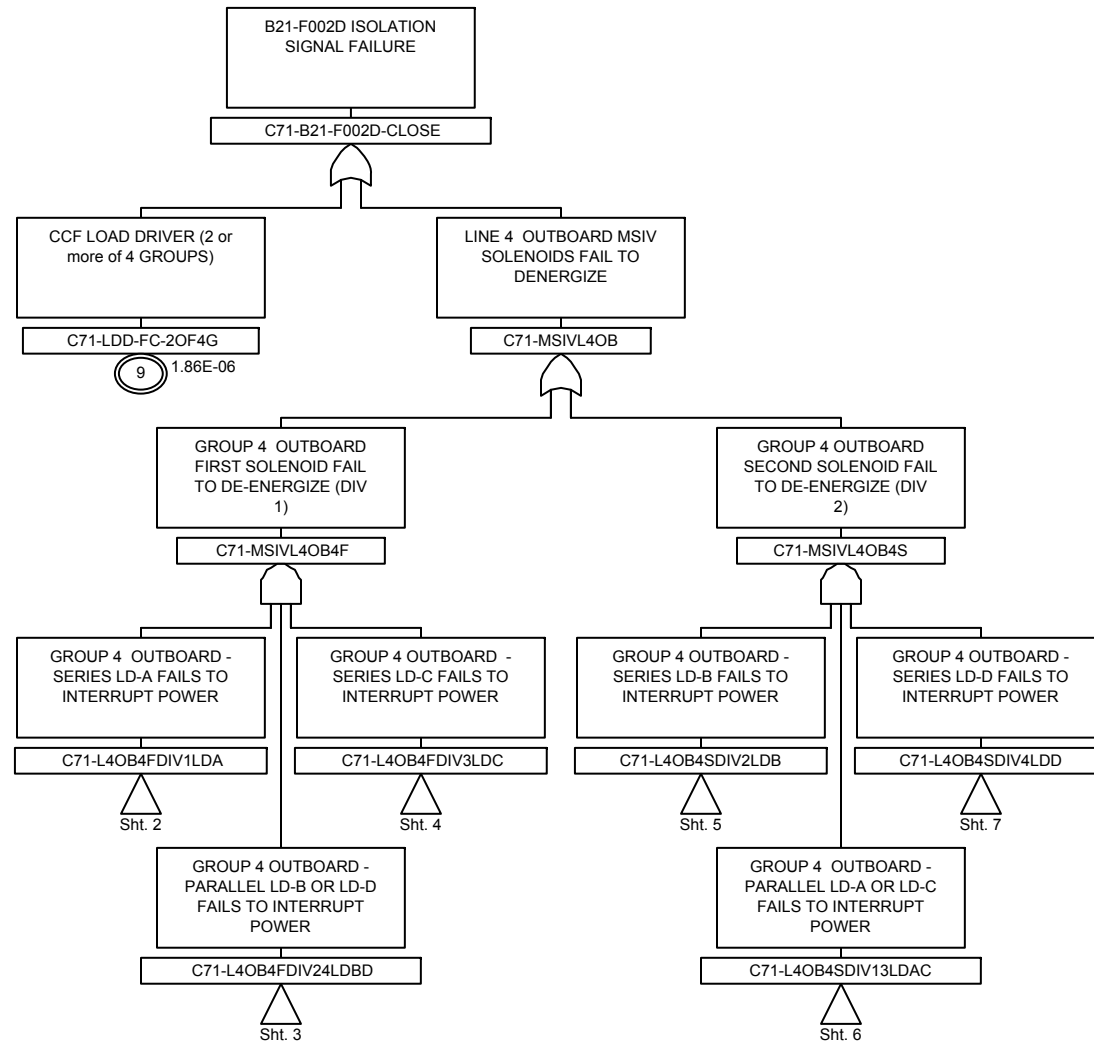


Figure 4.5-3c. Reactor Protection System  
Sheet 1

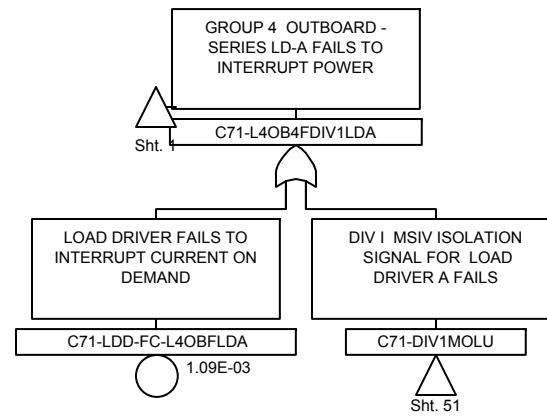


Figure 4.5-3c. Sheet 2 Reactor Protection System

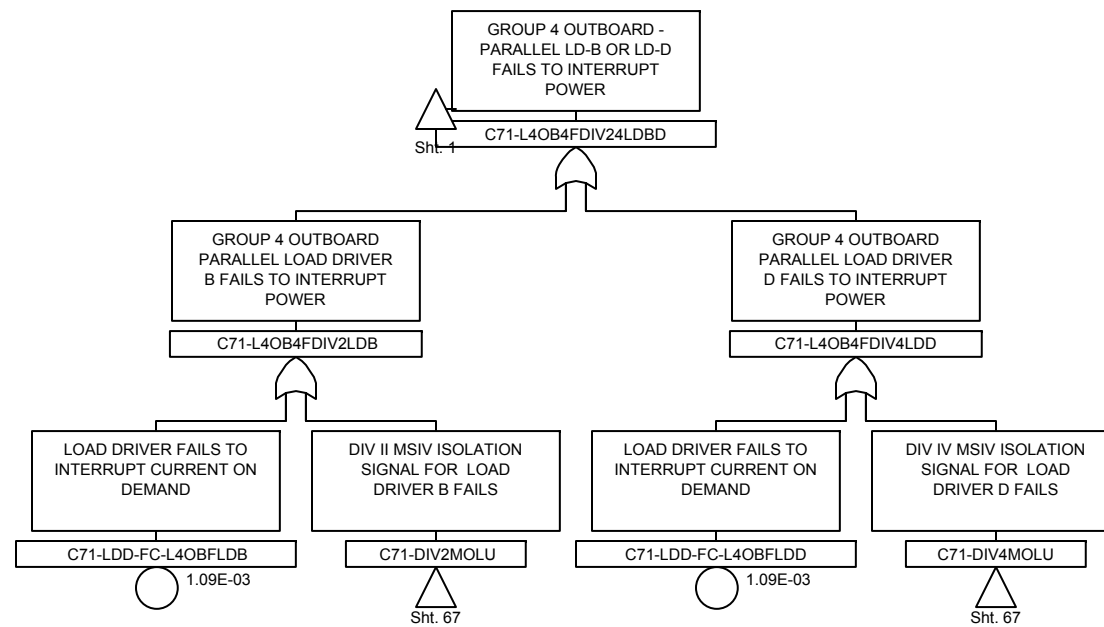


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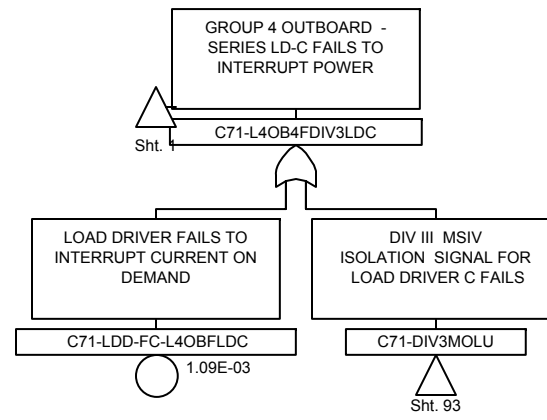


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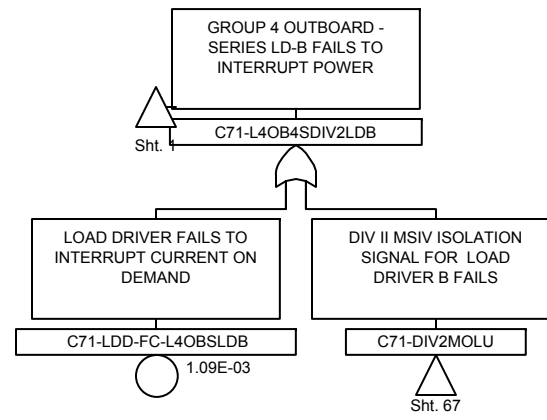


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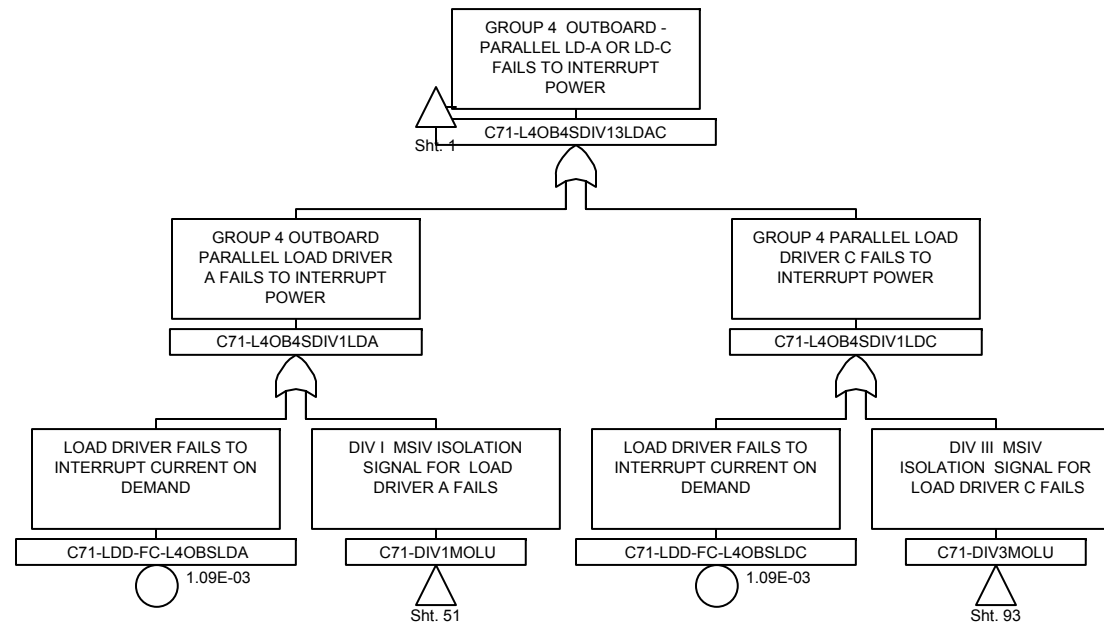


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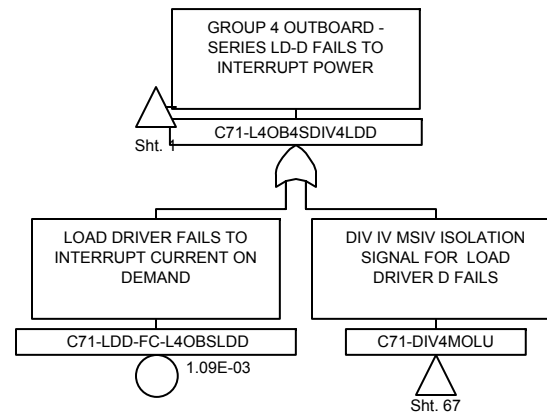


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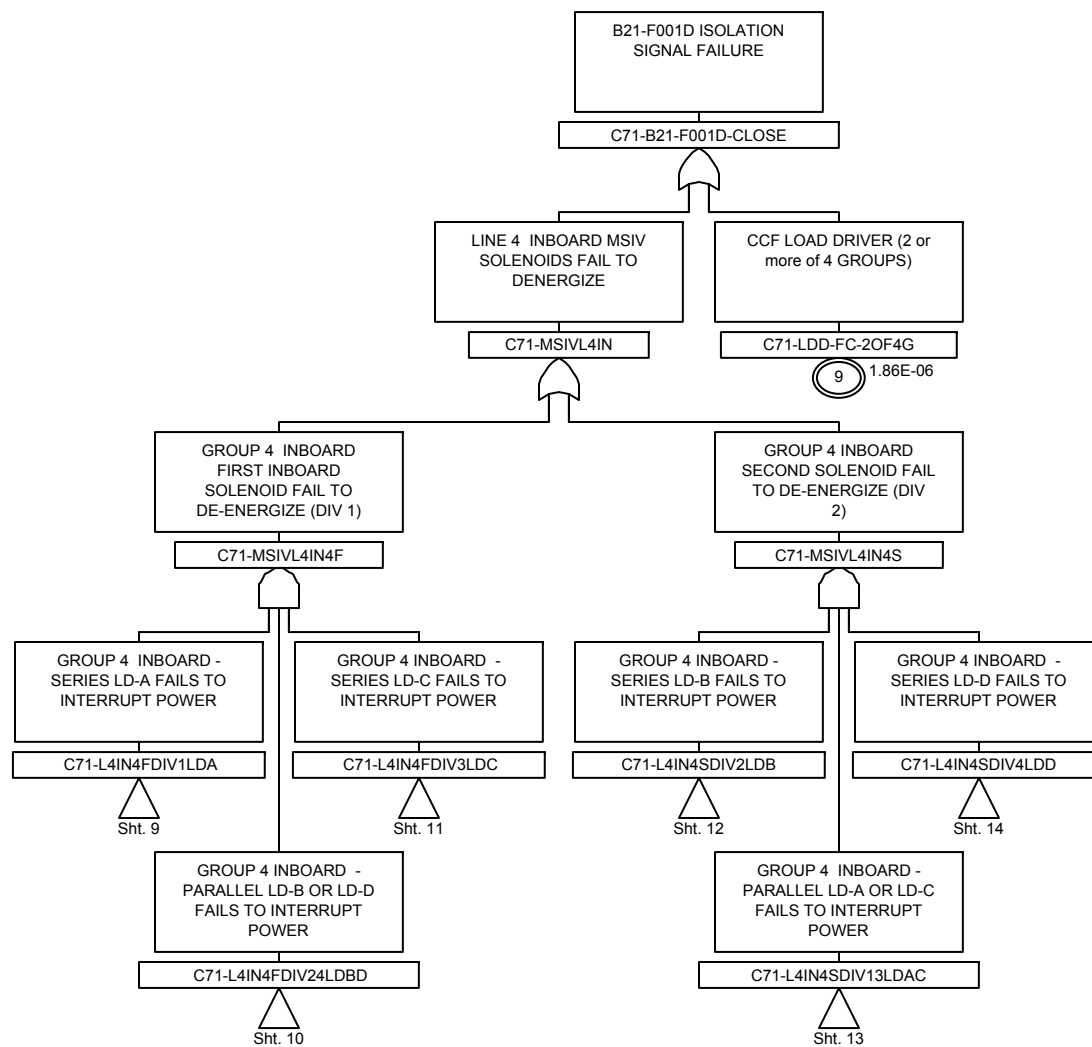


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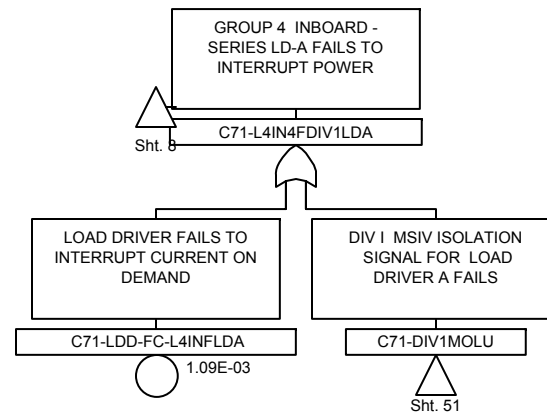


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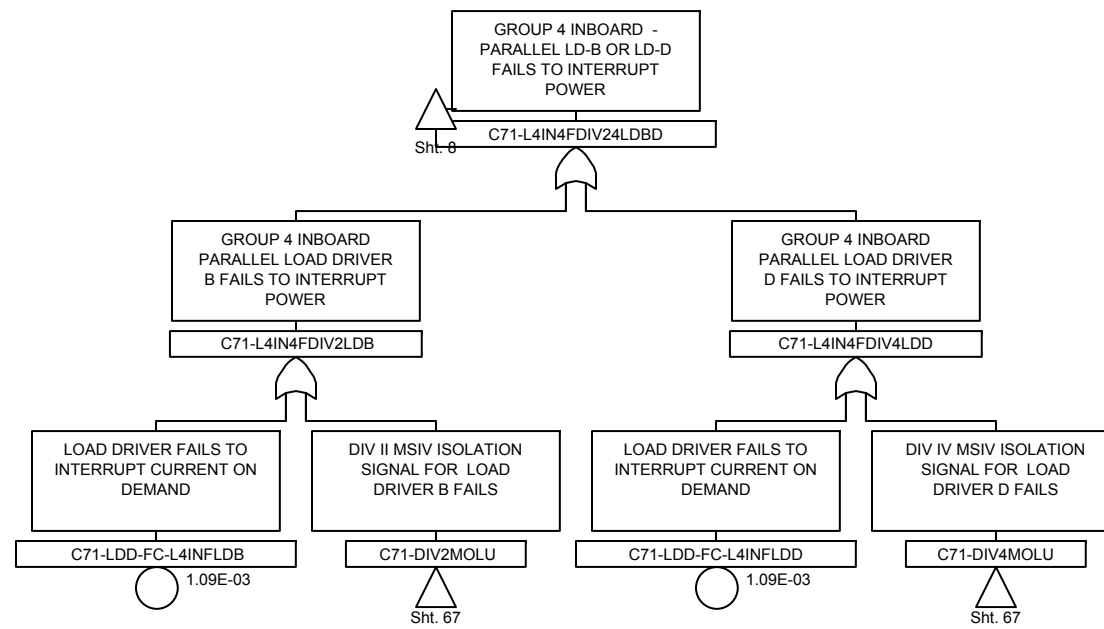


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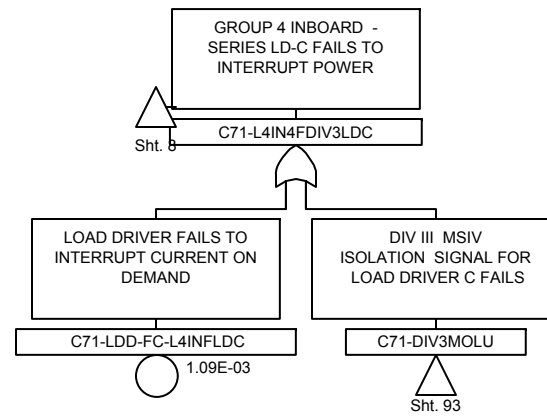


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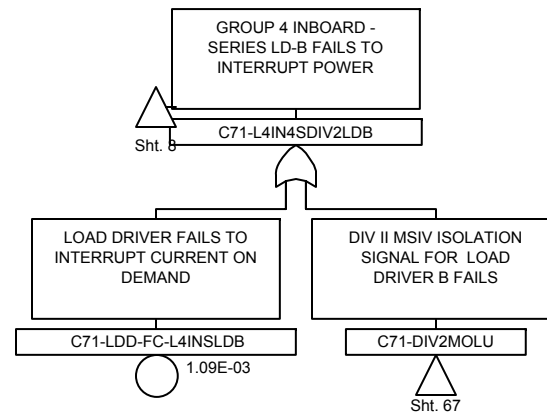


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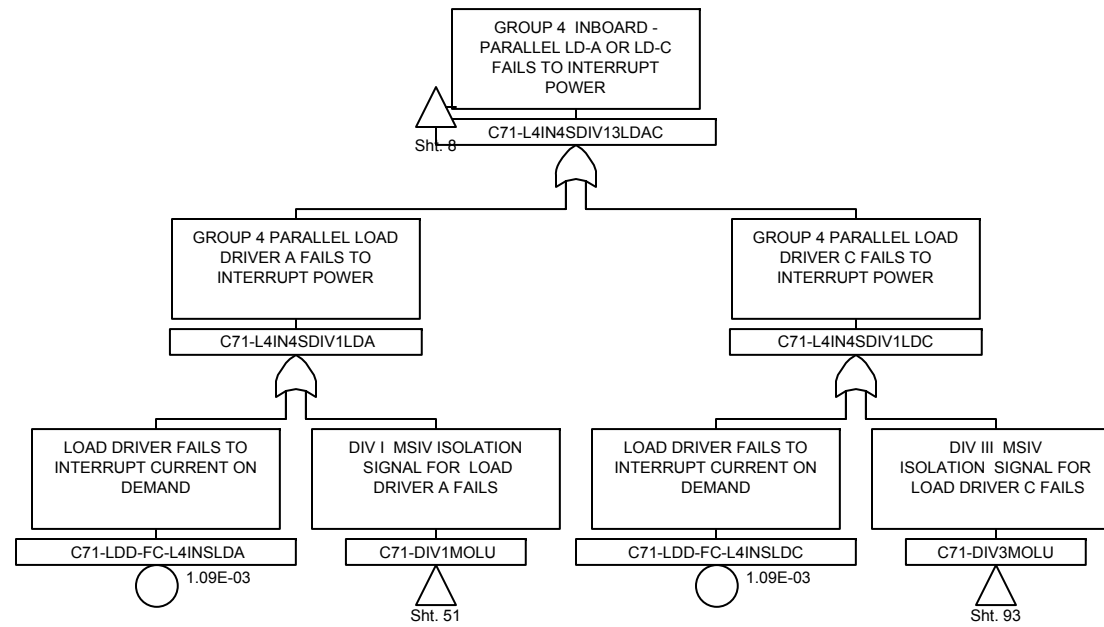


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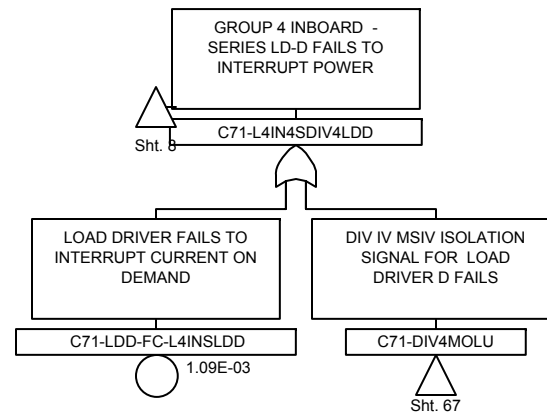


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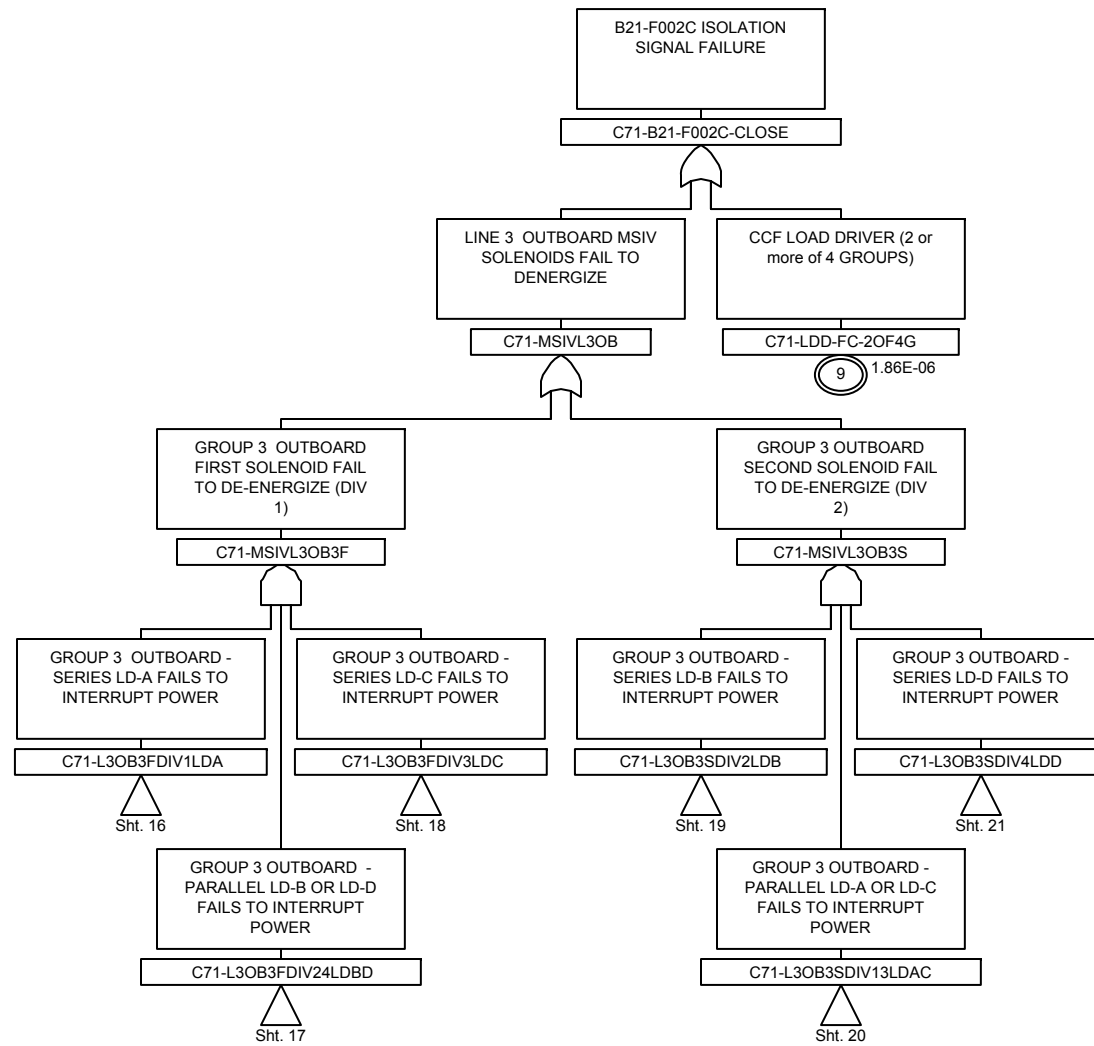


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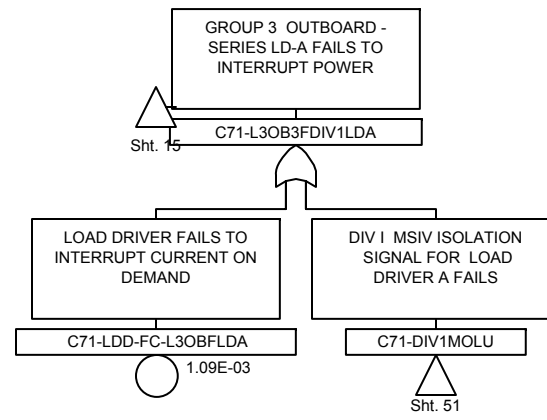


Figure 4.5-3c. Sheet 16 Reactor Protection System



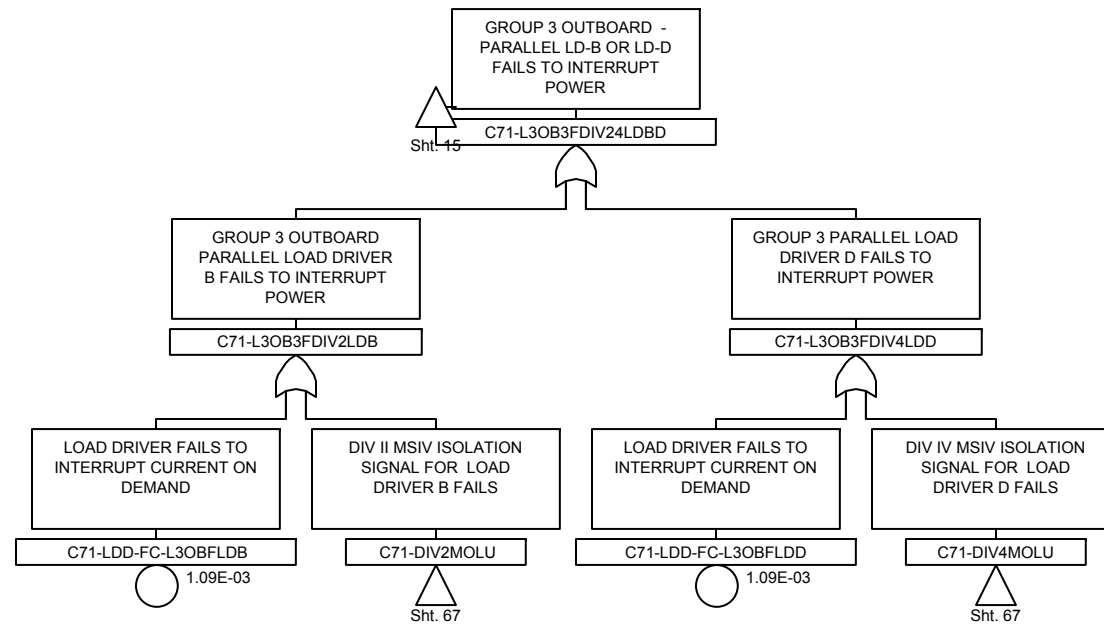


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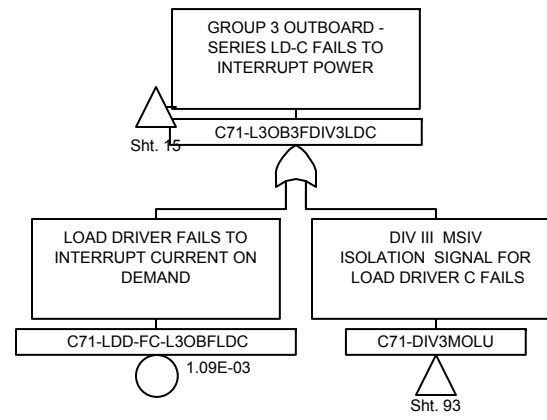


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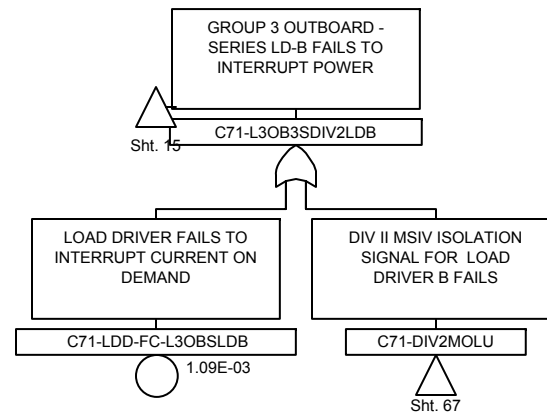


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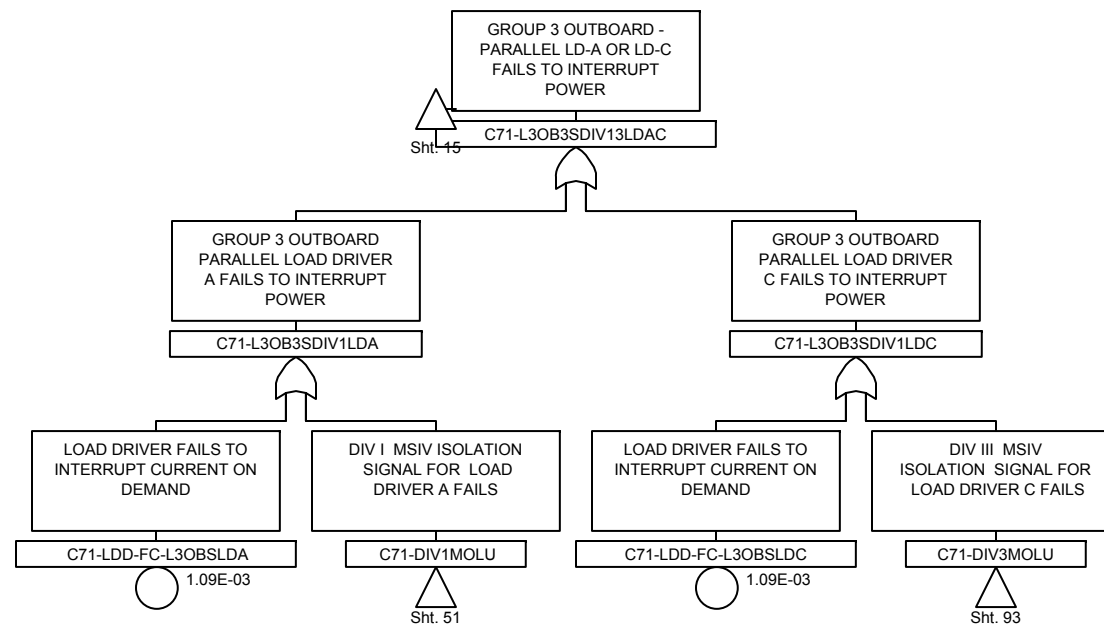


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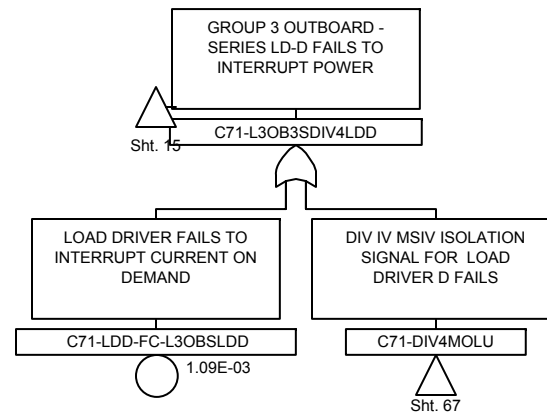


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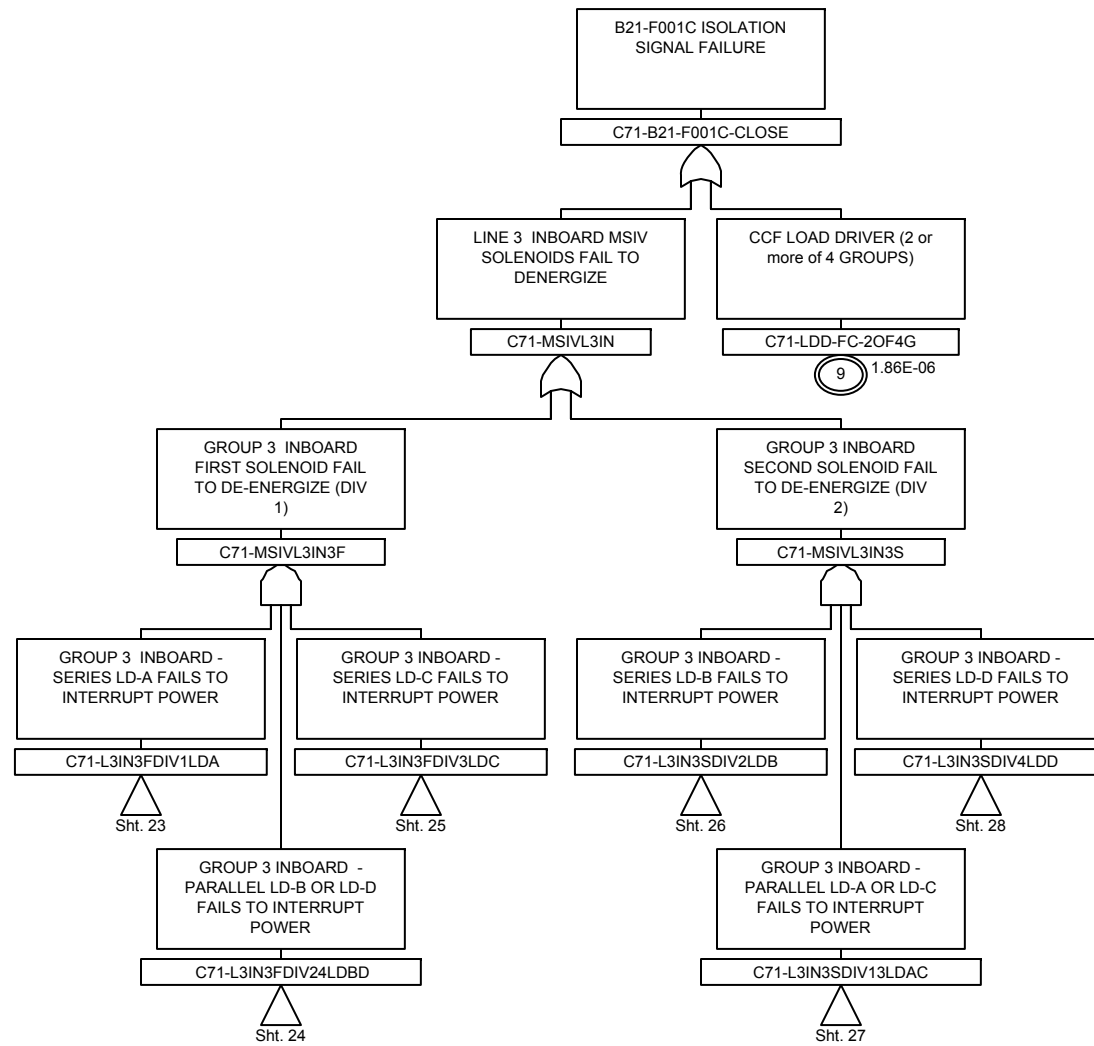


Figure 4.5-3c. Sheet 22 Reactor Protection System

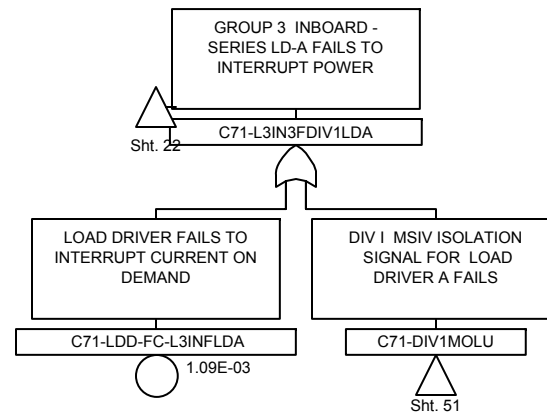


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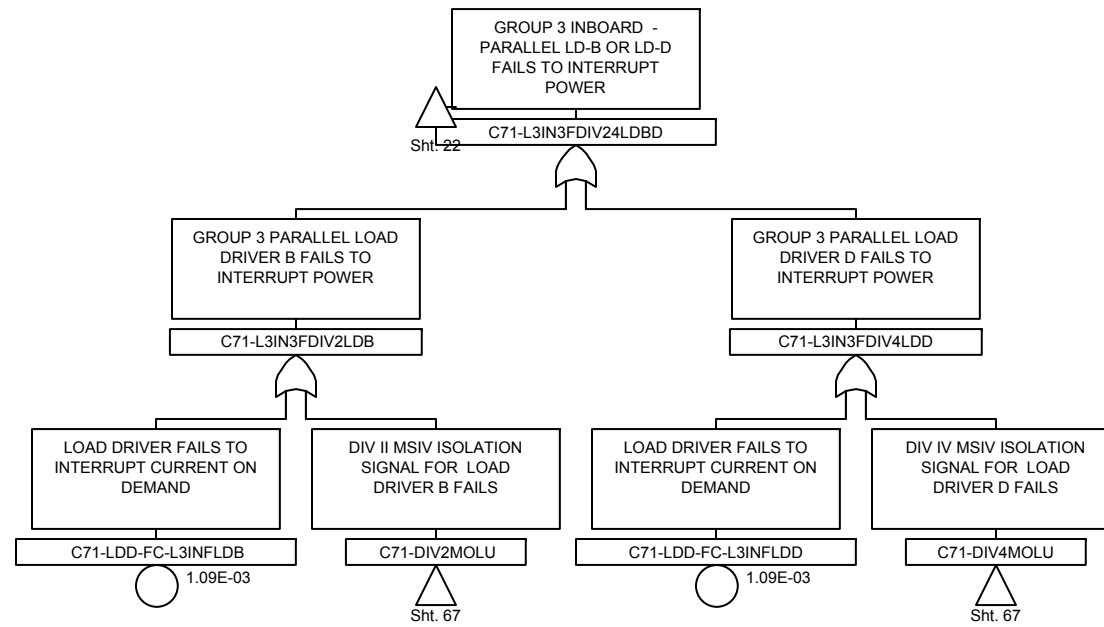


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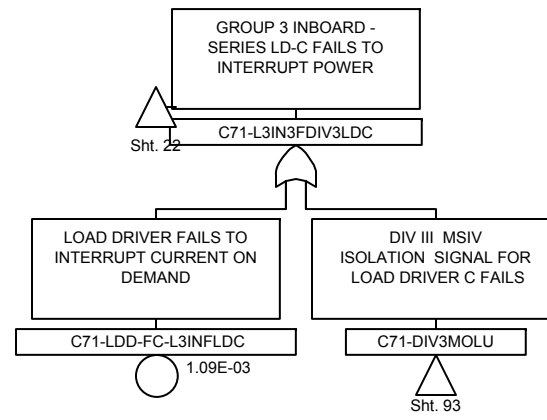


Figure 4.5-3c. Sheet 25 Reactor Protection System

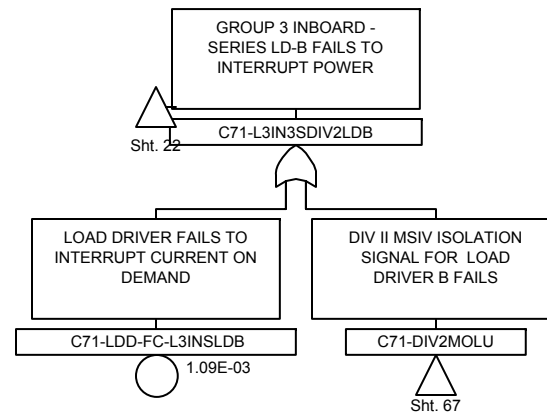


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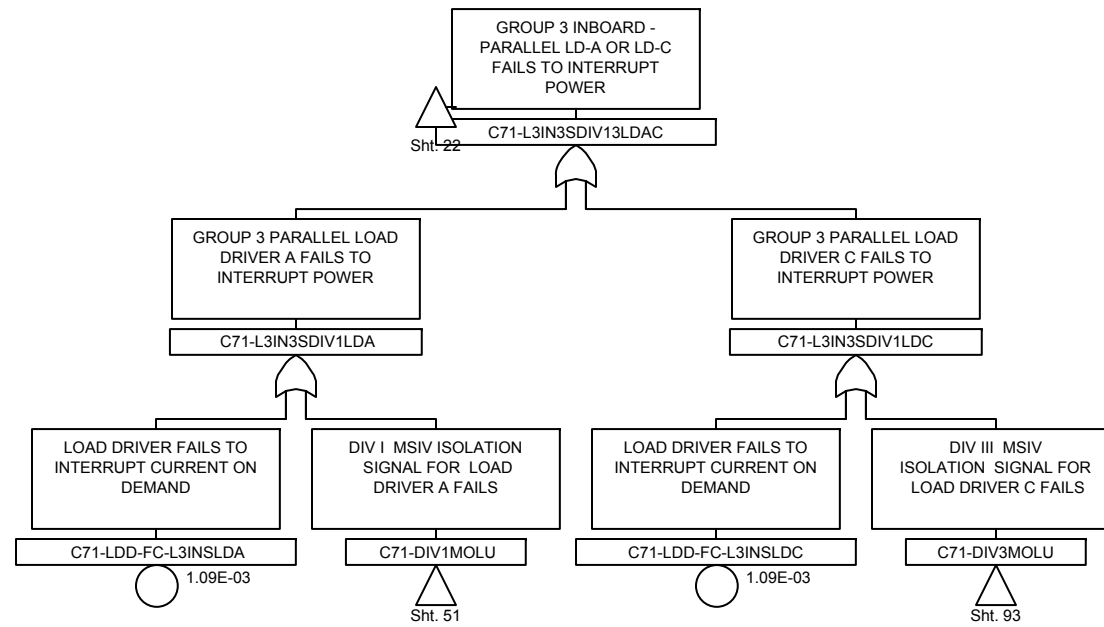


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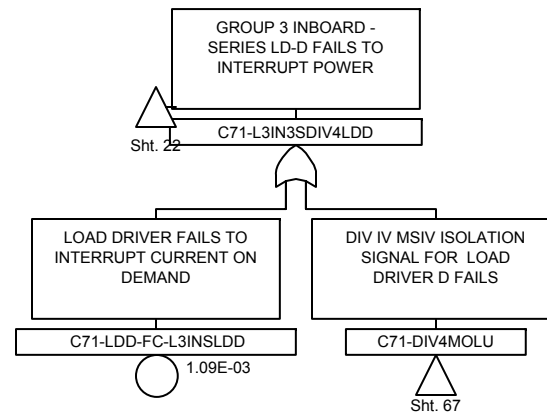


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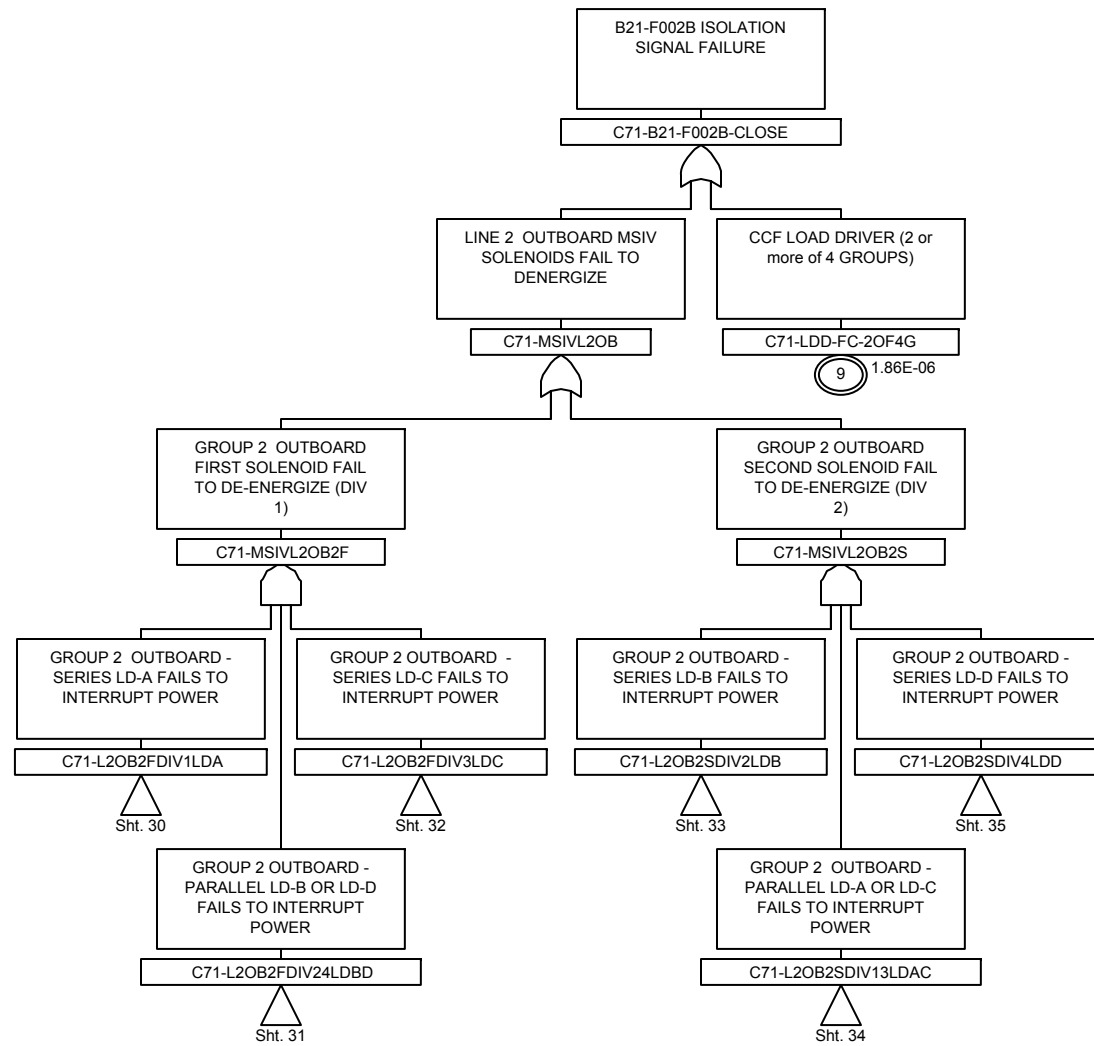


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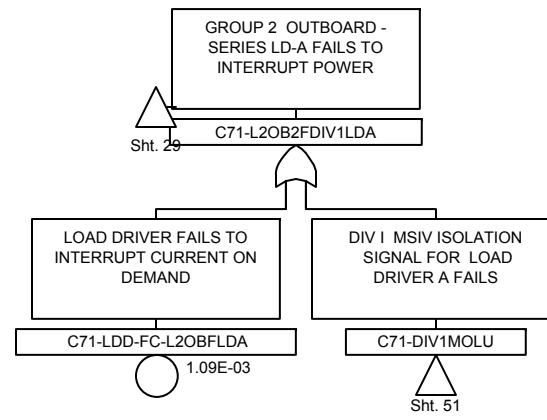


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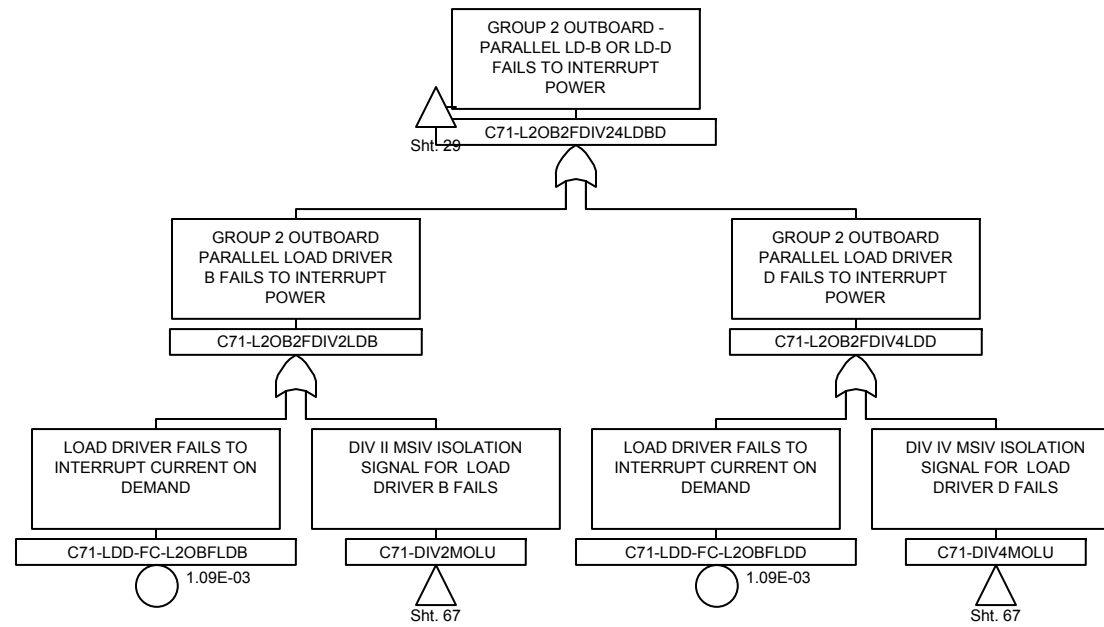


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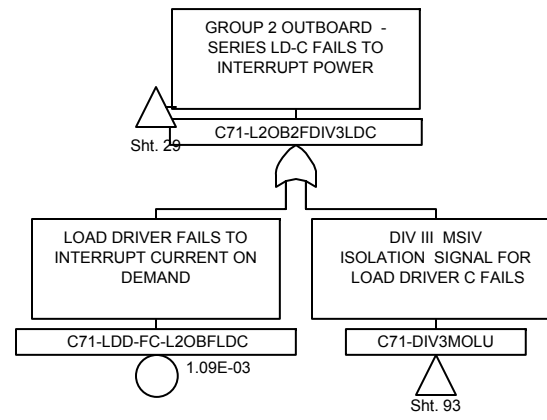


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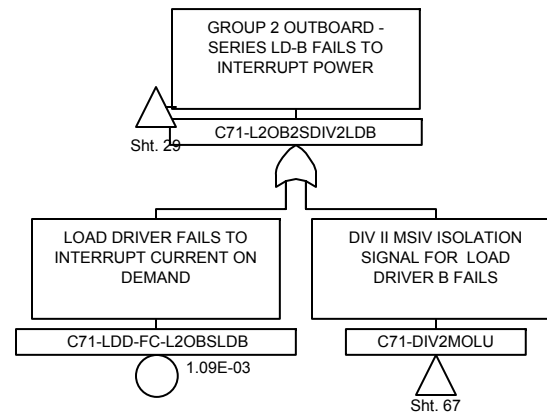


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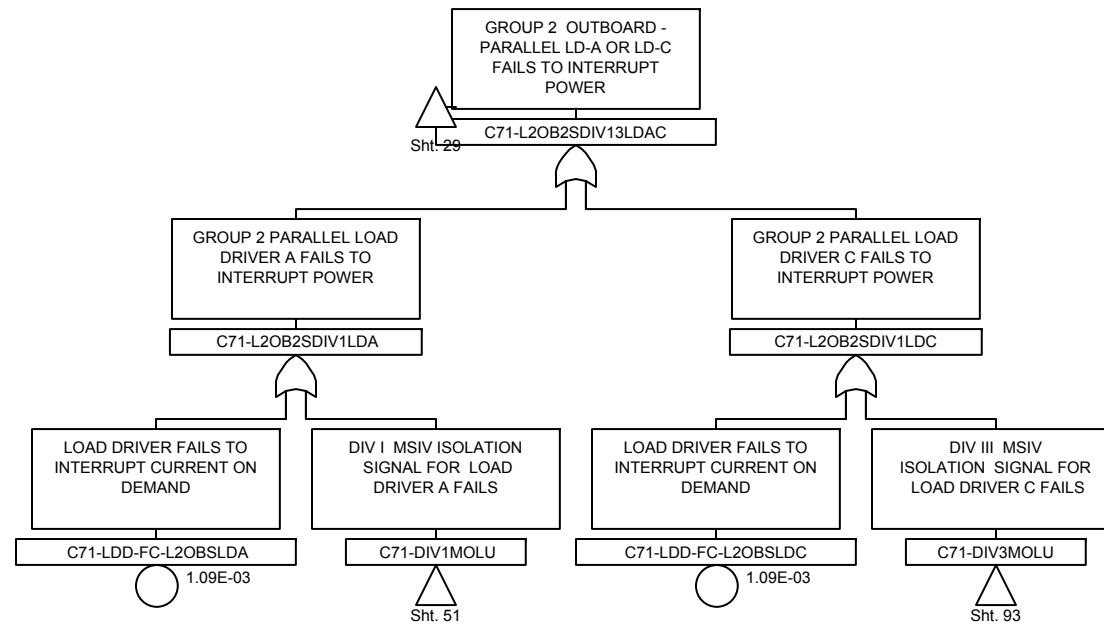


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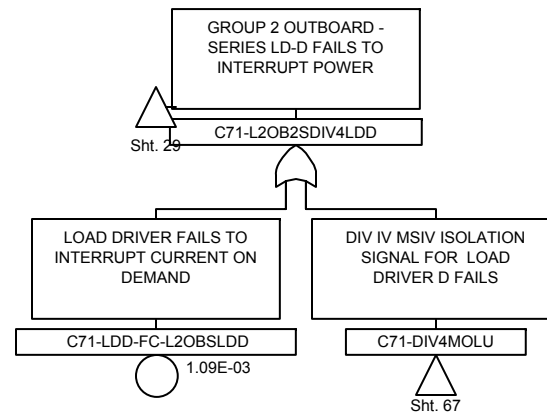


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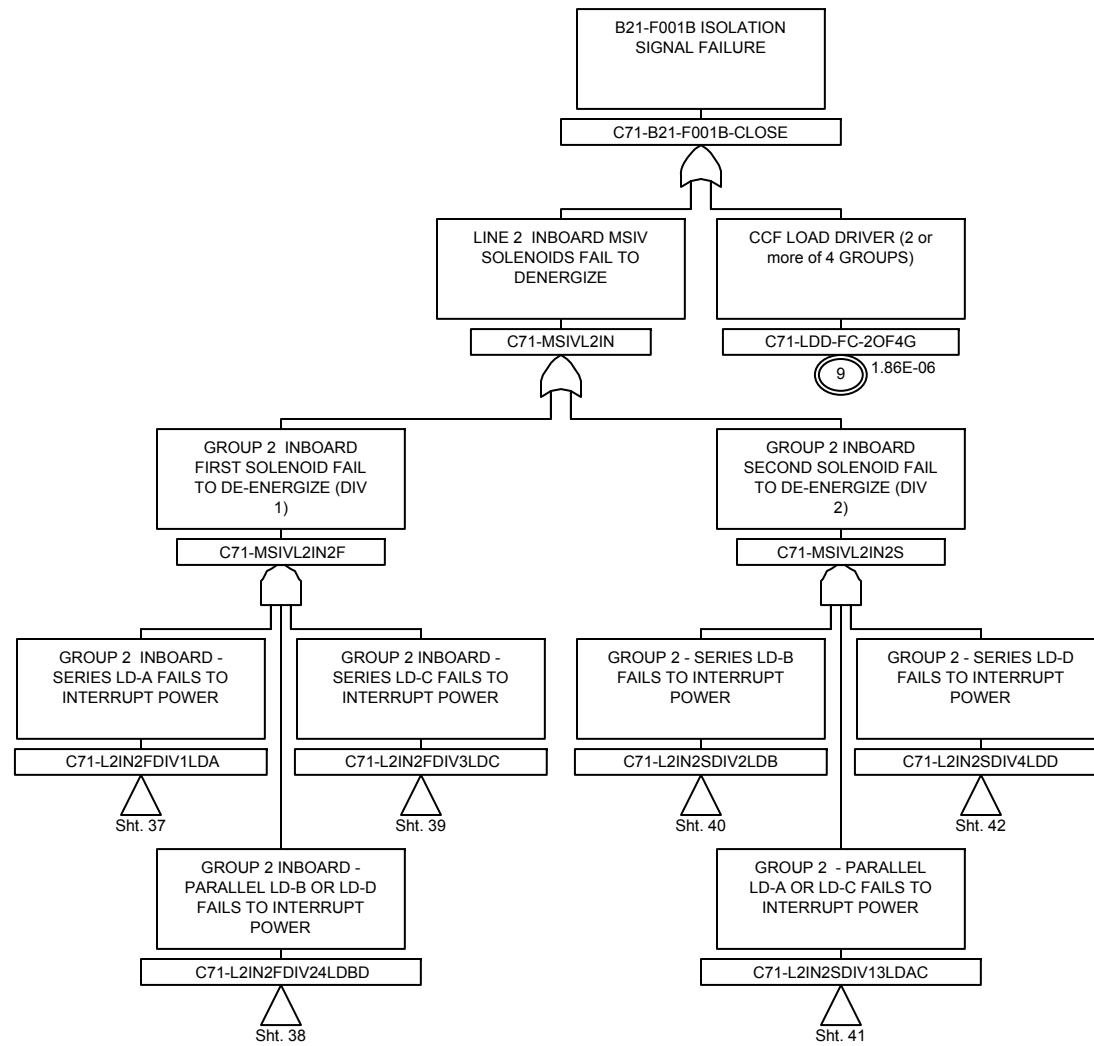


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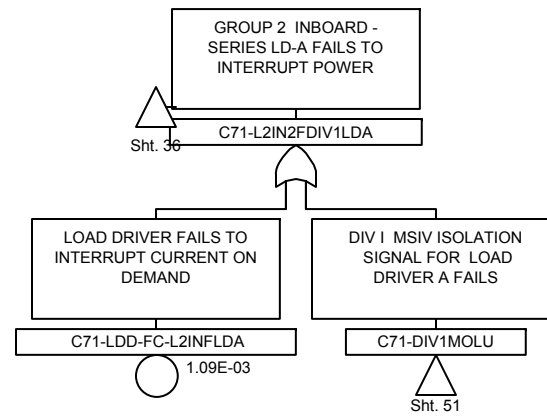


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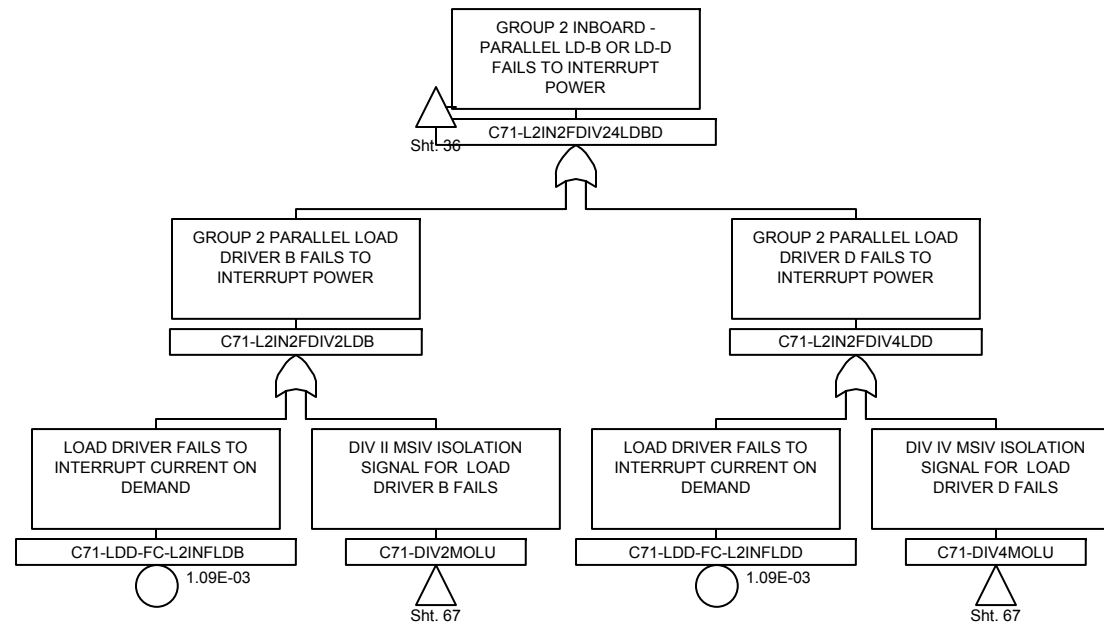


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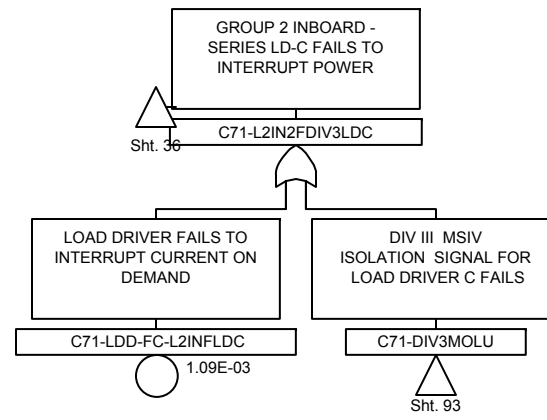


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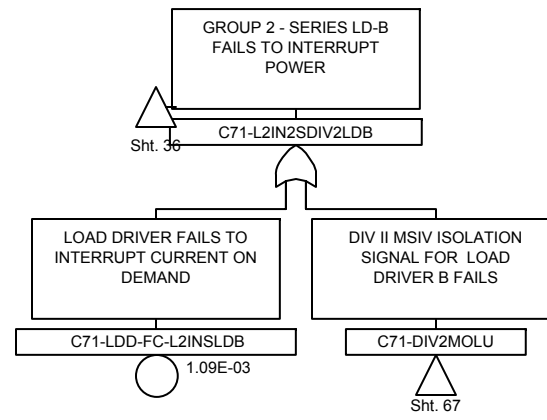


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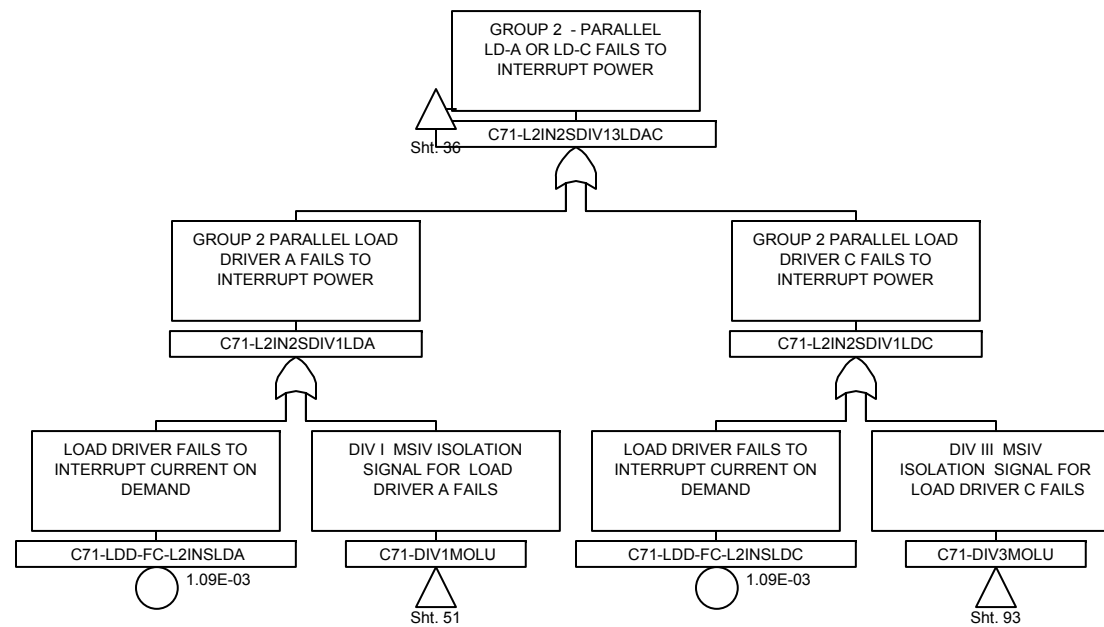


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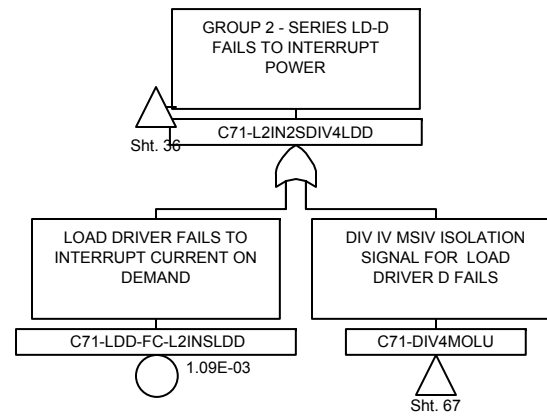


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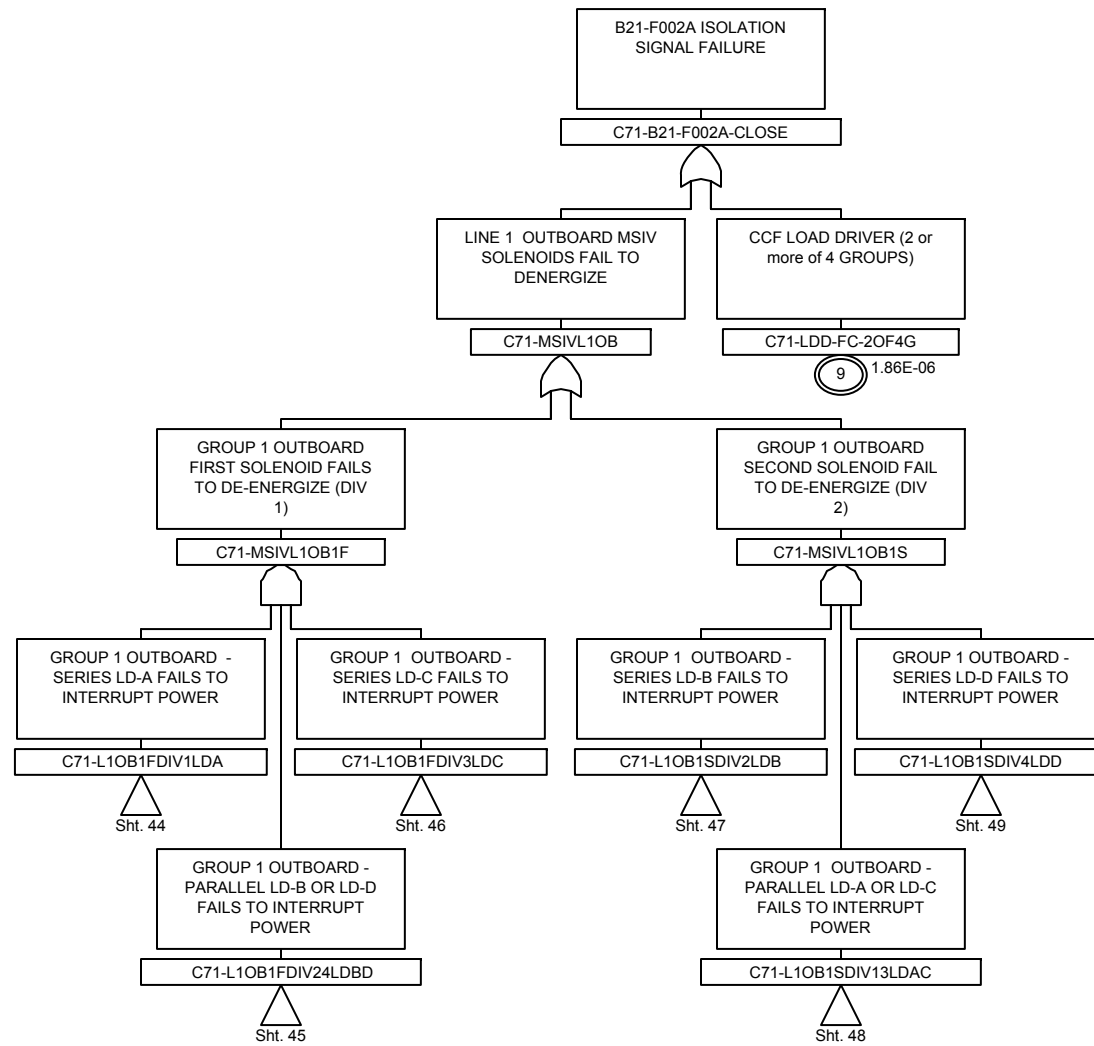


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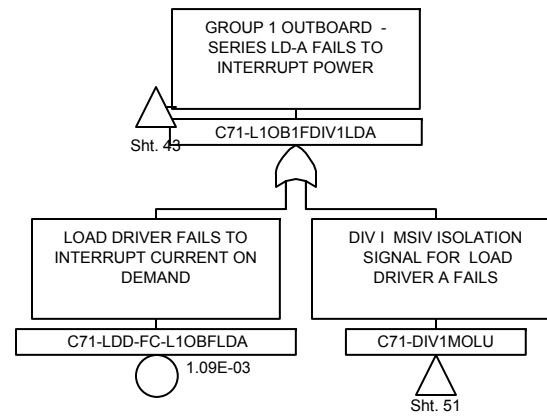


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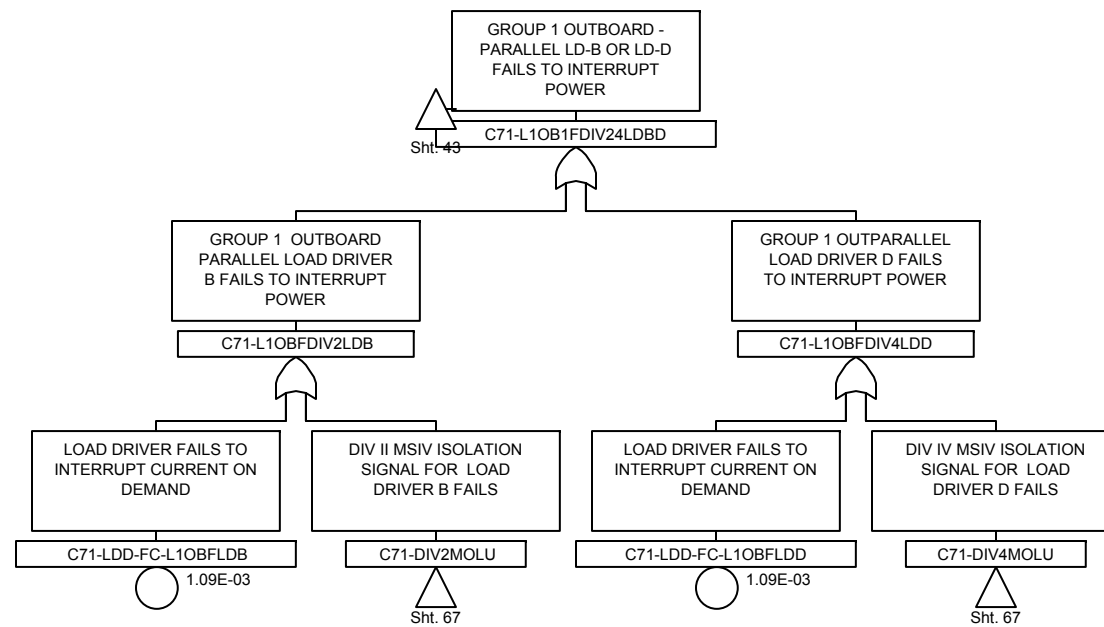


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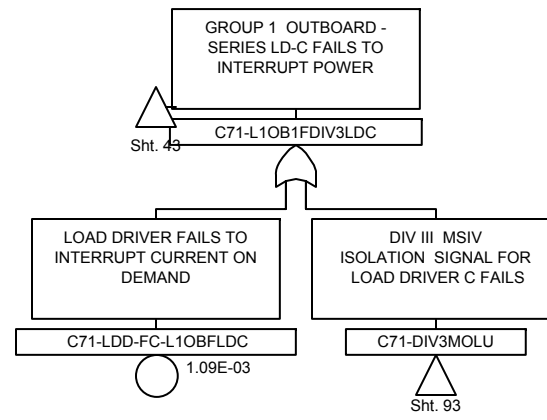


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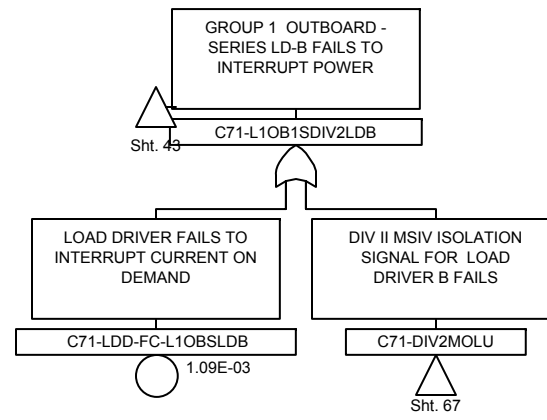


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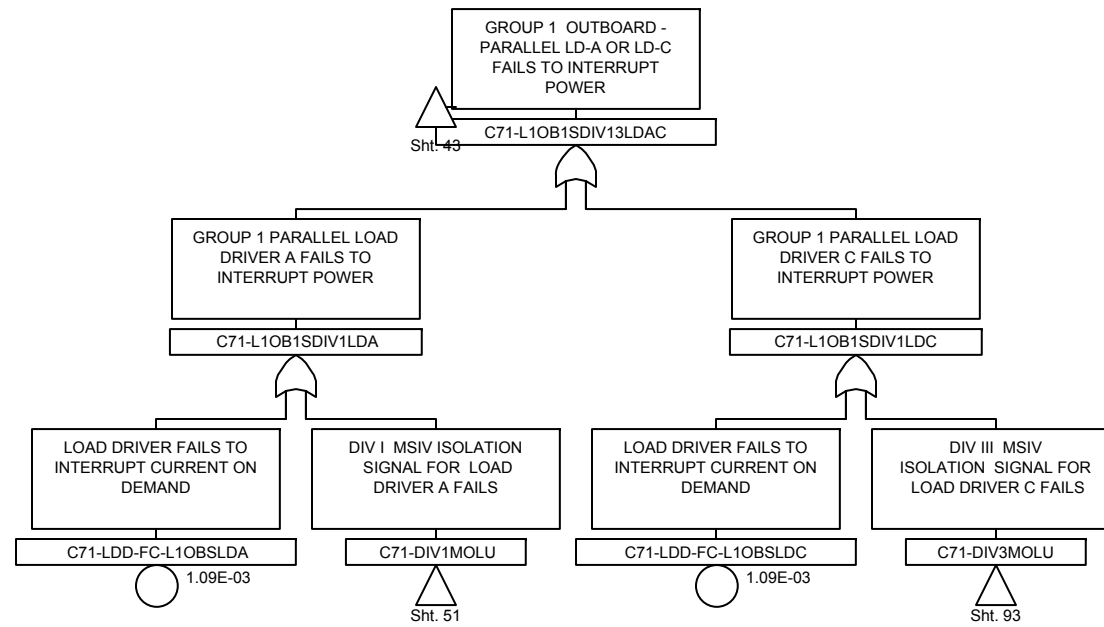


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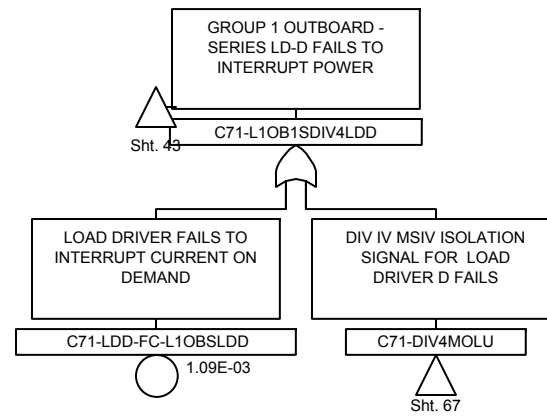


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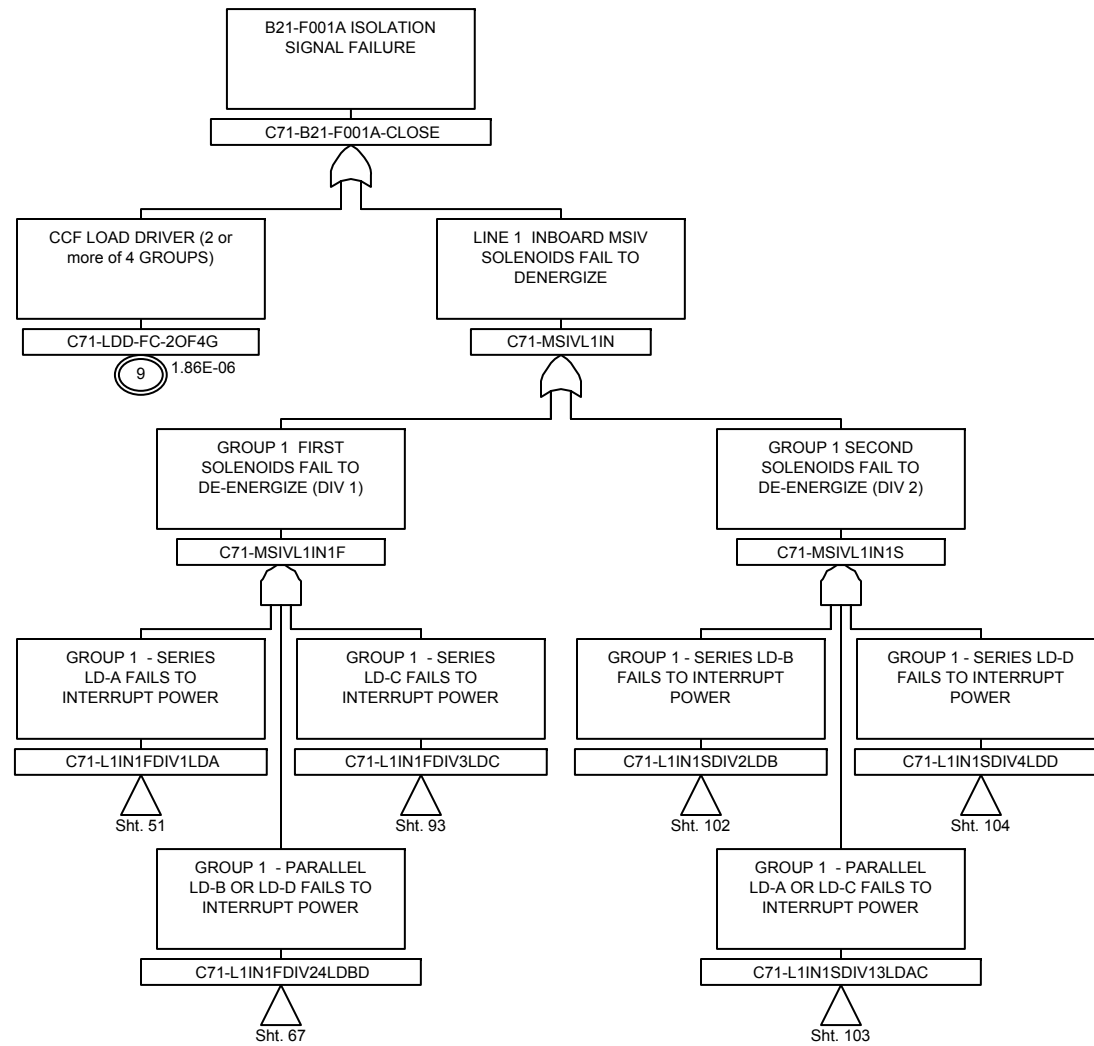


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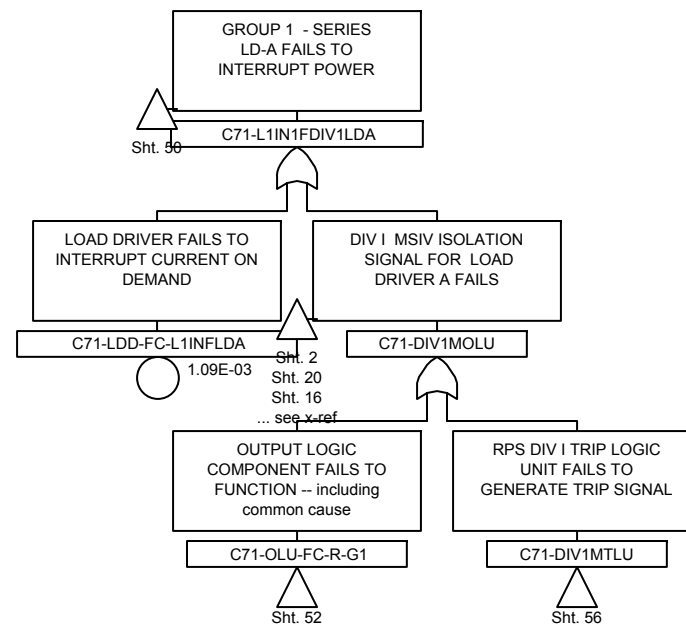


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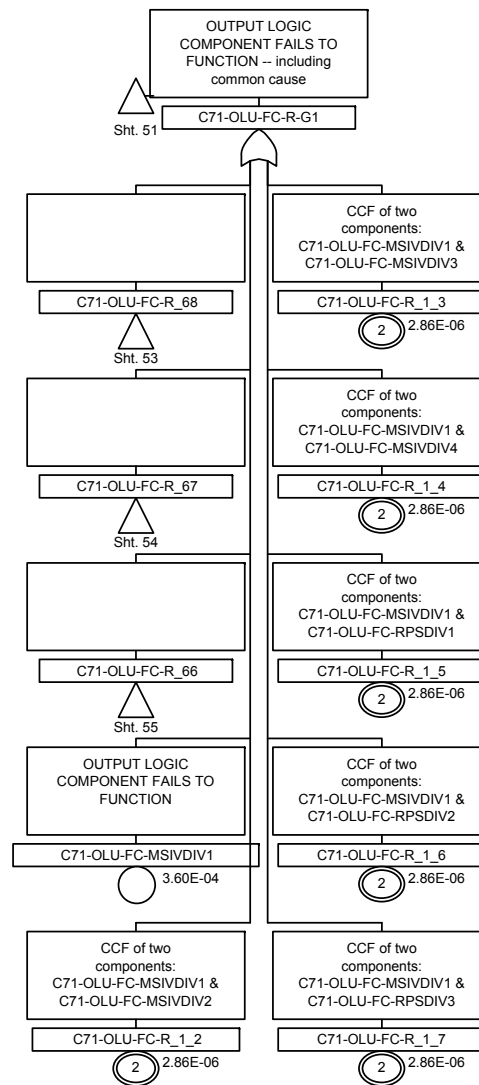


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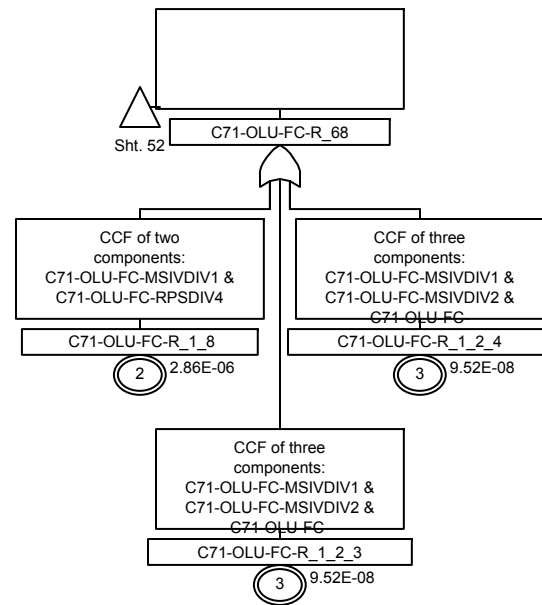


Figure 4.5-3c. Sheet 53 Reactor Protection System

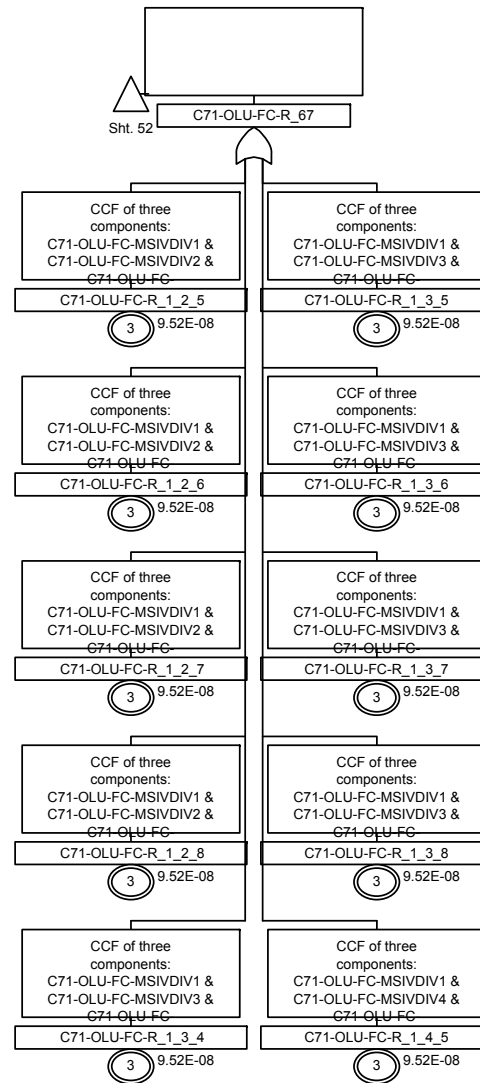


Figure 4.5-3c. Sheet 54 Reactor Protection System

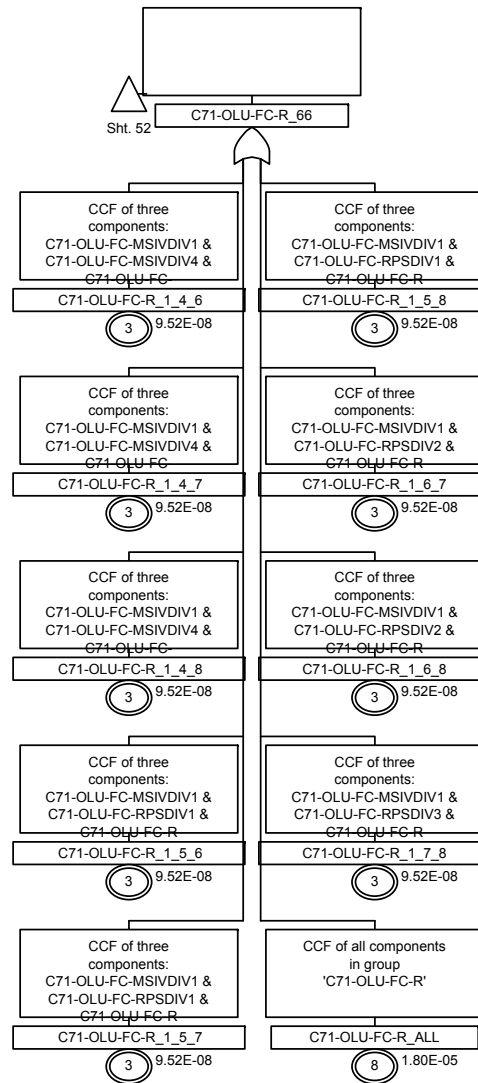


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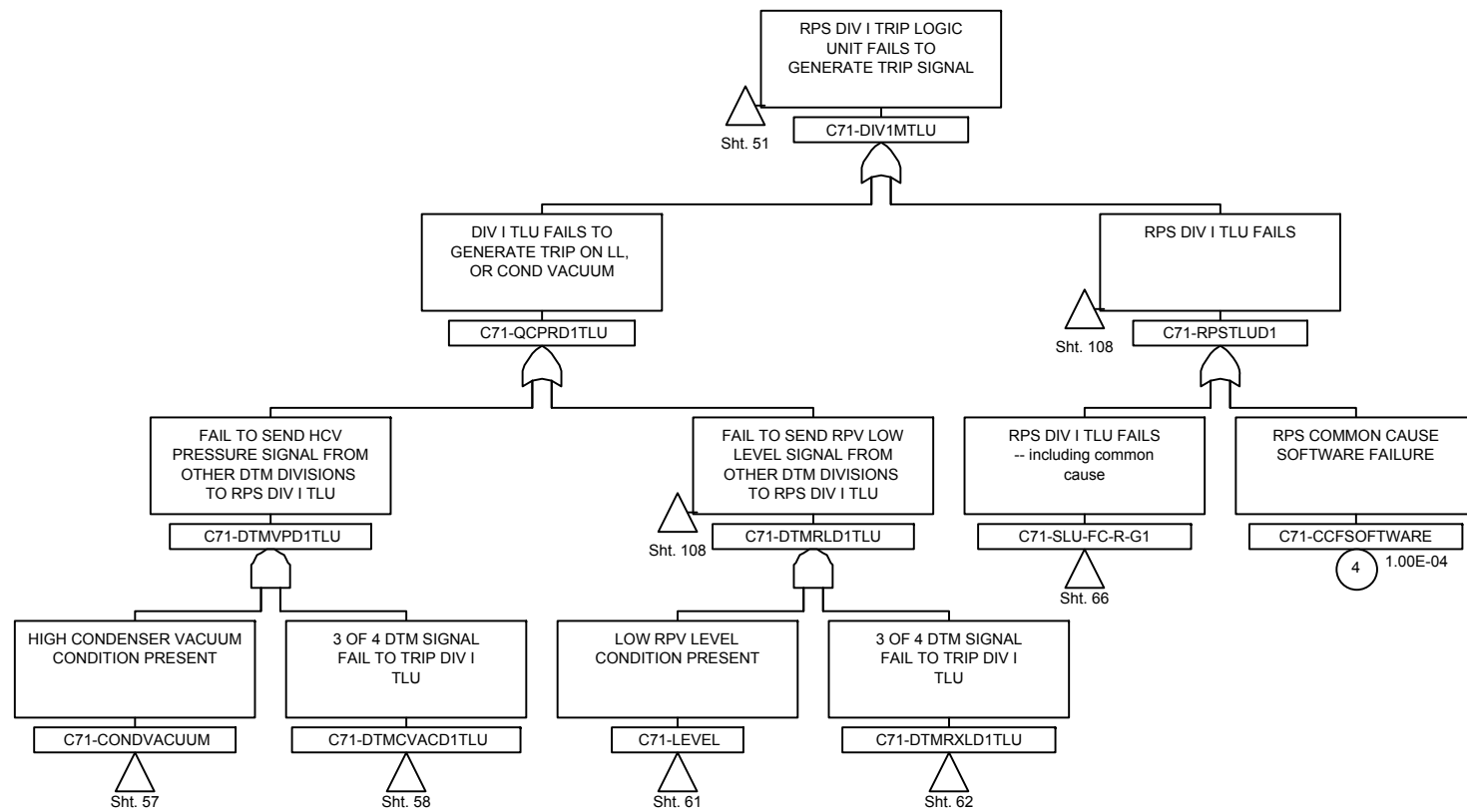


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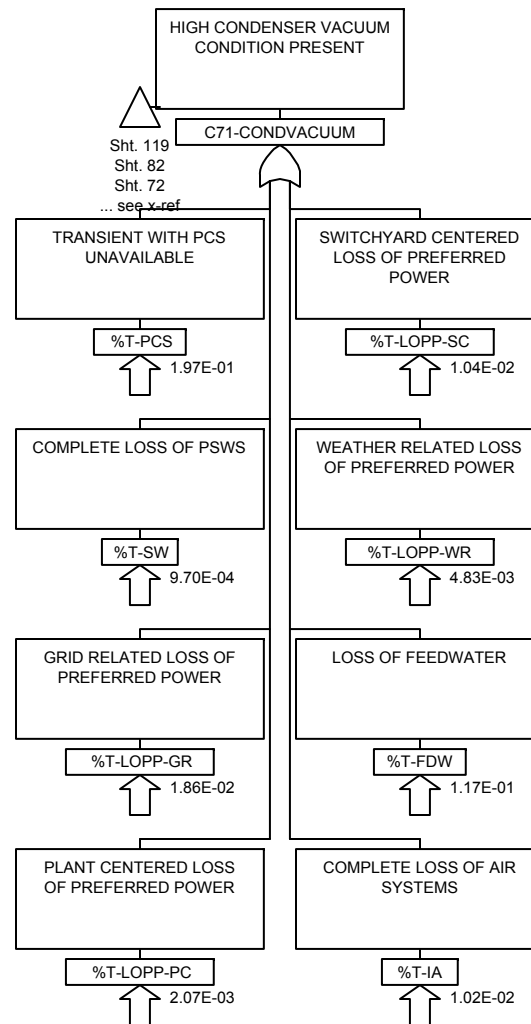


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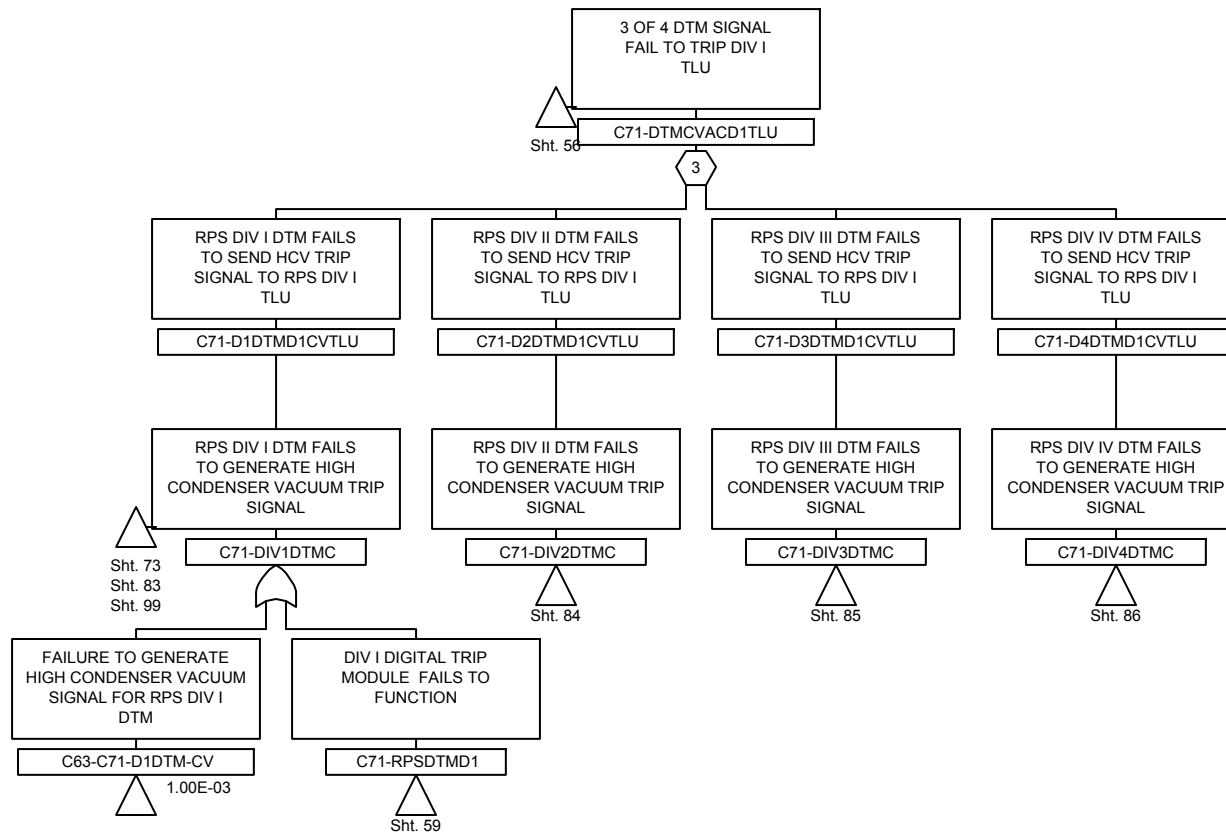


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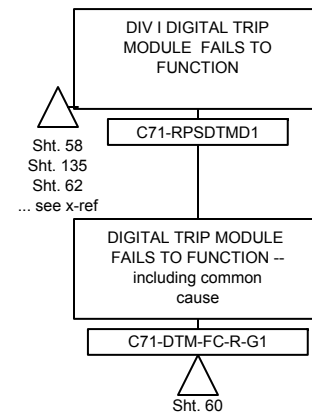


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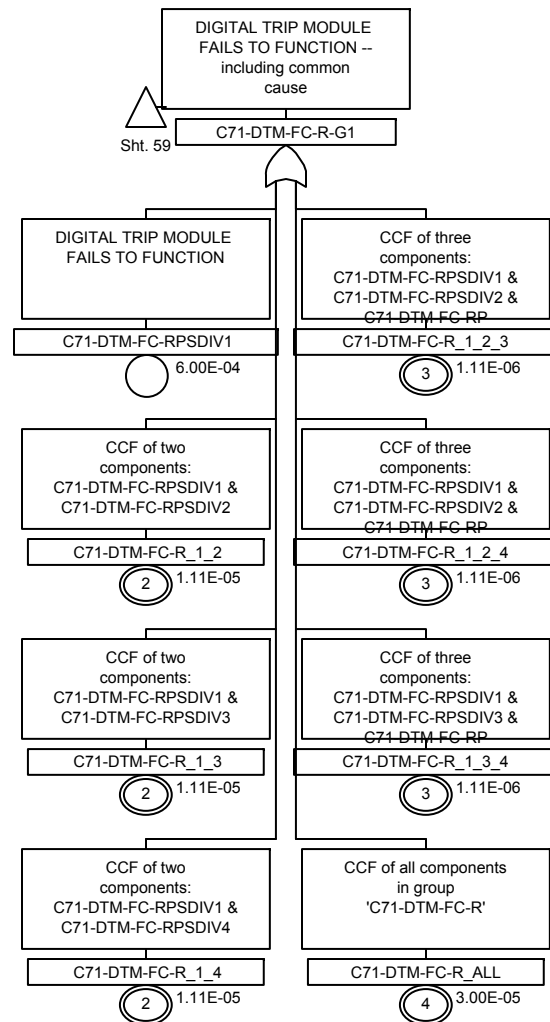


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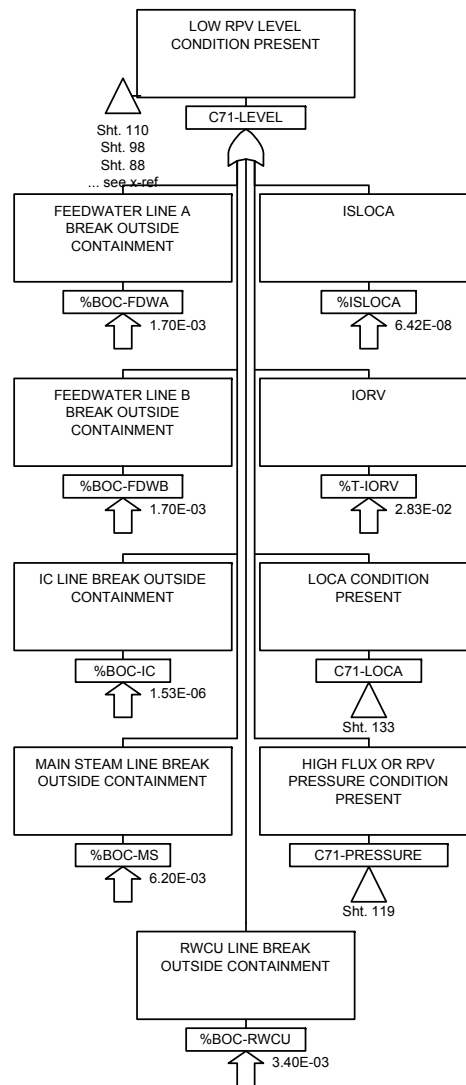


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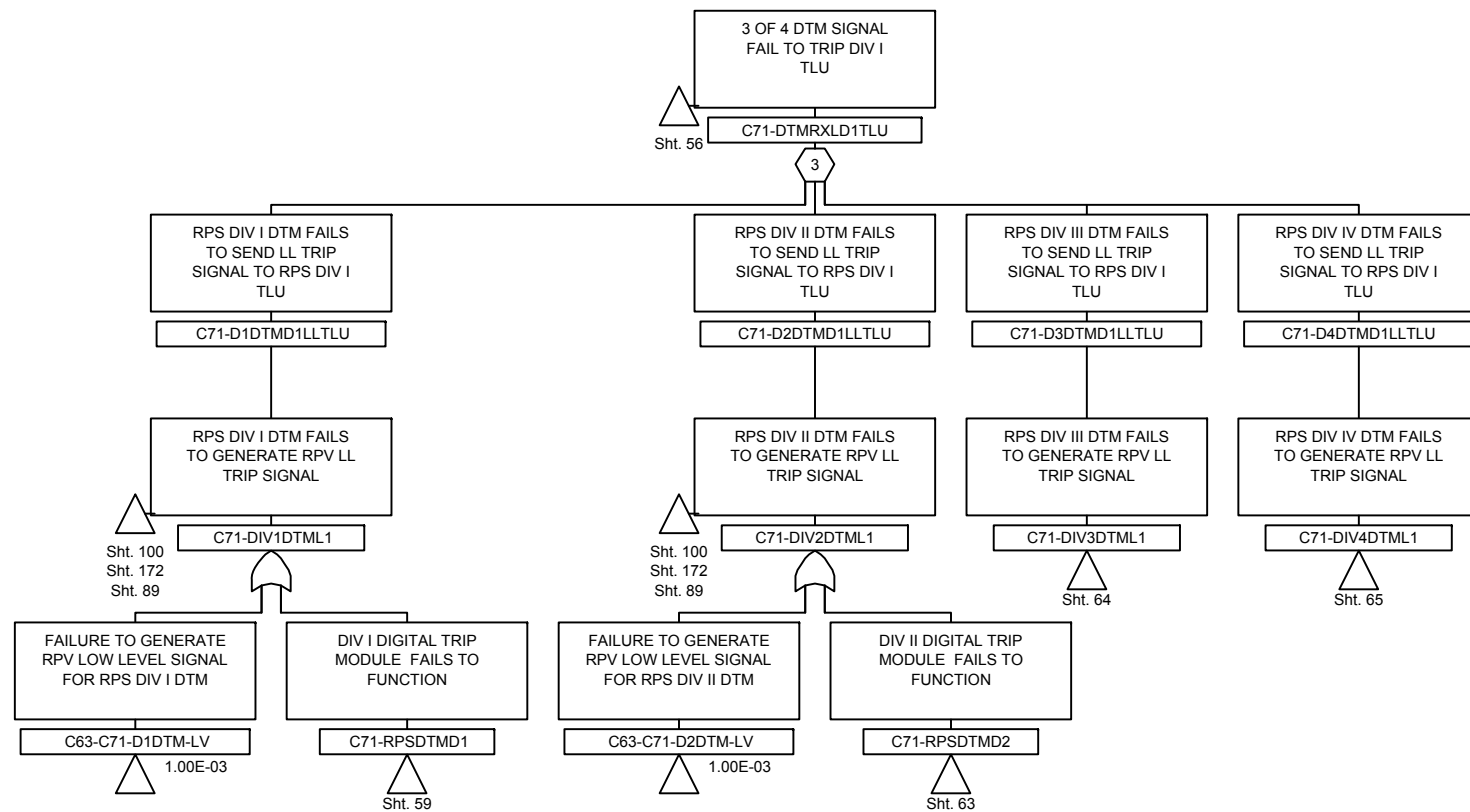


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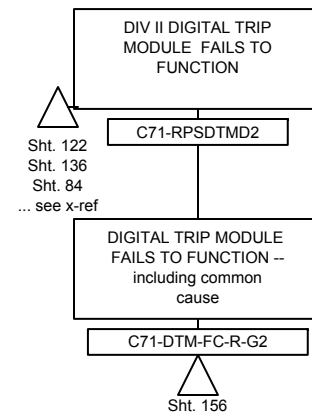


Figure 4.5-3c. Sheet 63 Reactor Protection System

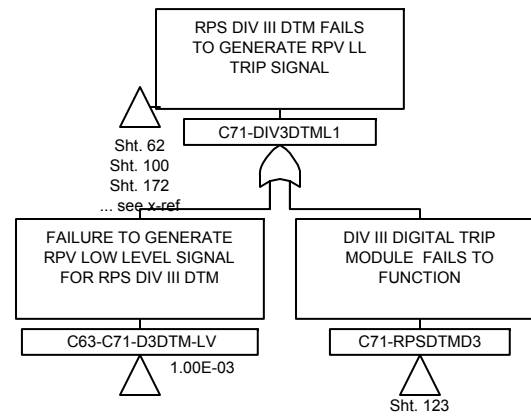


Figure 4.5-3c. Sheet 64 Reactor Protection System



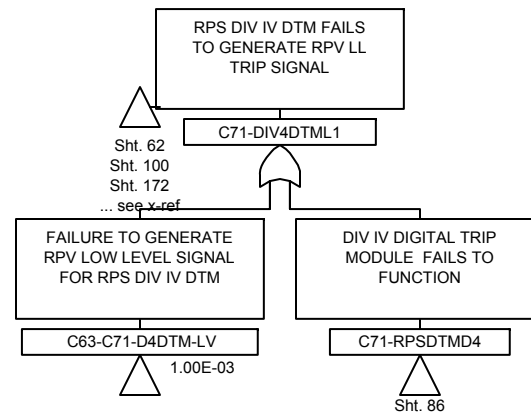


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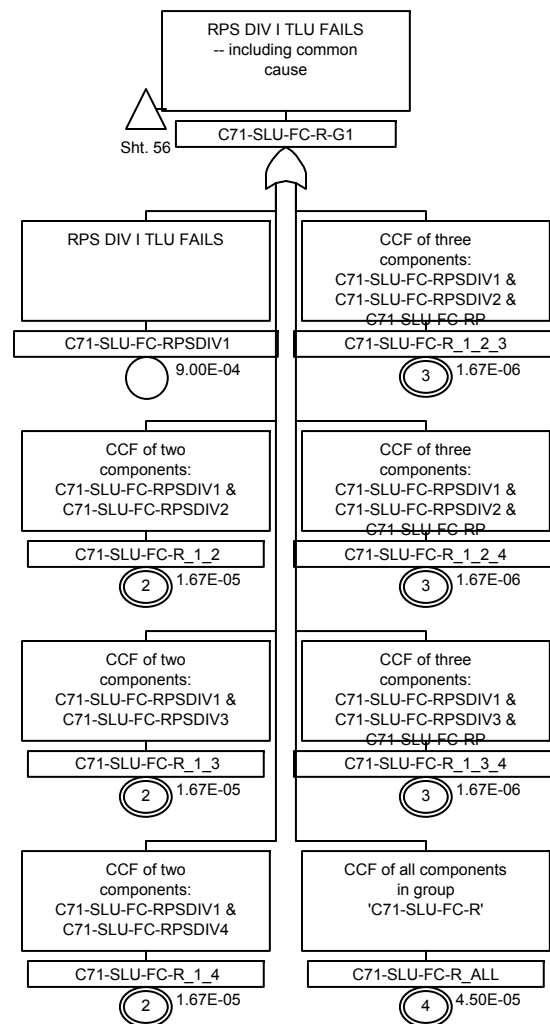


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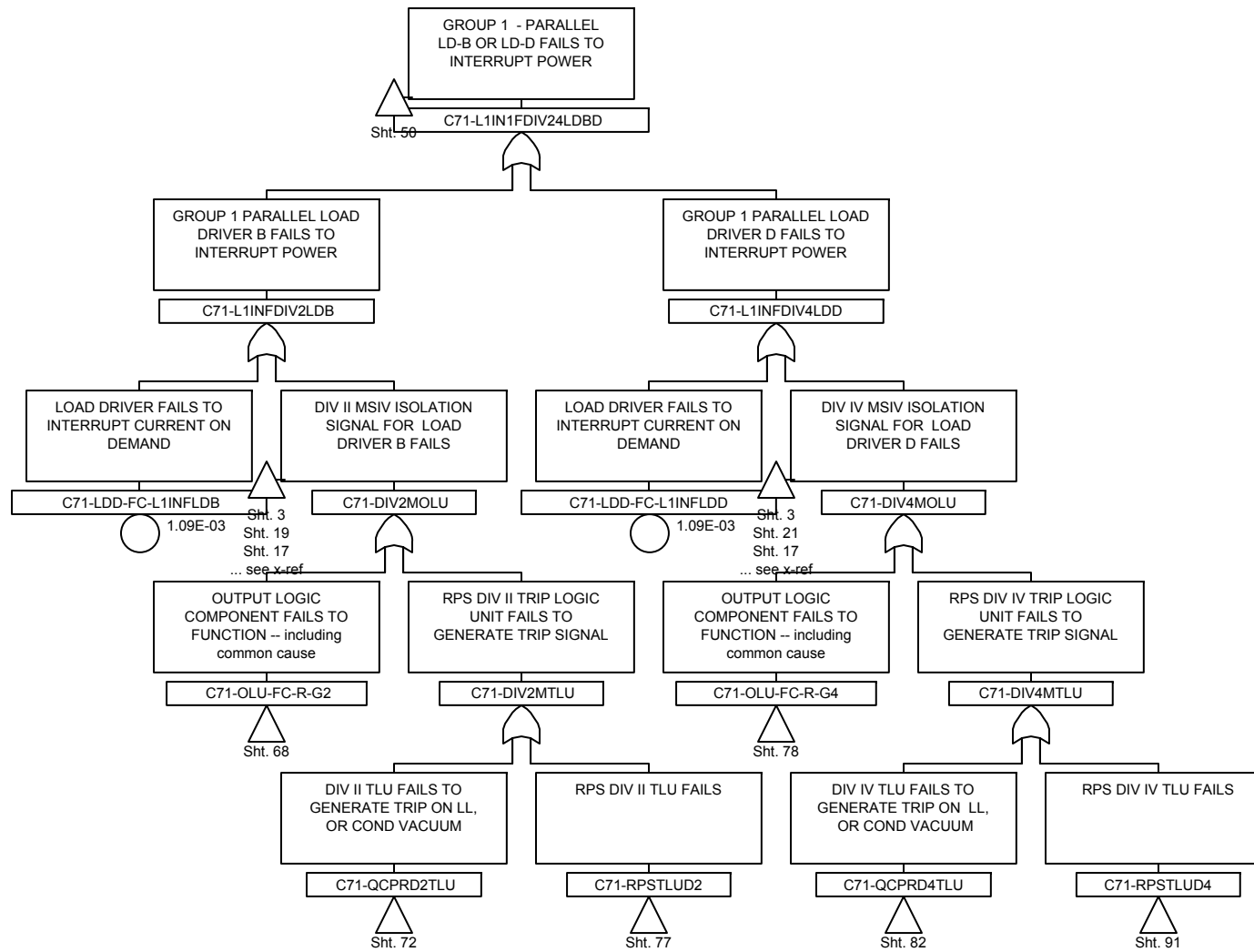


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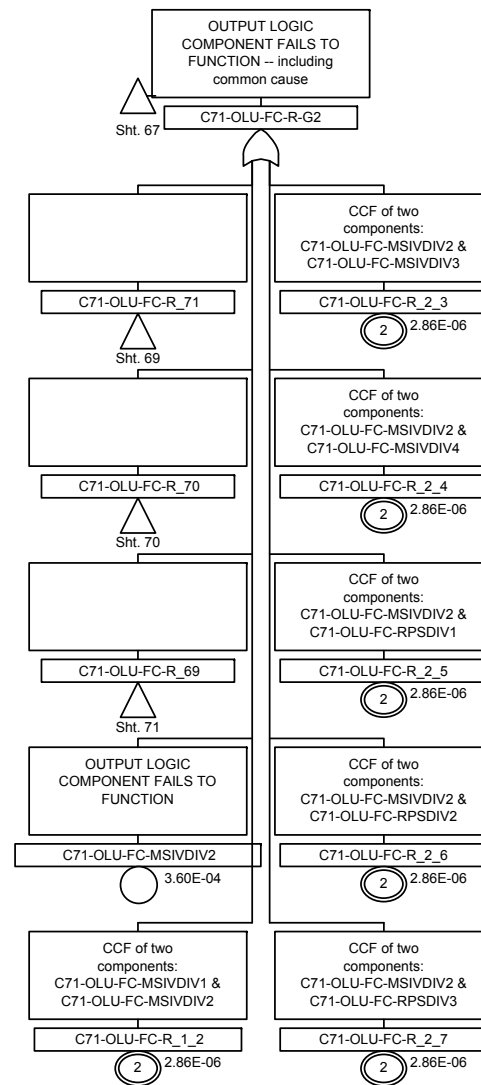


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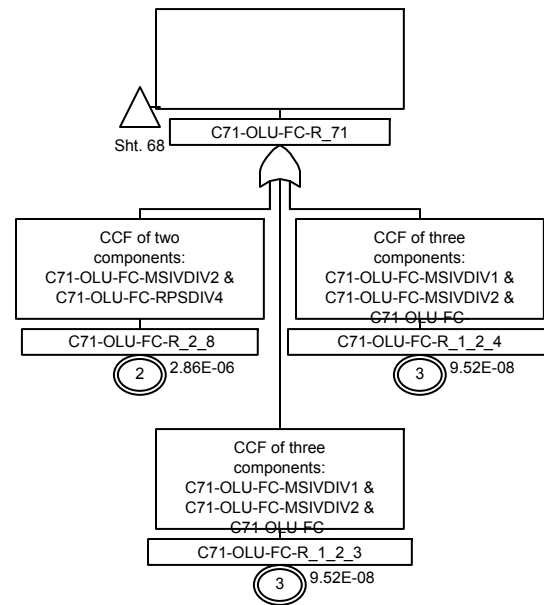


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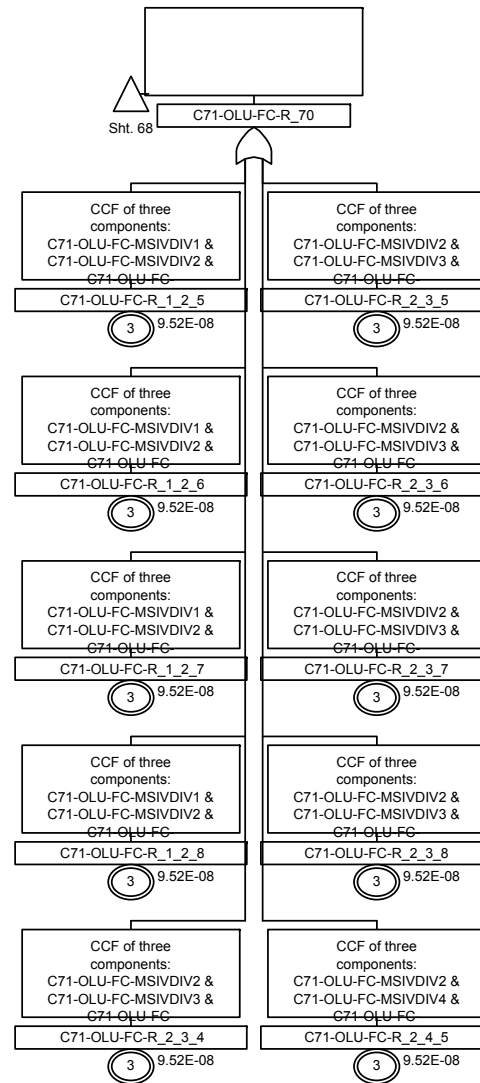


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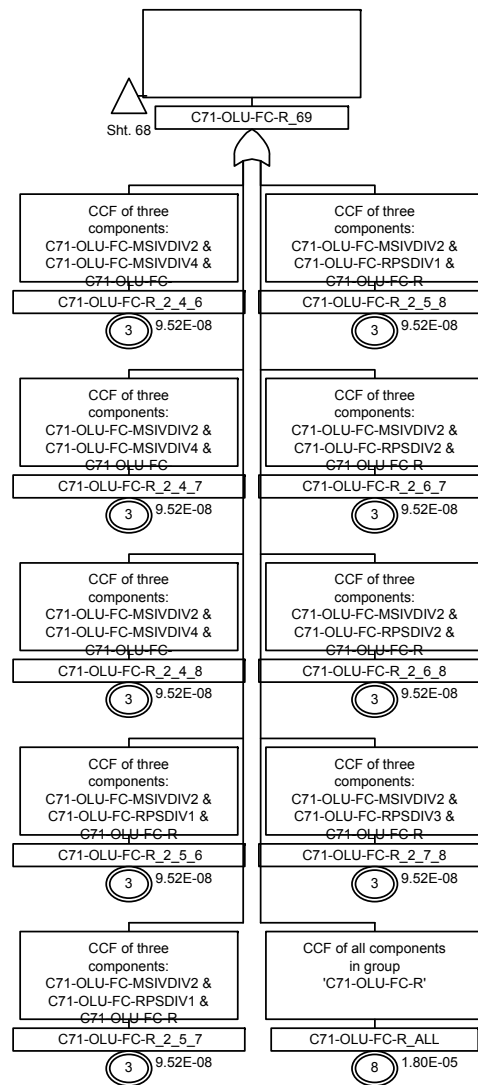


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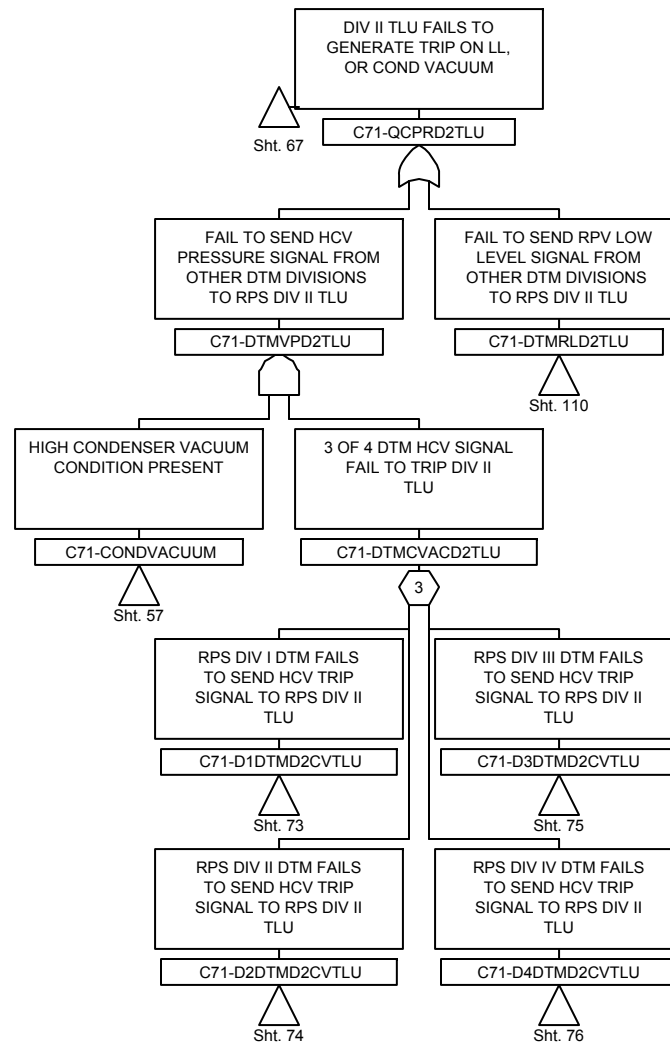


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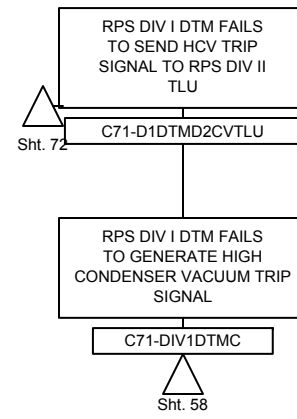


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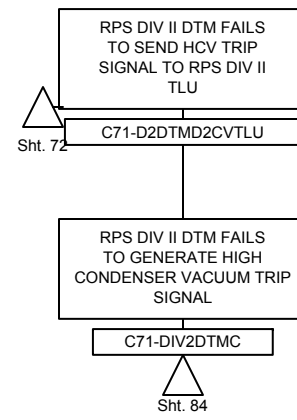


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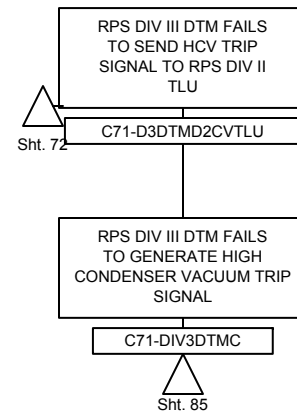


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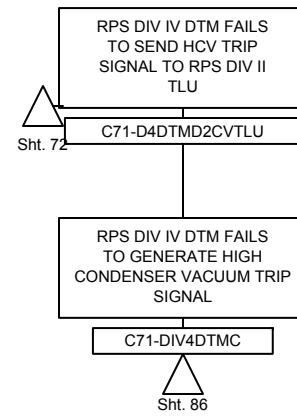


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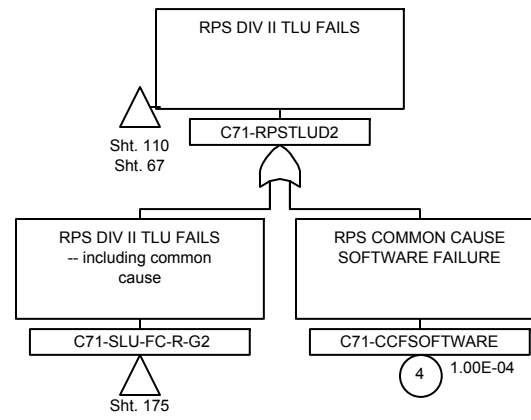


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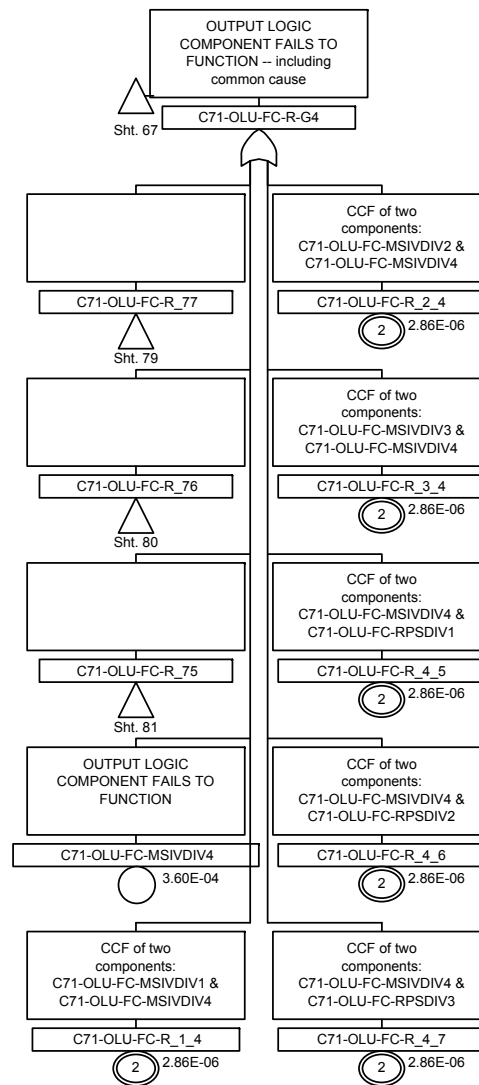


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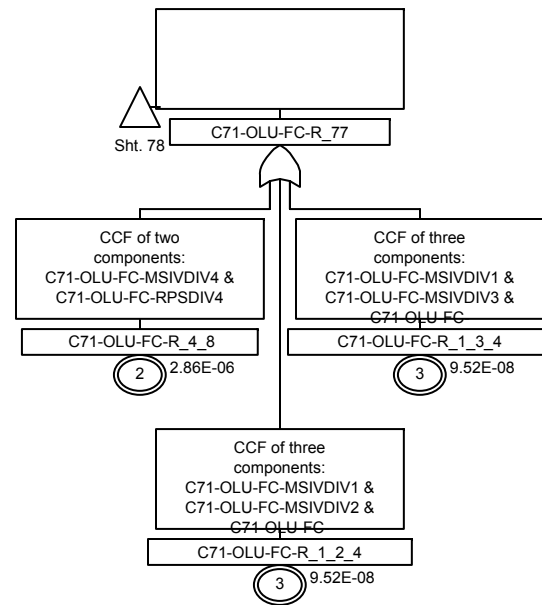


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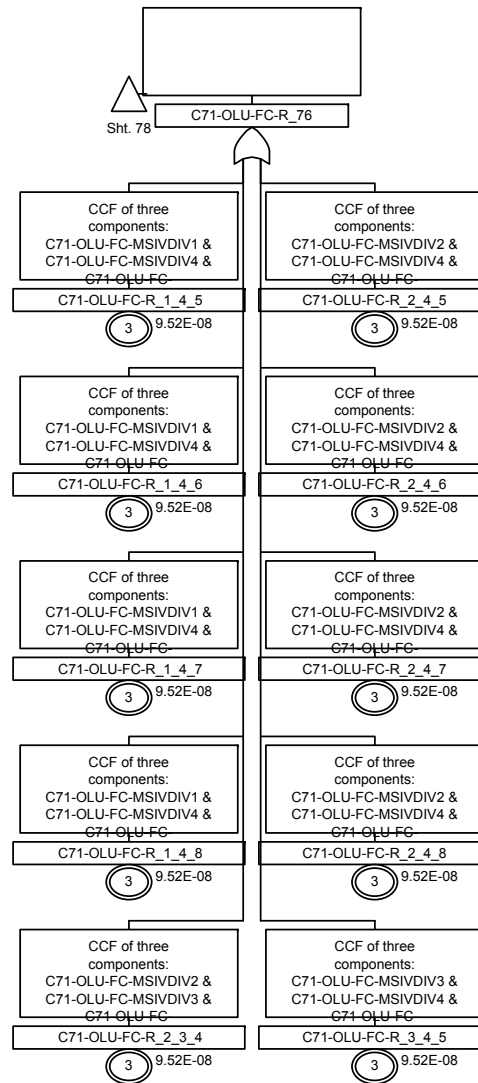


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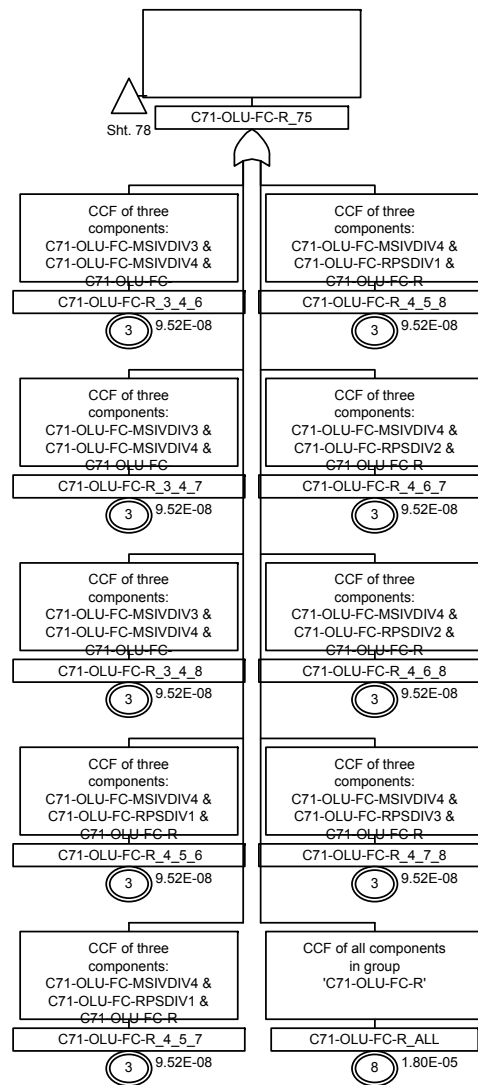


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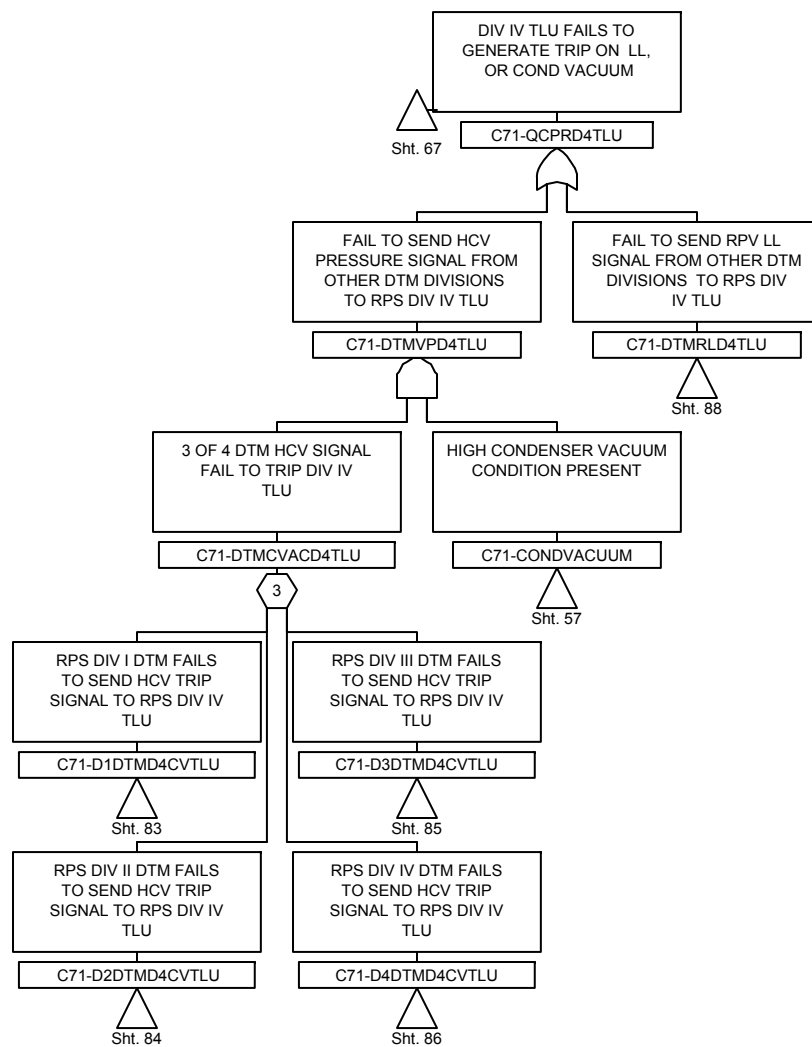


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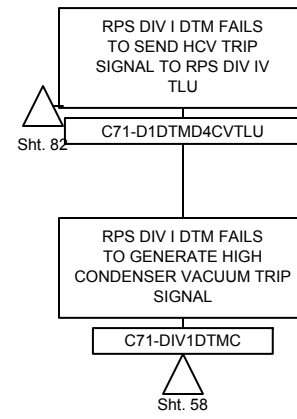


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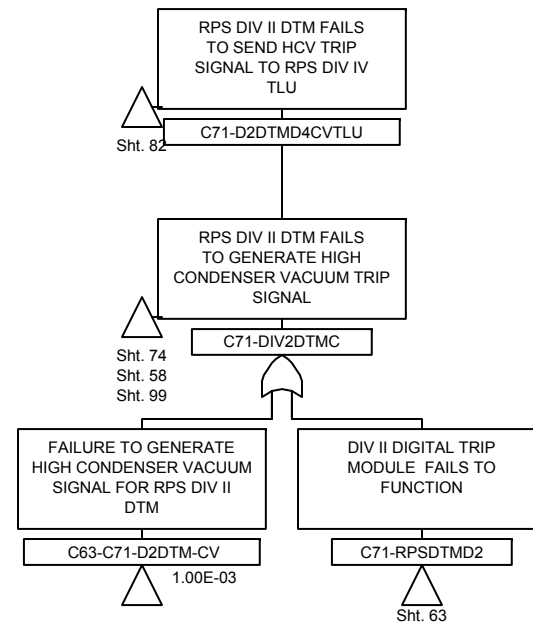


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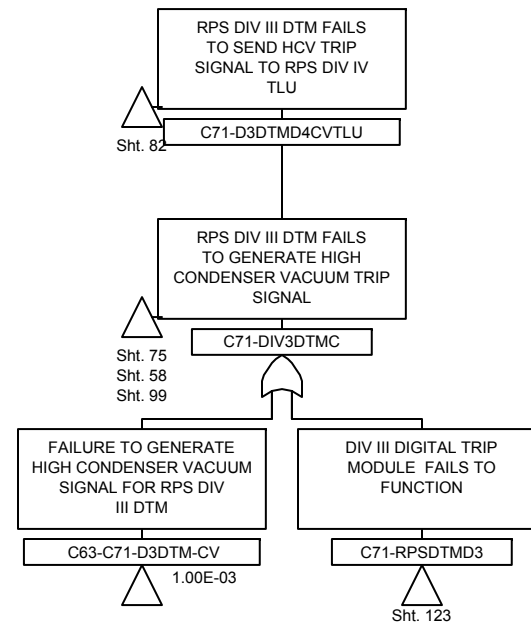


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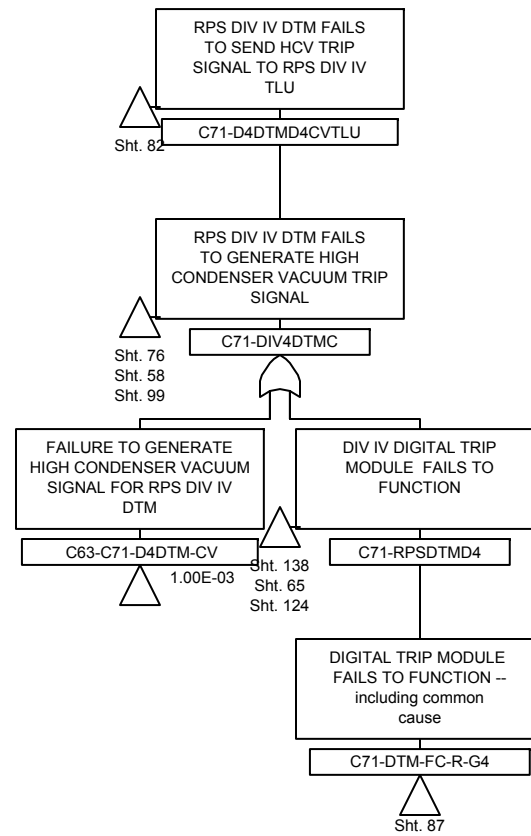


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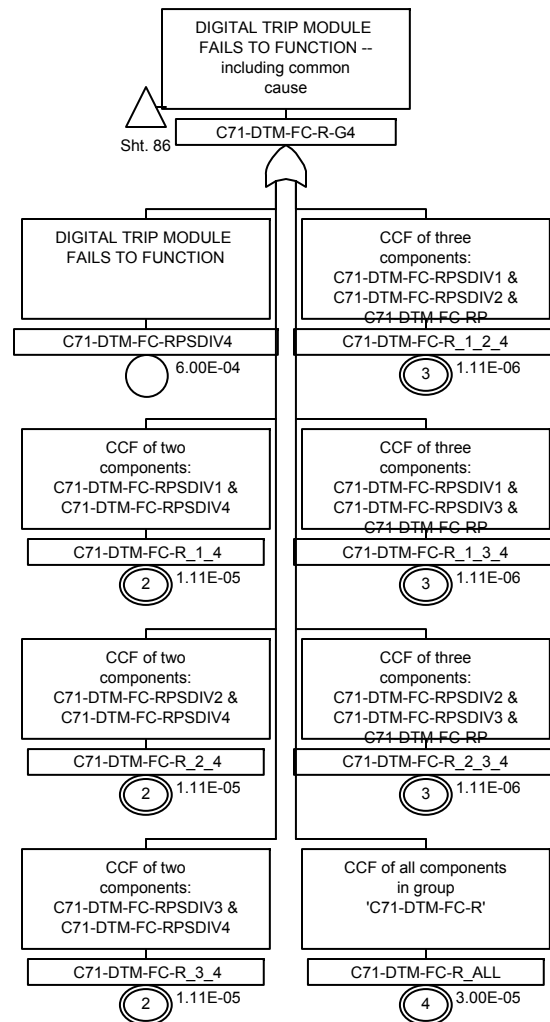


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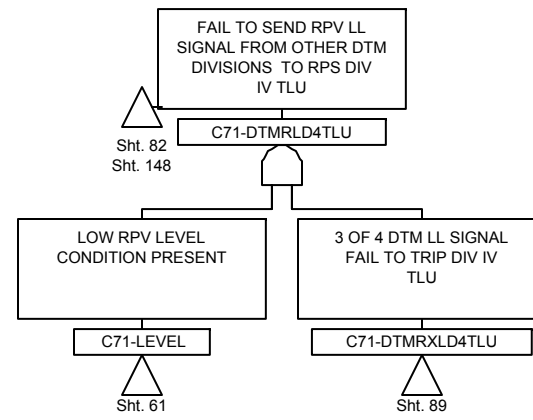


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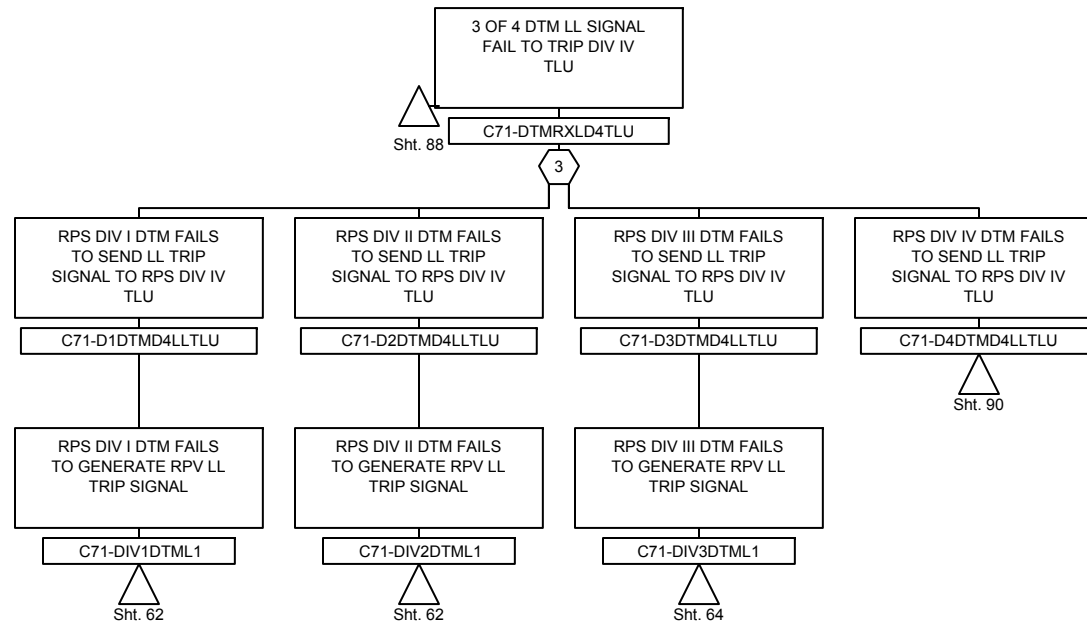


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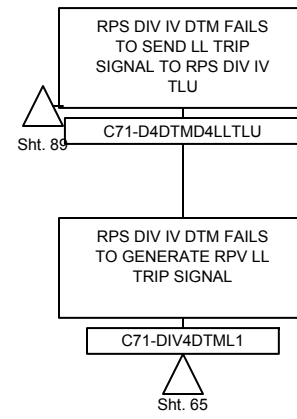


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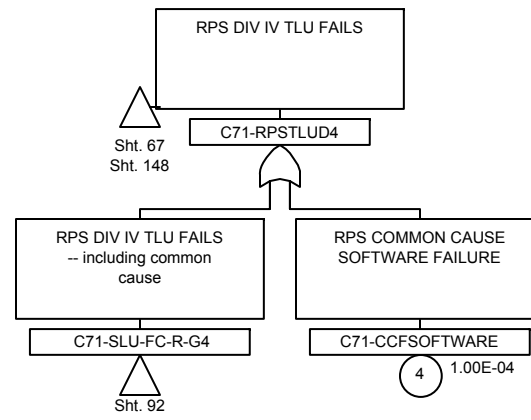


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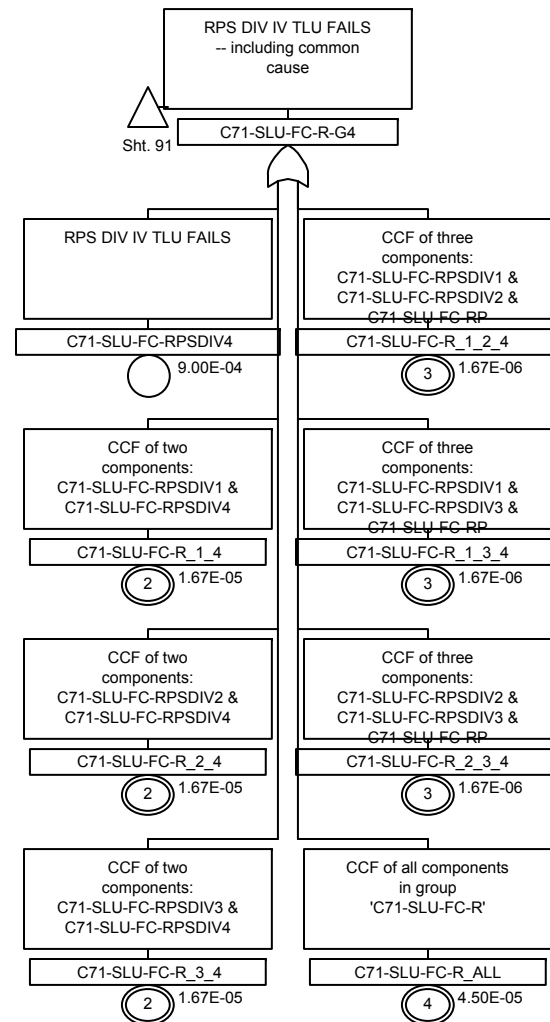


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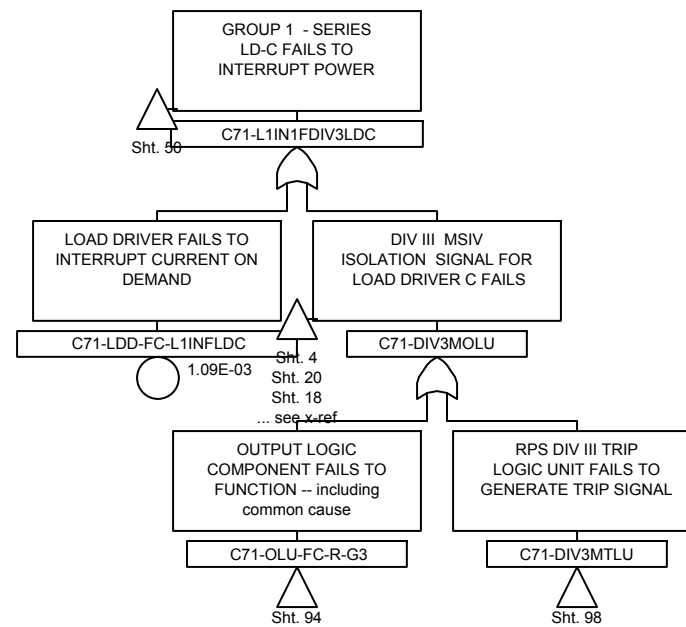


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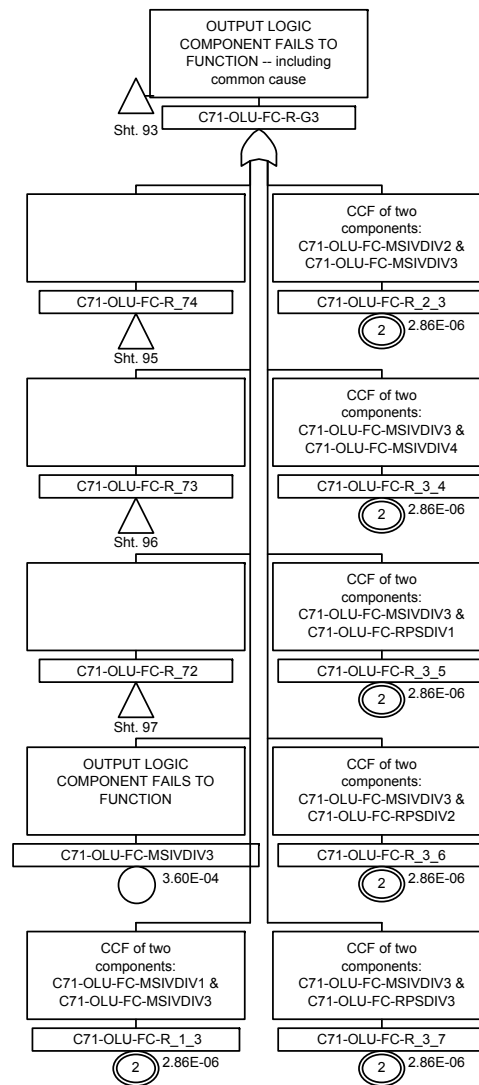


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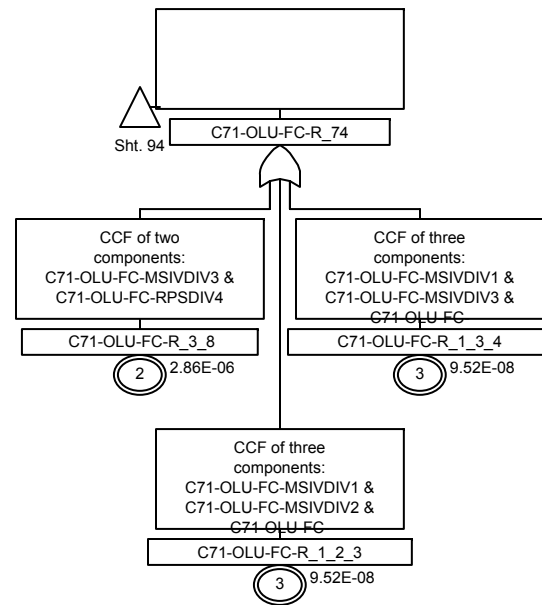


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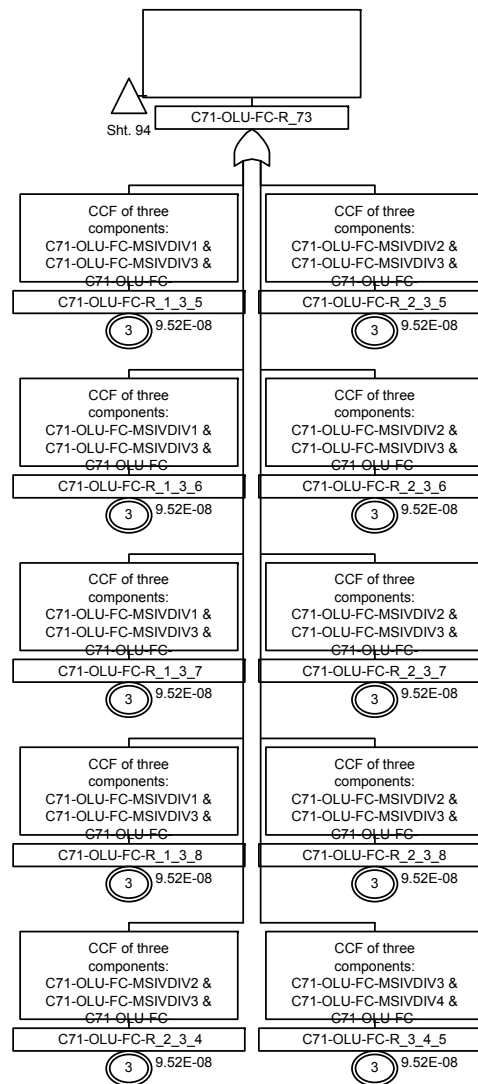


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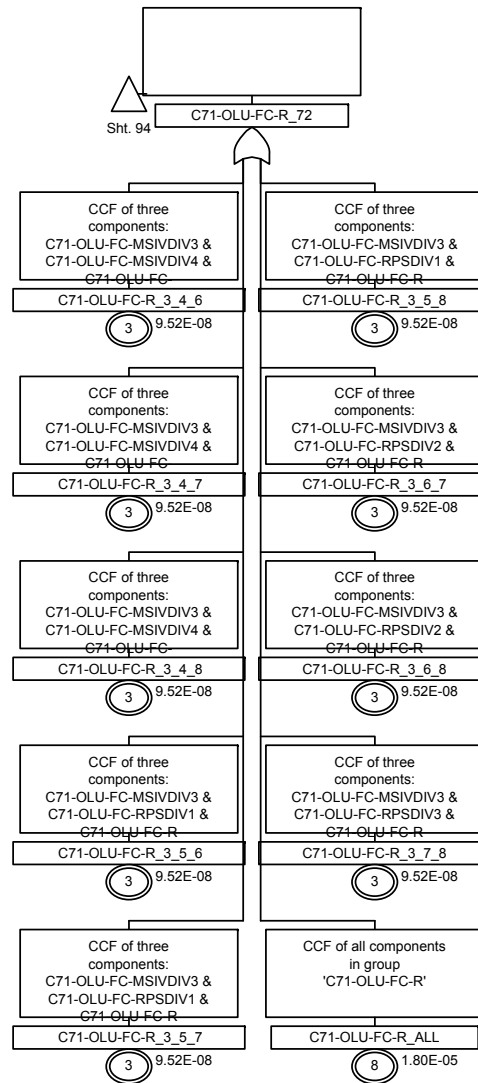


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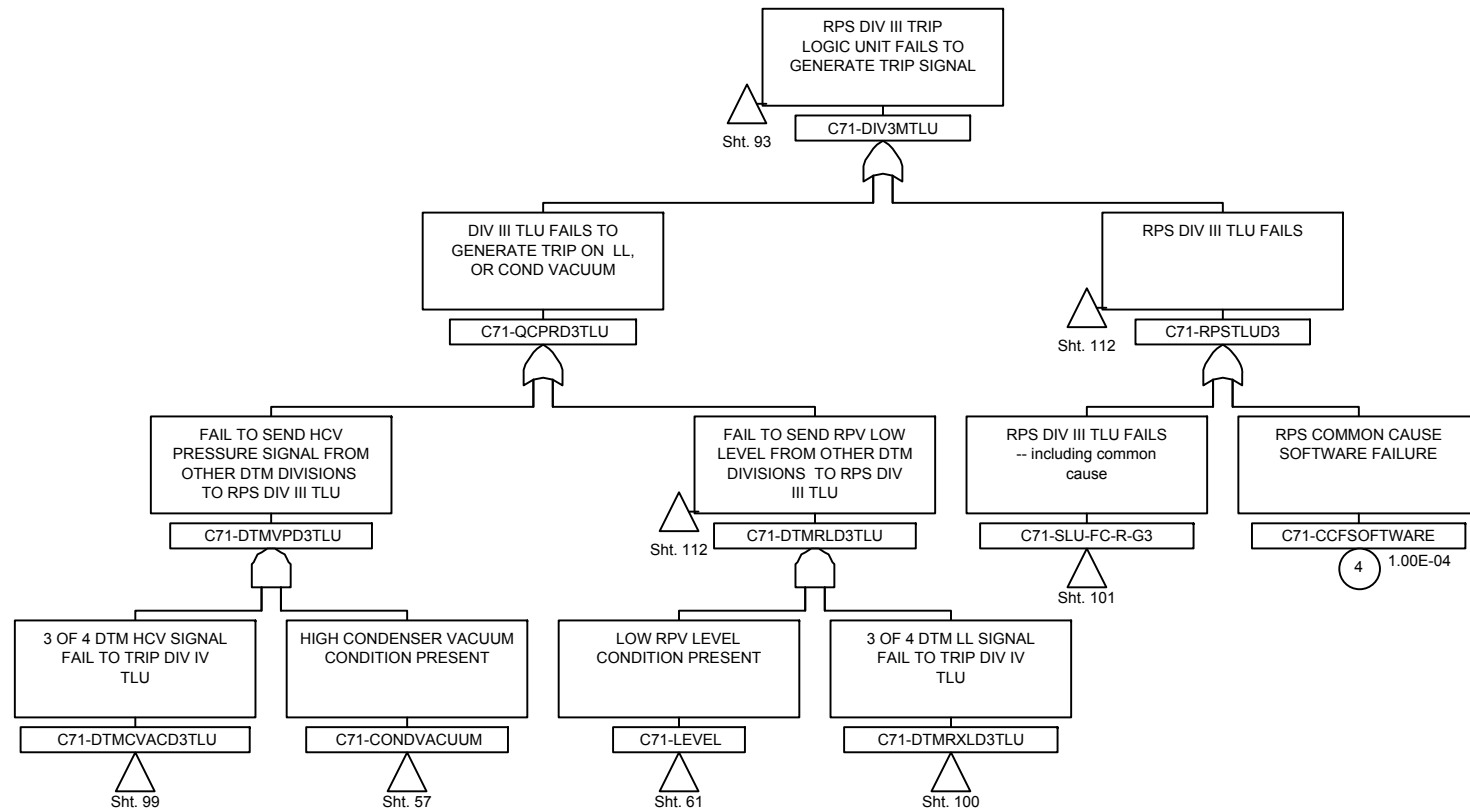


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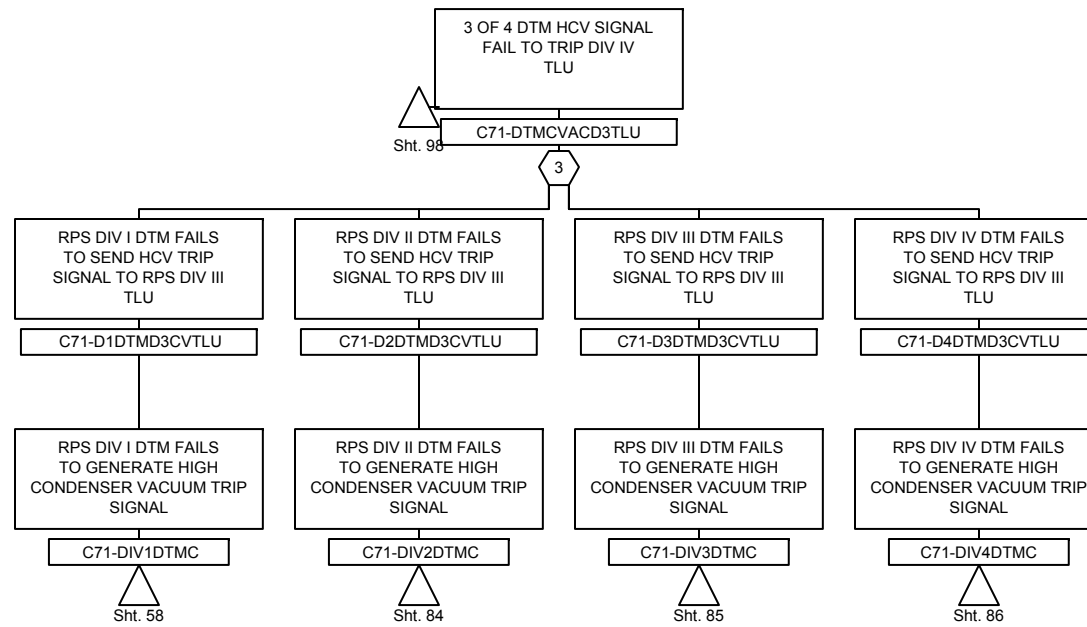


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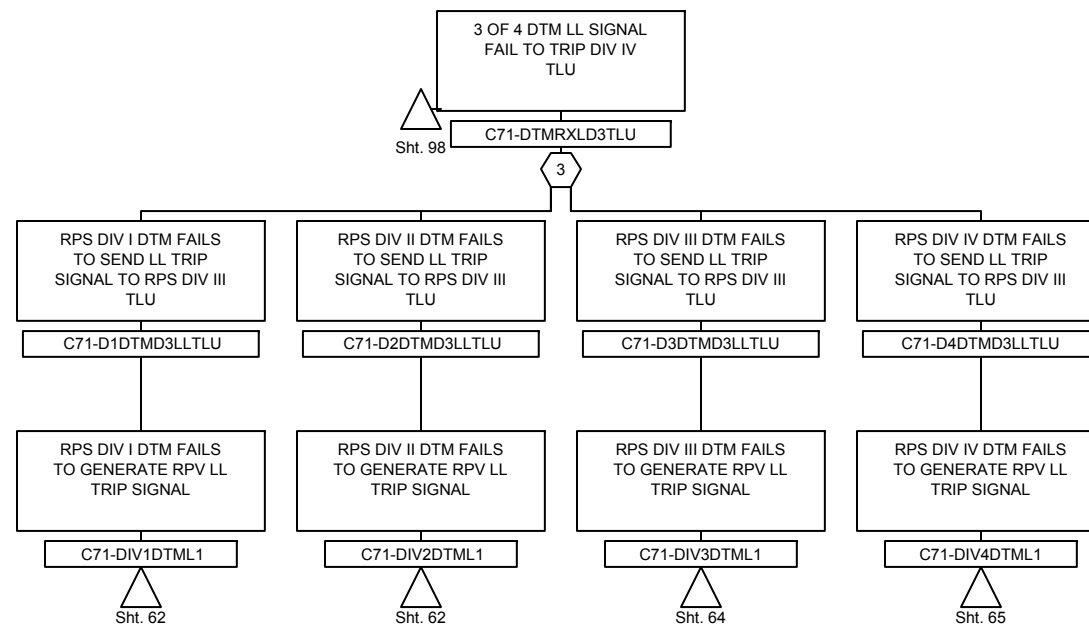


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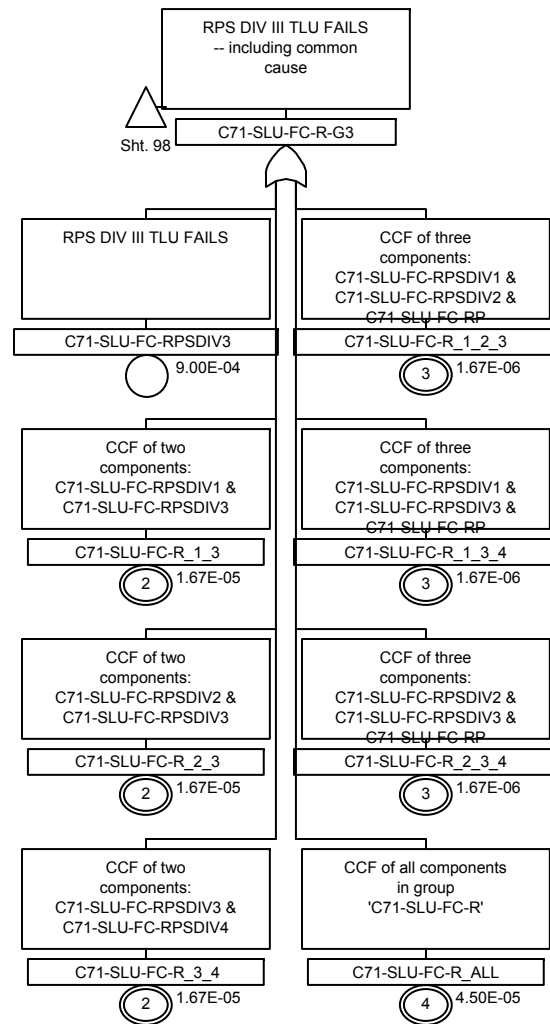


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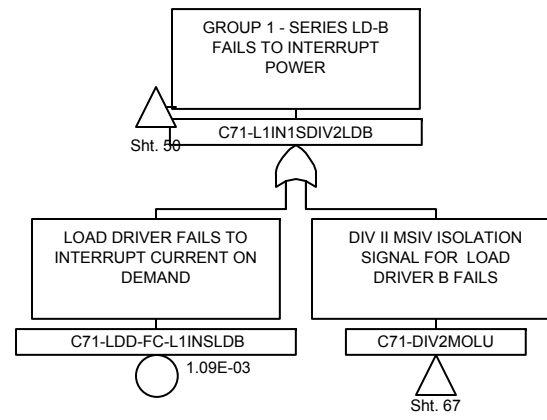


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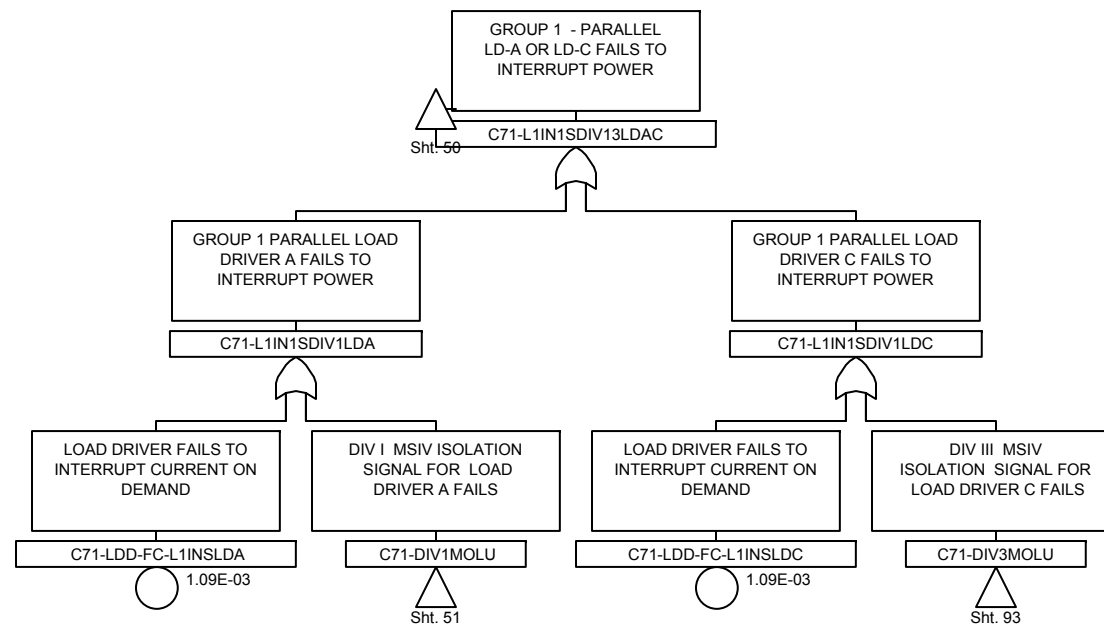


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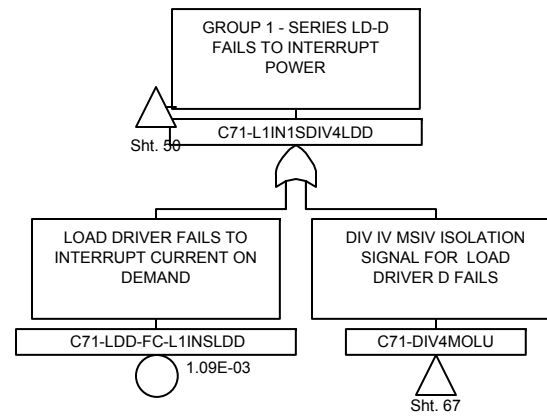


Figure 4.5-3c. Sheet 104 Reactor Protection System



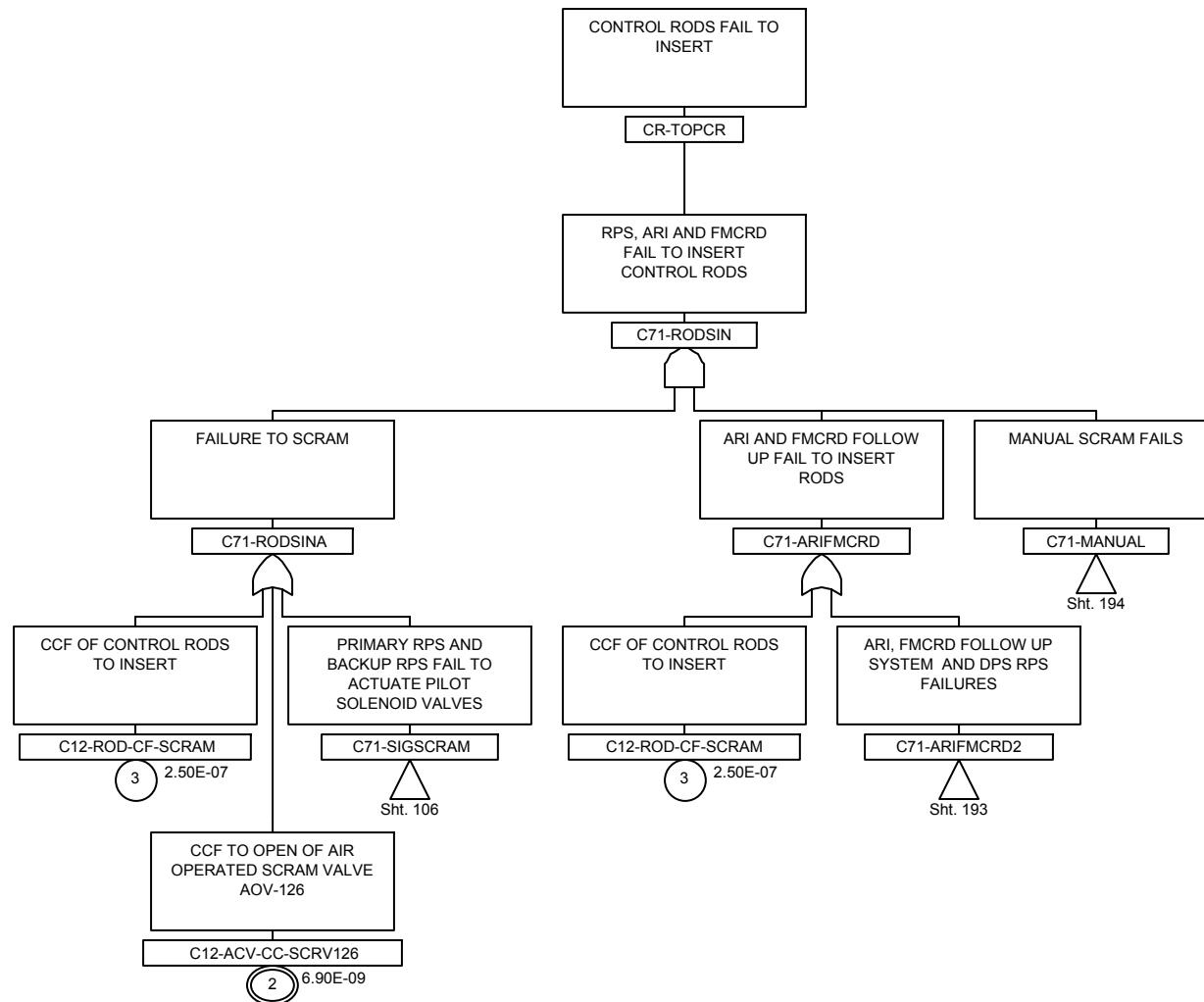


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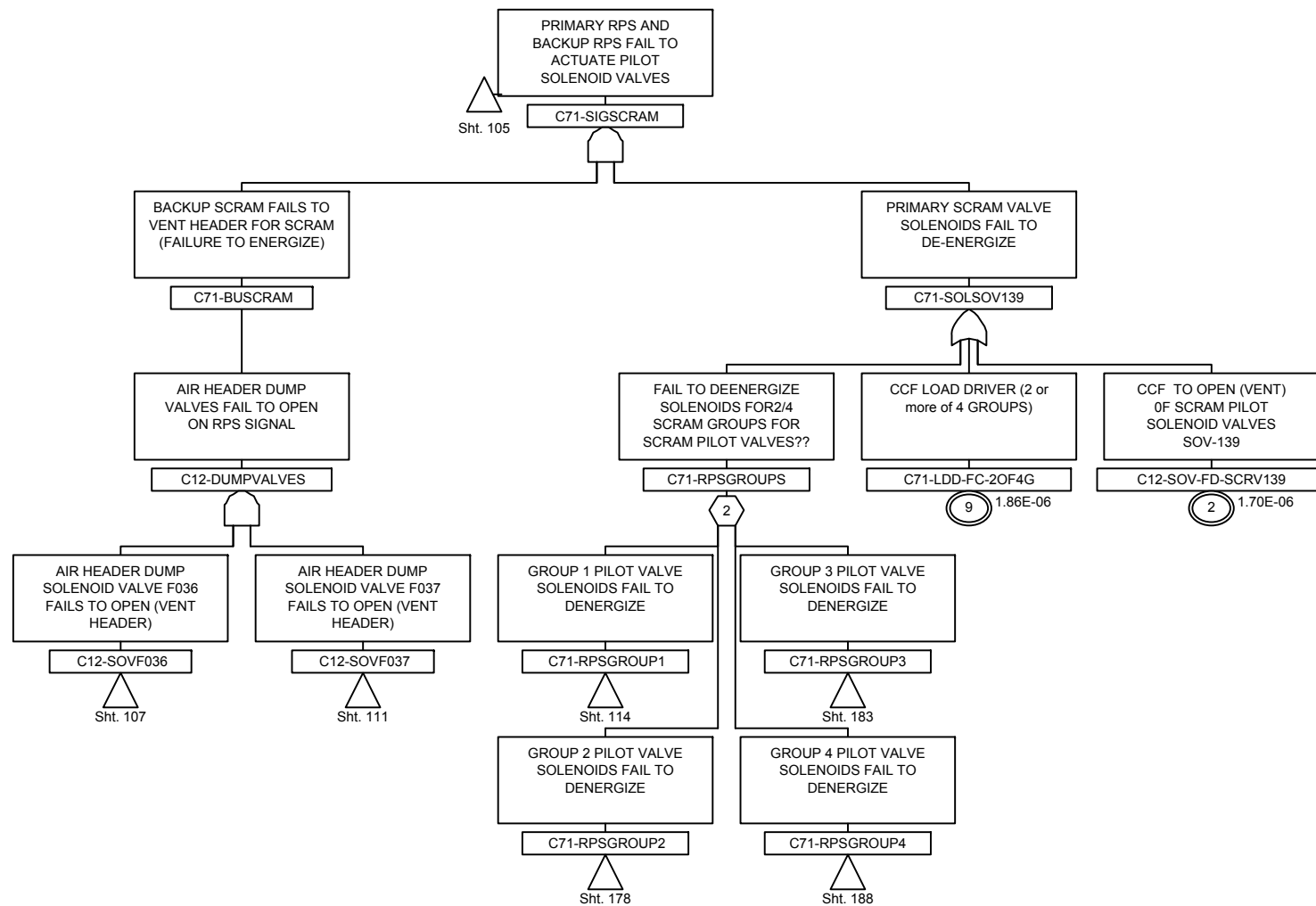


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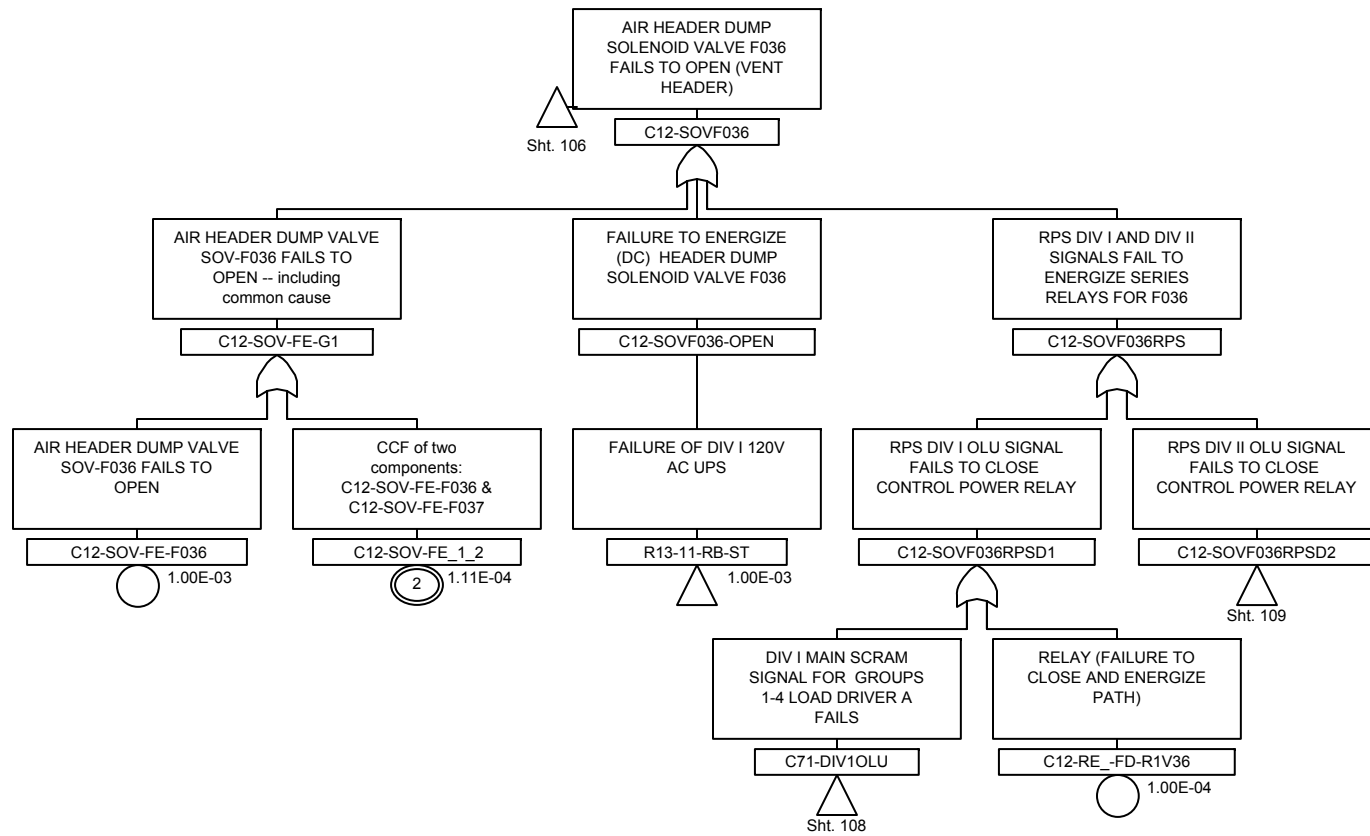


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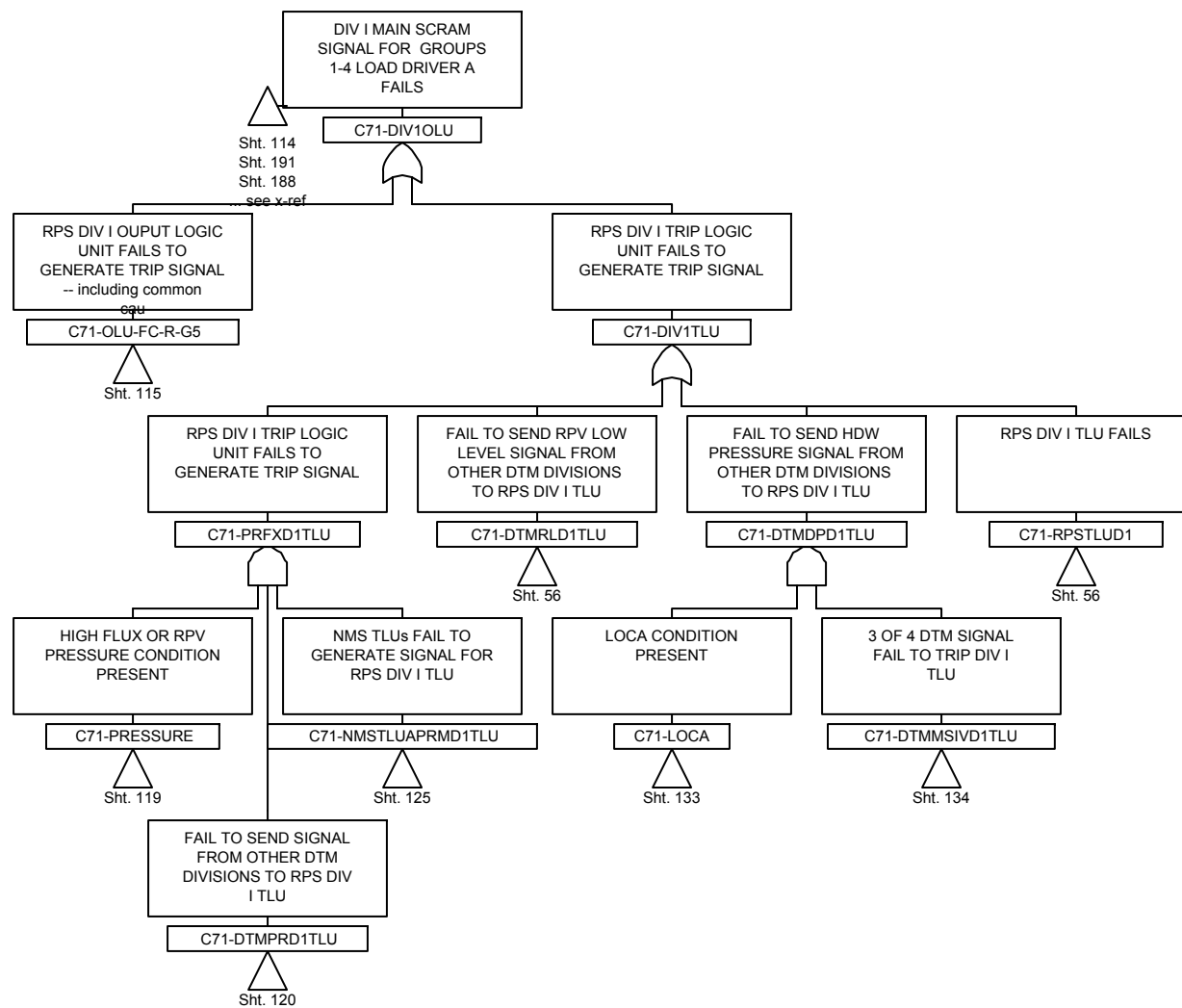


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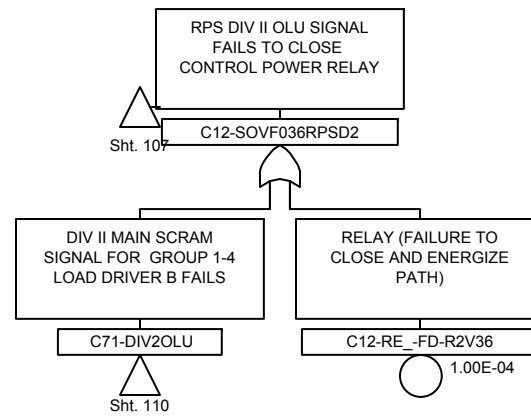


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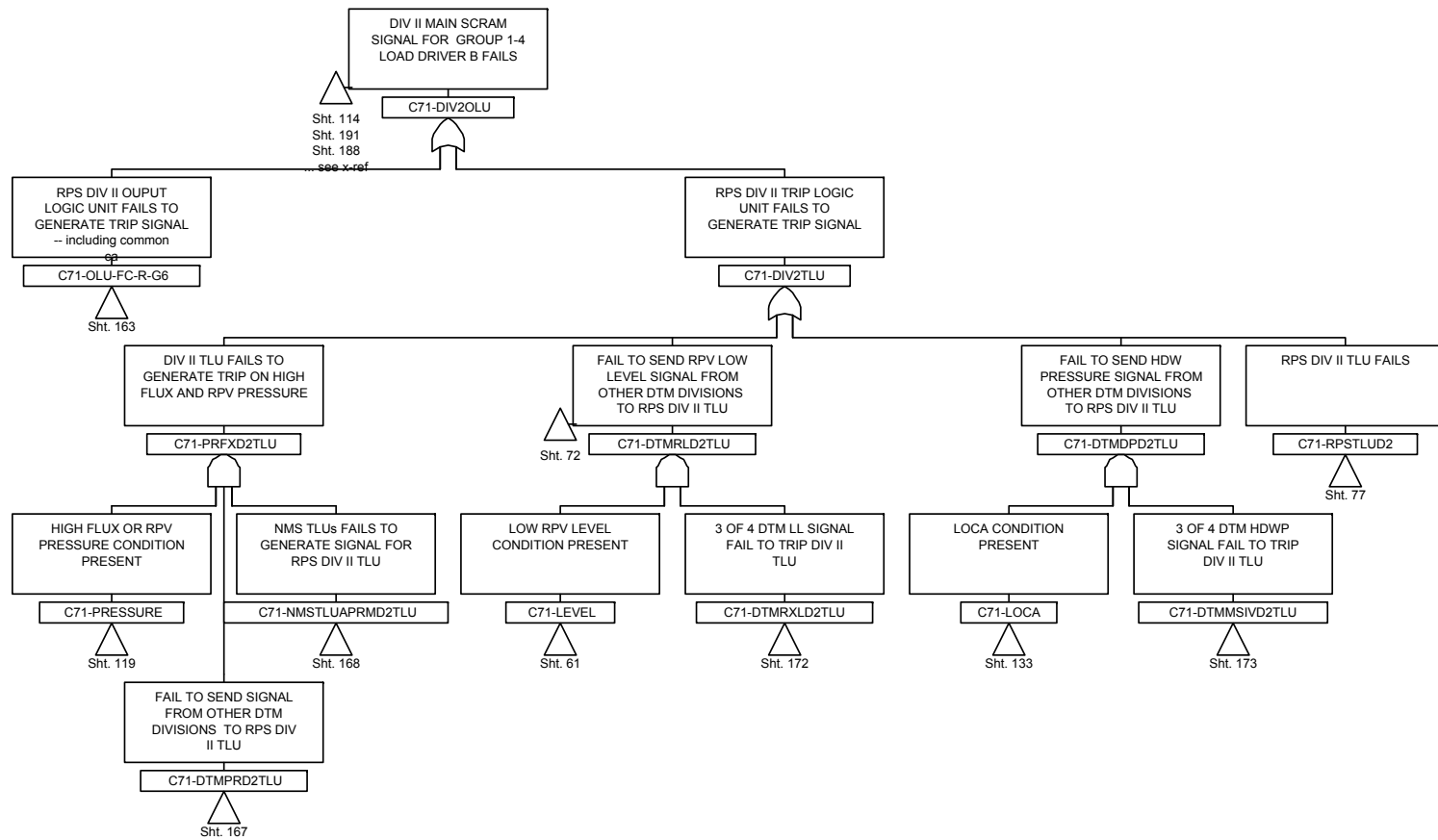


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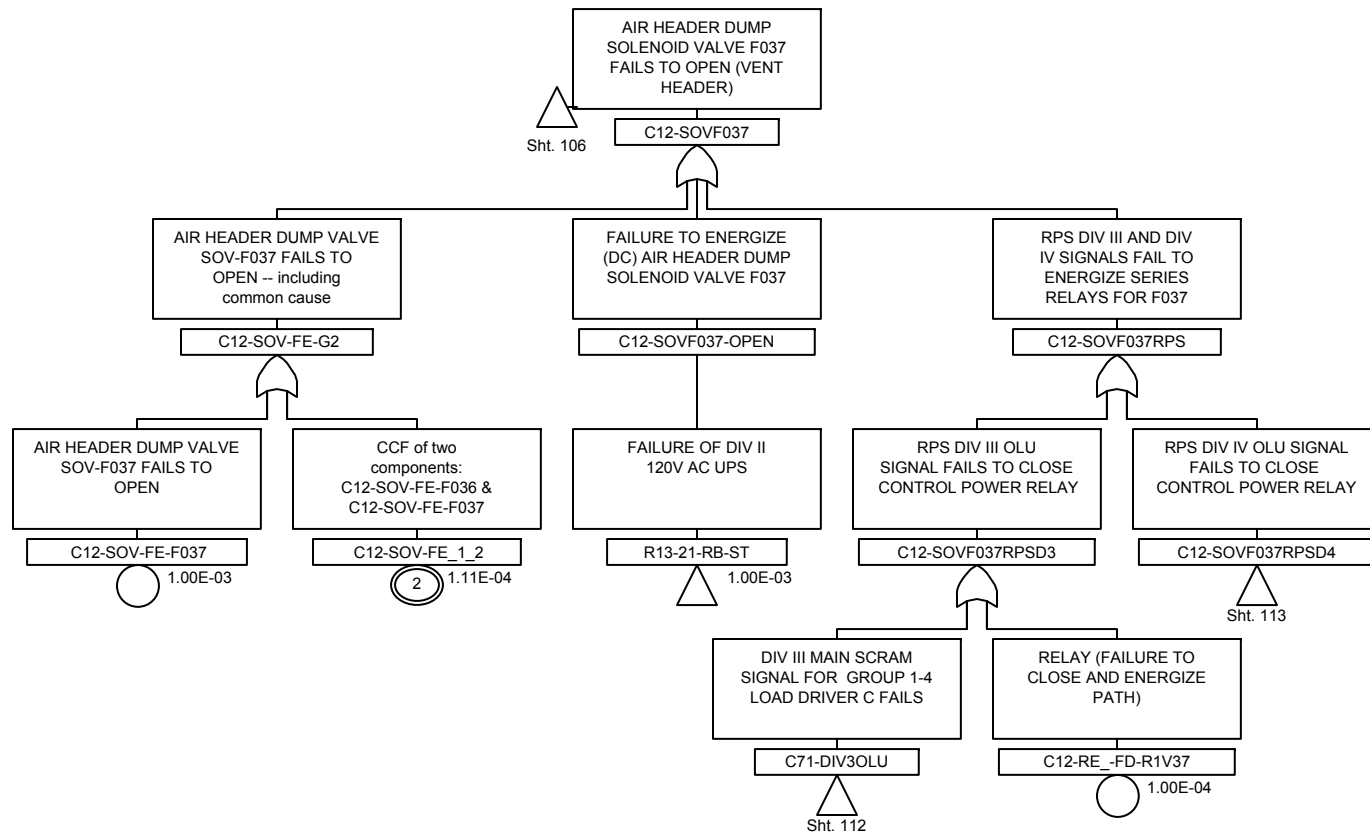


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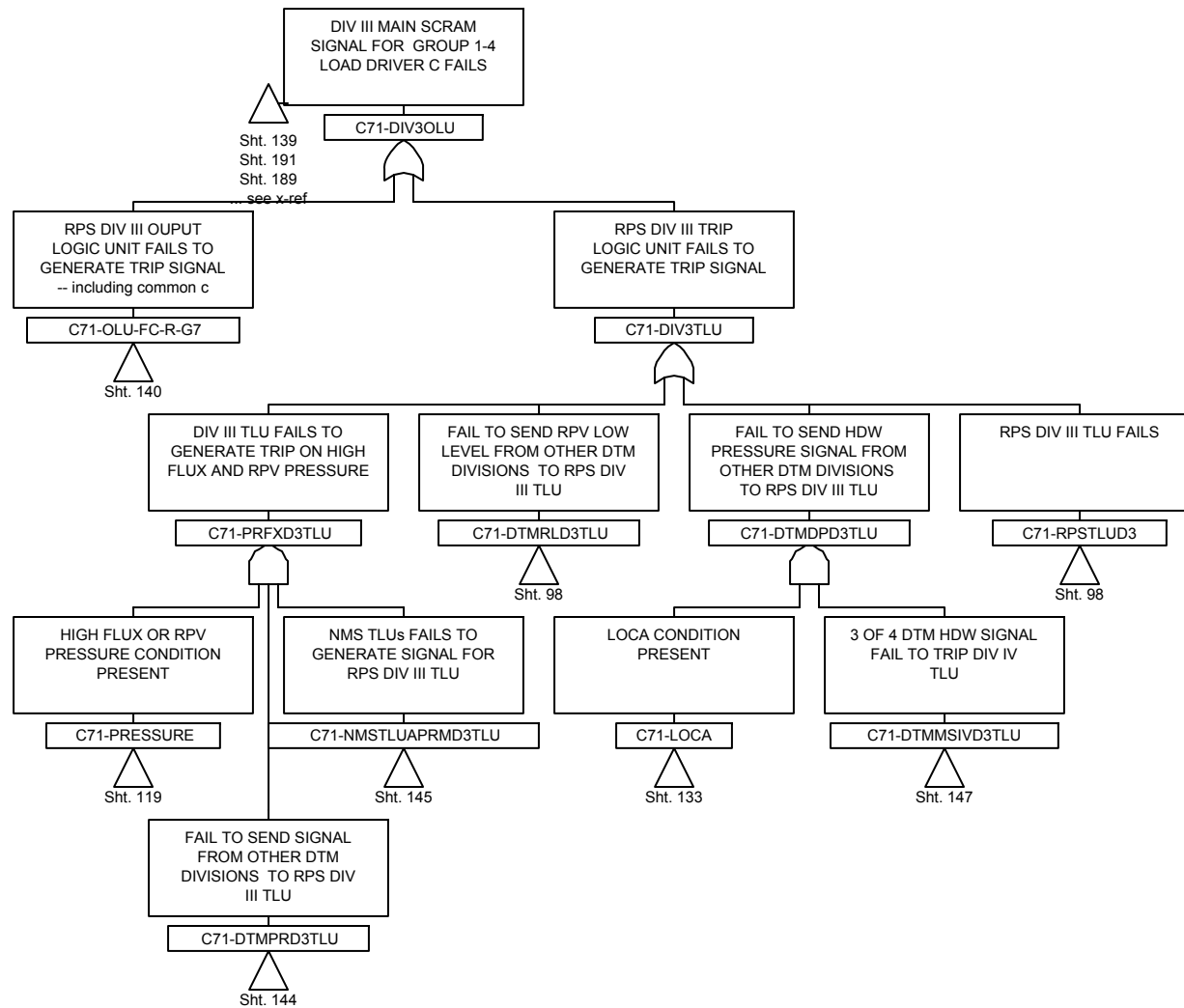


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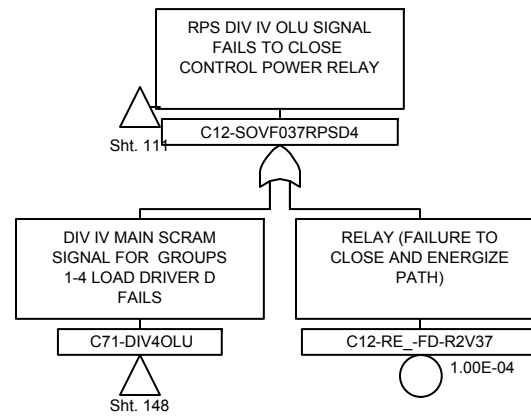


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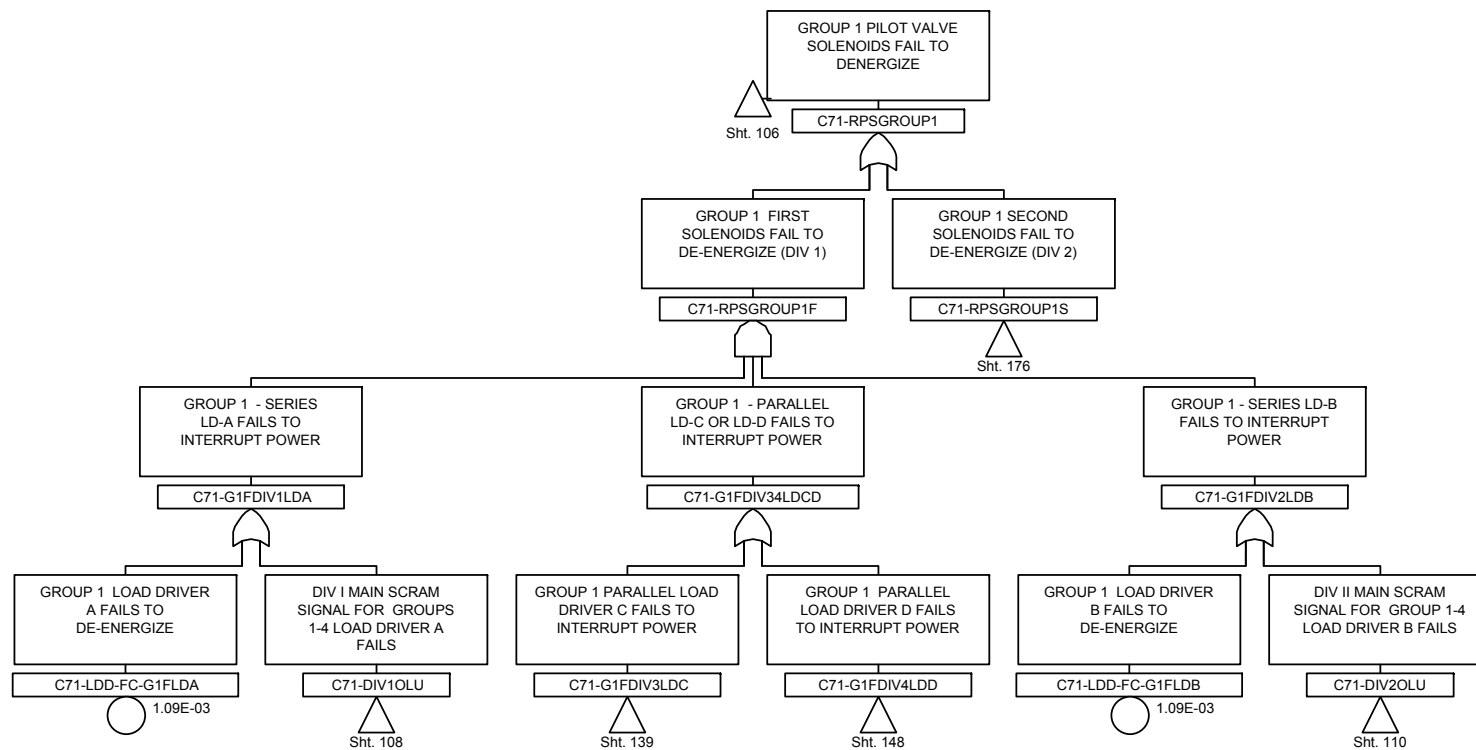


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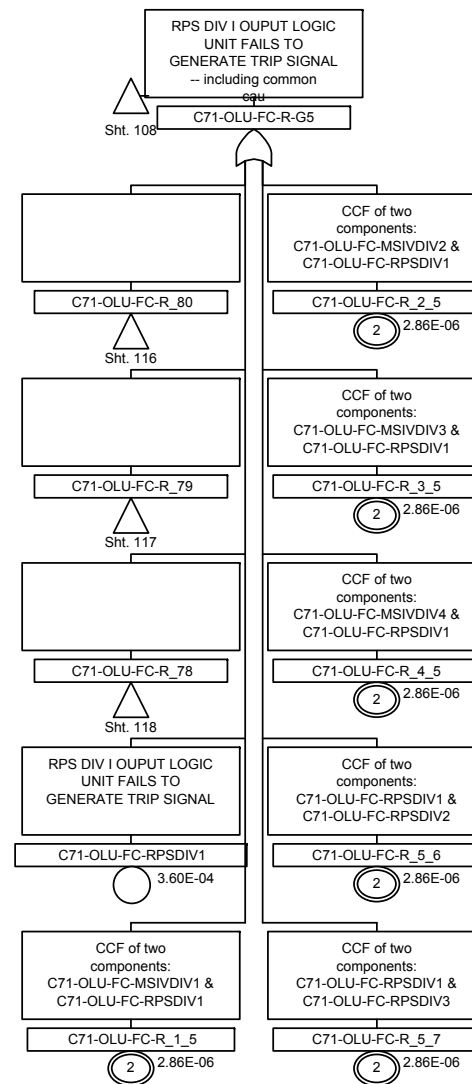


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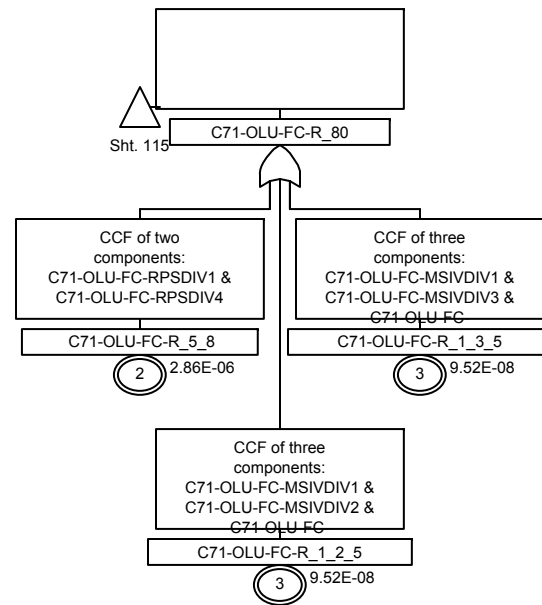


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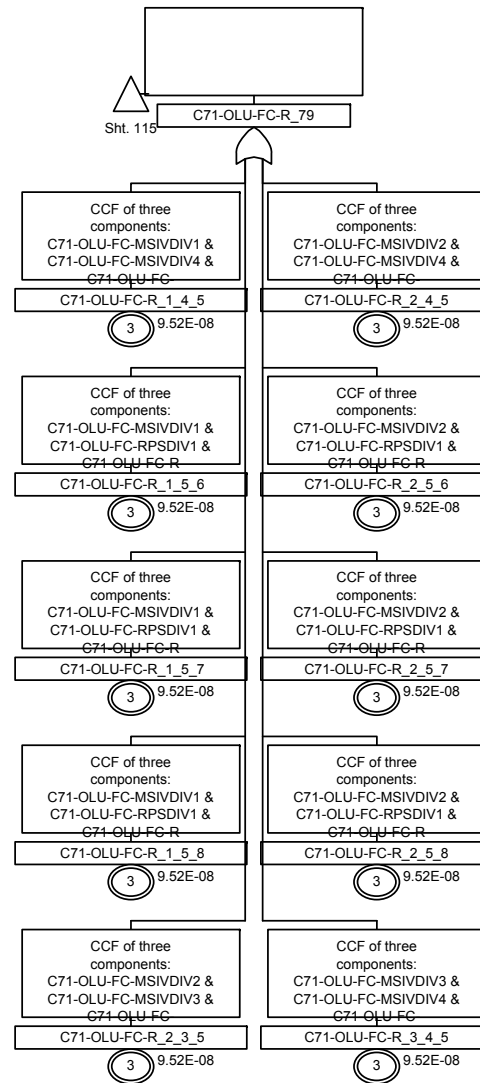


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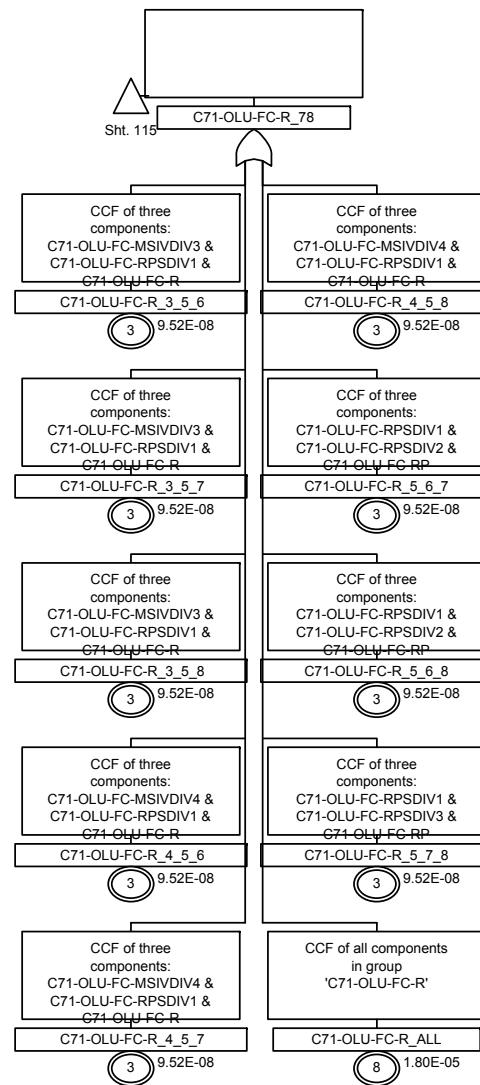


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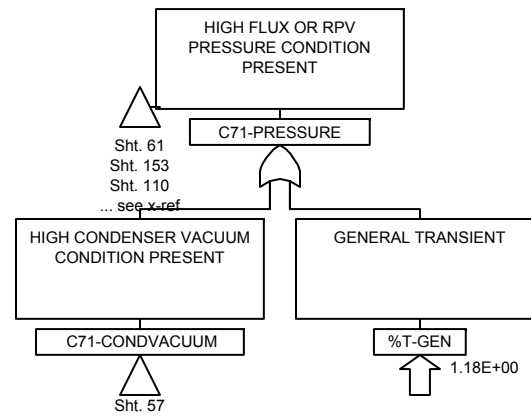


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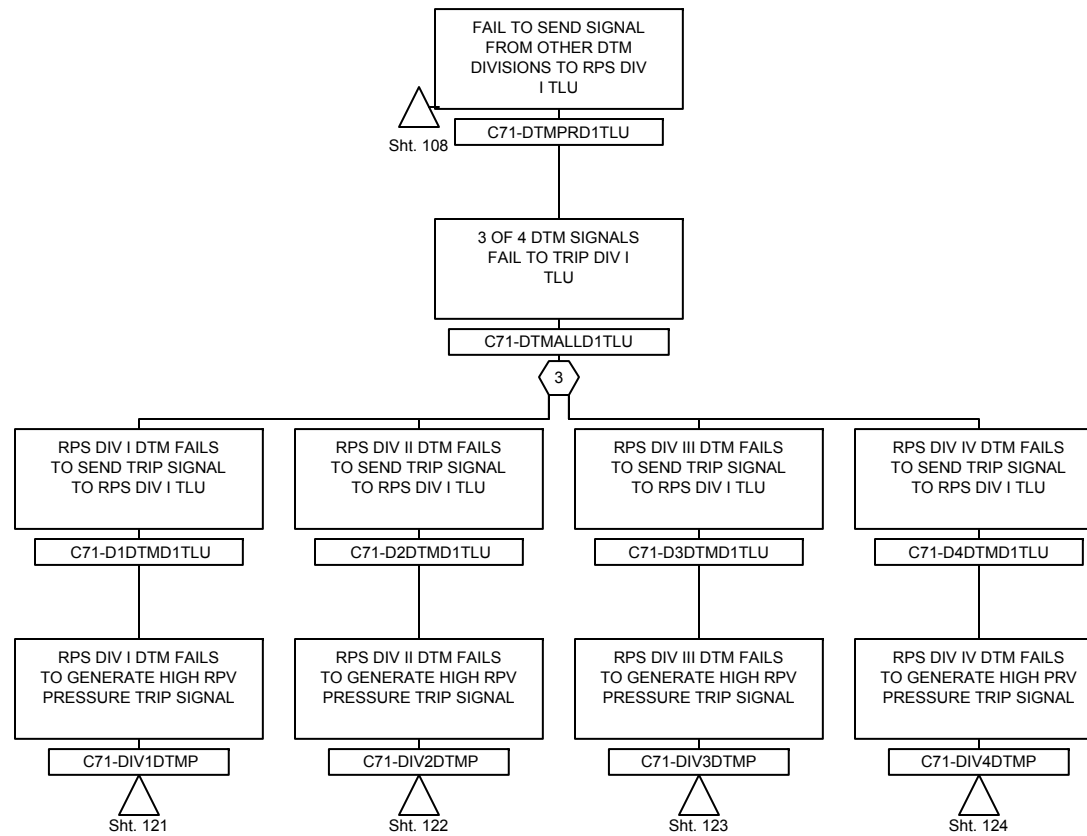


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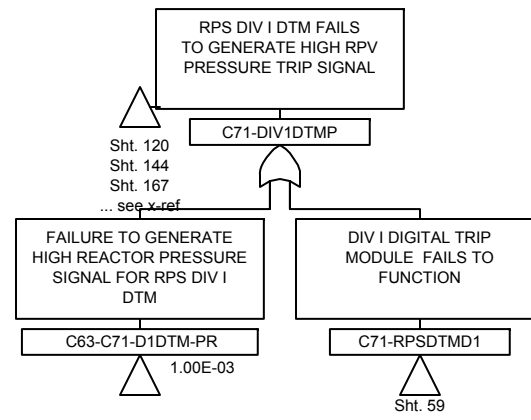


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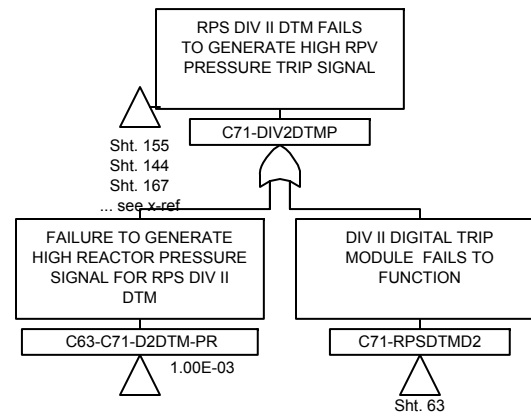


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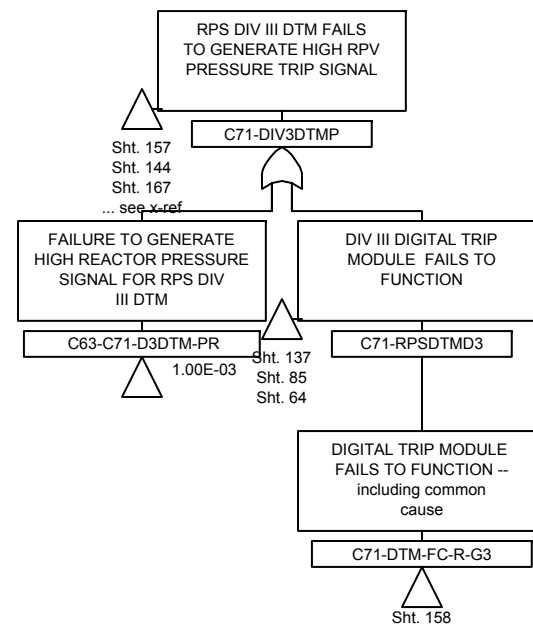


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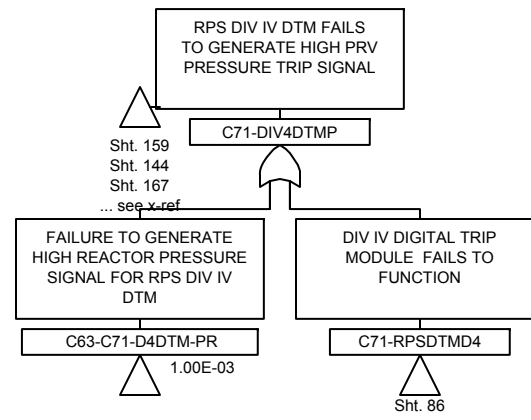


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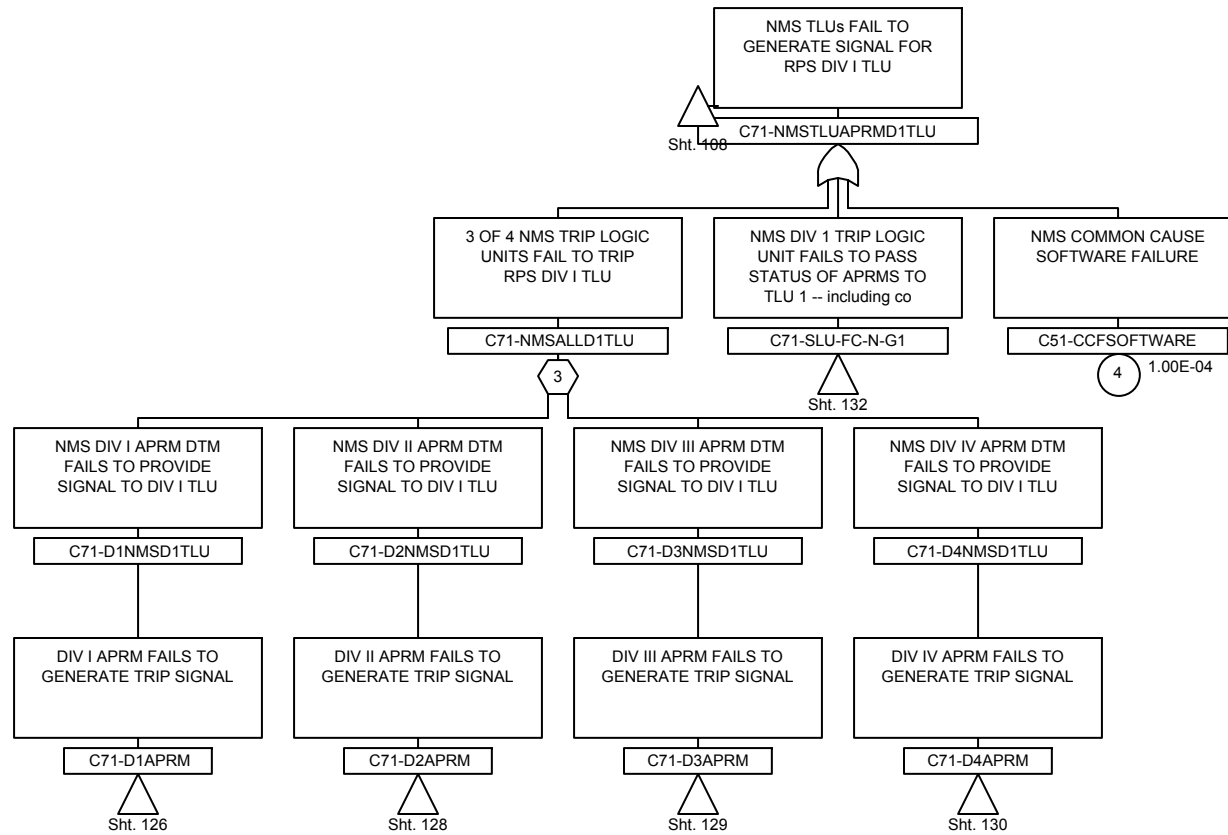


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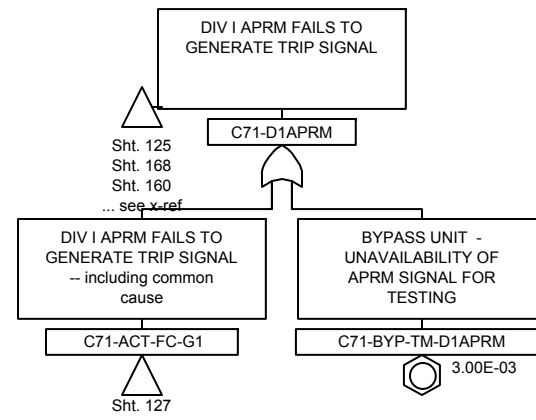


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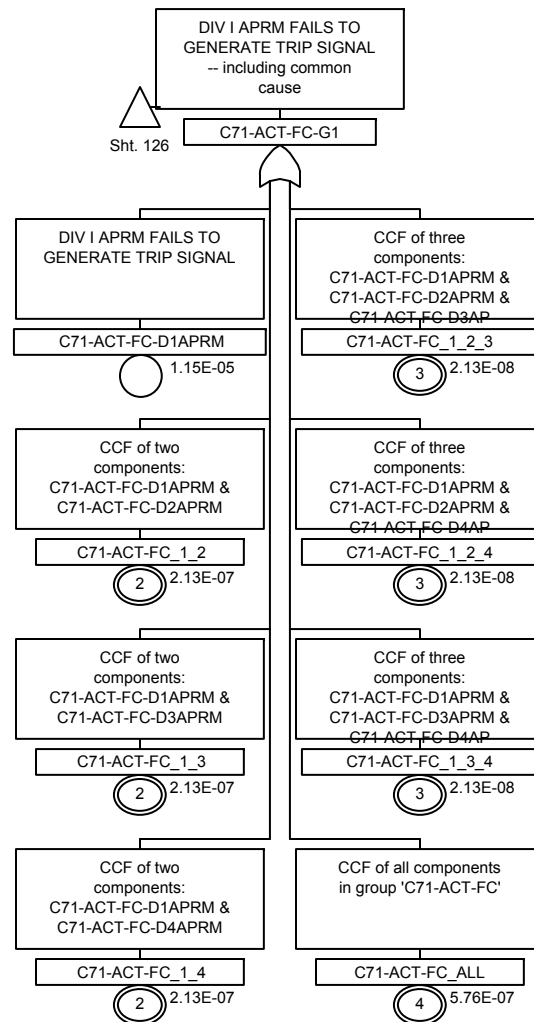


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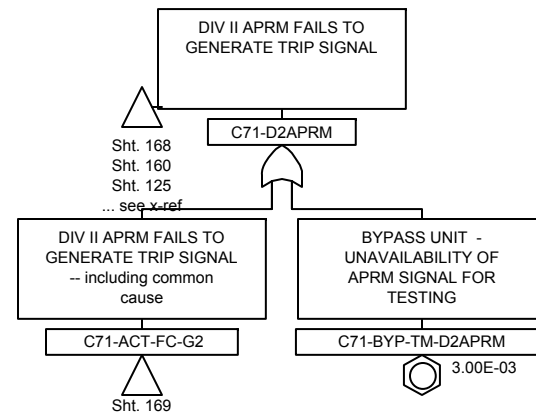


Figure 4.5-3c. Sheet 128 Reactor Protection System



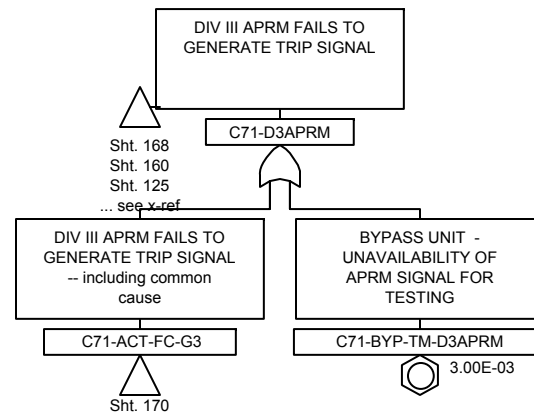


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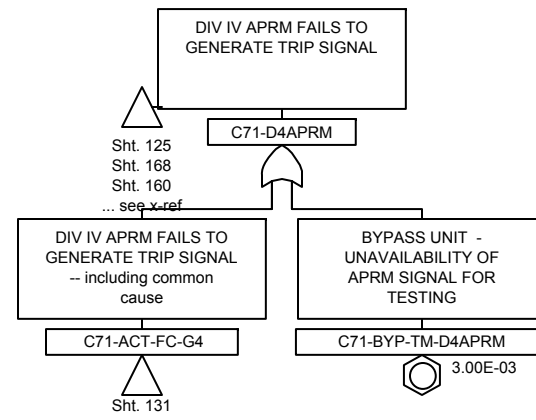


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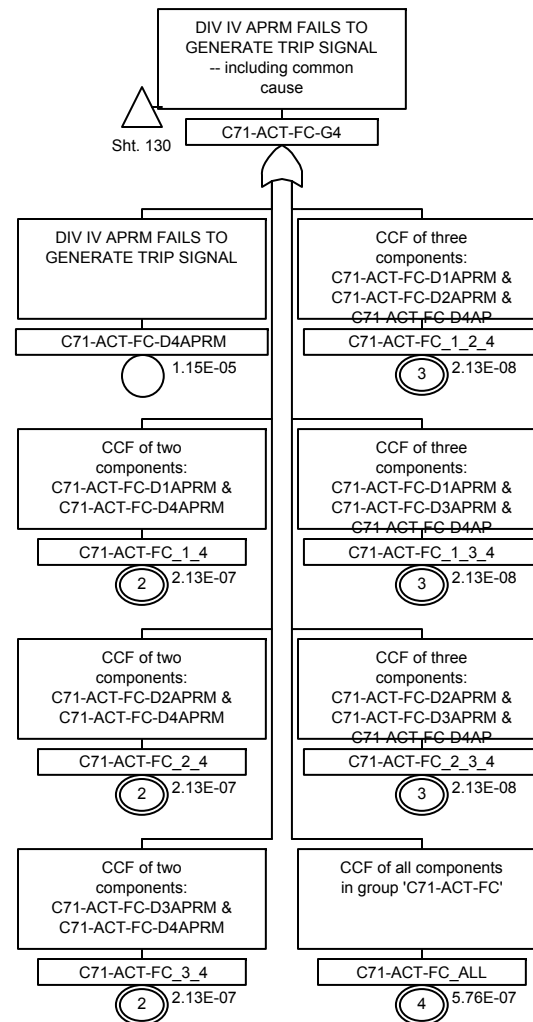


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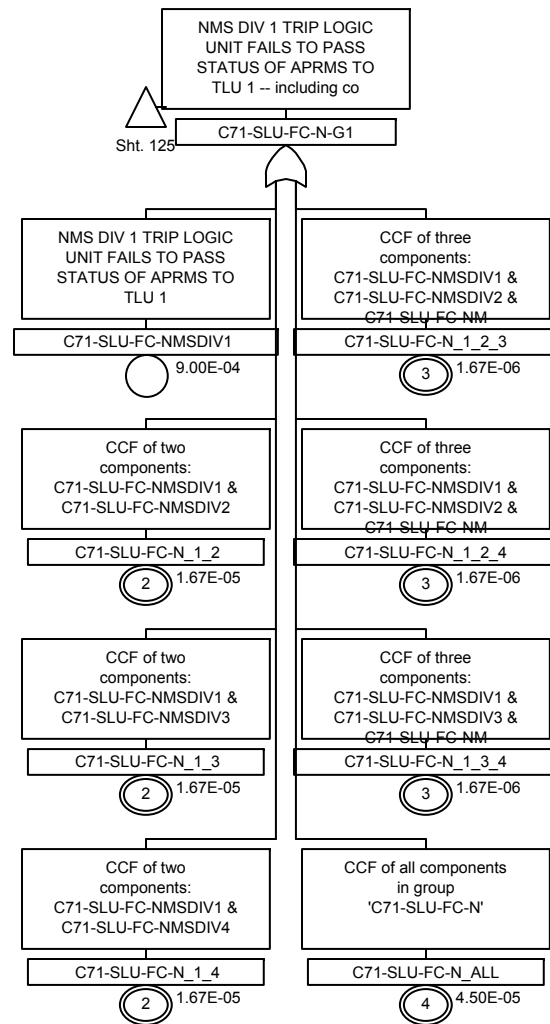


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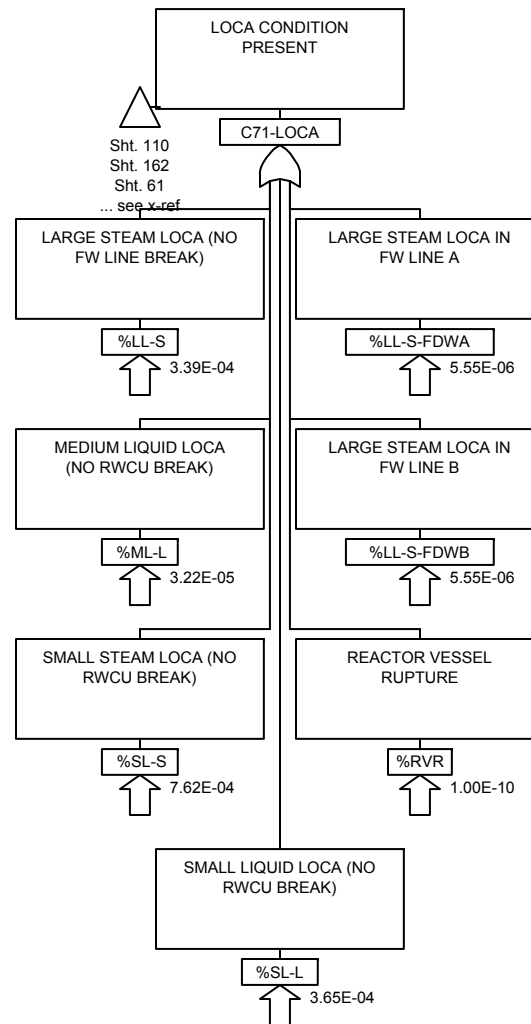


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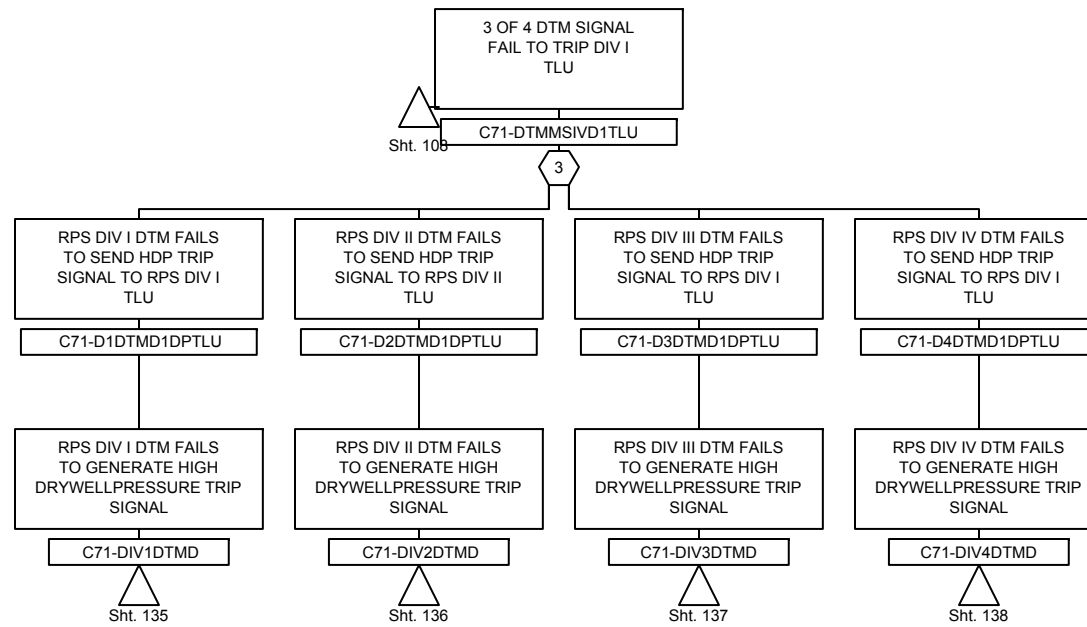


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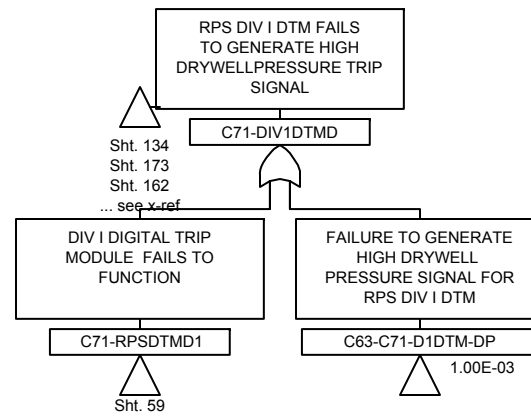


Figure 4.5-3c. Sheet 135 Reactor Protection System

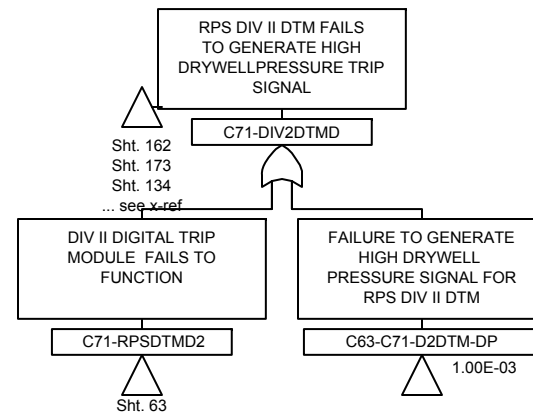


Figure 4.5-3c. Sheet 136 Reactor Protection System



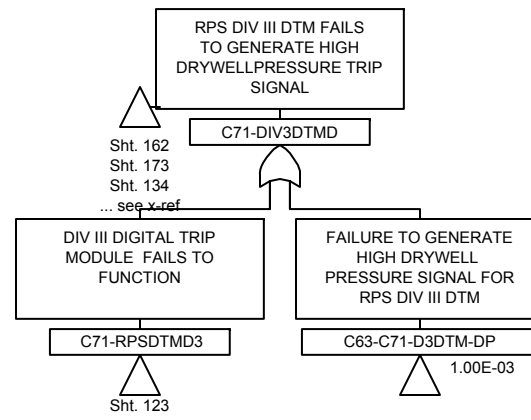


Figure 4.5-3c. Sheet 137 Reactor Protection System

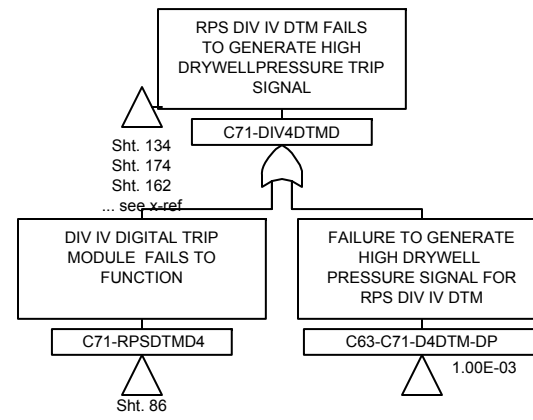


Figure 4.5-3c. Sheet 138 Reactor Protection System

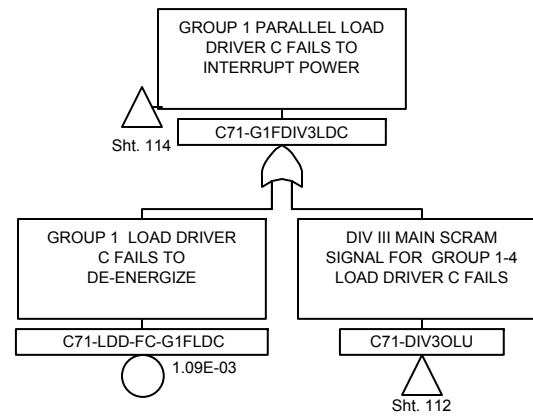


Figure 4.5-3c. Sheet 139 Reactor Protection System

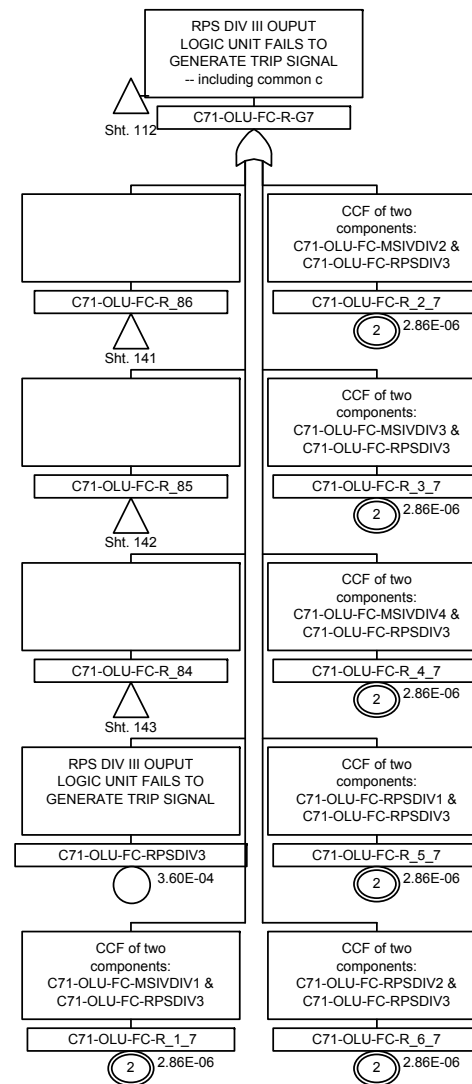


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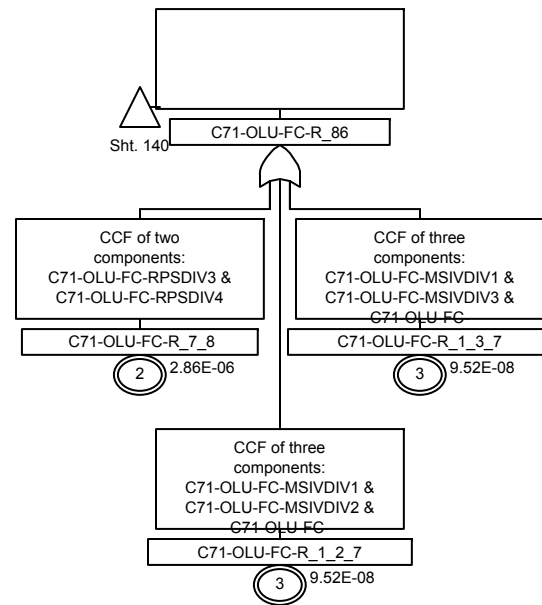


Figure 4.5-3c. Sheet 141 Reactor Protection System

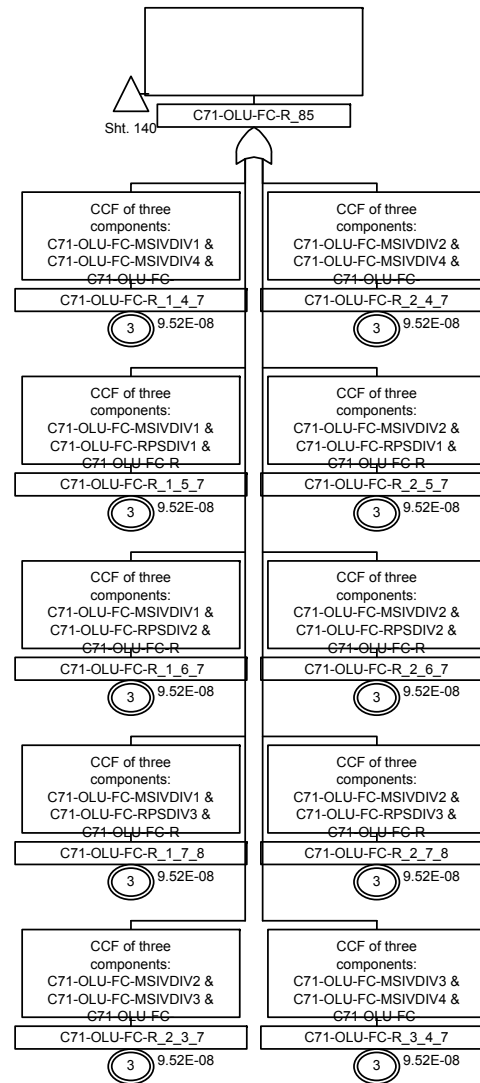


Figure 4.5-3c. Sheet 142 Reactor Protection System

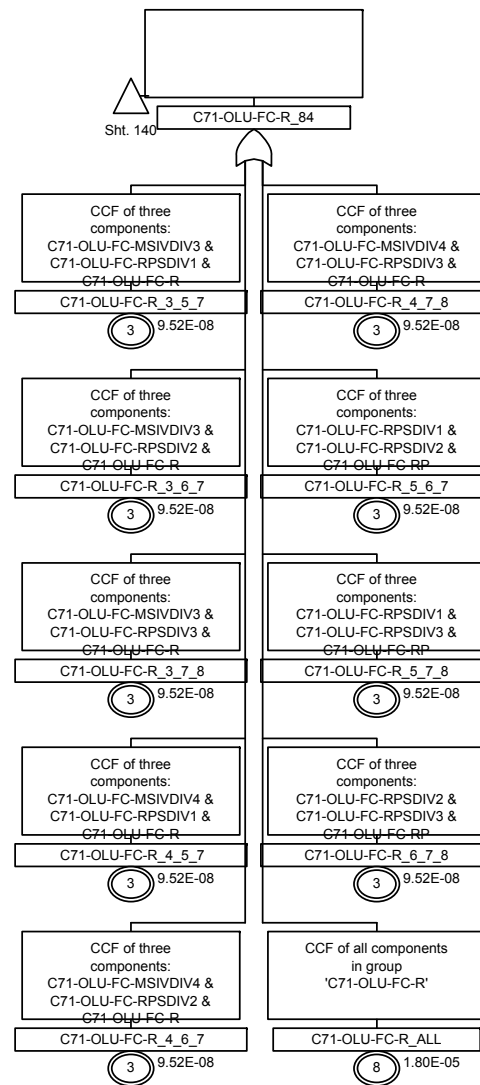


Figure 4.5-3c. Sheet 143 Reactor Protection System

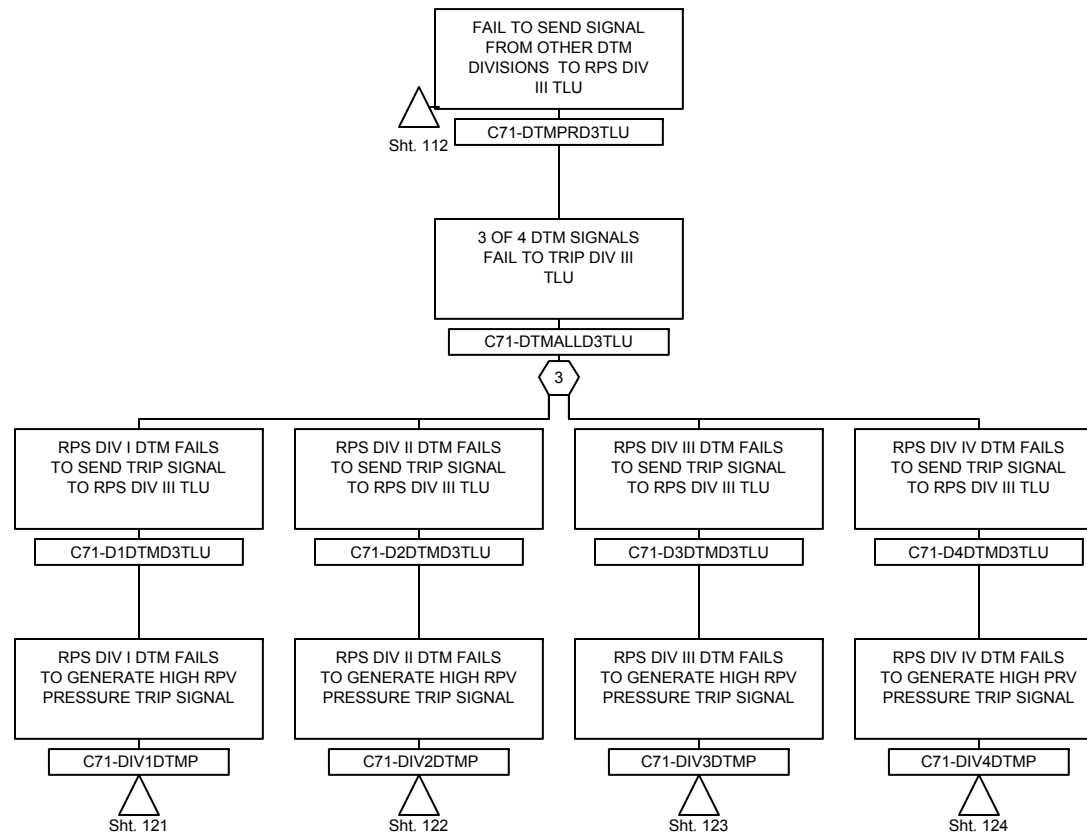


Figure 4.5-3c. Sheet 144 Reactor Protection System



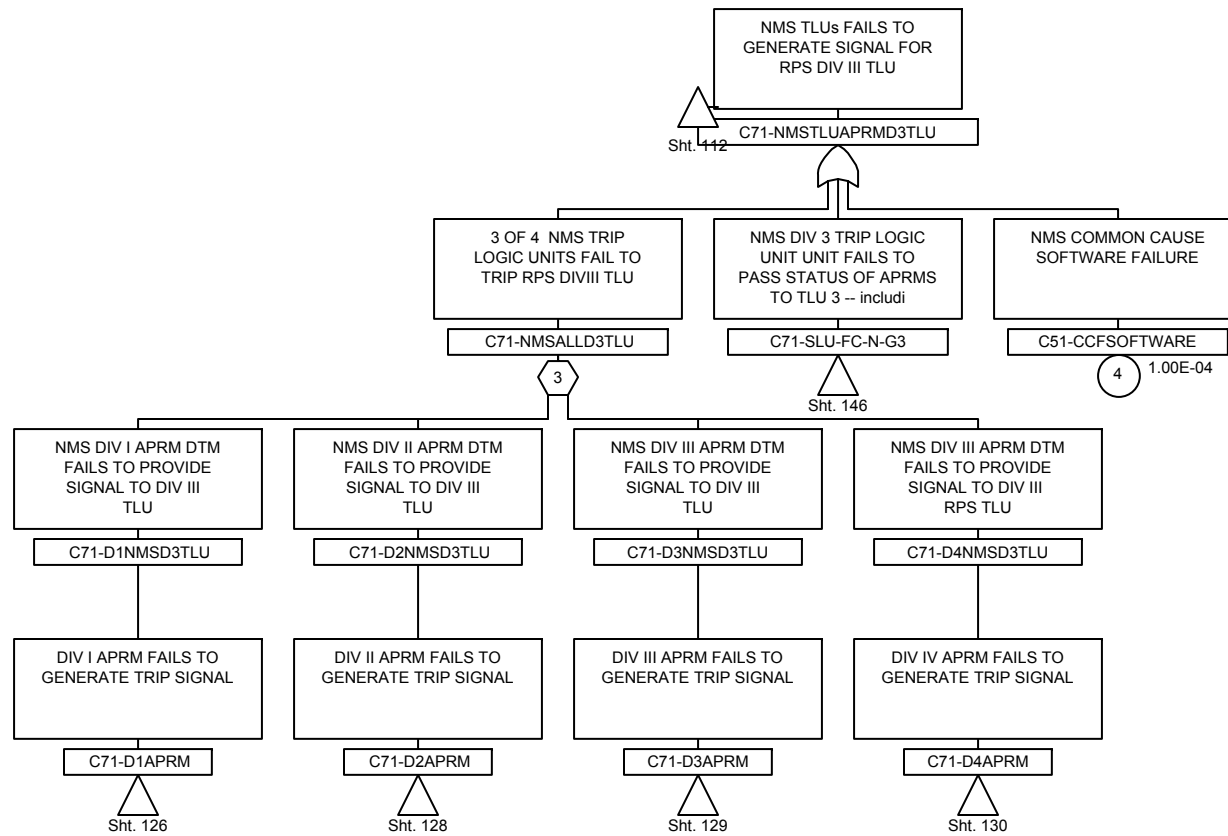


Figure 4.5-3c. Sheet 145 Reactor Protection System

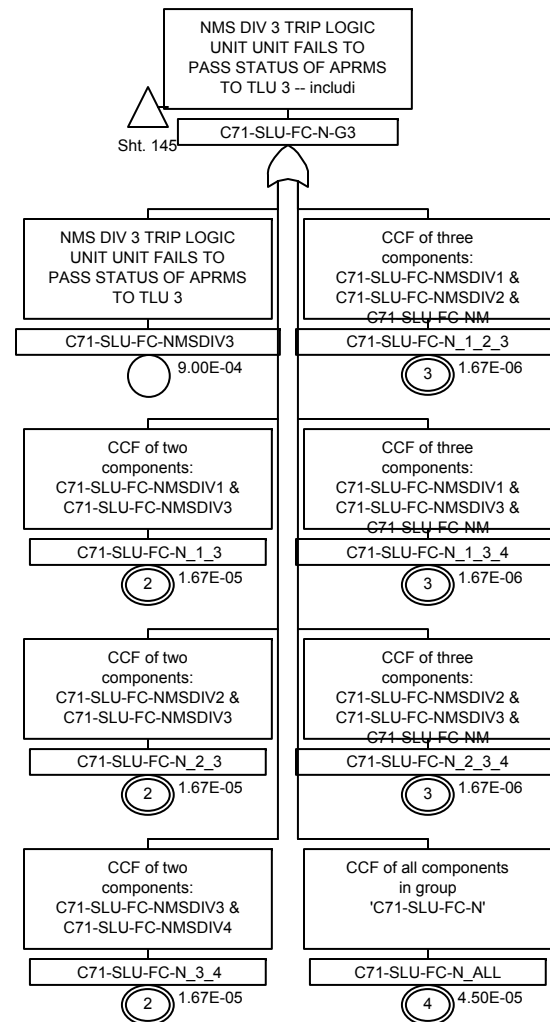


Figure 4.5-3c. Sheet 146 Reactor Protection System

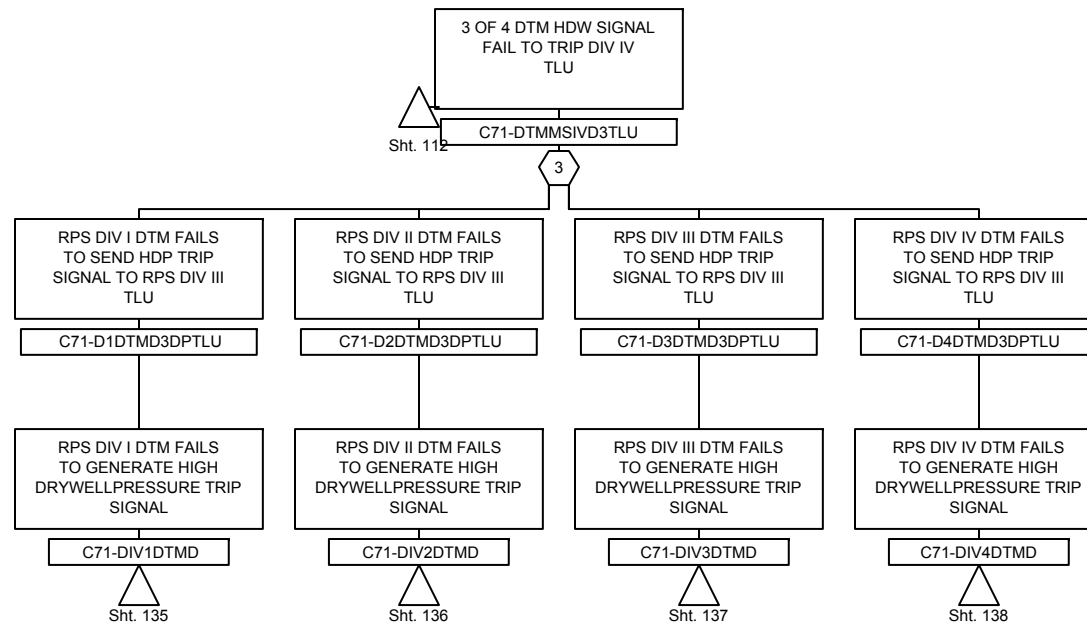


Figure 4.5-3c. Sheet 147 Reactor Protection System

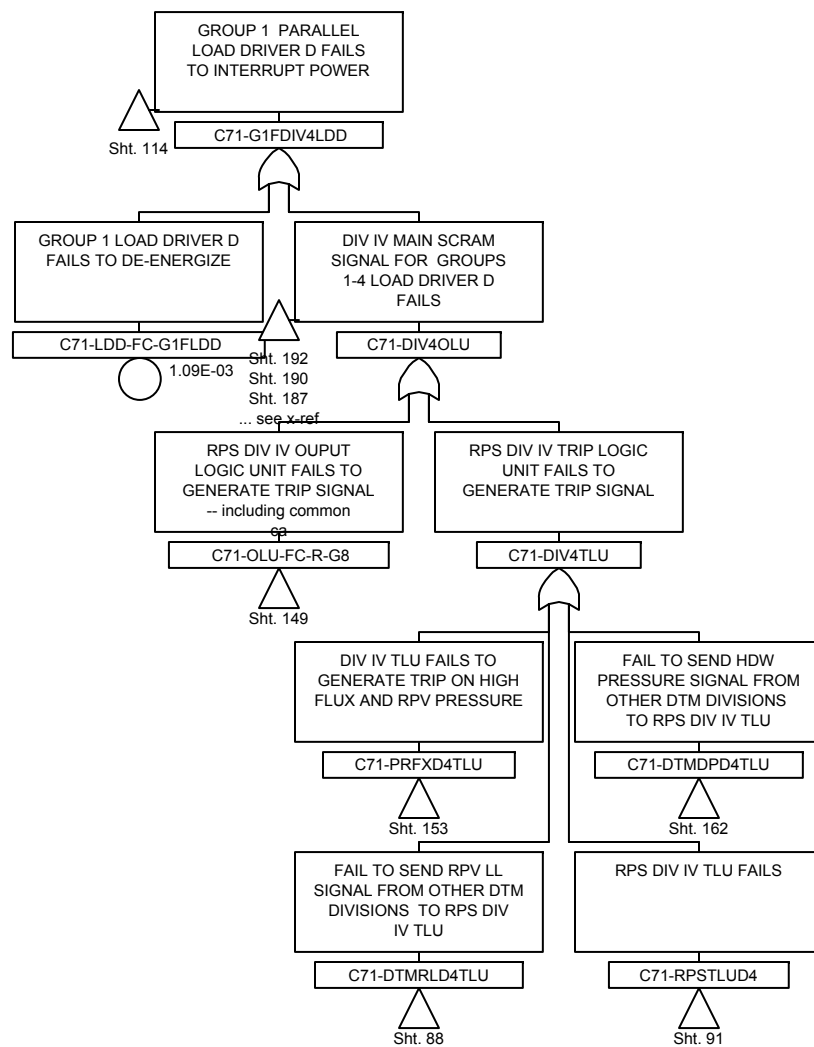


Figure 4.5-3c. Sheet 148 Reactor Protection System

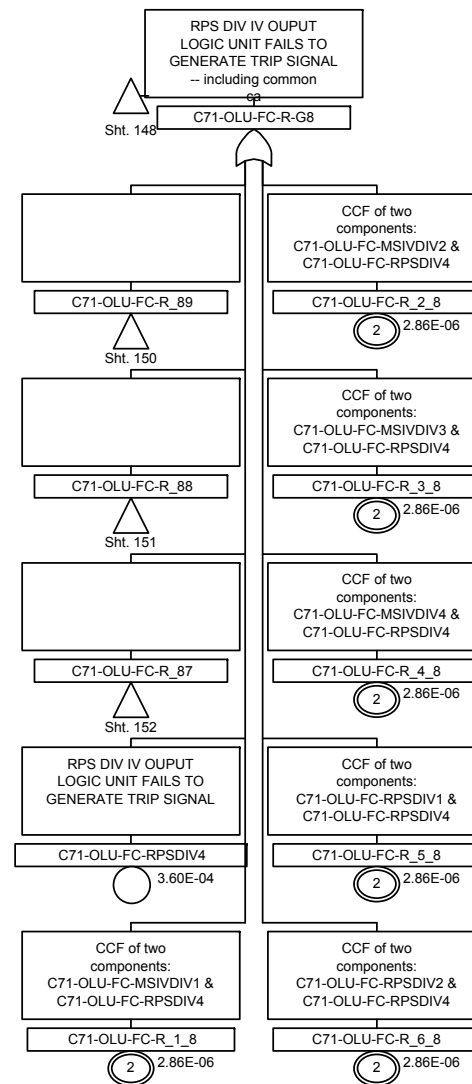


Figure 4.5-3c. Sheet 149 Reactor Protection System

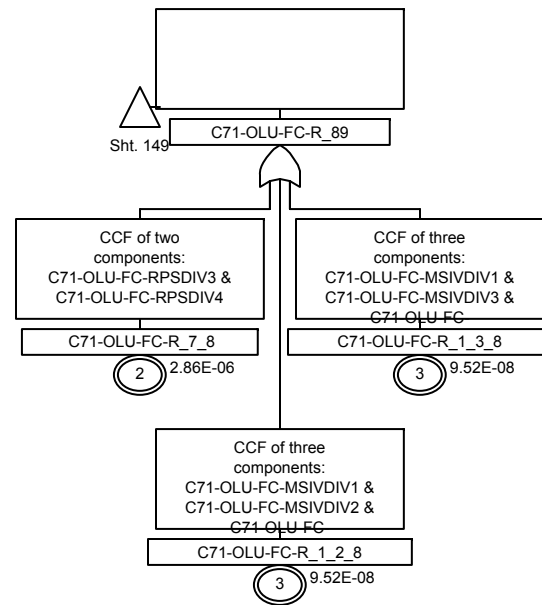


Figure 4.5-3c. Sheet 150 Reactor Protection System

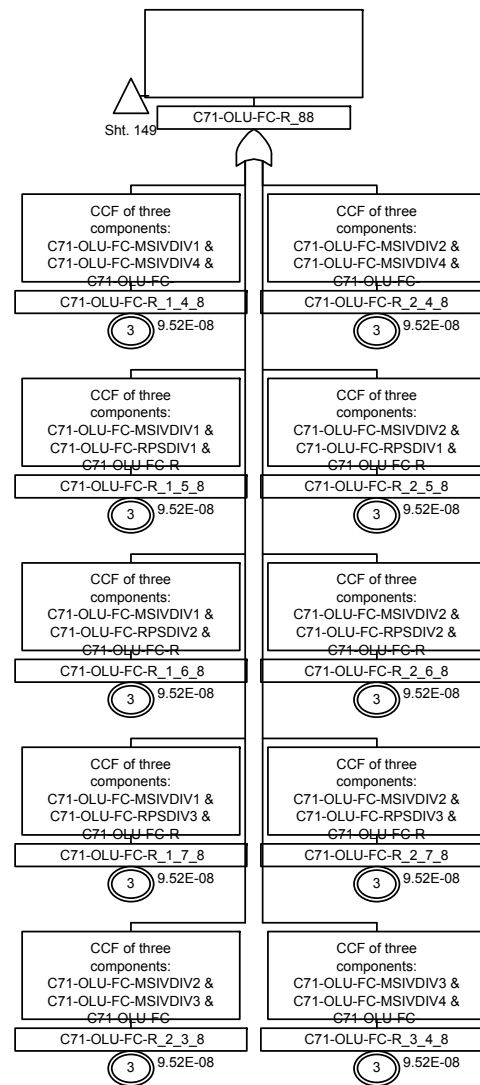


Figure 4.5-3c. Sheet 151 Reactor Protection System

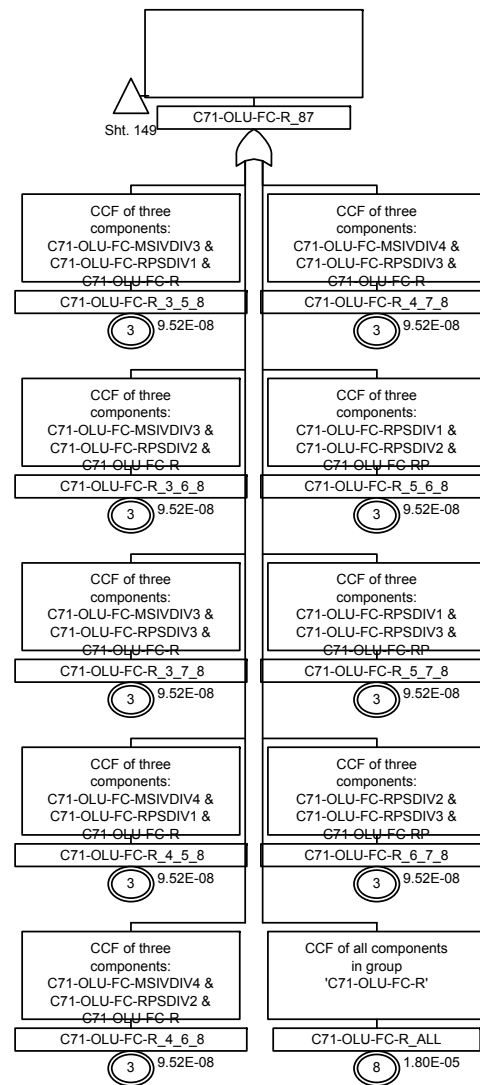


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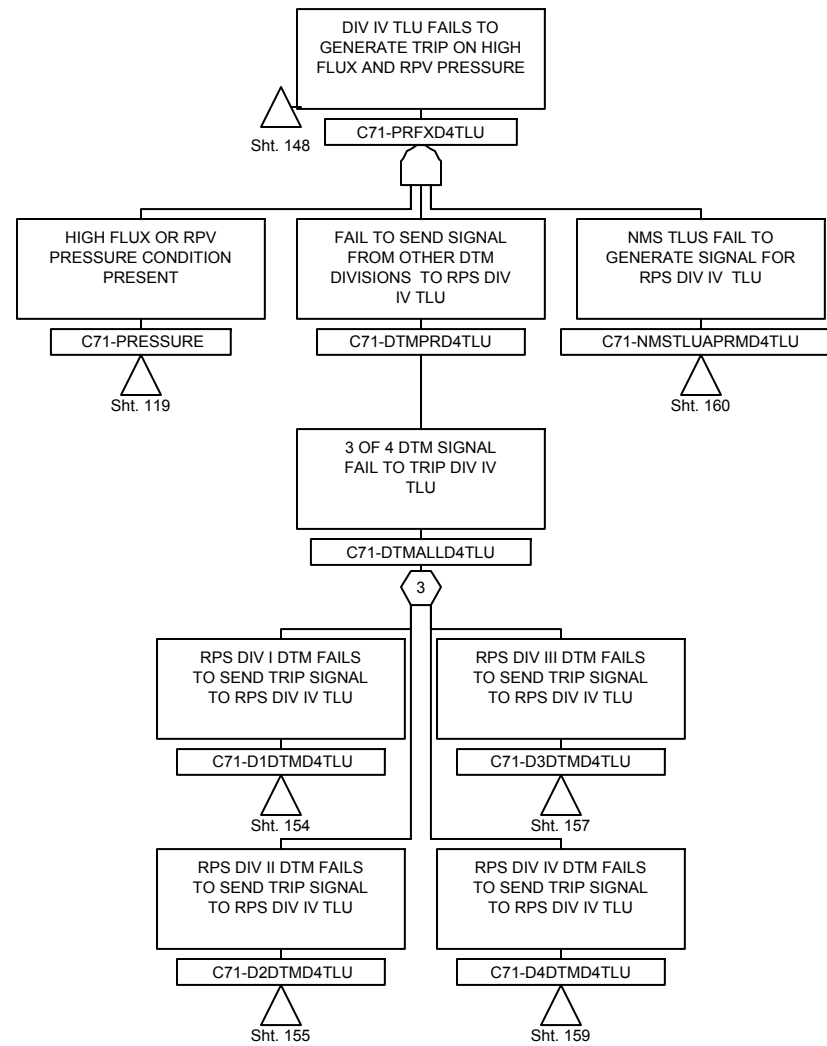


Figure 4.5-3c. Sheet 153 Reactor Protection System

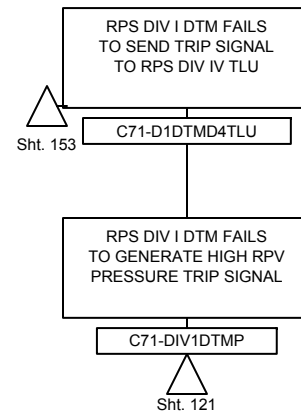


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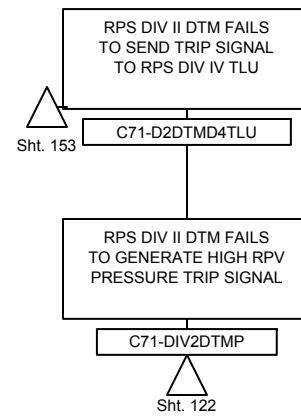


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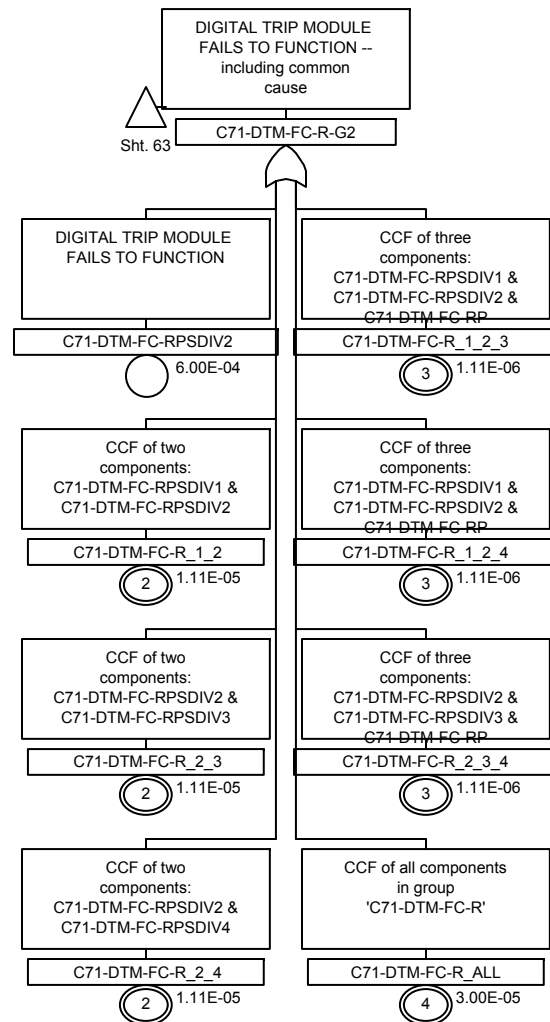


Figure 4.5-3c. Sheet 156 Reactor Protection System

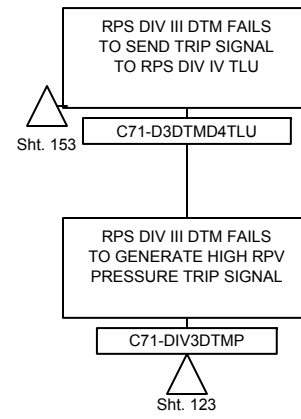


Figure 4.5-3c. Sheet 157 Reactor Protection System

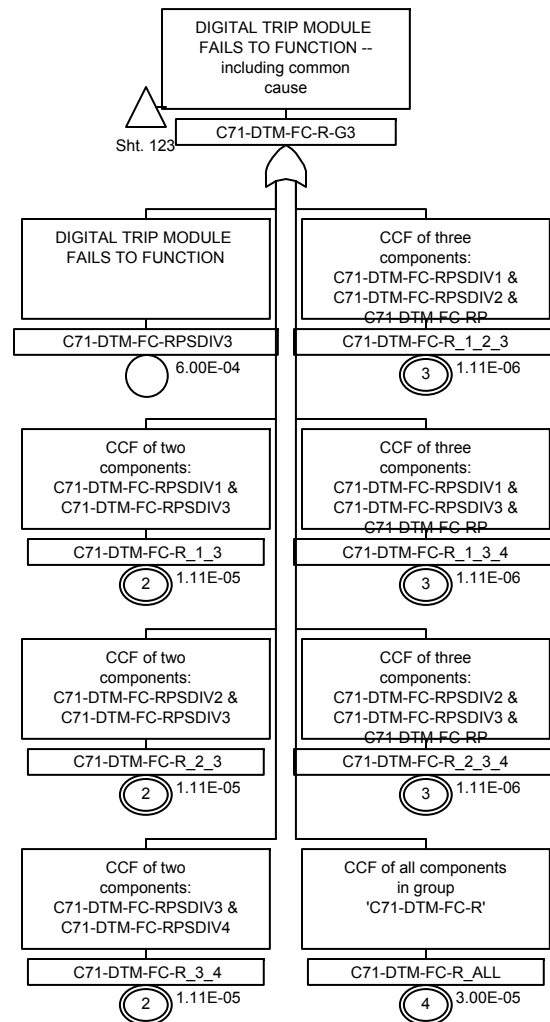


Figure 4.5-3c. Sheet 158 Reactor Protection System

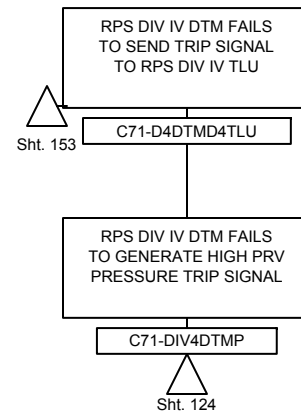


Figure 4.5-3c. Sheet 159 Reactor Protection System

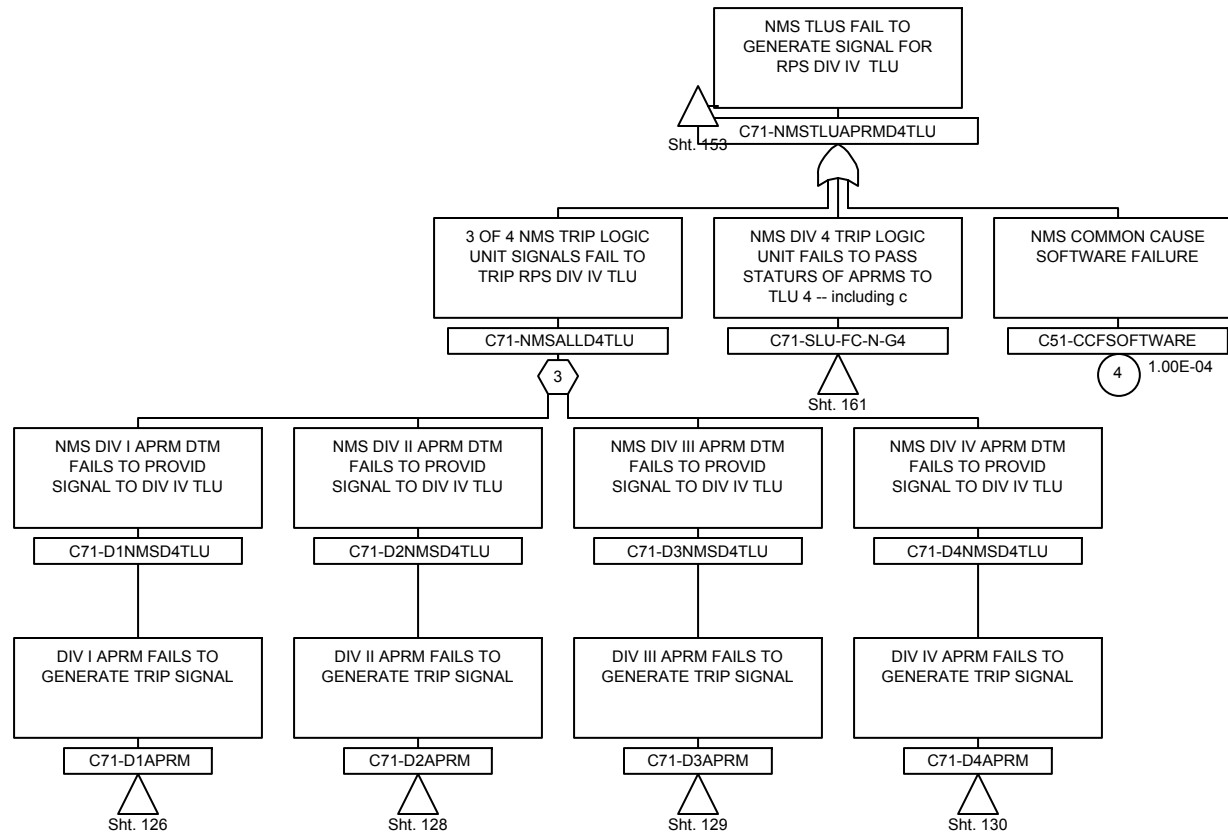


Figure 4.5-3c. Sheet 160 Reactor Protection System



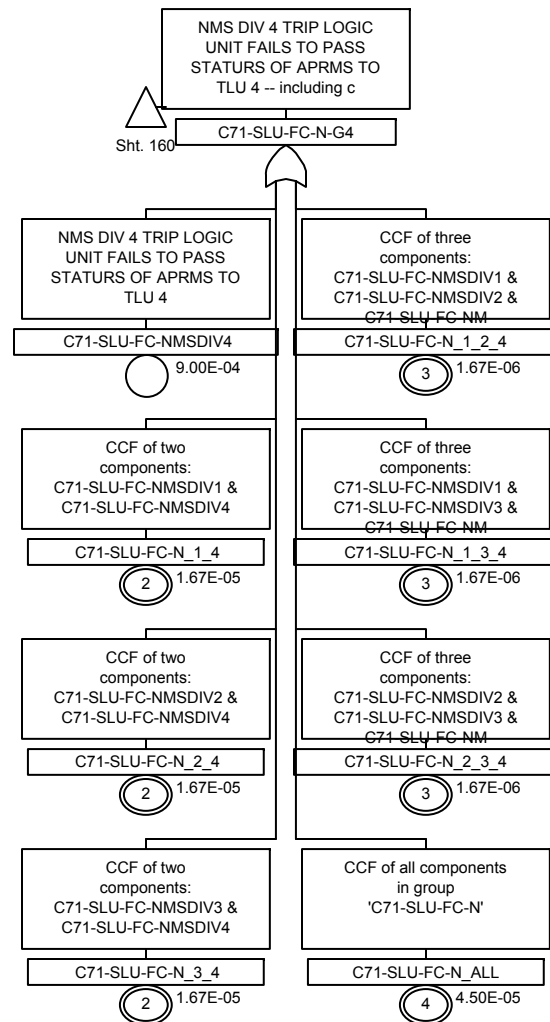


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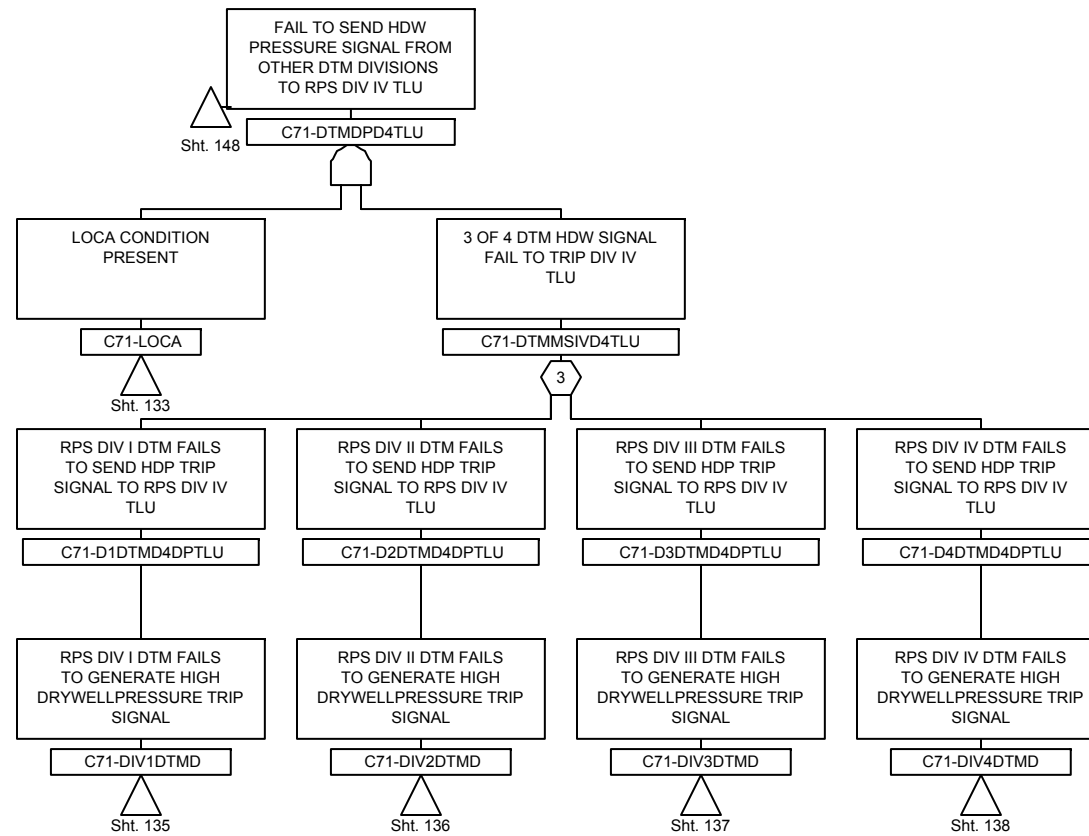


Figure 4.5-3c. Sheet 162 Reactor Protection System

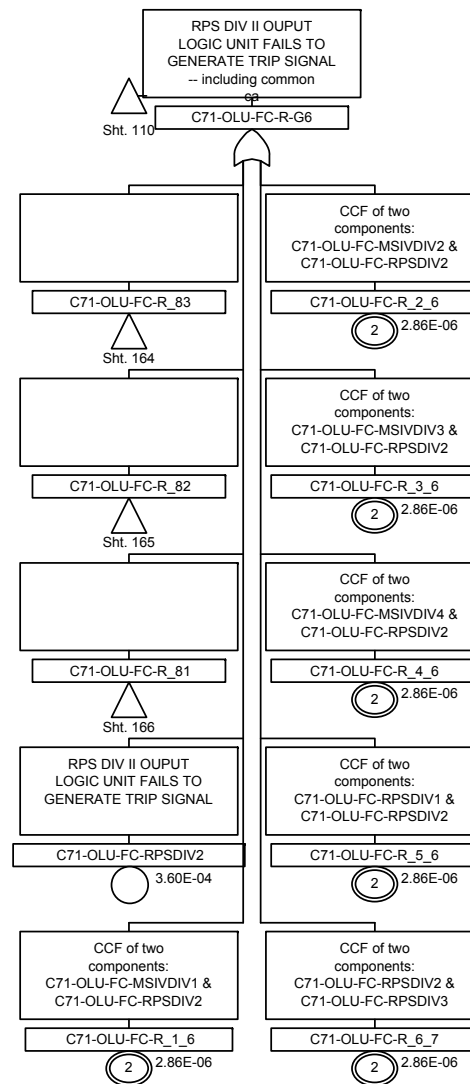


Figure 4.5-3c. Sheet 163 Reactor Protection System

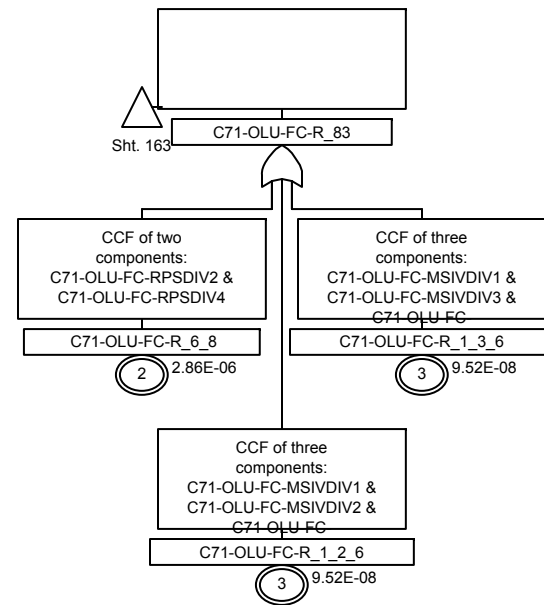


Figure 4.5-3c. Sheet 164 Reactor Protection System

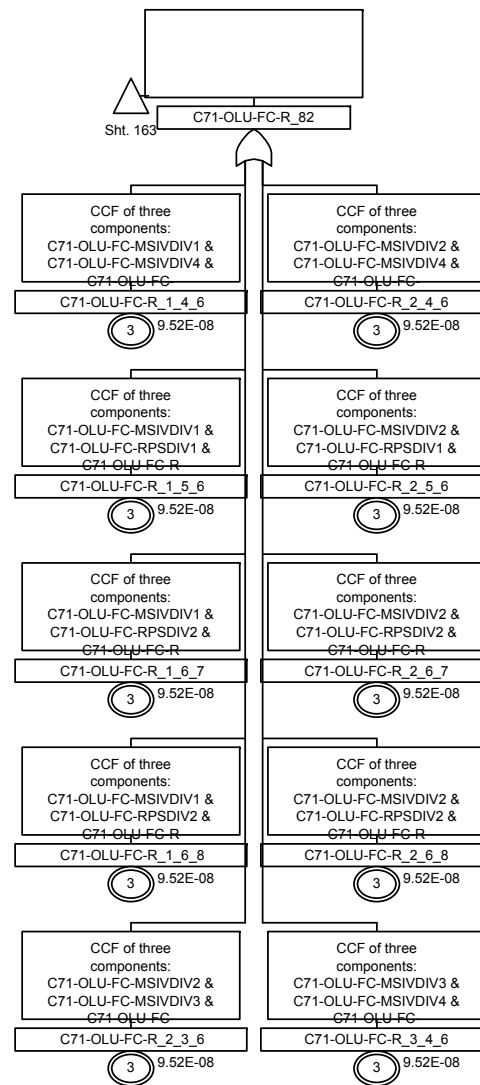


Figure 4.5-3c. Sheet 165 Reactor Protection System

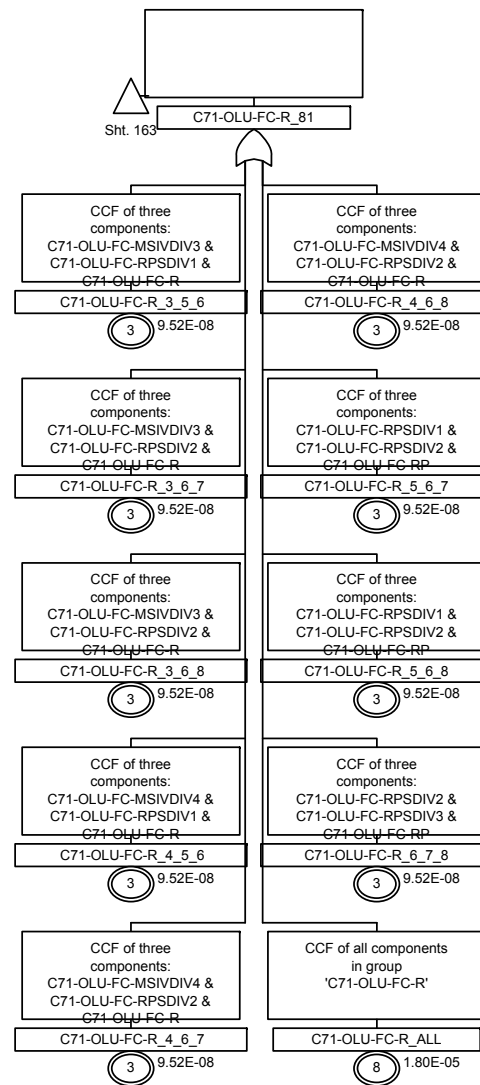


Figure 4.5-3c. Sheet 166 Reactor Protection System

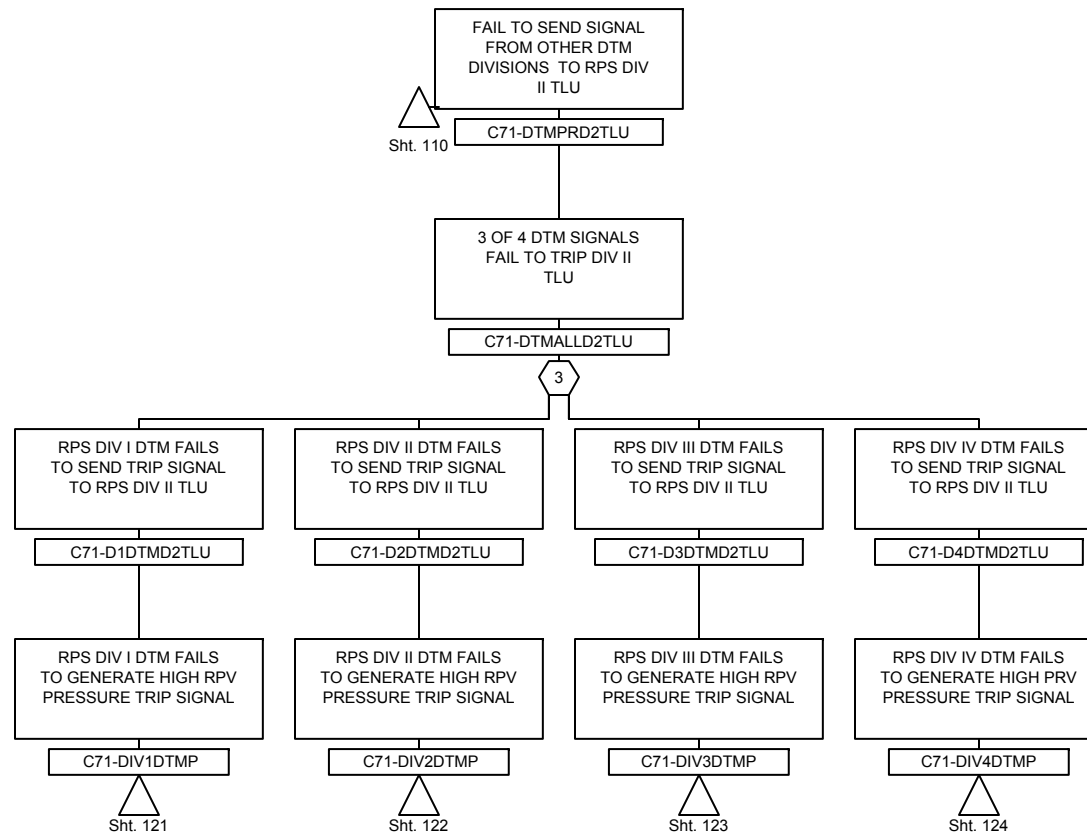


Figure 4.5-3c. Sheet 167 Reactor Protection System

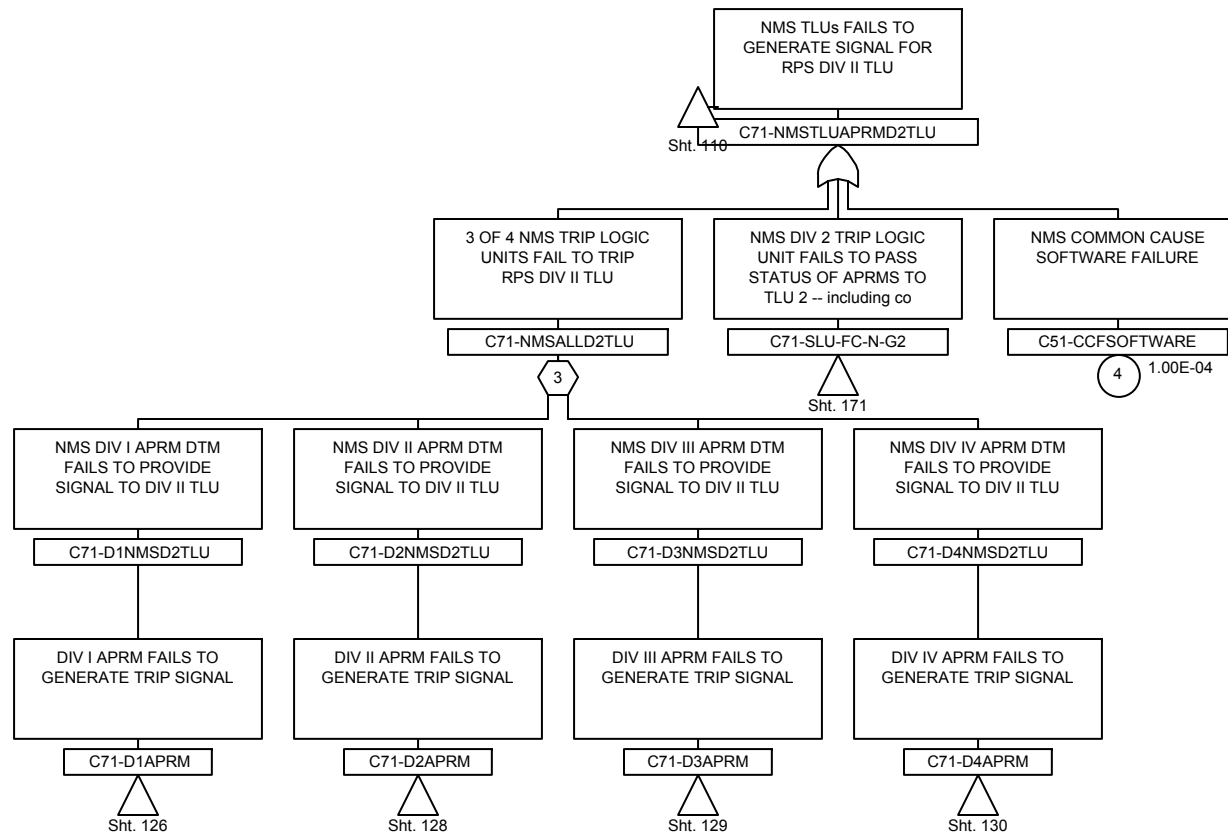


Figure 4.5-3c. Sheet 168 Reactor Protection System



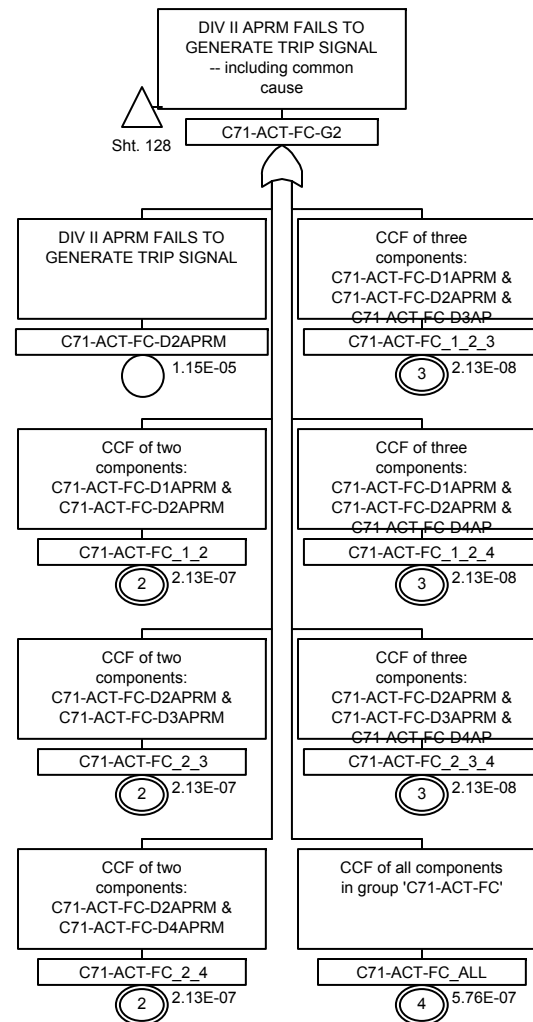


Figure 4.5-3c. Sheet 169 Reactor Protection System

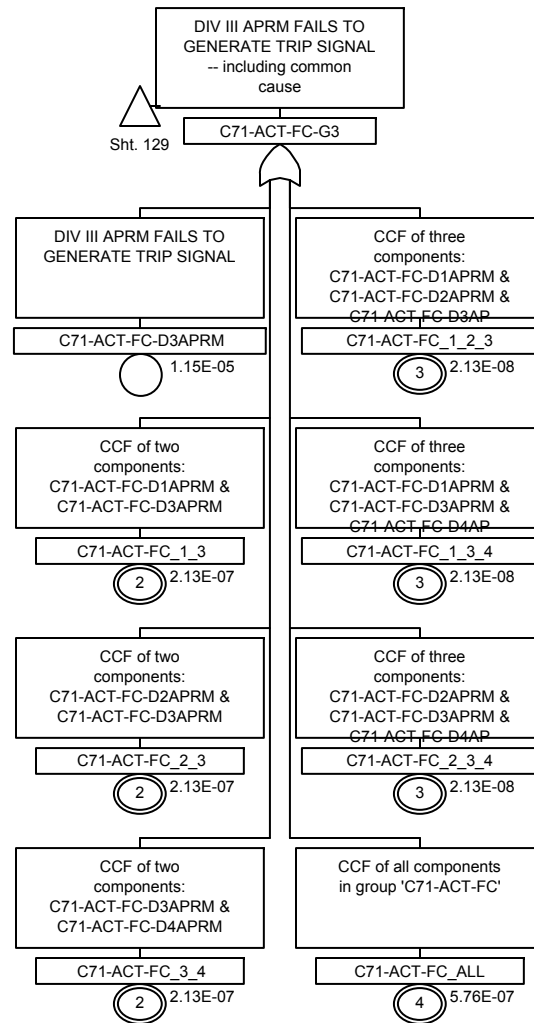


Figure 4.5-3c. Sheet 170 Reactor Protection System

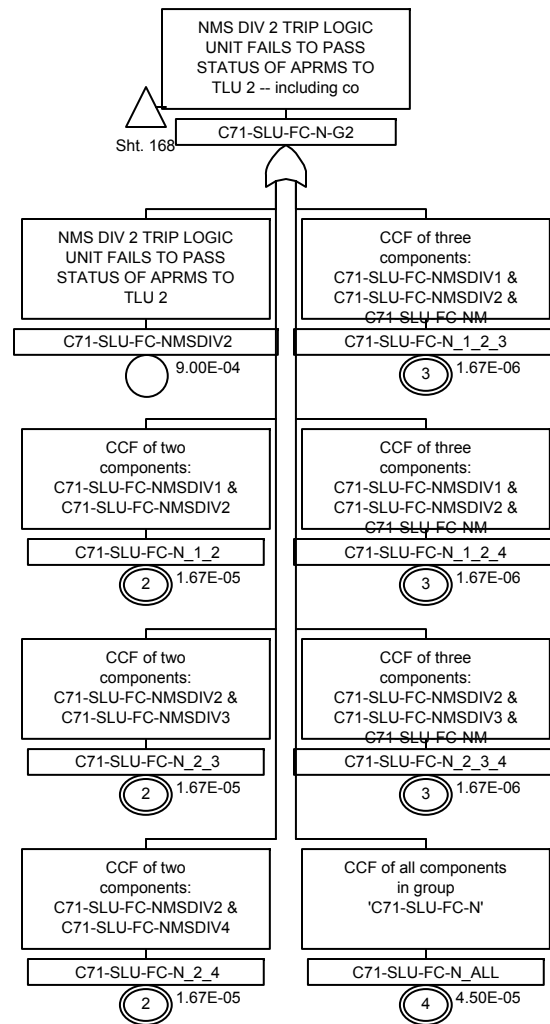


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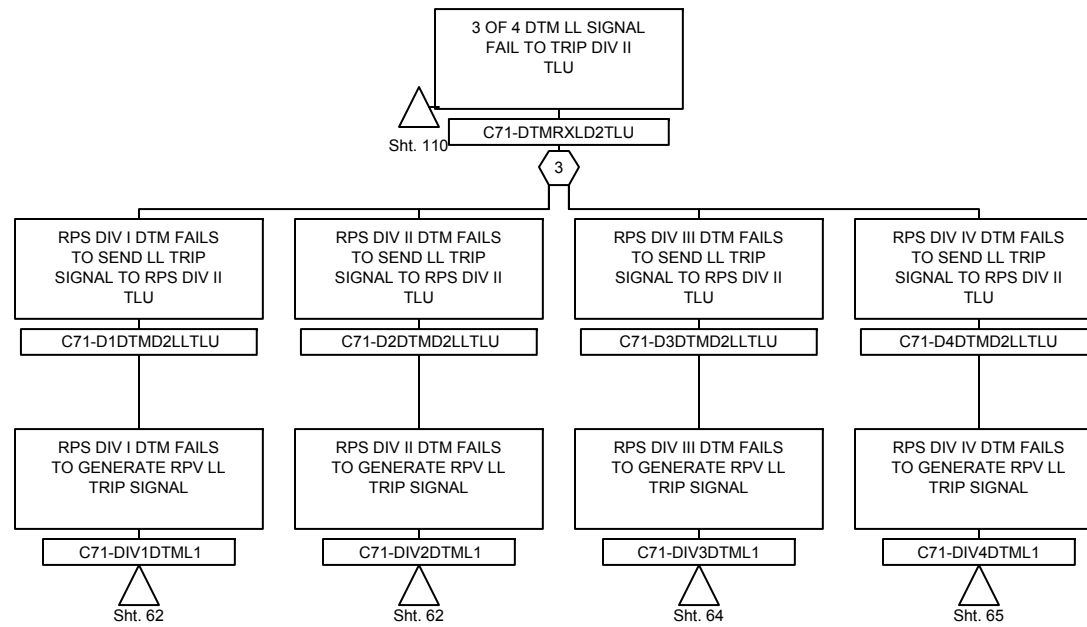


Figure 4.5-3c. Sheet 172 Reactor Protection System

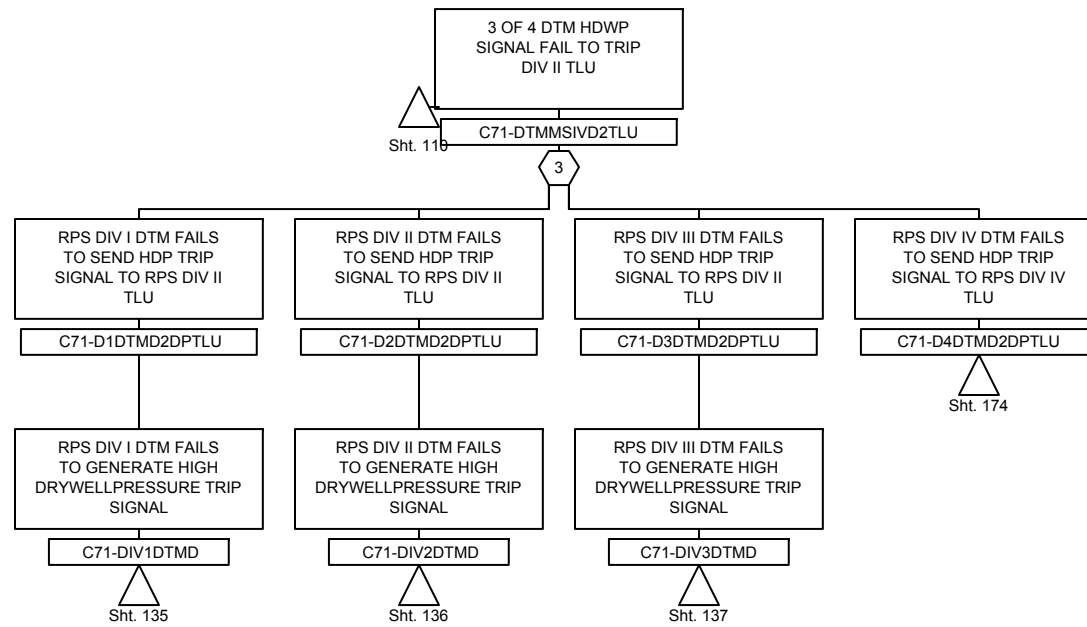


Figure 4.5-3c. Sheet 173 Reactor Protection System

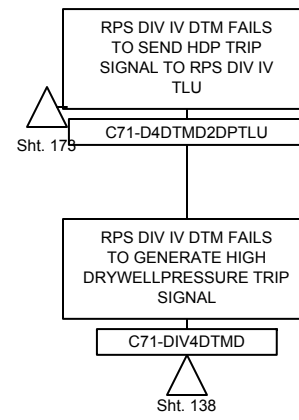


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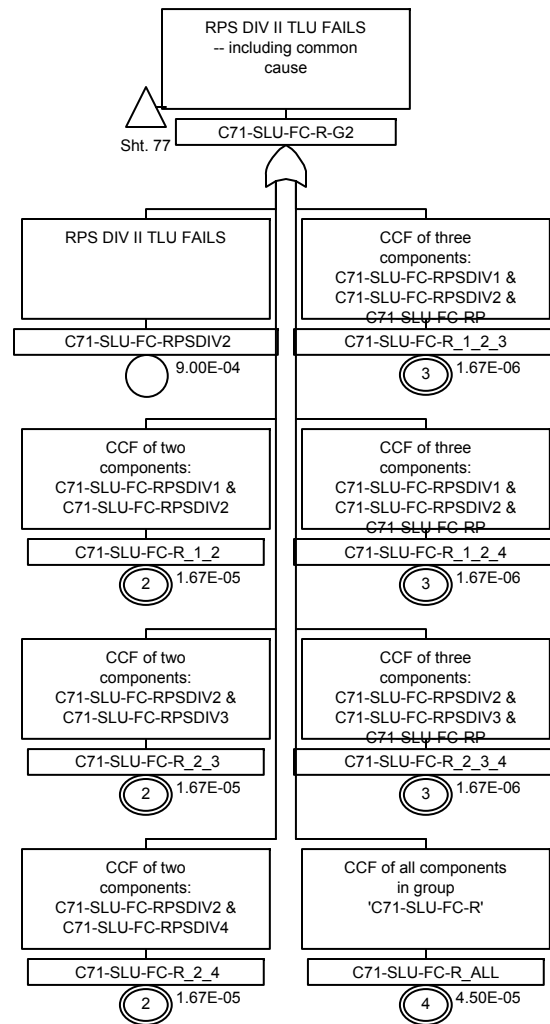


Figure 4.5-3c. Sheet 175 Reactor Protection System

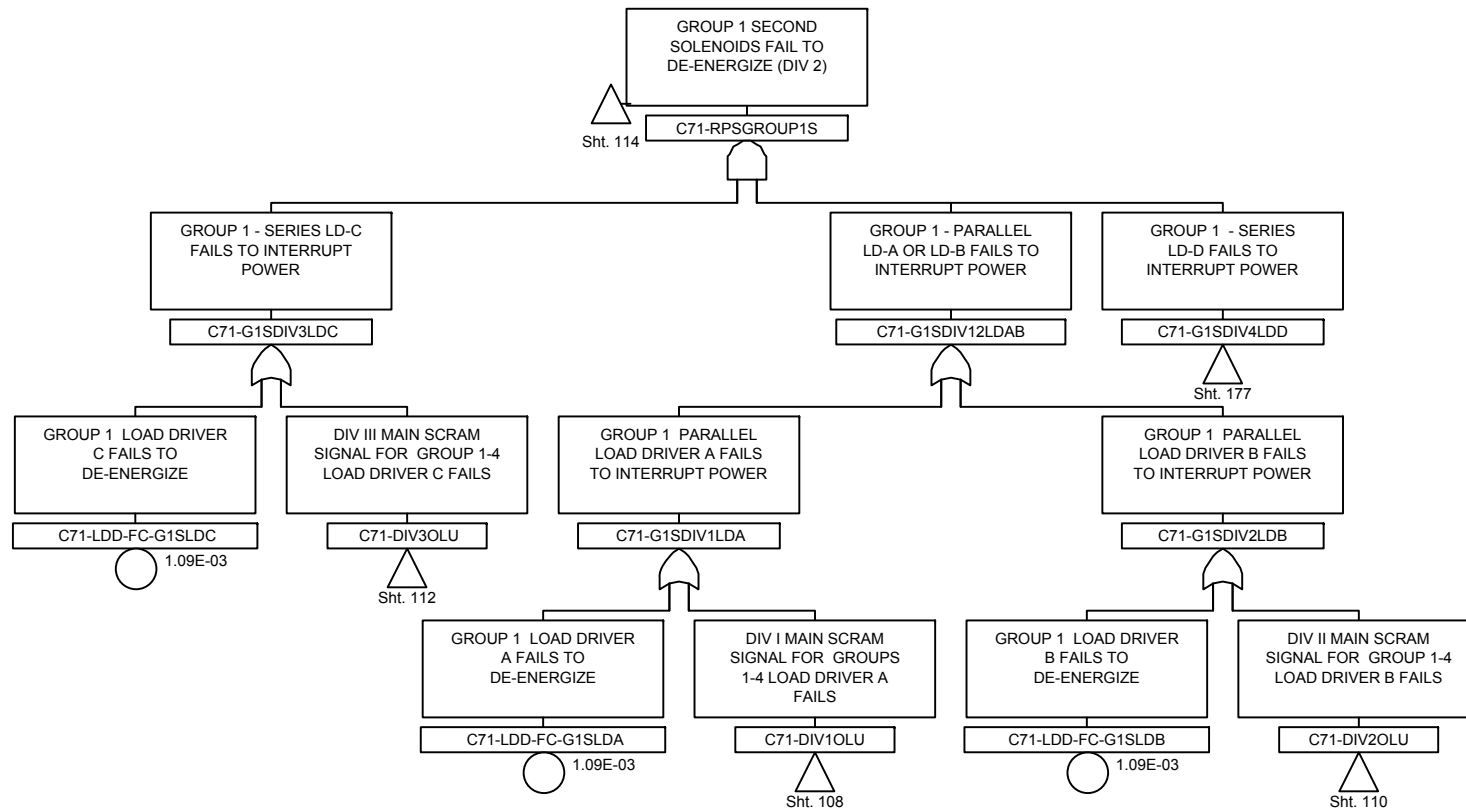


Figure 4.5-3c. Sheet 176 Reactor Protection System



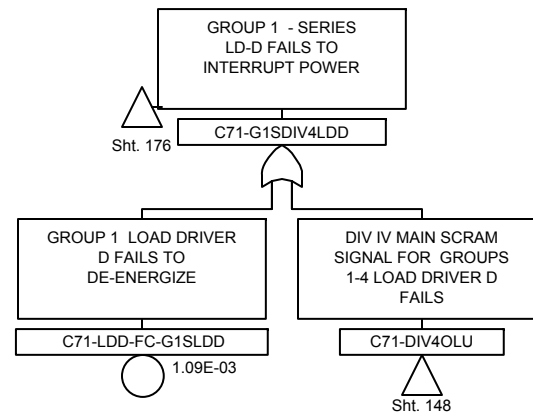


Figure 4.5-3c. Sheet 177 Reactor Protection System

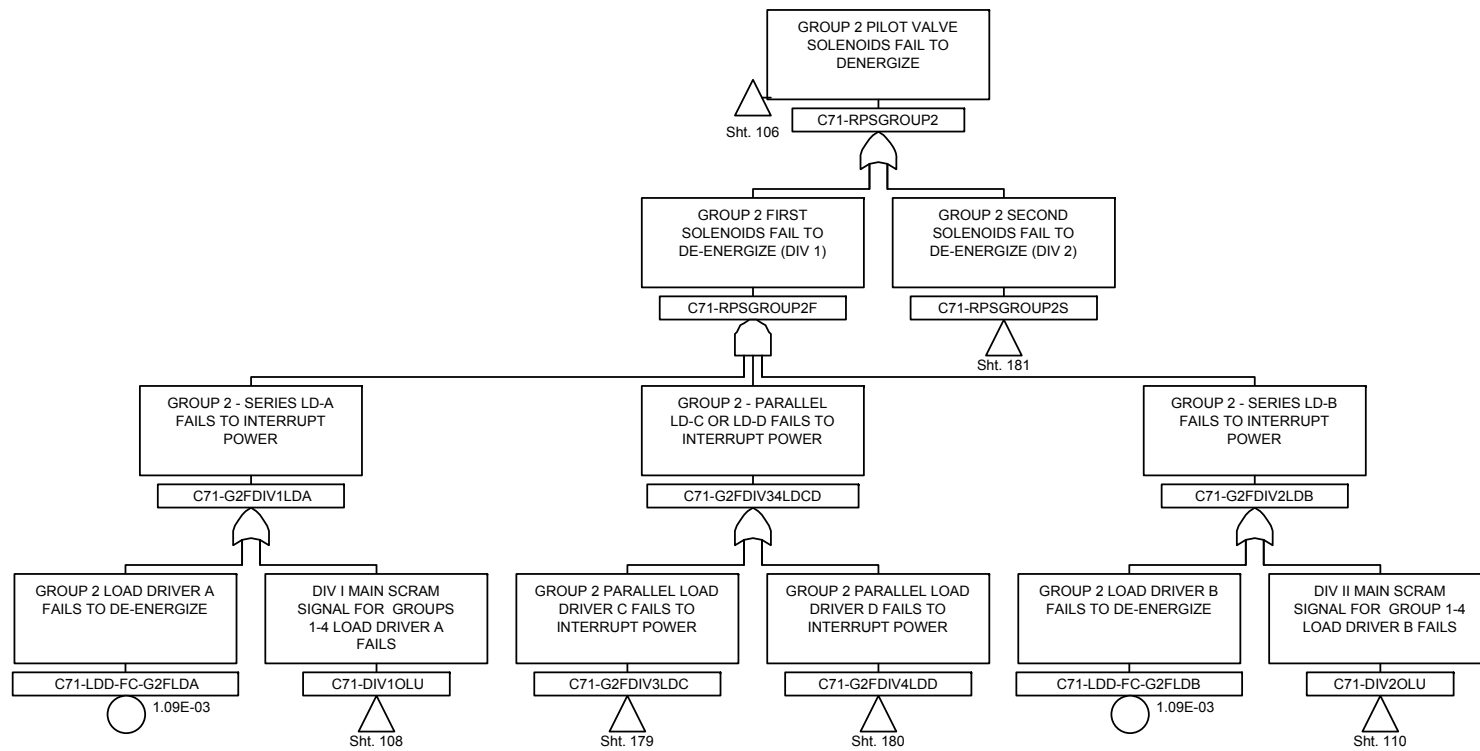


Figure 4.5-3c. Sheet 178 Reactor Protection System

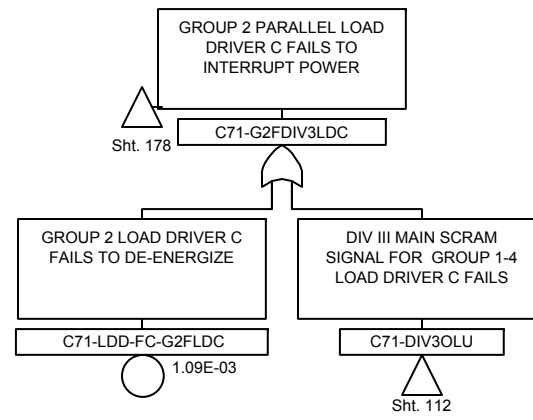
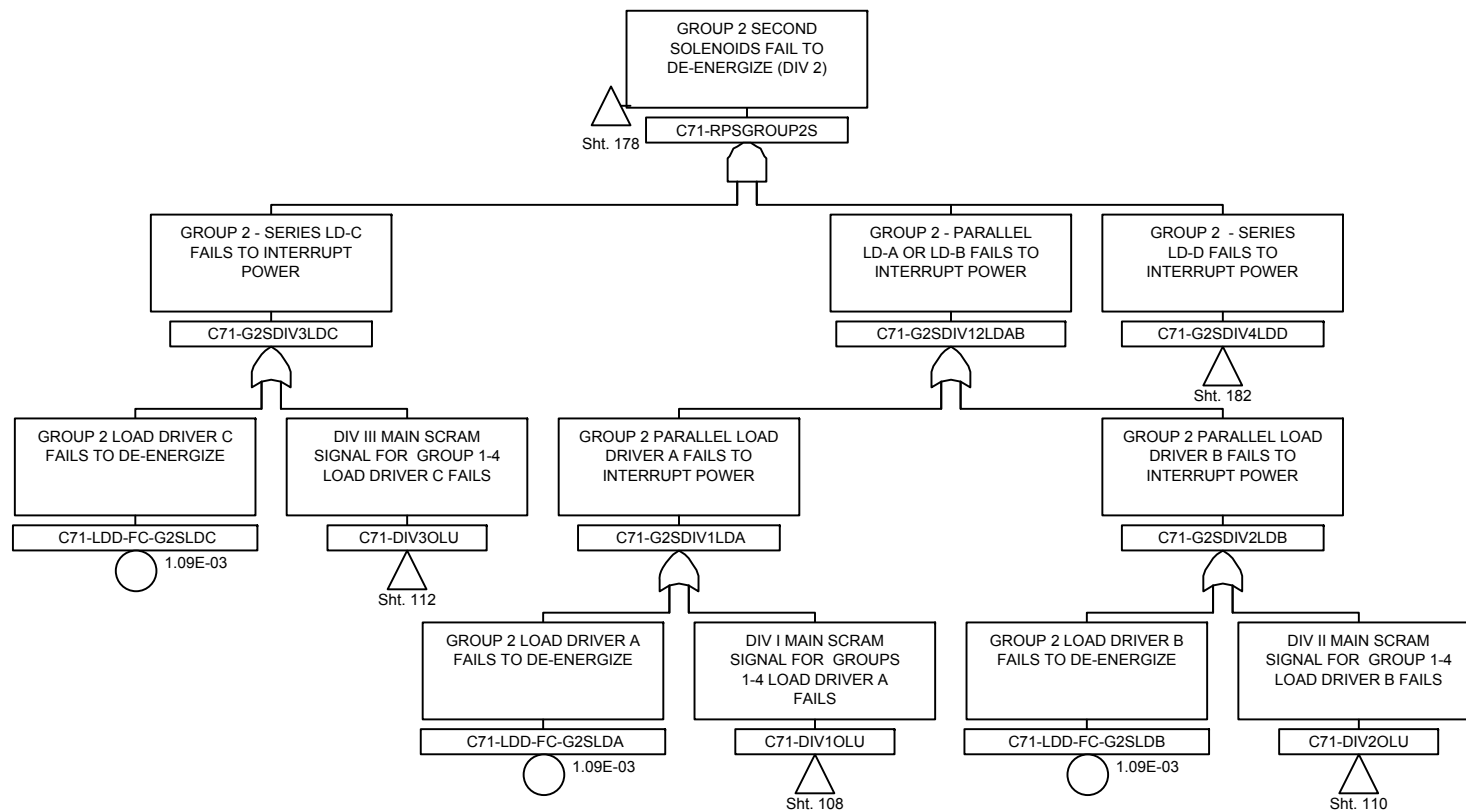


Figure 4.5-3c. Sheet 179 Reactor Protection System



1.09E-03



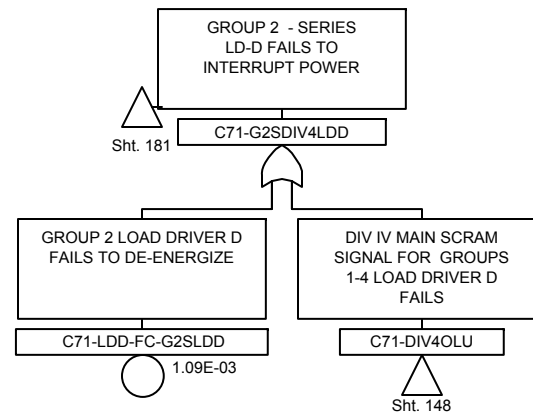


Figure 4.5-3c. Sheet 182 Reactor Protection System

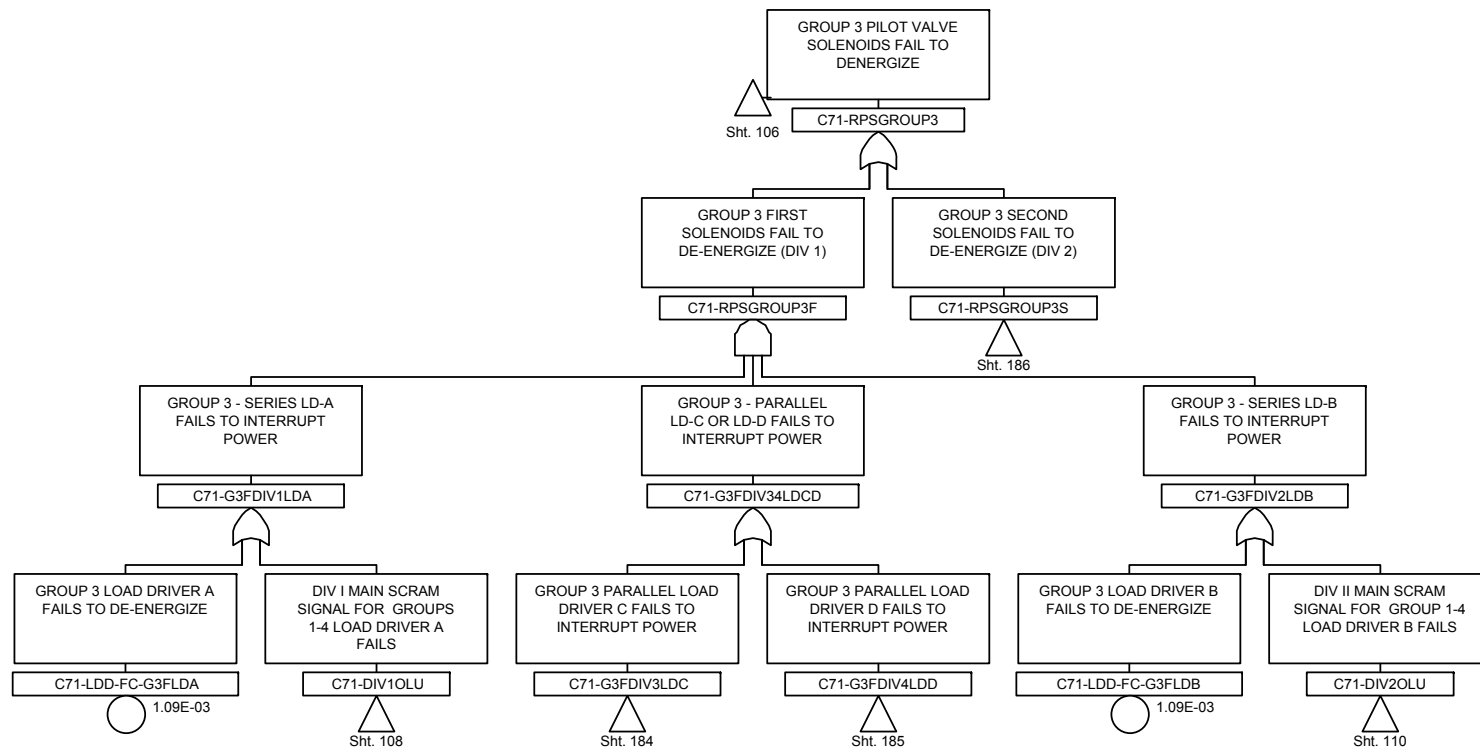


Figure 4.5-3c. Sheet 183 Reactor Protection System

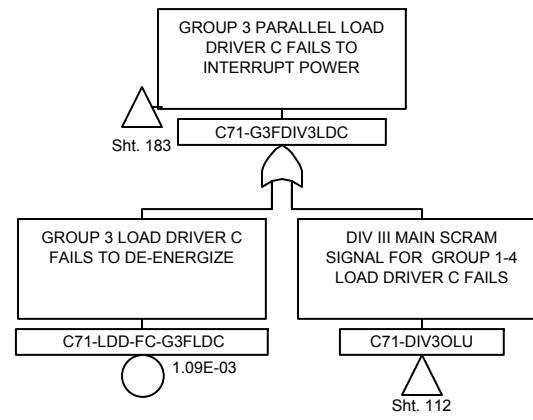


Figure 4.5-3c. Sheet 184 Reactor Protection System



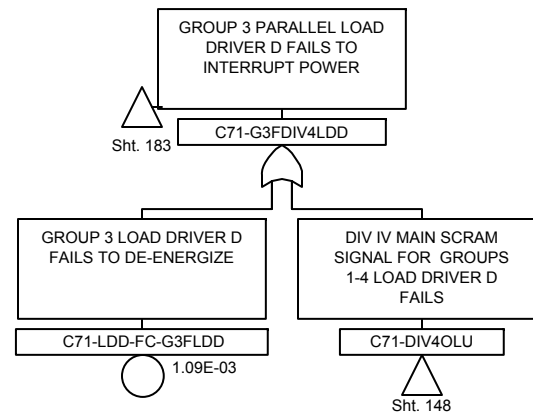


Figure 4.5-3c. Sheet 185 Reactor Protection System

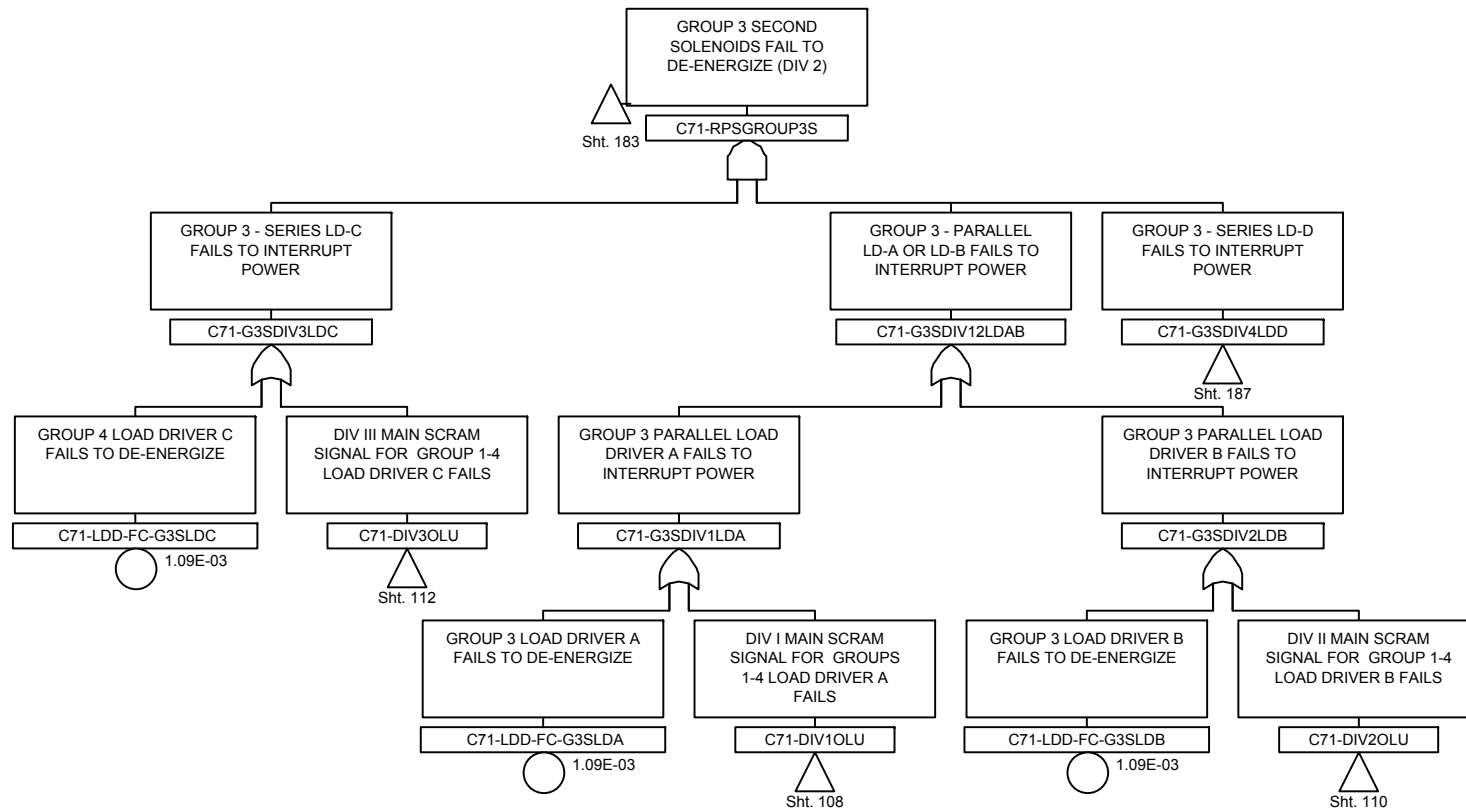


Figure 4.5-3c. Sheet 186 Reactor Protection System

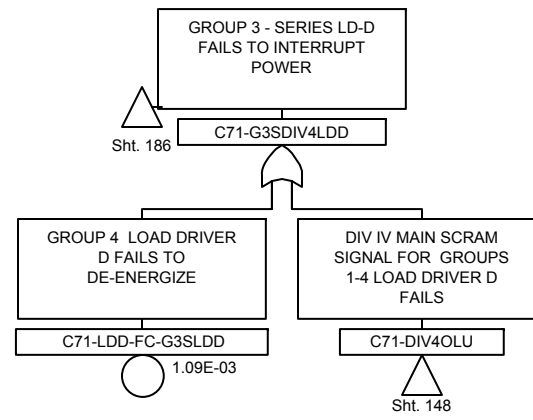


Figure 4.5-3c. Sheet 187 Reactor Protection System

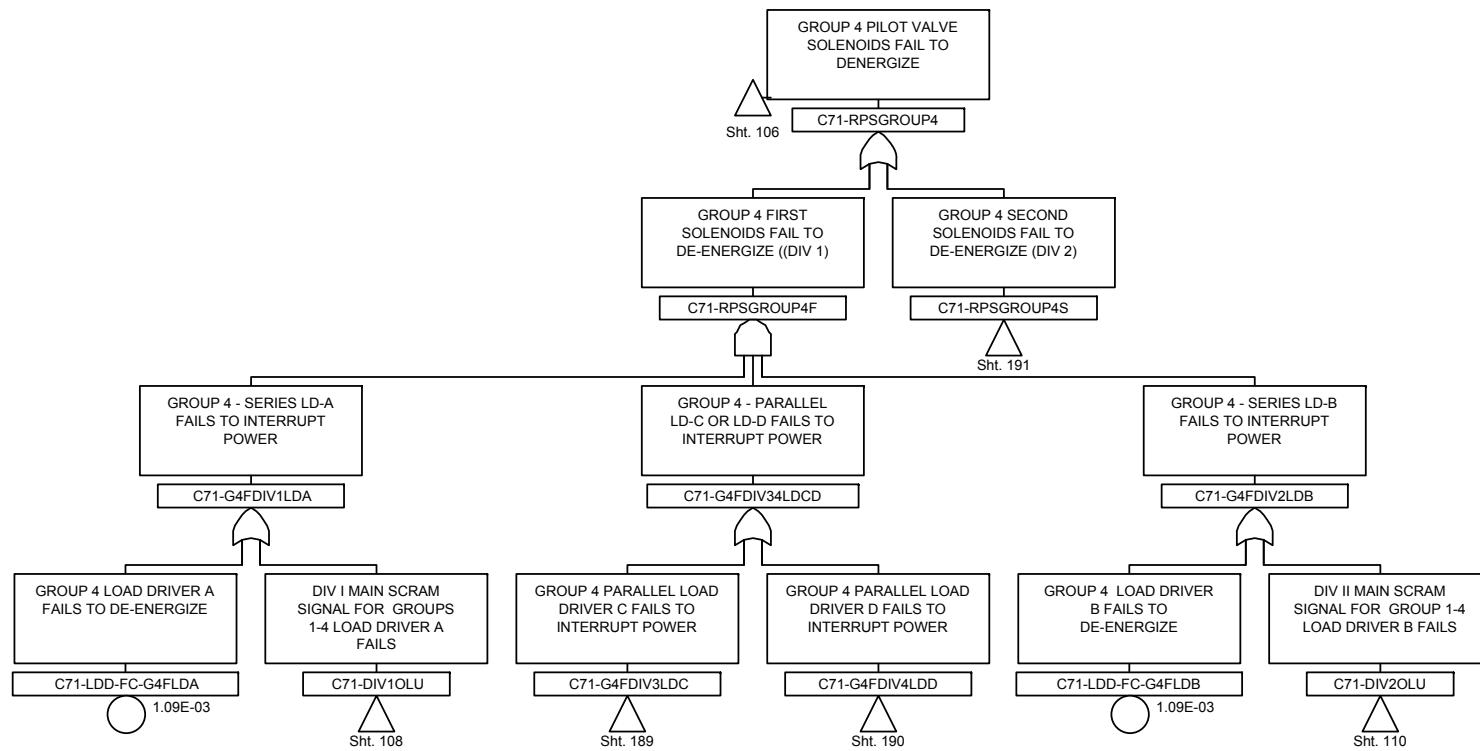


Figure 4.5-3c. Sheet 188 Reactor Protection System

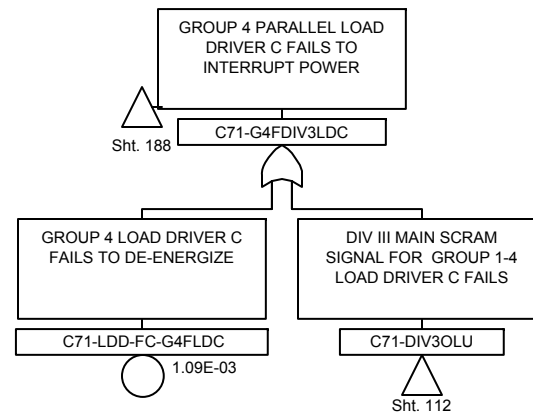


Figure 4.5-3c. Sheet 189 Reactor Protection System

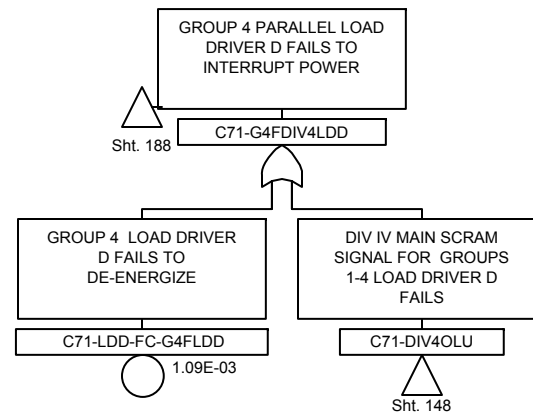


Figure 4.5-3c. Sheet 190 Reactor Protection System

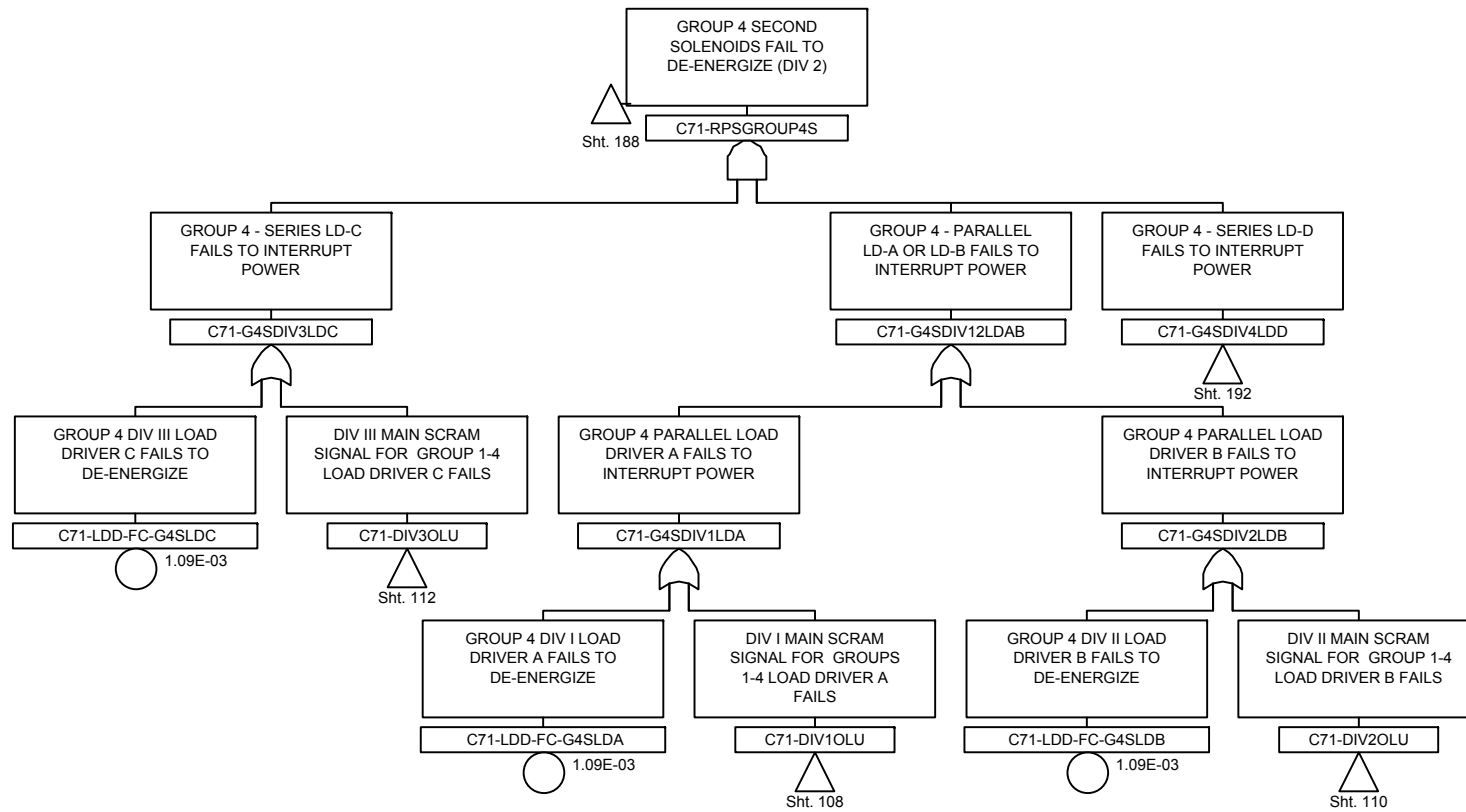


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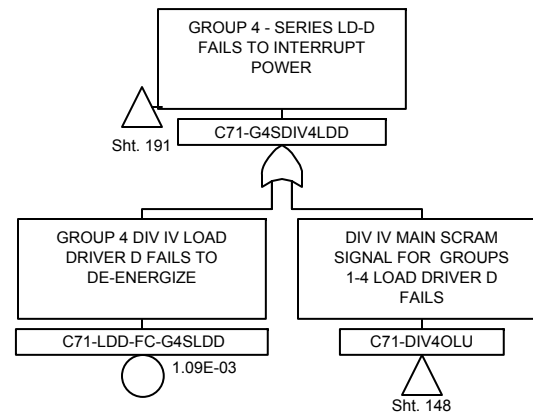


Figure 4.5-3c. Sheet 192 Reactor Protection System



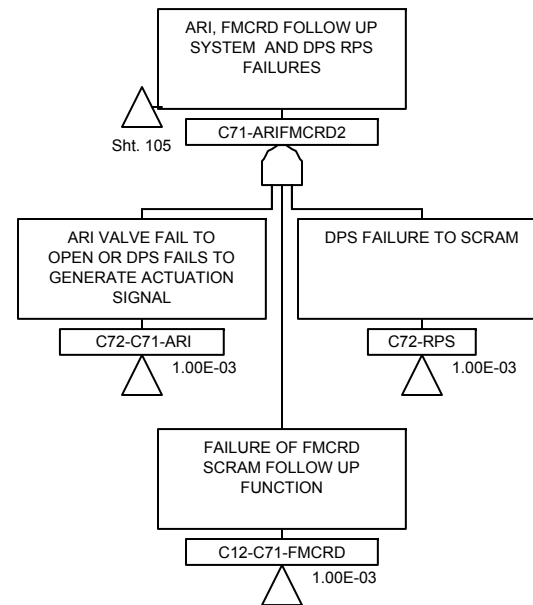


Figure 4.5-3c. Sheet 193 Reactor Protection System

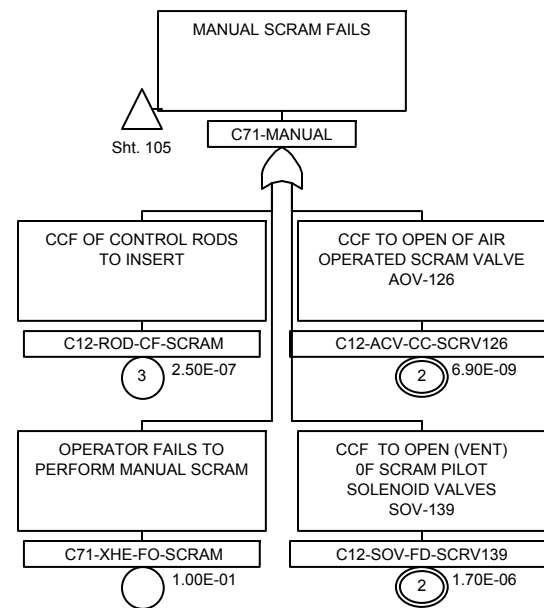
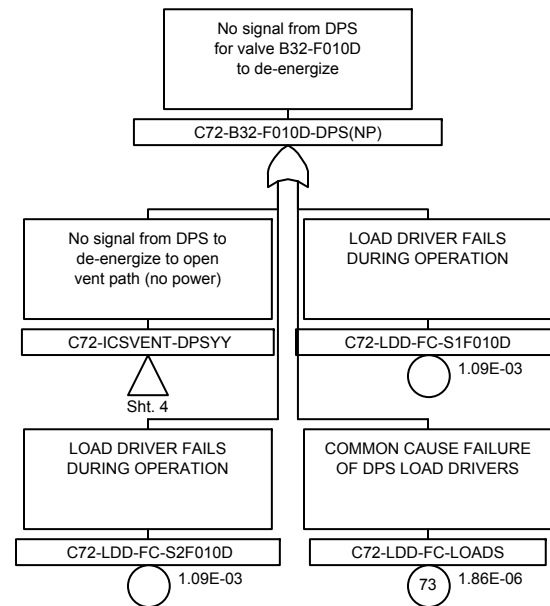


Figure 4.5-3c. Sheet 194 Reactor Protection System



**Figure 4.5-3d. Diverse Protection System**  
Sheet 1

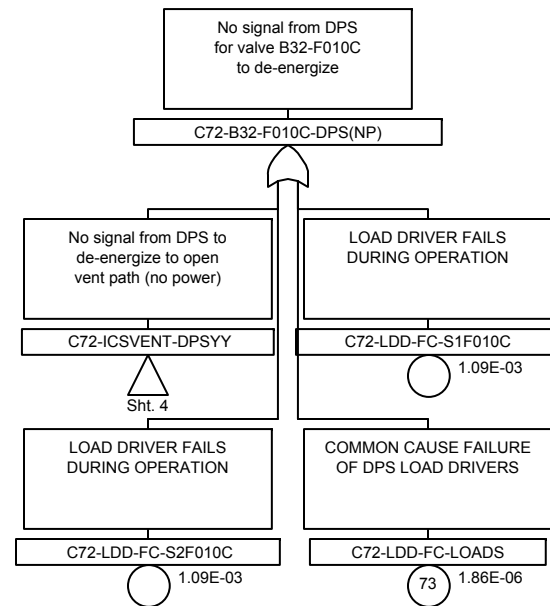


Figure 4.5-3d. Sheet 2 Diverse Protection System

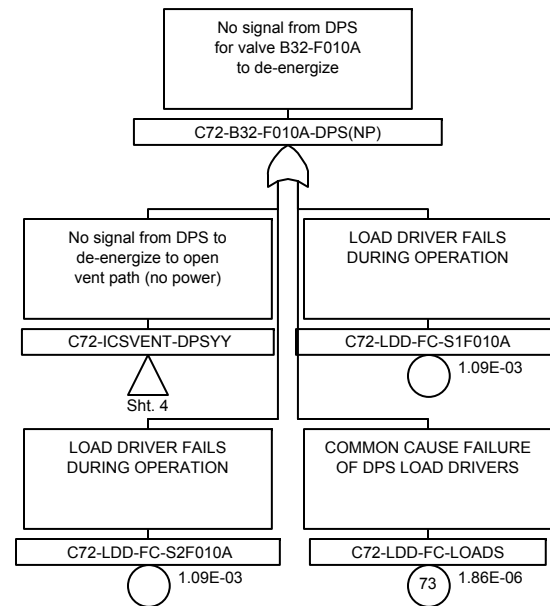


Figure 4.5-3d. Sheet 3 Diverse Protection System

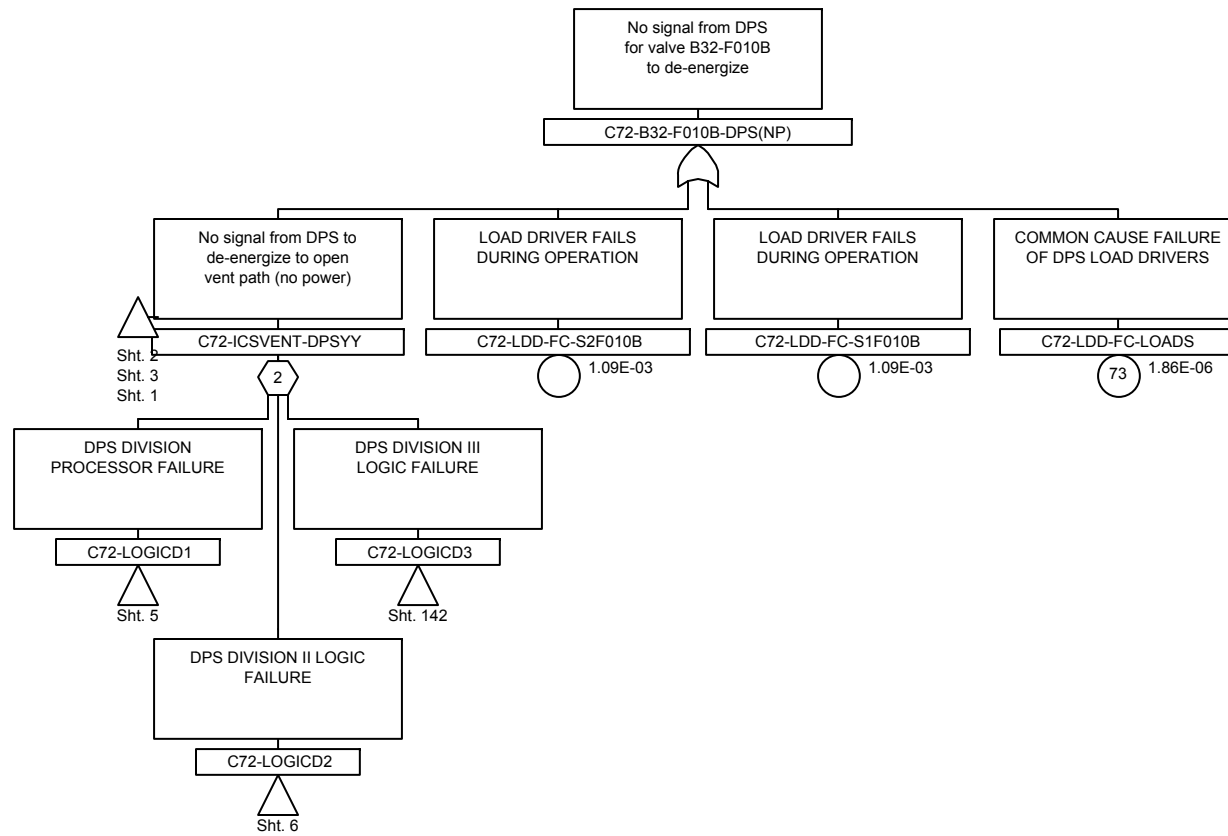


Figure 4.5-3d. Sheet 4 Diverse Protection System

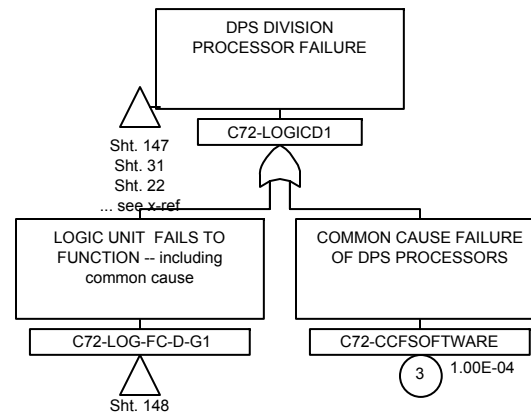


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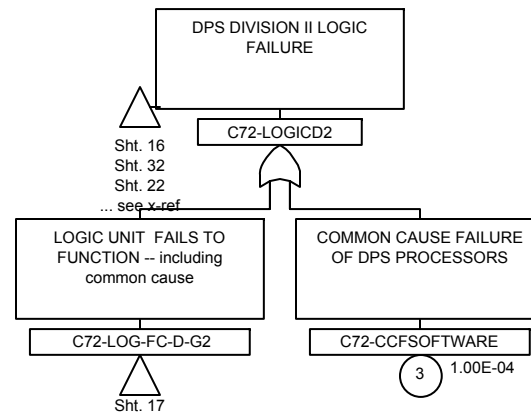


Figure 4.5-3d. Sheet 6 Diverse Protection System



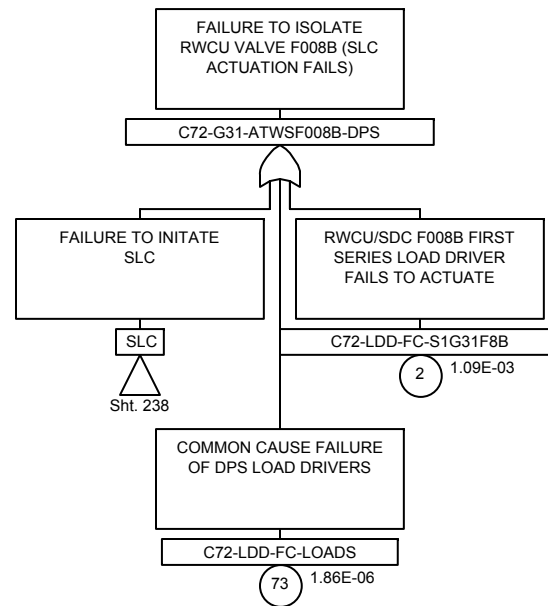


Figure 4.5-3d. Sheet 7 Diverse Protection System

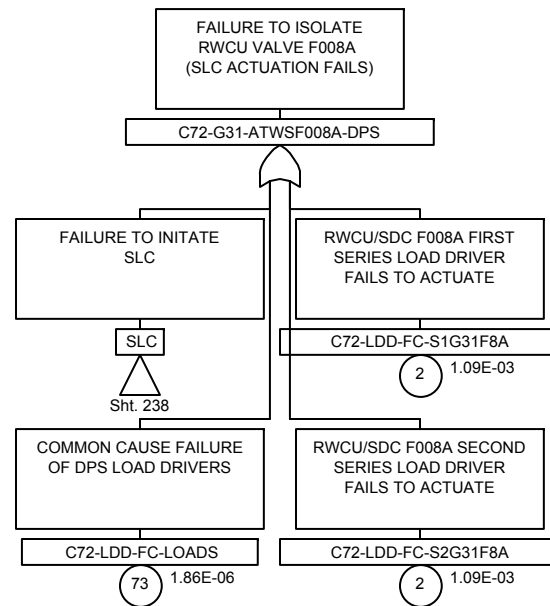


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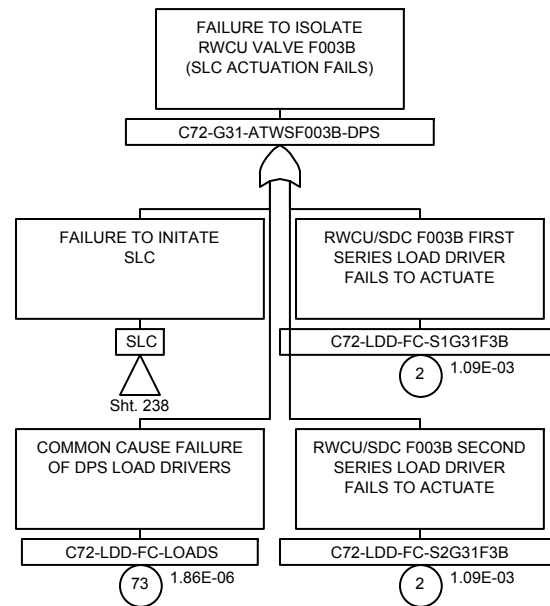


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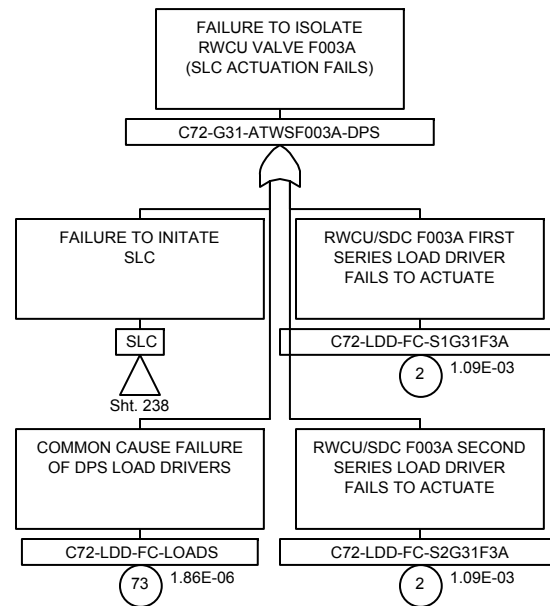


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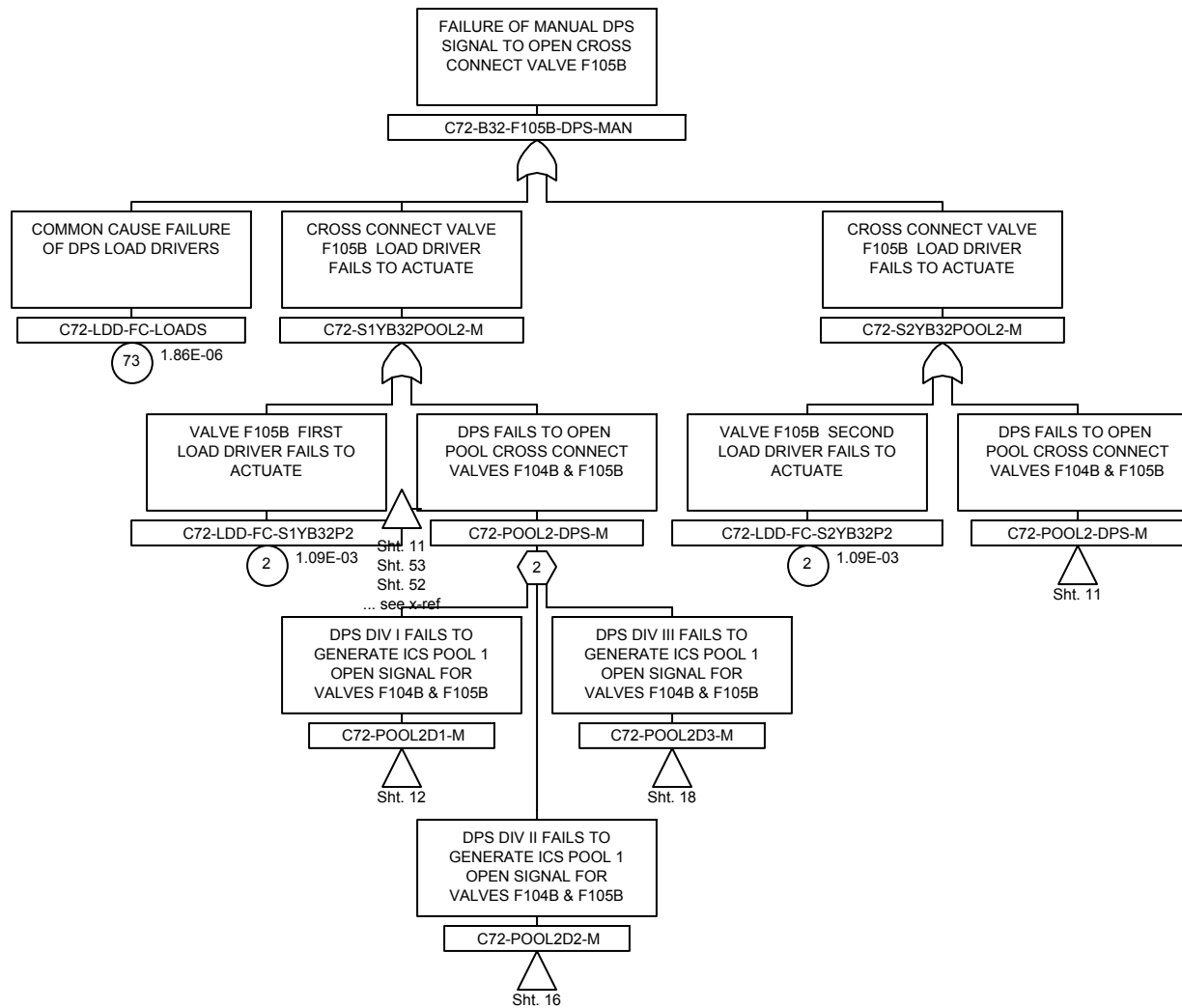


Figure 4.5-3d. Sheet 11 Diverse Protection System

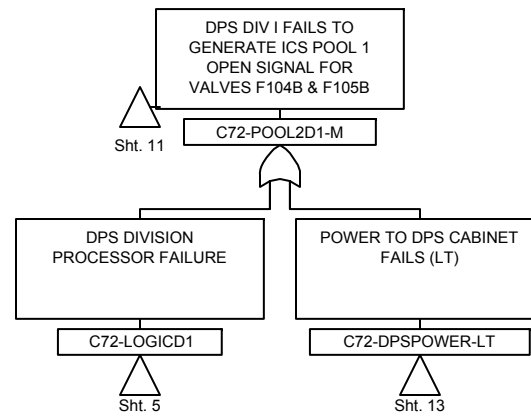


Figure 4.5-3d. Sheet 12 Diverse Protection System

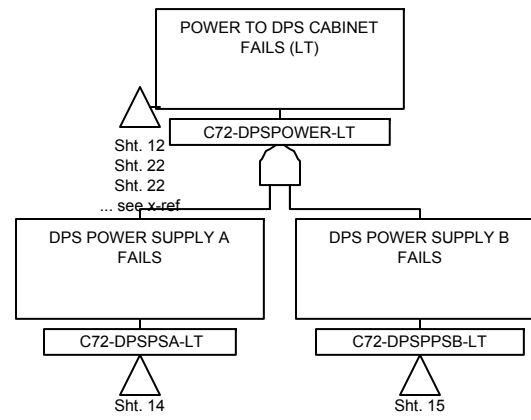


Figure 4.5-3d. Sheet 13 Diverse Protection System

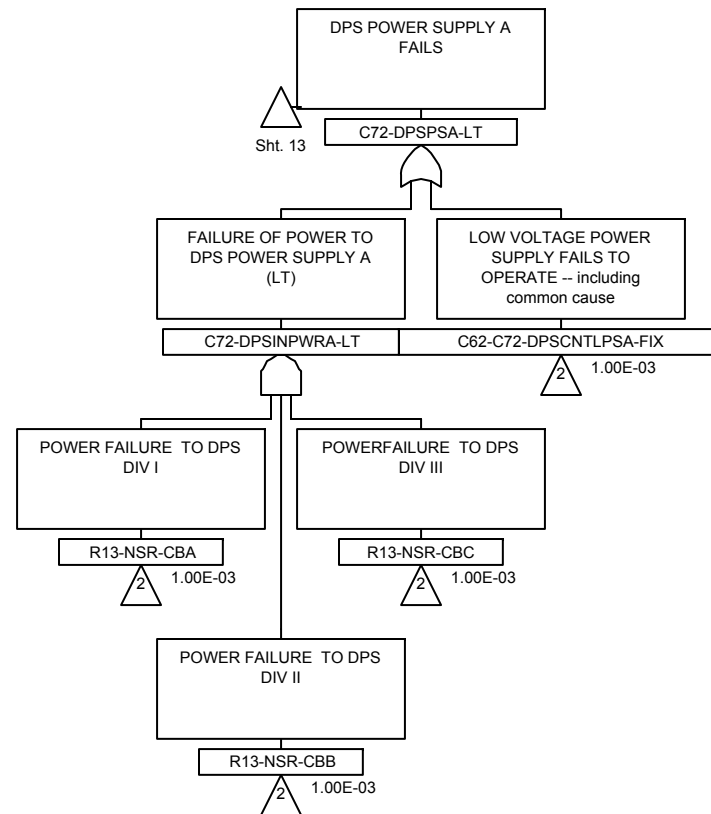


Figure 4.5-3d. Sheet 14 Diverse Protection System



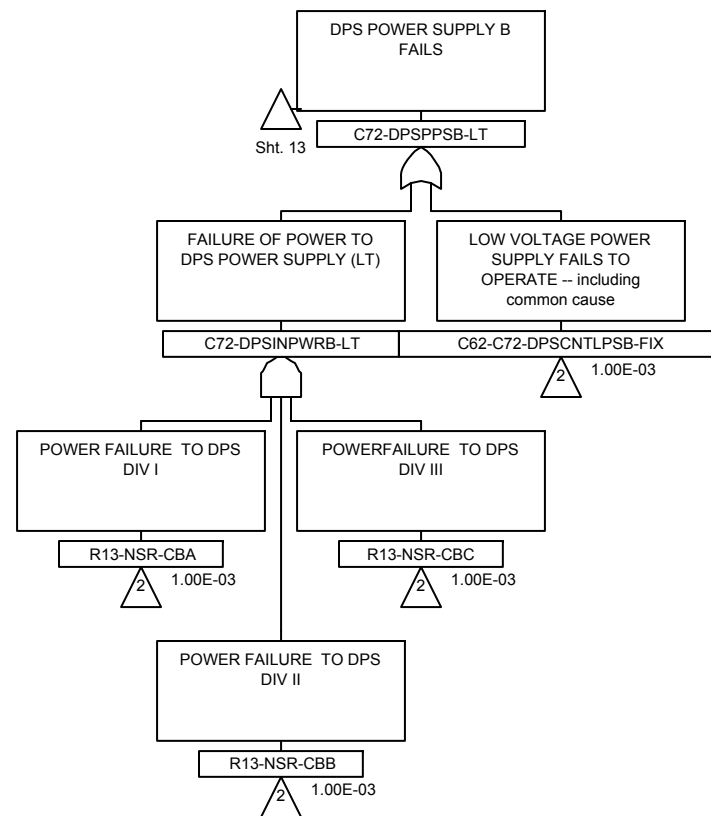


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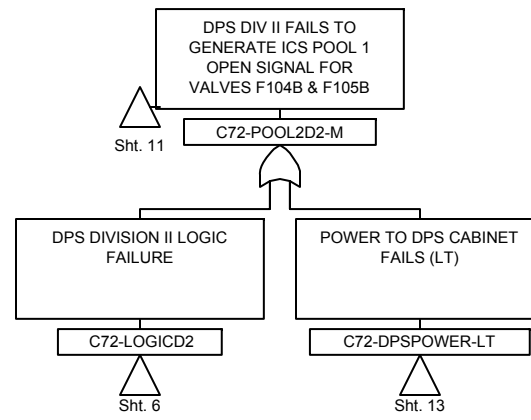


Figure 4.5-3d. Sheet 16 Diverse Protection System

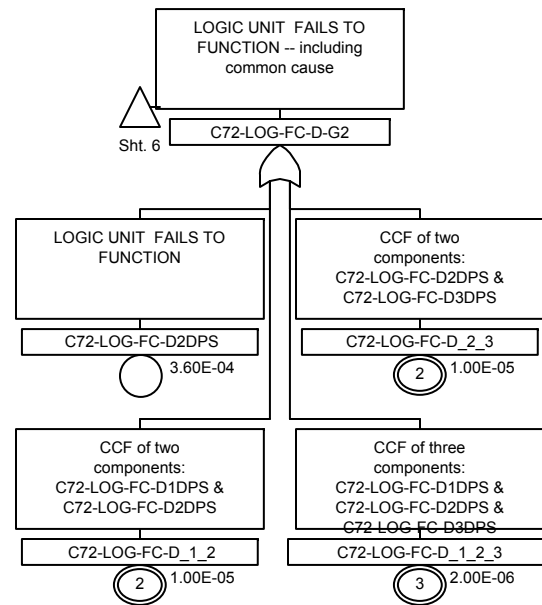


Figure 4.5-3d. Sheet 17 Diverse Protection System

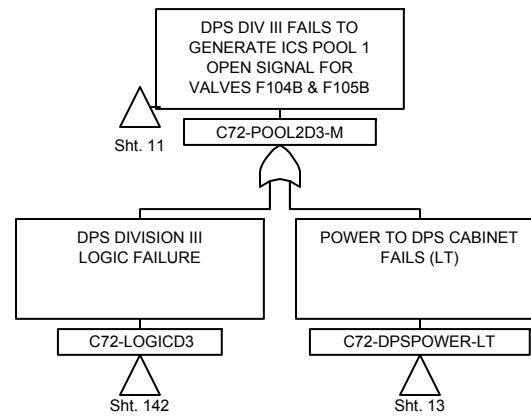


Figure 4.5-3d. Sheet 18 Diverse Protection System

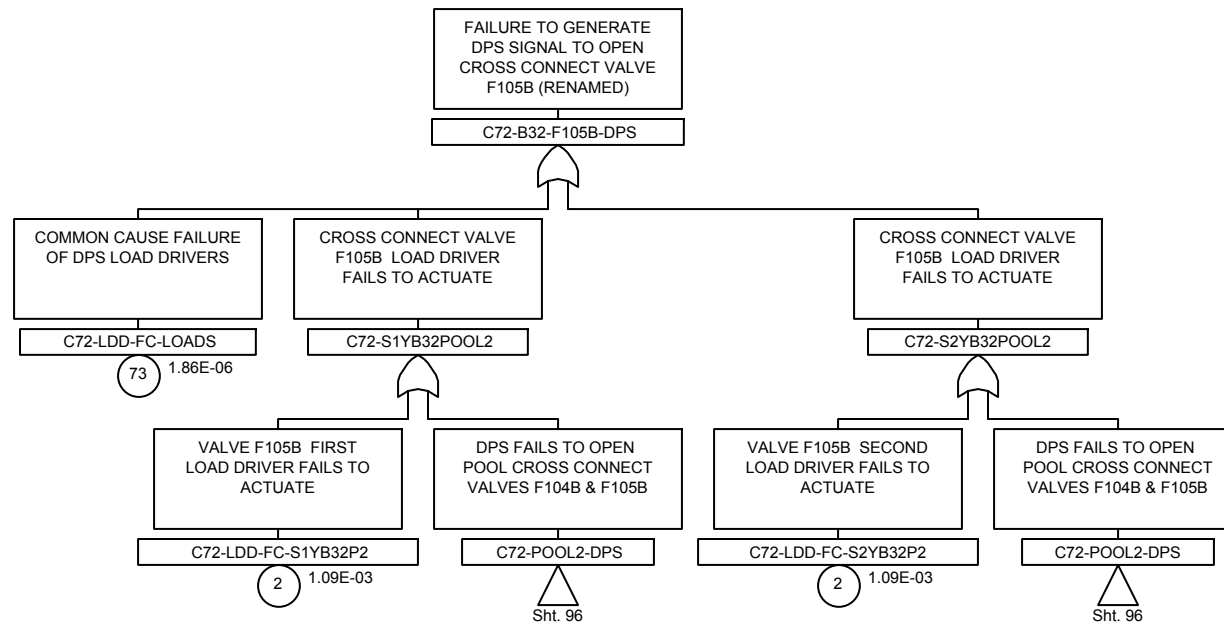


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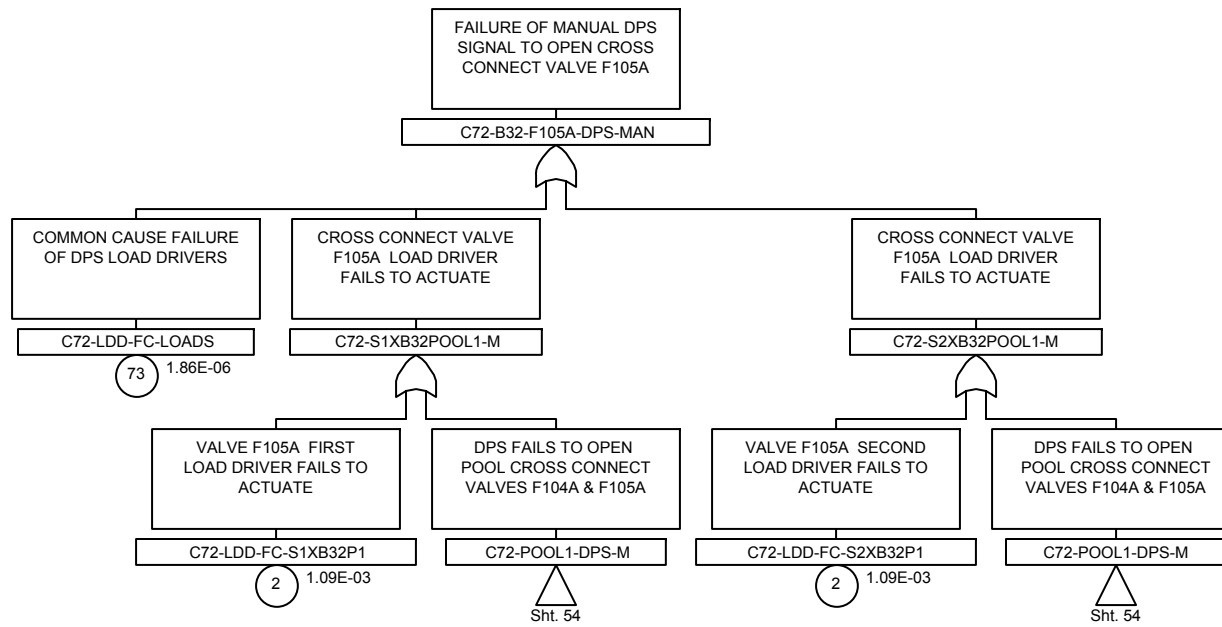


Figure 4.5-3d. Sheet 20 Diverse Protection System

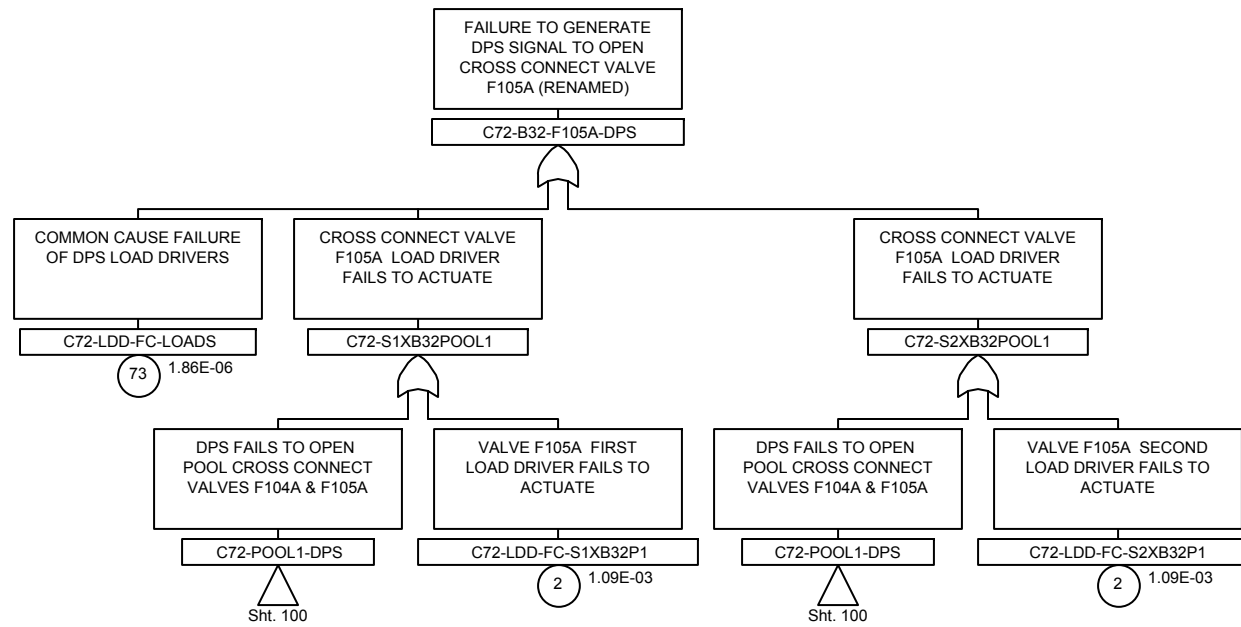


Figure 4.5-3d. Sheet 21 Diverse Protection System

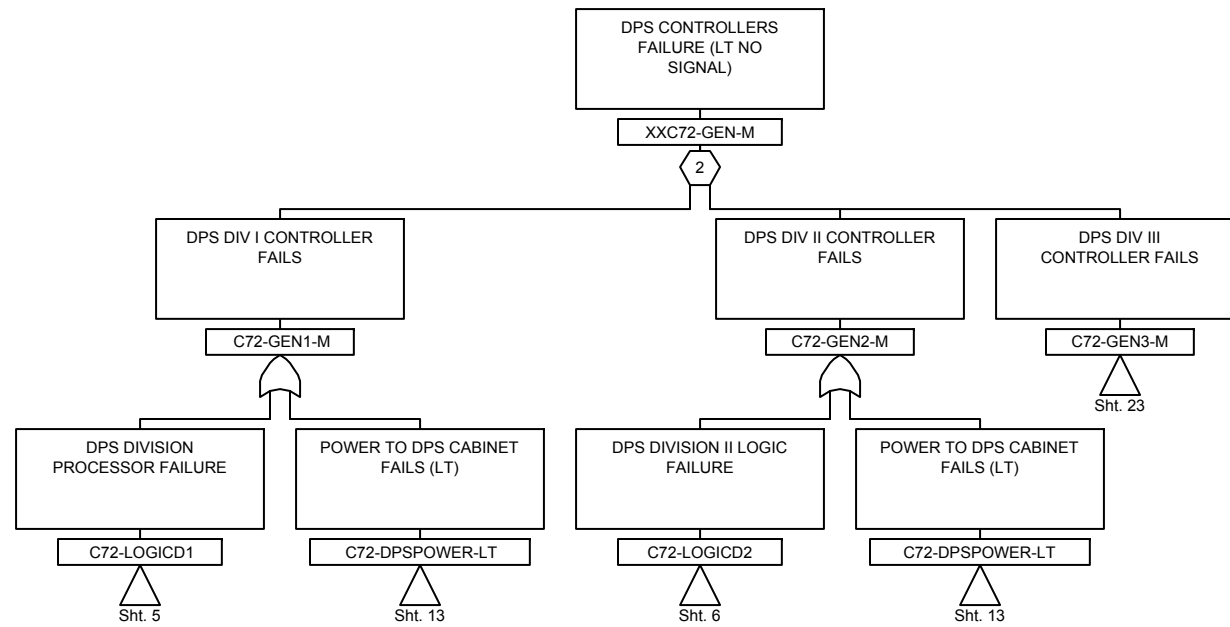


Figure 4.5-3d. Sheet 22 Diverse Protection System



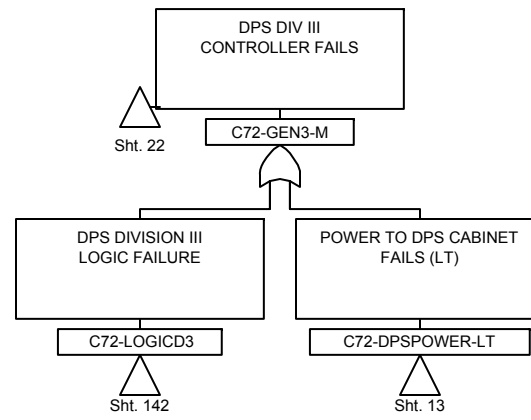


Figure 4.5-3d. Sheet 23 Diverse Protection System

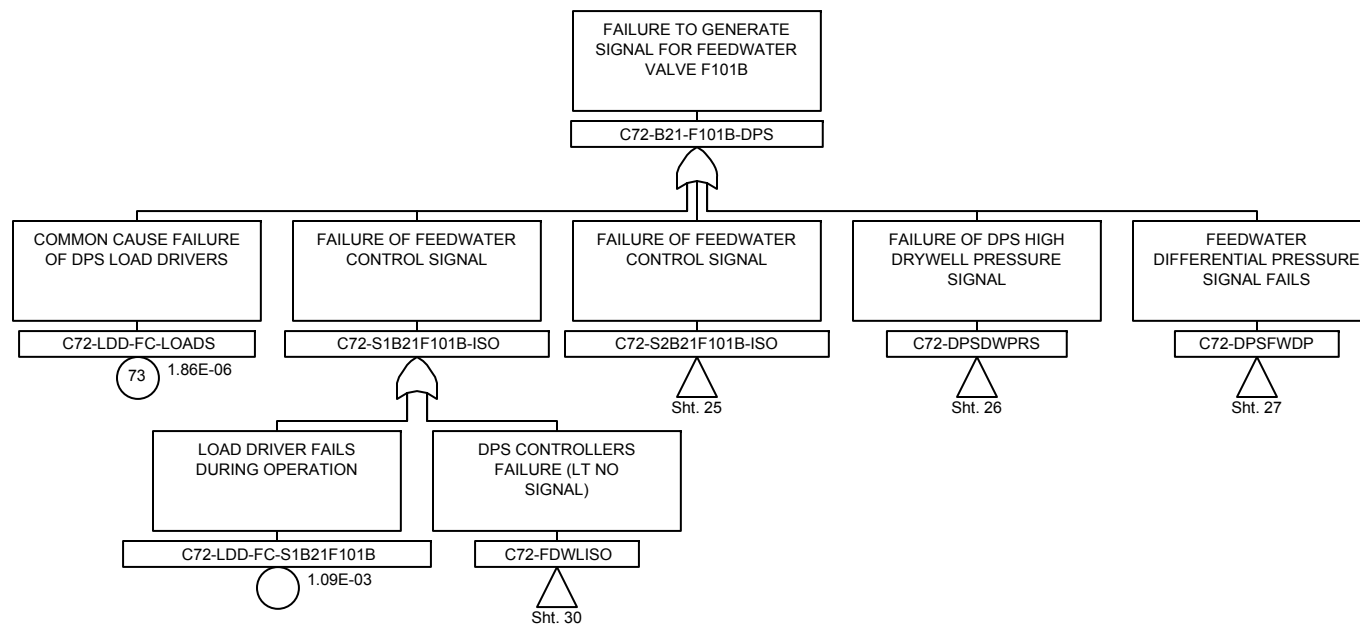


Figure 4.5-3d. Sheet 24 Diverse Protection System

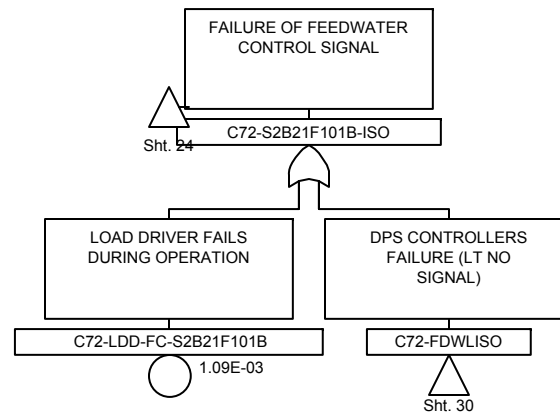


Figure 4.5-3d. Sheet 25 Diverse Protection System

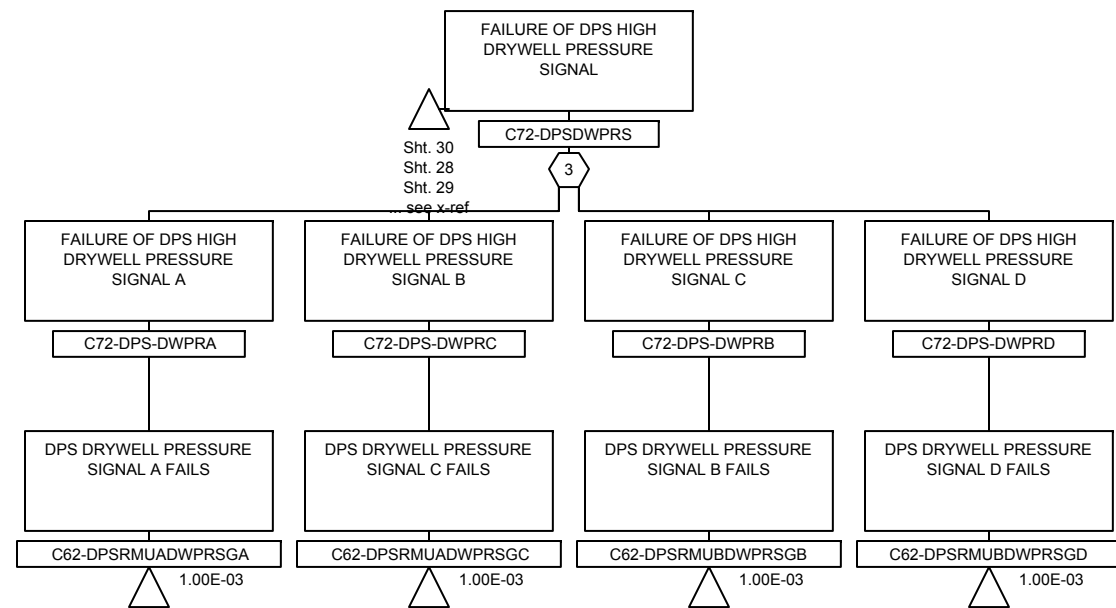


Figure 4.5-3d. Sheet 26 Diverse Protection System

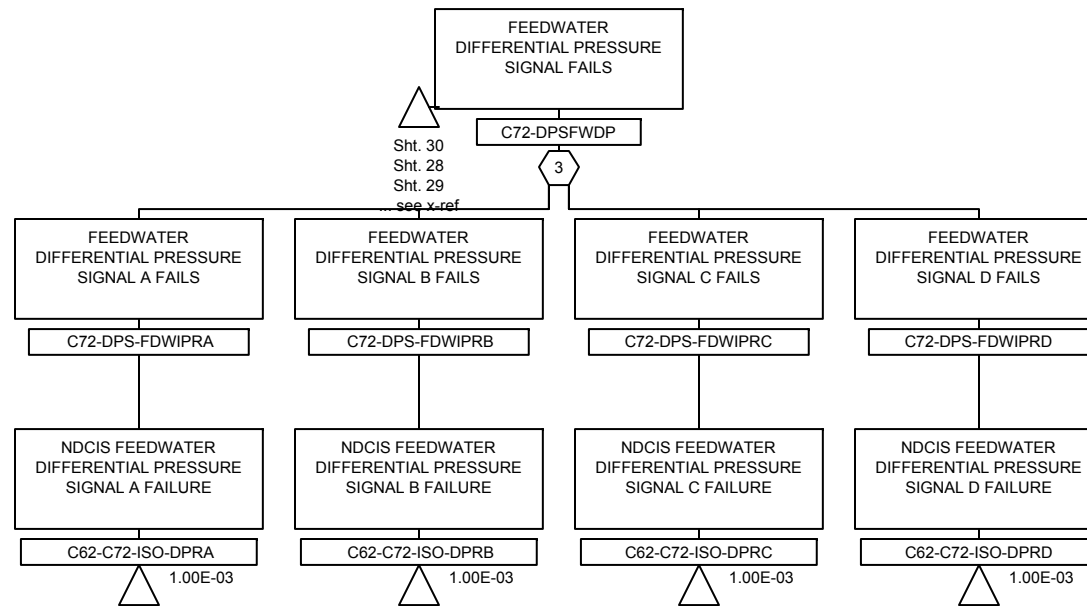


Figure 4.5-3d. Sheet 27 Diverse Protection System

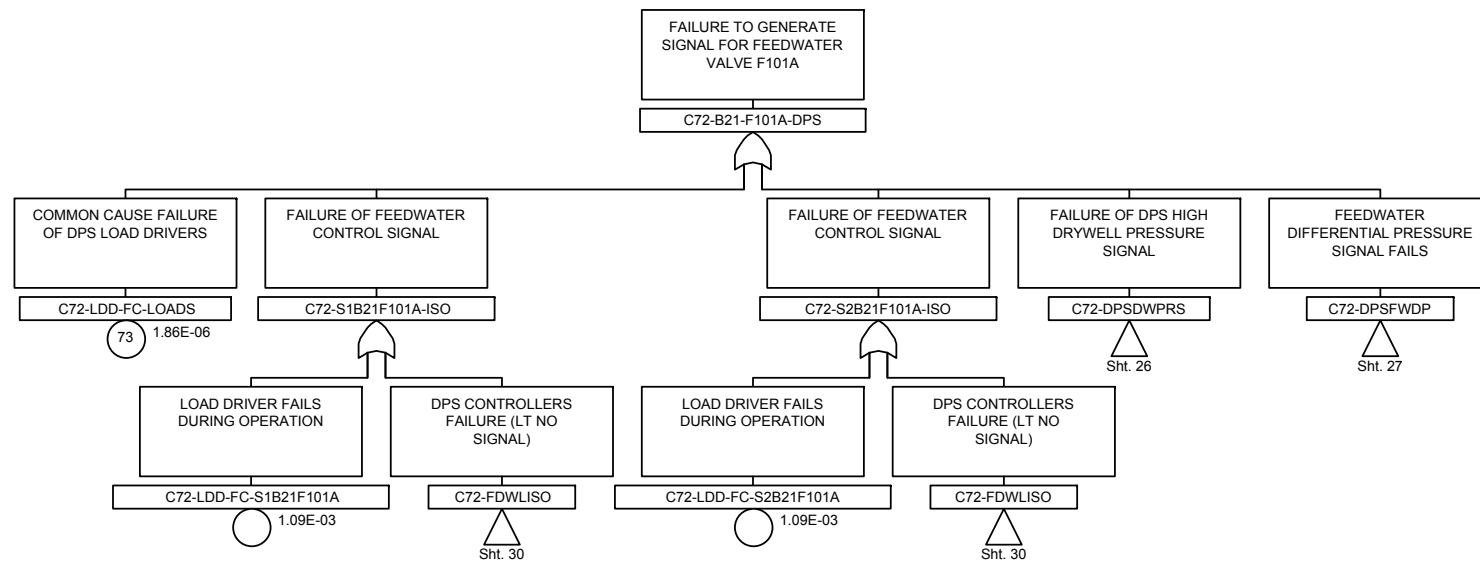


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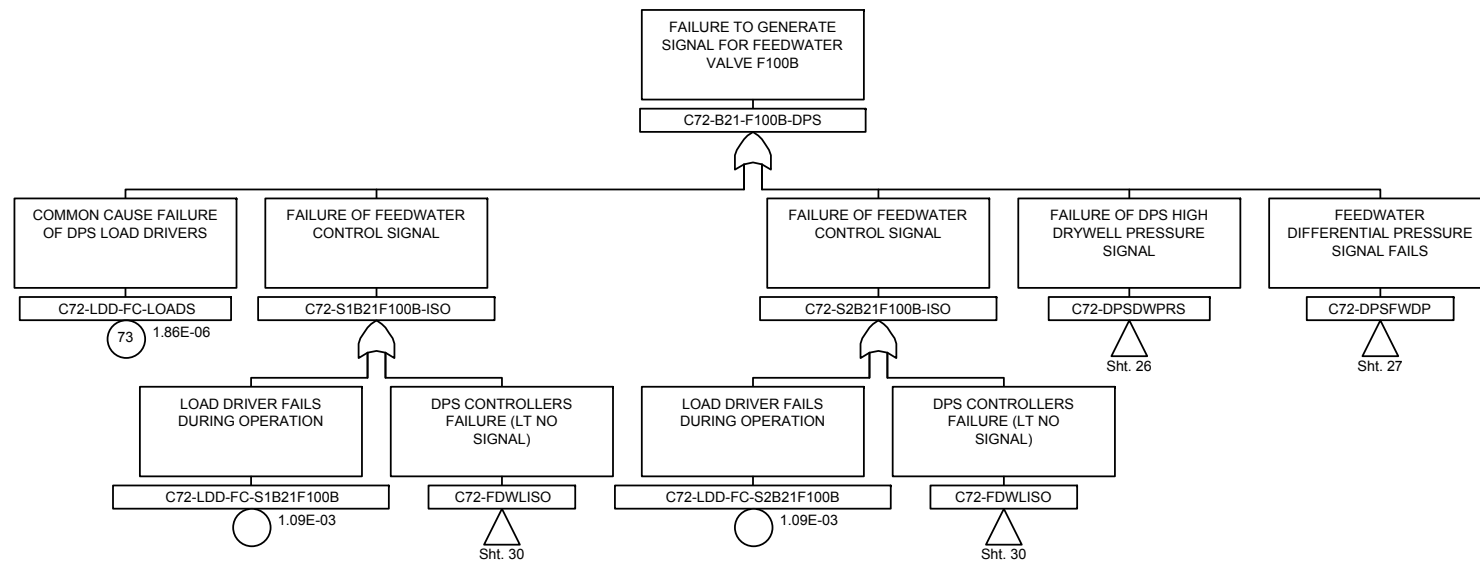


Figure 4.5-3d. Sheet 29 Diverse Protection System

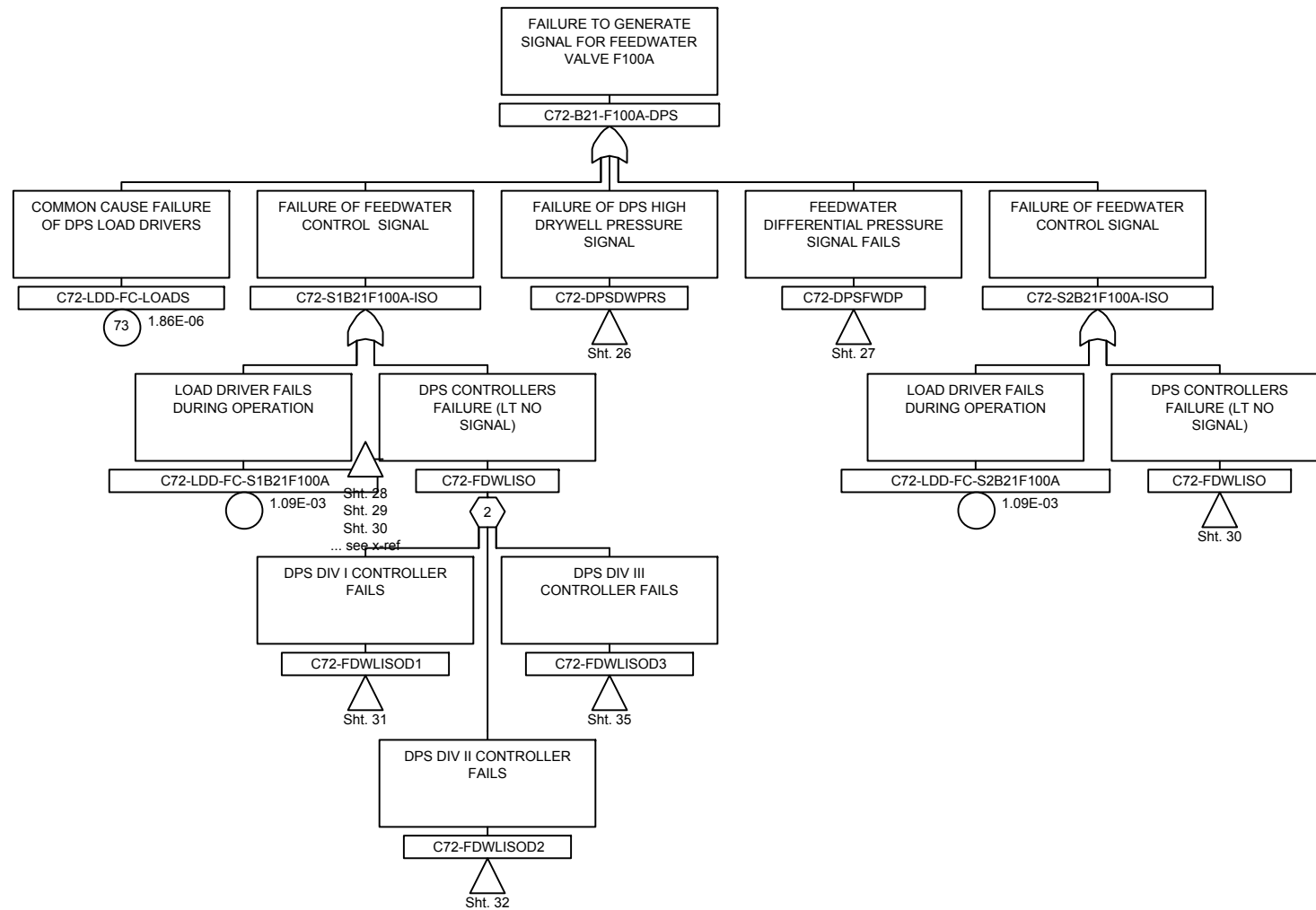


Figure 4.5-3d. Sheet 30 Diverse Protection System



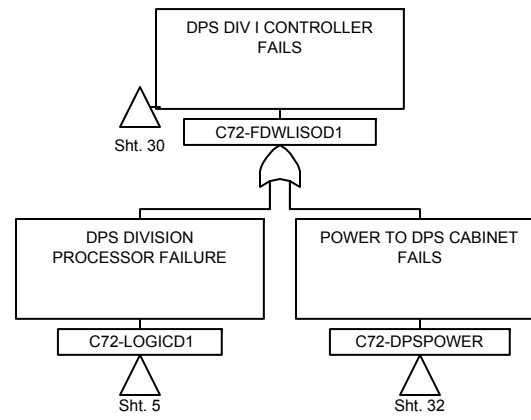


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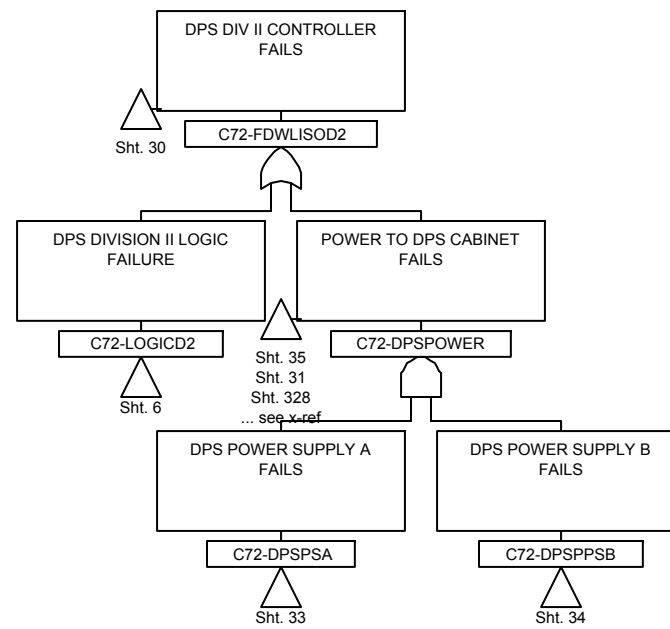


Figure 4.5-3d. Sheet 32 Diverse Protection System

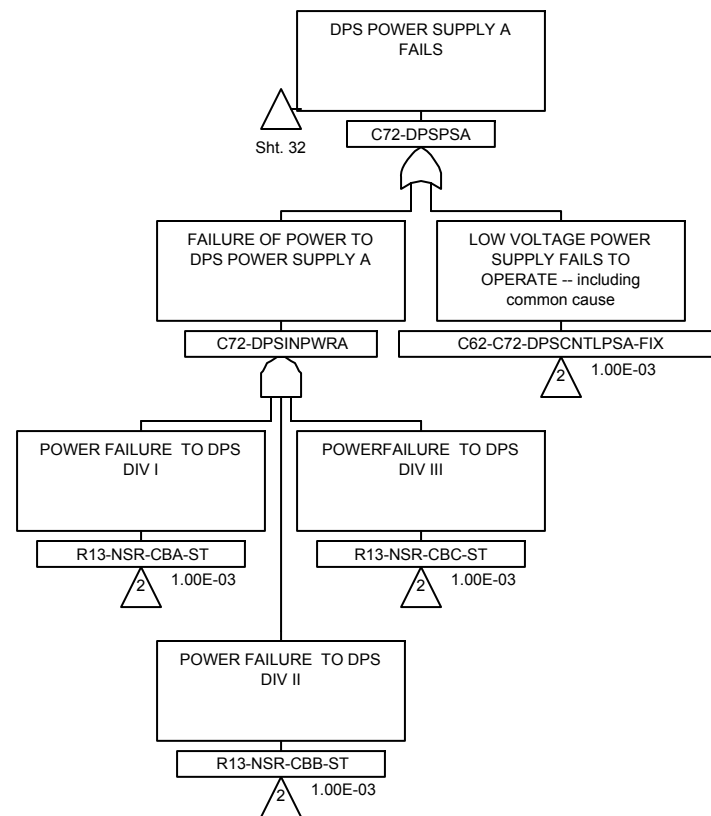


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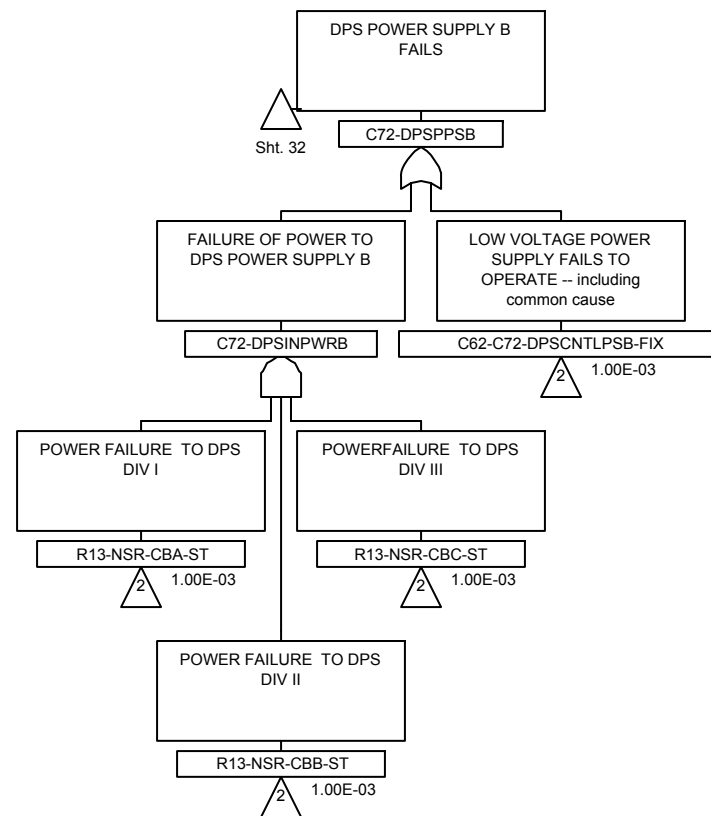


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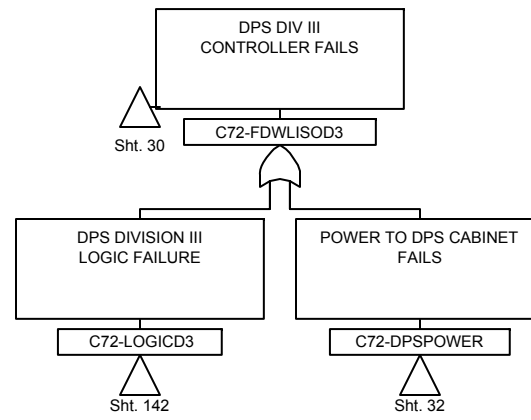


Figure 4.5-3d. Sheet 35 Diverse Protection System

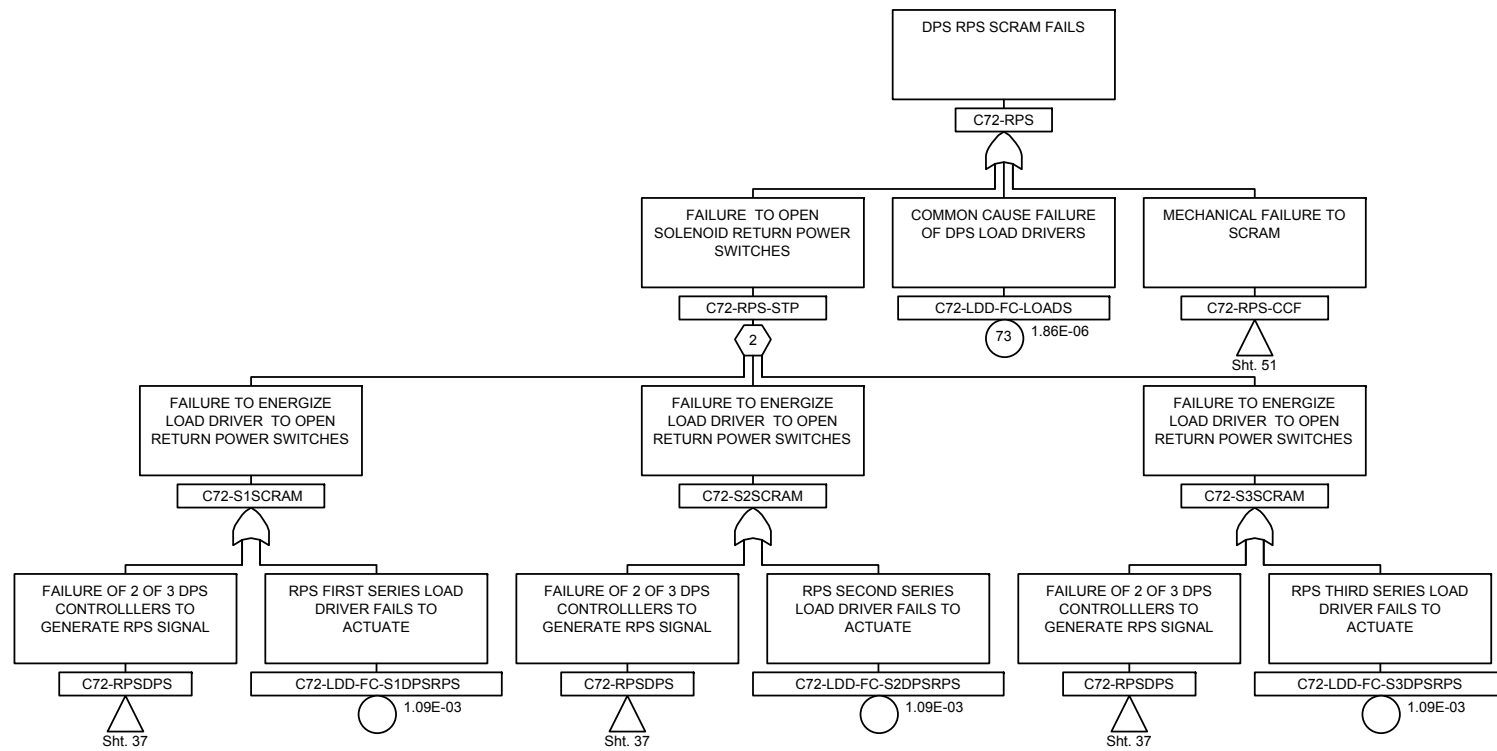


Figure 4.5-3d. Sheet 36 Diverse Protection System

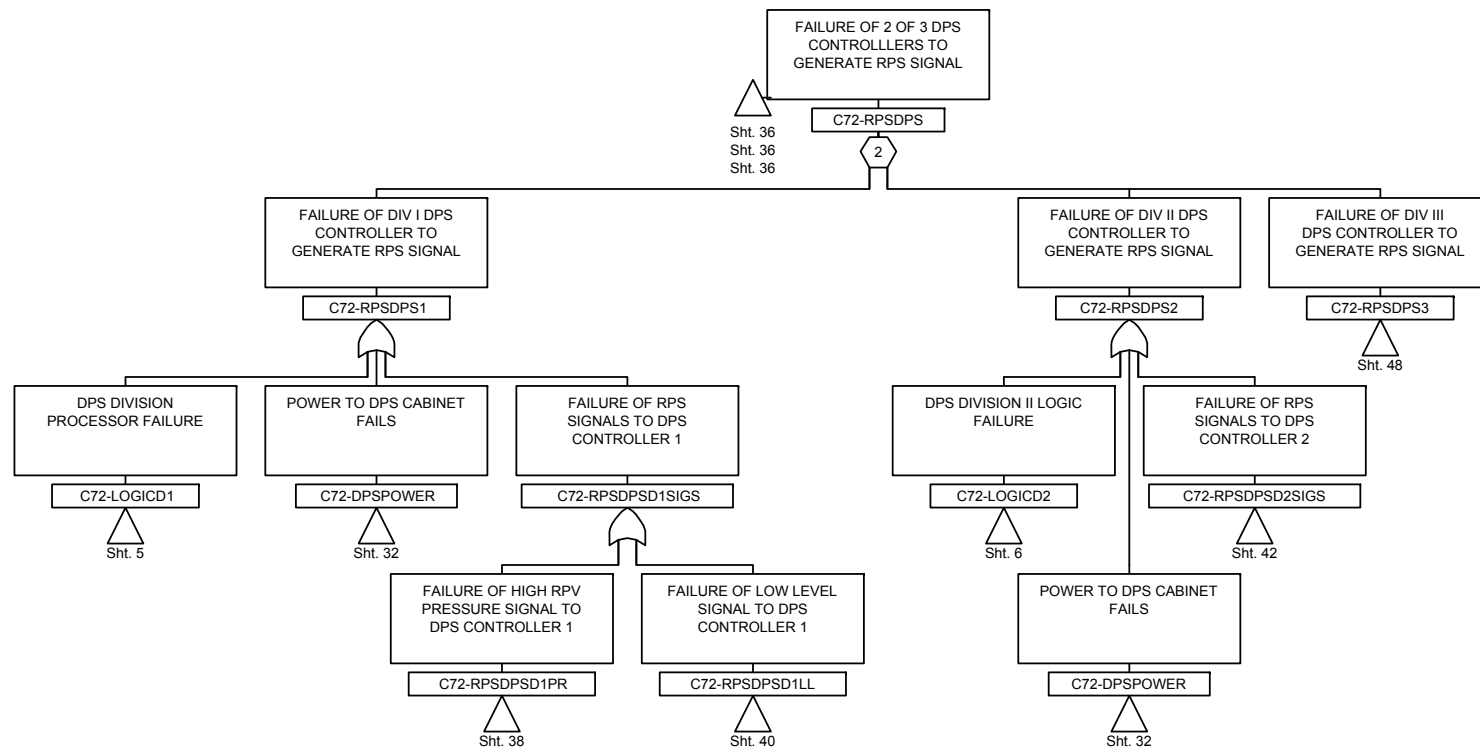


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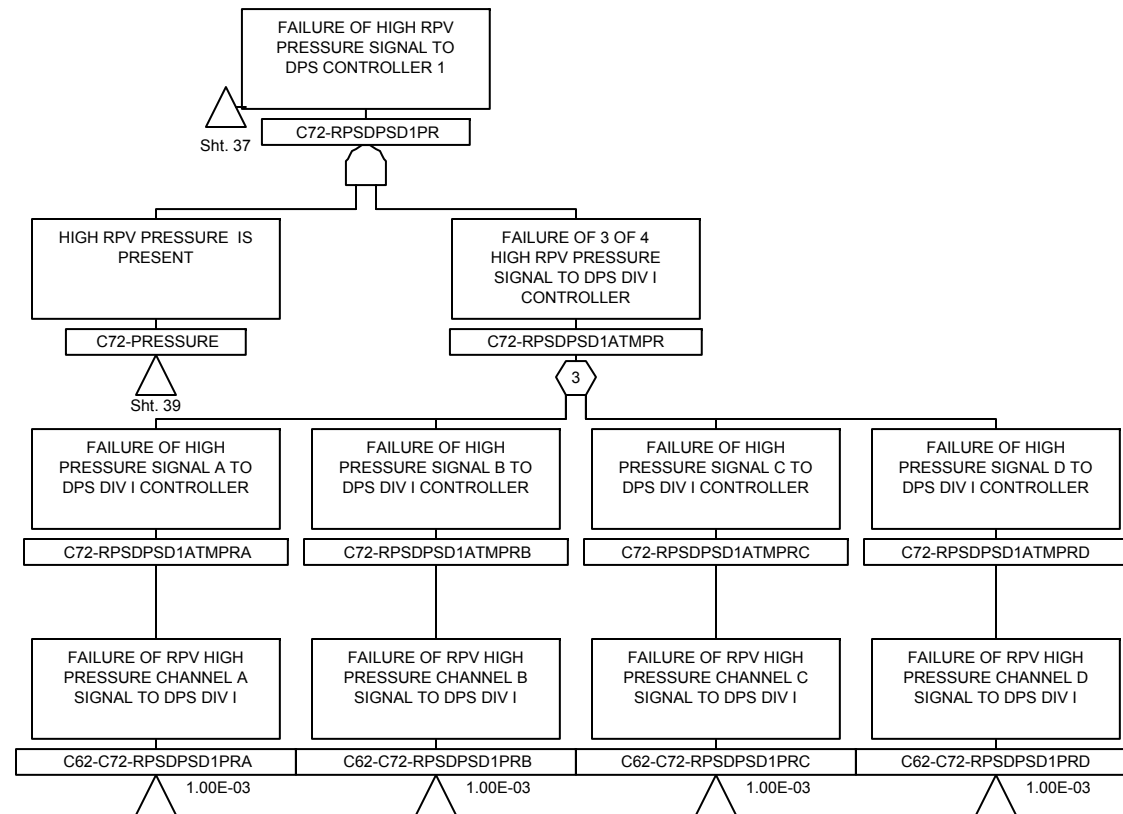


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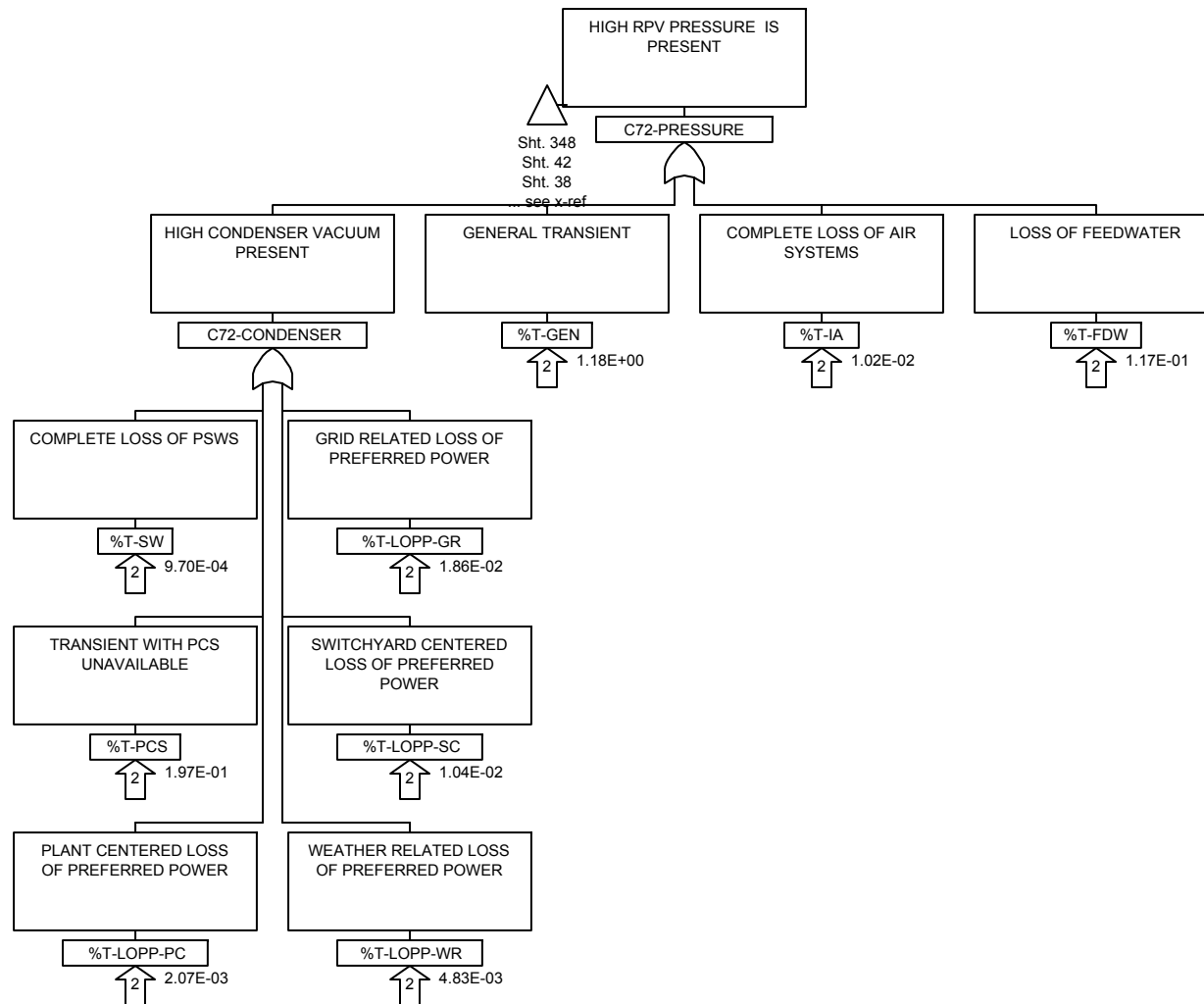


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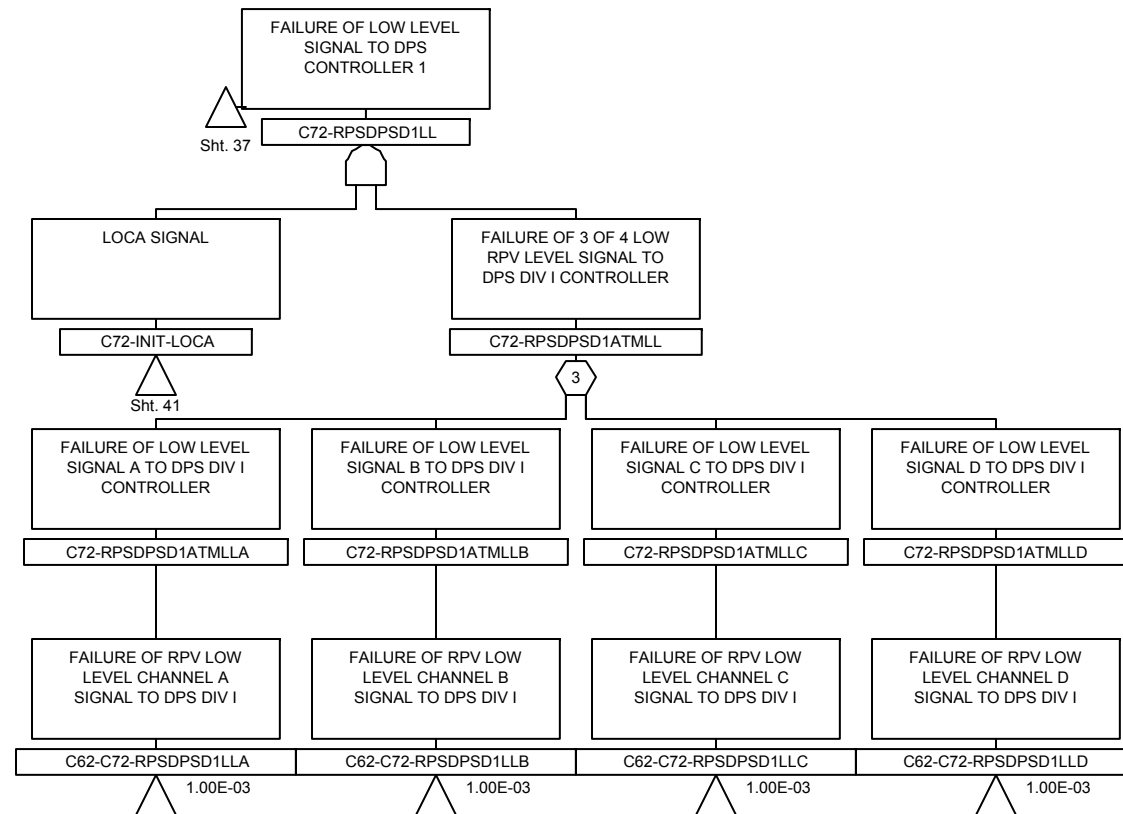


Figure 4.5-3d. Sheet 40 Diverse Protection System

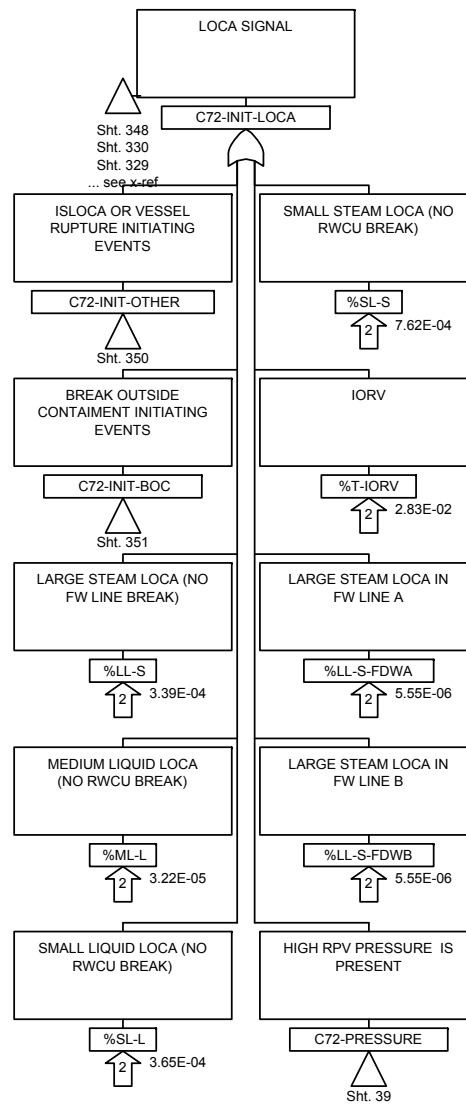


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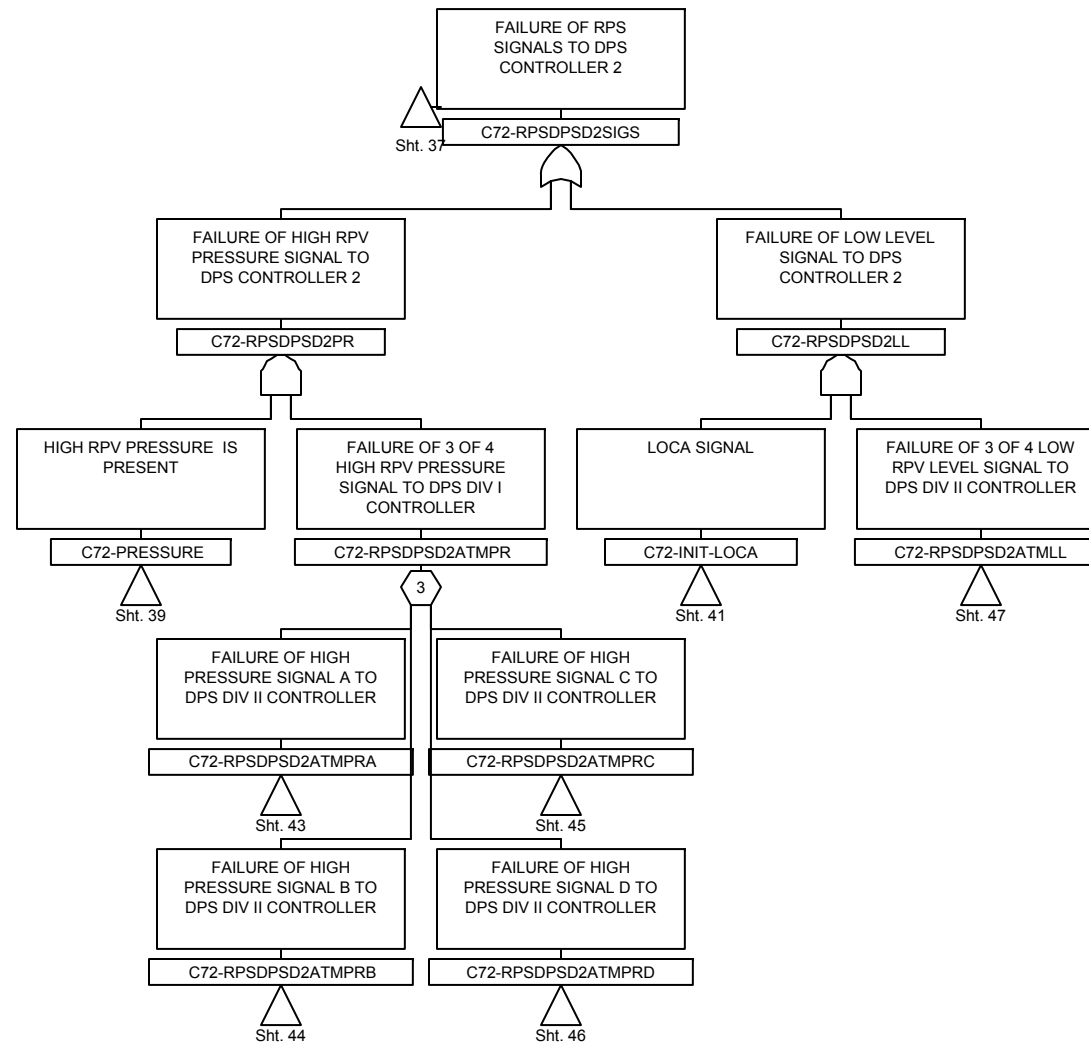


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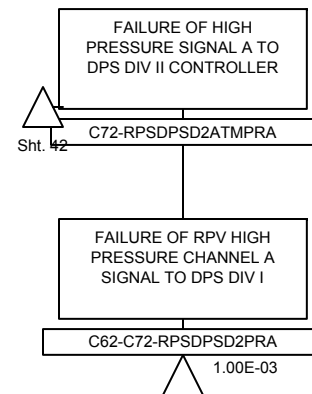


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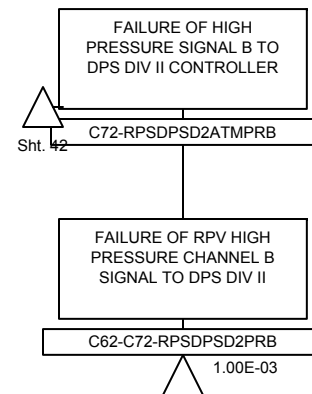


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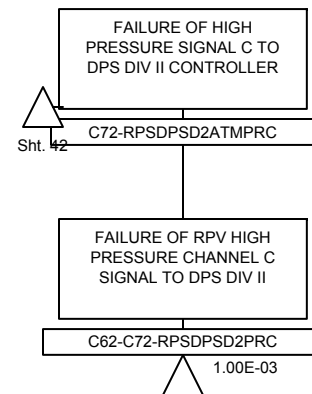


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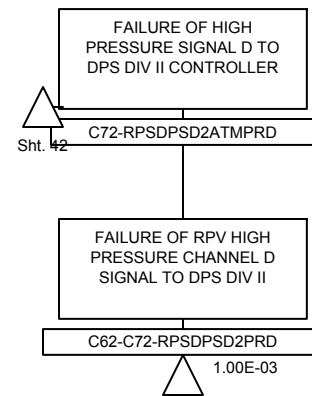


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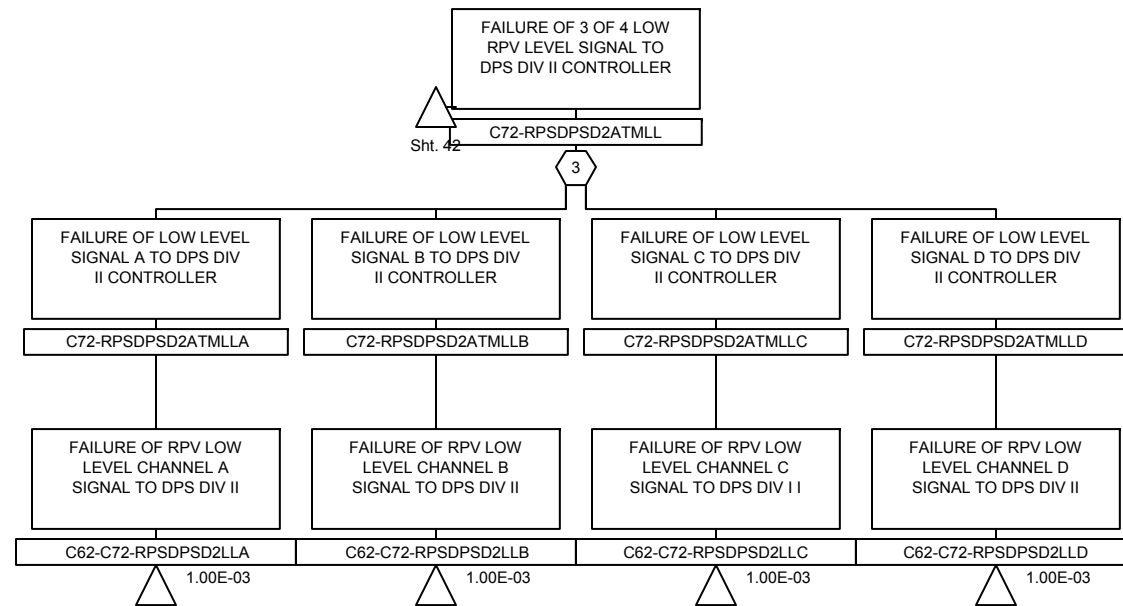


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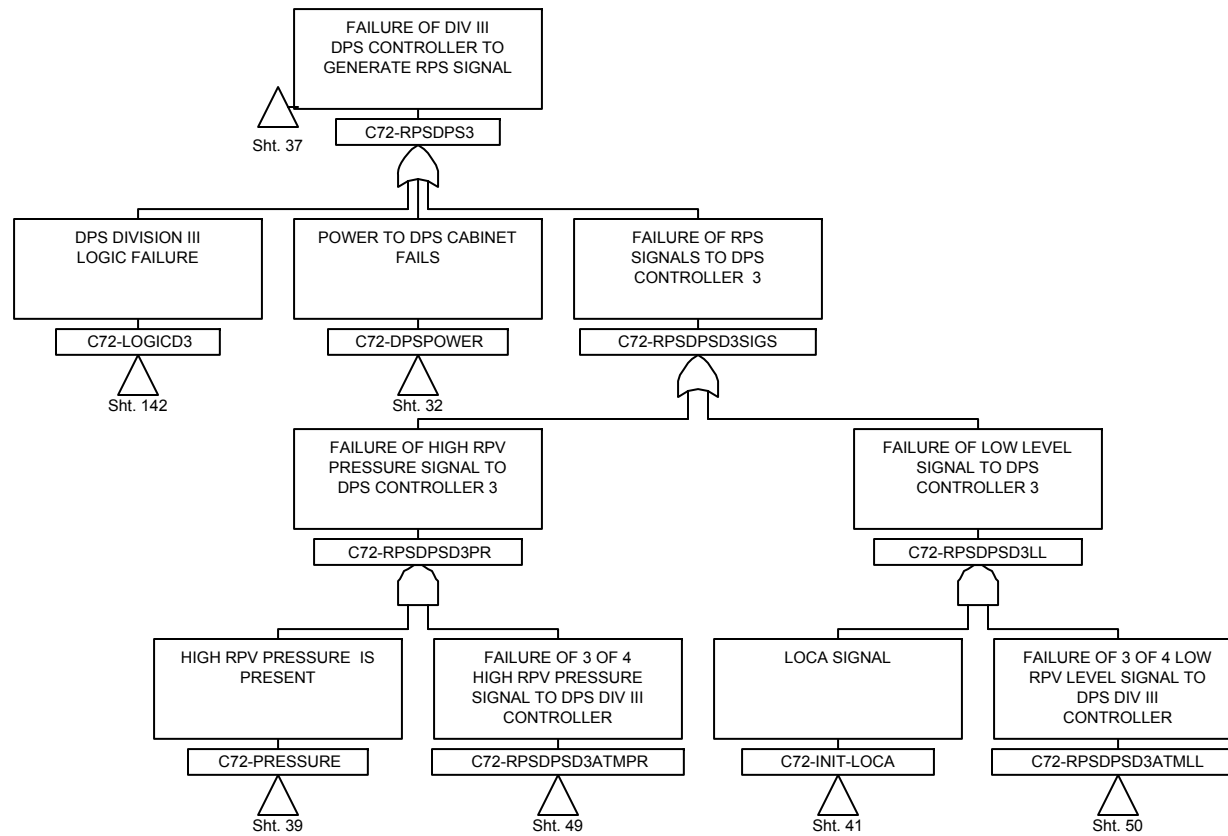


Figure 4.5-3d. Sheet 48 Diverse Protection System

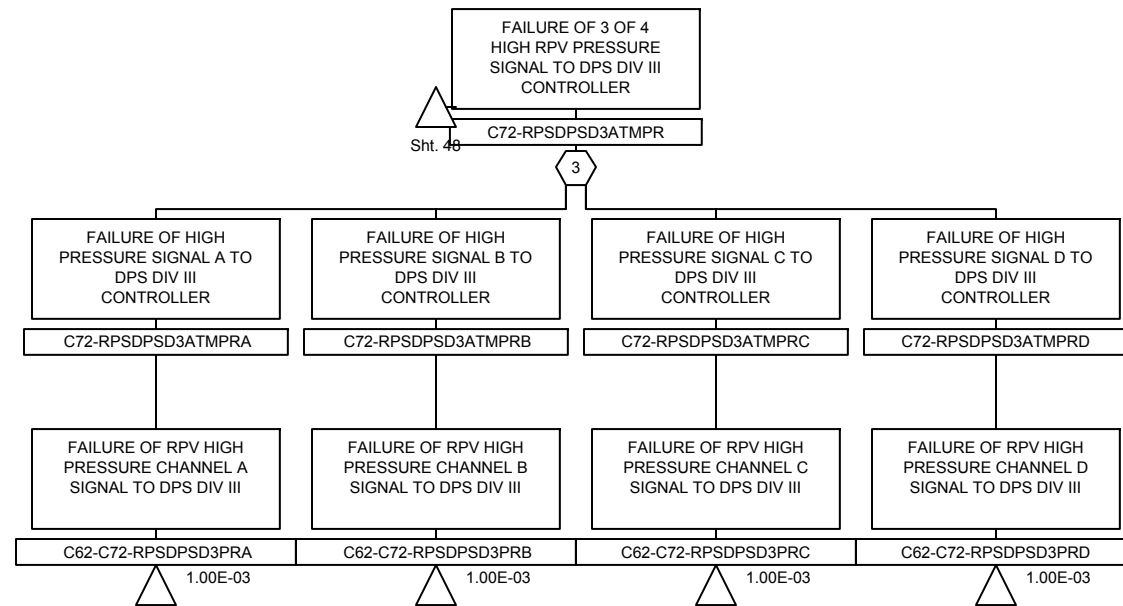


Figure 4.5-3d. Sheet 49 Diverse Protection System

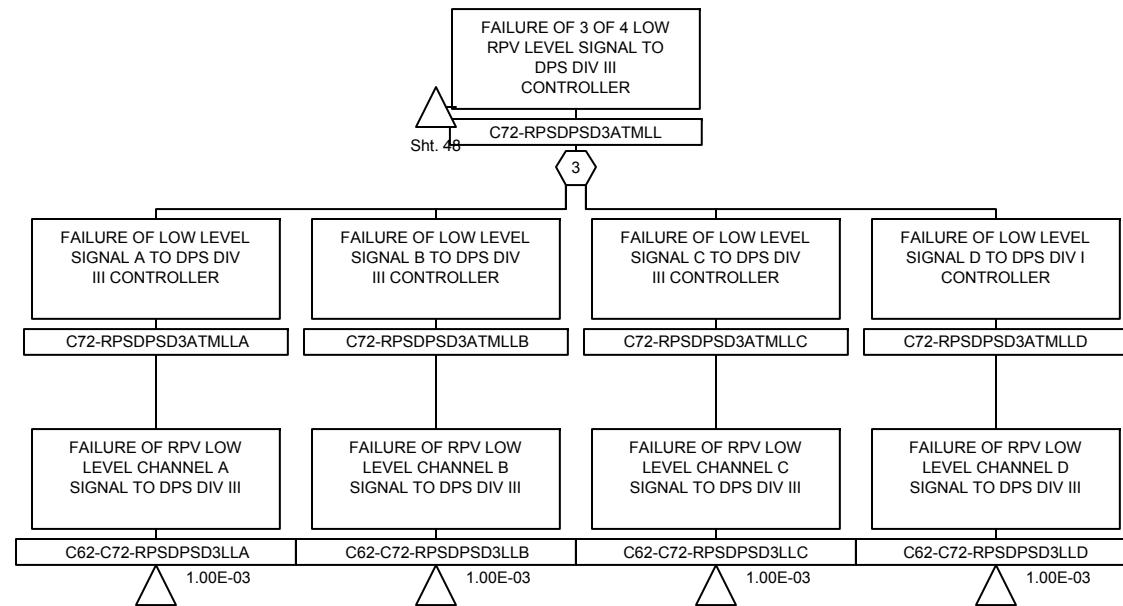


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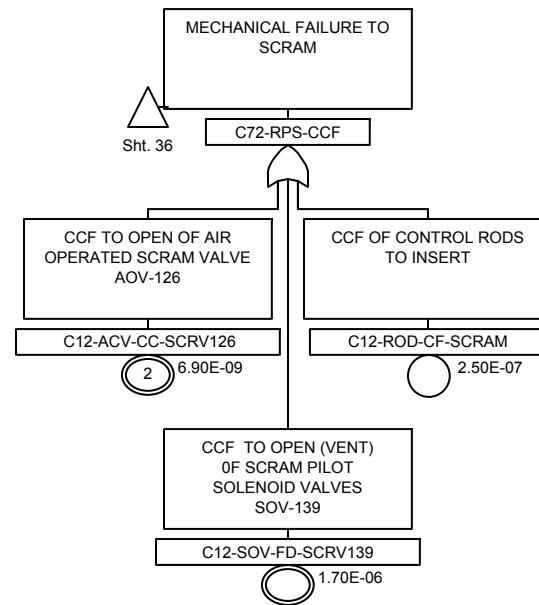


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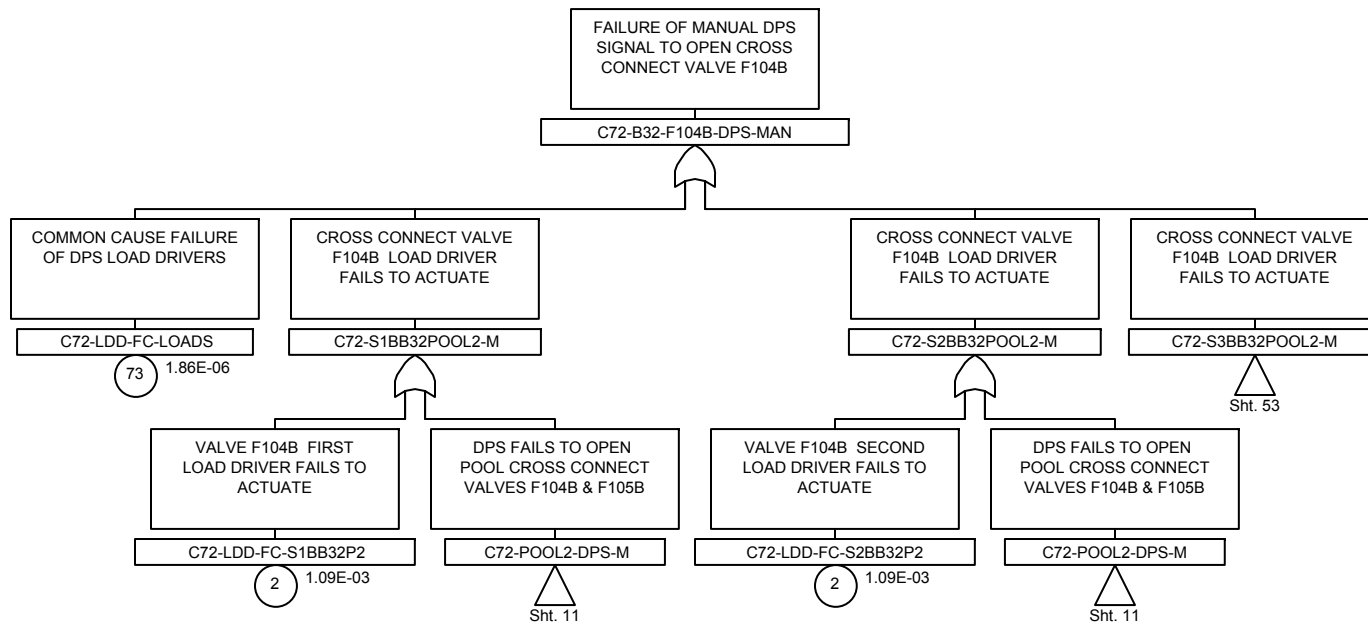


Figure 4.5-3d. Sheet 52 Diverse Protection System

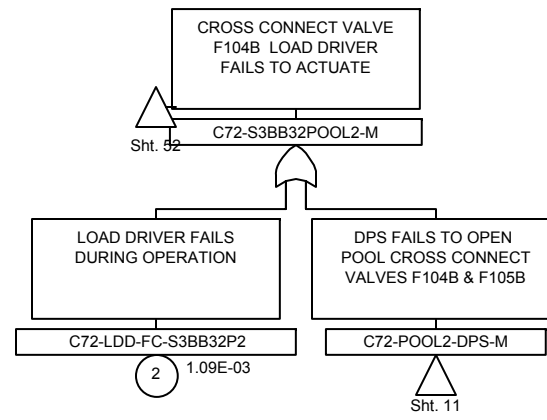


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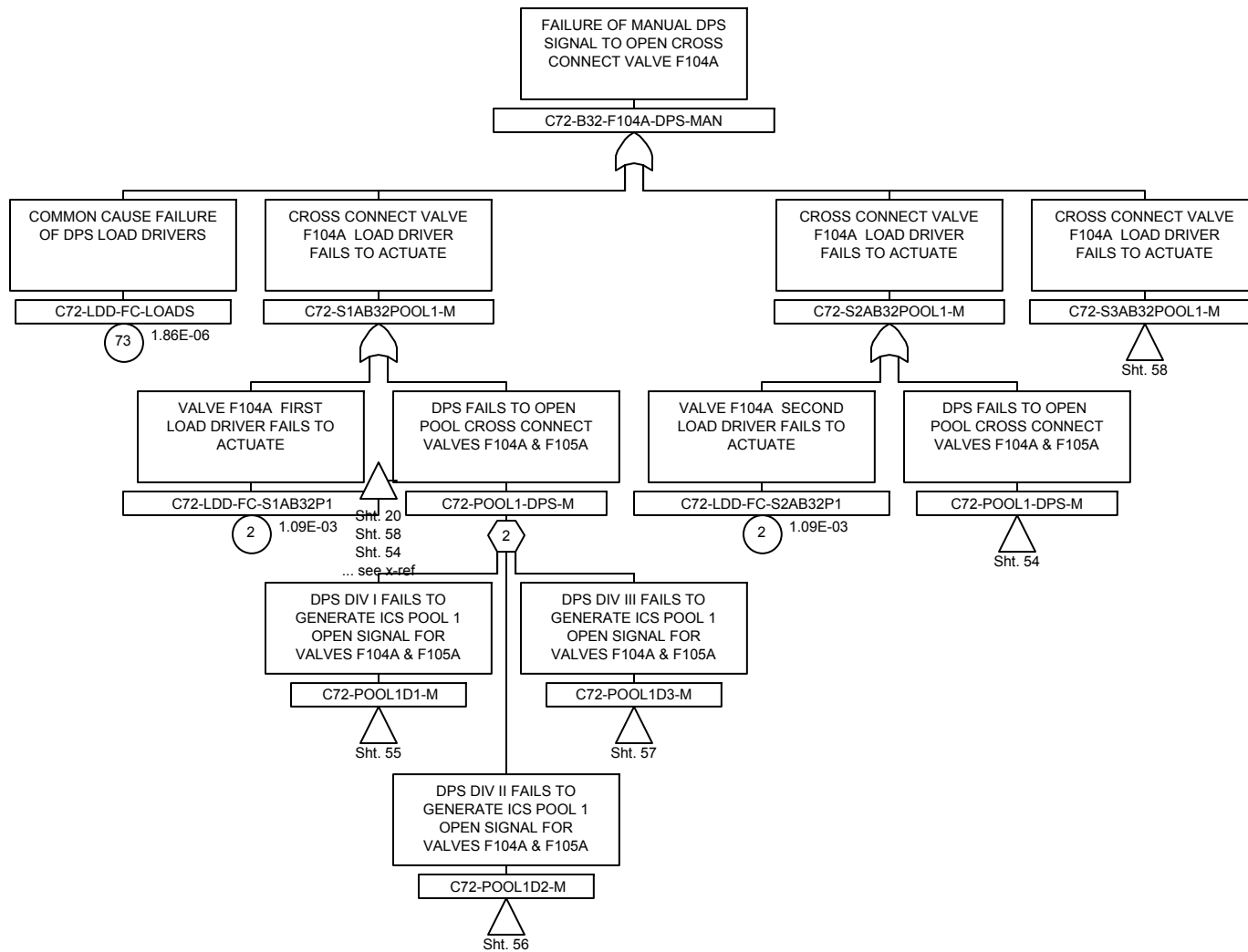


Figure 4.5-3d. Sheet 54 Diverse Protection System



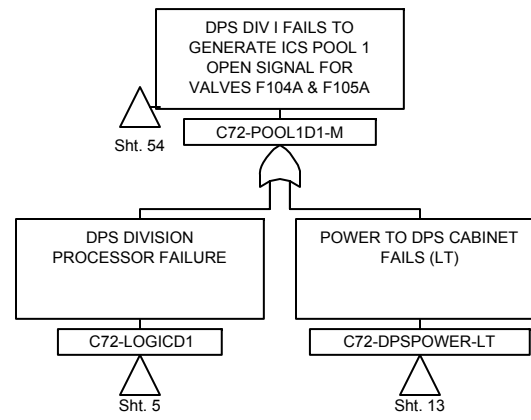


Figure 4.5-3d. Sheet 55 Diverse Protection System

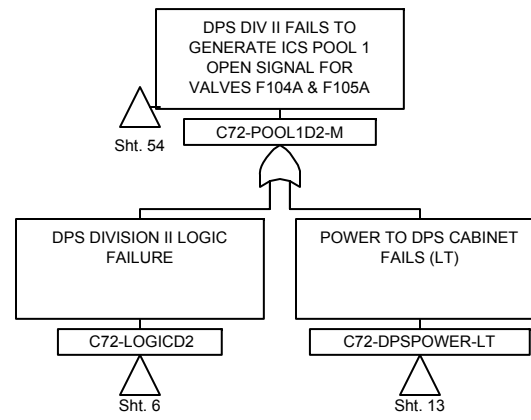


Figure 4.5-3d. Sheet 56 Diverse Protection System

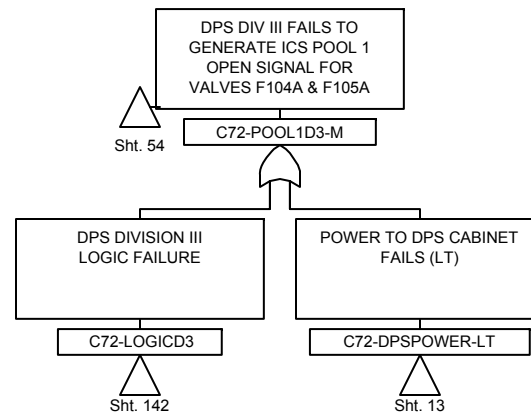


Figure 4.5-3d. Sheet 57 Diverse Protection System

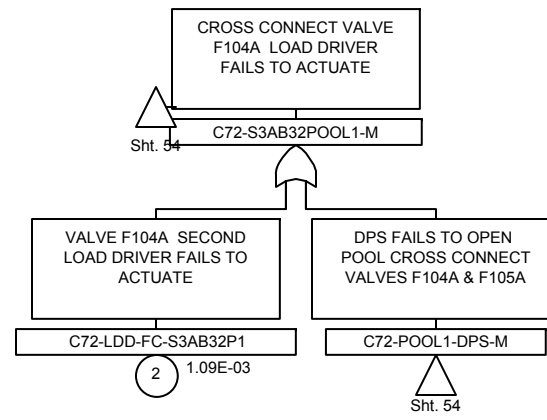


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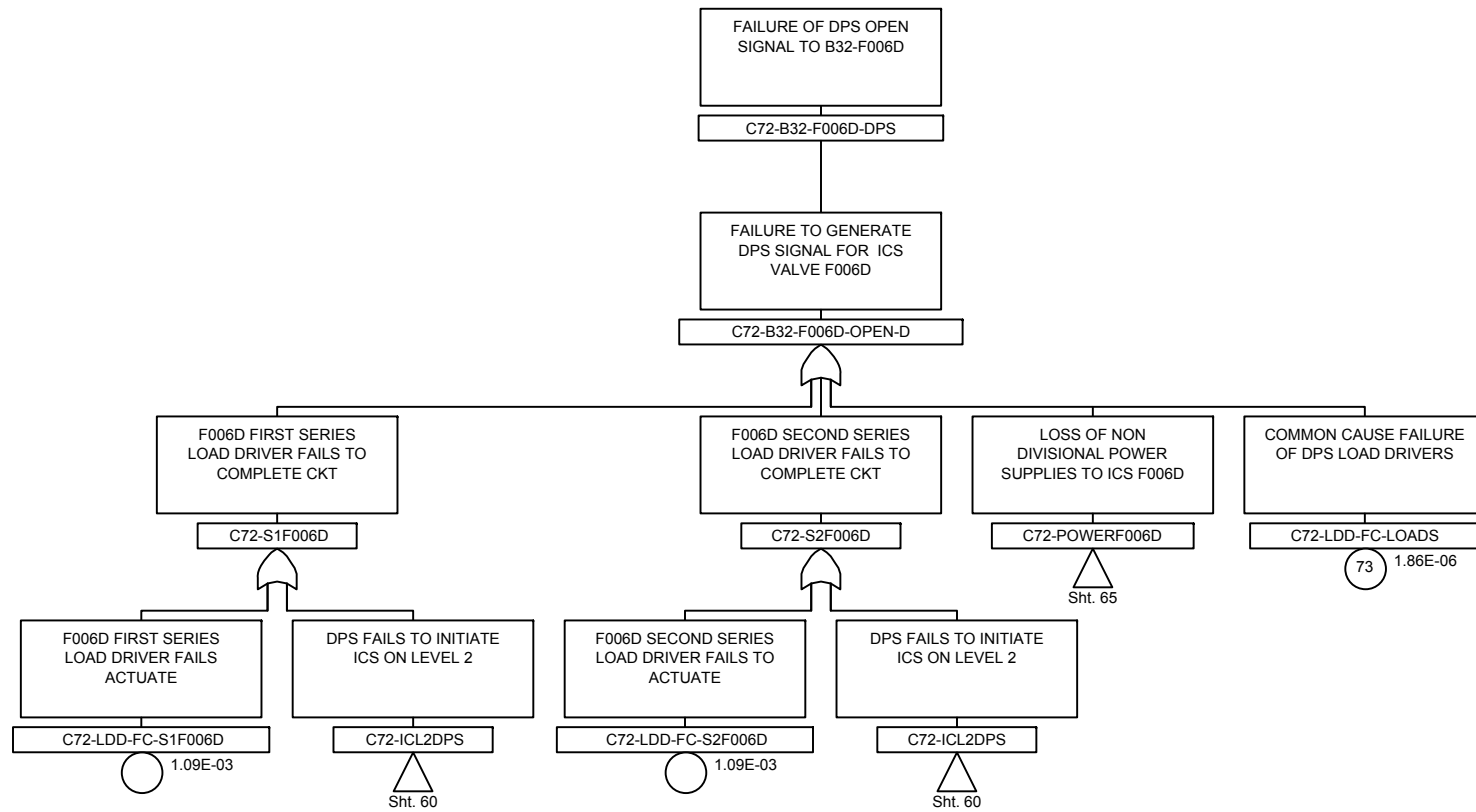


Figure 4.5-3d. Sheet 59 Diverse Protection System

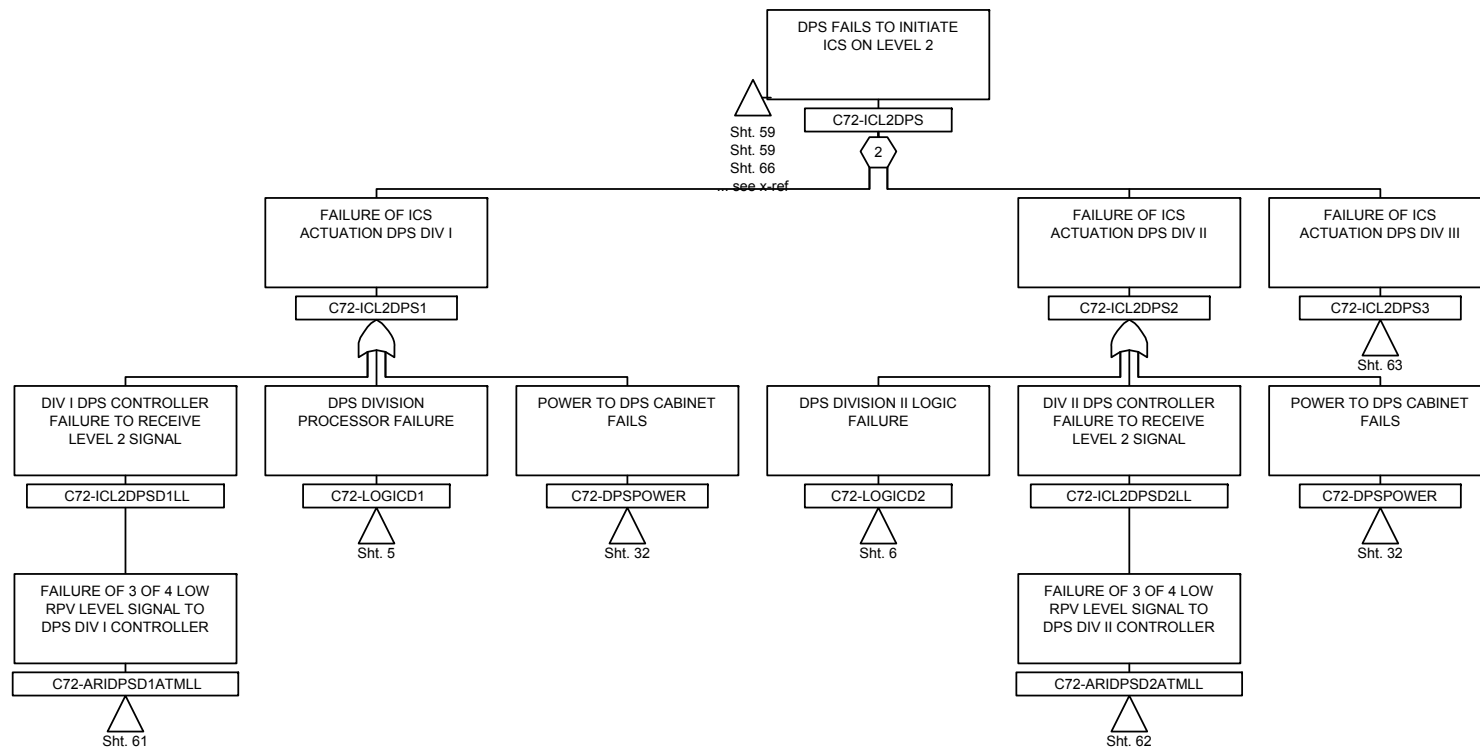


Figure 4.5-3d. Sheet 60 Diverse Protection System

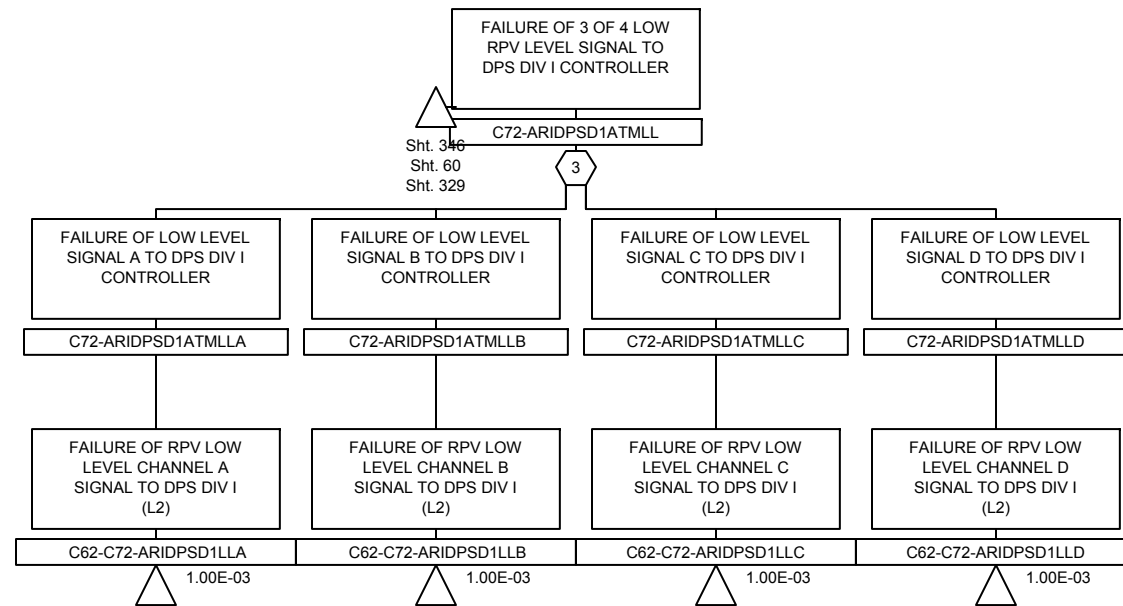


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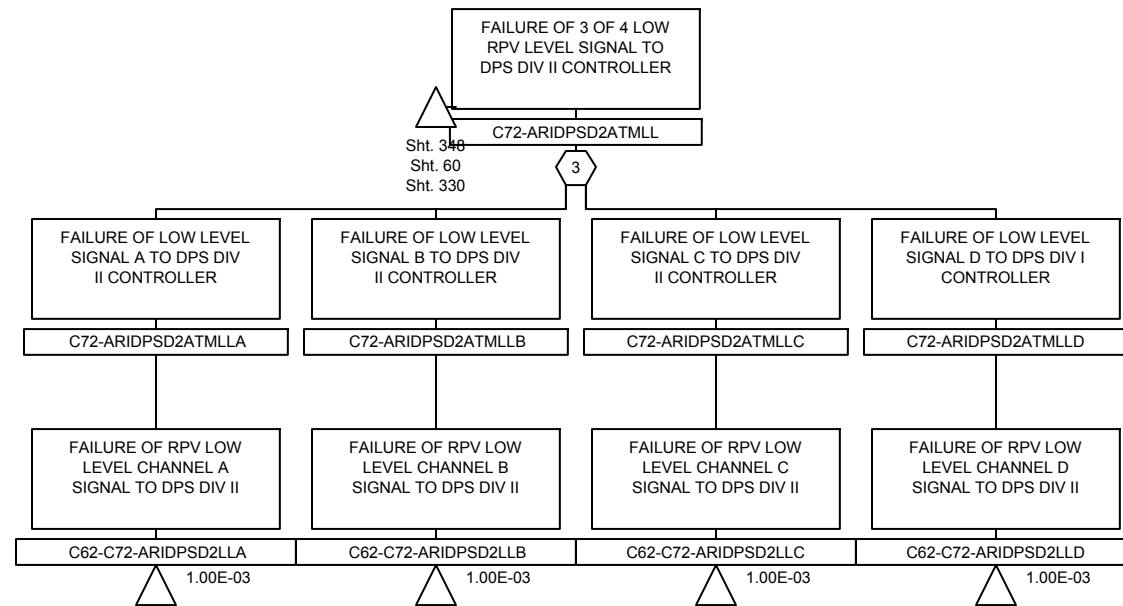


Figure 4.5-3d. Sheet 62 Diverse Protection System



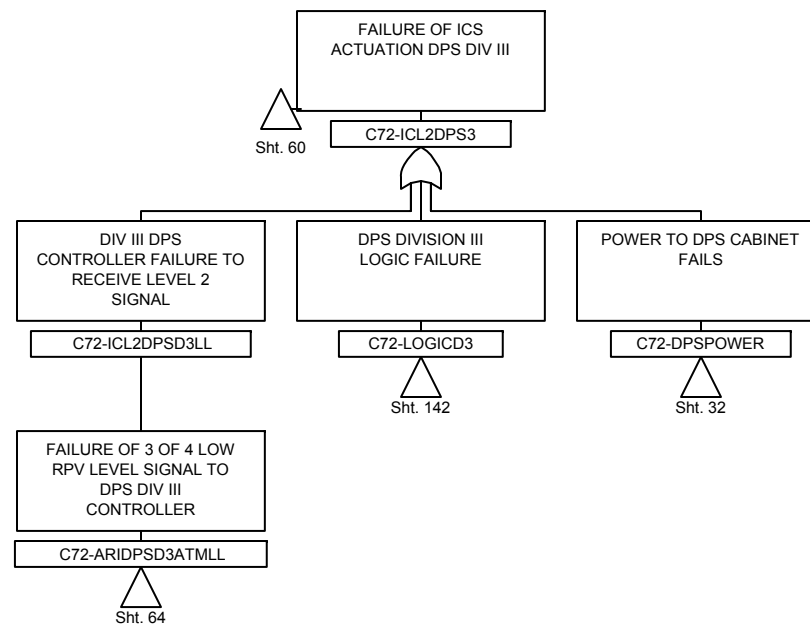


Figure 4.5-3d. Sheet 63 Diverse Protection System

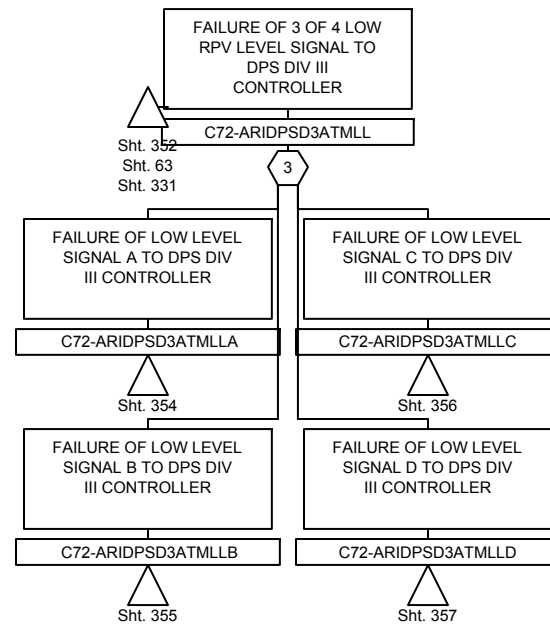


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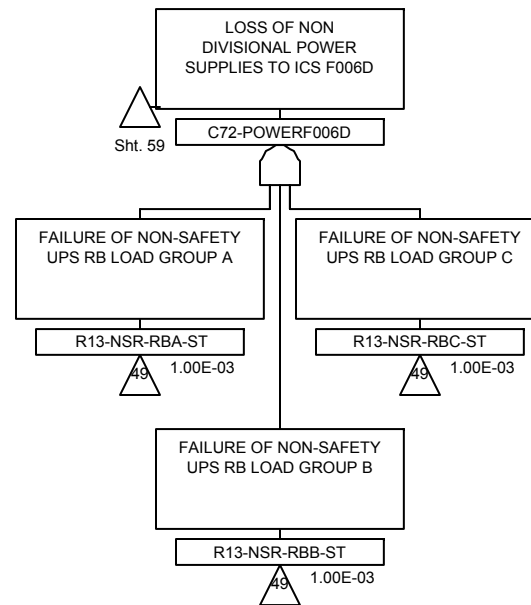


Figure 4.5-3d. Sheet 65 Diverse Protection System

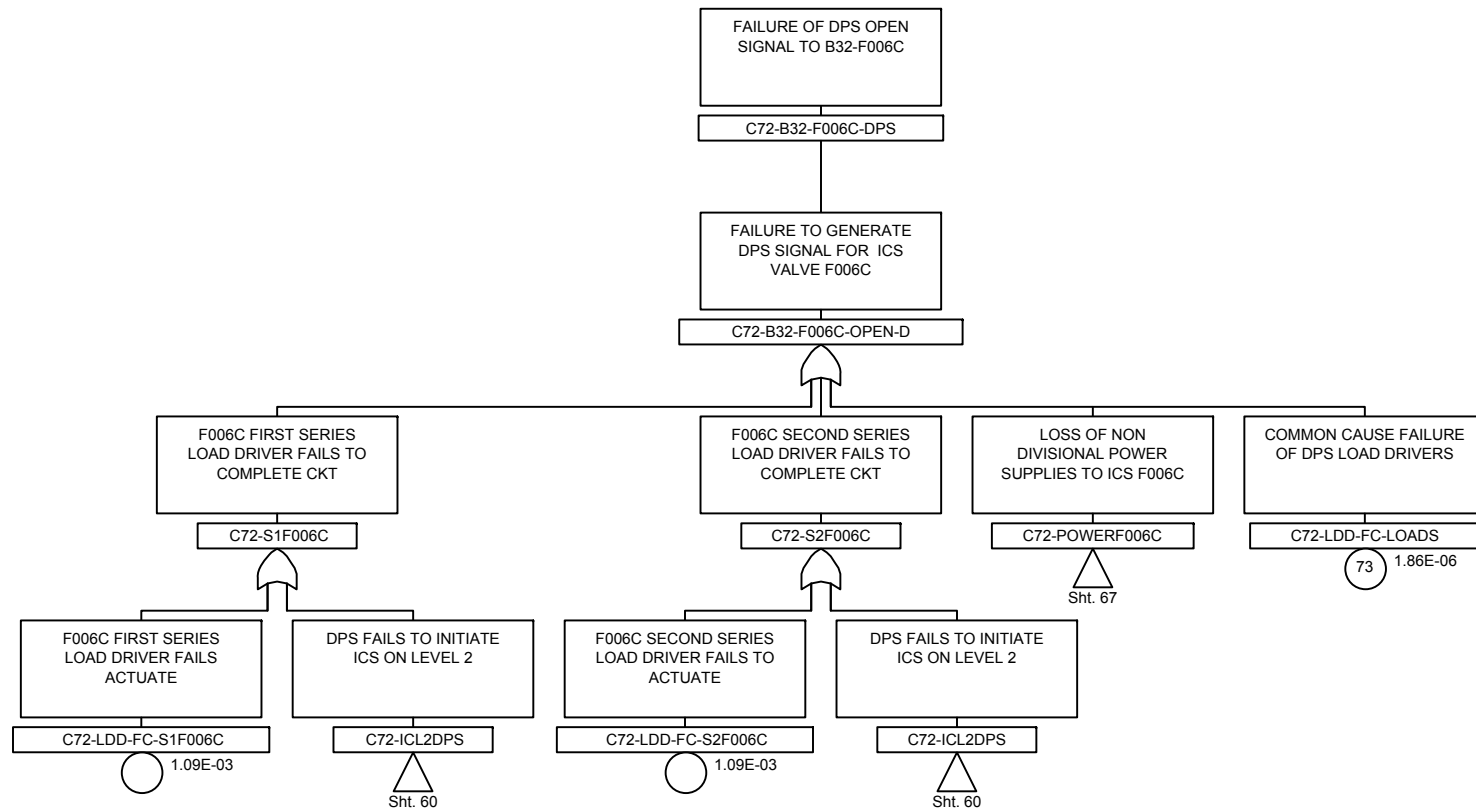


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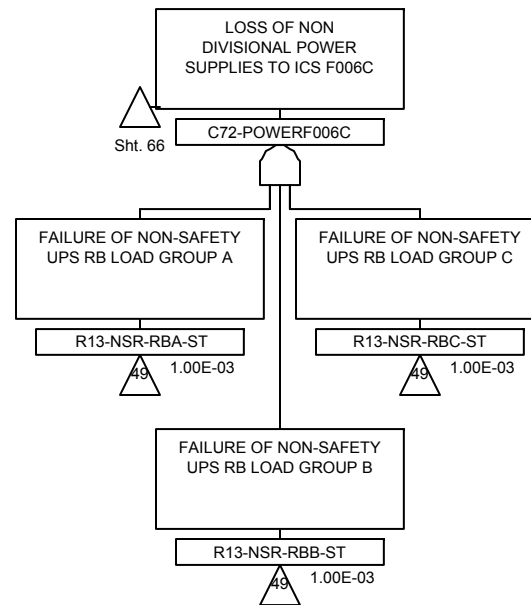


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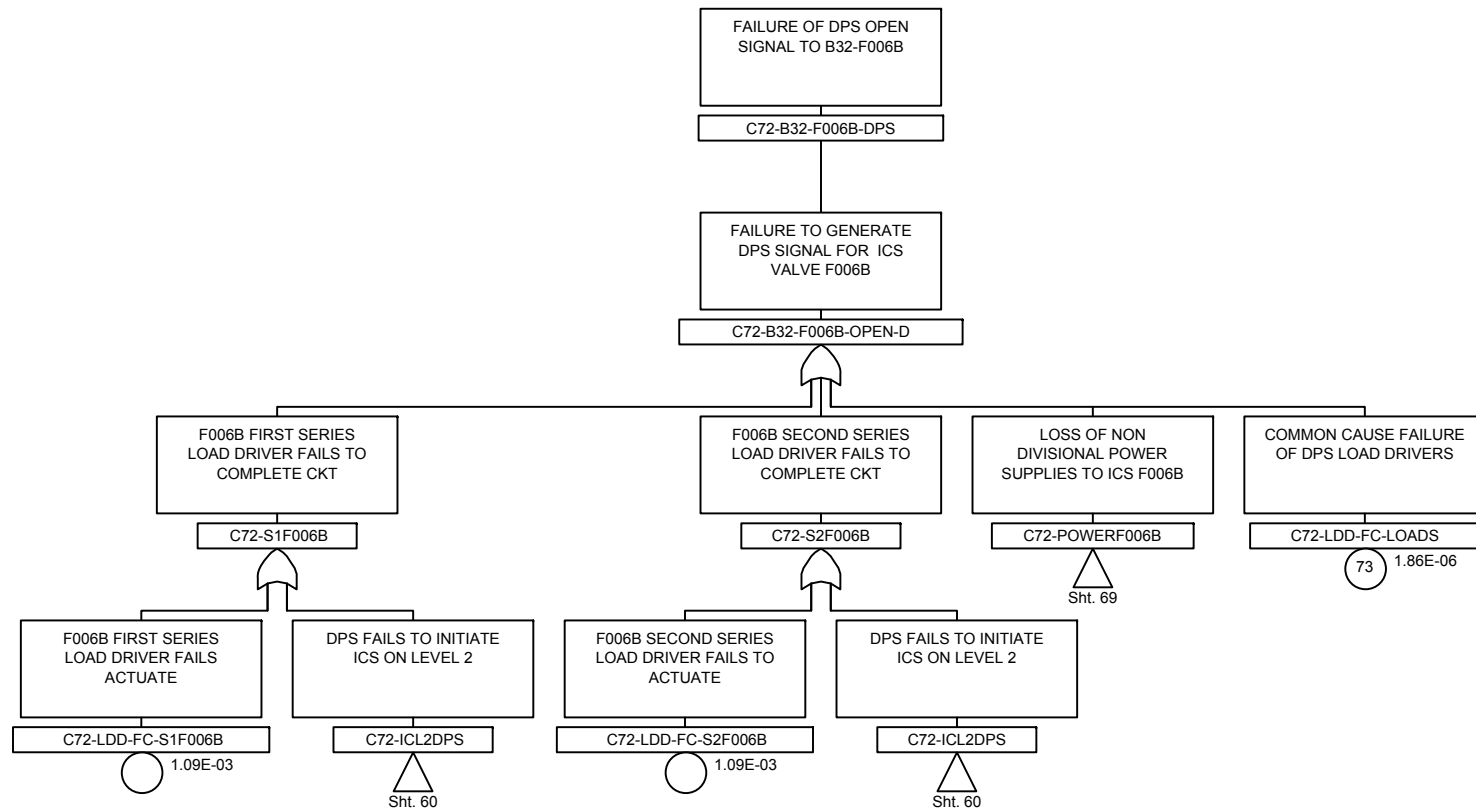


Figure 4.5-3d. Sheet 68 Diverse Protection System

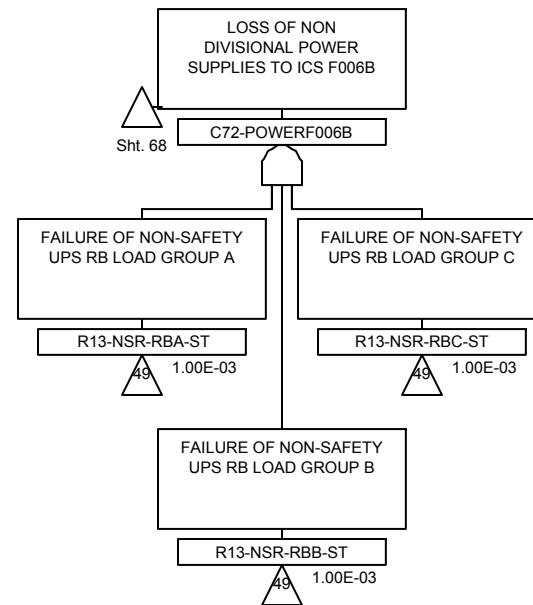


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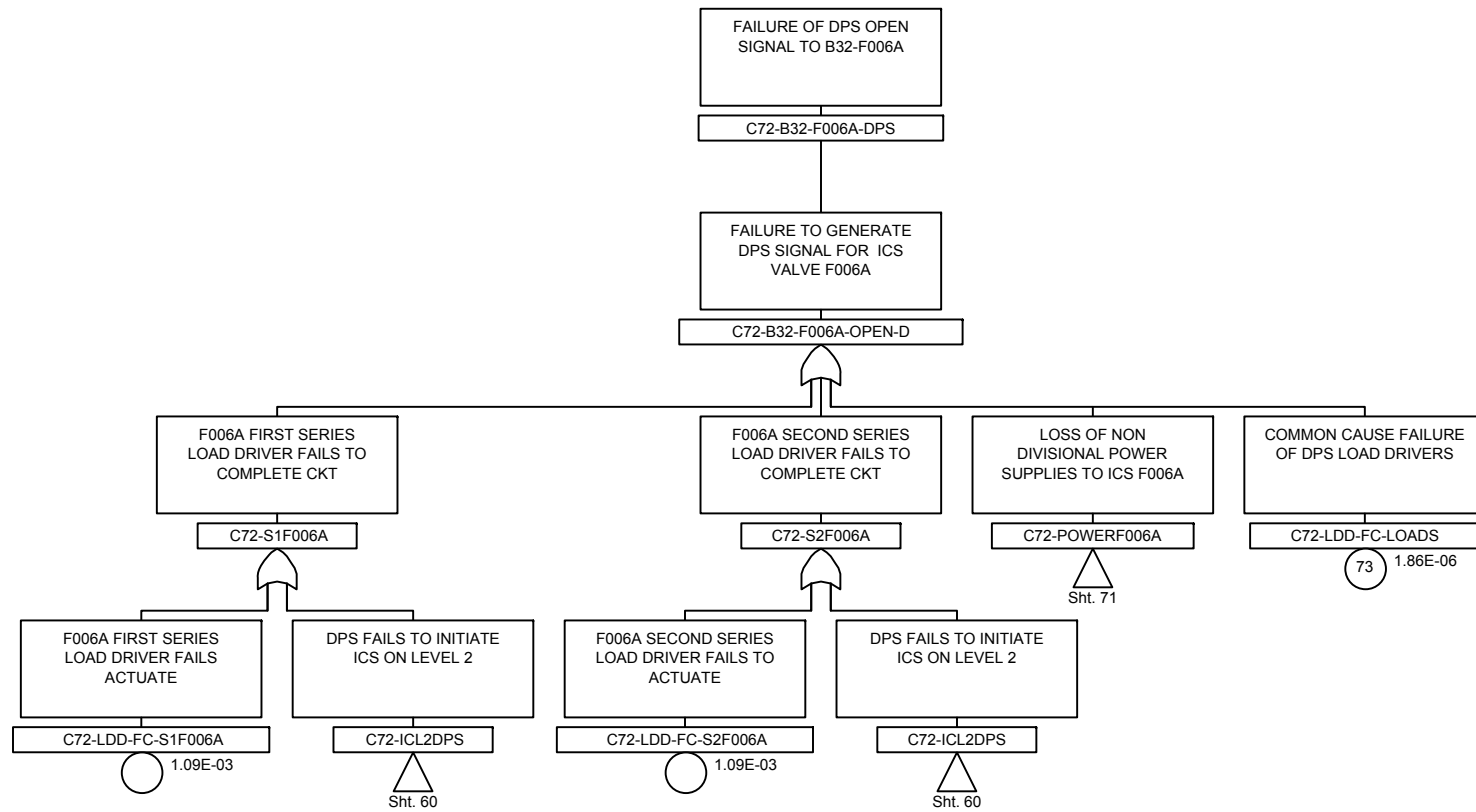


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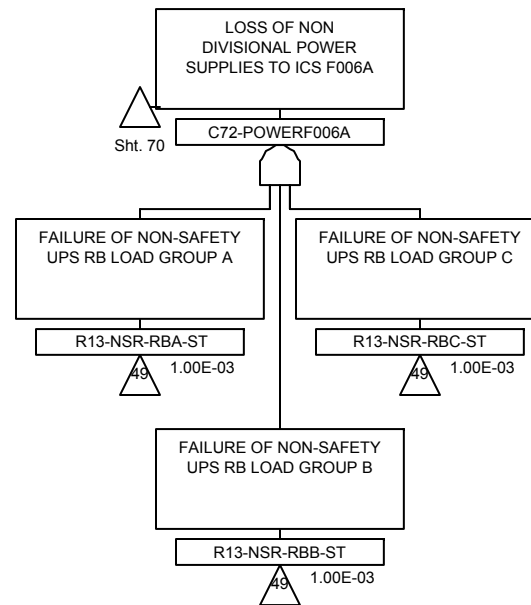


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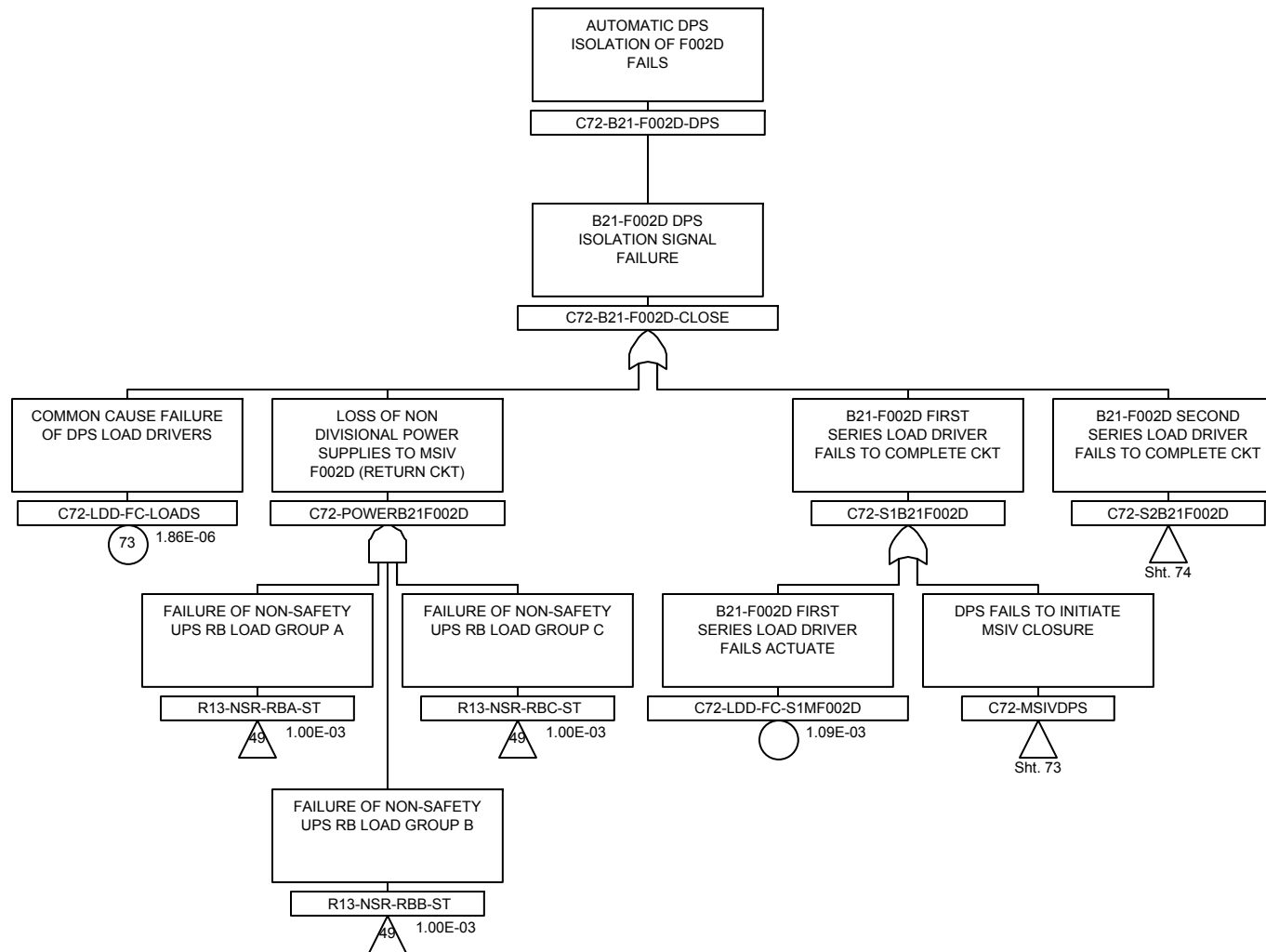


Figure 4.5-3d. Sheet 72 Diverse Protection System

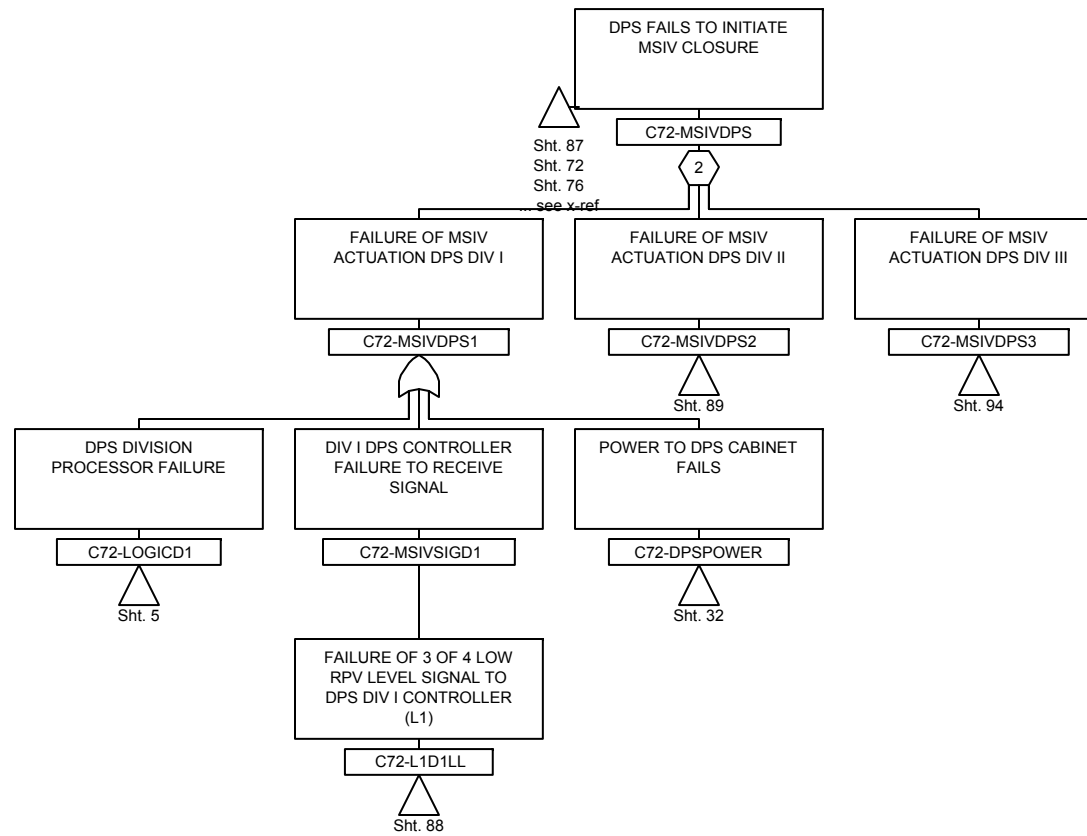


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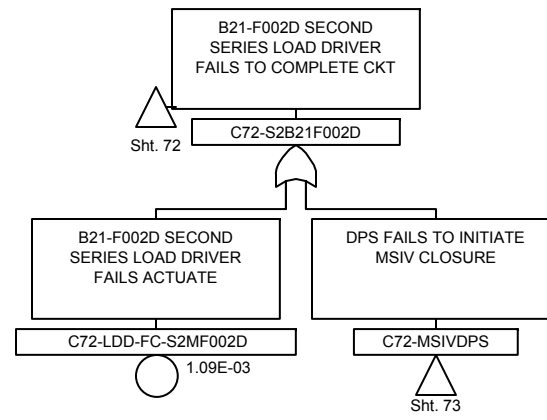


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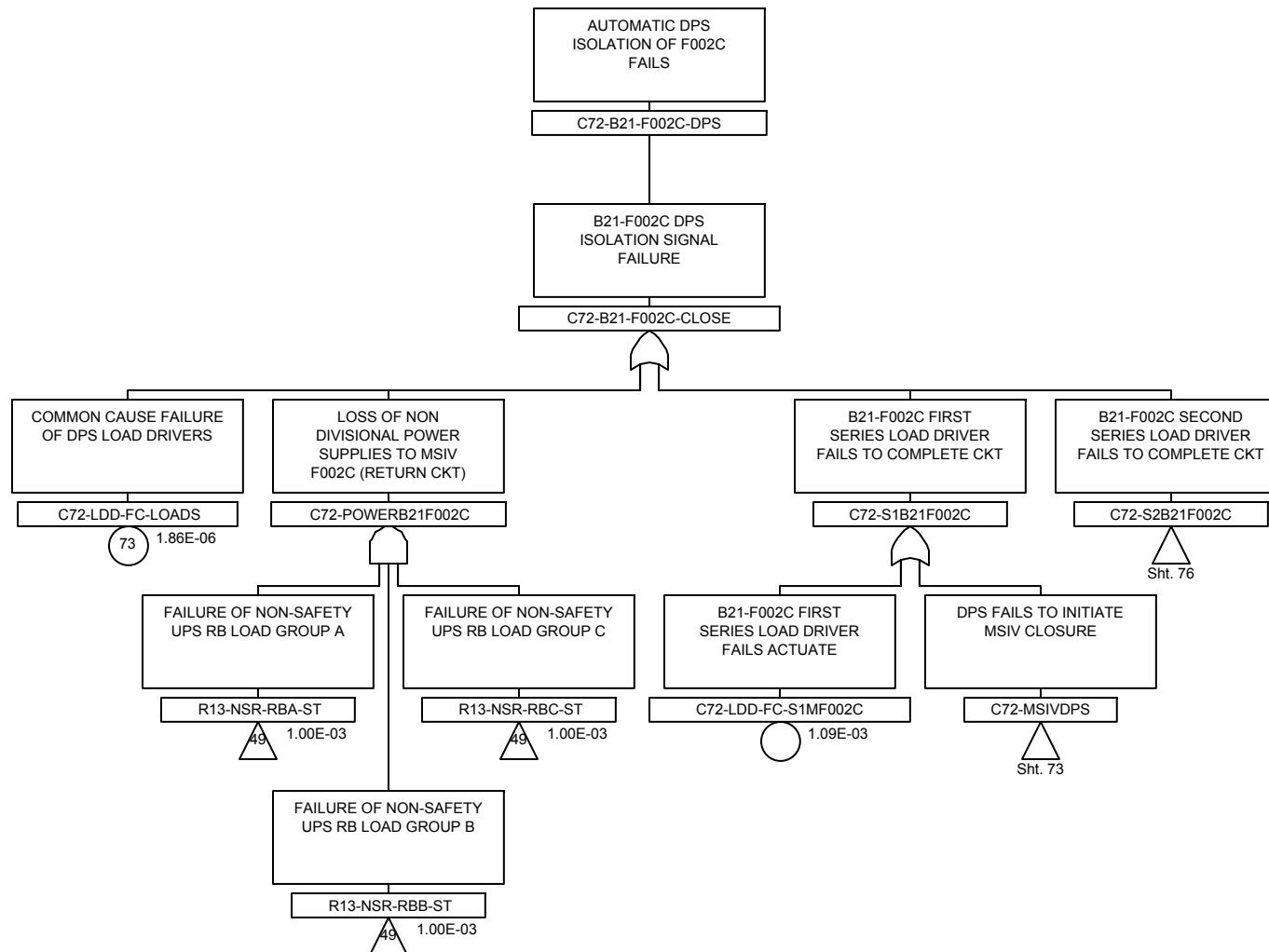


Figure 4.5-3d. Sheet 75 Diverse Protection System

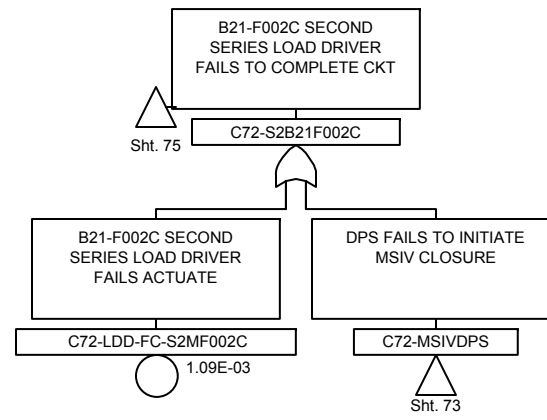


Figure 4.5-3d. Sheet 76 Diverse Protection System

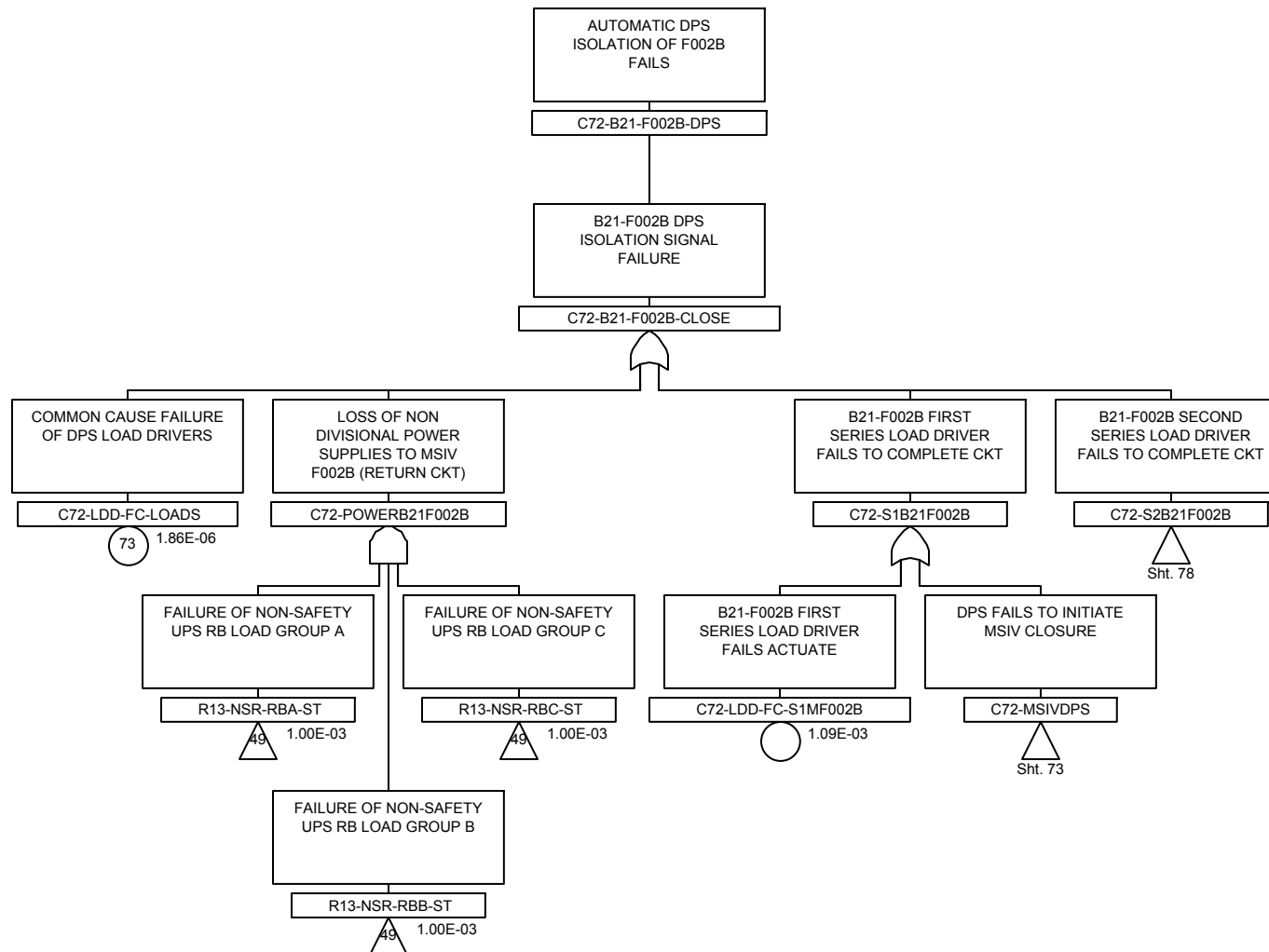


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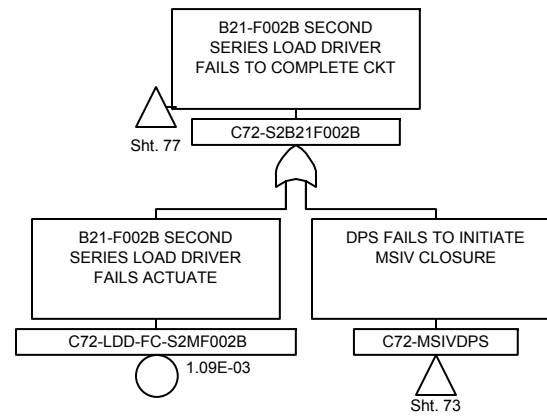


Figure 4.5-3d. Sheet 78 Diverse Protection System



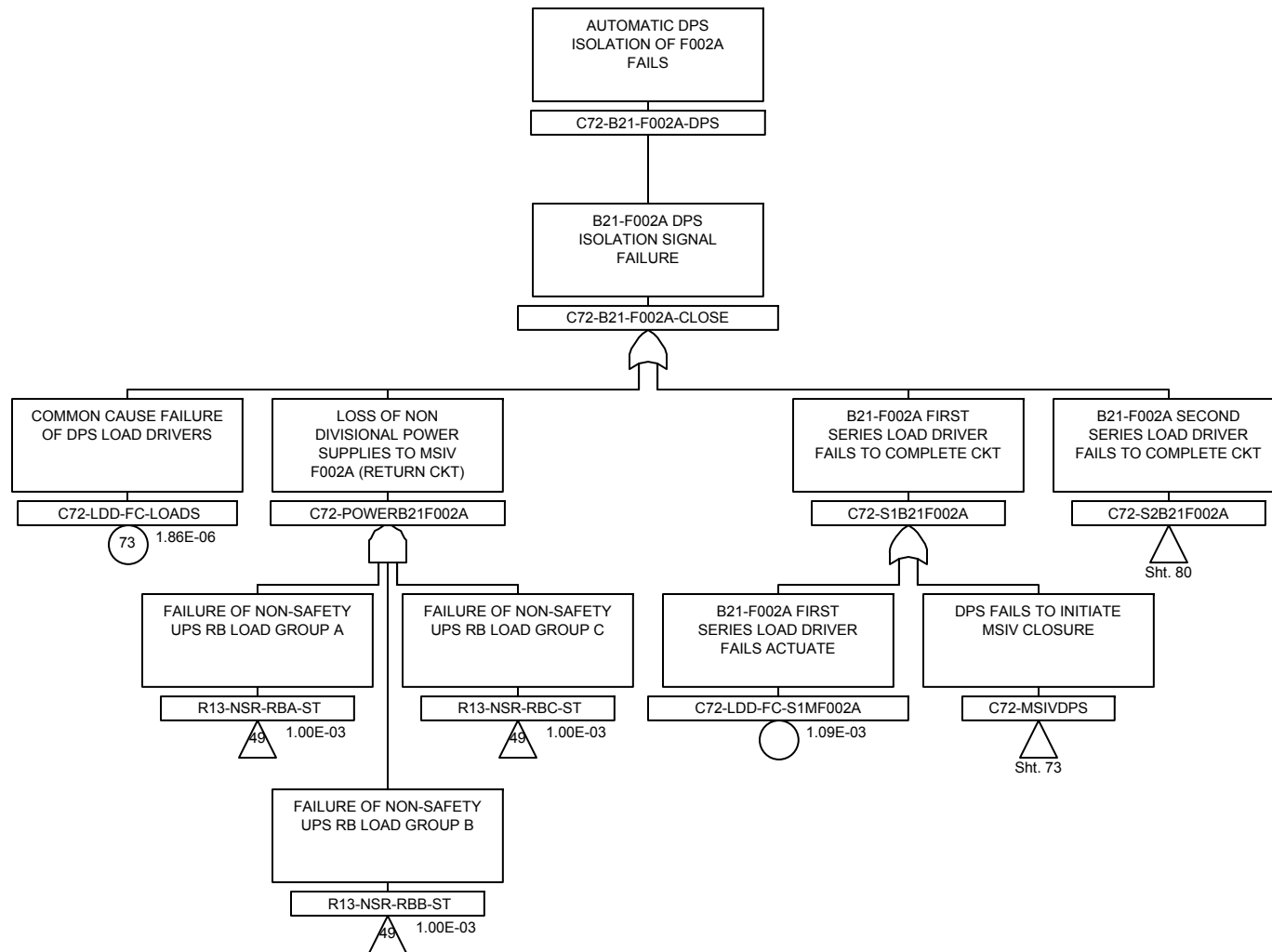


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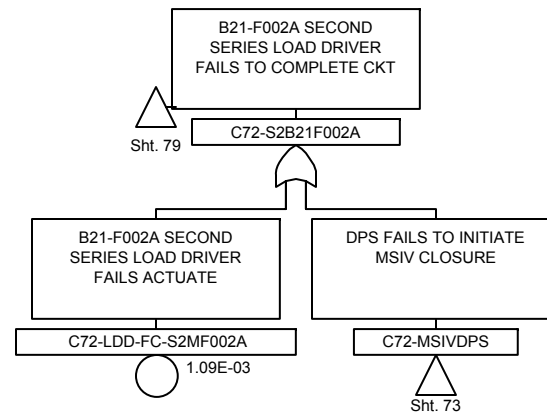


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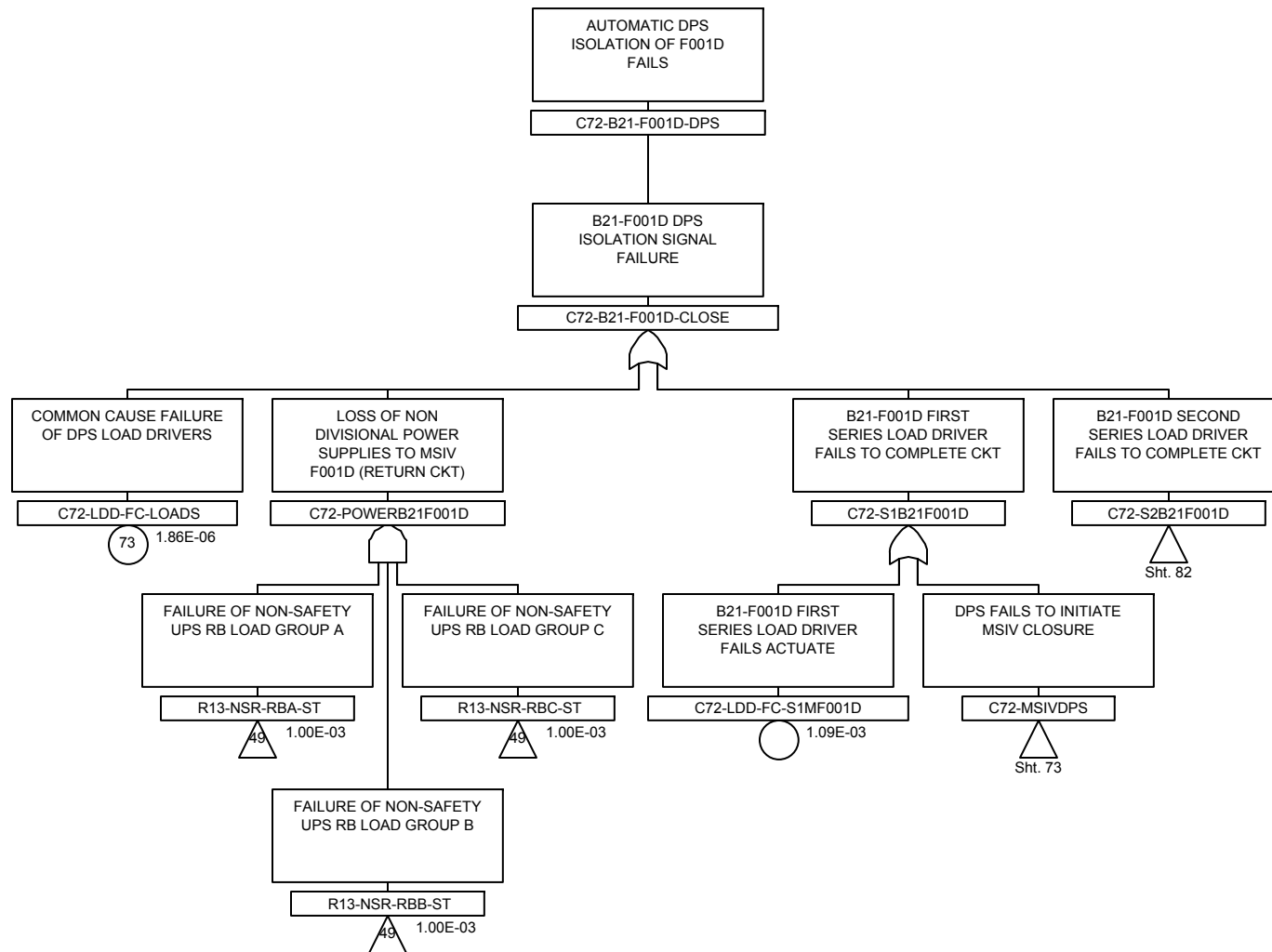


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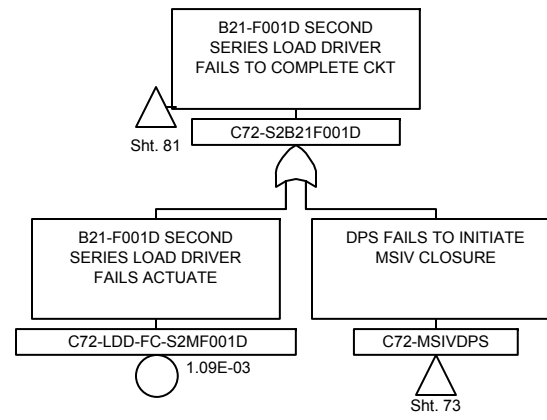


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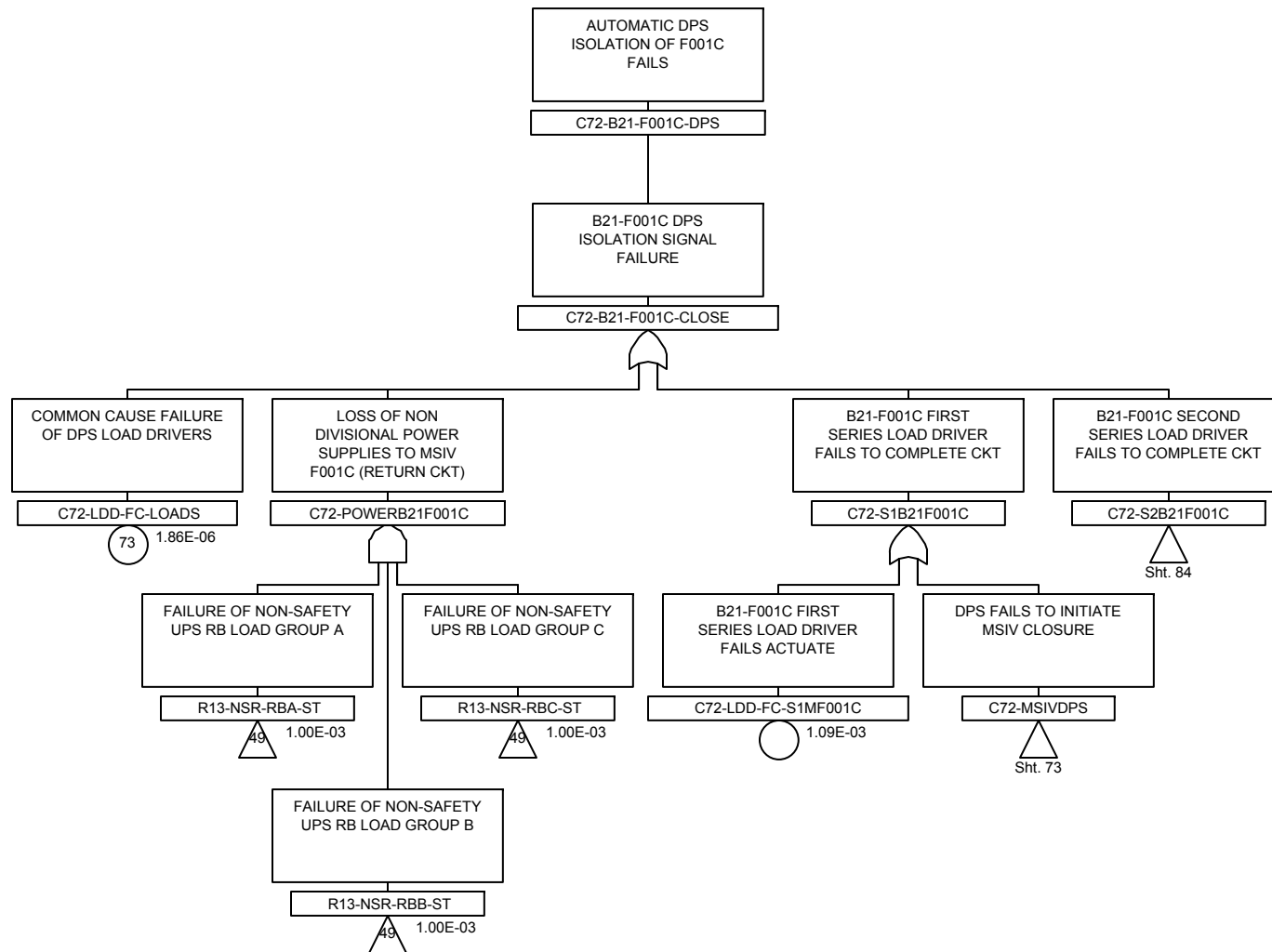


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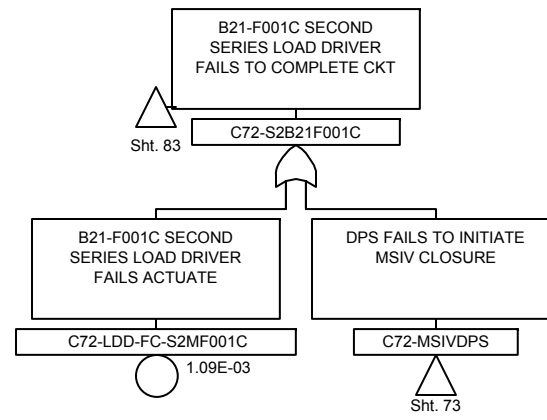


Figure 4.5-3d. Sheet 84 Diverse Protection System

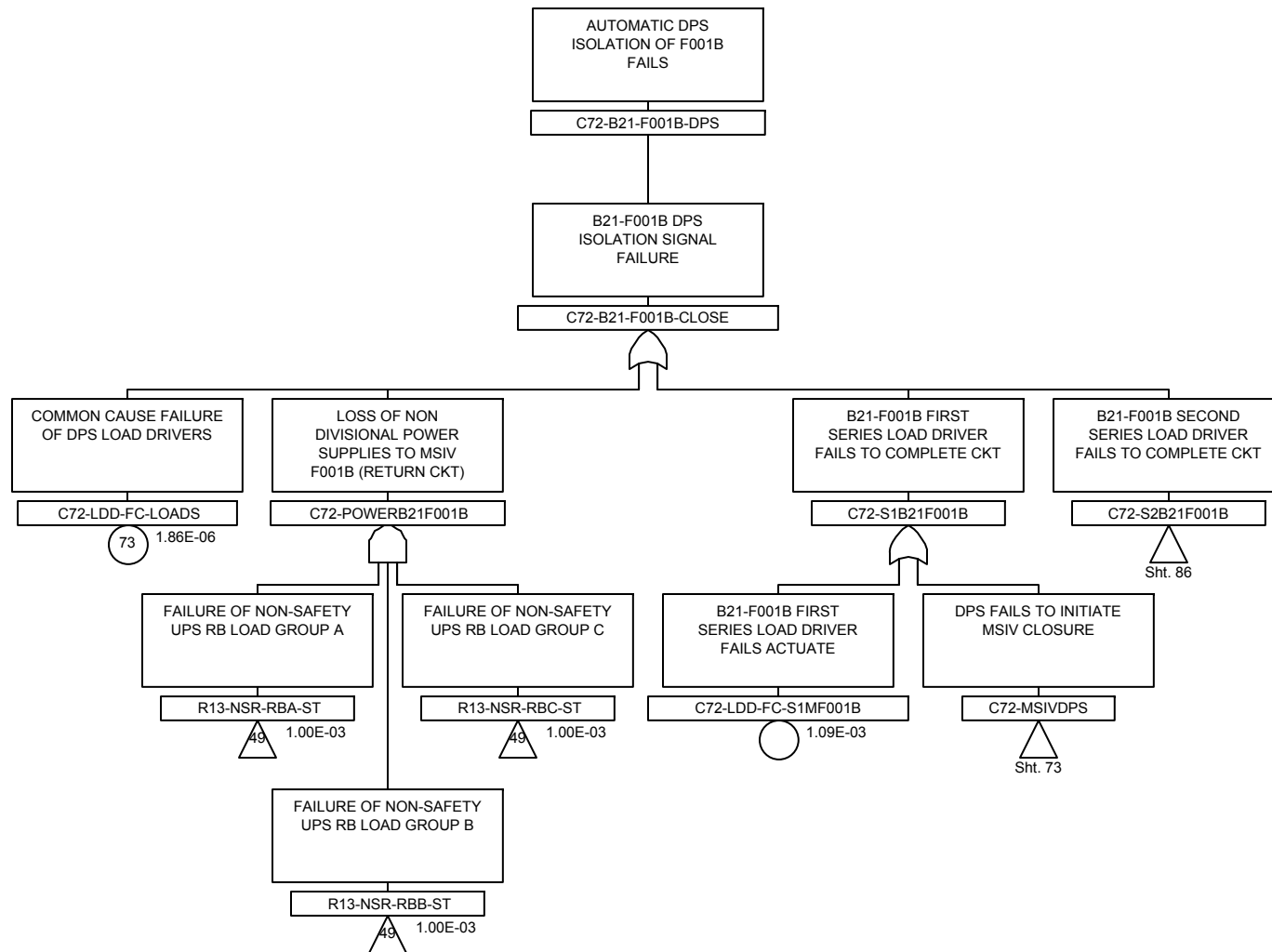


Figure 4.5-3d. Sheet 85 Diverse Protection System

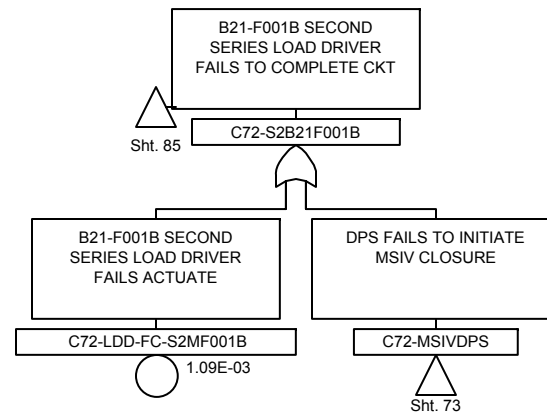


Figure 4.5-3d. Sheet 86 Diverse Protection System



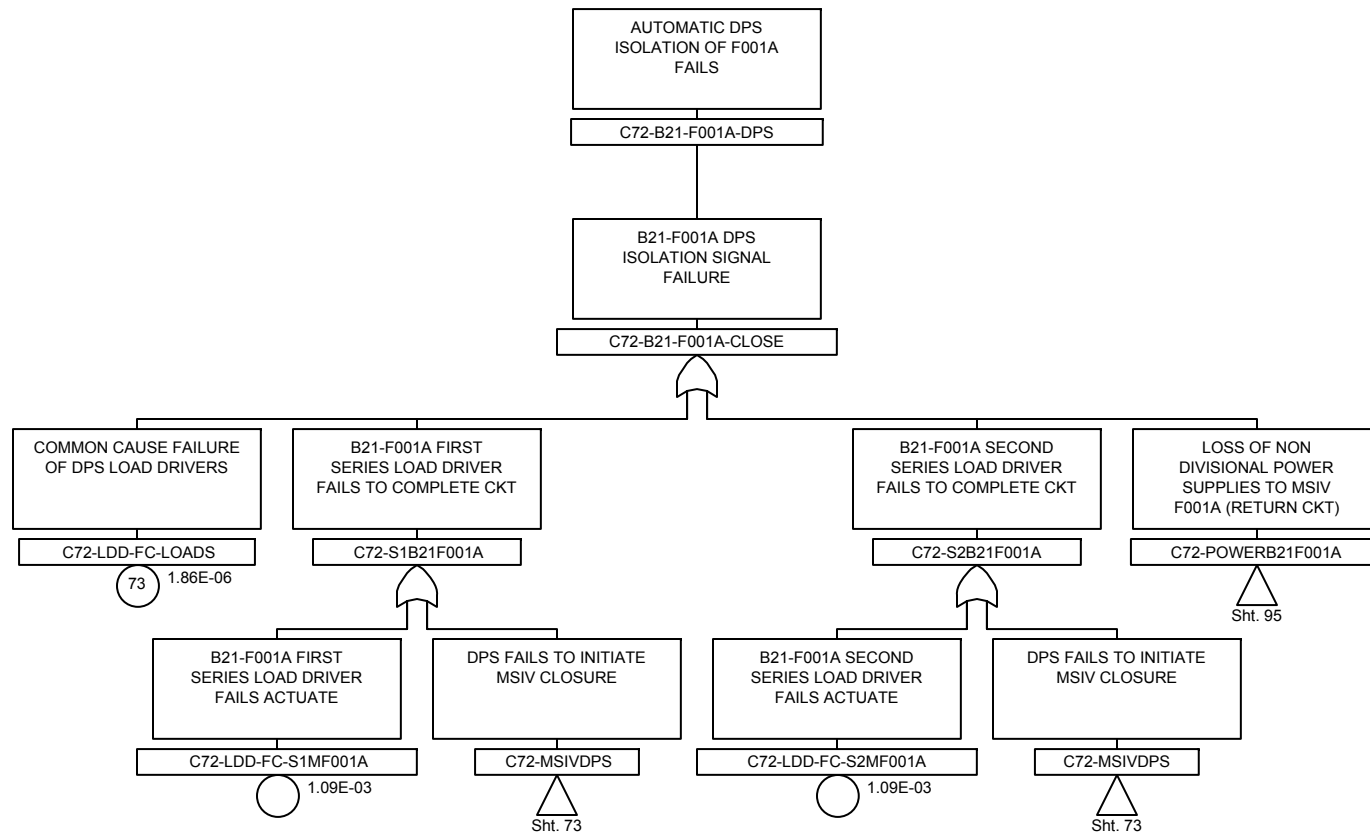


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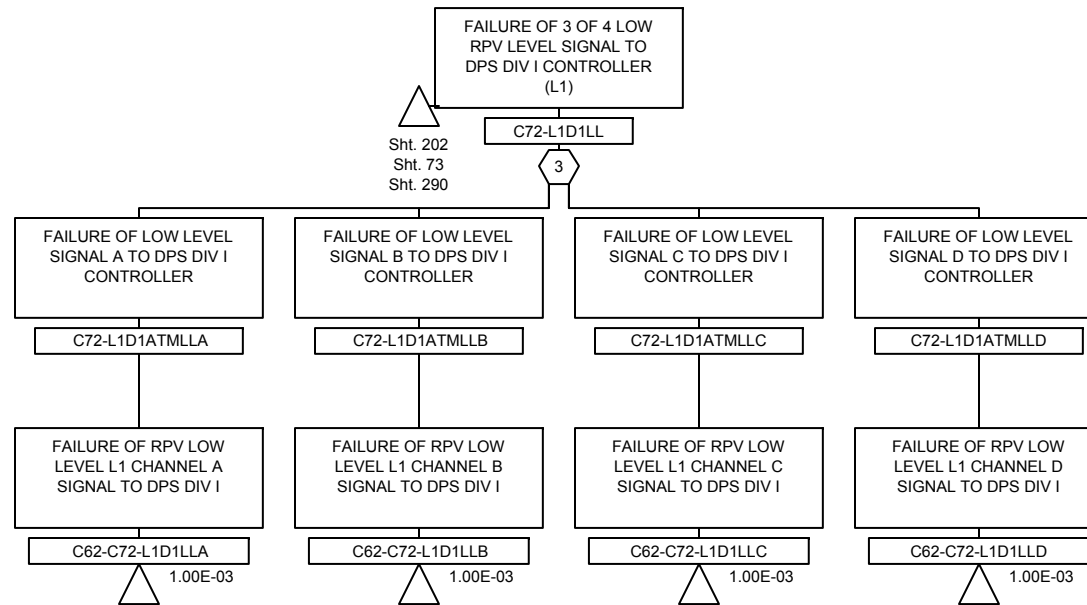


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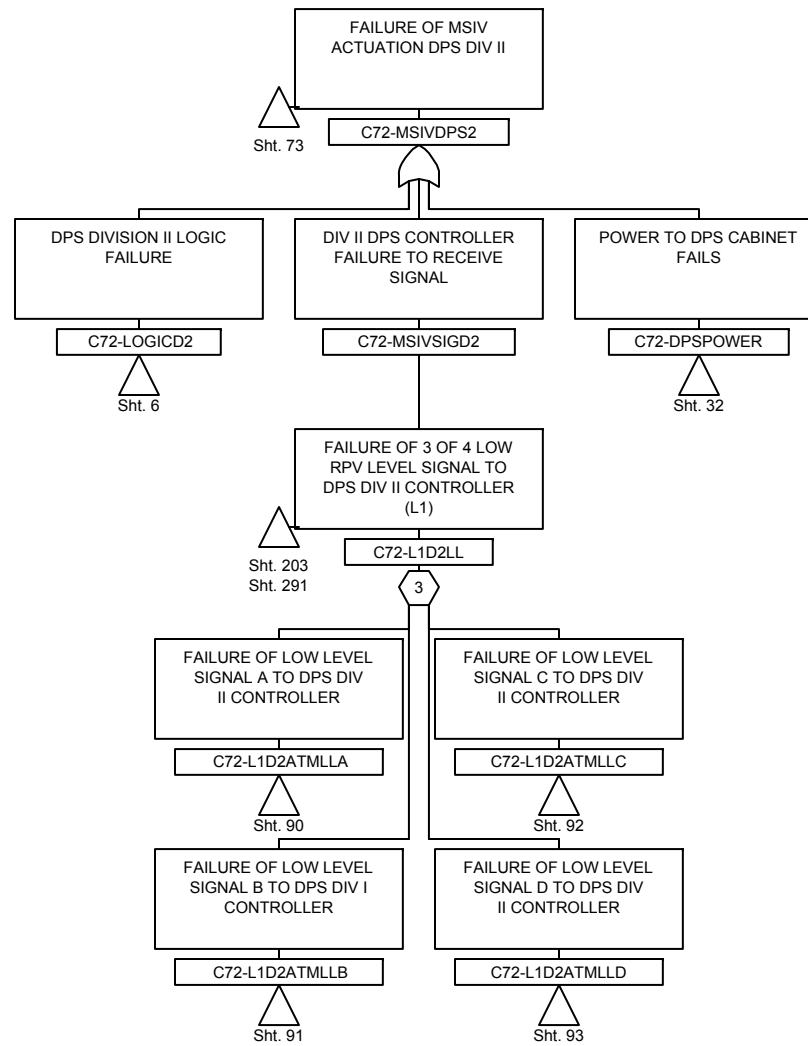


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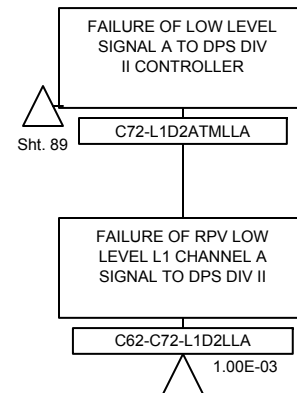


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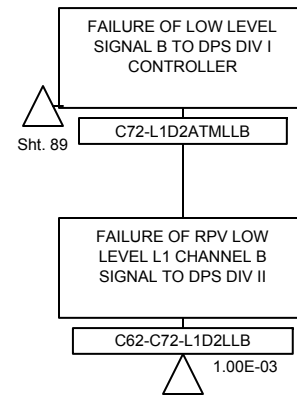


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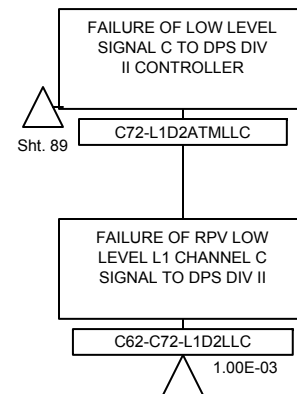


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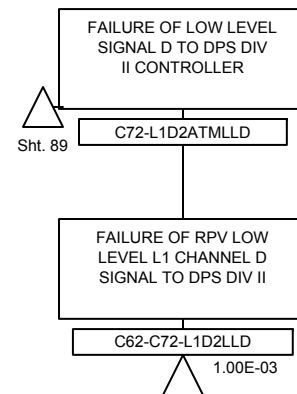


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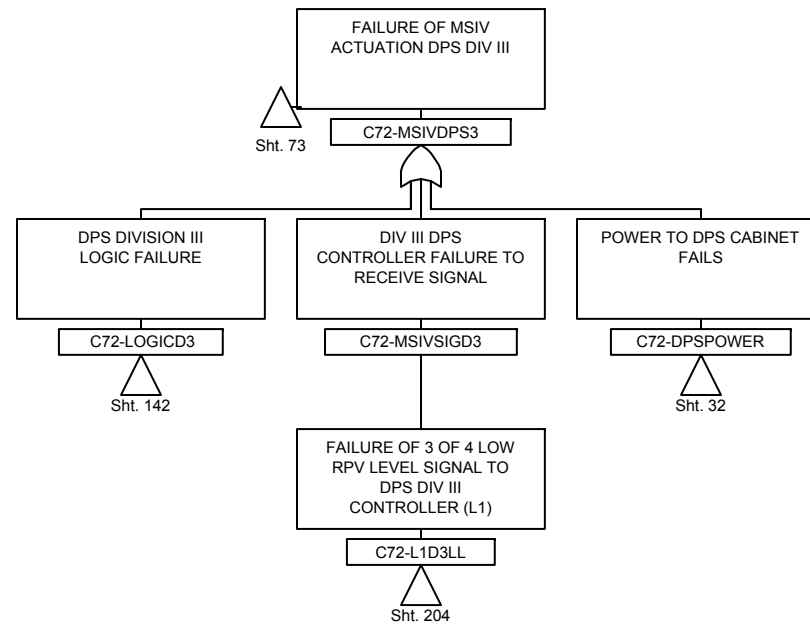


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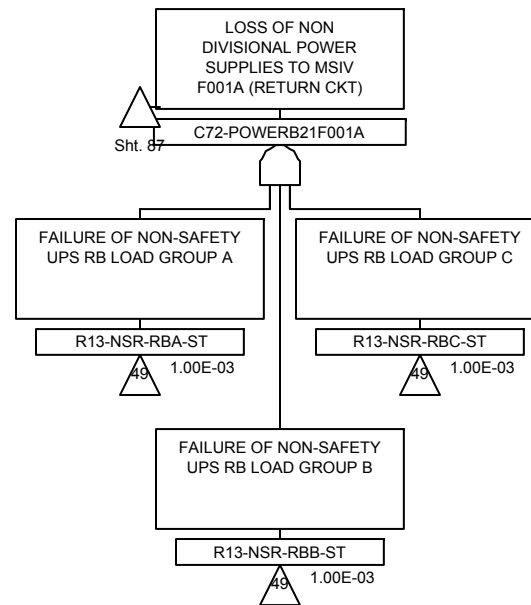


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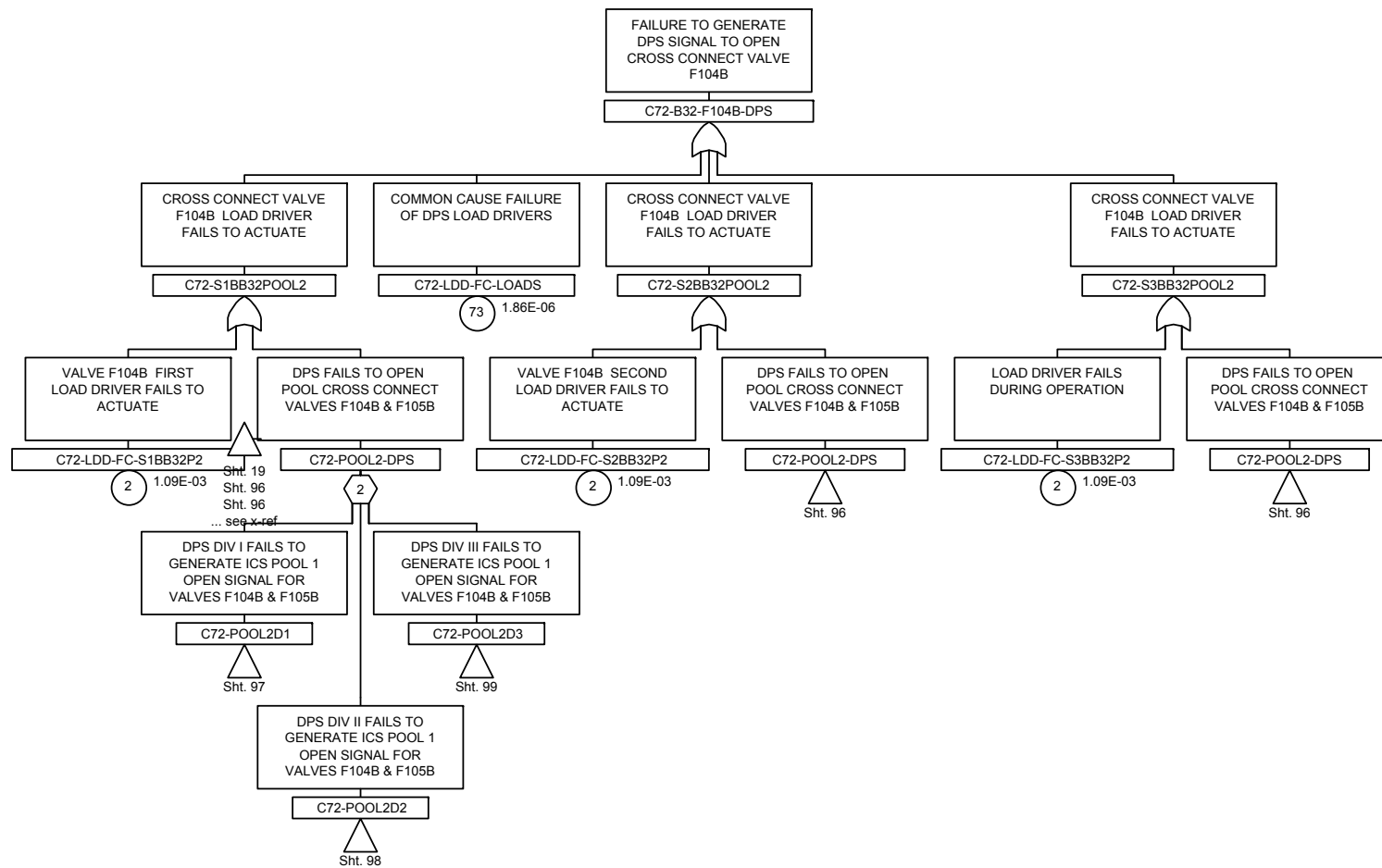


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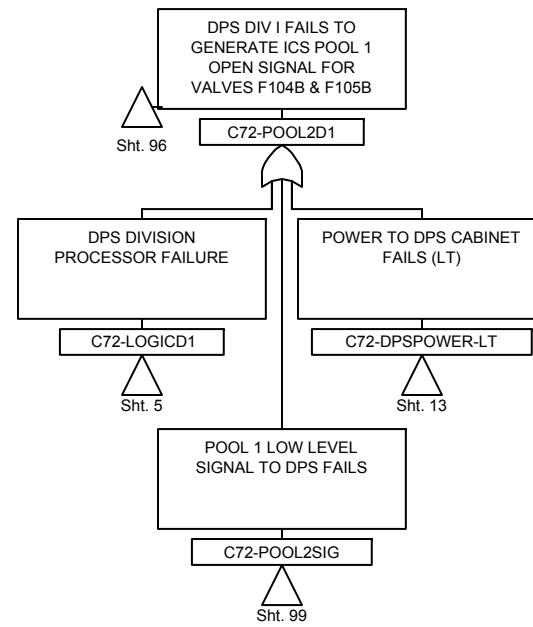


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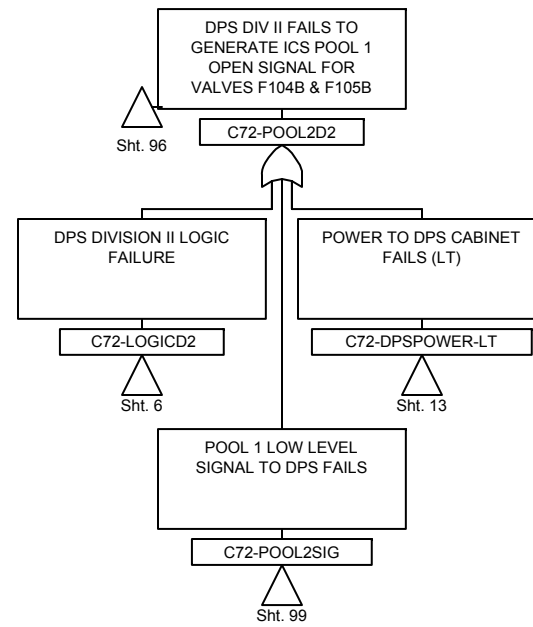


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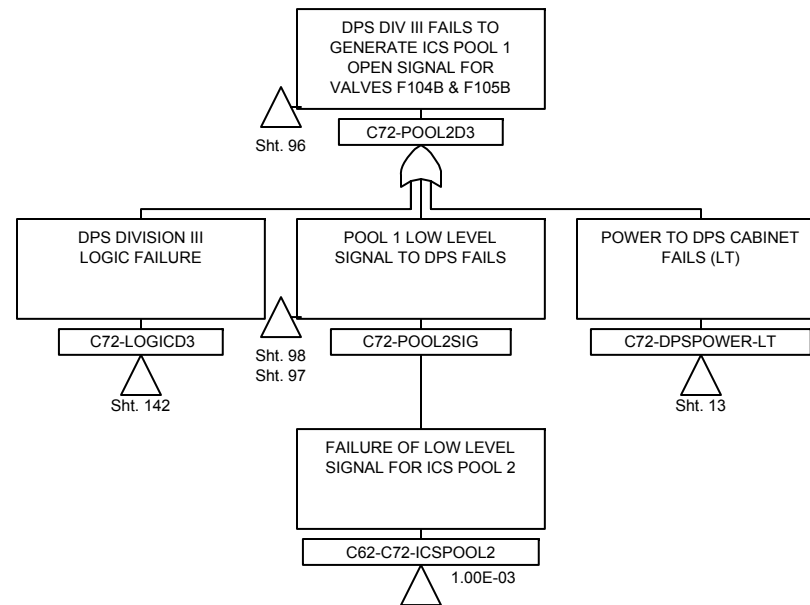


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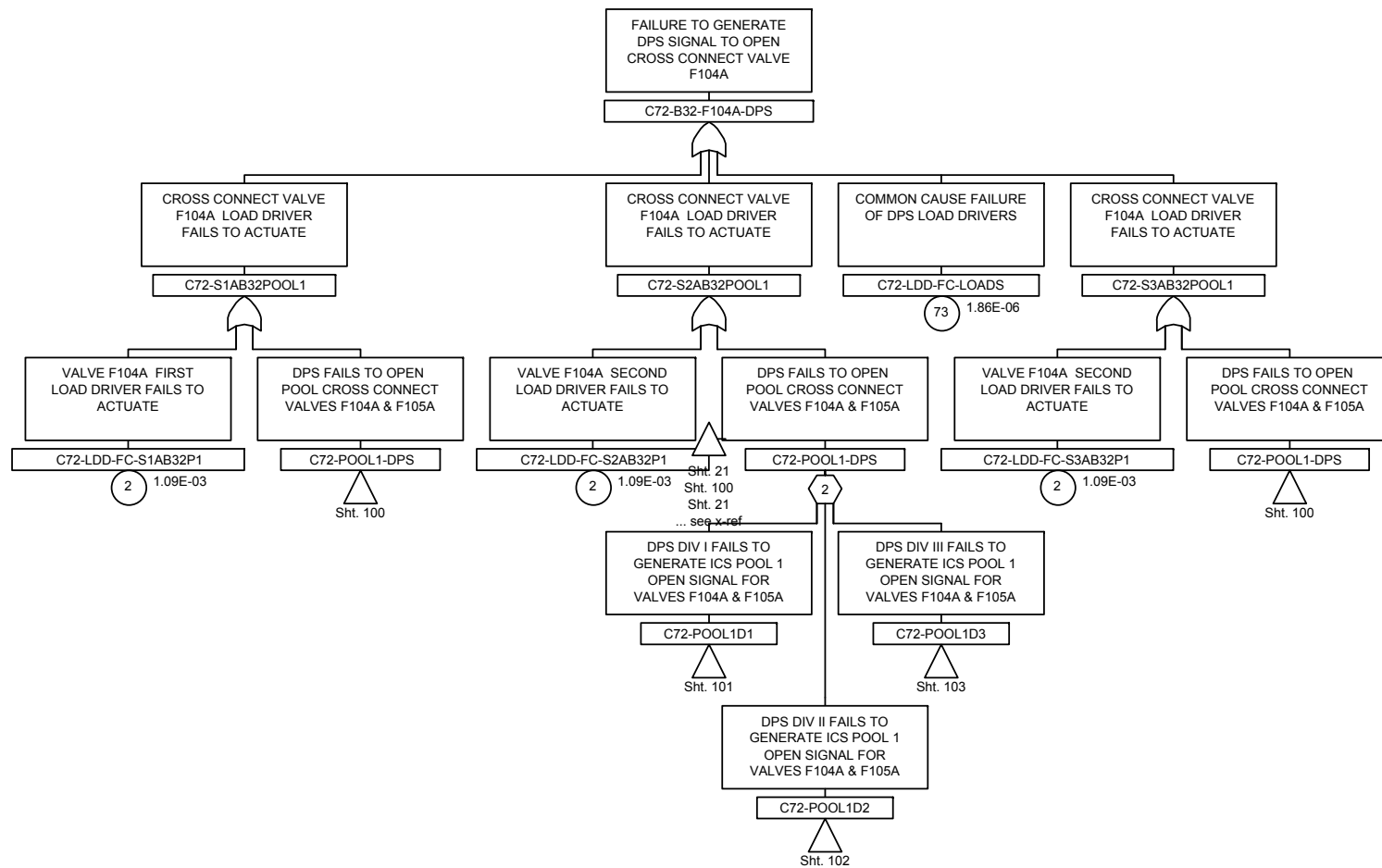


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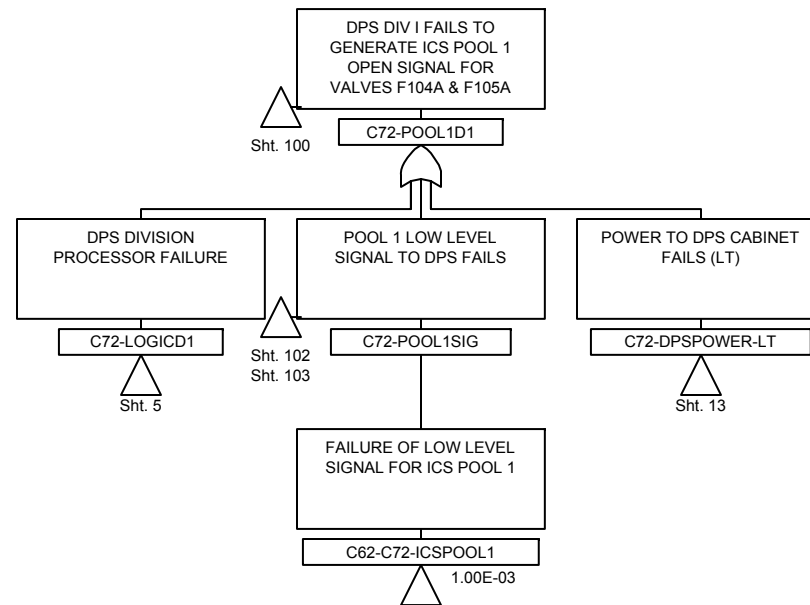


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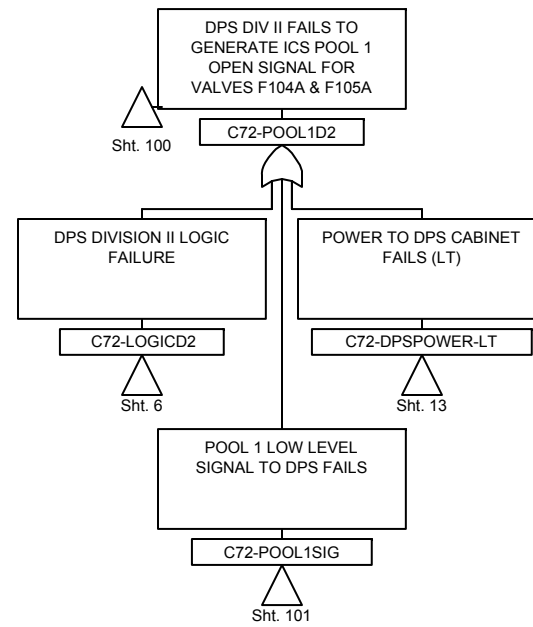


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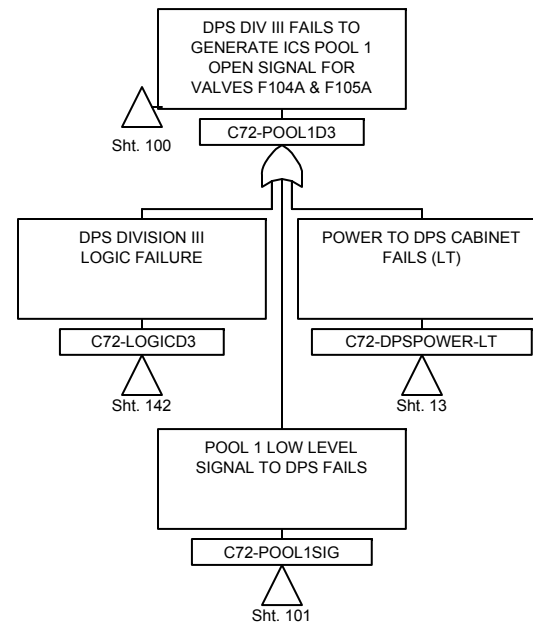


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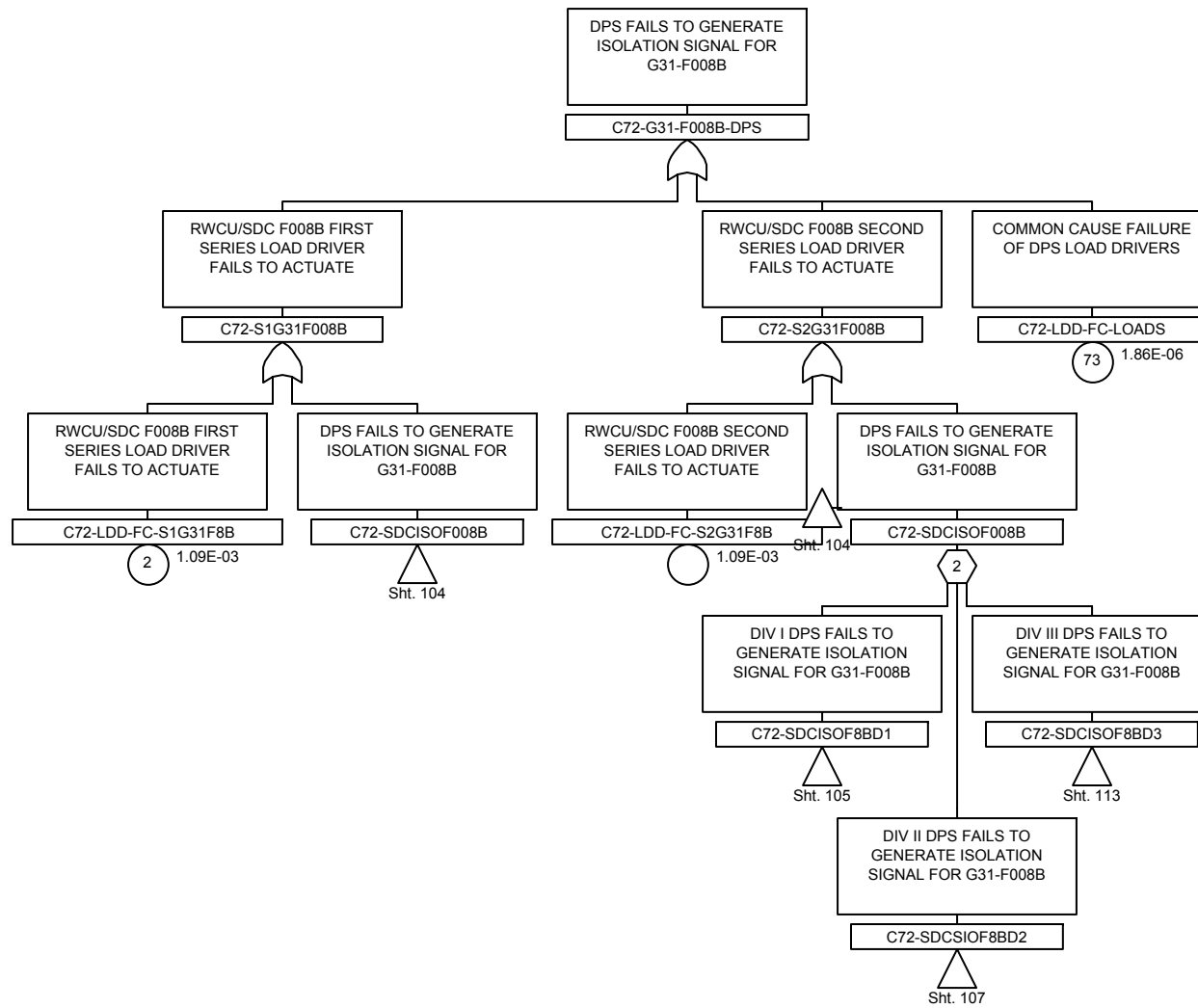


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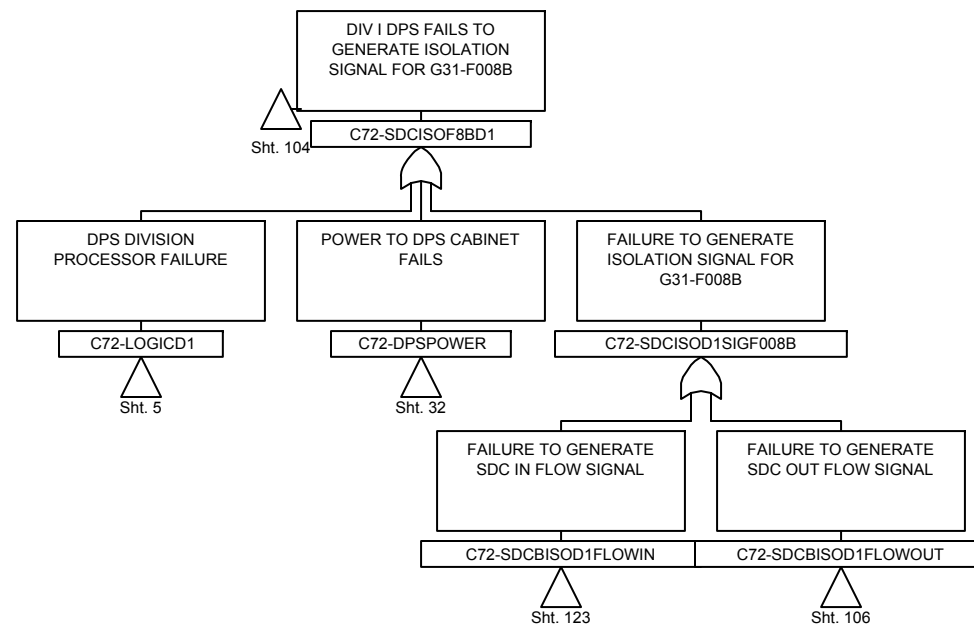


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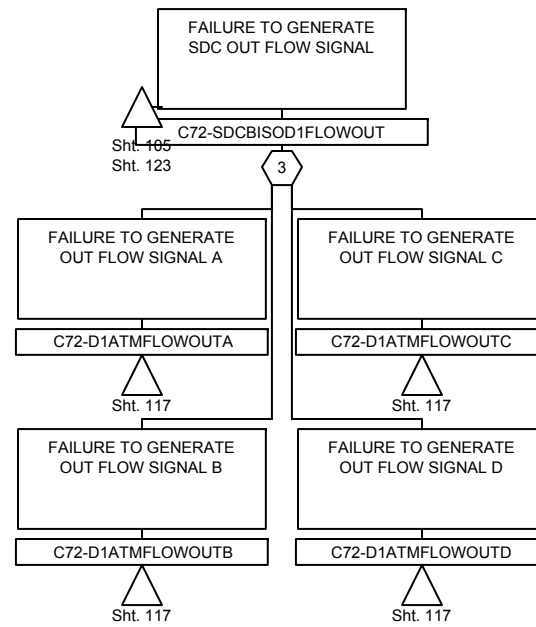


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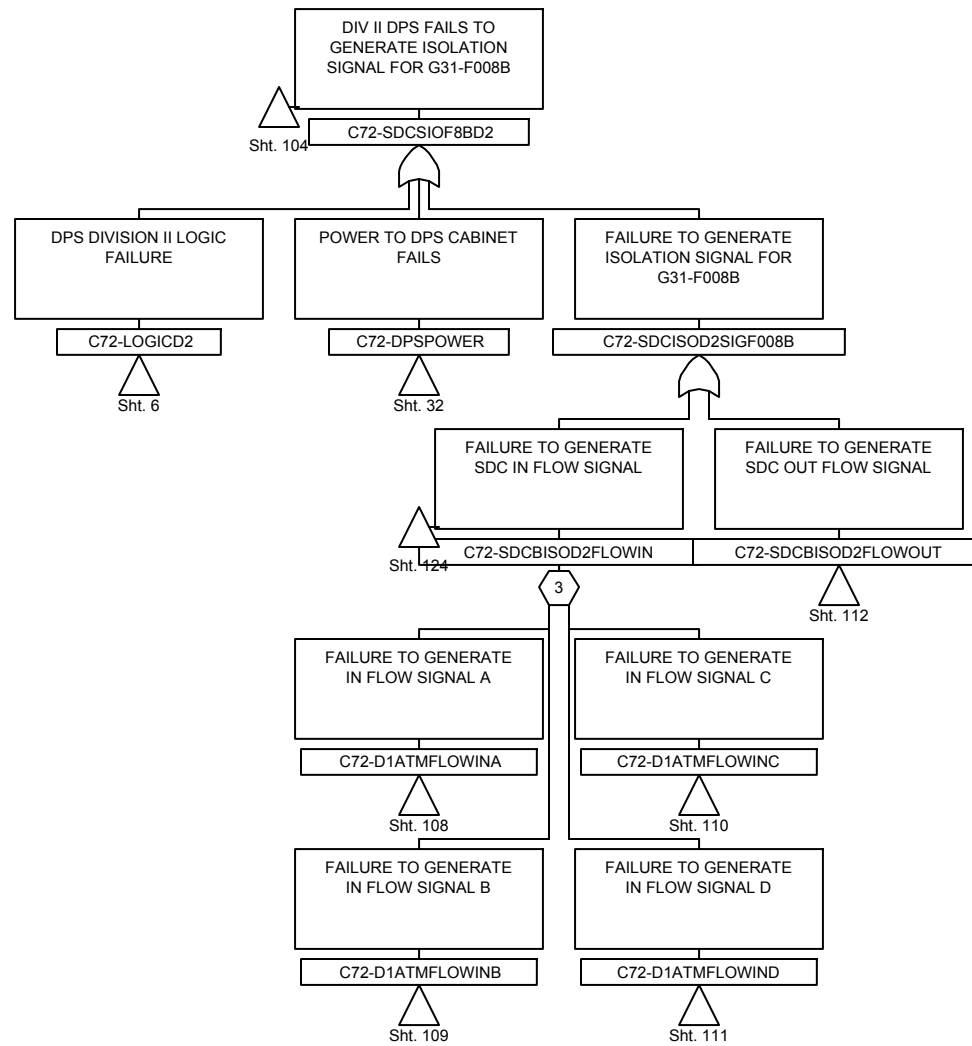


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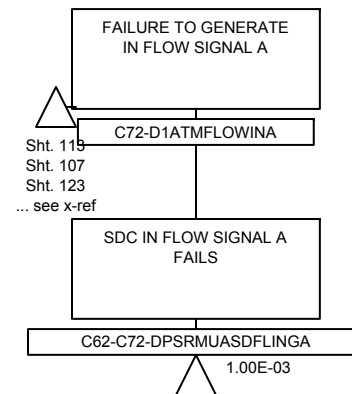


Figure 4.5-3d. Sheet 108 Diverse Protection System

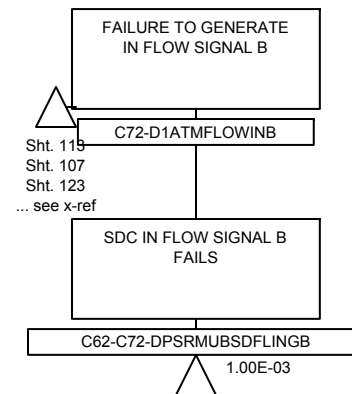


Figure 4.5-3d. Sheet 109 Diverse Protection System

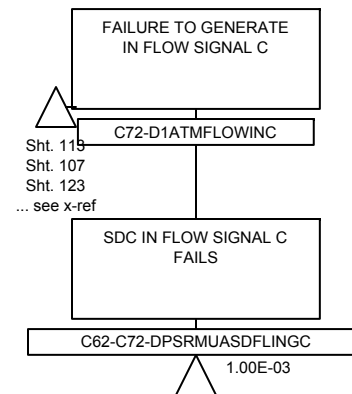


Figure 4.5-3d. Sheet 110 Diverse Protection System



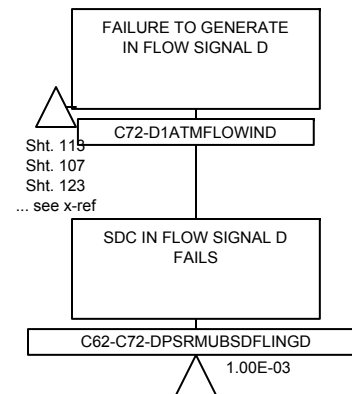


Figure 4.5-3d. Sheet 111 Diverse Protection System

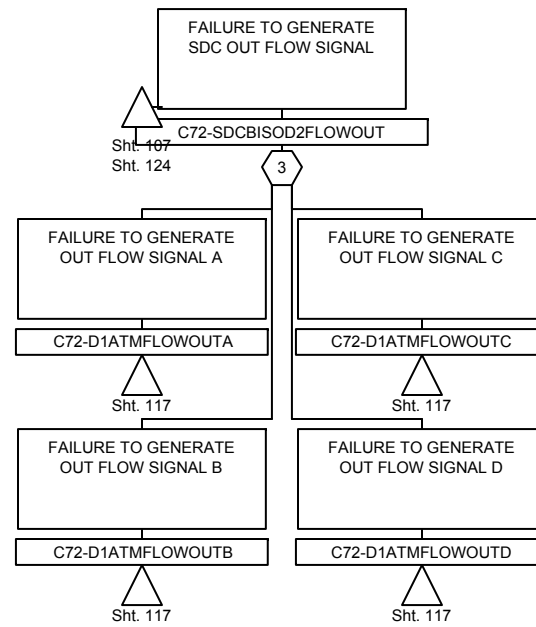


Figure 4.5-3d. Sheet 112 Diverse Protection System

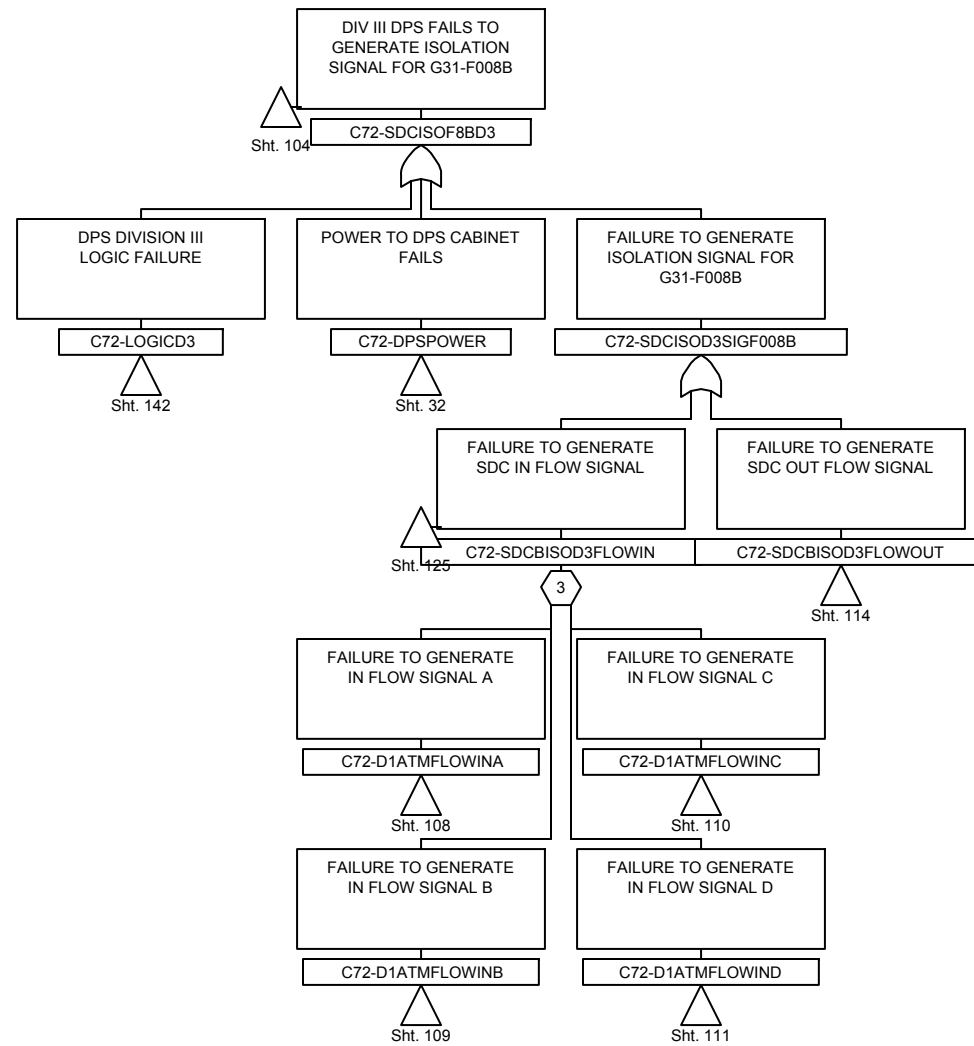


Figure 4.5-3d. Sheet 113 Diverse Protection System

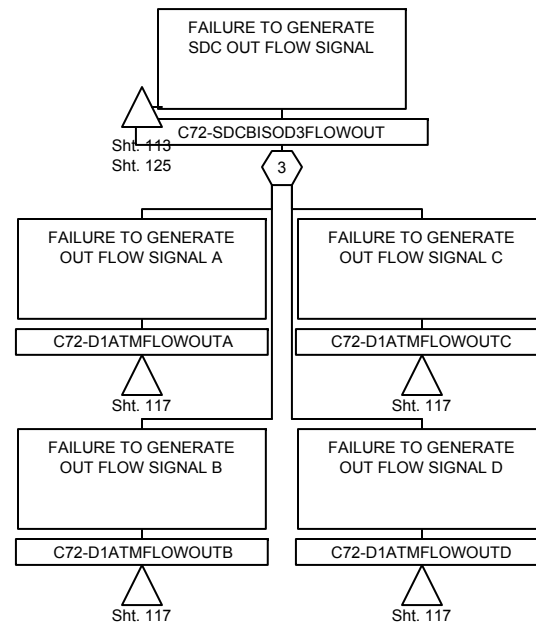


Figure 4.5-3d. Sheet 114 Diverse Protection System

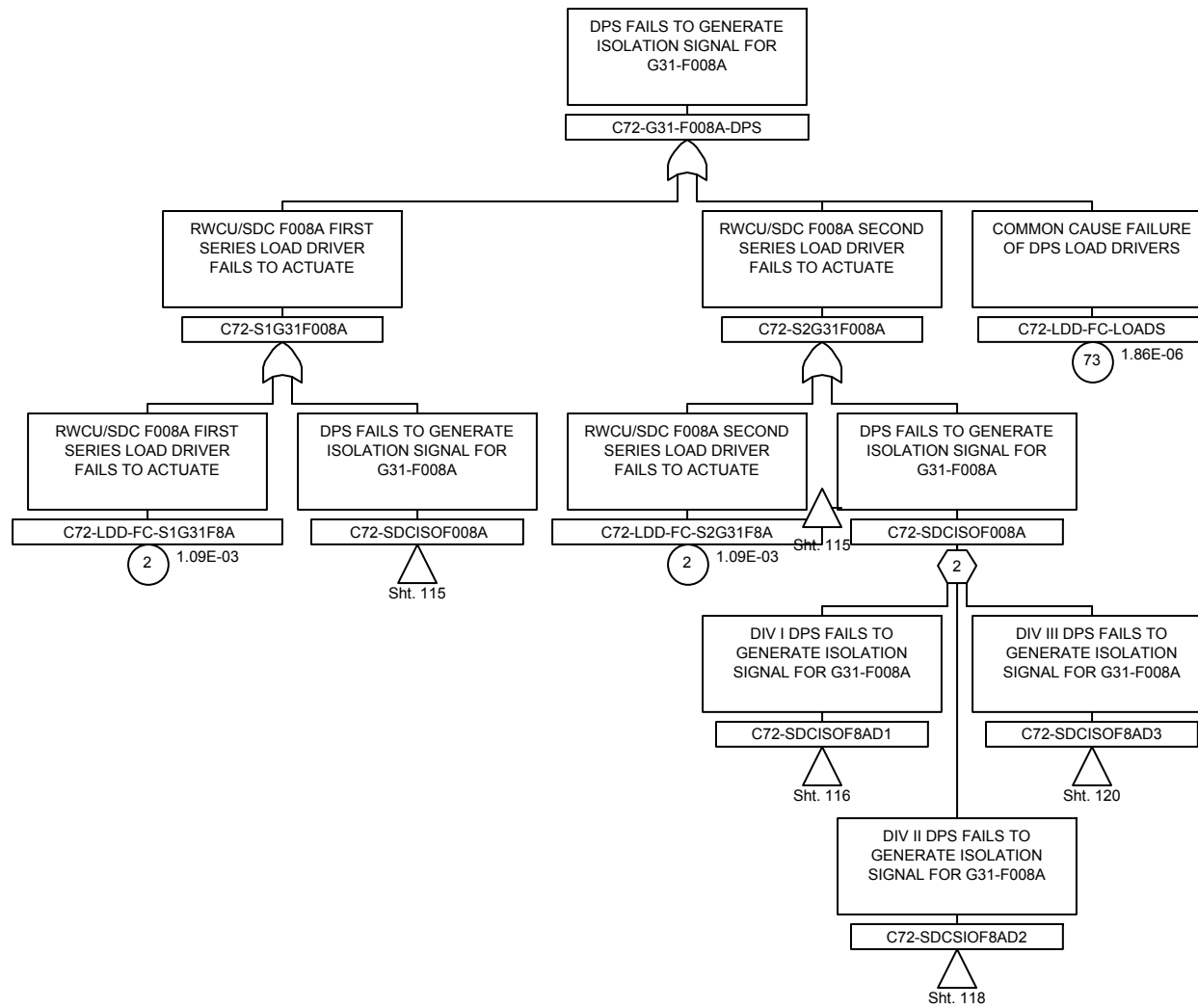


Figure 4.5-3d. Sheet 115 Diverse Protection System

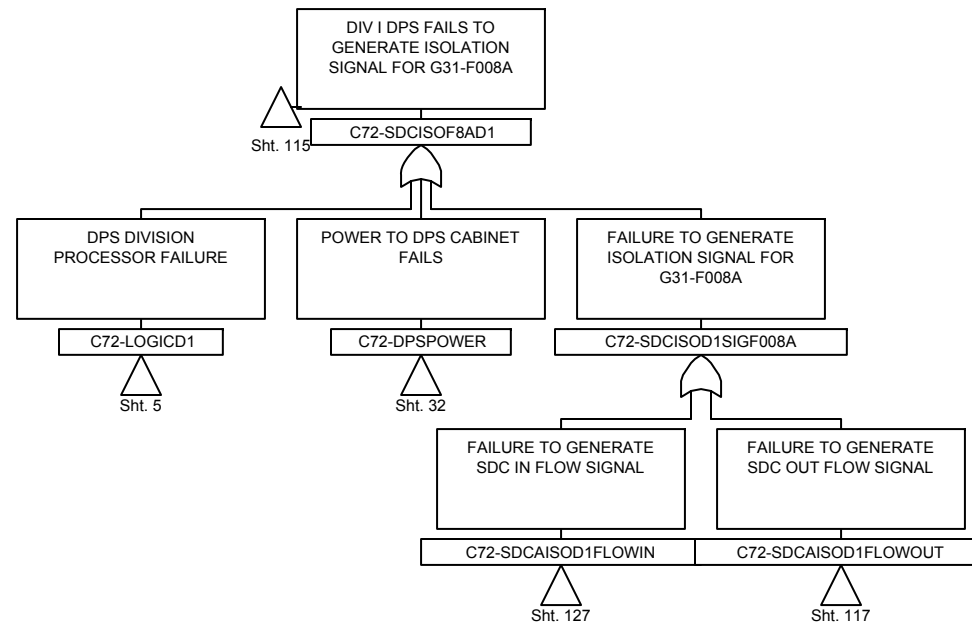


Figure 4.5-3d. Sheet 116 Diverse Protection System



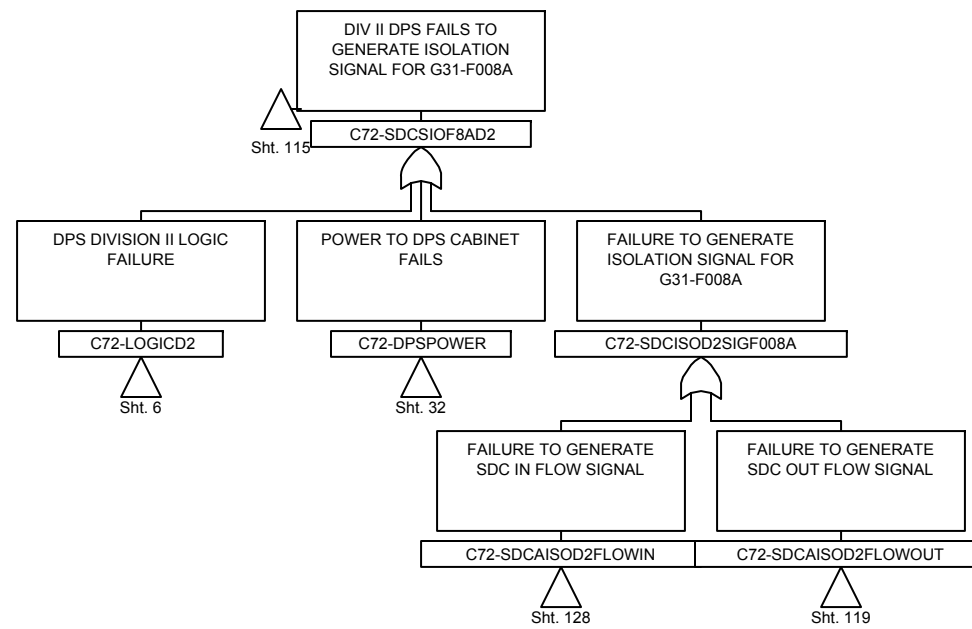


Figure 4.5-3d. Sheet 118 Diverse Protection System



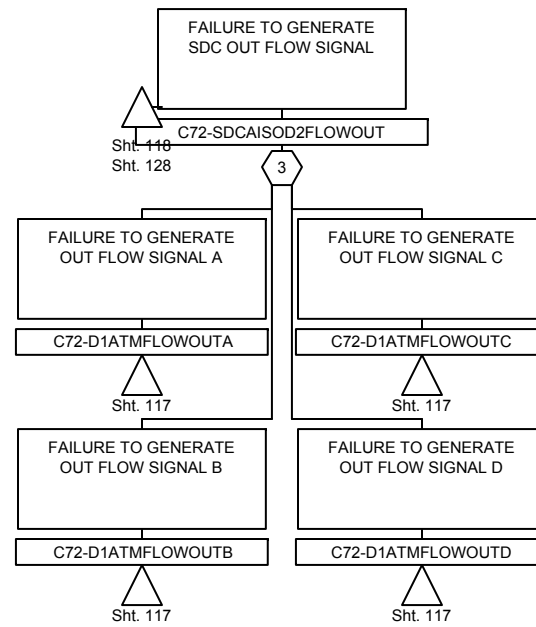


Figure 4.5-3d. Sheet 119 Diverse Protection System

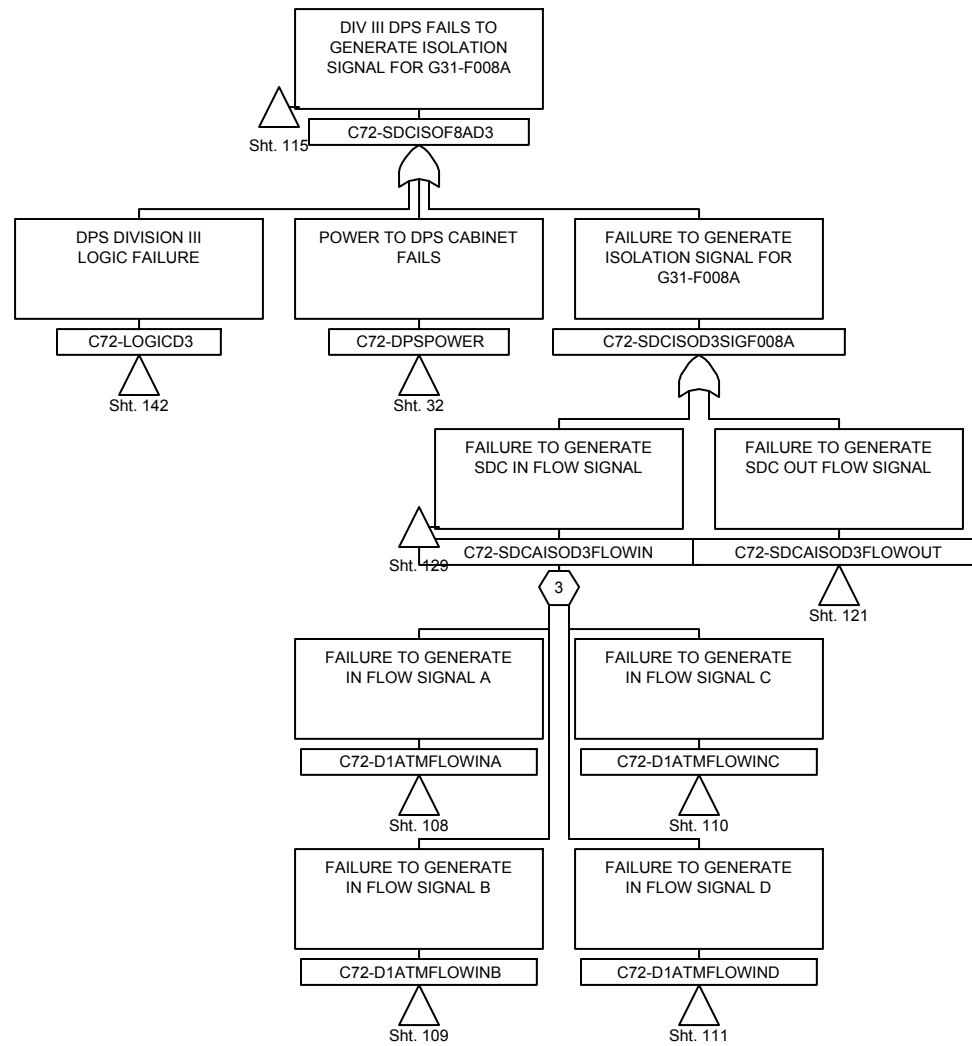


Figure 4.5-3d. Sheet 120 Diverse Protection System

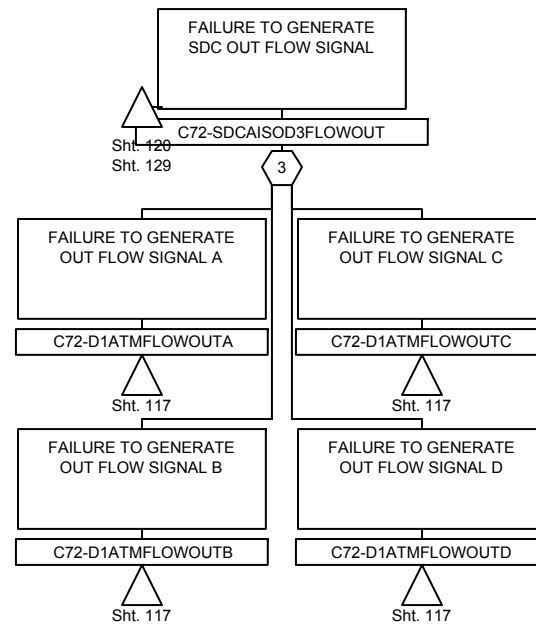


Figure 4.5-3d. Sheet 121 Diverse Protection System

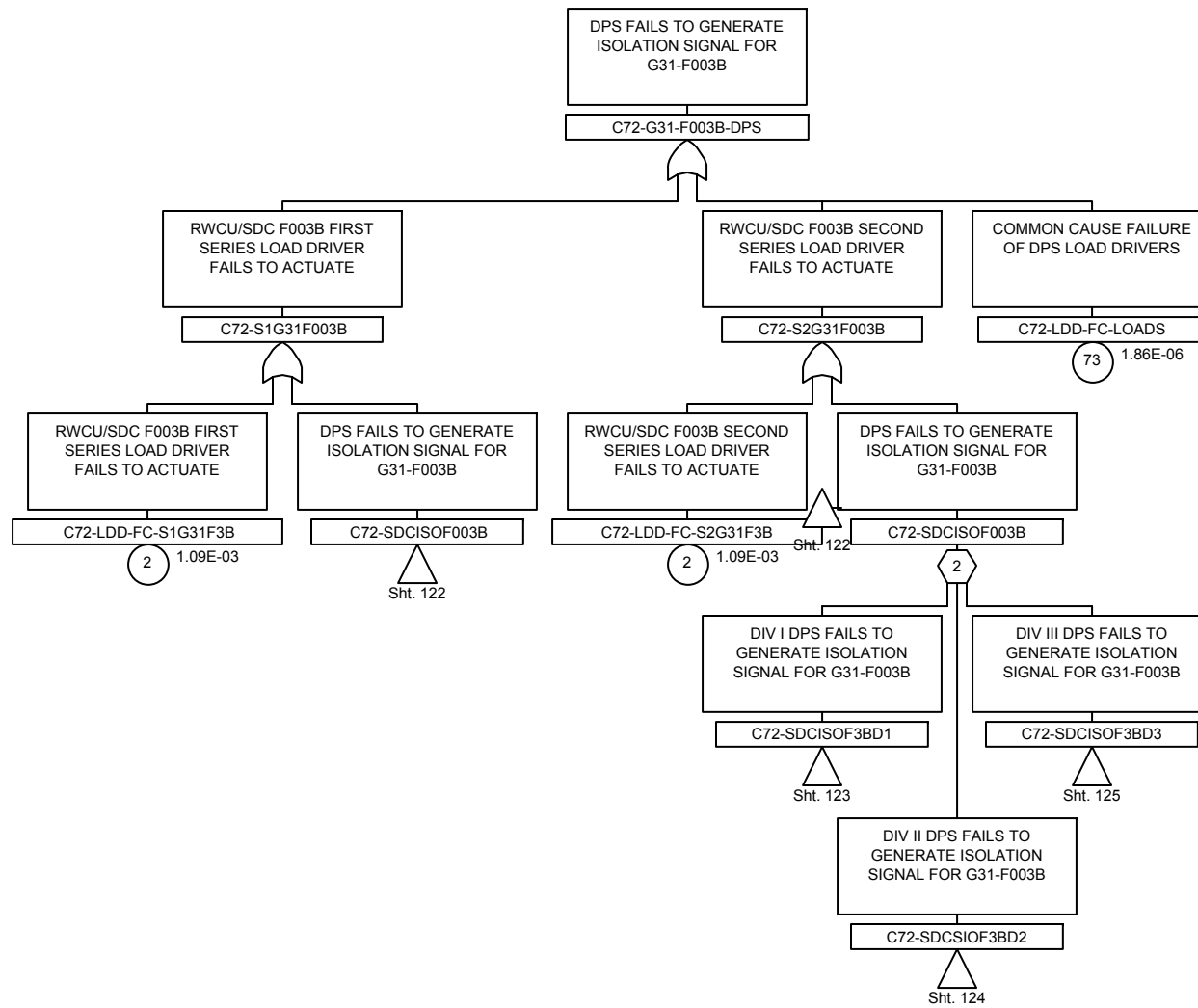


Figure 4.5-3d. Sheet 122 Diverse Protection System

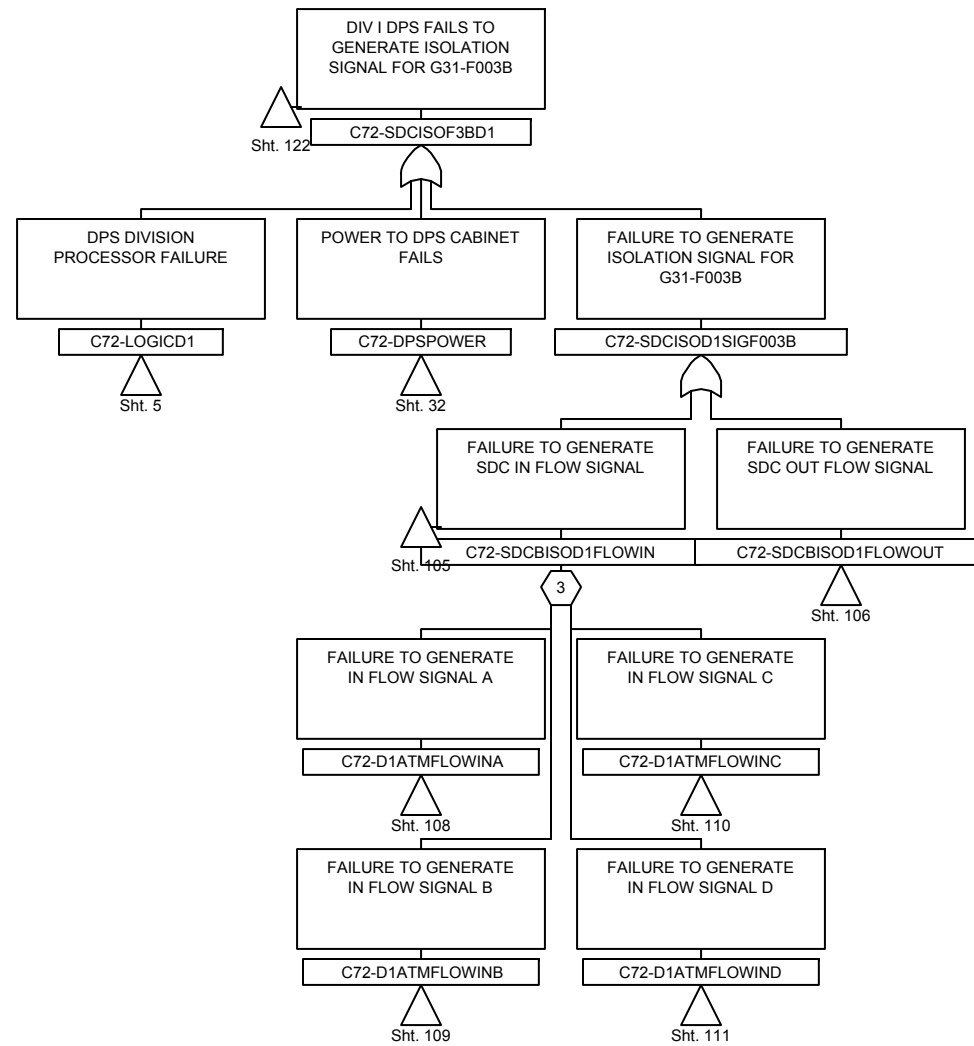


Figure 4.5-3d. Sheet 123 Diverse Protection System

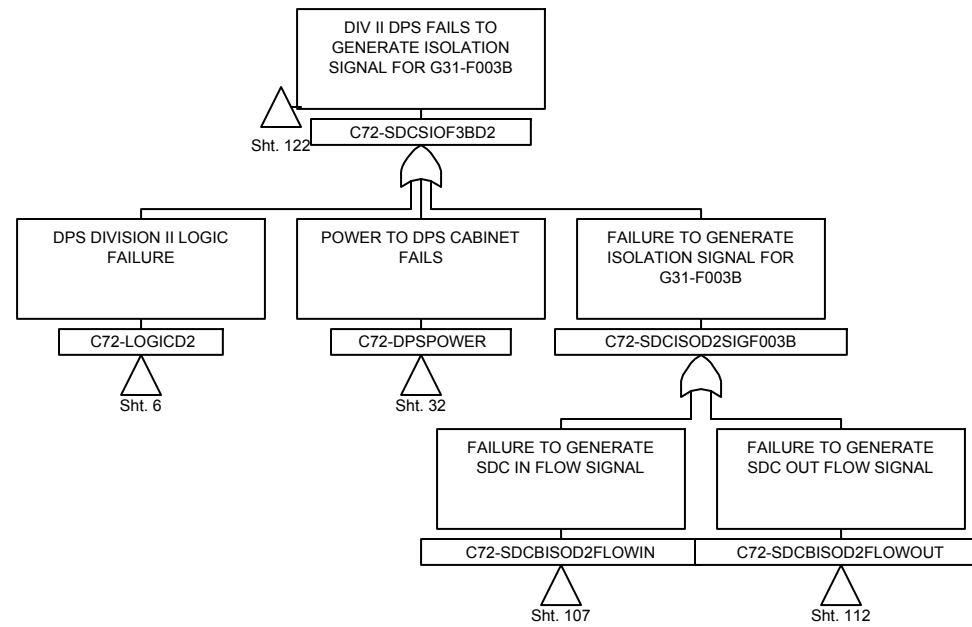


Figure 4.5-3d. Sheet 124 Diverse Protection System

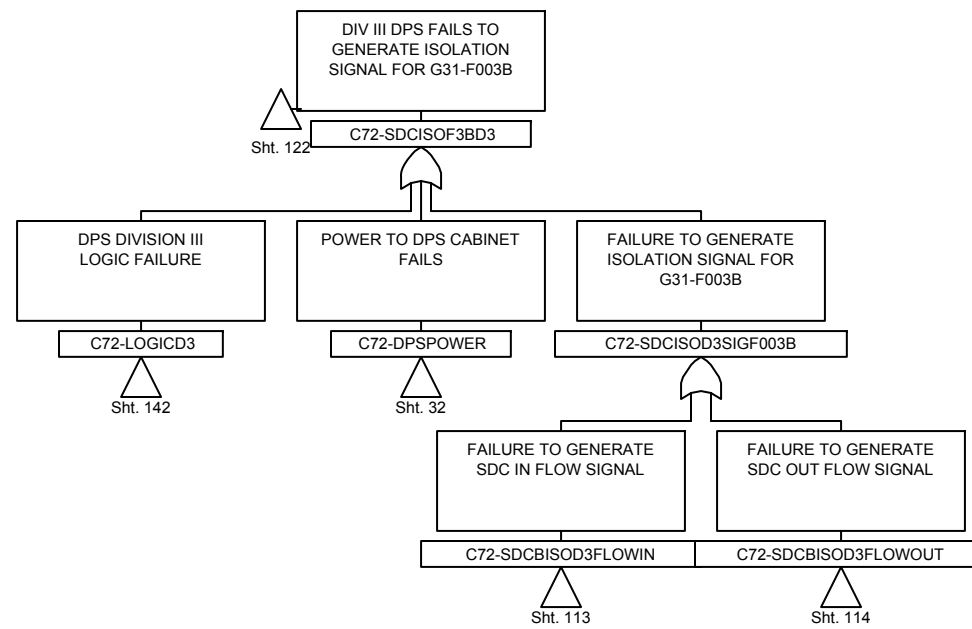


Figure 4.5-3d. Sheet 125 Diverse Protection System

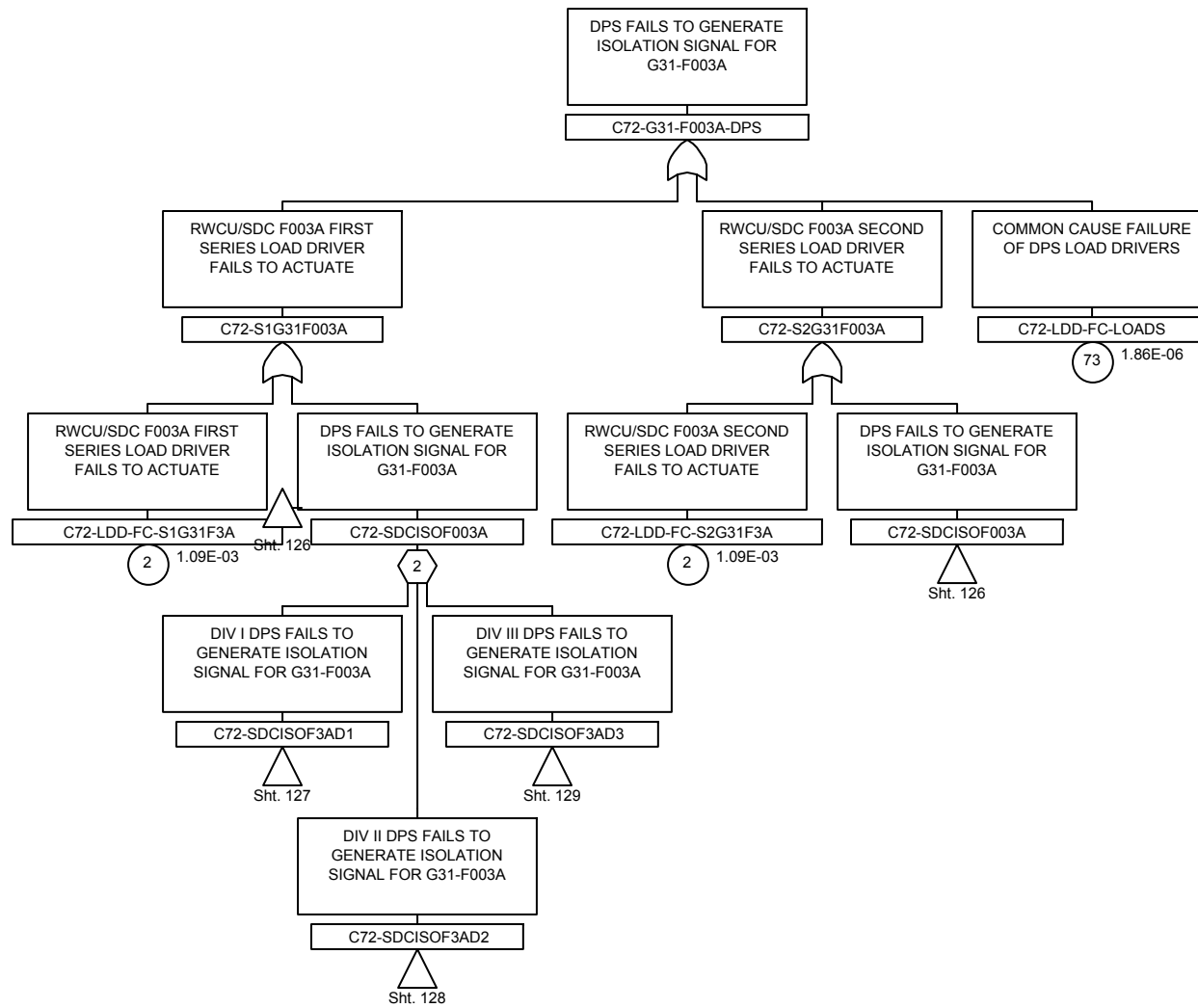


Figure 4.5-3d. Sheet 126 Diverse Protection System



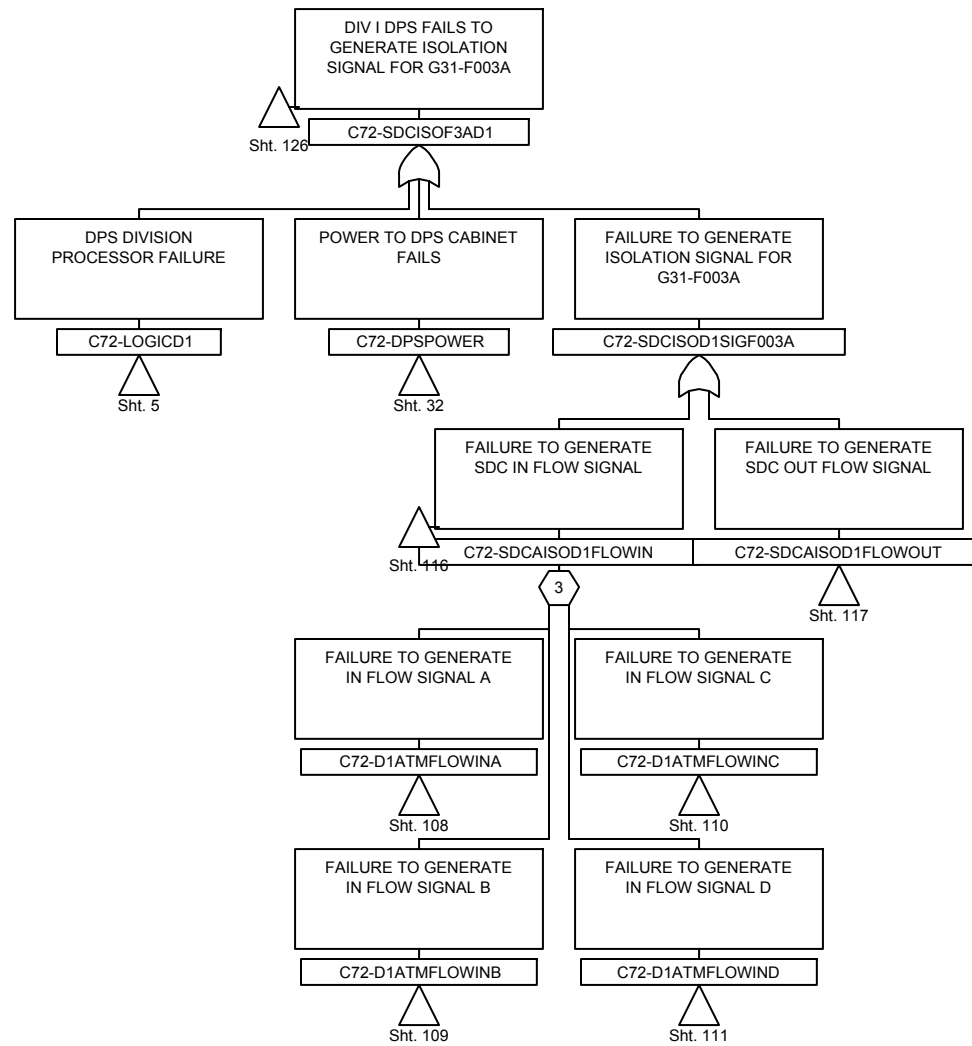


Figure 4.5-3d. Sheet 127 Diverse Protection System

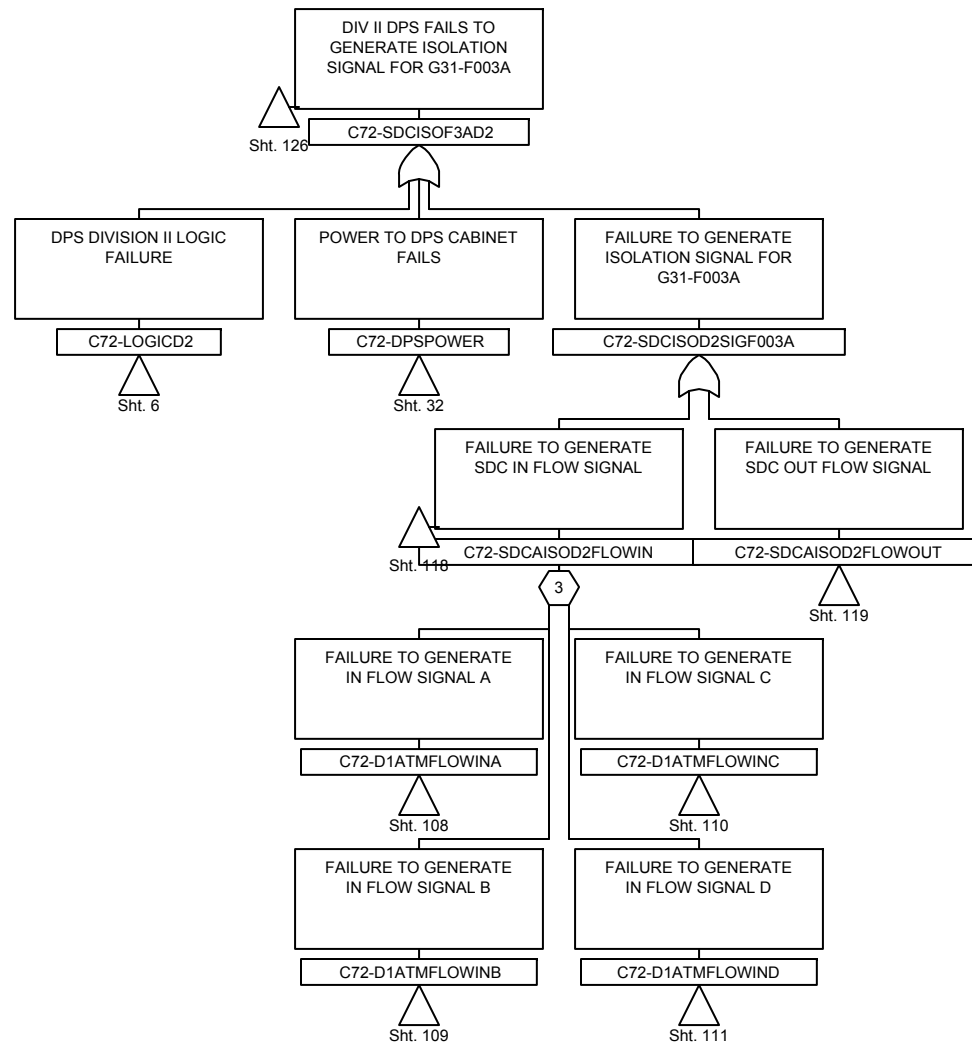


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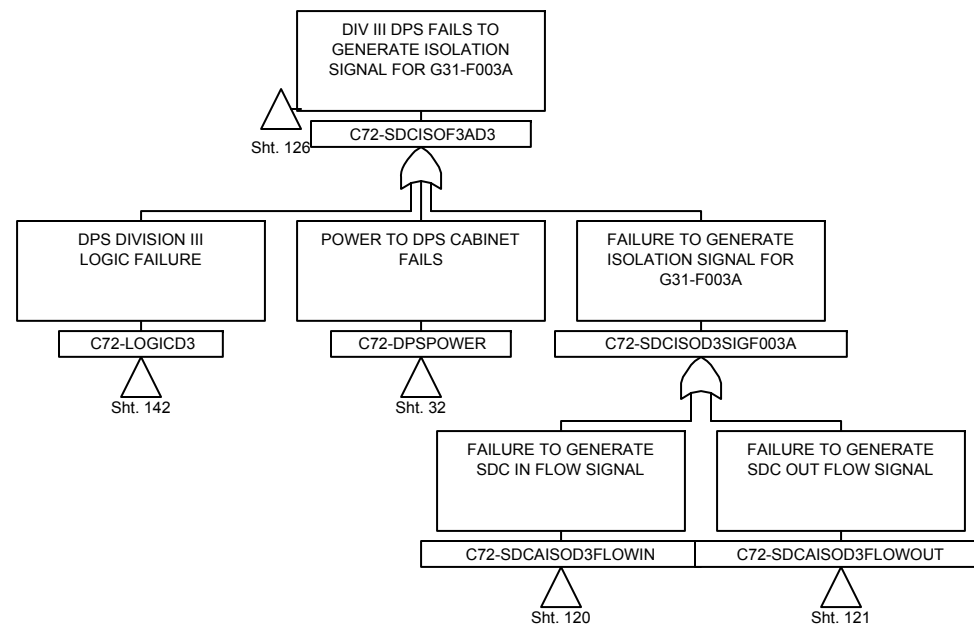


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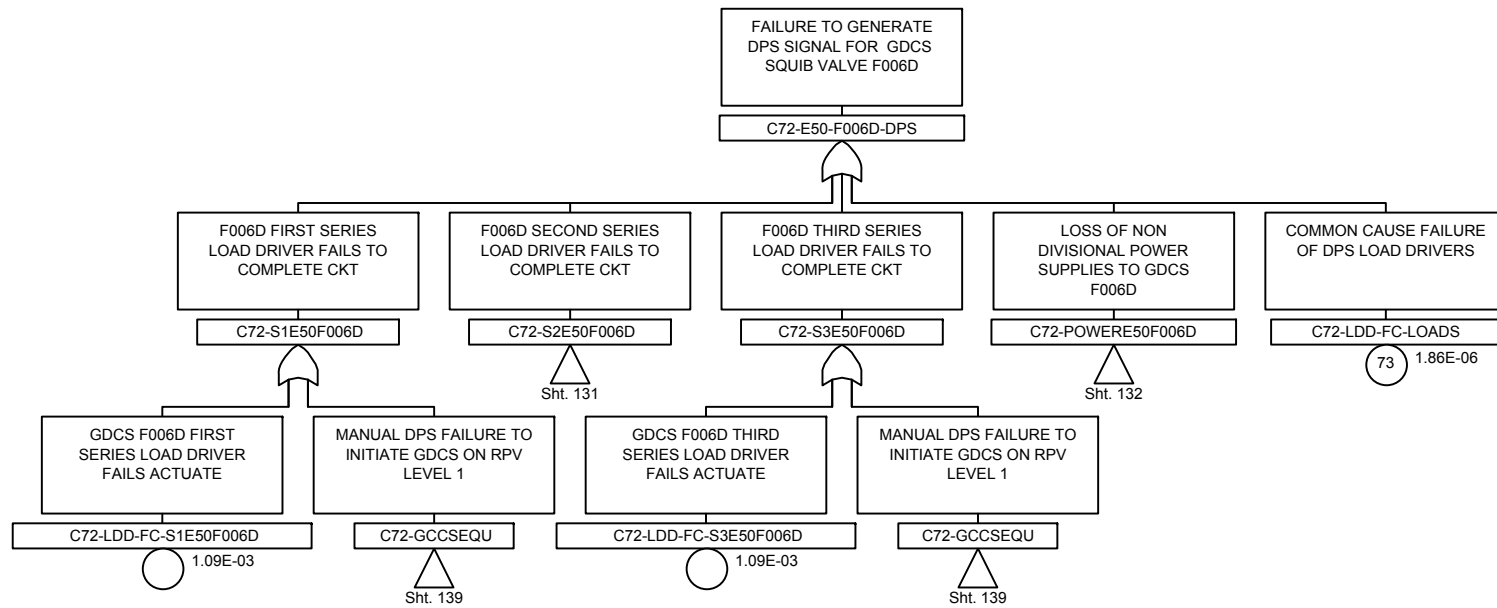


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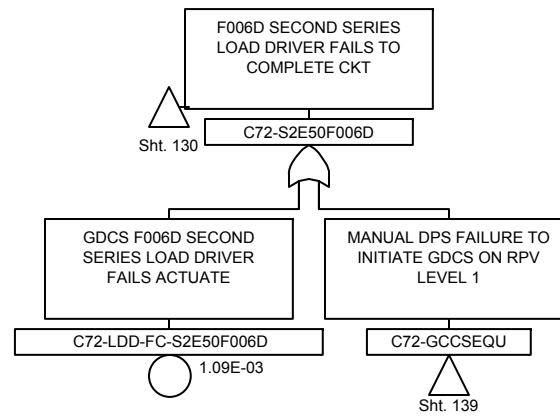


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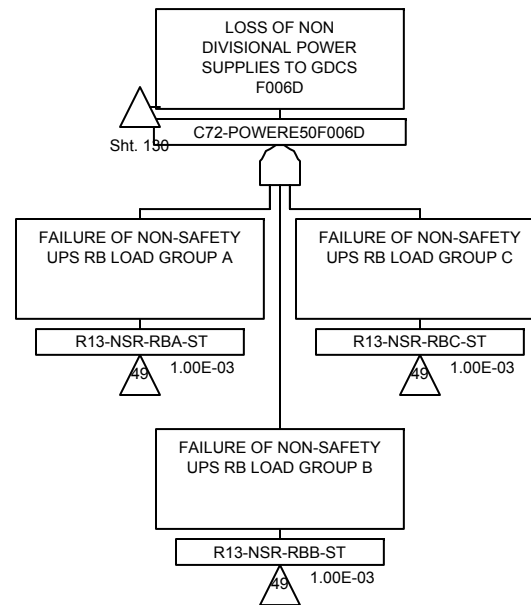


Figure 4.5-3d. Sheet 132 Diverse Protection System

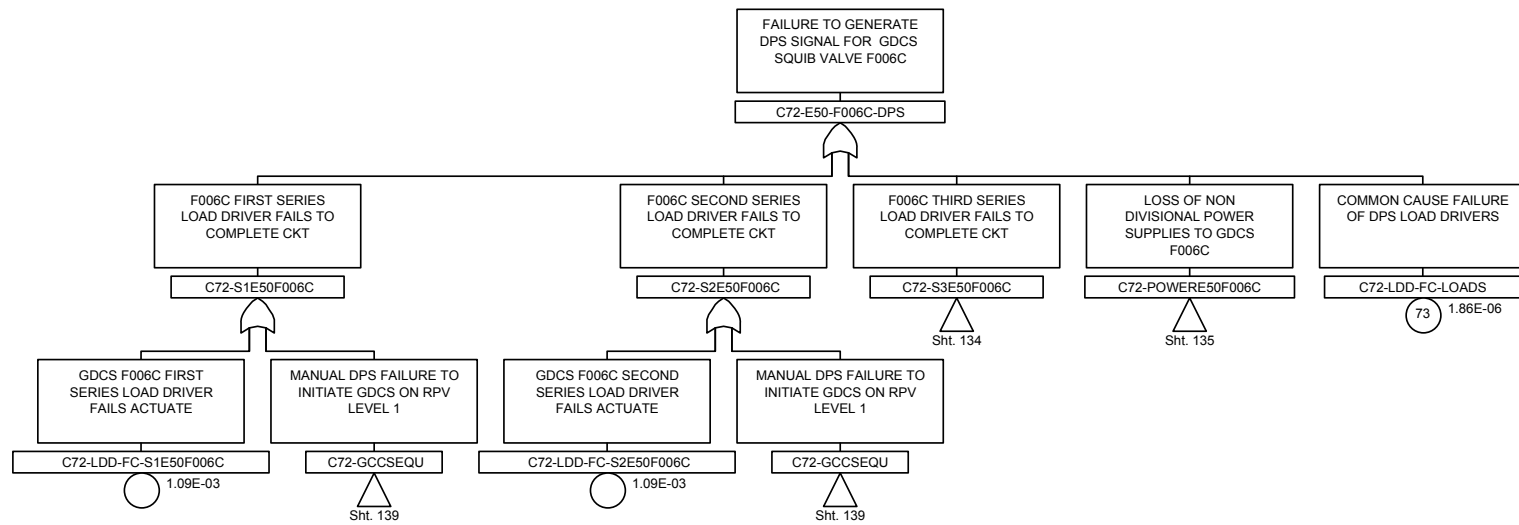


Figure 4.5-3d. Sheet 133 Diverse Protection System

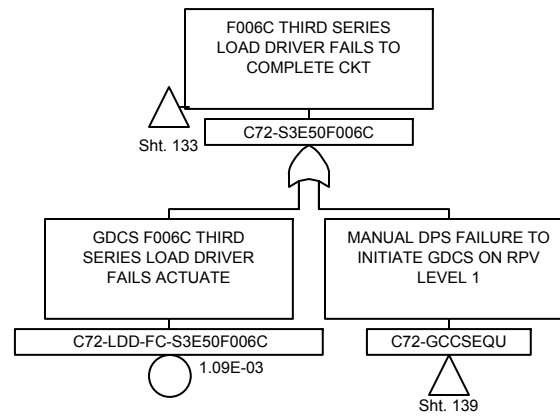


Figure 4.5-3d. Sheet 134 Diverse Protection System



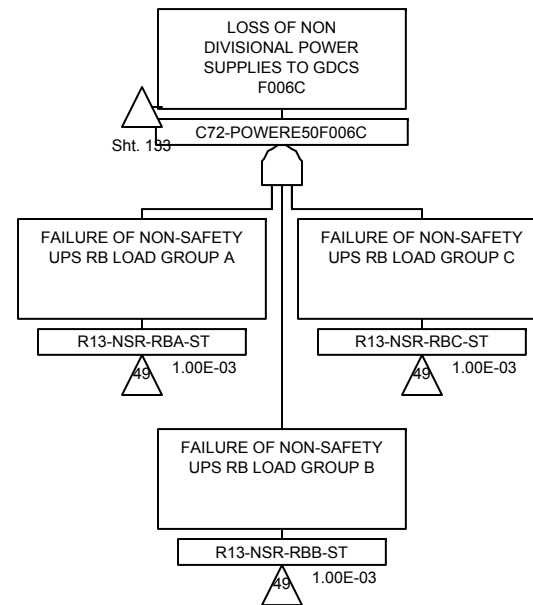


Figure 4.5-3d. Sheet 135 Diverse Protection System

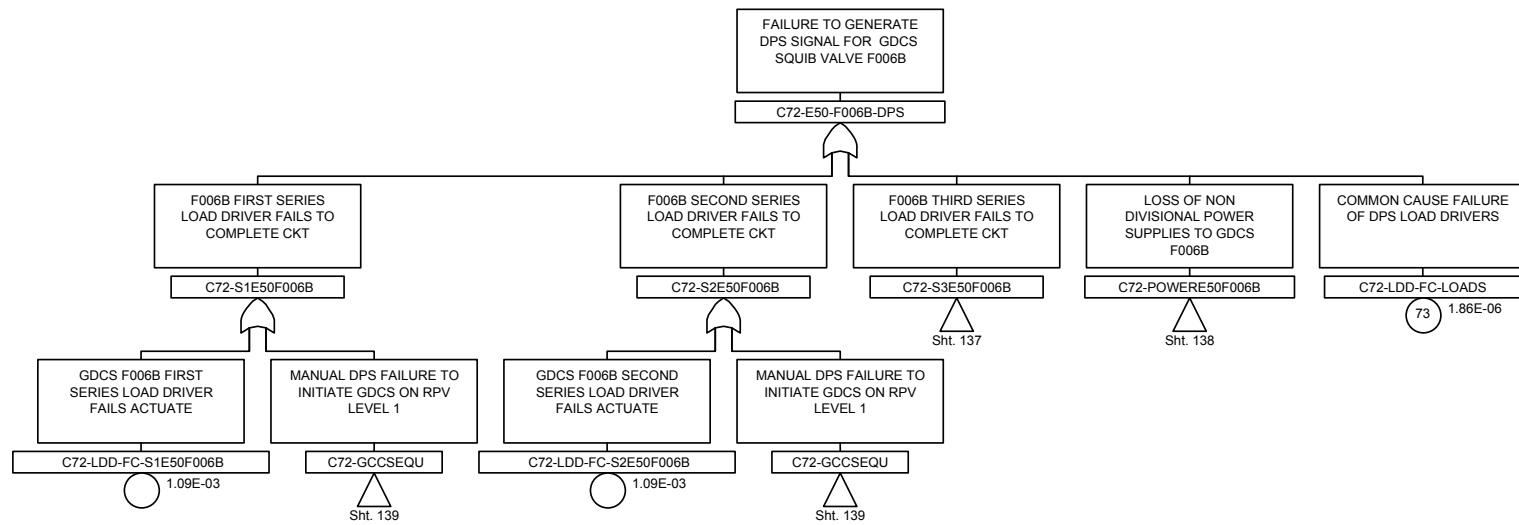


Figure 4.5-3d. Sheet 136 Diverse Protection System

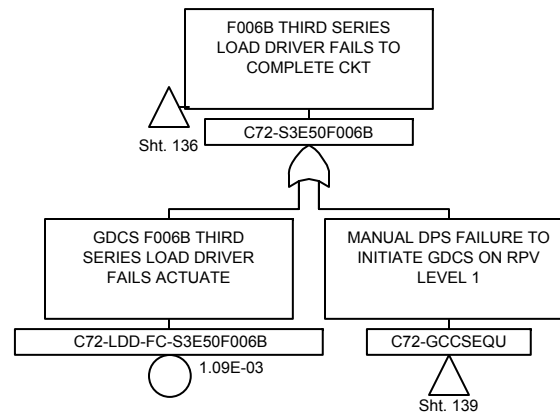


Figure 4.5-3d. Sheet 137 Diverse Protection System

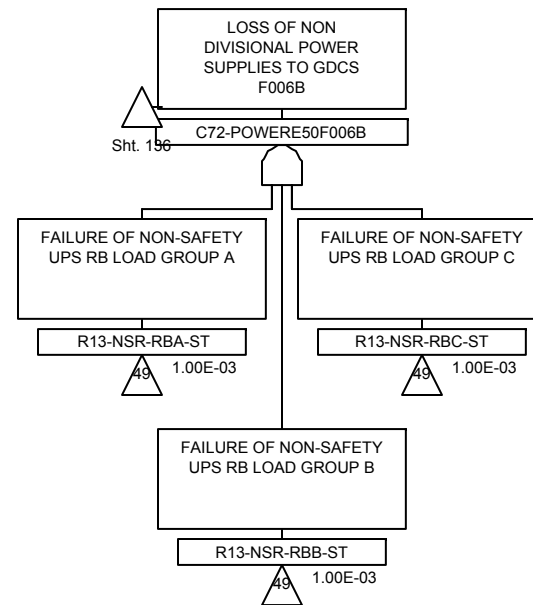


Figure 4.5-3d. Sheet 138 Diverse Protection System

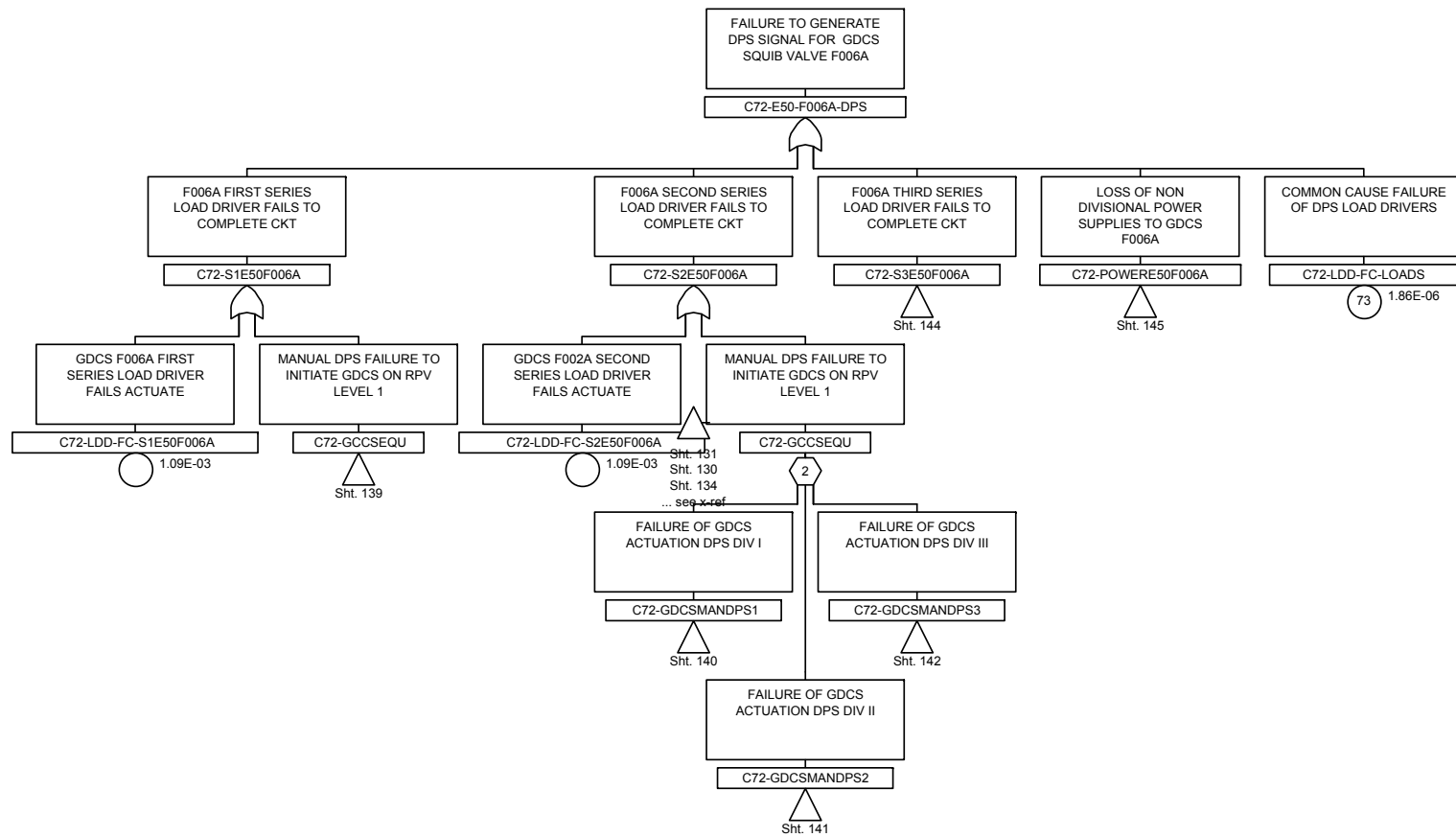


Figure 4.5-3d. Sheet 139 Diverse Protection System

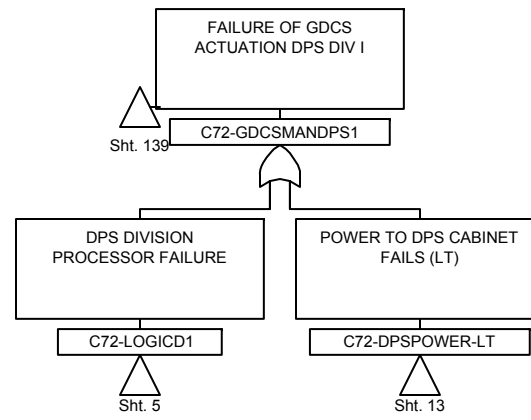


Figure 4.5-3d. Sheet 140 Diverse Protection System

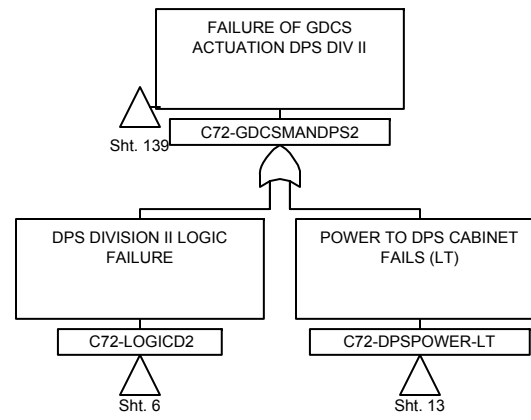


Figure 4.5-3d. Sheet 141 Diverse Protection System

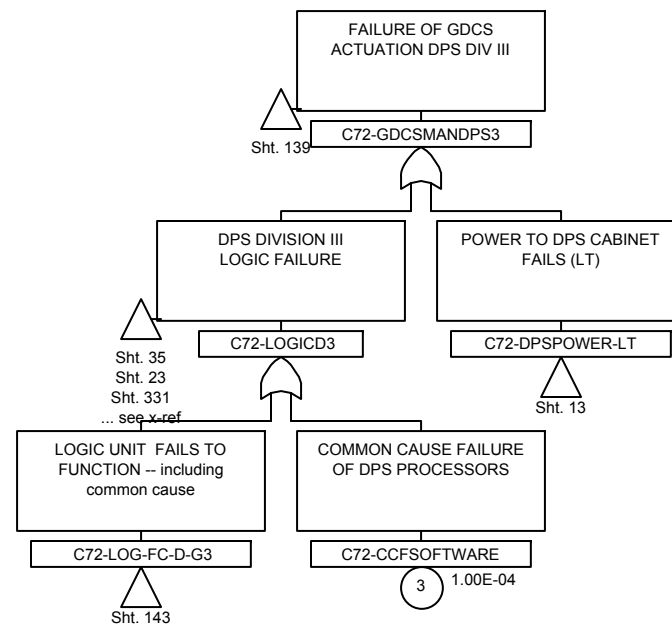


Figure 4.5-3d. Sheet 142 Diverse Protection System



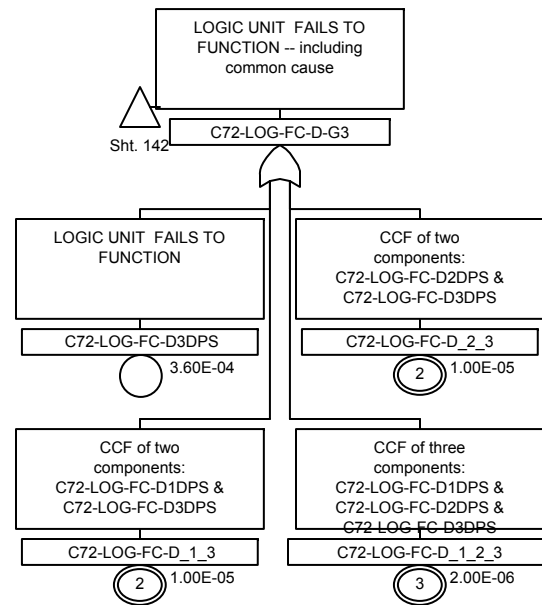


Figure 4.5-3d. Sheet 143 Diverse Protection System

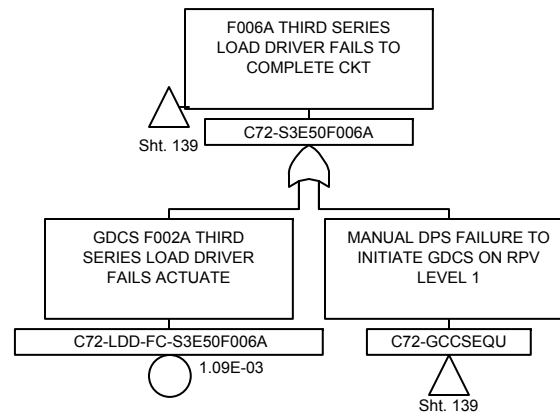


Figure 4.5-3d. Sheet 144 Diverse Protection System

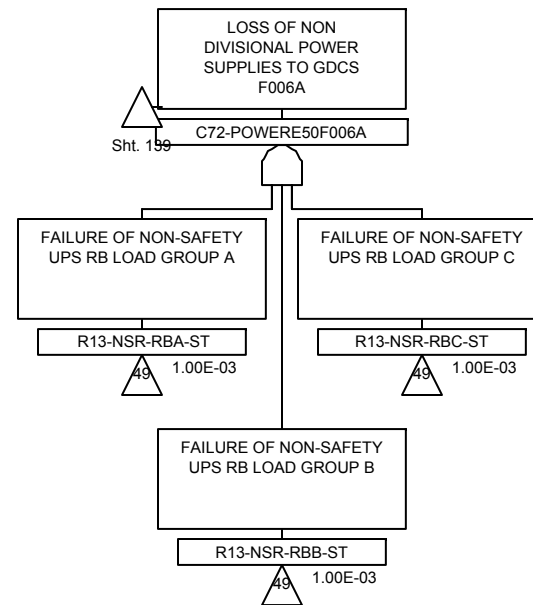


Figure 4.5-3d. Sheet 145 Diverse Protection System

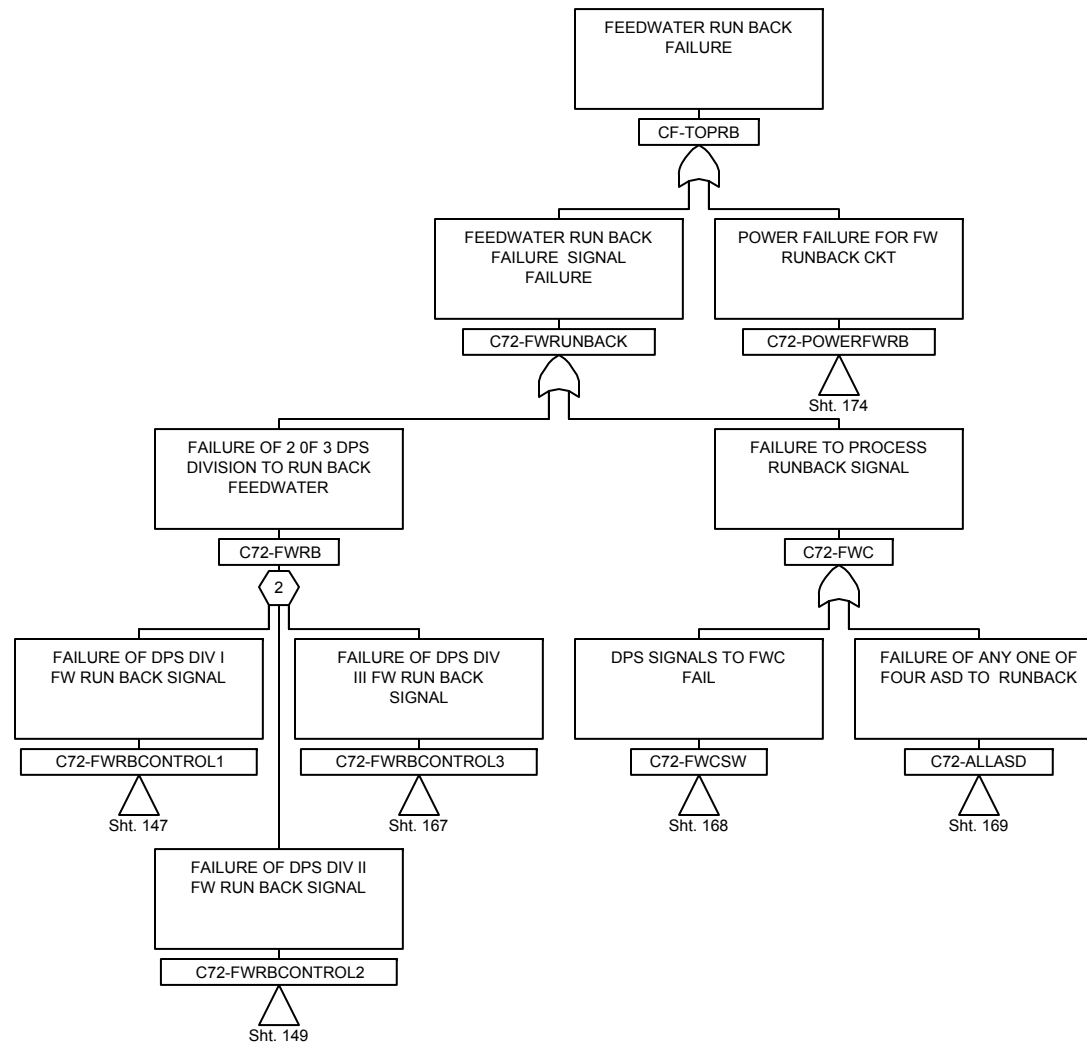


Figure 4.5-3d. Sheet 146 Diverse Protection System

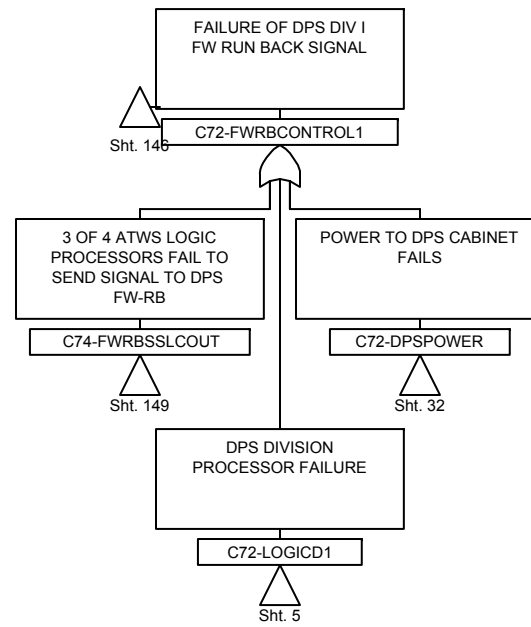


Figure 4.5-3d. Sheet 147 Diverse Protection System

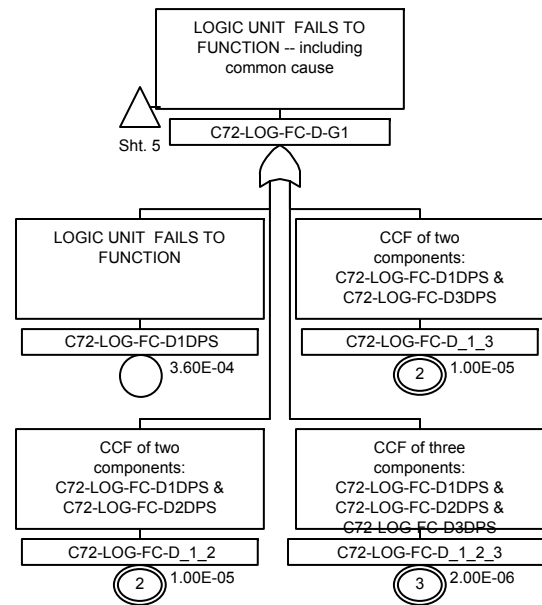


Figure 4.5-3d. Sheet 148 Diverse Protection System

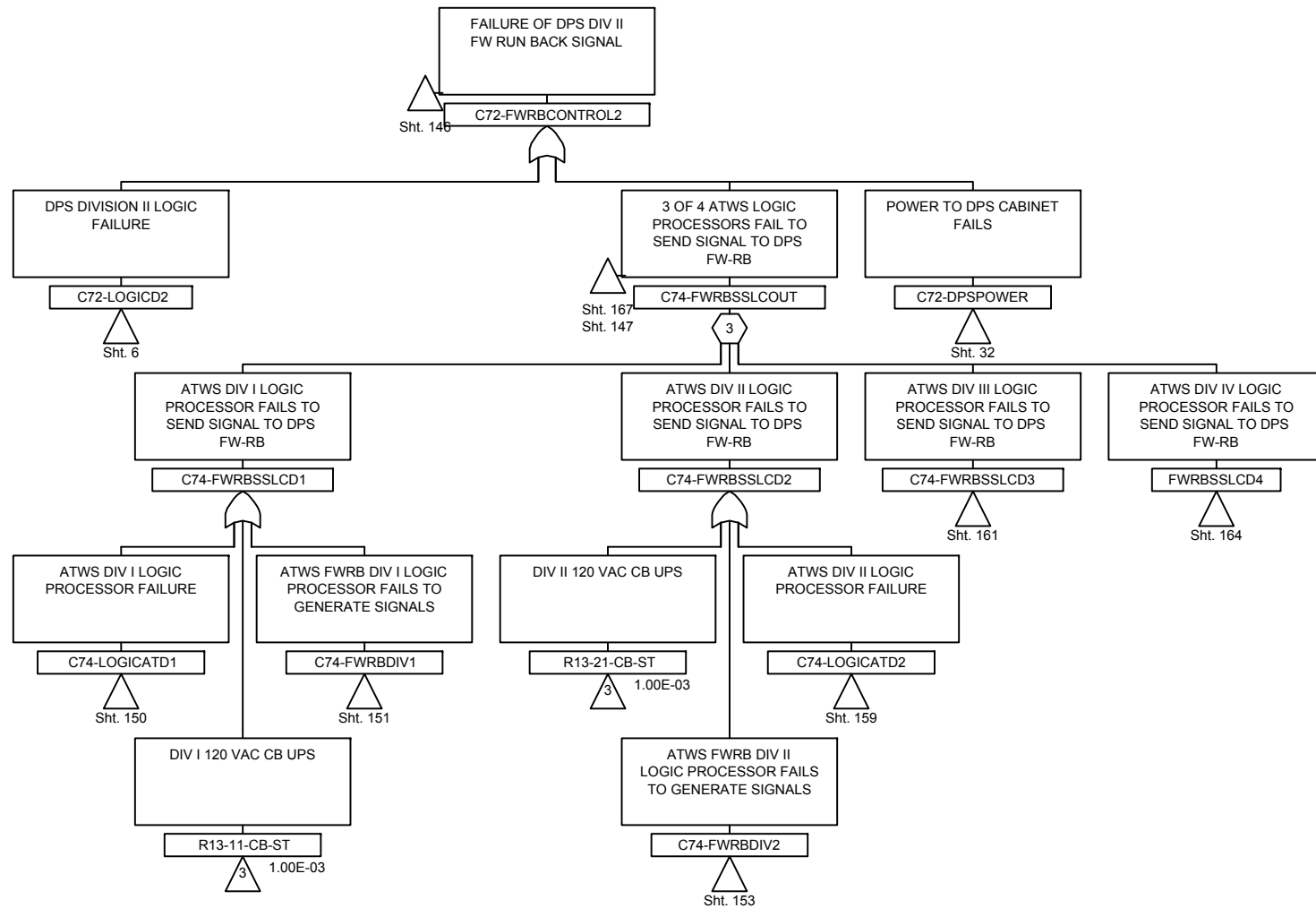


Figure 4.5-3d. Sheet 149 Diverse Protection System

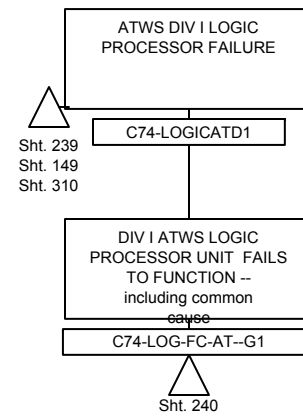


Figure 4.5-3d. Sheet 150 Diverse Protection System



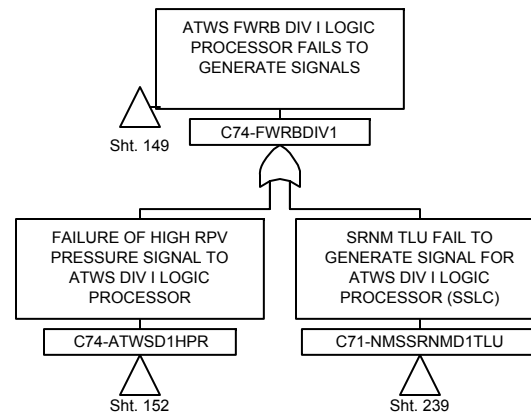


Figure 4.5-3d. Sheet 151 Diverse Protection System

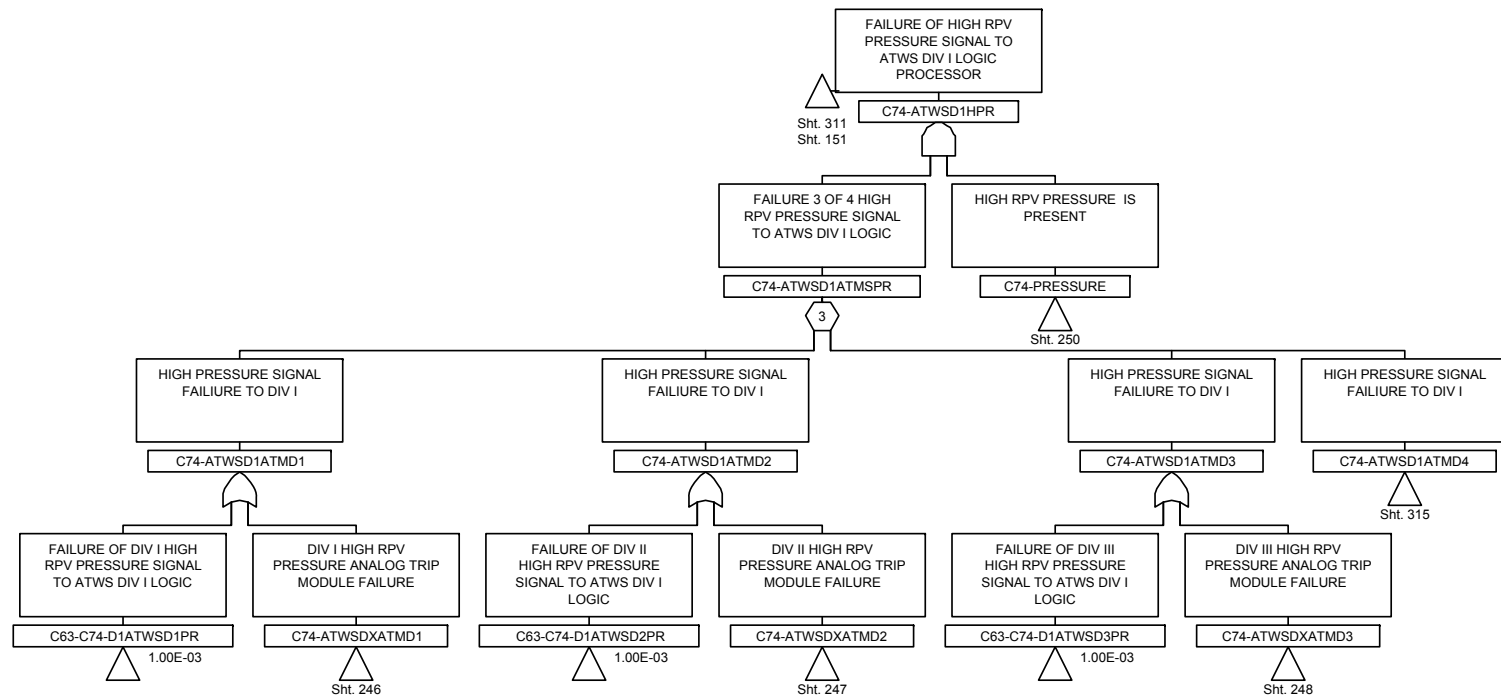


Figure 4.5-3d. Sheet 152 Diverse Protection System

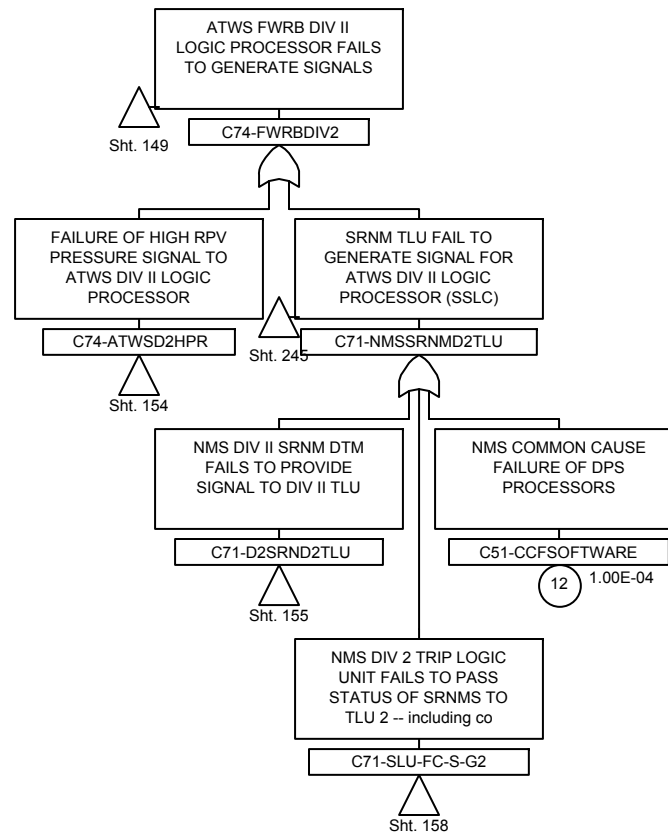


Figure 4.5-3d. Sheet 153 Diverse Protection System

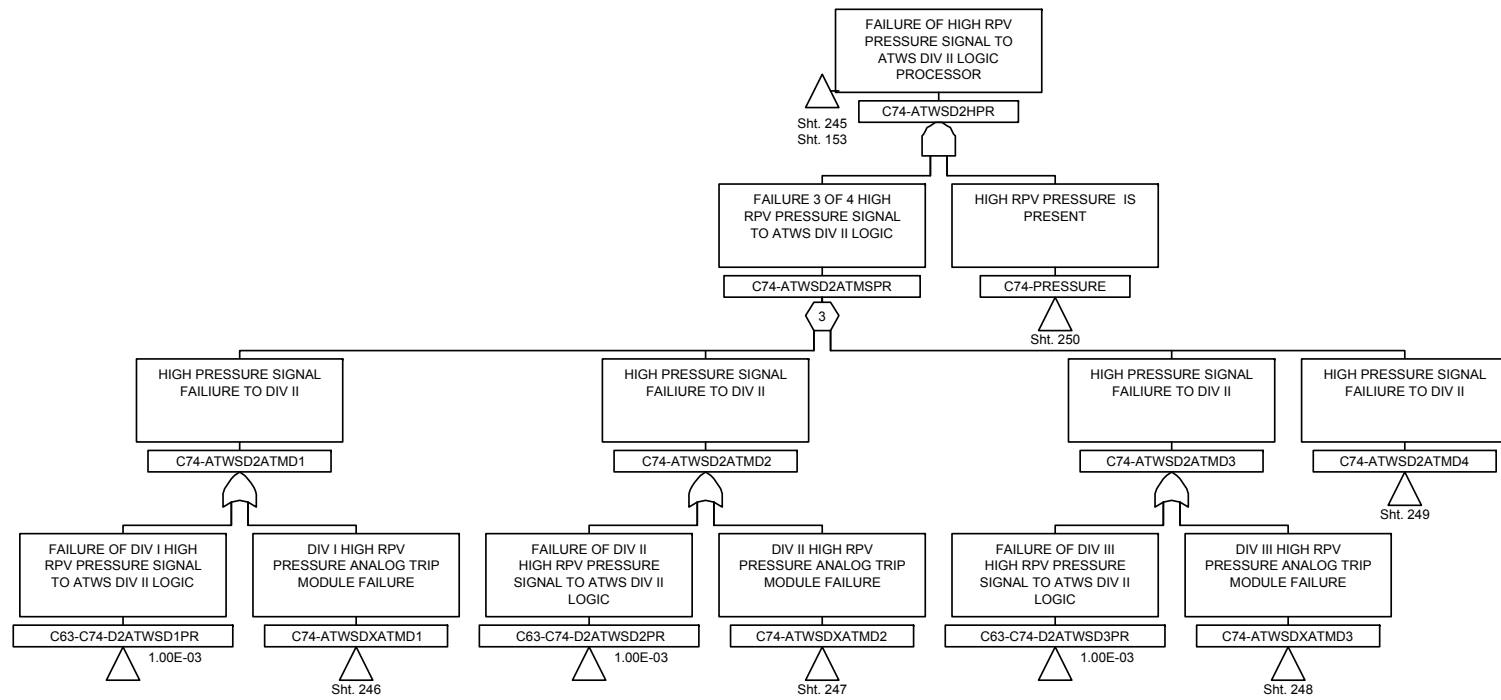


Figure 4.5-3d. Sheet 154 Diverse Protection System

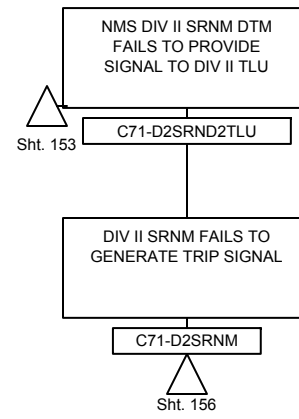


Figure 4.5-3d. Sheet 155 Diverse Protection System

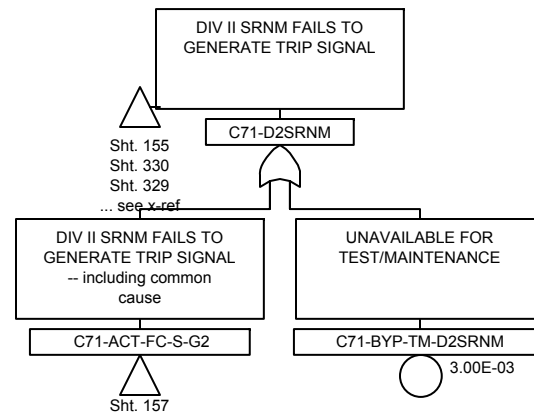


Figure 4.5-3d. Sheet 156 Diverse Protection System

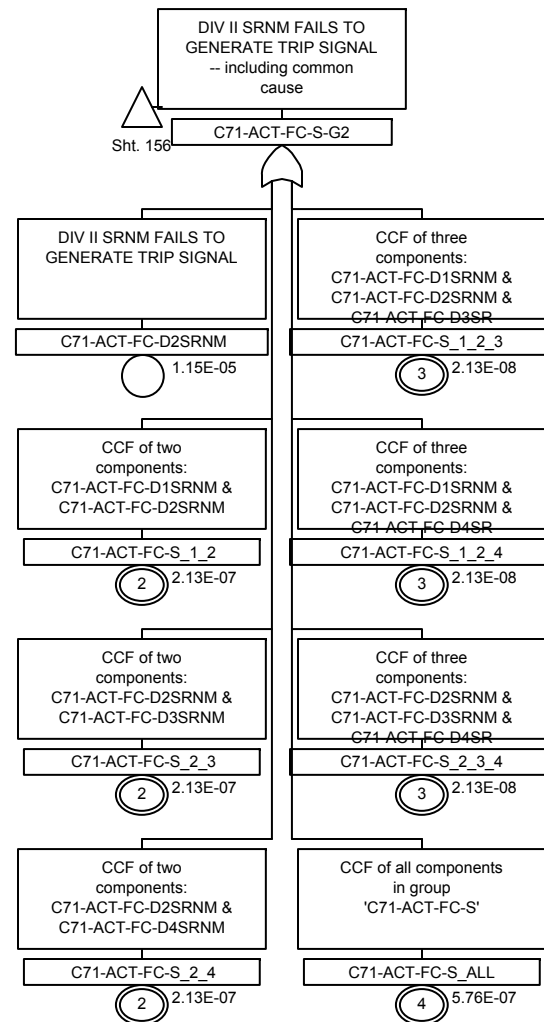


Figure 4.5-3d. Sheet 157 Diverse Protection System

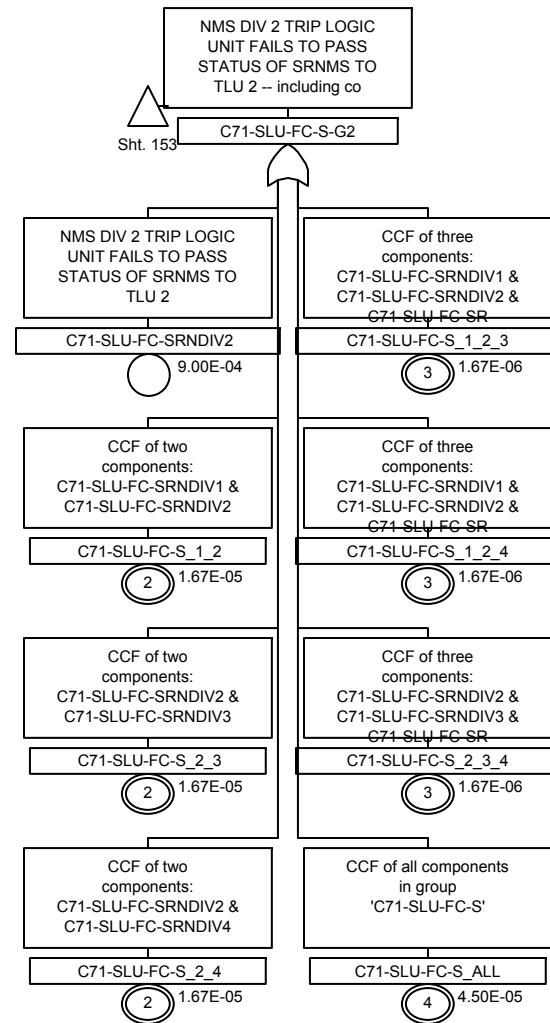


Figure 4.5-3d. Sheet 158 Diverse Protection System



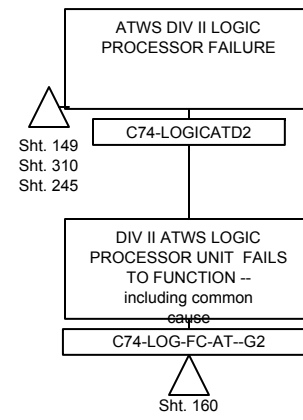


Figure 4.5-3d. Sheet 159 Diverse Protection System

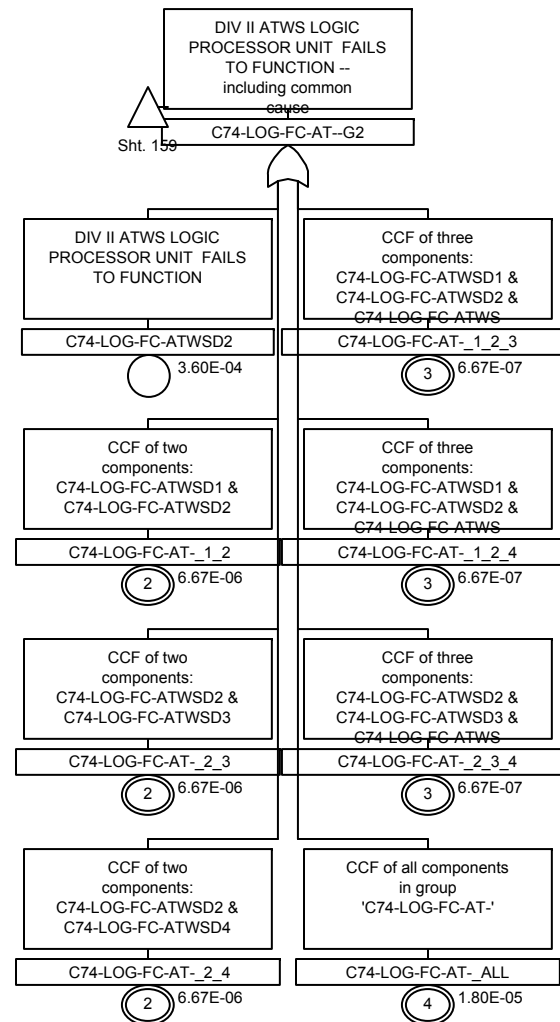


Figure 4.5-3d. Sheet 160 Diverse Protection System

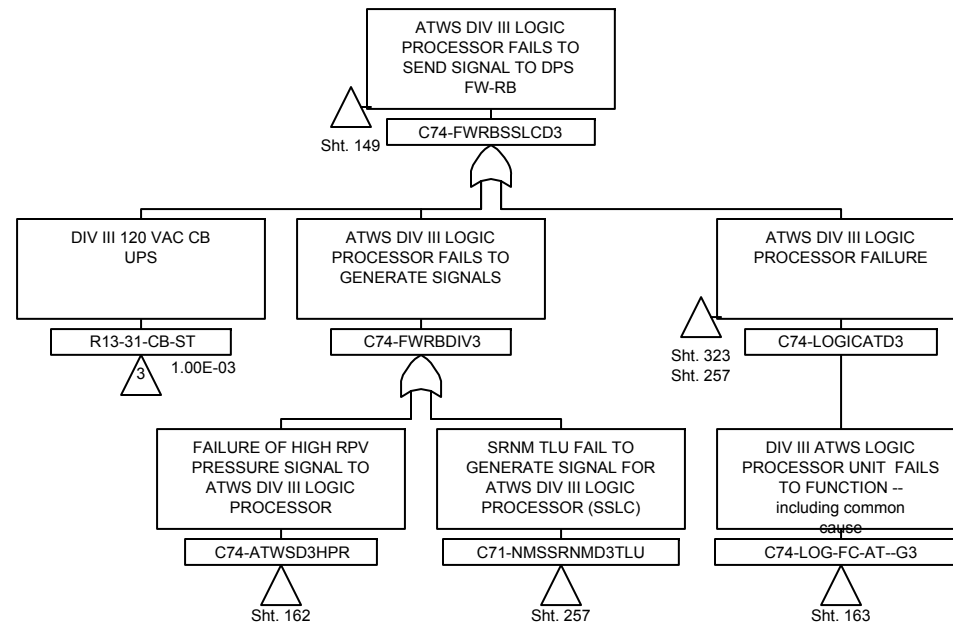


Figure 4.5-3d. Sheet 161 Diverse Protection System

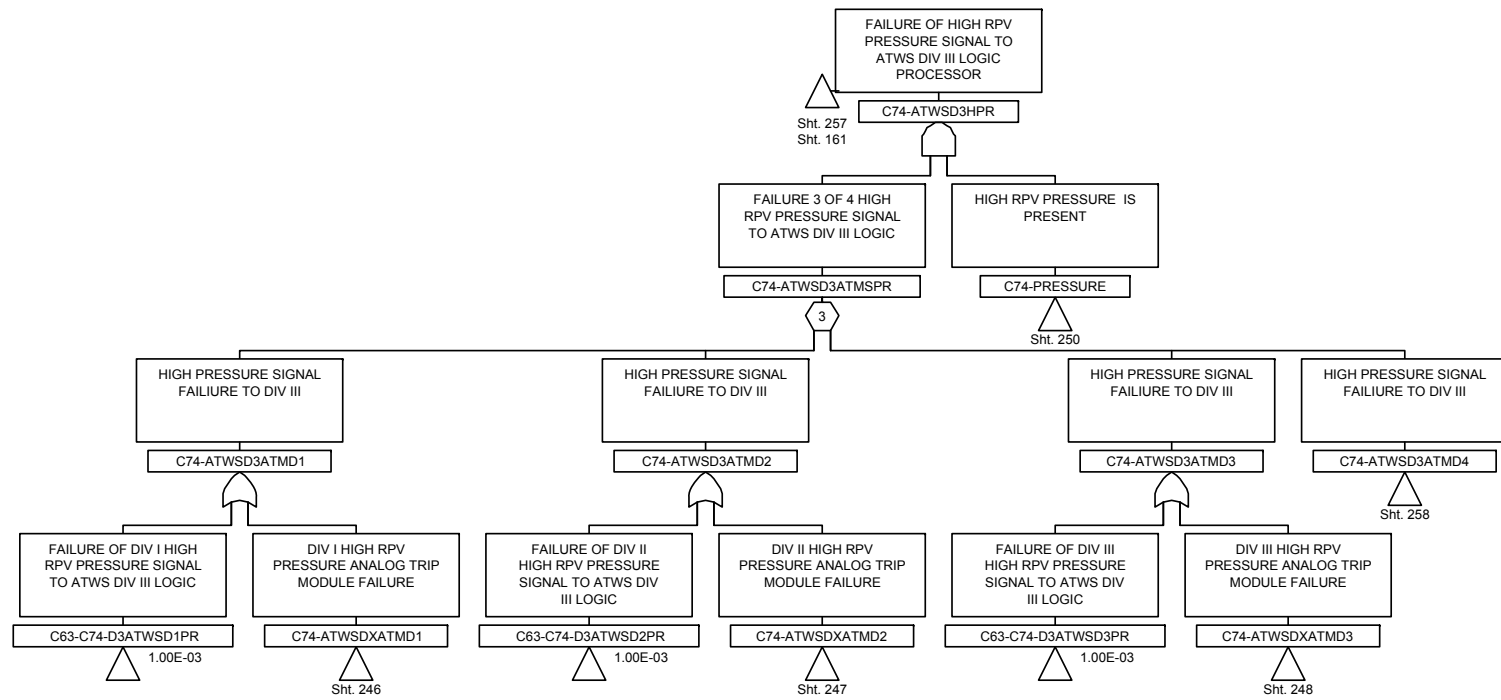


Figure 4.5-3d. Sheet 162 Diverse Protection System

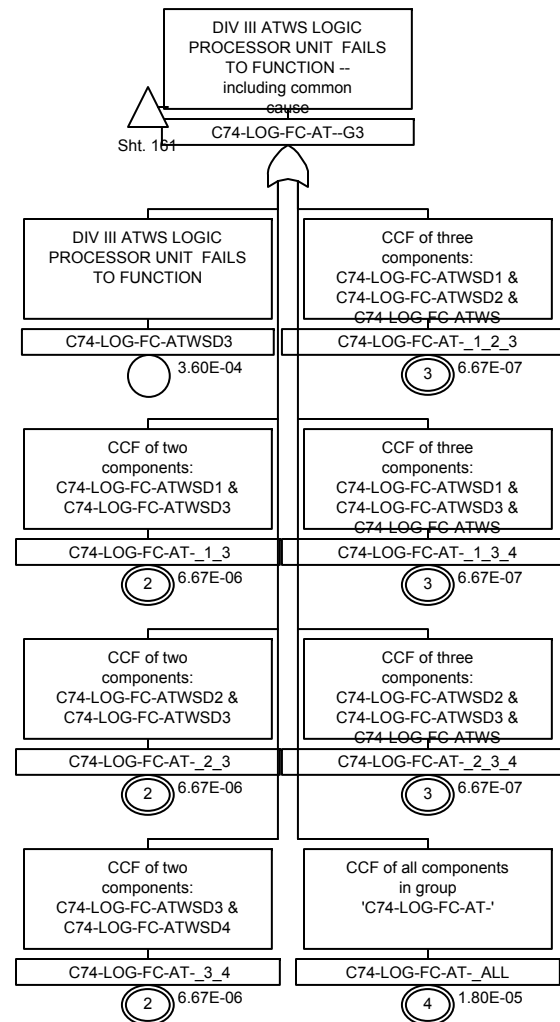


Figure 4.5-3d. Sheet 163 Diverse Protection System

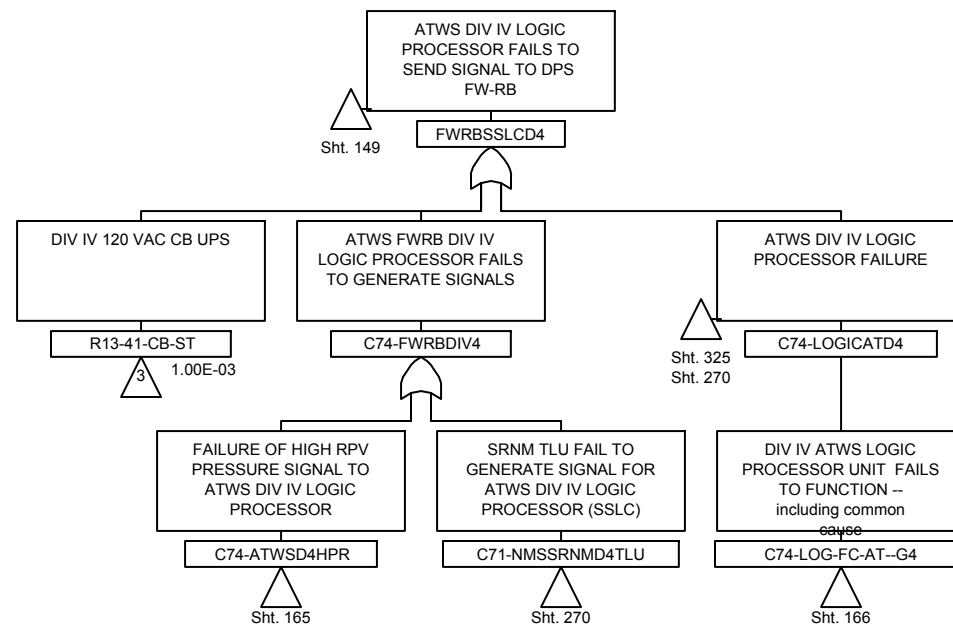


Figure 4.5-3d. Sheet 164 Diverse Protection System

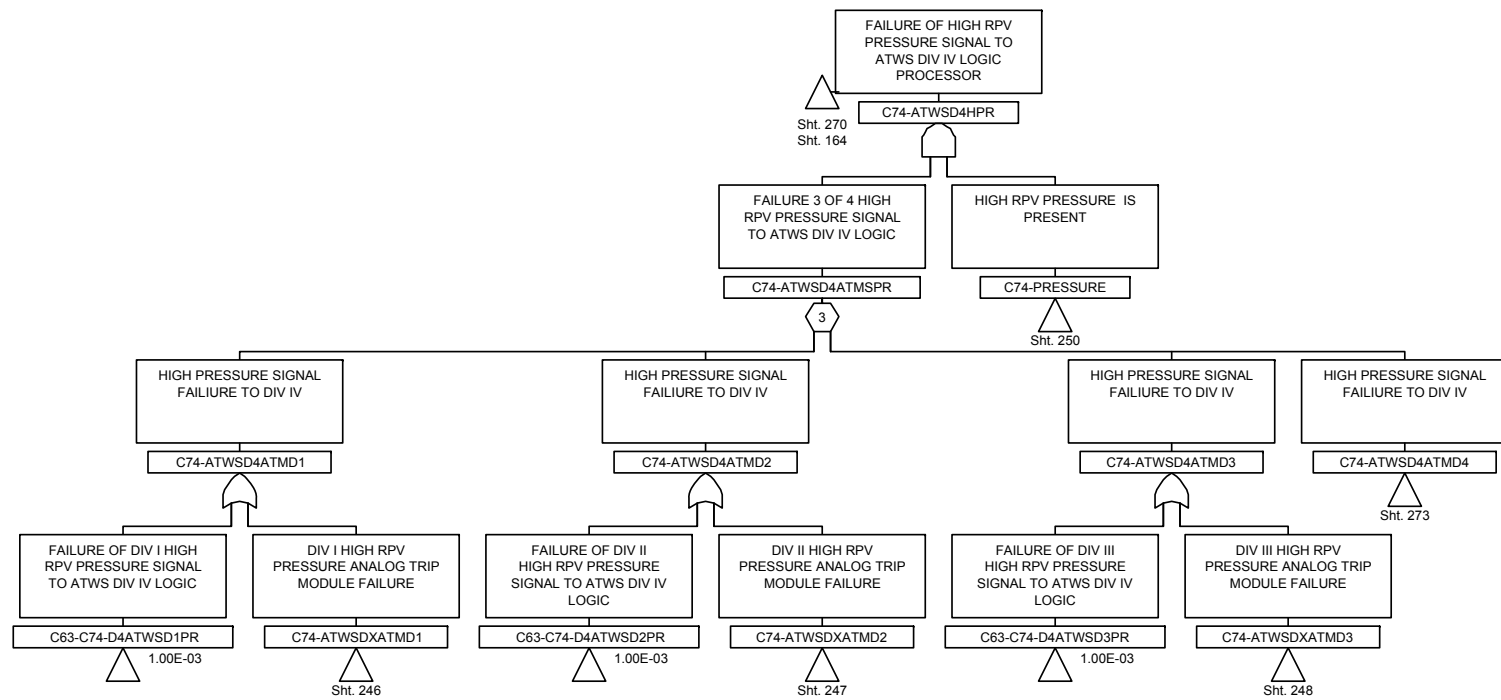


Figure 4.5-3d. Sheet 165 Diverse Protection System

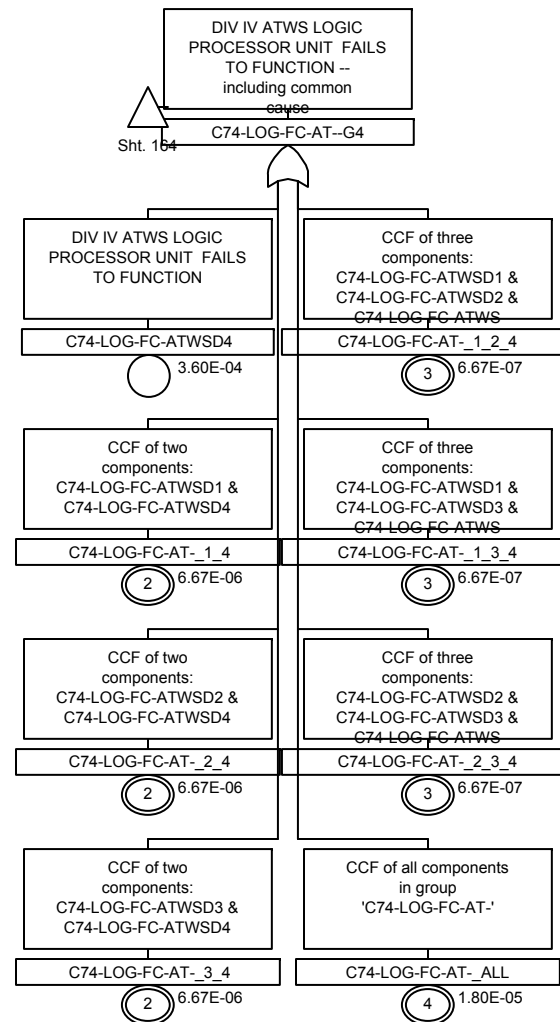


Figure 4.5-3d. Sheet 166 Diverse Protection System



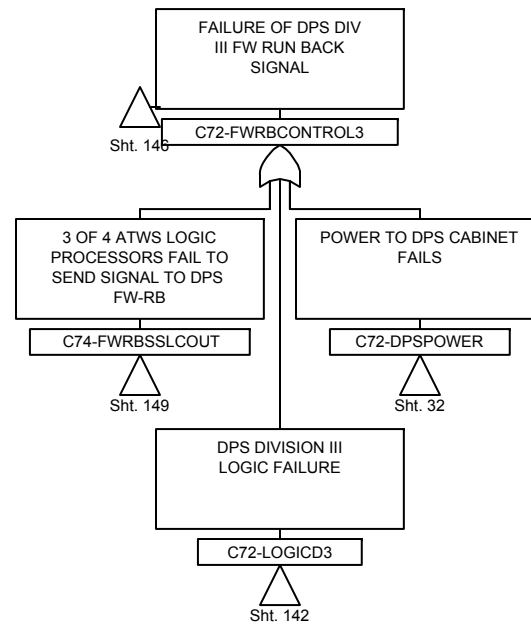


Figure 4.5-3d. Sheet 167 Diverse Protection System

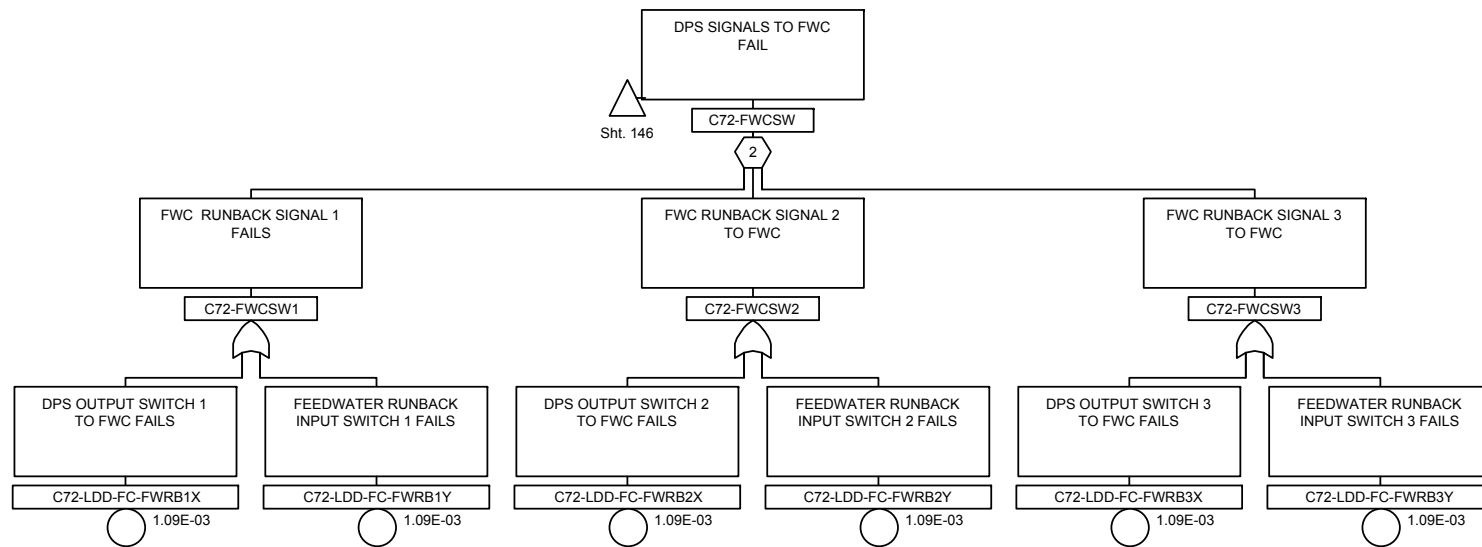


Figure 4.5-3d. Sheet 168 Diverse Protection System

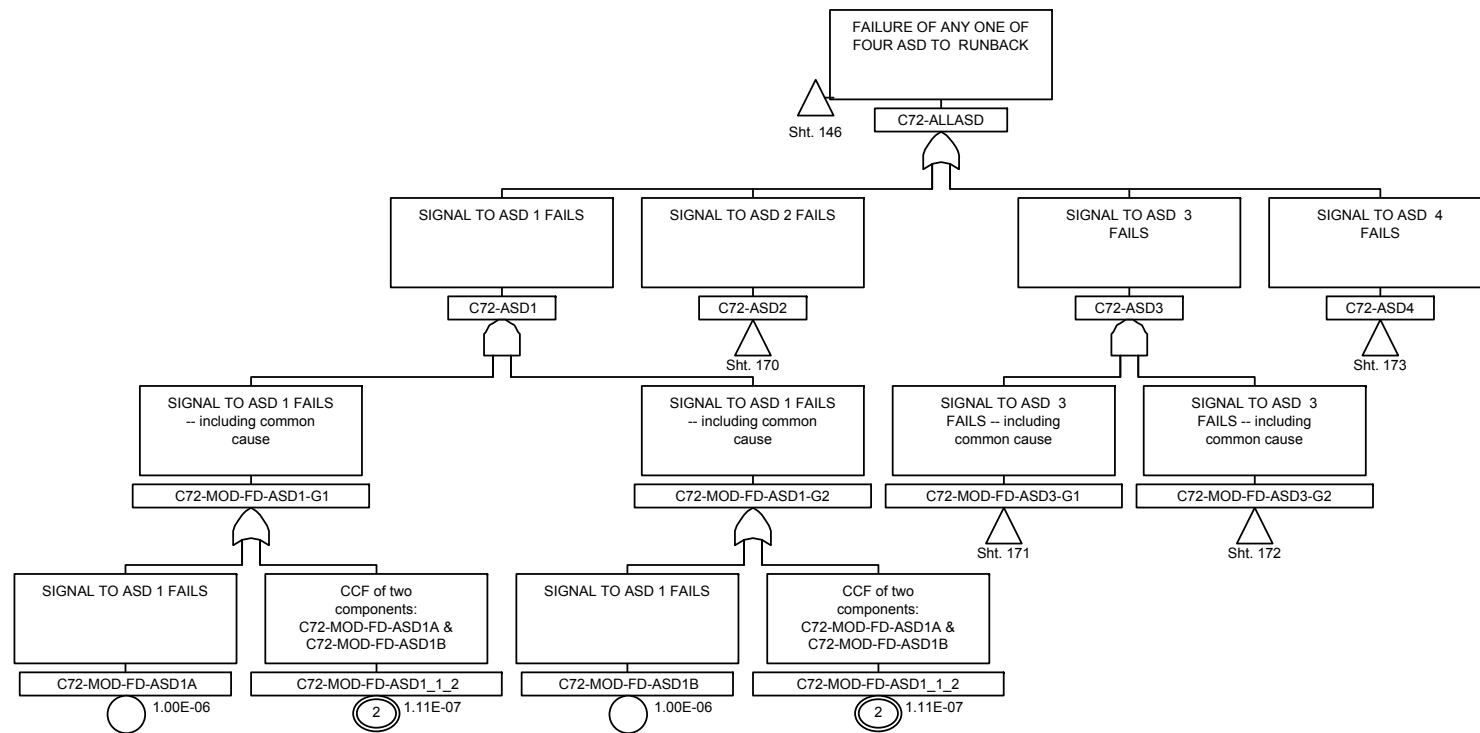


Figure 4.5-3d. Sheet 169 Diverse Protection System

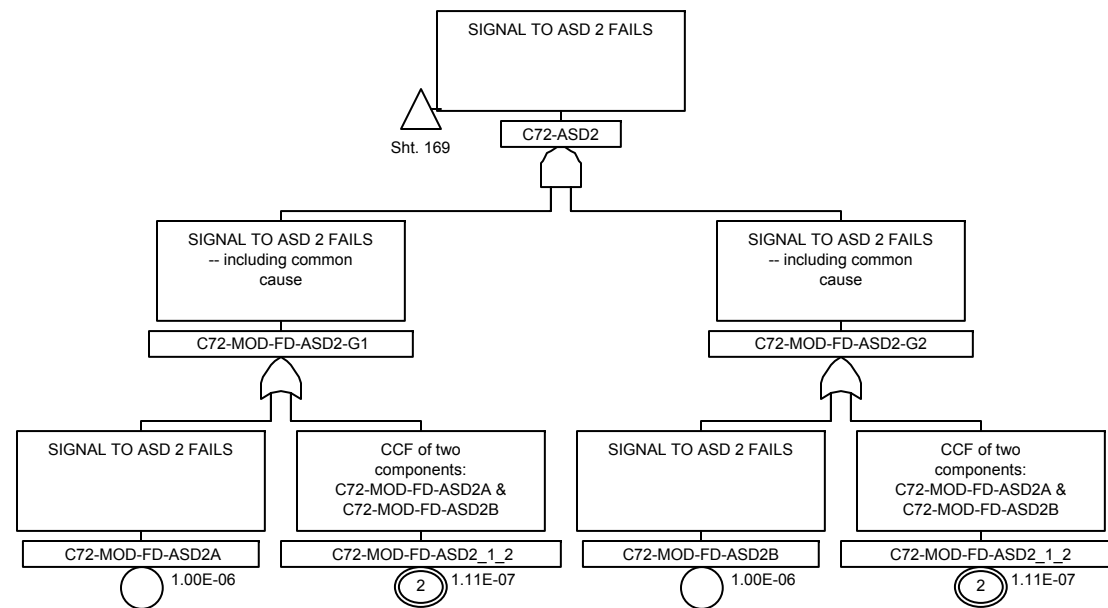


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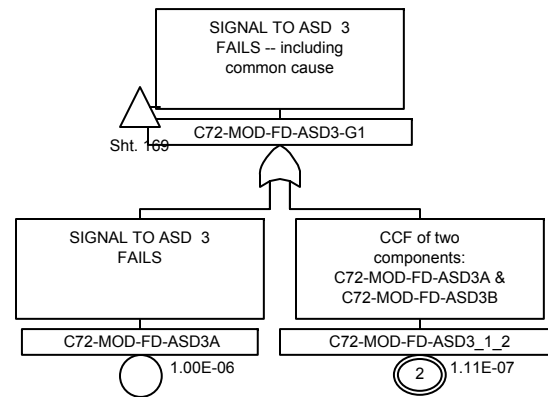


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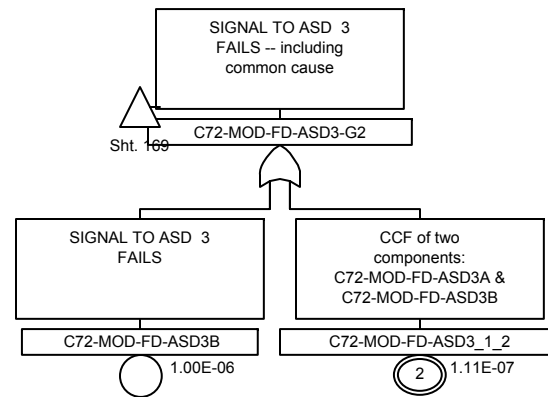


Figure 4.5-3d. Sheet 172 Diverse Protection System

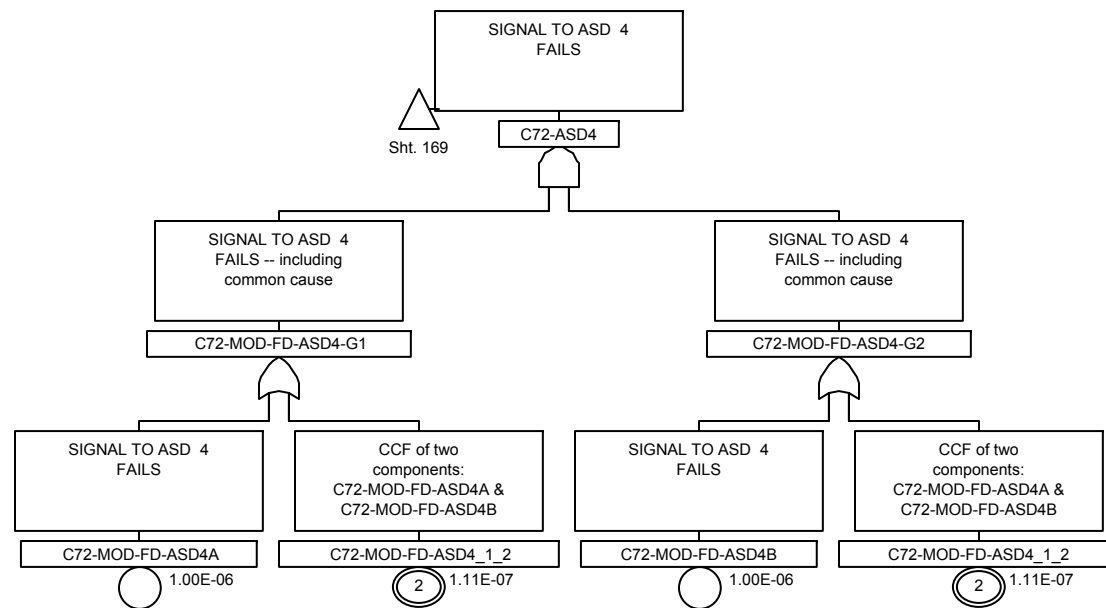


Figure 4.5-3d. Sheet 173 Diverse Protection System

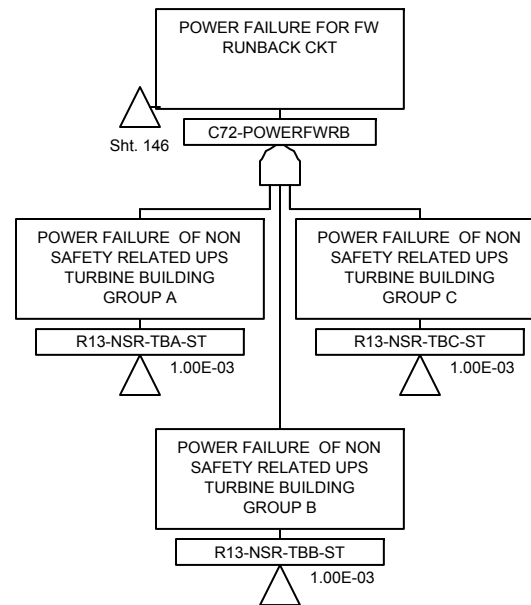


Figure 4.5-3d. Sheet 174 Diverse Protection System



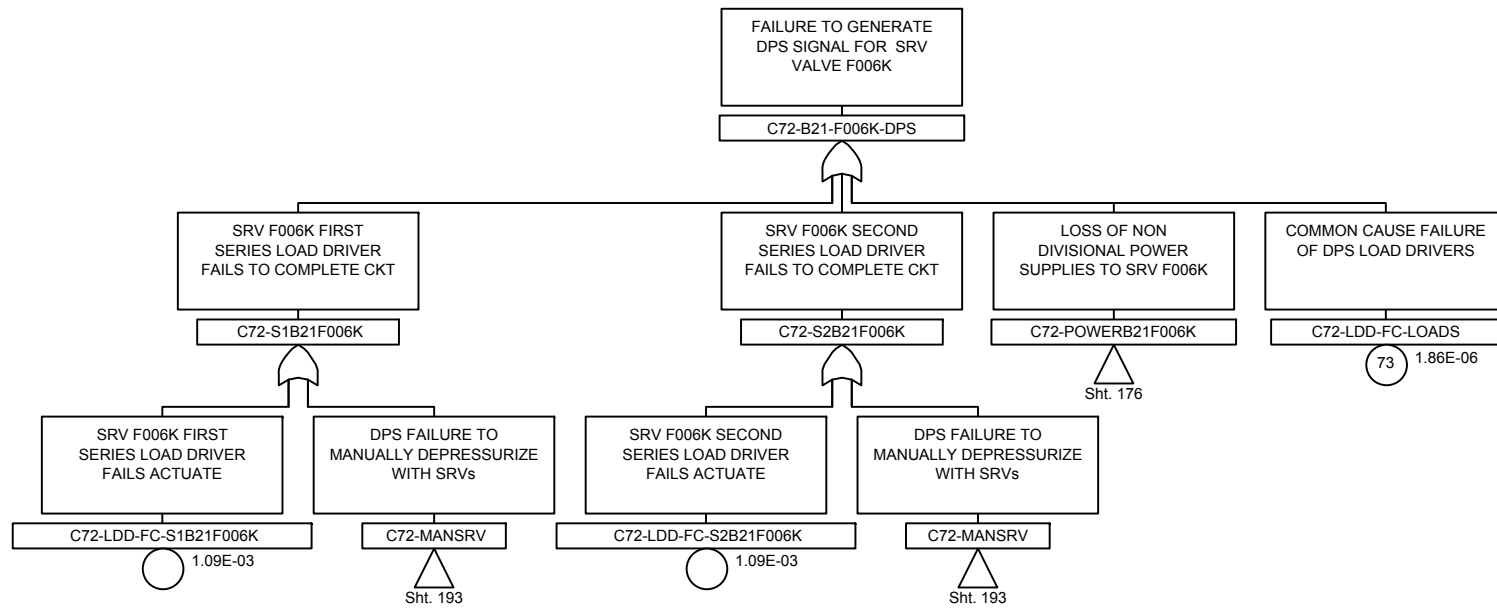


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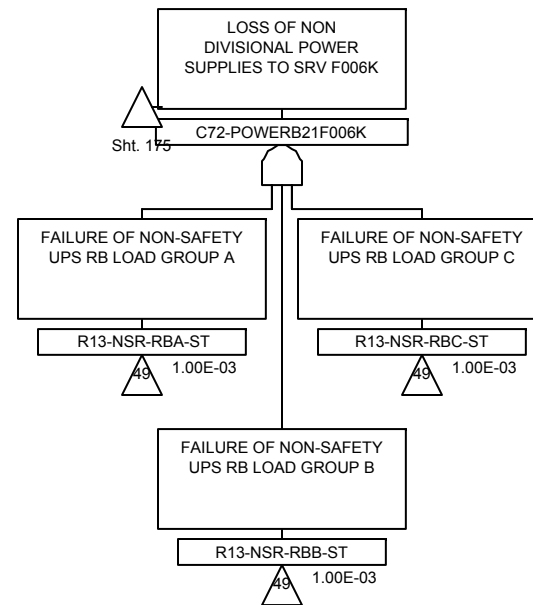


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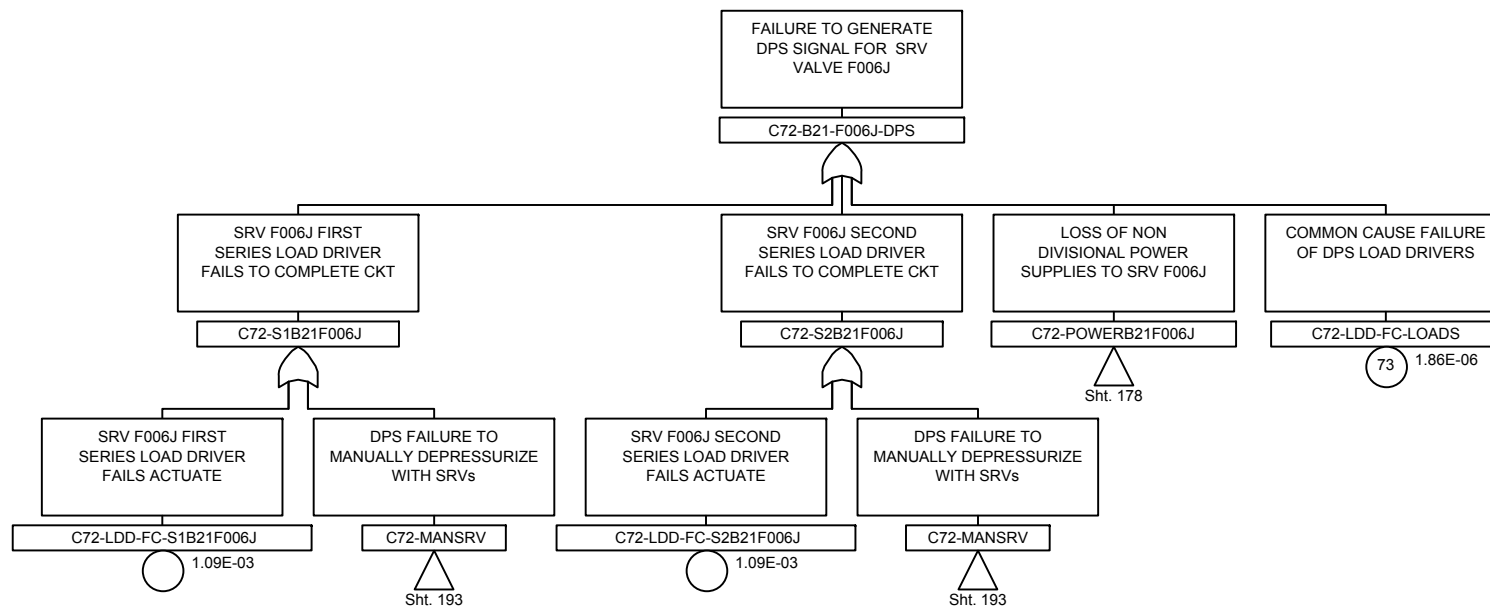


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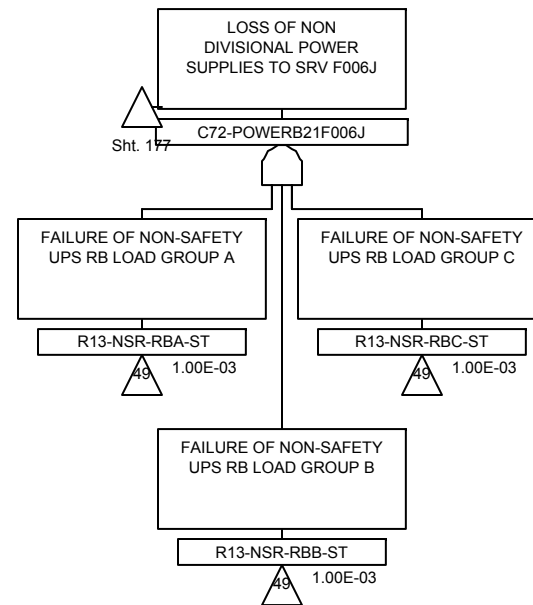


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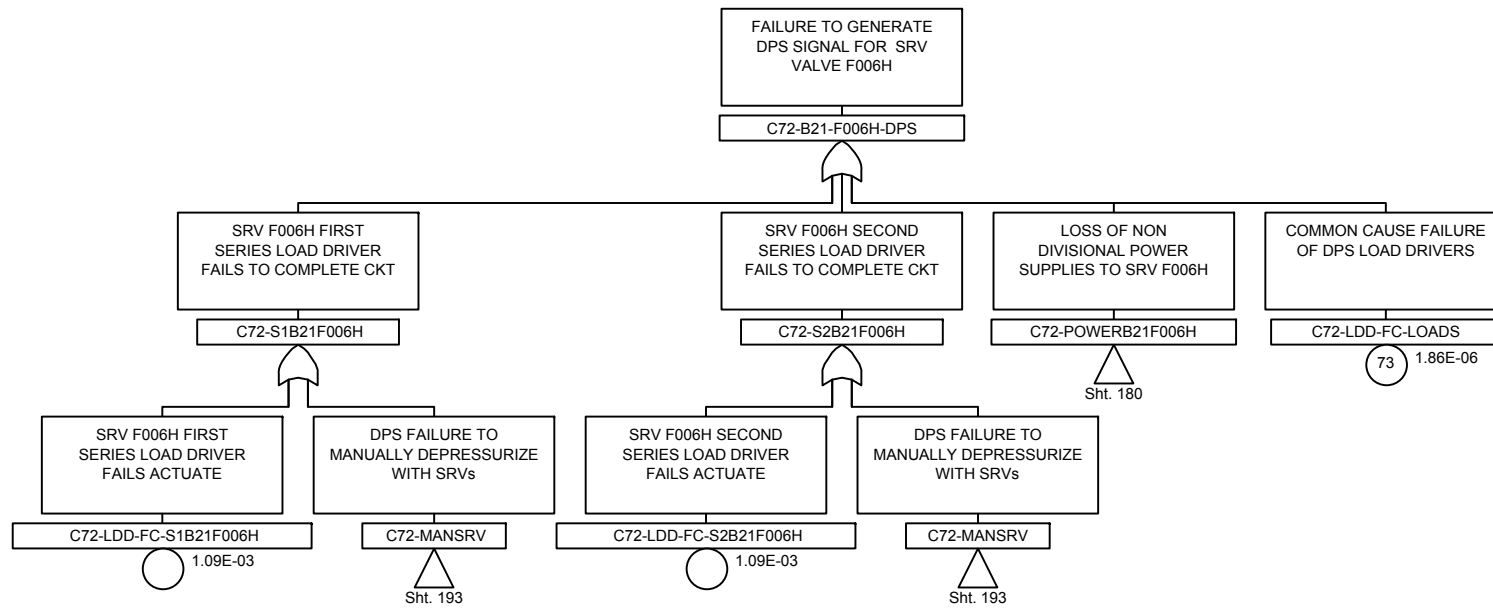


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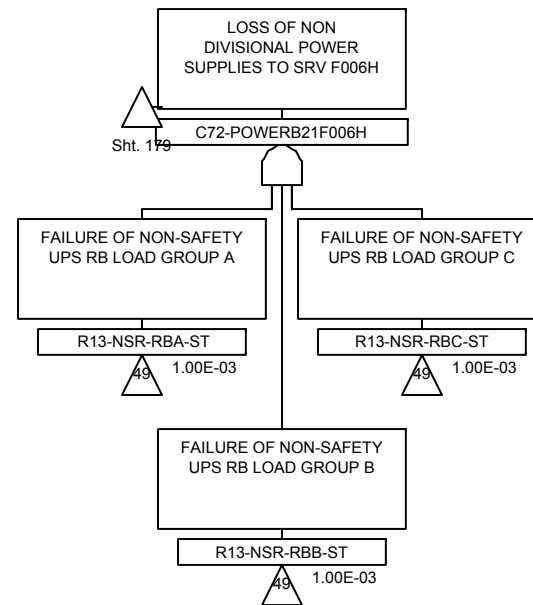


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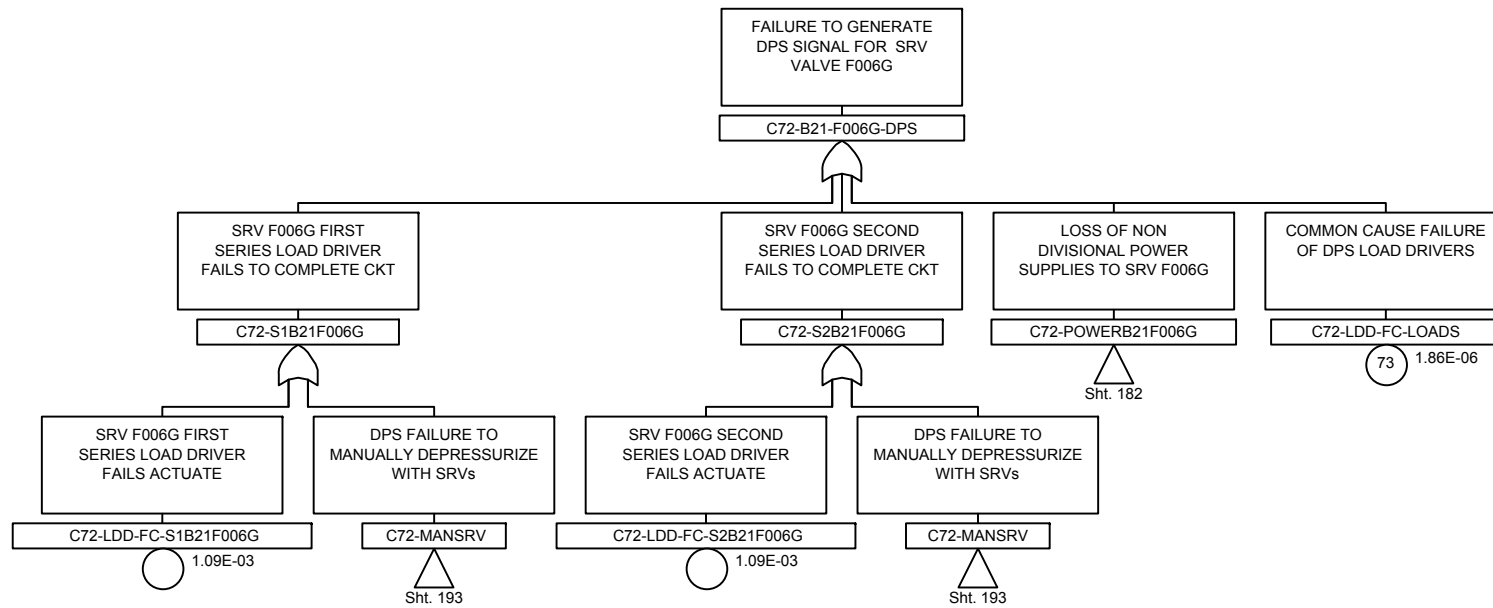


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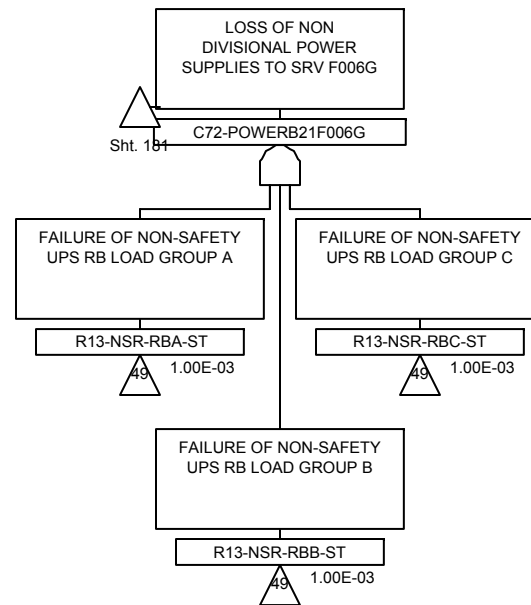


Figure 4.5-3d. Sheet 182 Diverse Protection System



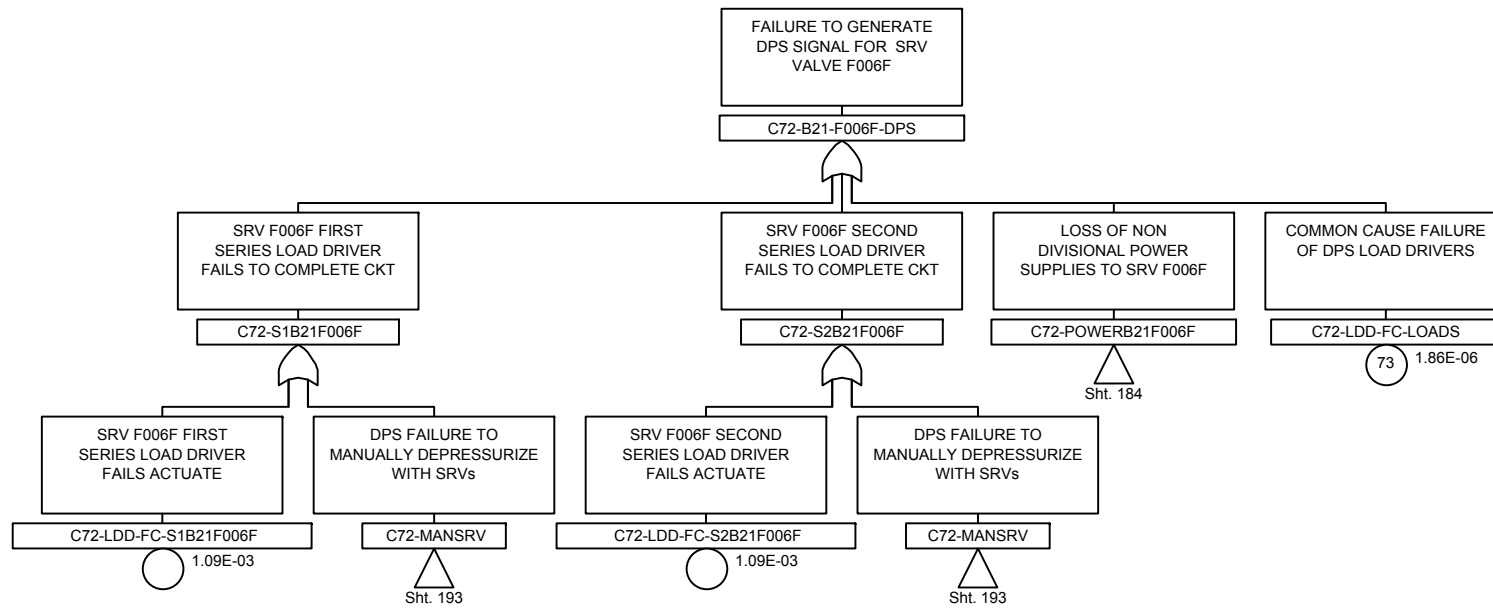


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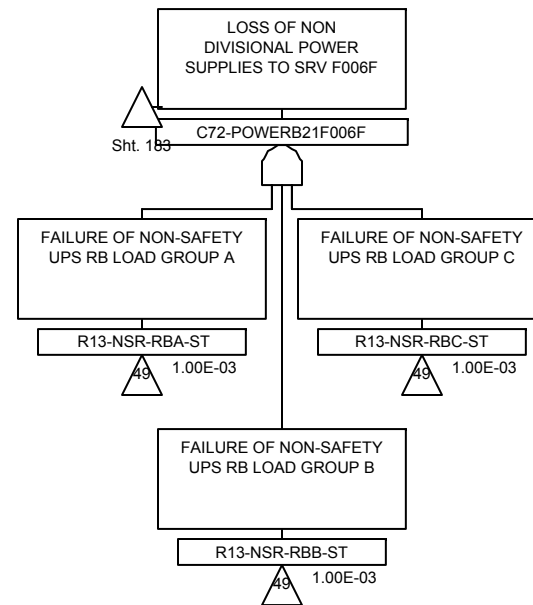


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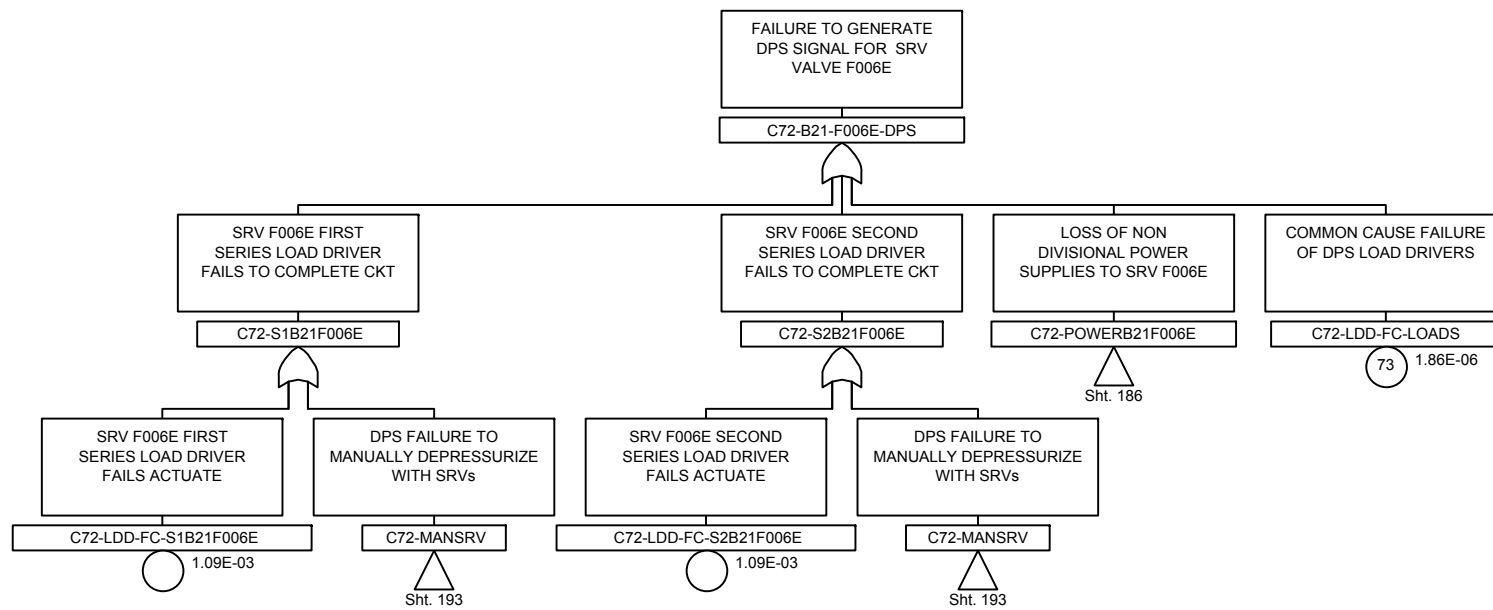


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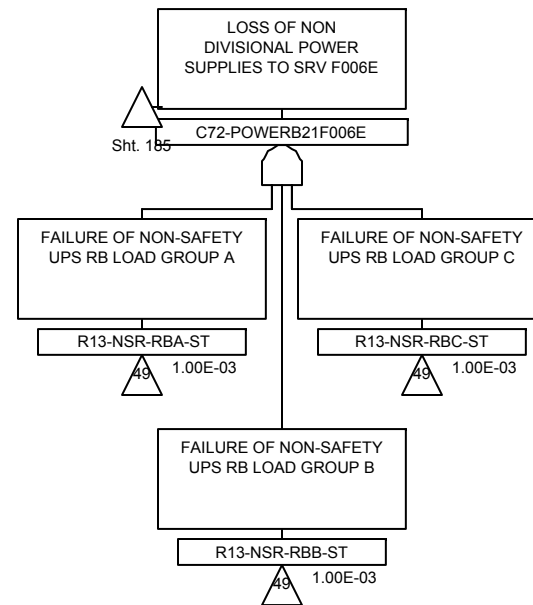


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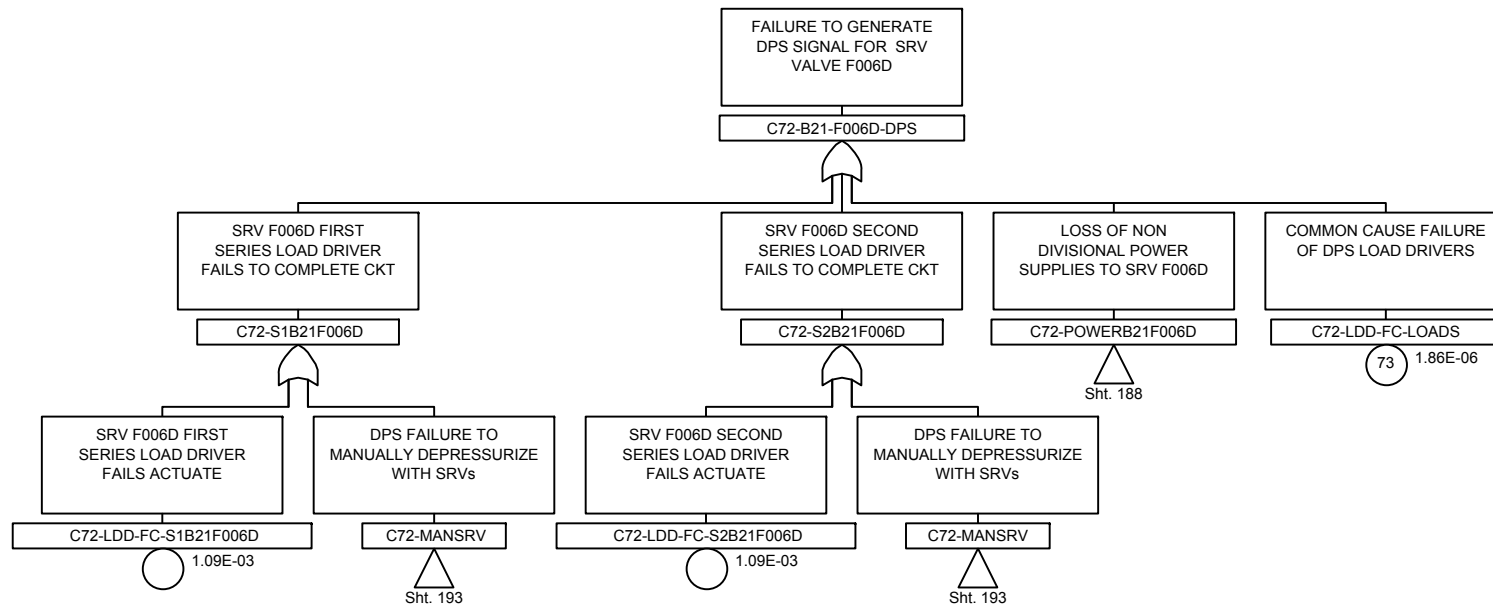


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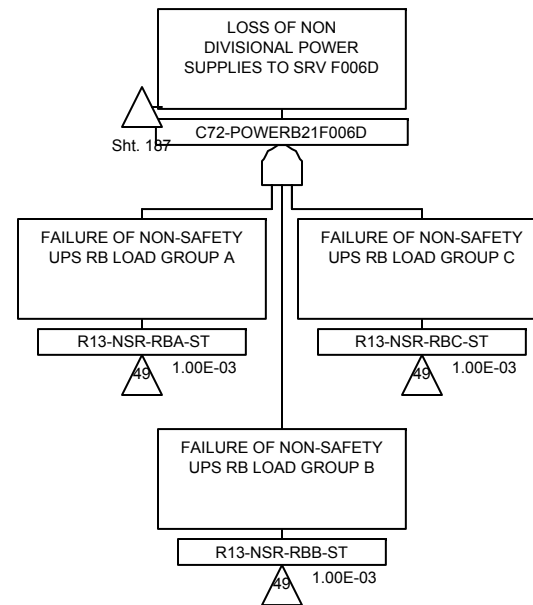


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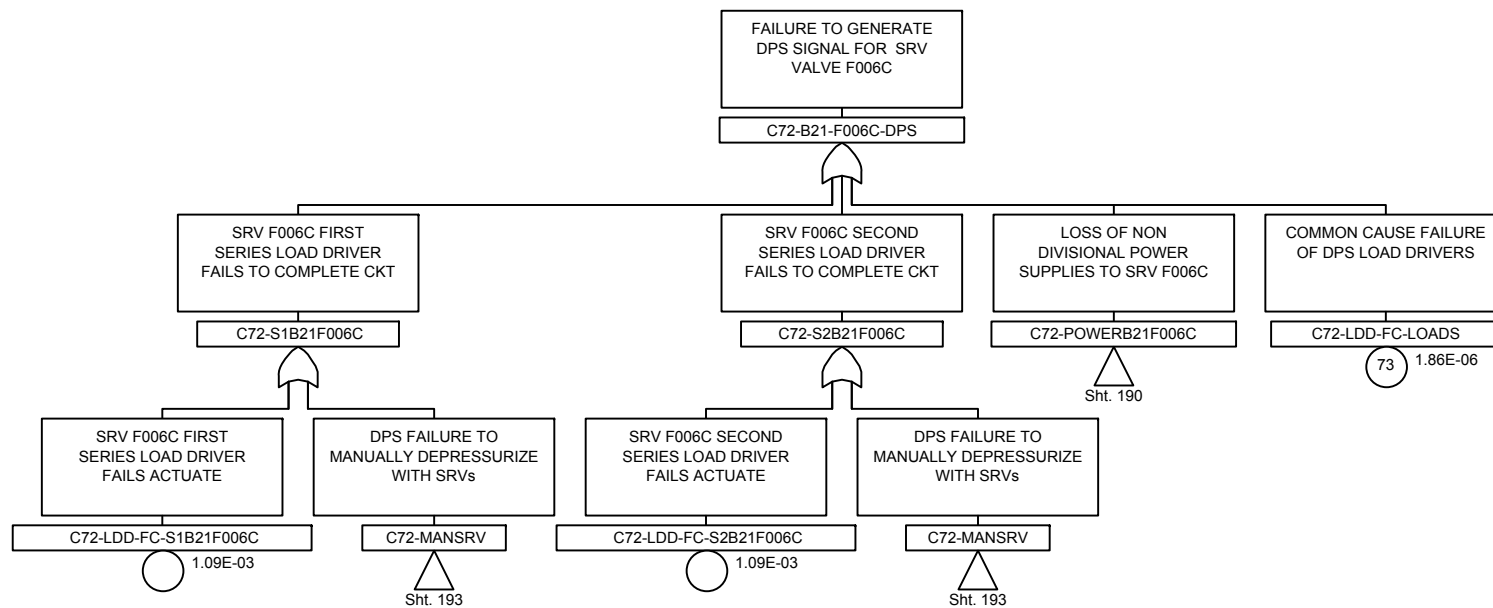


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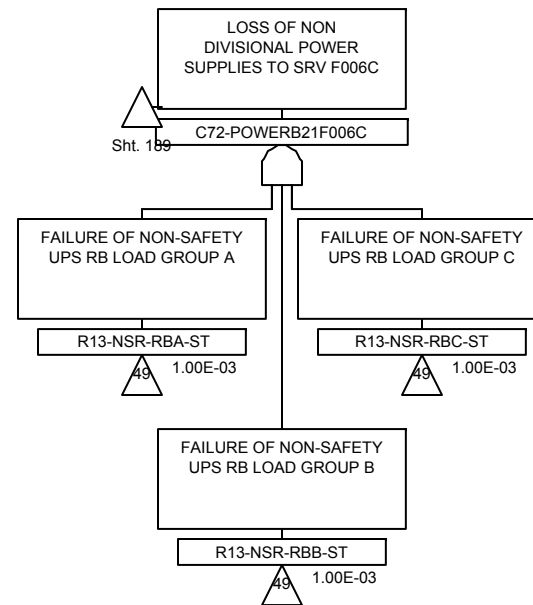


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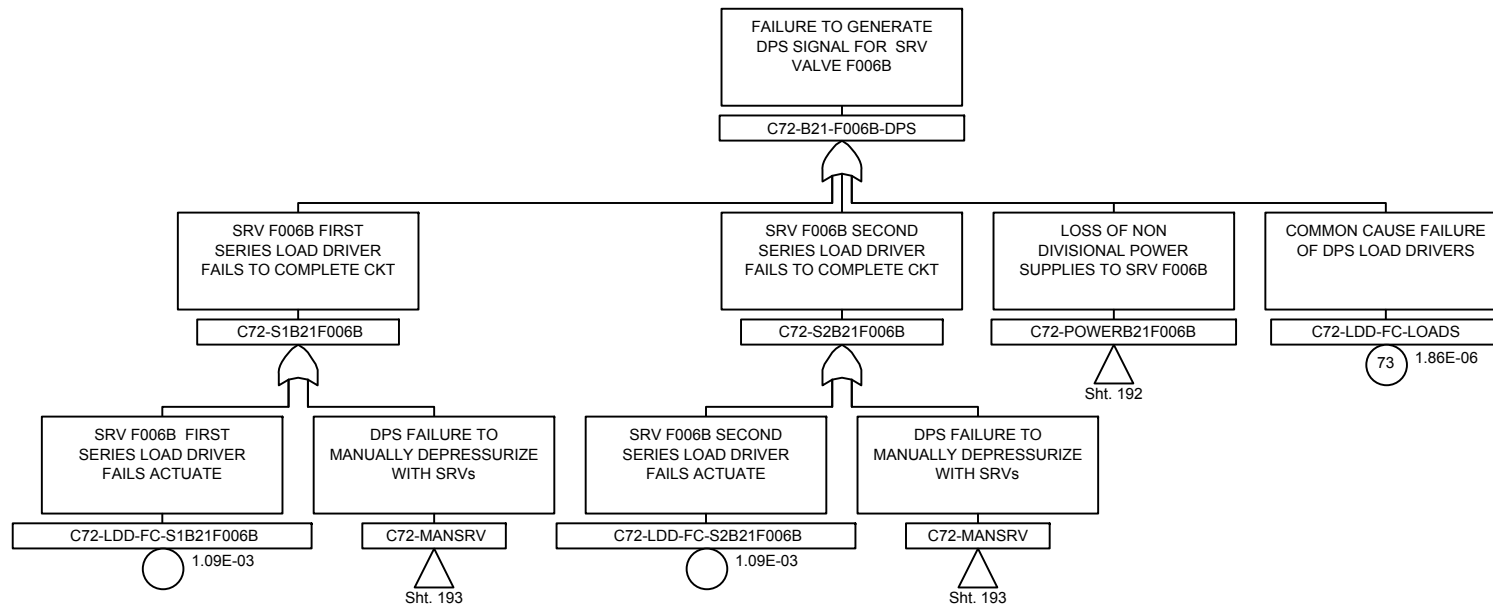


Figure 4.5-3d. Sheet 191 Diverse Protection System

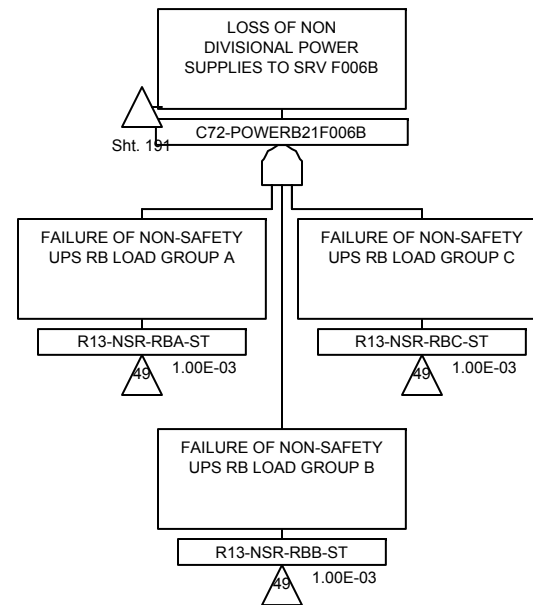


Figure 4.5-3d. Sheet 192 Diverse Protection System

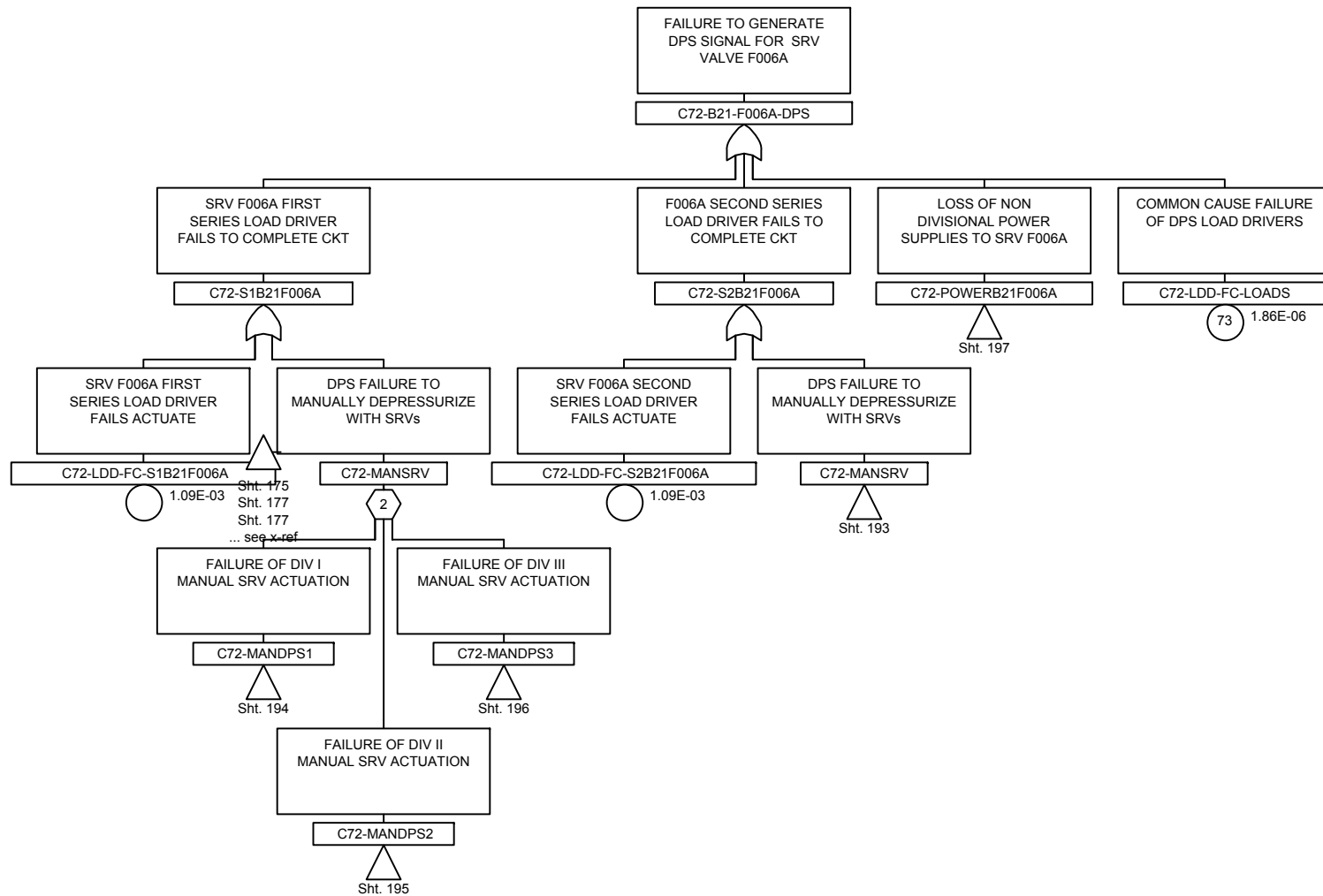


Figure 4.5-3d. Sheet 193 Diverse Protection System

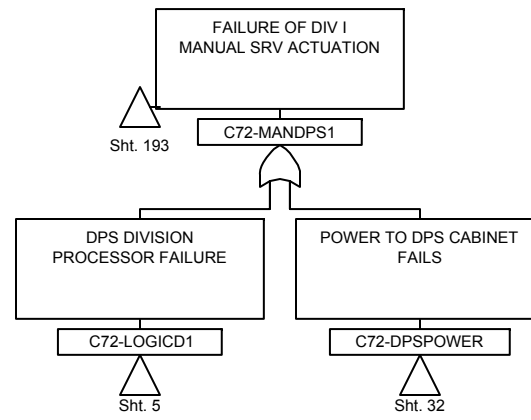


Figure 4.5-3d. Sheet 194 Diverse Protection System

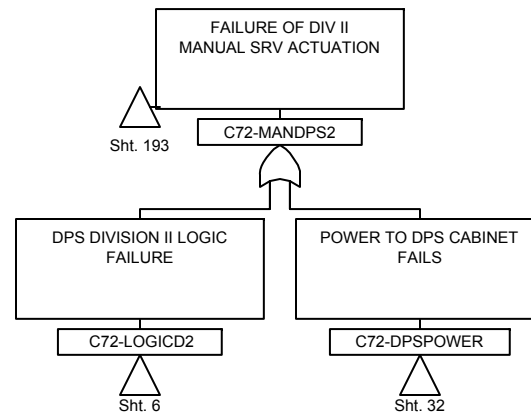


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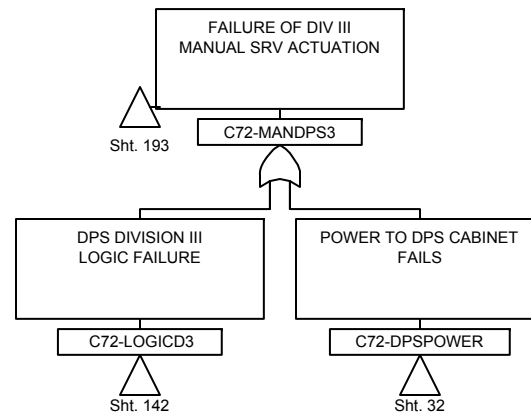


Figure 4.5-3d. Sheet 196 Diverse Protection System

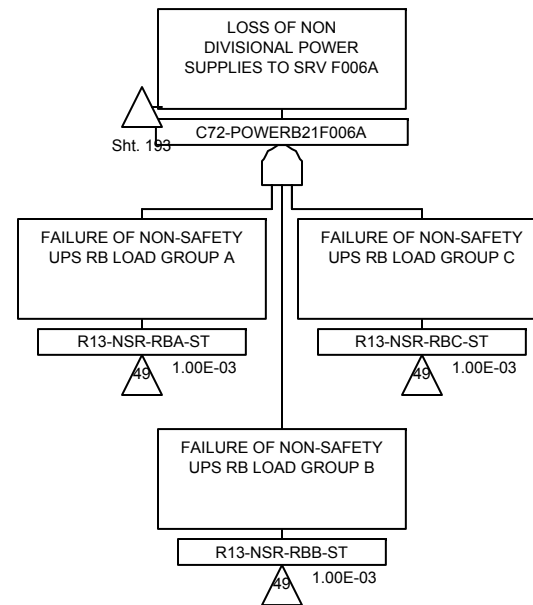


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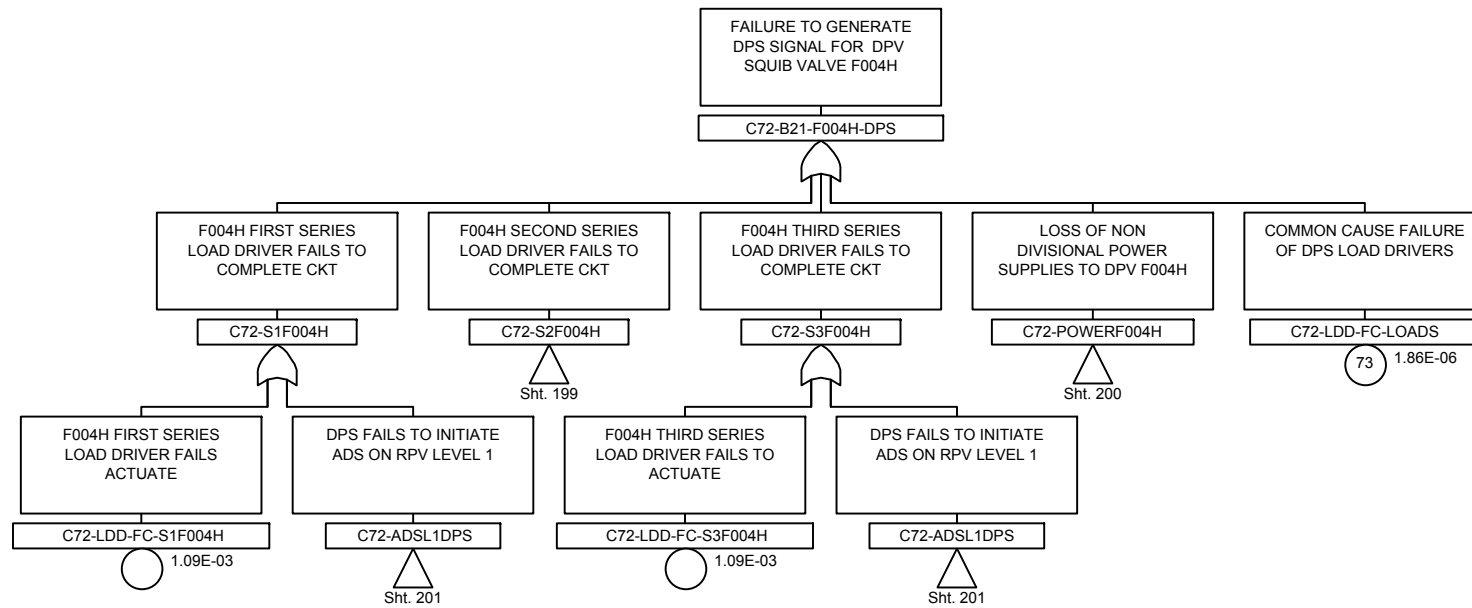


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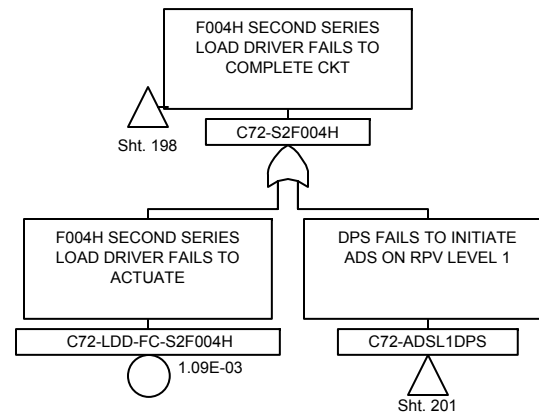


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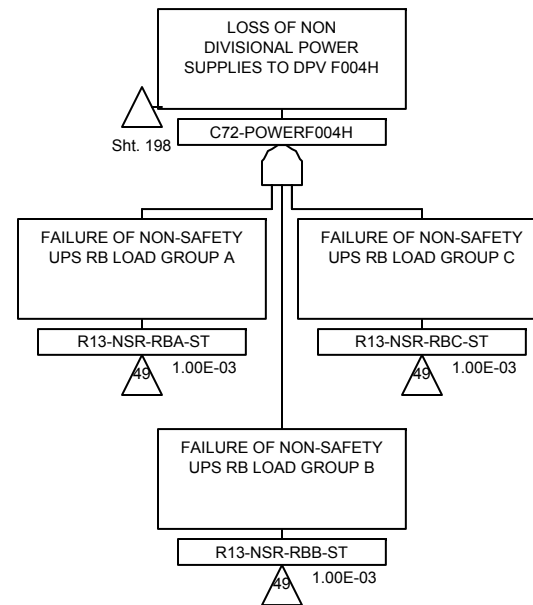


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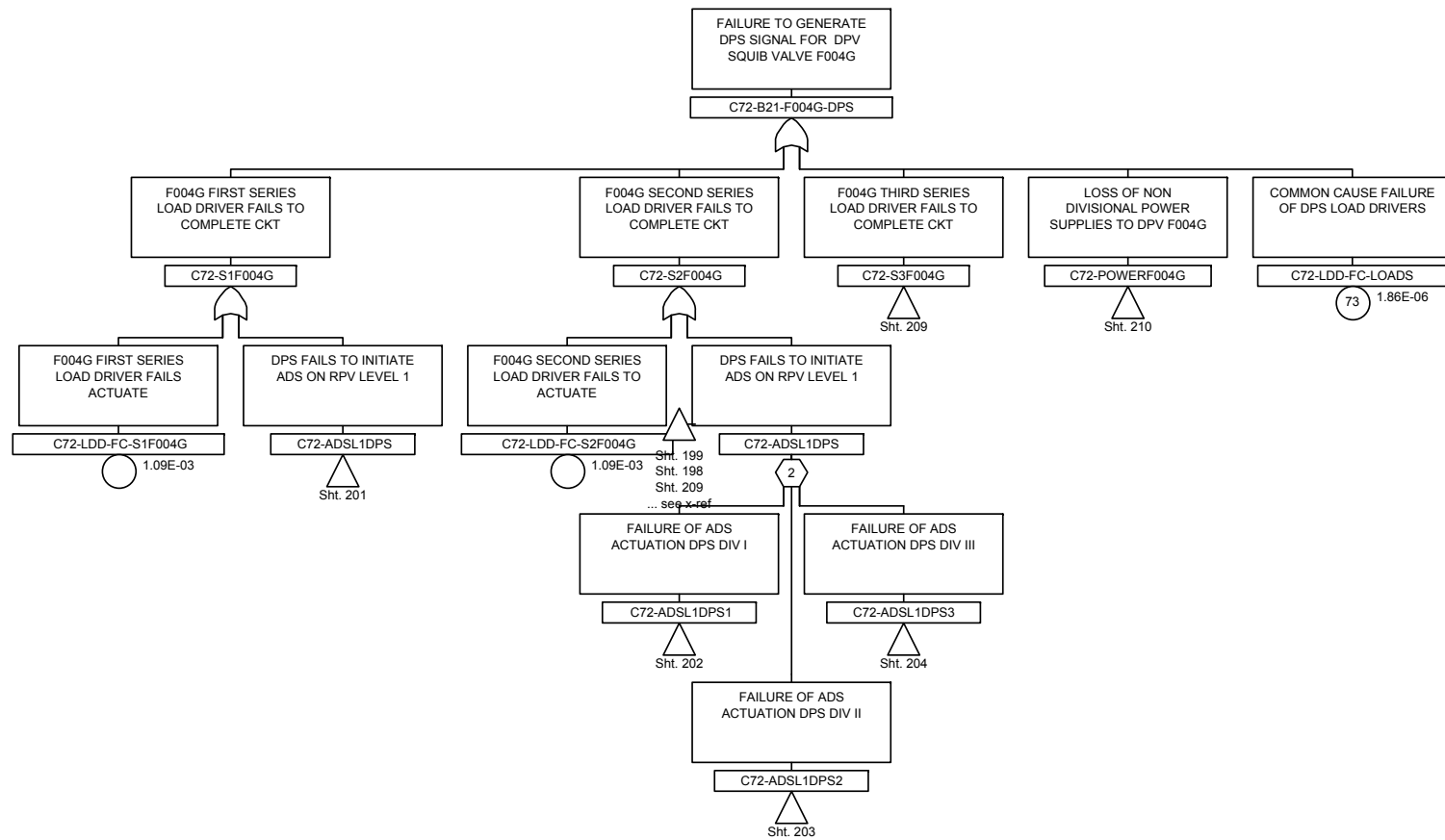


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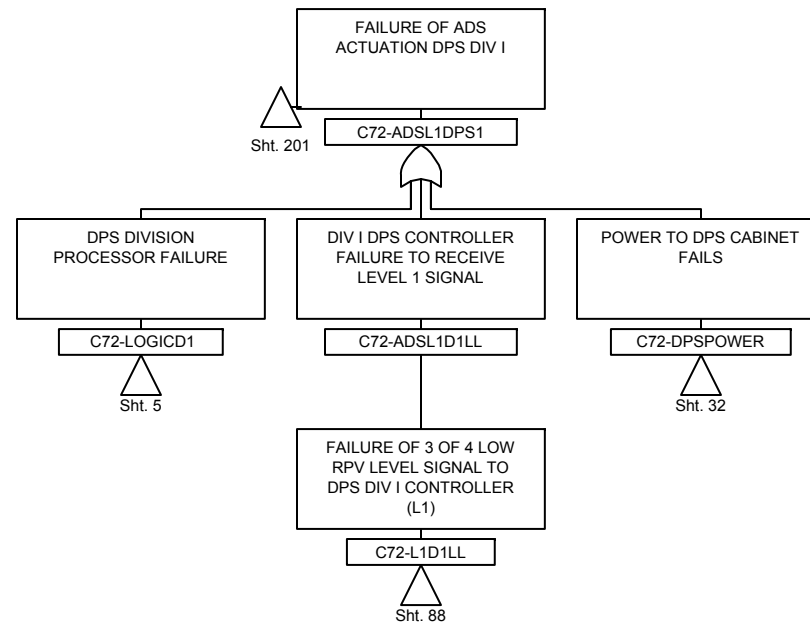


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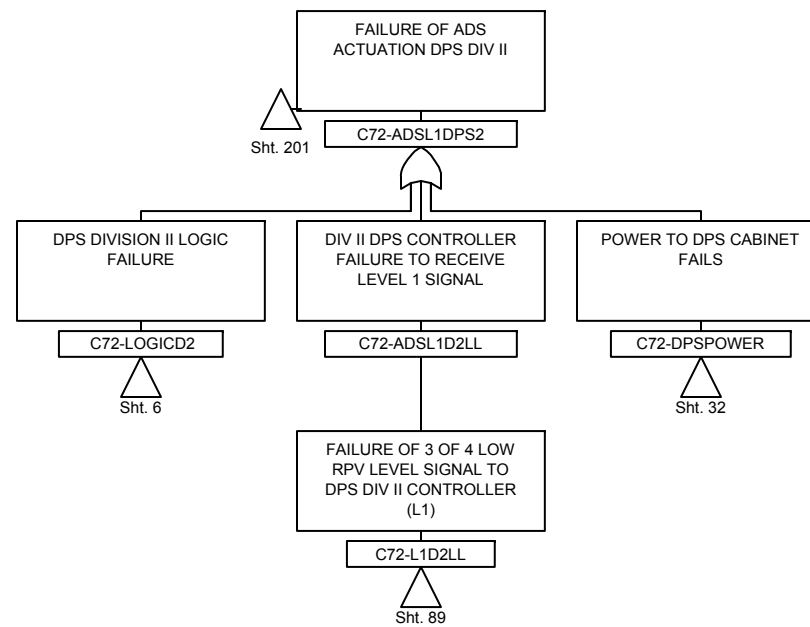


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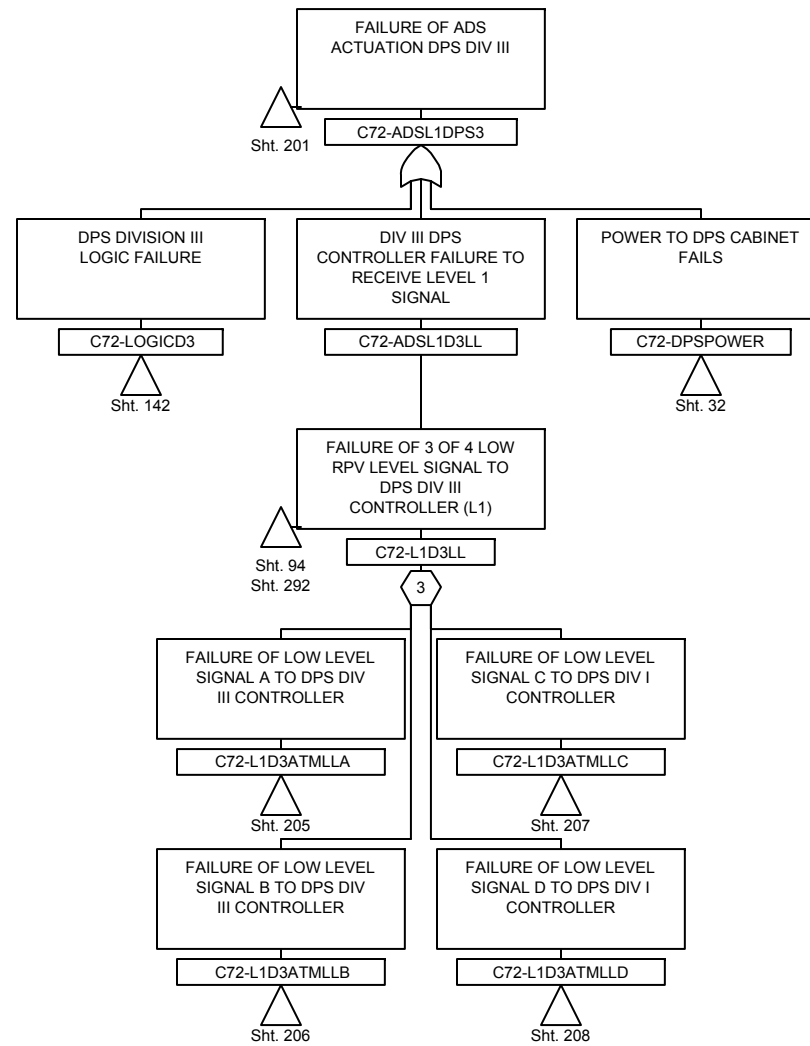


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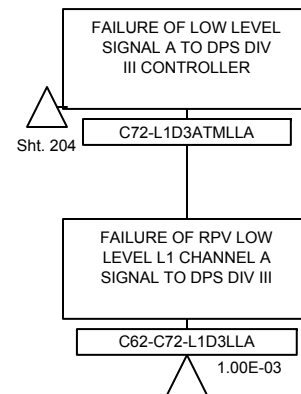


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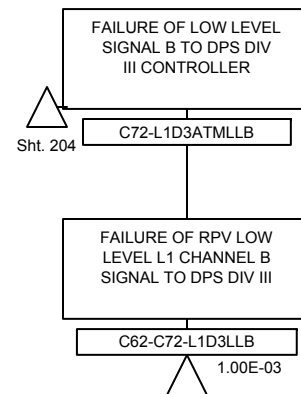


Figure 4.5-3d. Sheet 206 Diverse Protection System



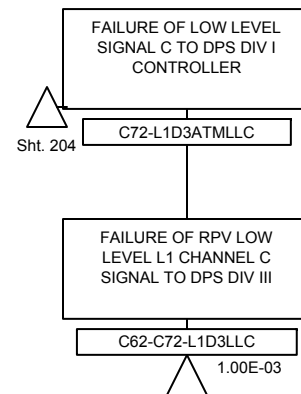


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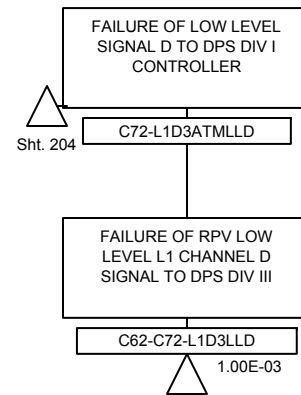


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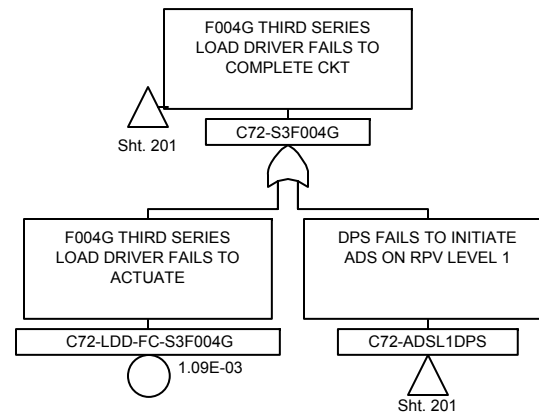


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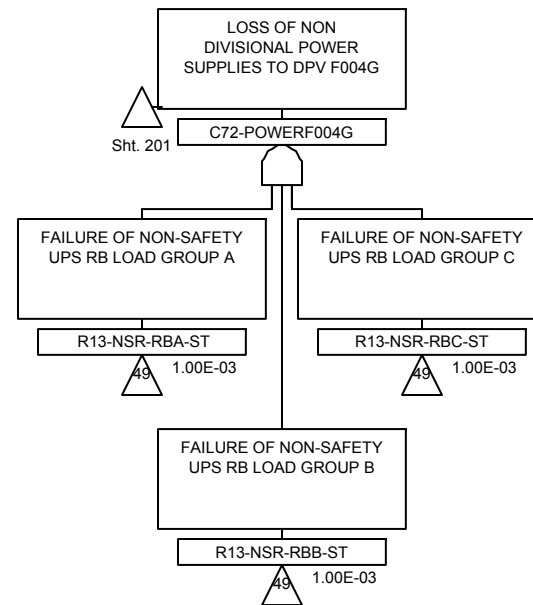


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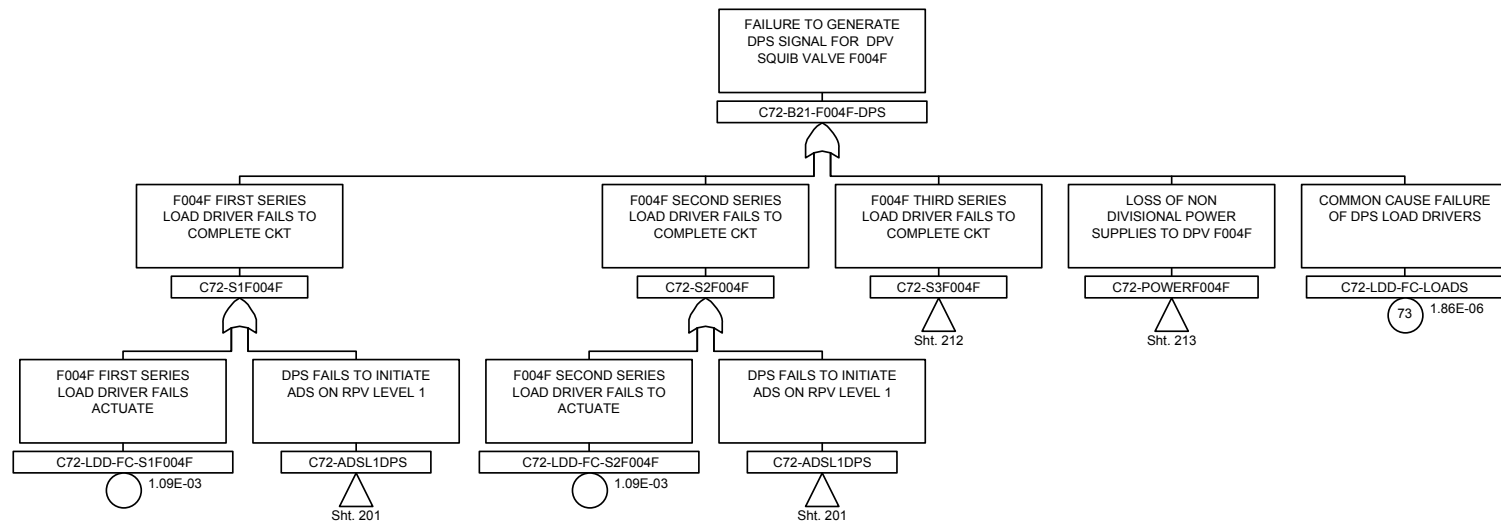


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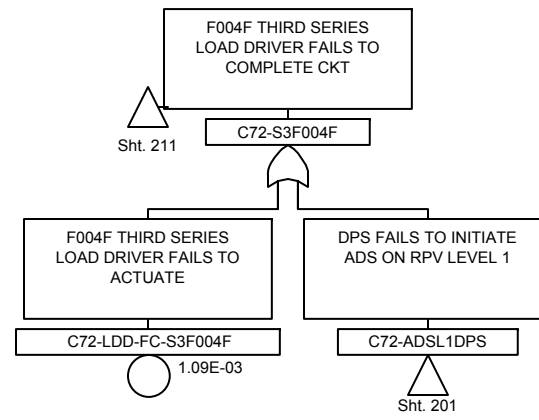


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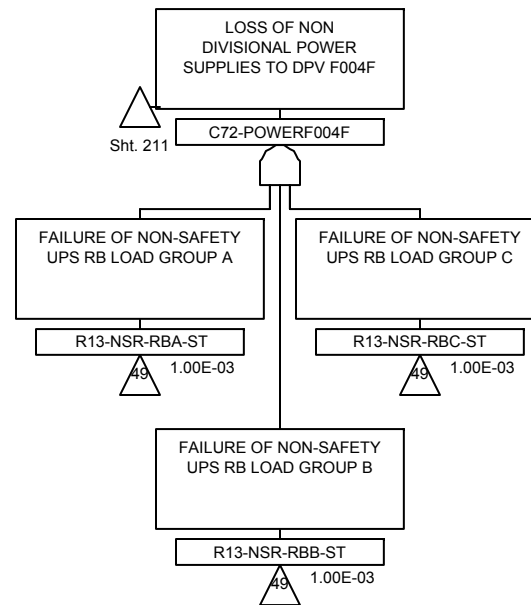


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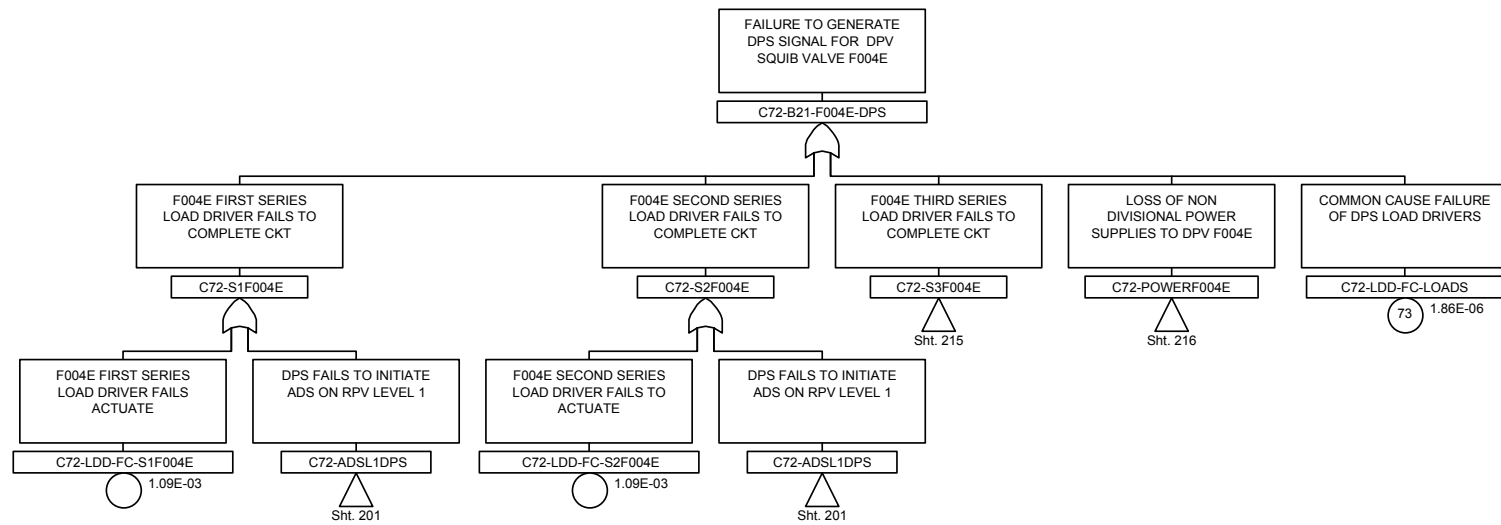


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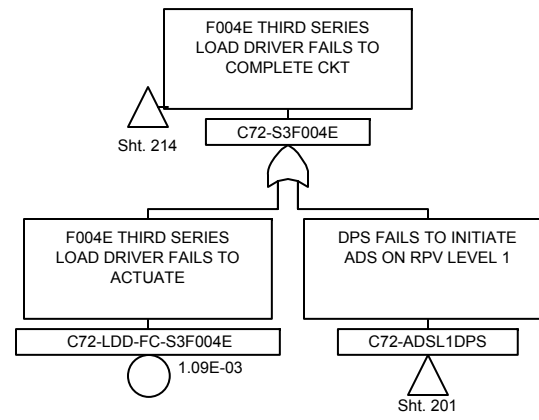


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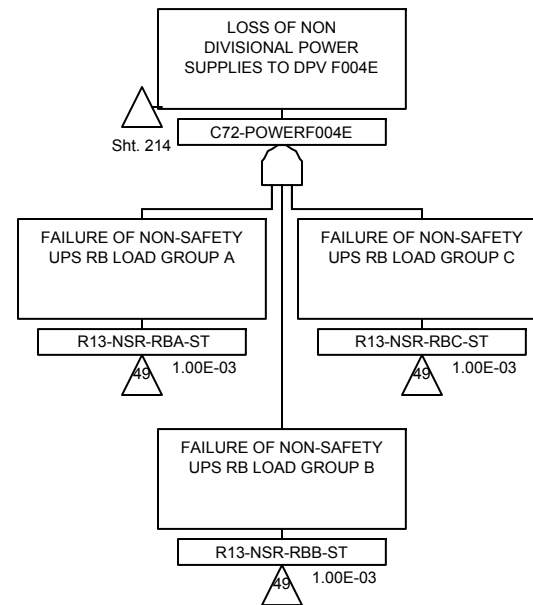


Figure 4.5-3d. Sheet 216 Diverse Protection System

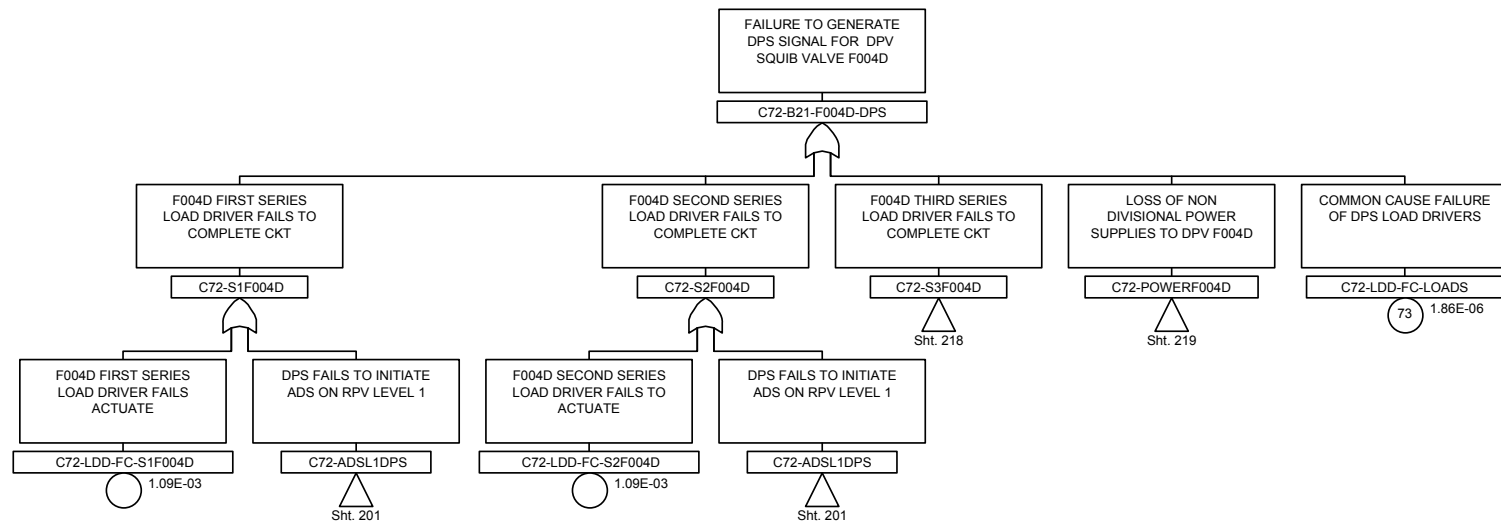


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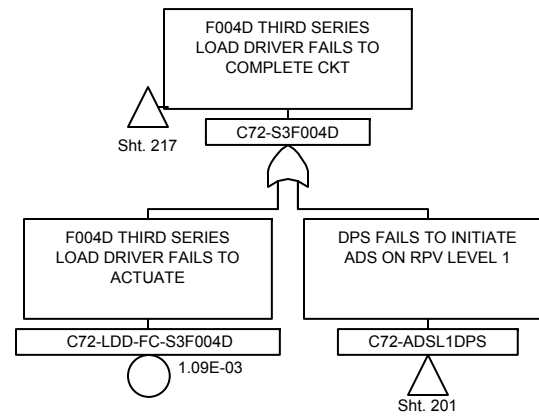


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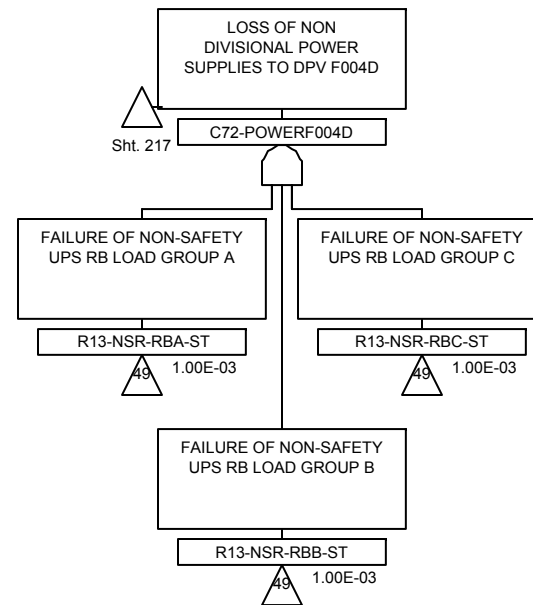


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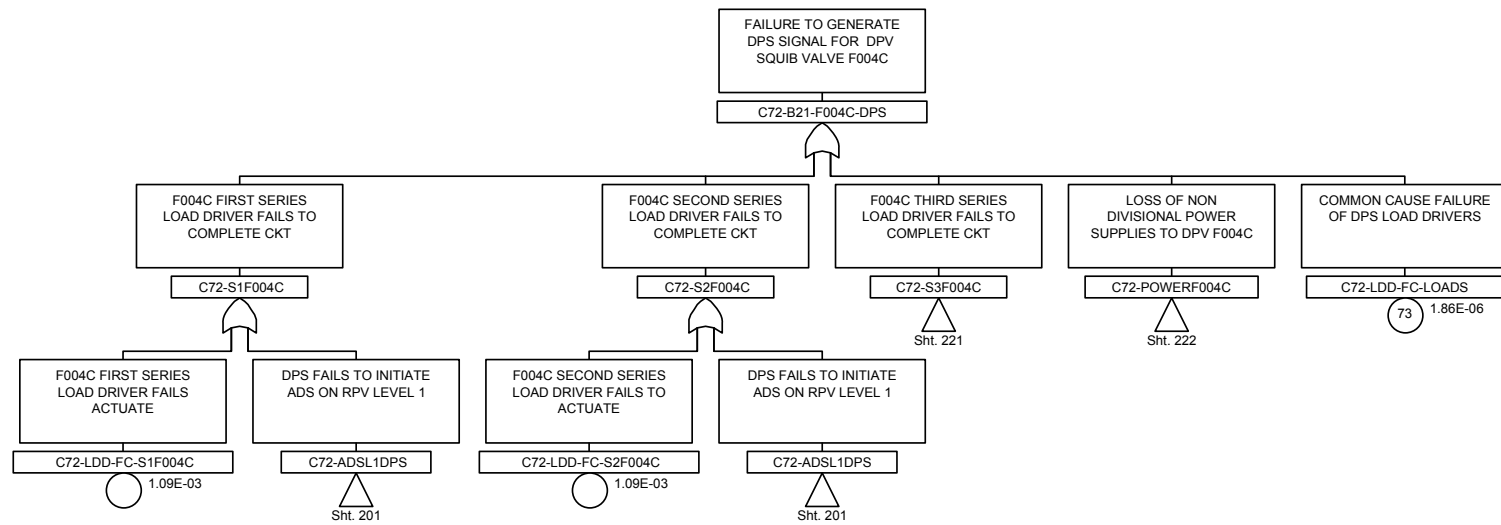


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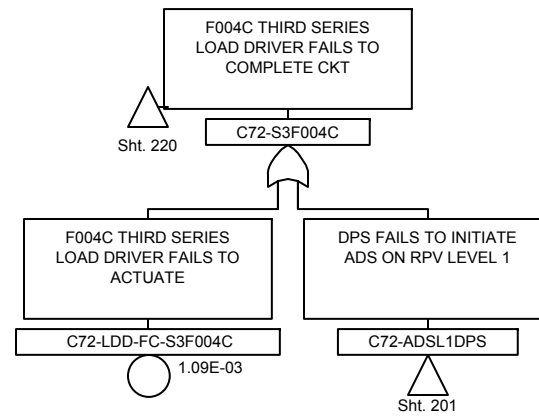


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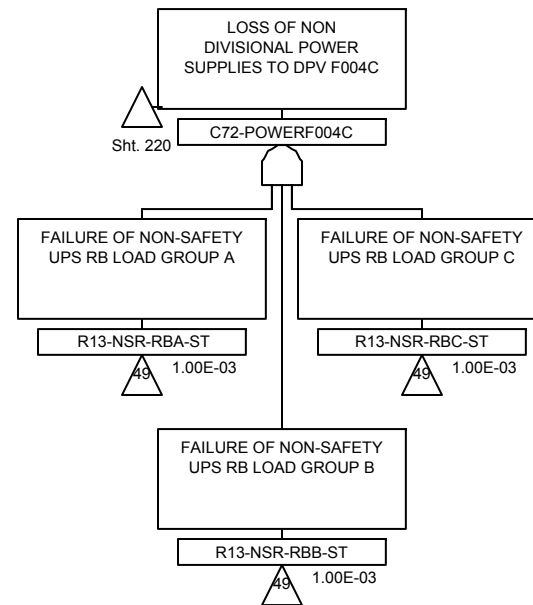


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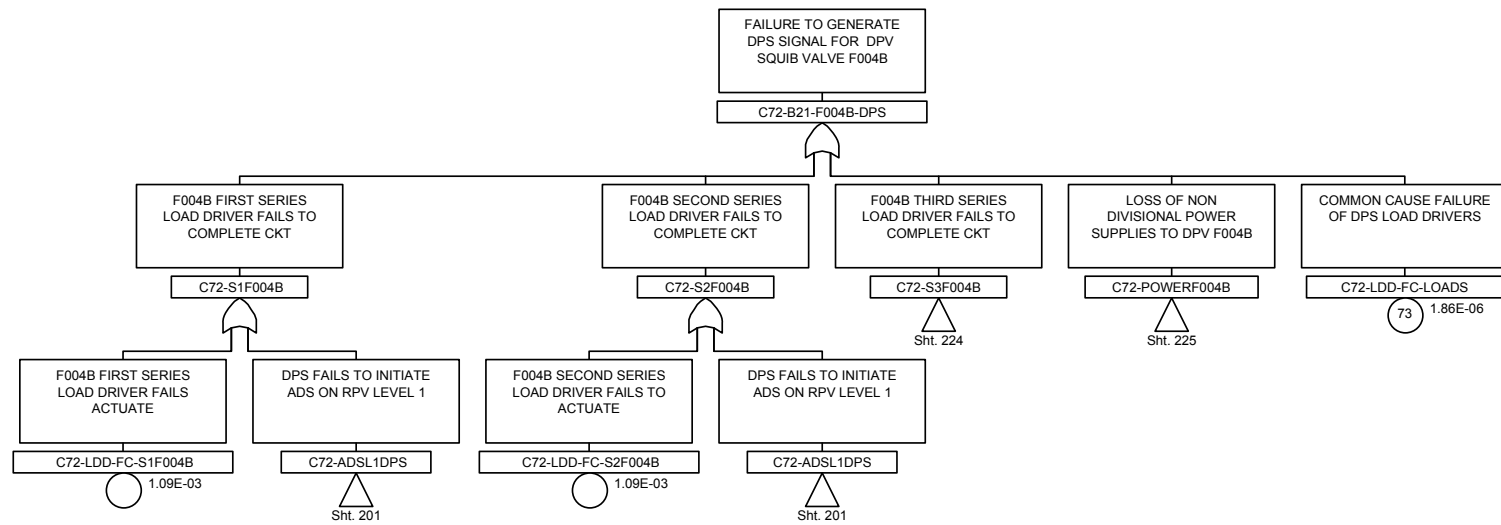


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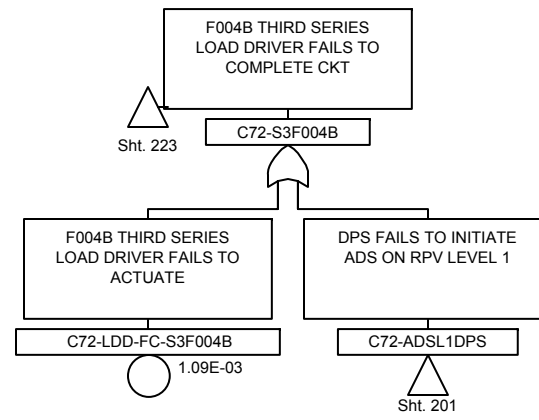


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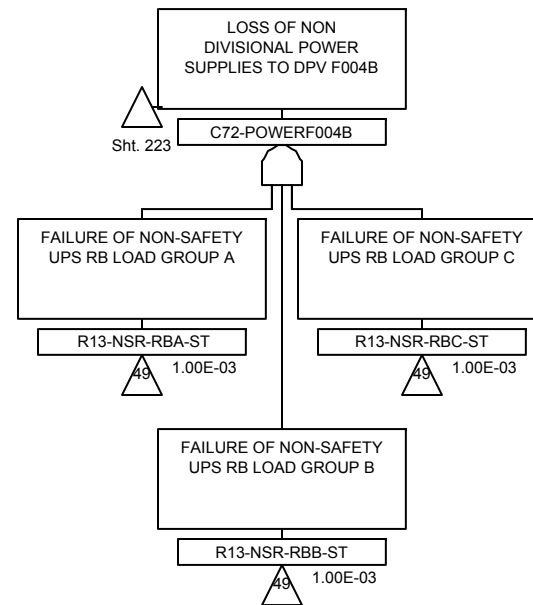


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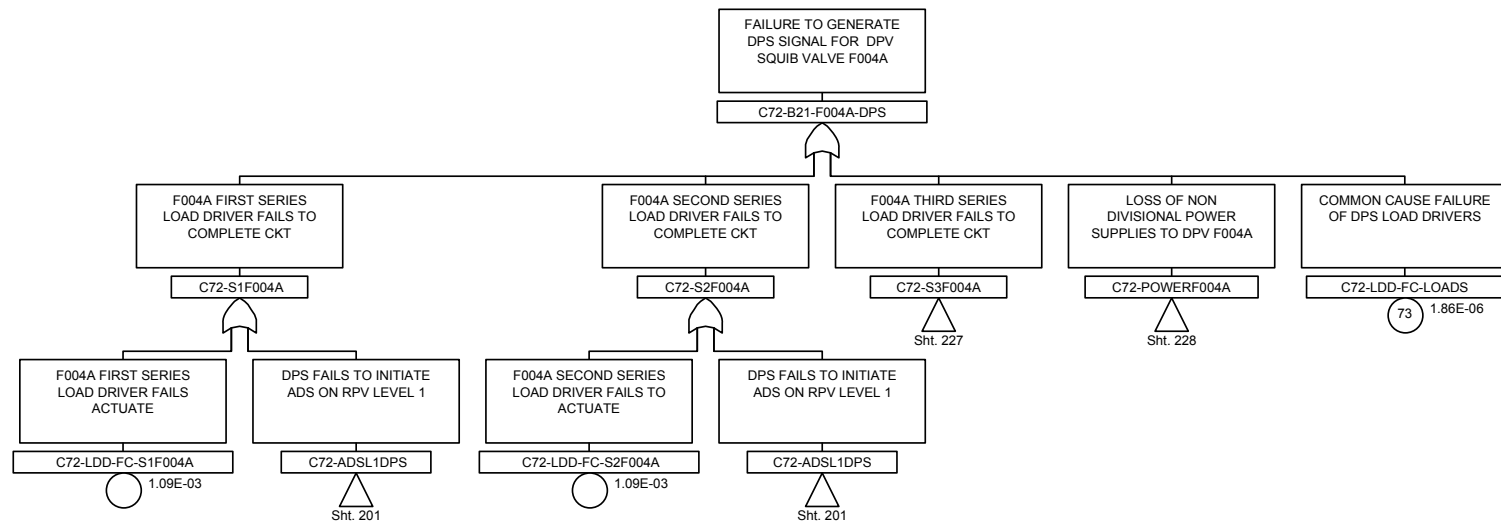


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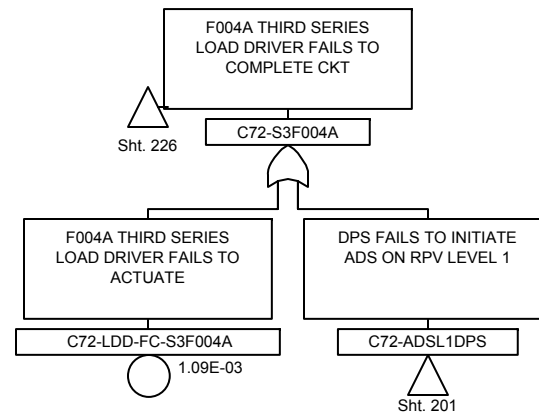


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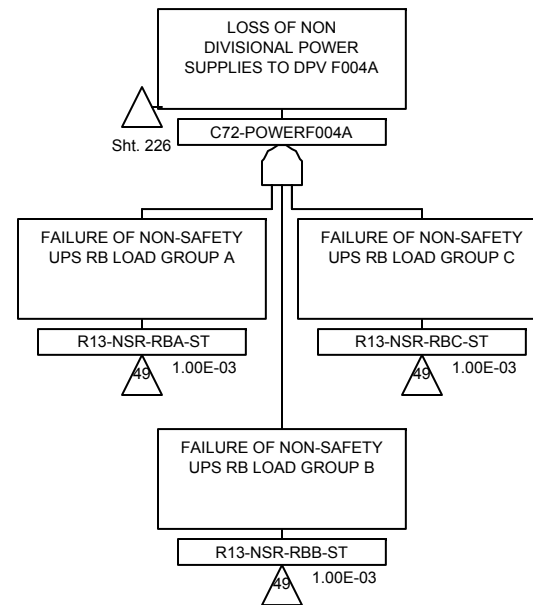


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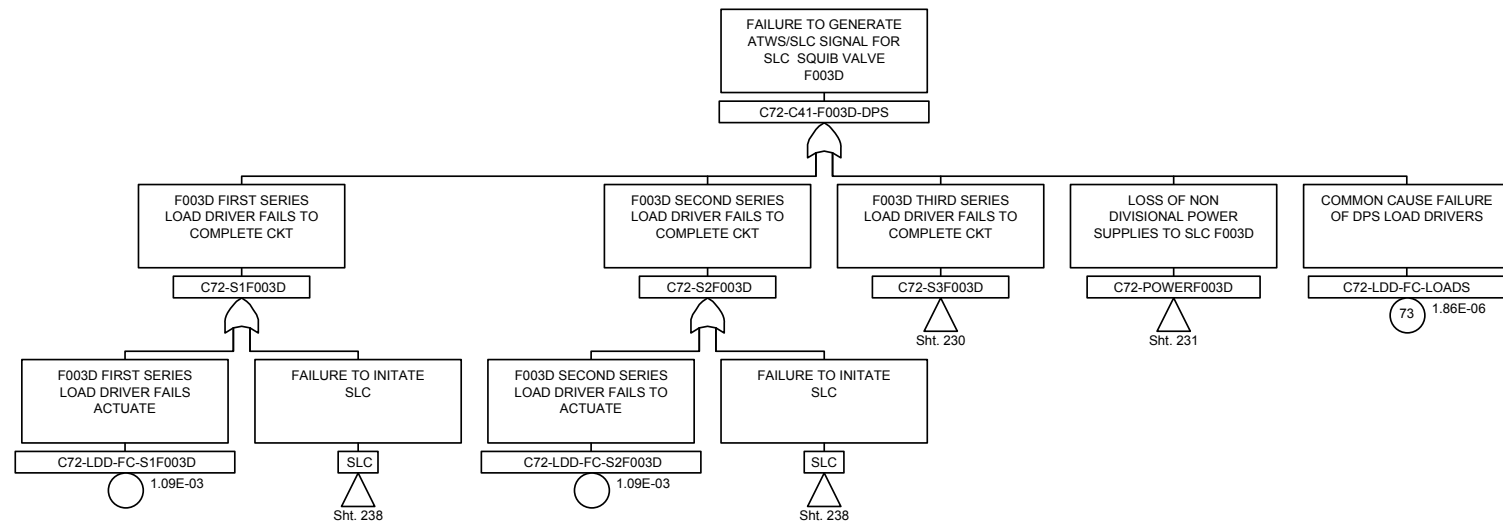


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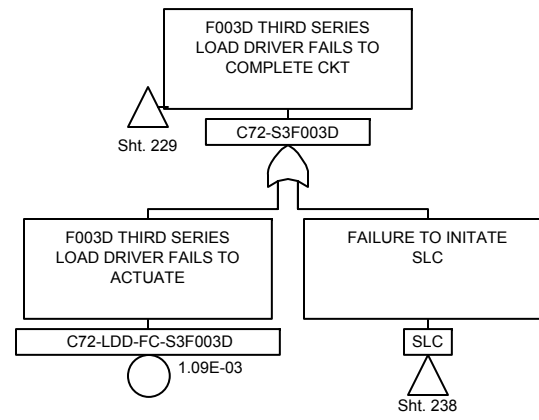


Figure 4.5-3d. Sheet 230 Diverse Protection System



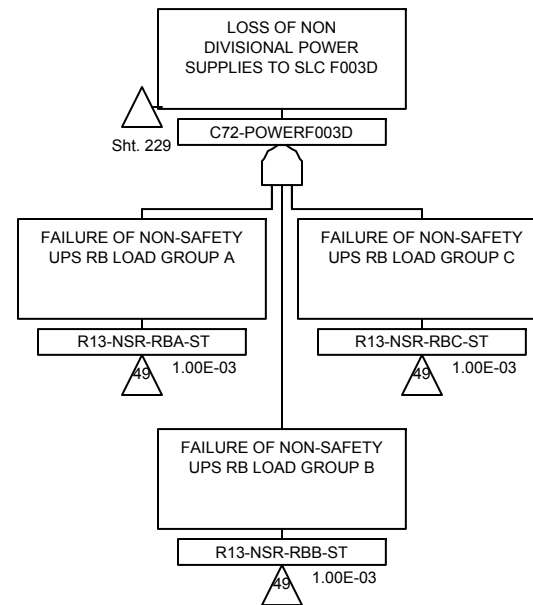


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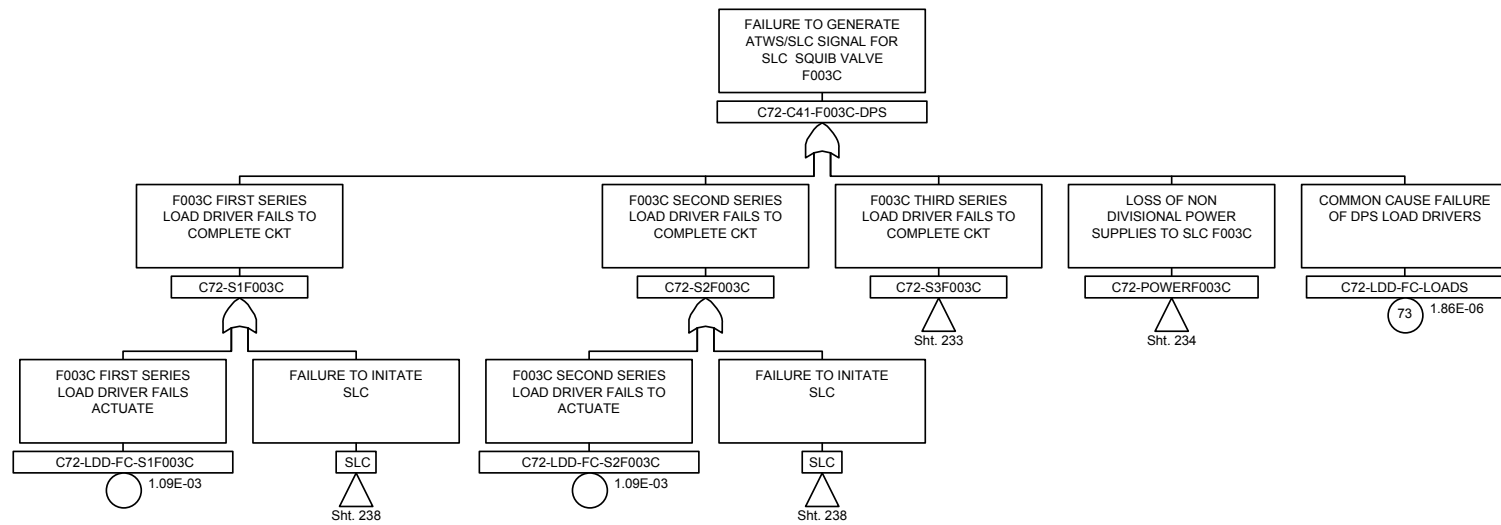


Figure 4.5-3d. Sheet 232 Diverse Protection System

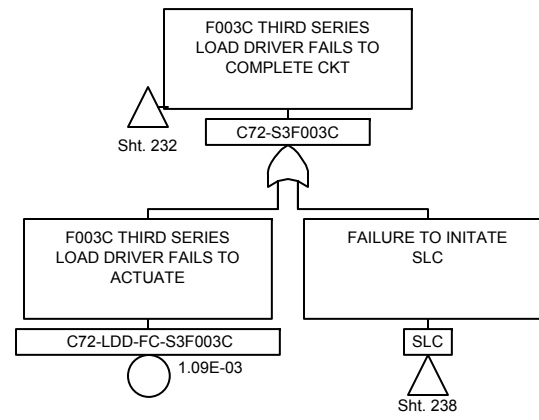


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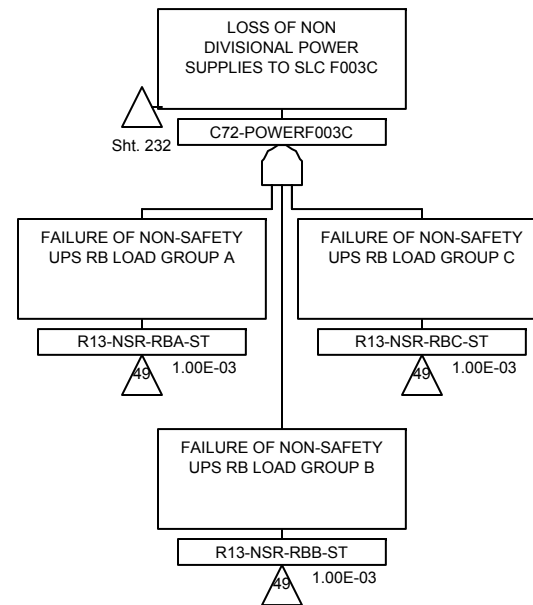


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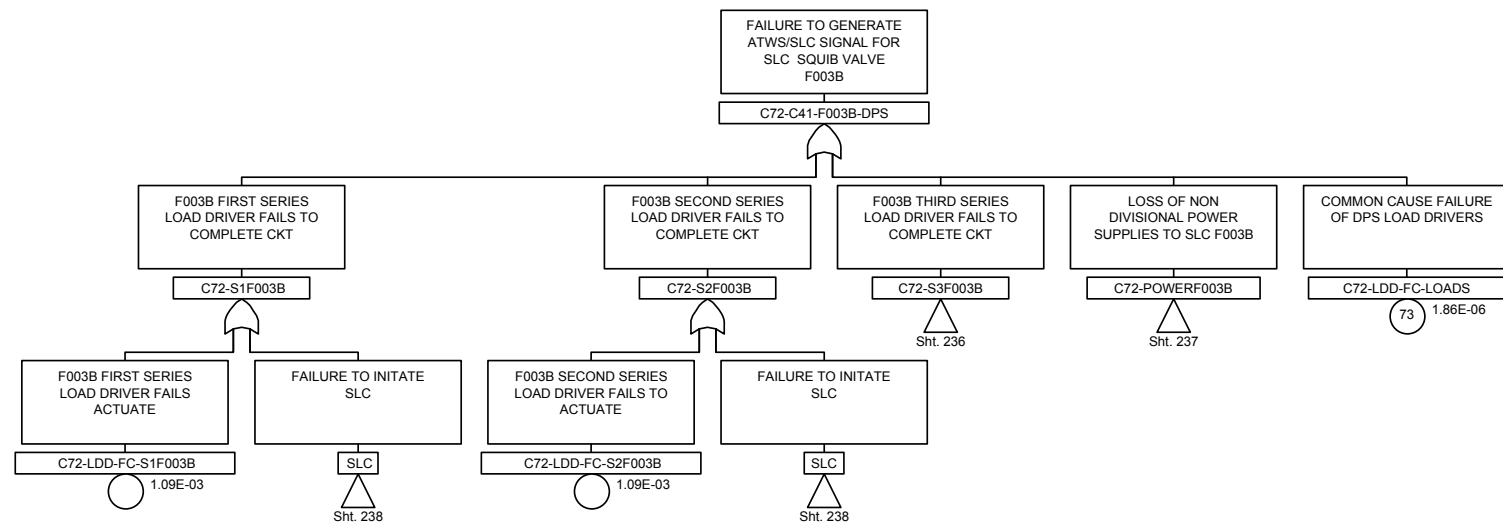


Figure 4.5-3d. Sheet 235 Diverse Protection System

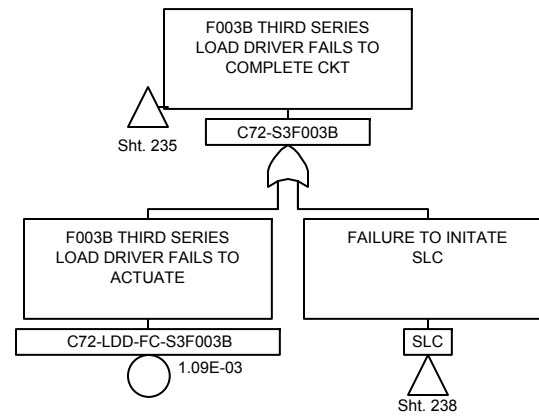


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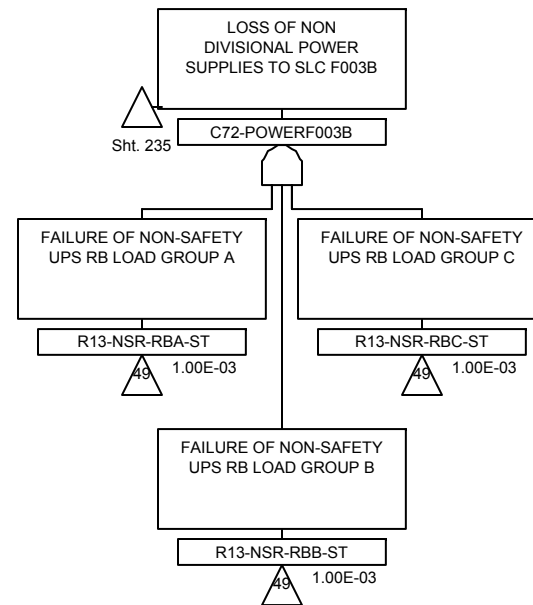


Figure 4.5-3d. Sheet 237 Diverse Protection System





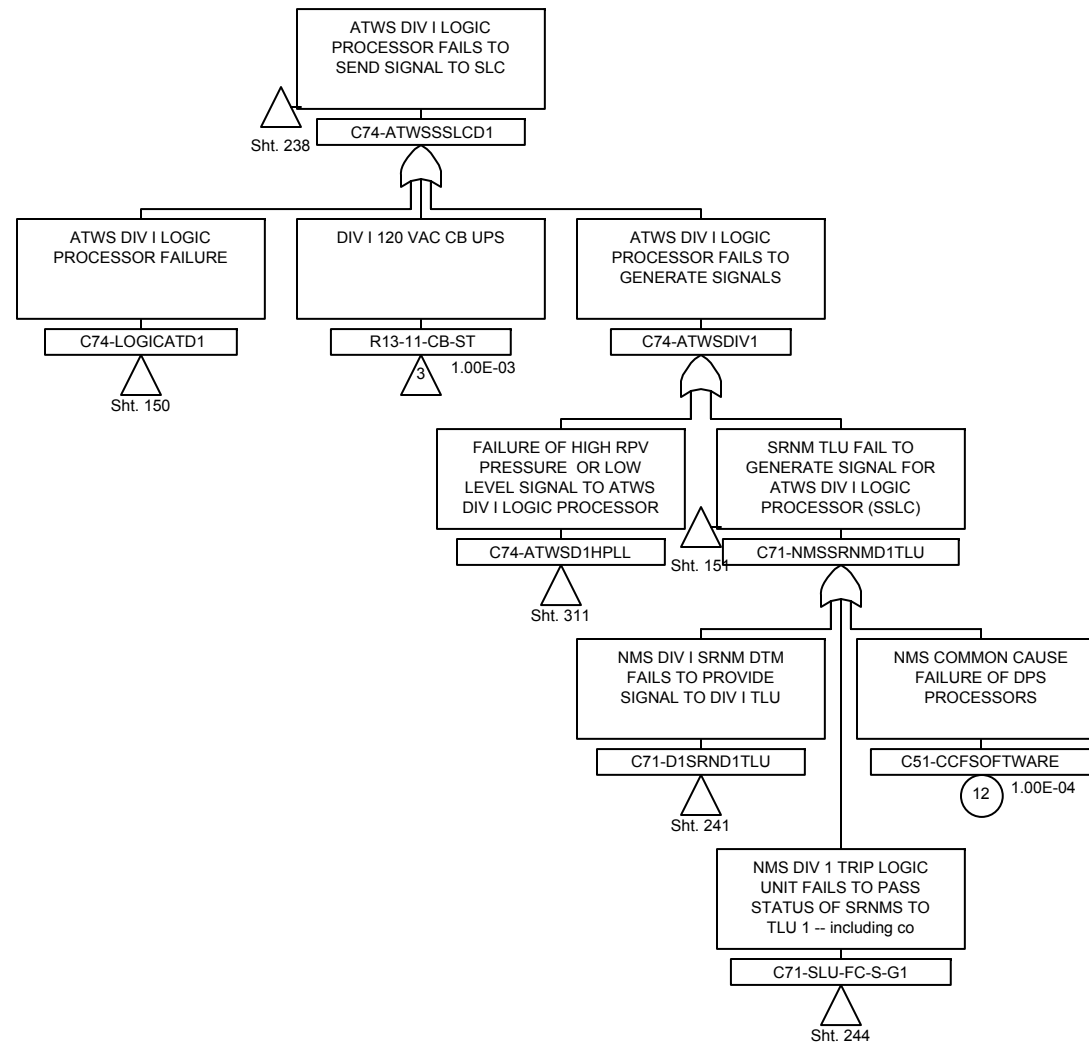


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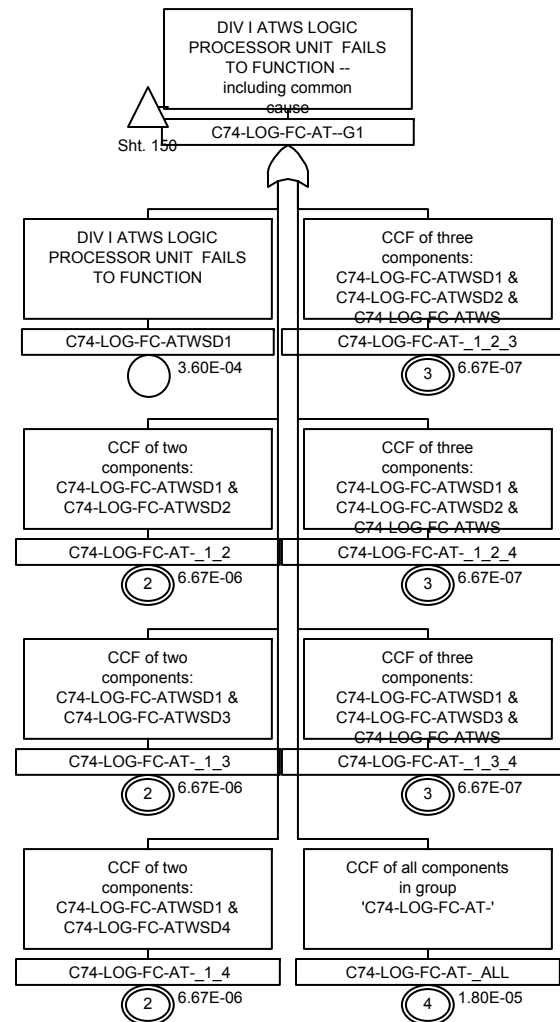


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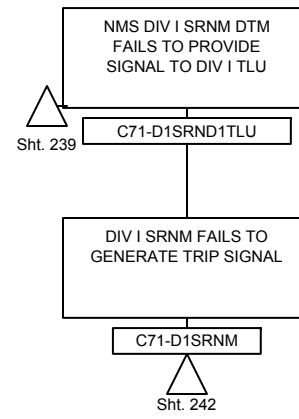


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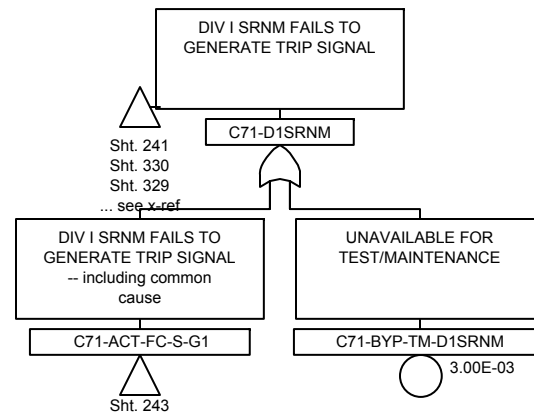


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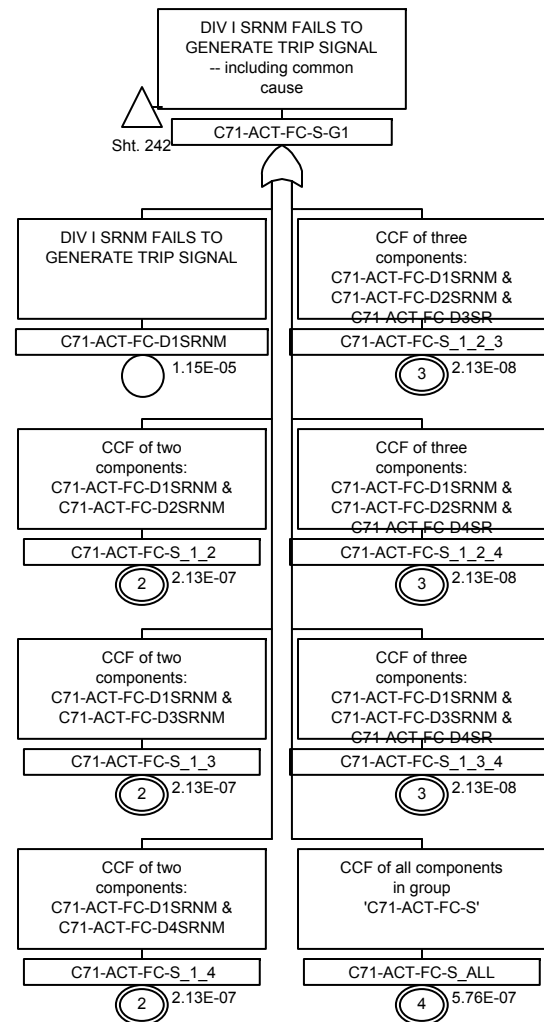


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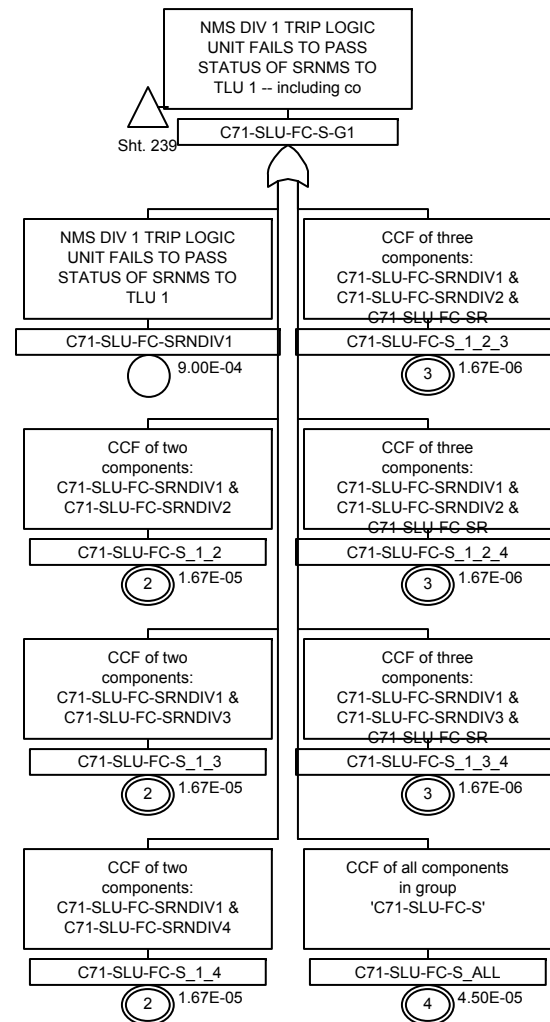


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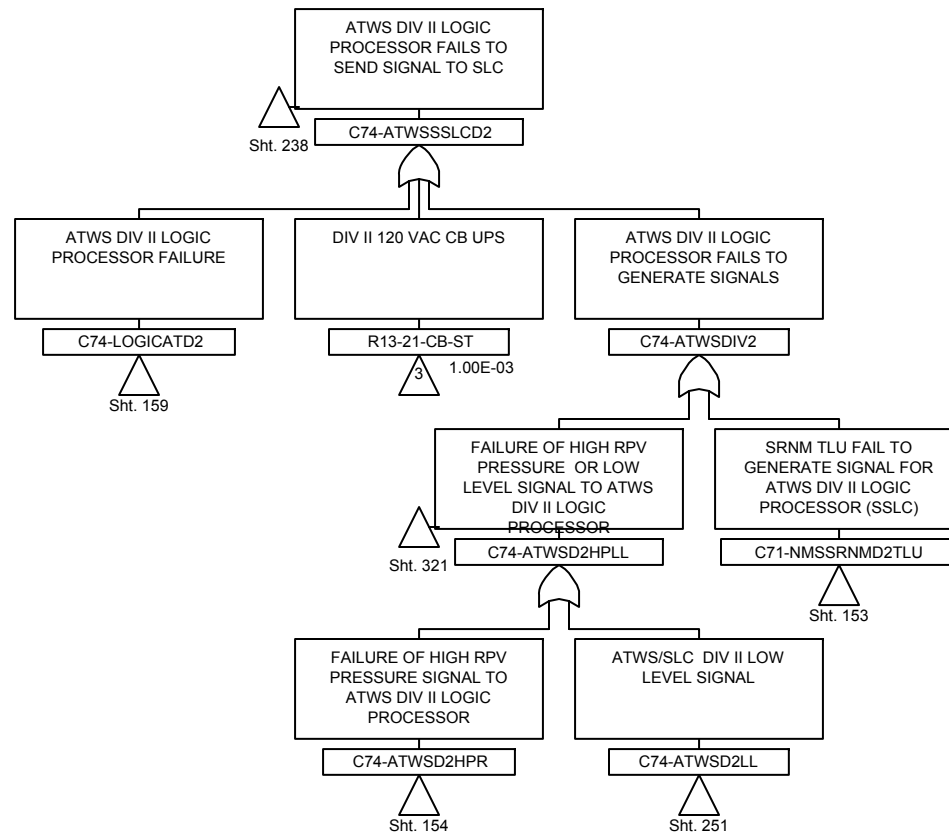


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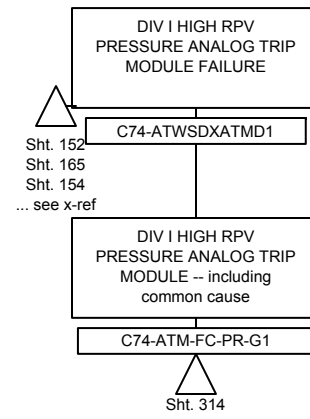


Figure 4.5-3d. Sheet 246 Diverse Protection System



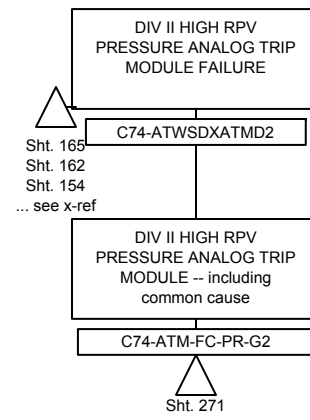


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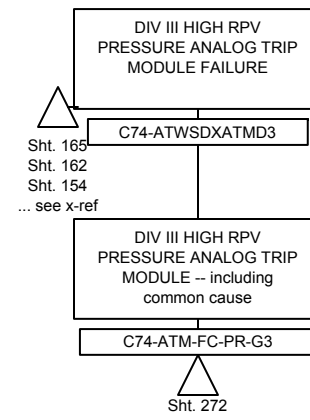


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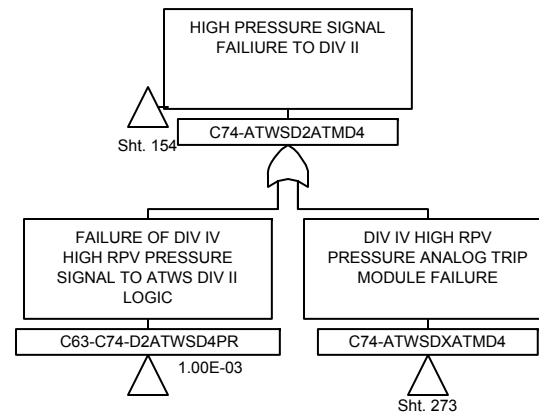


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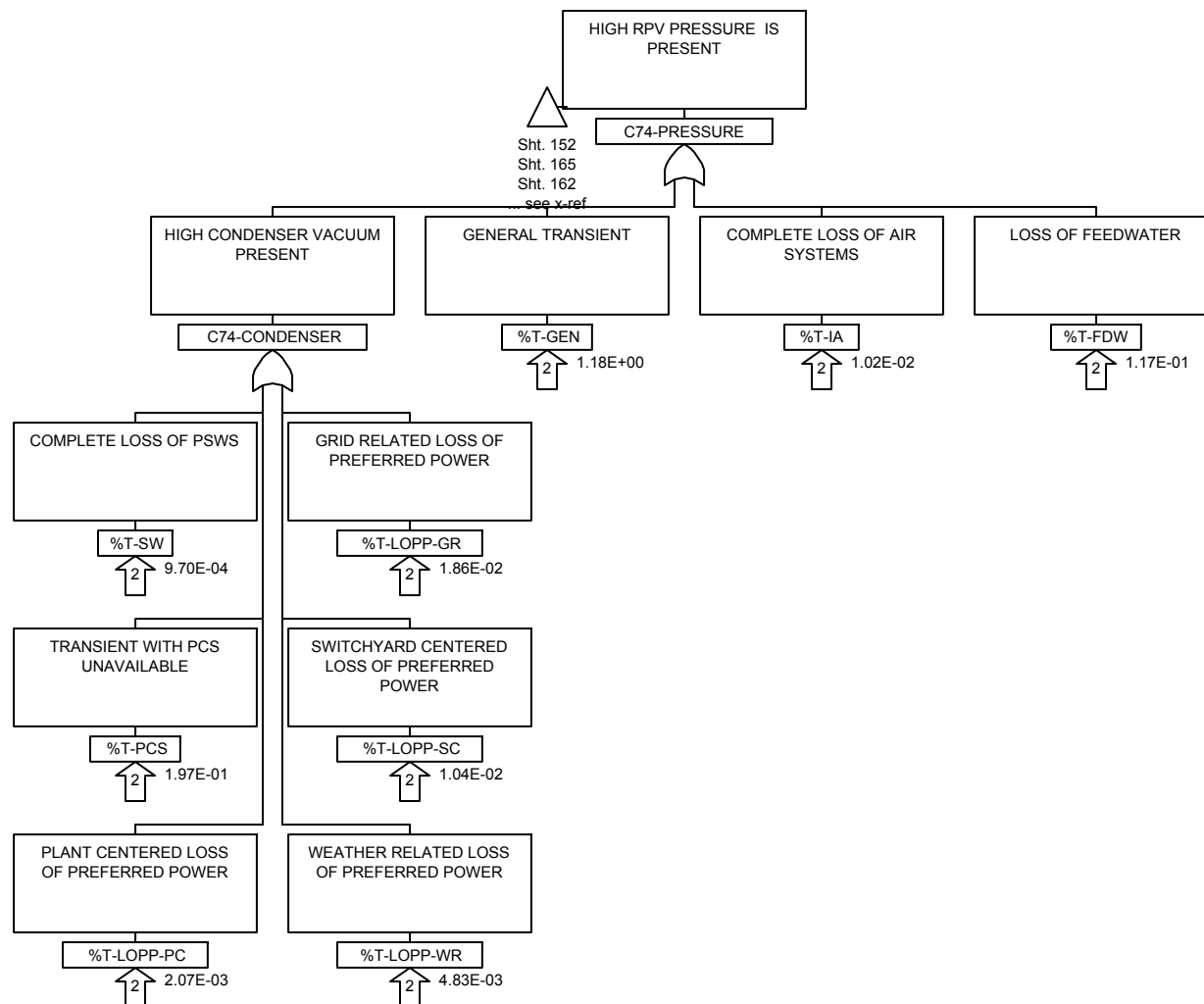


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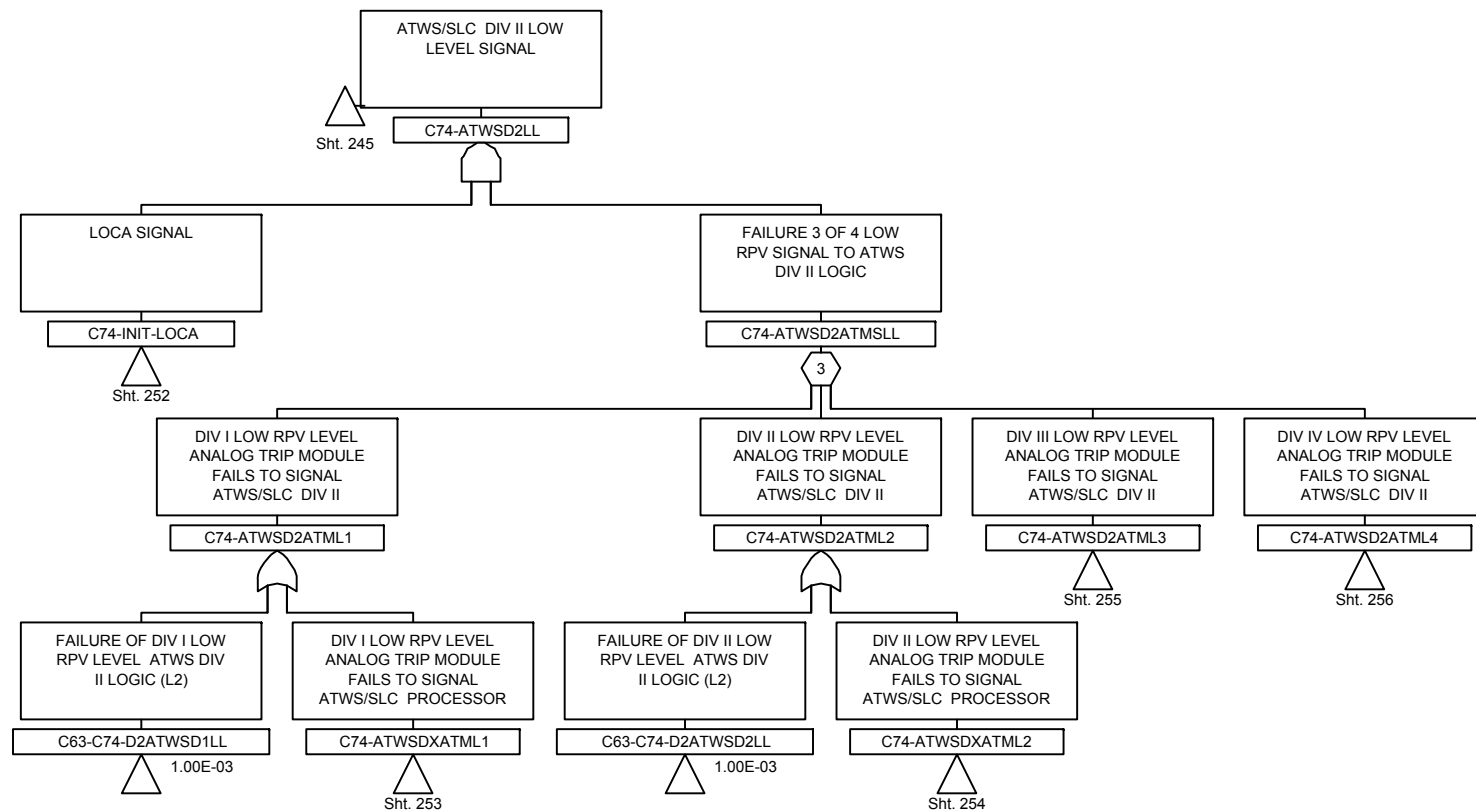


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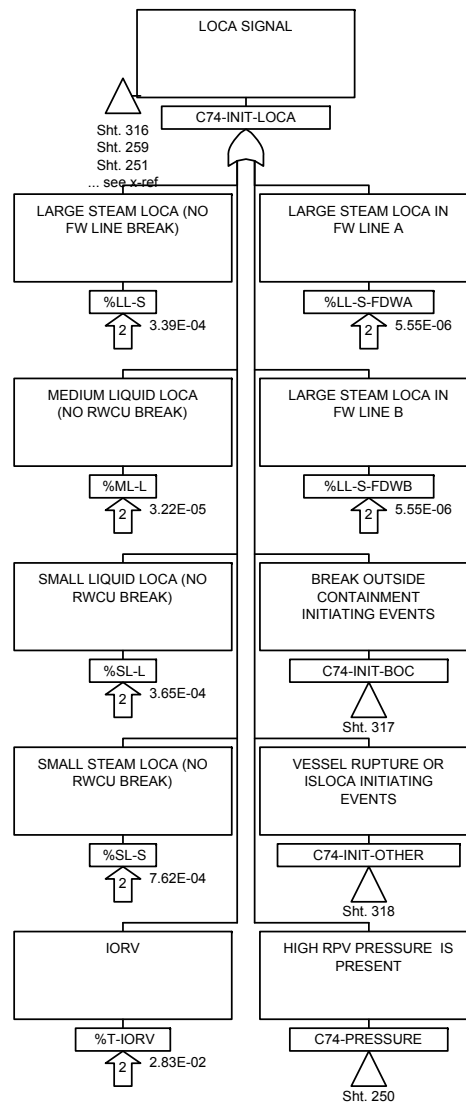


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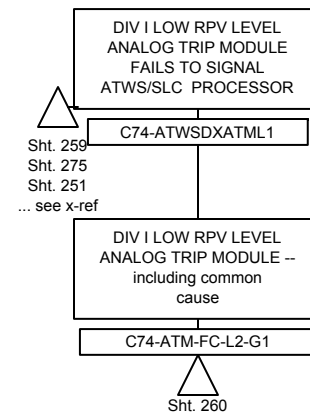


Figure 4.5-3d. Sheet 253 Diverse Protection System

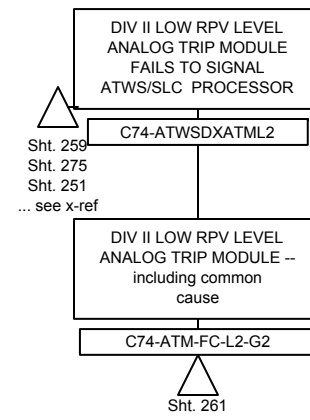


Figure 4.5-3d. Sheet 254 Diverse Protection System



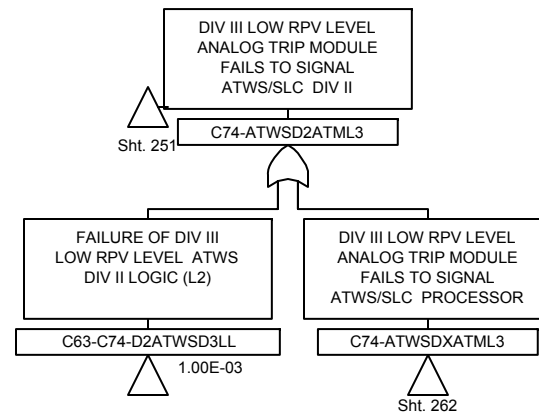


Figure 4.5-3d. Sheet 255 Diverse Protection System

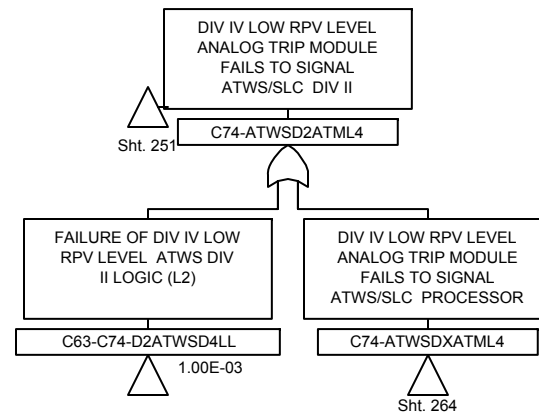


Figure 4.5-3d. Sheet 256 Diverse Protection System

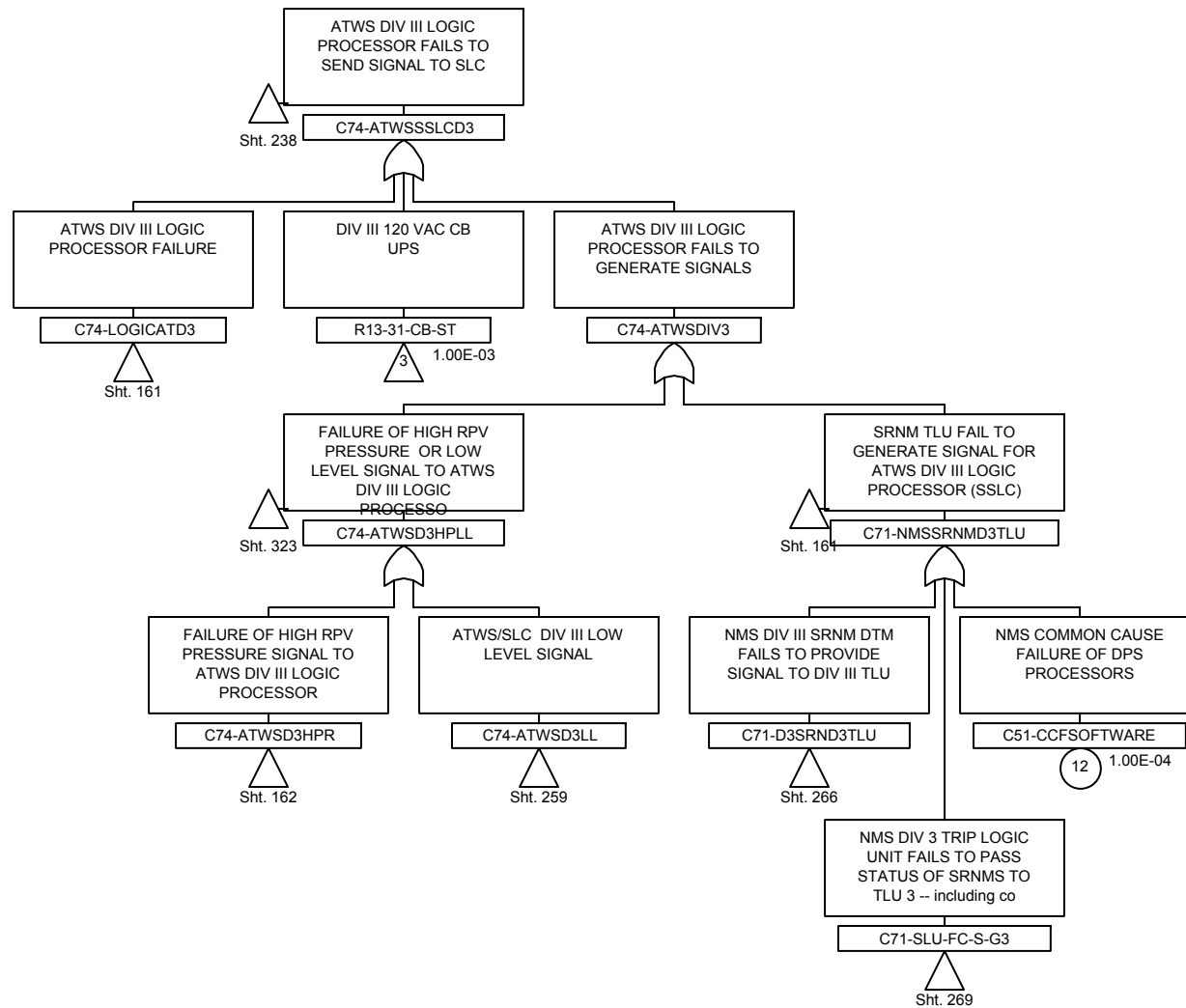


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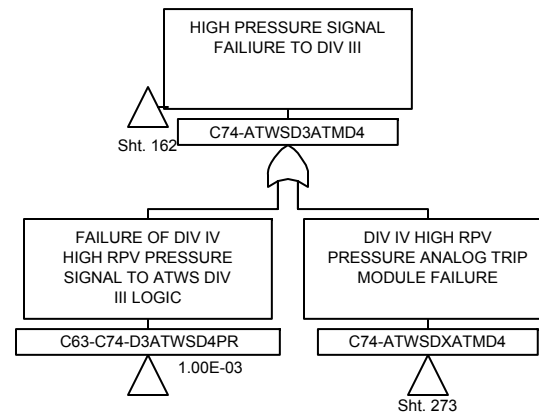


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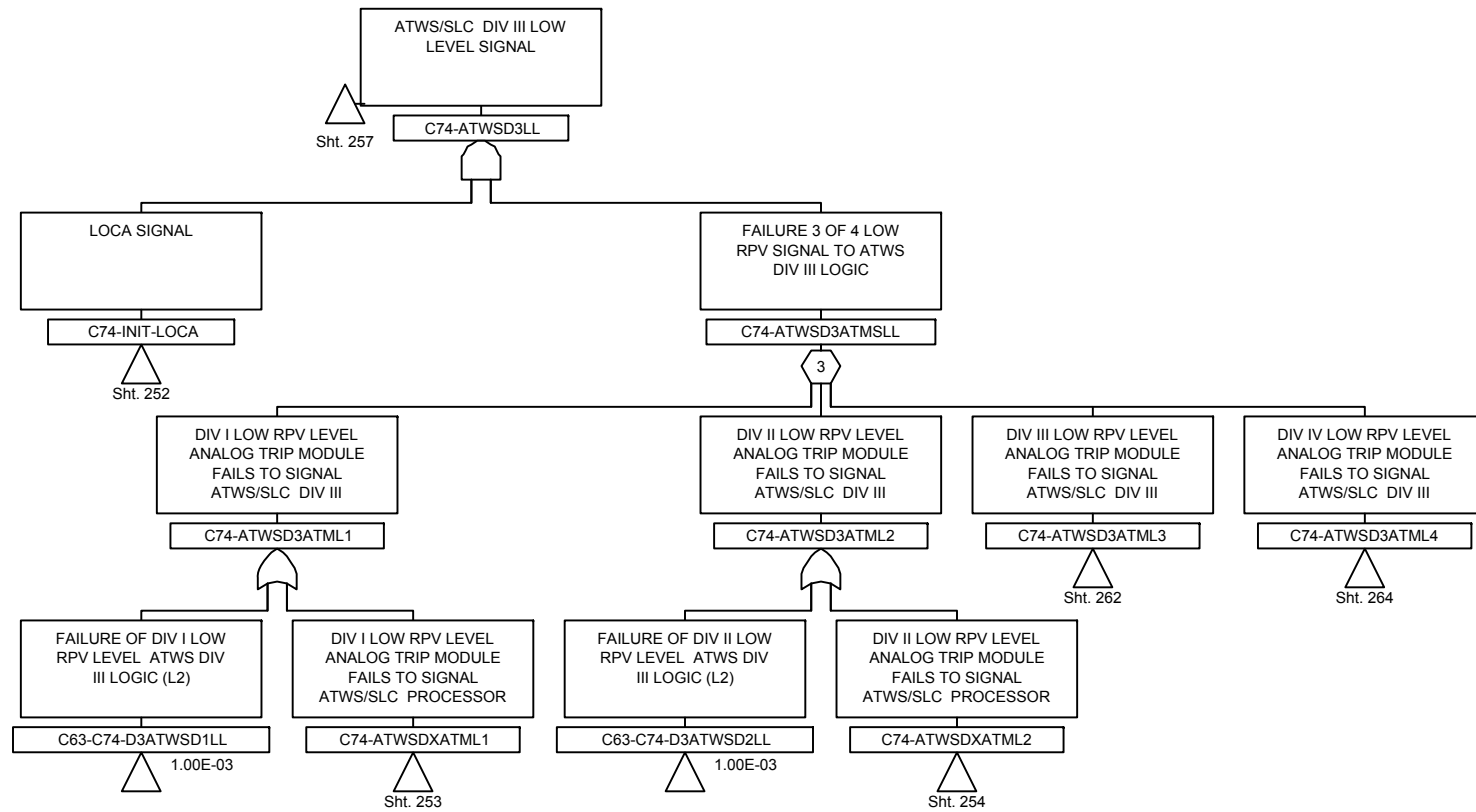


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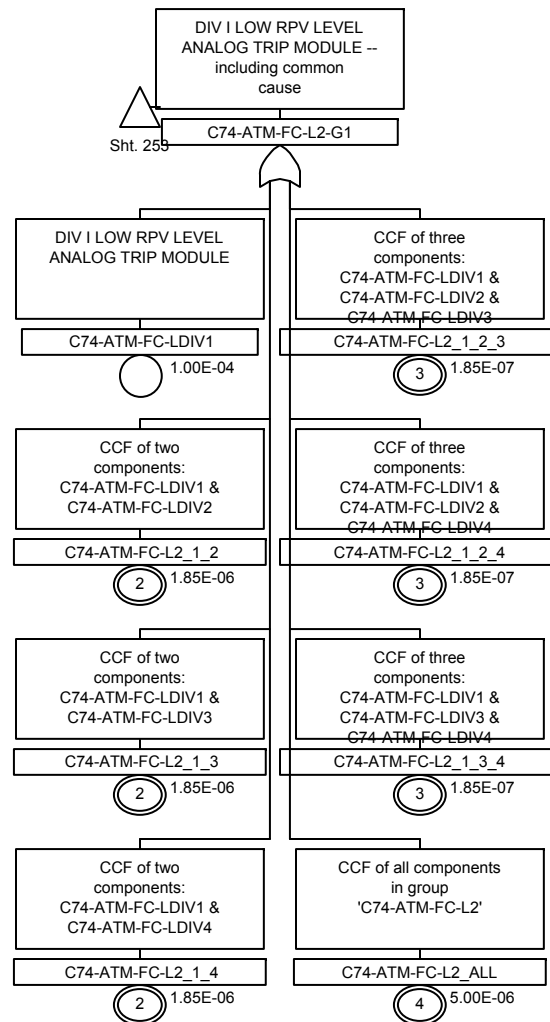


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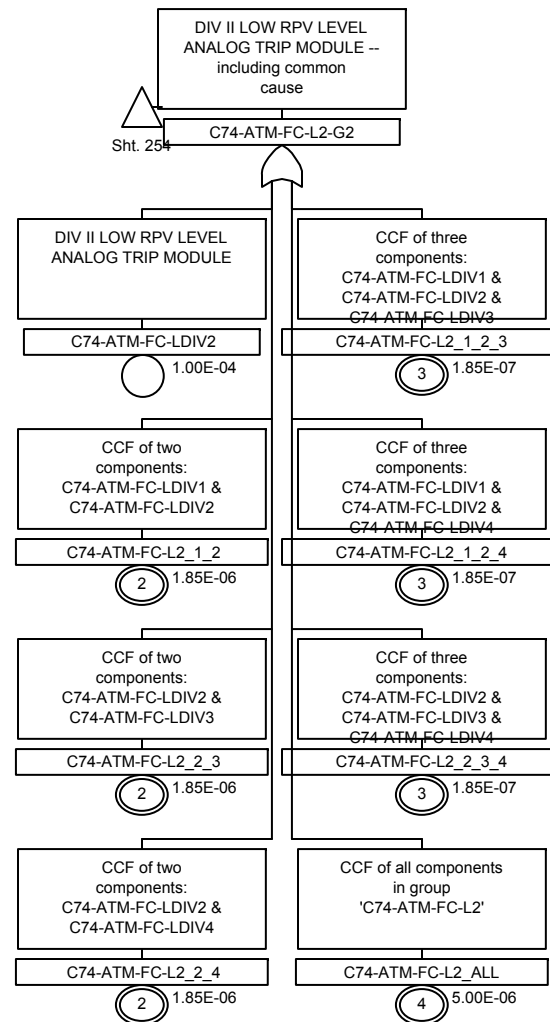


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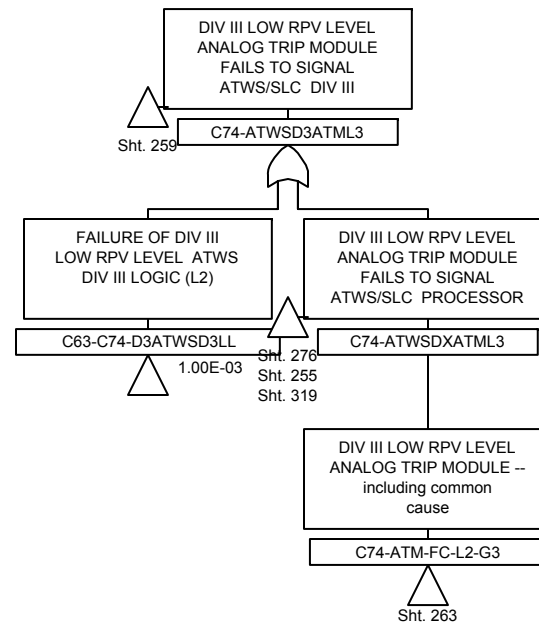


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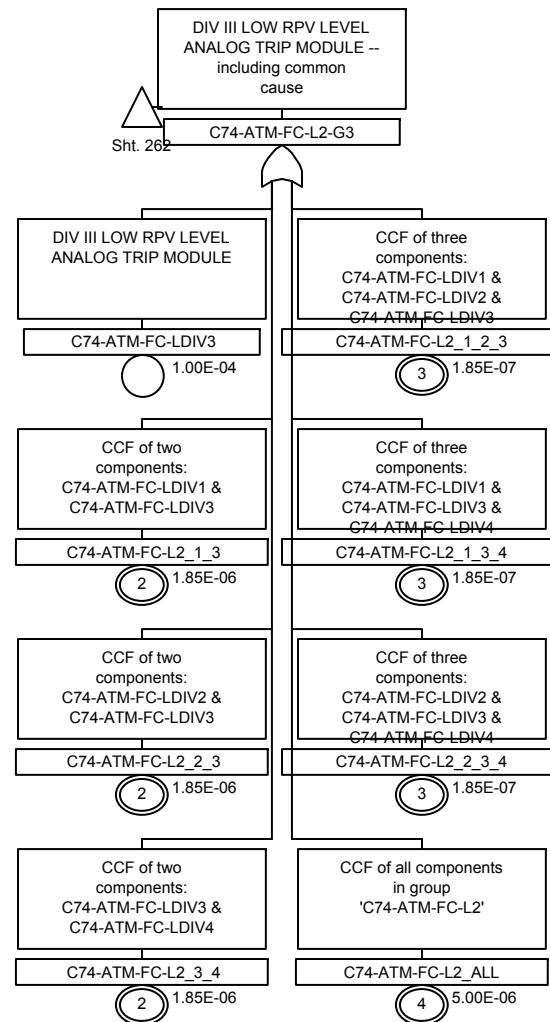


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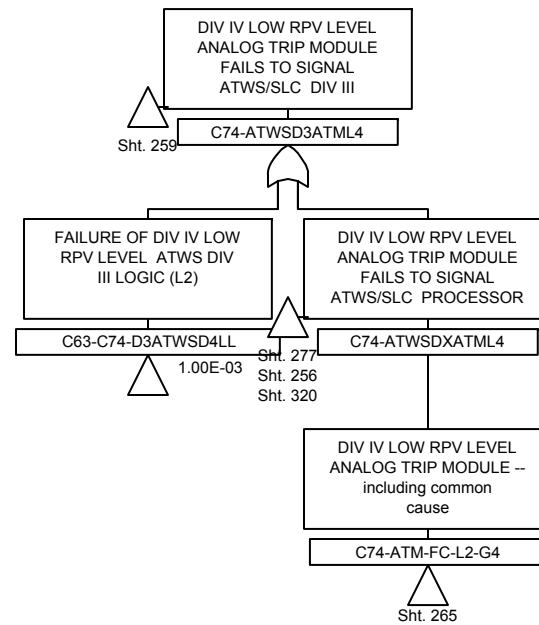


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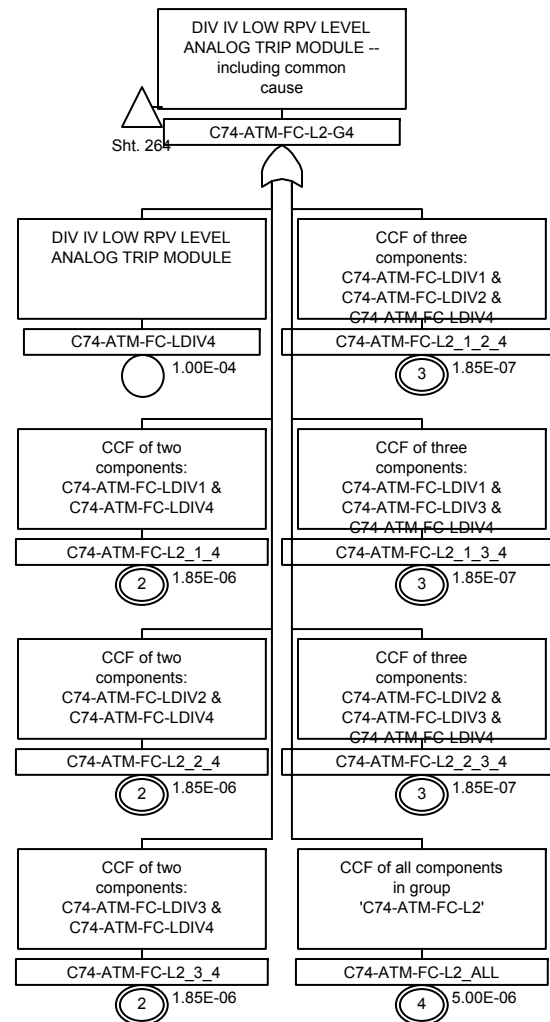


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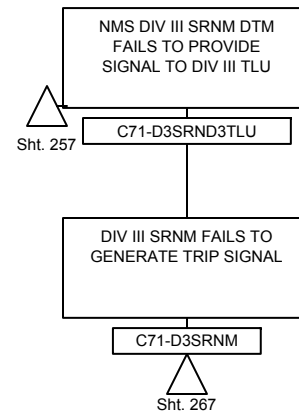


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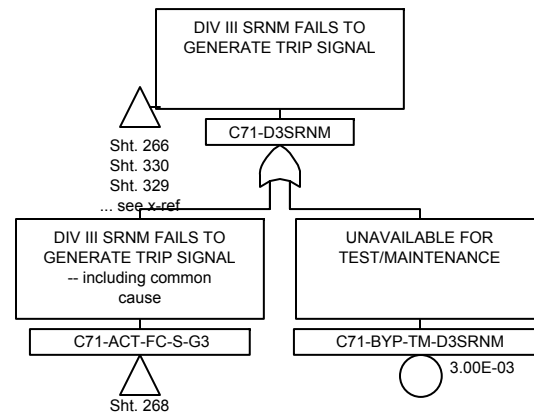


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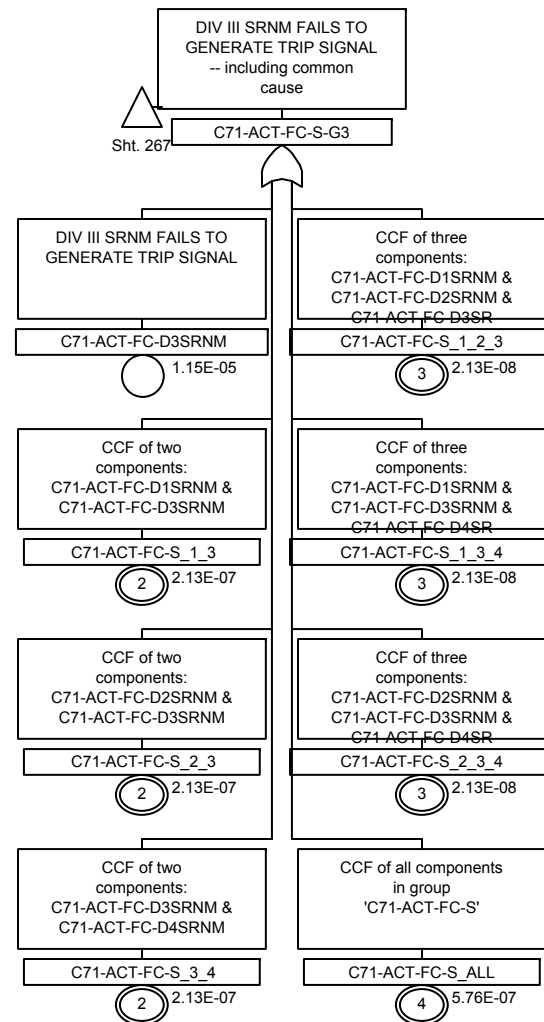


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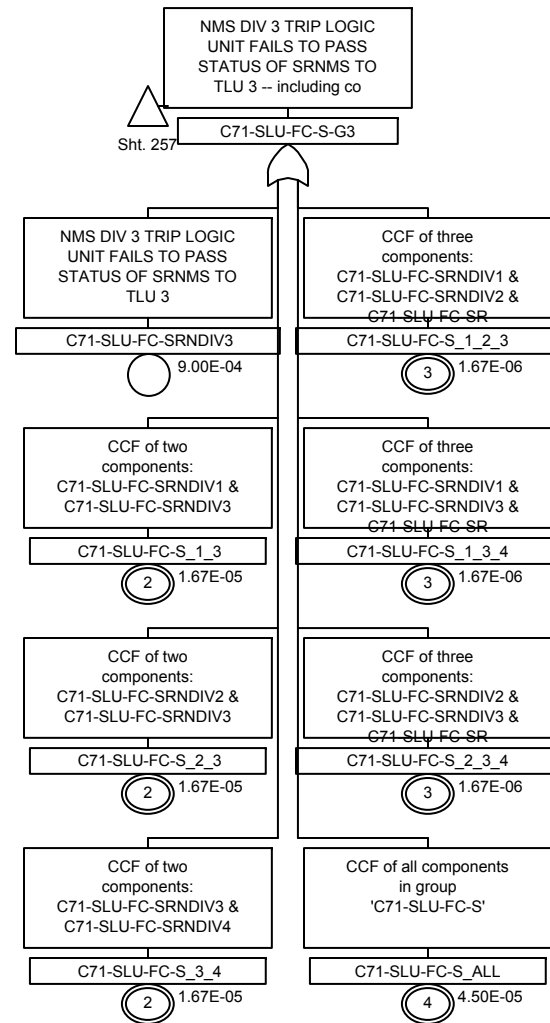


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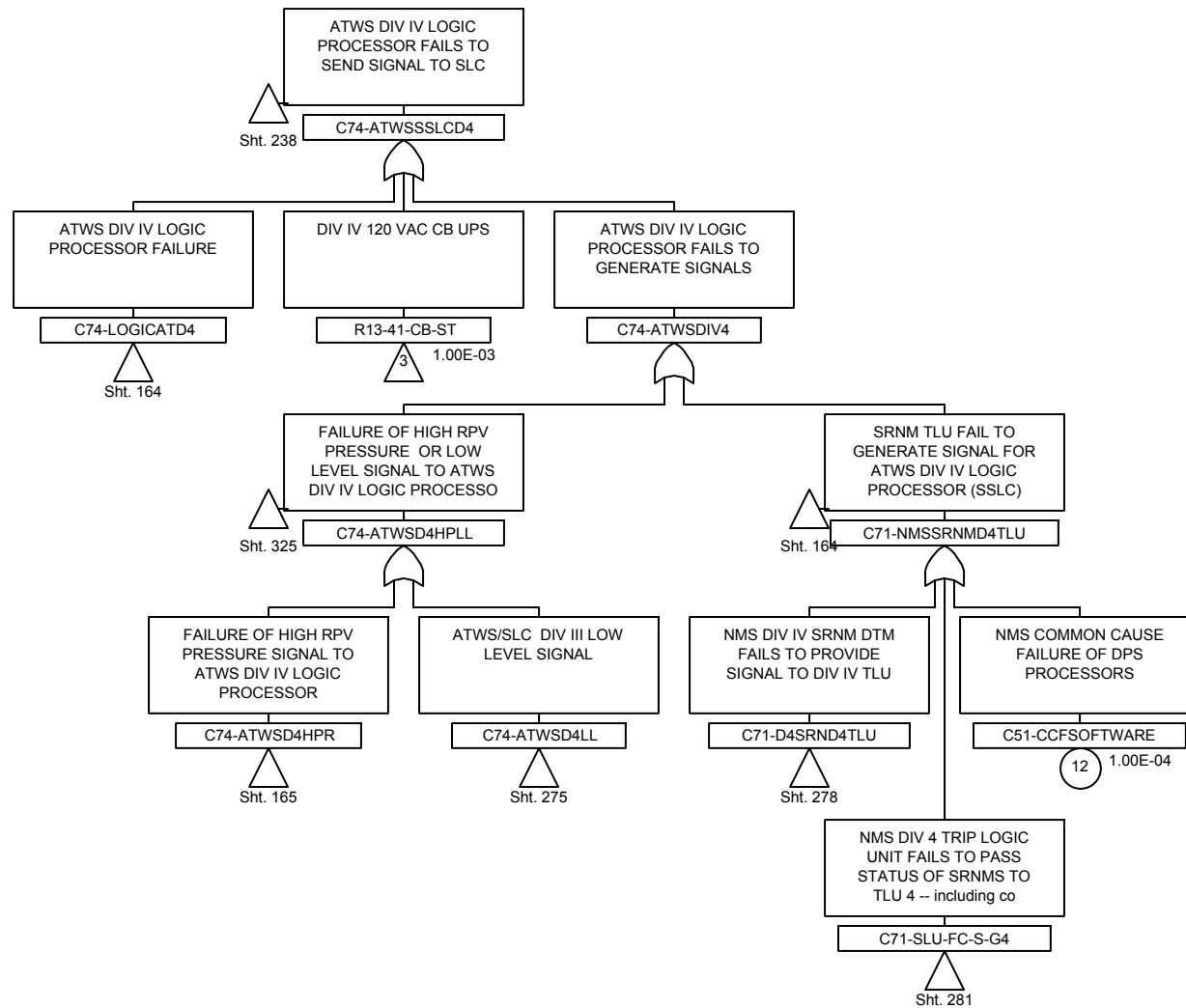


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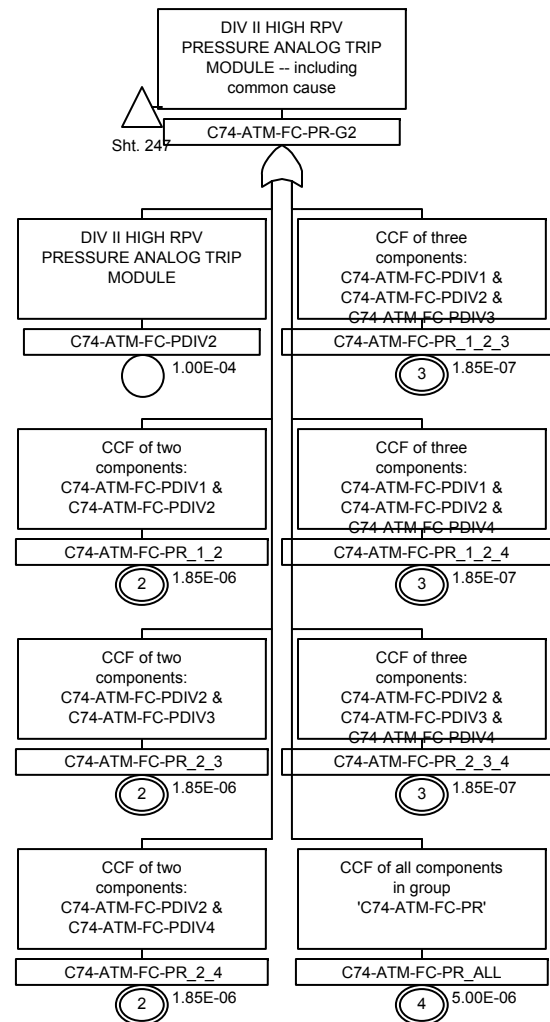


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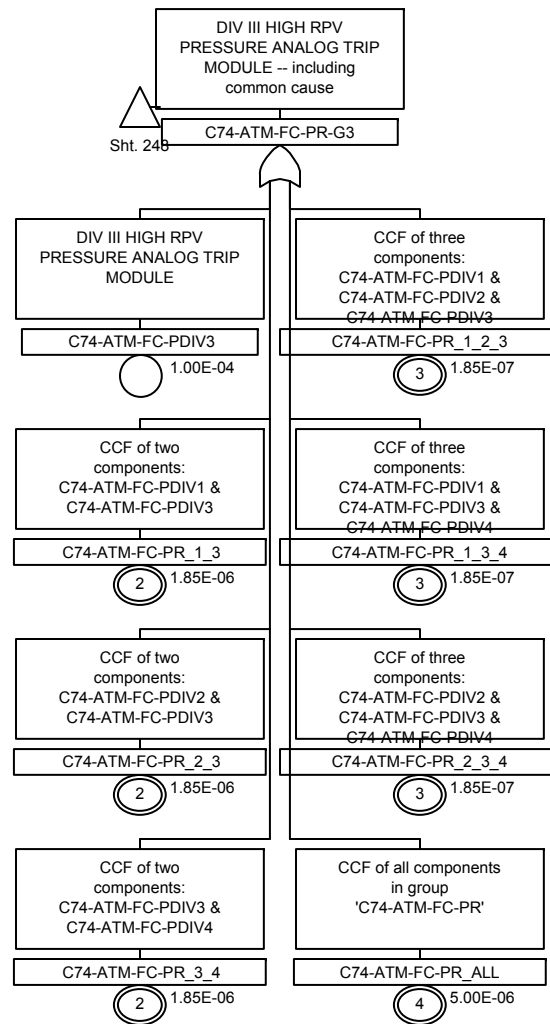


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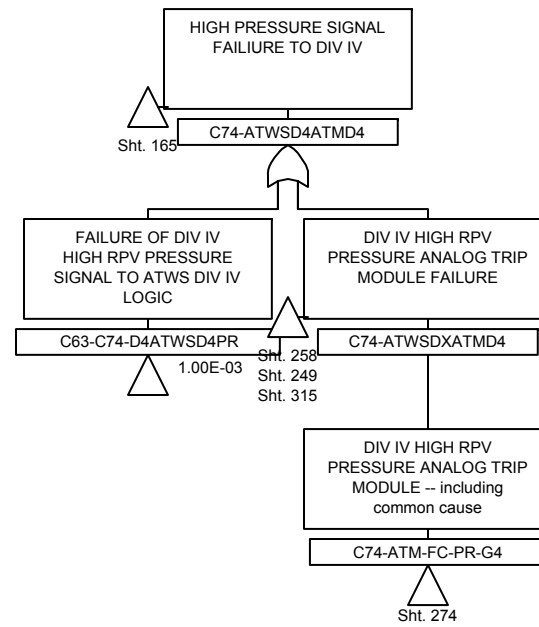


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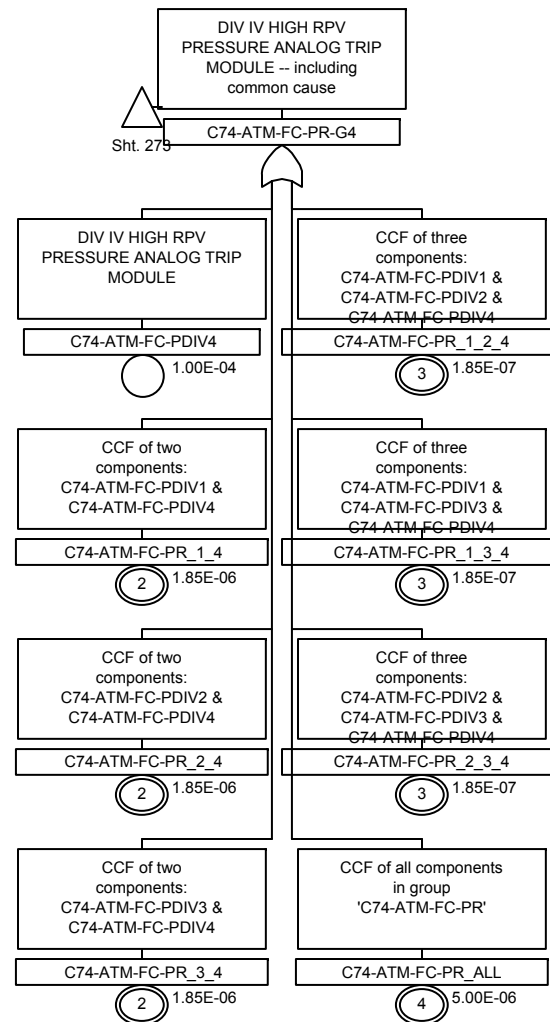


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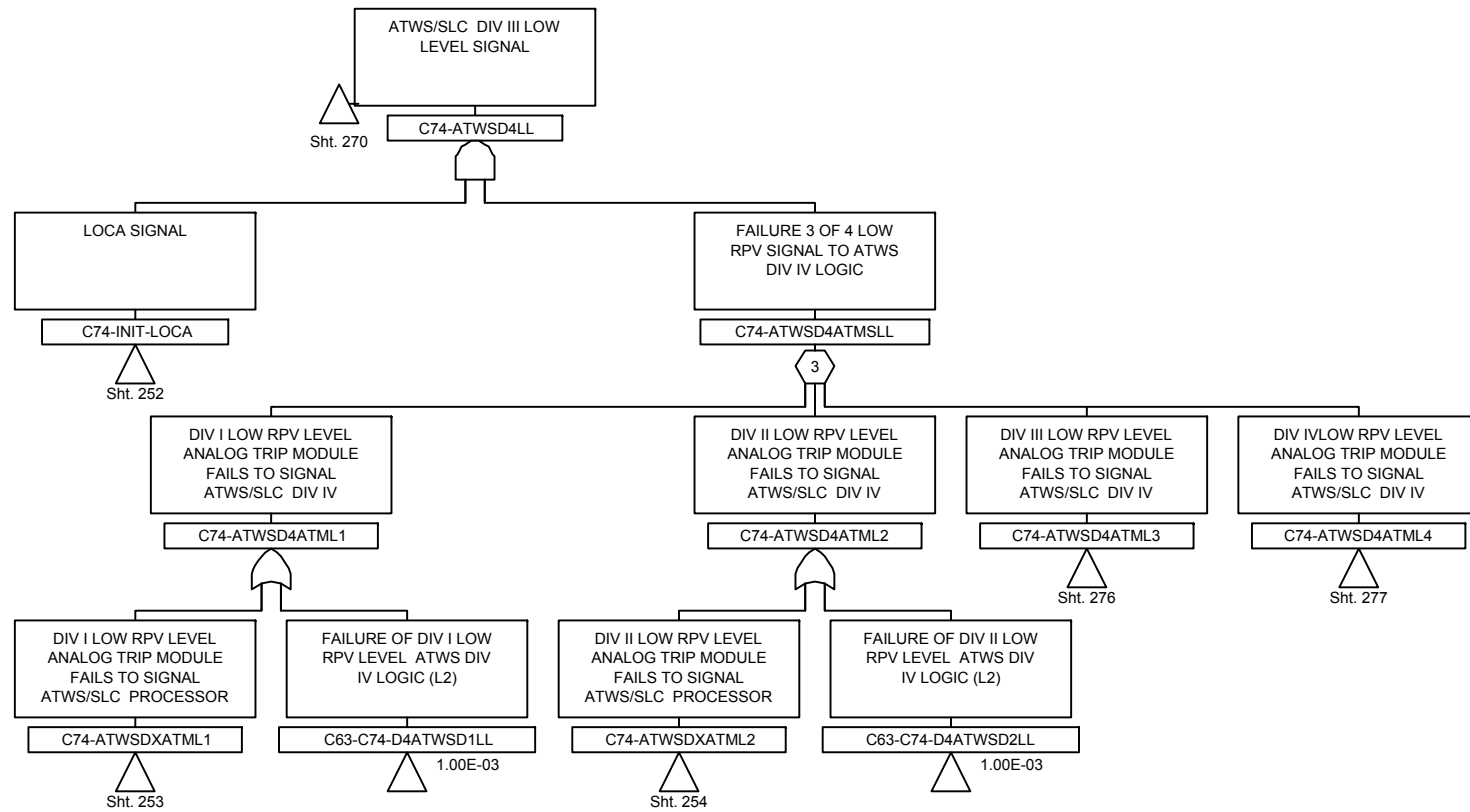


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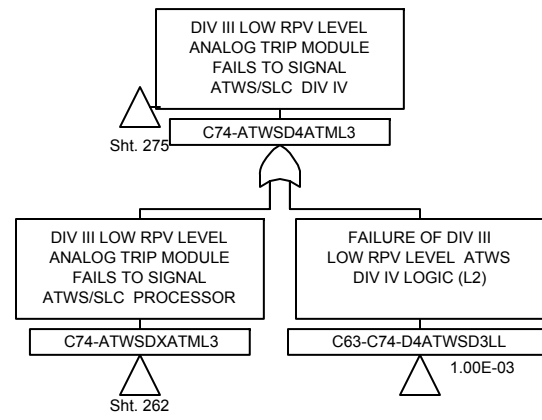


Figure 4.5-3d. Sheet 276 Diverse Protection System

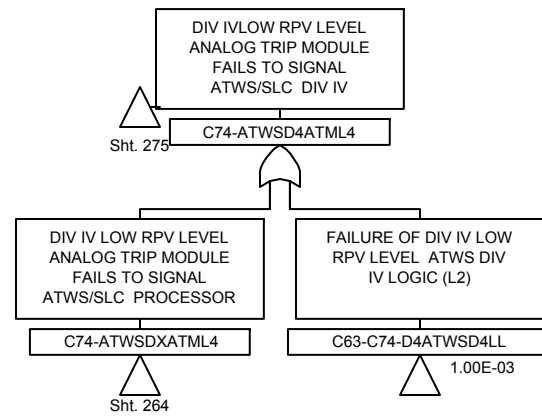


Figure 4.5-3d. Sheet 277 Diverse Protection System

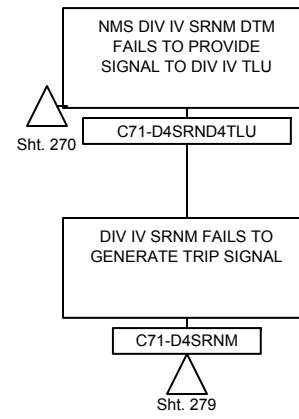


Figure 4.5-3d. Sheet 278 Diverse Protection System



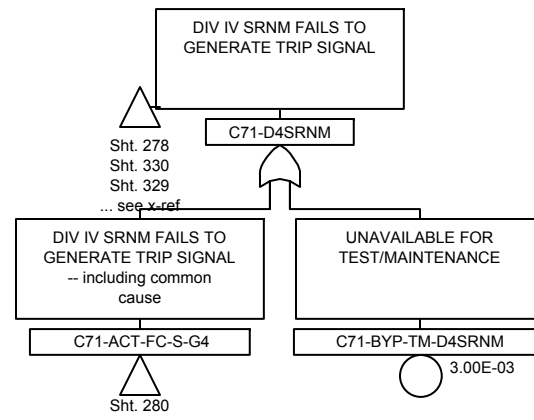


Figure 4.5-3d. Sheet 279 Diverse Protection System

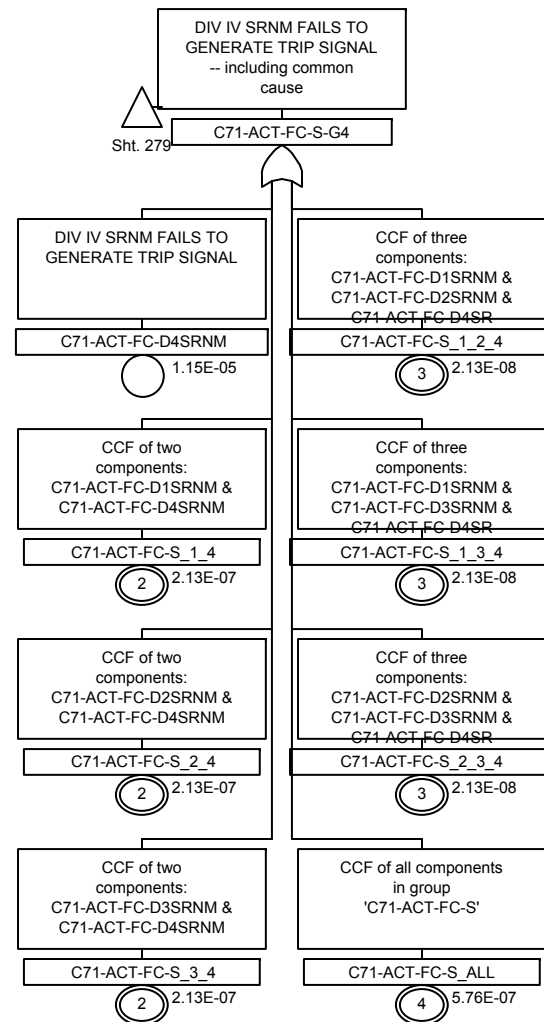


Figure 4.5-3d. Sheet 280 Diverse Protection System

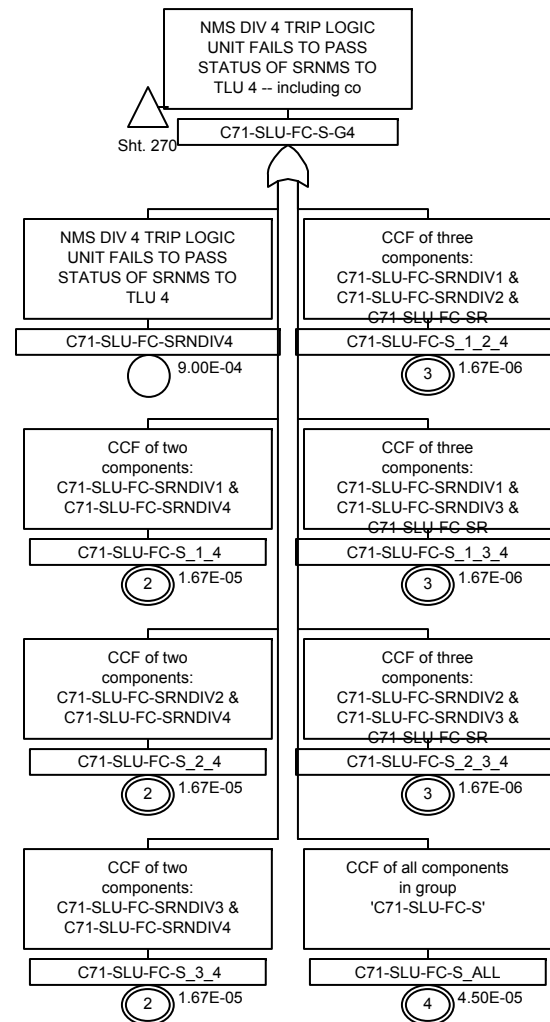


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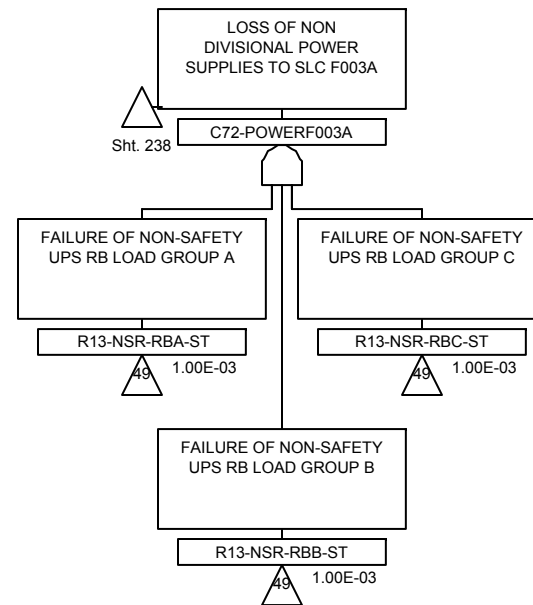


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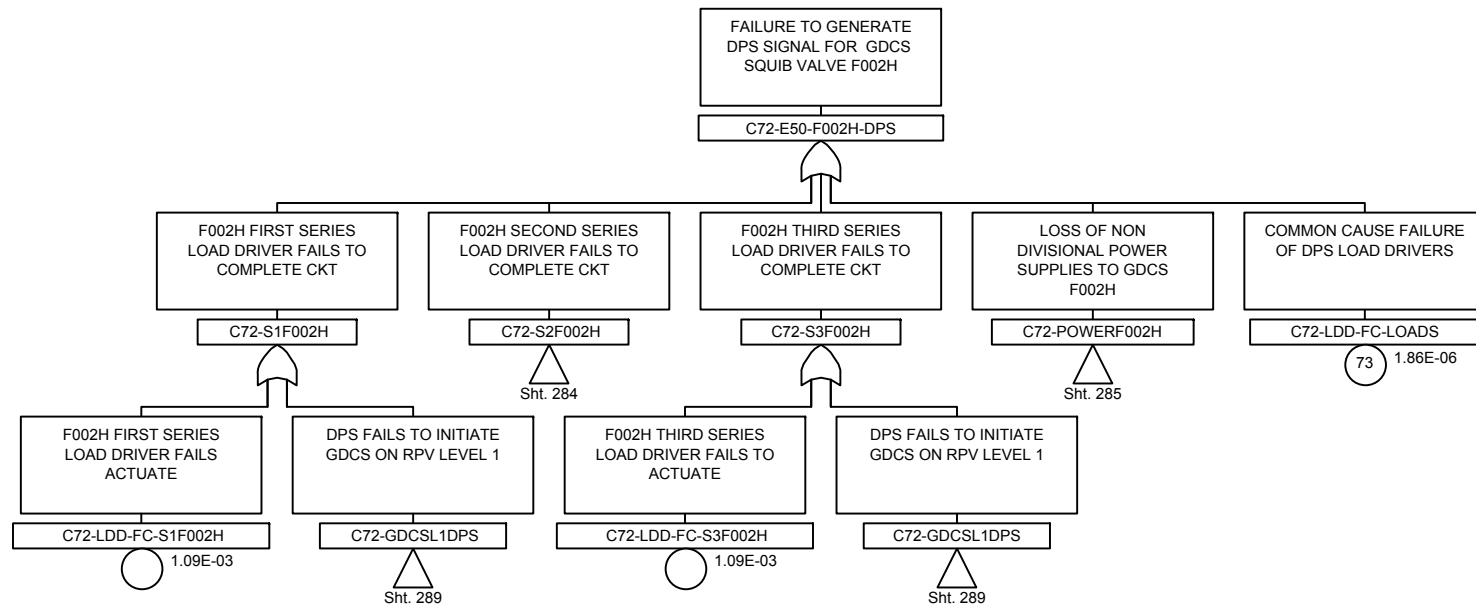


Figure 4.5-3d. Sheet 283 Diverse Protection System

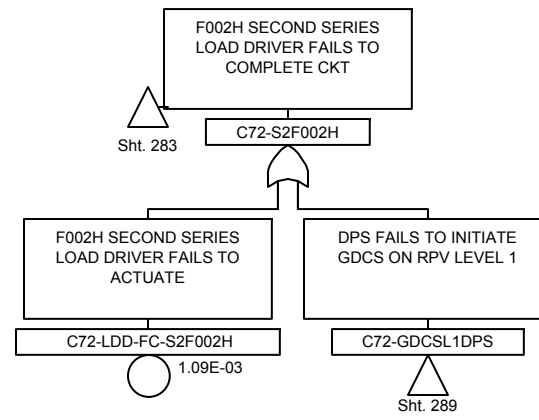


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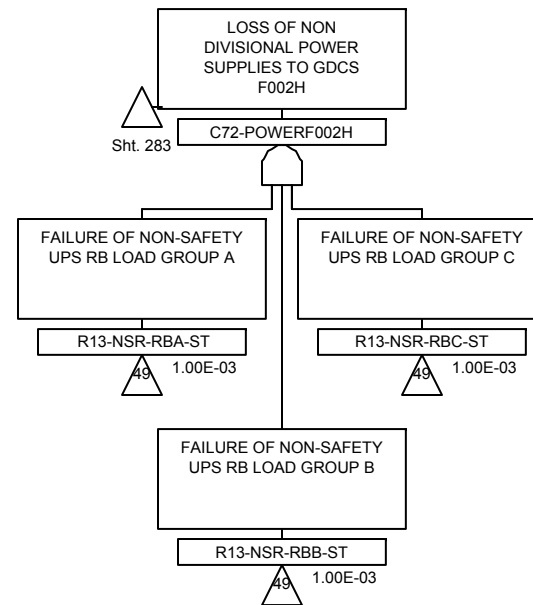


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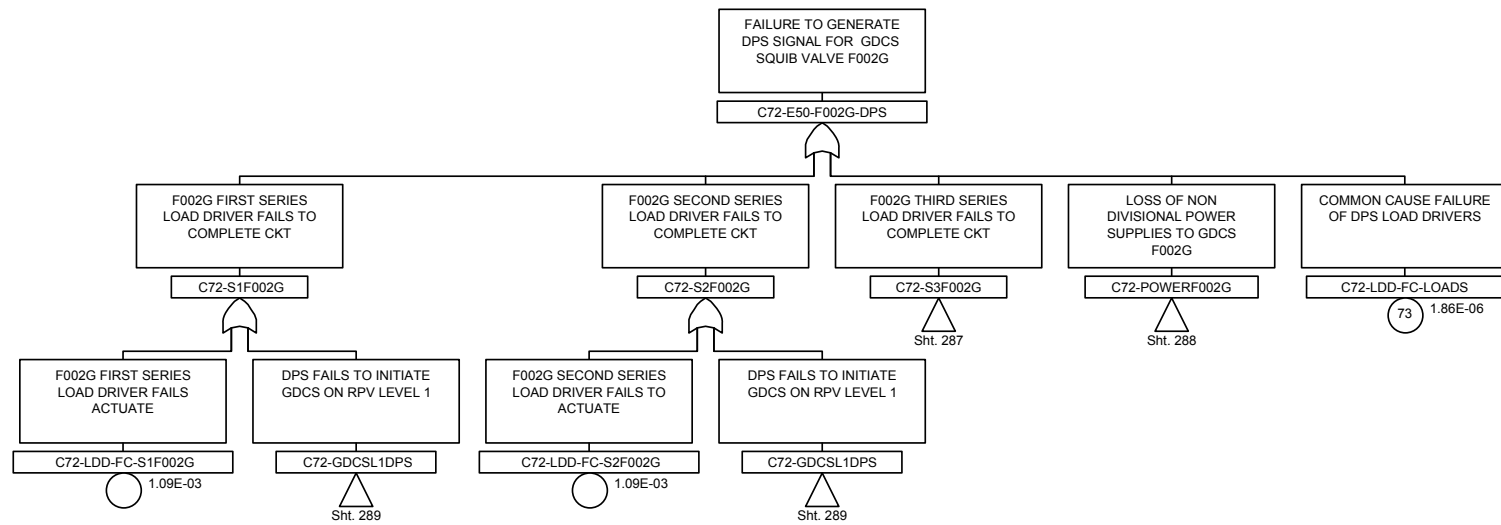


Figure 4.5-3d. Sheet 286 Diverse Protection System



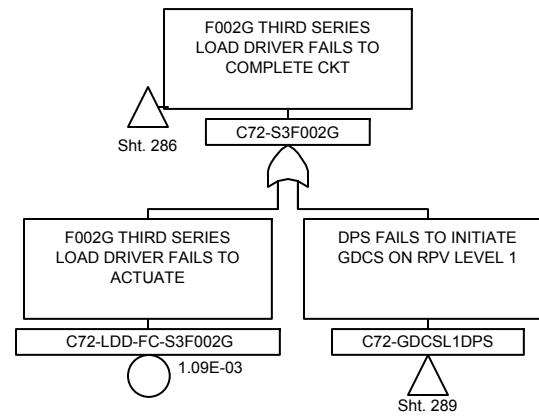


Figure 4.5-3d. Sheet 287 Diverse Protection System

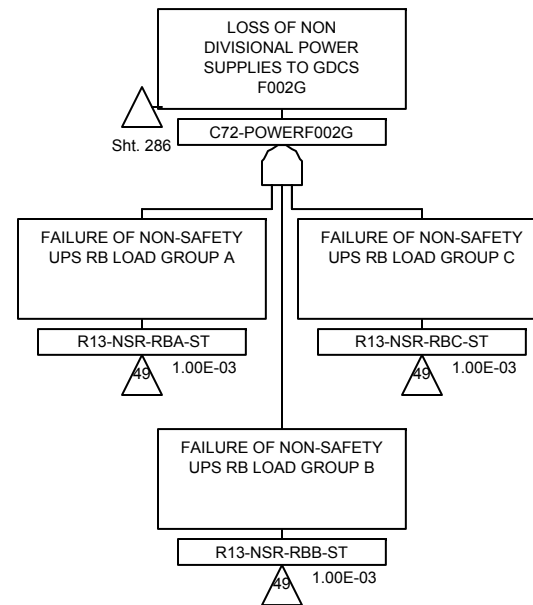


Figure 4.5-3d. Sheet 288 Diverse Protection System

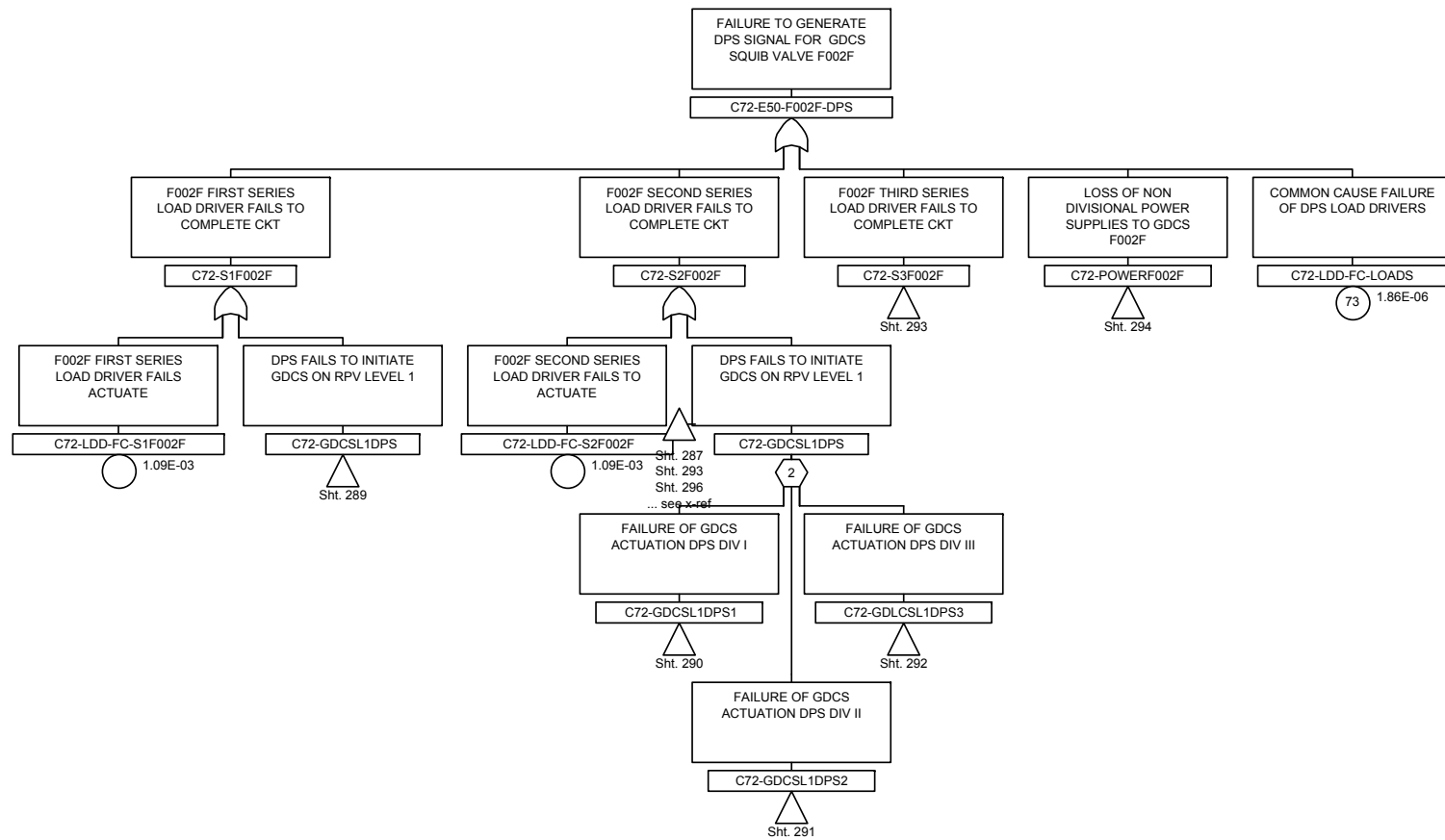


Figure 4.5-3d. Sheet 289 Diverse Protection System

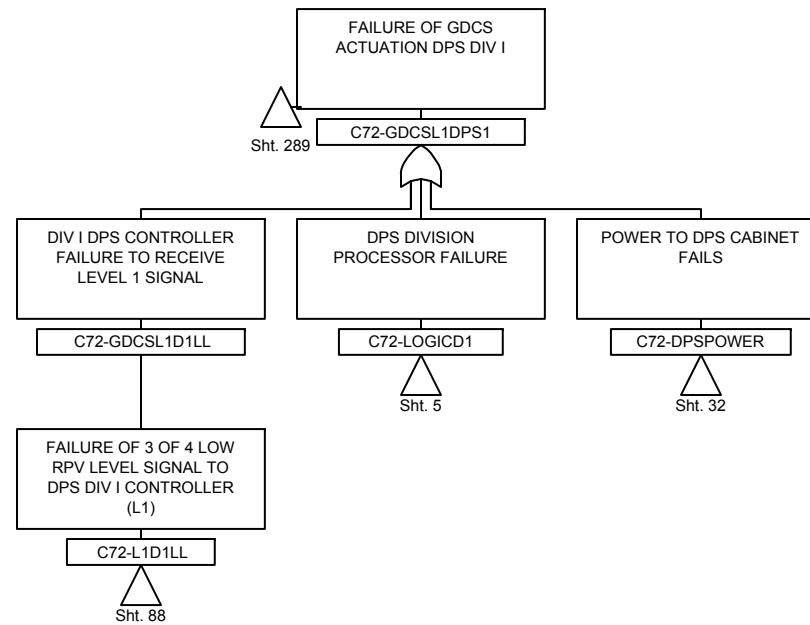


Figure 4.5-3d. Sheet 290 Diverse Protection System

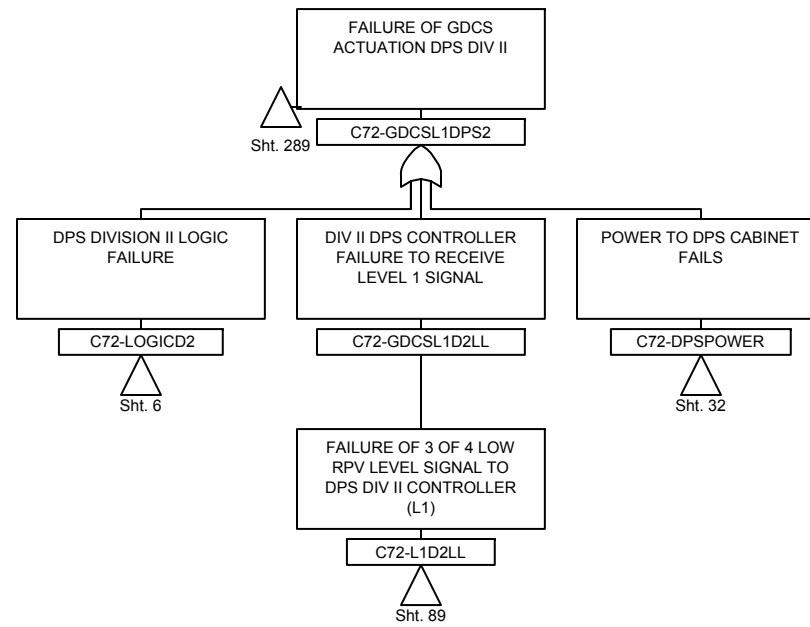


Figure 4.5-3d. Sheet 291 Diverse Protection System

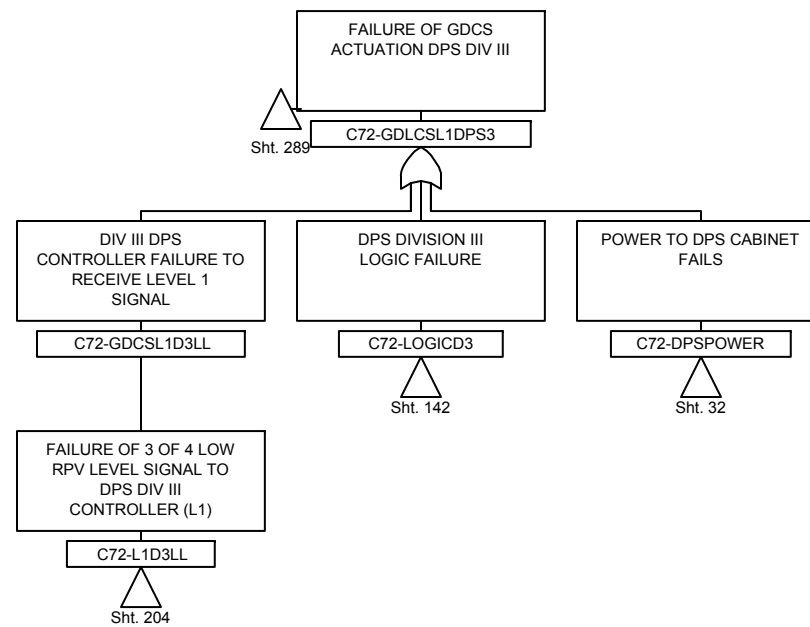


Figure 4.5-3d. Sheet 292 Diverse Protection System

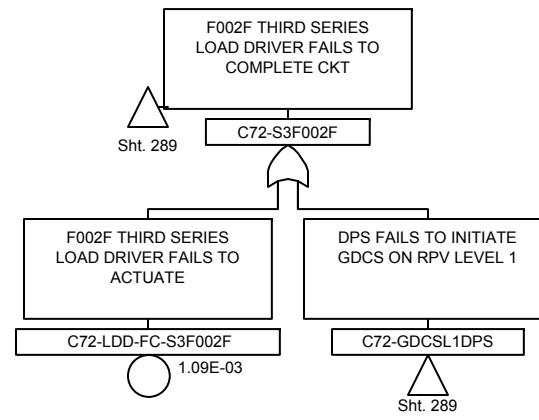


Figure 4.5-3d. Sheet 293 Diverse Protection System

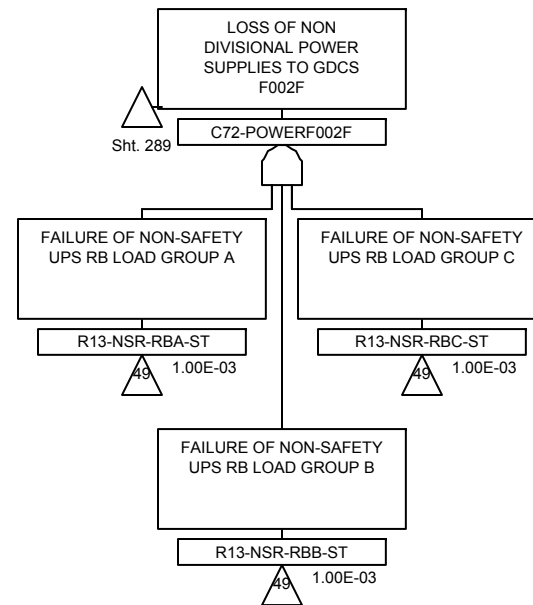


Figure 4.5-3d. Sheet 294 Diverse Protection System



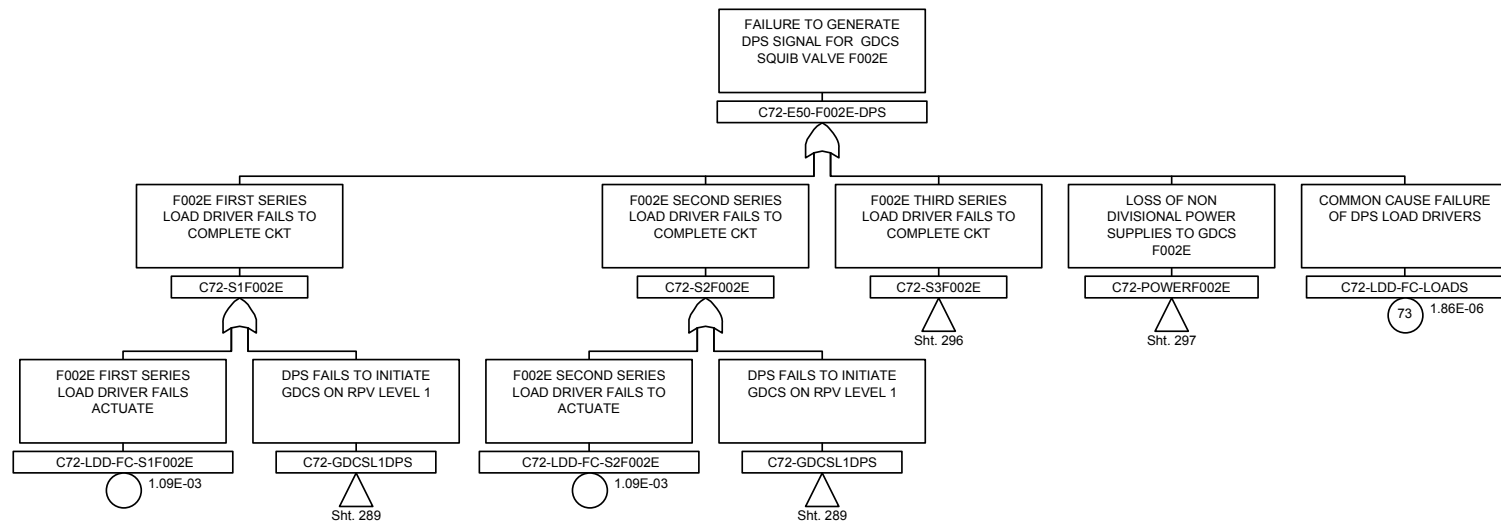


Figure 4.5-3d. Sheet 295 Diverse Protection System

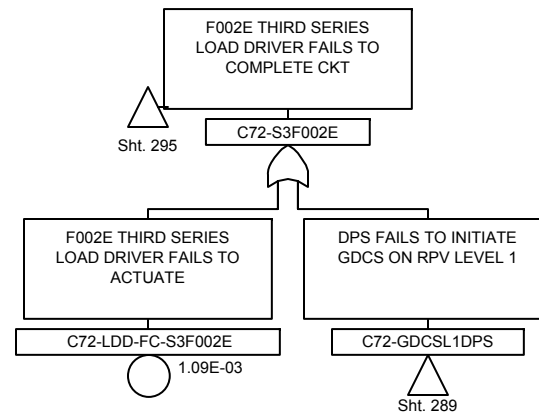


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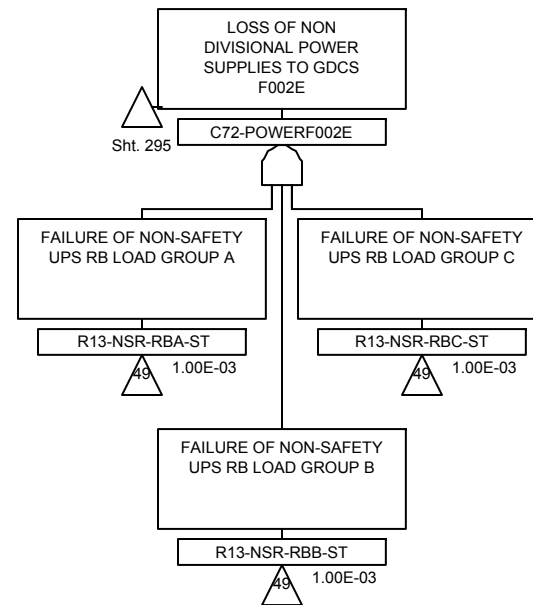


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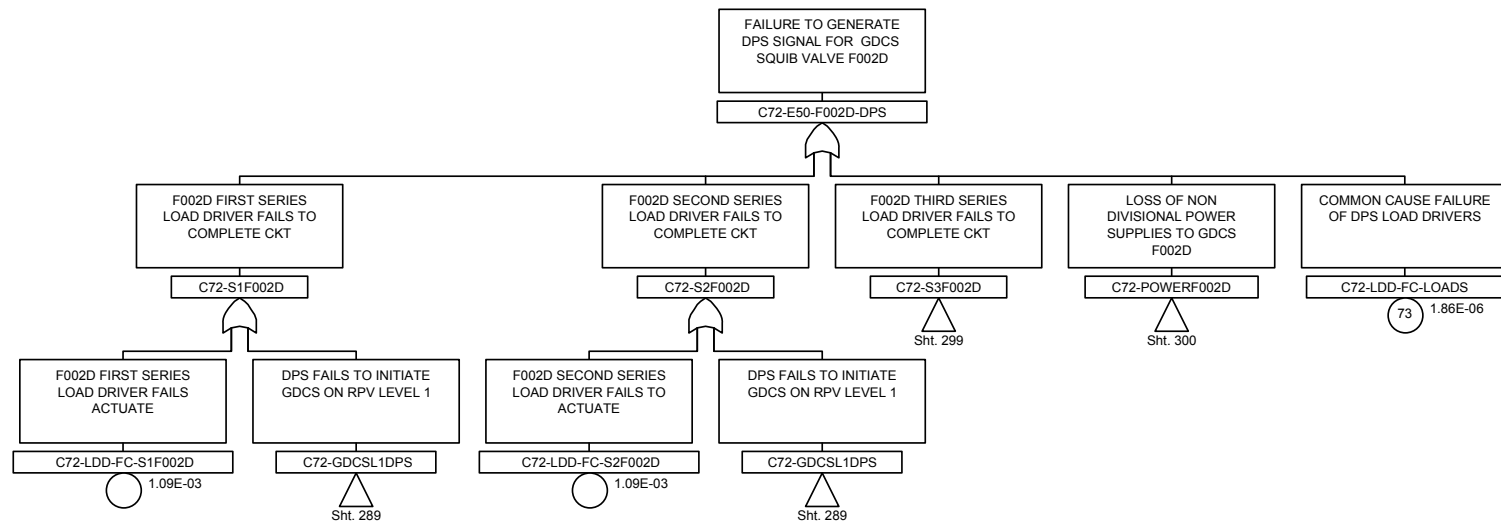


Figure 4.5-3d. Sheet 298 Diverse Protection System

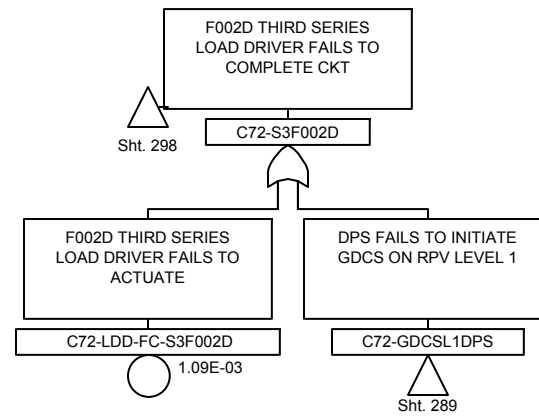


Figure 4.5-3d. Sheet 299 Diverse Protection System



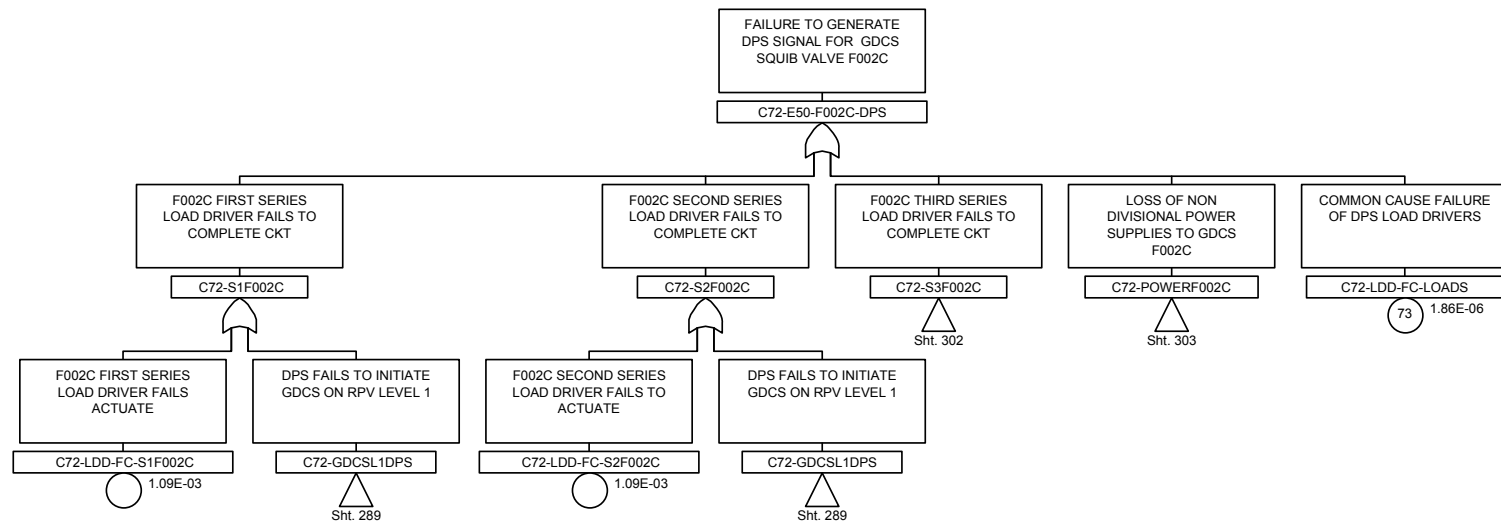


Figure 4.5-3d. Sheet 301 Diverse Protection System

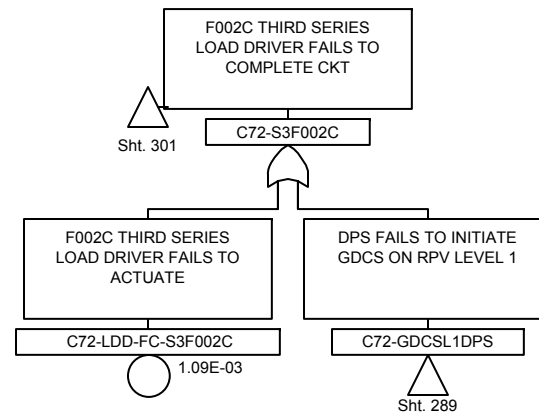


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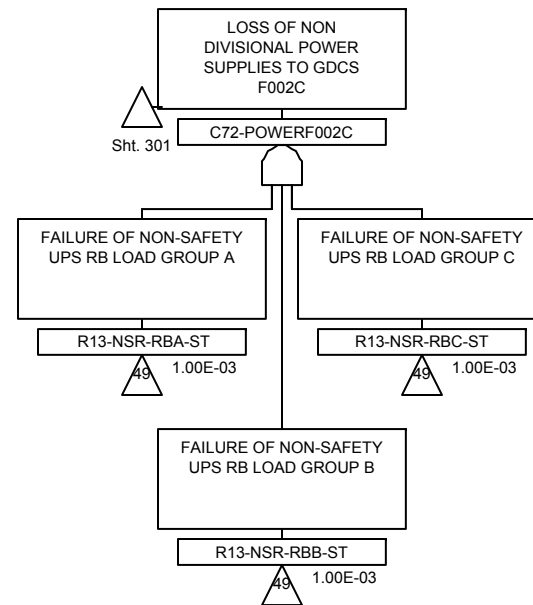


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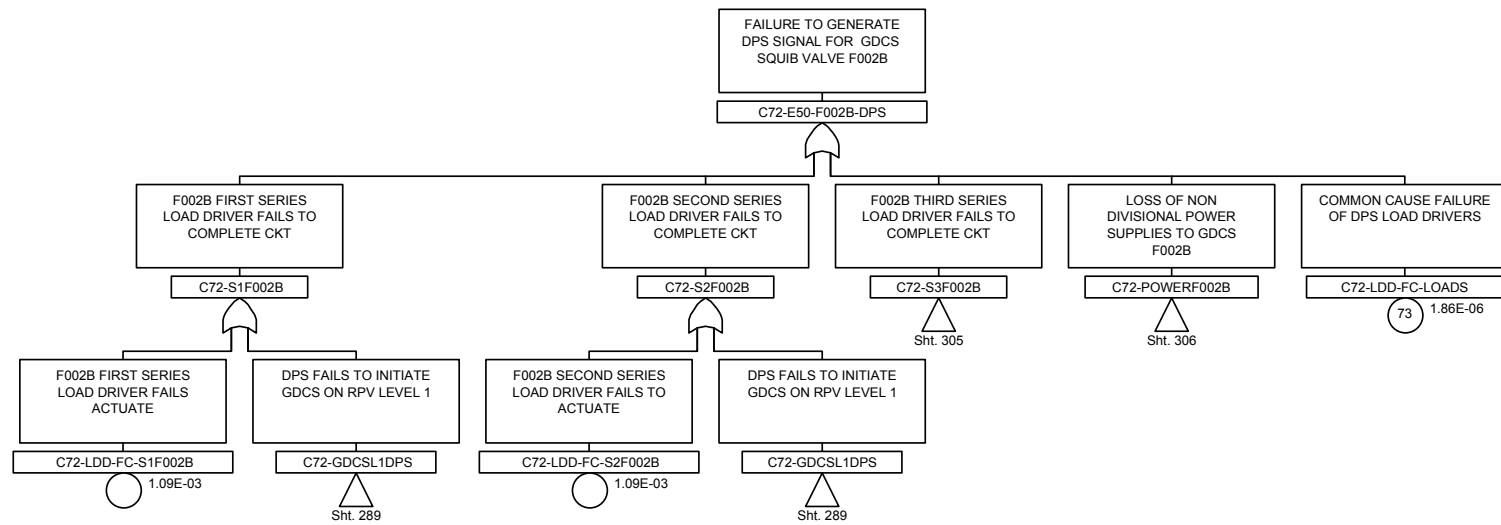


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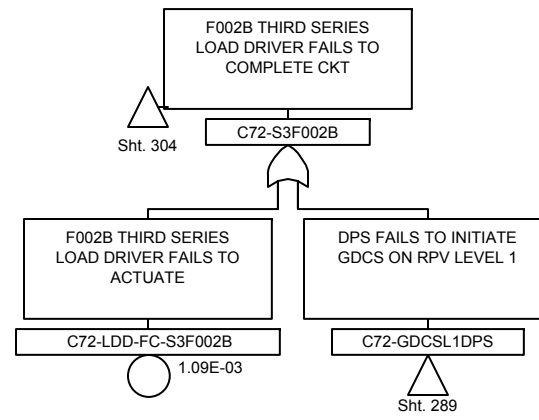


Figure 4.5-3d. Sheet 305 Diverse Protection System

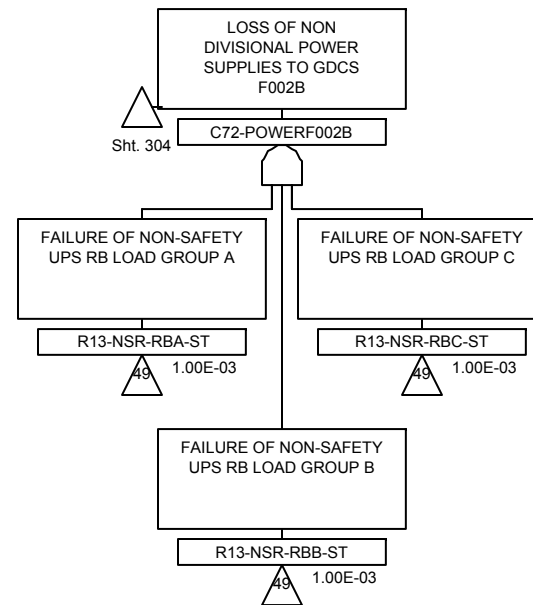


Figure 4.5-3d. Sheet 306 Diverse Protection System

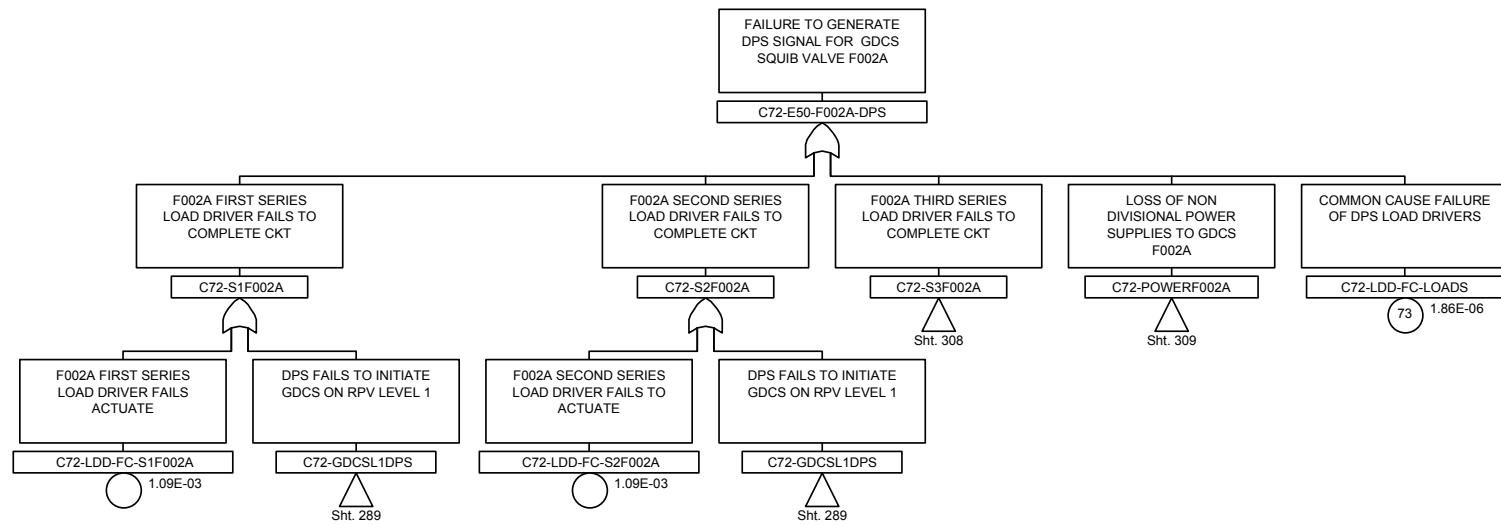


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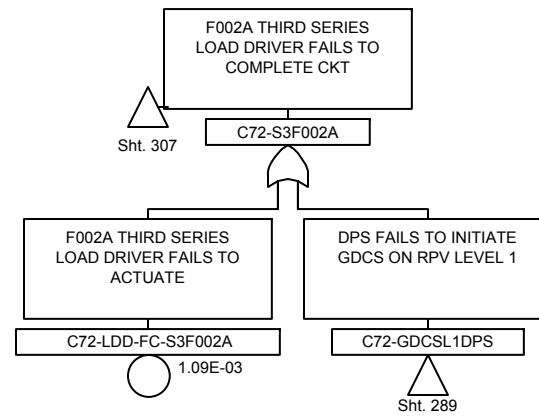


Figure 4.5-3d. Sheet 308 Diverse Protection System

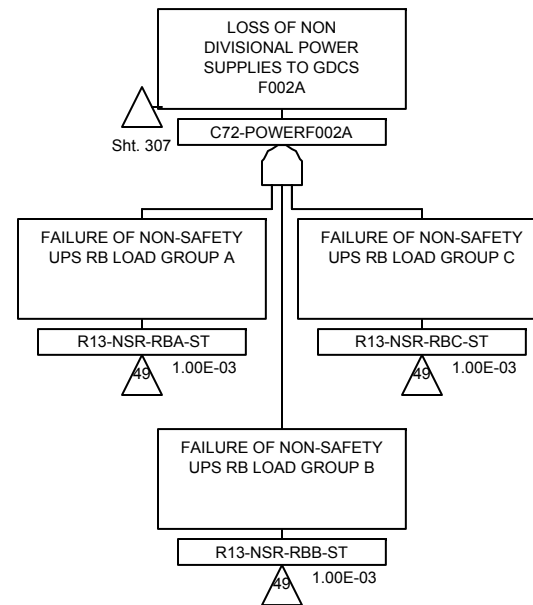


Figure 4.5-3d. Sheet 309 Diverse Protection System

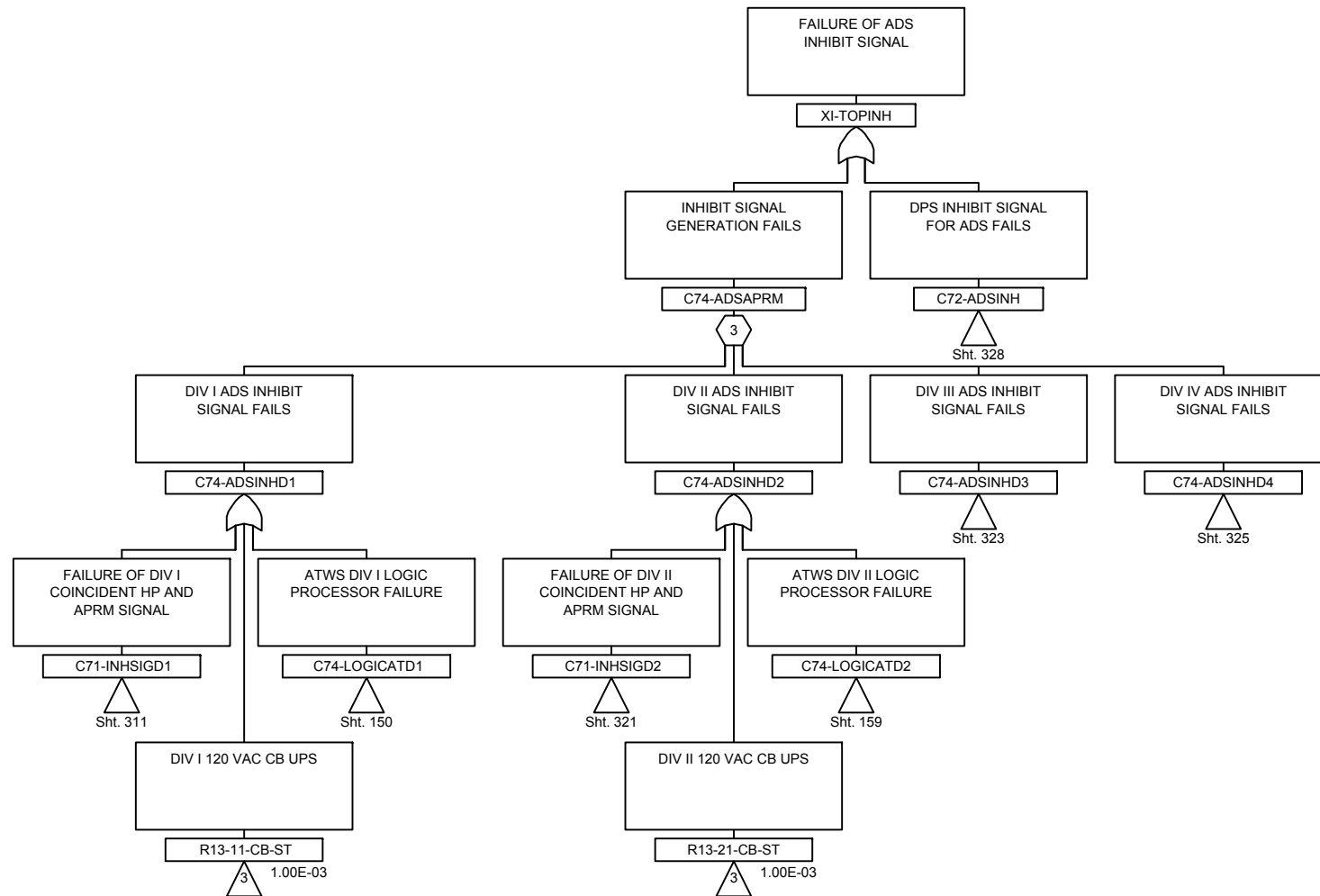


Figure 4.5-3d. Sheet 310 Diverse Protection System



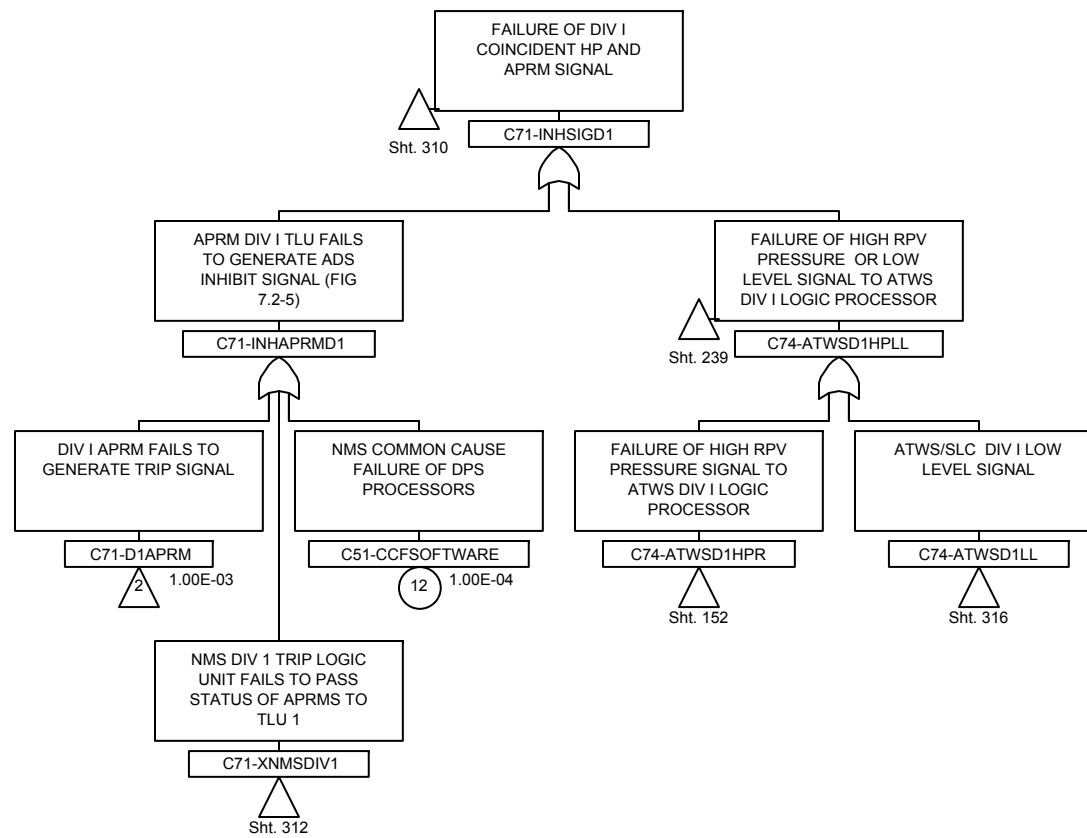


Figure 4.5-3d. Sheet 311 Diverse Protection System

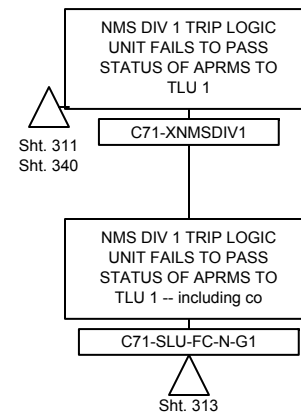


Figure 4.5-3d. Sheet 312 Diverse Protection System

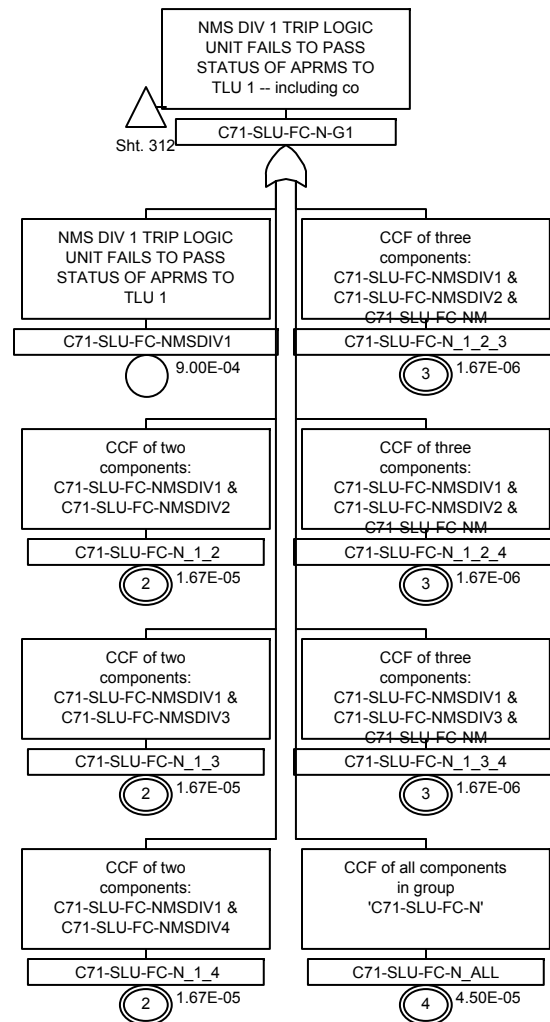


Figure 4.5-3d. Sheet 313 Diverse Protection System

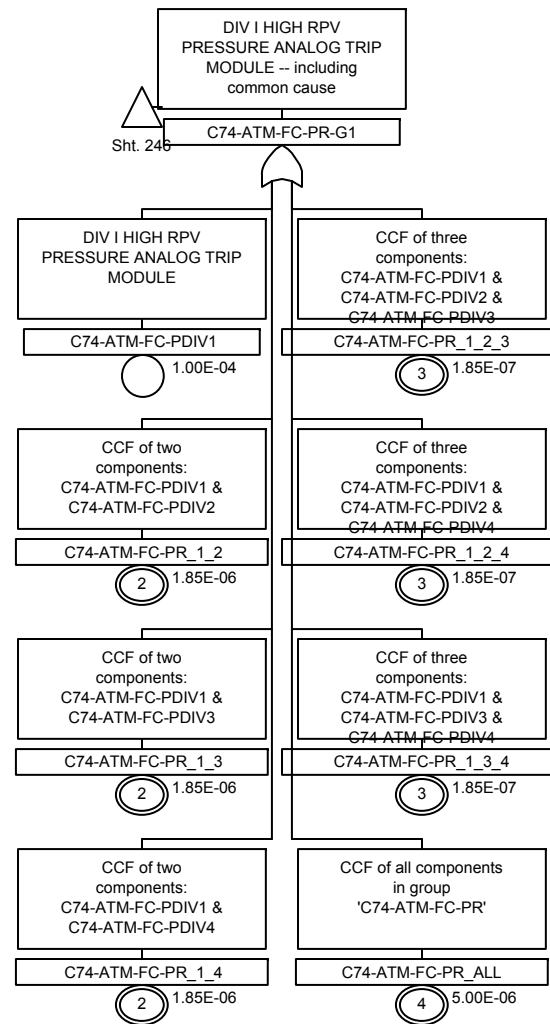


Figure 4.5-3d. Sheet 314 Diverse Protection System

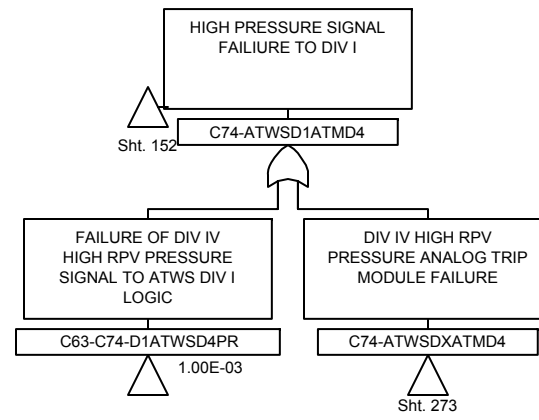


Figure 4.5-3d. Sheet 315 Diverse Protection System



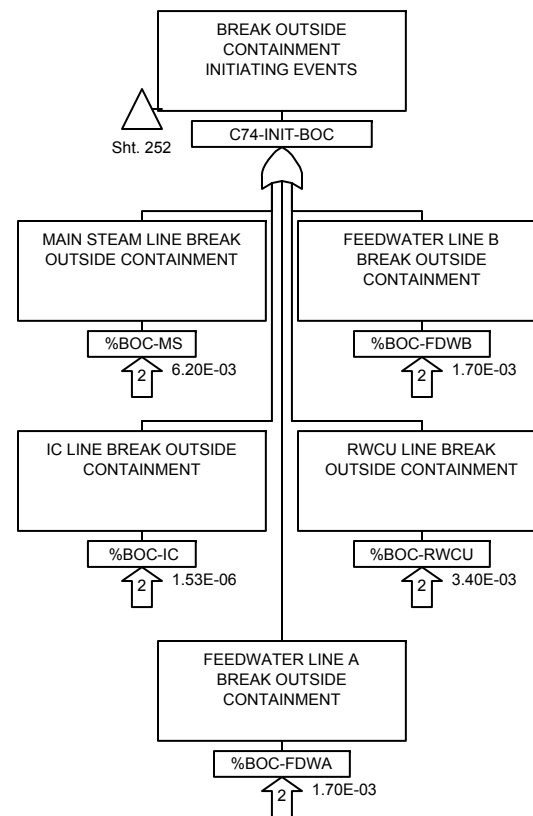


Figure 4.5-3d. Sheet 317 Diverse Protection System

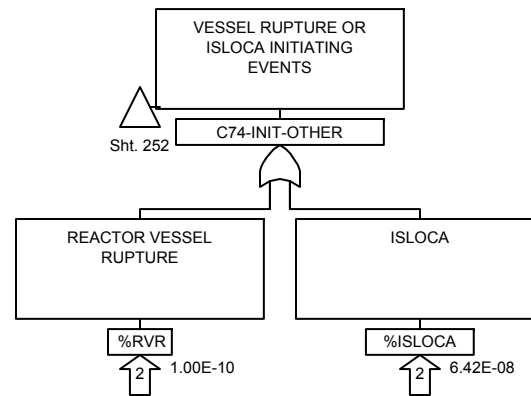


Figure 4.5-3d. Sheet 318 Diverse Protection System



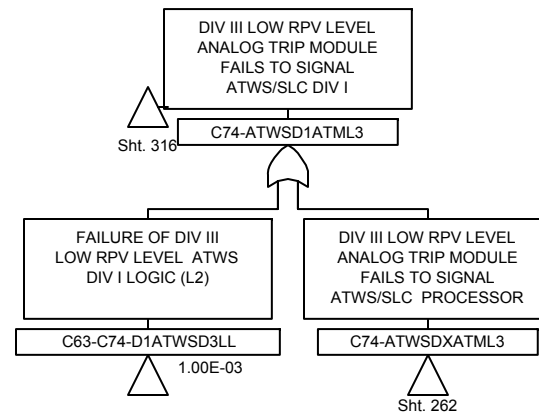


Figure 4.5-3d. Sheet 319 Diverse Protection System

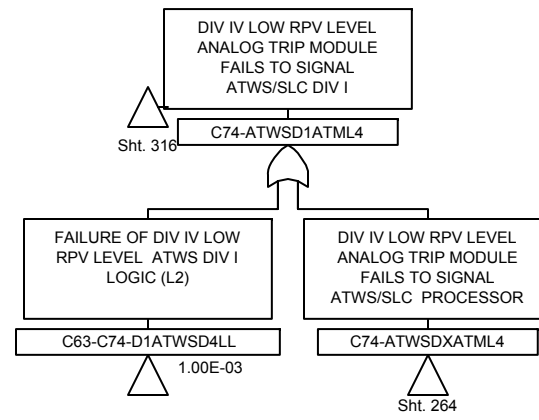


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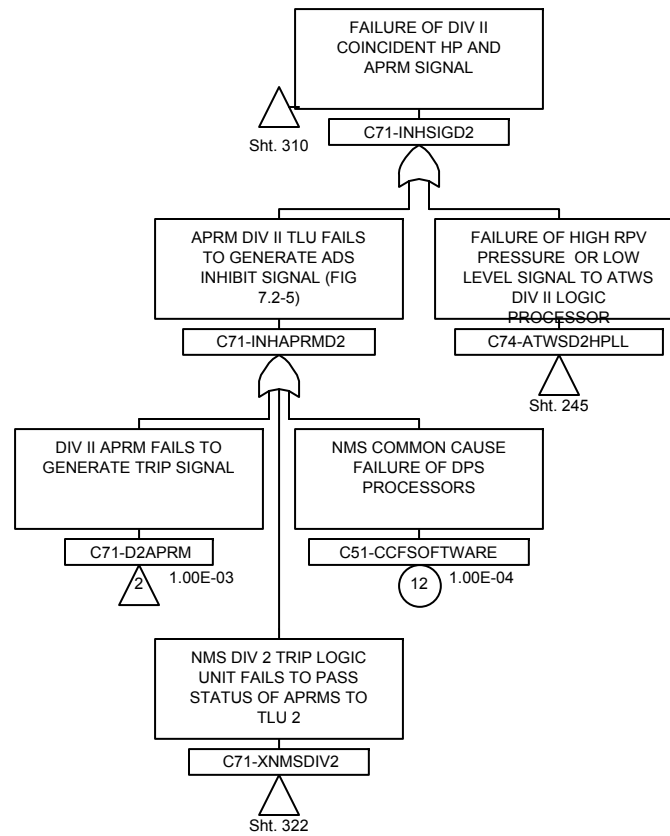


Figure 4.5-3d. Sheet 321 Diverse Protection System

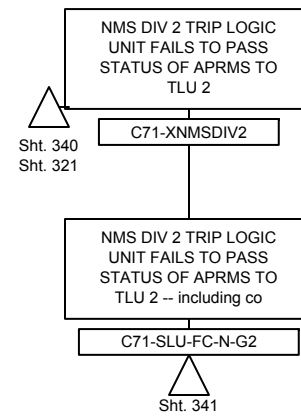


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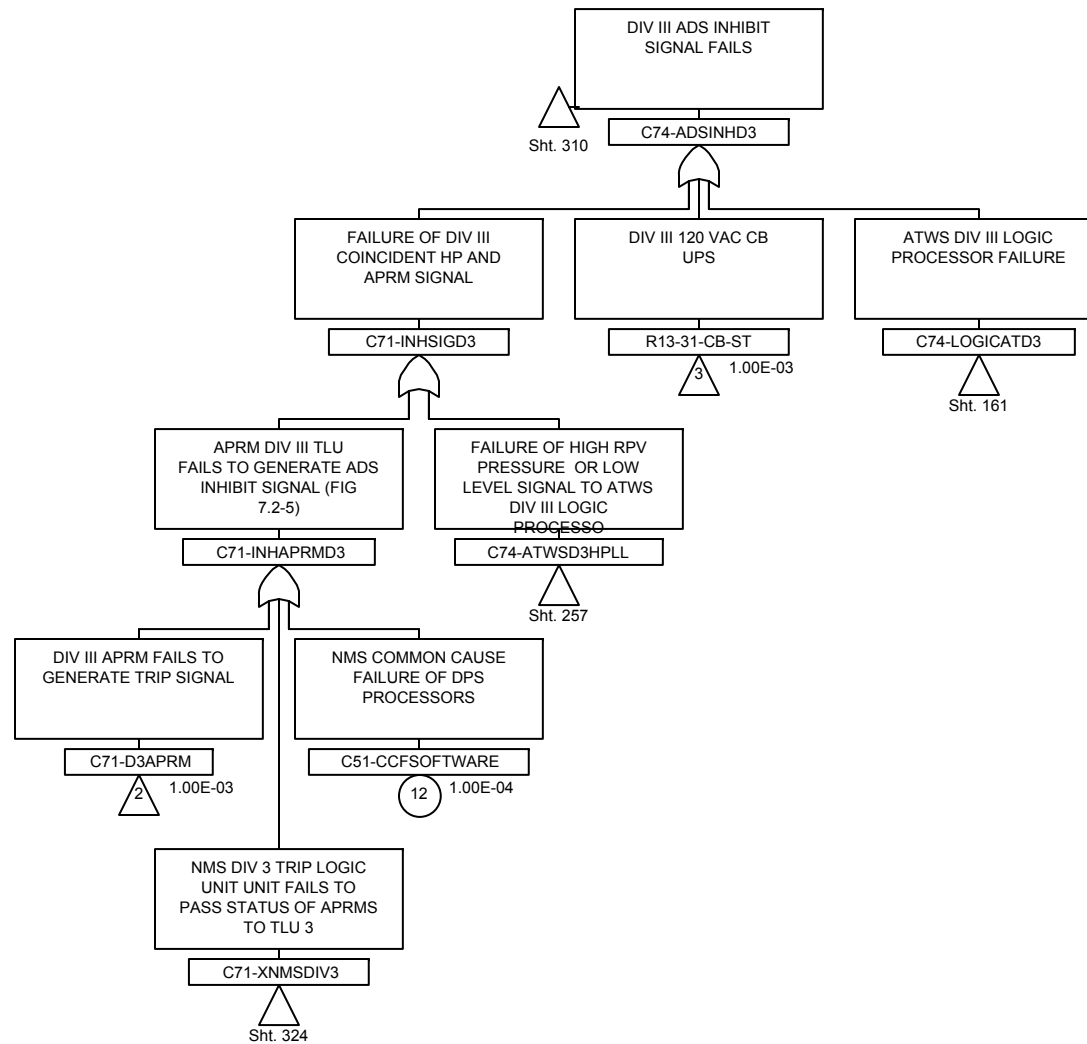


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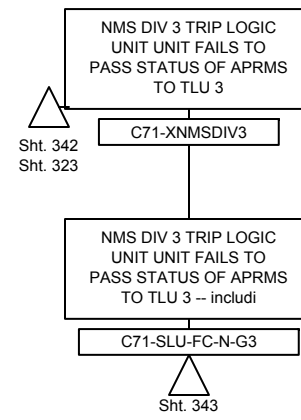


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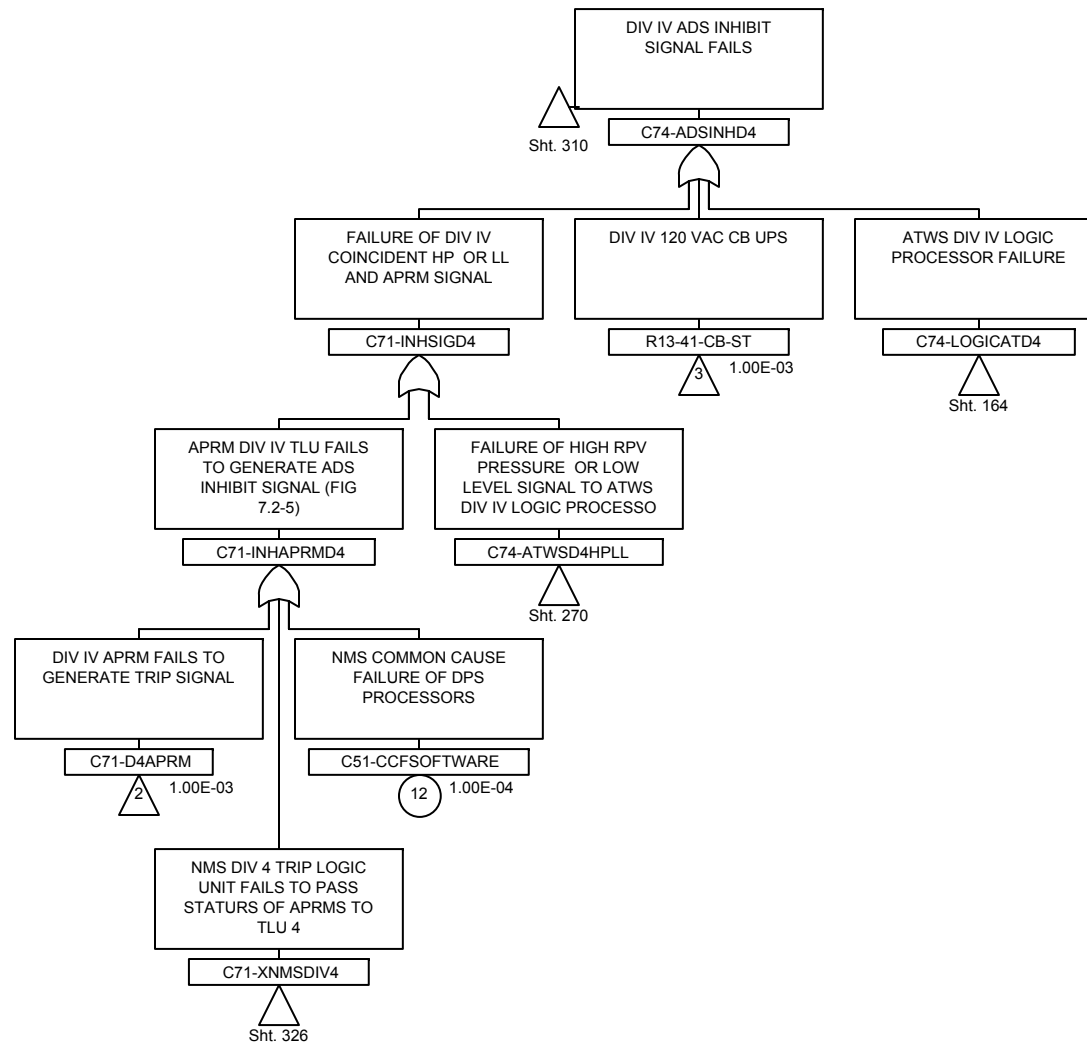


Figure 4.5-3d. Sheet 325 Diverse Protection System

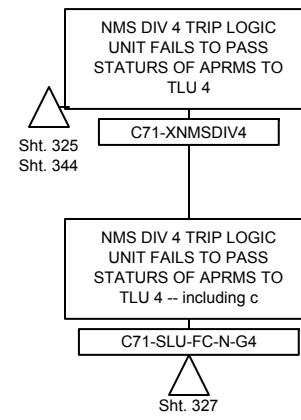


Figure 4.5-3d. Sheet 326 Diverse Protection System



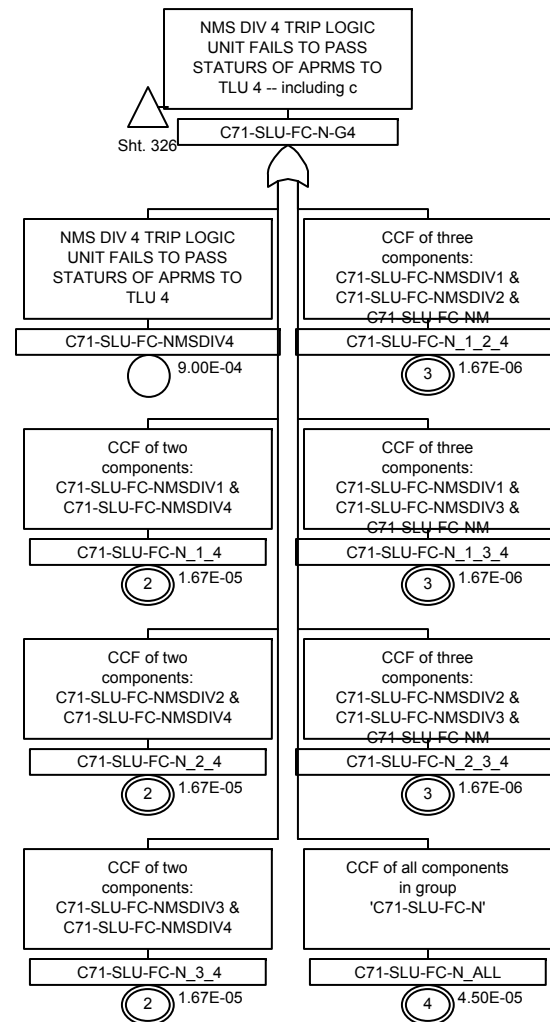


Figure 4.5-3d. Sheet 327 Diverse Protection System

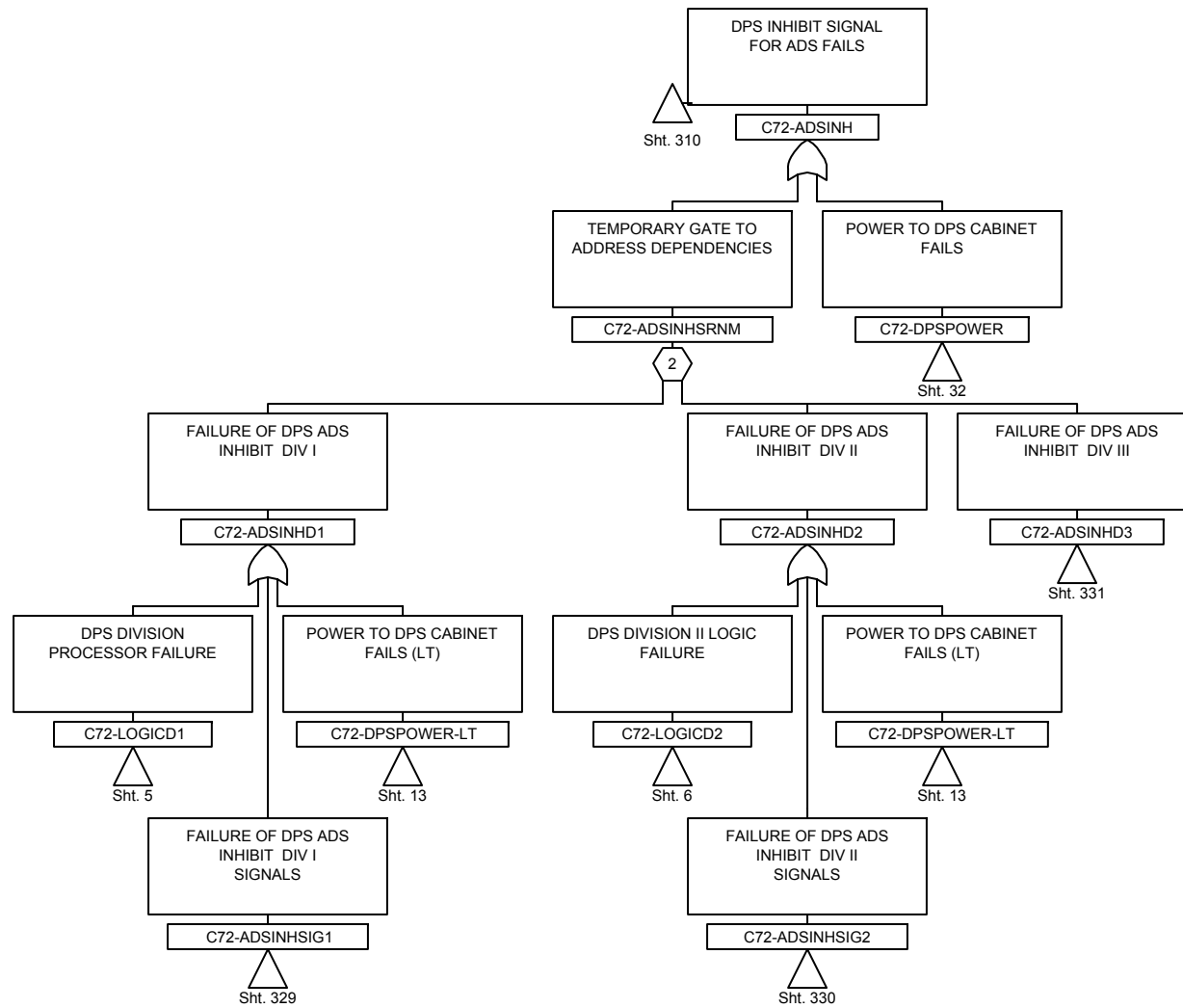


Figure 4.5-3d. Sheet 328 Diverse Protection System

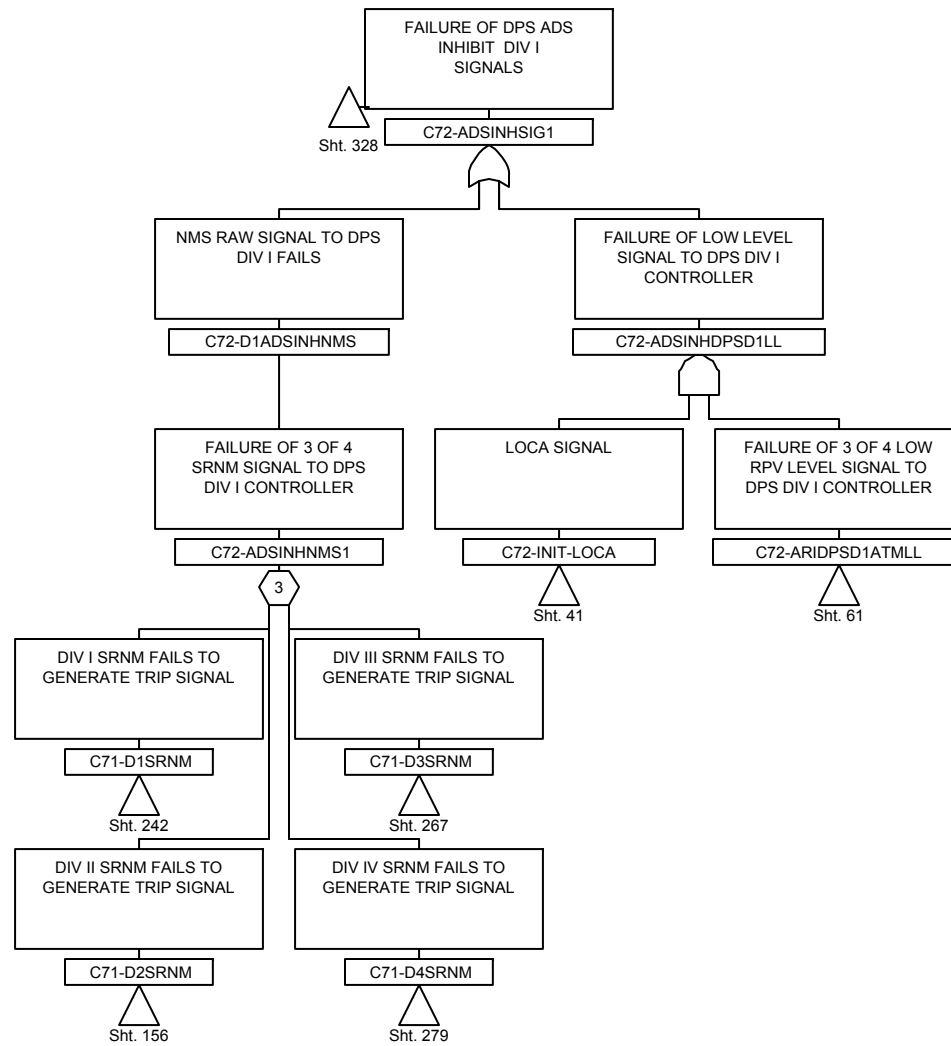


Figure 4.5-3d. Sheet 329 Diverse Protection System

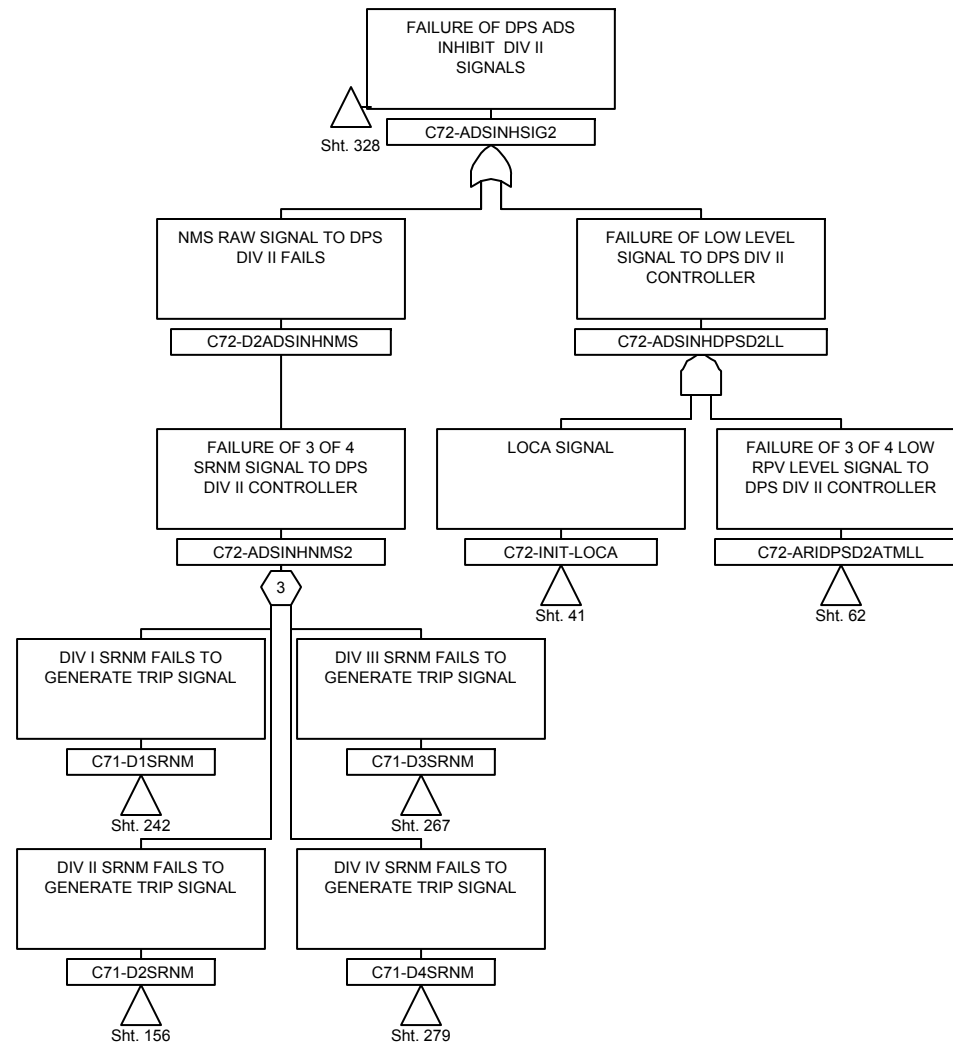


Figure 4.5-3d. Sheet 330 Diverse Protection System

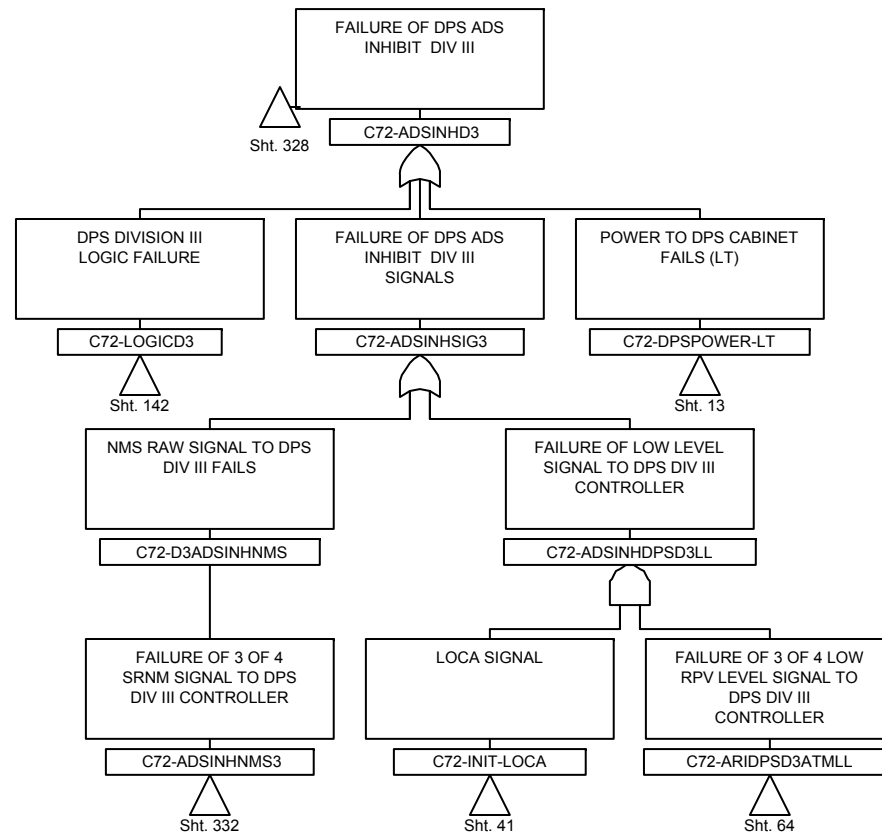


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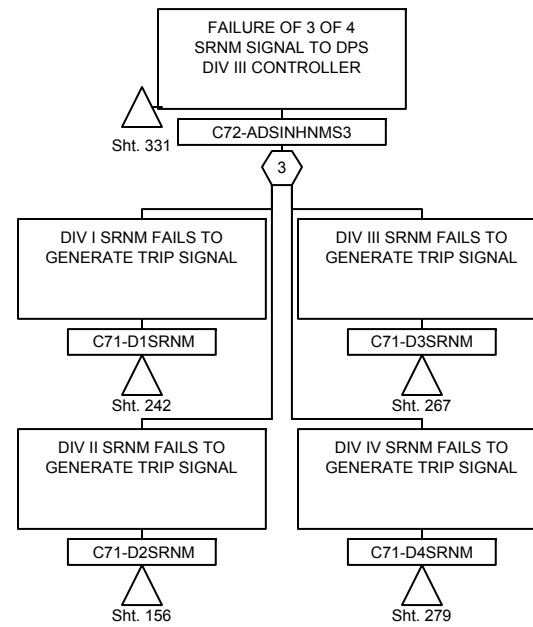


Figure 4.5-3d. Sheet 332 Diverse Protection System

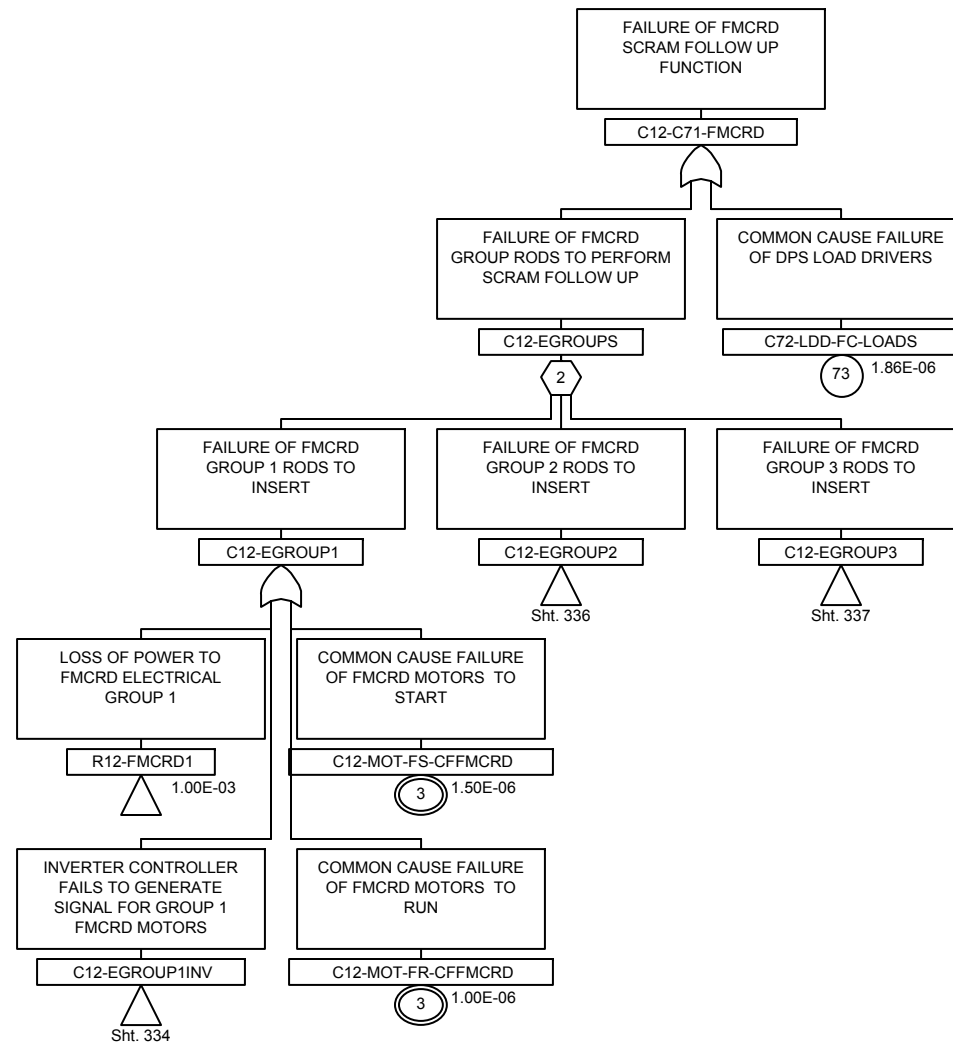


Figure 4.5-3d. Sheet 333 Diverse Protection System

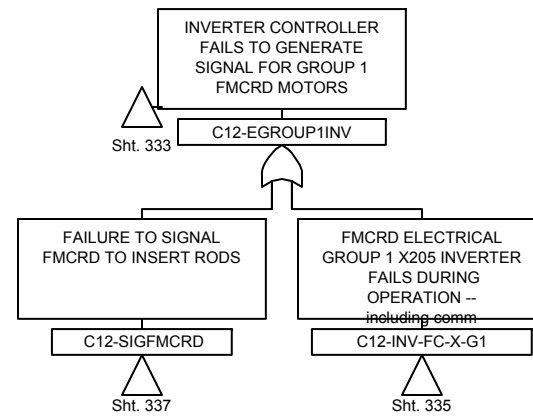


Figure 4.5-3d. Sheet 334 Diverse Protection System



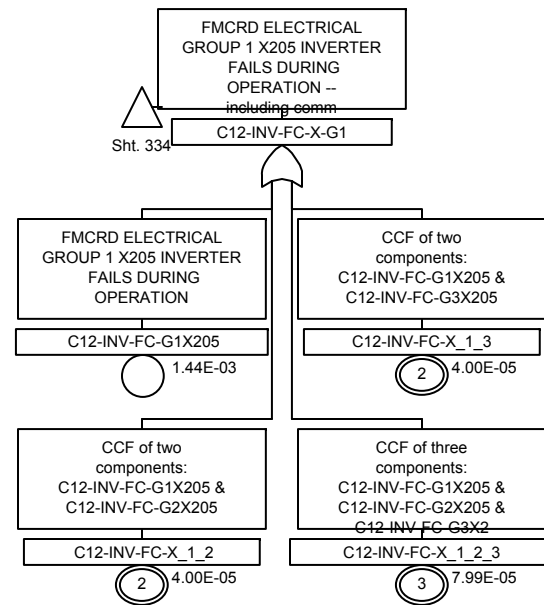


Figure 4.5-3d. Sheet 335 Diverse Protection System

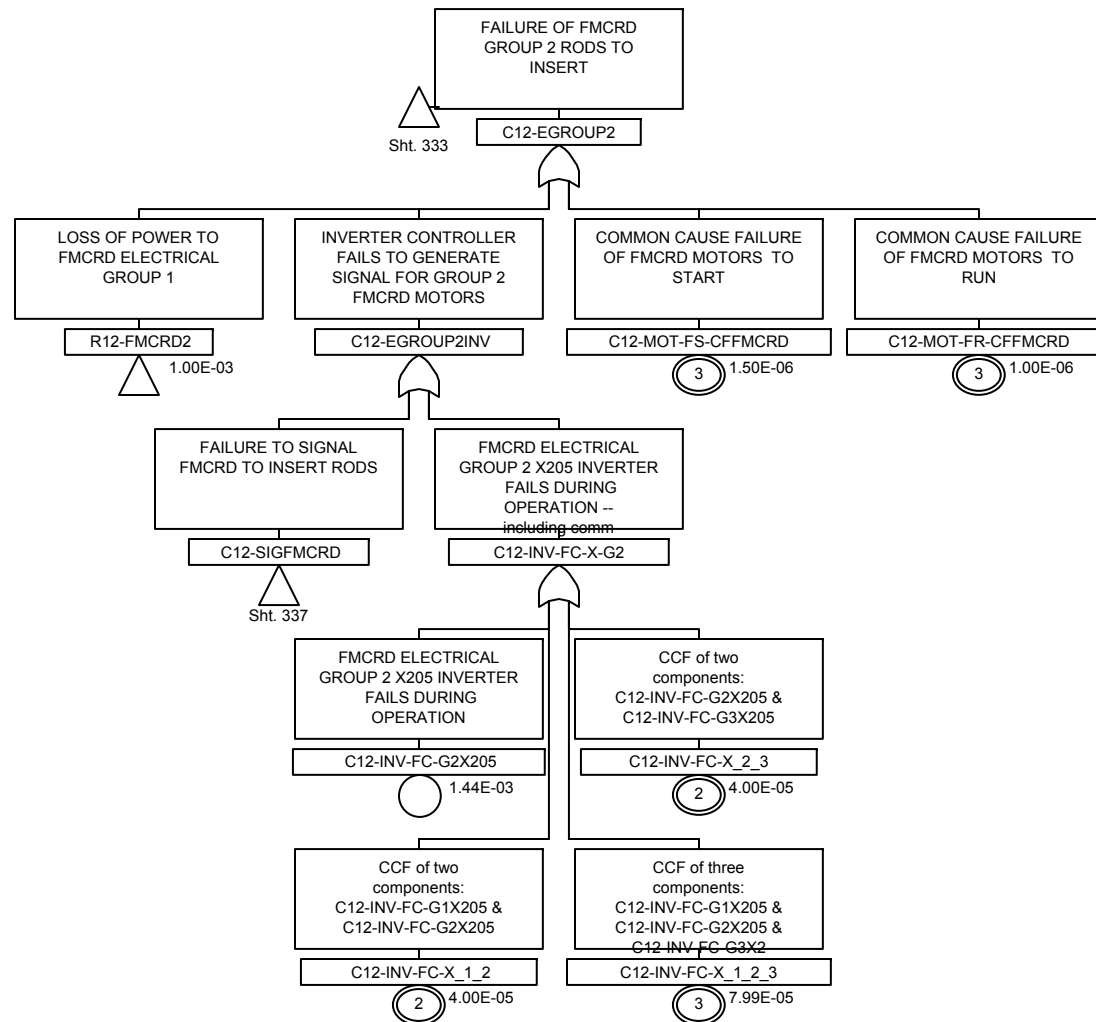


Figure 4.5-3d. Sheet 336 Diverse Protection System

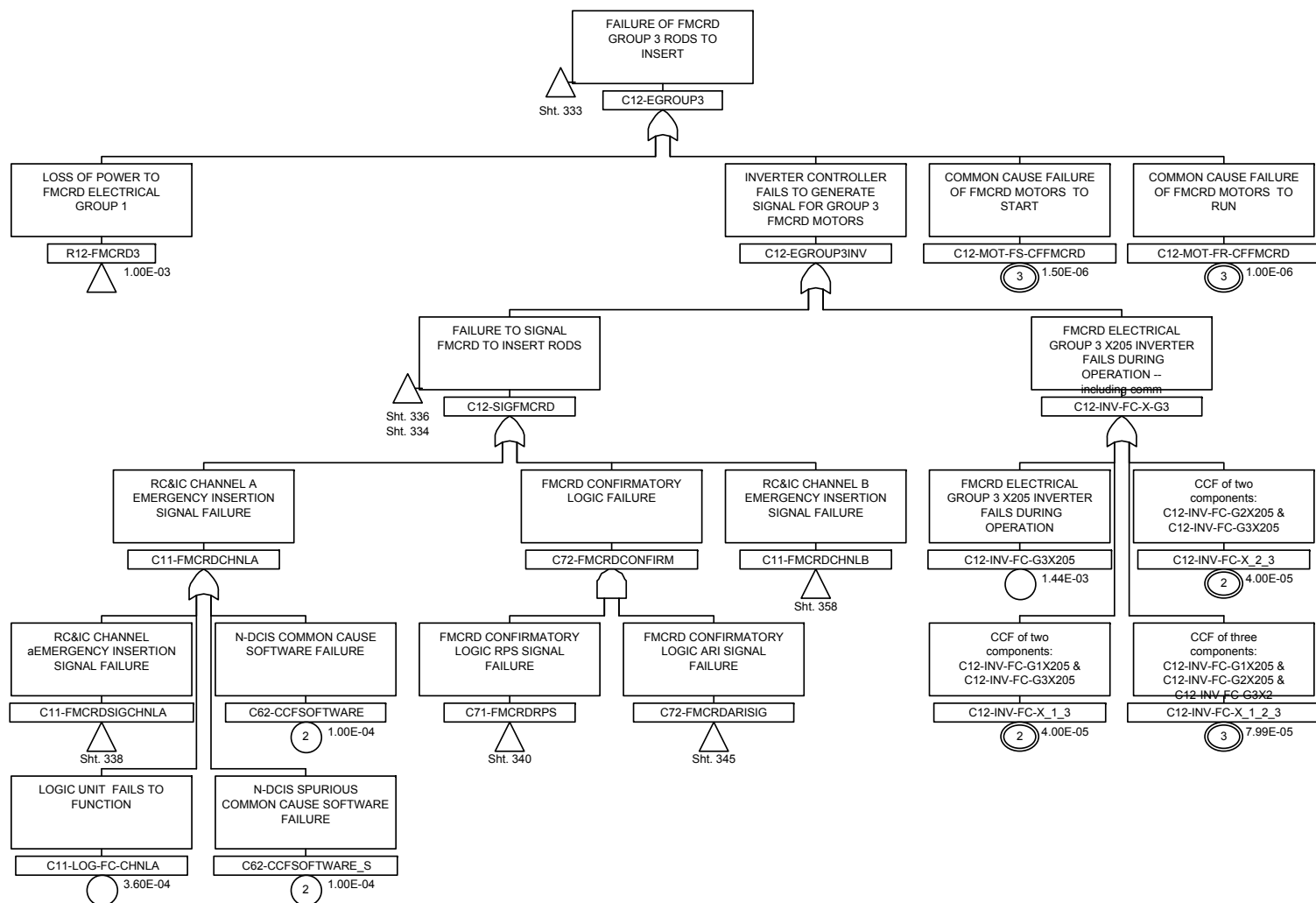


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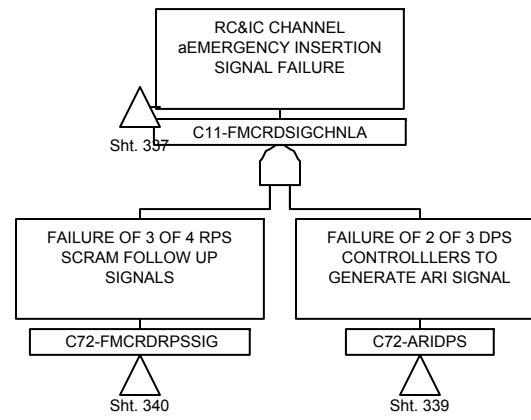


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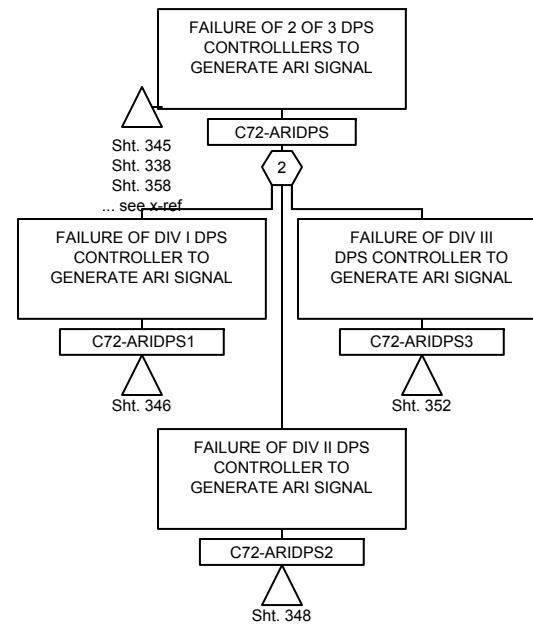


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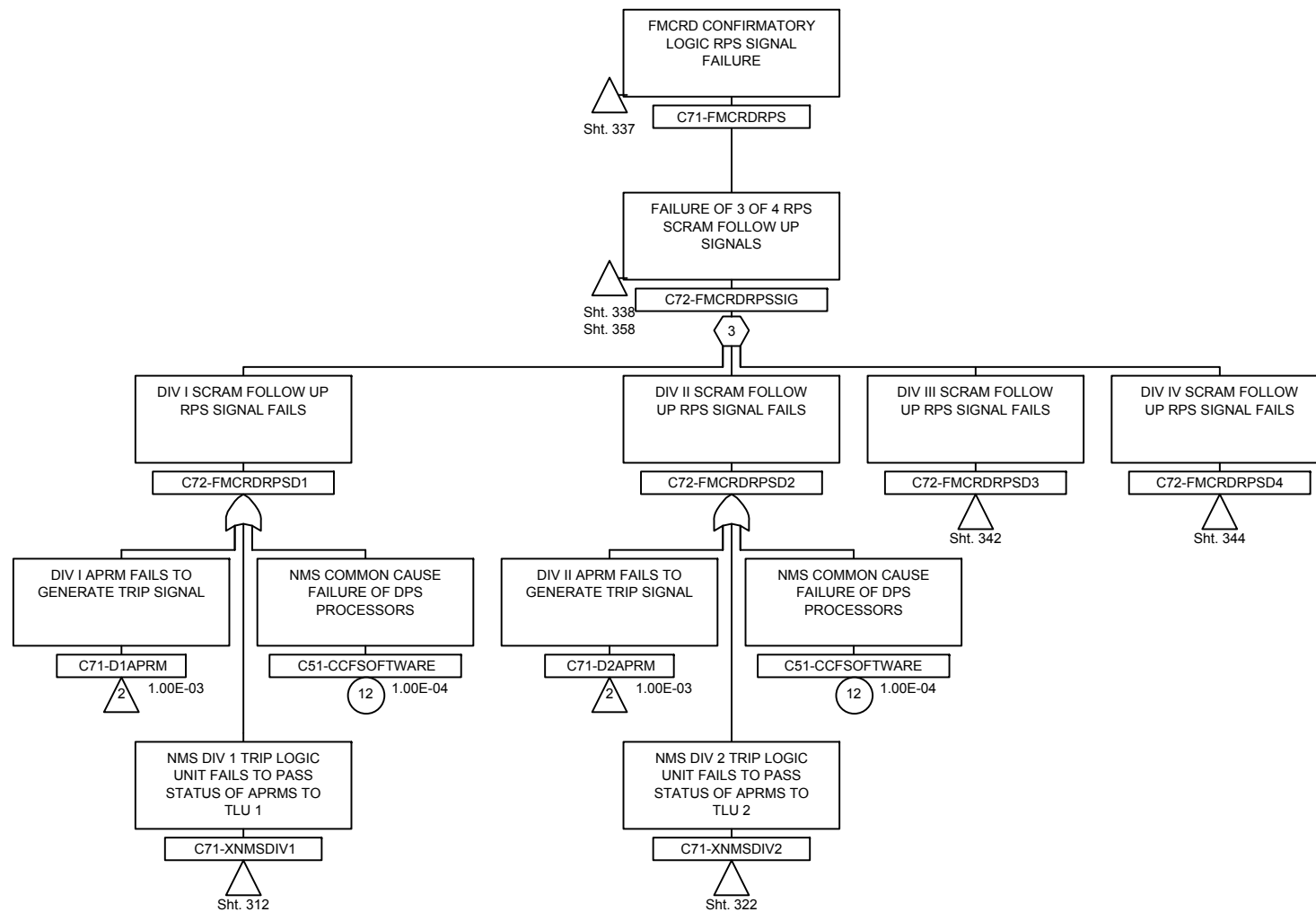


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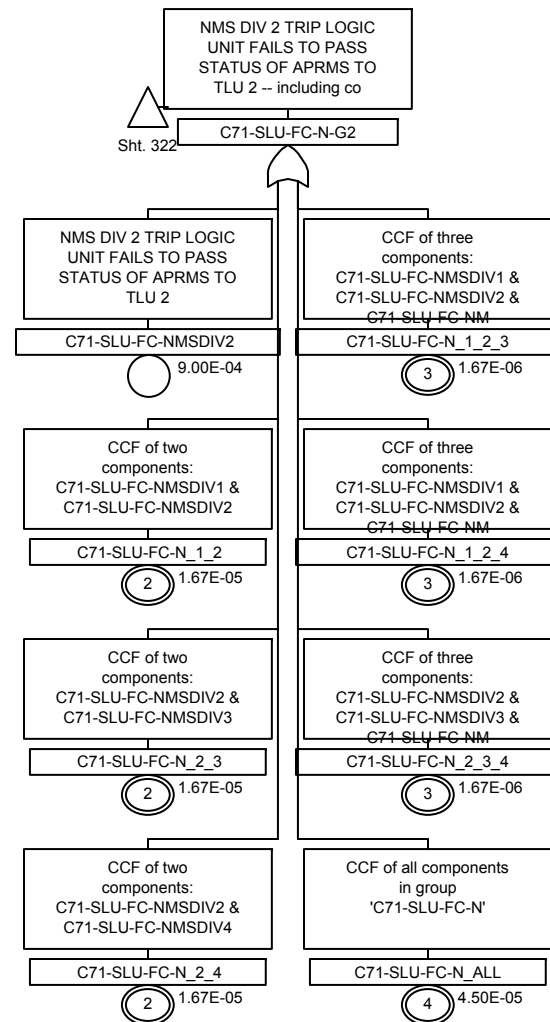


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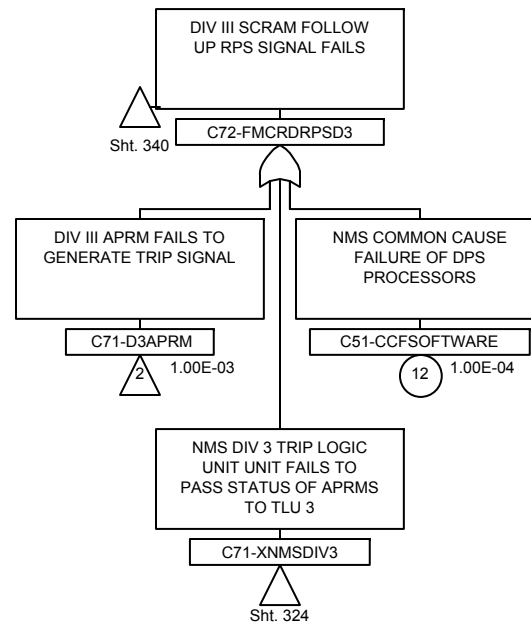


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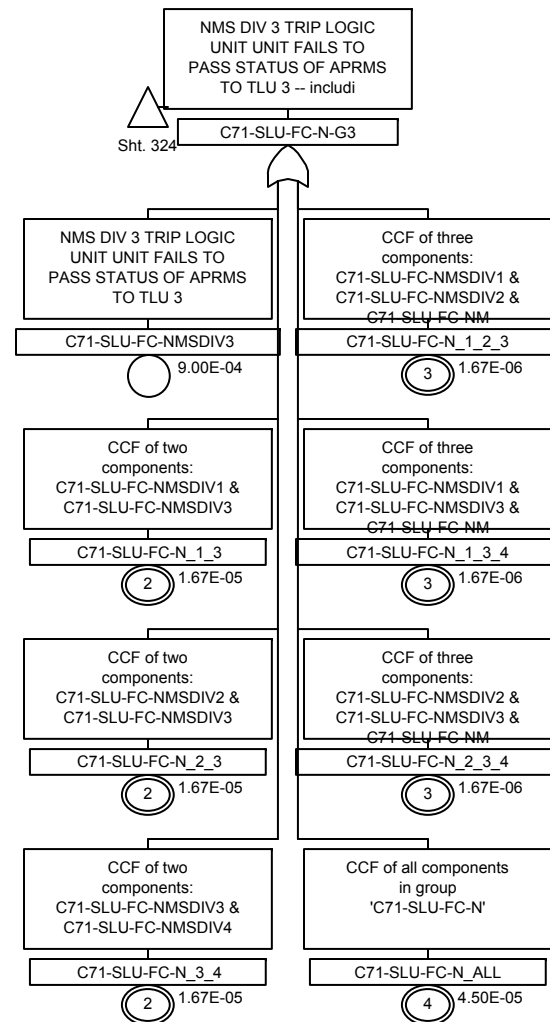


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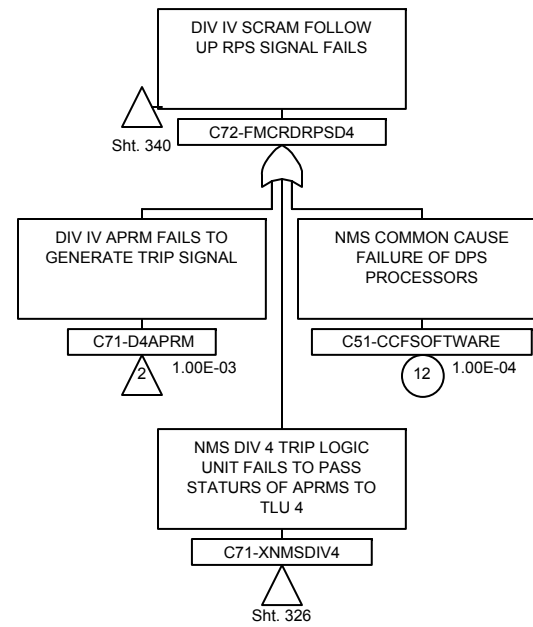


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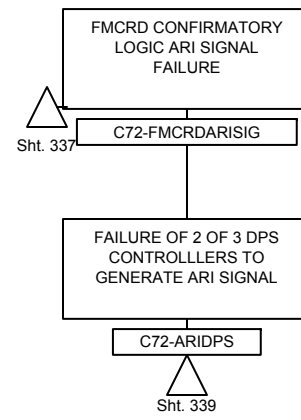


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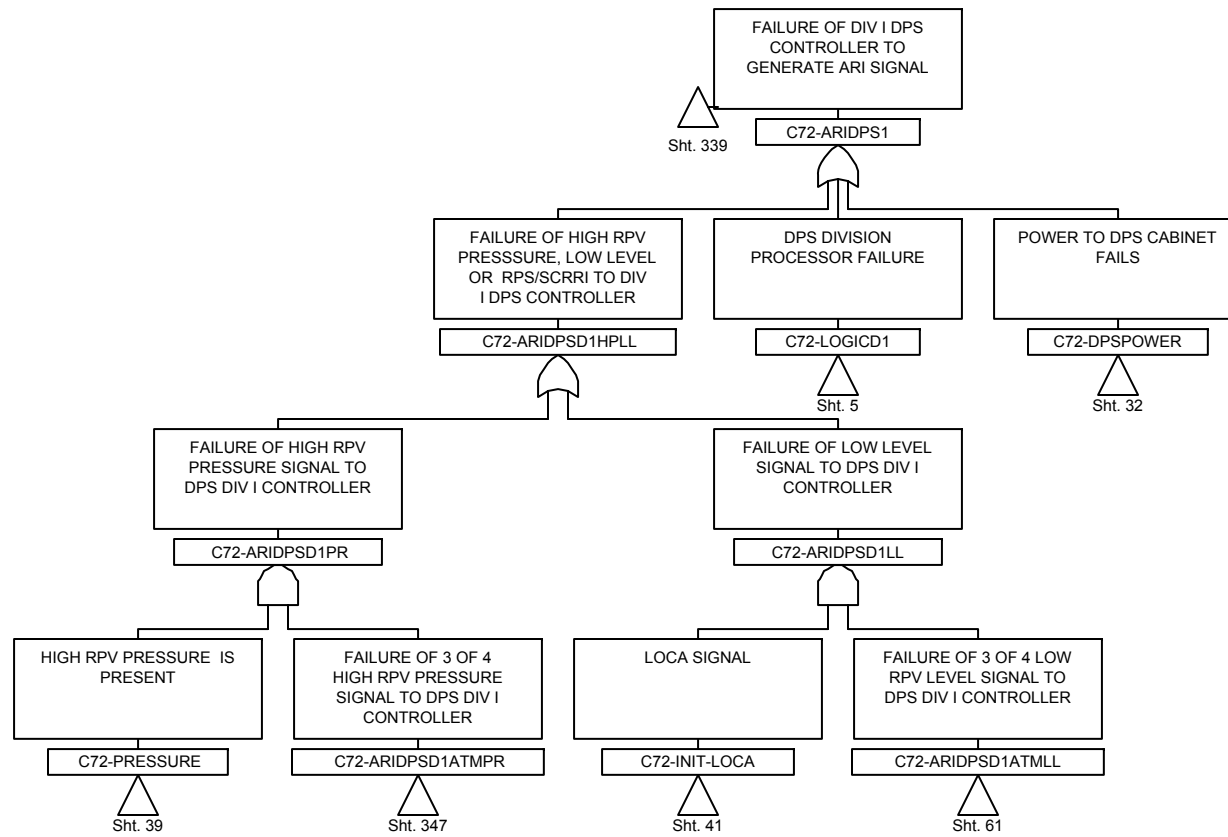


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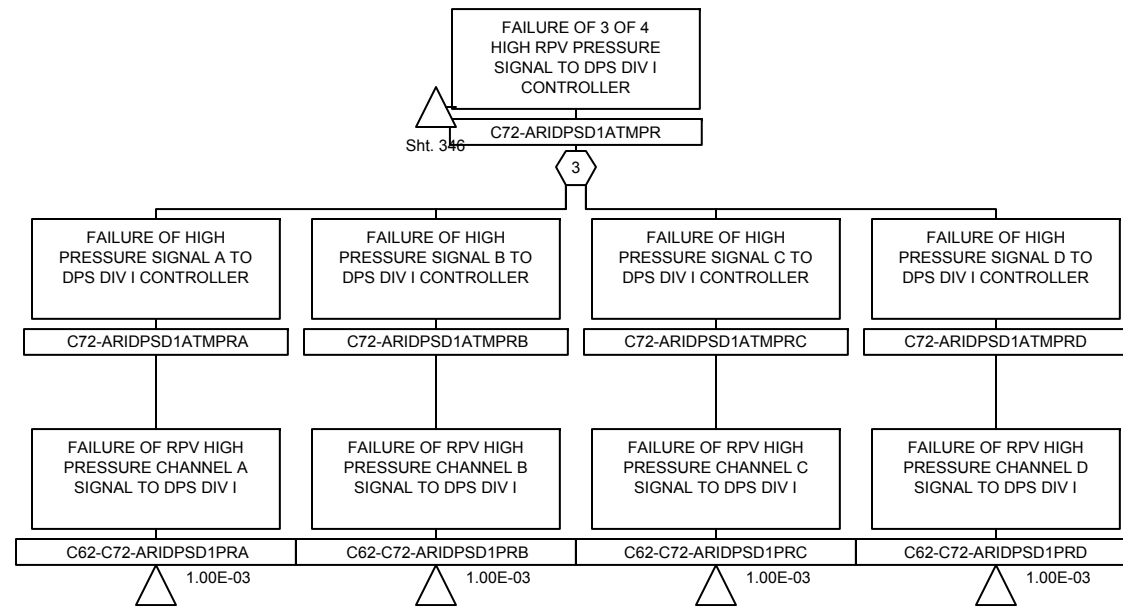


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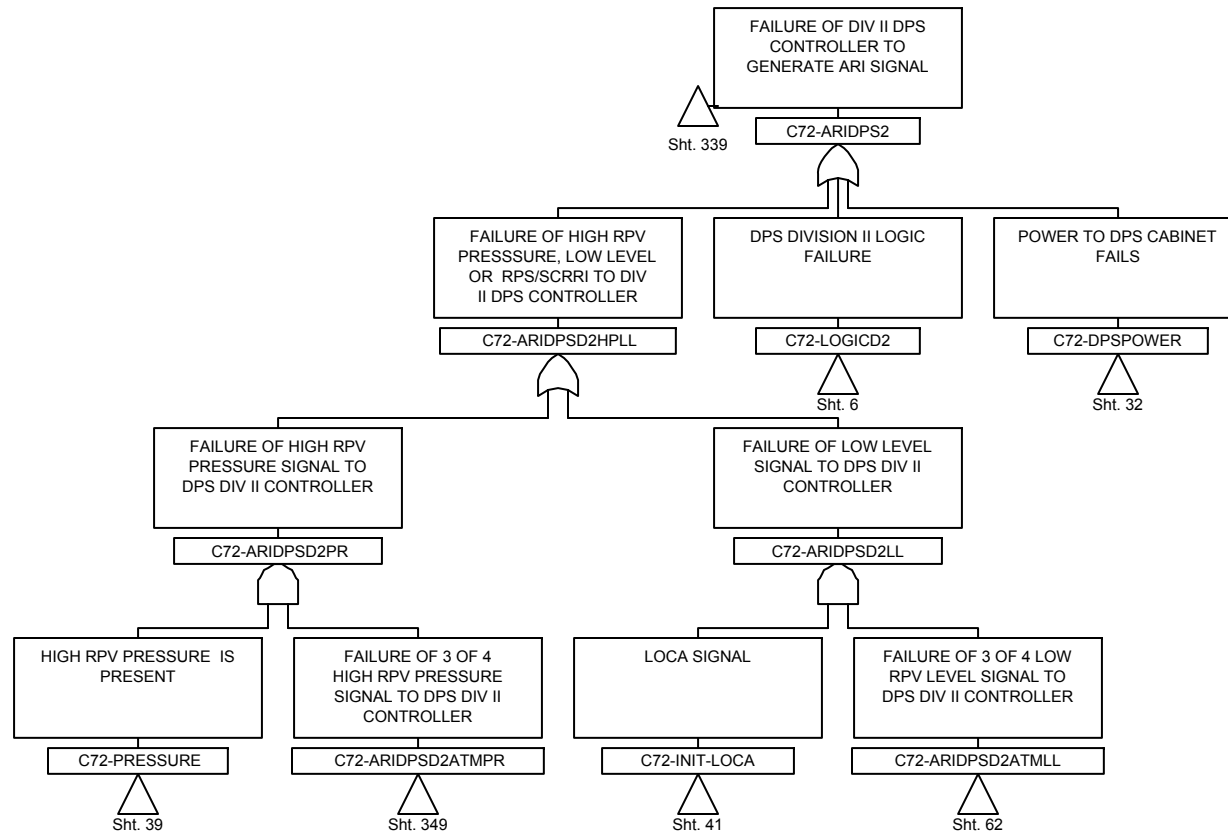


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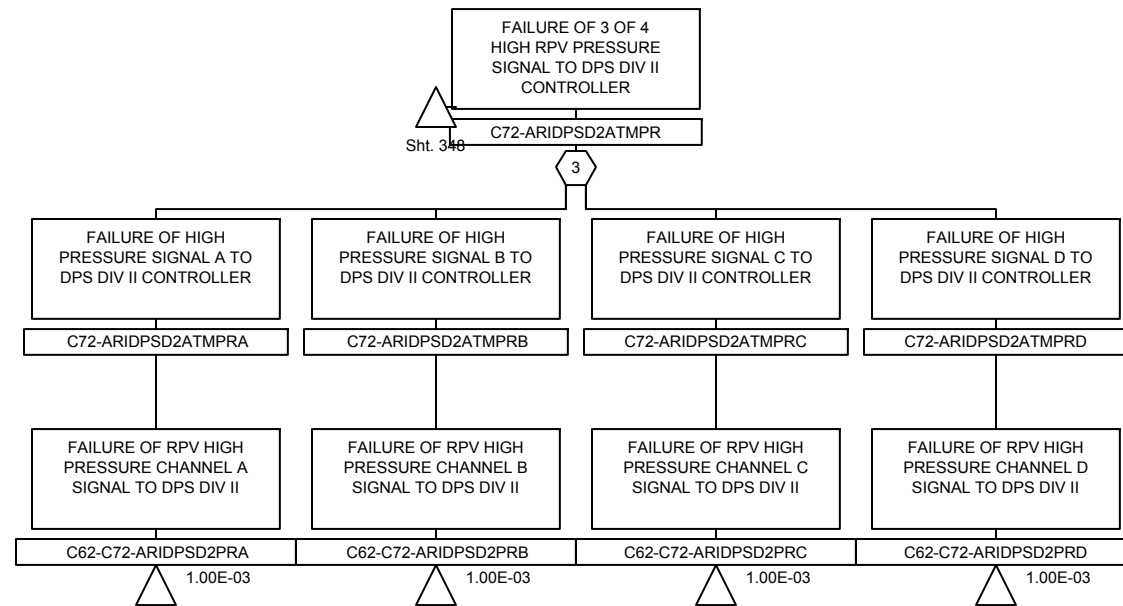


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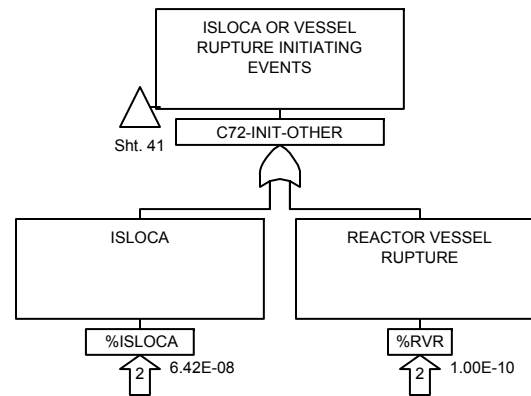


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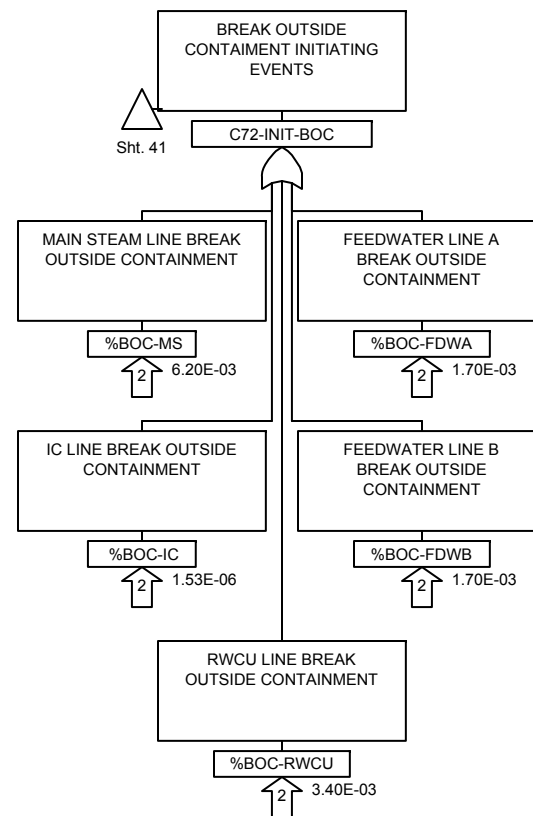


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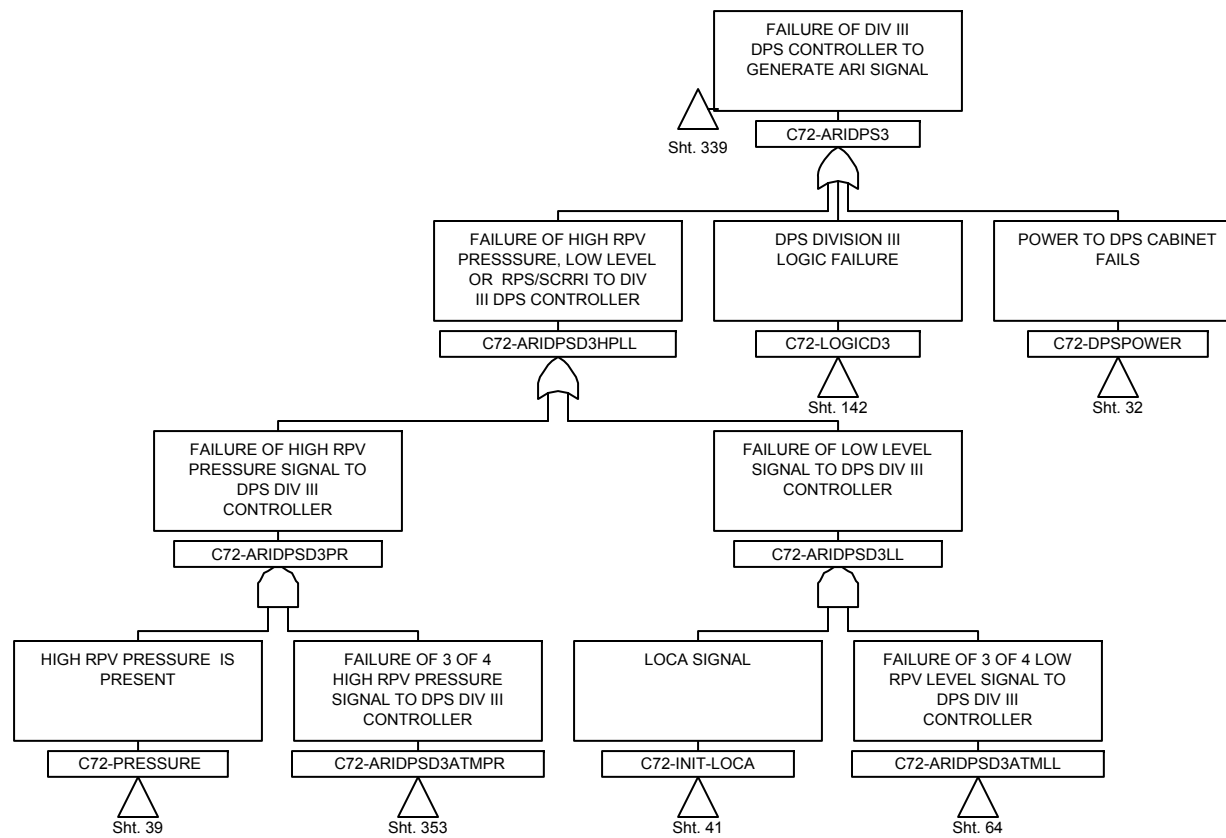


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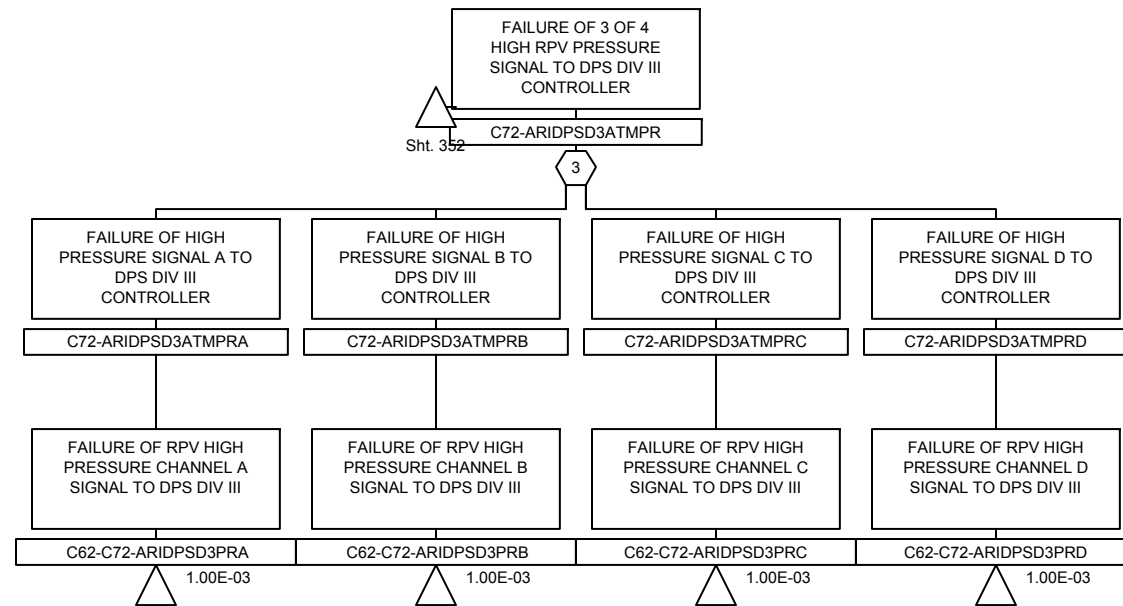


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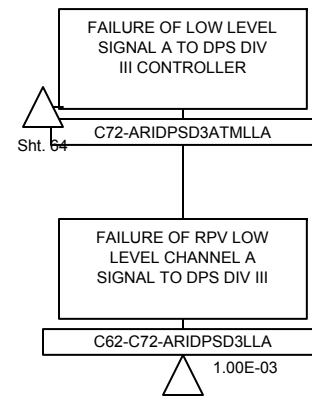


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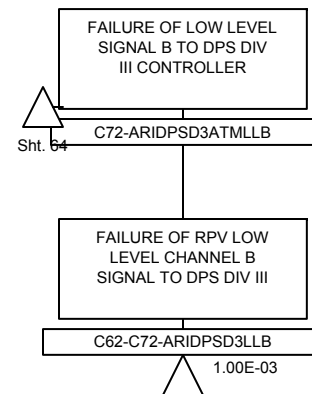


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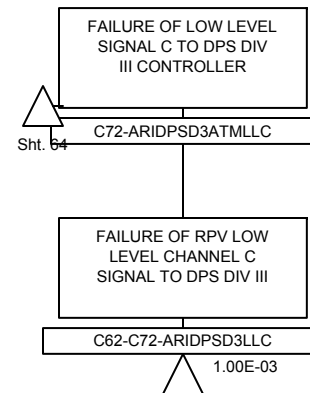


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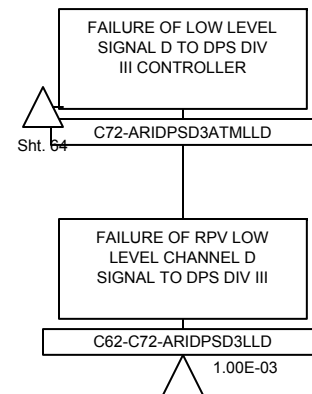


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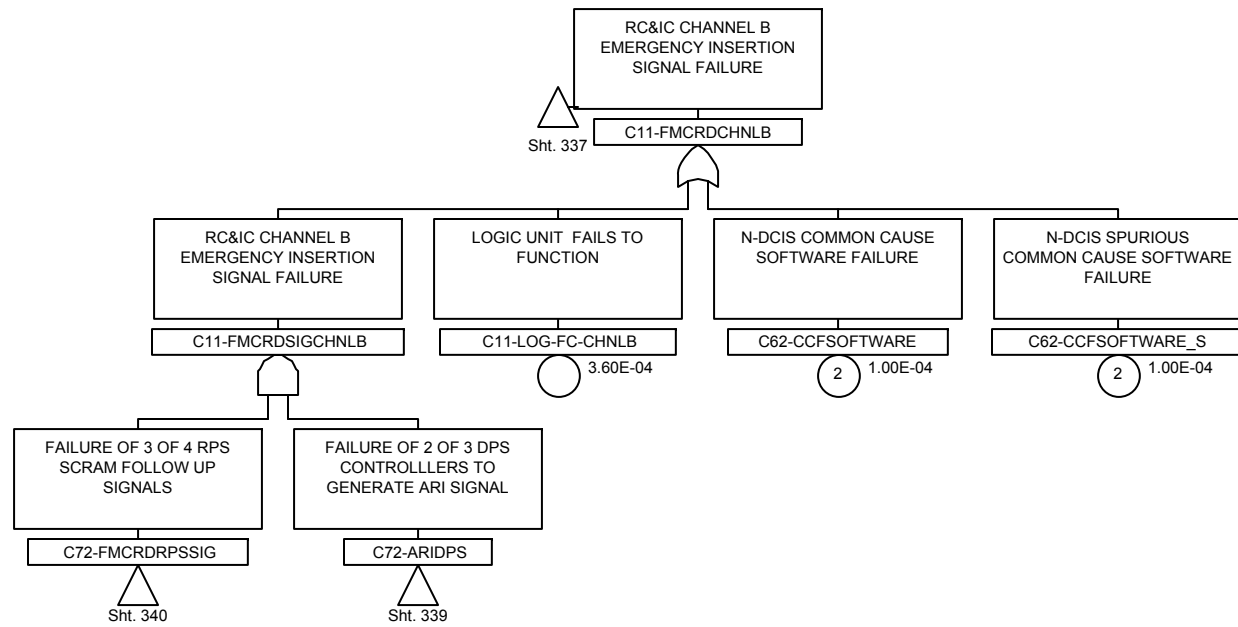


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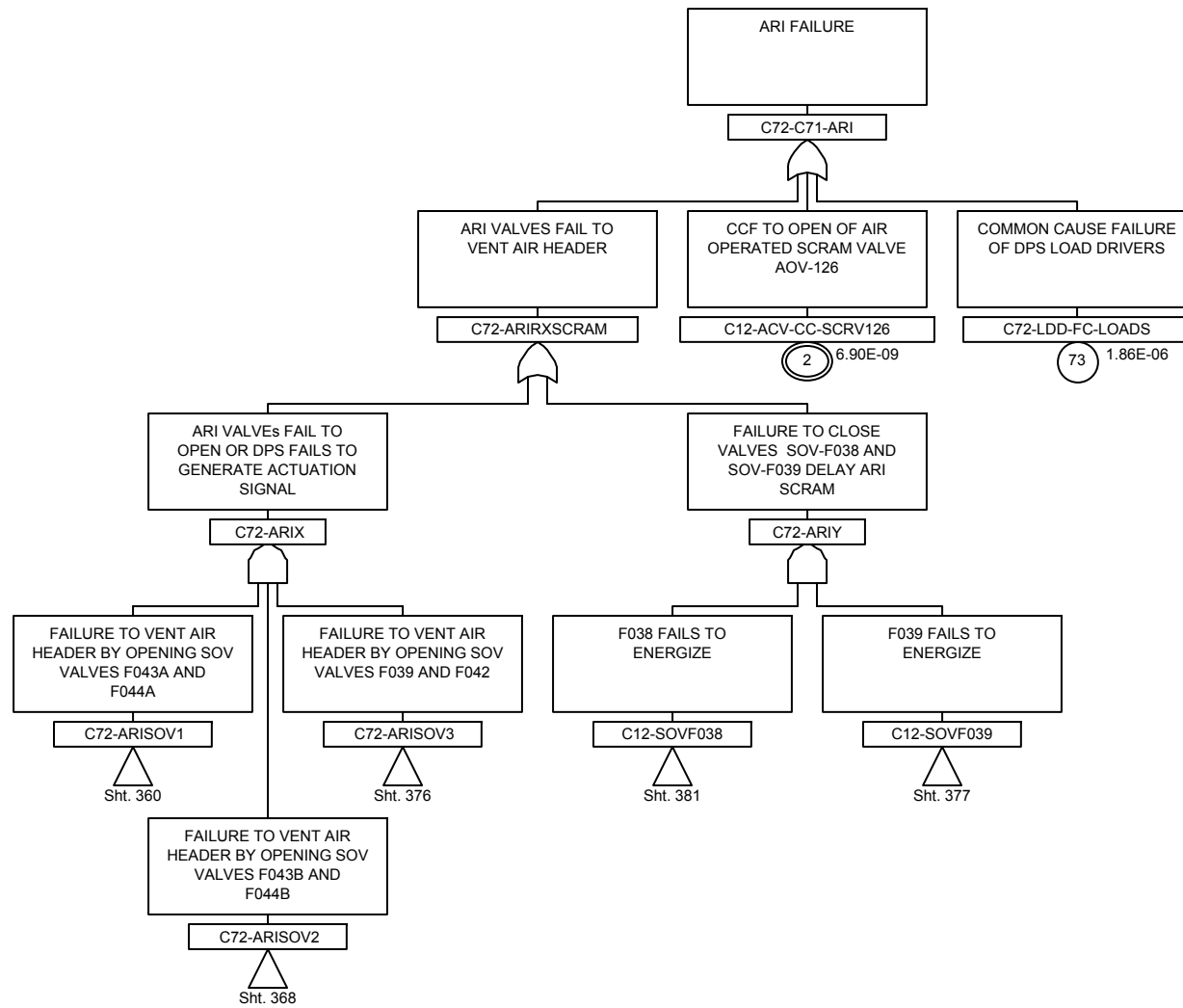


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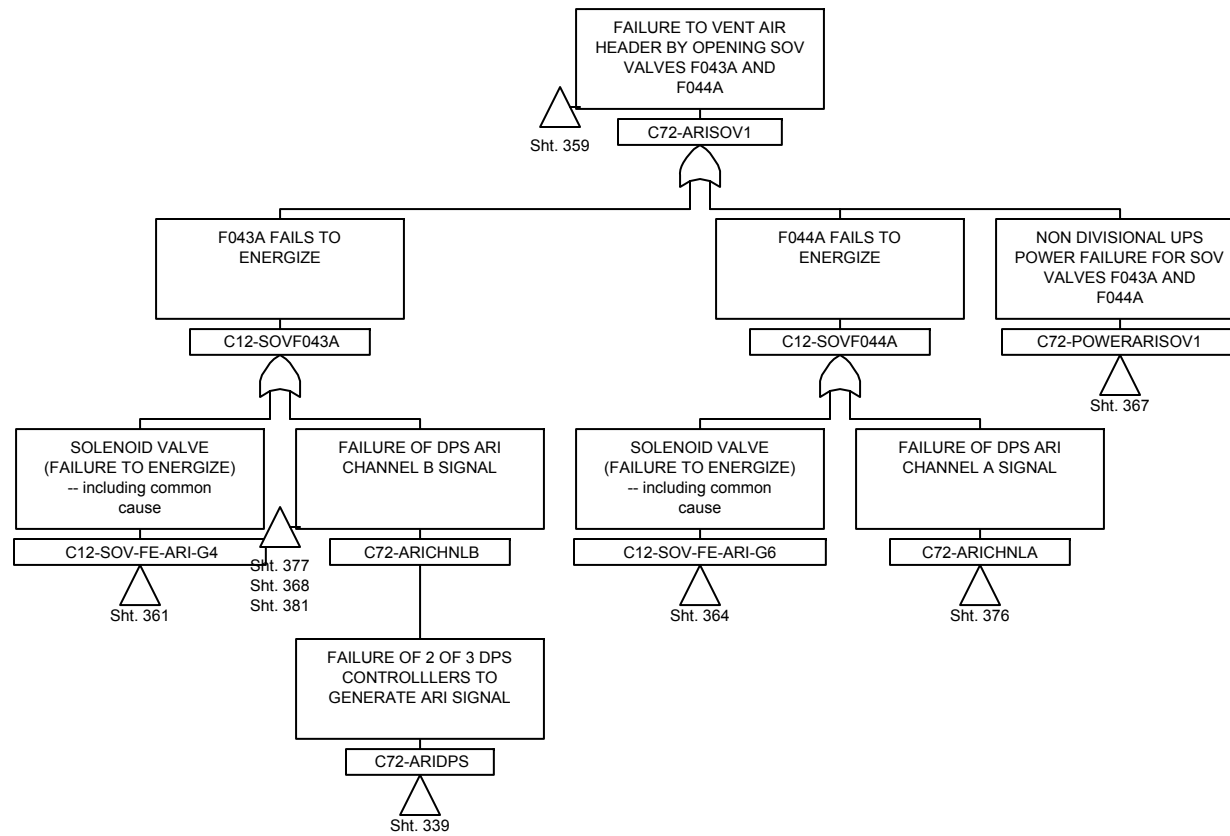


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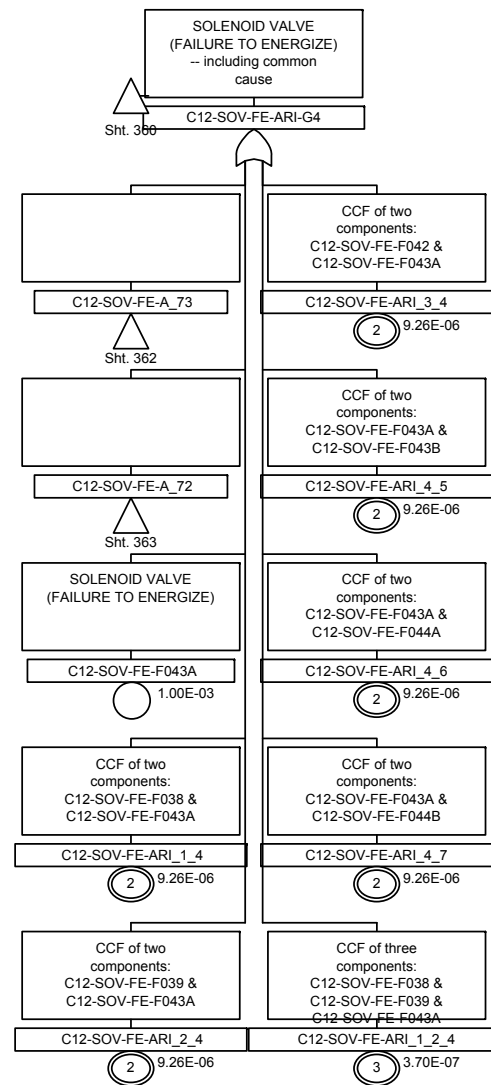


Figure 4.5-3d. Sheet 361 Diverse Protection System

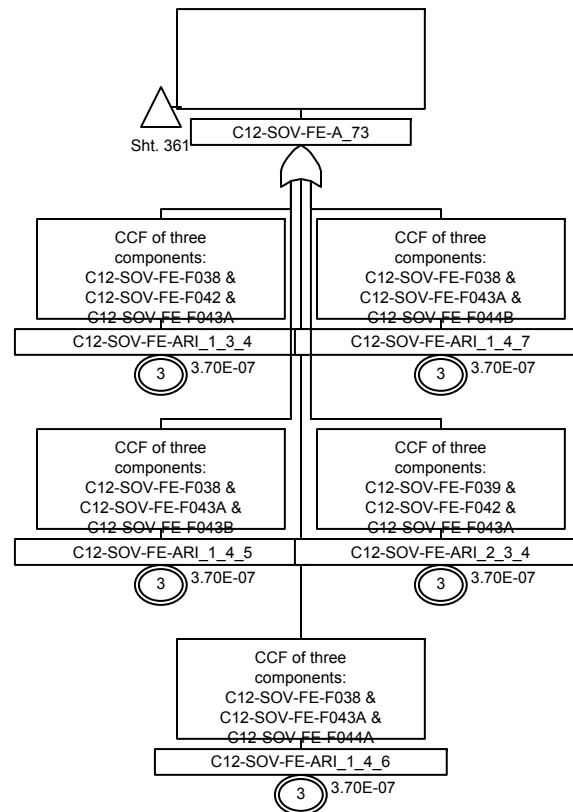


Figure 4.5-3d. Sheet 362 Diverse Protection System

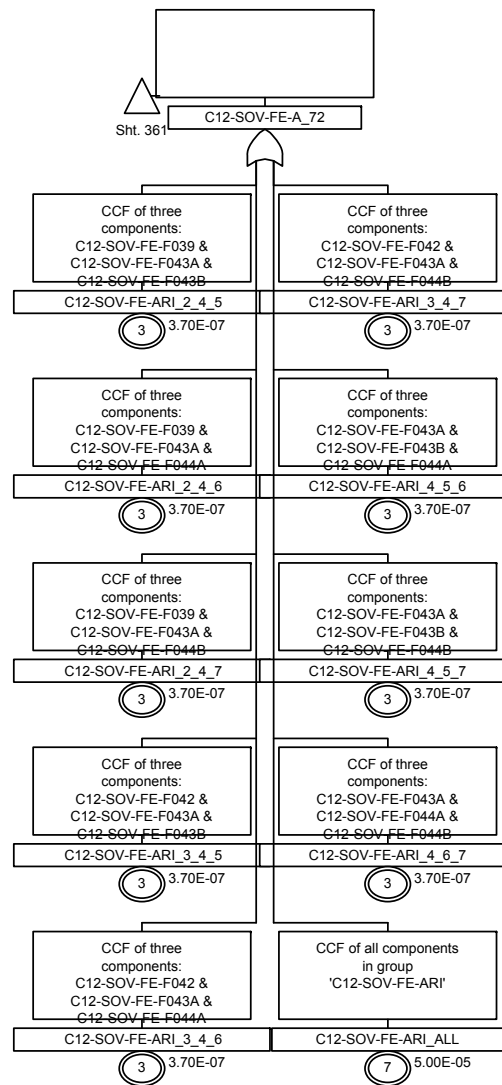


Figure 4.5-3d. Sheet 363 Diverse Protection System

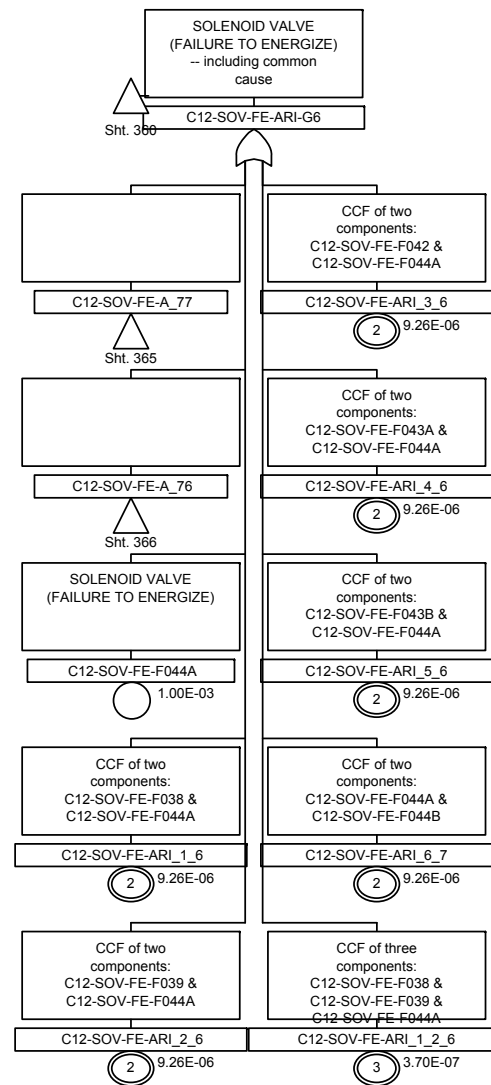


Figure 4.5-3d. Sheet 364 Diverse Protection System

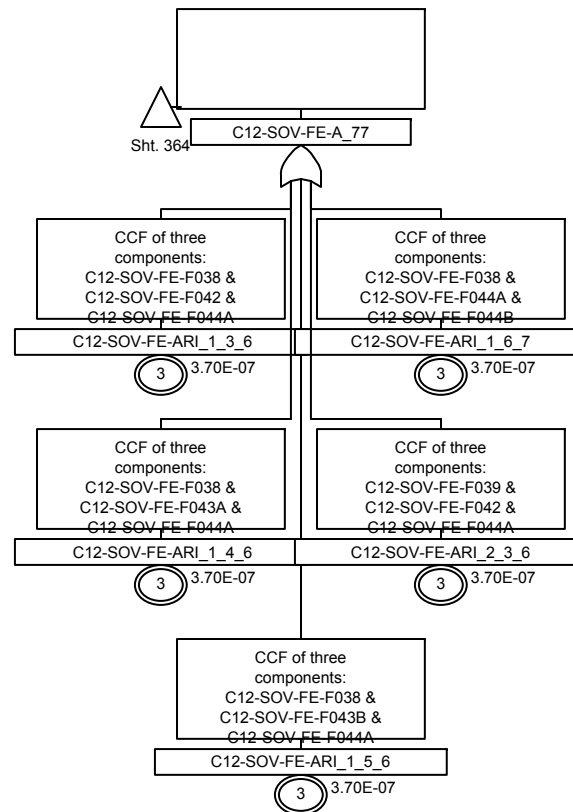


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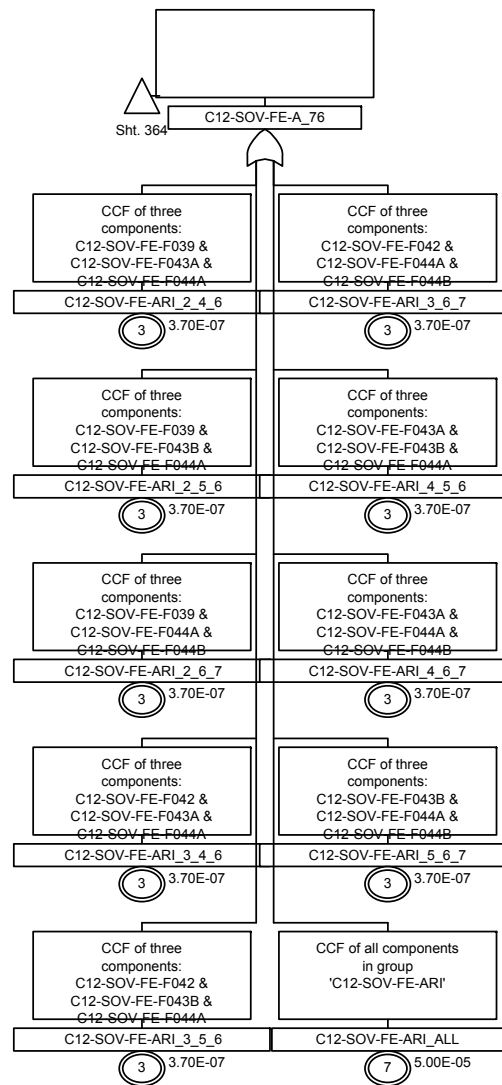


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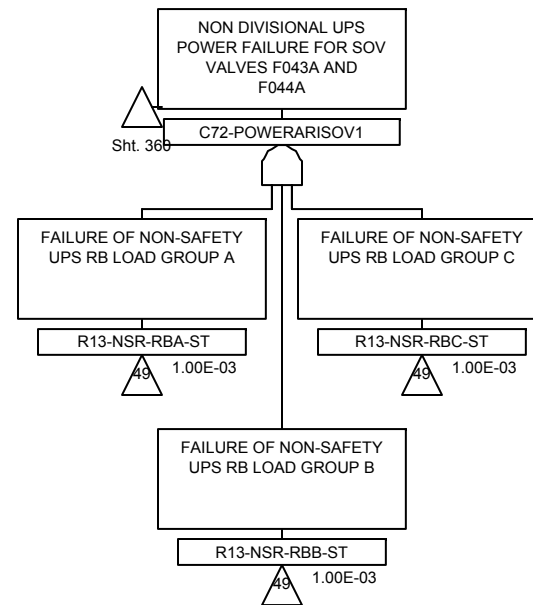


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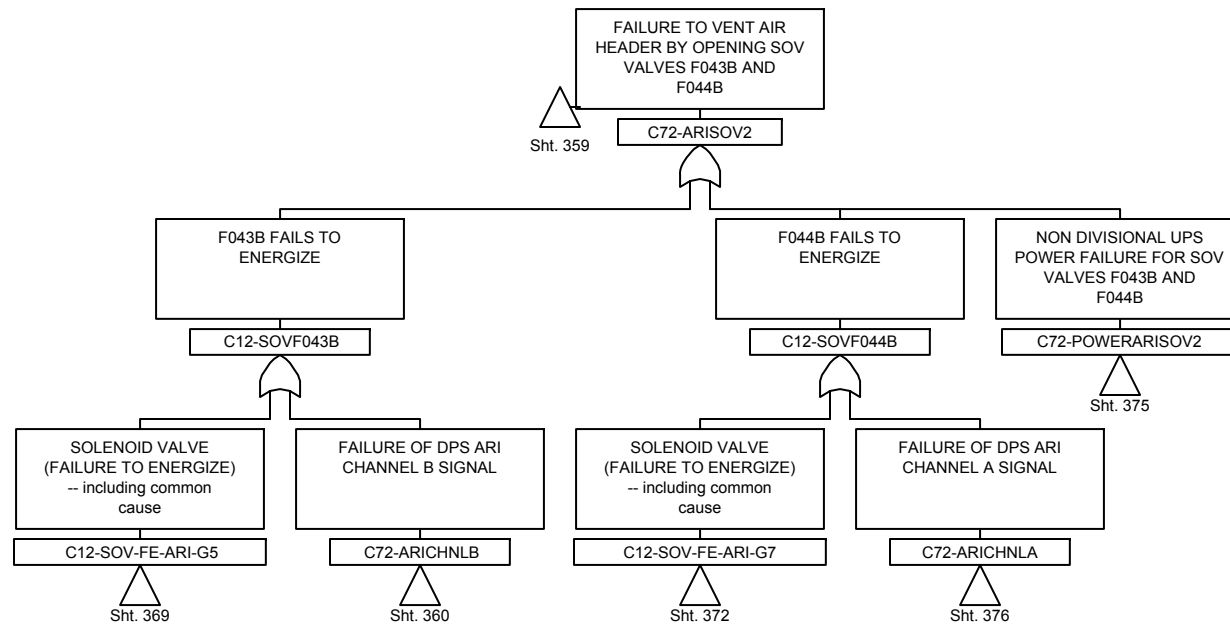


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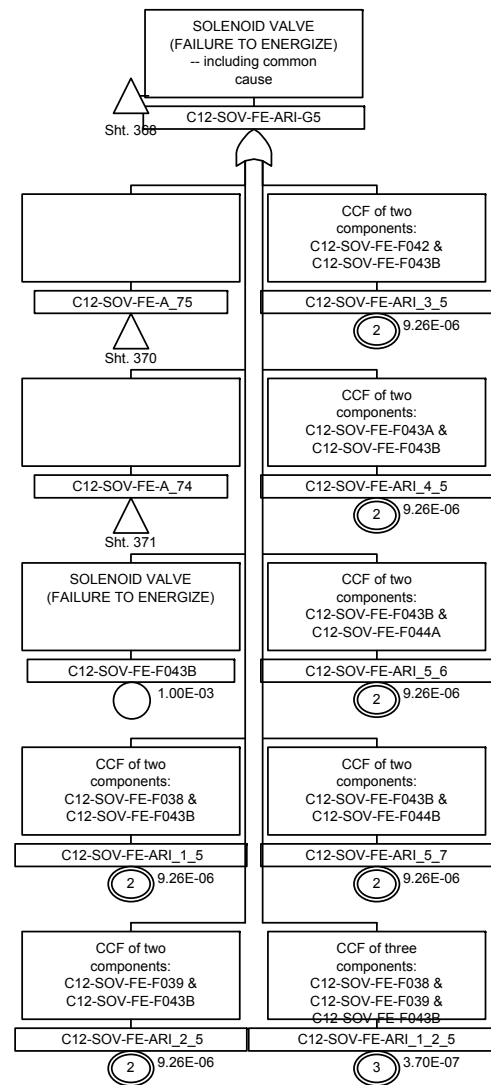


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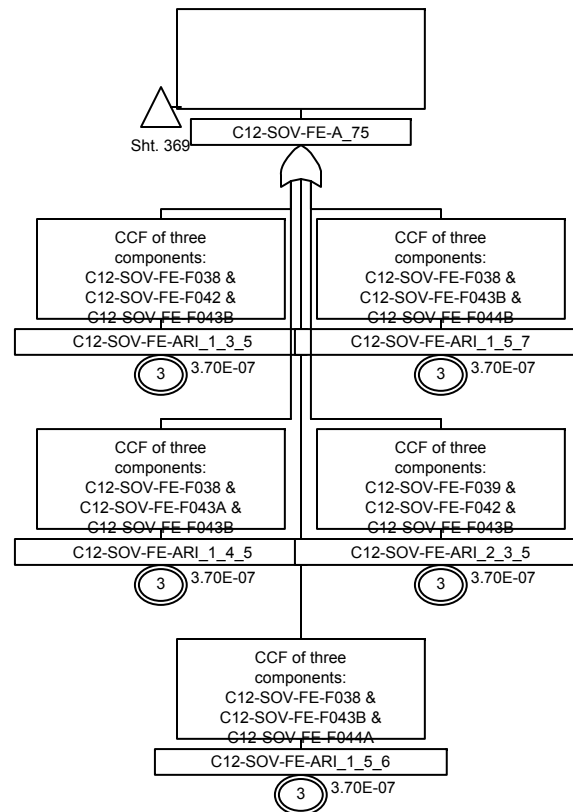


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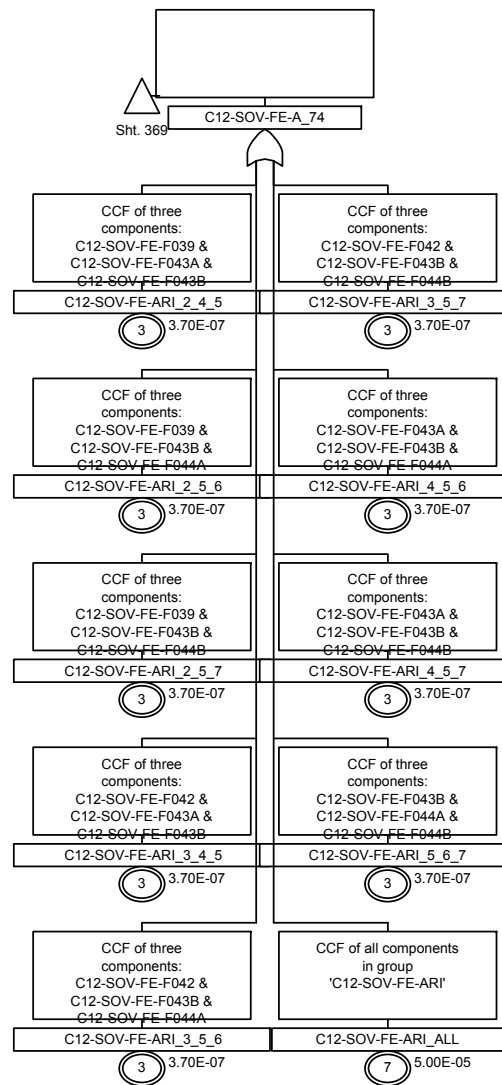


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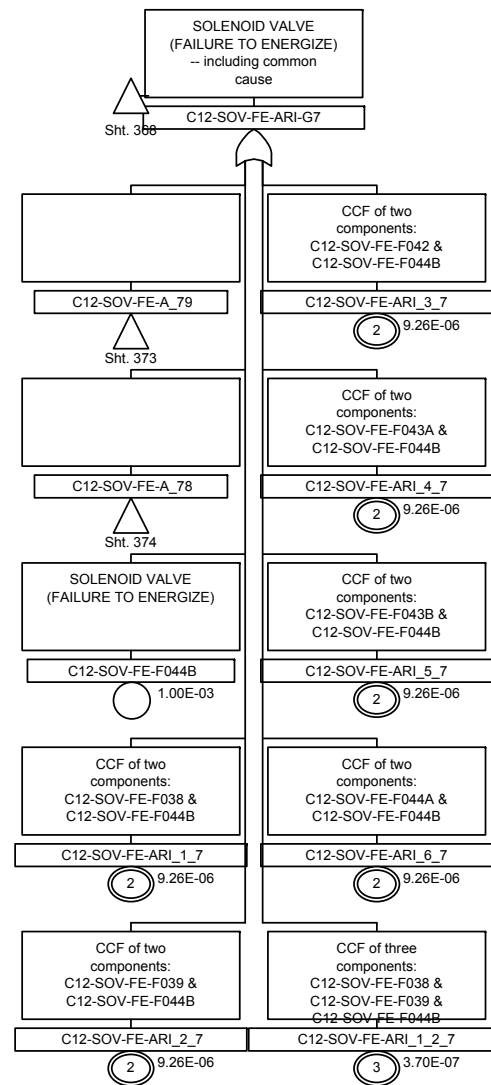


Figure 4.5-3d. Sheet 372 Diverse Protection System

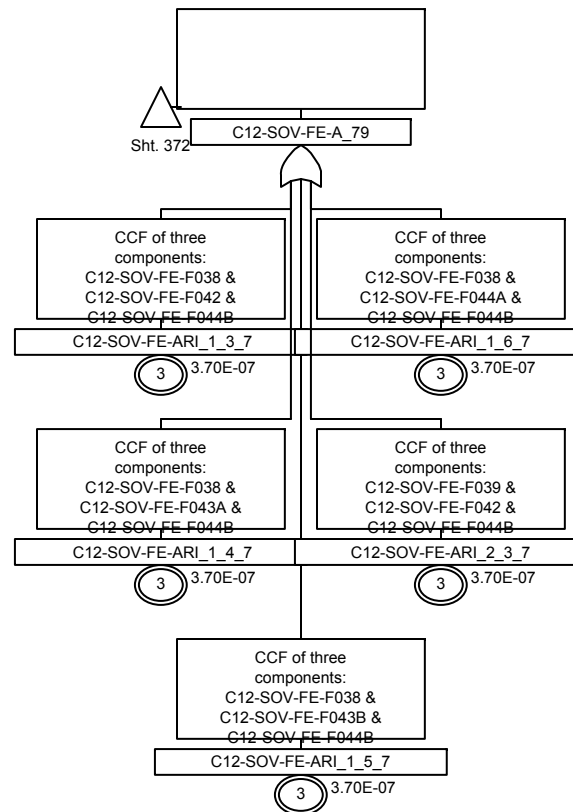


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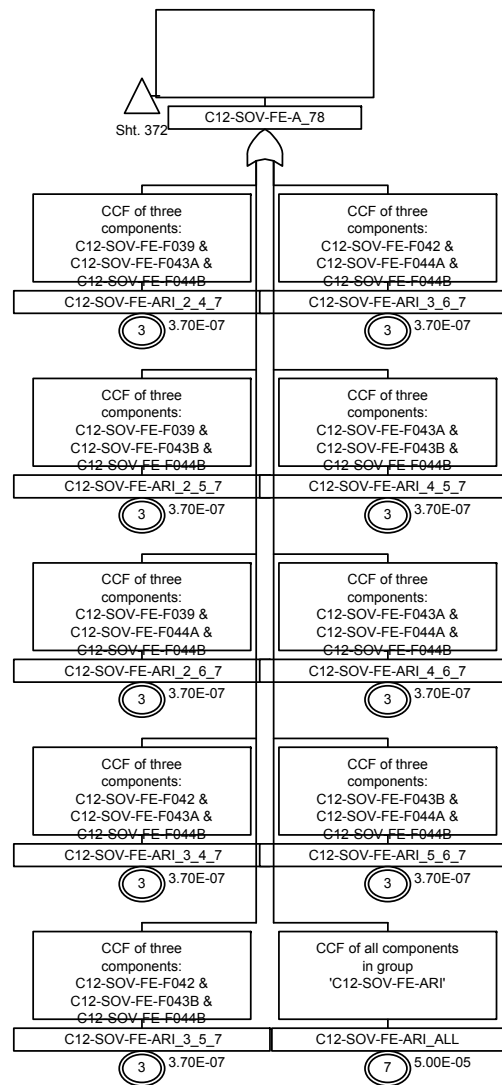


Figure 4.5-3d. Sheet 374 Diverse Protection System



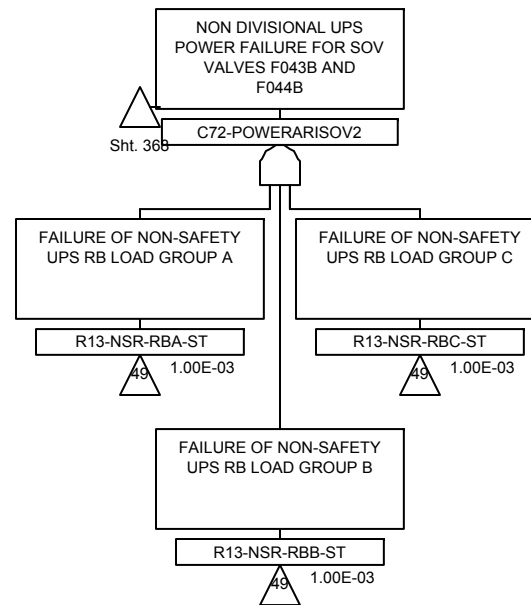


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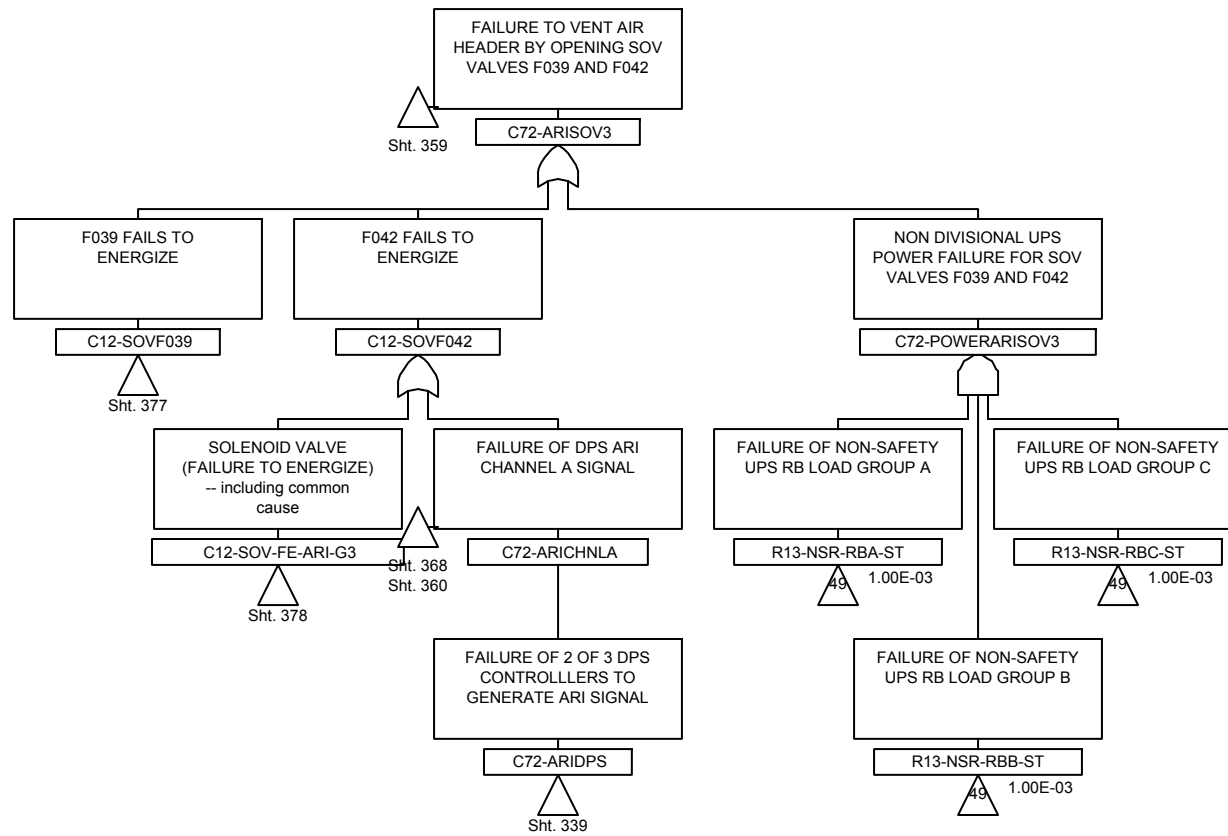


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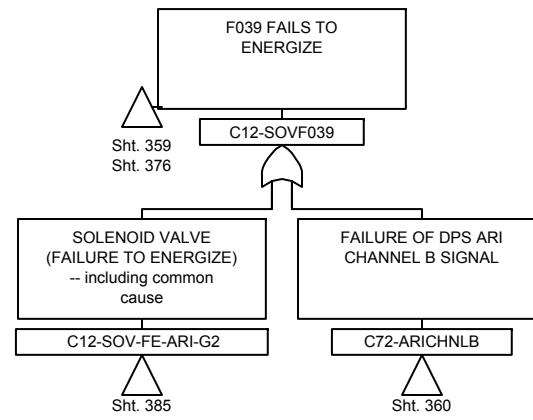


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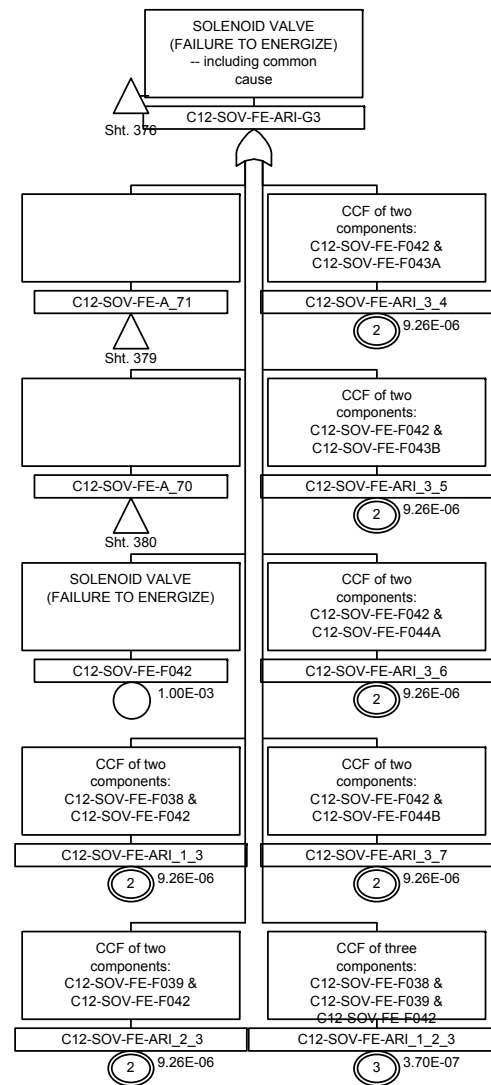


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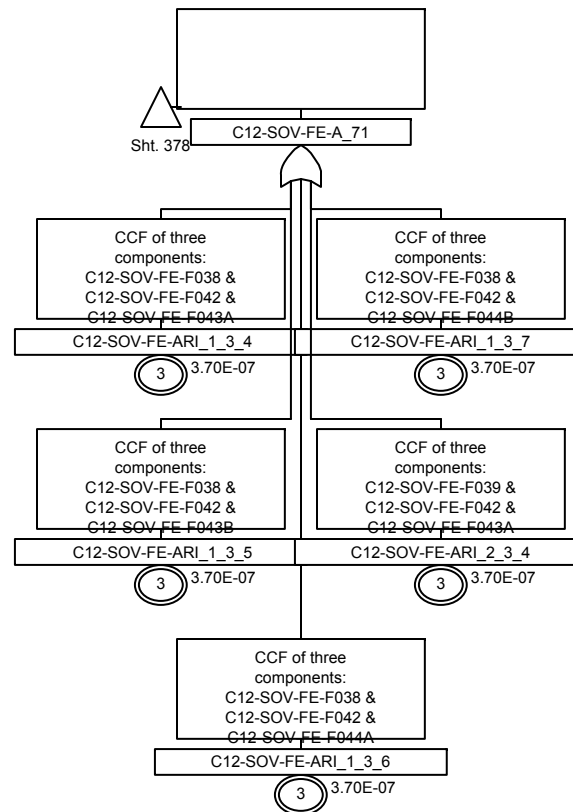


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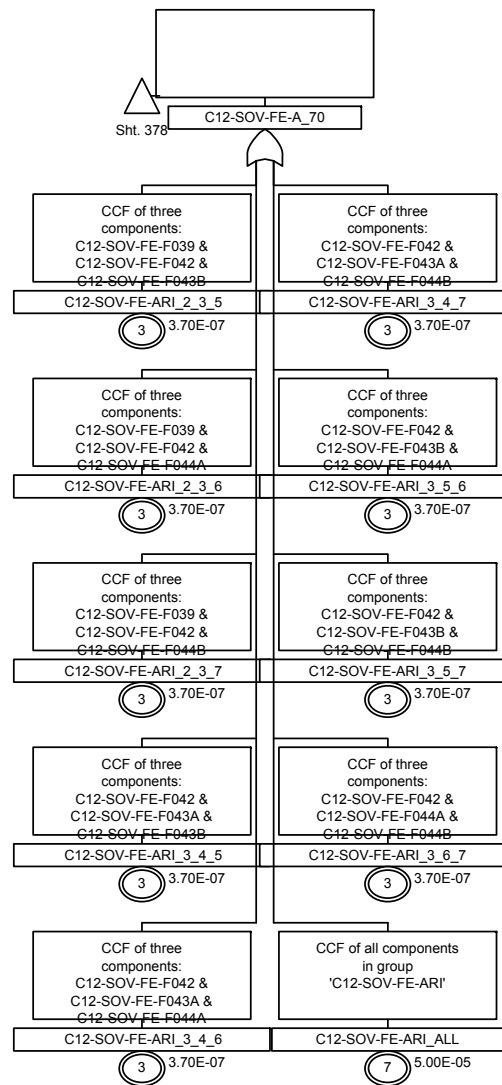


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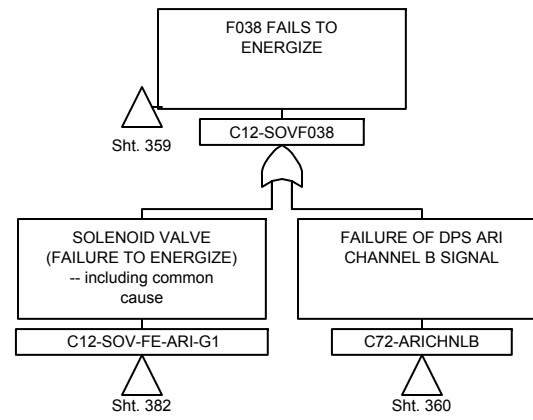


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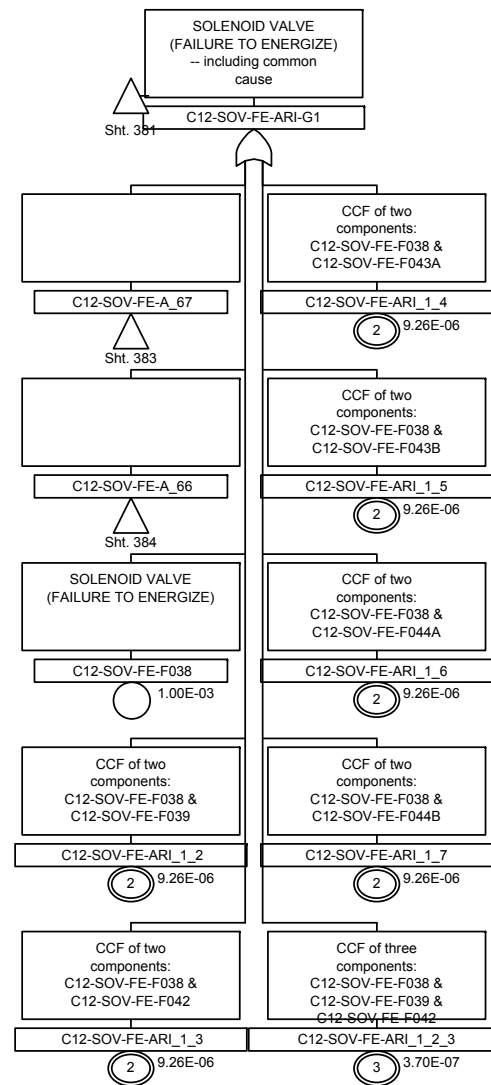


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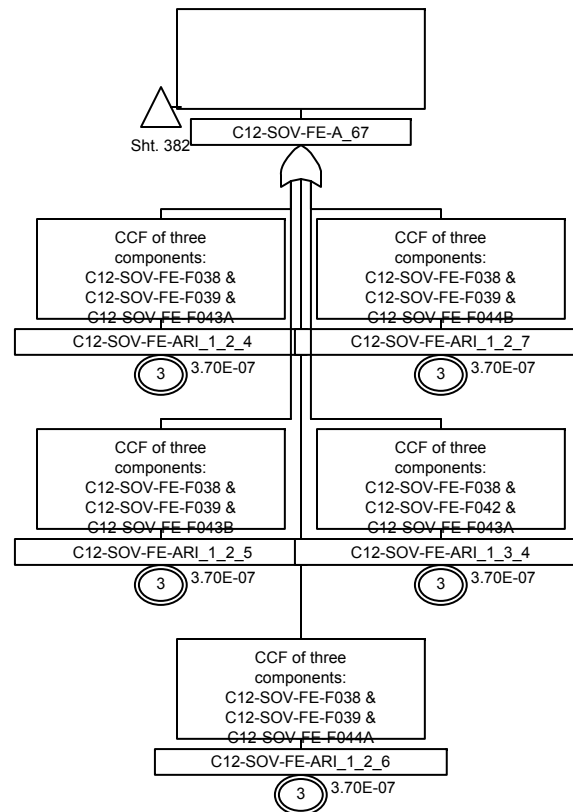


Figure 4.5-3d. Sheet 383 Diverse Protection System



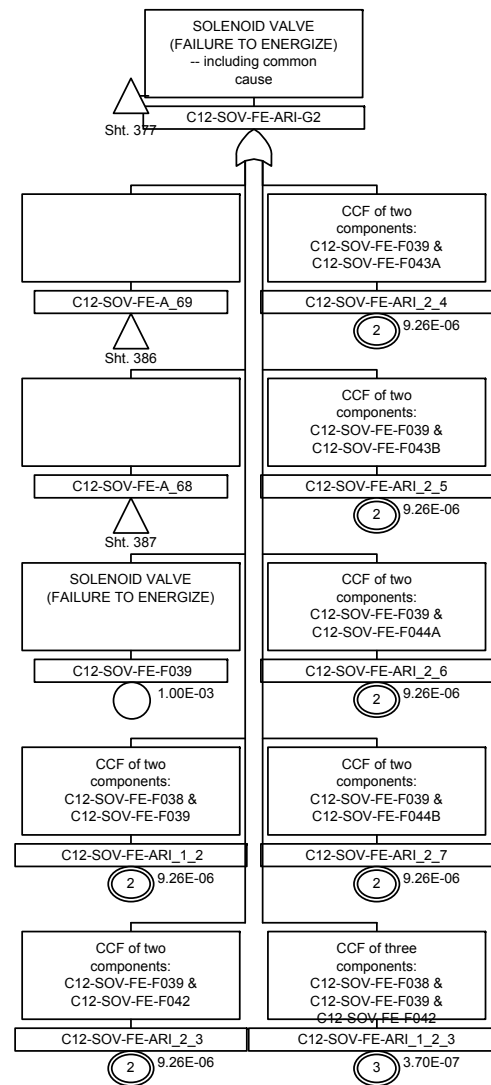


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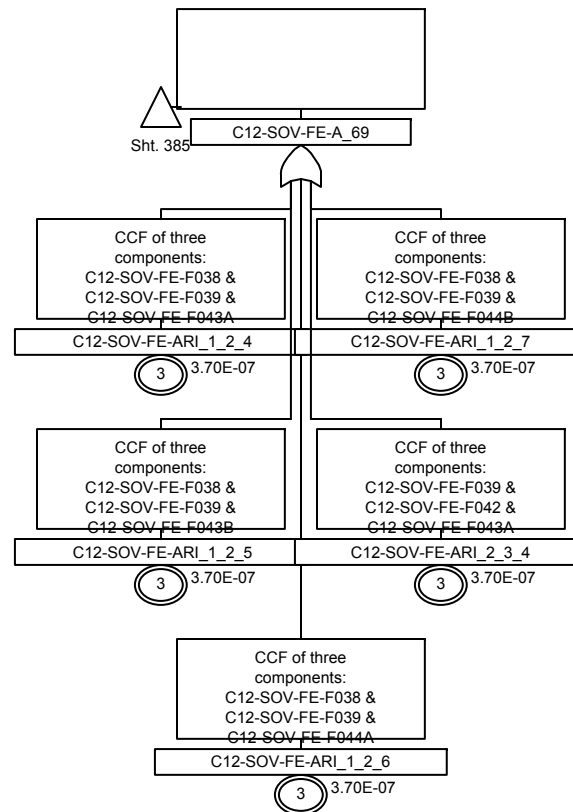


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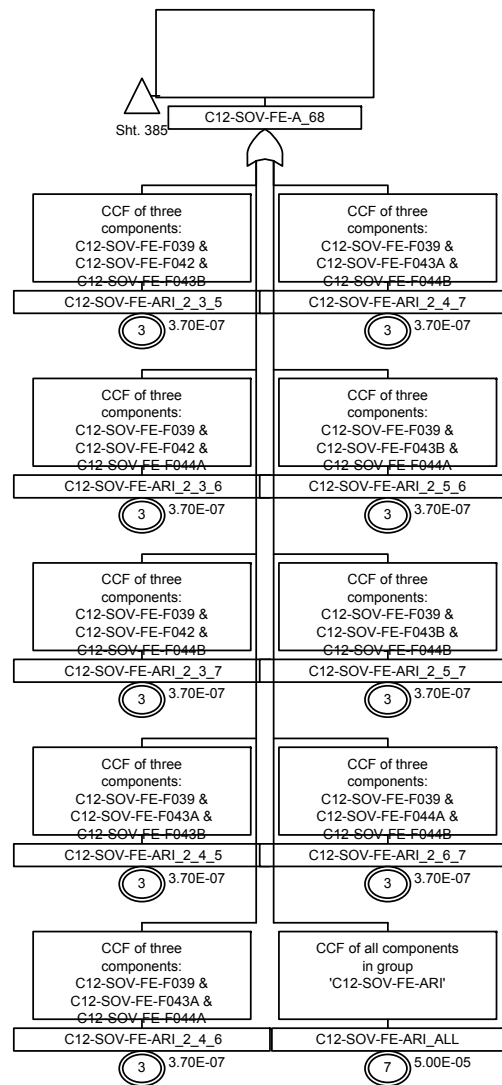


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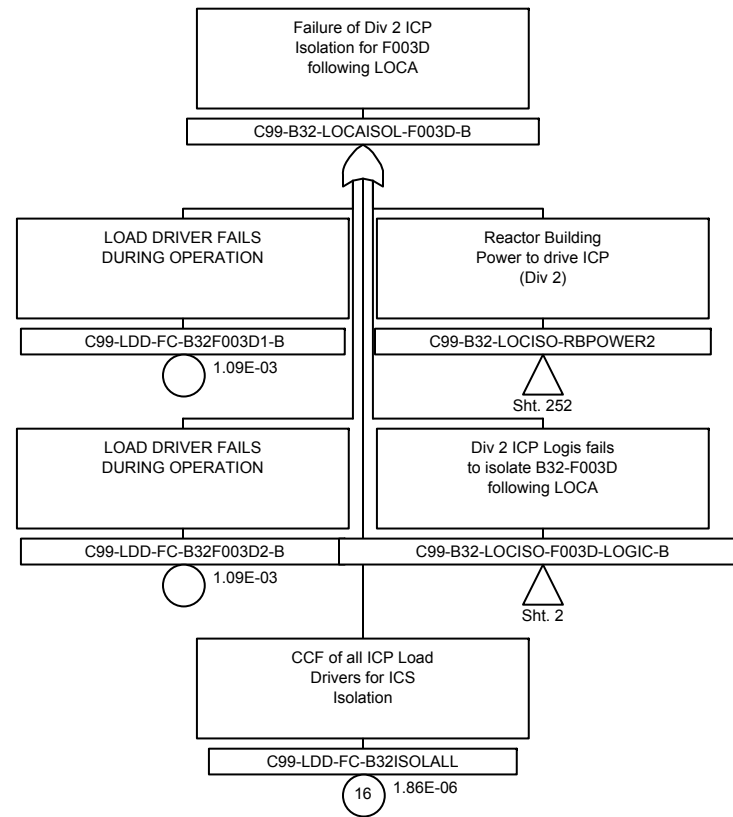


Figure 4.5-3e. Independent Control Platforms - HP CRD Isolation Bypass and ICS DPV Isolation  
Sheet 1

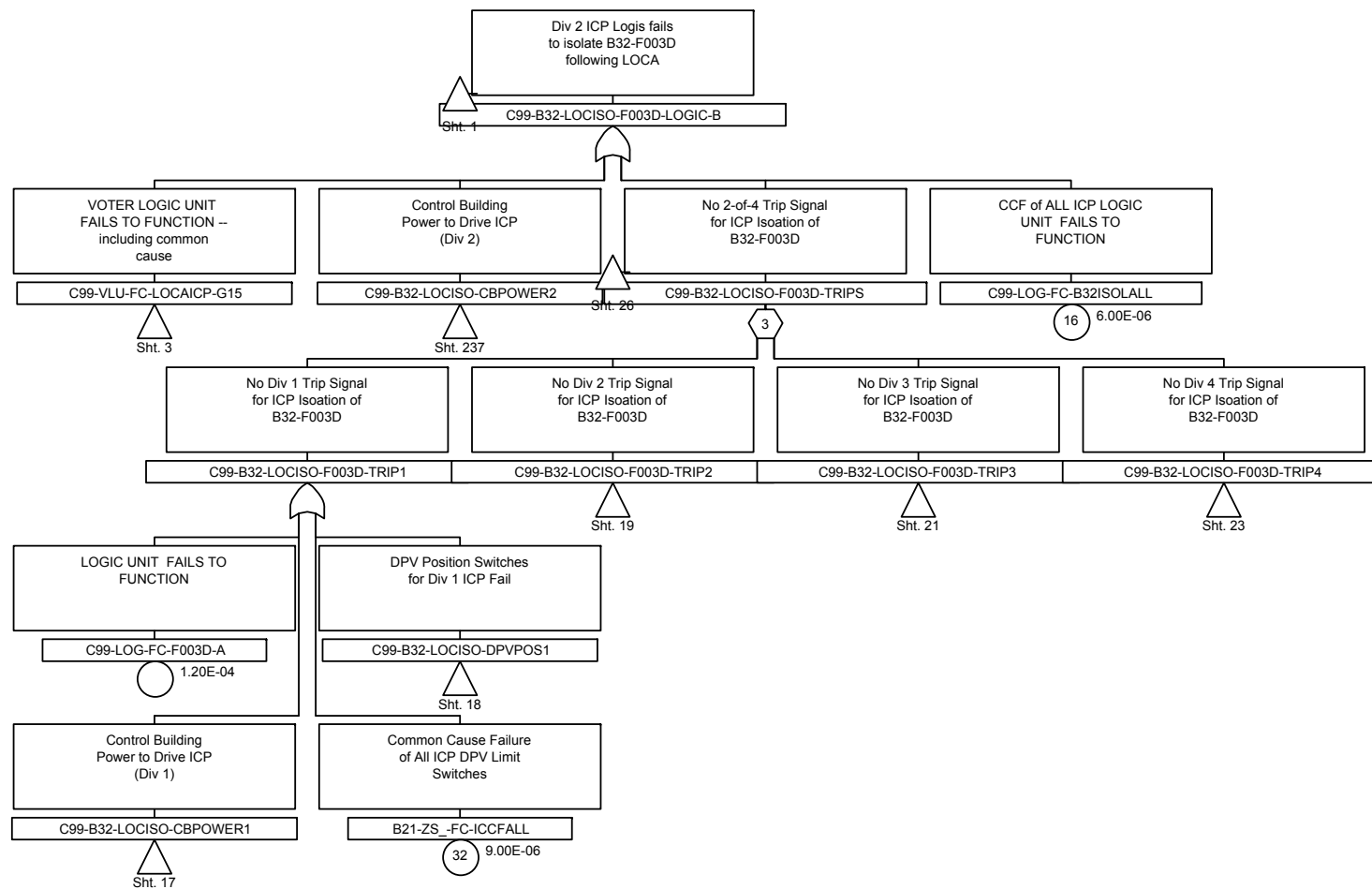


Figure 4.5-3e. Sheet 2 Independent Control Platforms



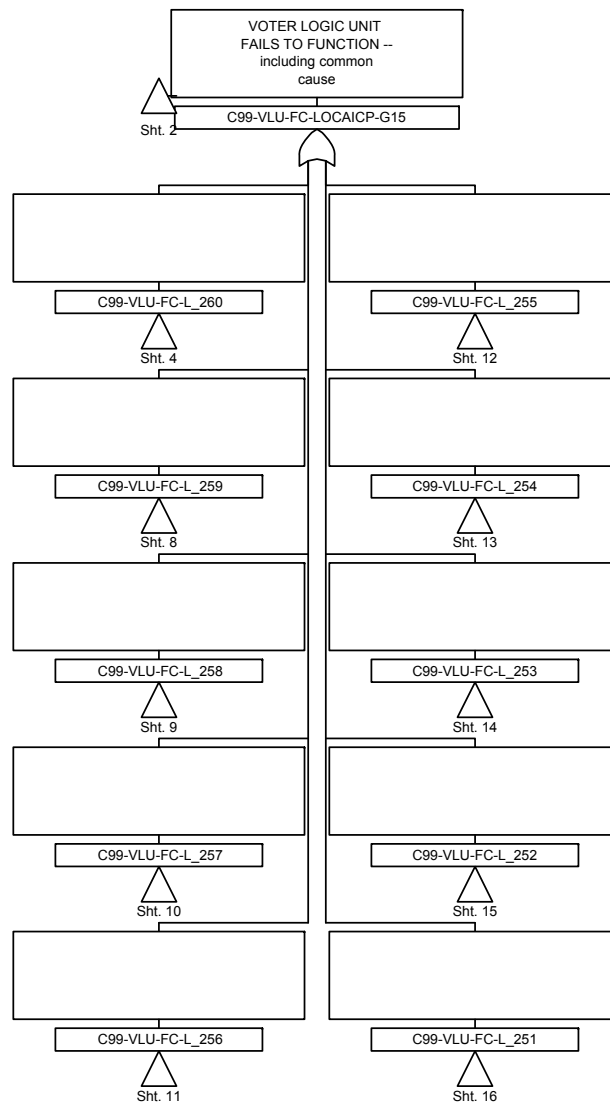


Figure 4.5-3e. Sheet 3 Independent Control Platforms

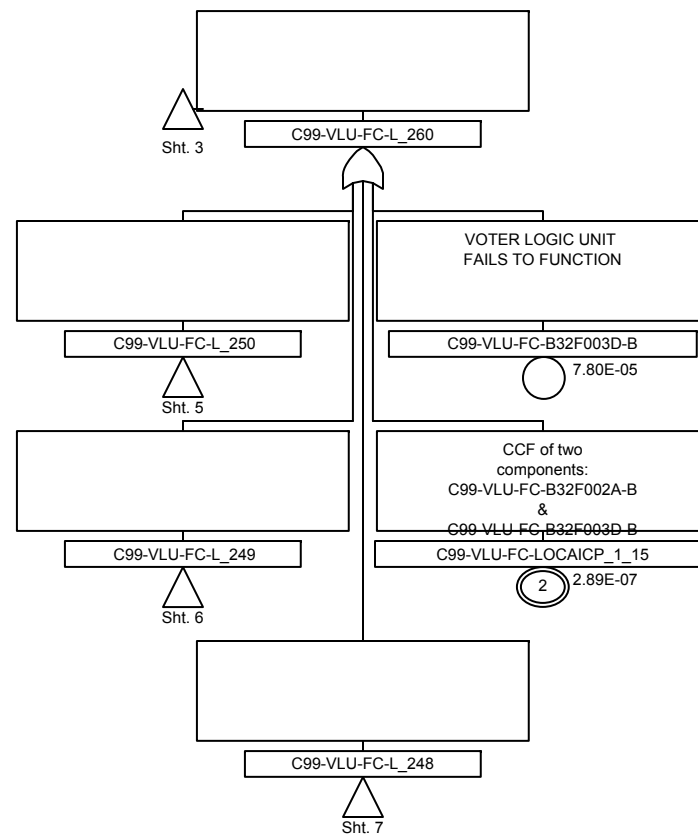


Figure 4.5-3e. Sheet 4 Independent Control Platforms

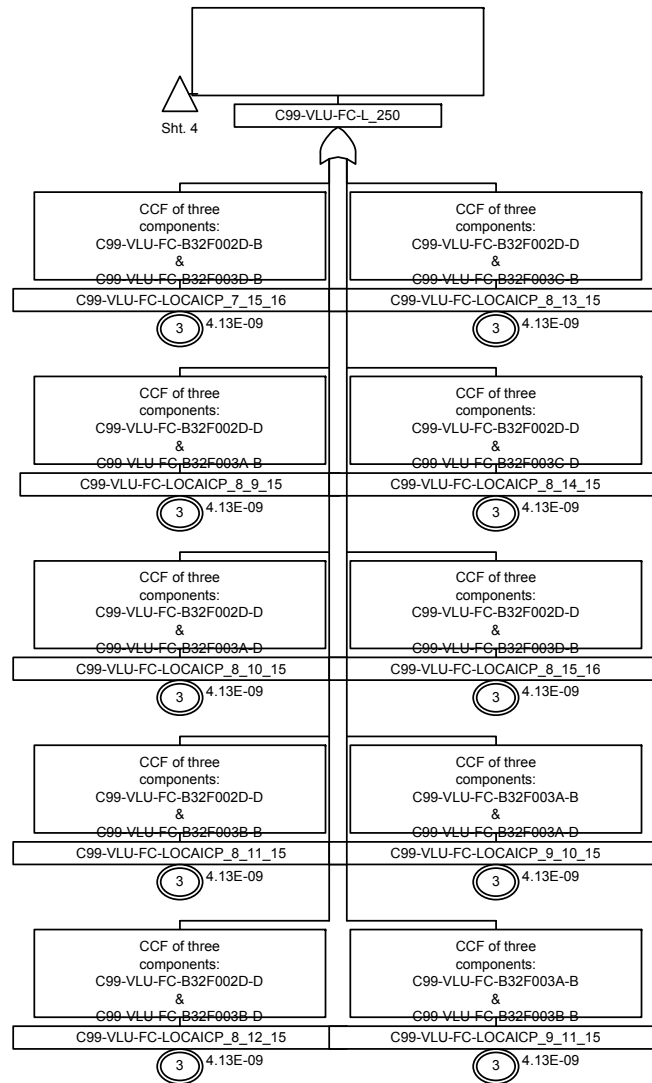


Figure 4.5-3e. Sheet 5 Independent Control Platforms

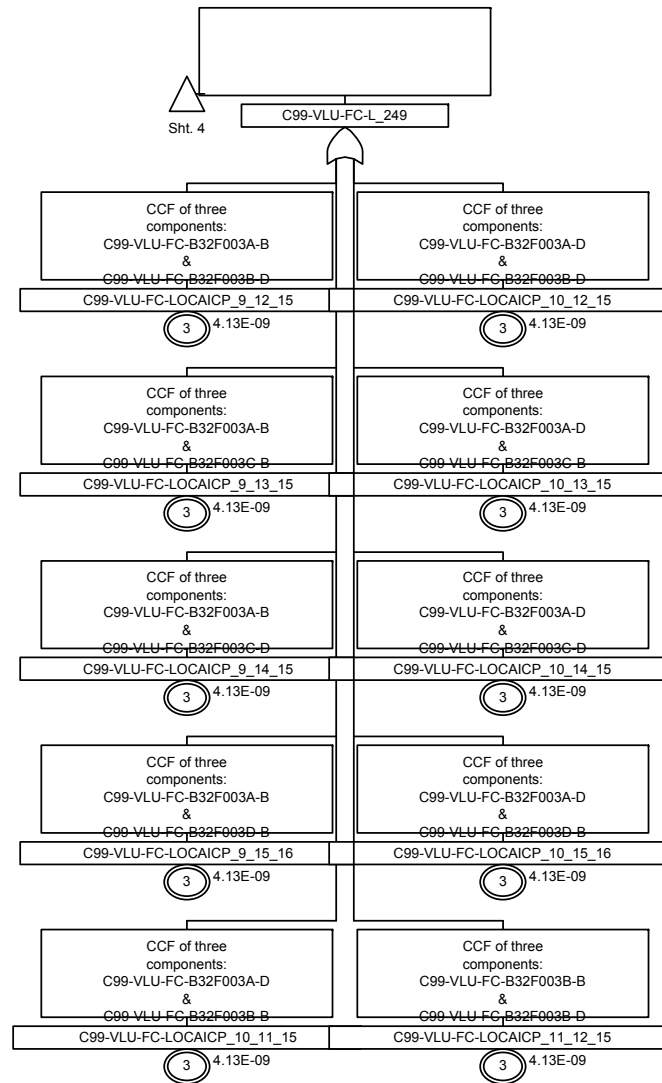


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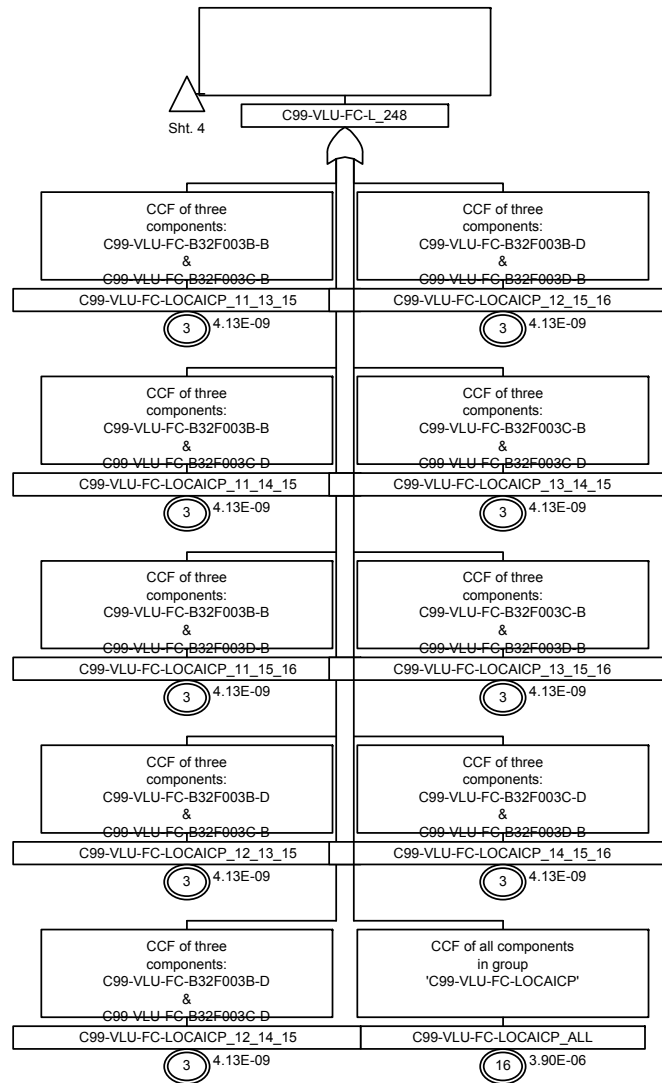


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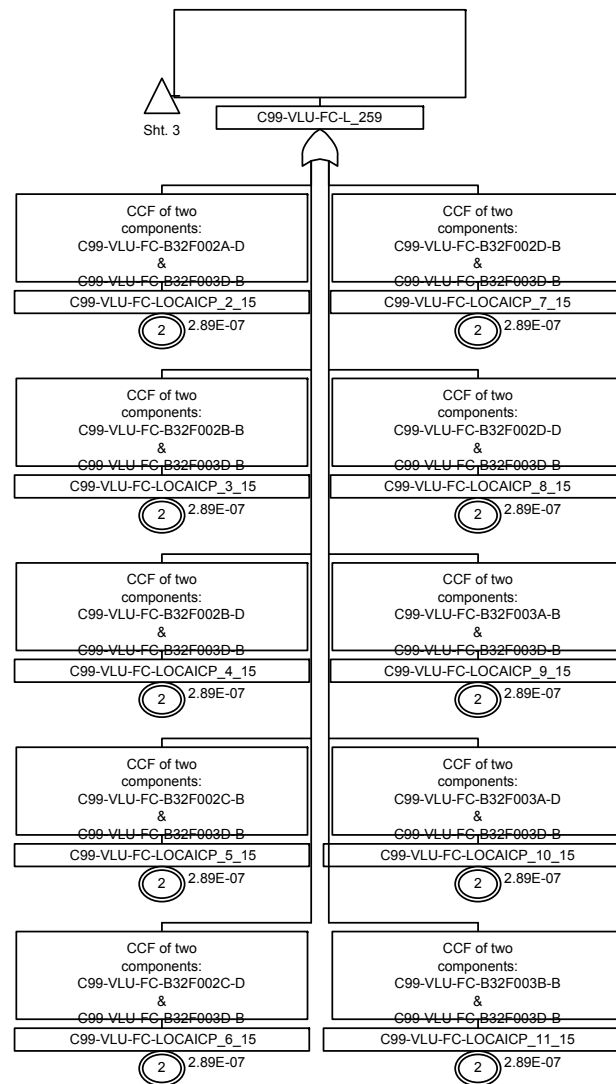


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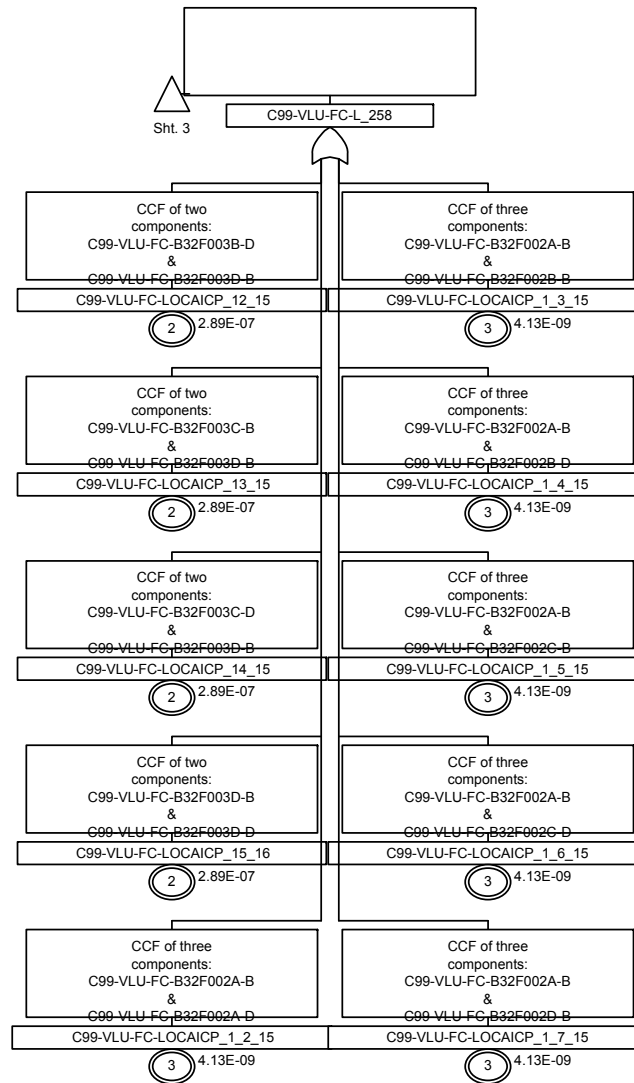


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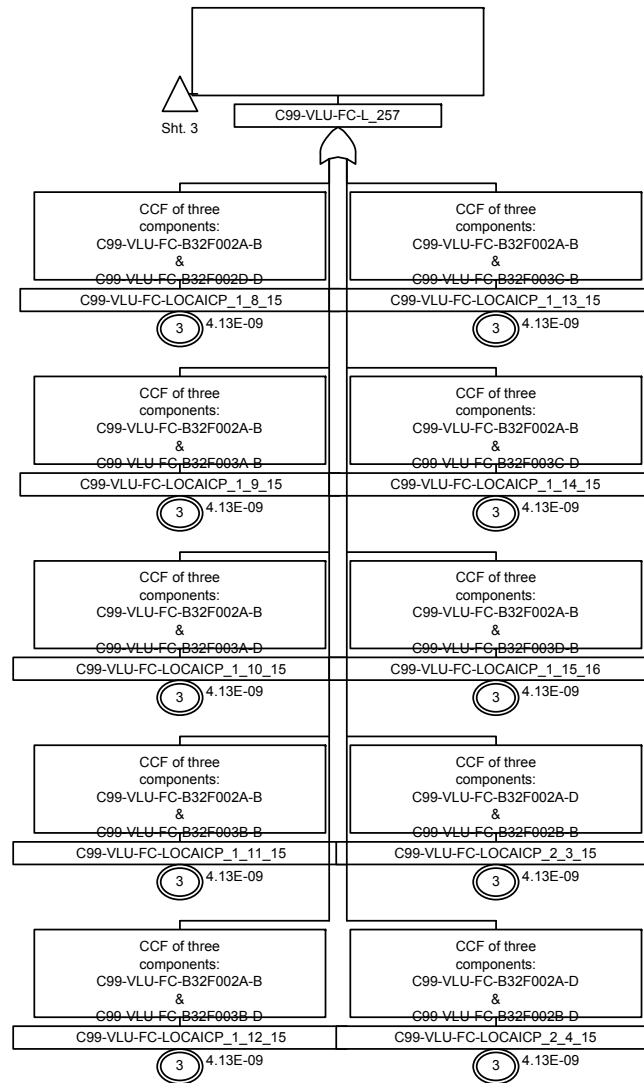


Figure 4.5-3e. Sheet 10 Independent Control Platforms



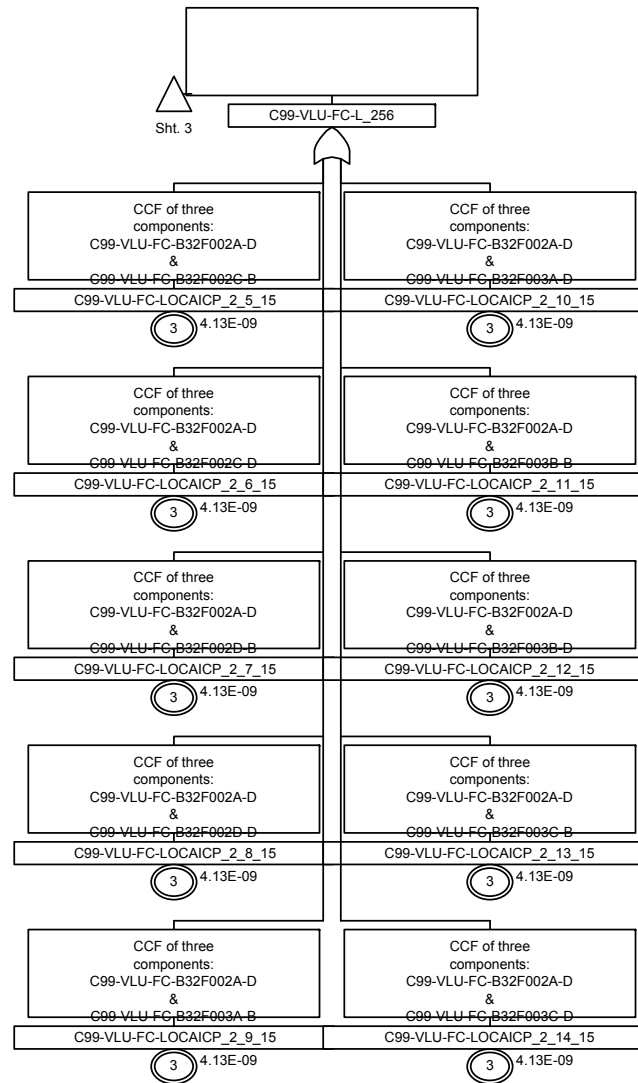


Figure 4.5-3e. Sheet 11 Independent Control Platforms

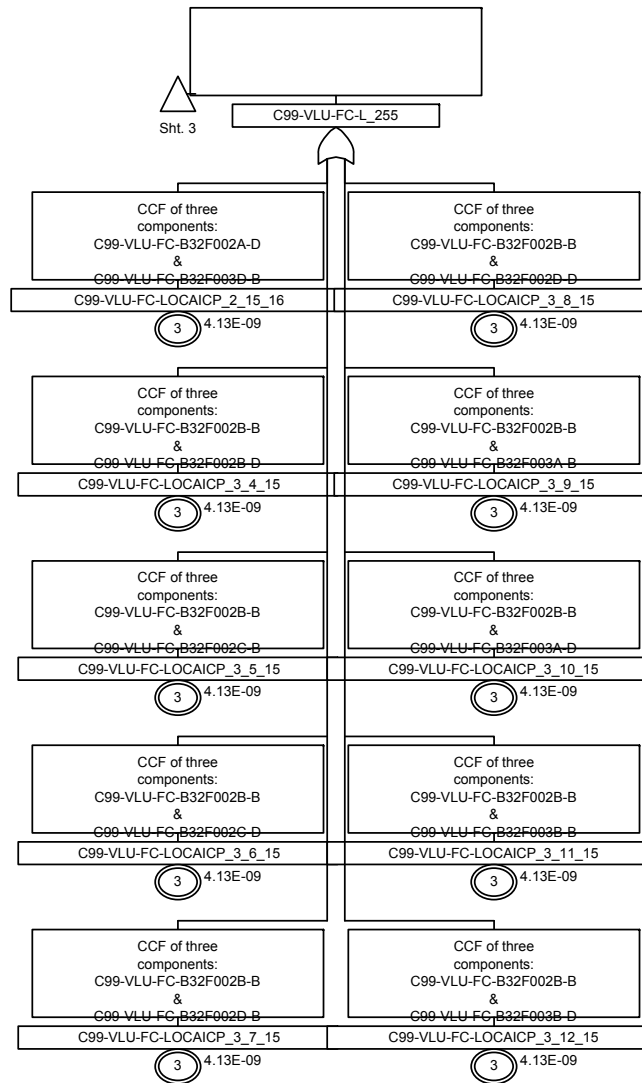


Figure 4.5-3e. Sheet 12 Independent Control Platforms

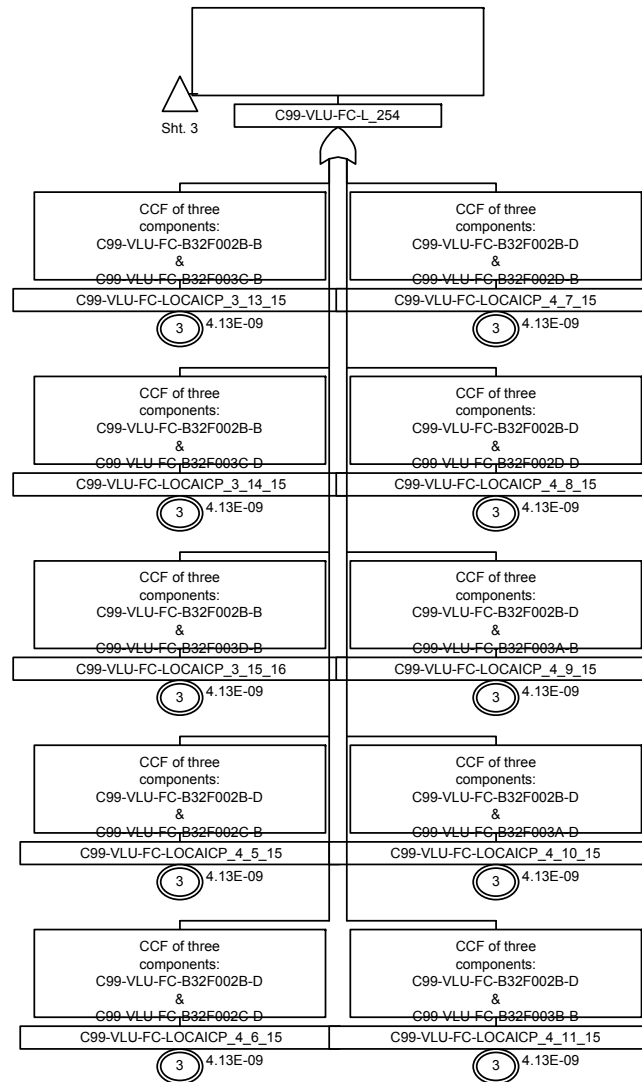


Figure 4.5-3e. Sheet 13 Independent Control Platforms

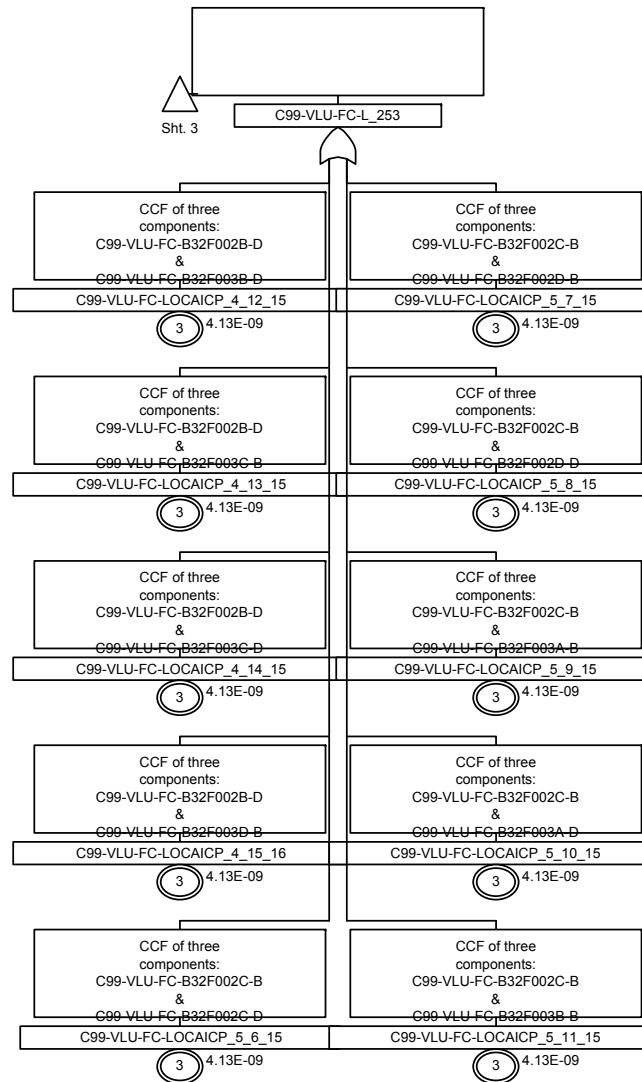


Figure 4.5-3e. Sheet 14 Independent Control Platforms

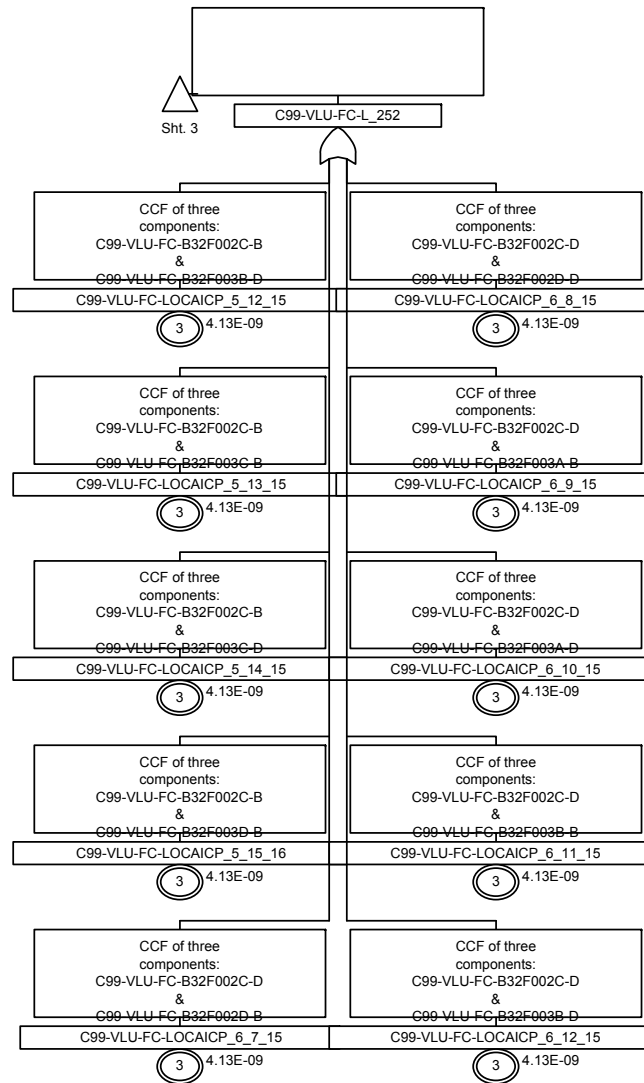


Figure 4.5-3e. Sheet 15 Independent Control Platforms

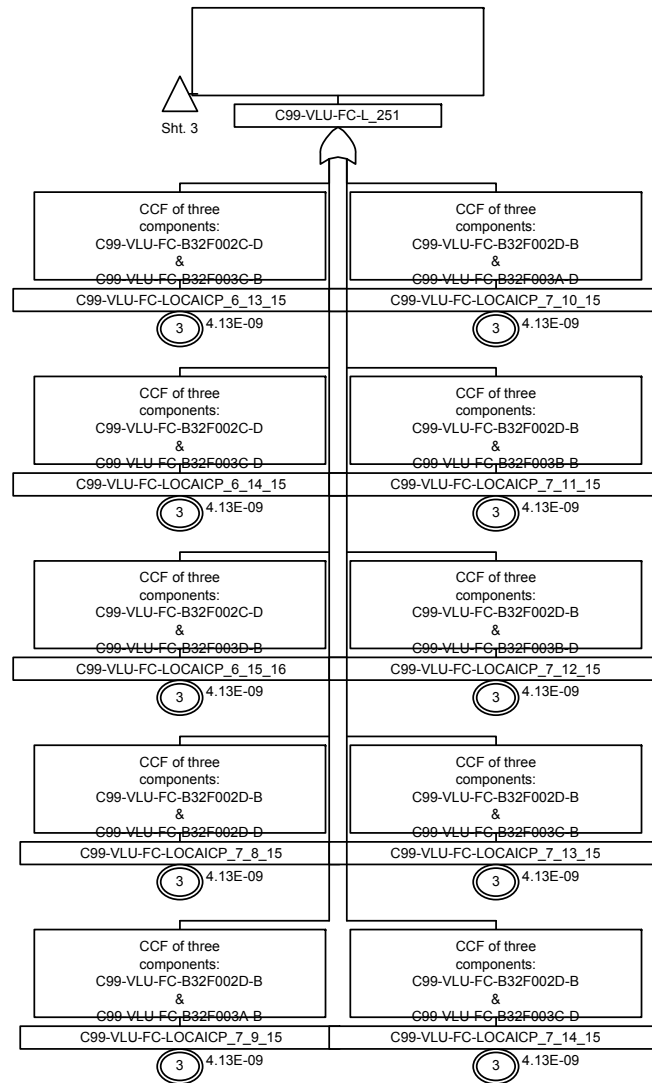


Figure 4.5-3e. Sheet 16 Independent Control Platforms

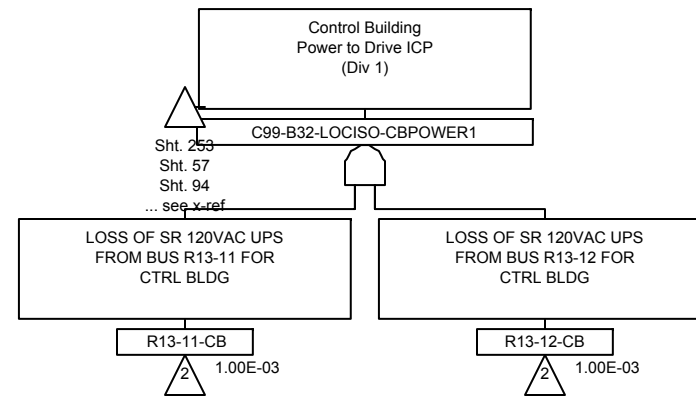


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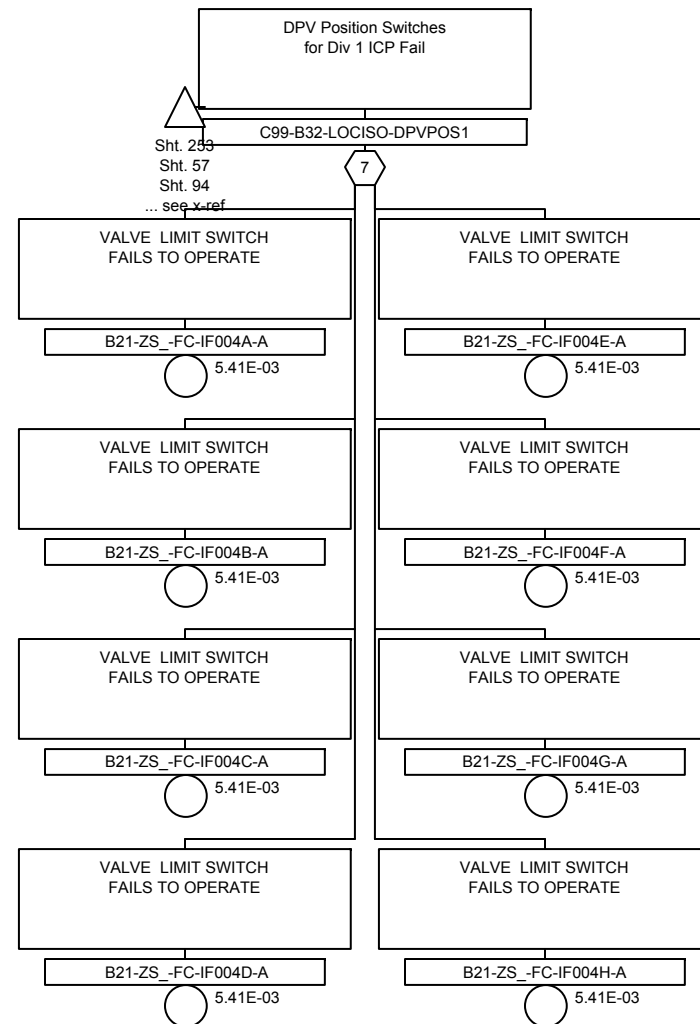


Figure 4.5-3e. Sheet 18 Independent Control Platforms



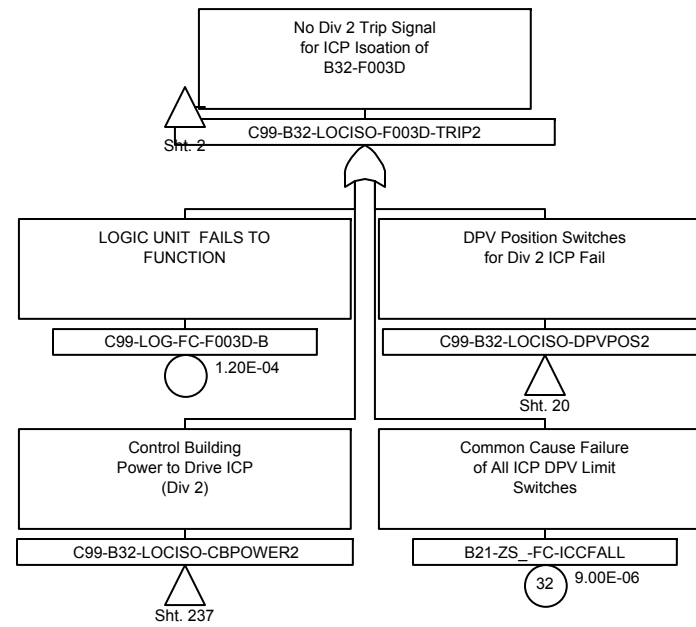


Figure 4.5-3e. Sheet 19 Independent Control Platforms

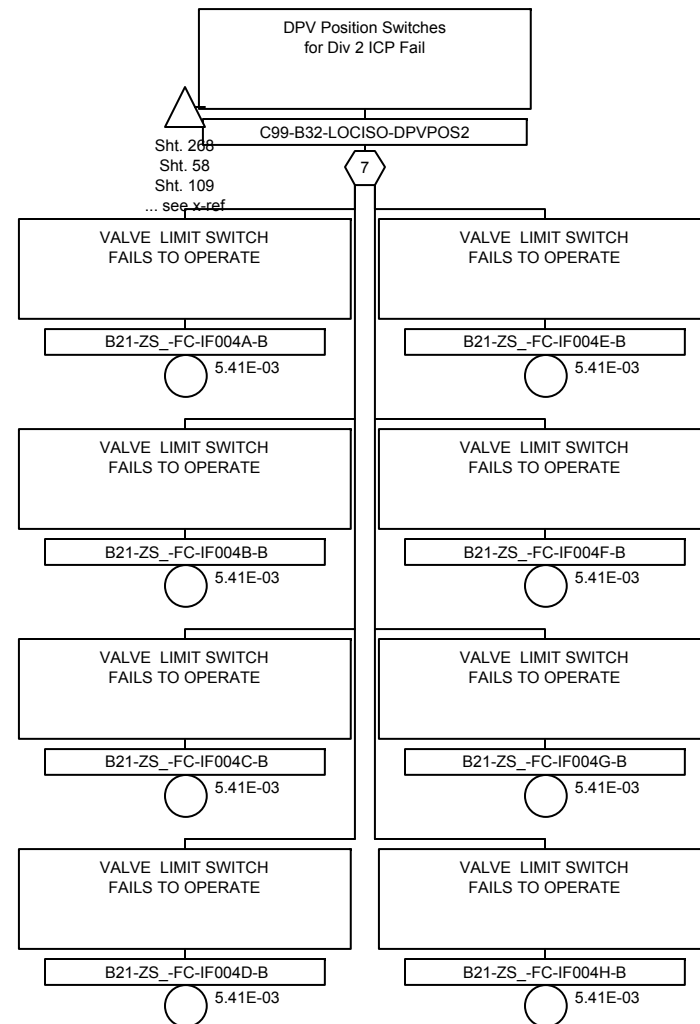


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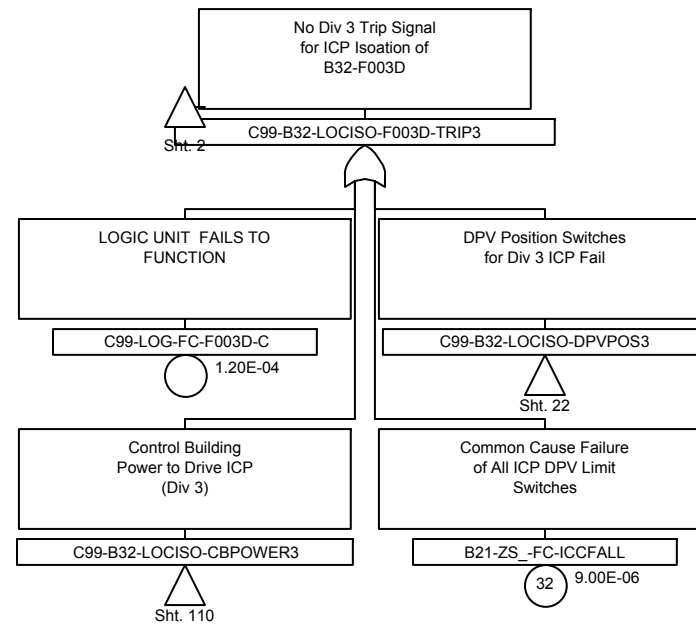


Figure 4.5-3e. Sheet 21 Independent Control Platforms

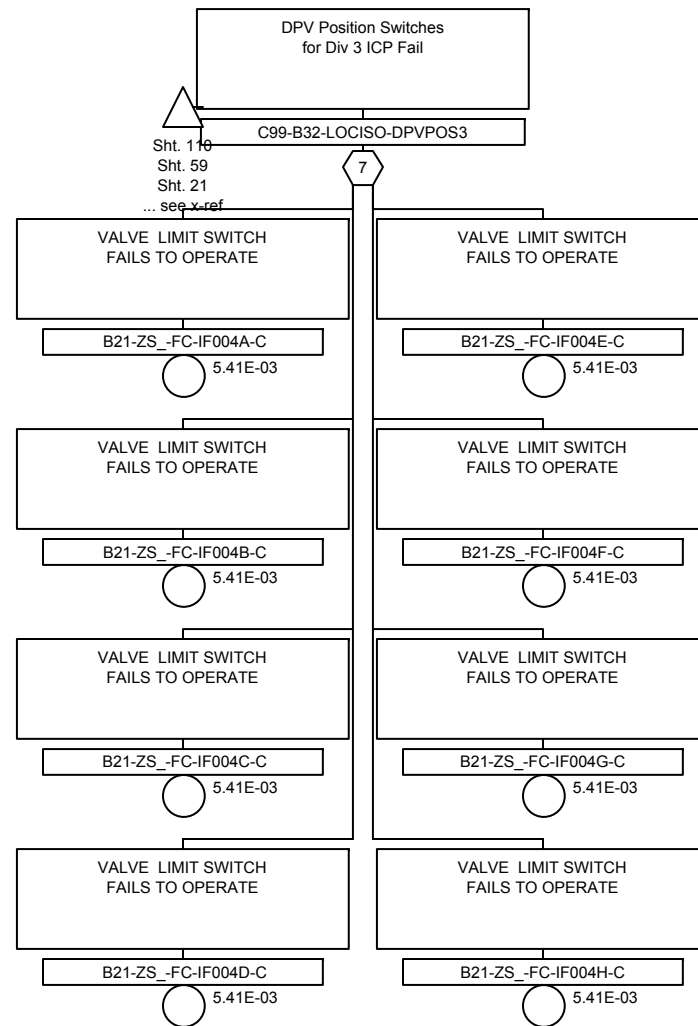


Figure 4.5-3e. Sheet 22 Independent Control Platforms

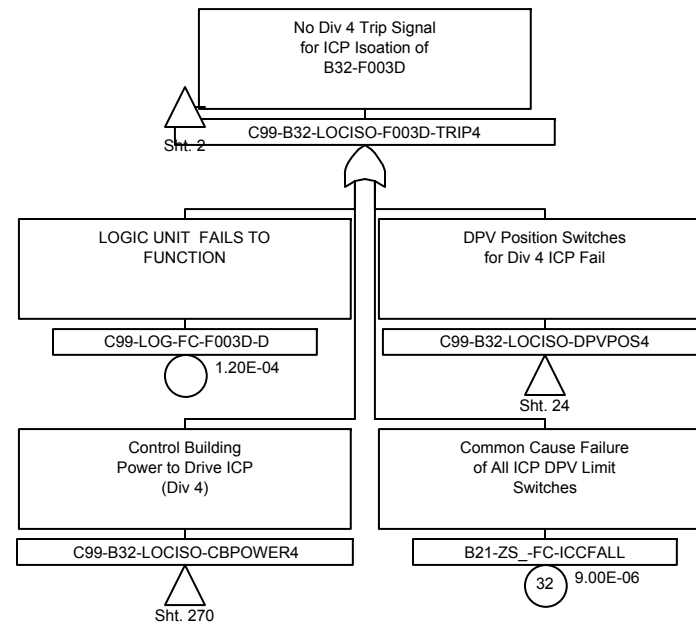


Figure 4.5-3e. Sheet 23 Independent Control Platforms

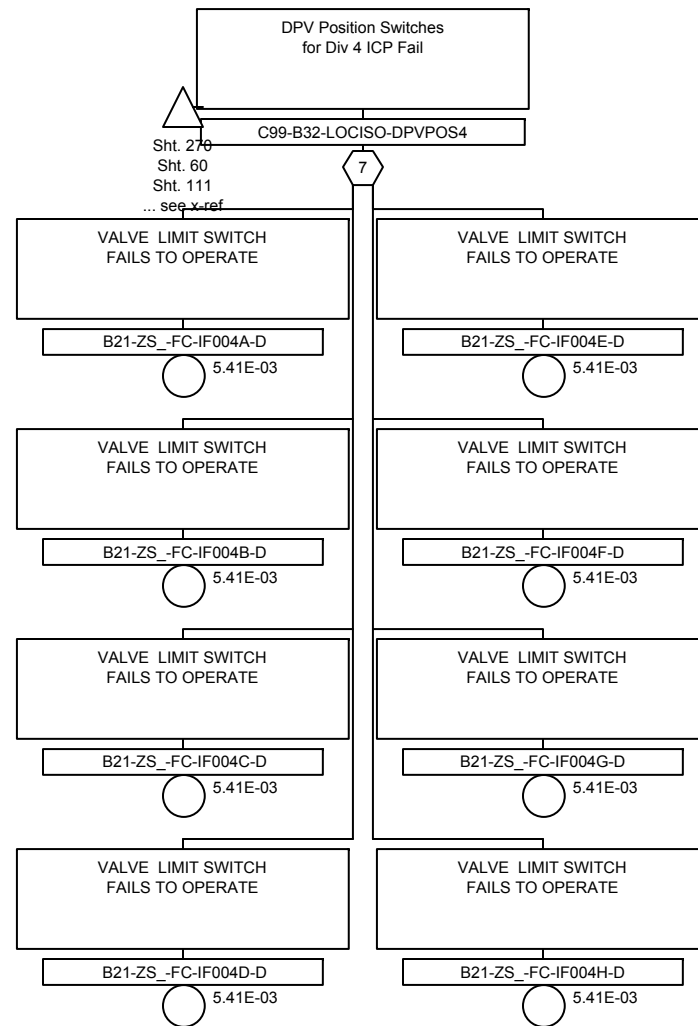


Figure 4.5-3e. Sheet 24 Independent Control Platforms

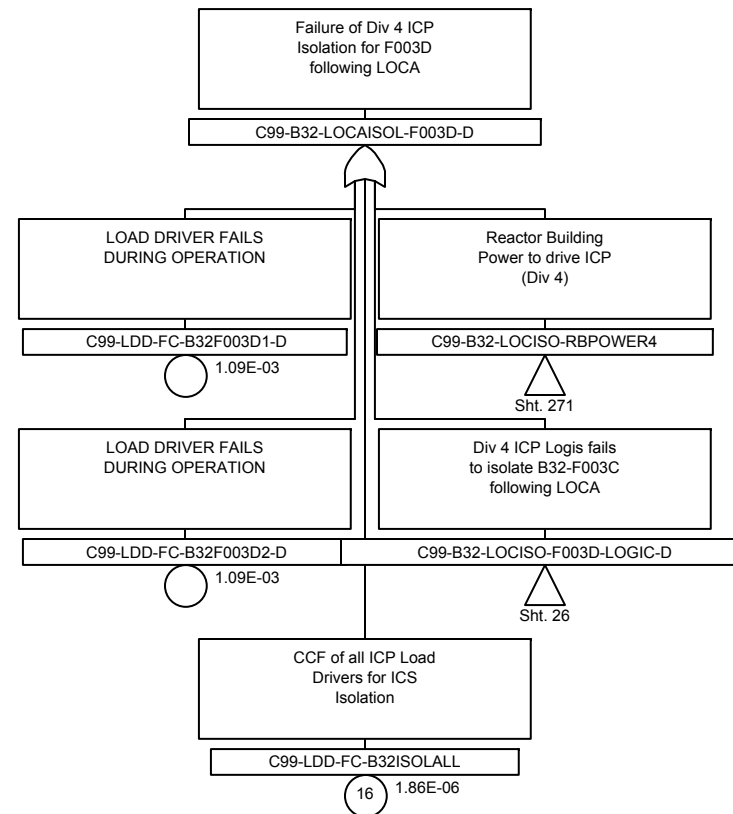


Figure 4.5-3e. Sheet 25 Independent Control Platforms

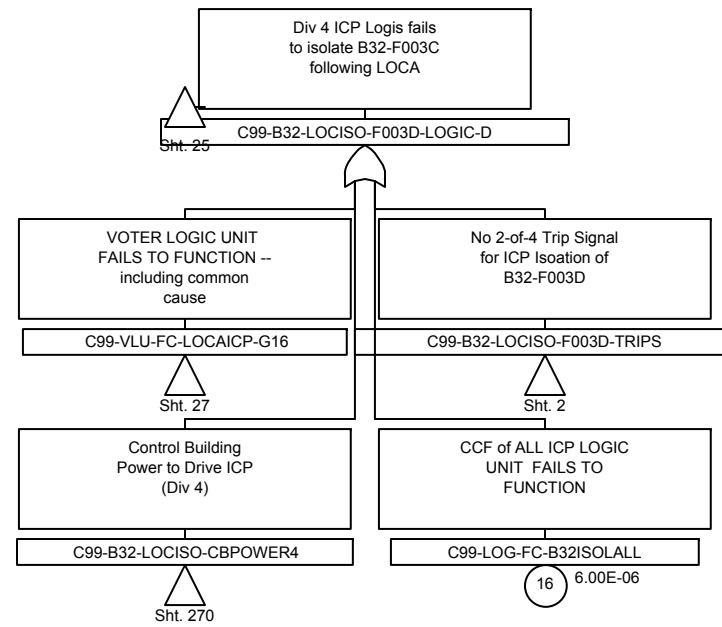


Figure 4.5-3e. Sheet 26 Independent Control Platforms



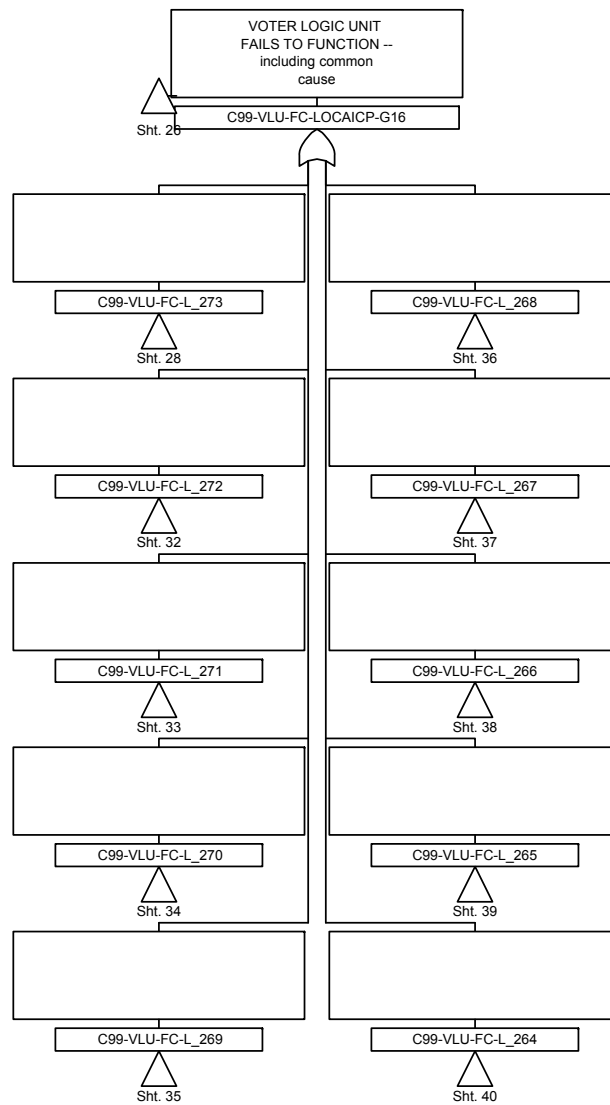


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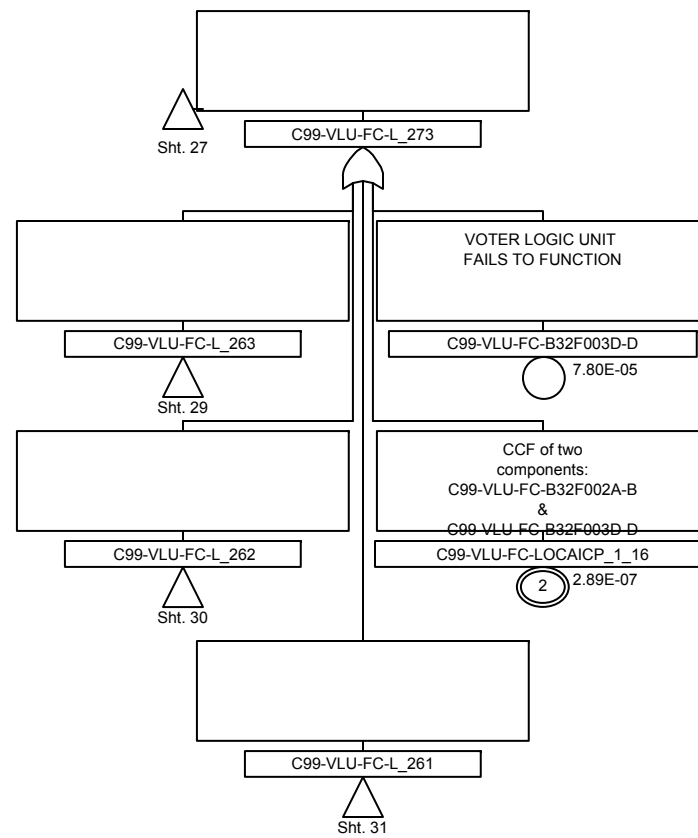


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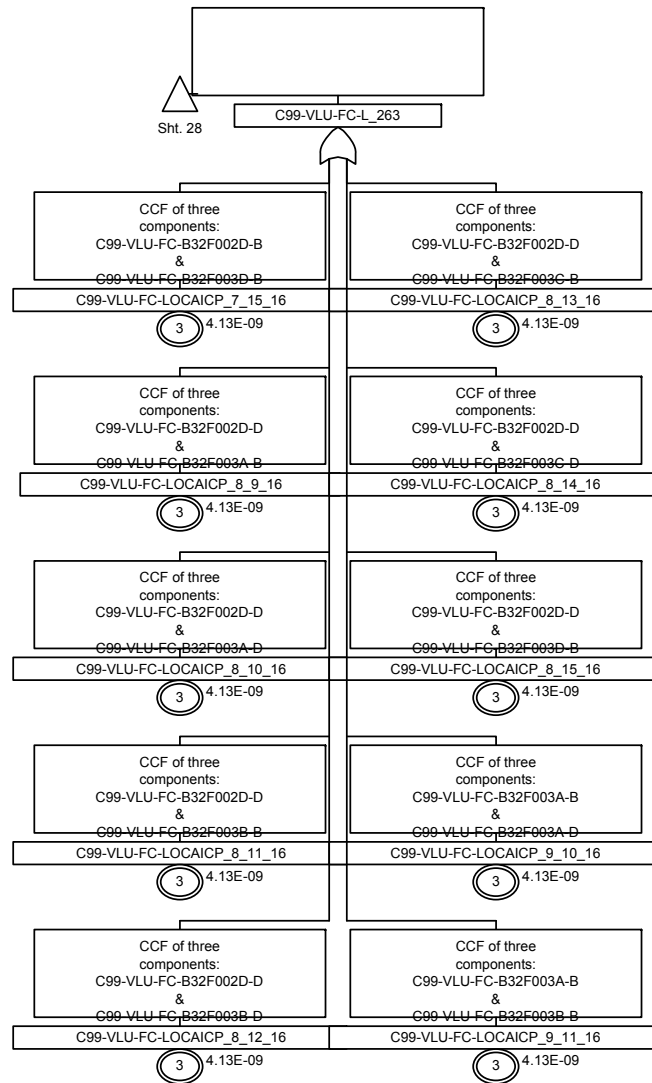


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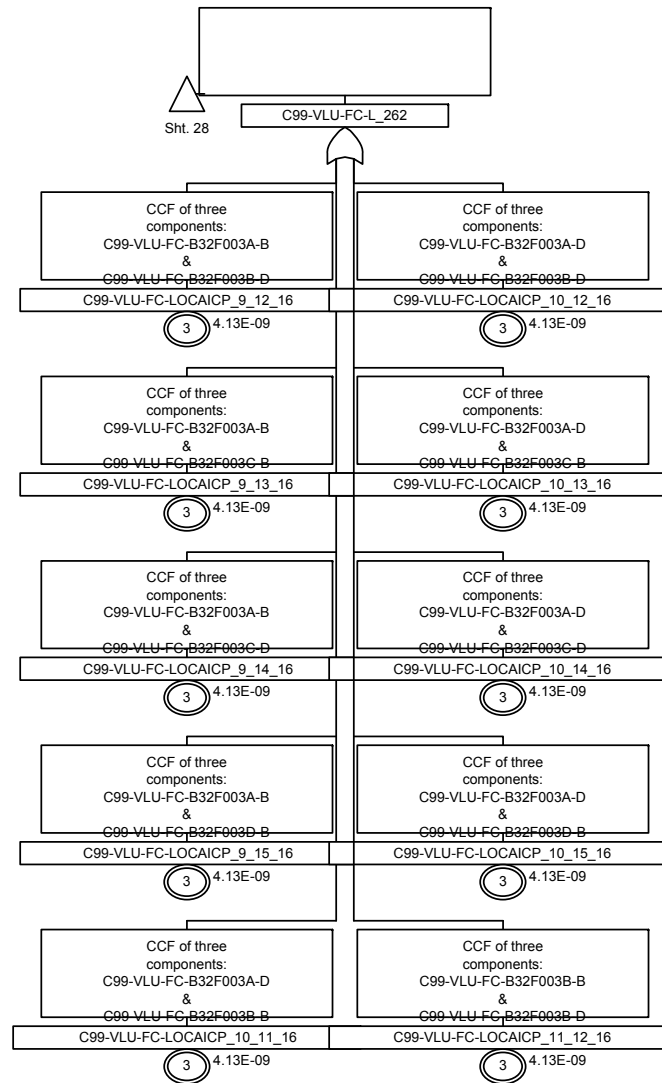


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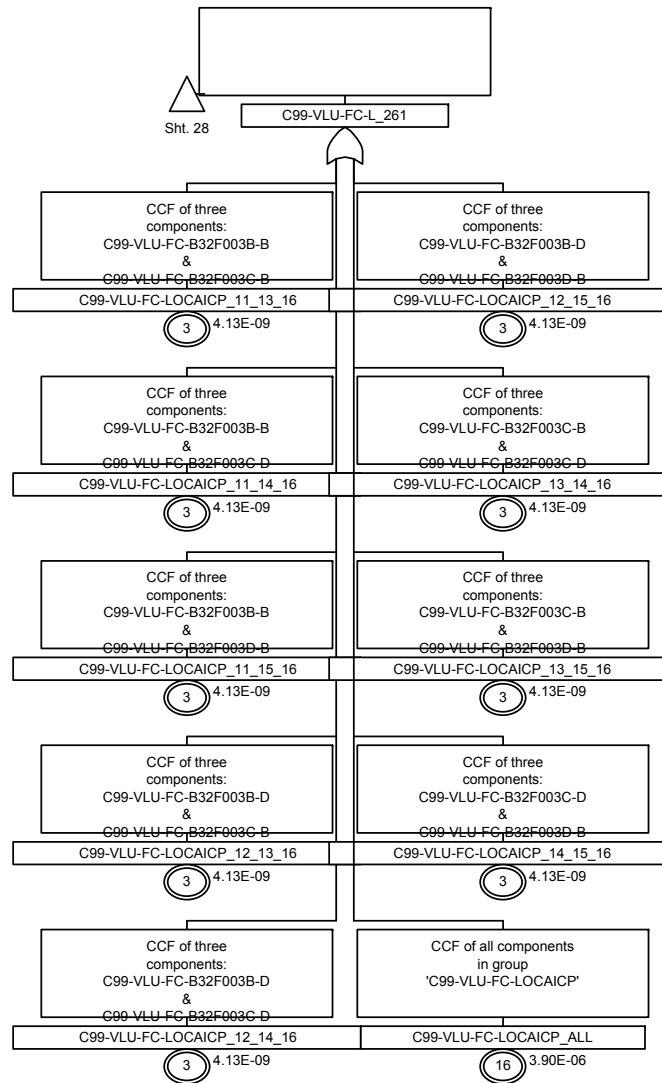


Figure 4.5-3e. Sheet 31 Independent Control Platforms

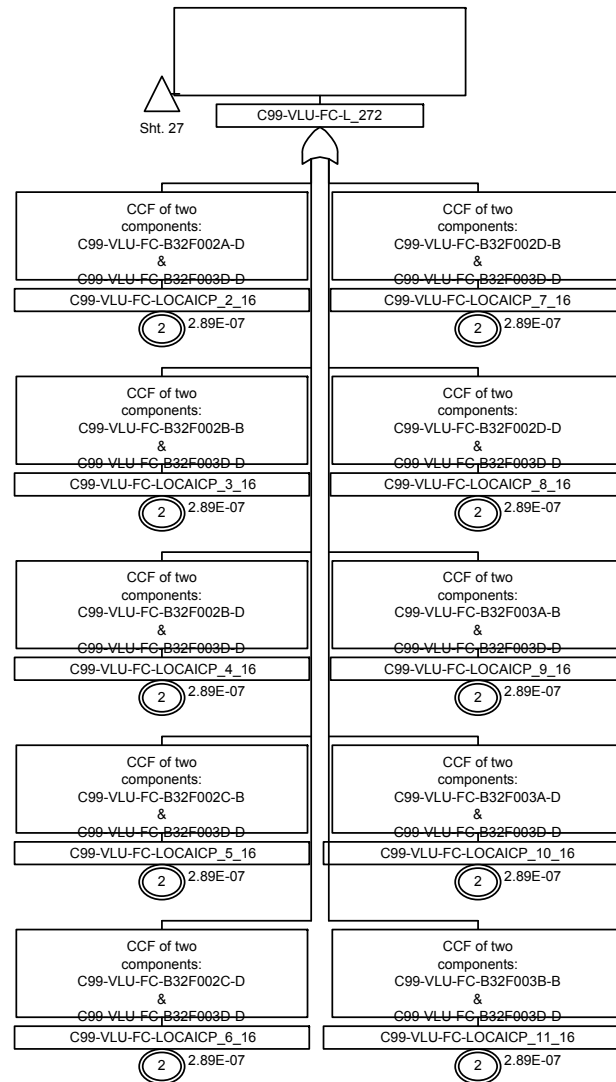


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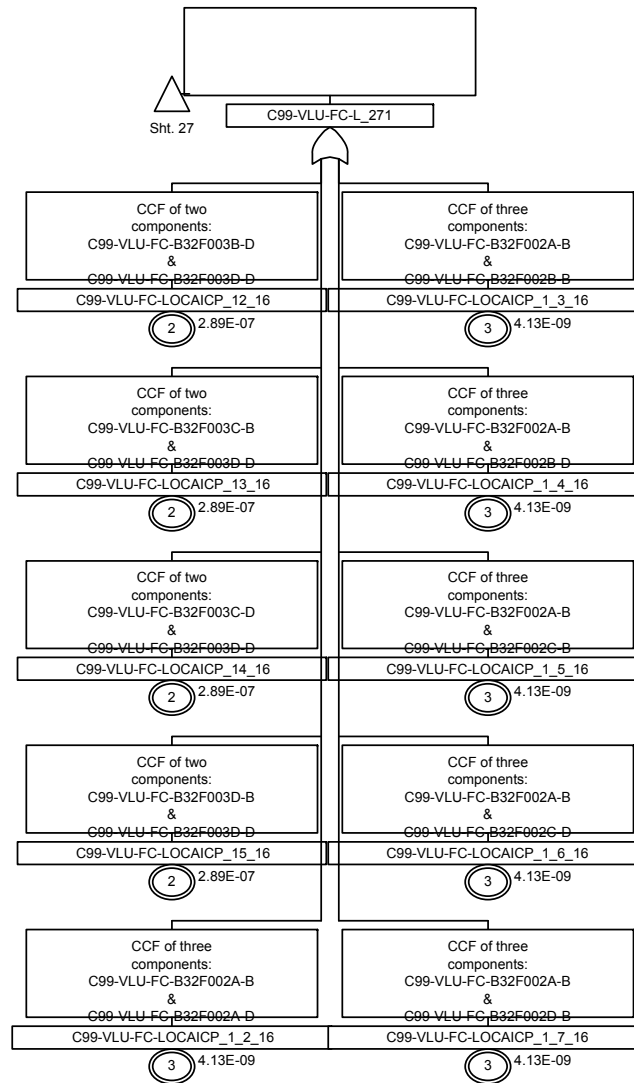


Figure 4.5-3e. Sheet 33 Independent Control Platforms

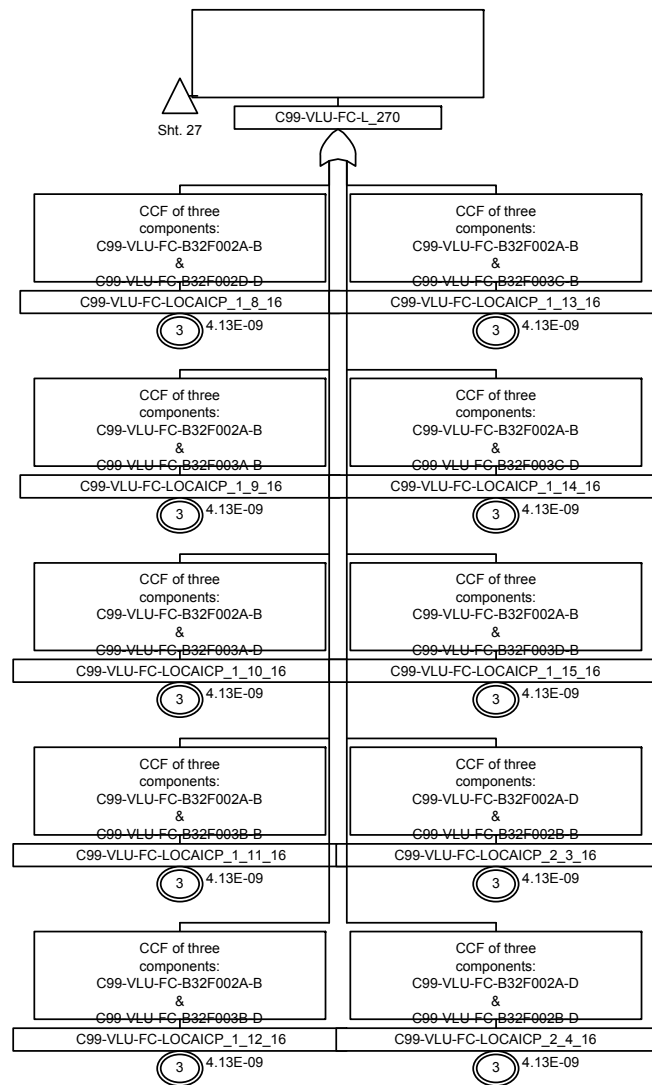


Figure 4.5-3e. Sheet 34 Independent Control Platforms



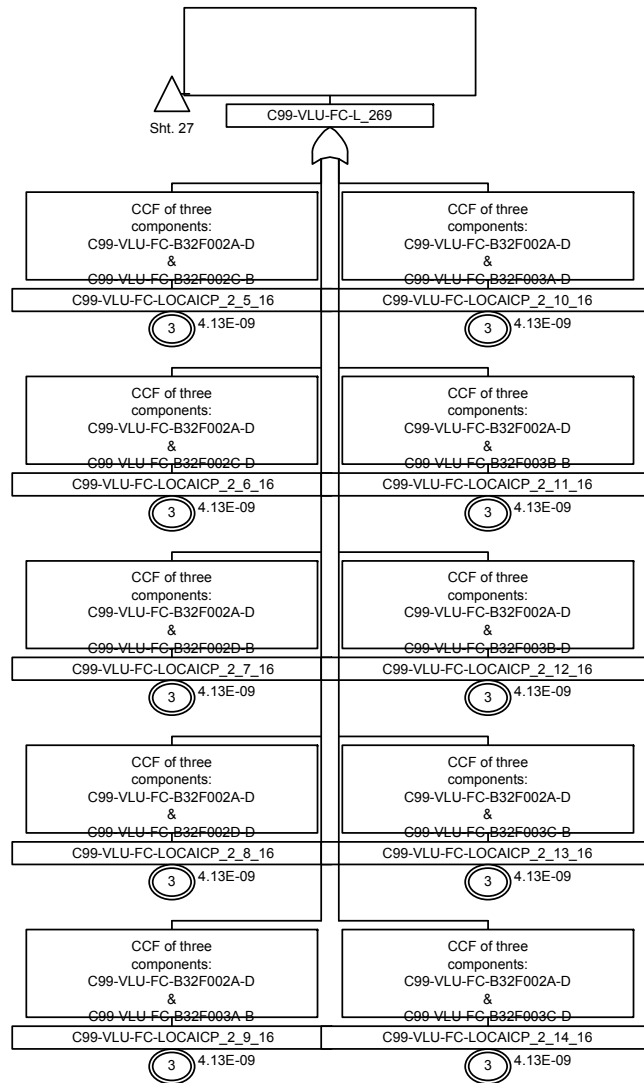


Figure 4.5-3e. Sheet 35 Independent Control Platforms

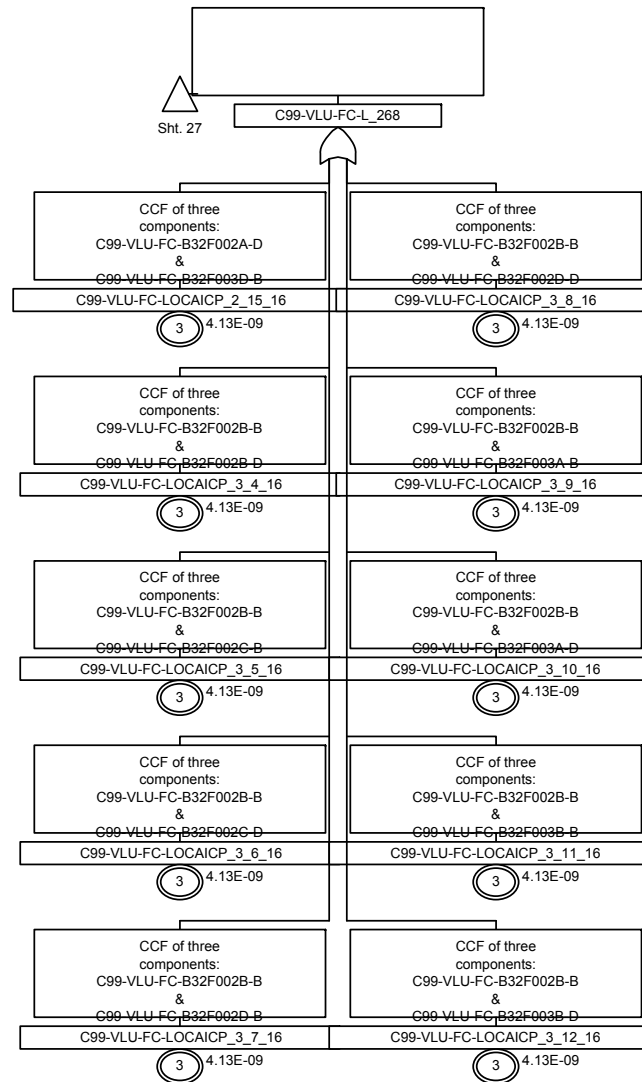


Figure 4.5-3e. Sheet 36 Independent Control Platforms

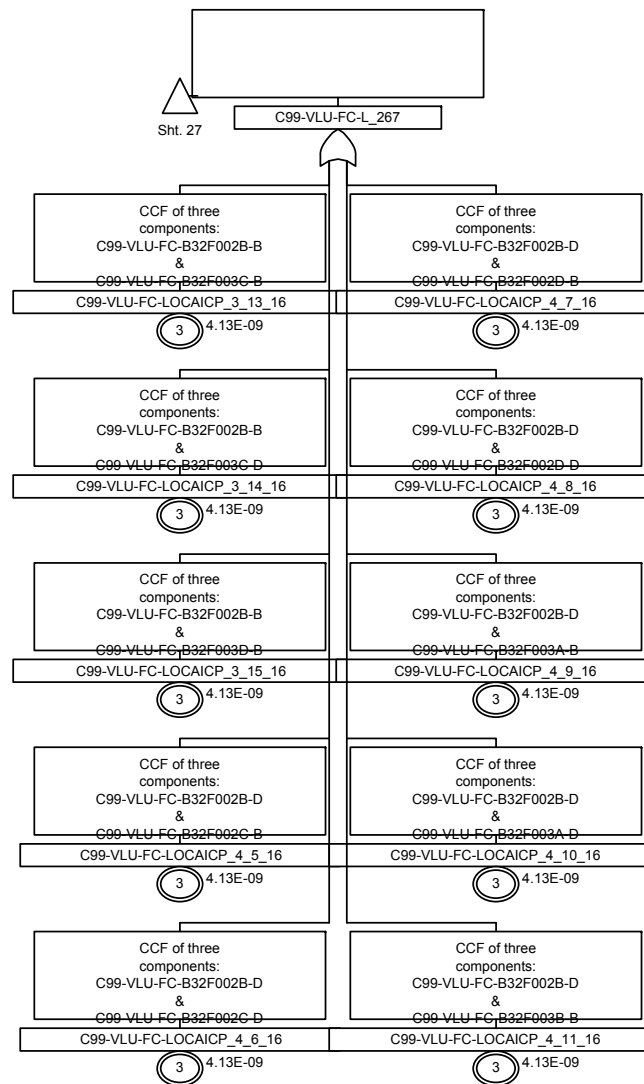


Figure 4.5-3e. Sheet 37 Independent Control Platforms

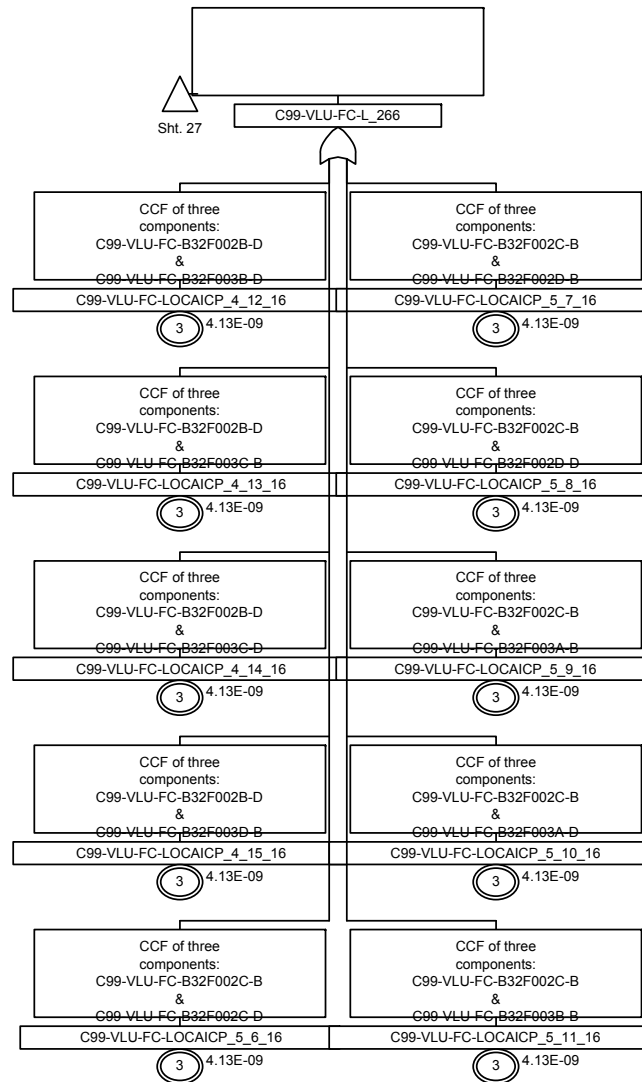


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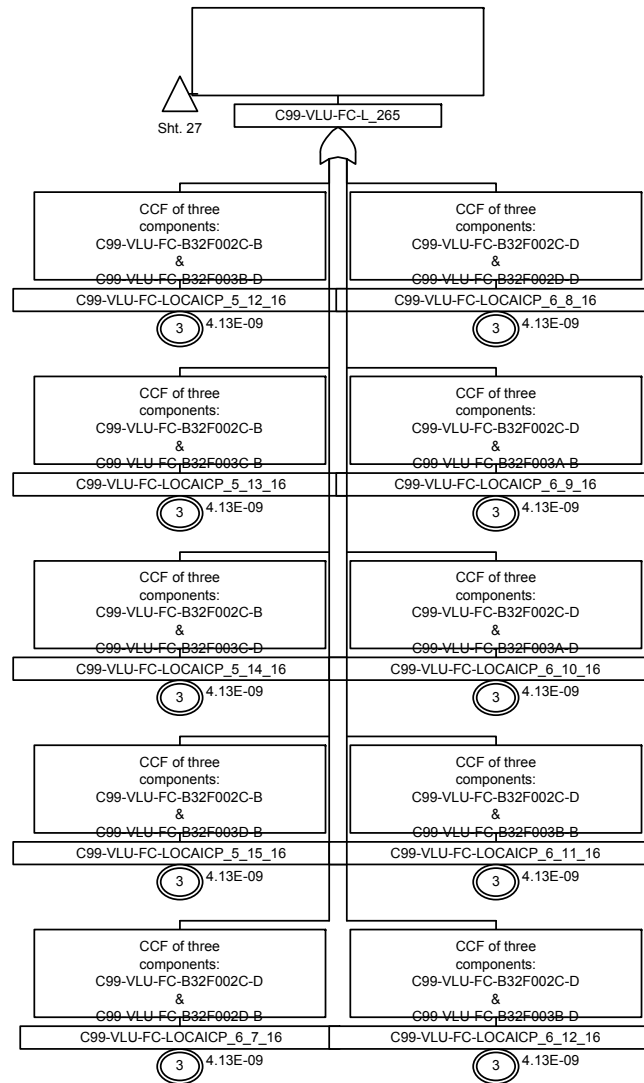


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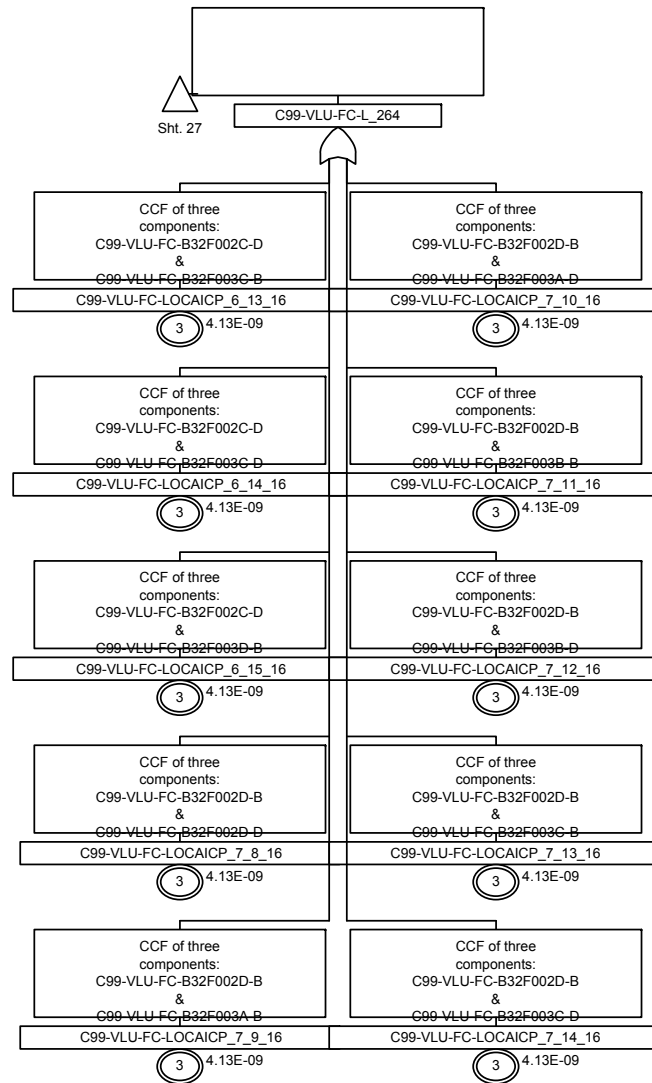


Figure 4.5-3e. Sheet 40 Independent Control Platforms

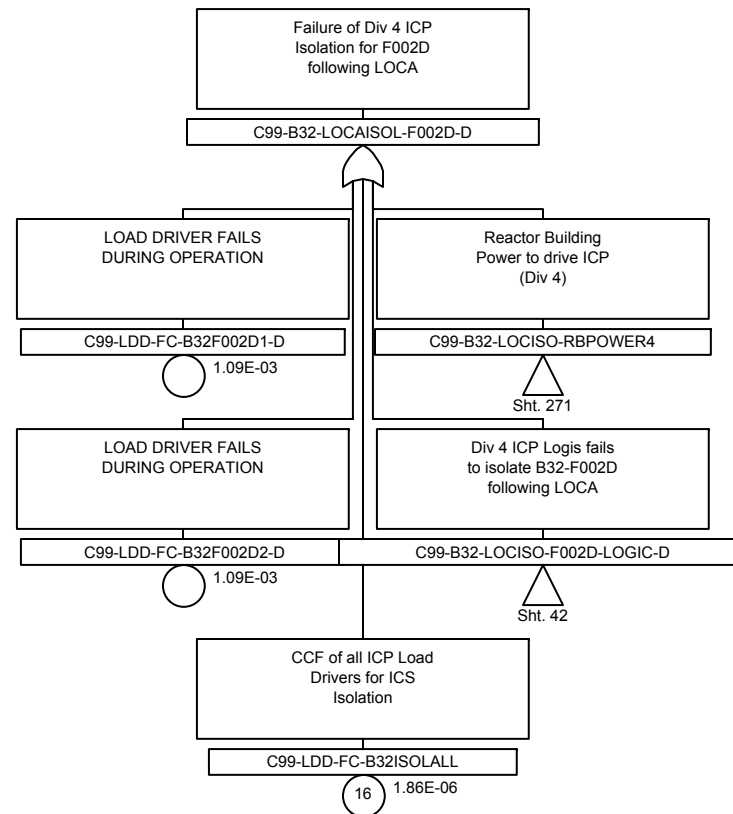


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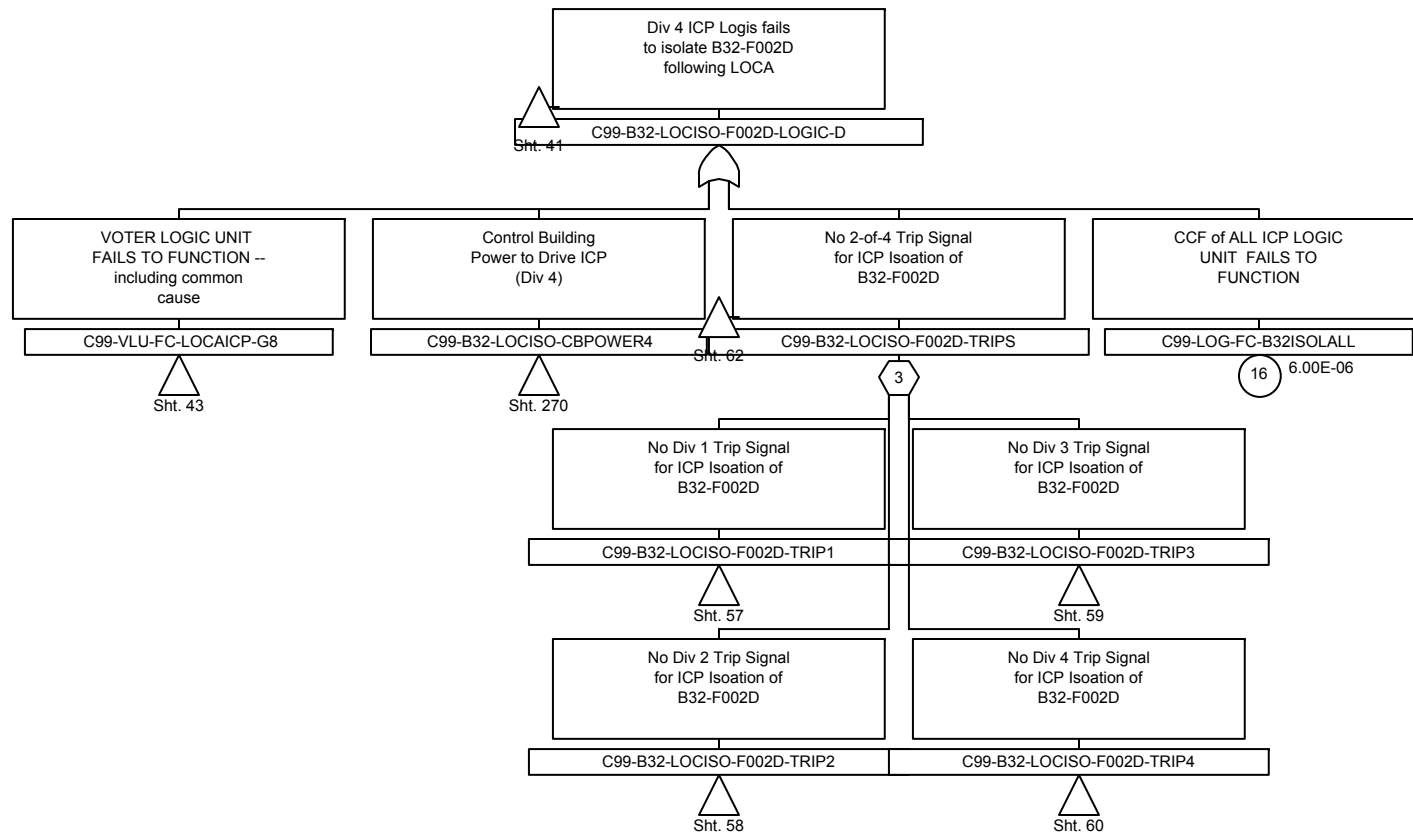


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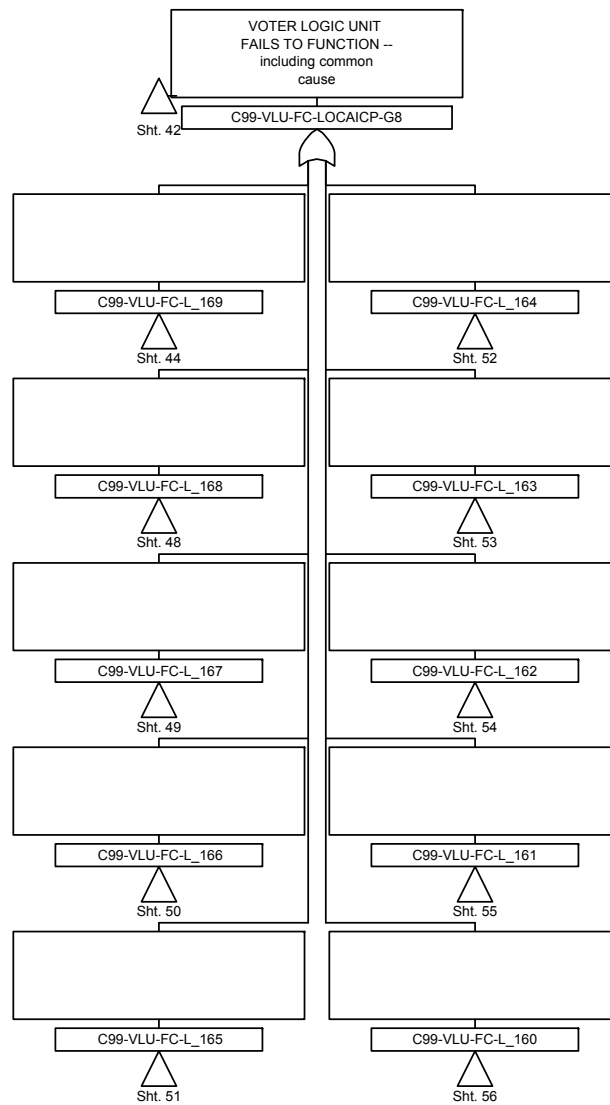


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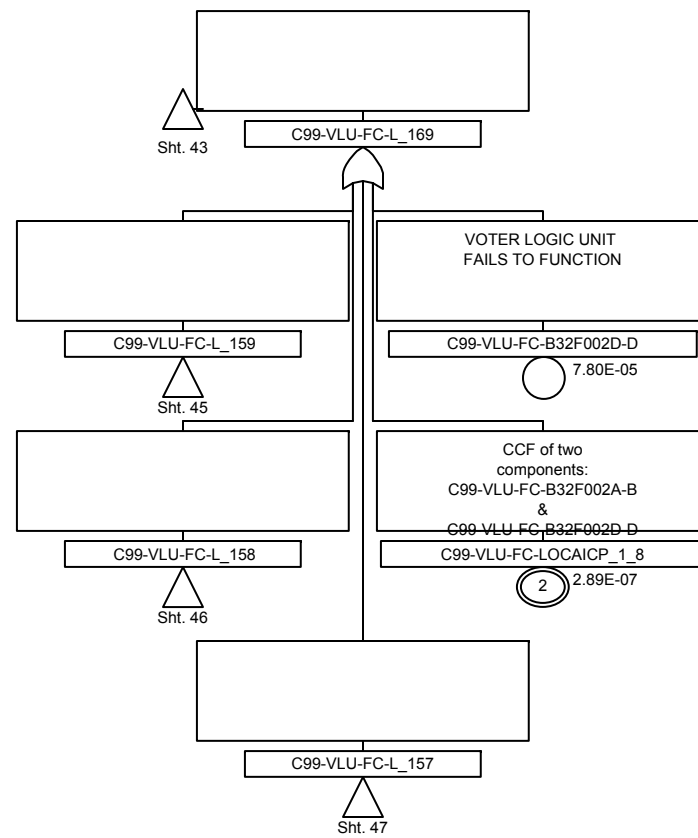


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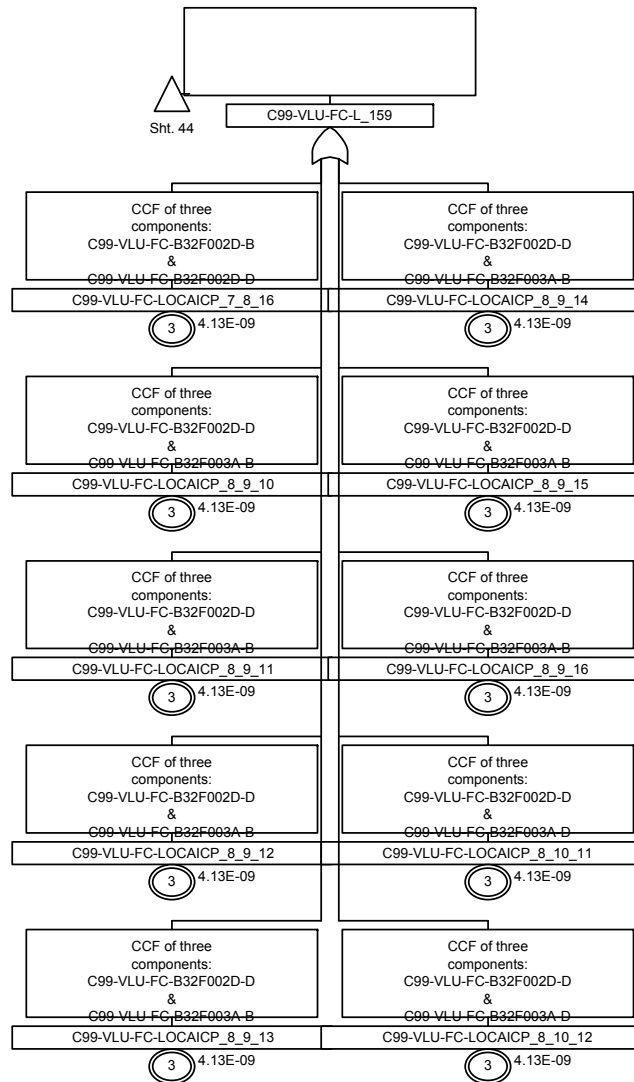


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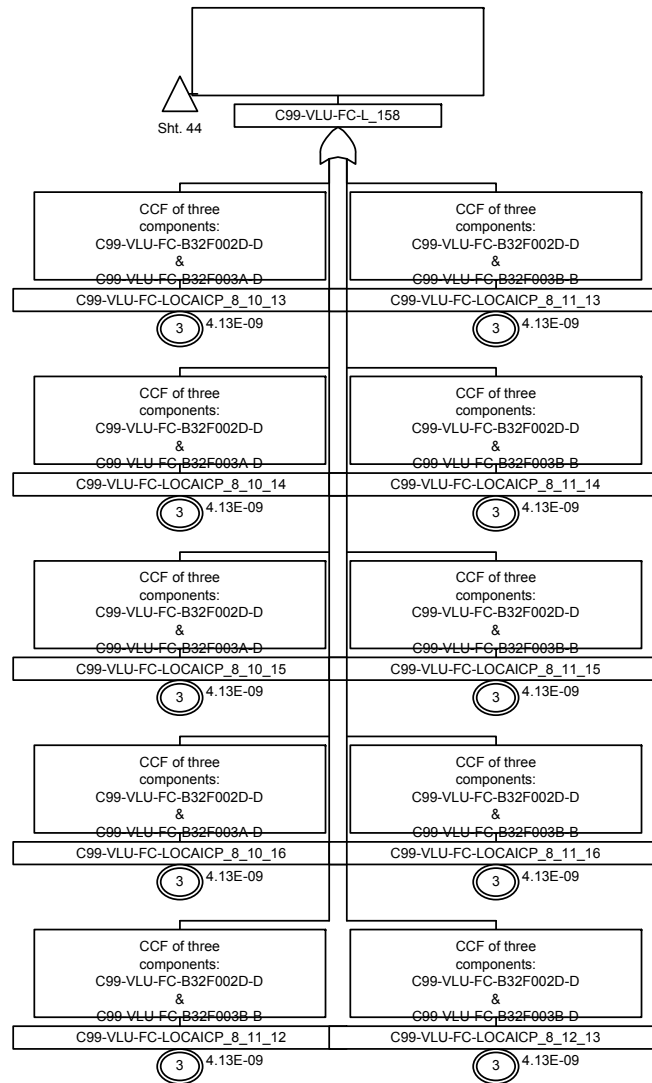


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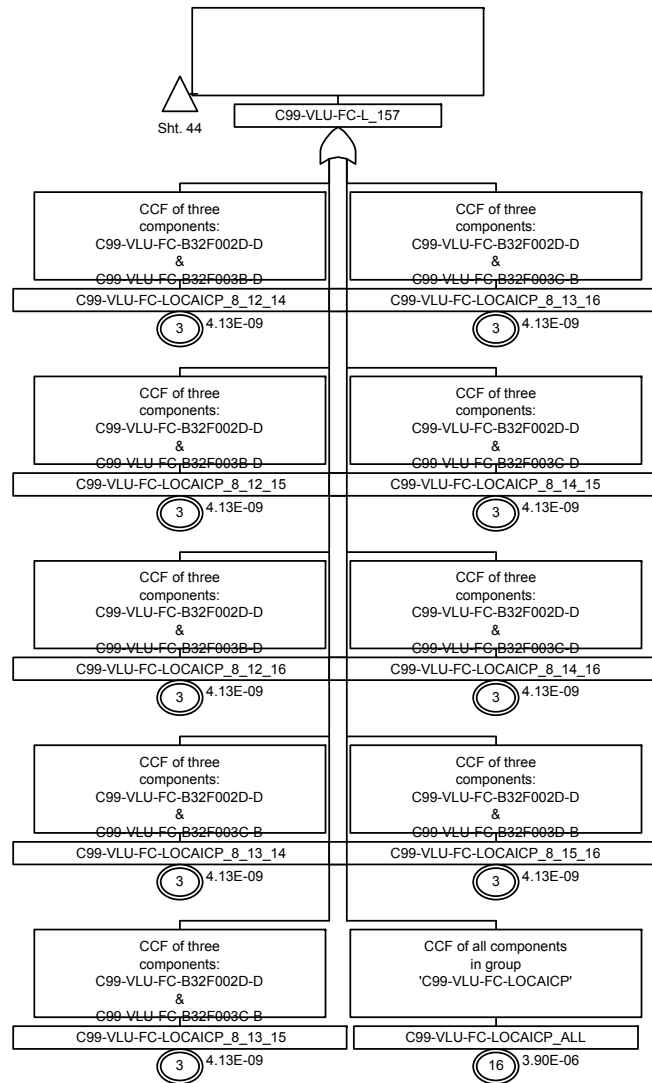


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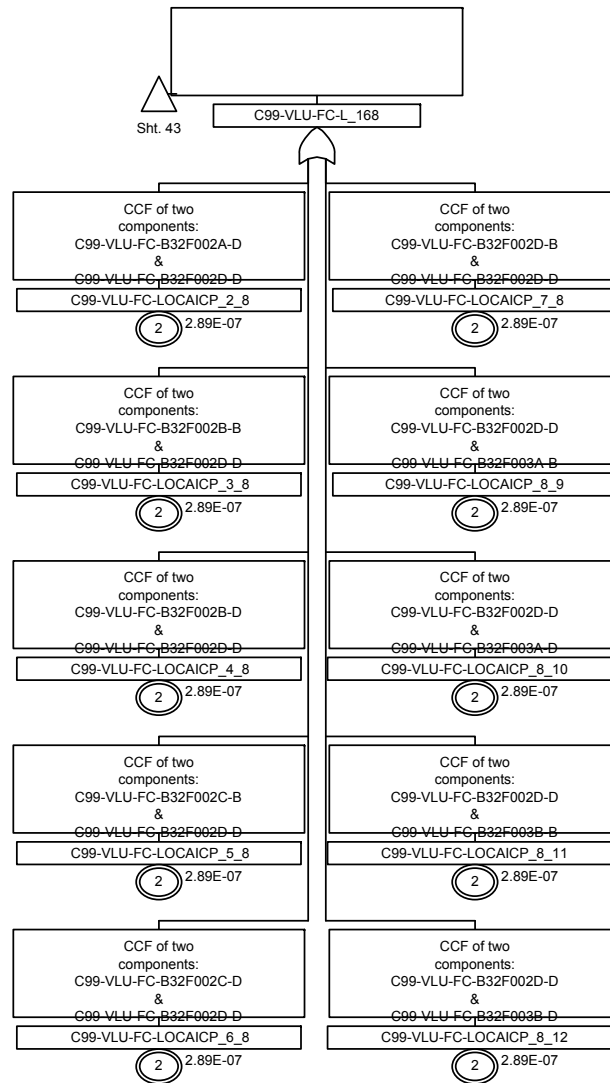


Figure 4.5-3e. Sheet 48 Independent Control Platforms

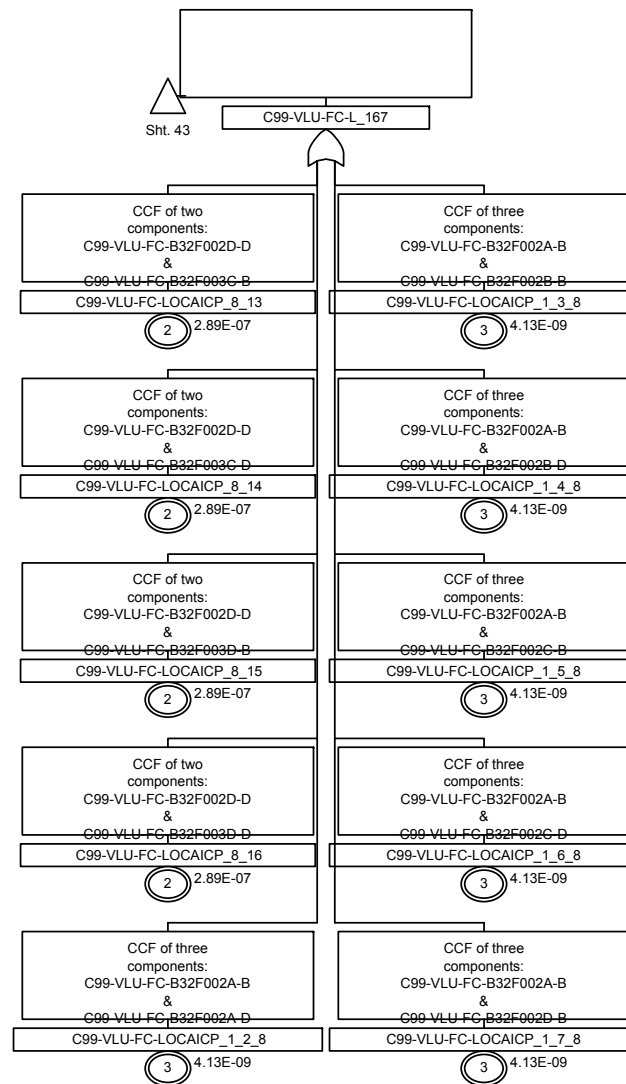


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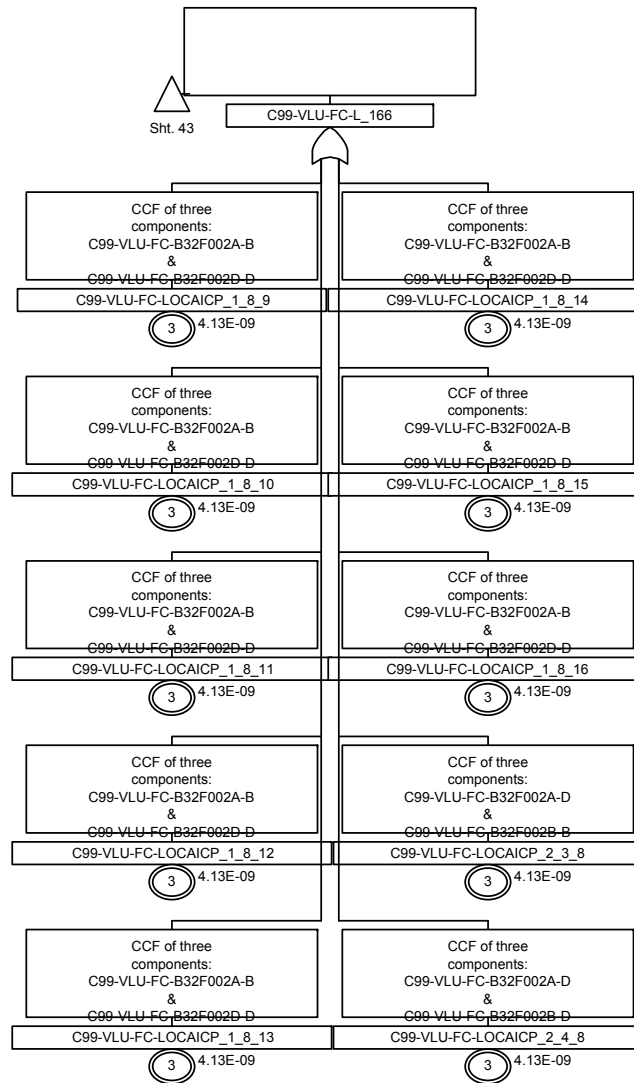


Figure 4.5-3e. Sheet 50 Independent Control Platforms



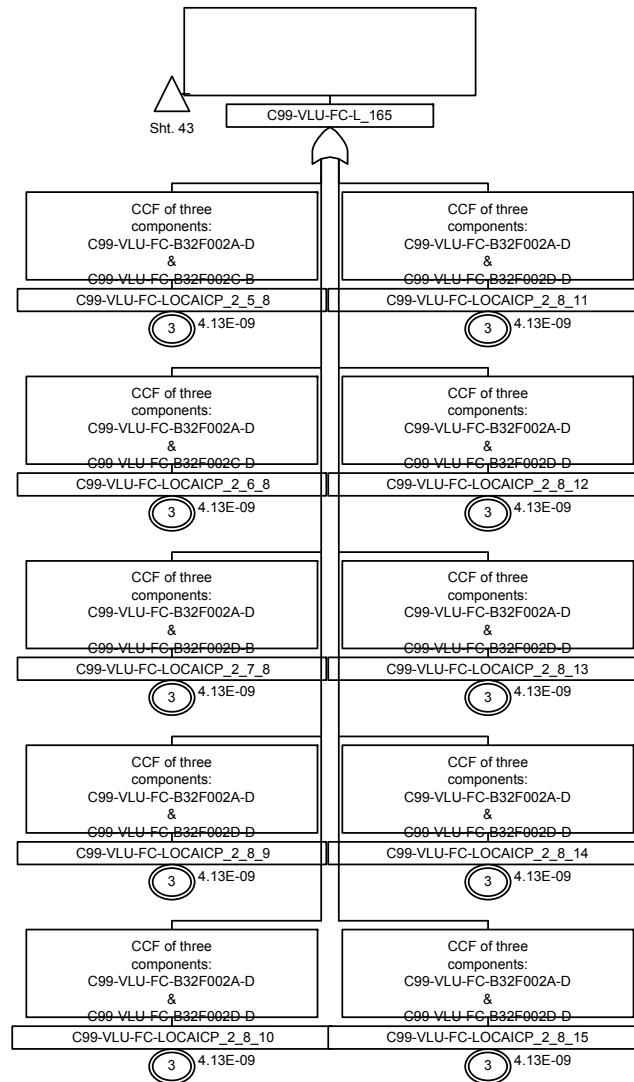


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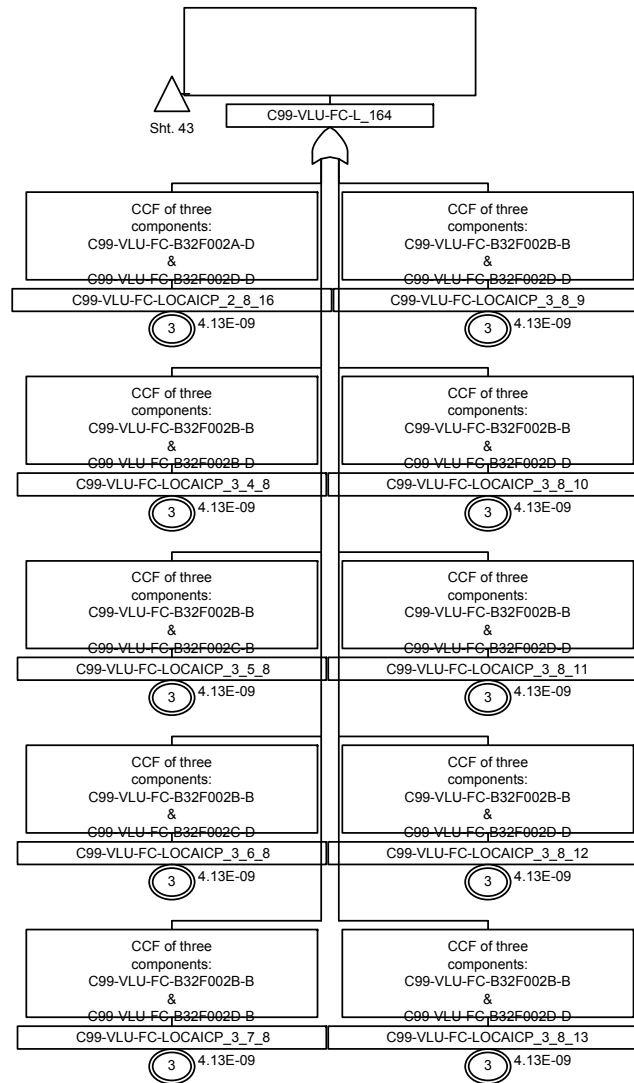


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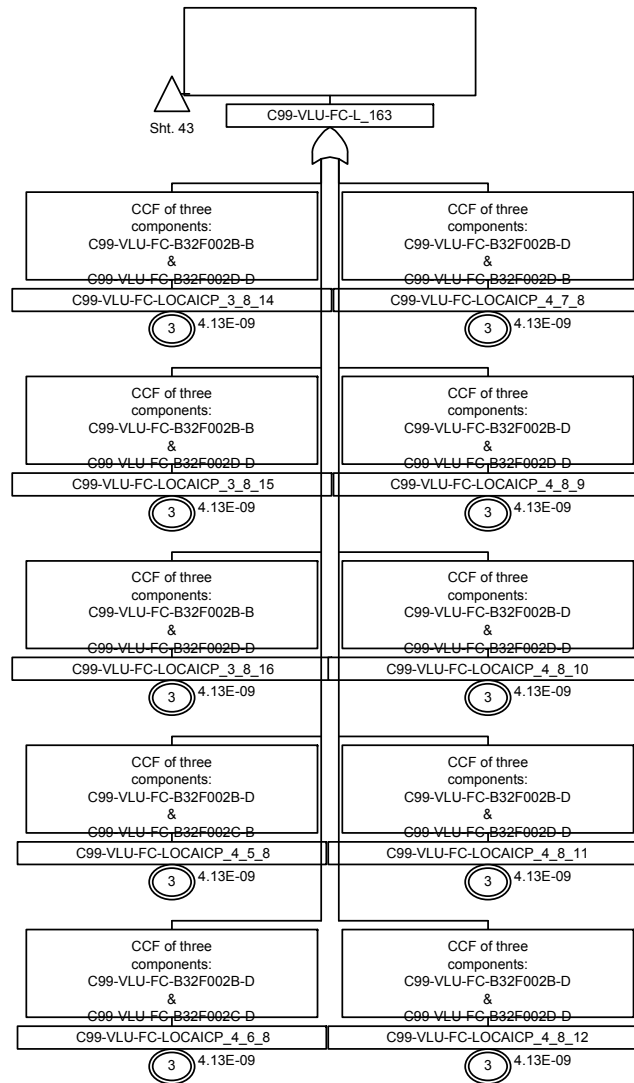


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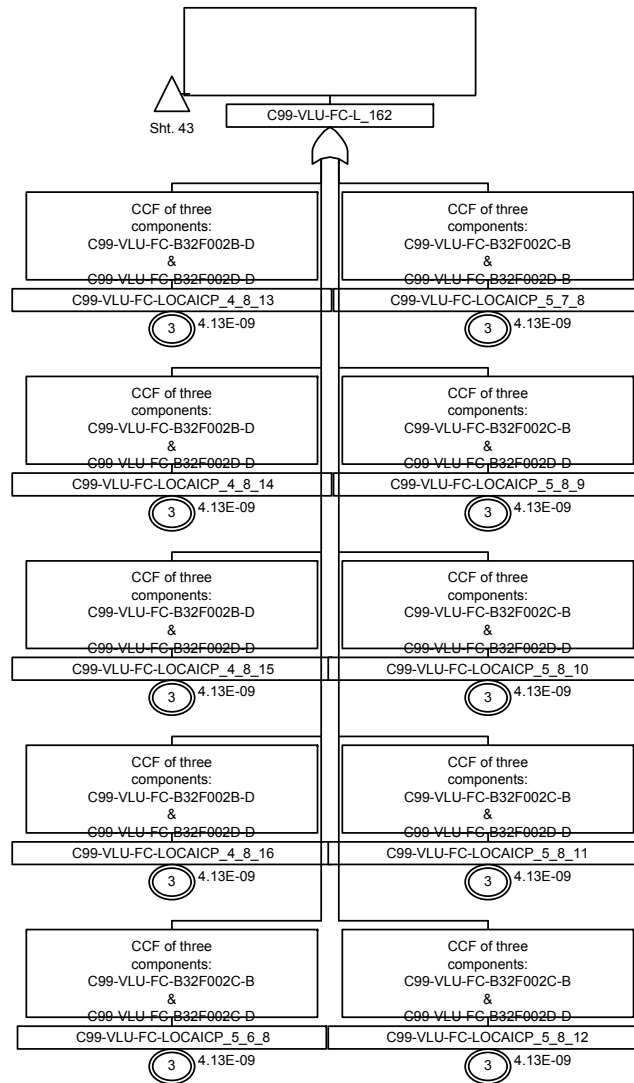


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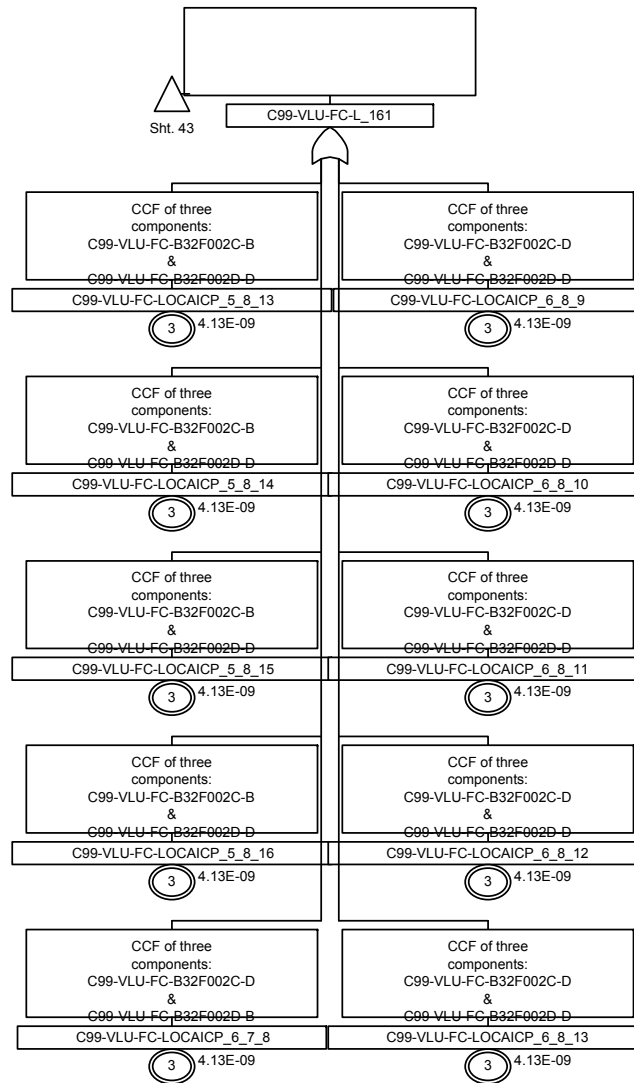


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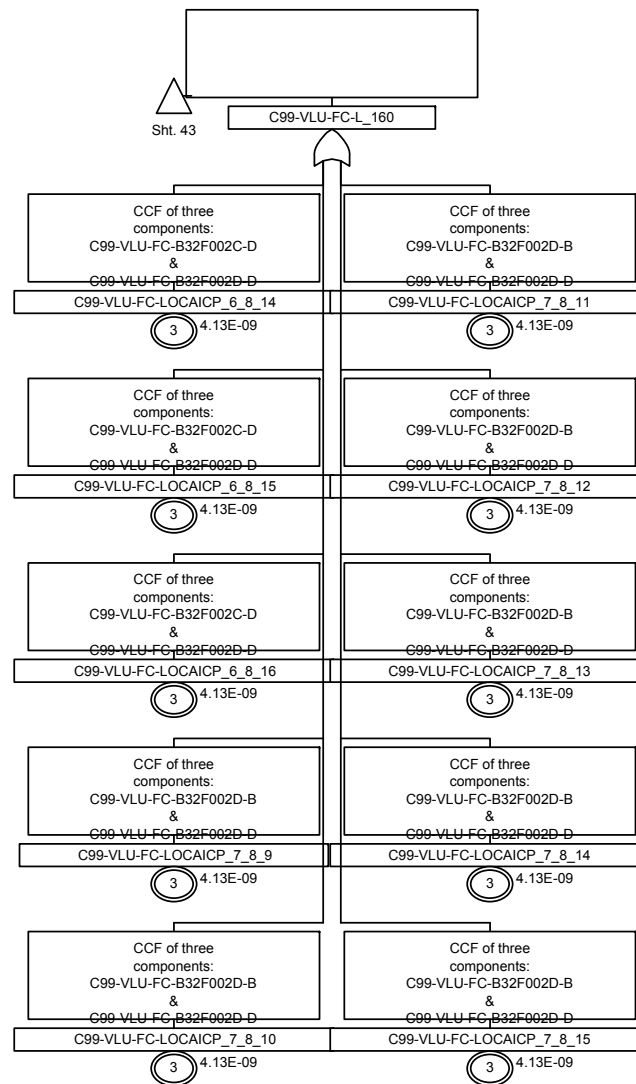


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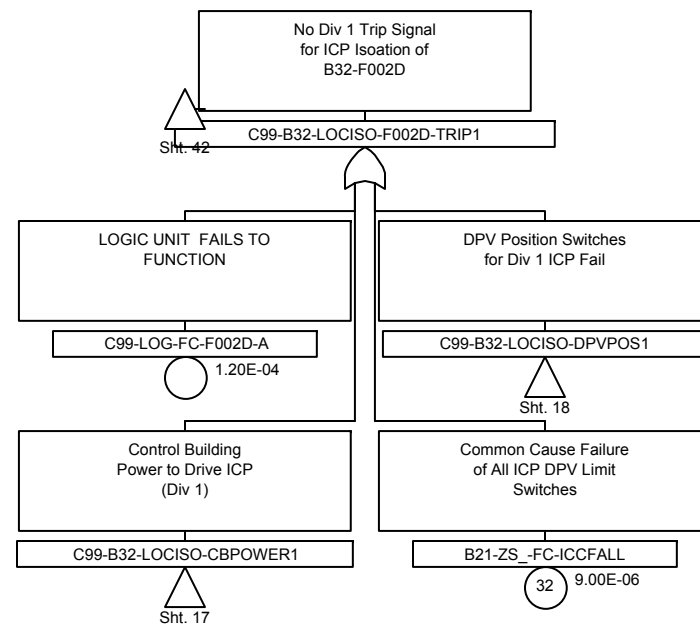


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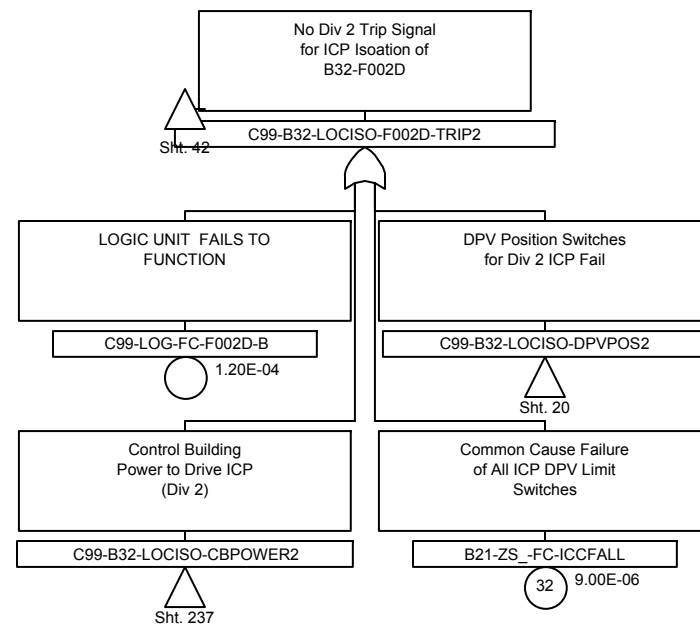


Figure 4.5-3e. Sheet 58 Independent Control Platforms



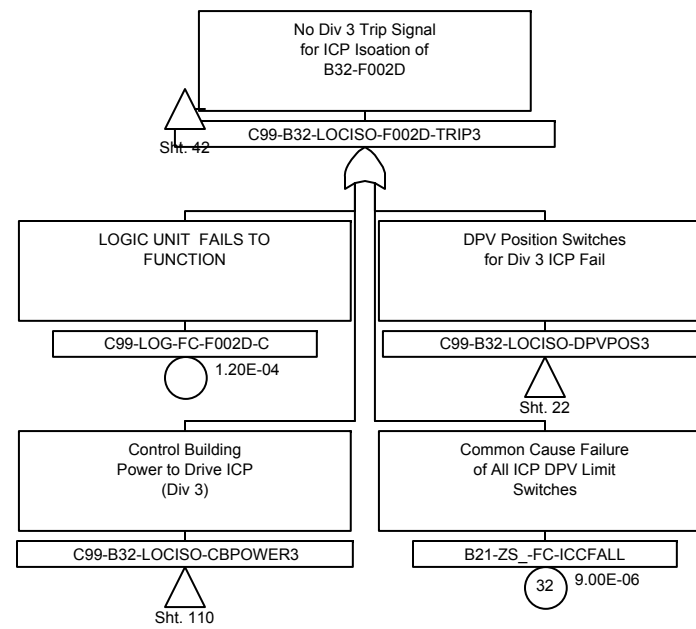


Figure 4.5-3e. Sheet 59 Independent Control Platforms

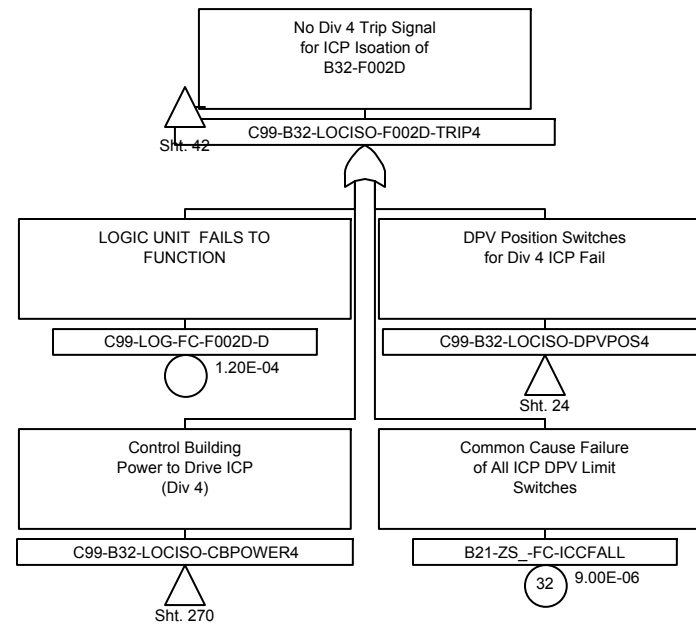


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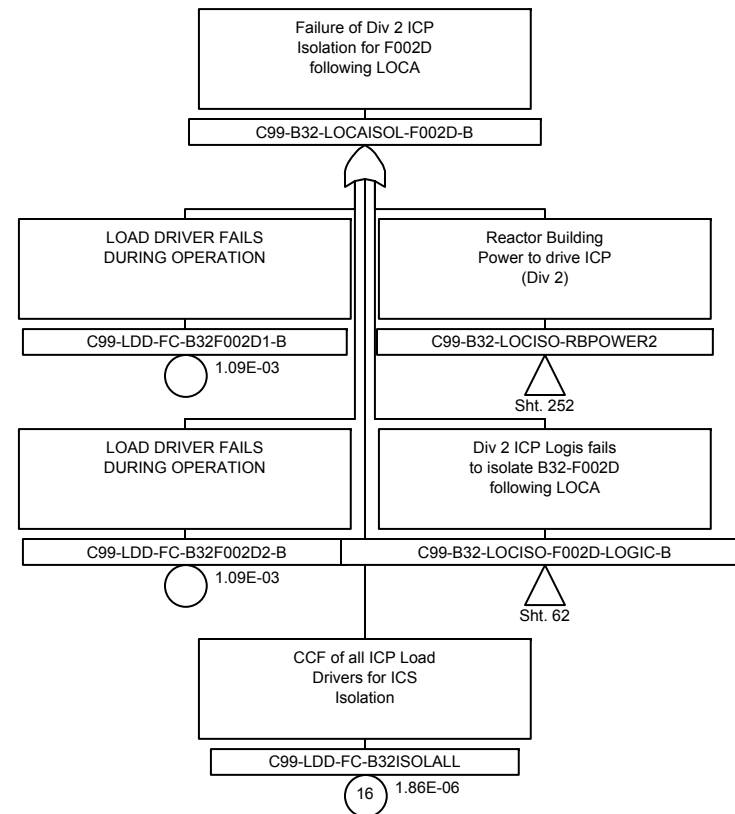


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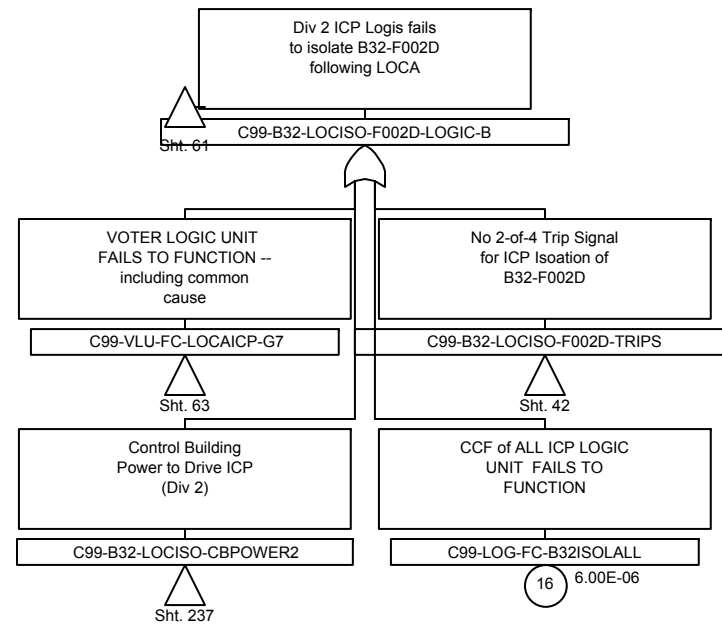


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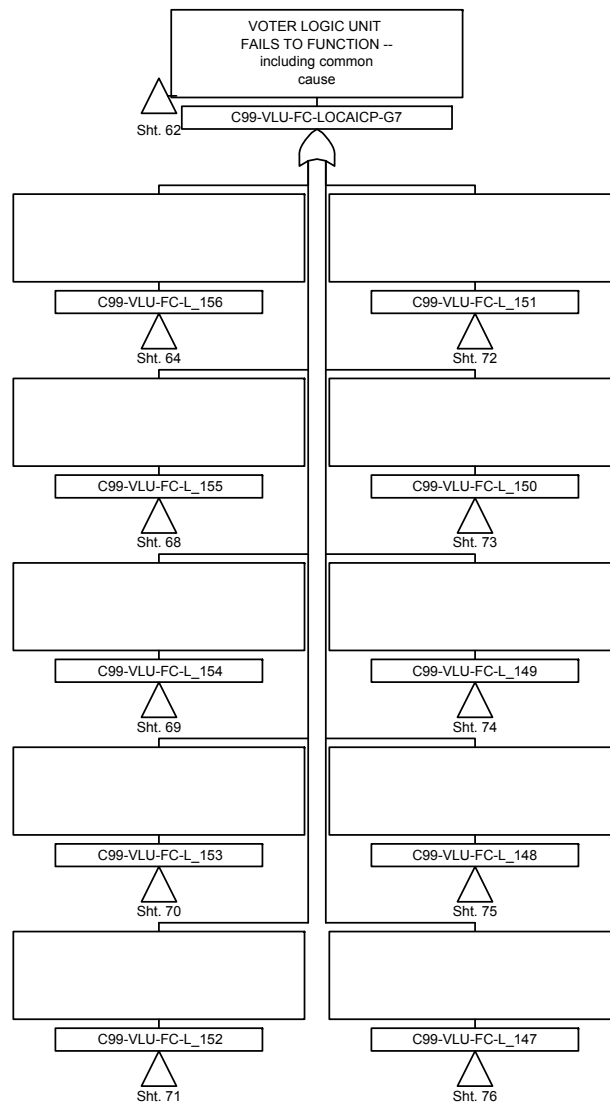


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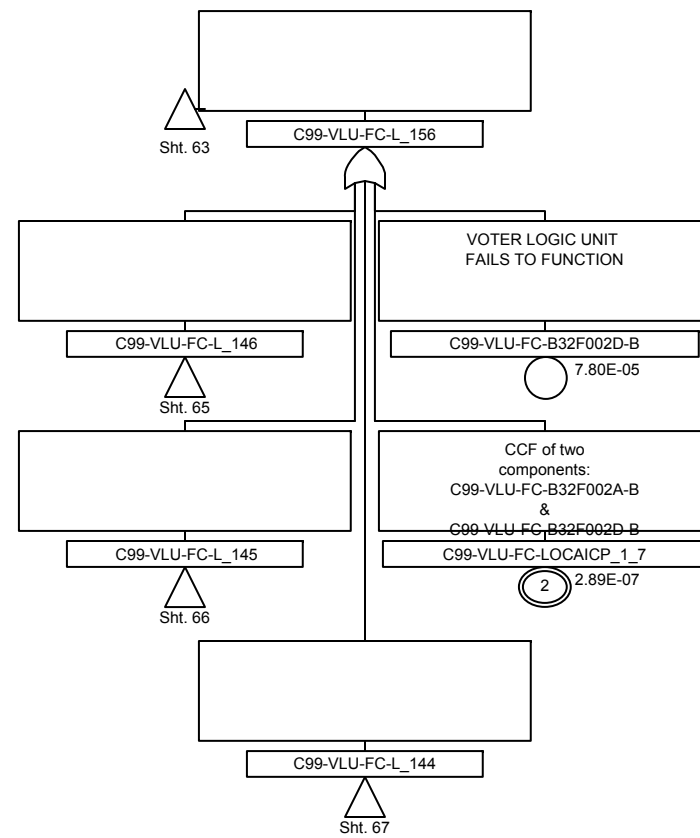


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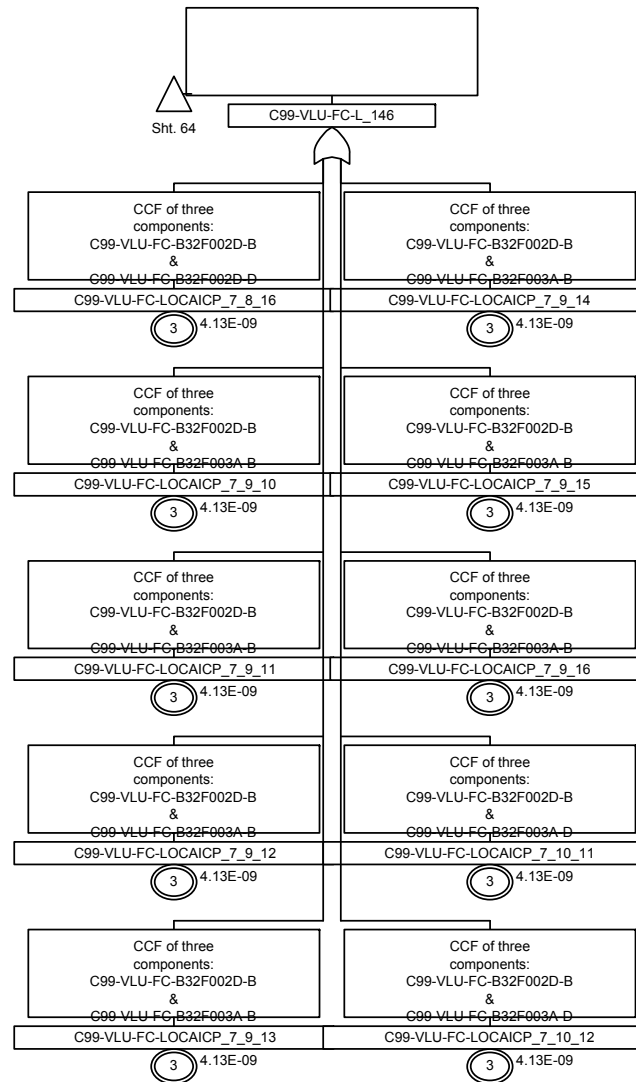


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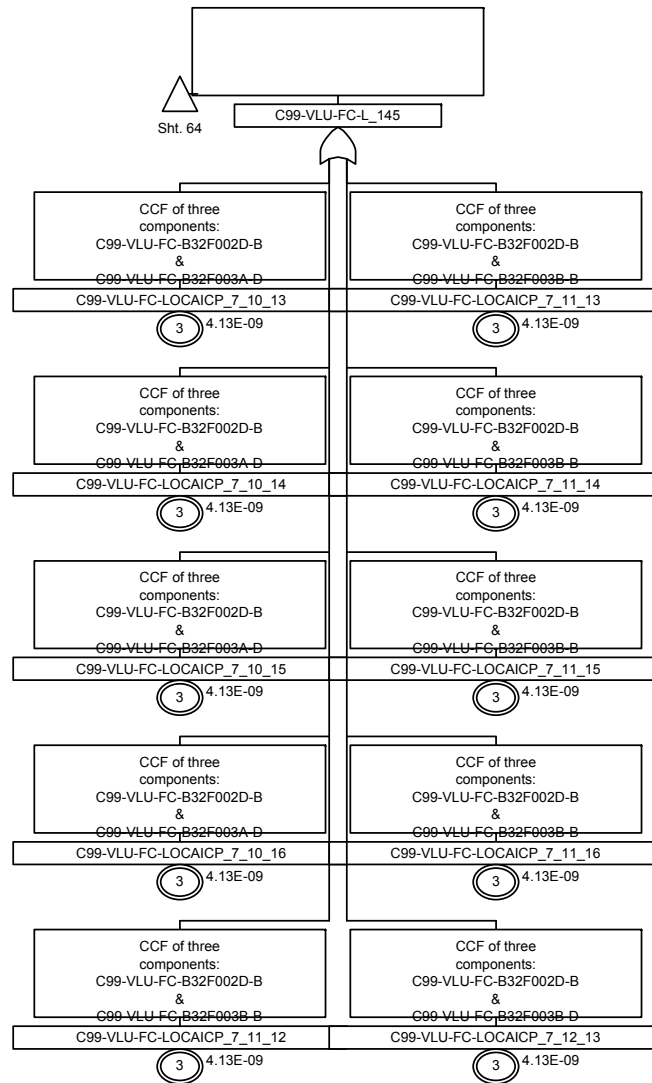


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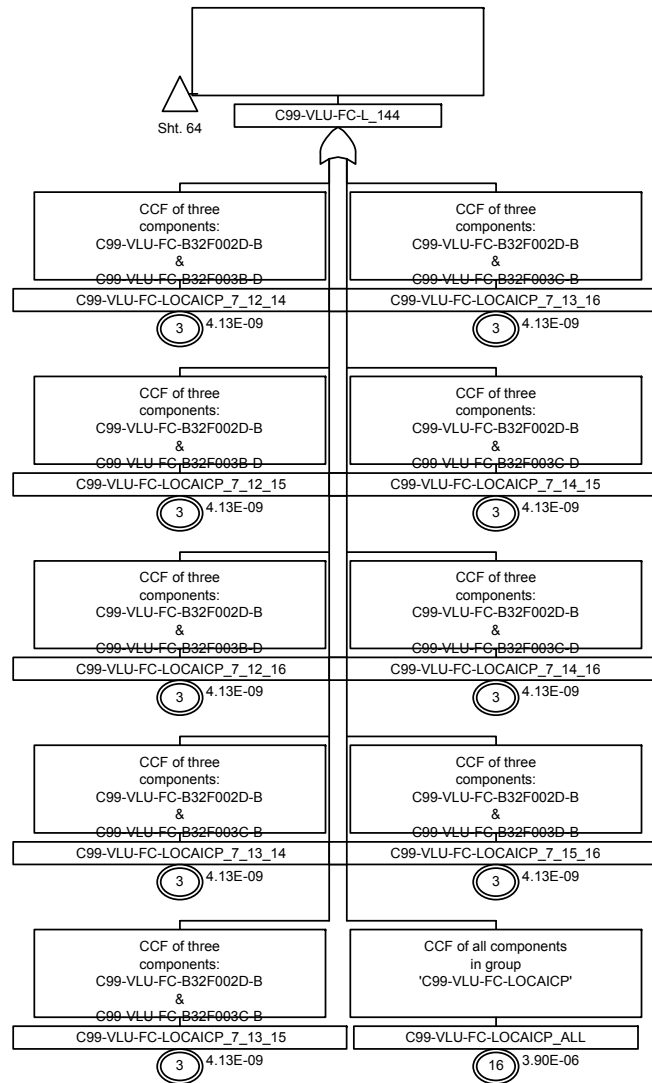


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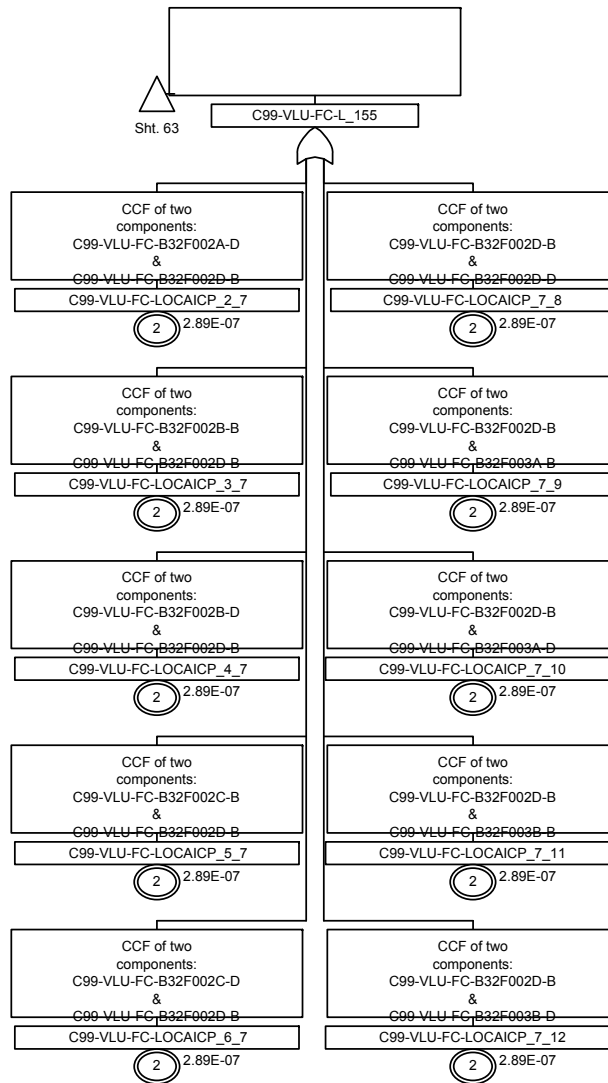


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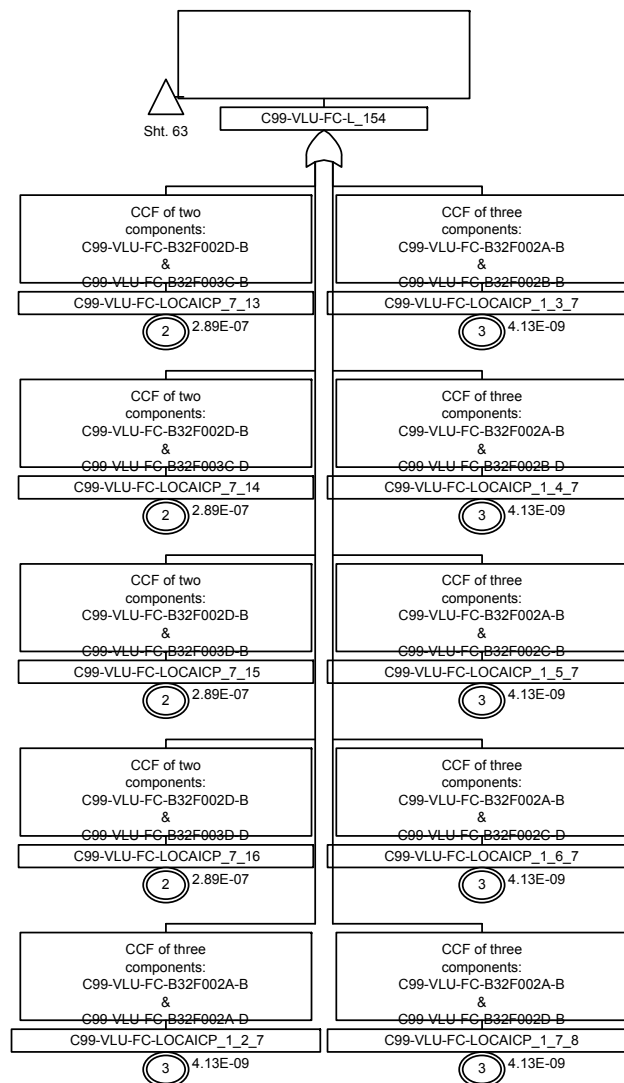


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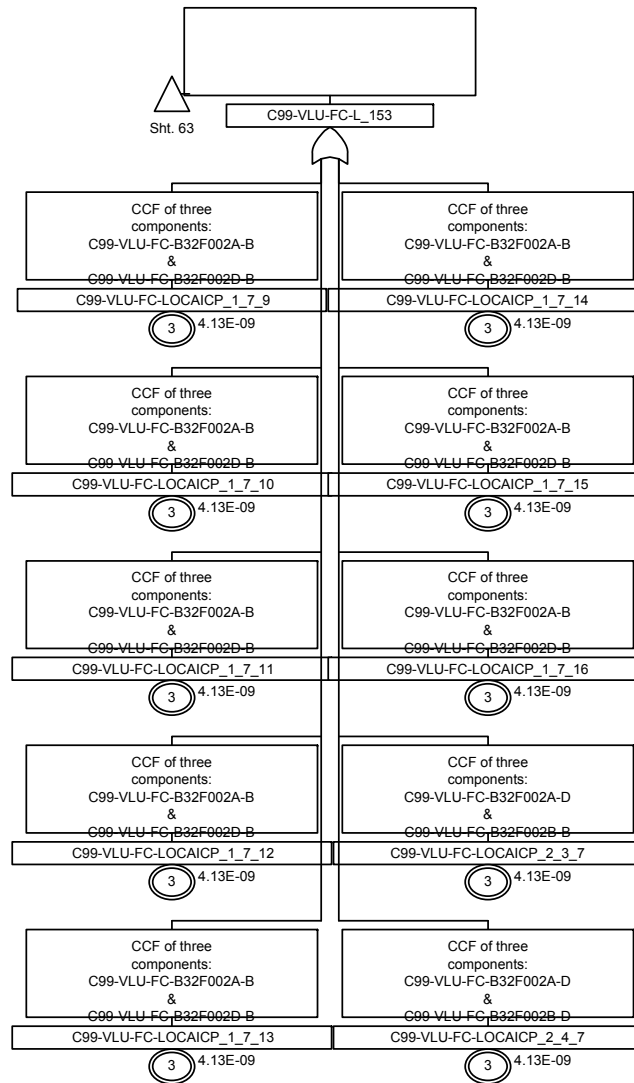


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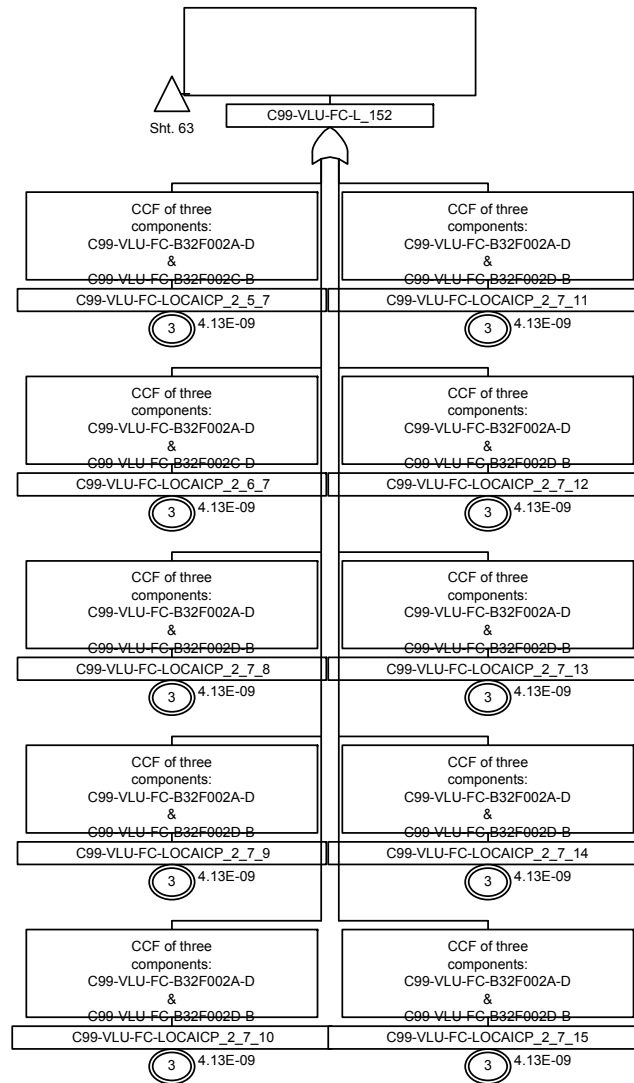


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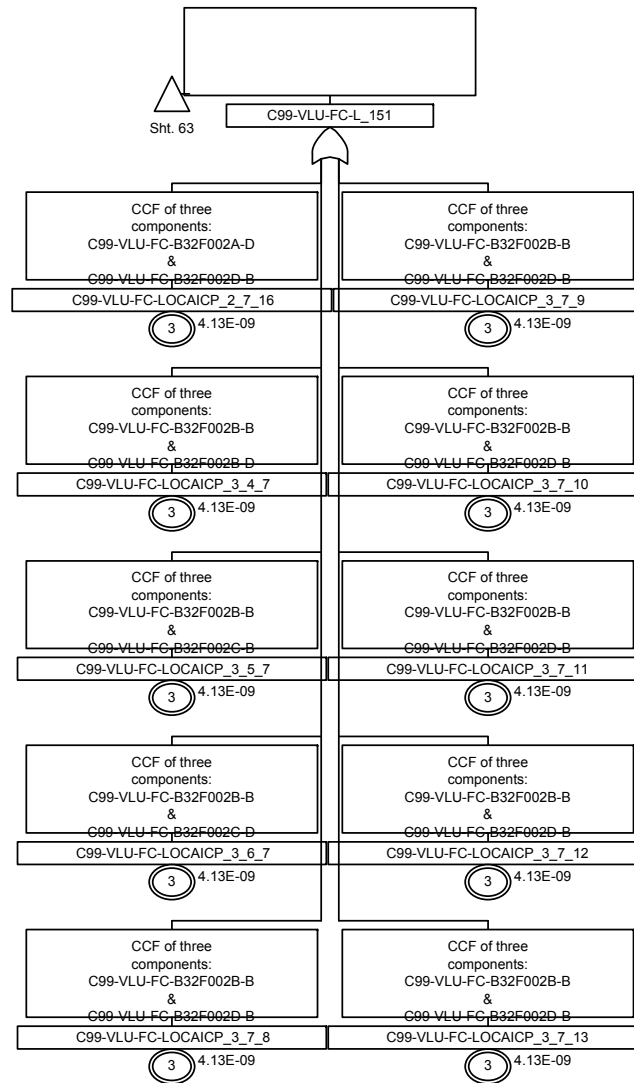


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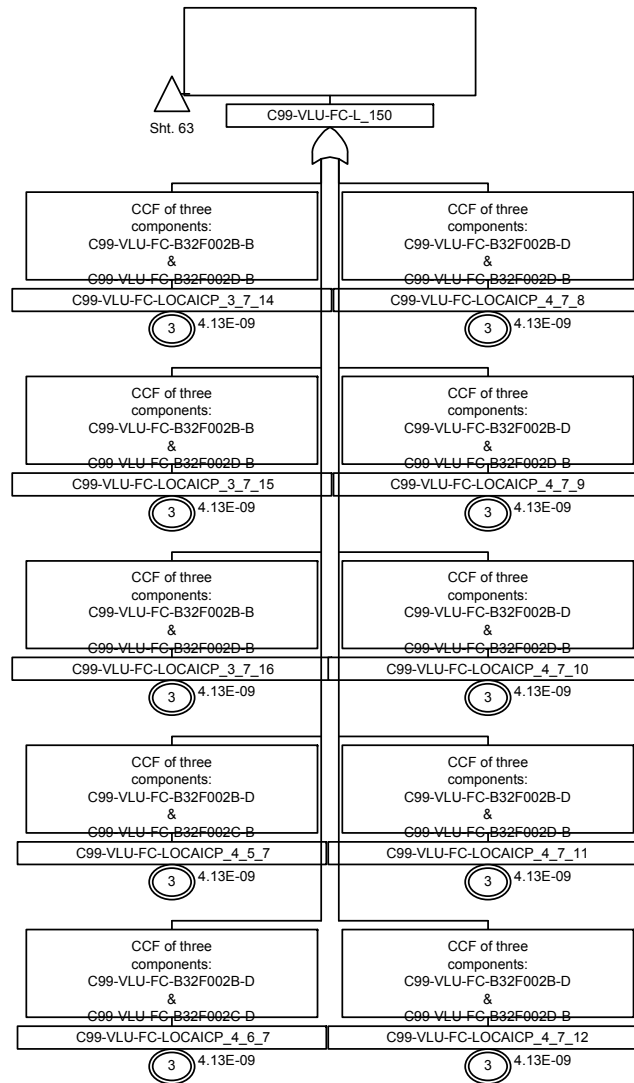


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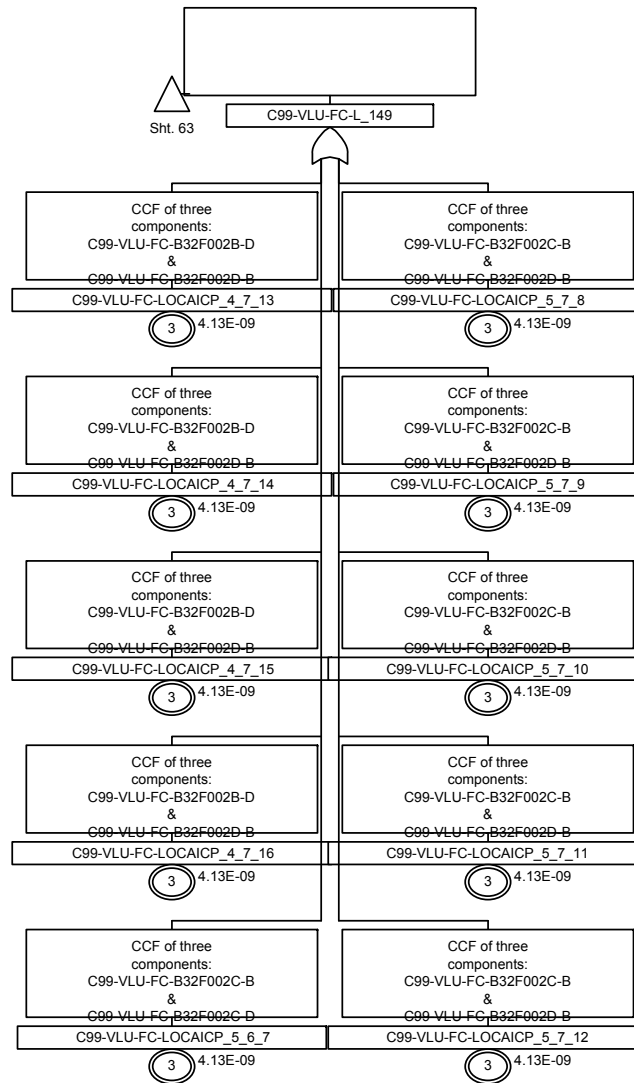


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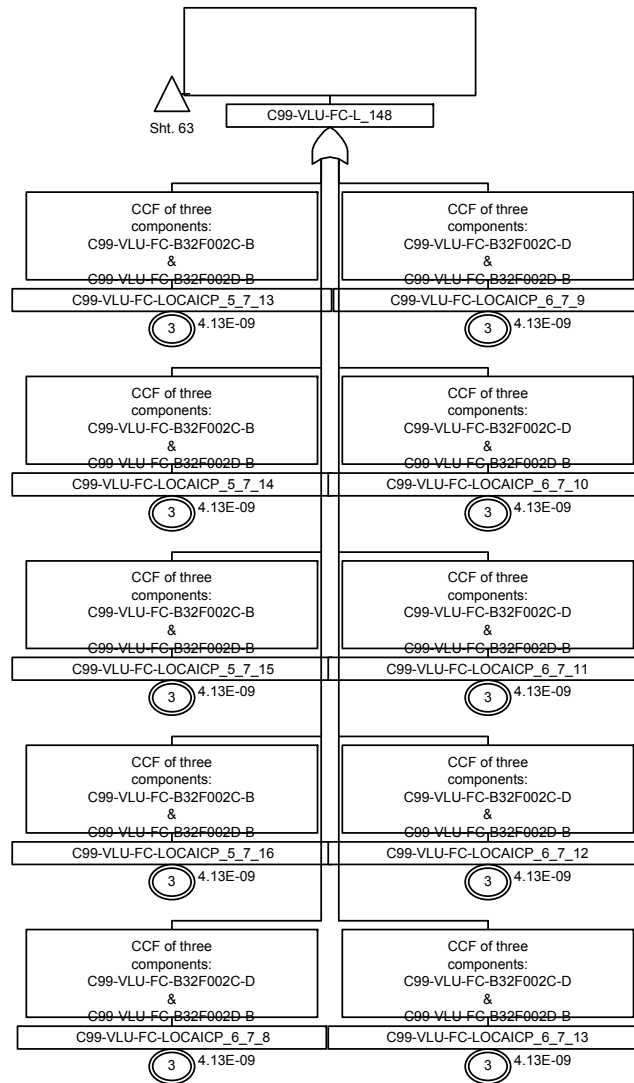


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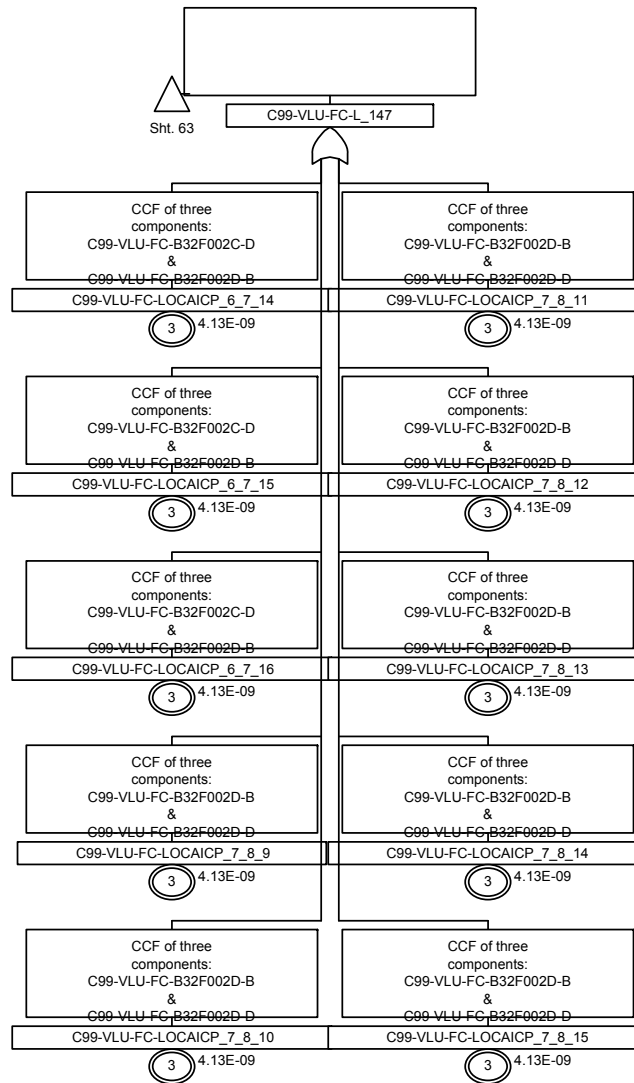


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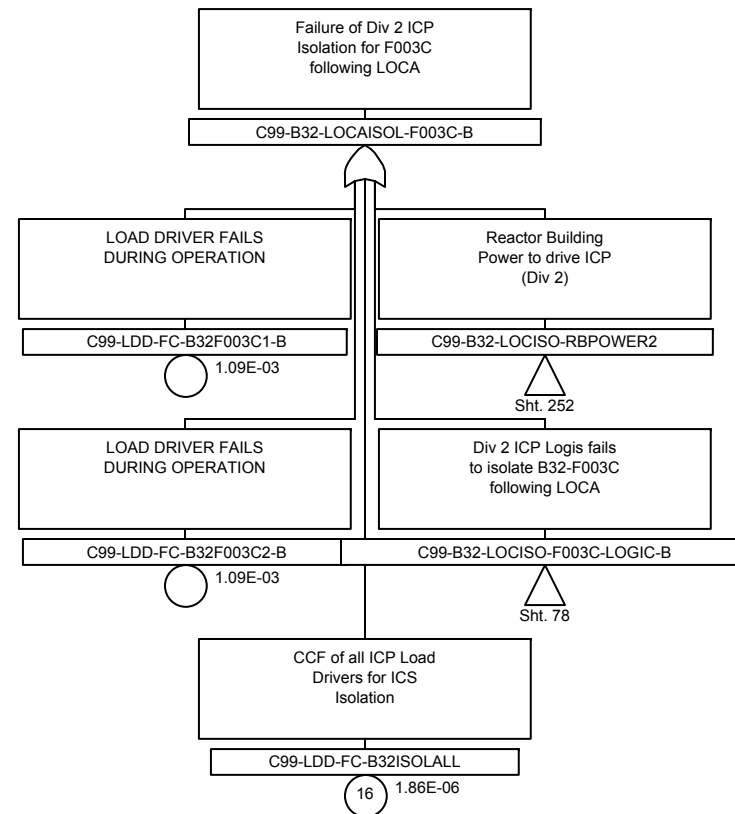


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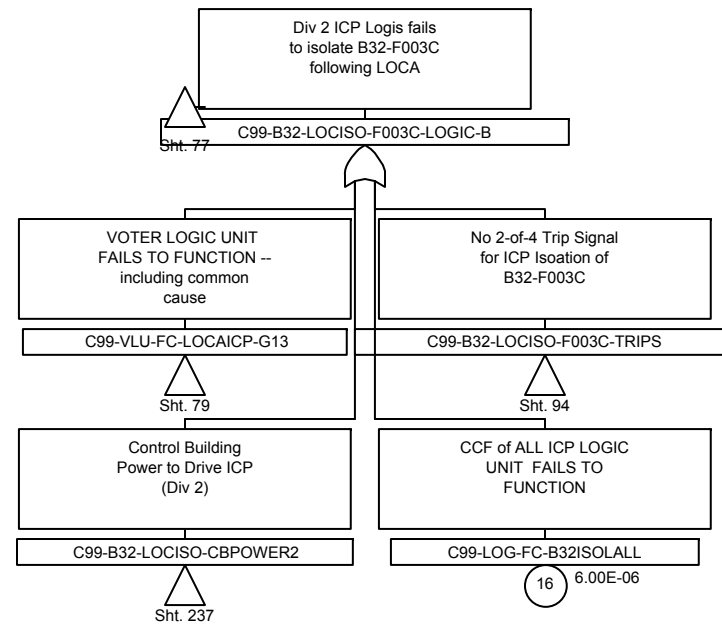


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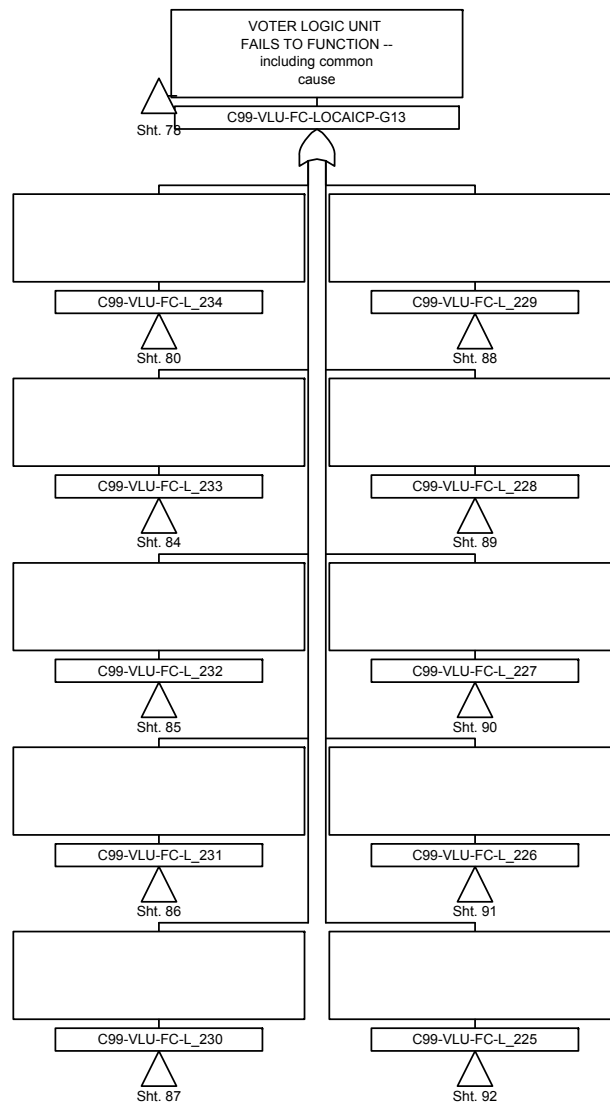


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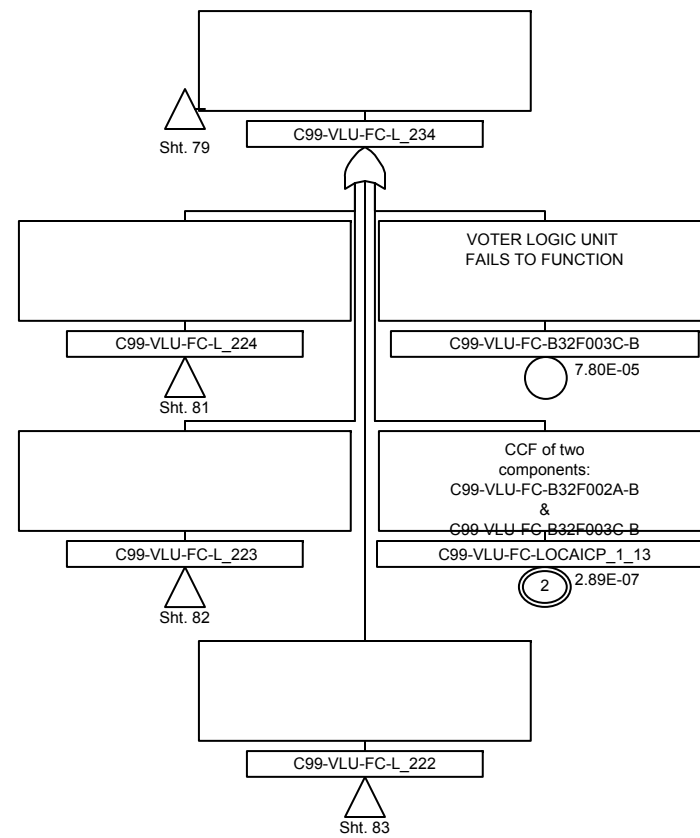


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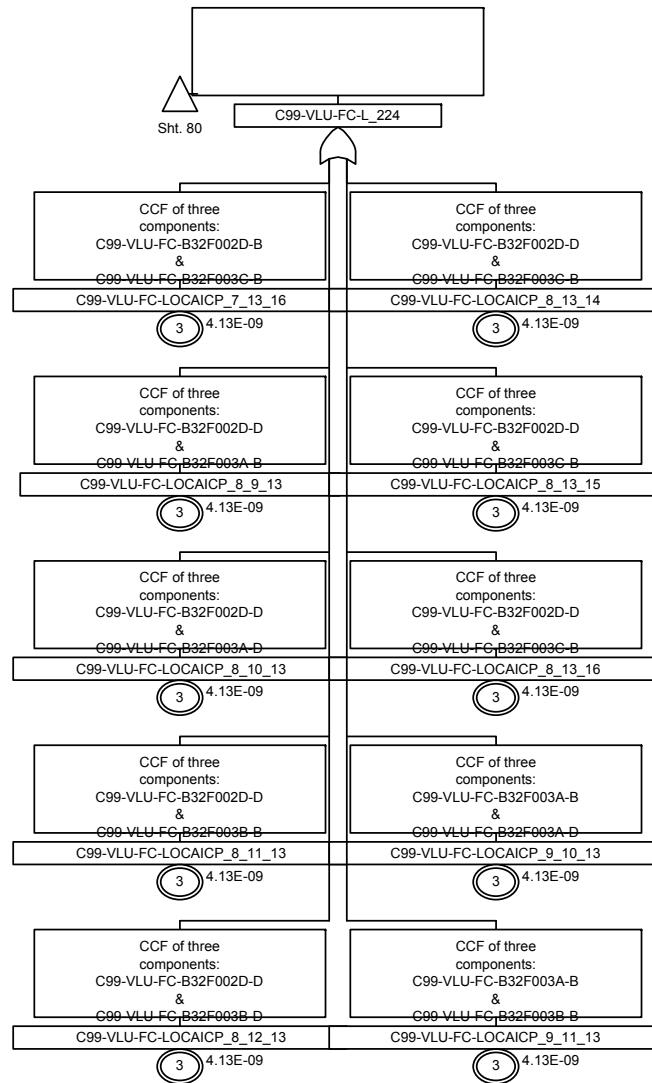


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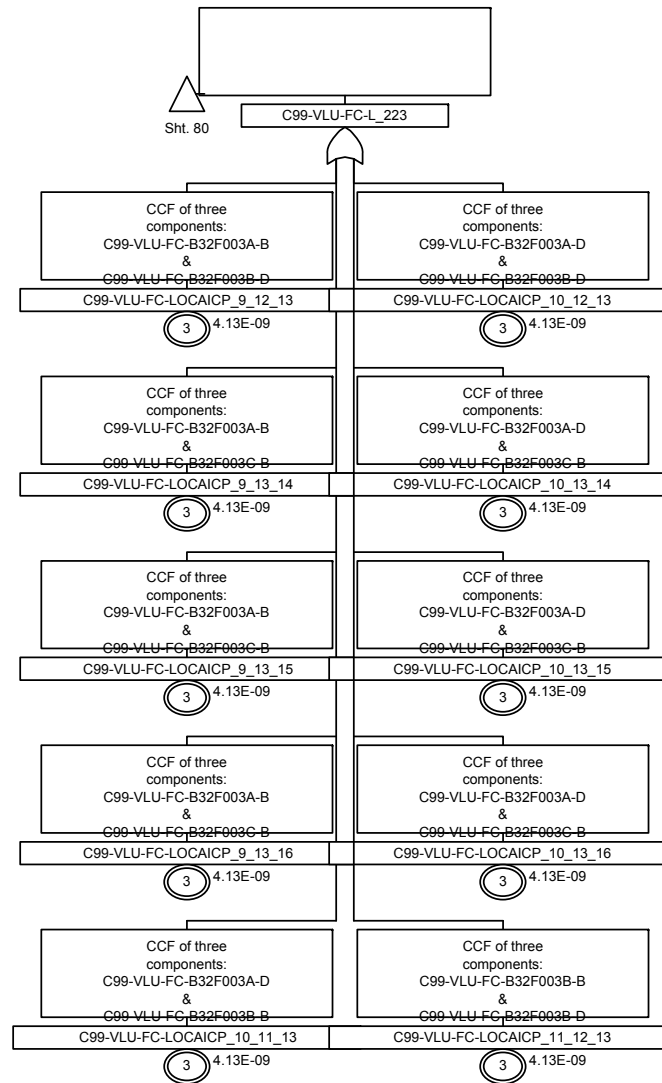


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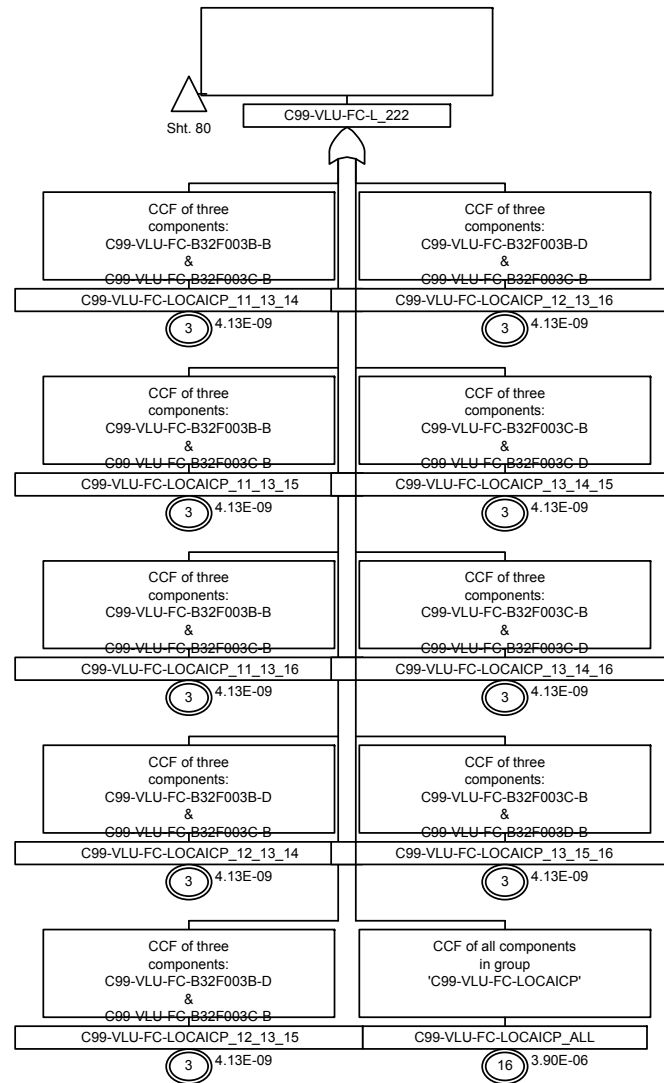


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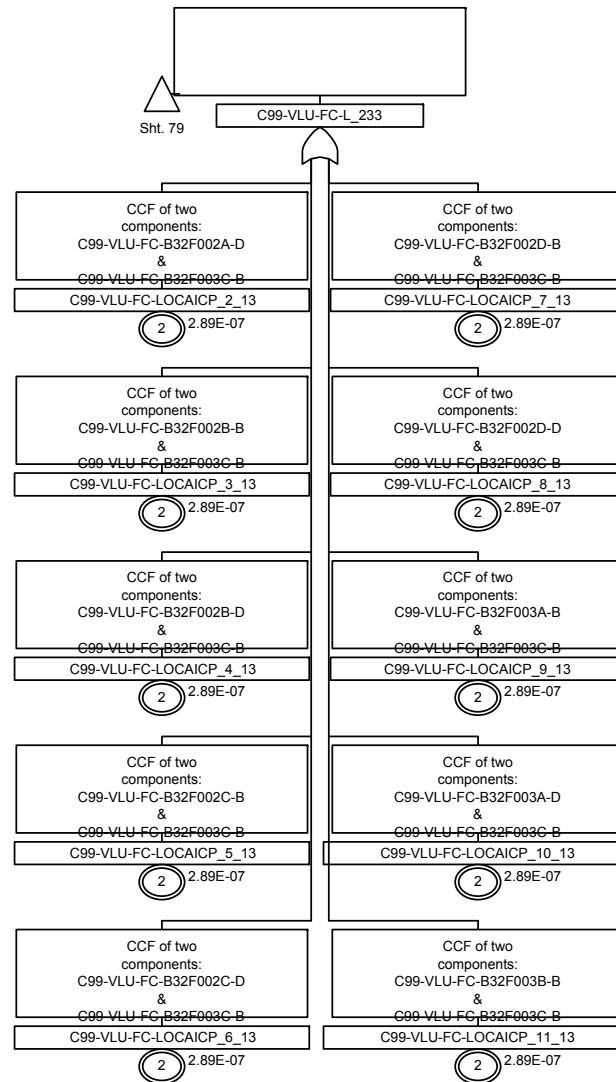


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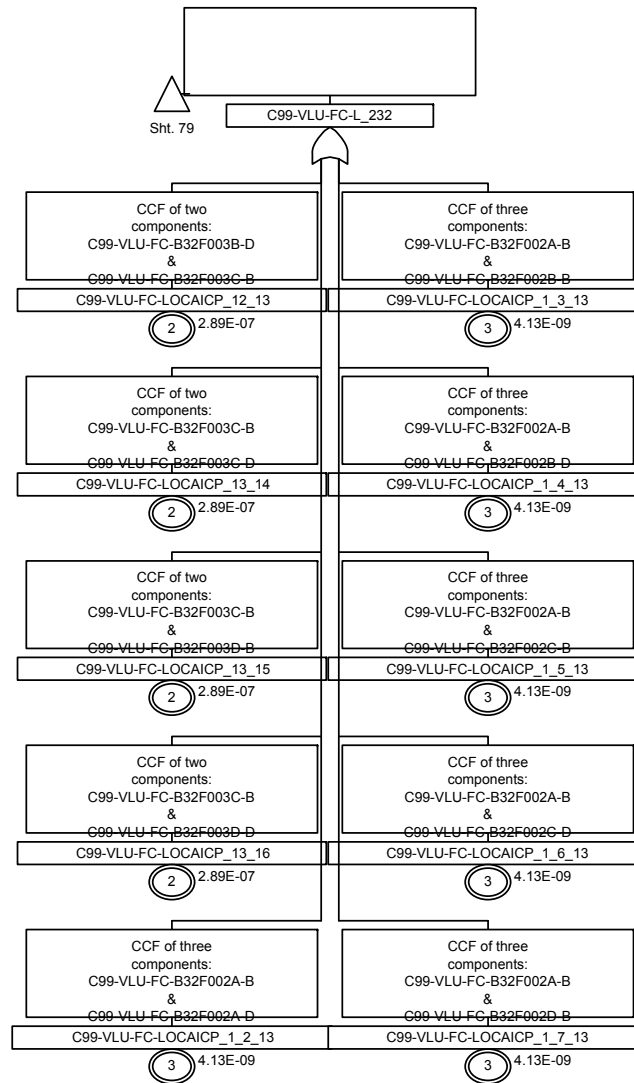


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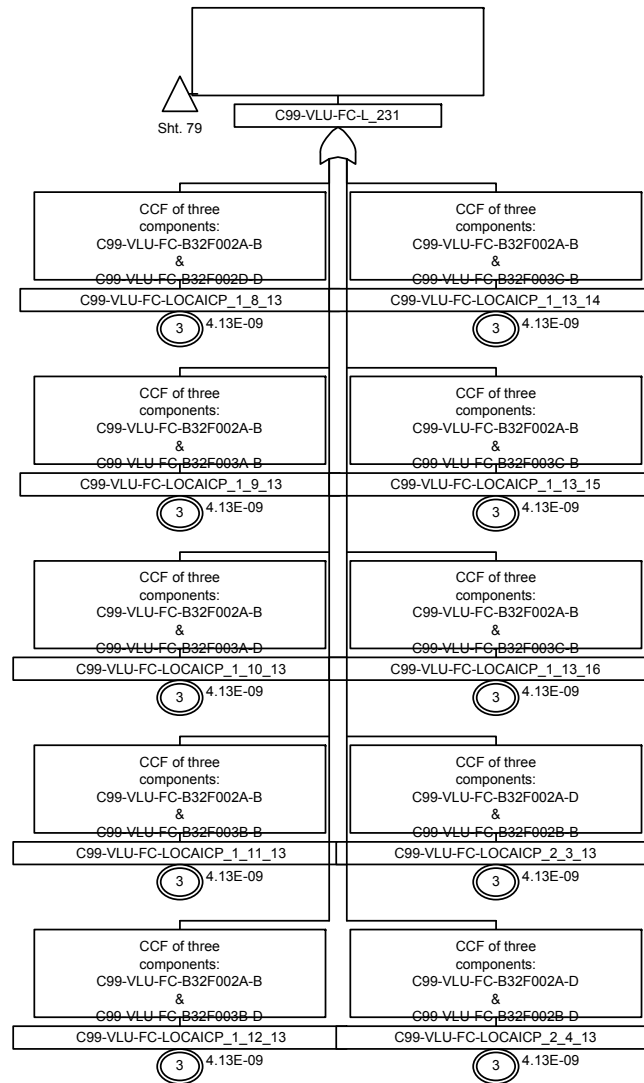


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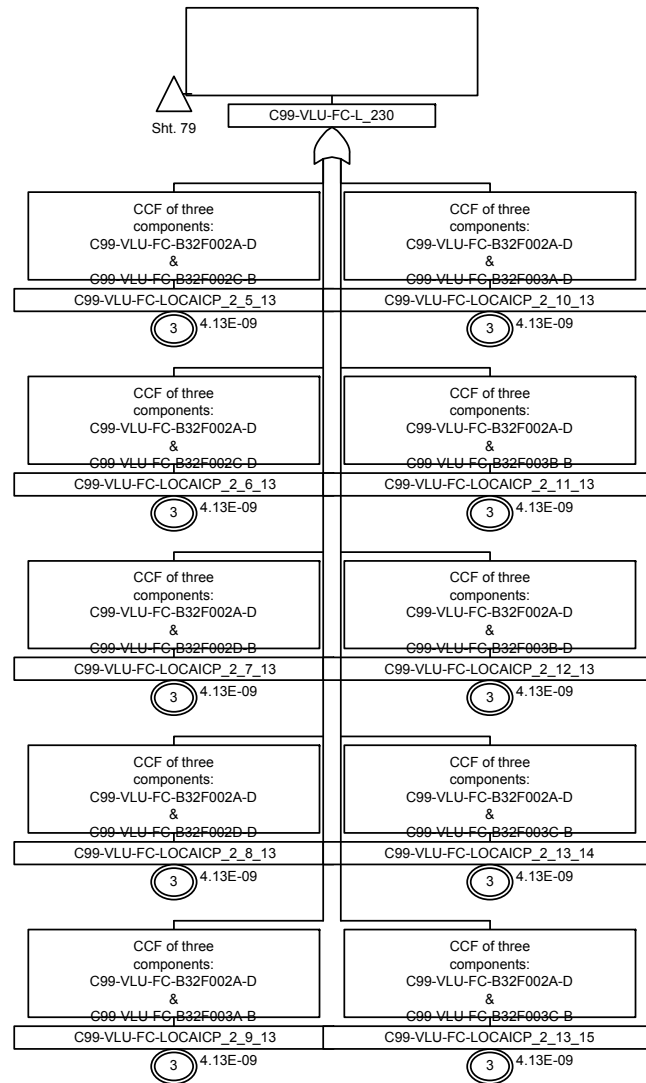


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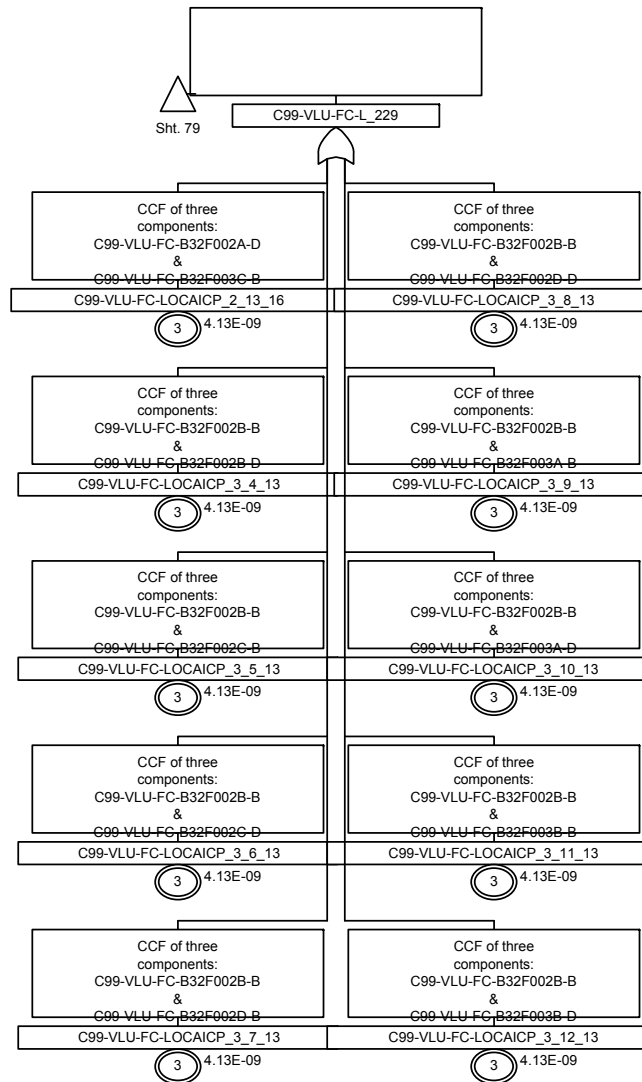


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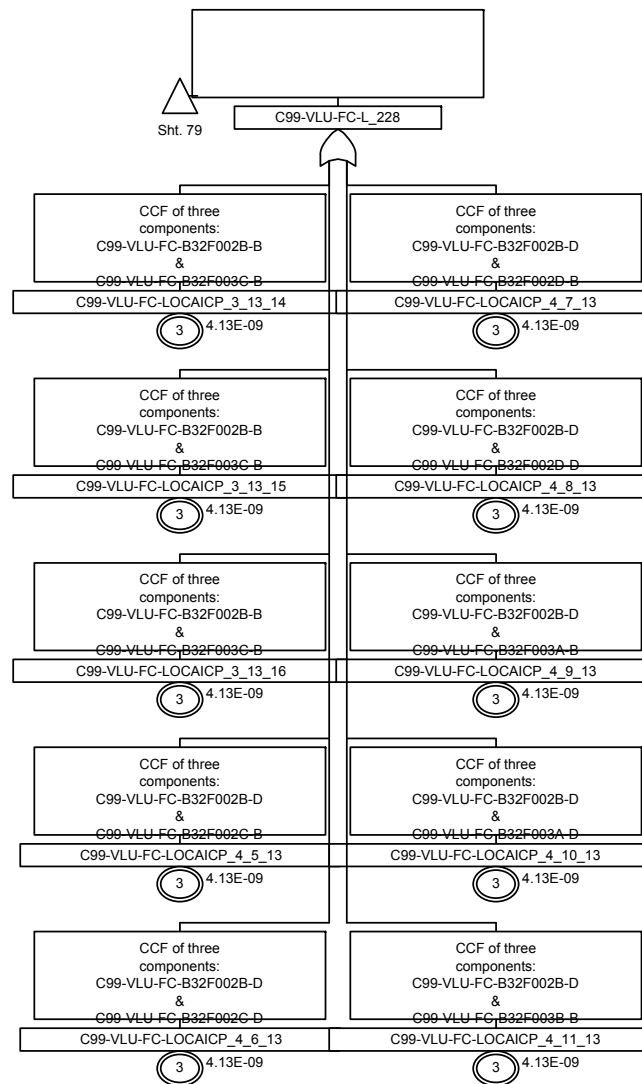


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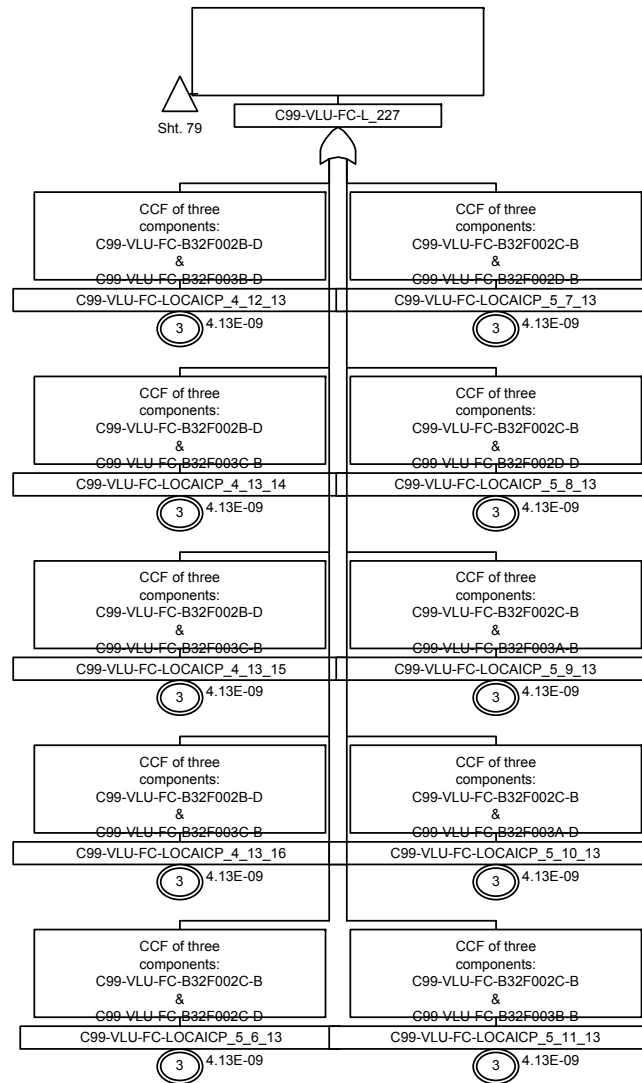


Figure 4.5-3e. Sheet 90 Independent Control Platforms



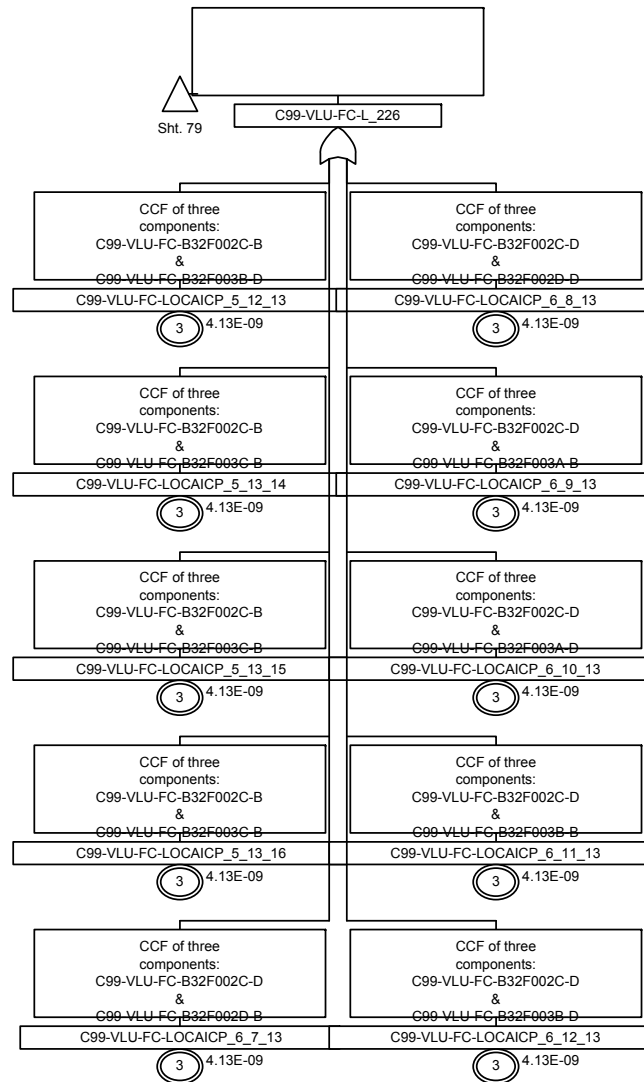


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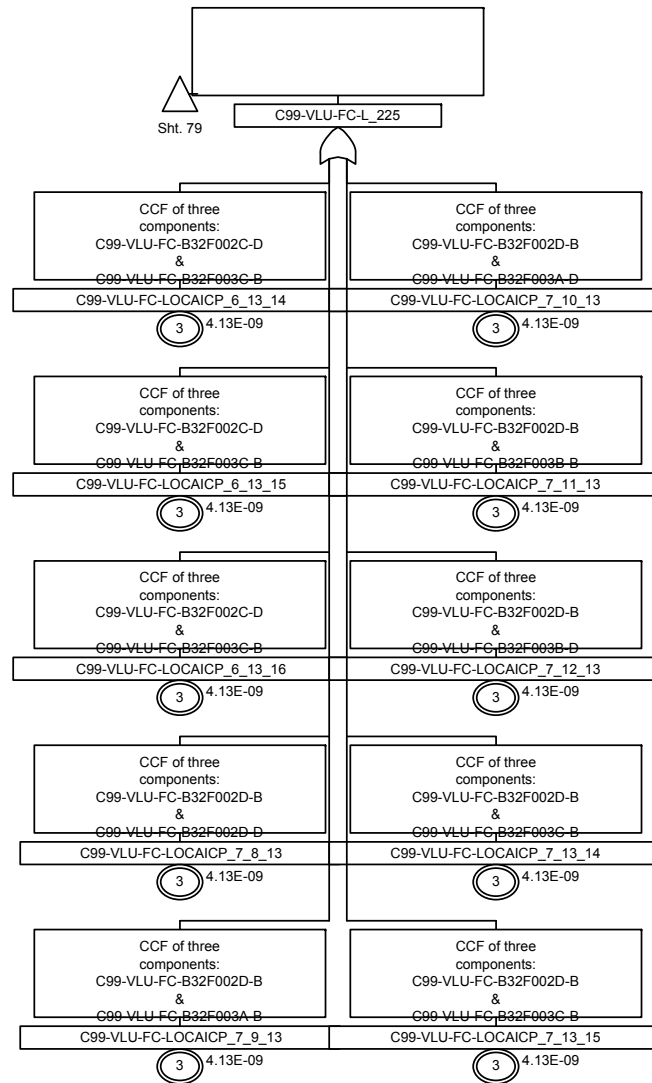


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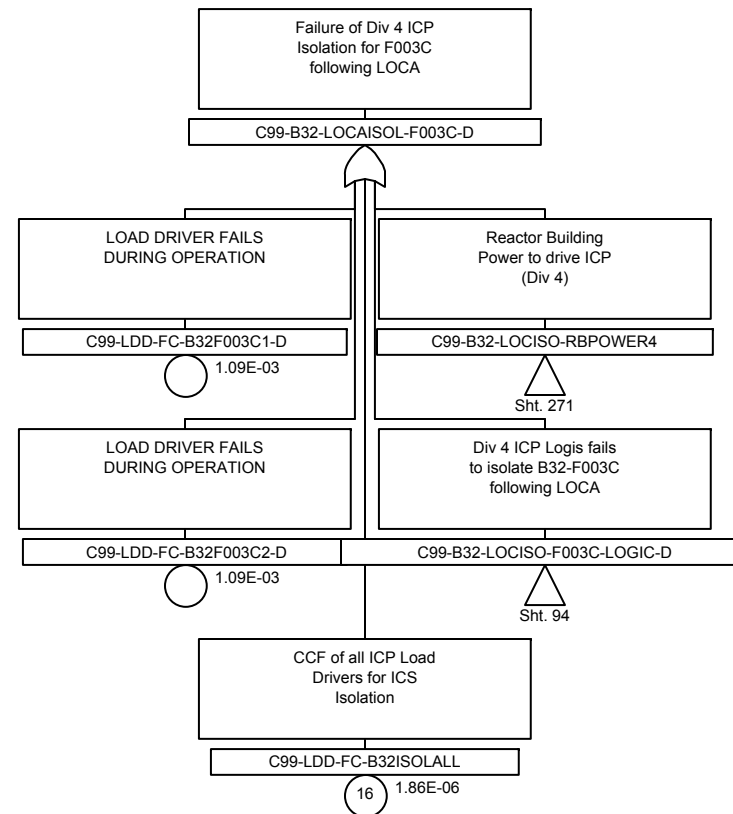


Figure 4.5-3e. Sheet 93 Independent Control Platforms



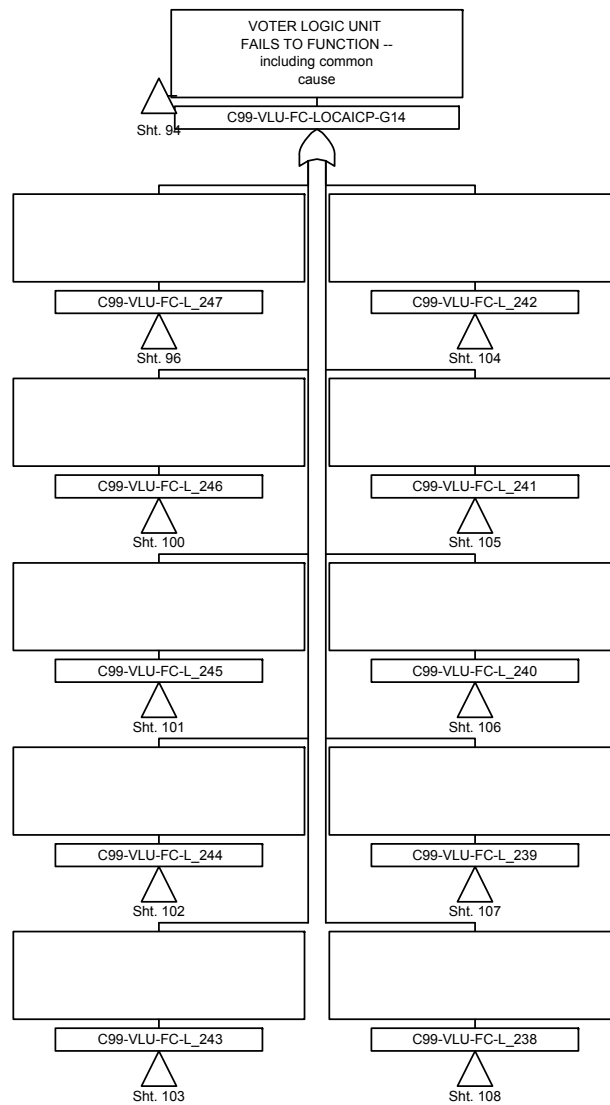


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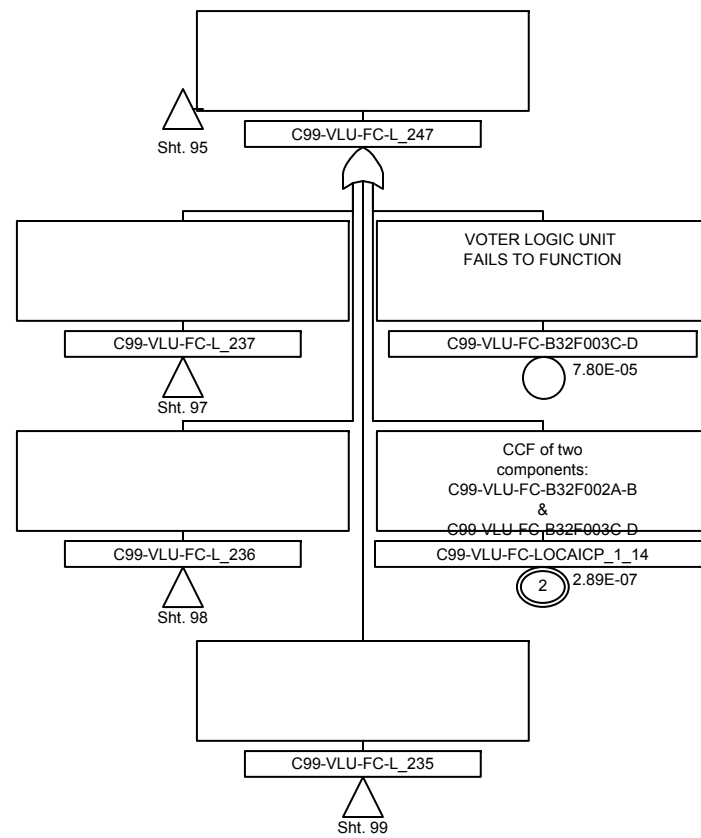


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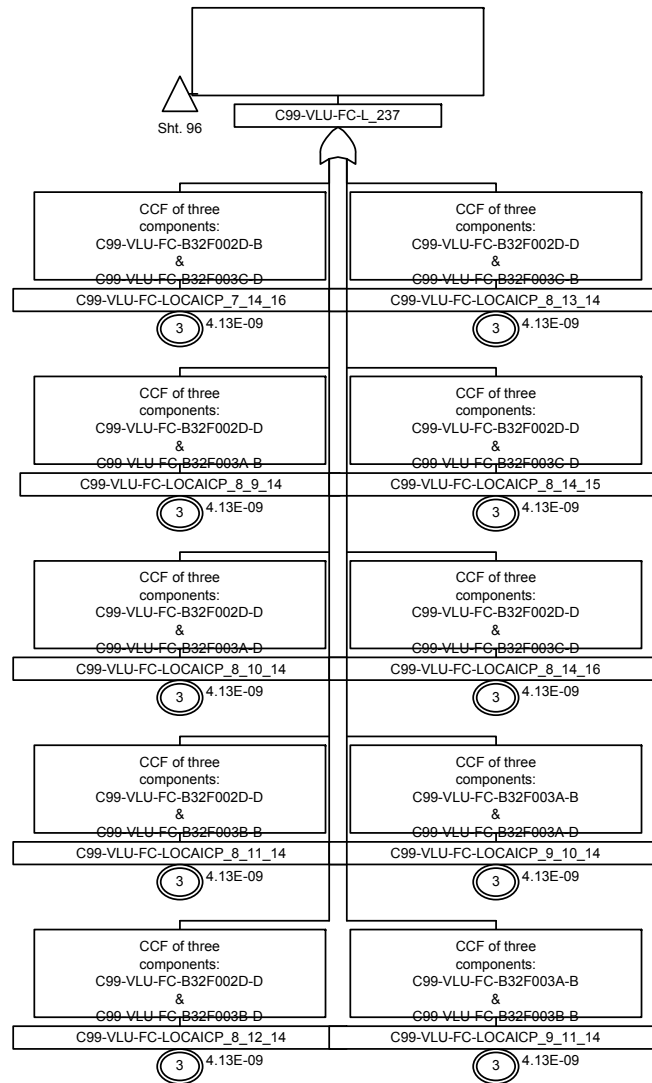


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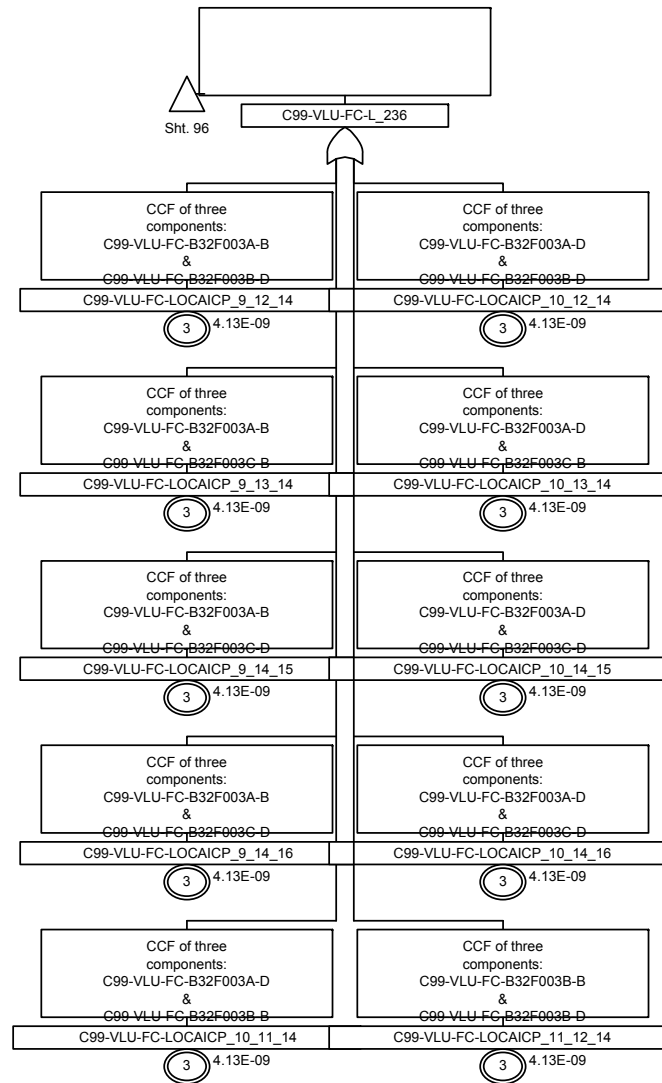


Figure 4.5-3e. Sheet 98 Independent Control Platforms



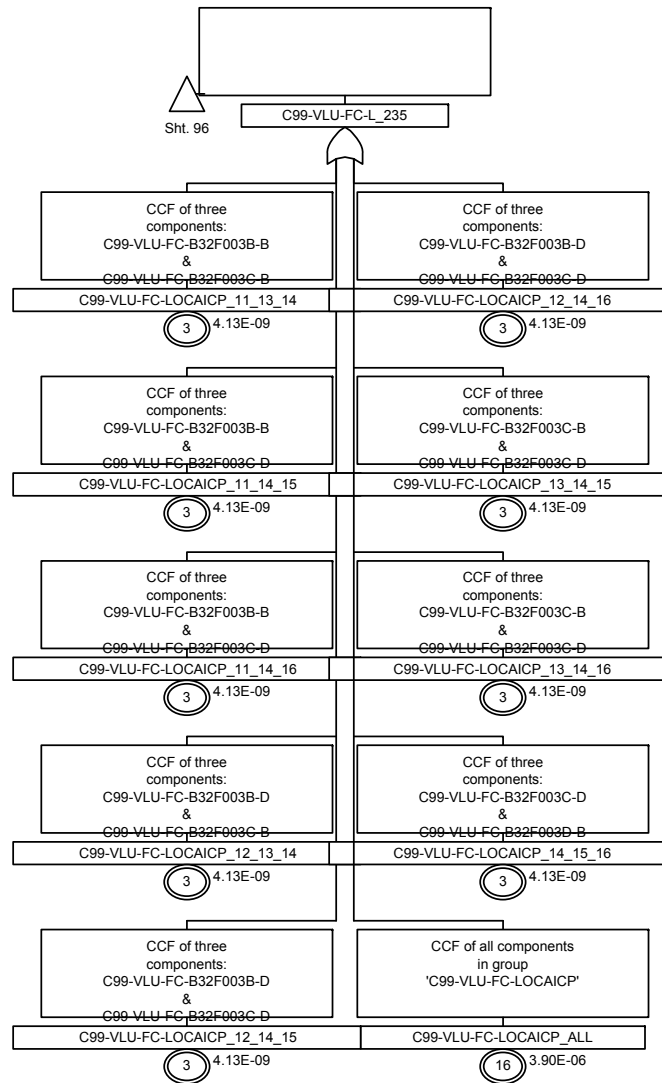


Figure 4.5-3e. Sheet 99 Independent Control Platforms

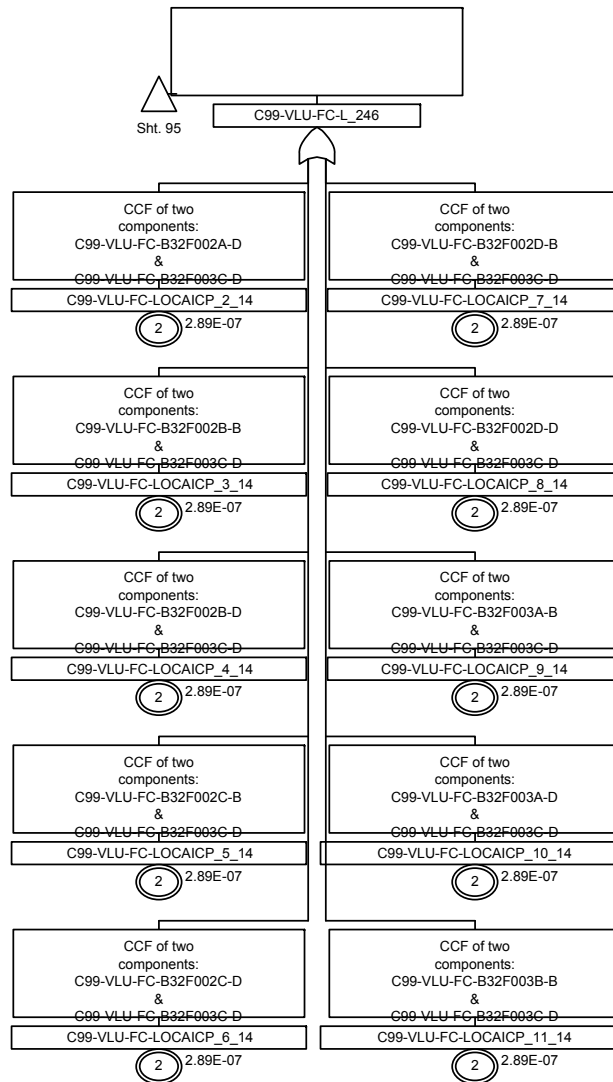


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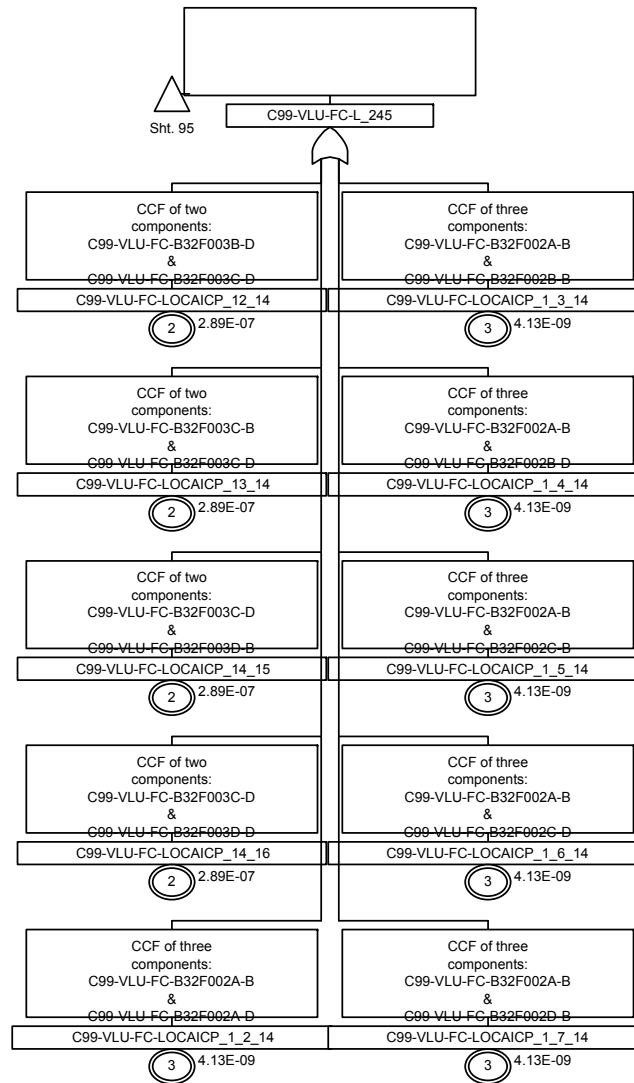


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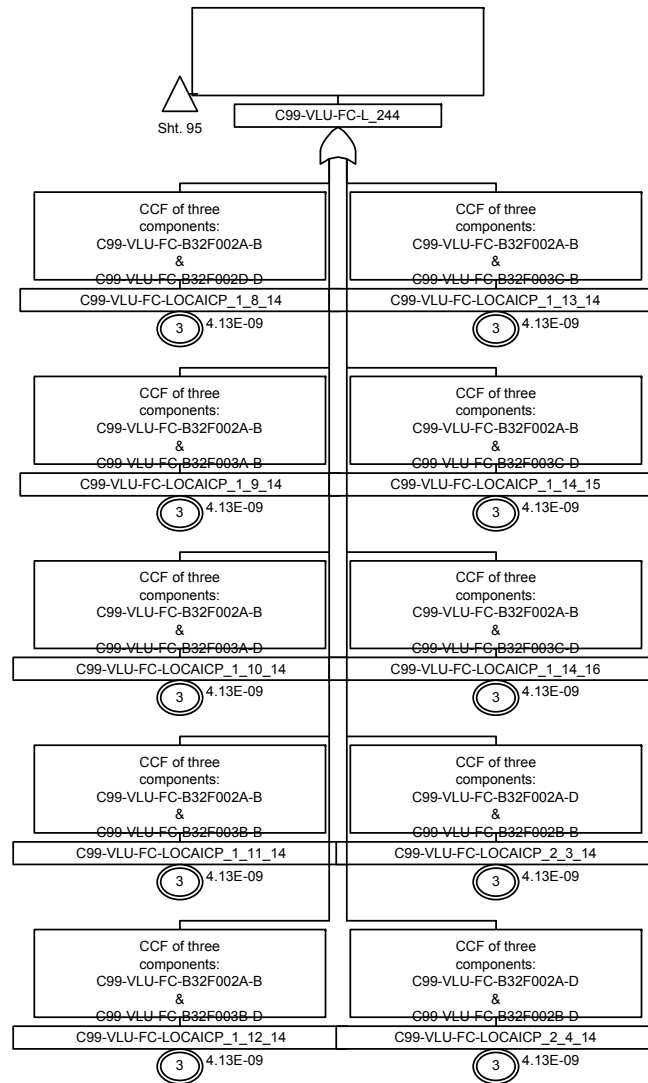


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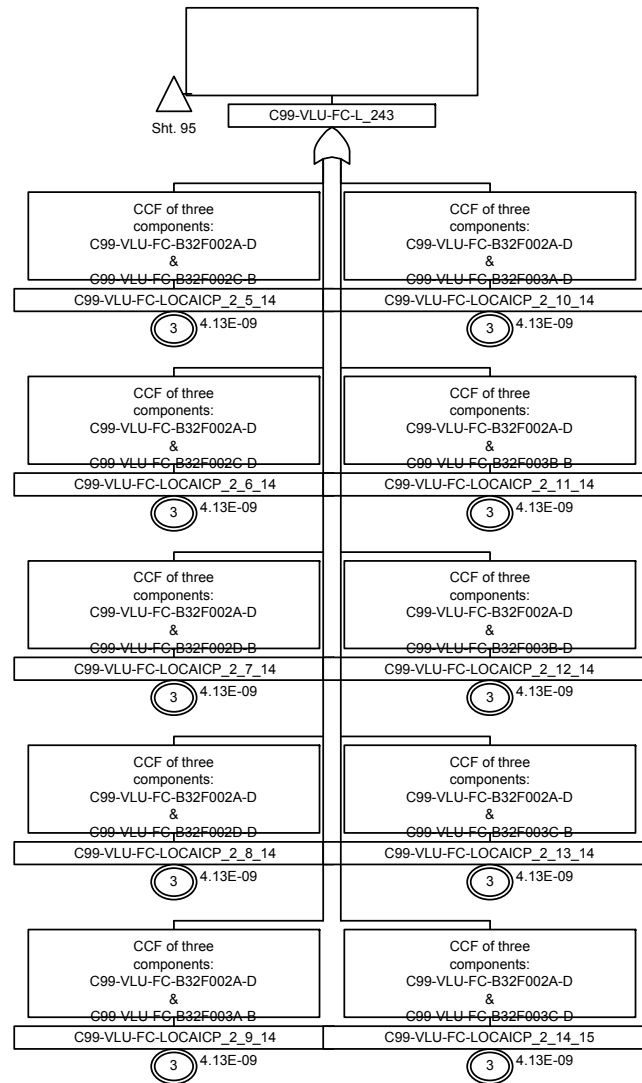


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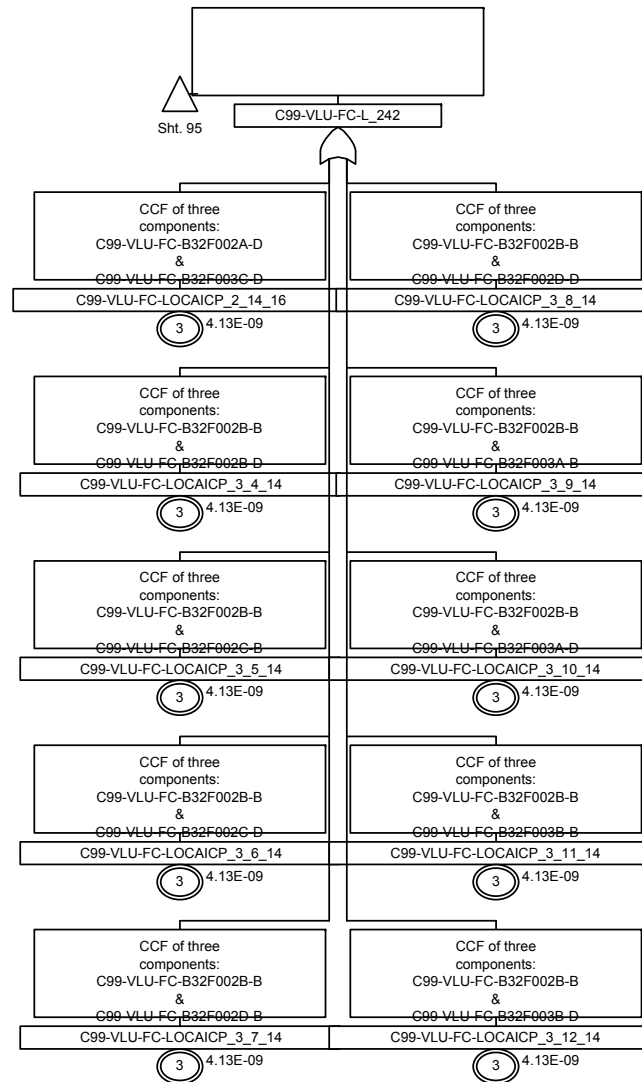


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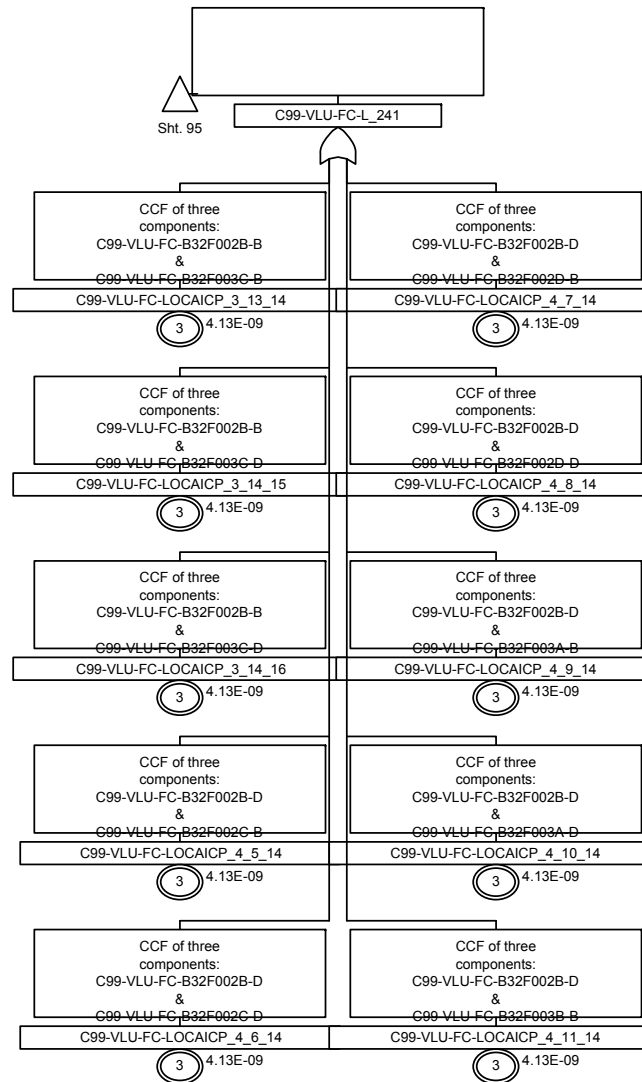


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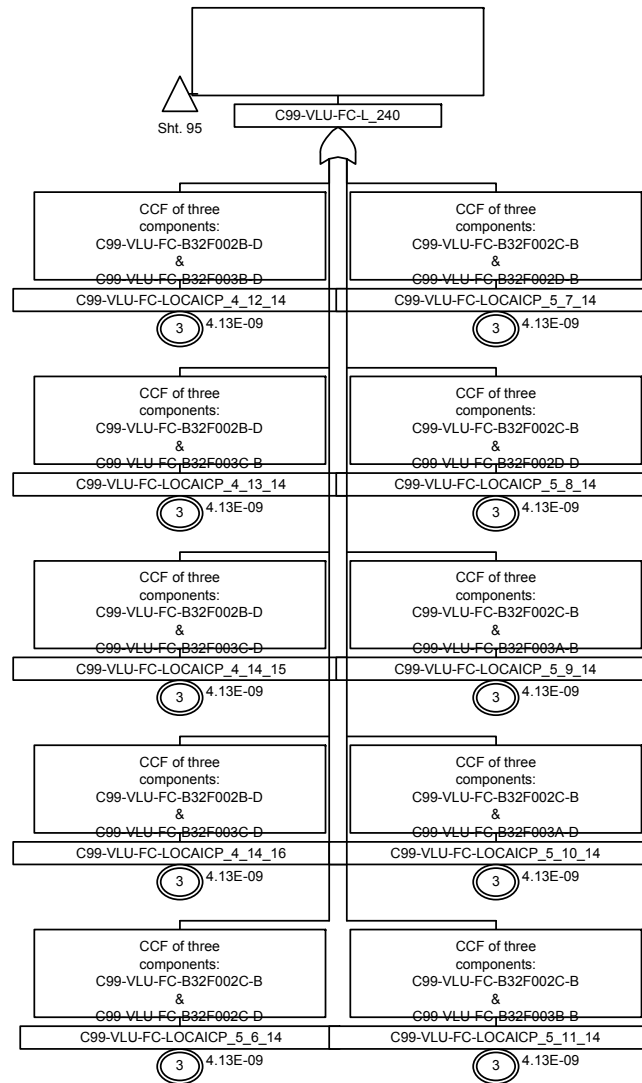


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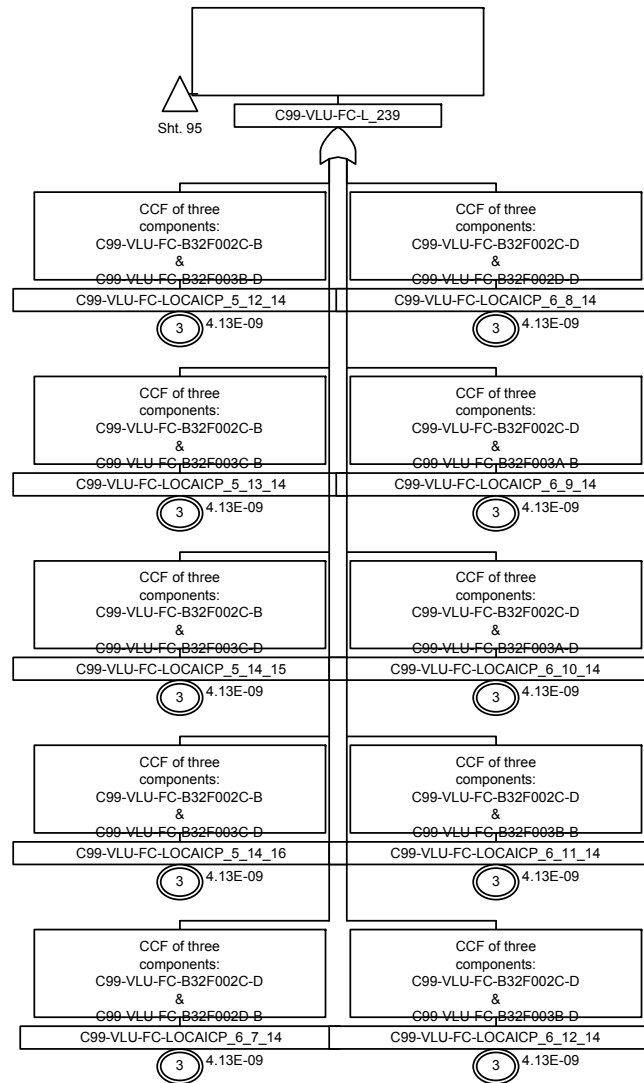


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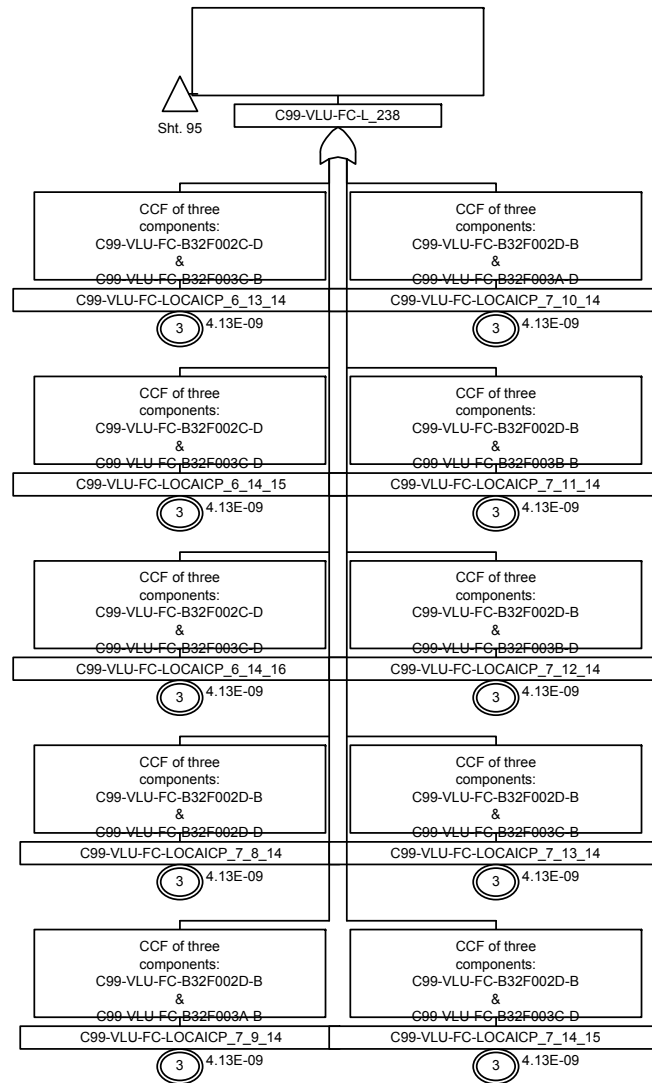


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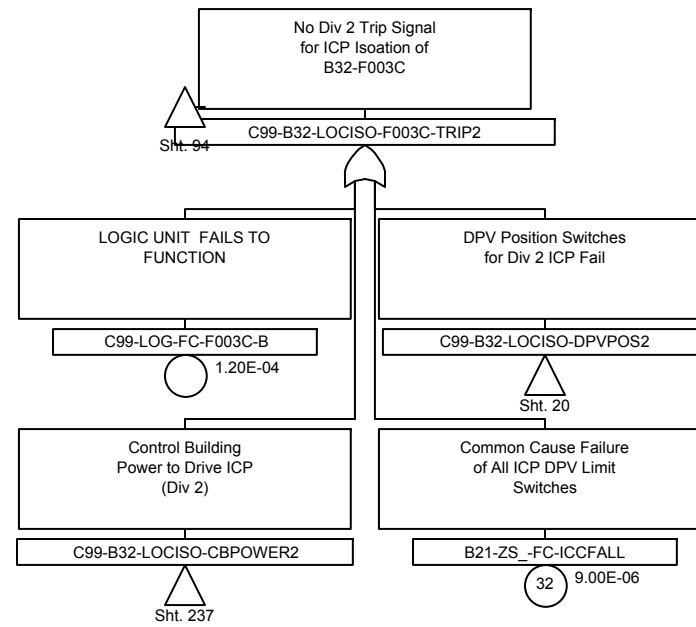


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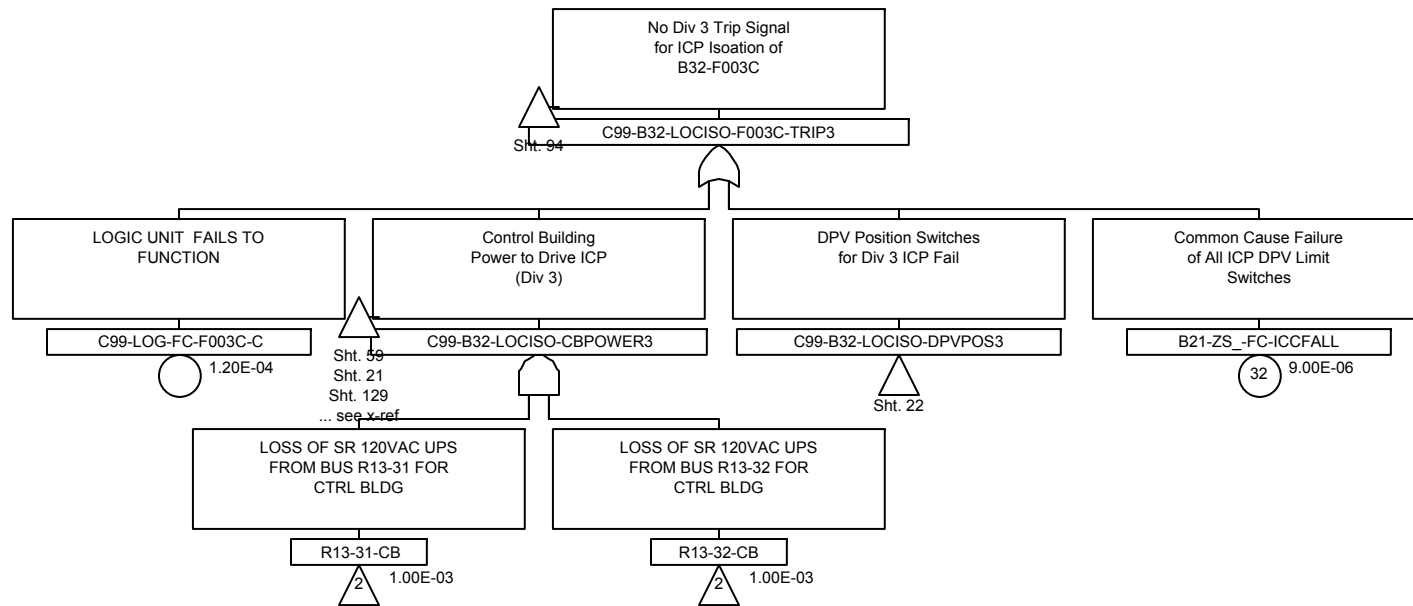


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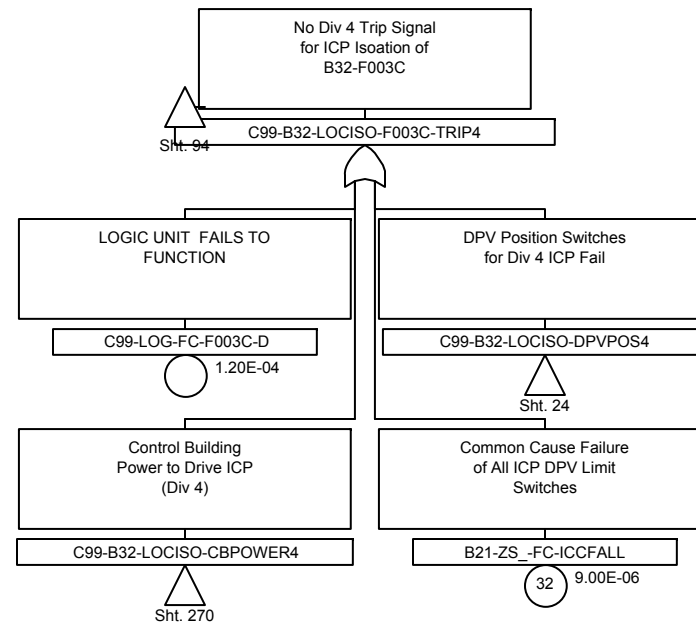


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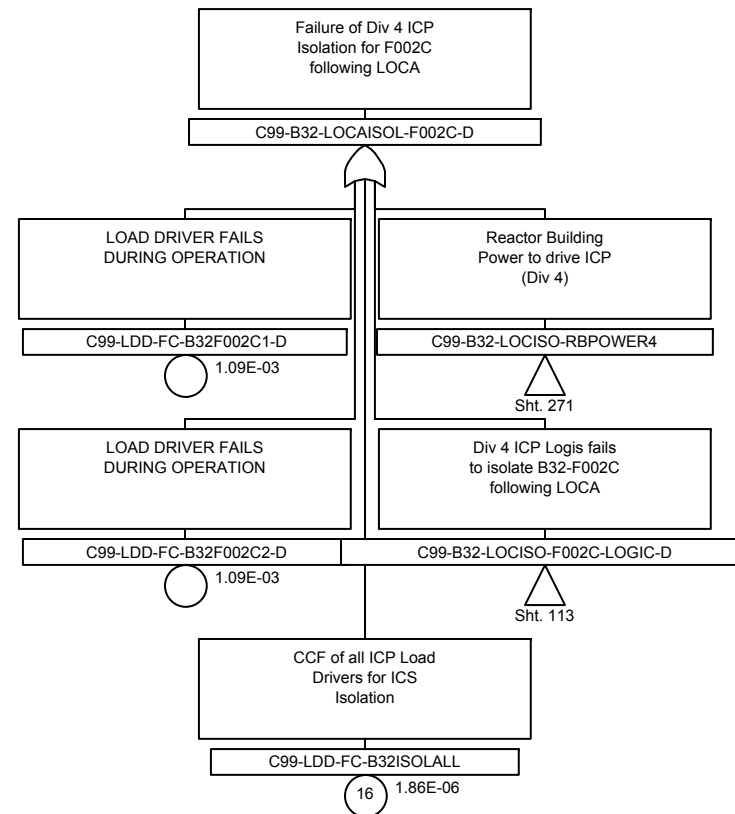


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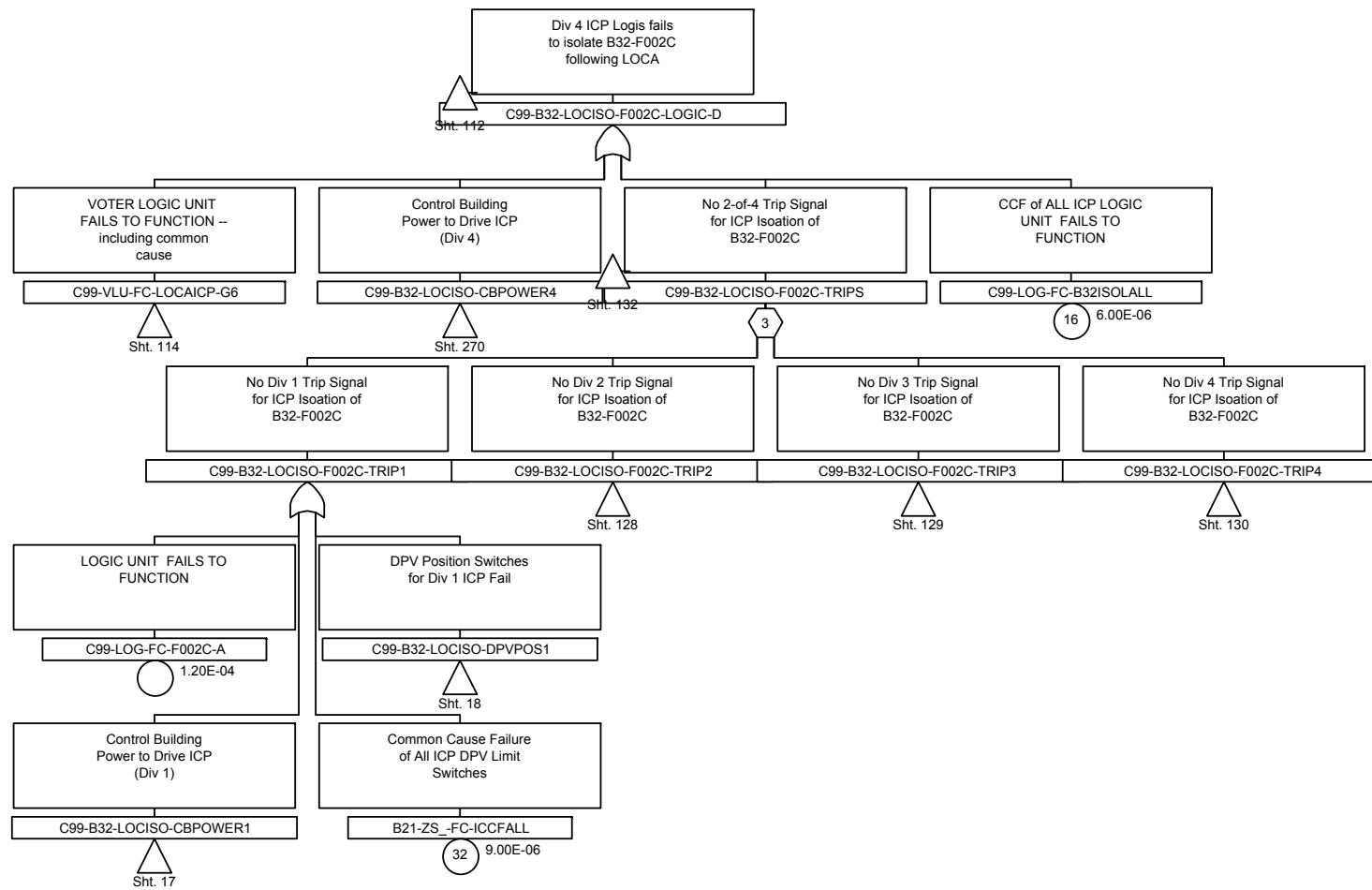


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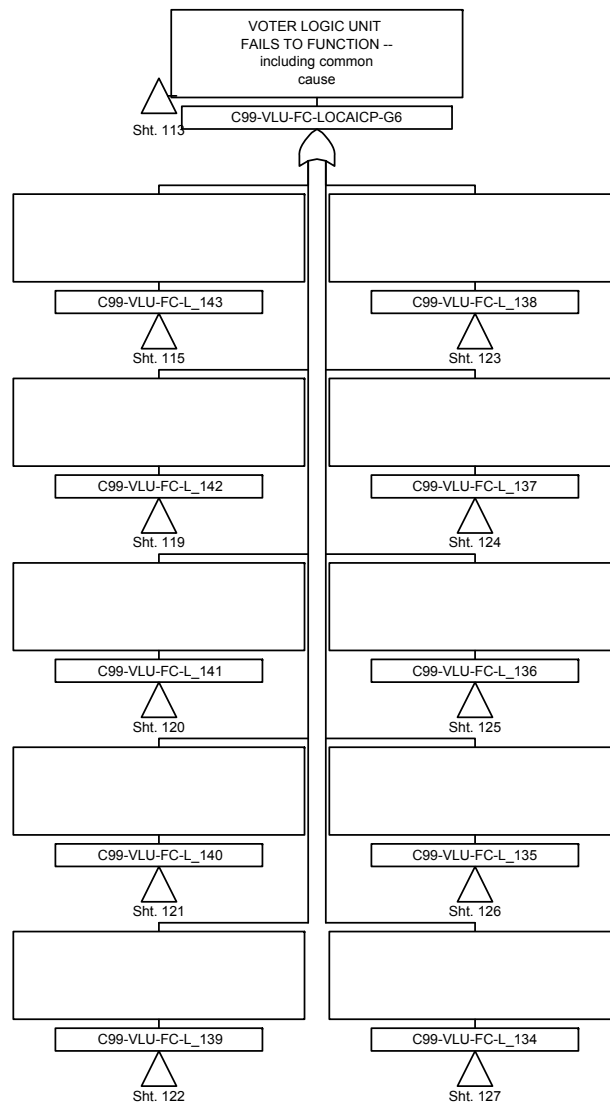


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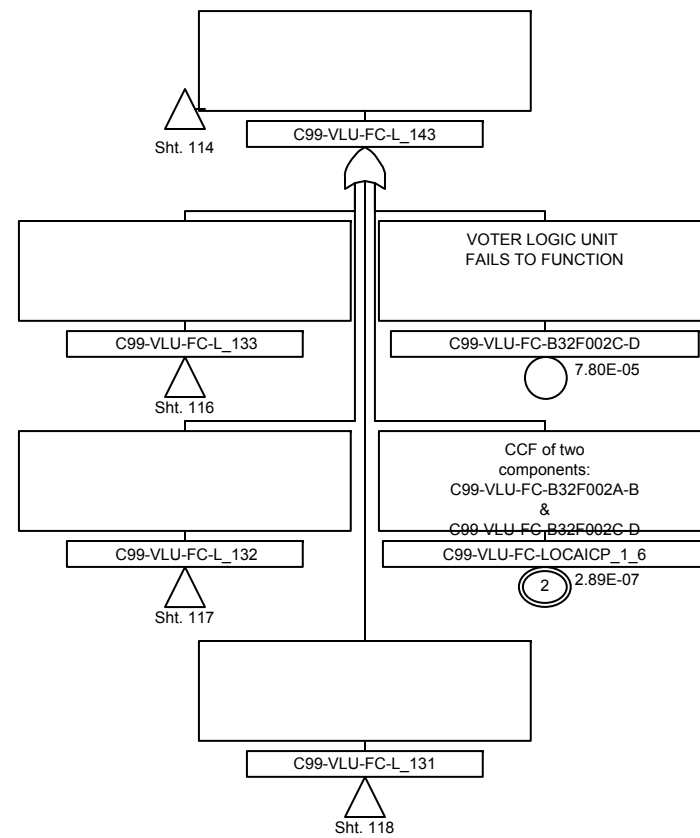


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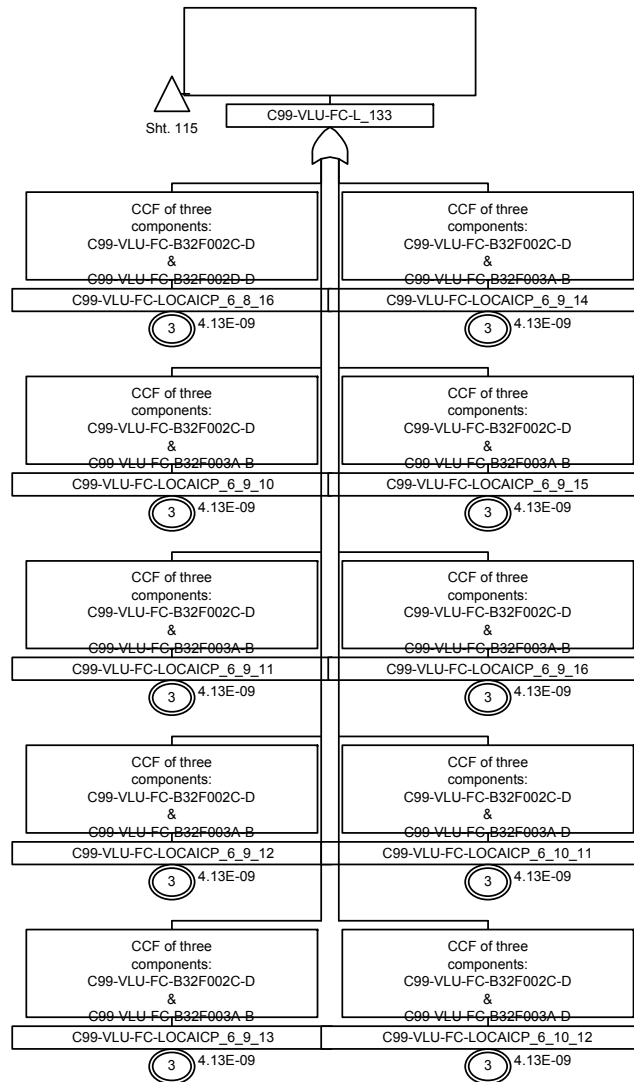


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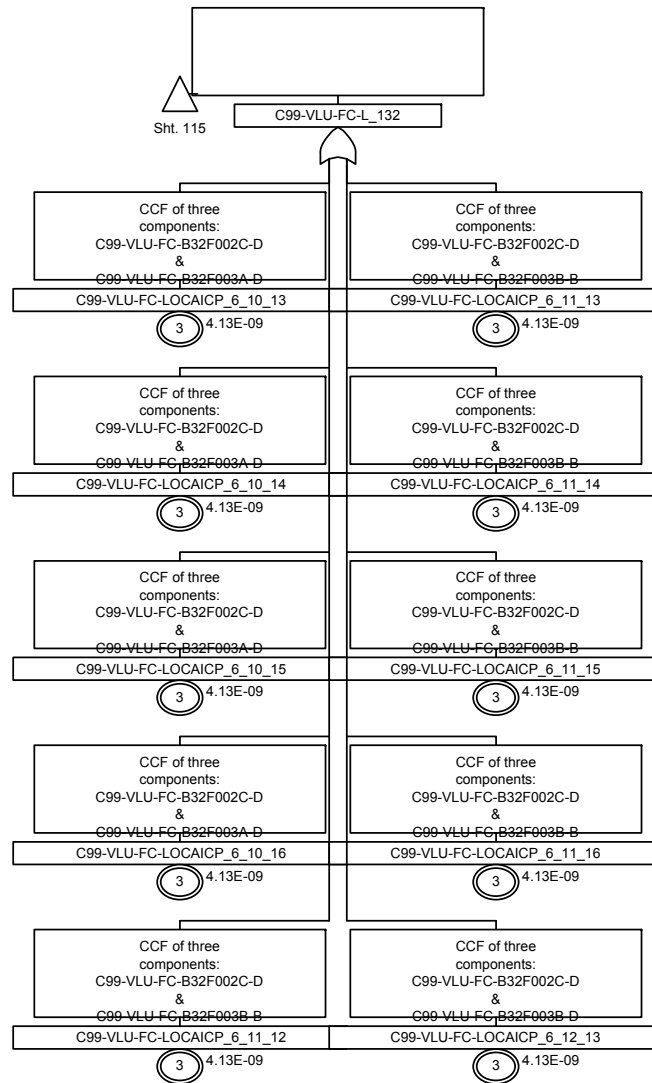


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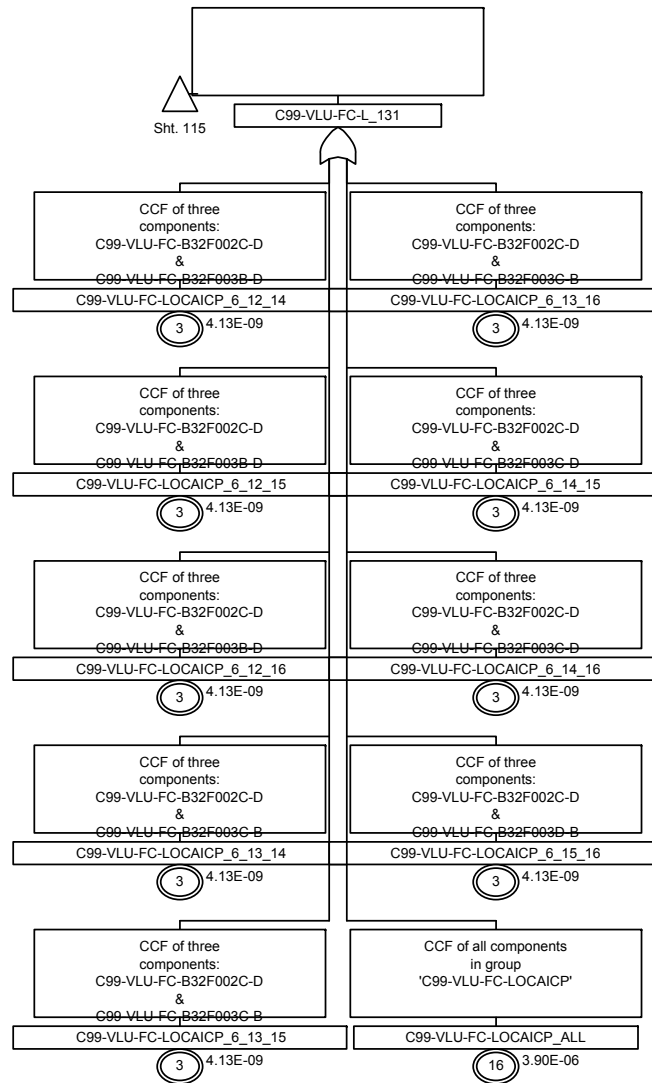


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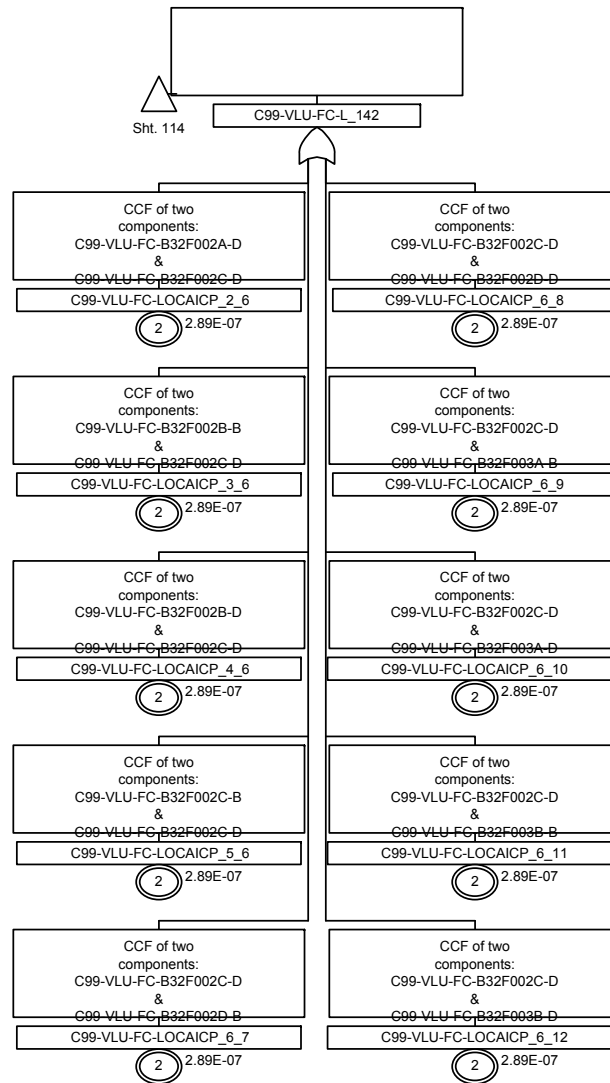


Figure 4.5-3e. Sheet 119 Independent Control Platforms



Figure 4.5-3e. Sheet 120 Independent Control Platforms

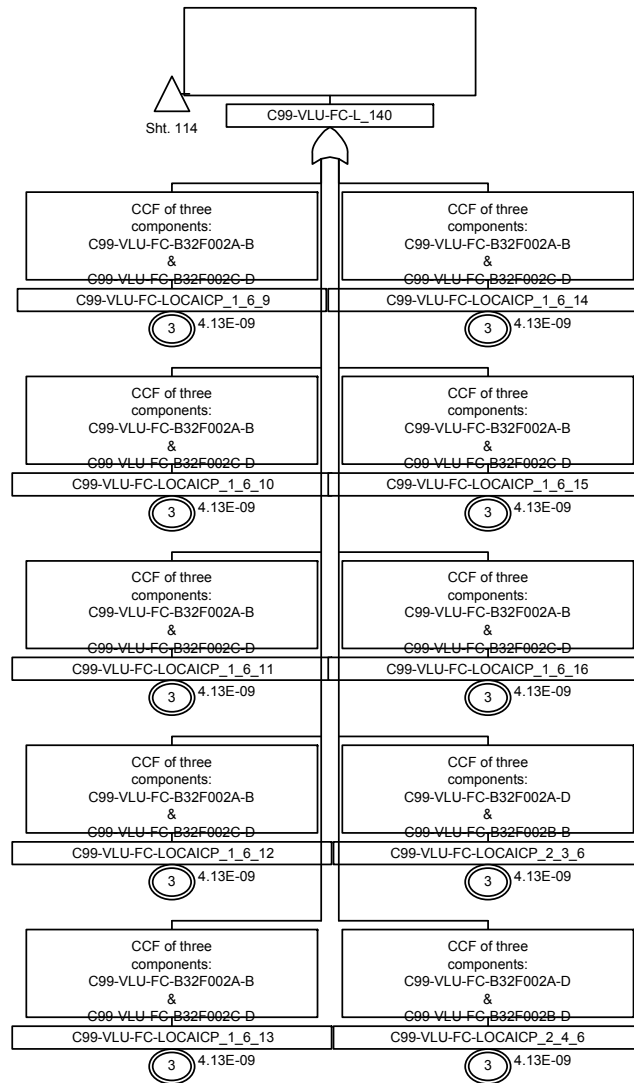


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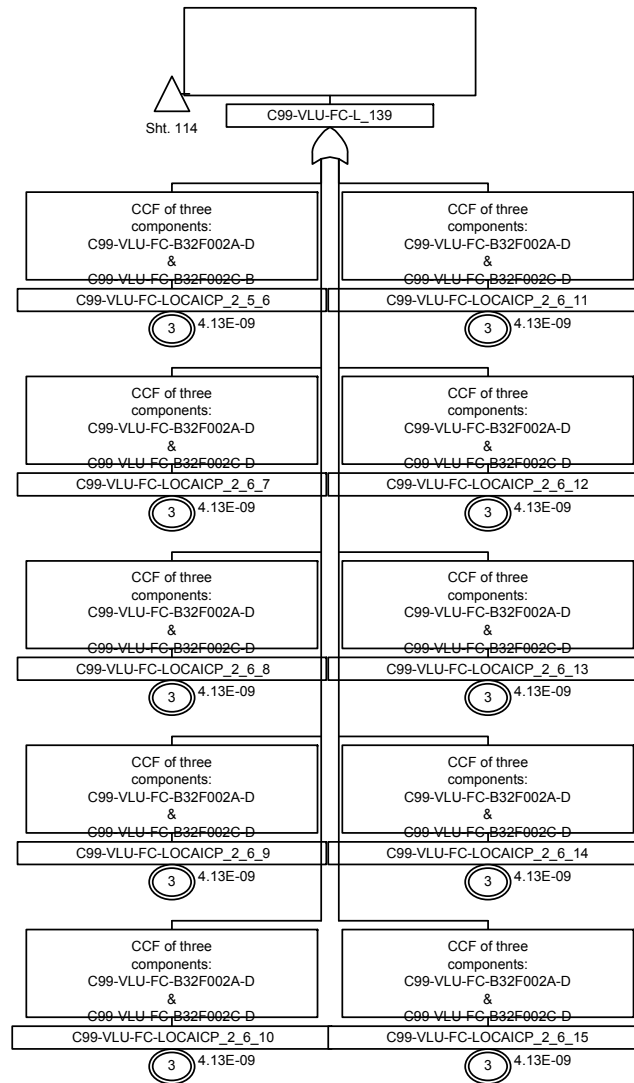


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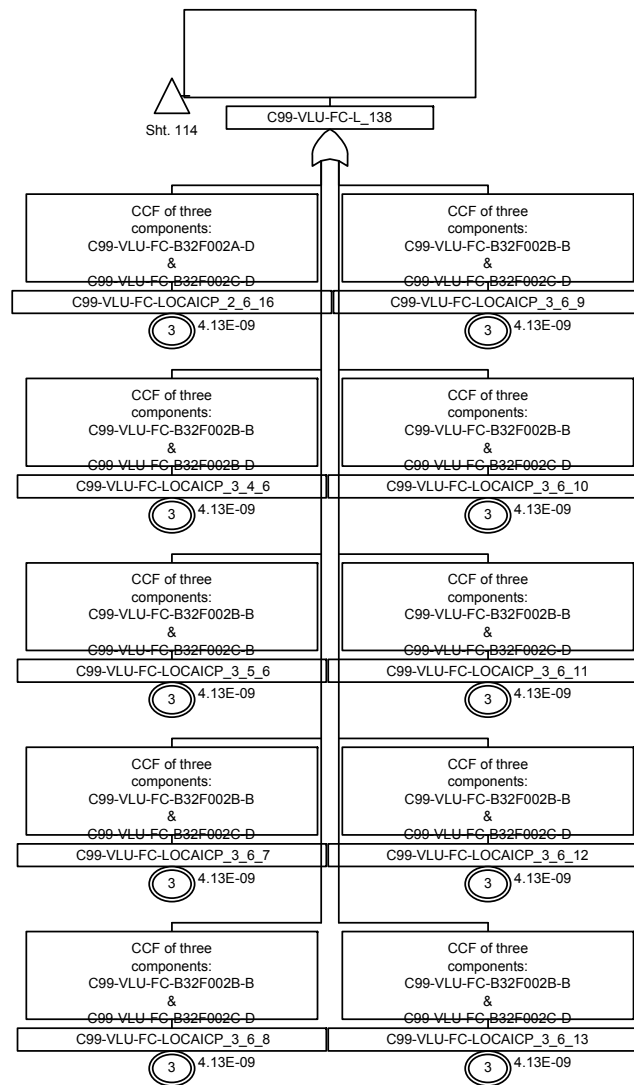


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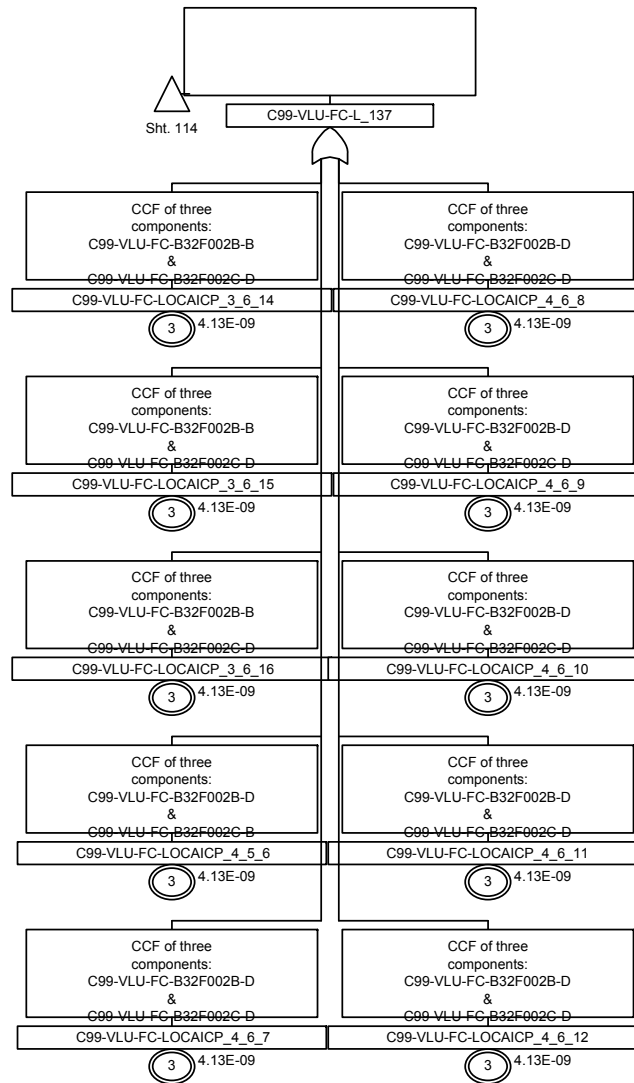


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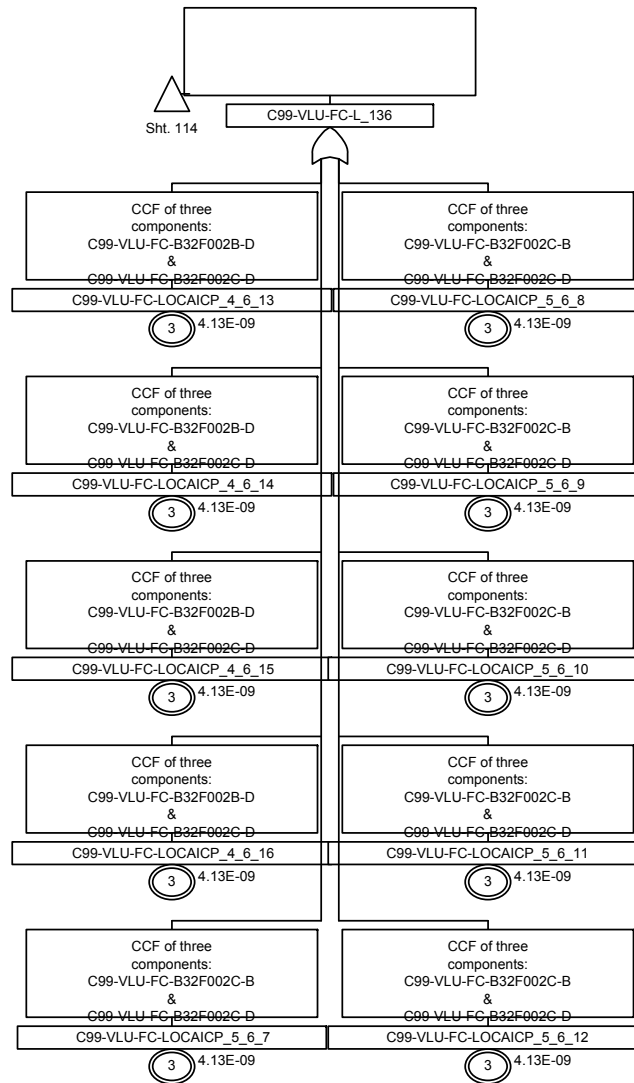


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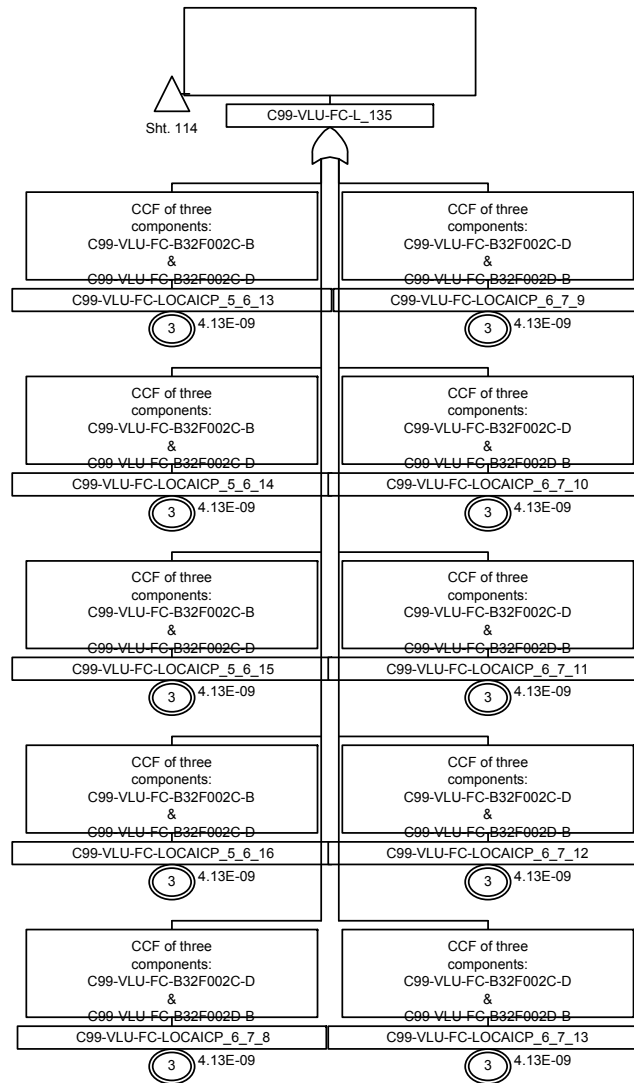


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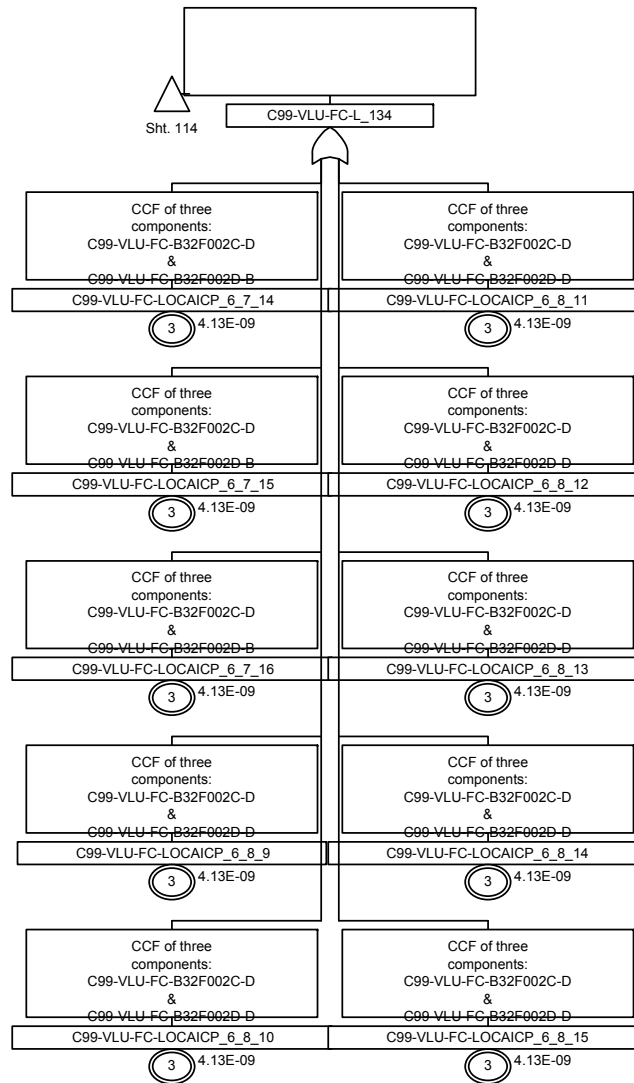


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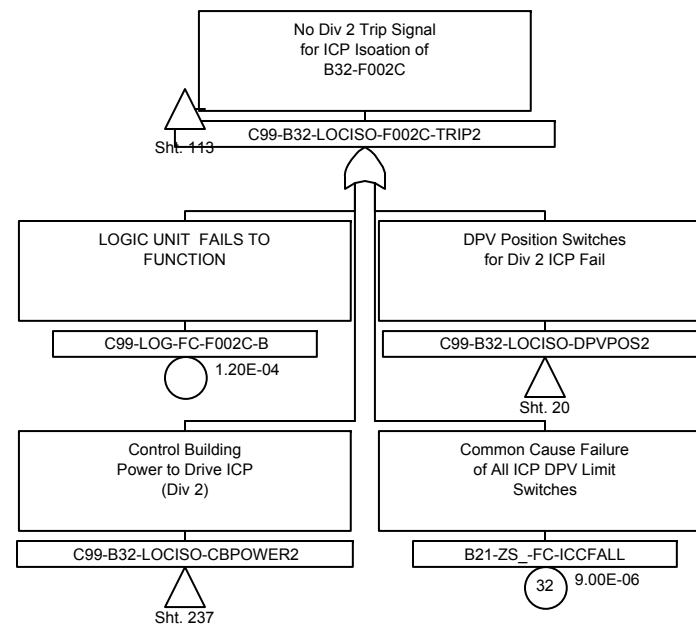


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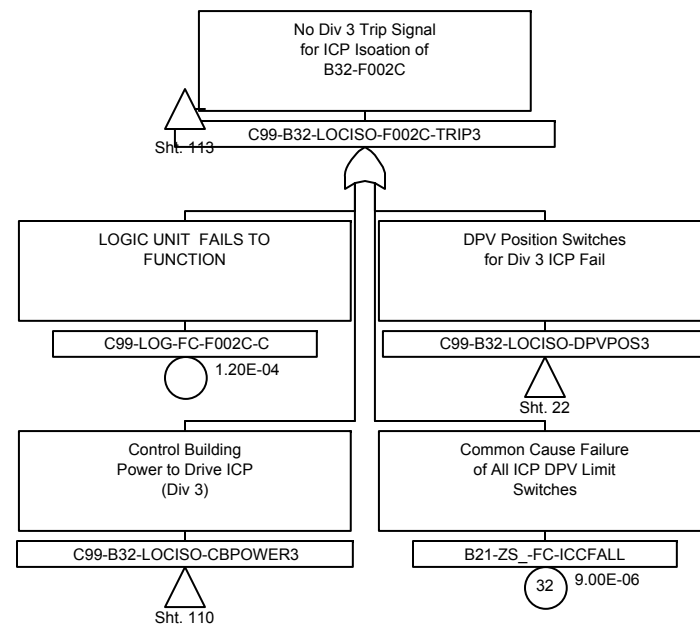


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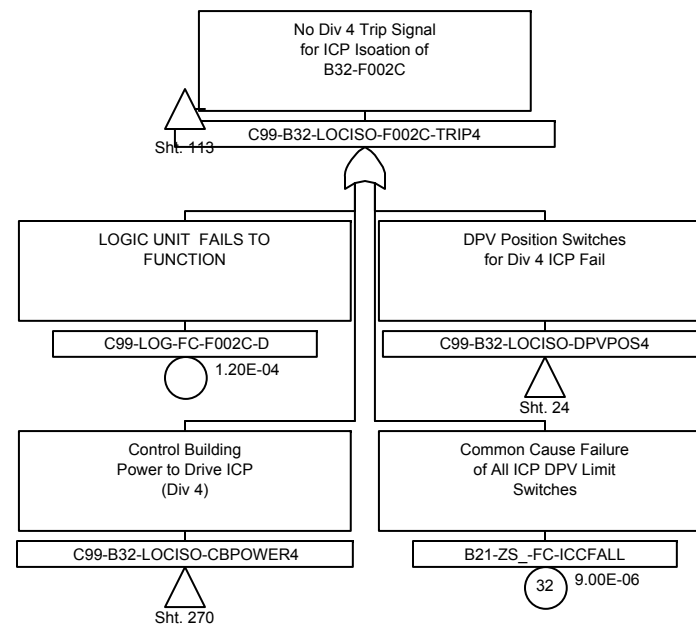


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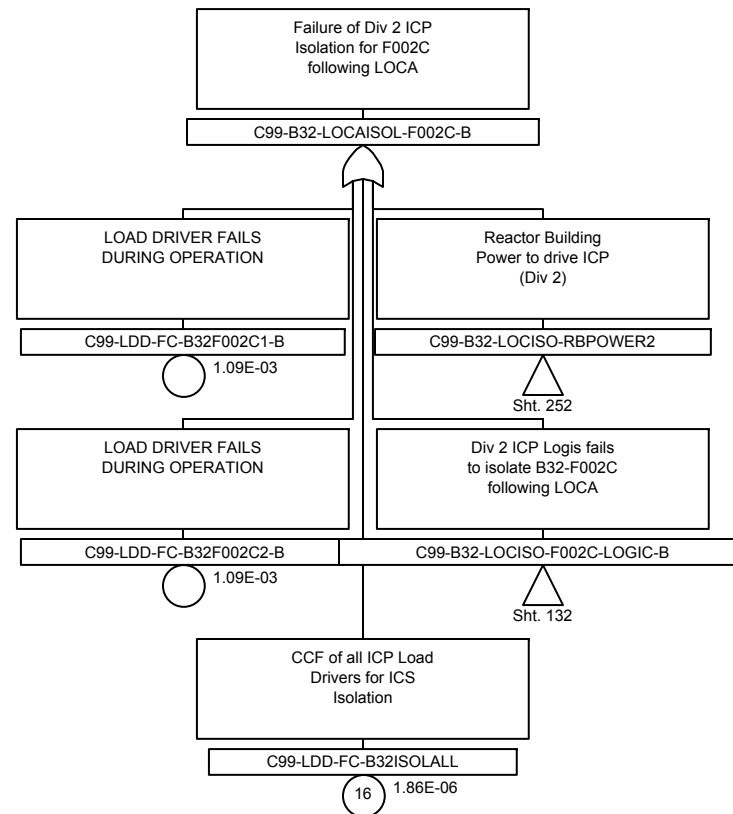


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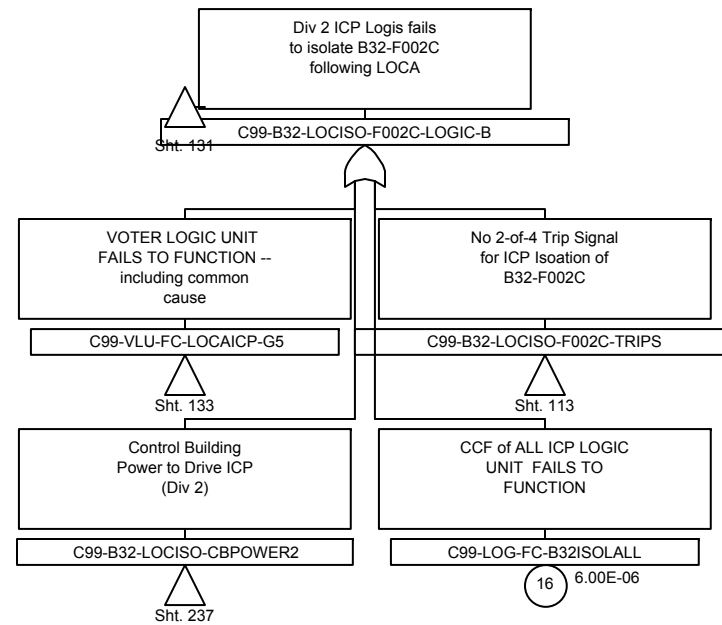


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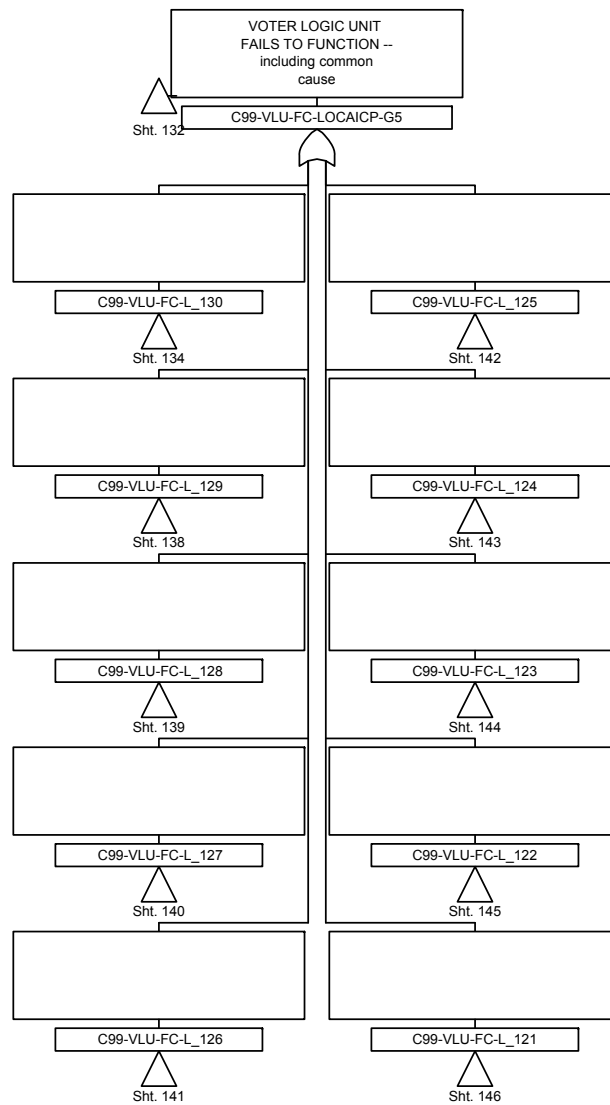


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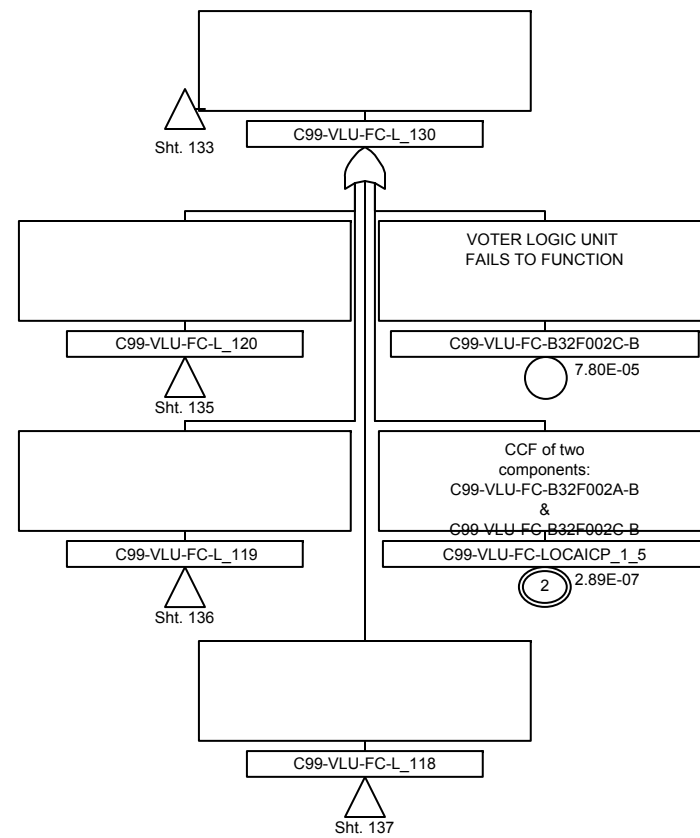


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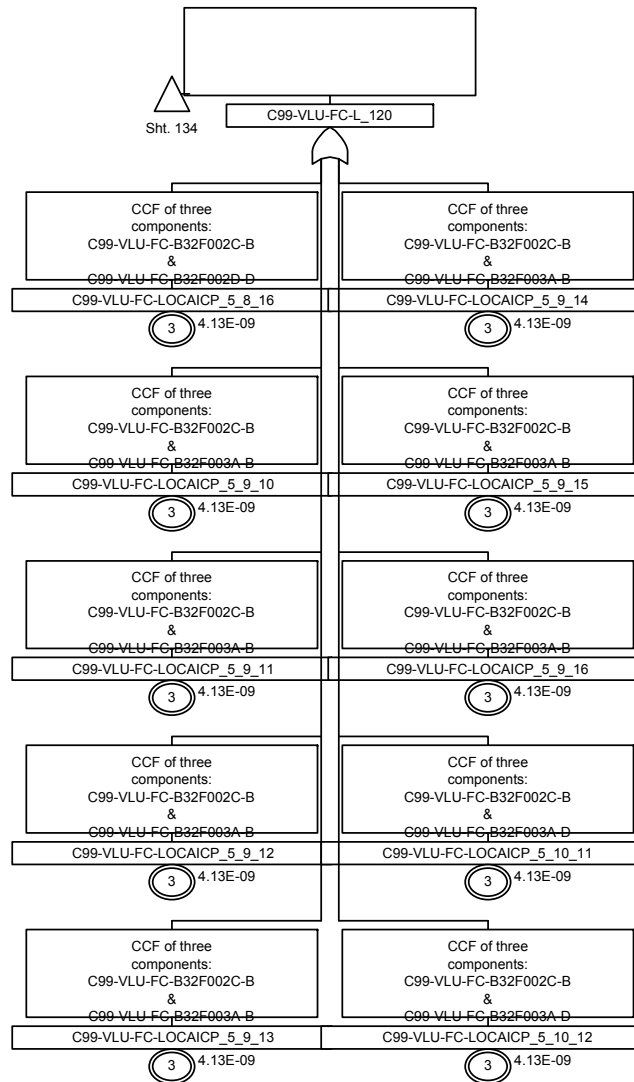


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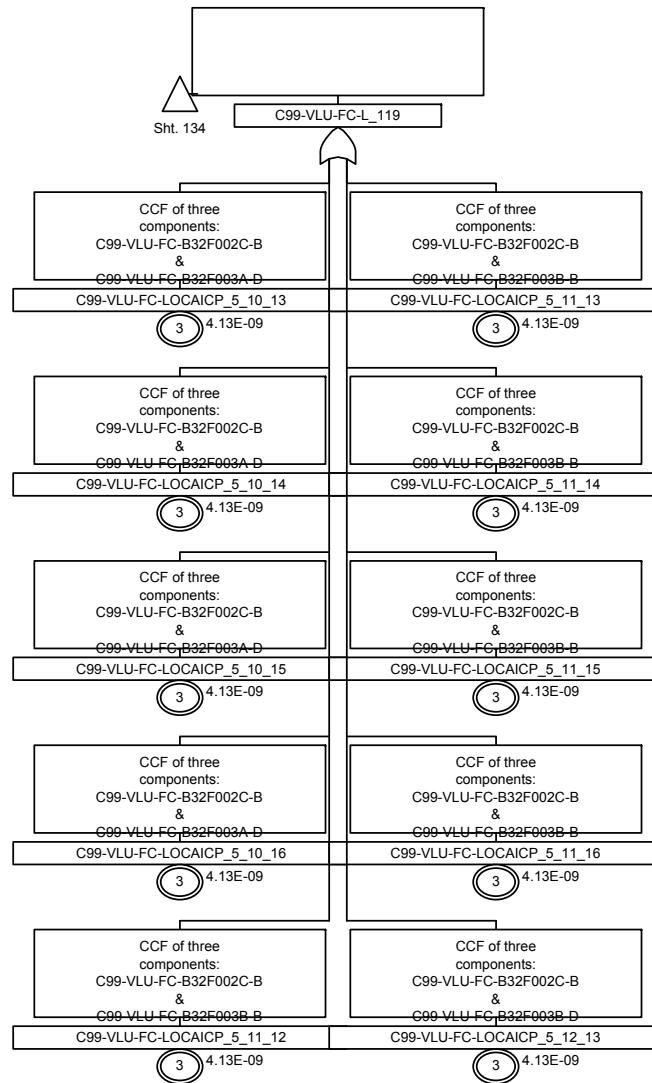


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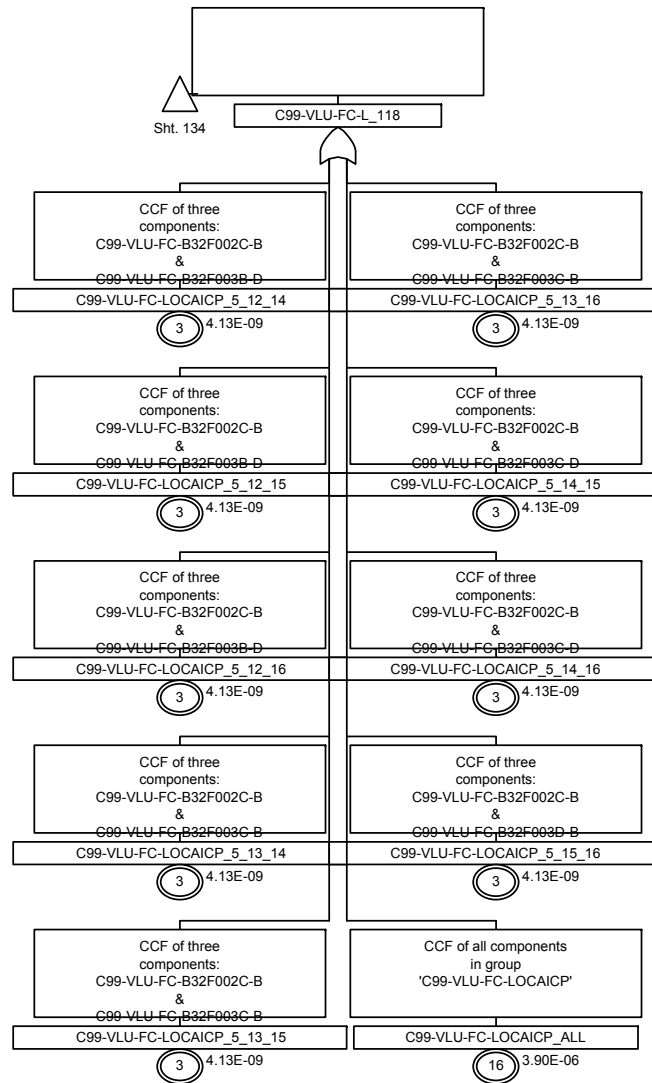


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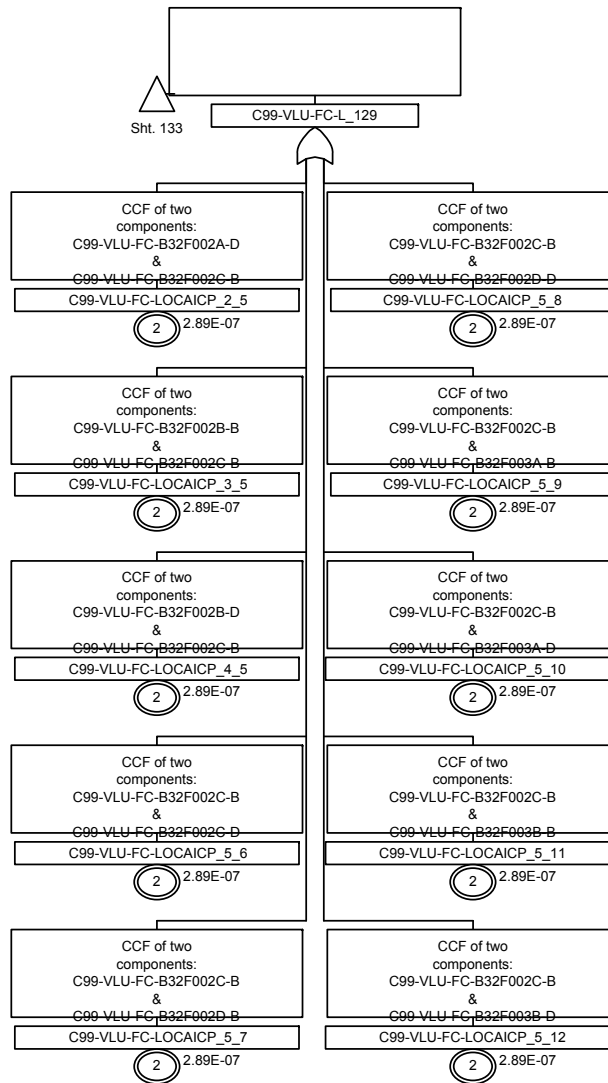


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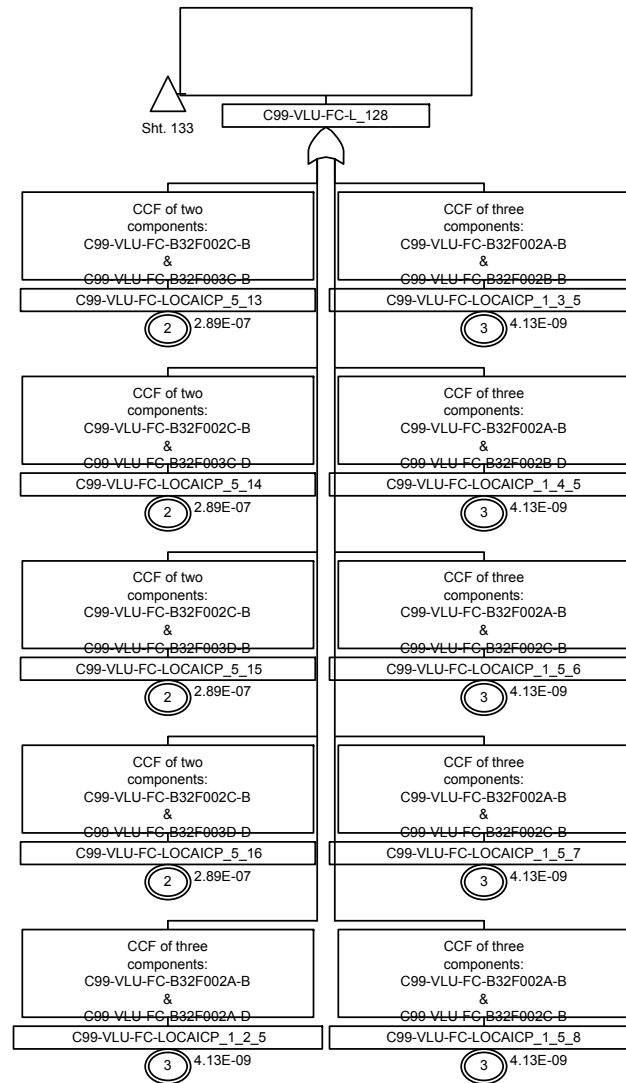


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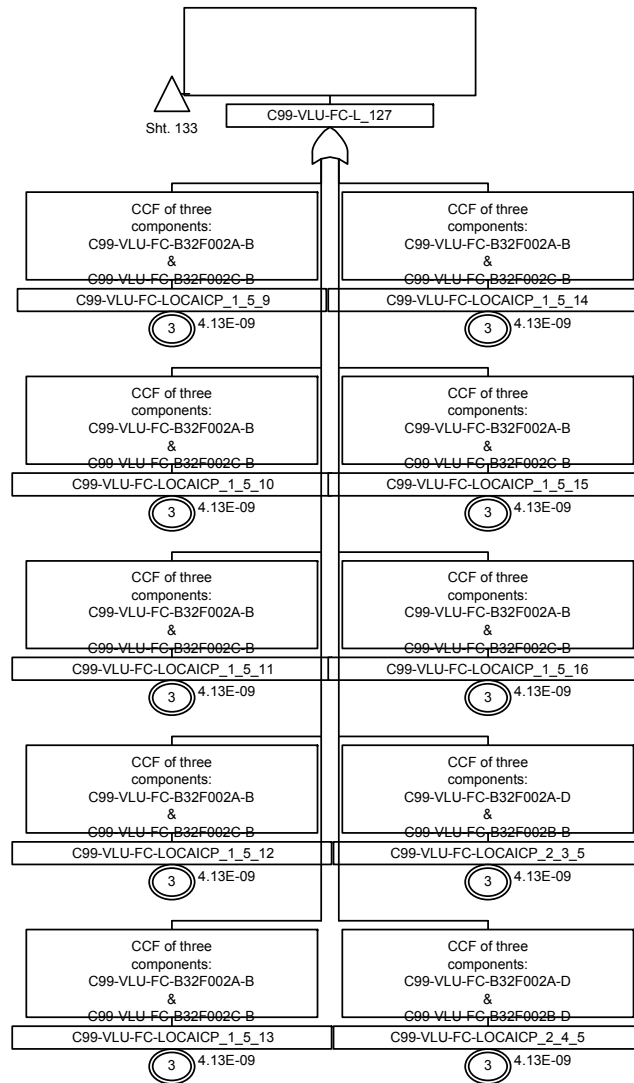


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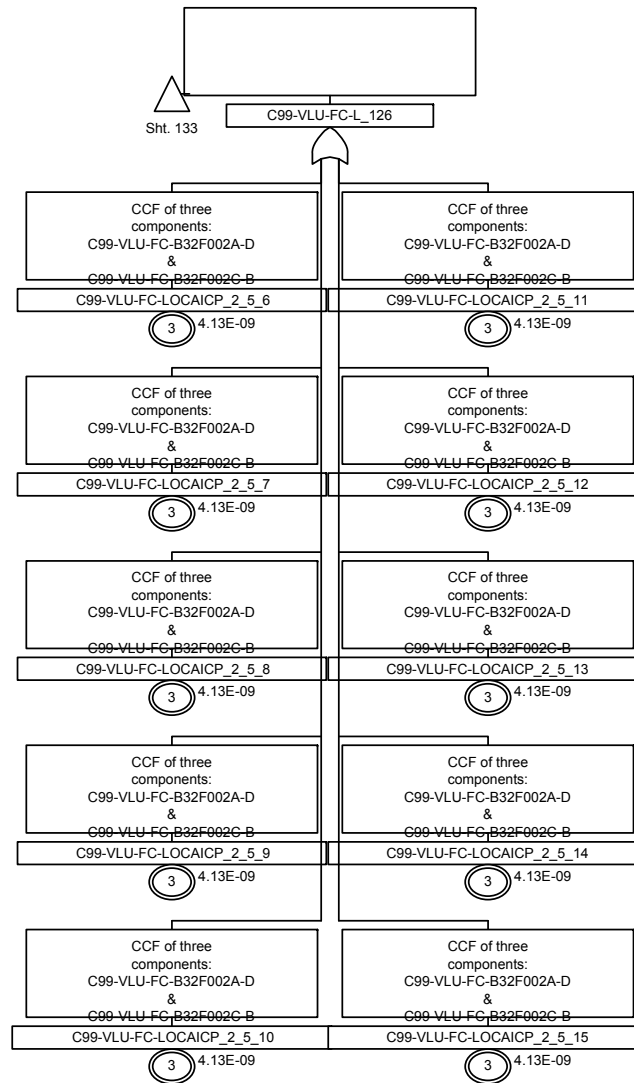


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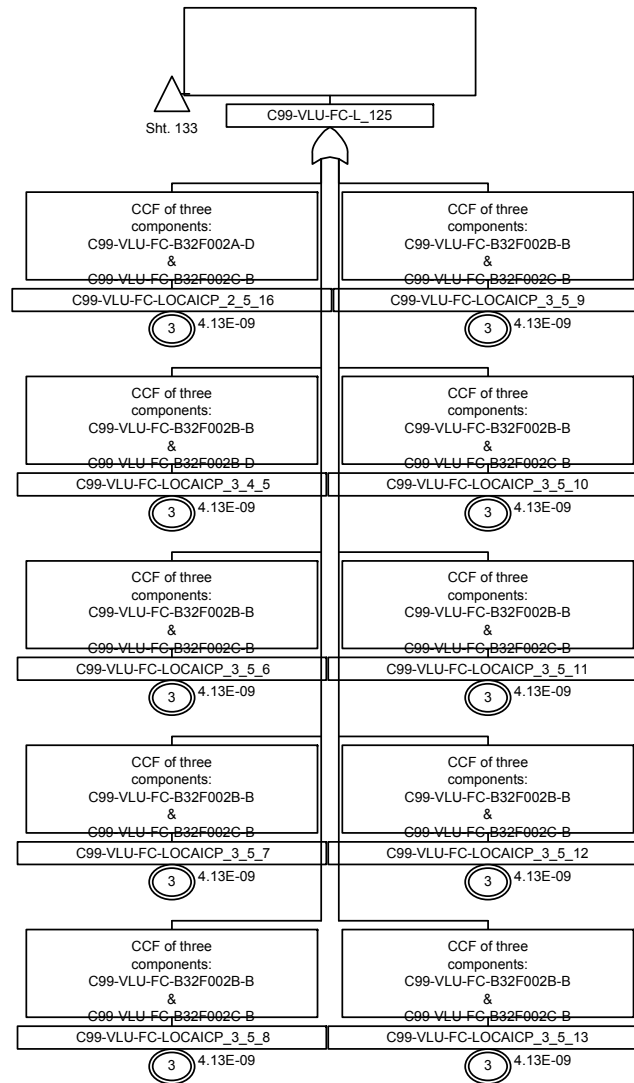


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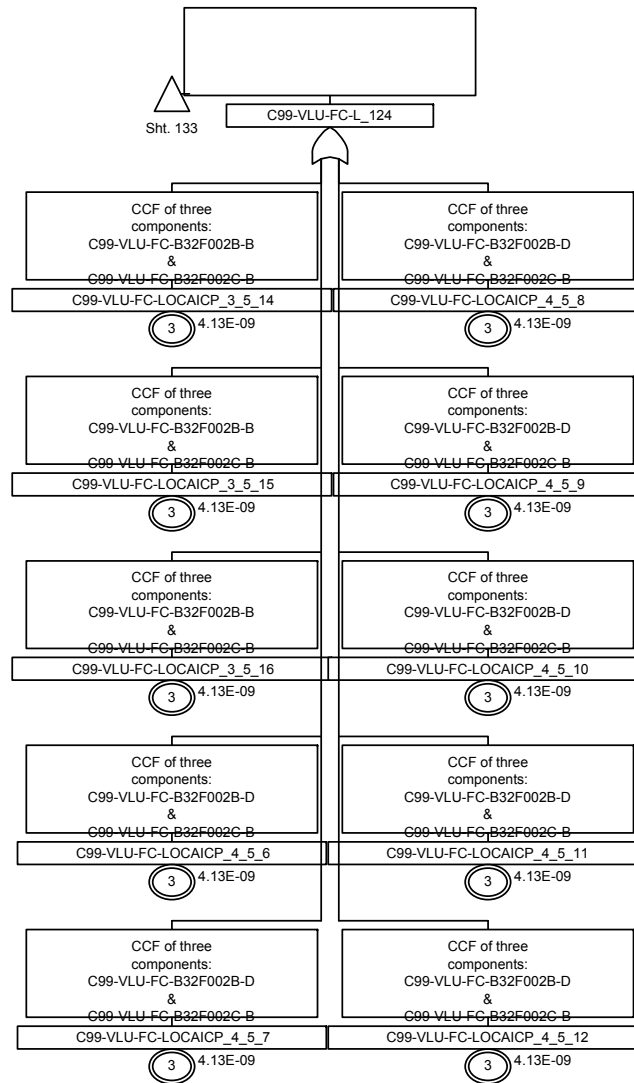


Figure 4.5-3e. Sheet 143 Independent Control Platforms

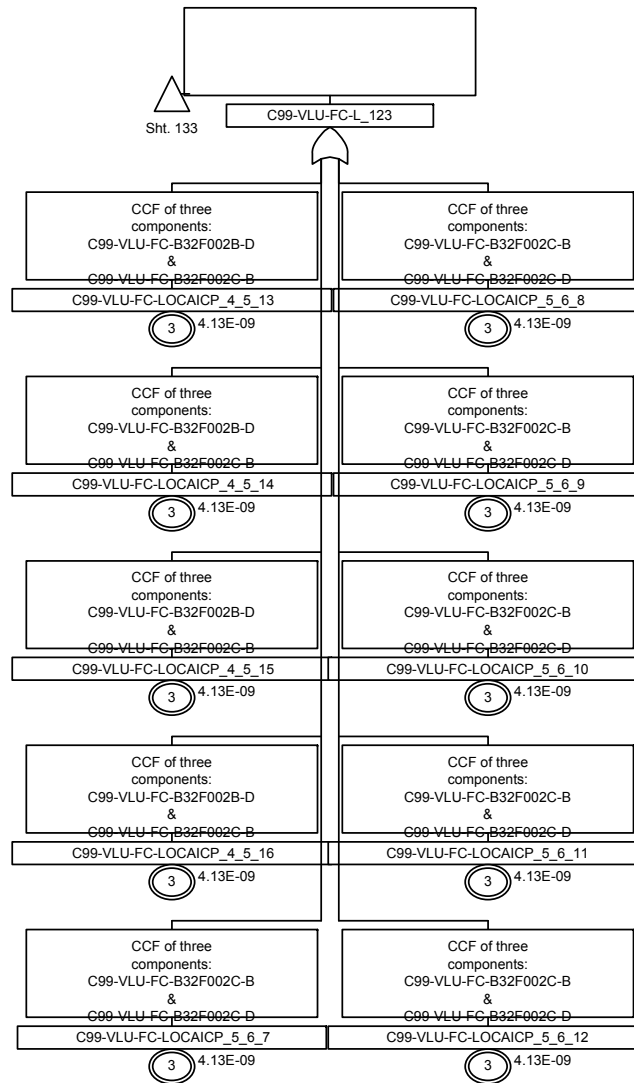


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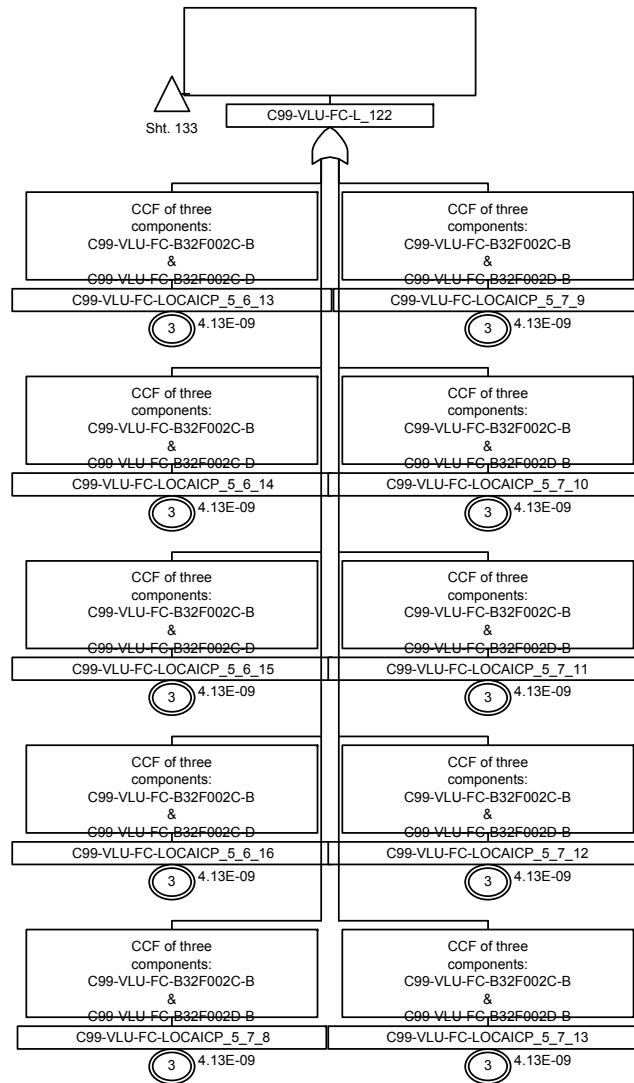


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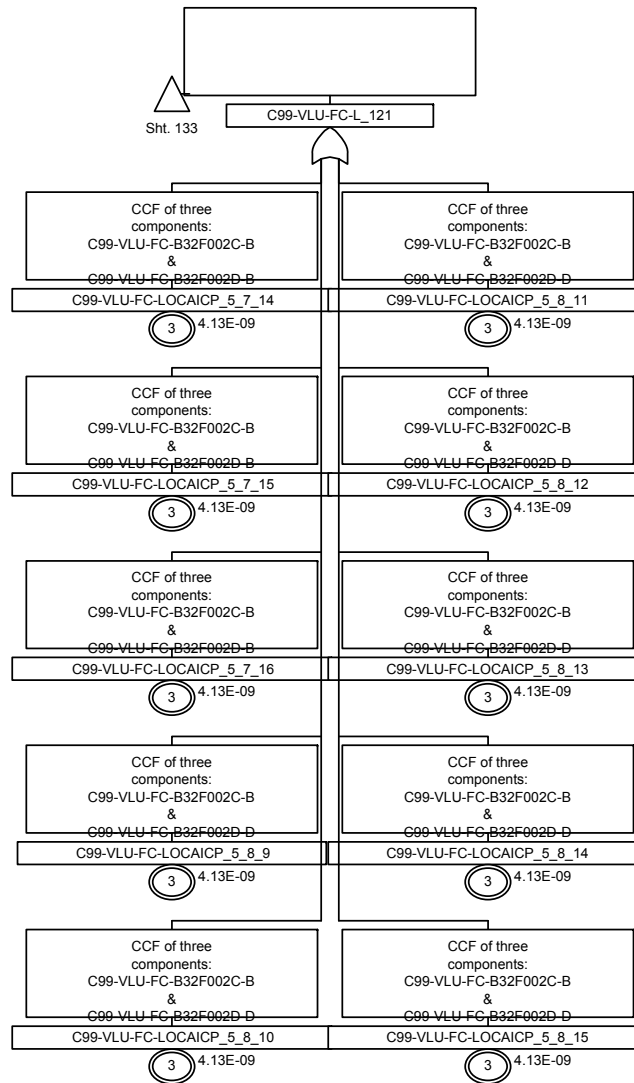


Figure 4.5-3e. Sheet 146 Independent Control Platforms



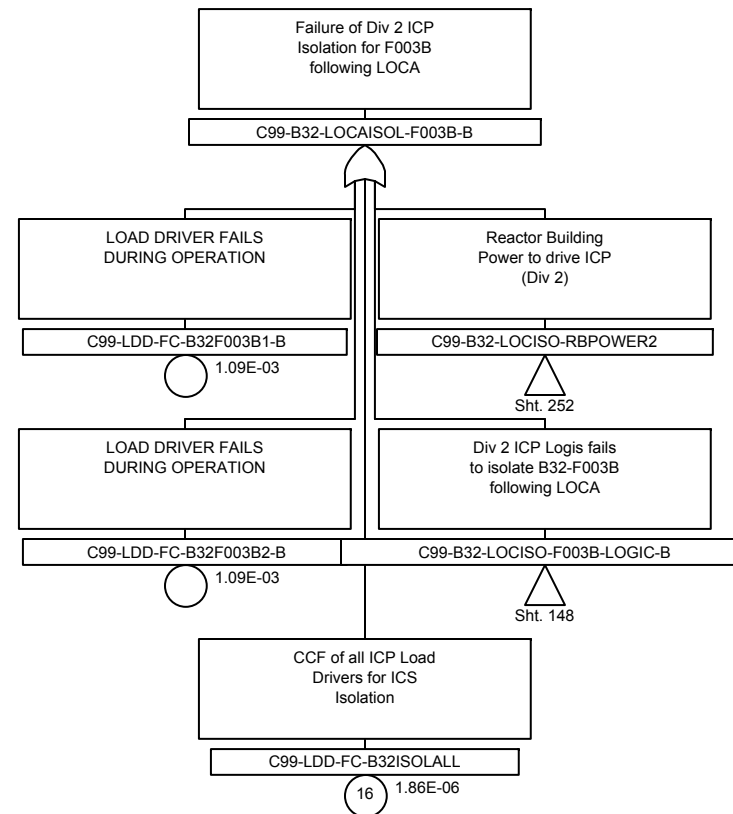


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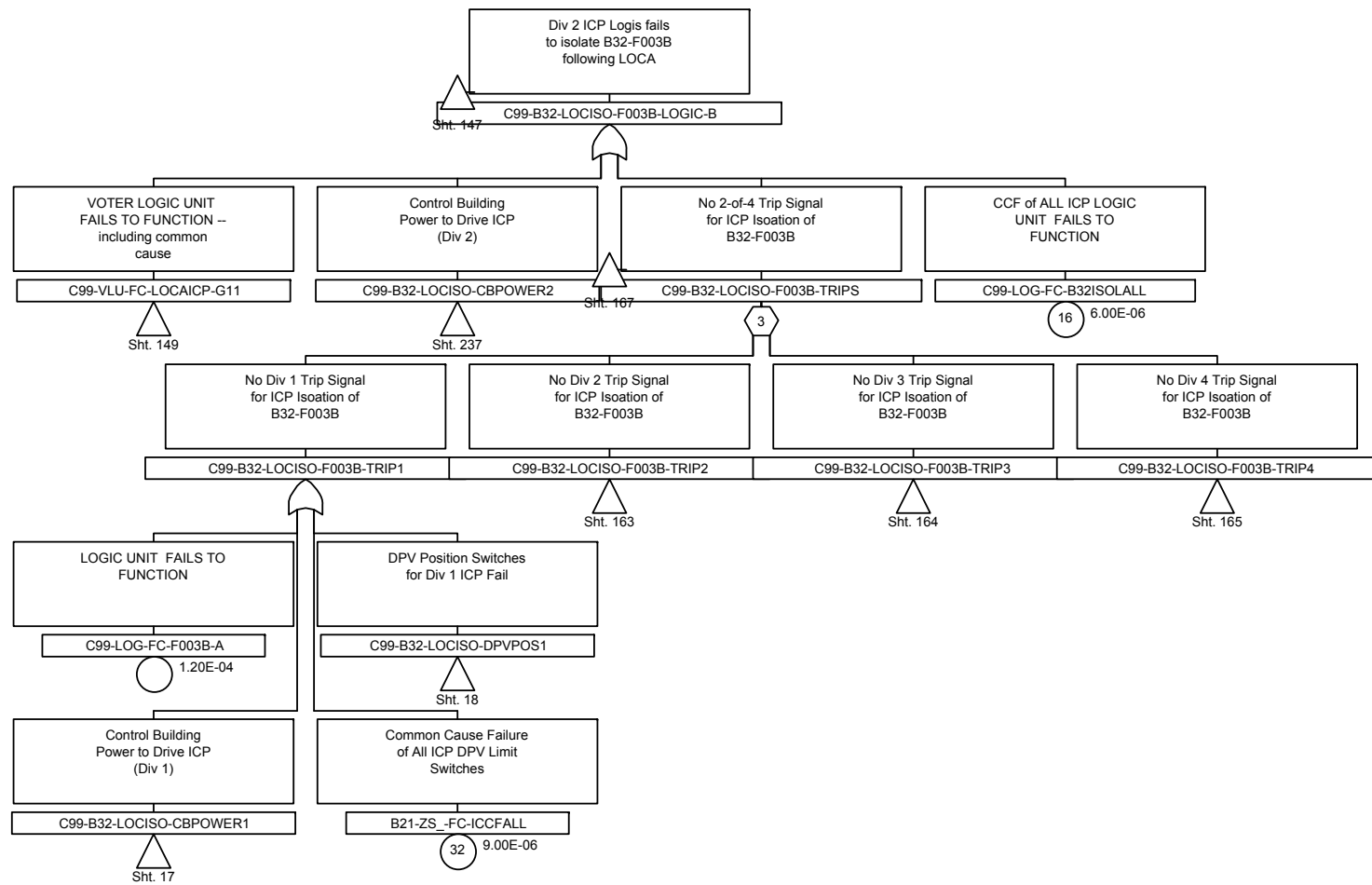


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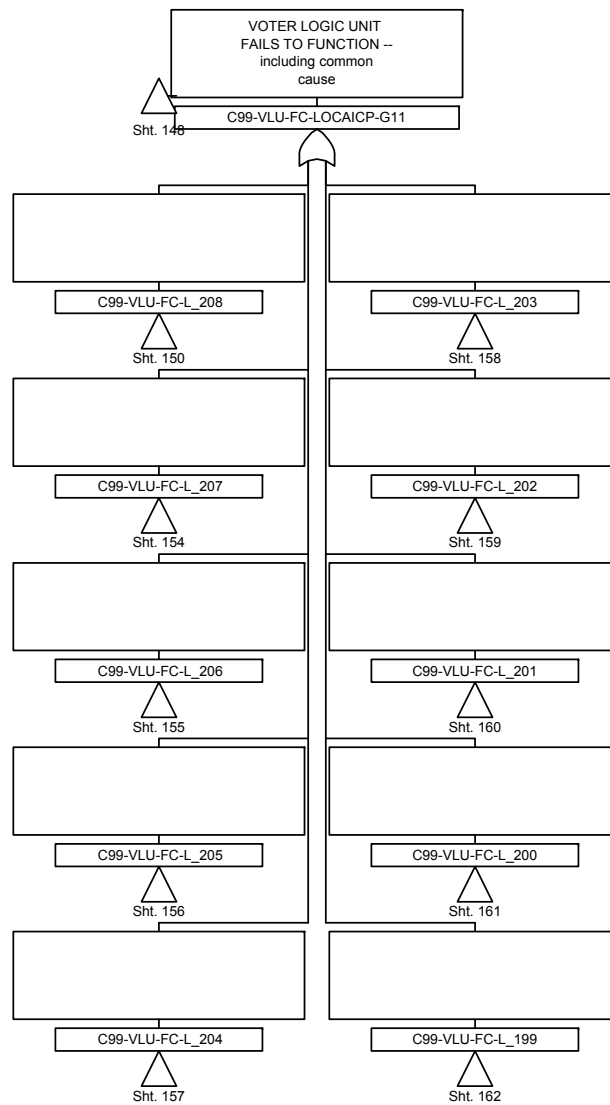


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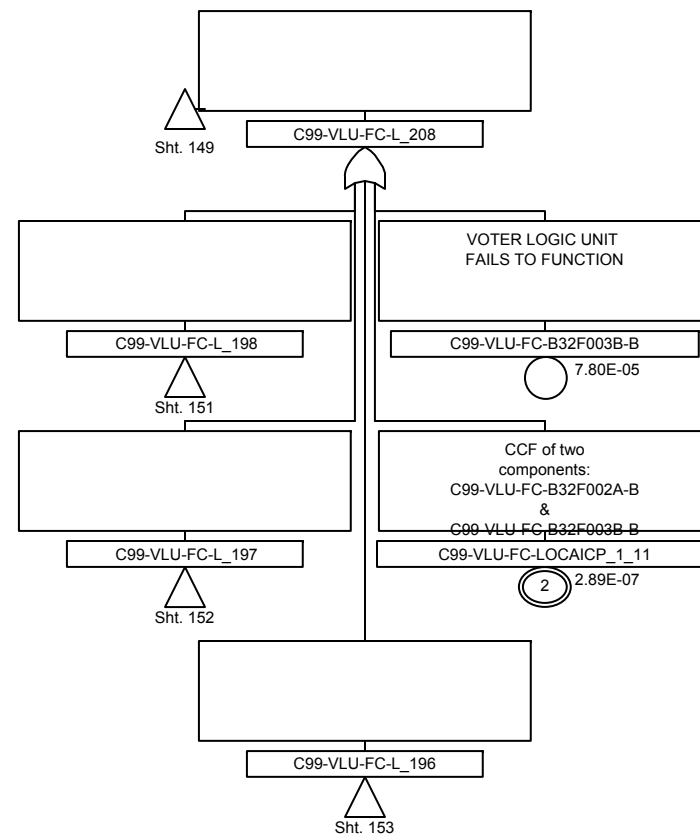


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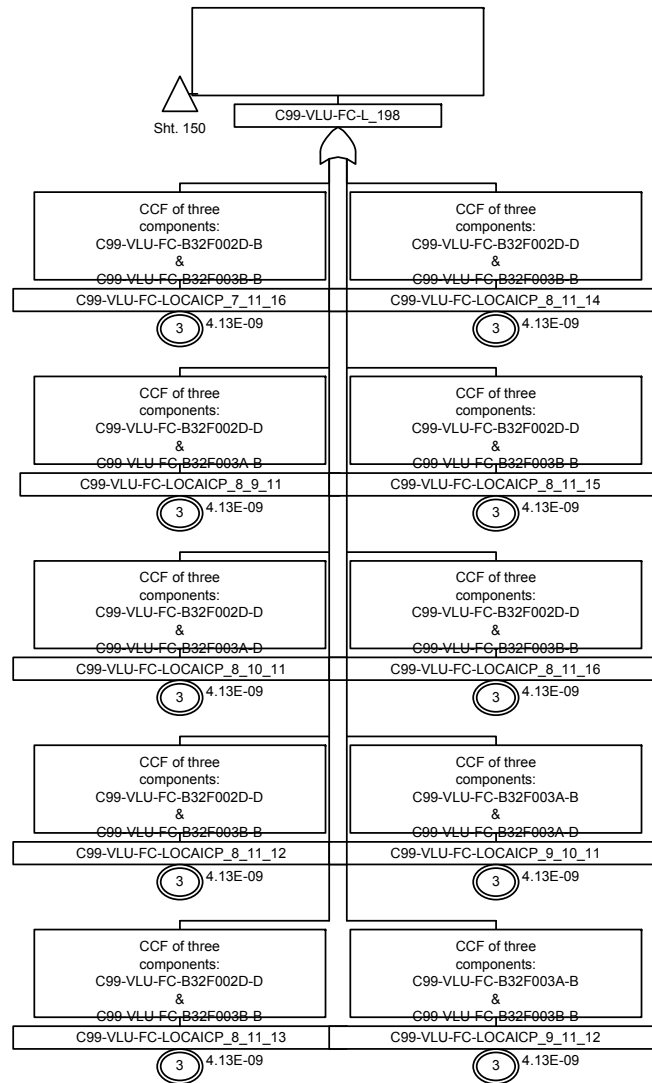


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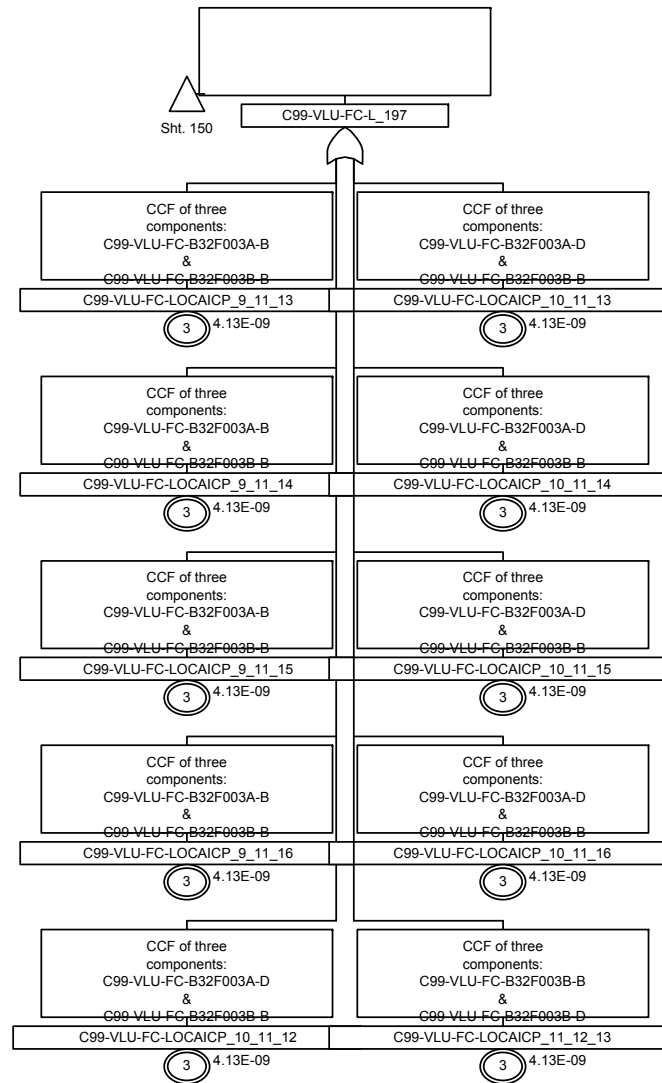


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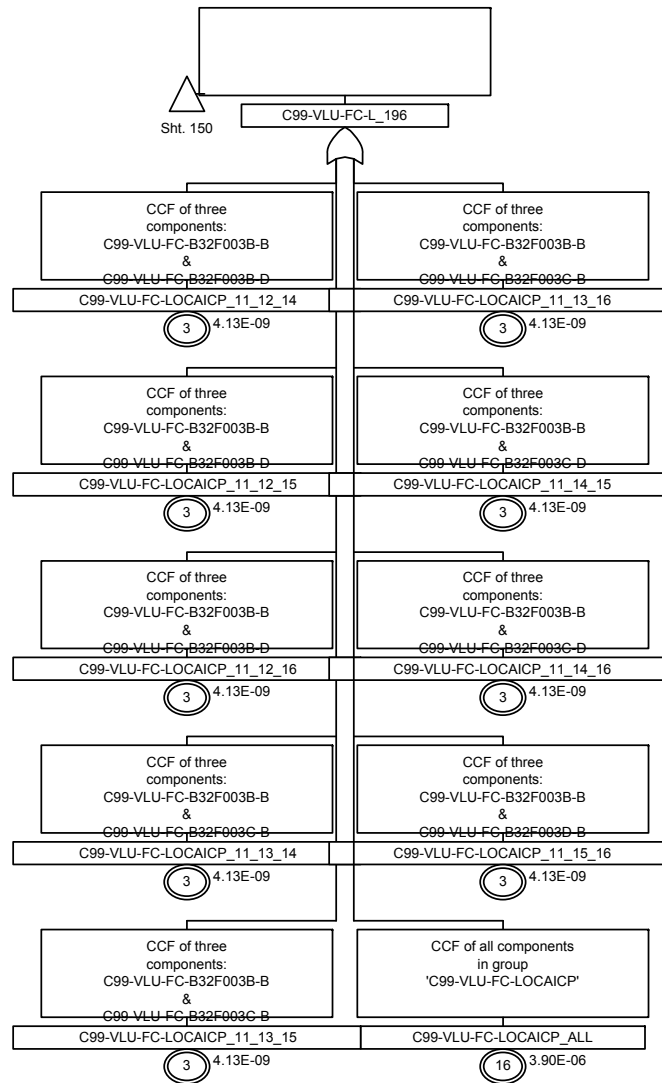


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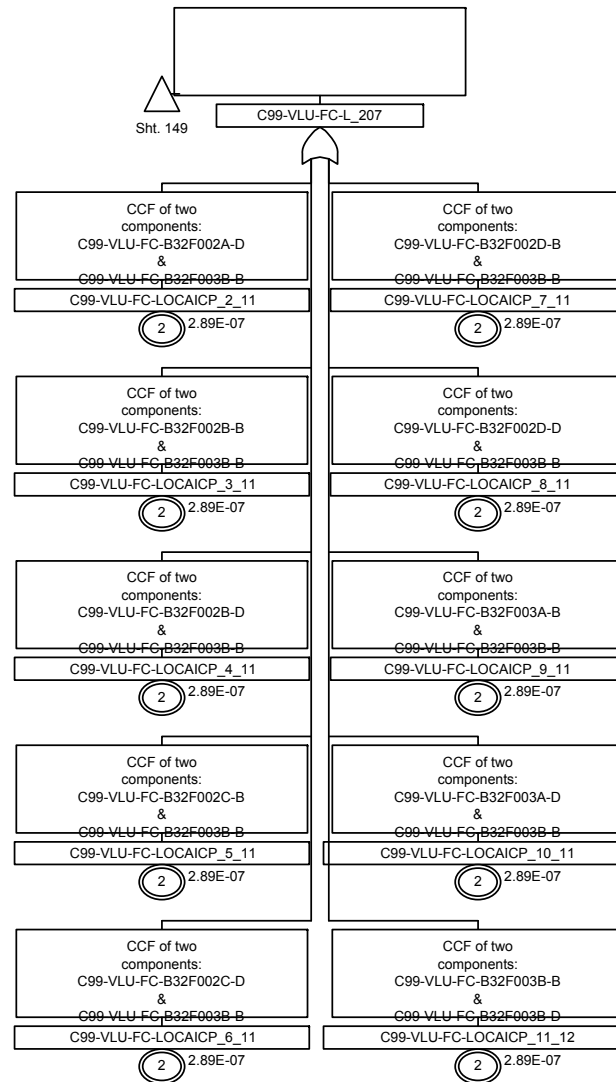


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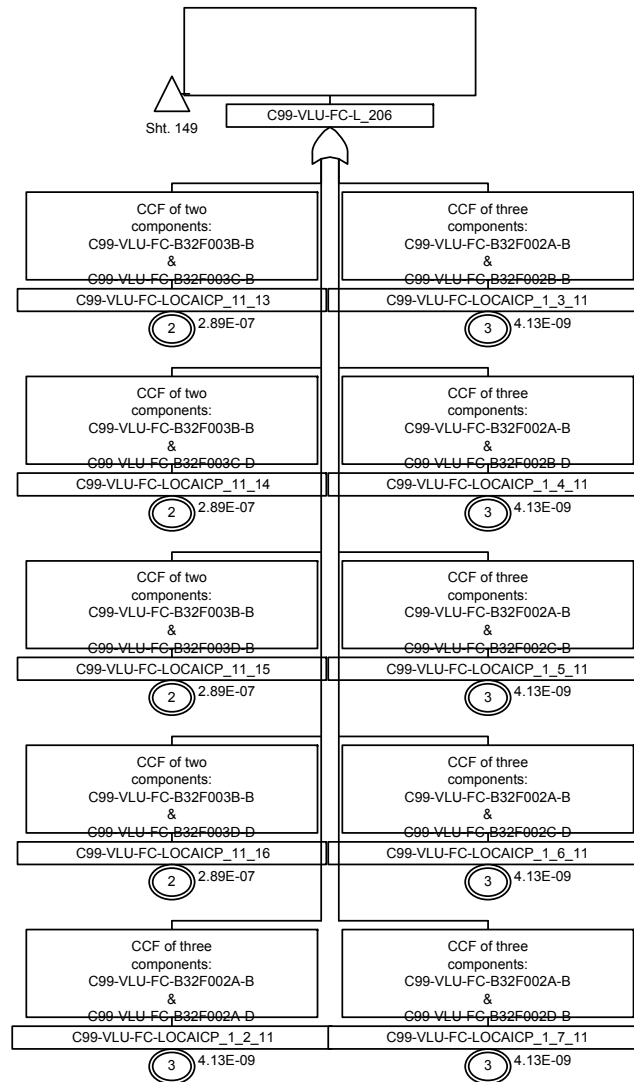


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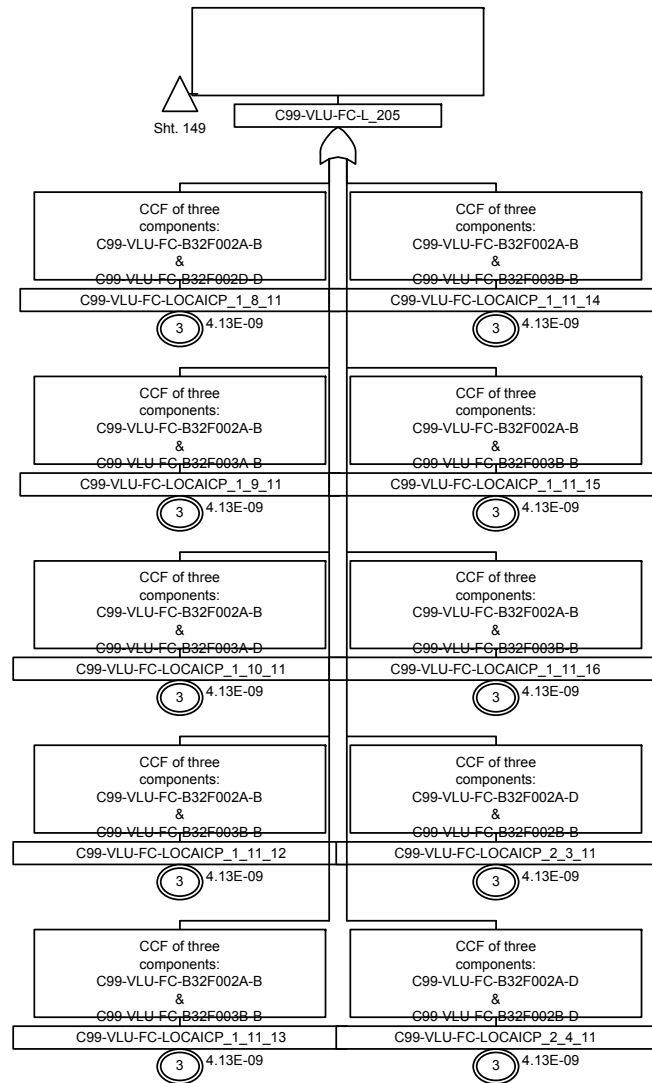


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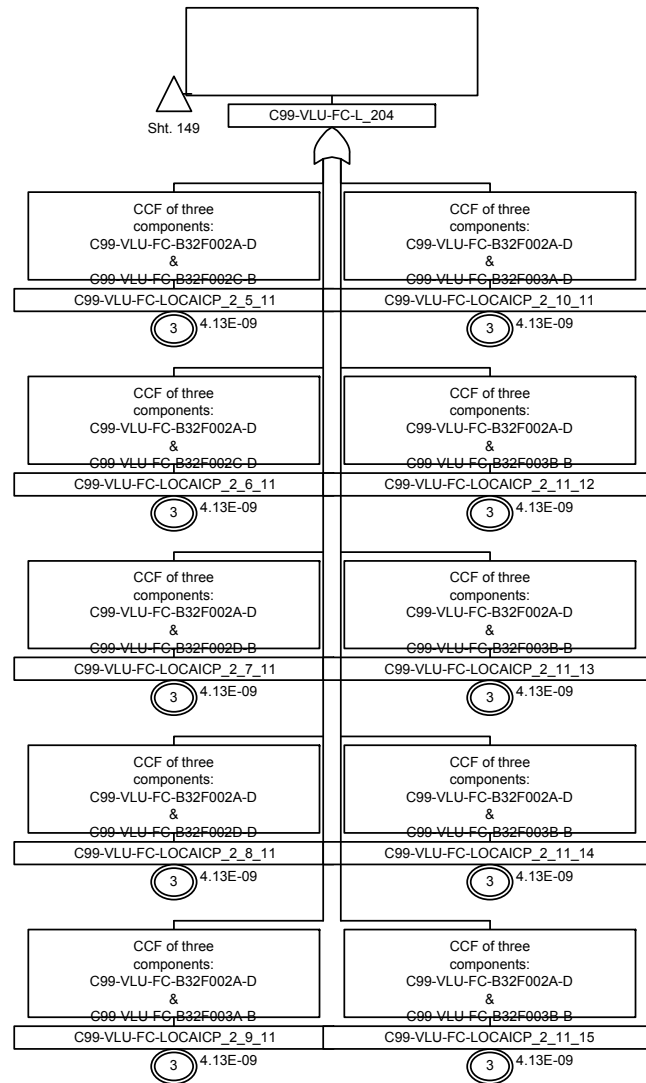


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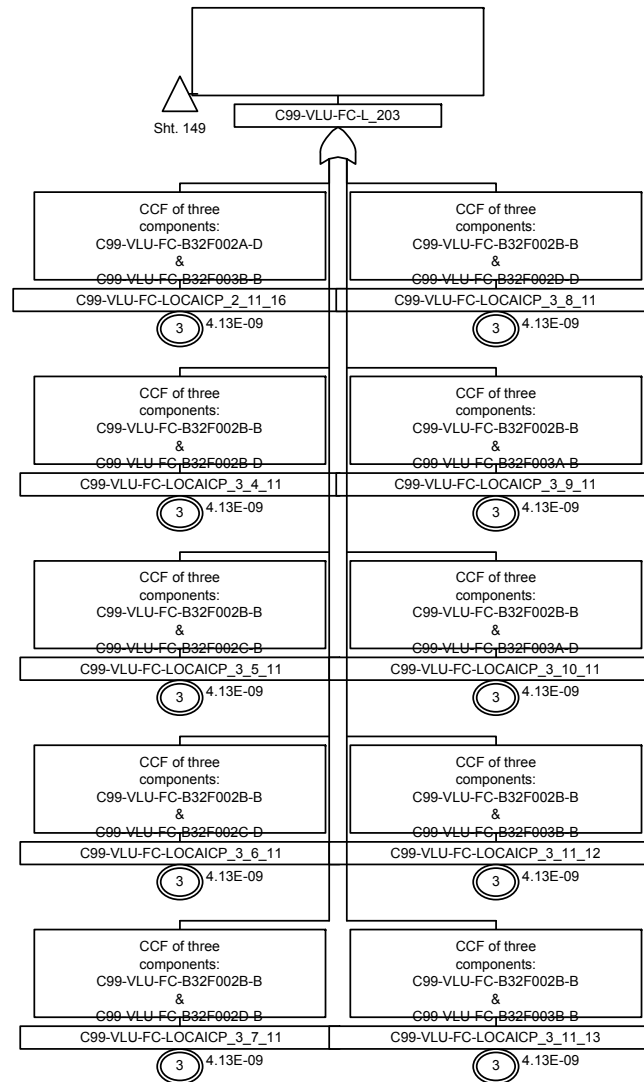


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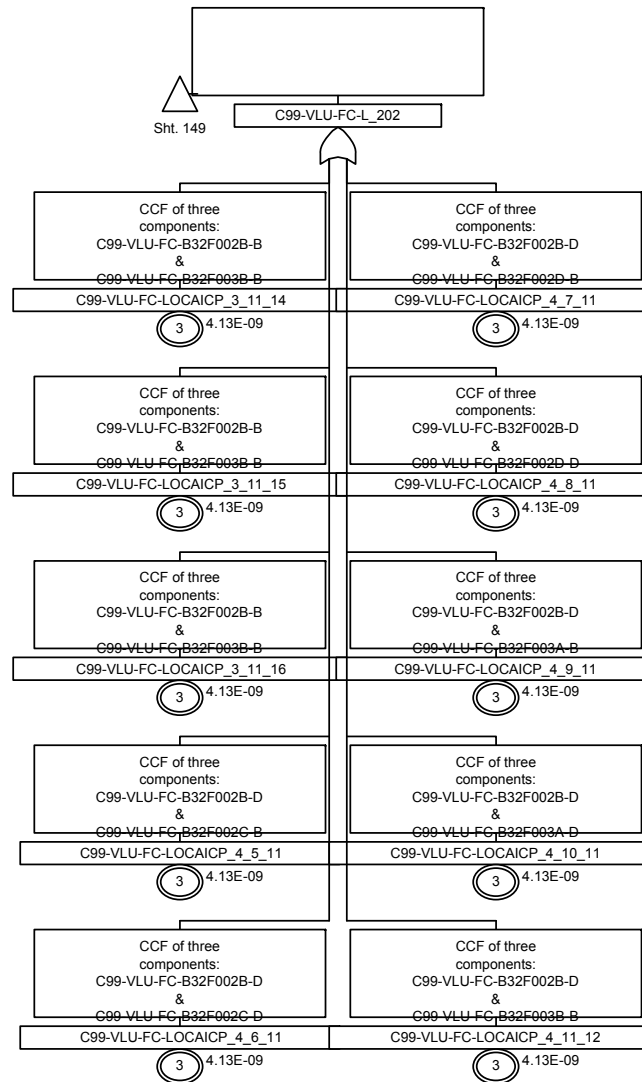


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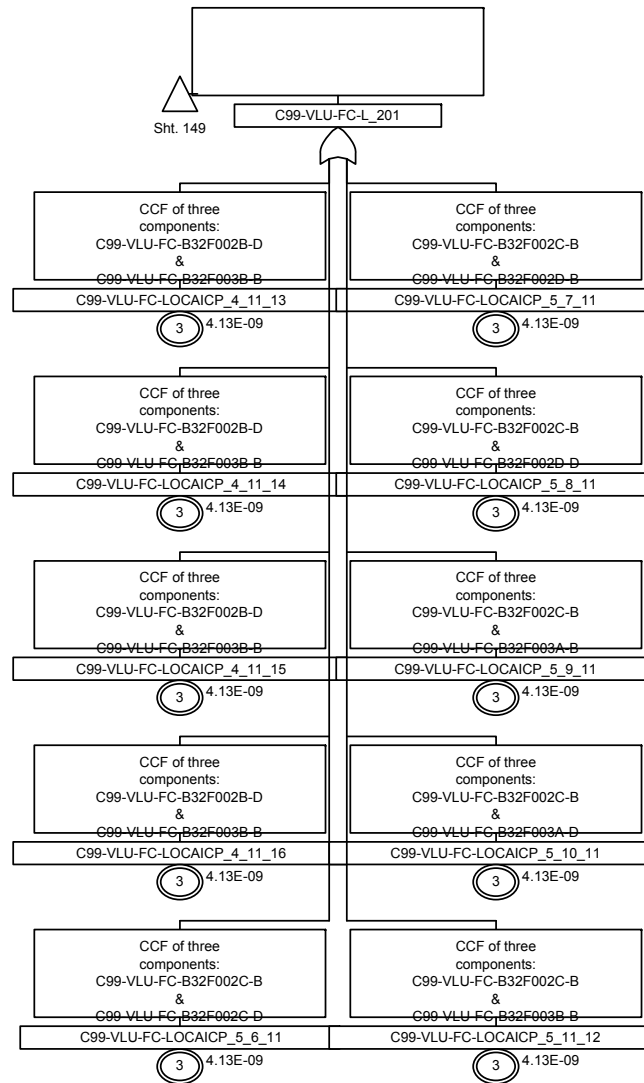


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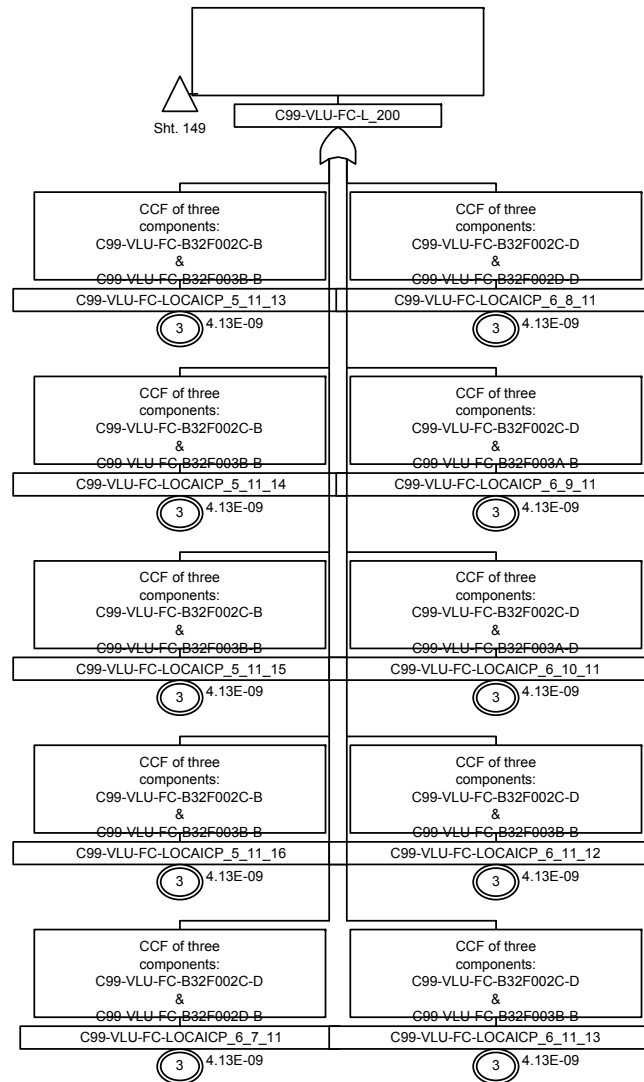


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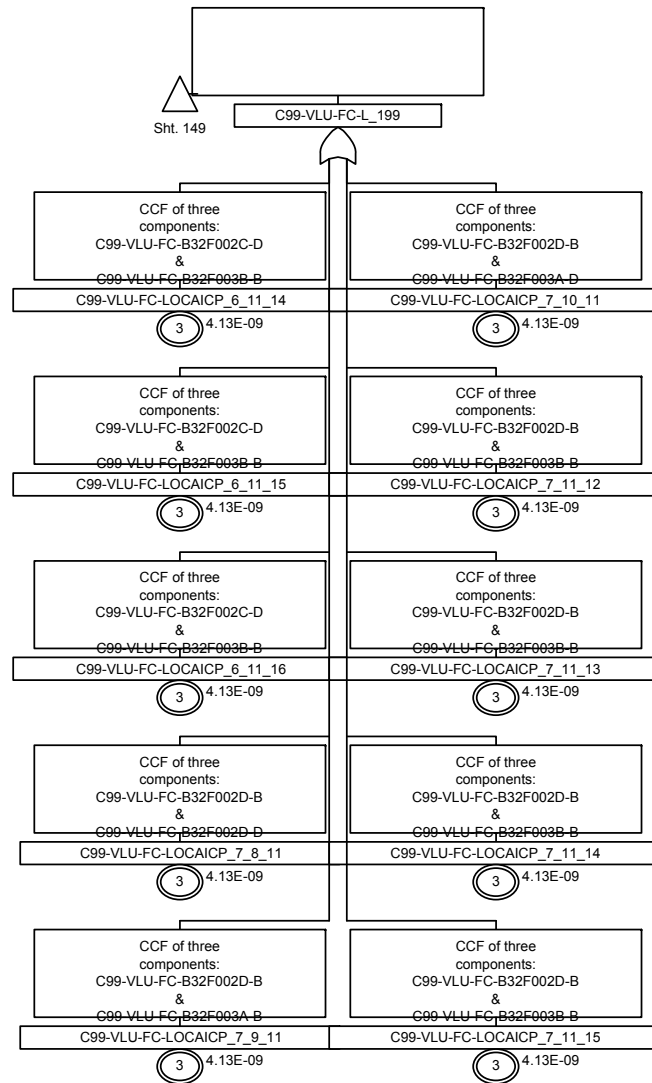


Figure 4.5-3e. Sheet 162 Independent Control Platforms



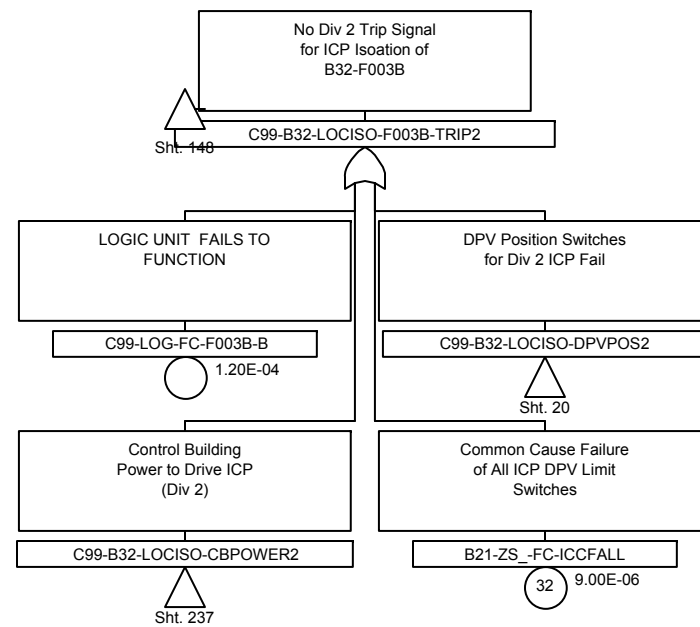


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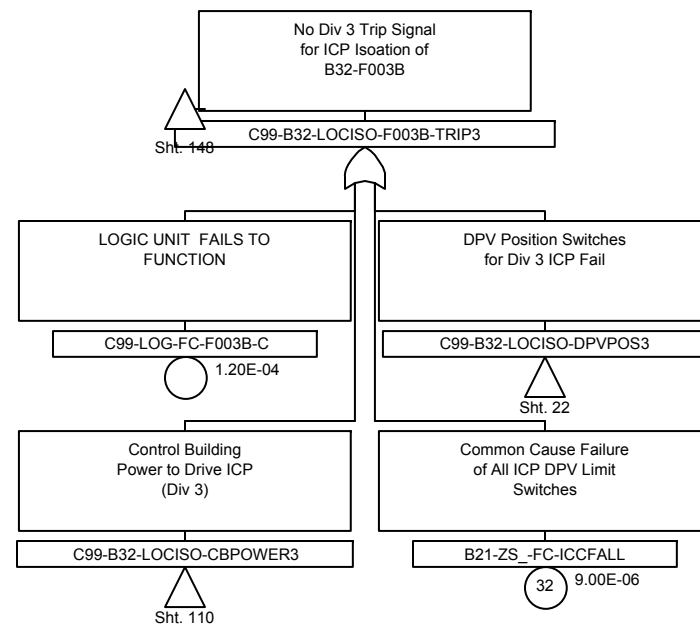


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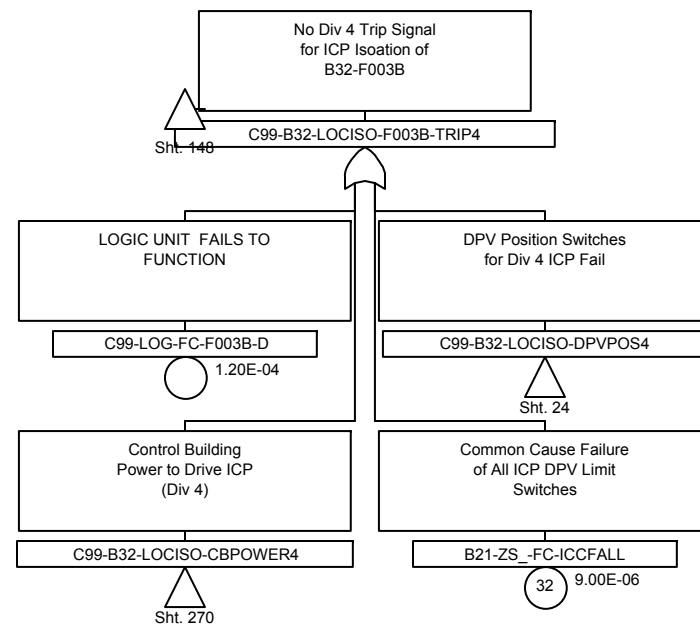


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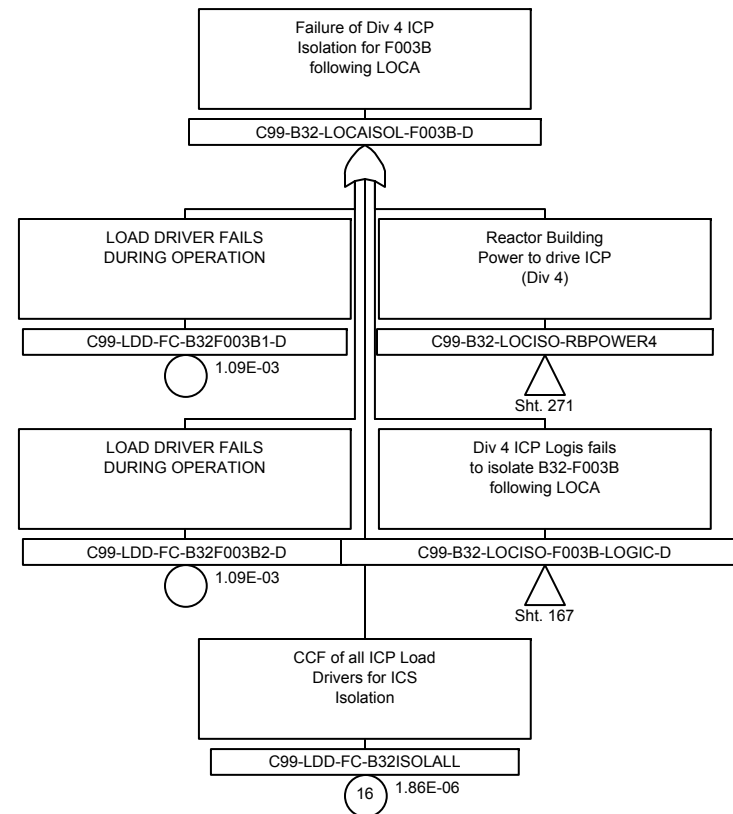


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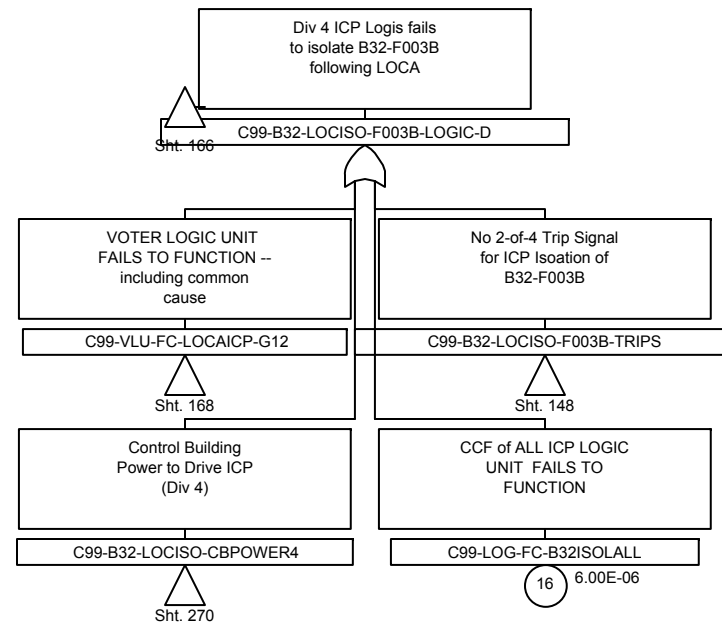


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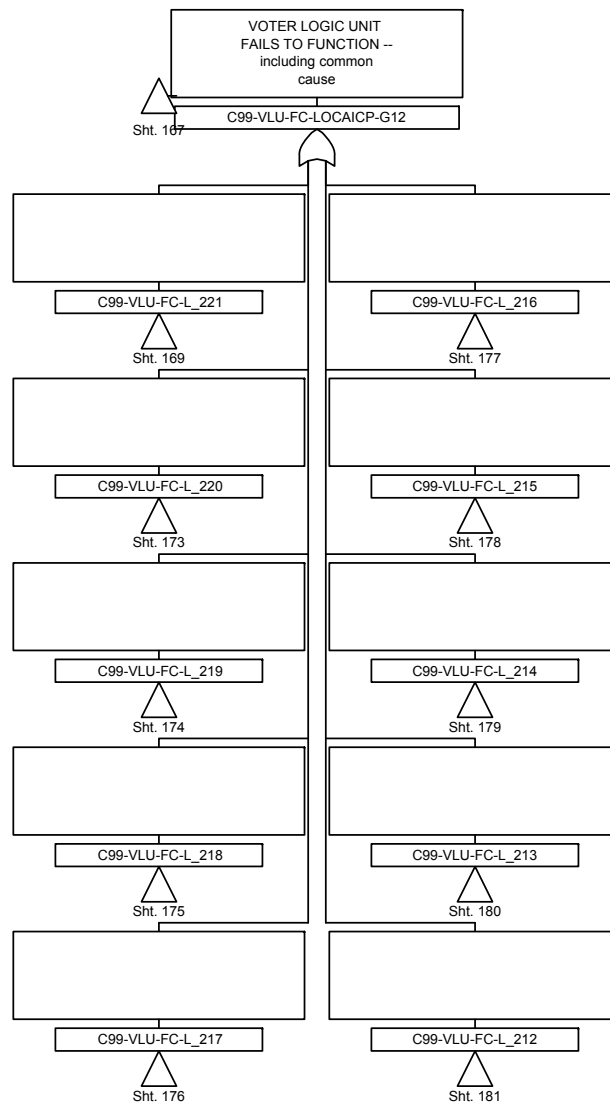


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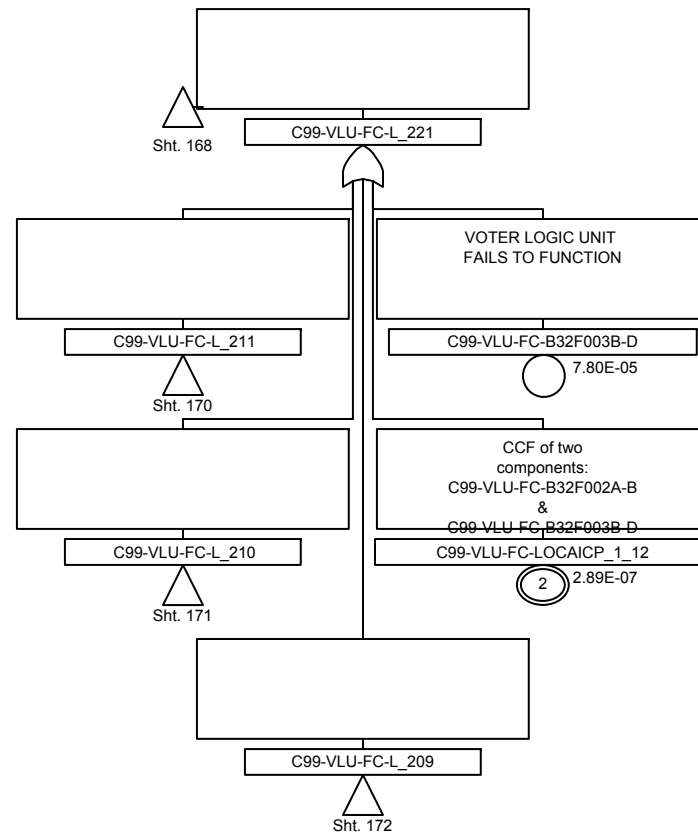


Figure 4.5-3e. Sheet 169 Independent Control Platforms

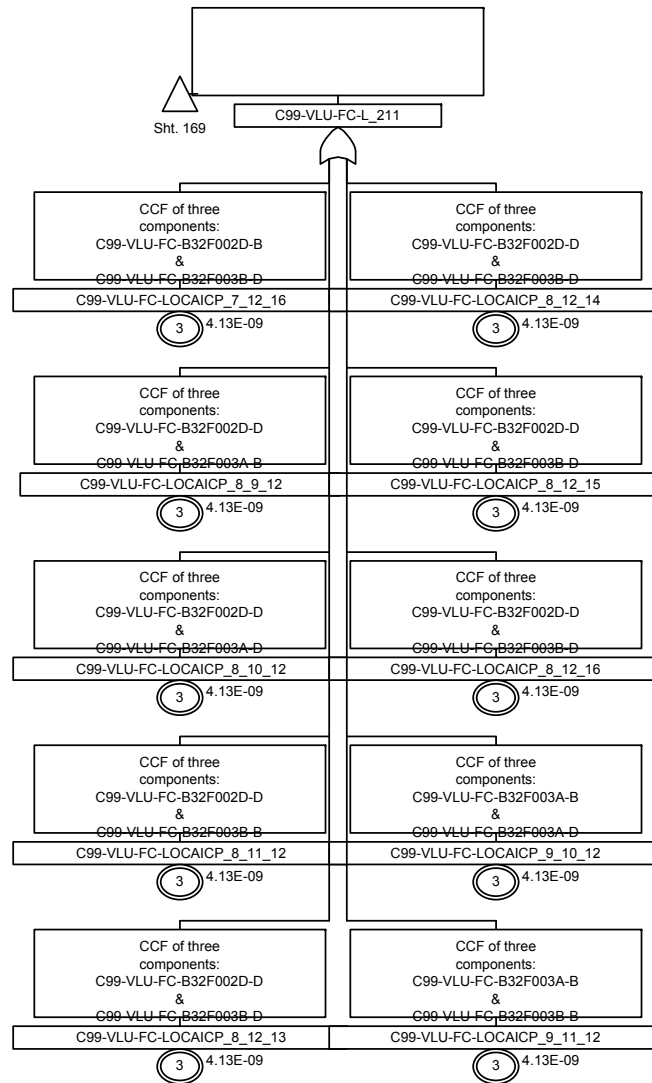


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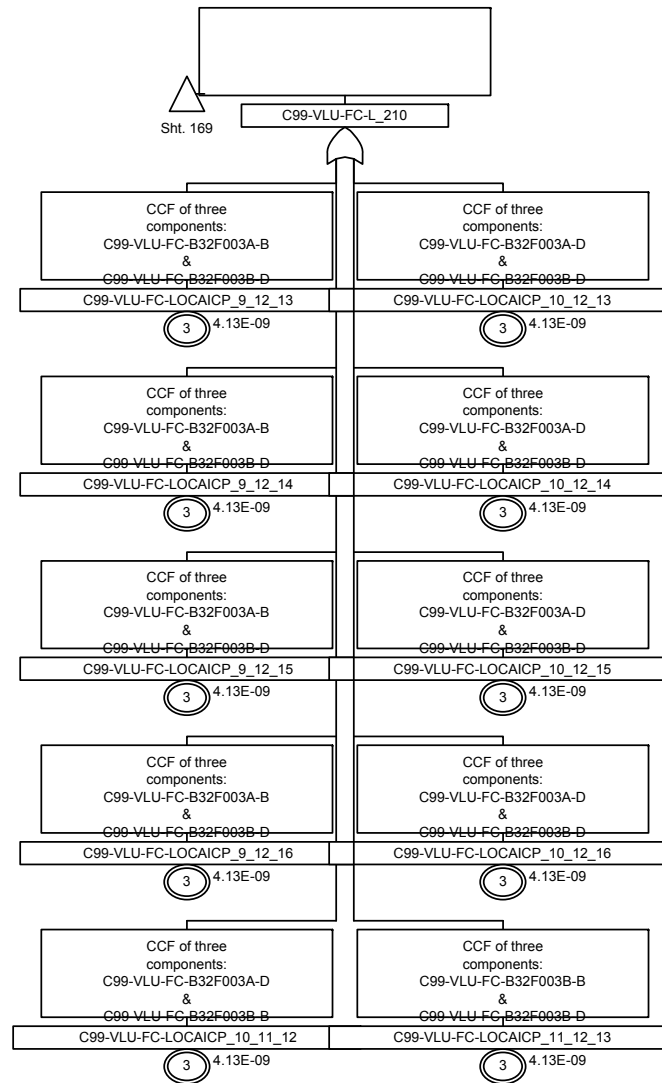


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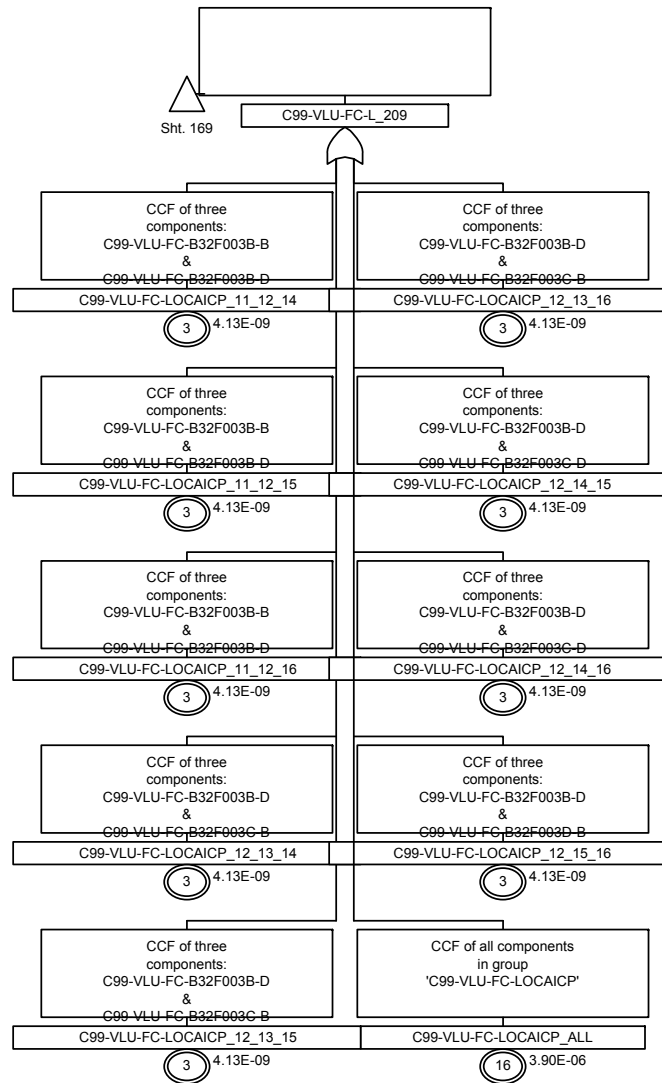


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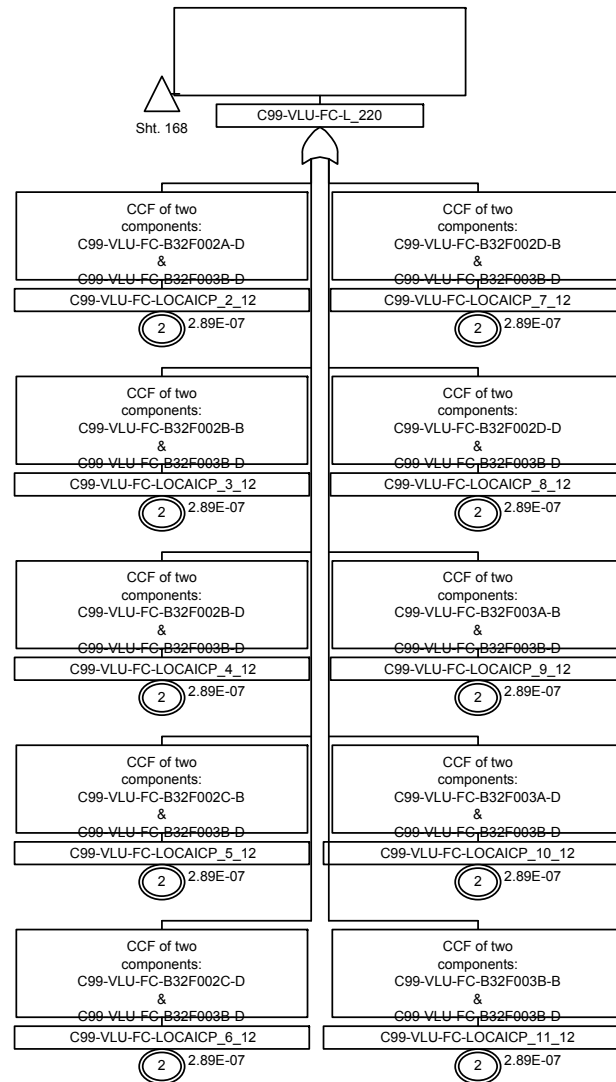


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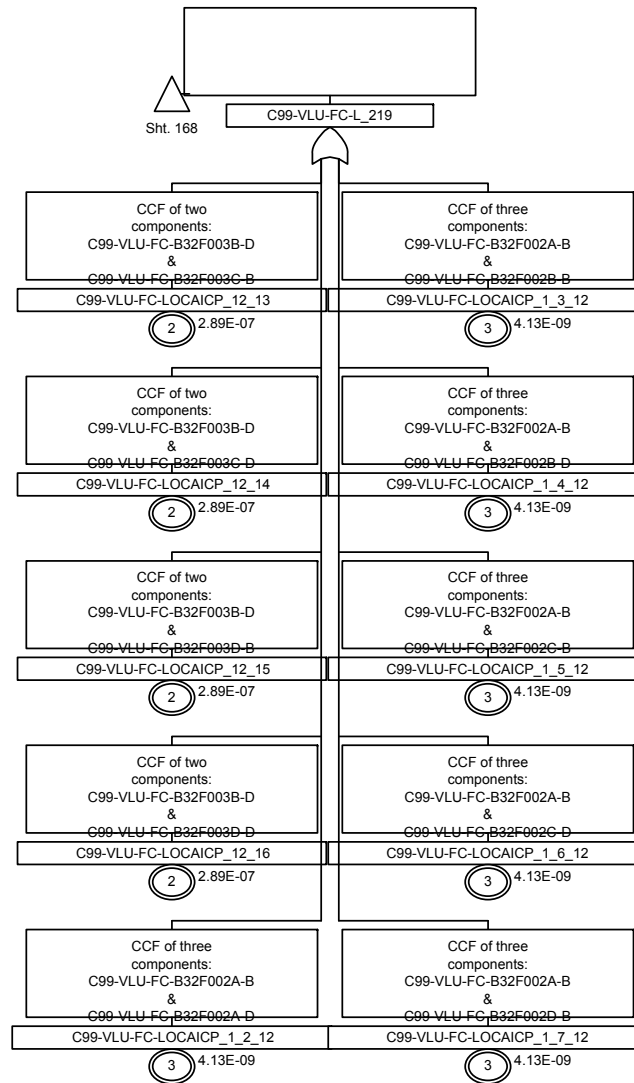


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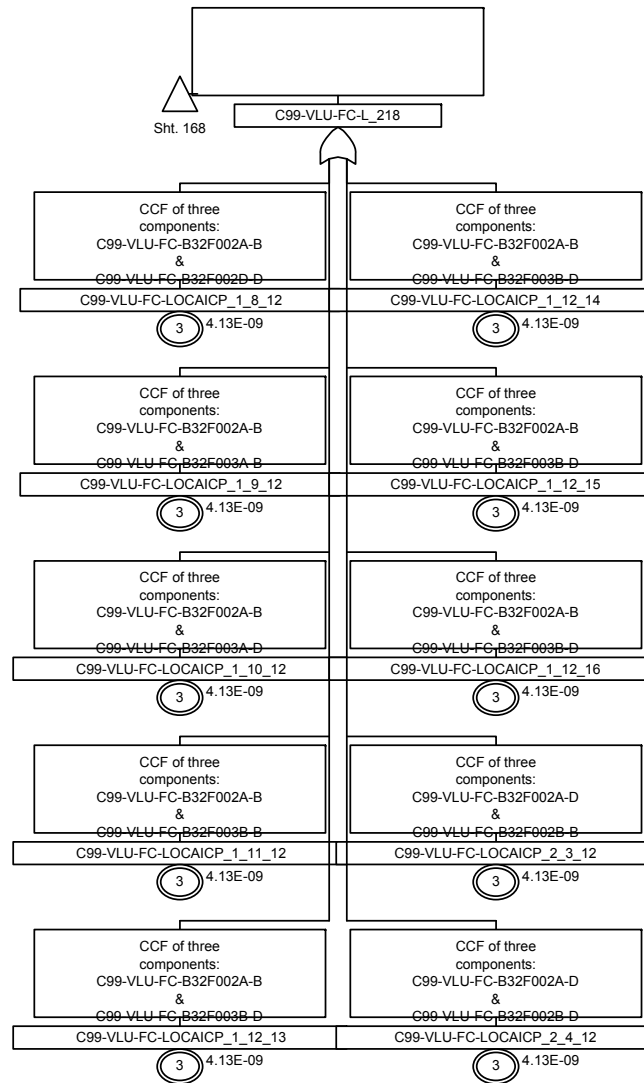


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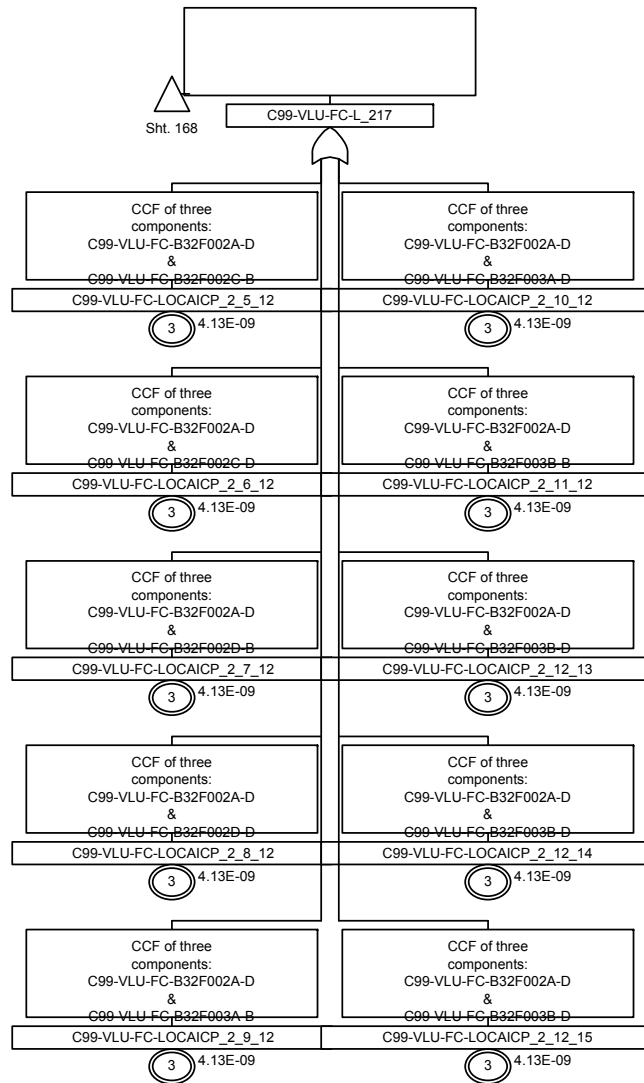


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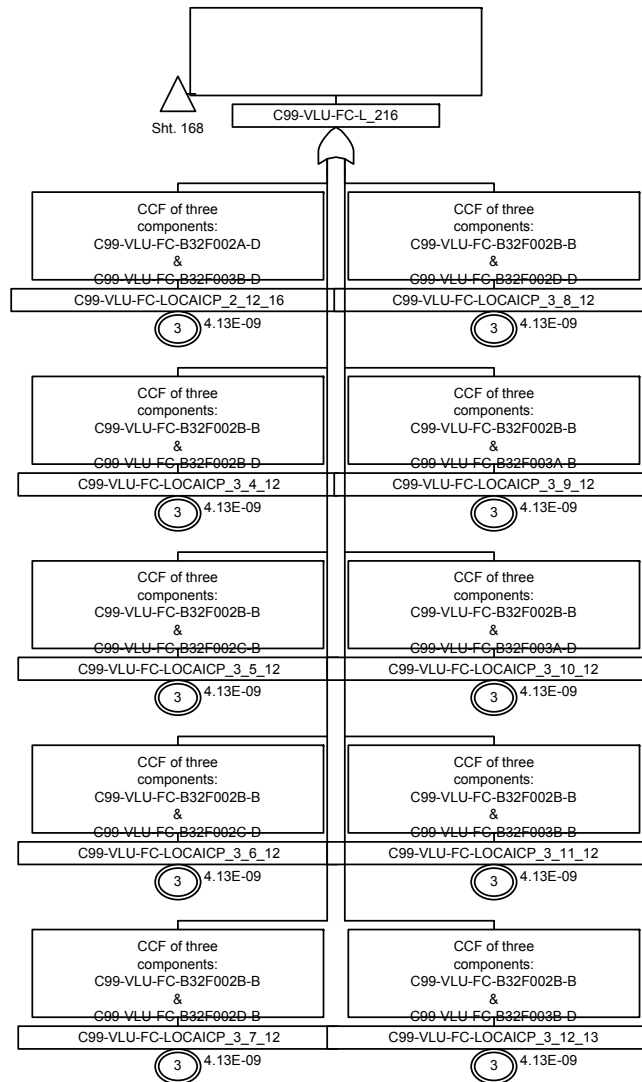


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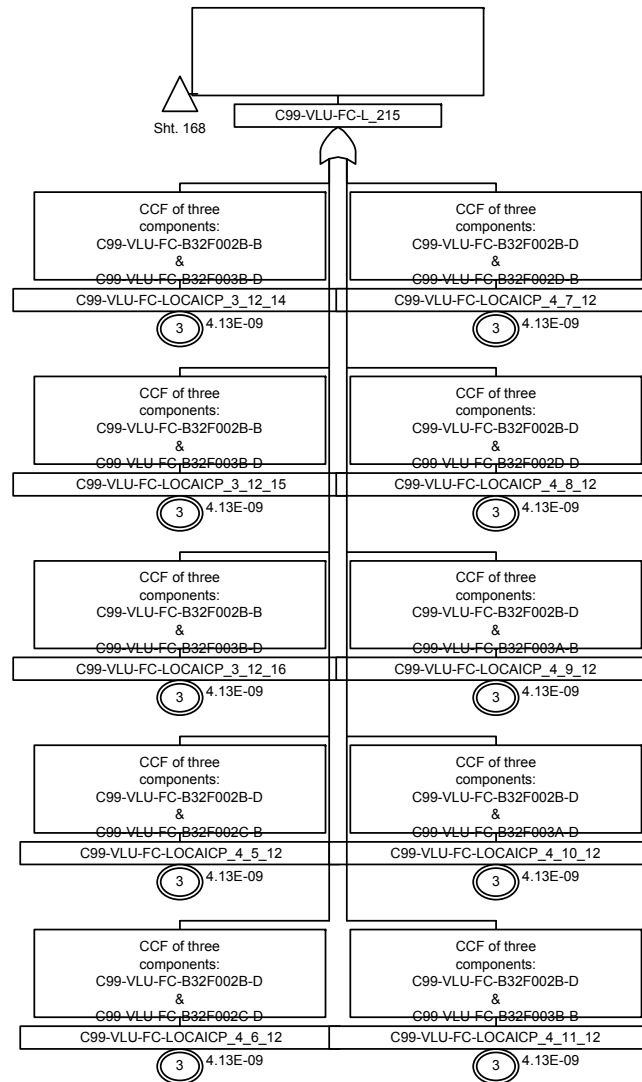


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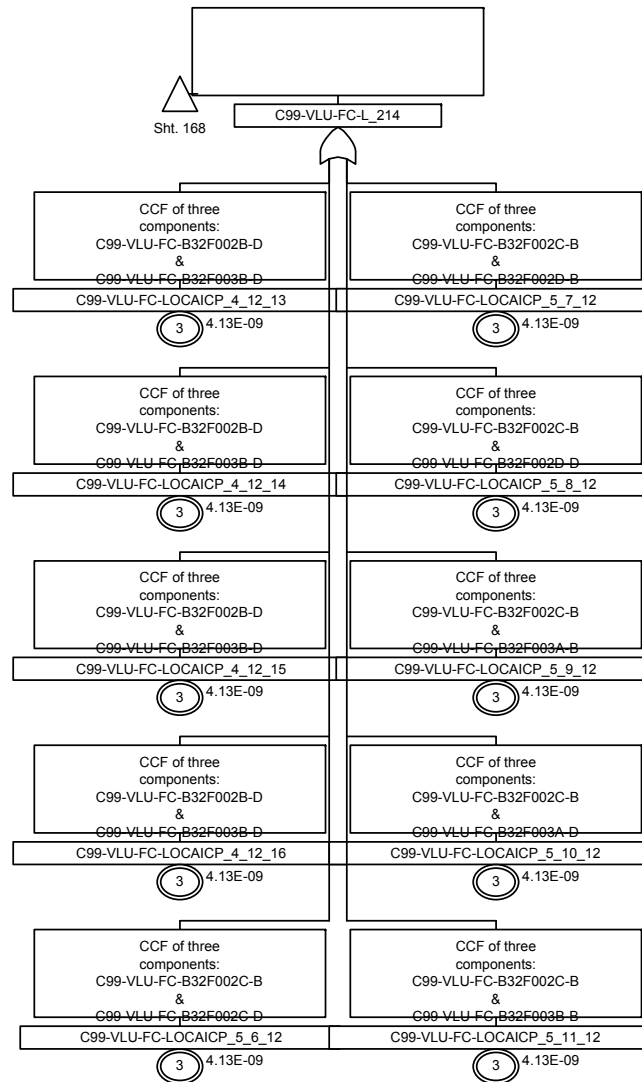


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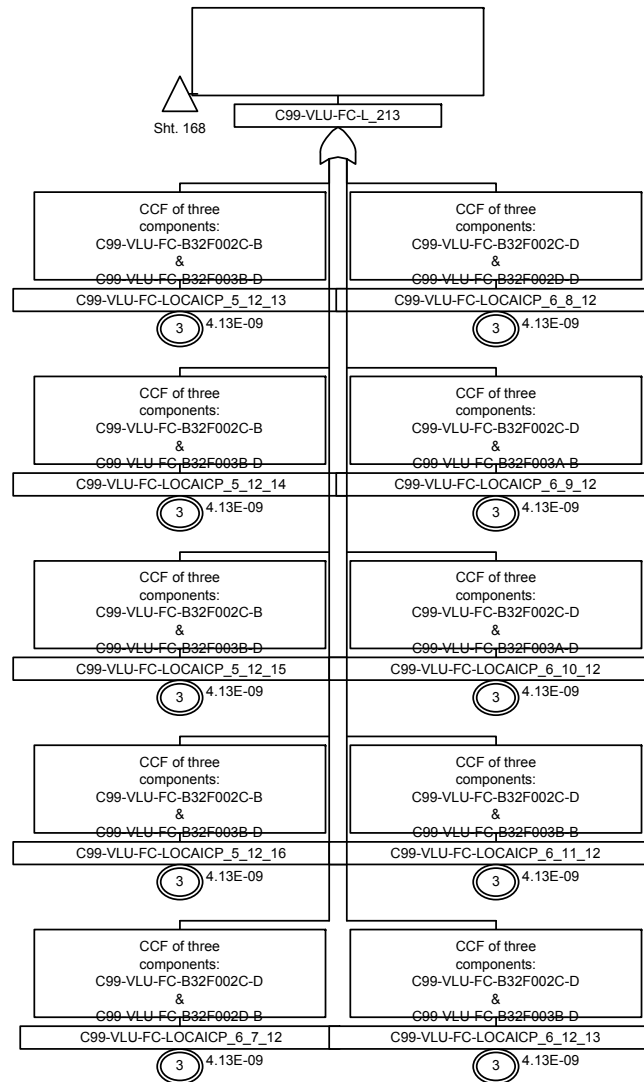


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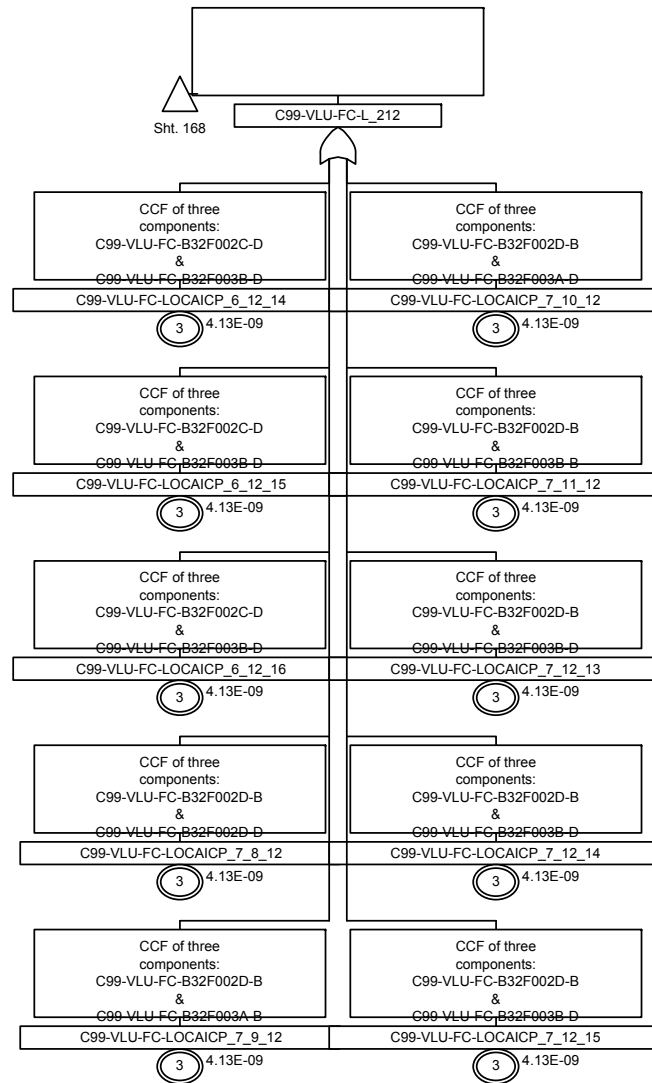


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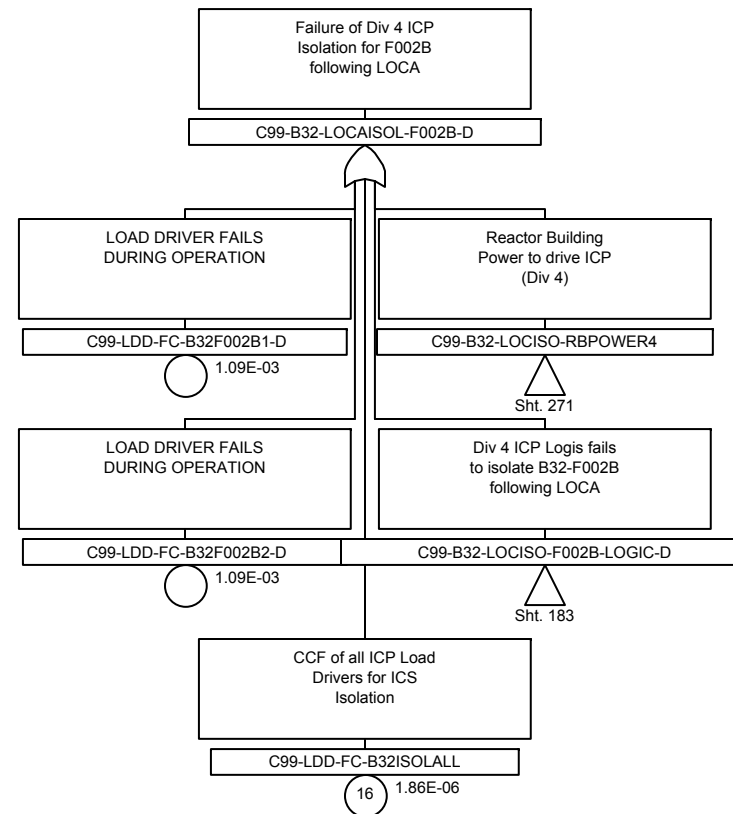


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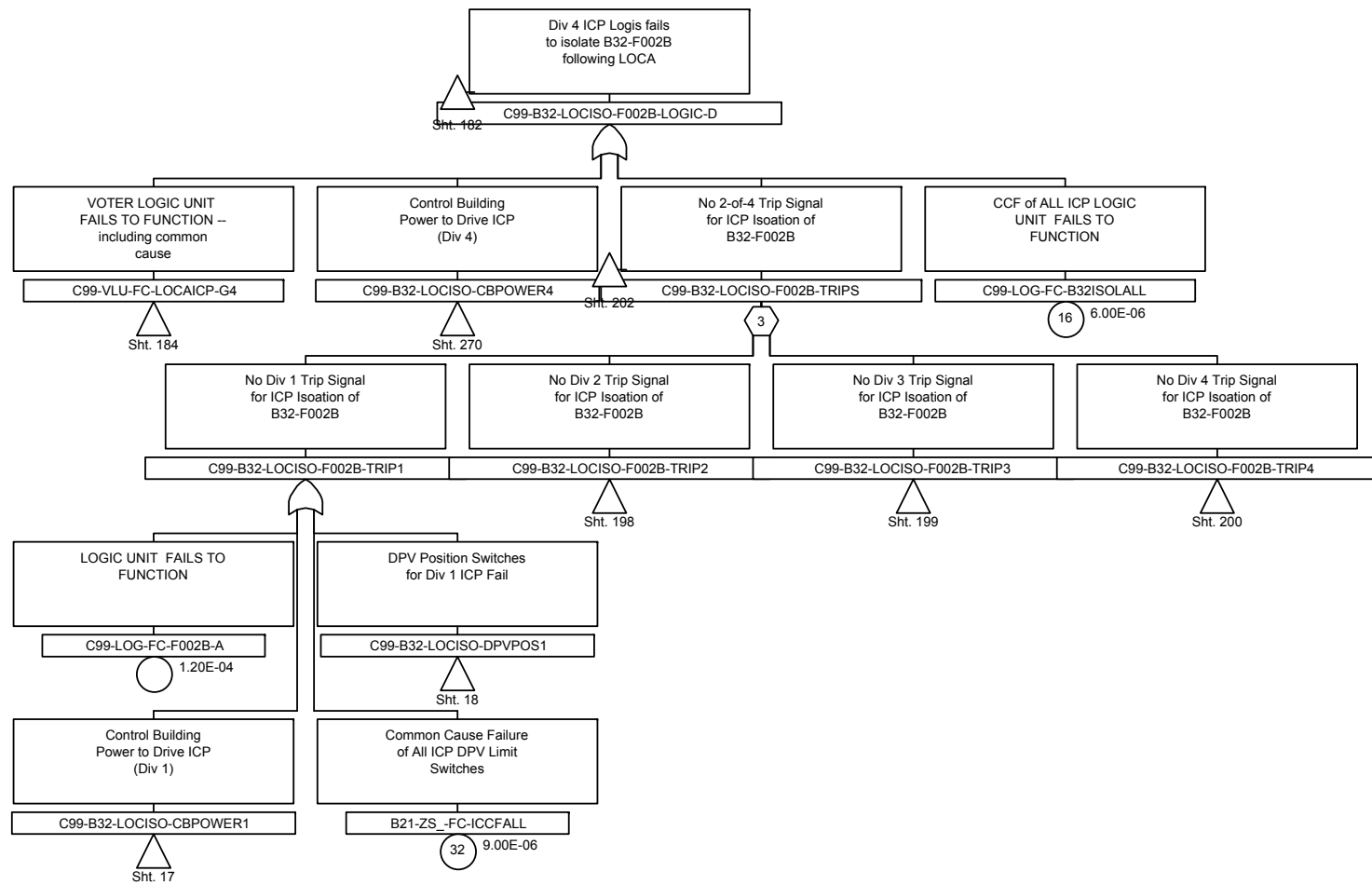


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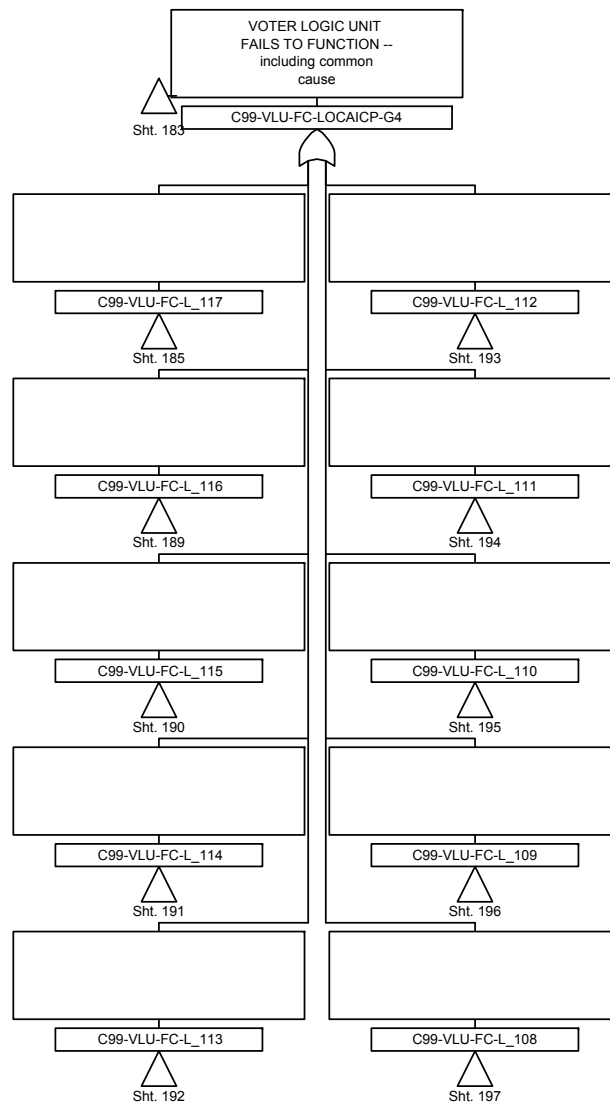


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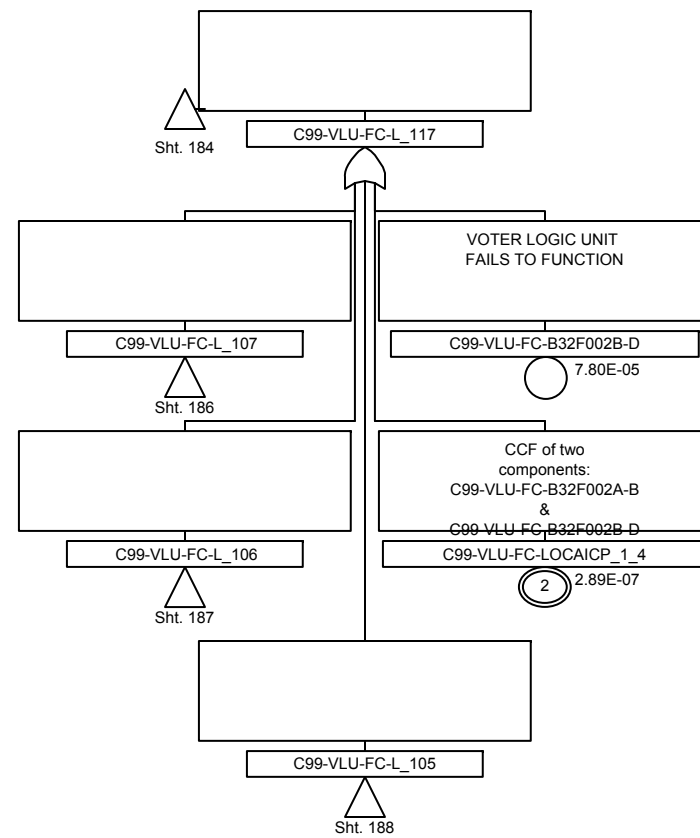


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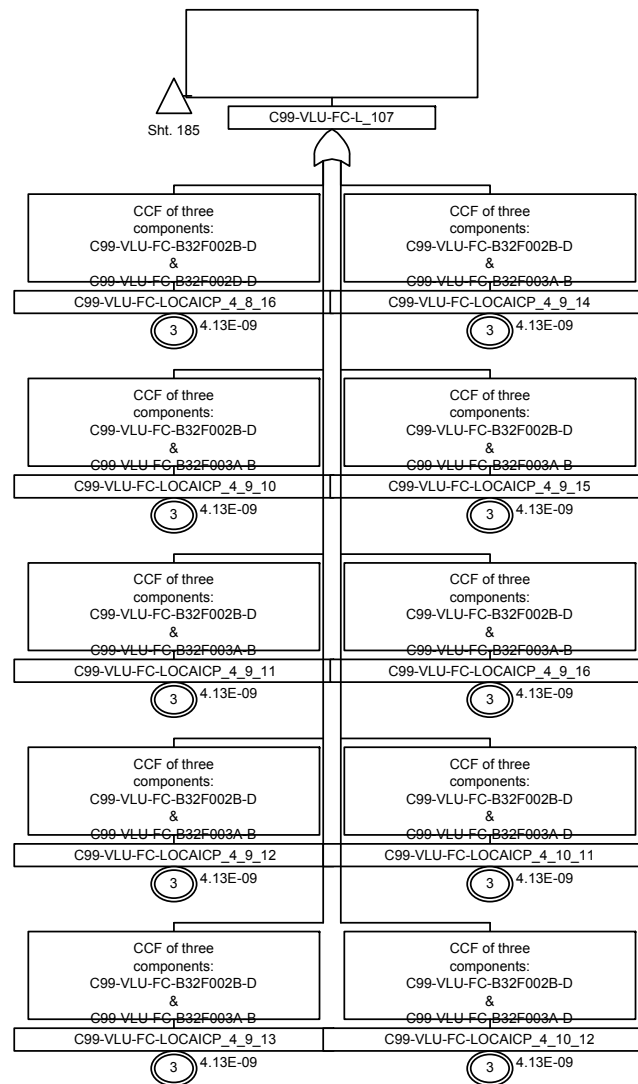


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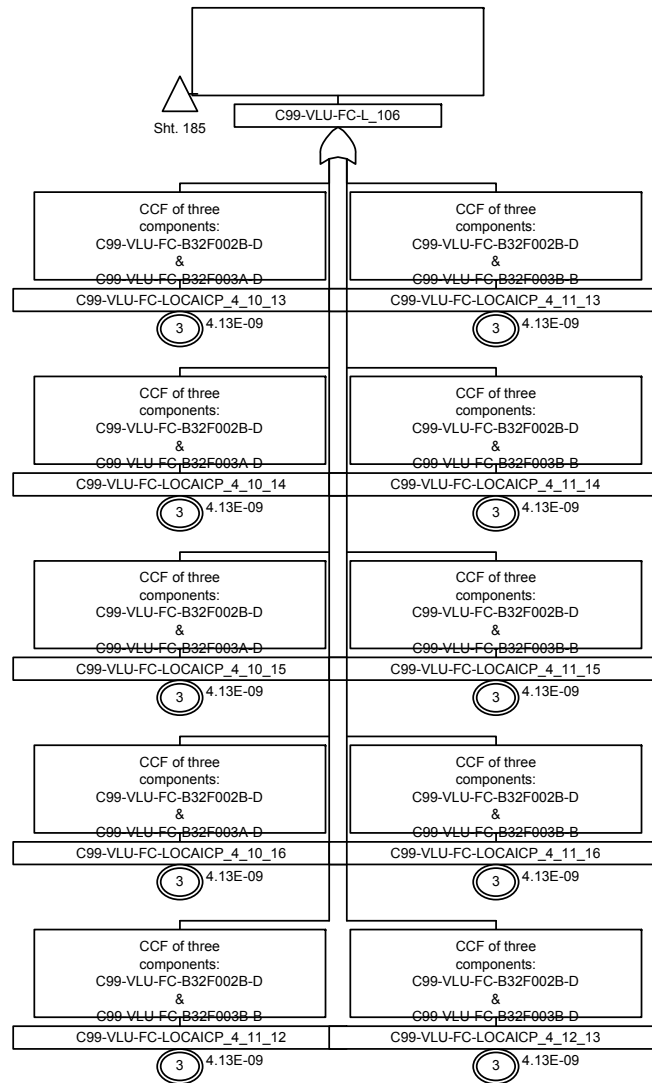


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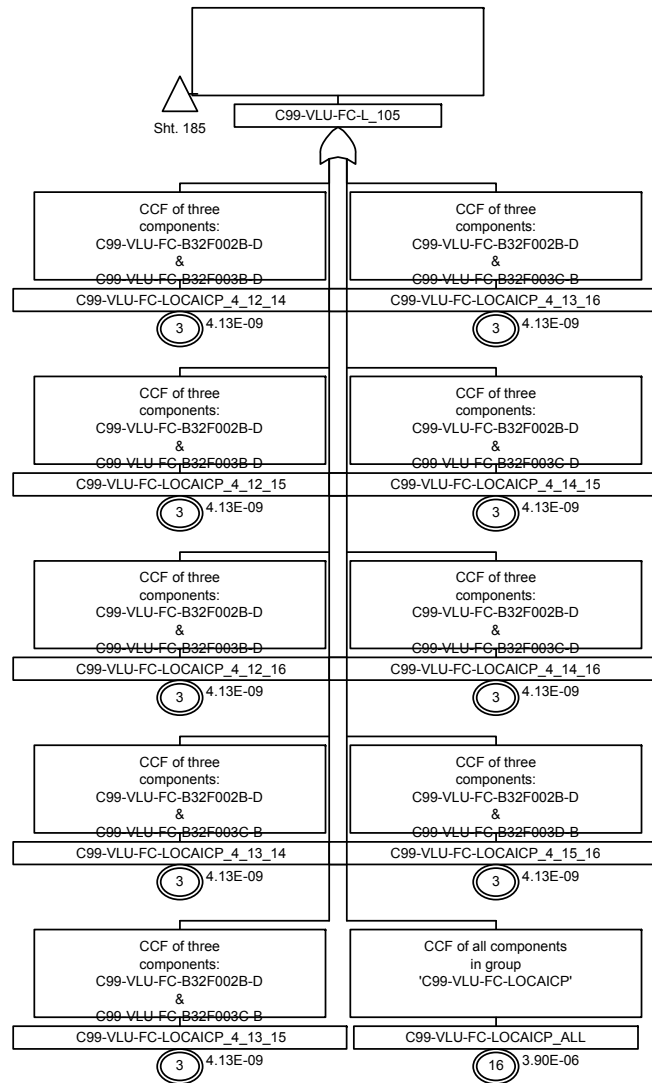


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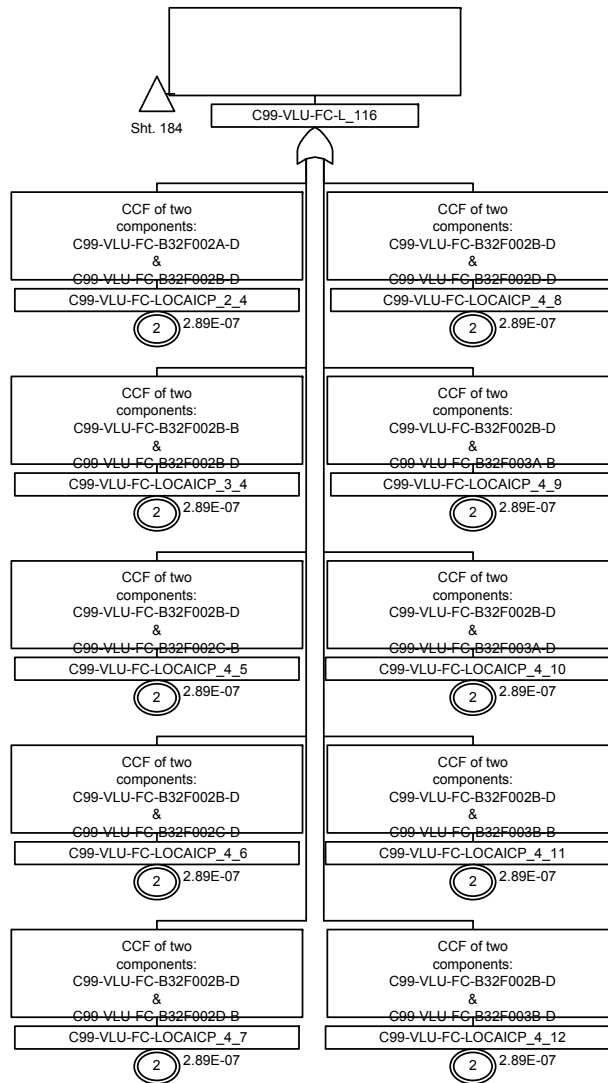


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Figure 4.5-3e. Sheet 190 Independent Control Platforms

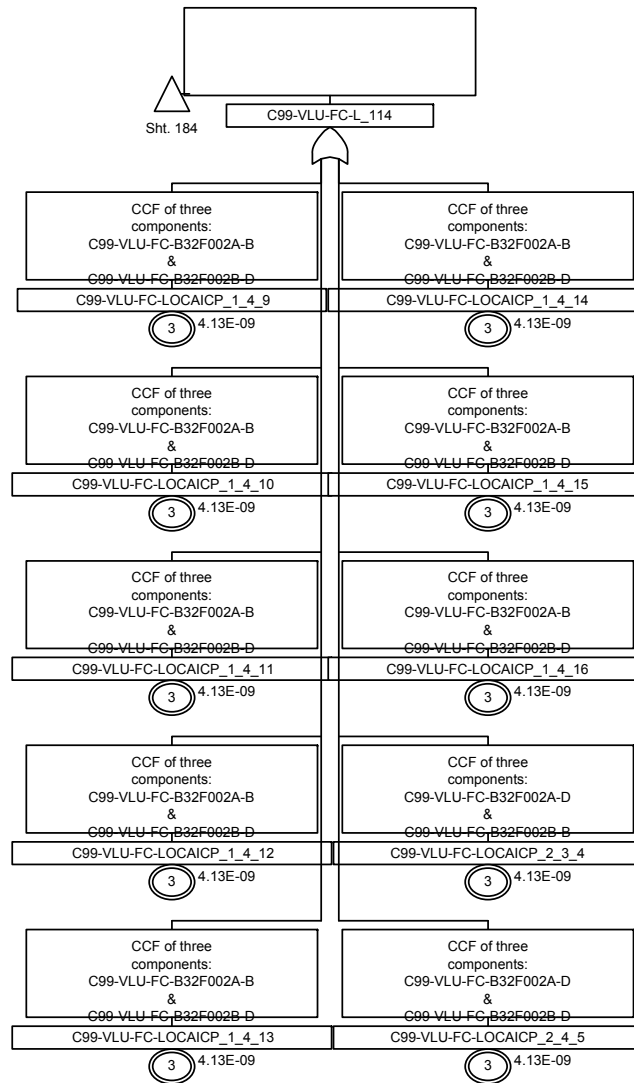


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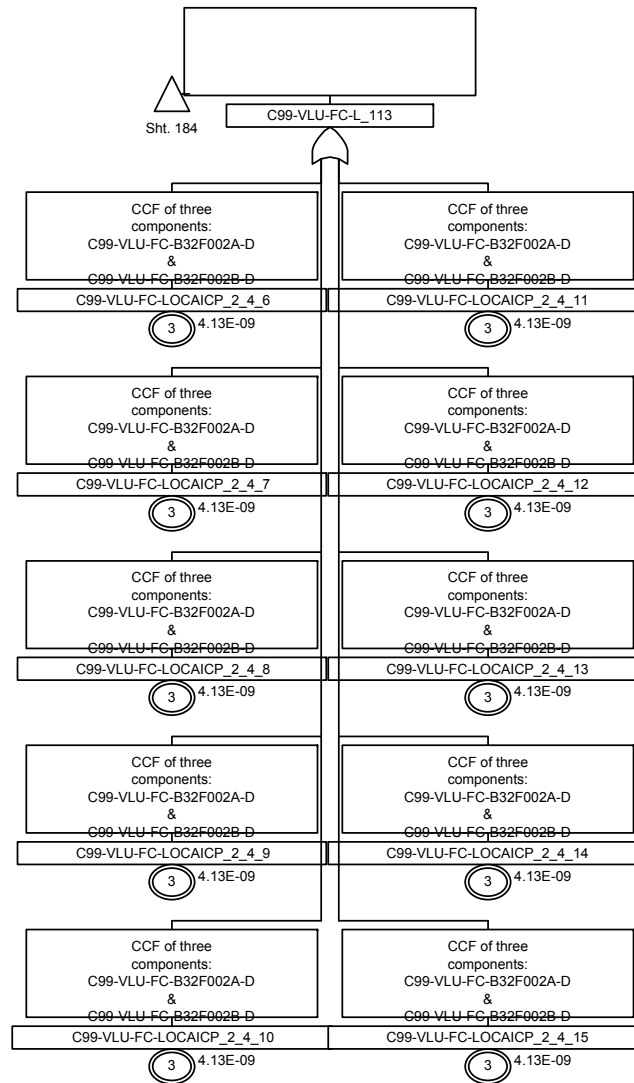


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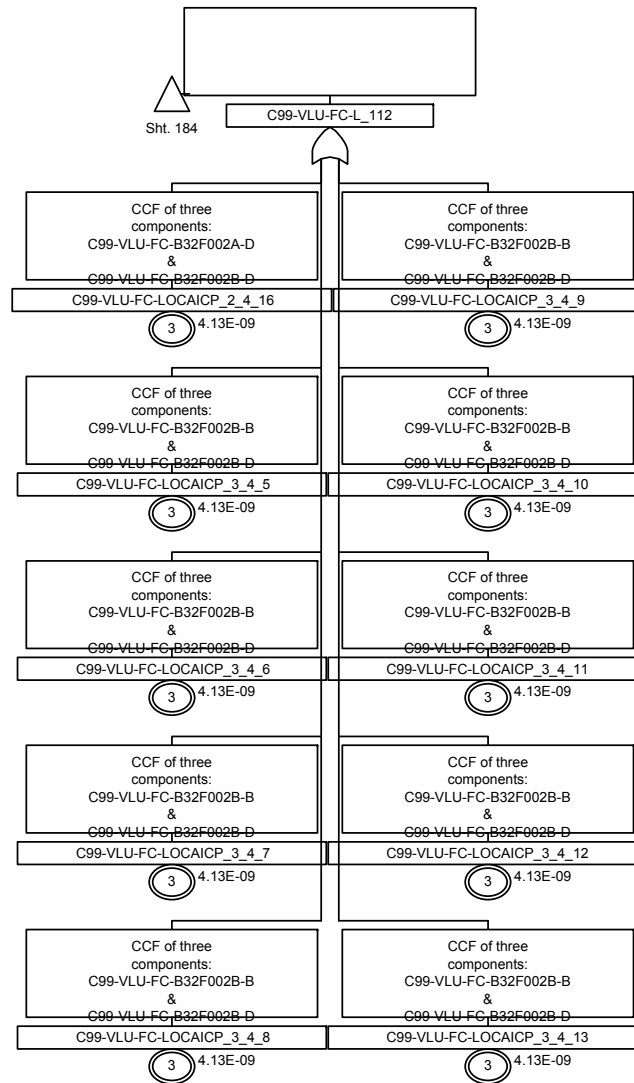


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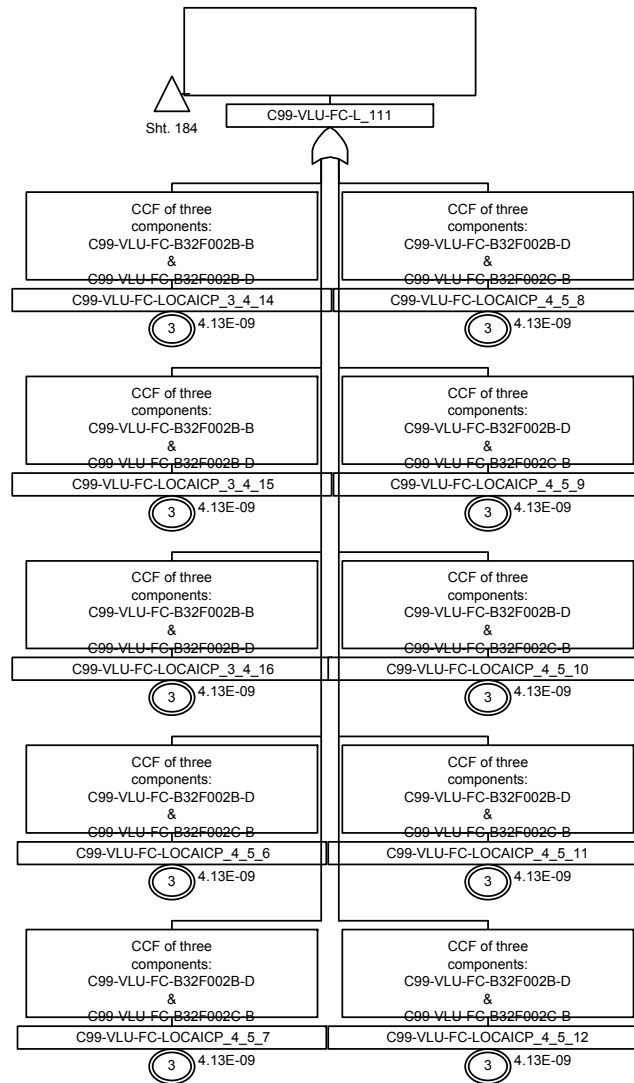


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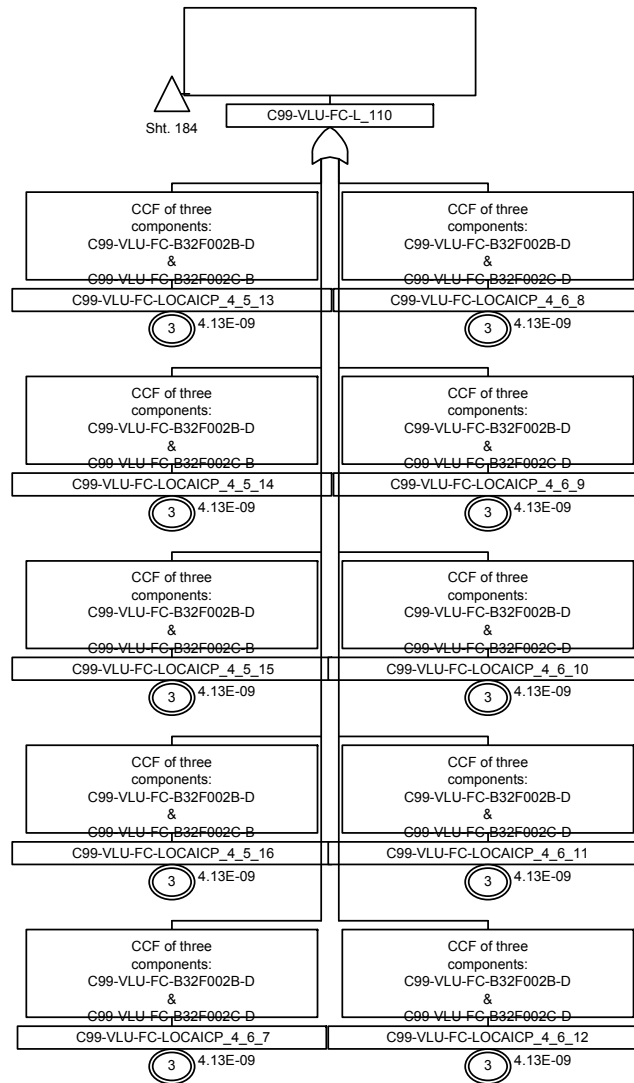


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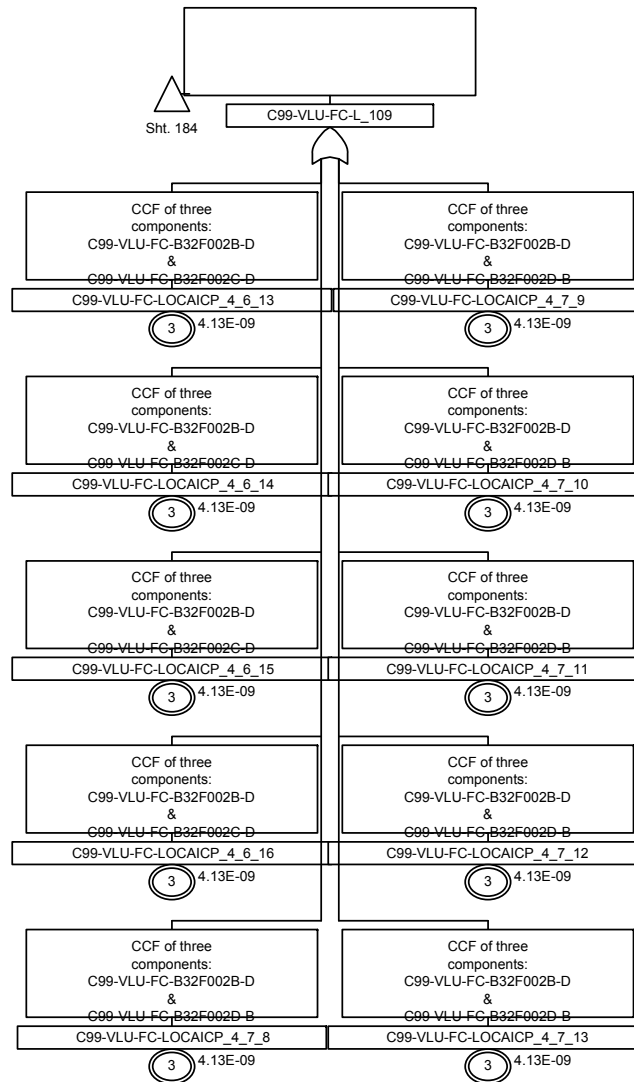


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Figure 4.5-3e. Sheet 197 Independent Control Platforms

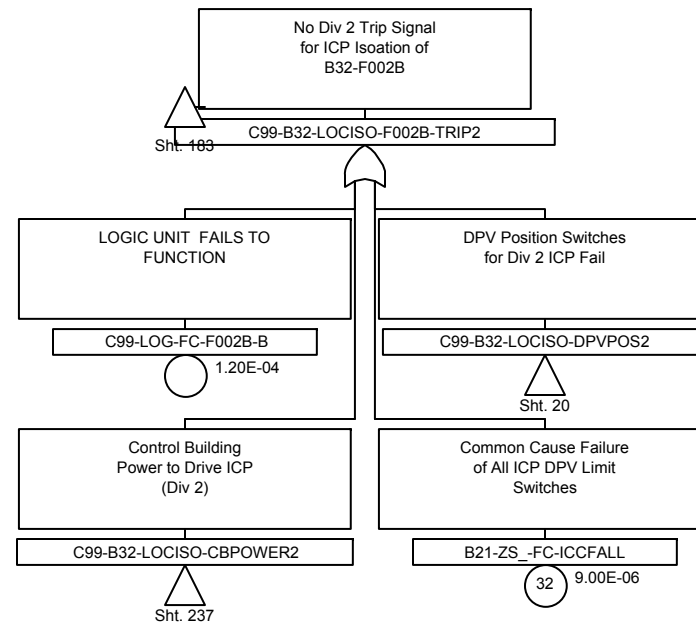


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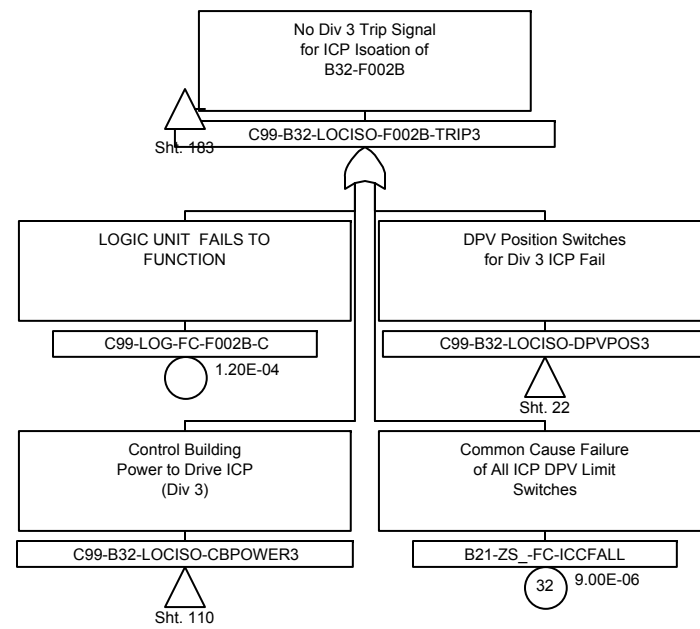


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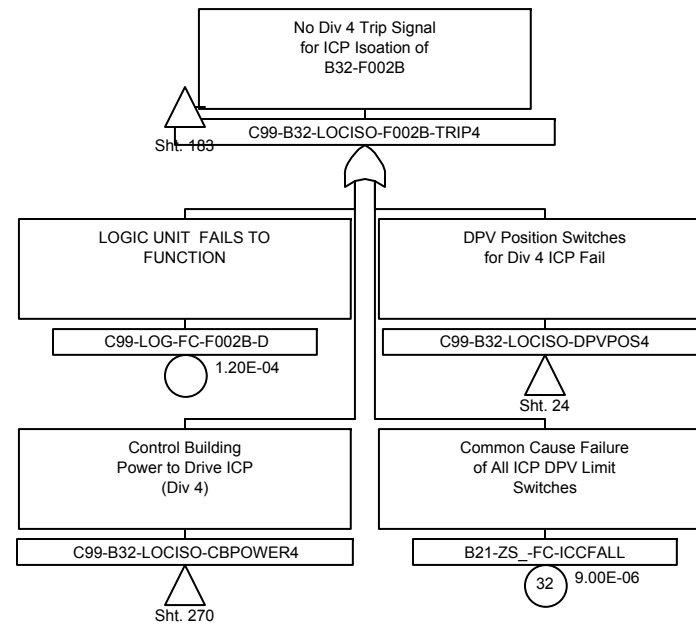


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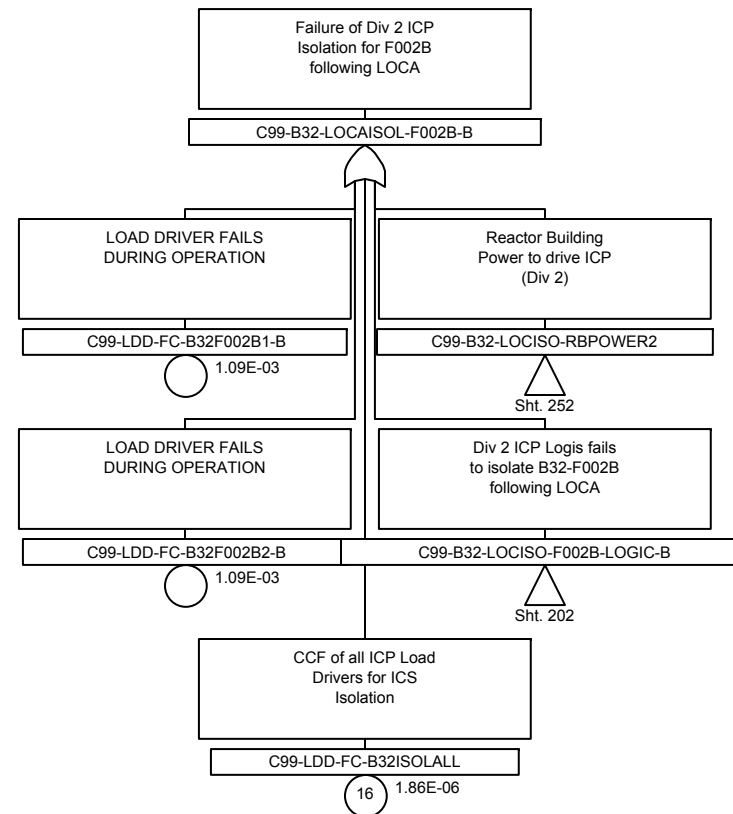


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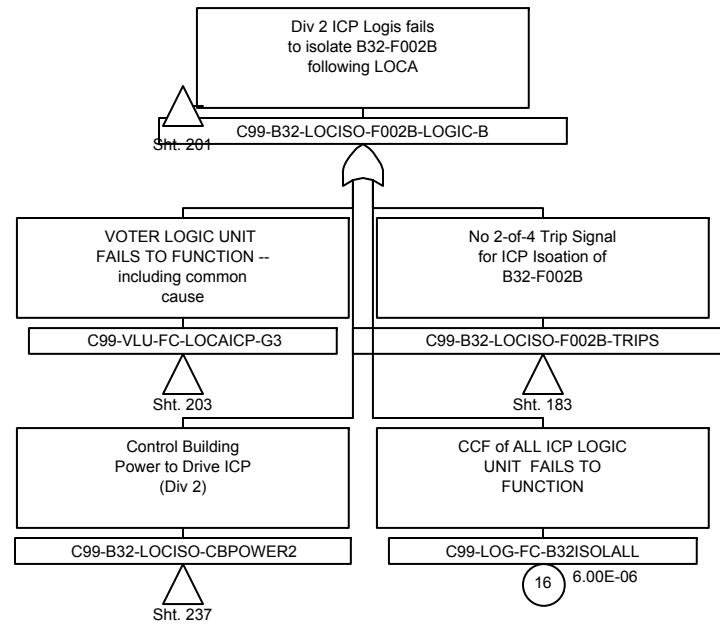


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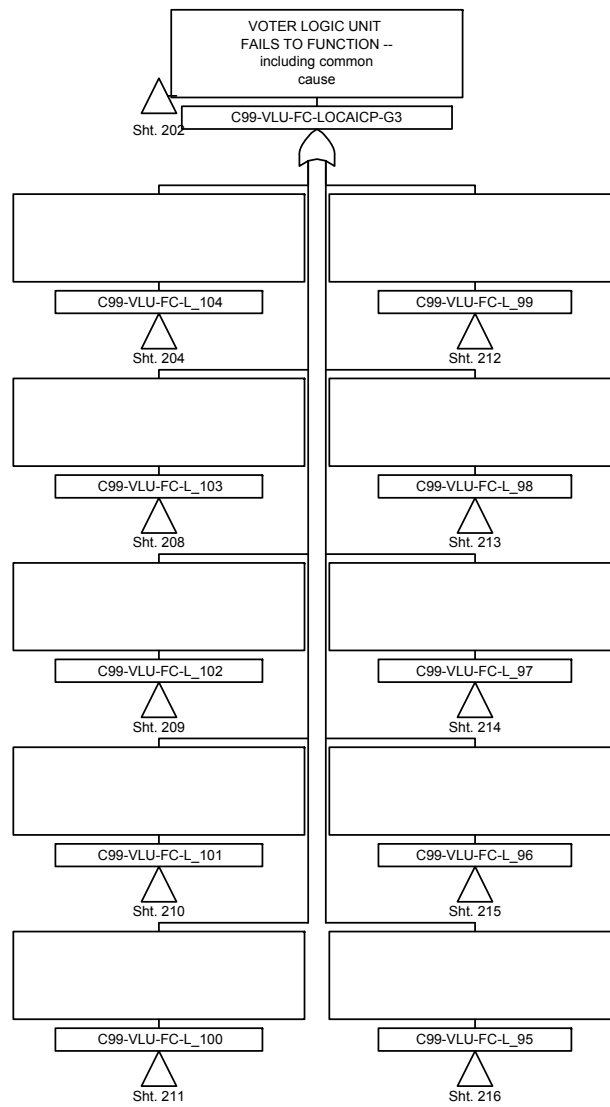


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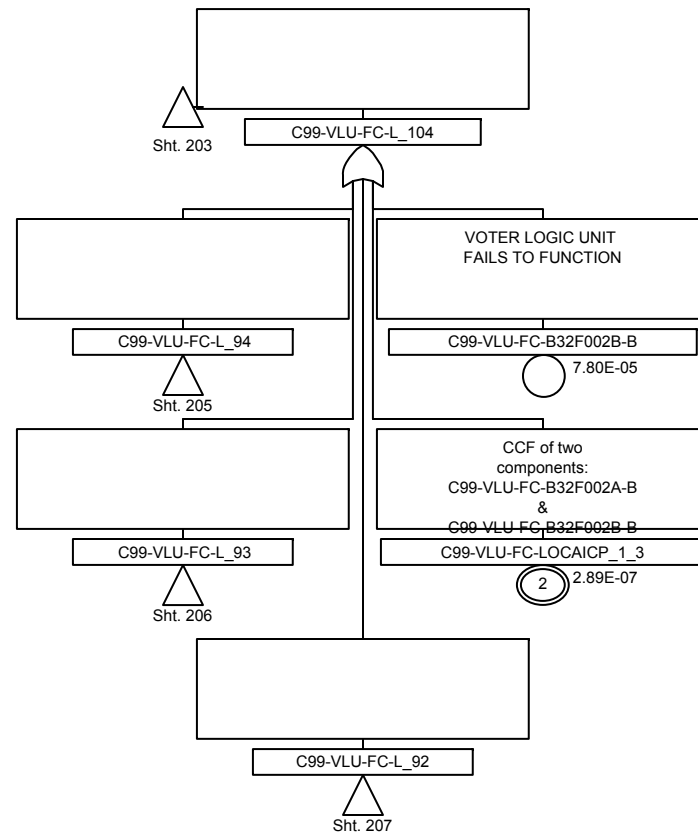


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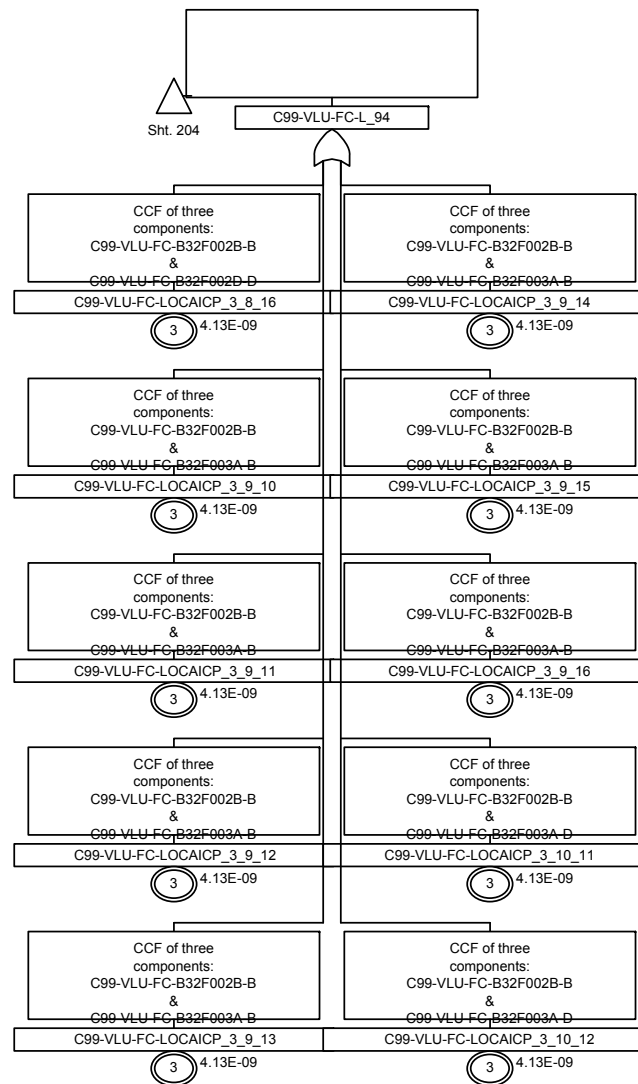


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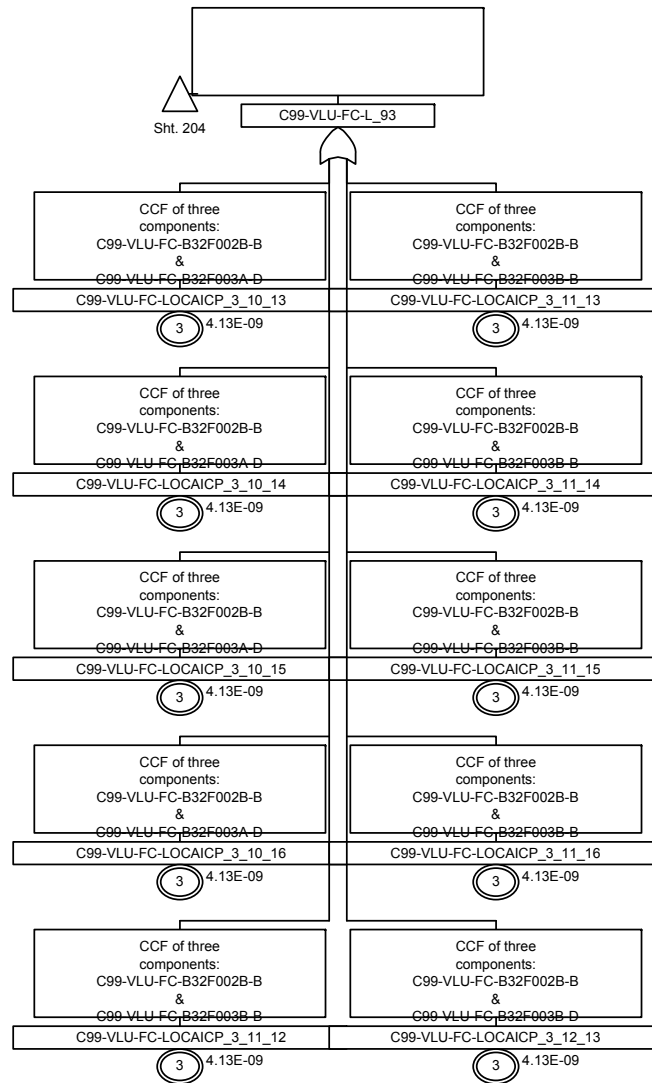


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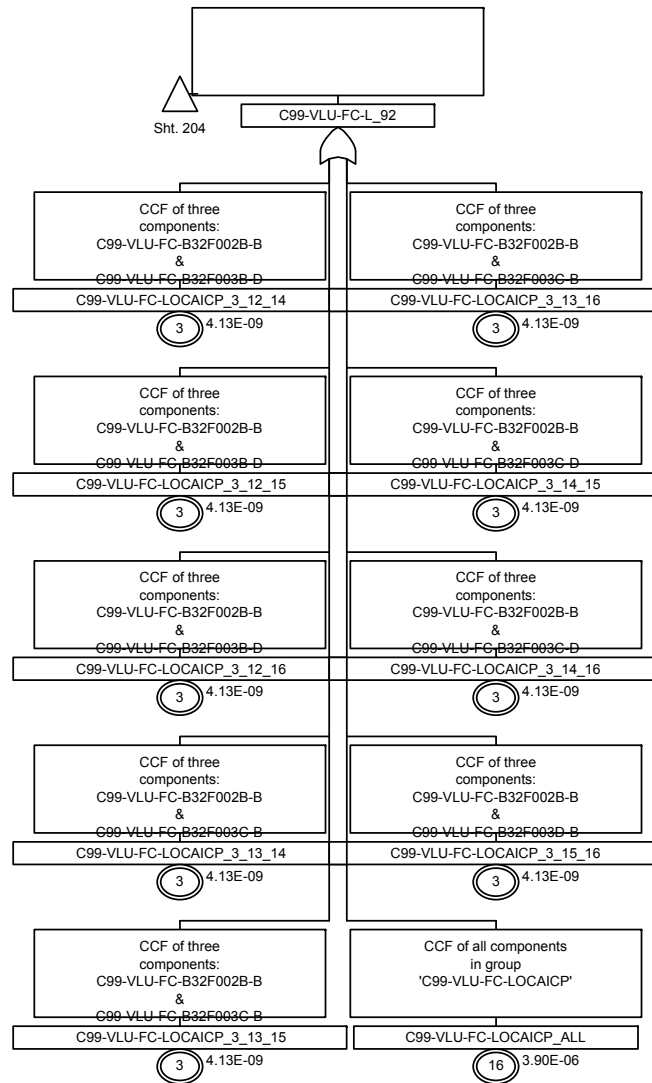


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Figure 4.5-3e. Sheet 208 Independent Control Platforms

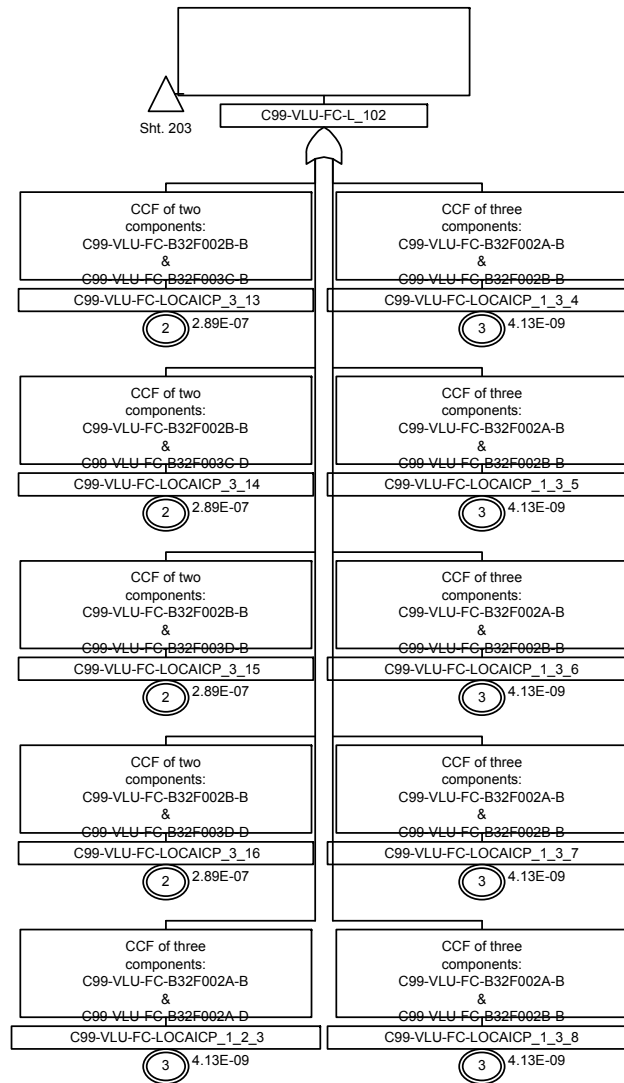


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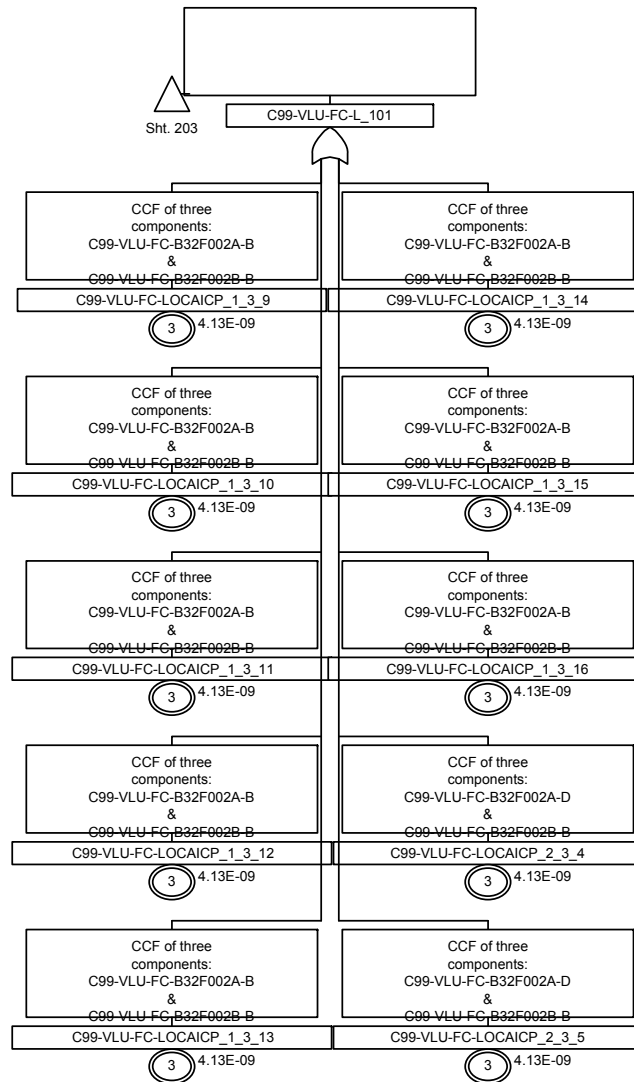


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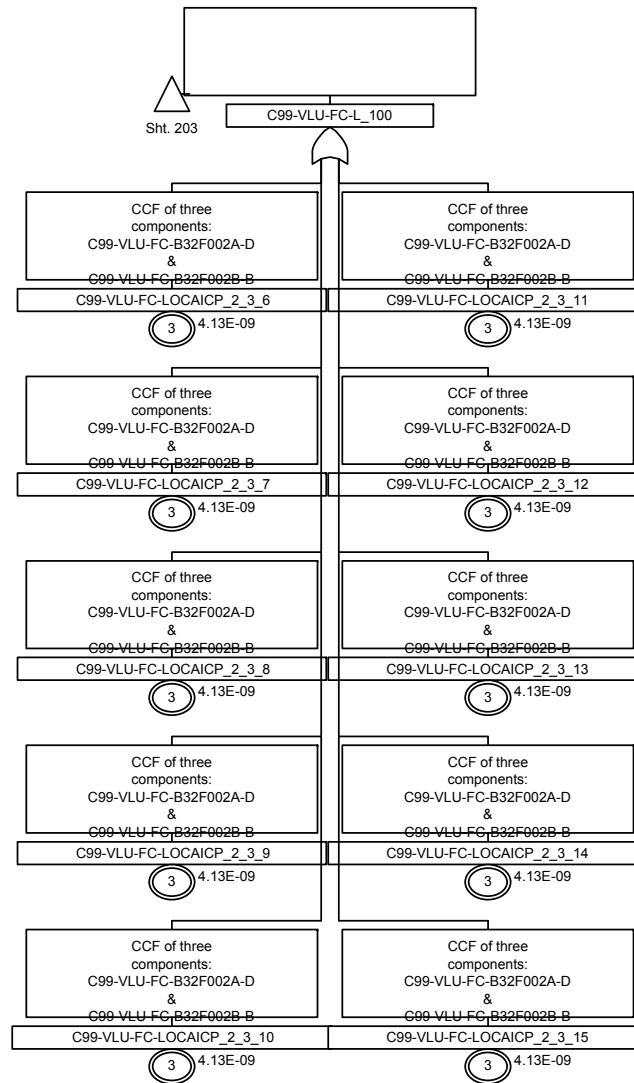


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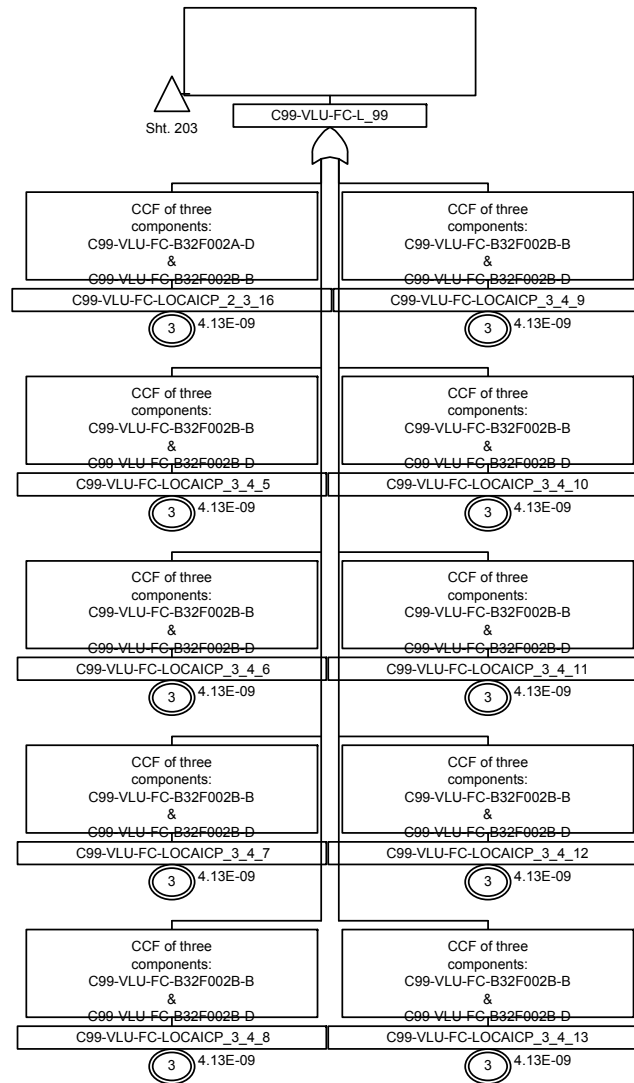


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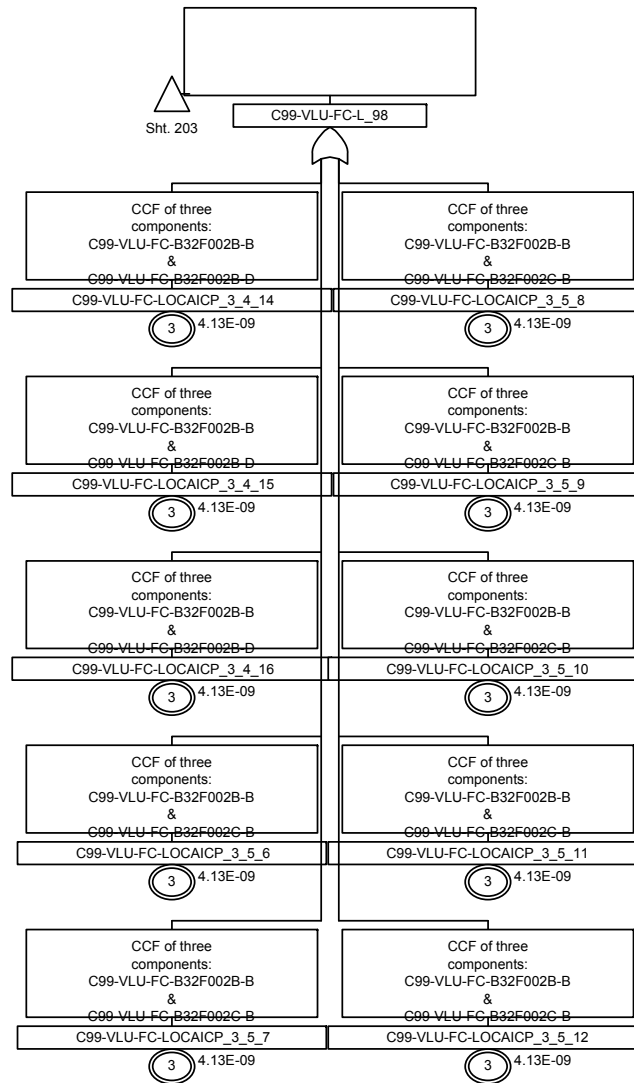


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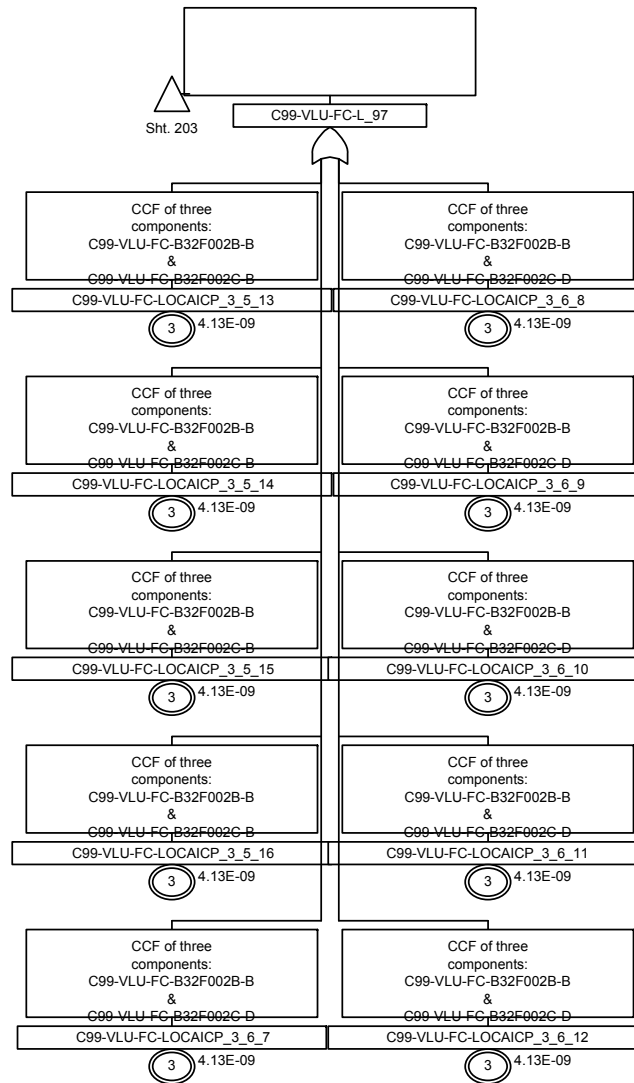


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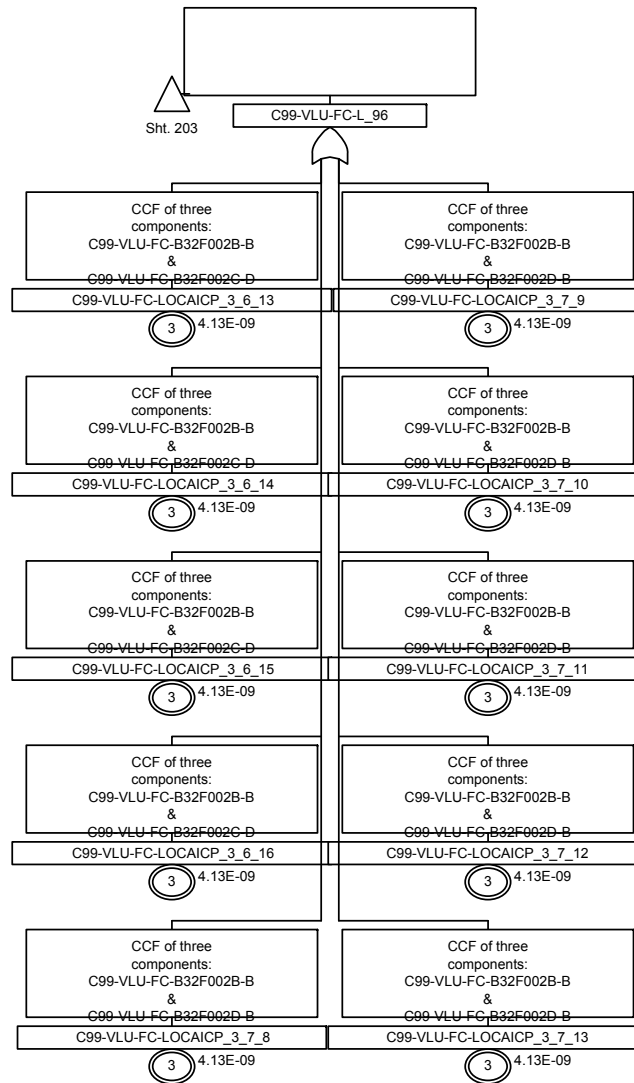


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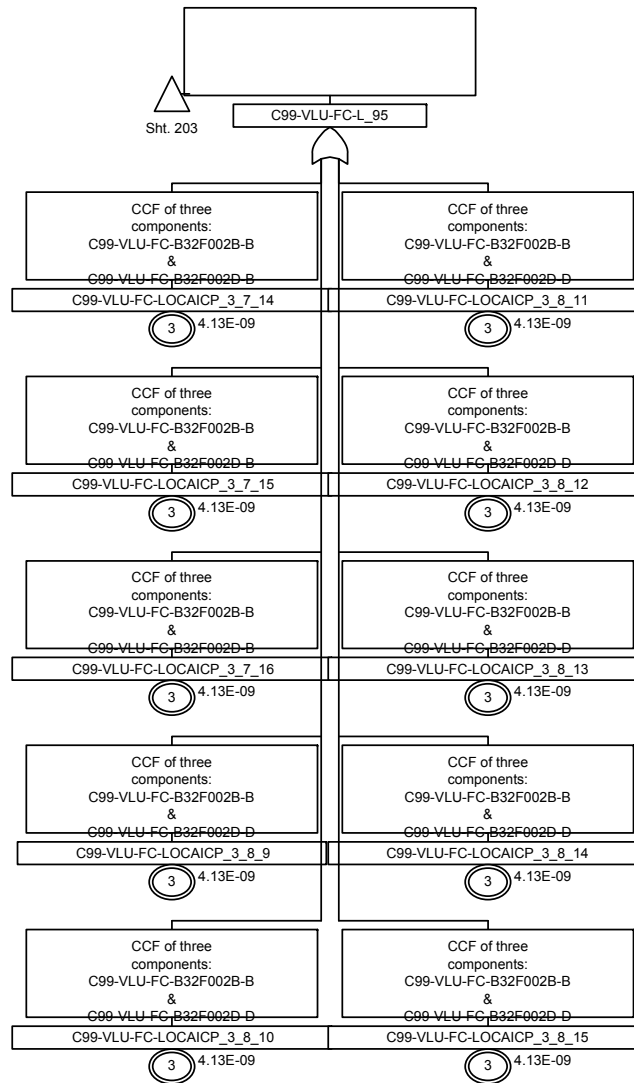


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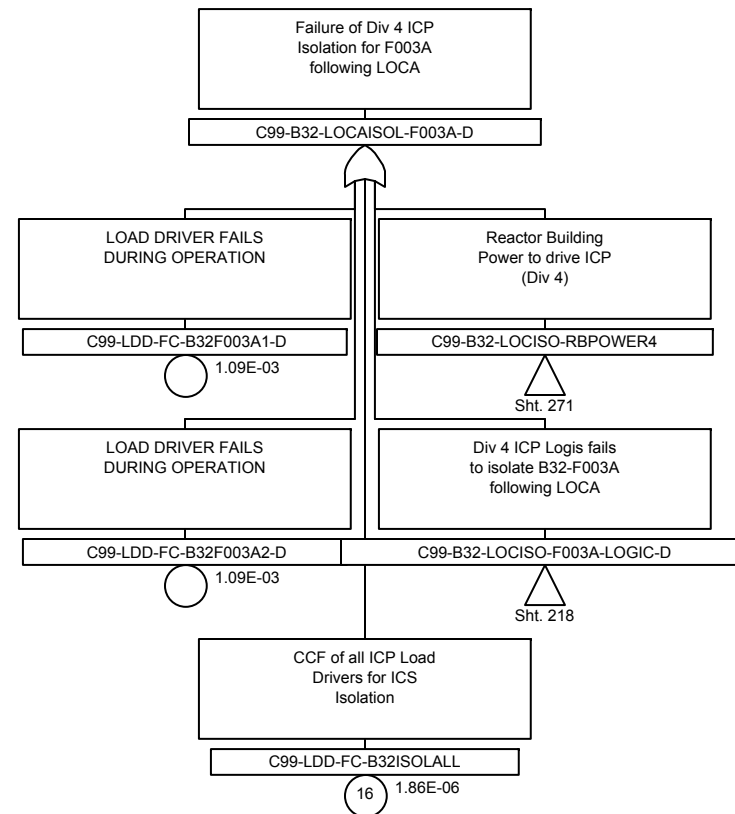


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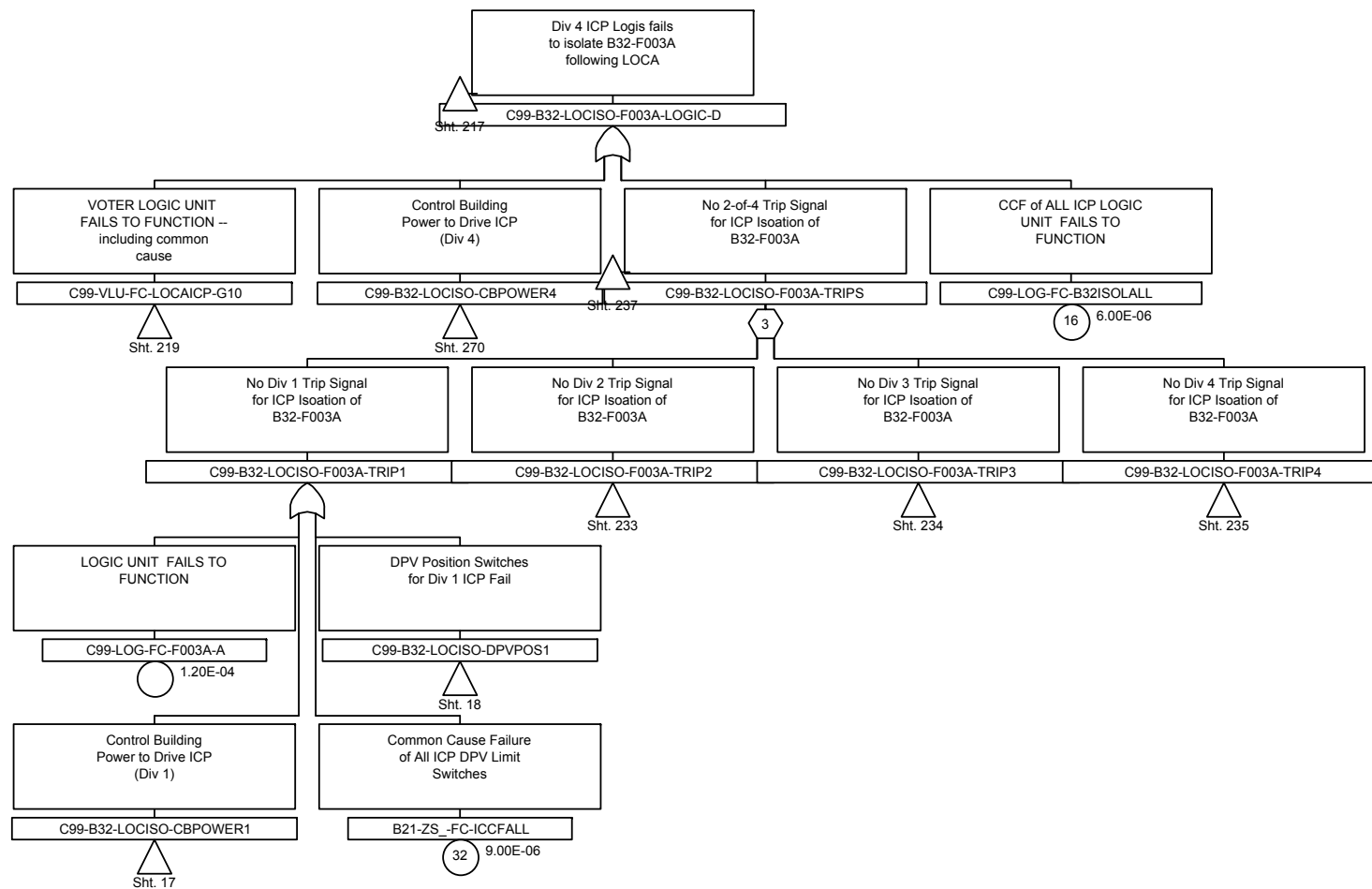


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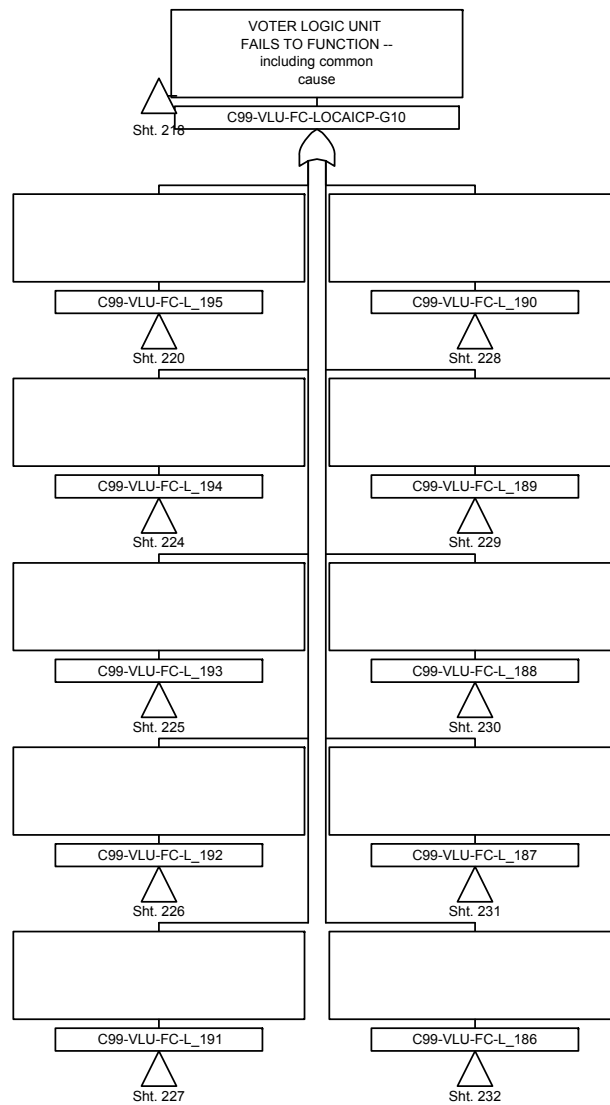


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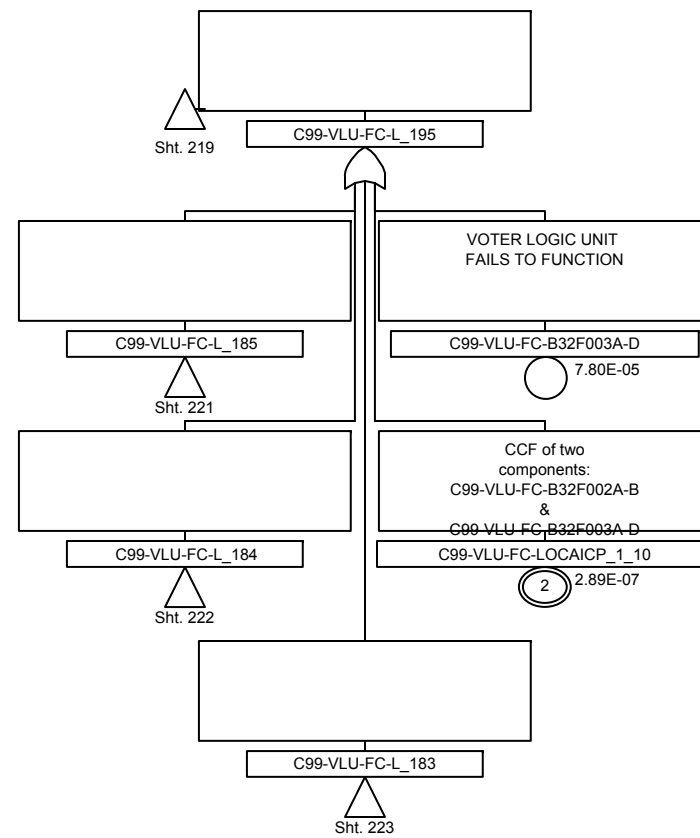


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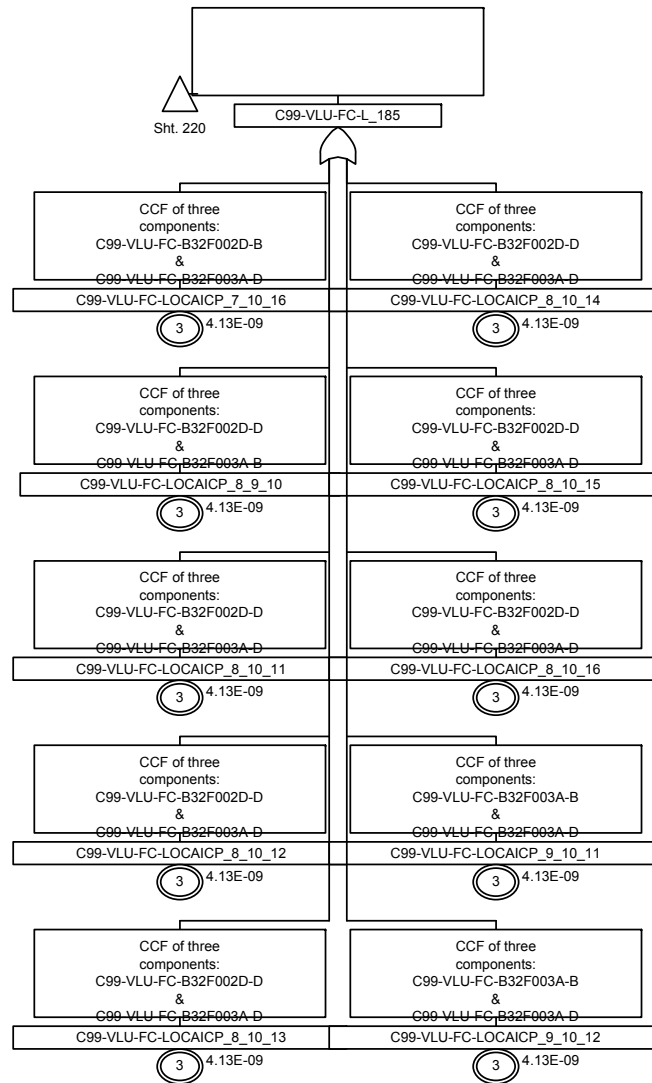


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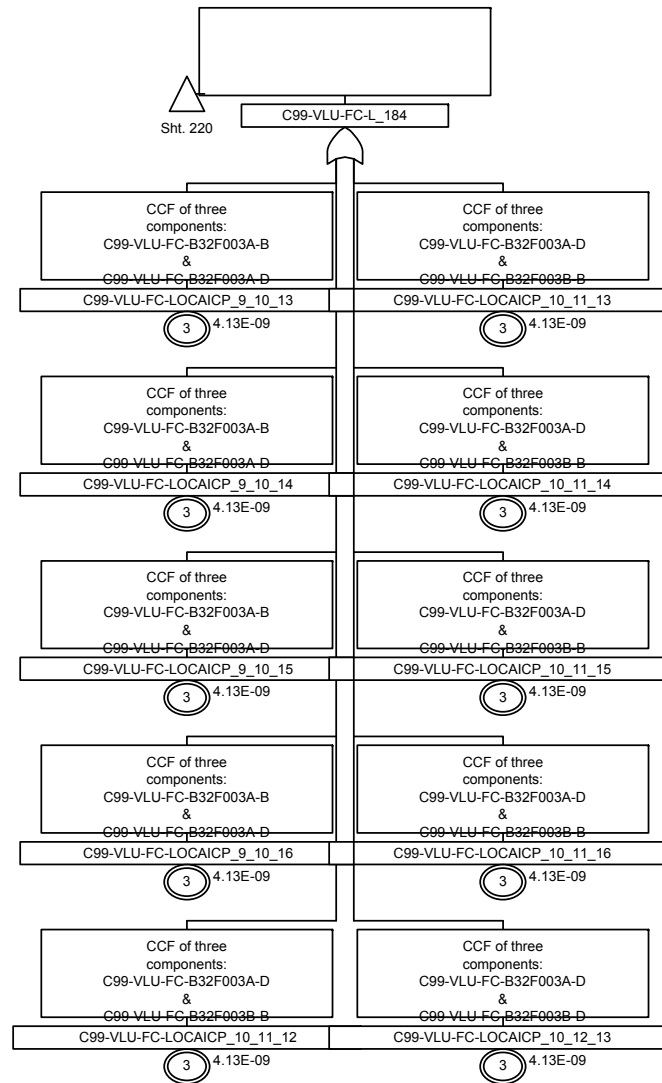


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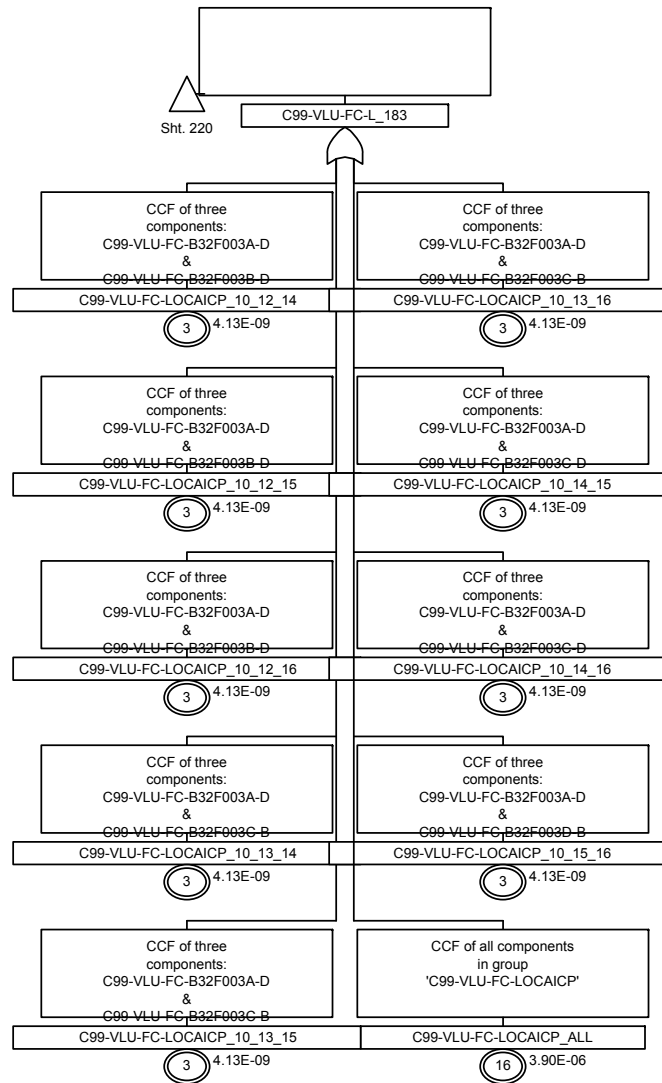


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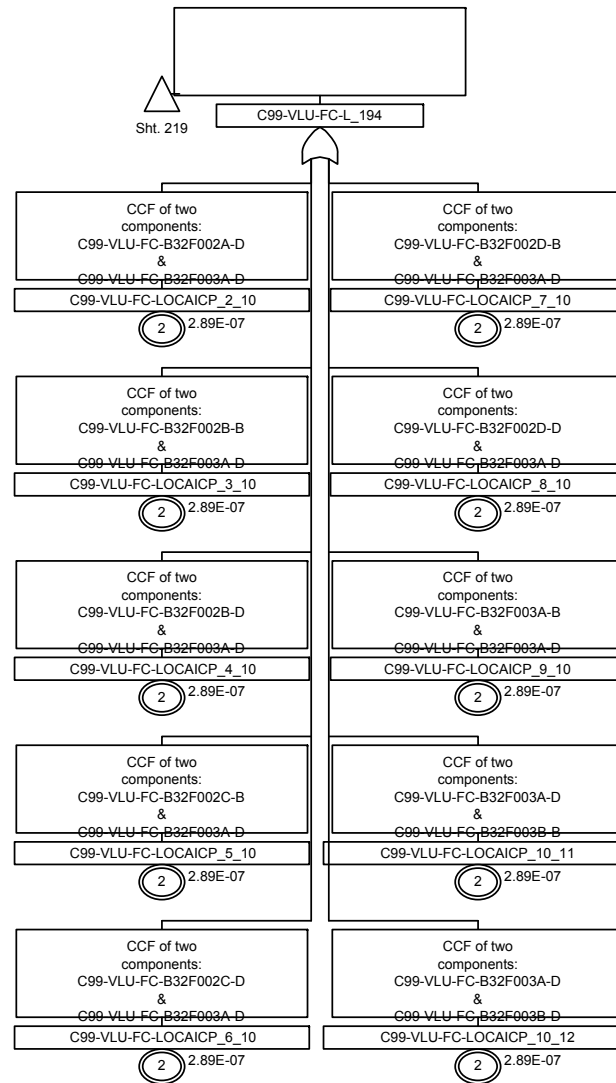


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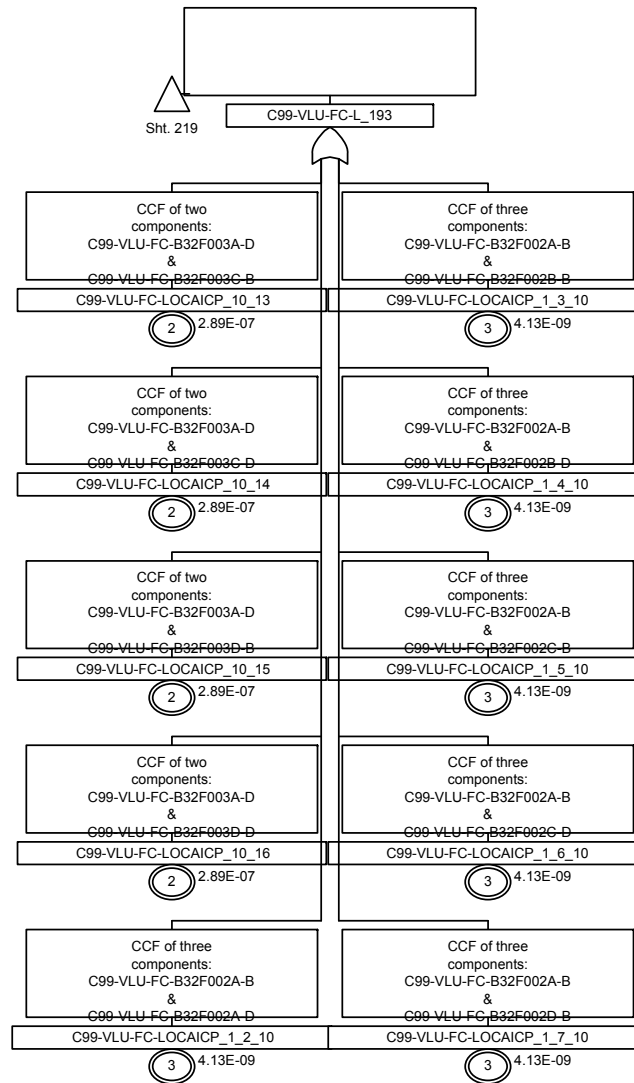


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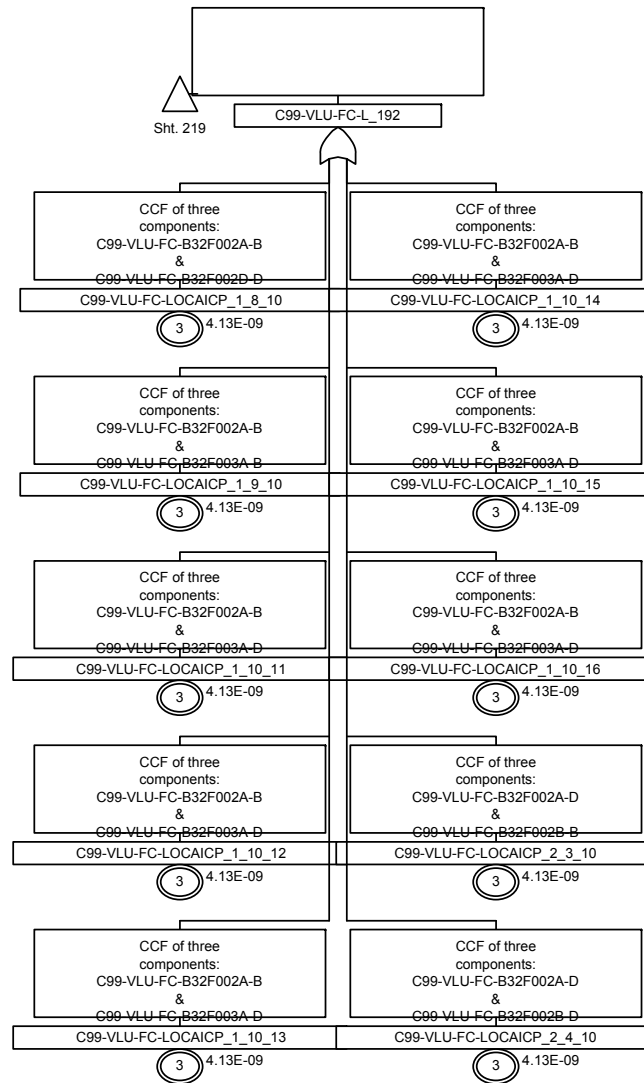


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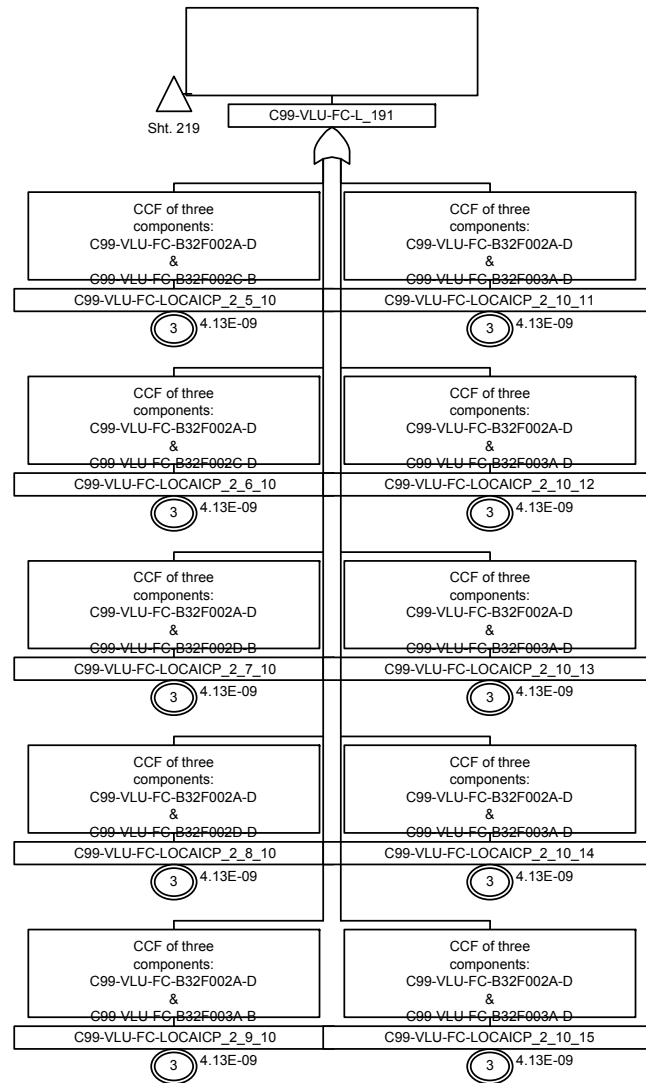


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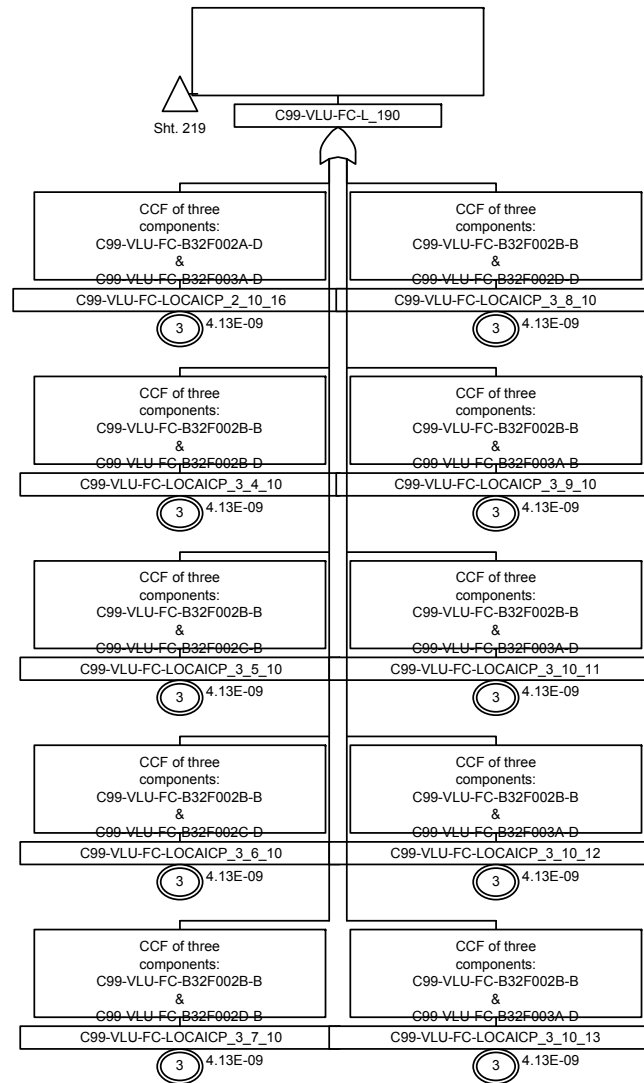


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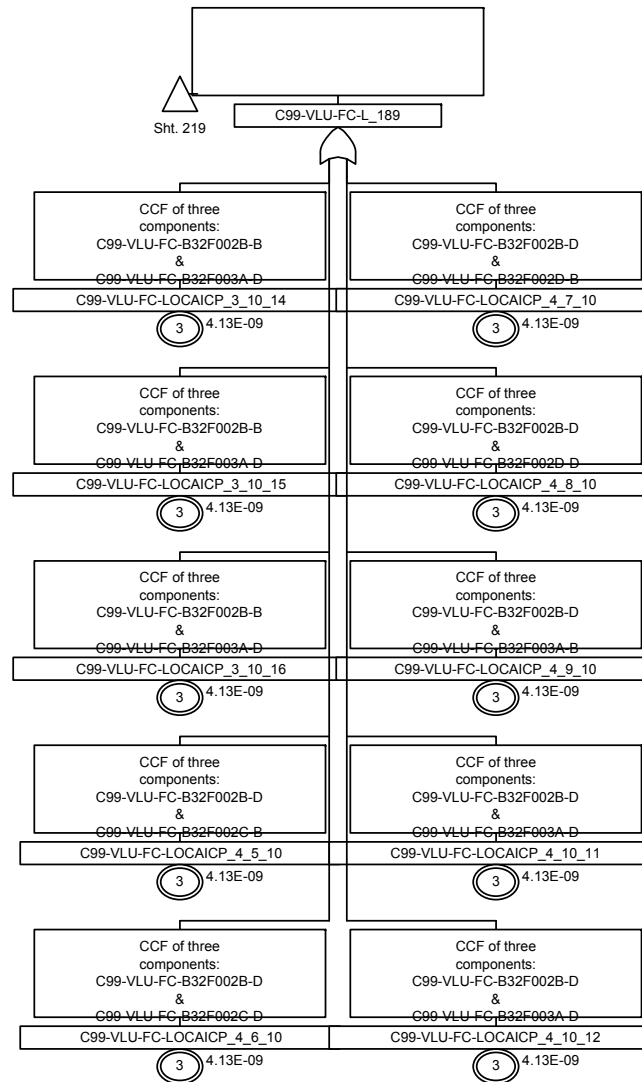


Figure 4.5-3e. Sheet 229 Independent Control Platforms

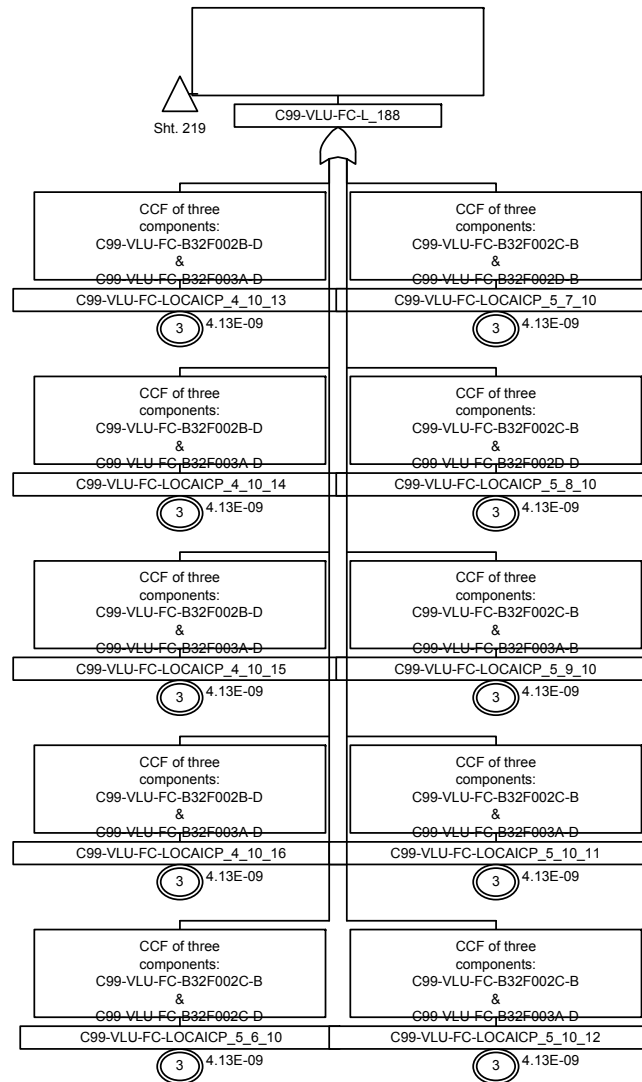


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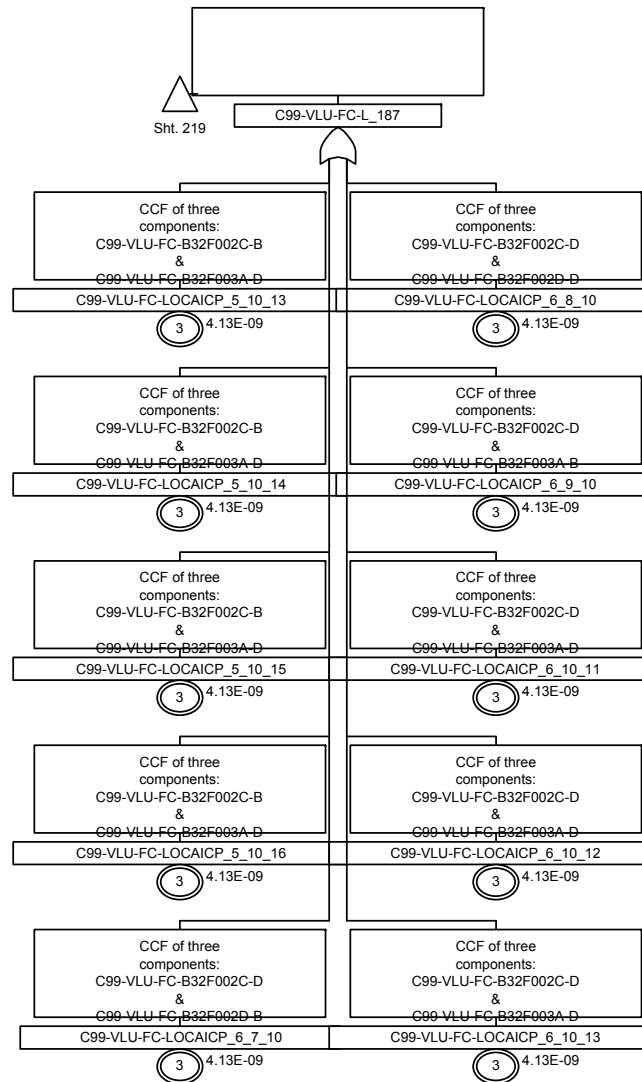


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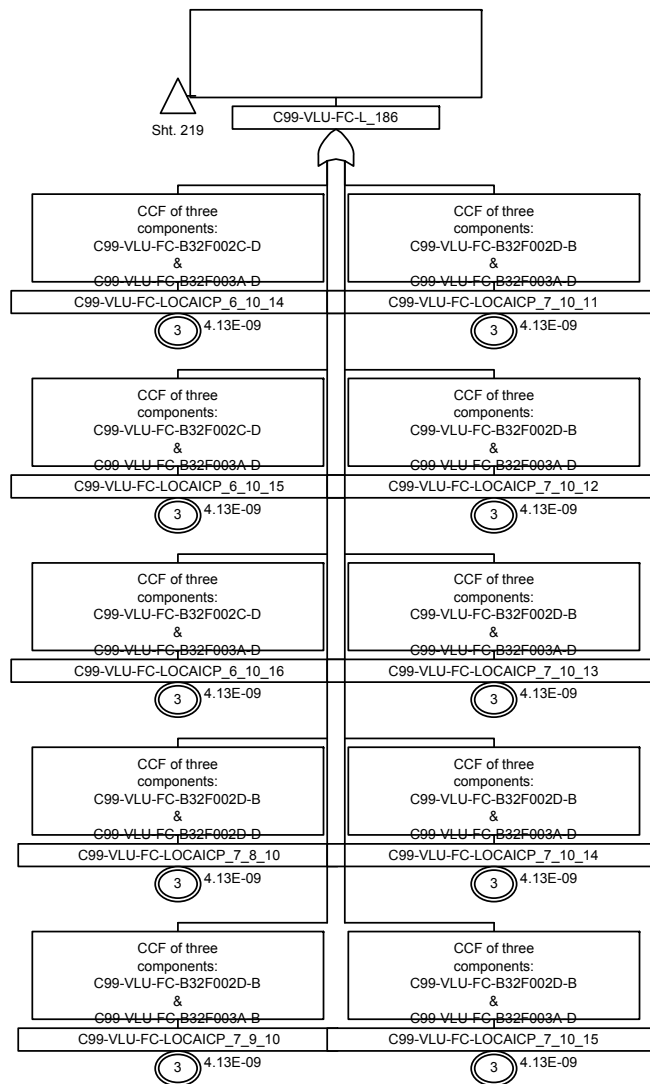


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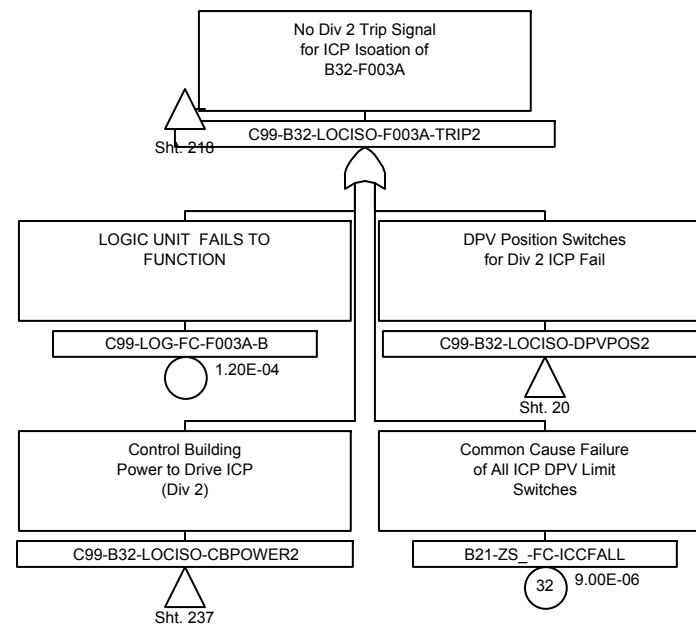


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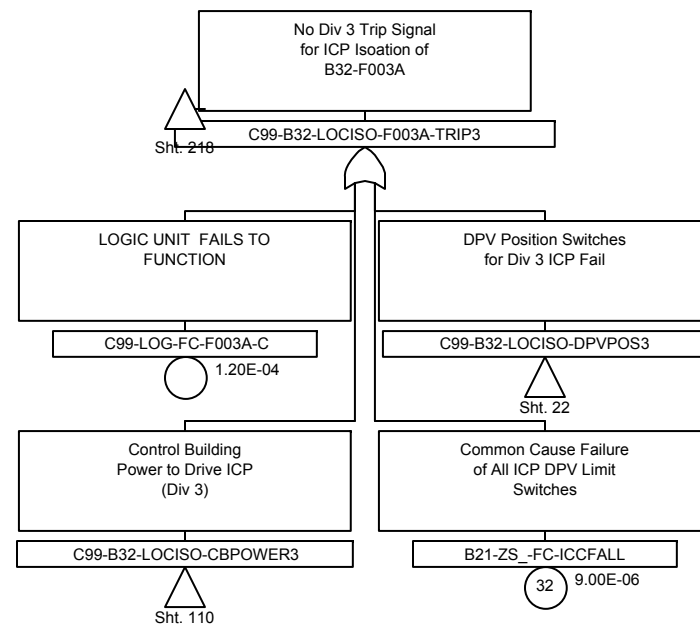


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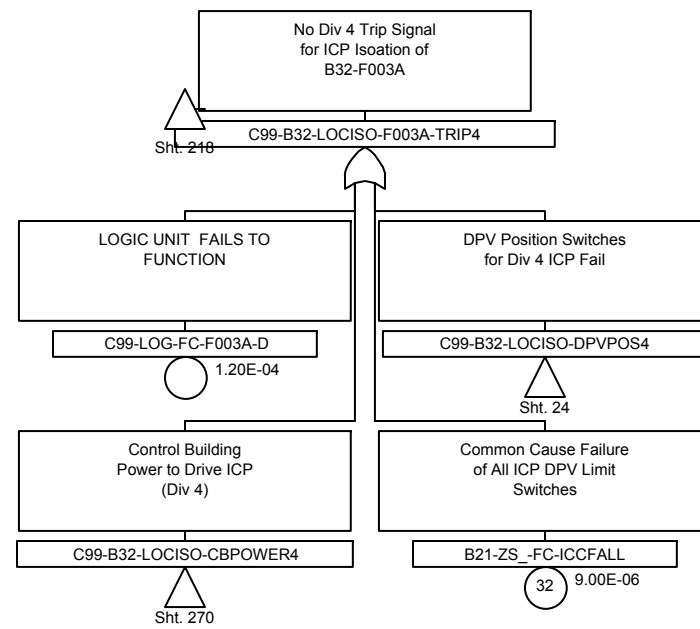


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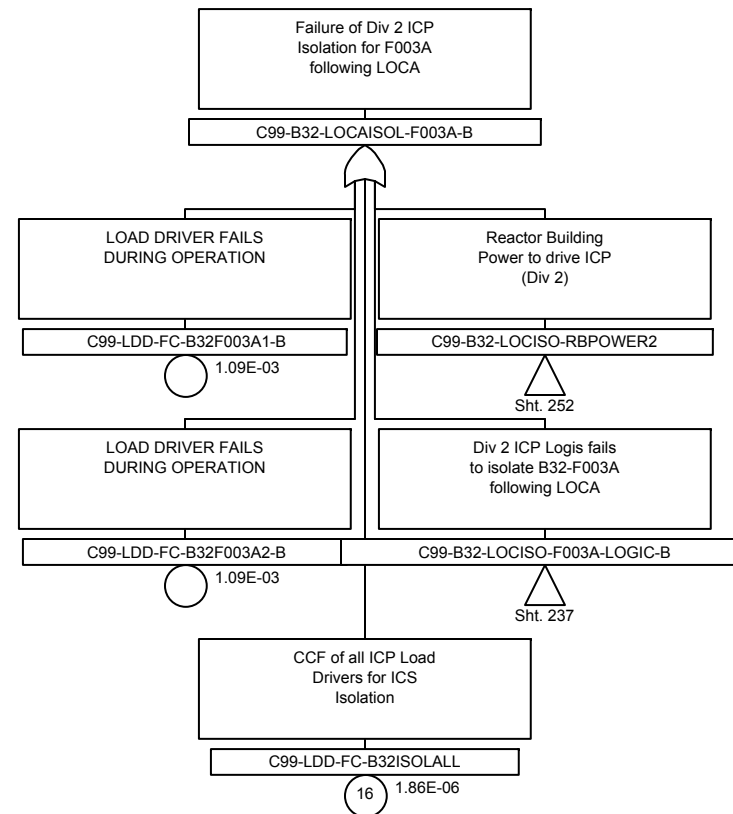


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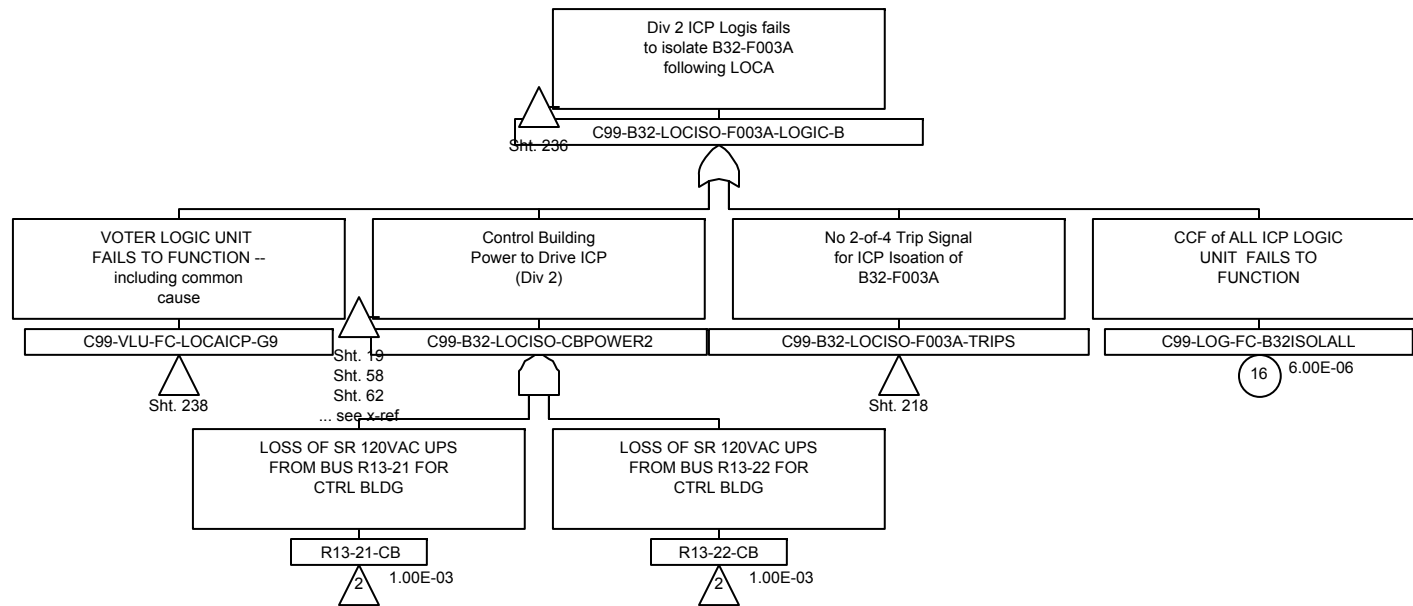


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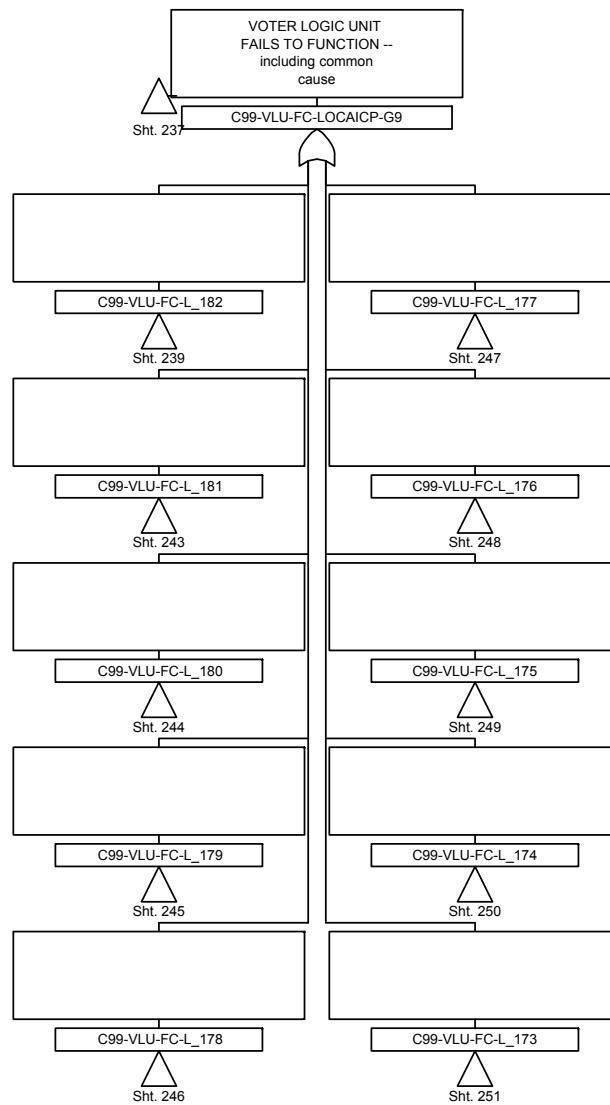


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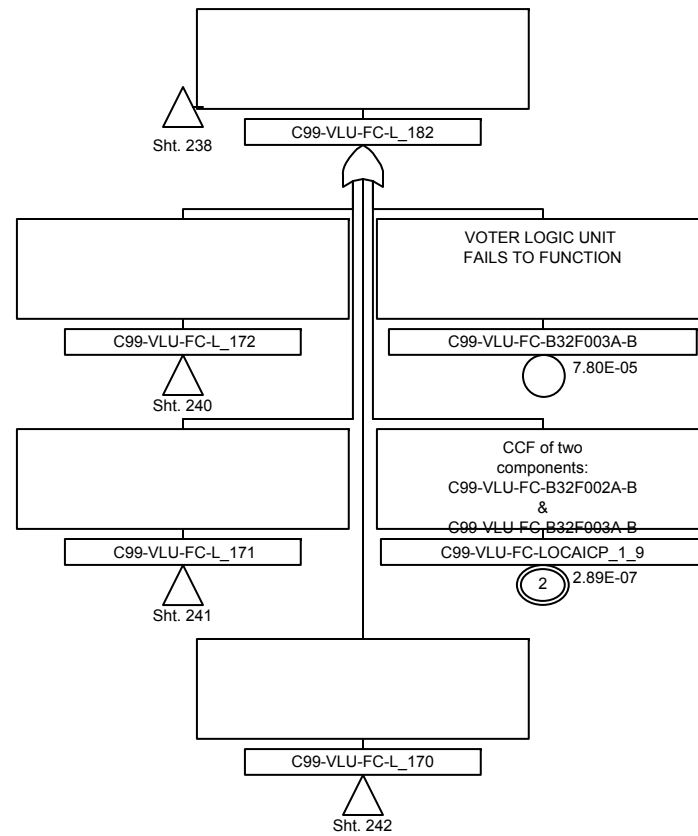


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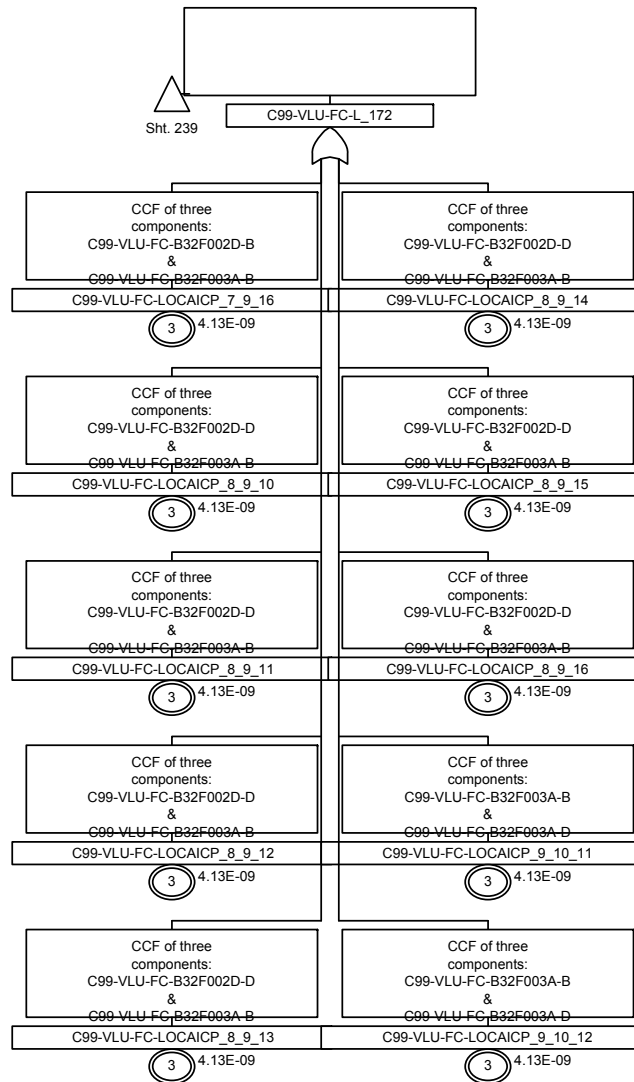


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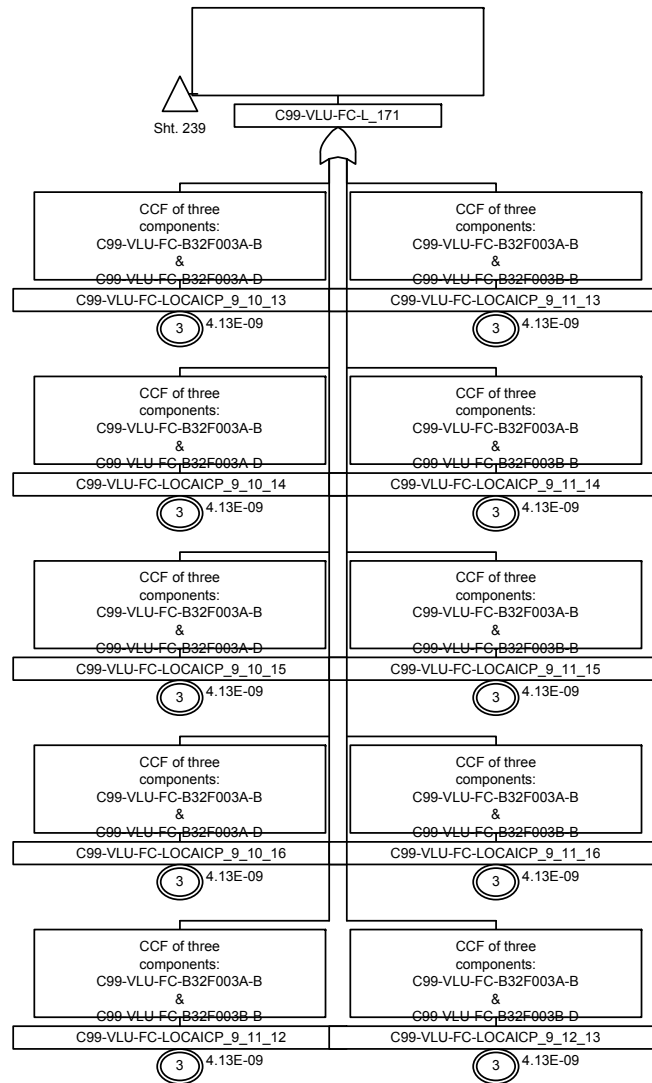


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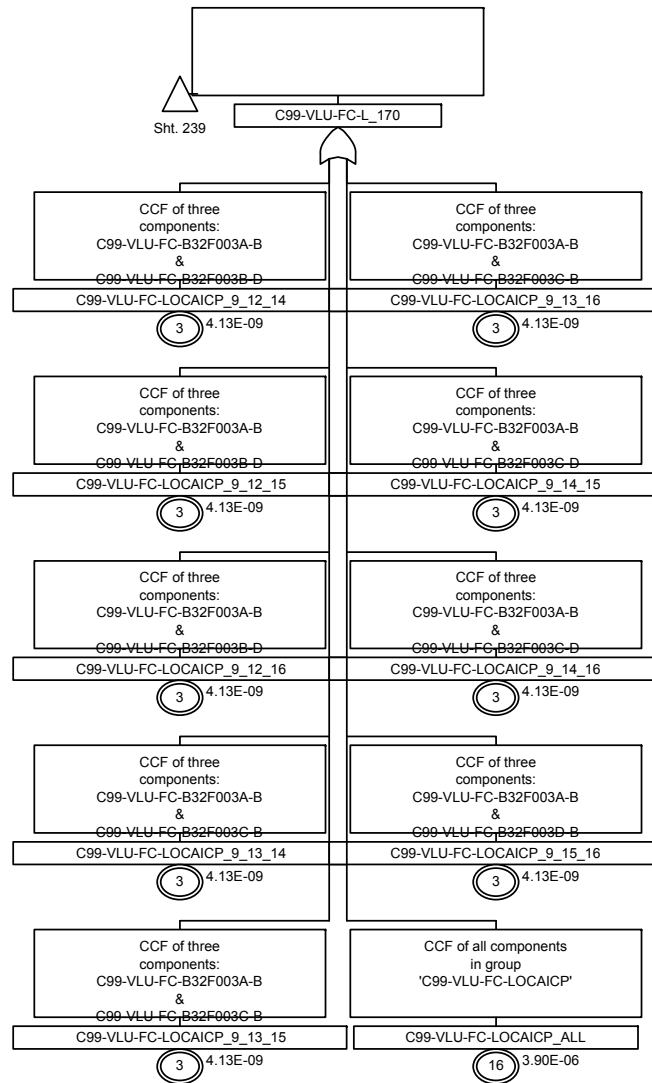


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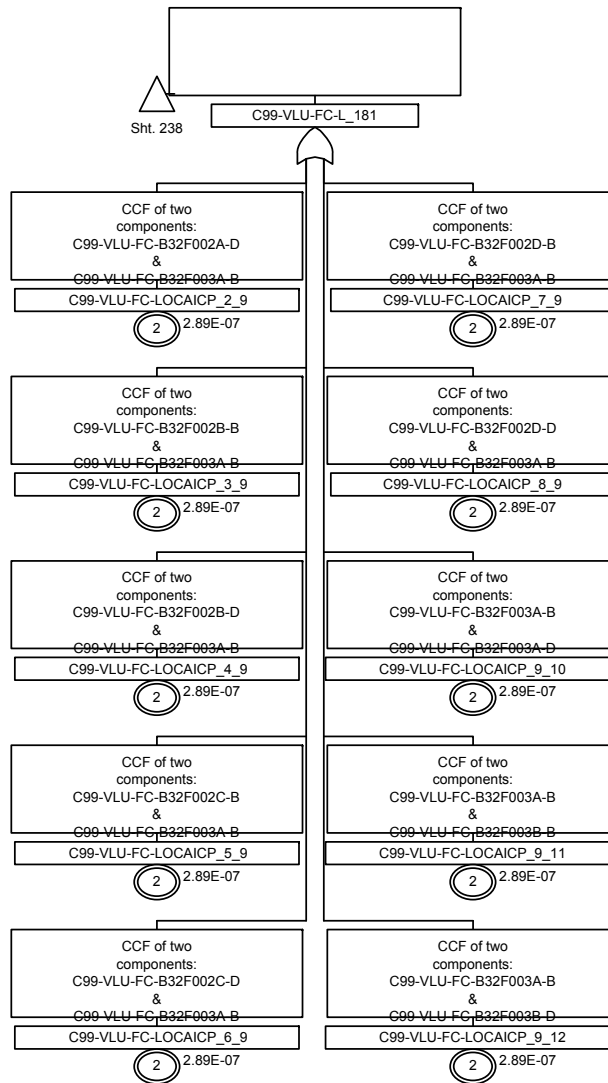


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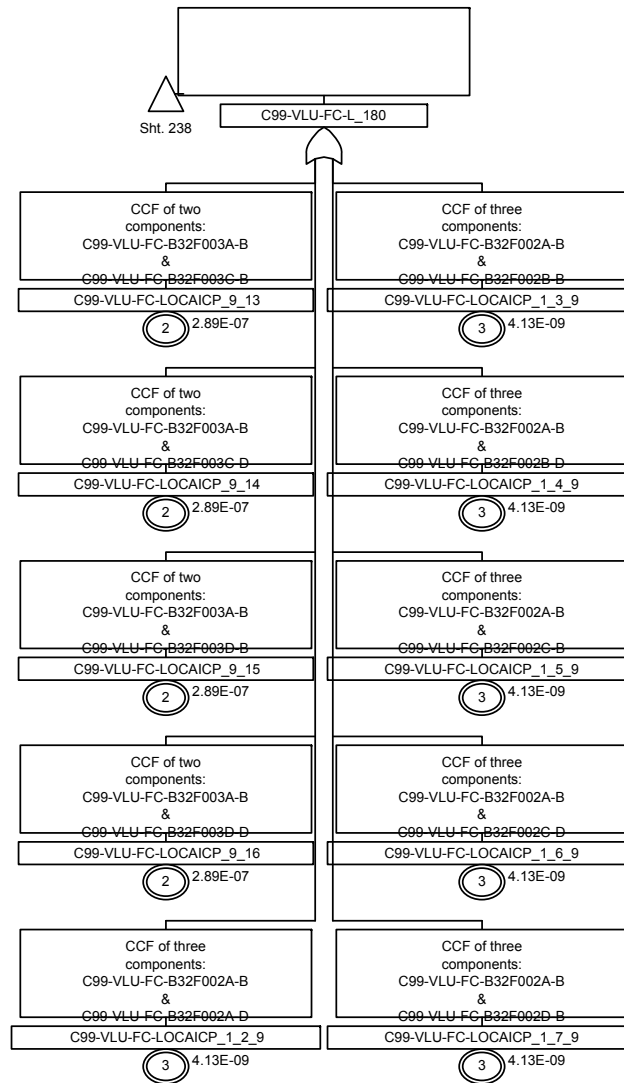


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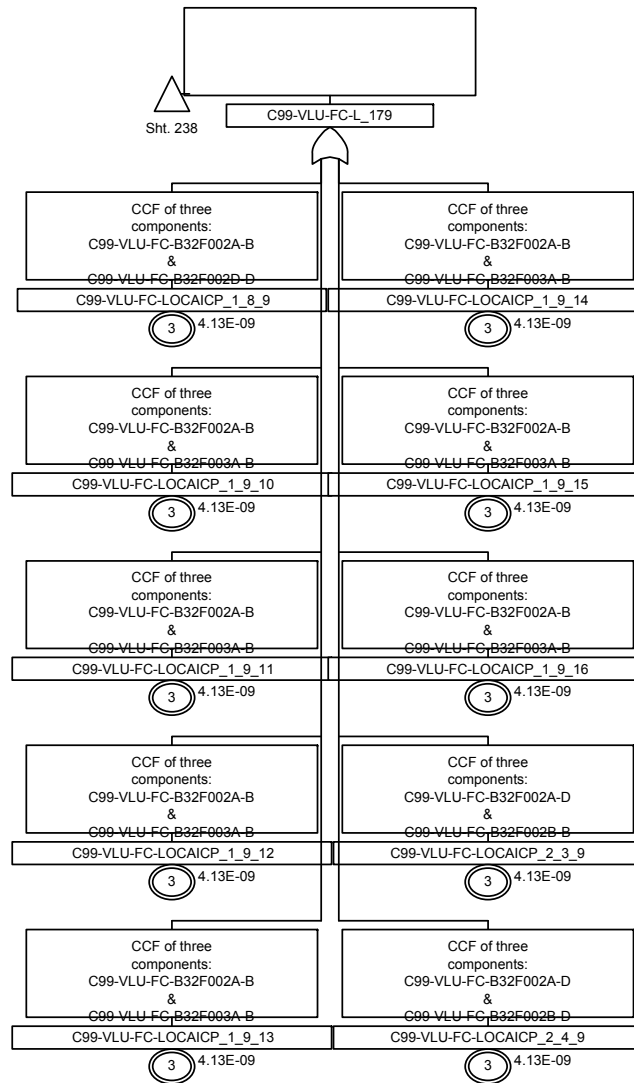


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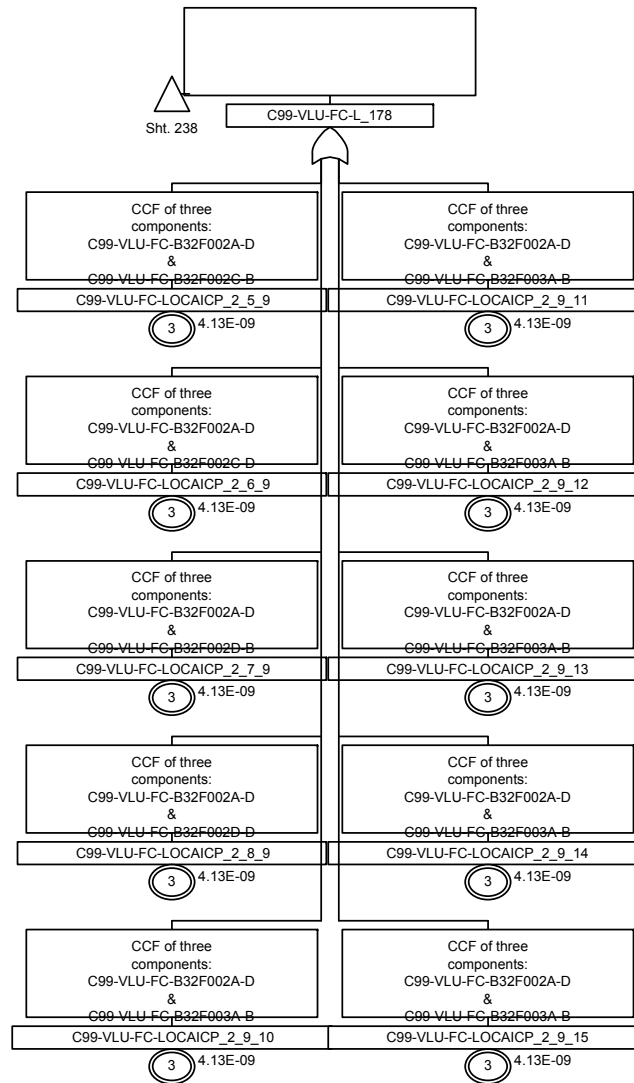


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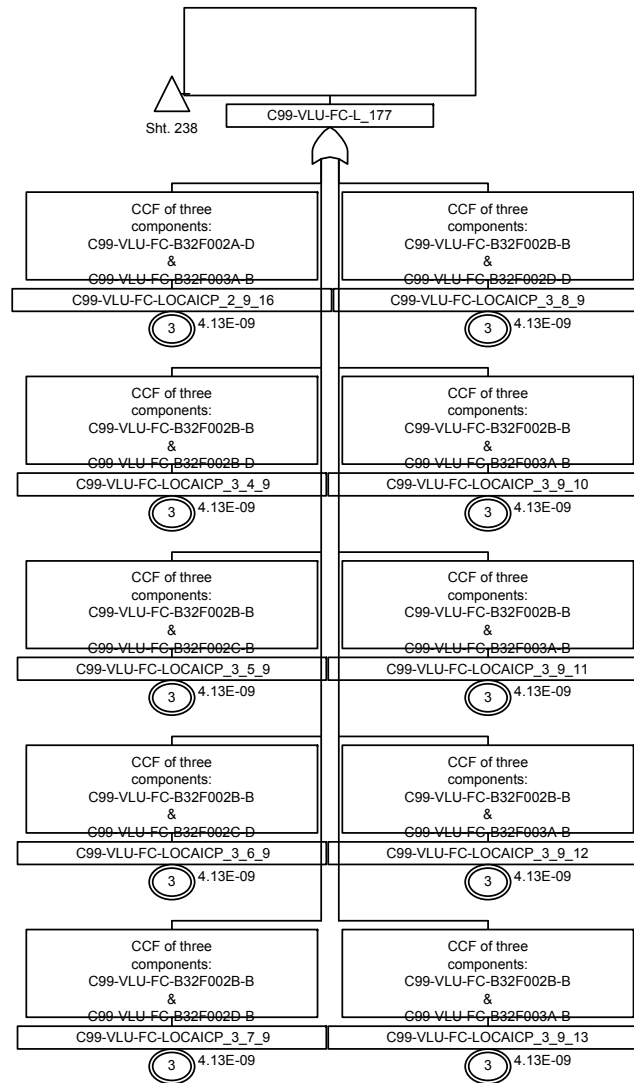


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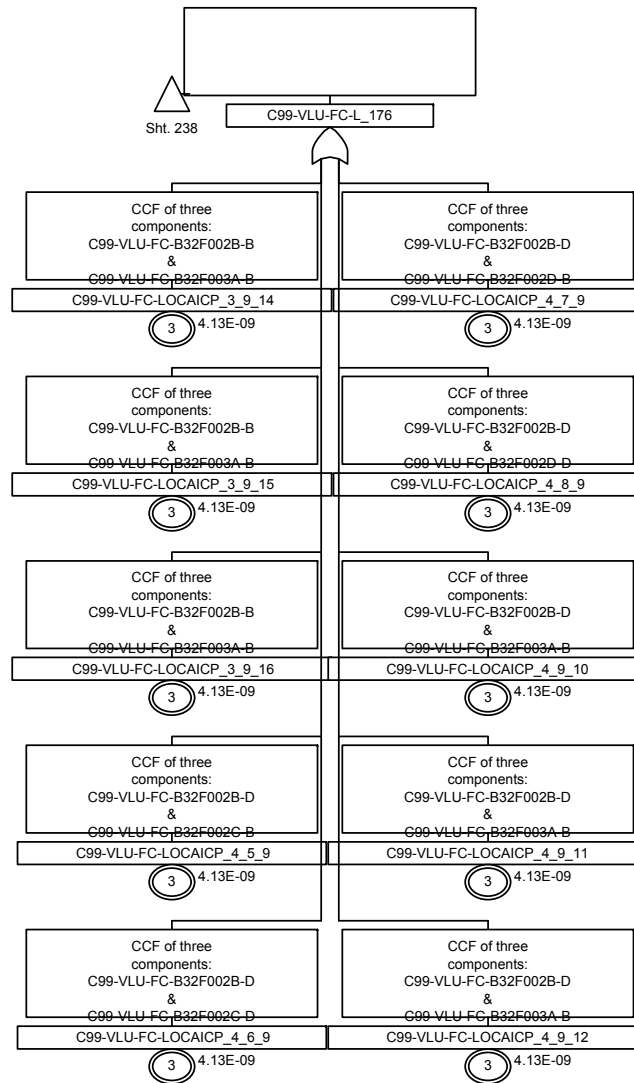


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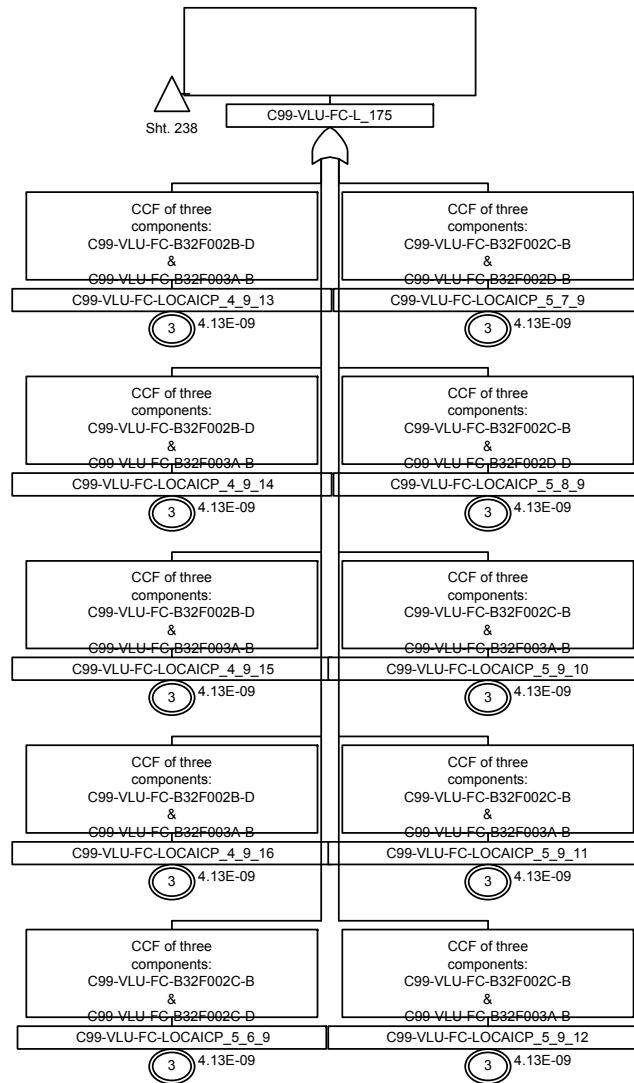


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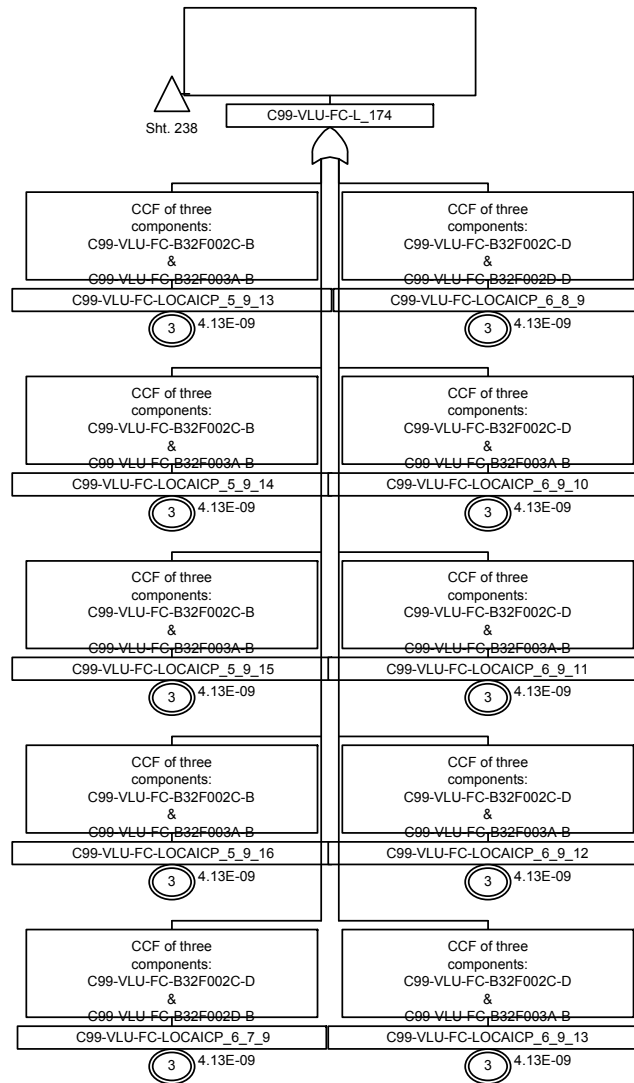


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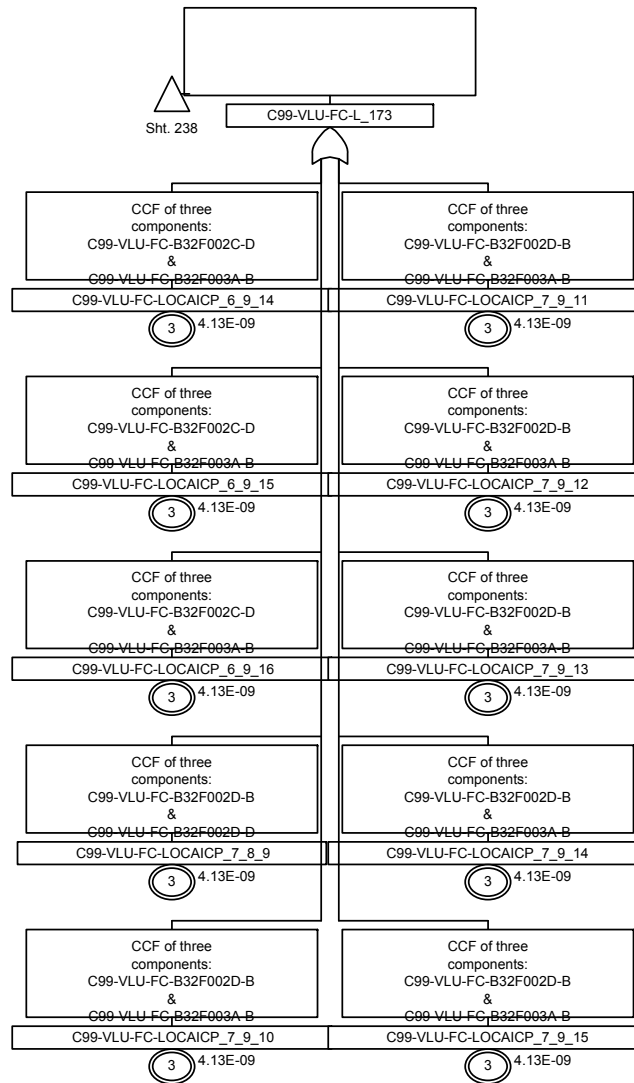


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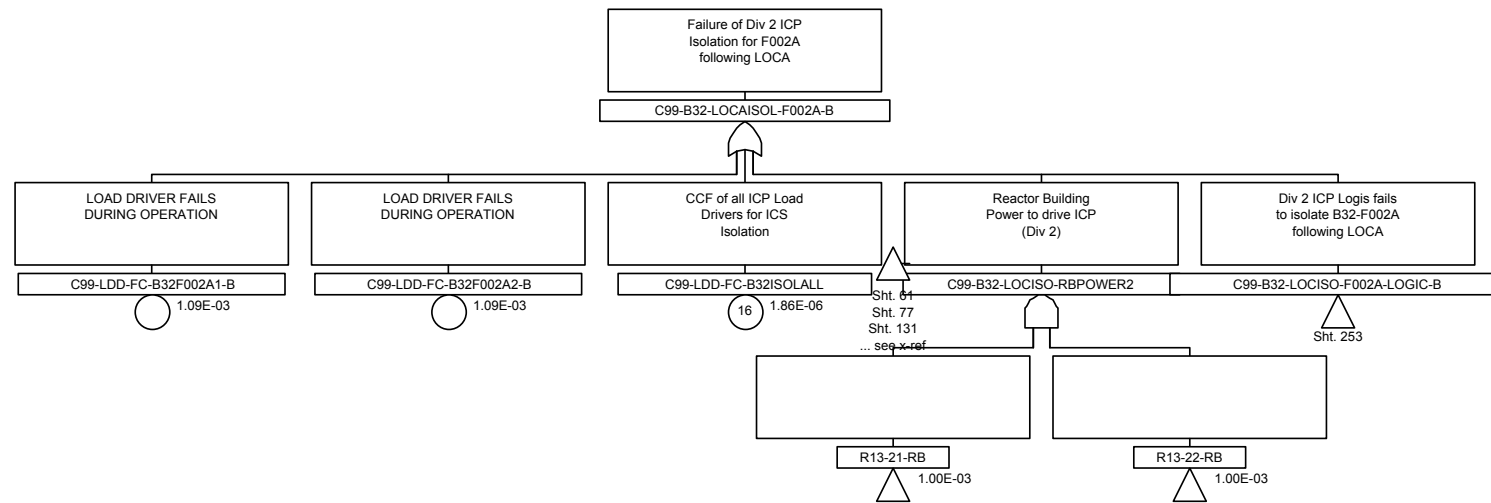


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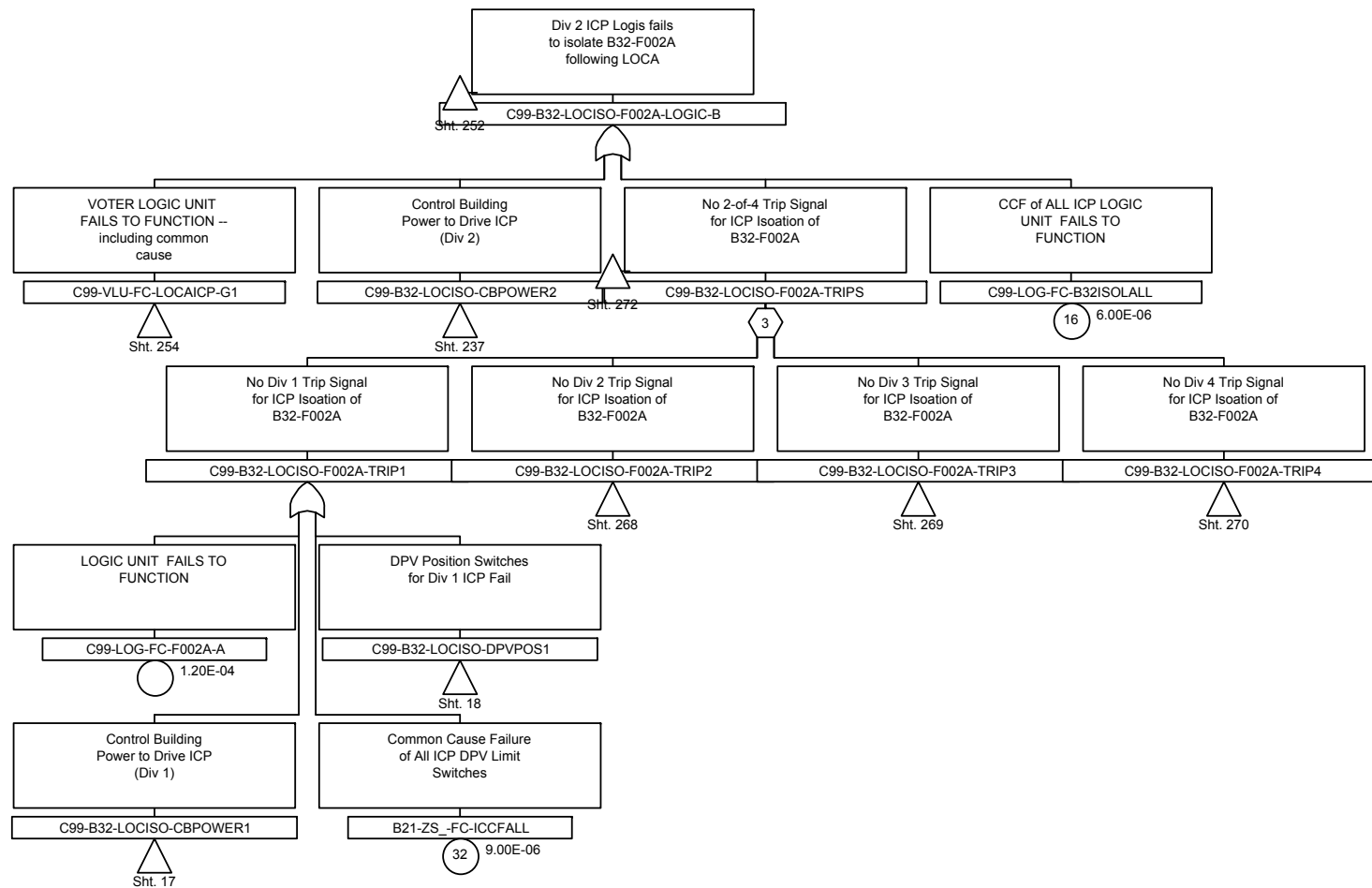


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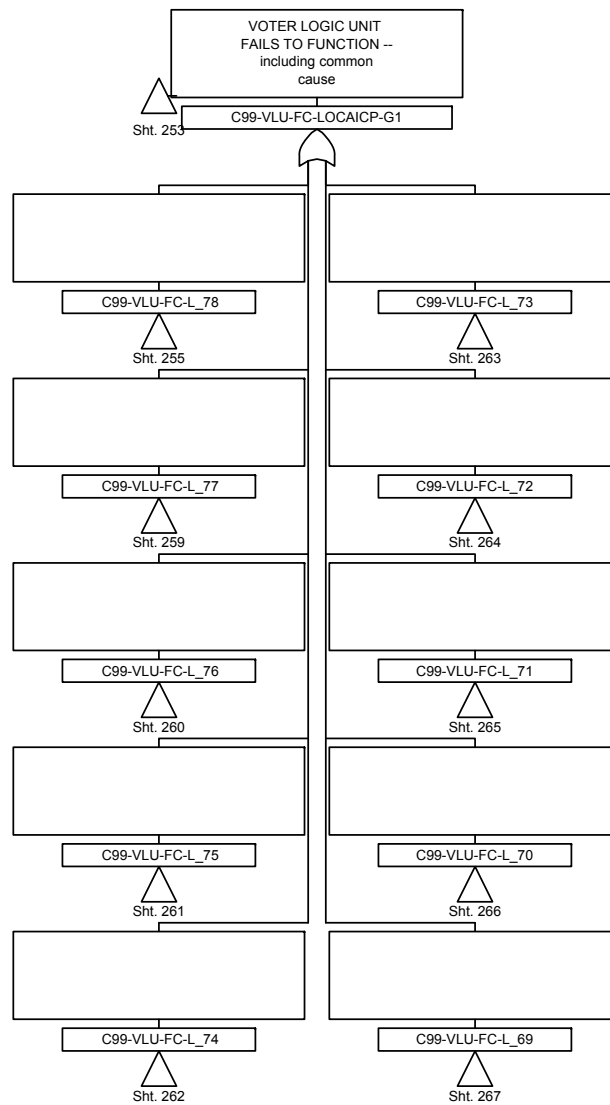


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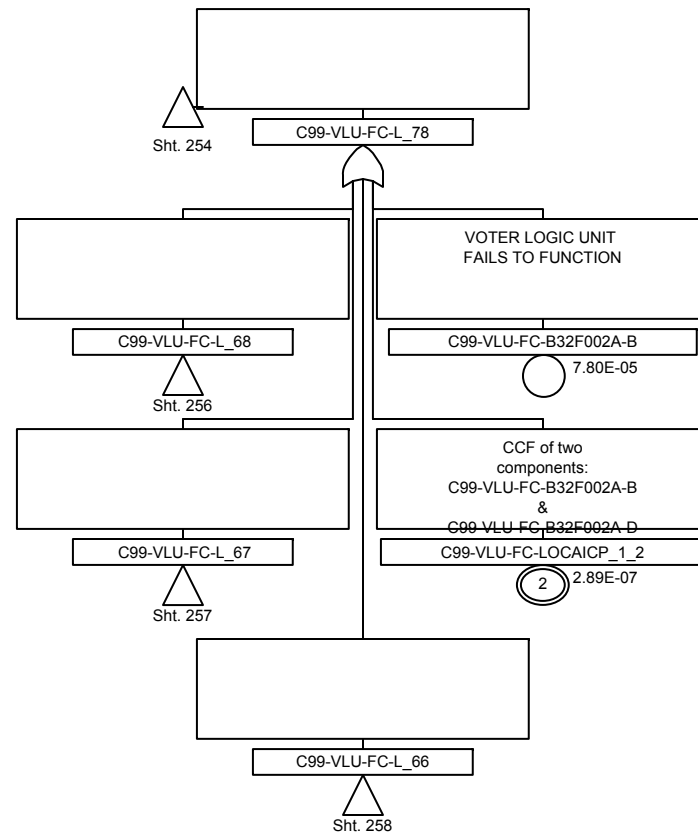


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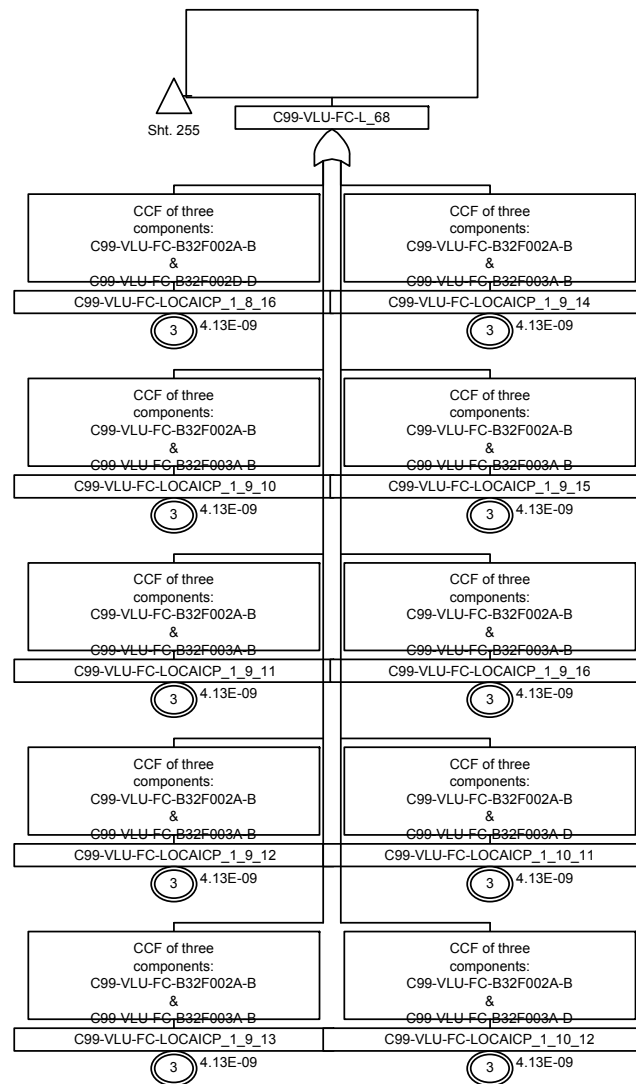


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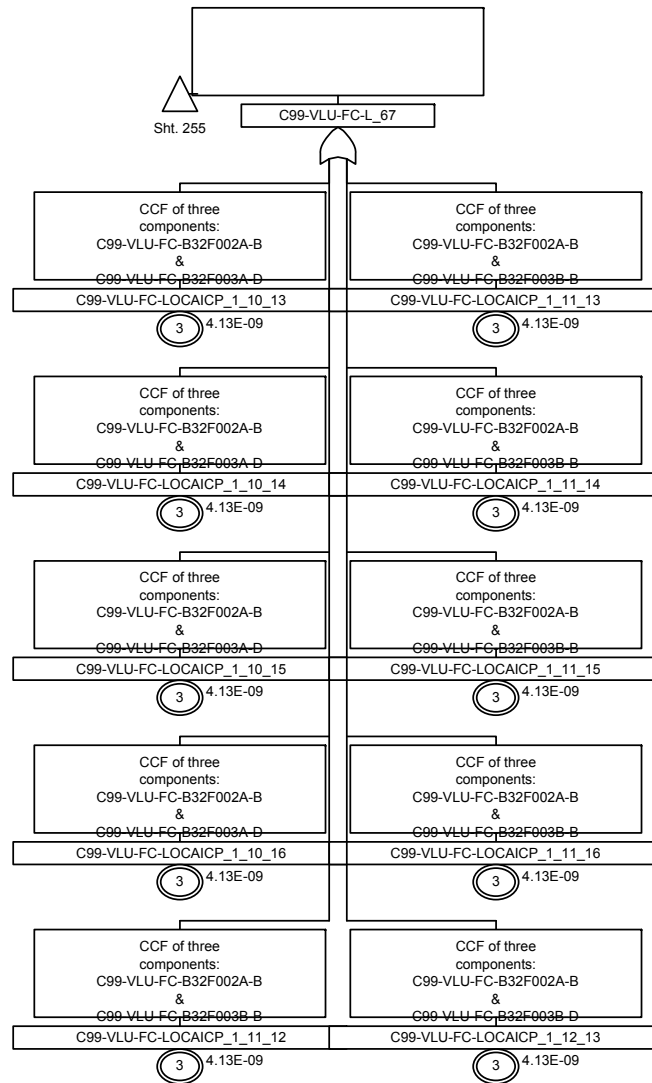


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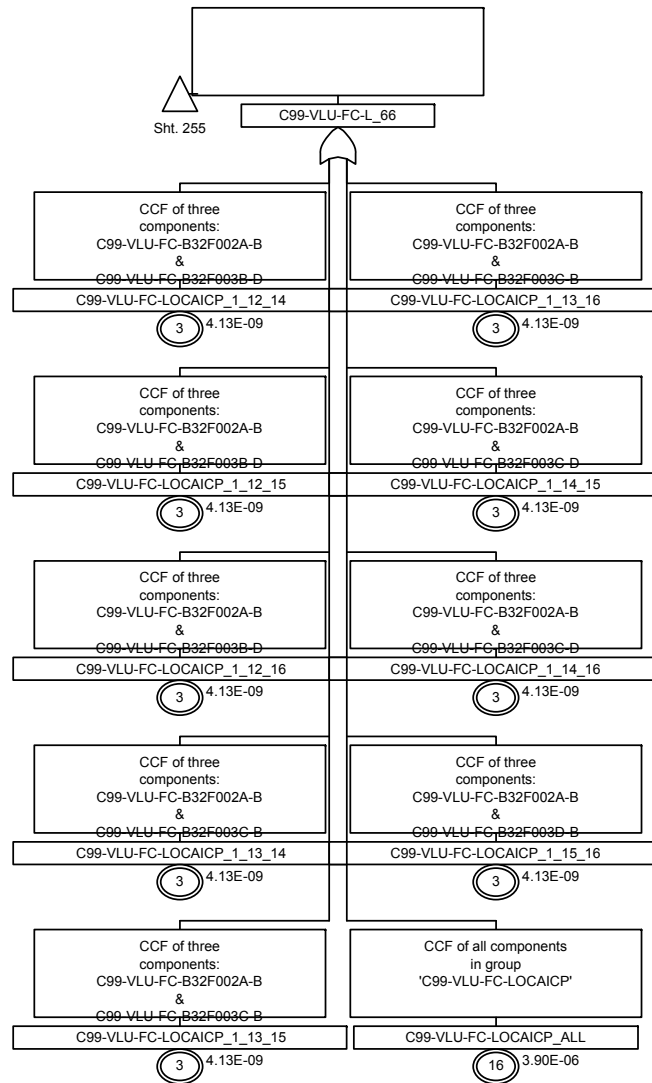


Figure 4.5-3e. Sheet 258 Independent Control Platforms



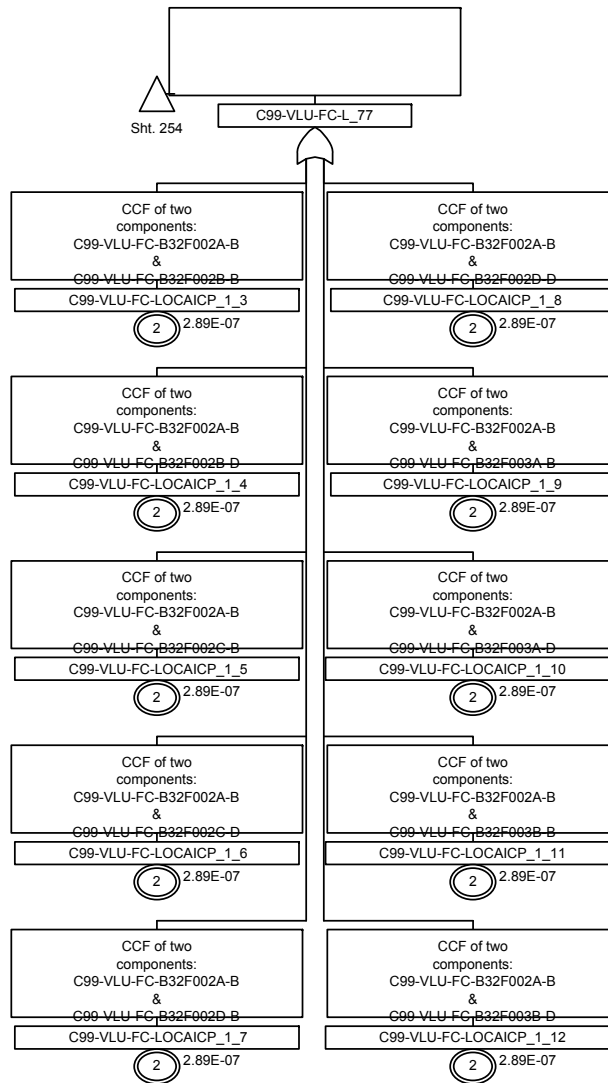


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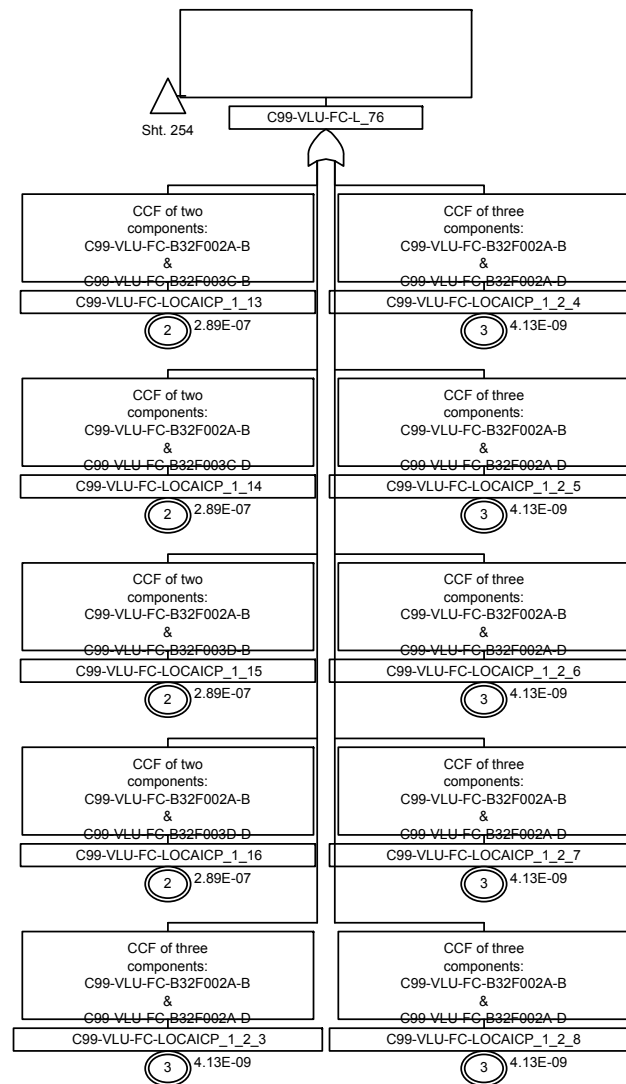


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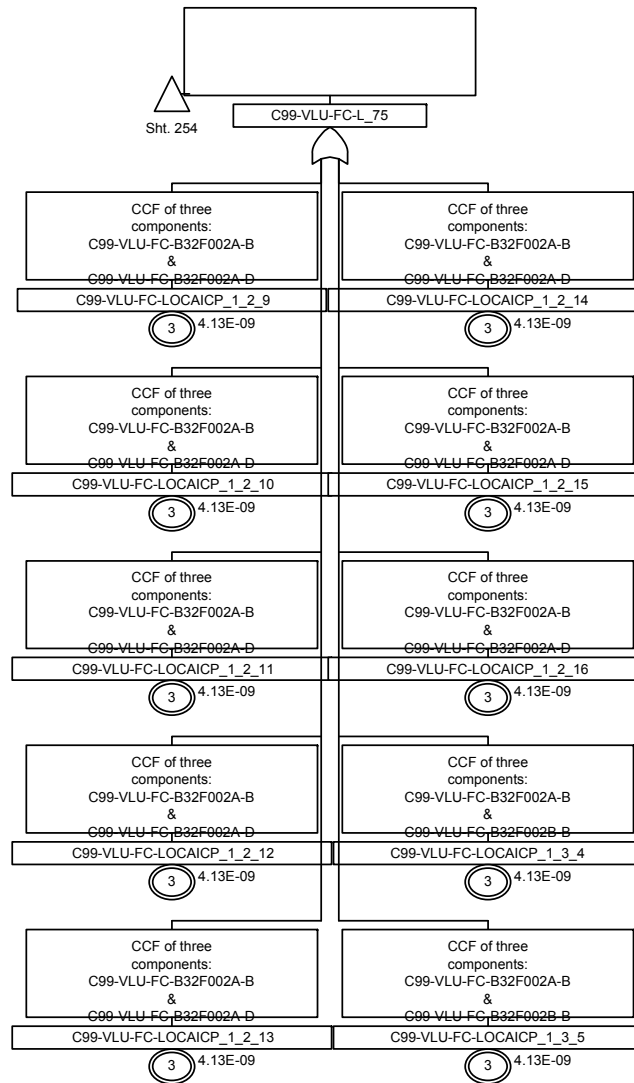


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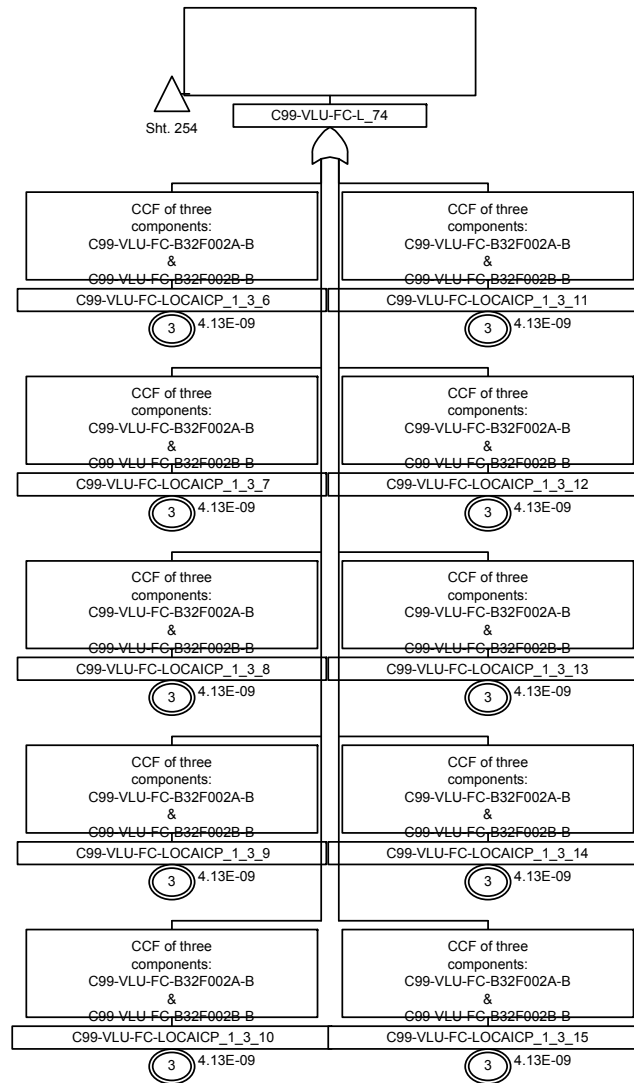


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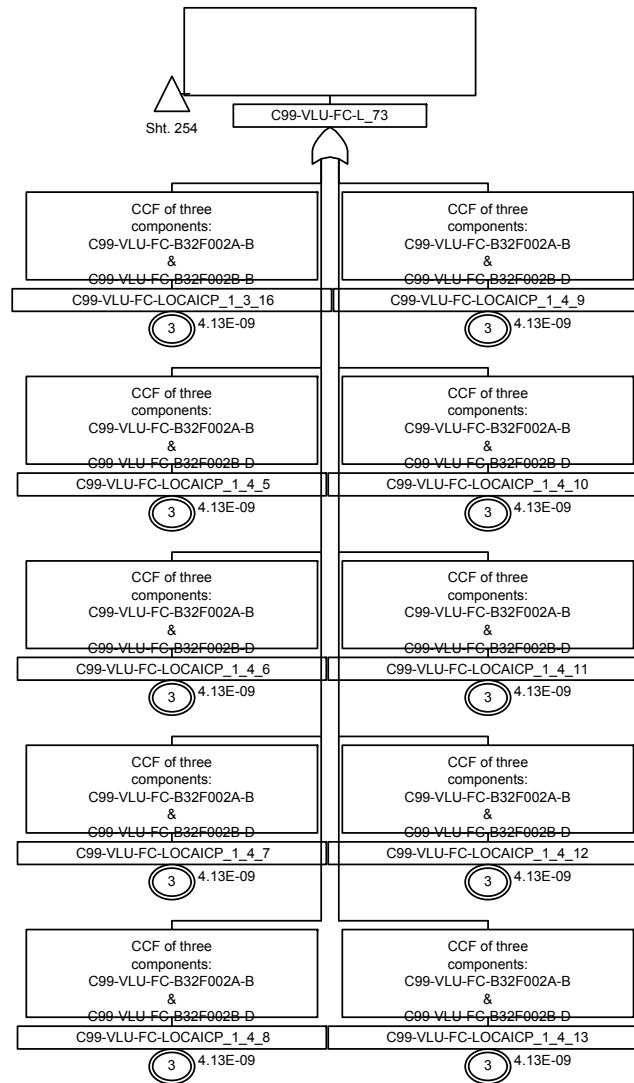


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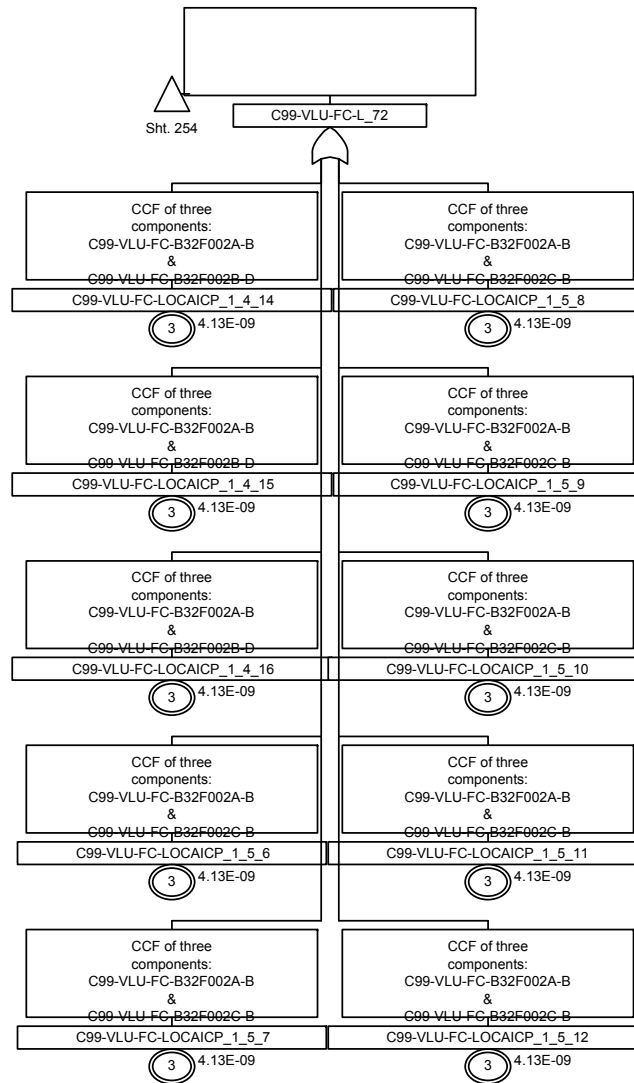


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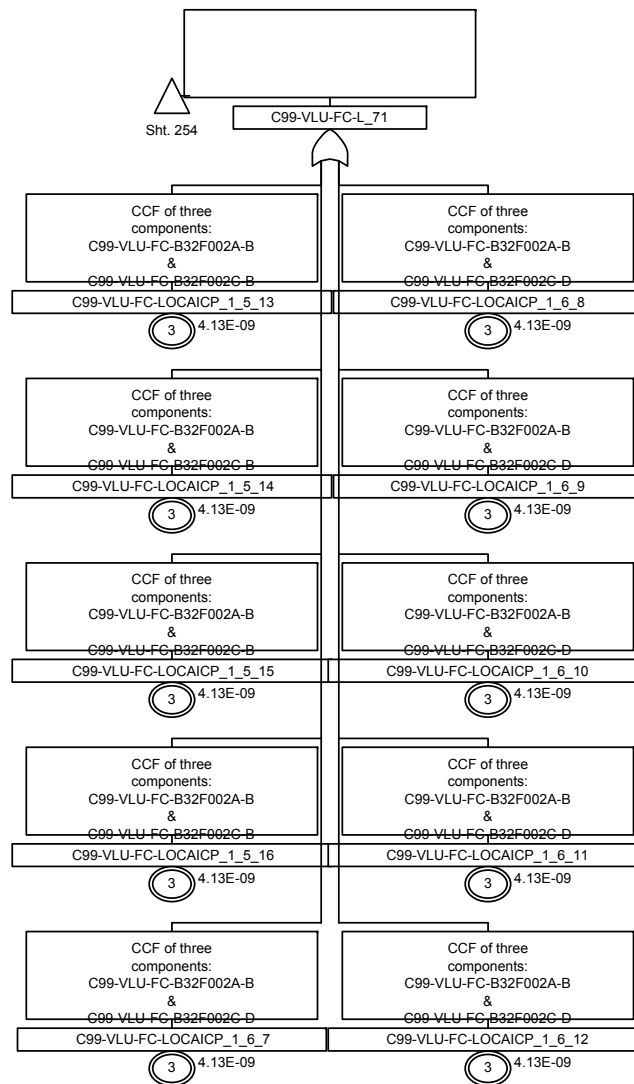


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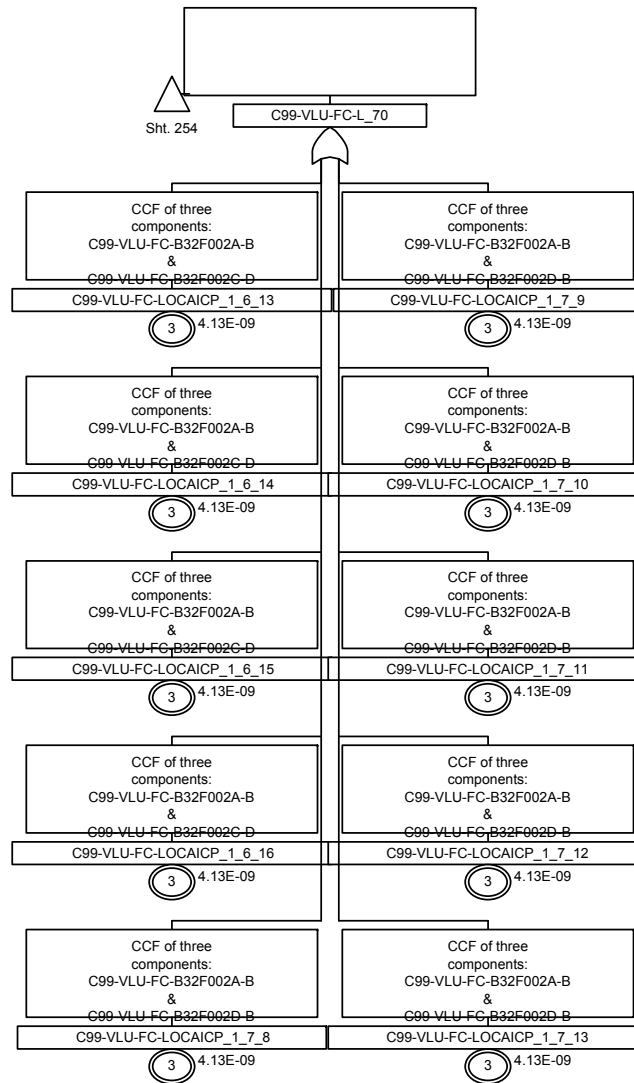


Figure 4.5-3e. Sheet 266 Independent Control Platforms



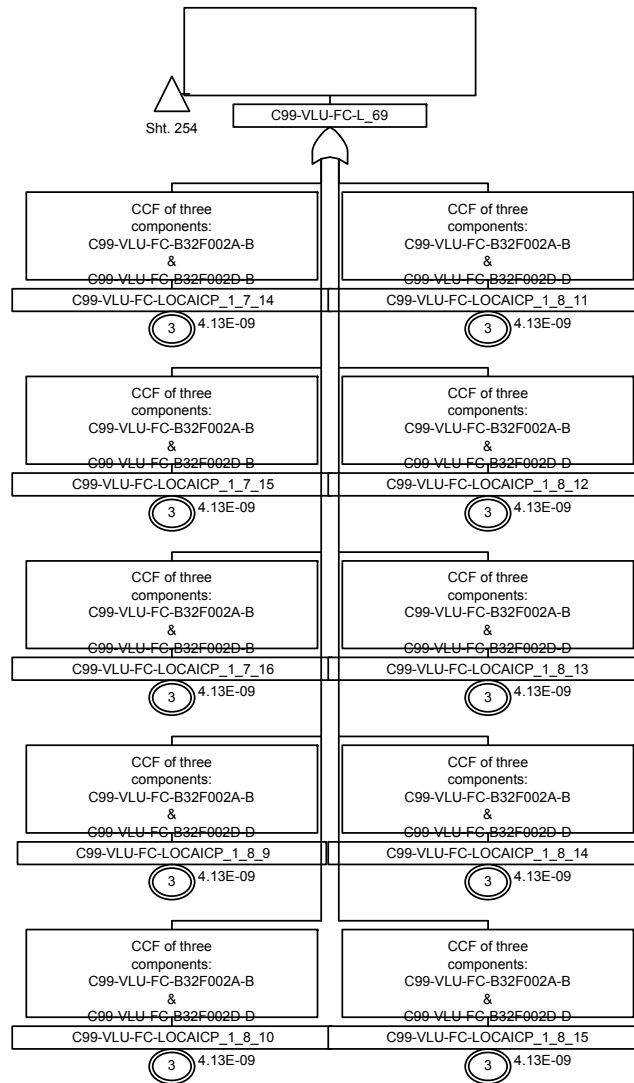


Figure 4.5-3e. Sheet 267 Independent Control Platforms

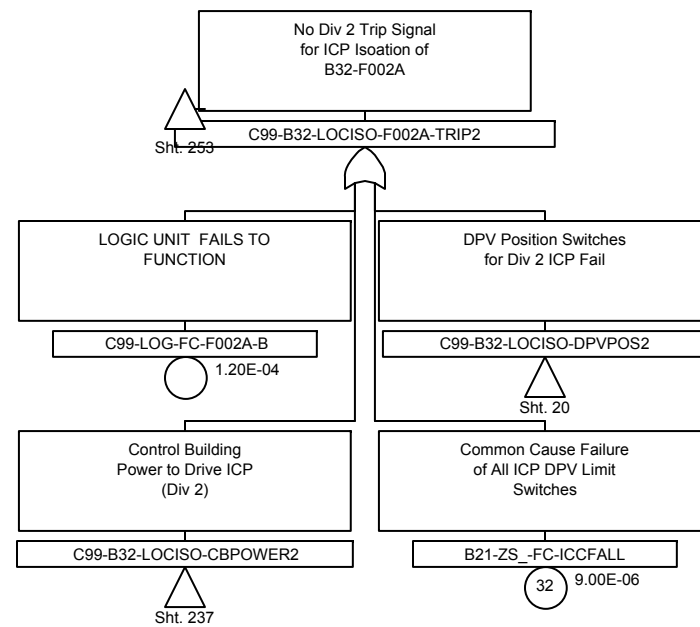


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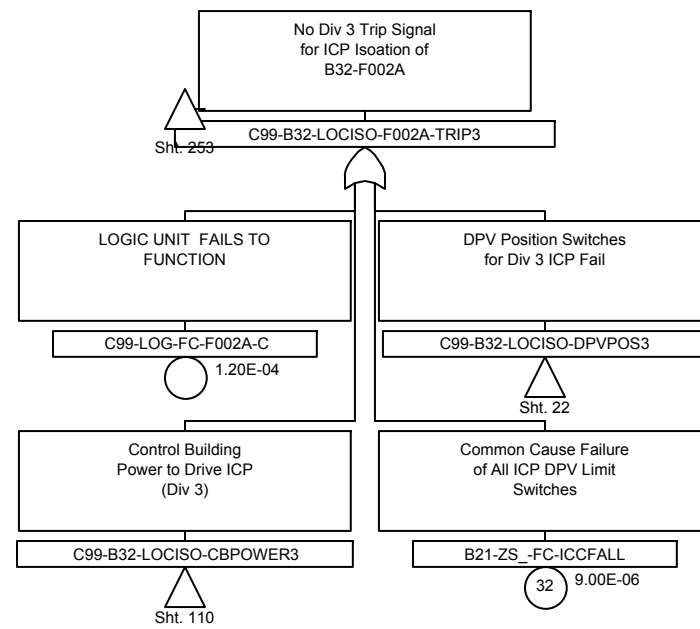


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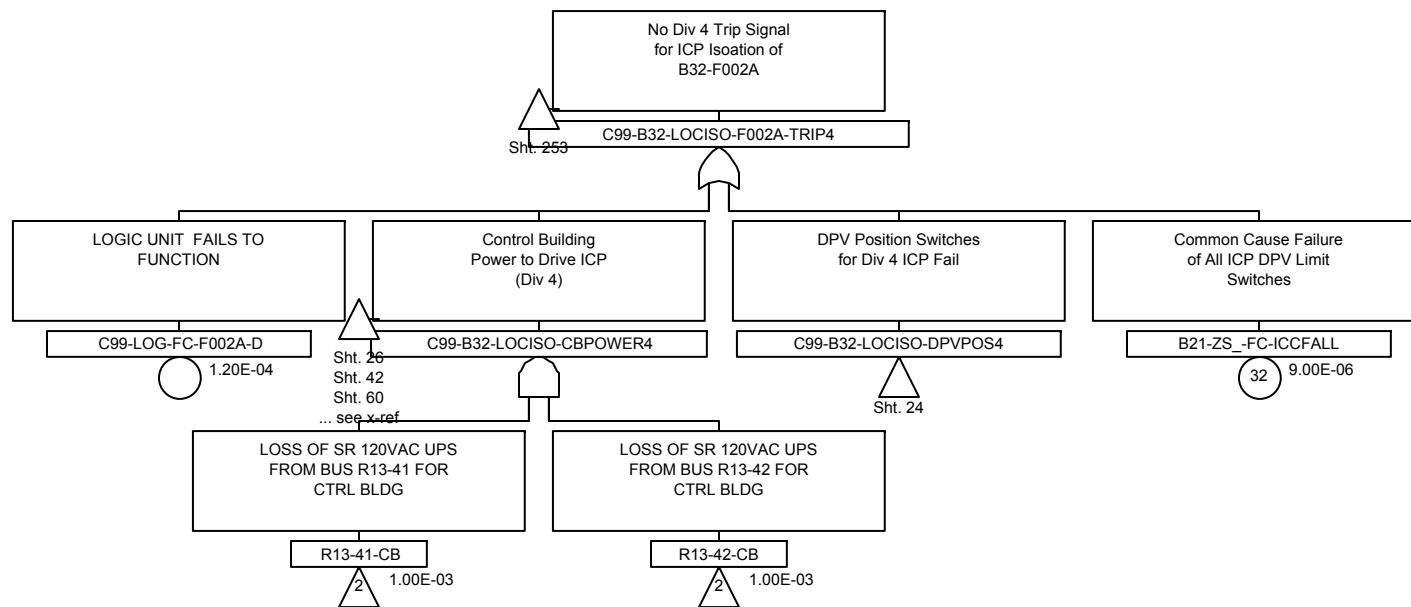


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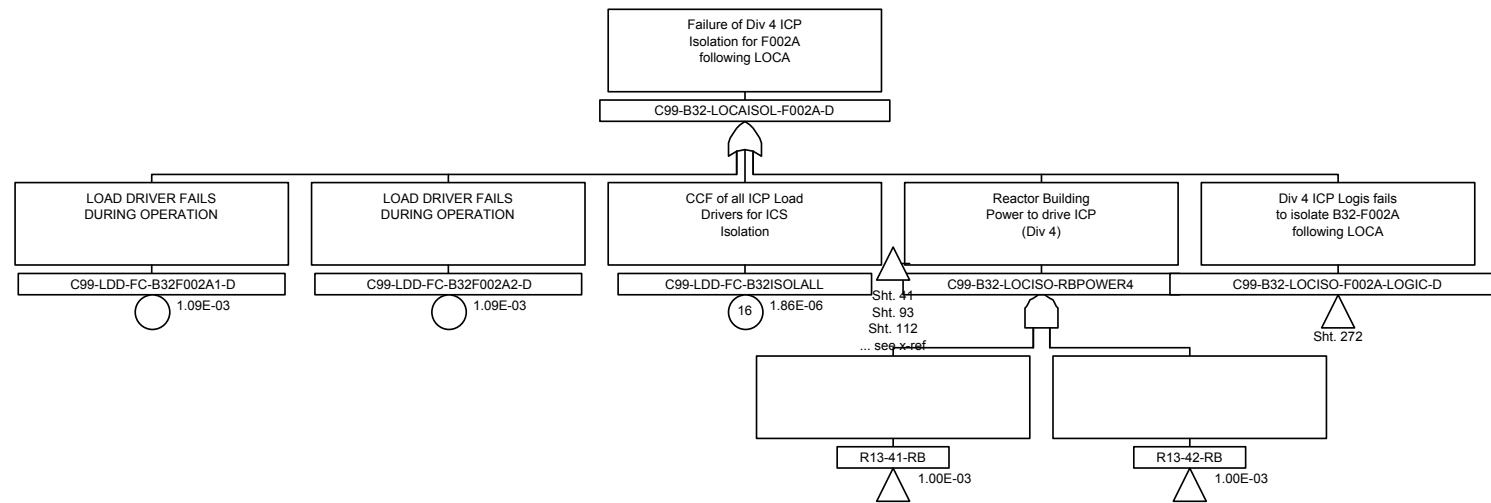


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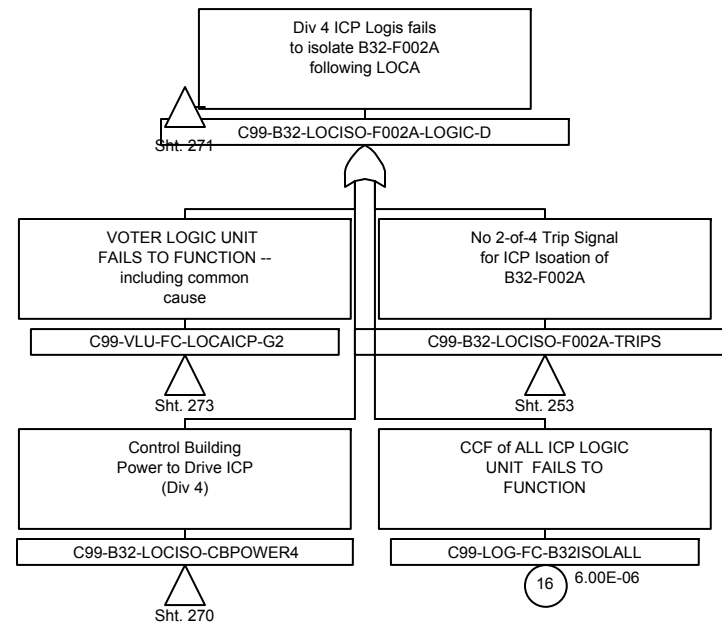


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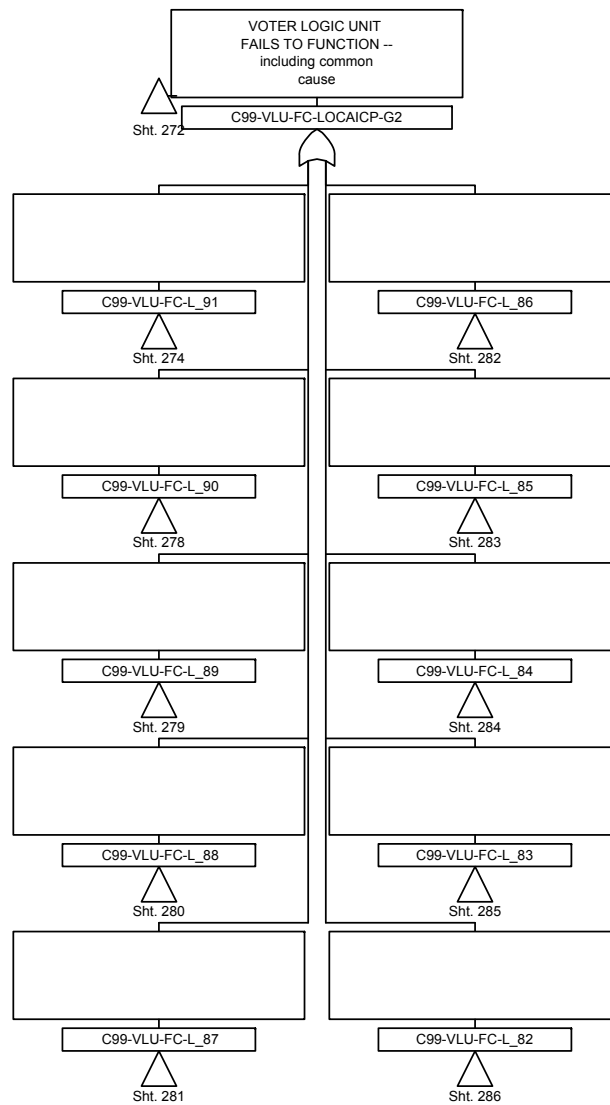


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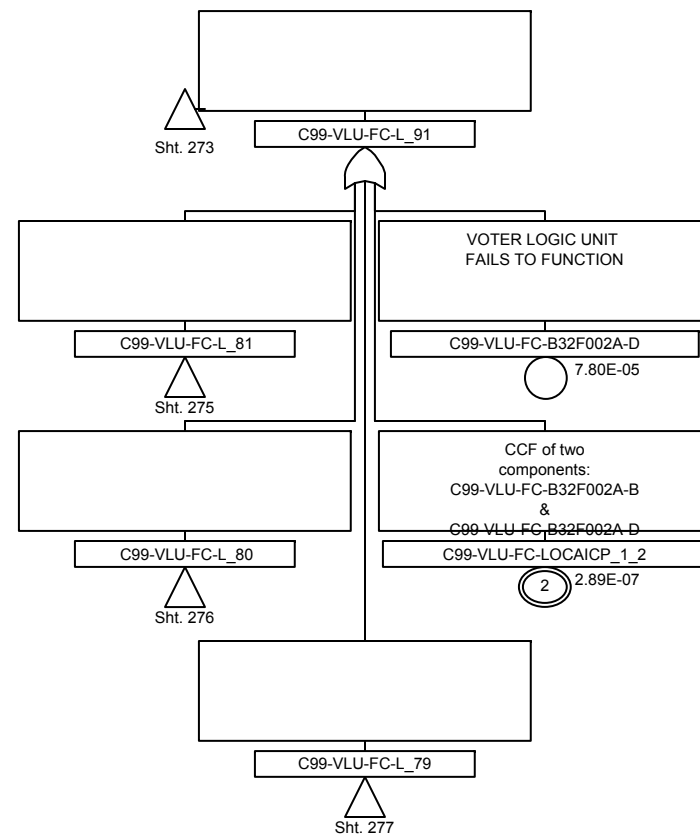


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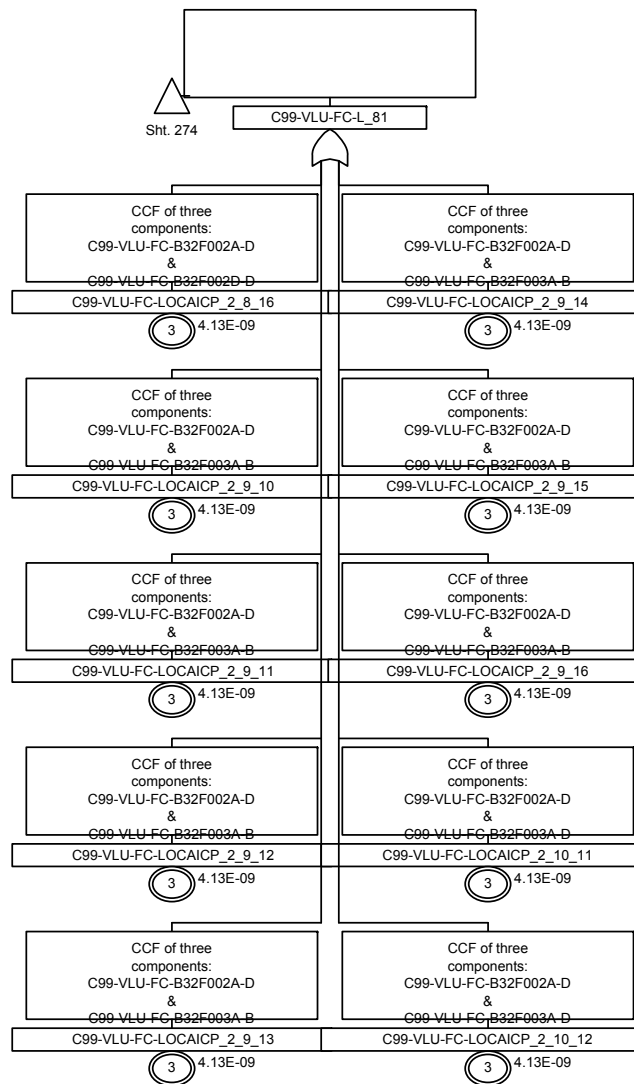


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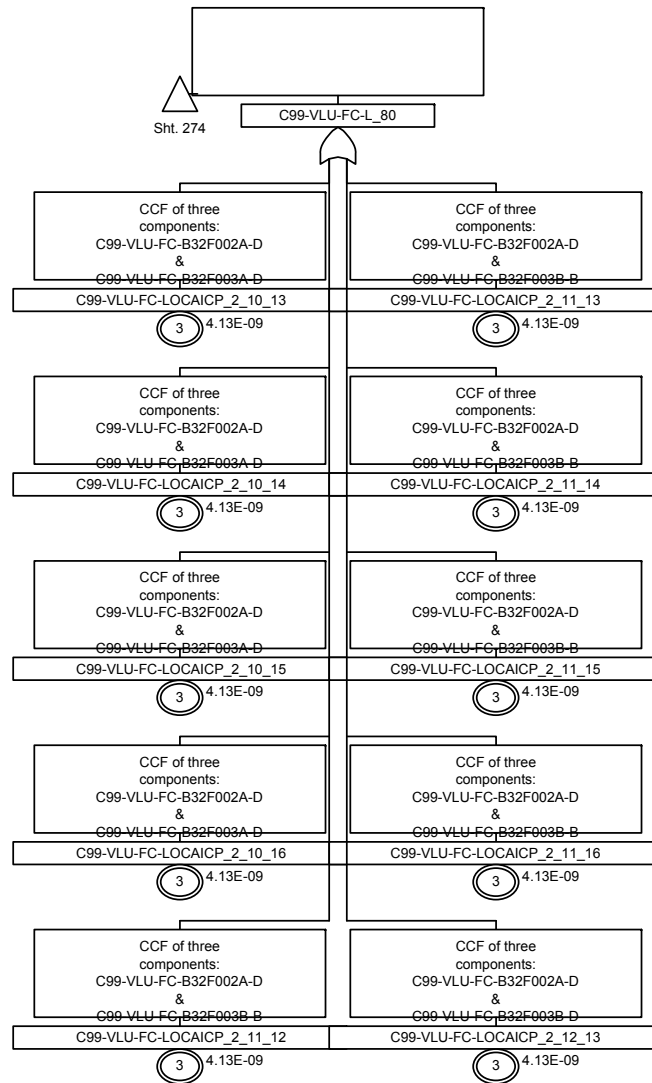


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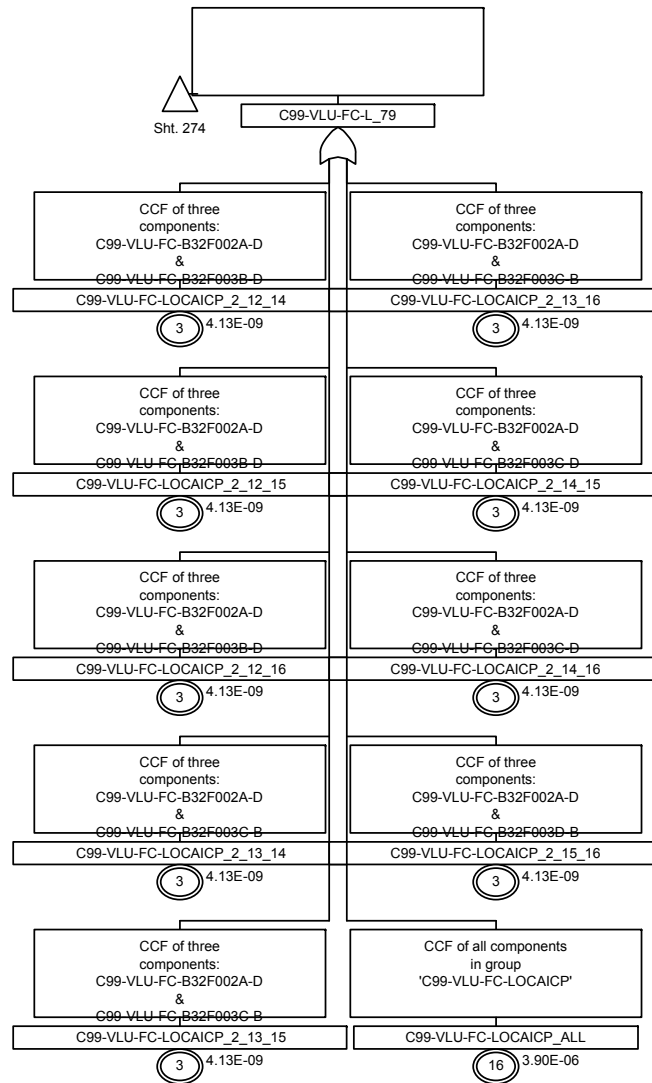


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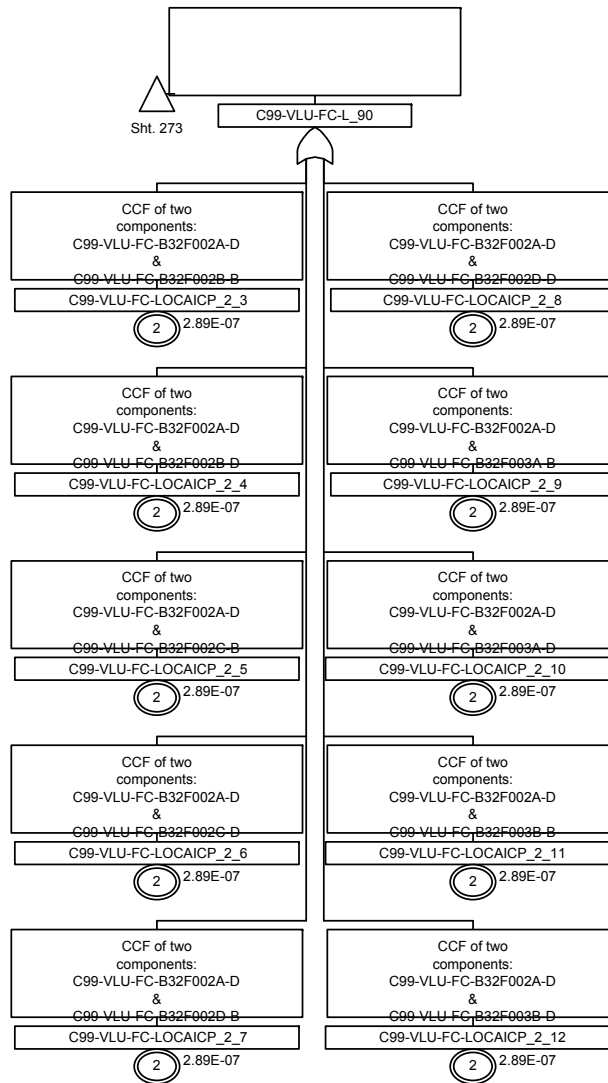


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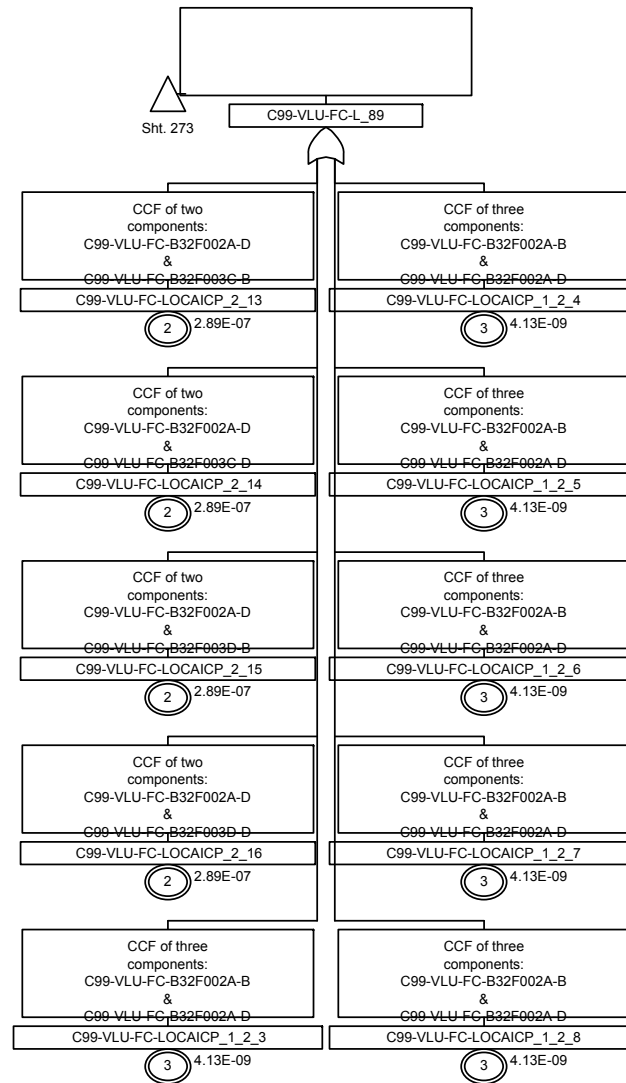


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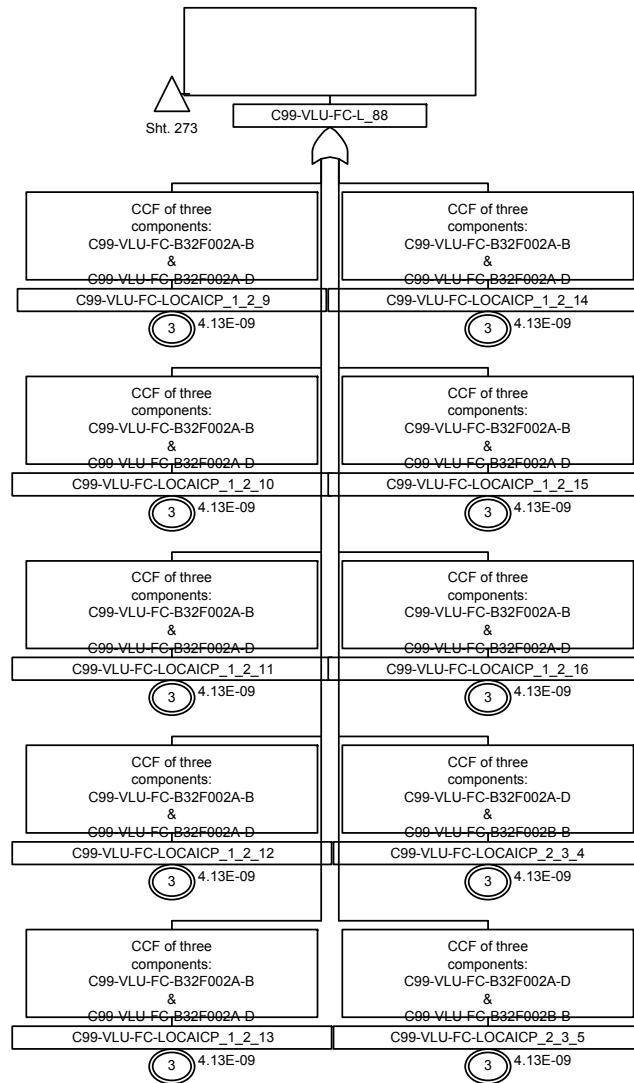


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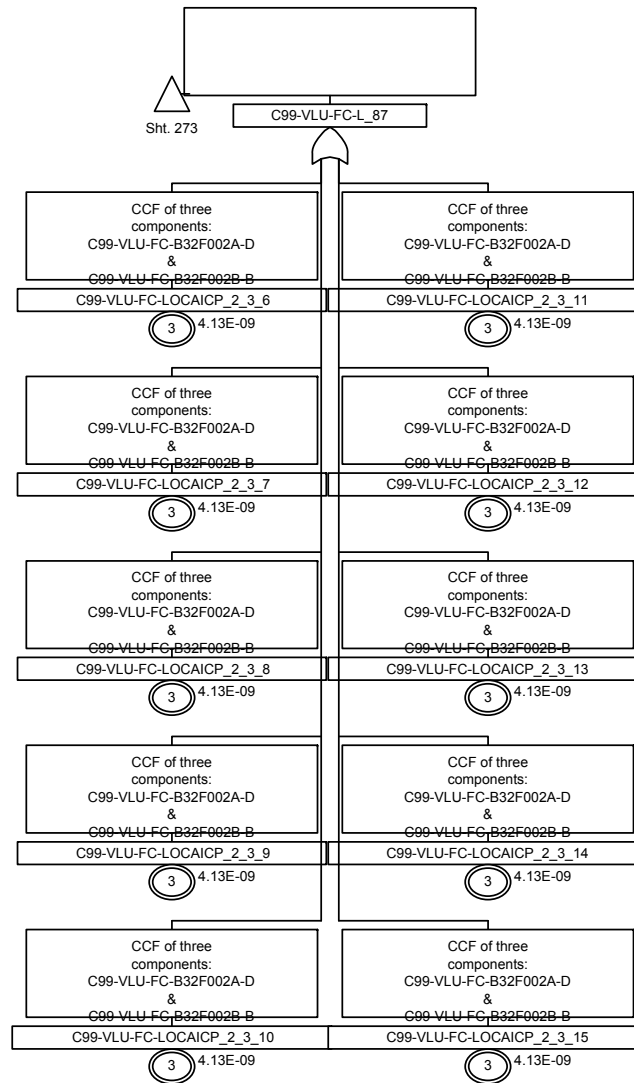


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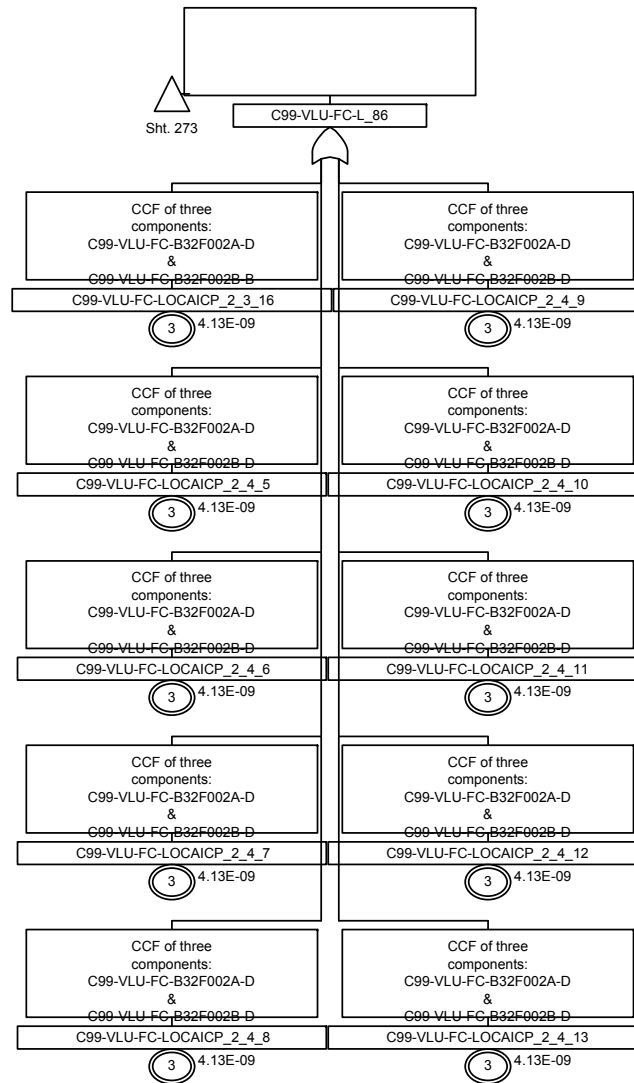


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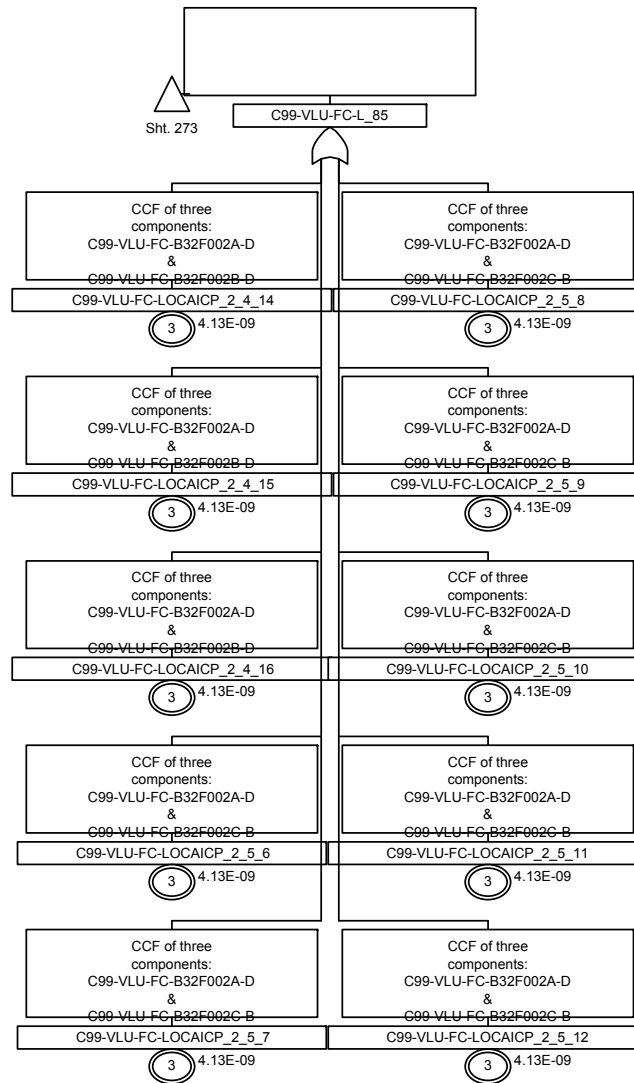


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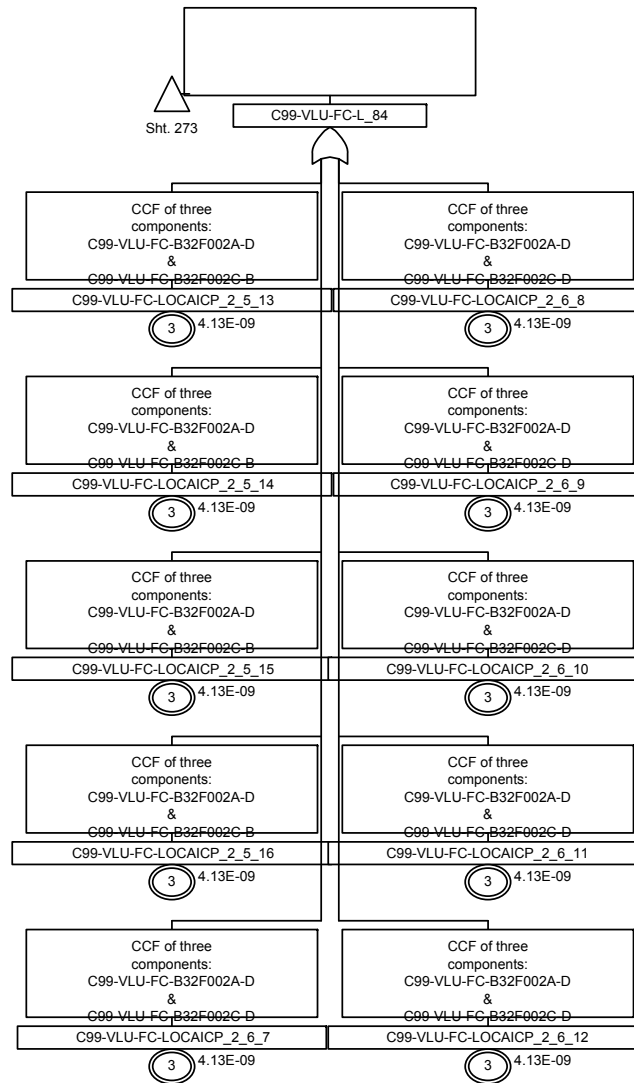


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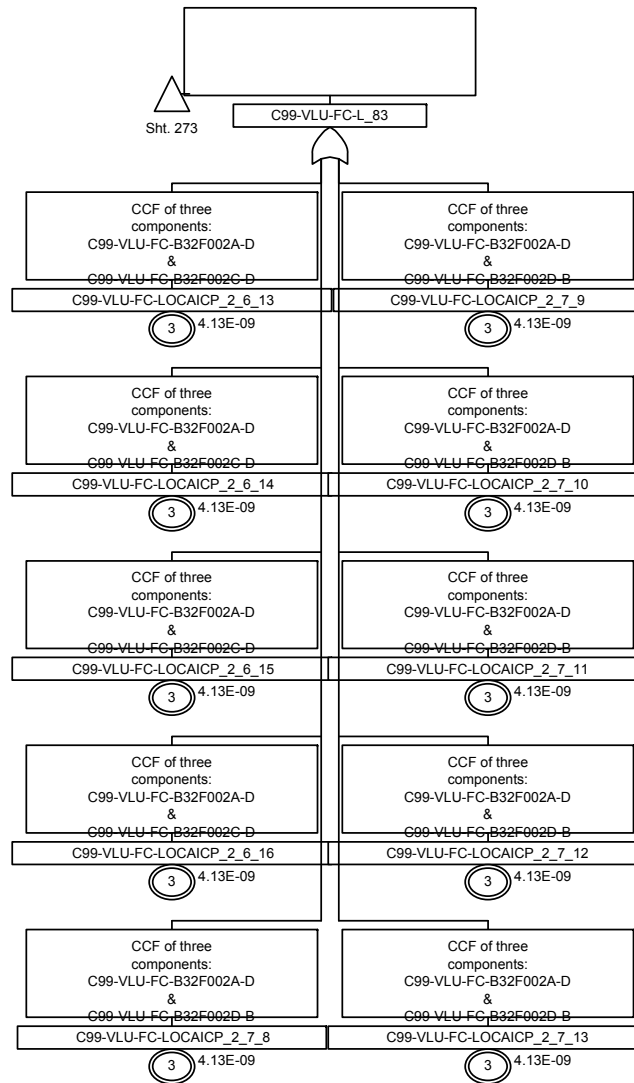


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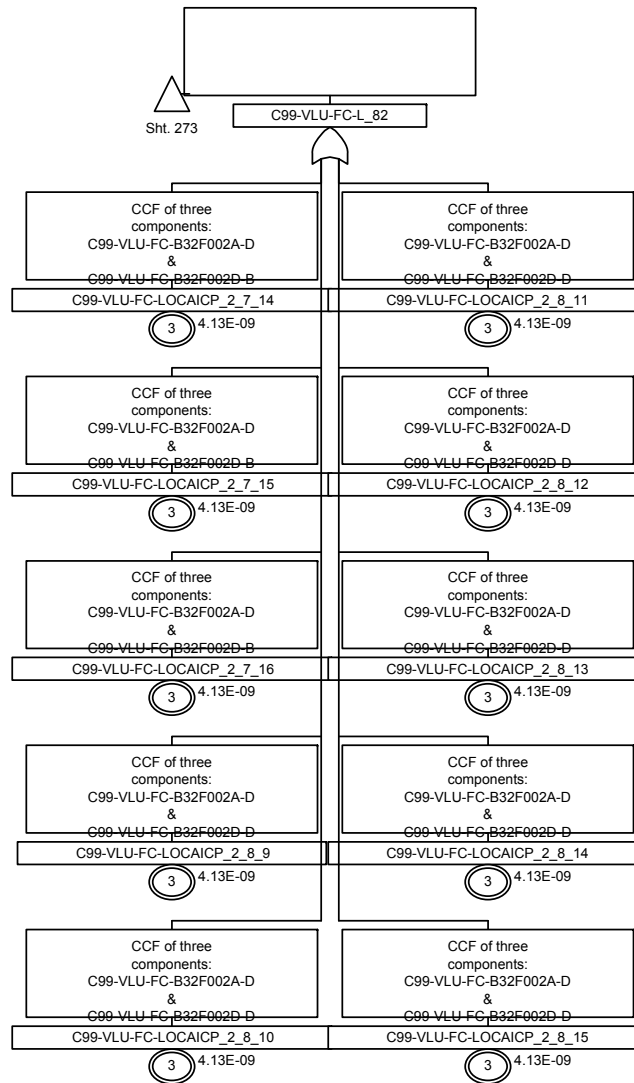


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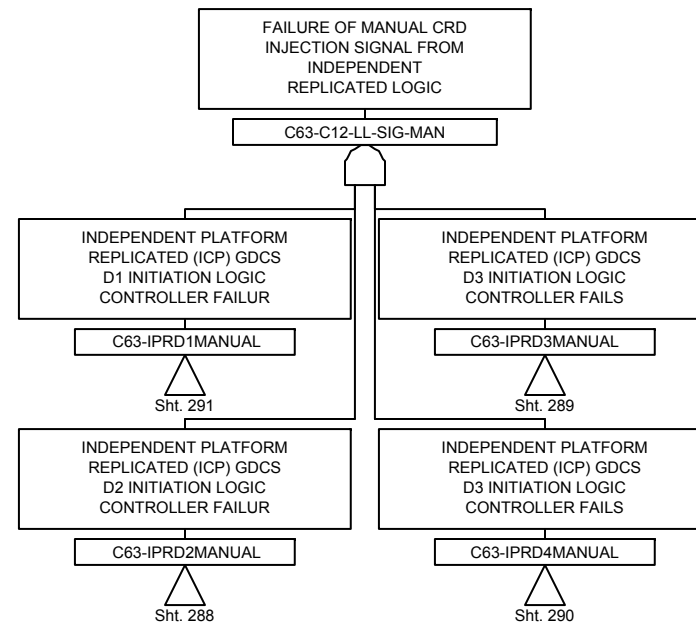


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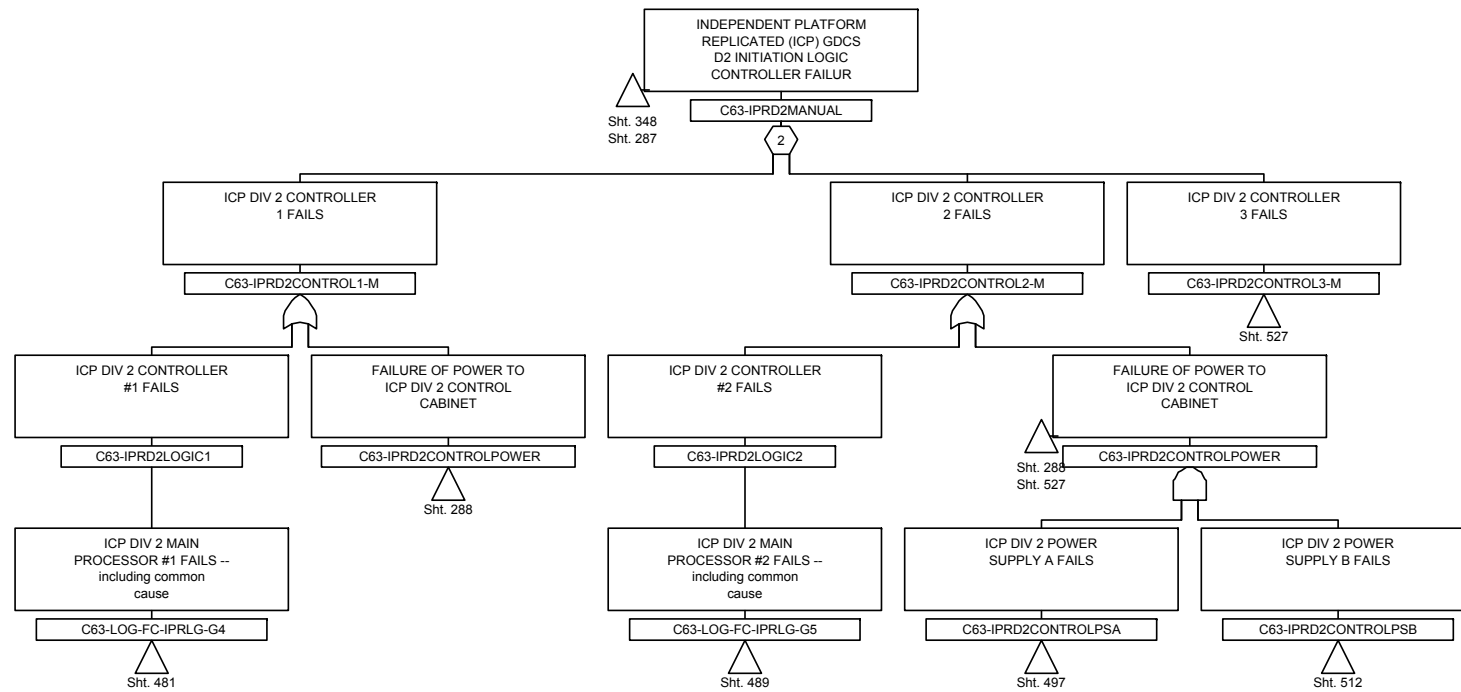


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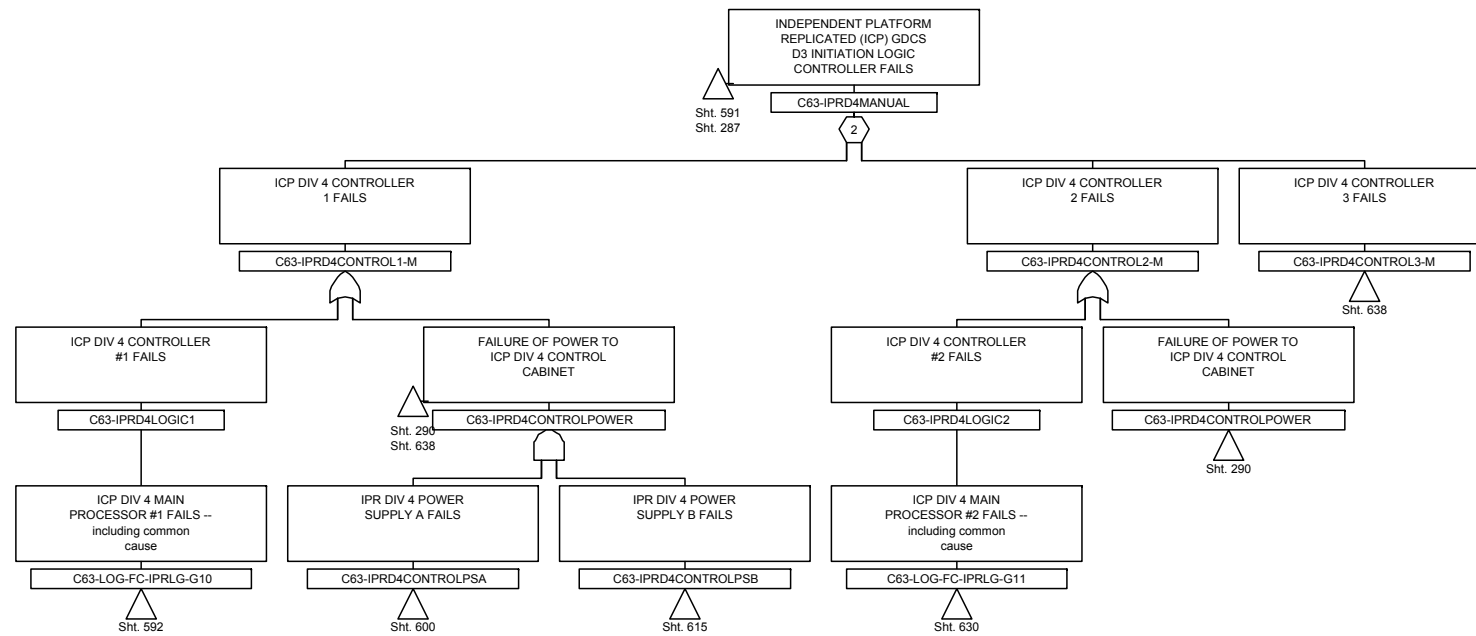


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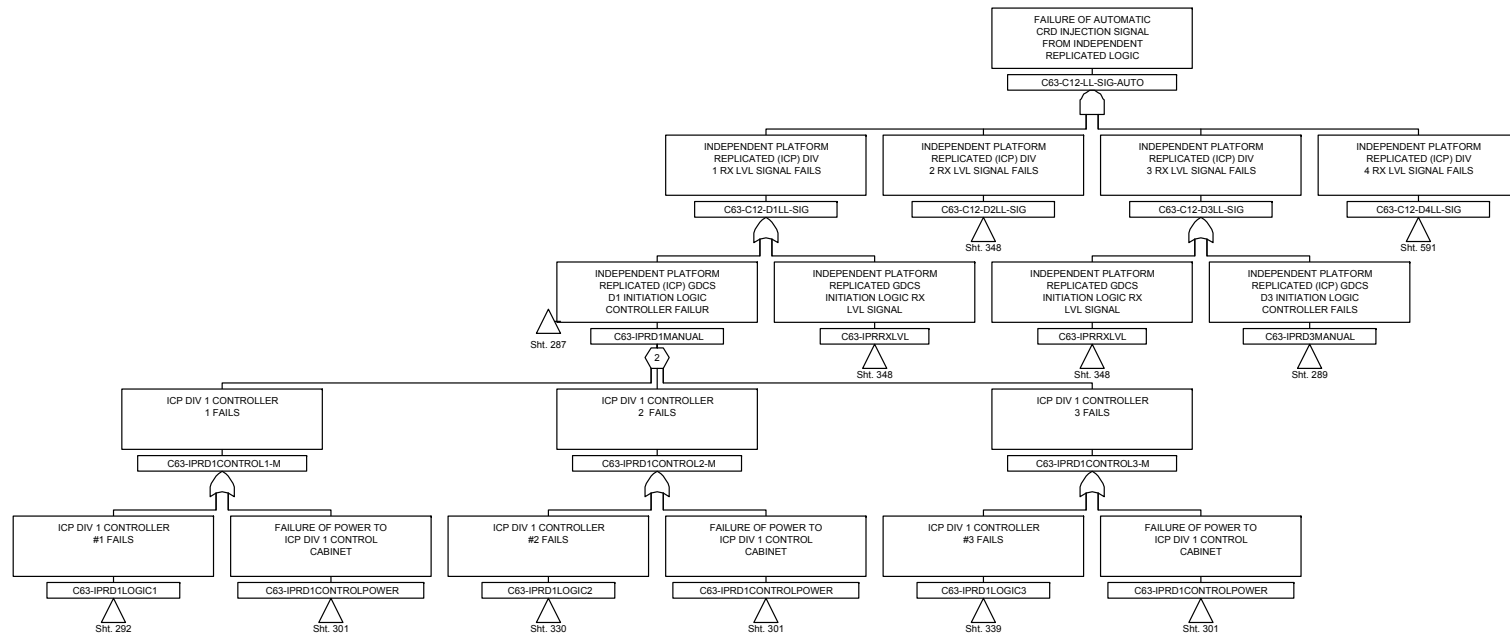


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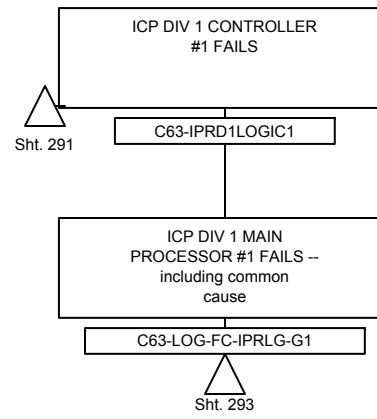


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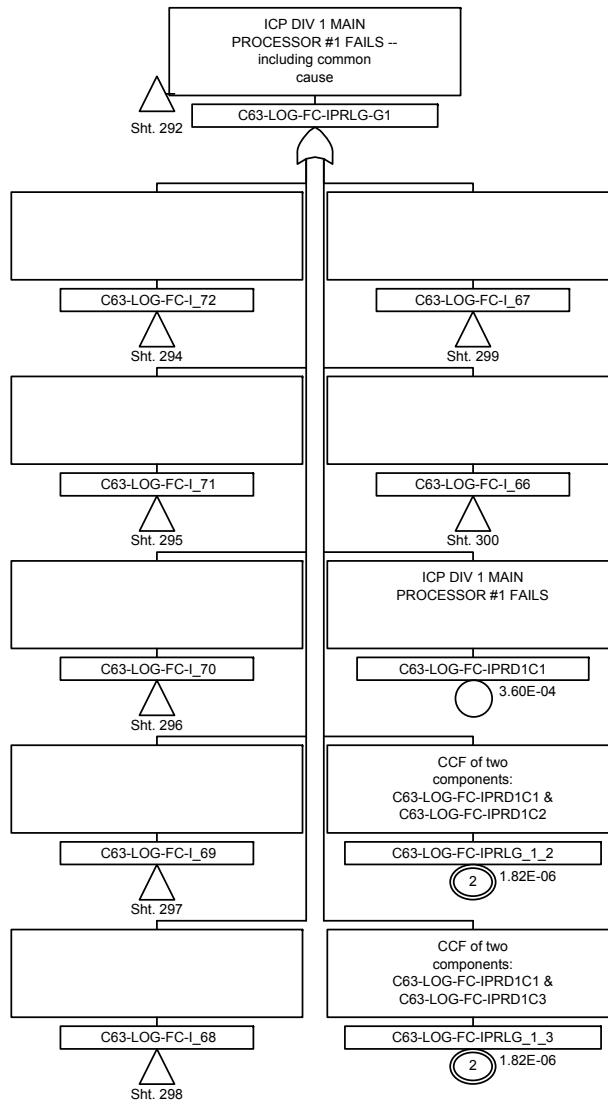


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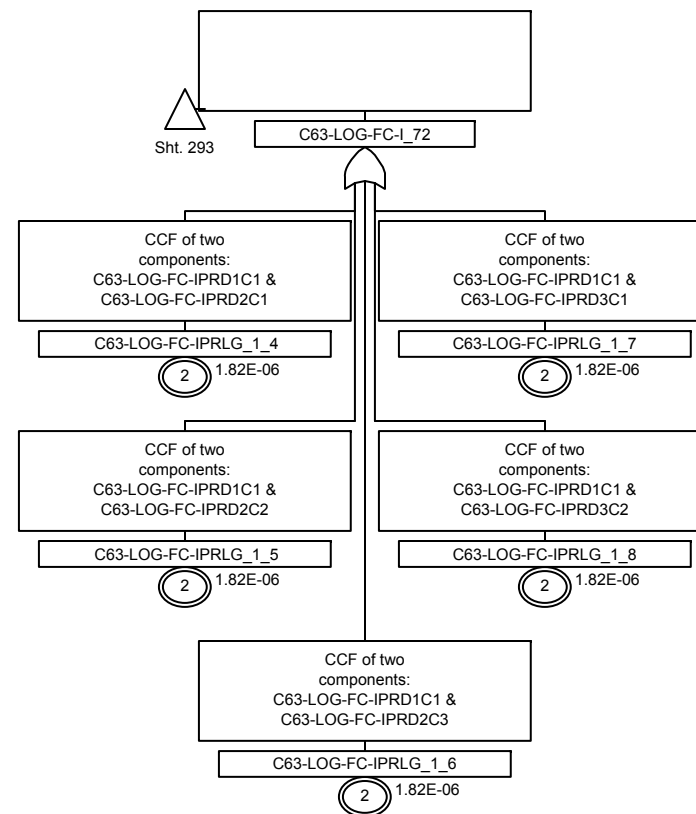


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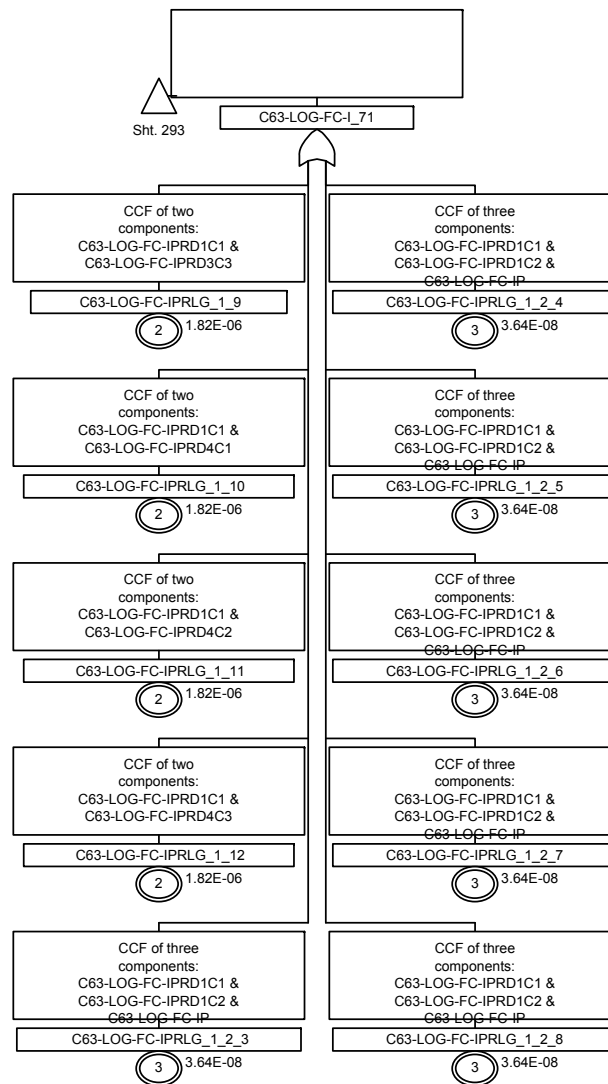


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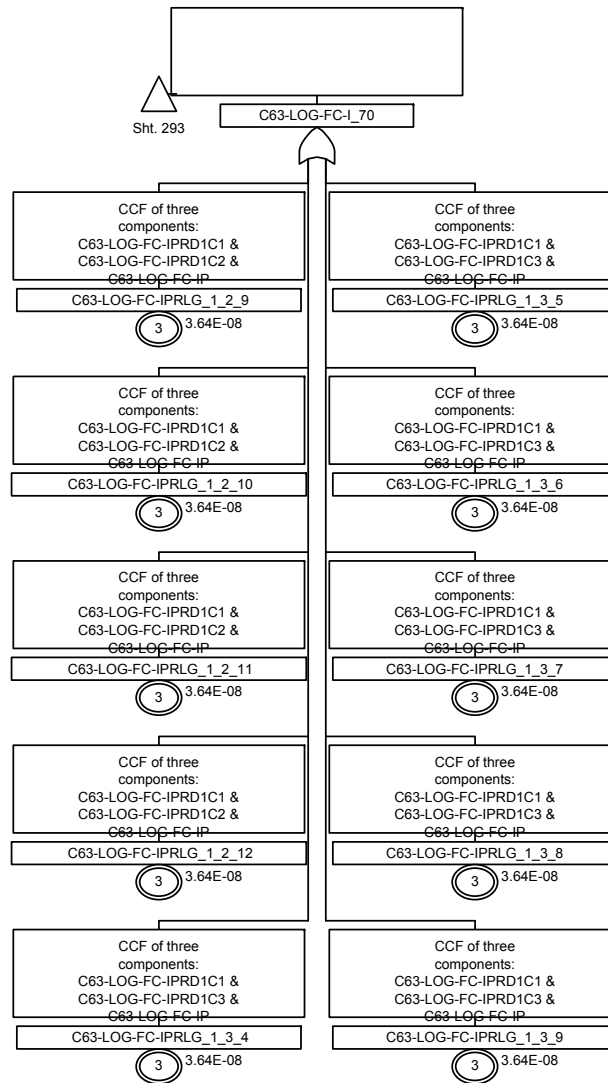


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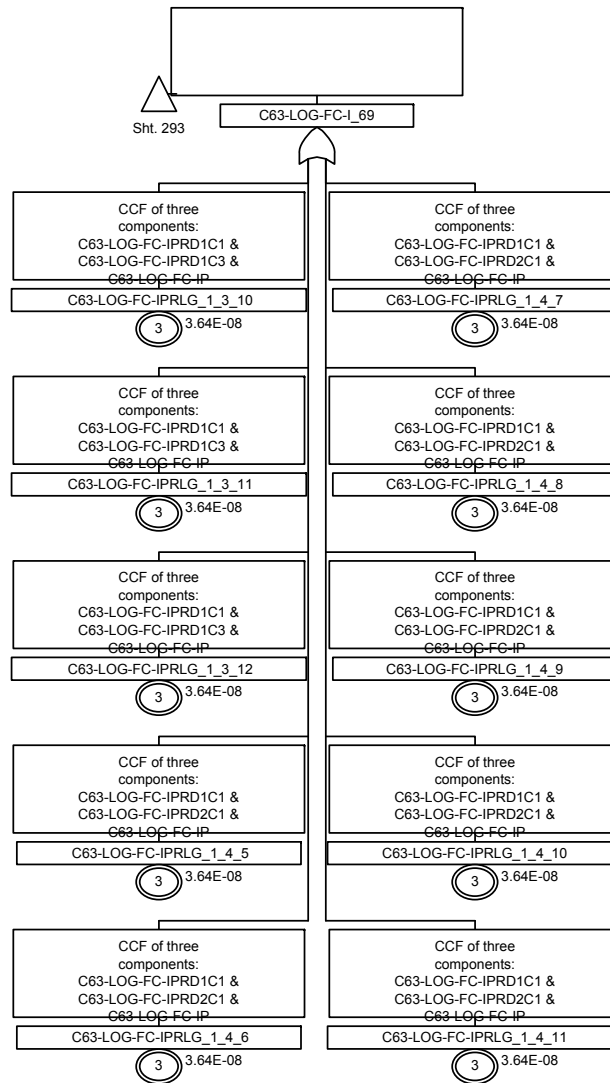


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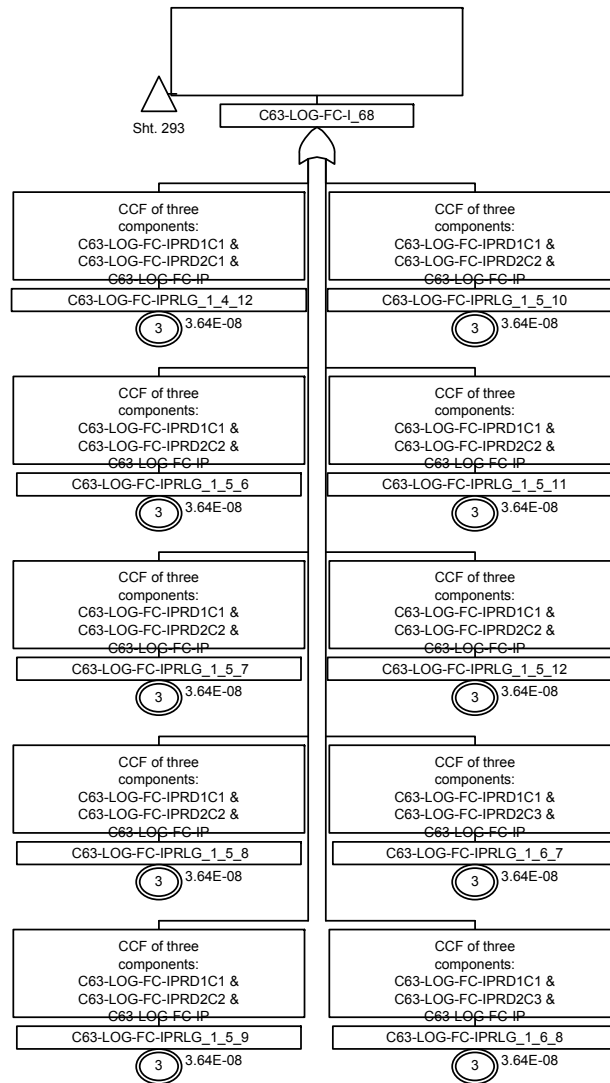


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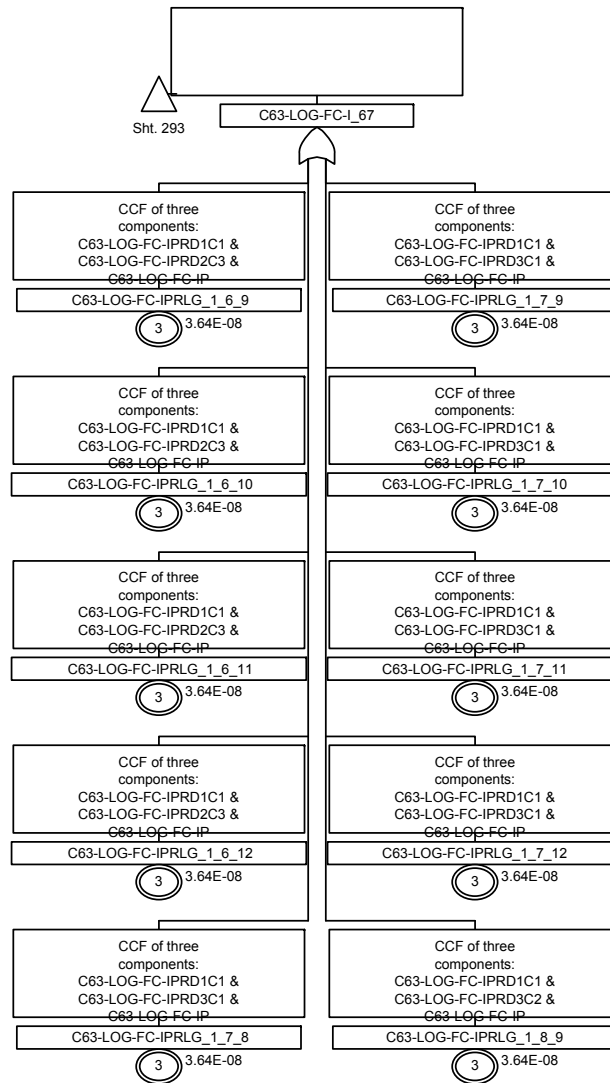


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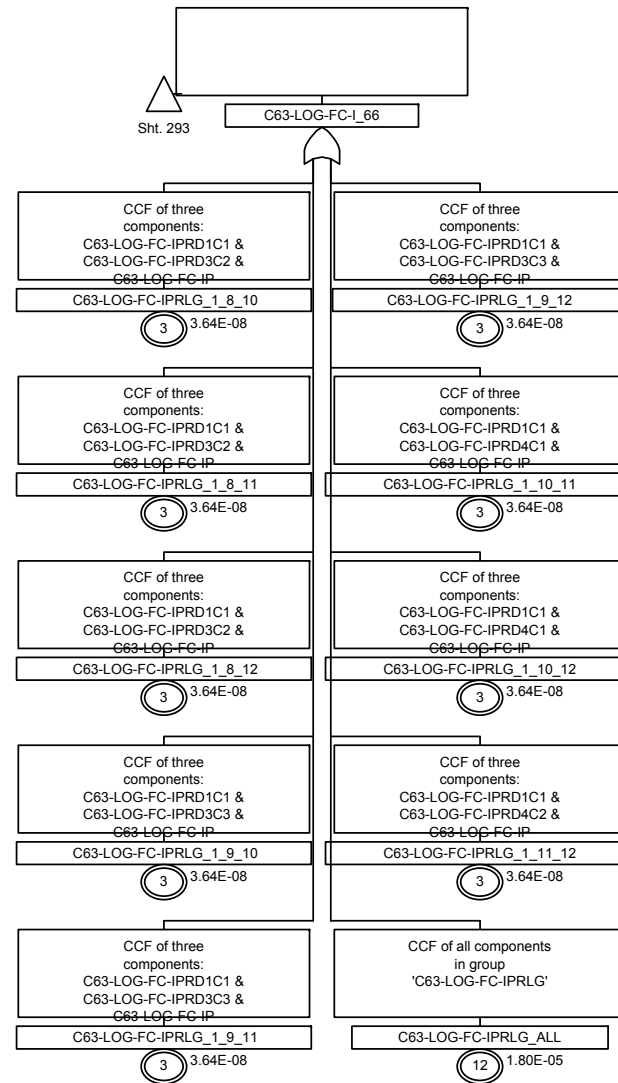


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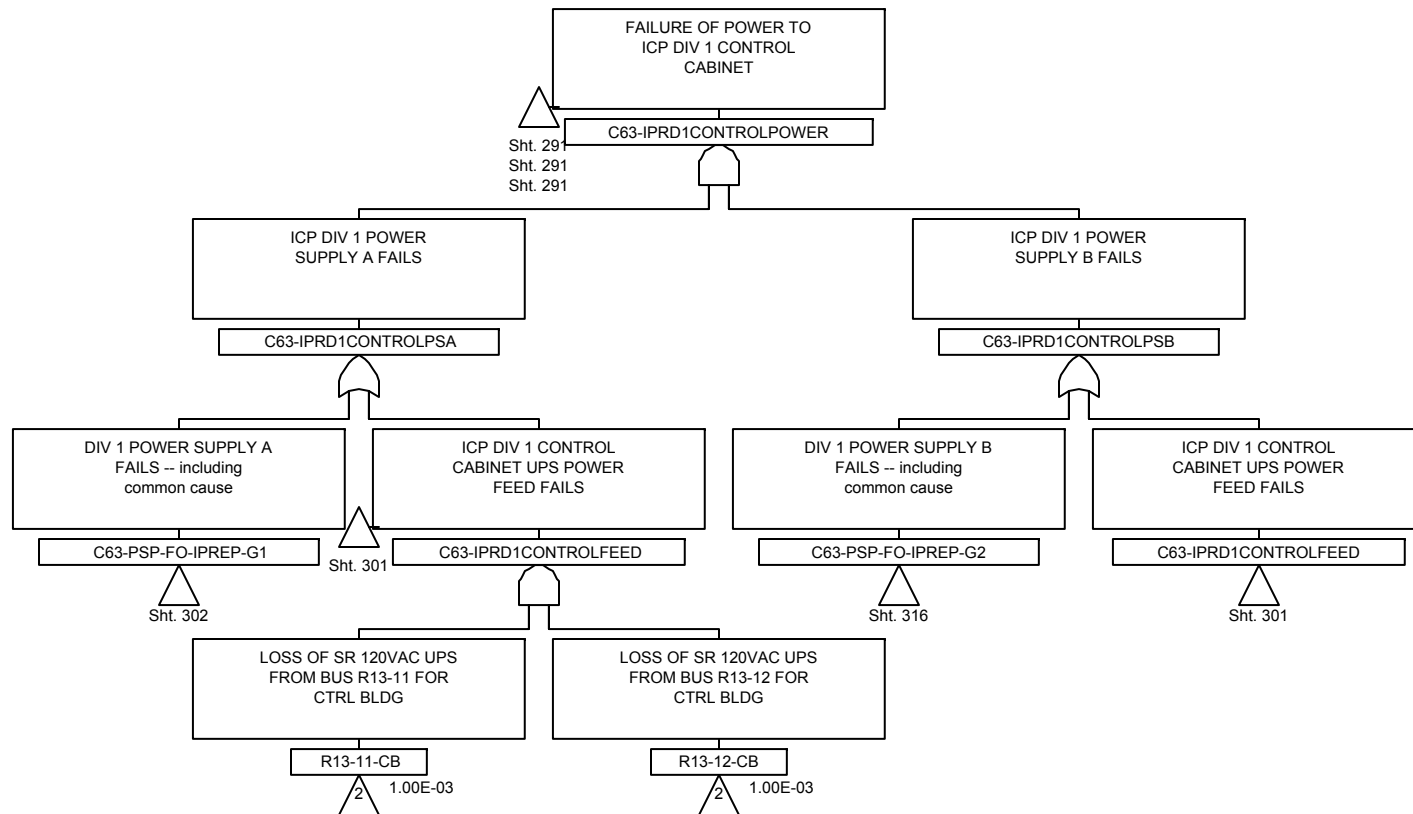


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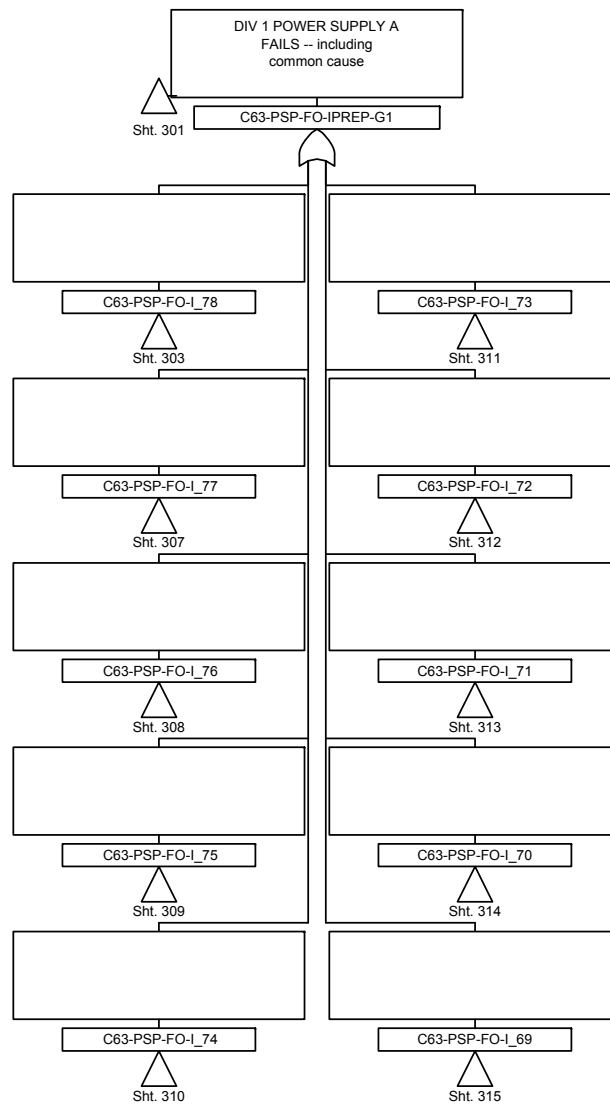


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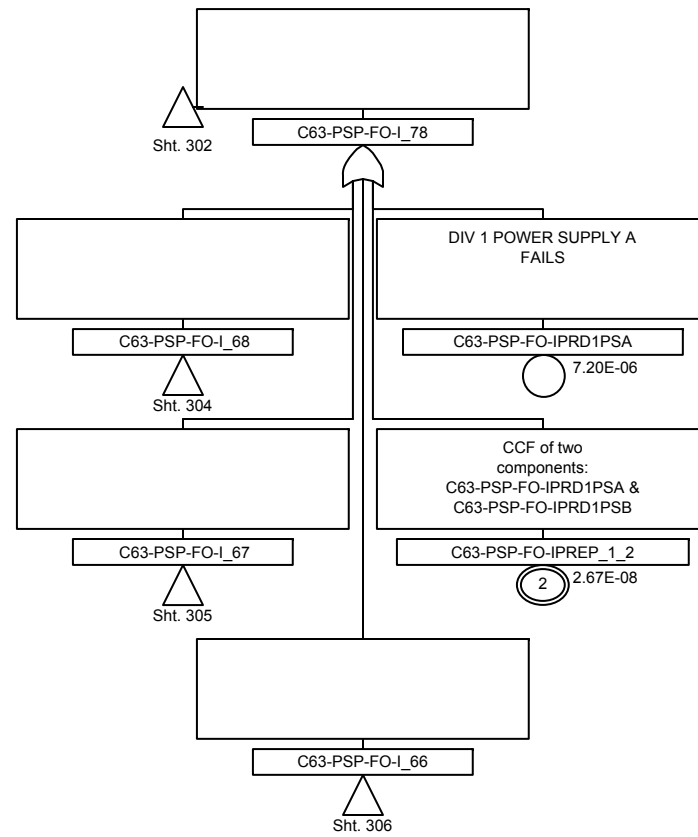


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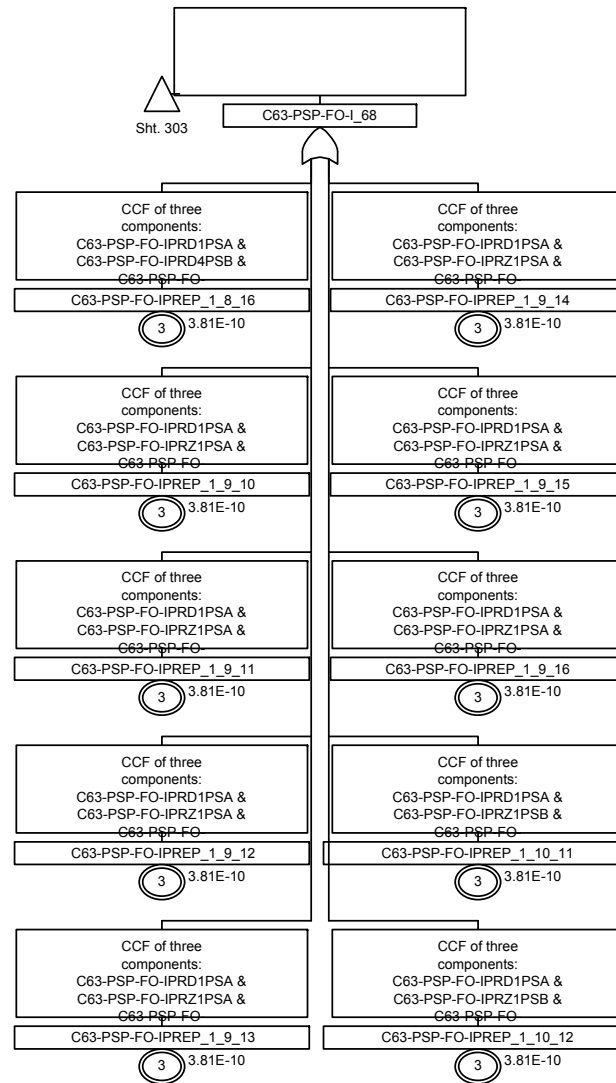


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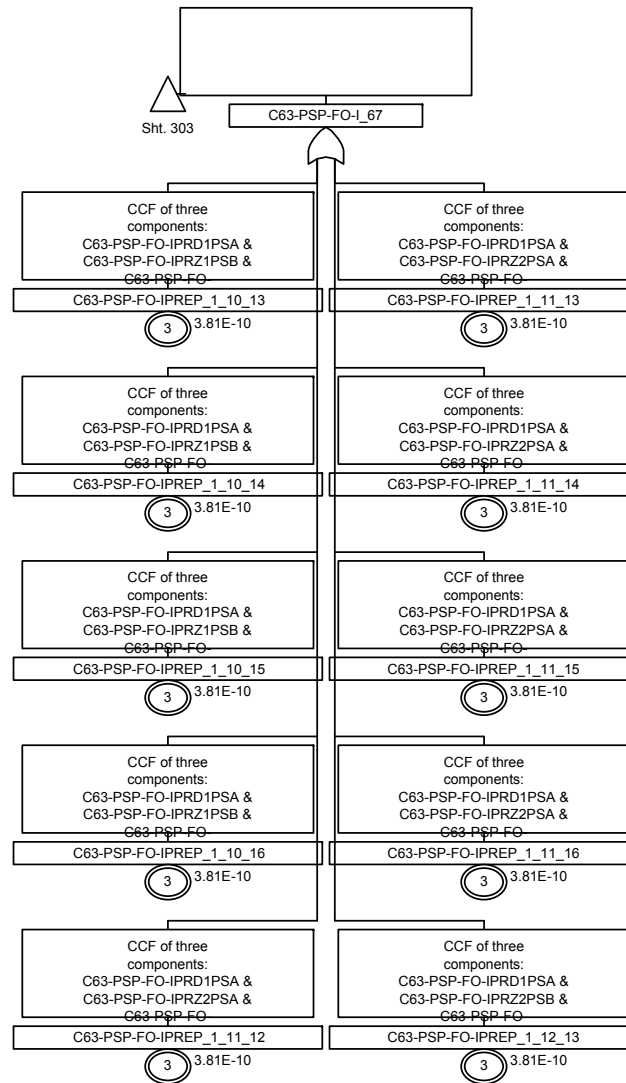


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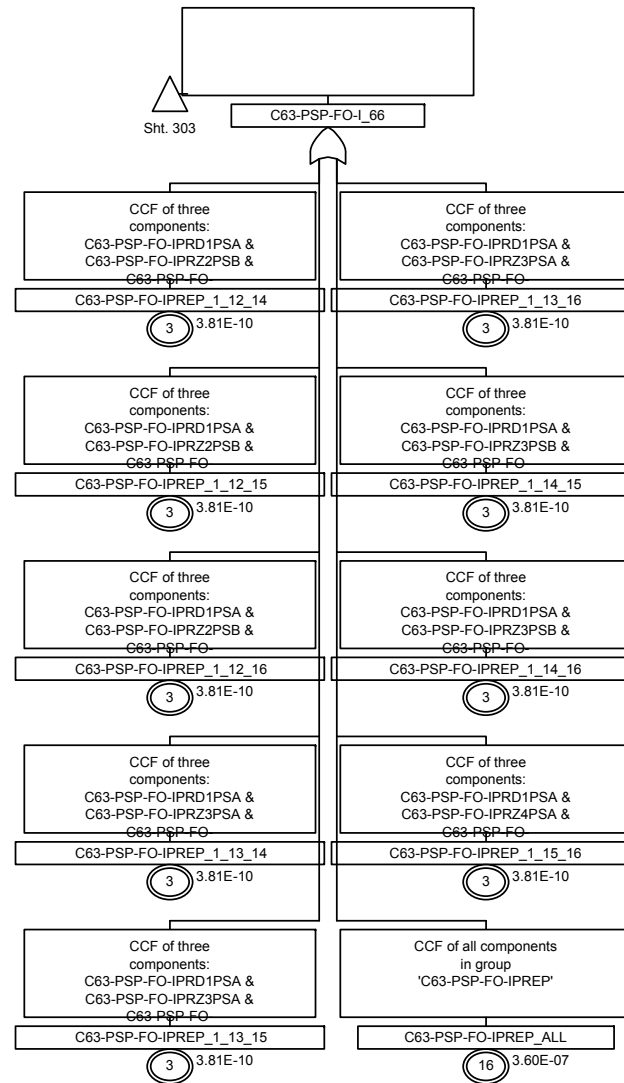


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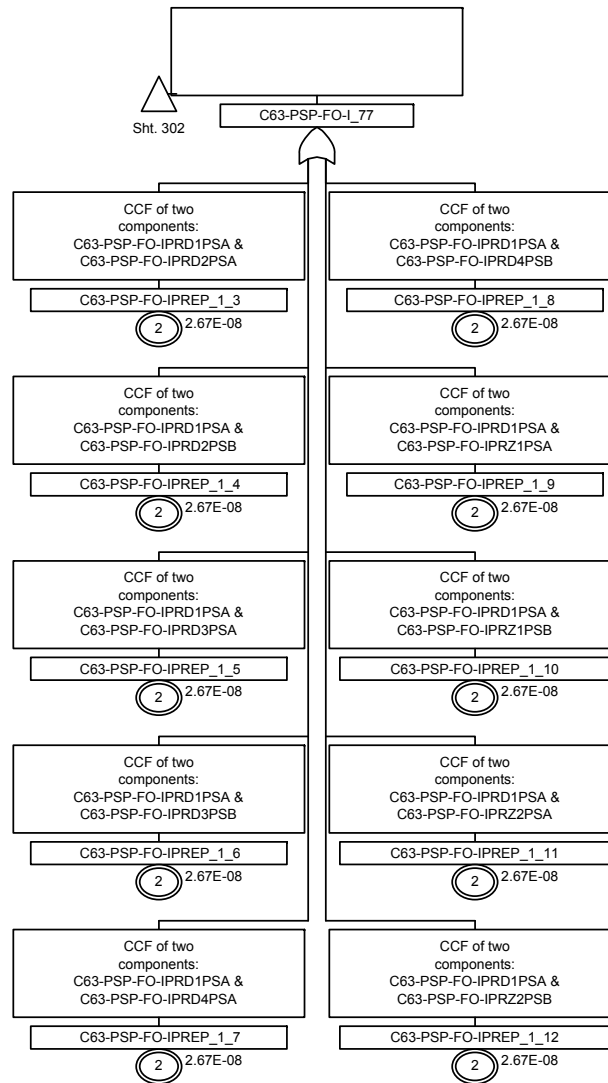


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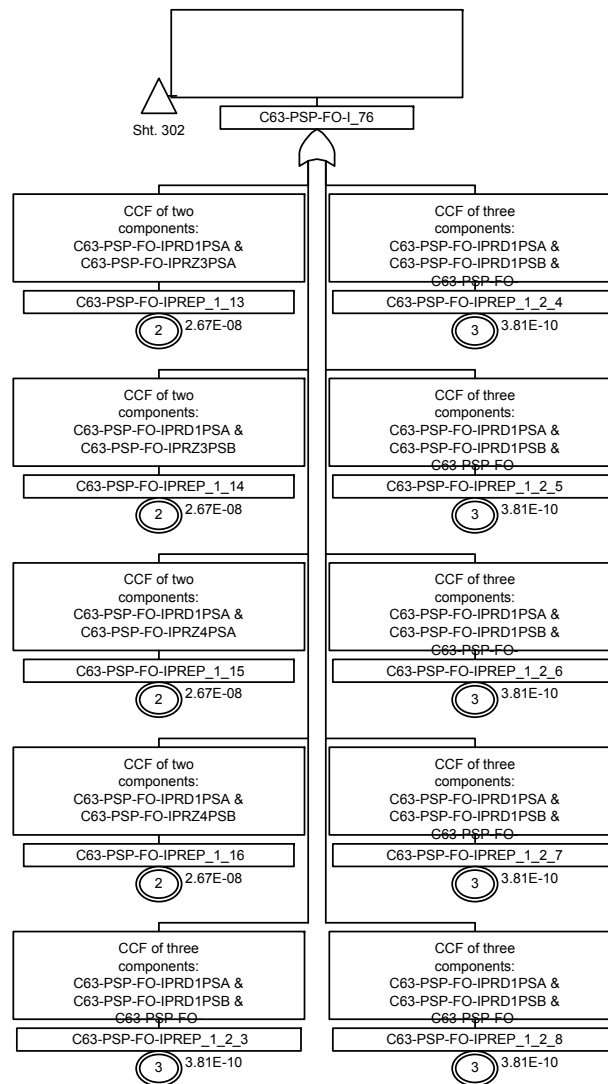


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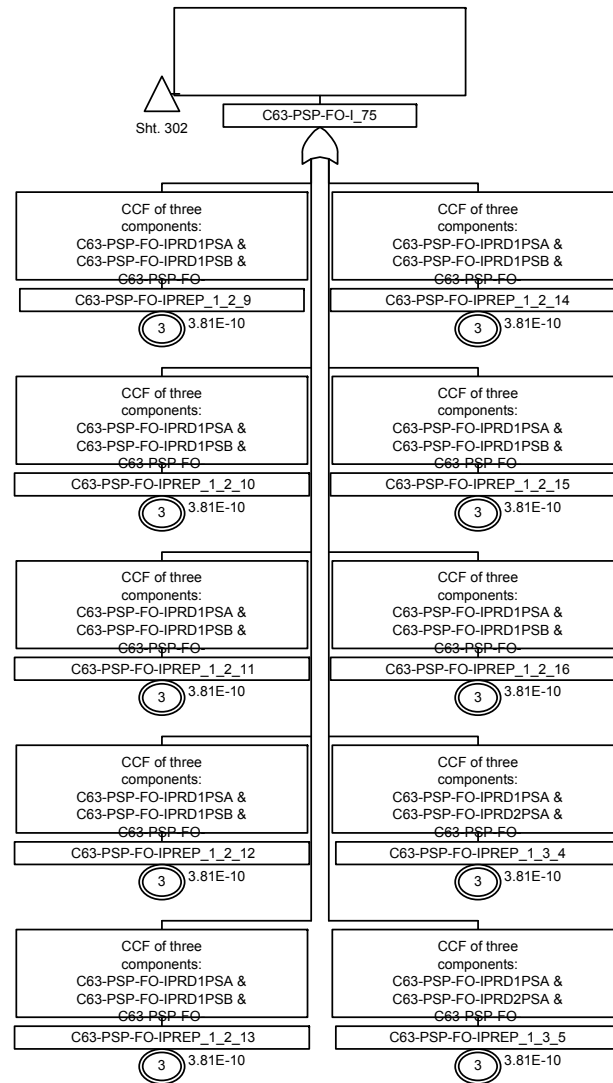


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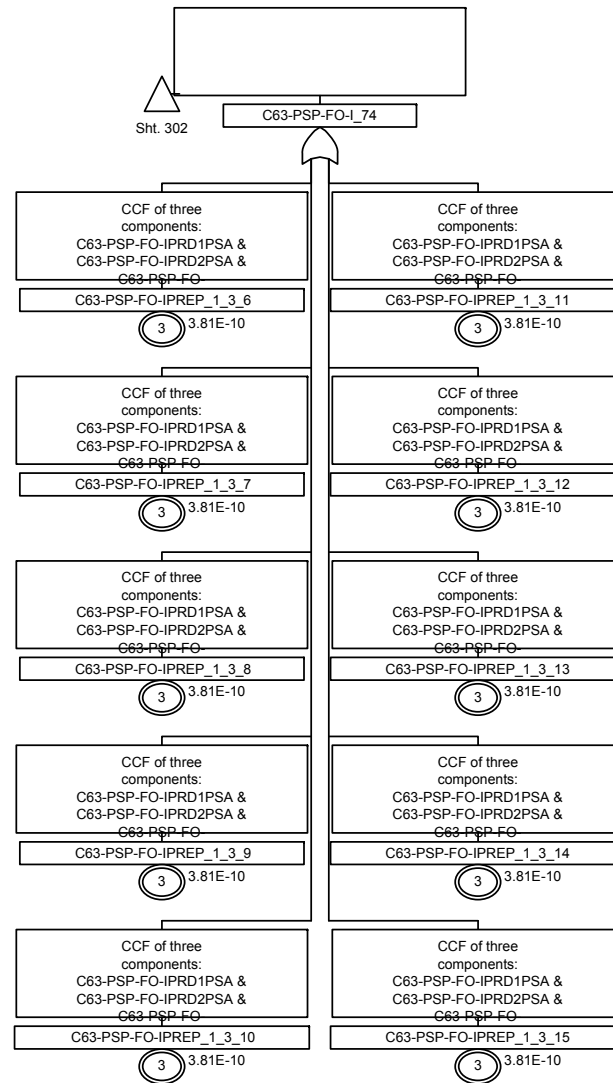


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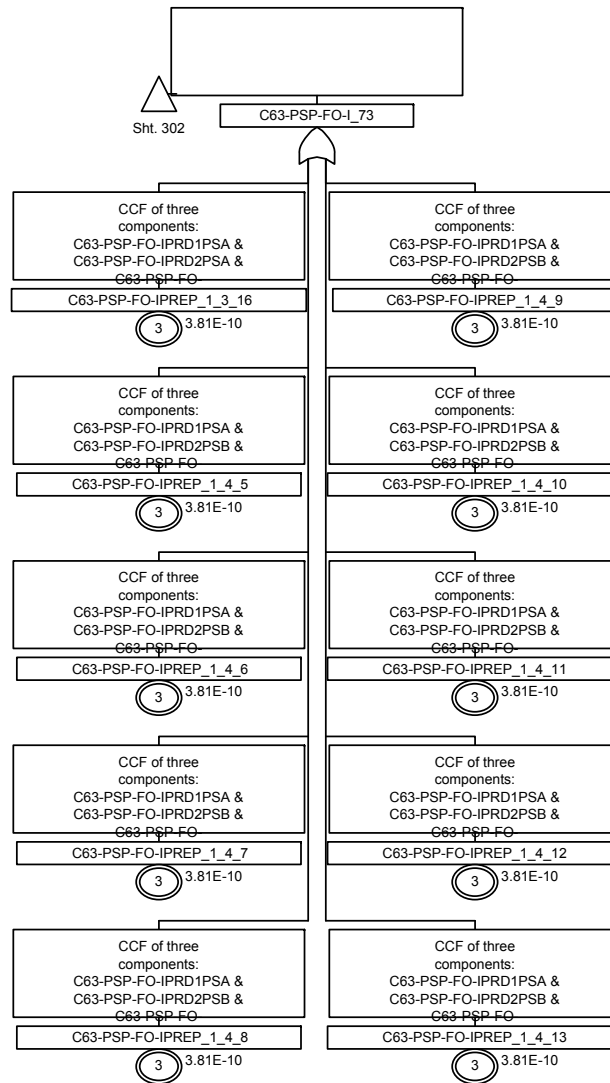


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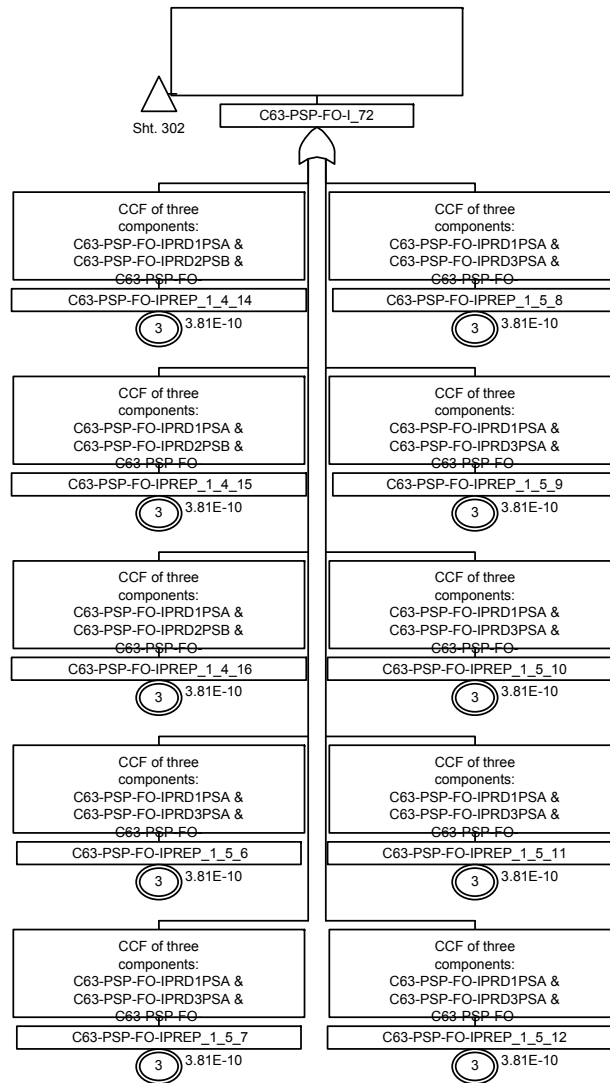


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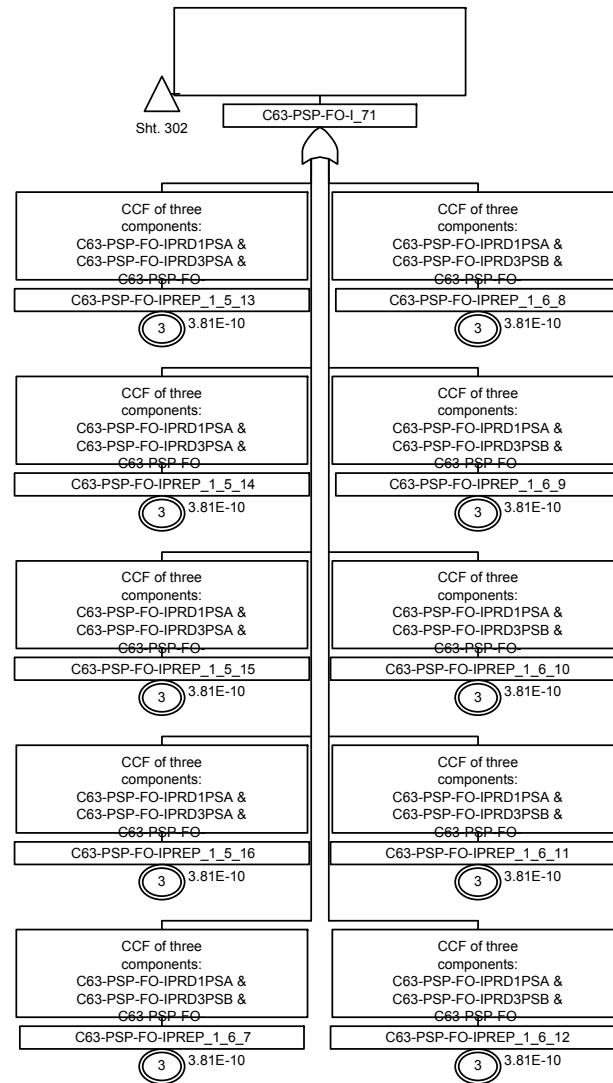


Figure 4.5-3e. Sheet 313 Independent Control Platforms

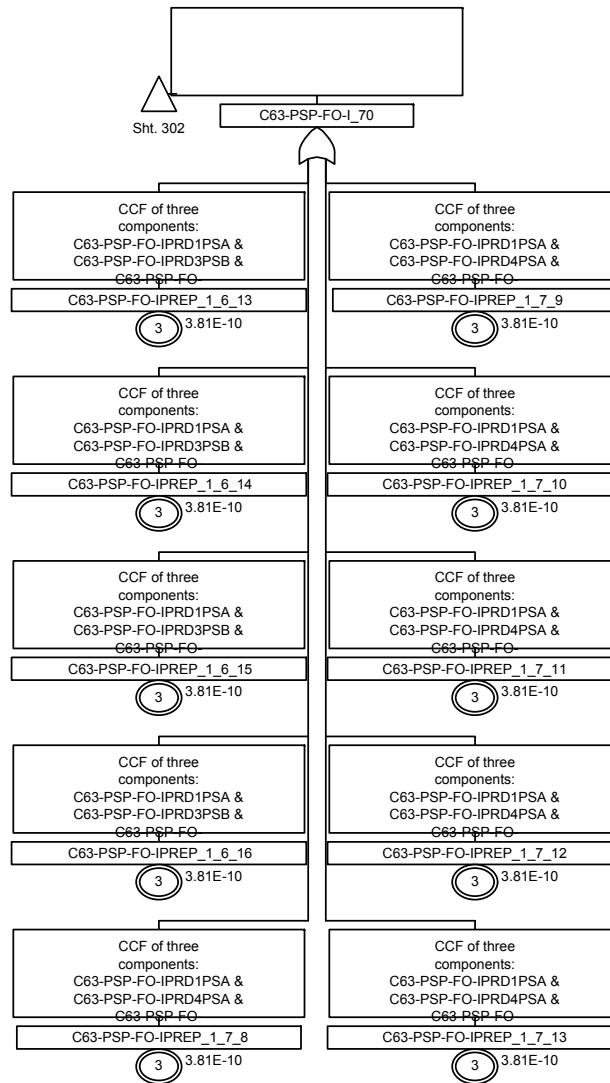


Figure 4.5-3e. Sheet 314 Independent Control Platforms





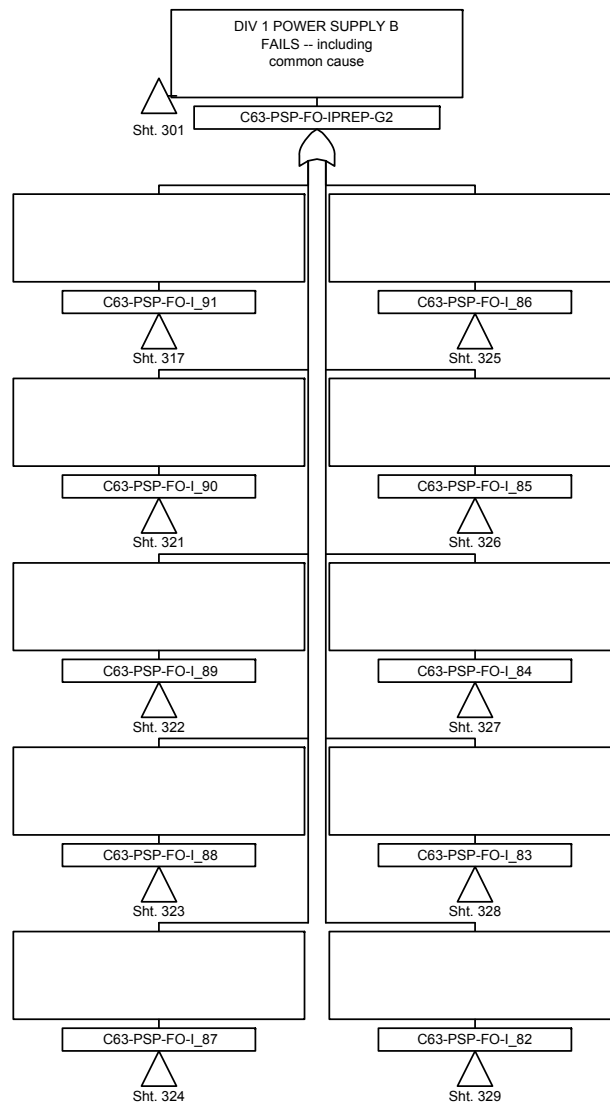


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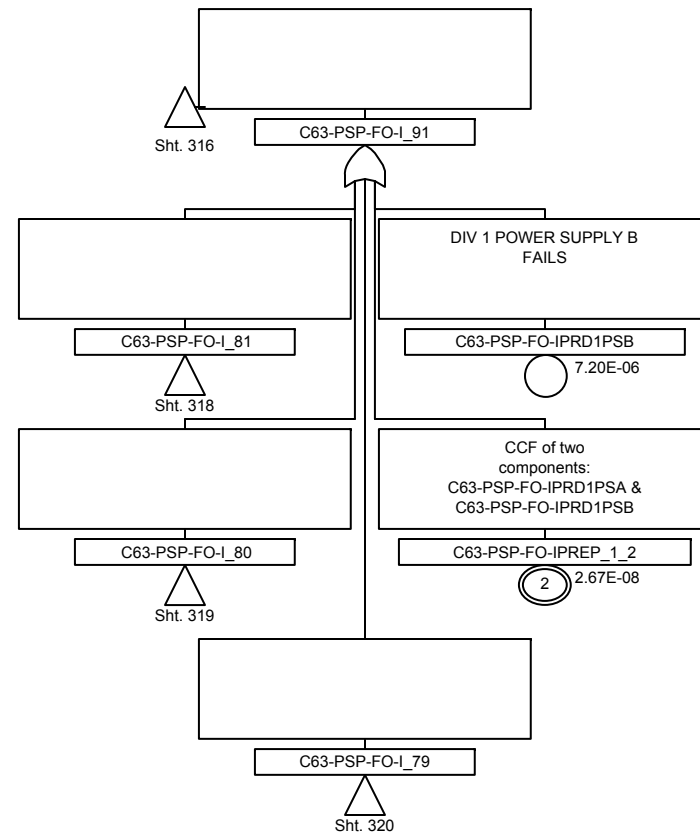


Figure 4.5-3e. Sheet 317 Independent Control Platforms

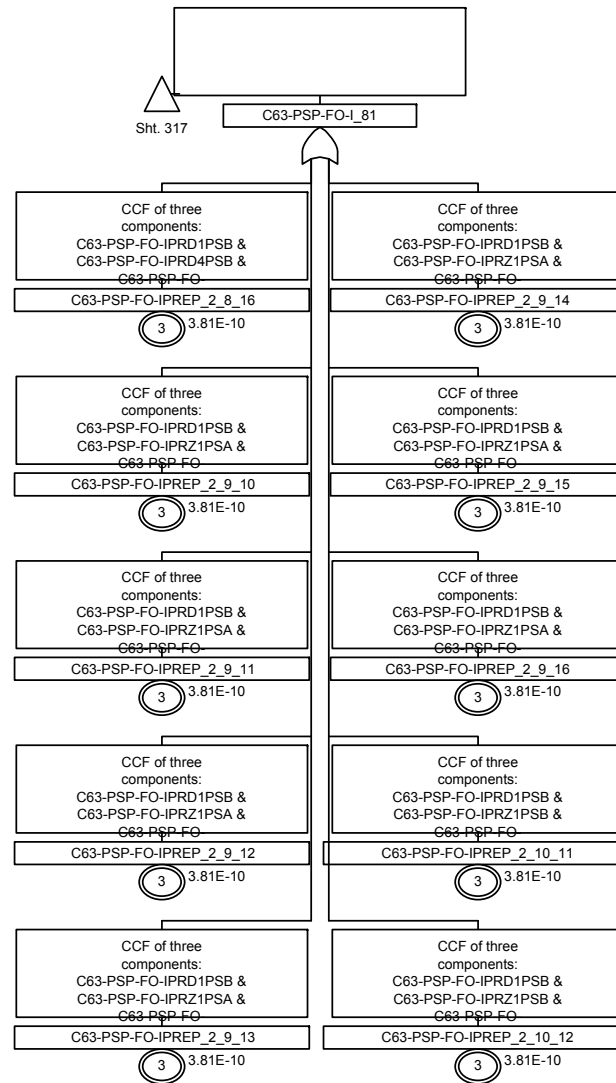


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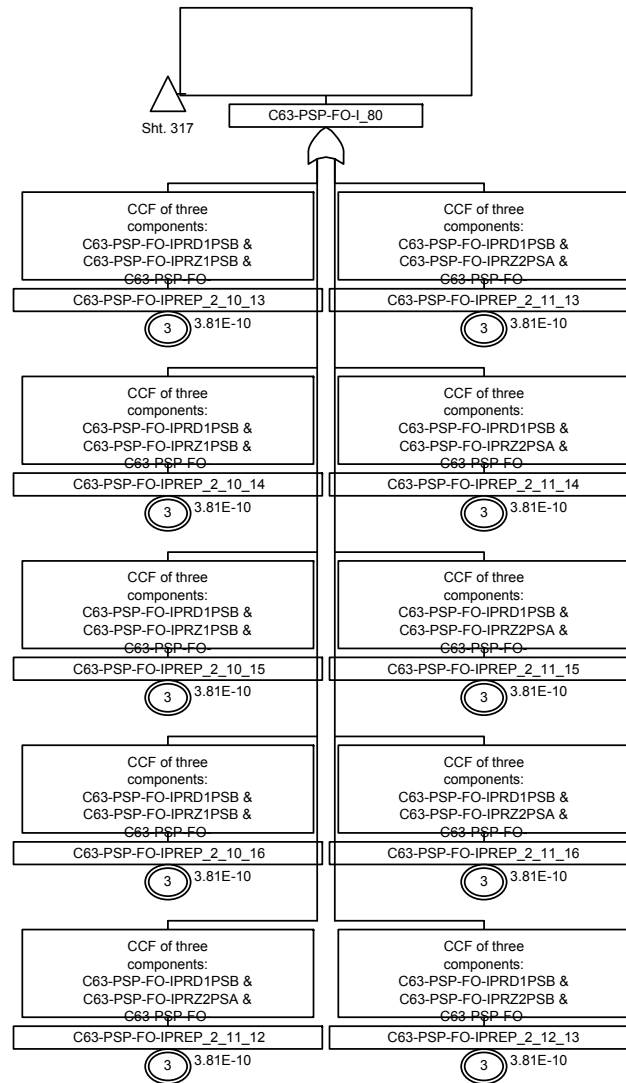


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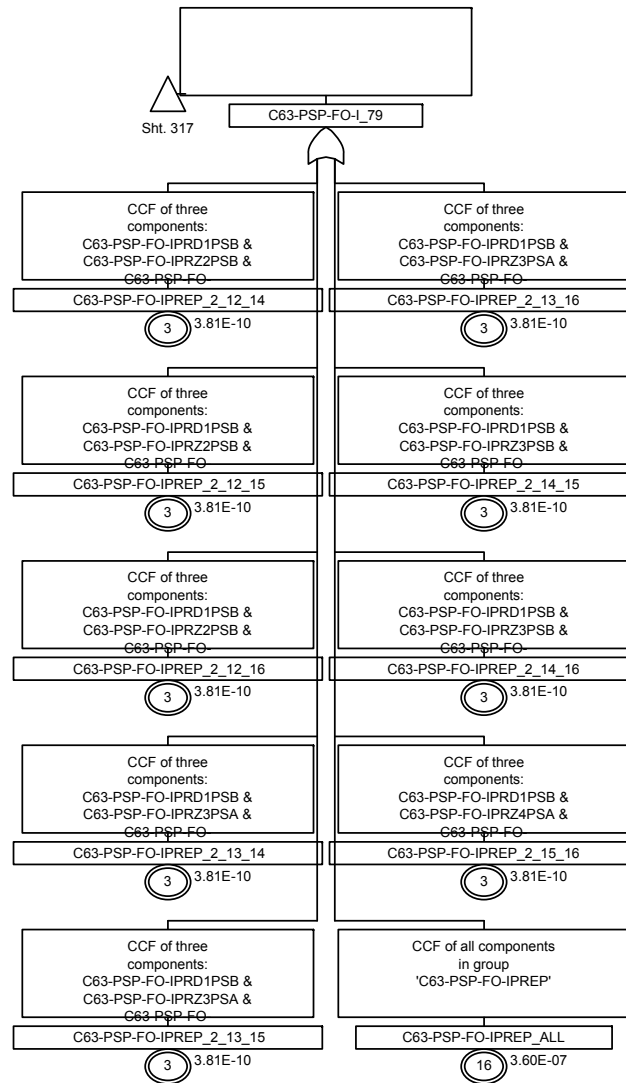


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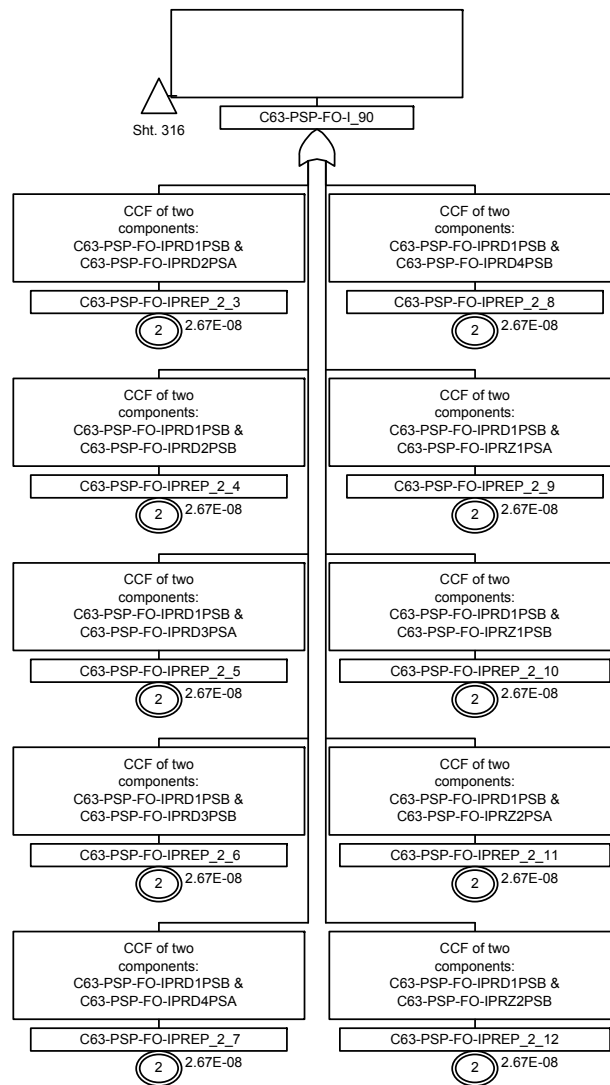


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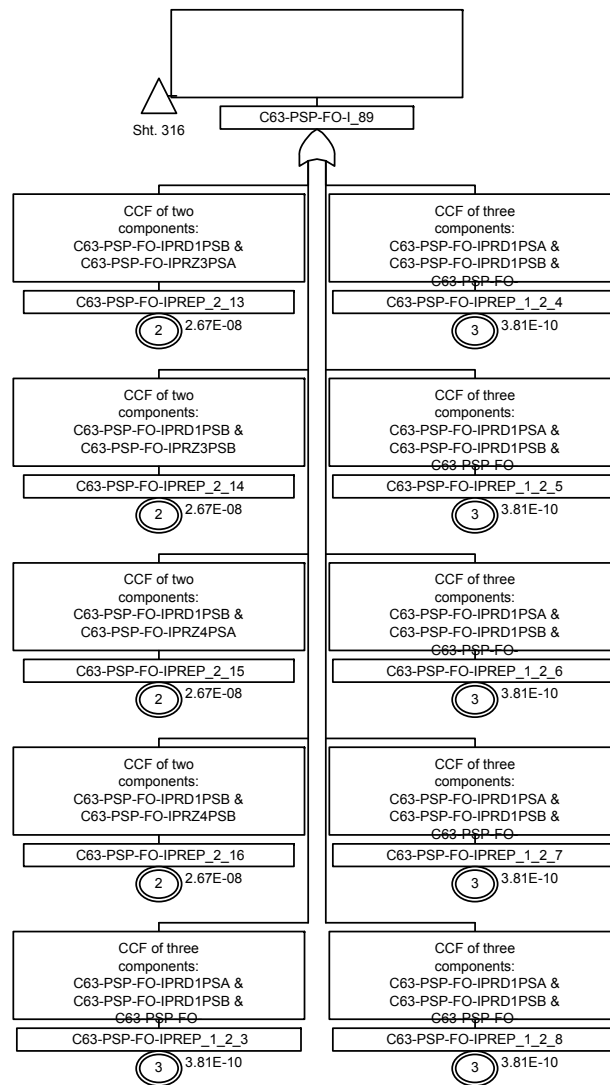


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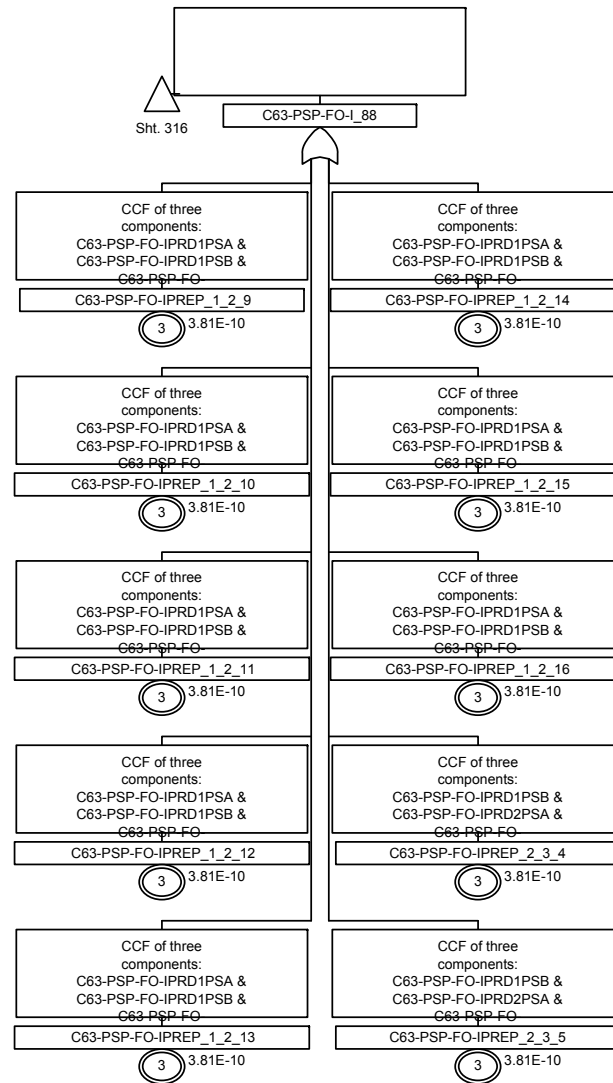


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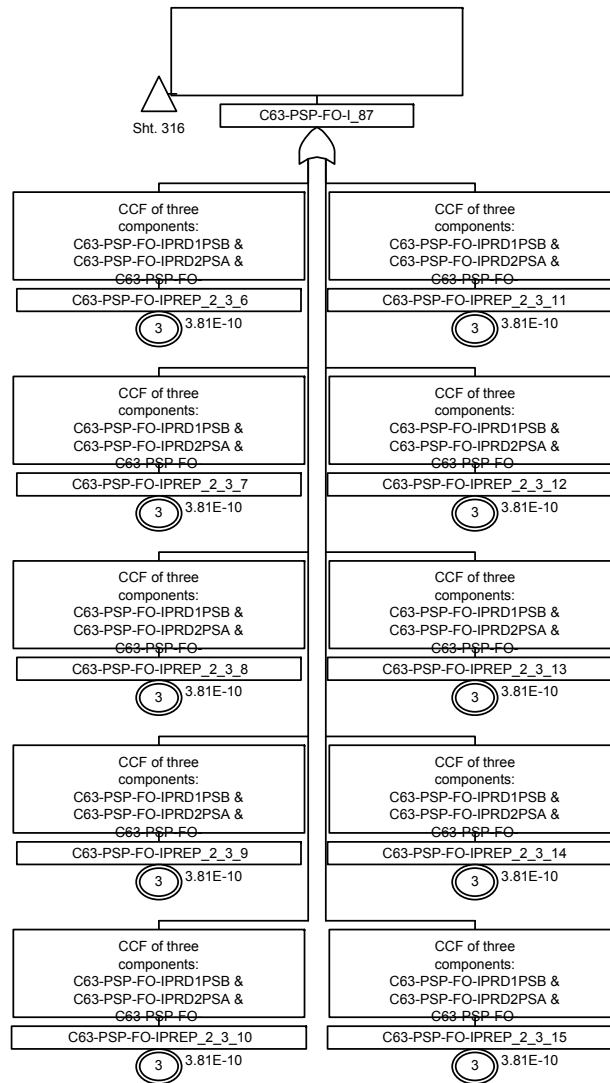


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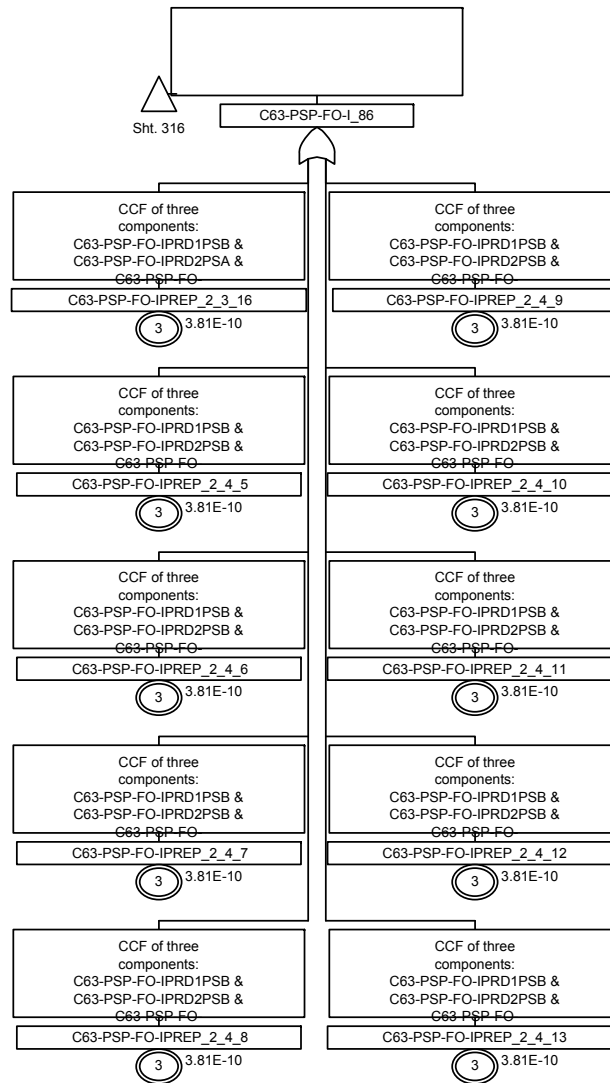


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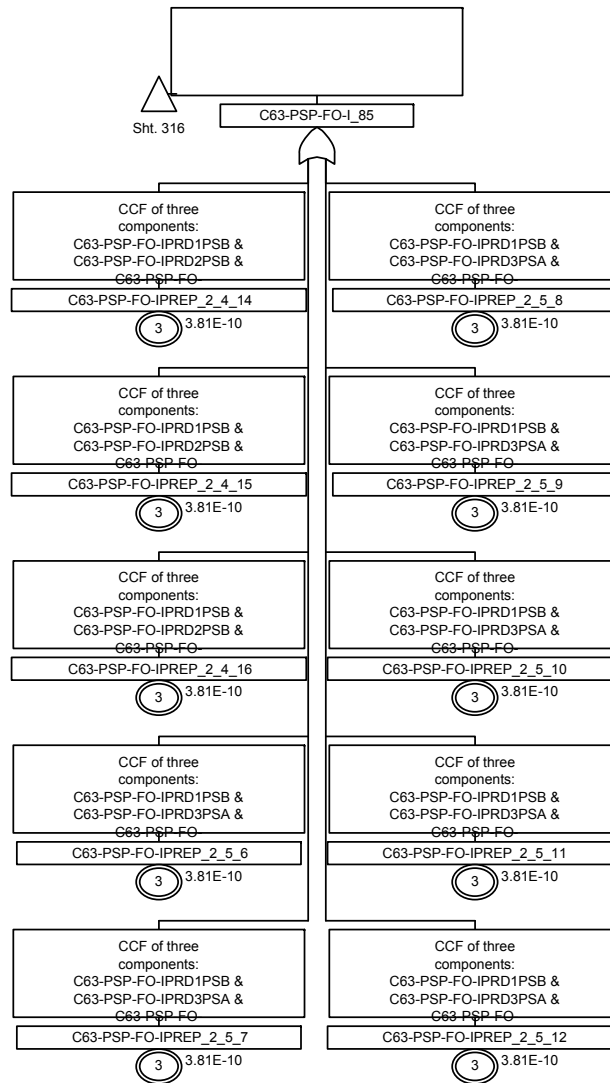


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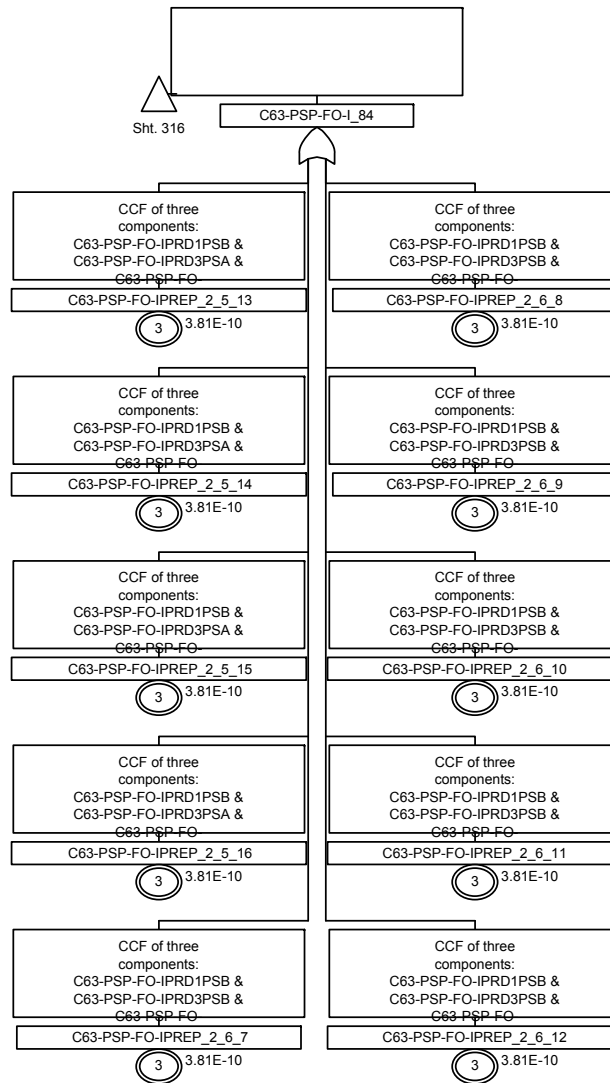


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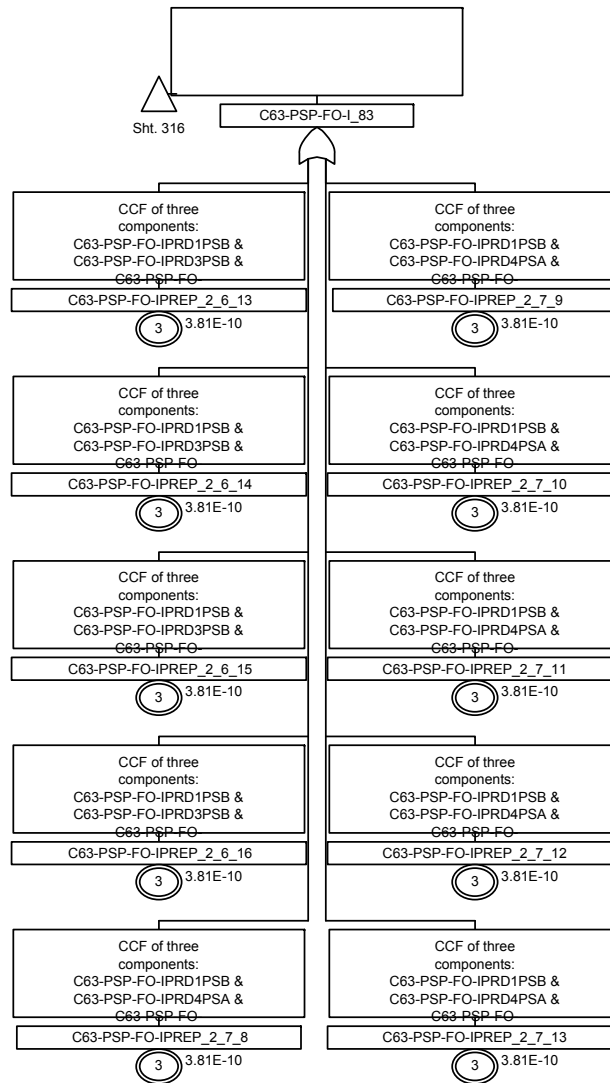


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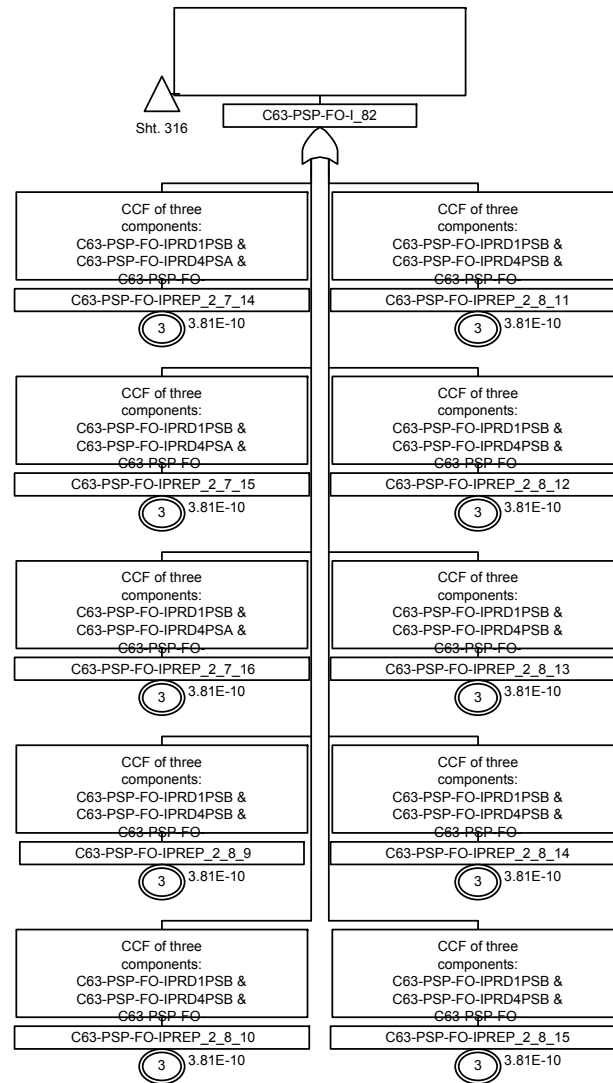


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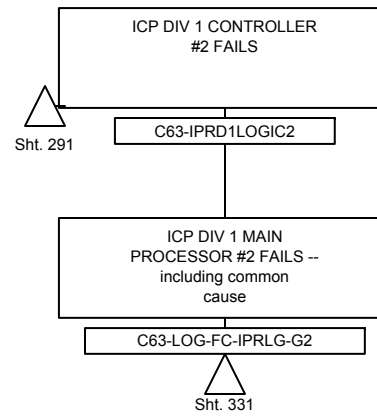


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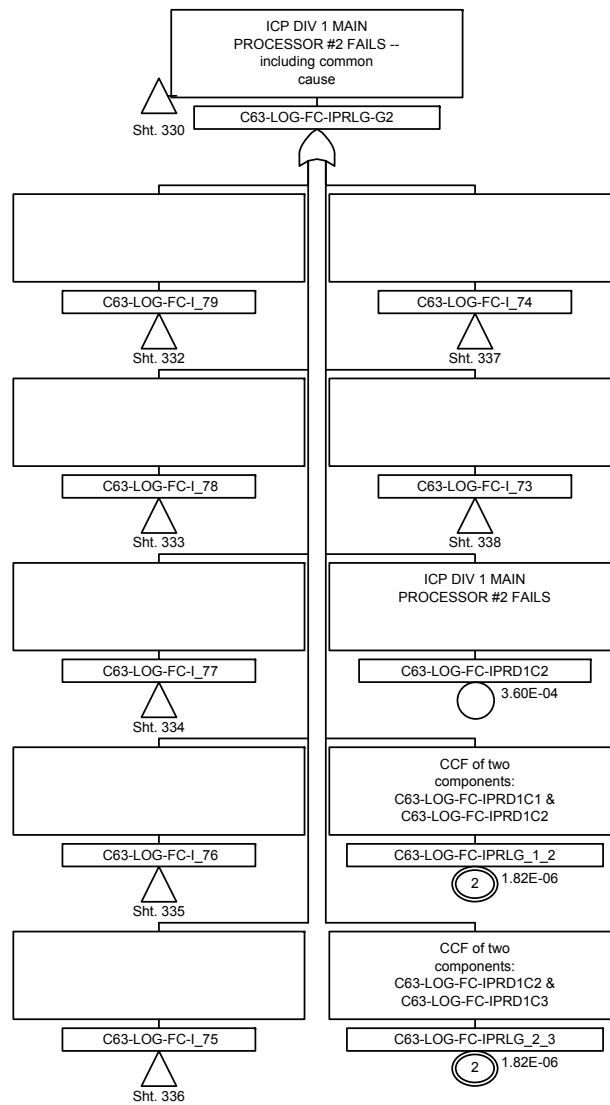


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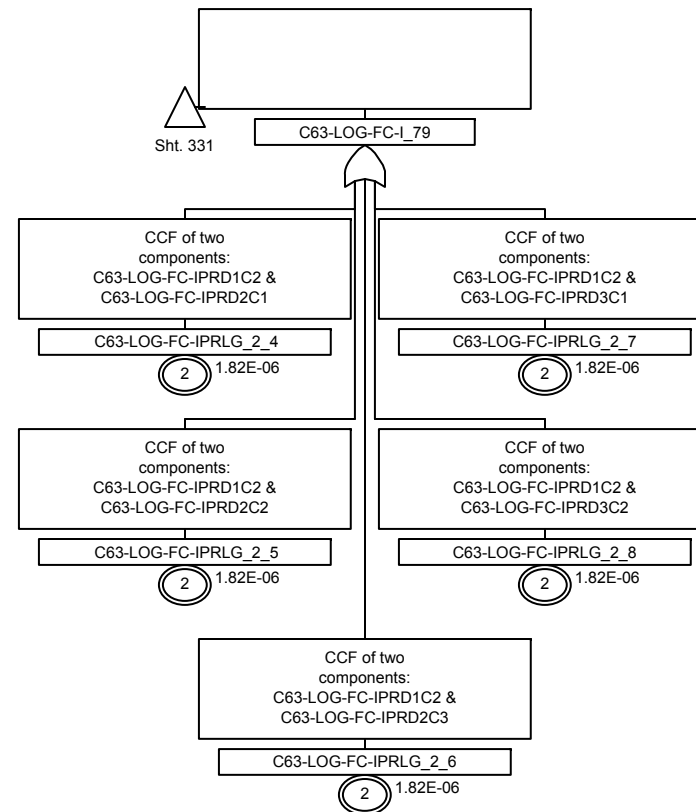


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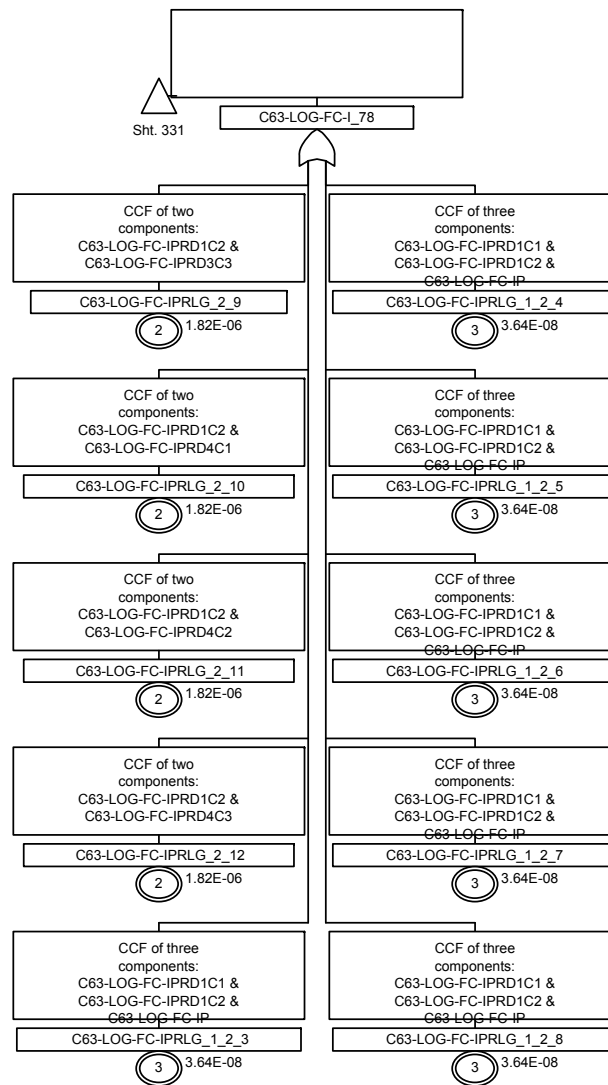


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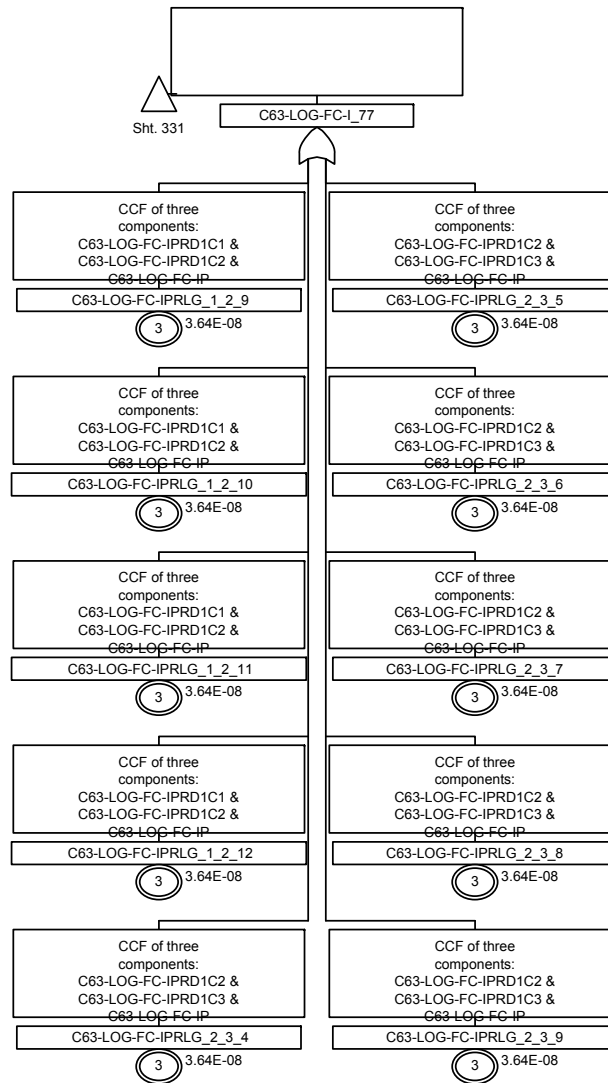


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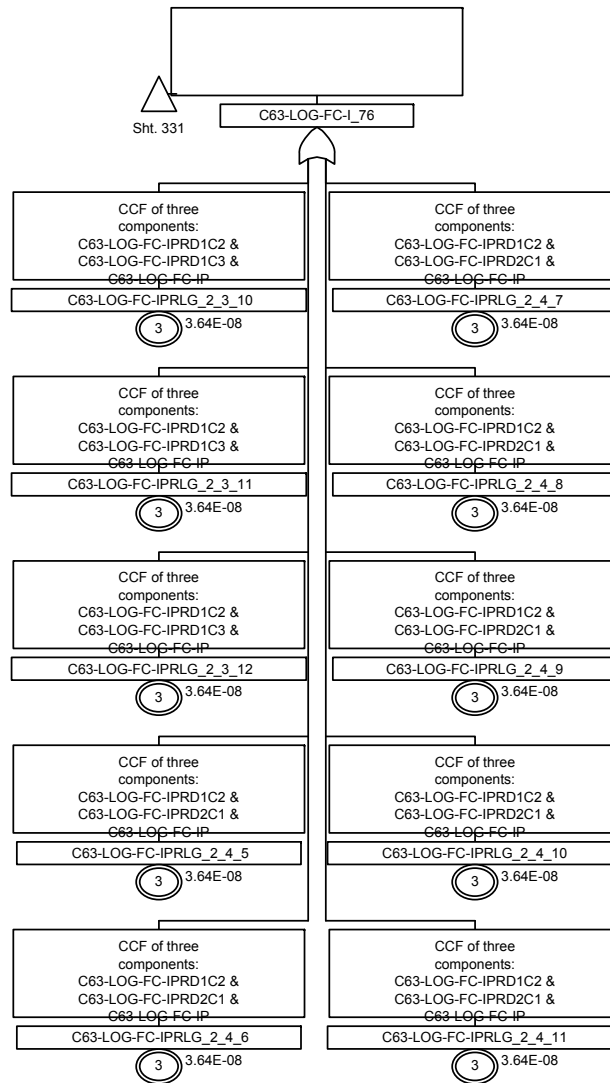


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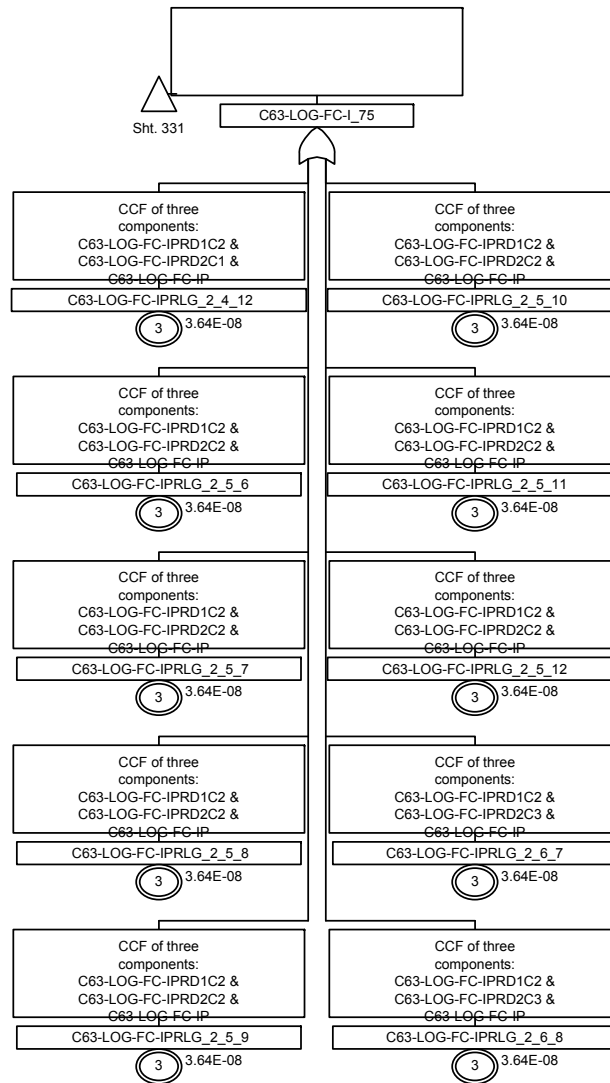


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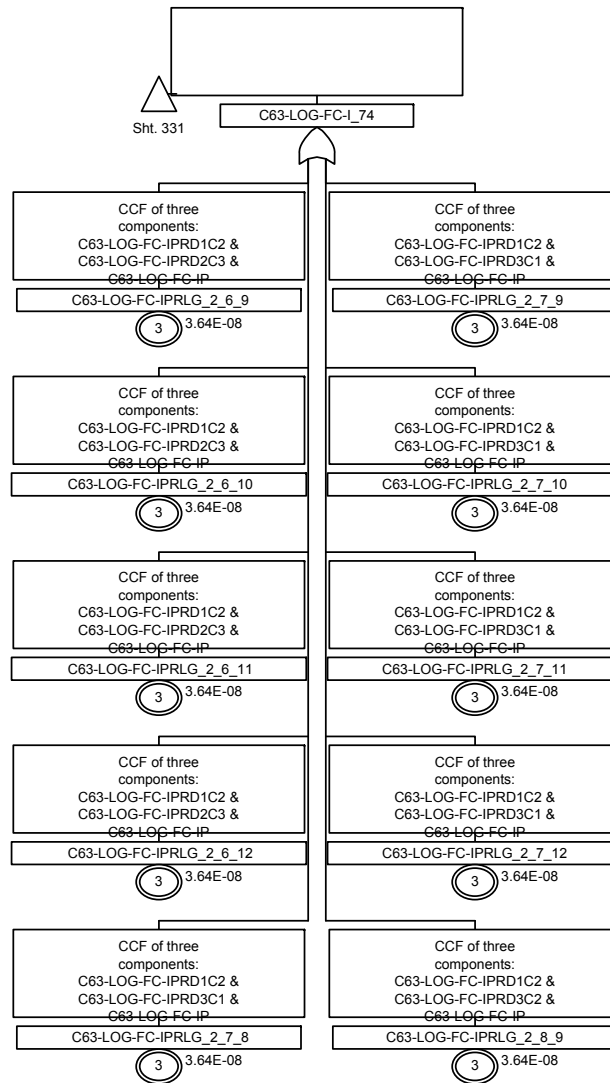


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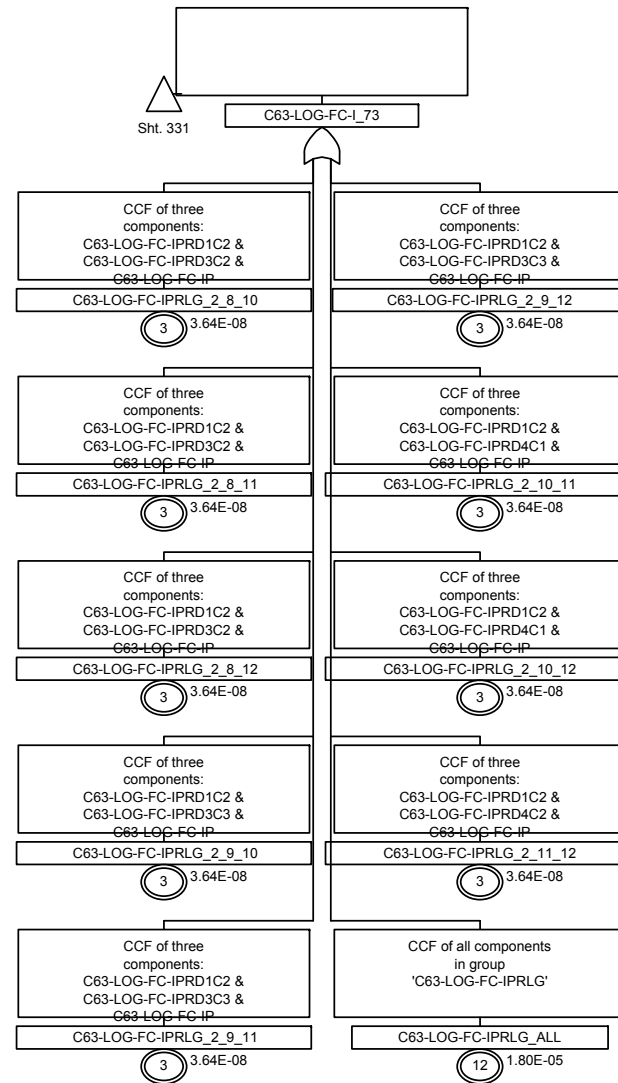


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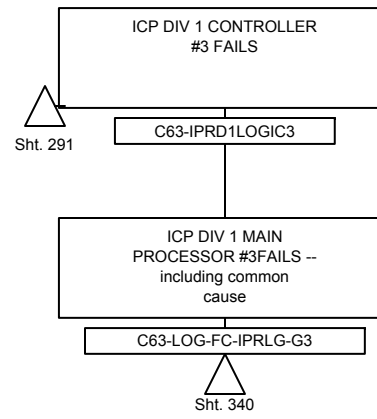


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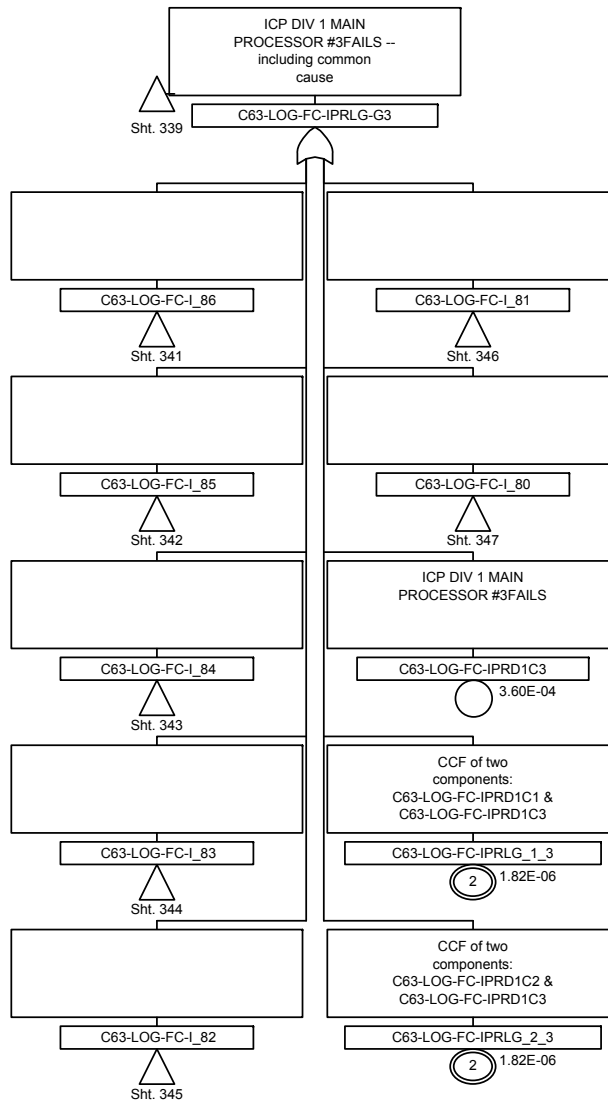


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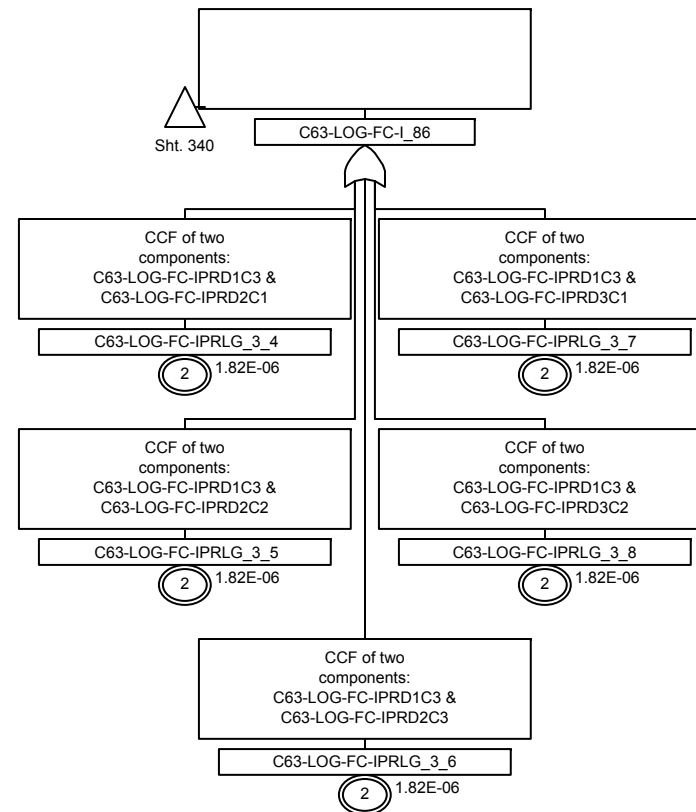


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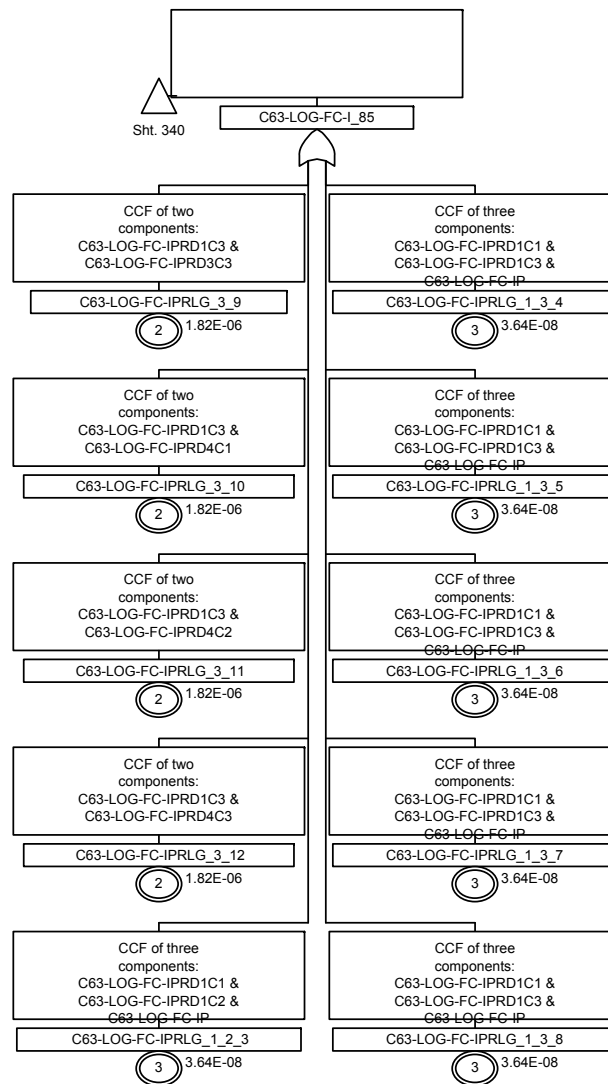


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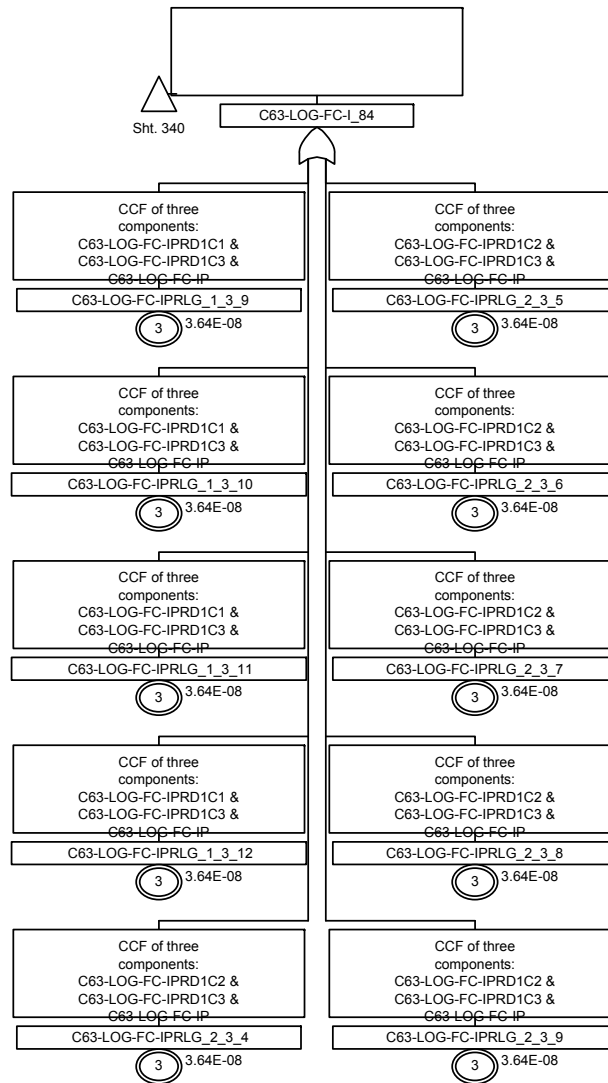


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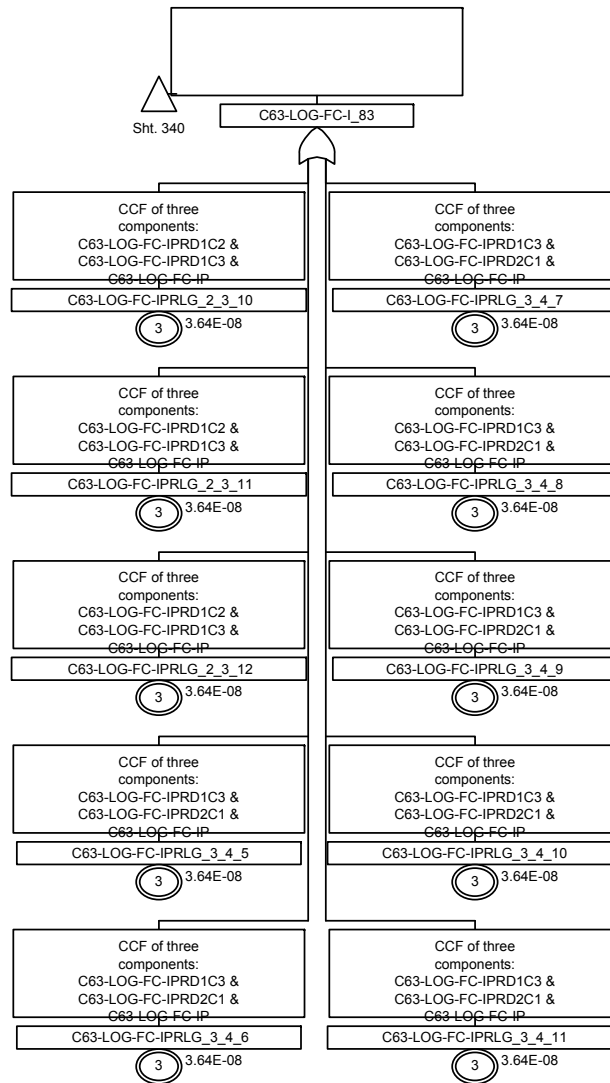


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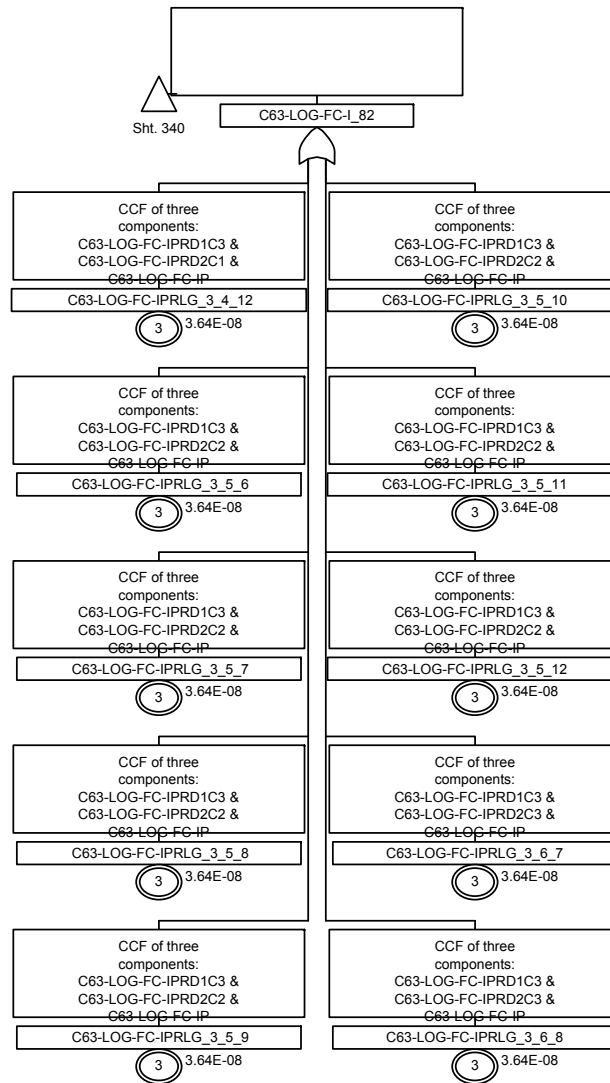


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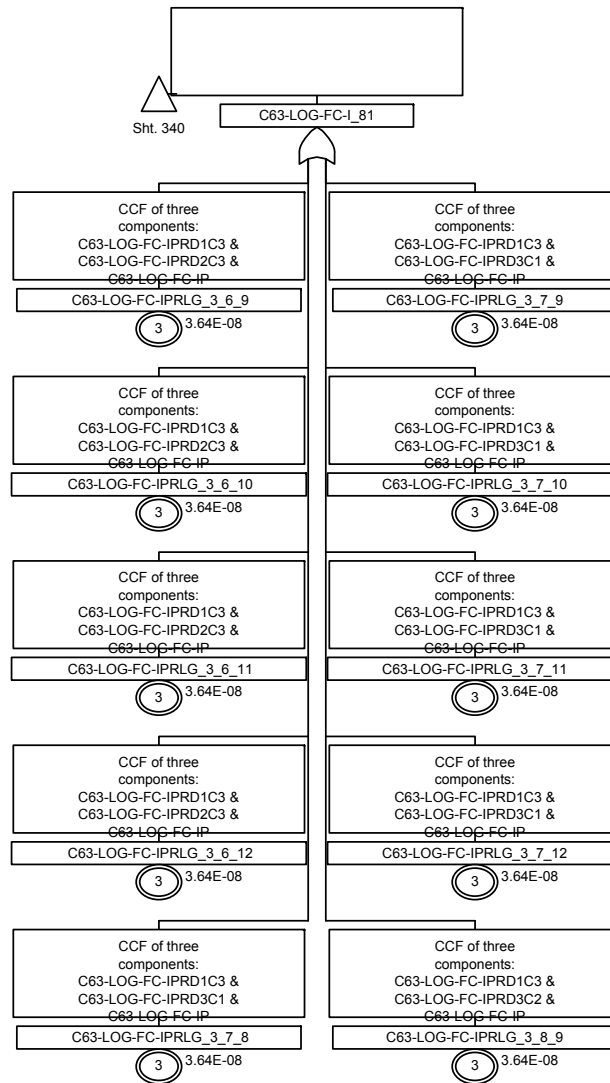


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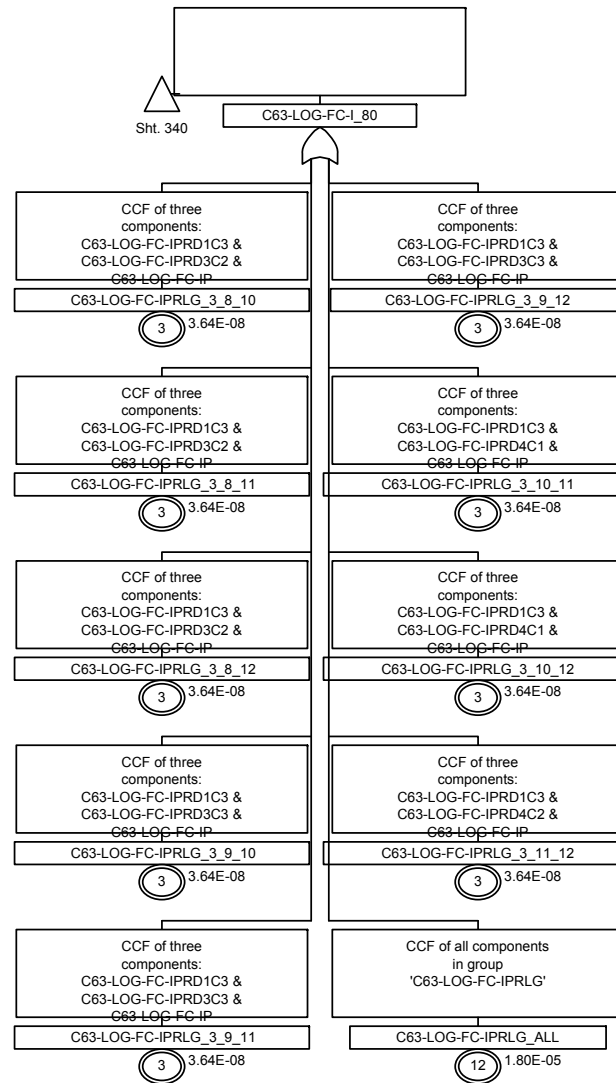


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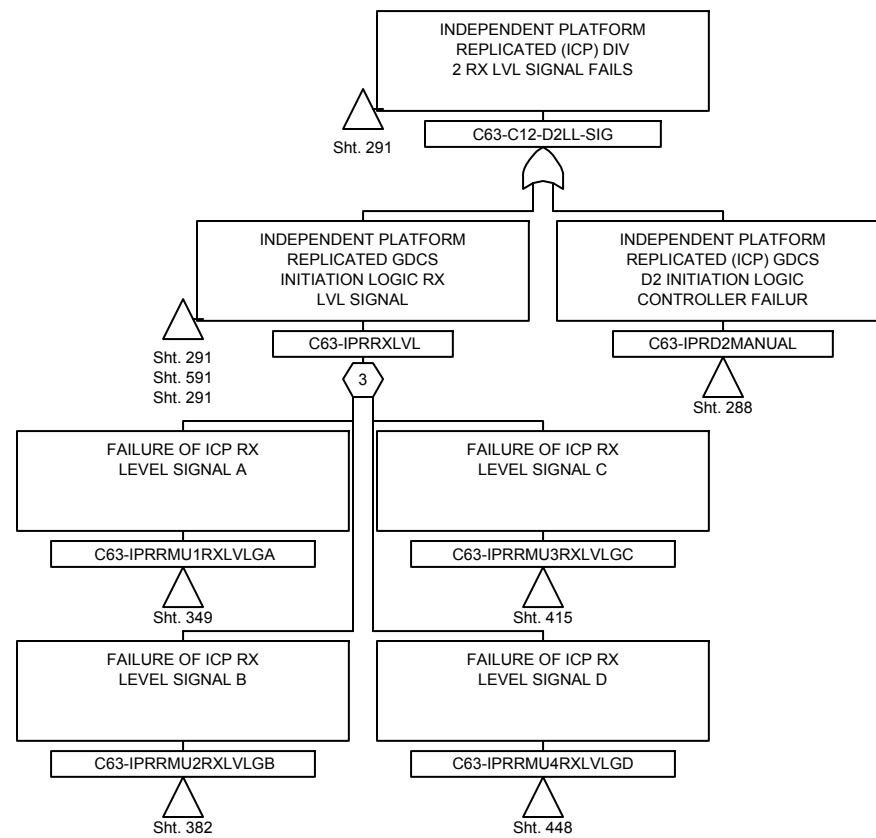


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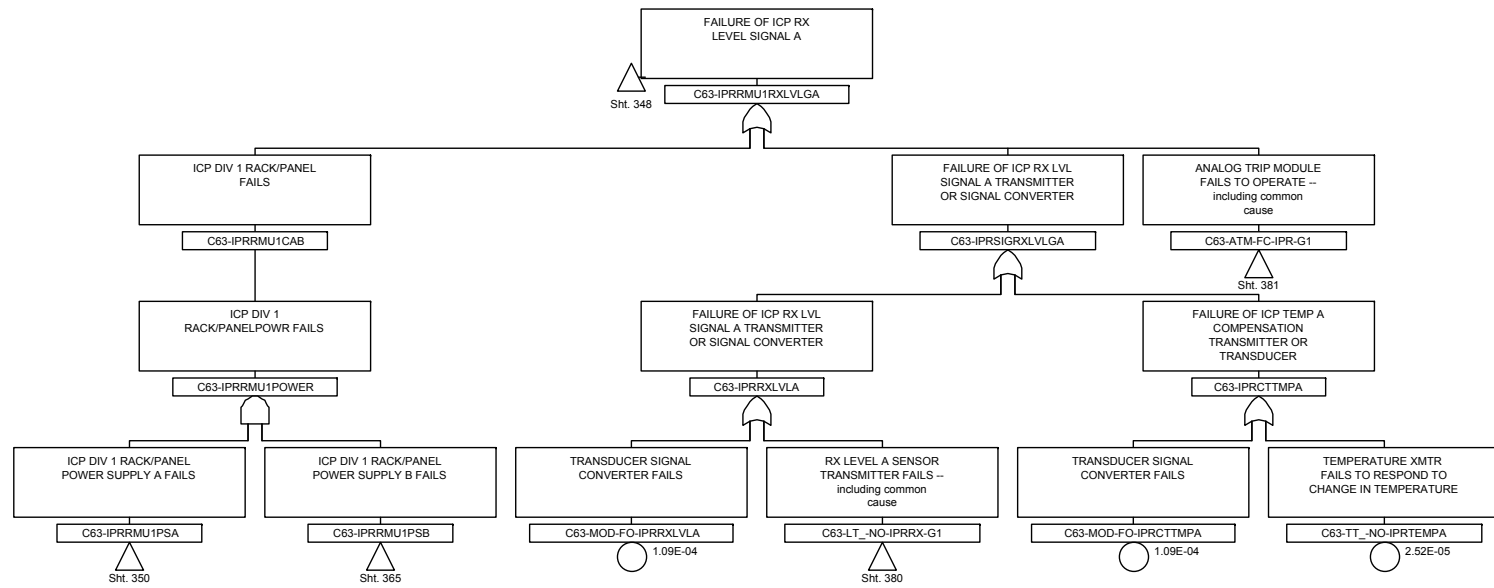


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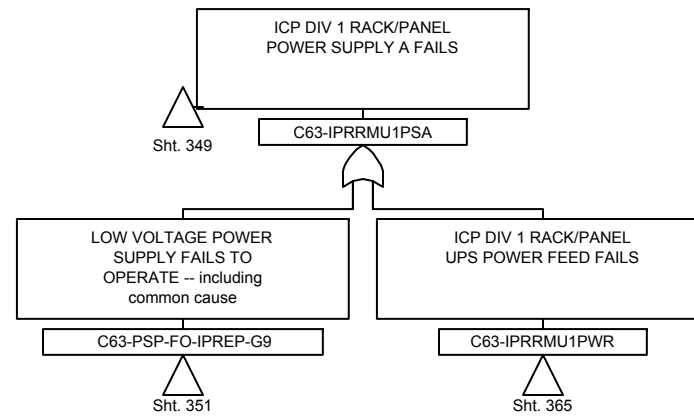


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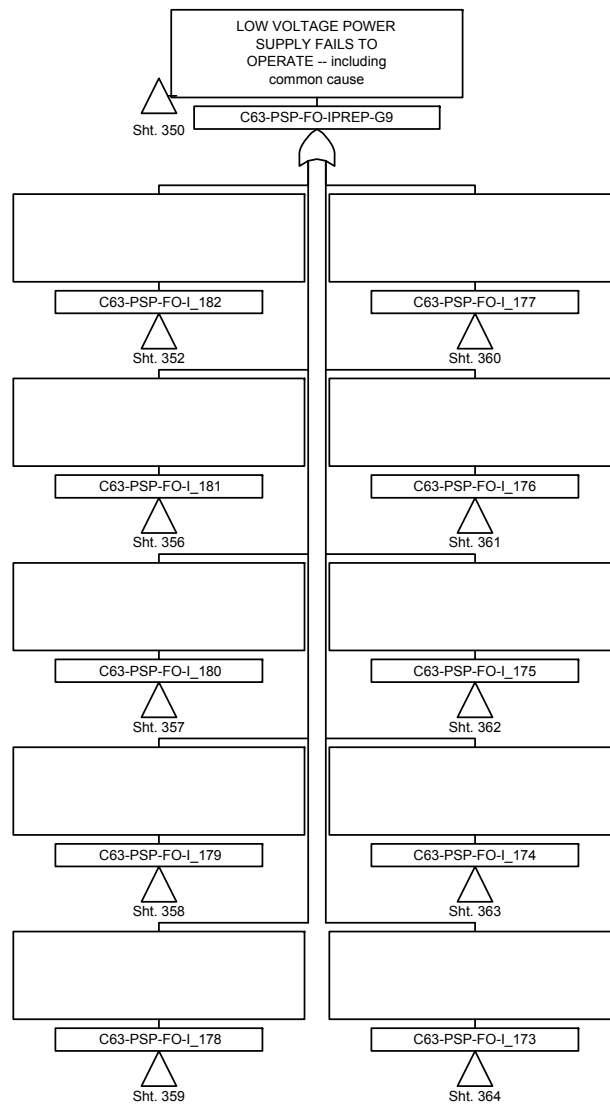


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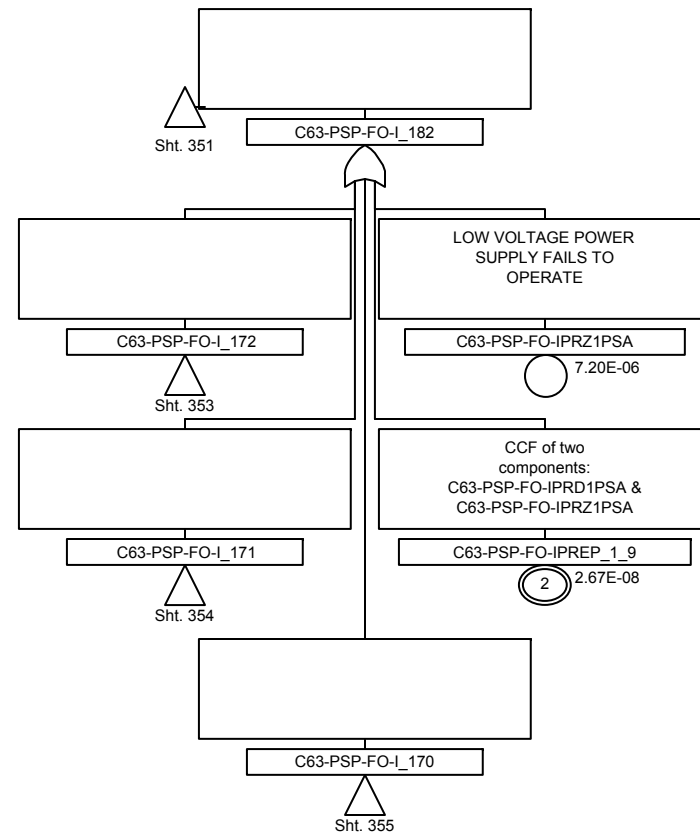


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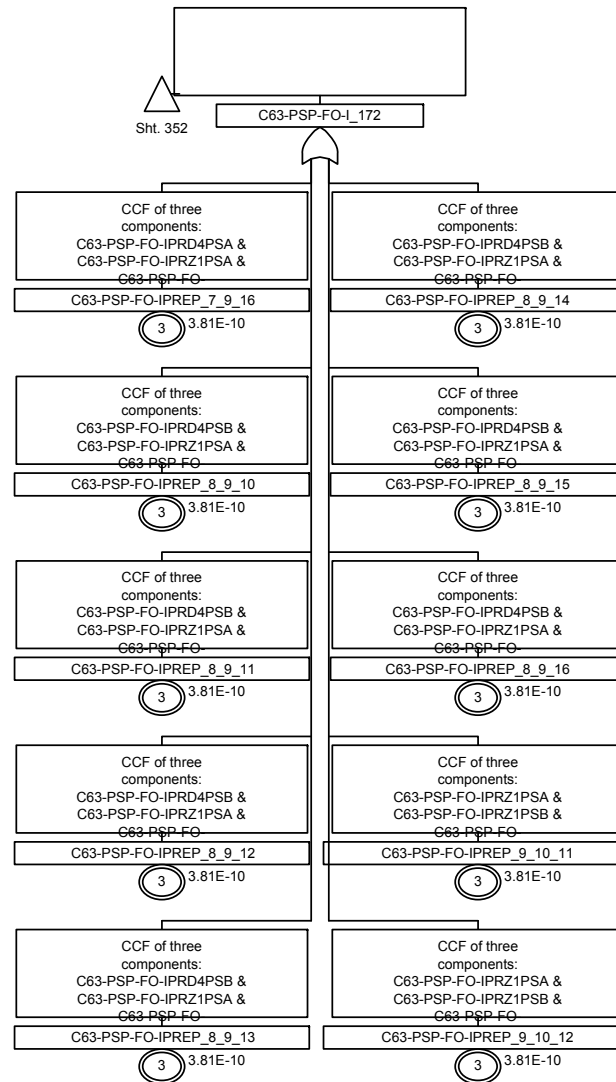


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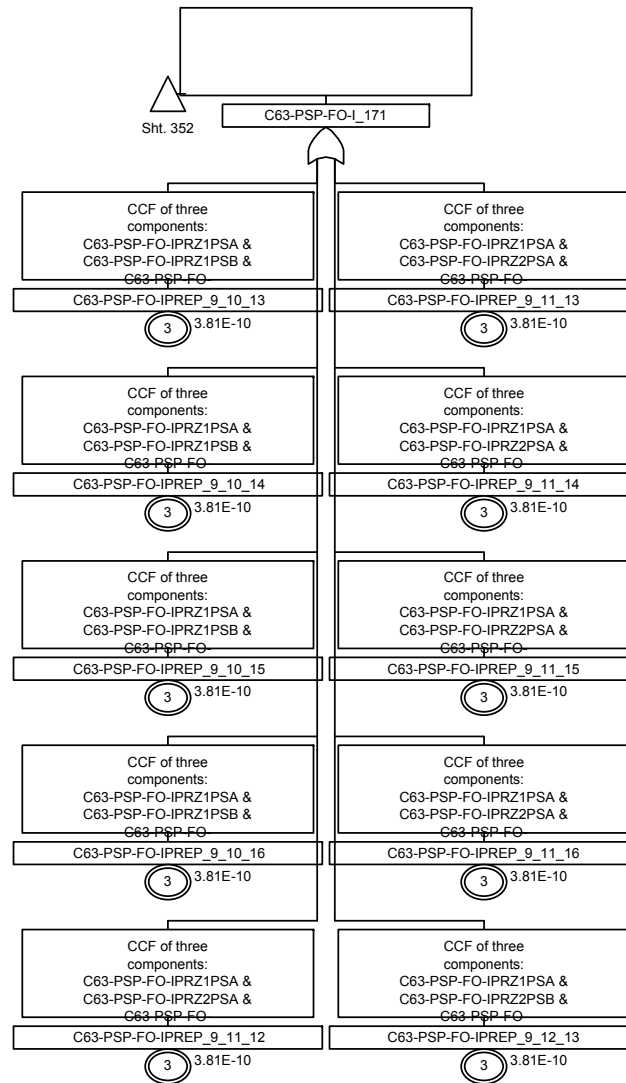


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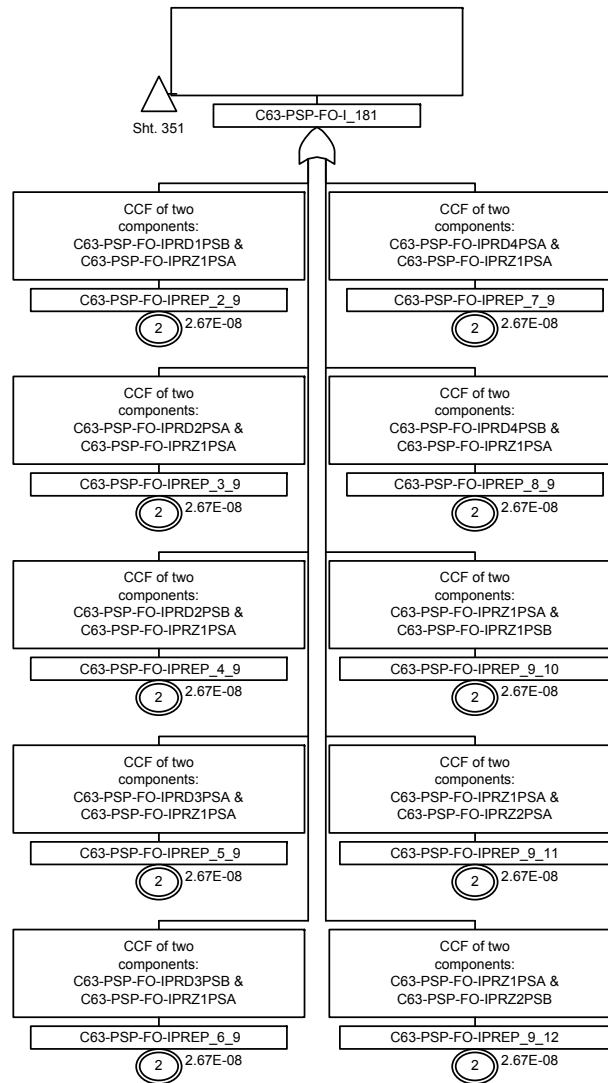


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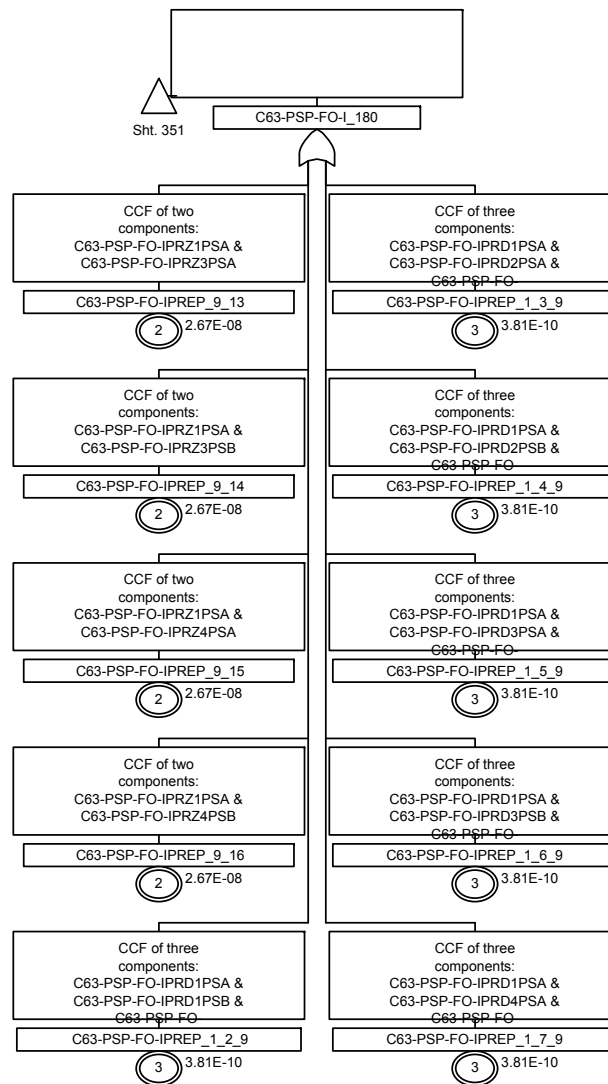


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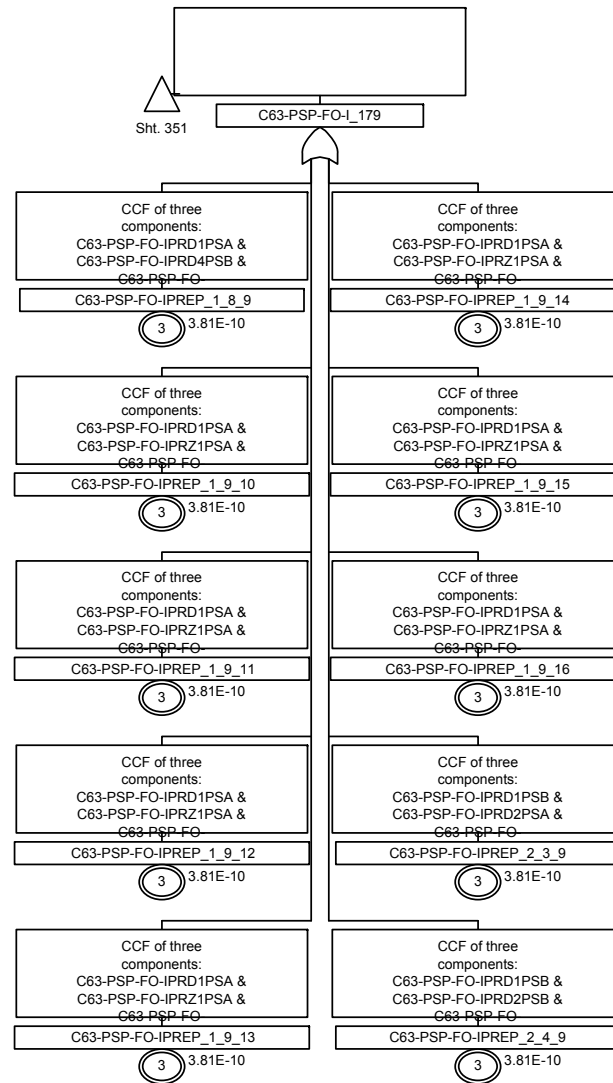


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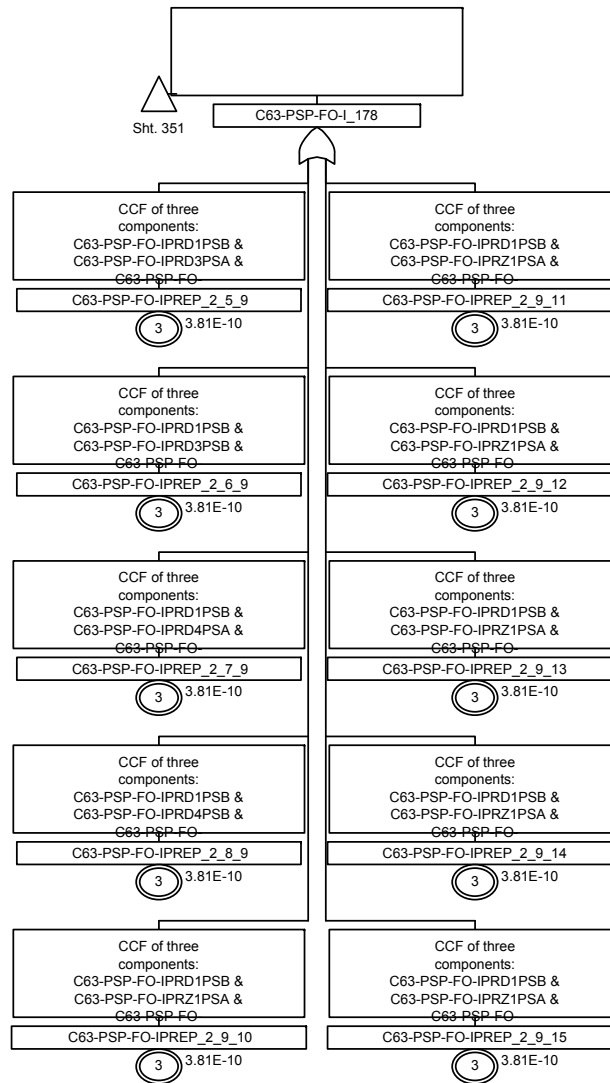


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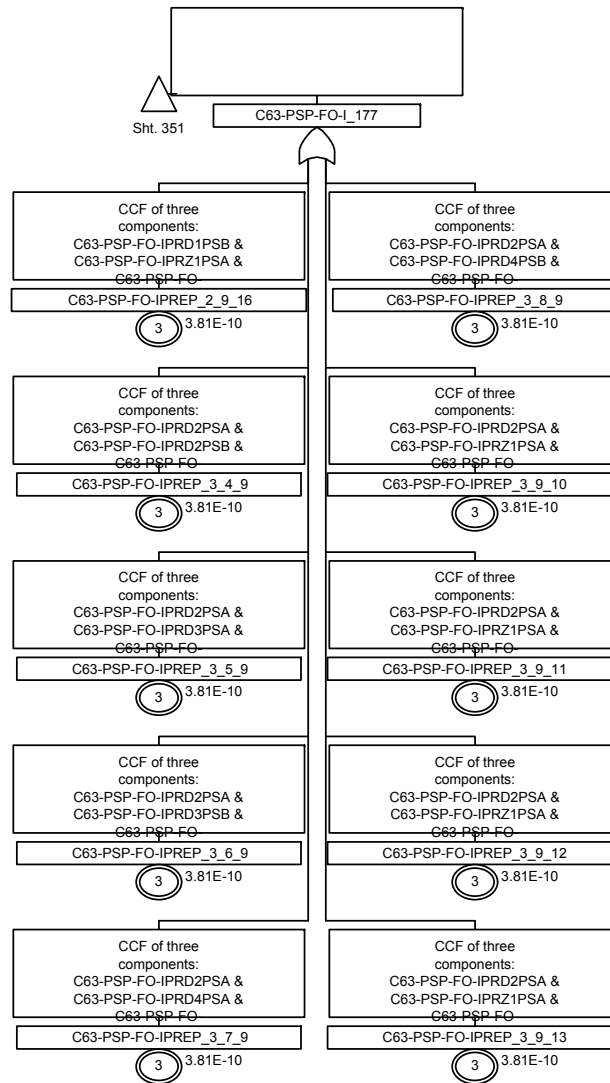


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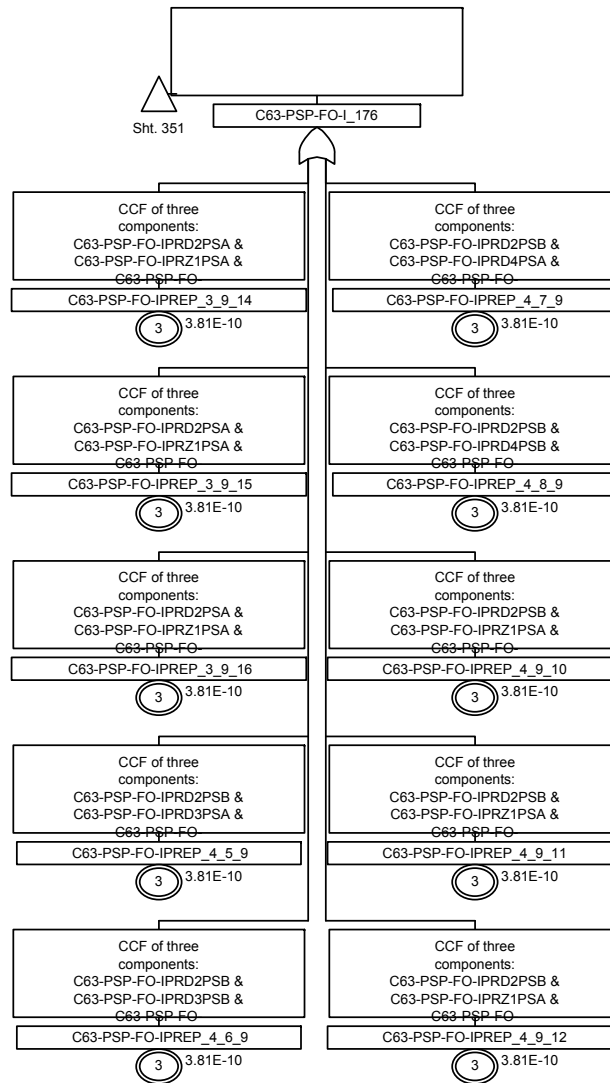


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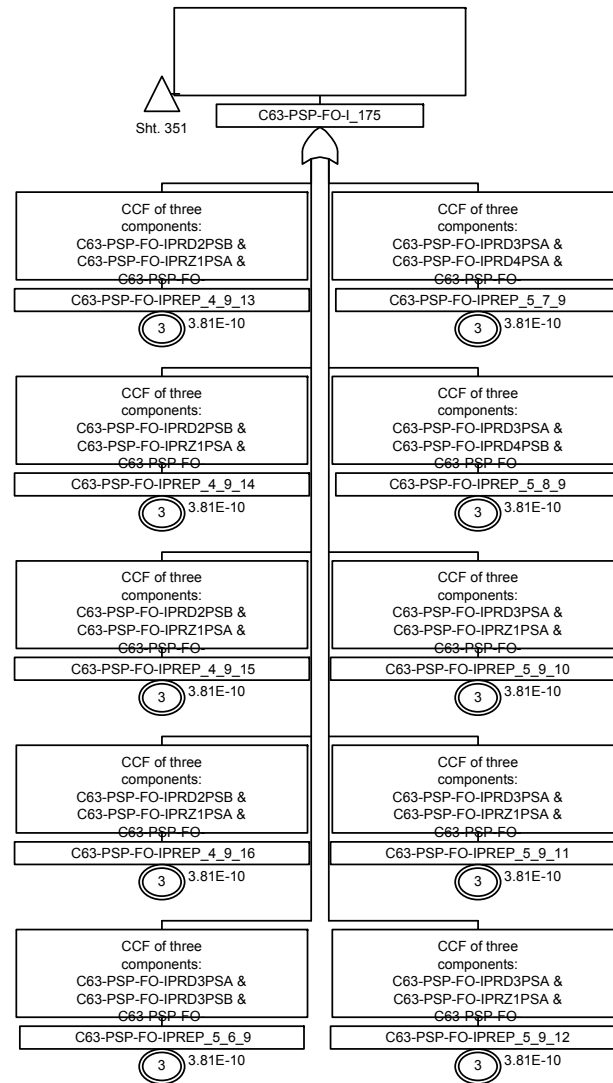


Figure 4.5-3e. Sheet 362 Independent Control Platforms



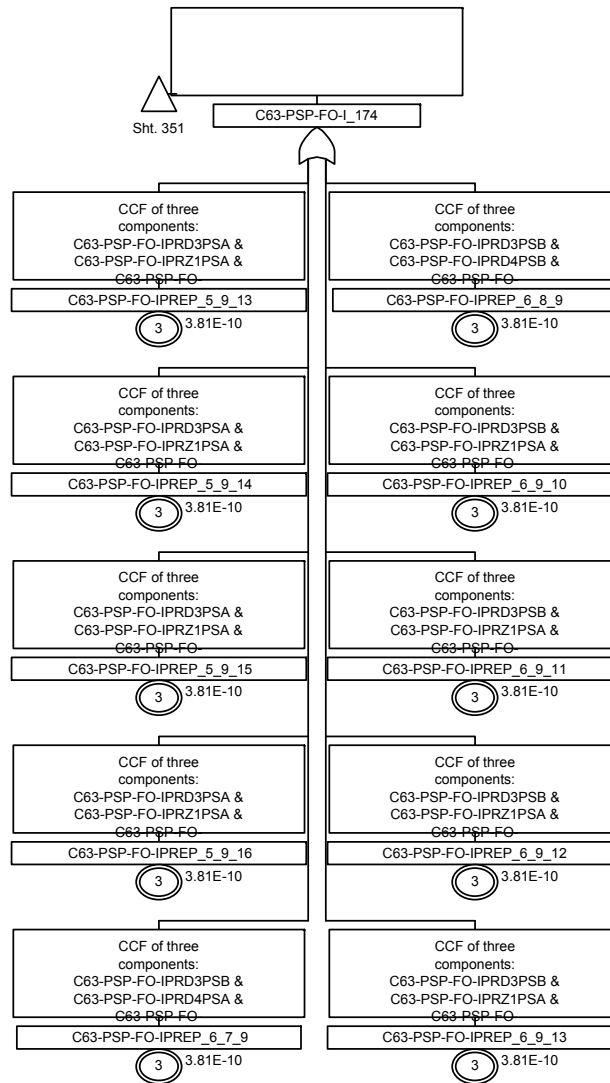


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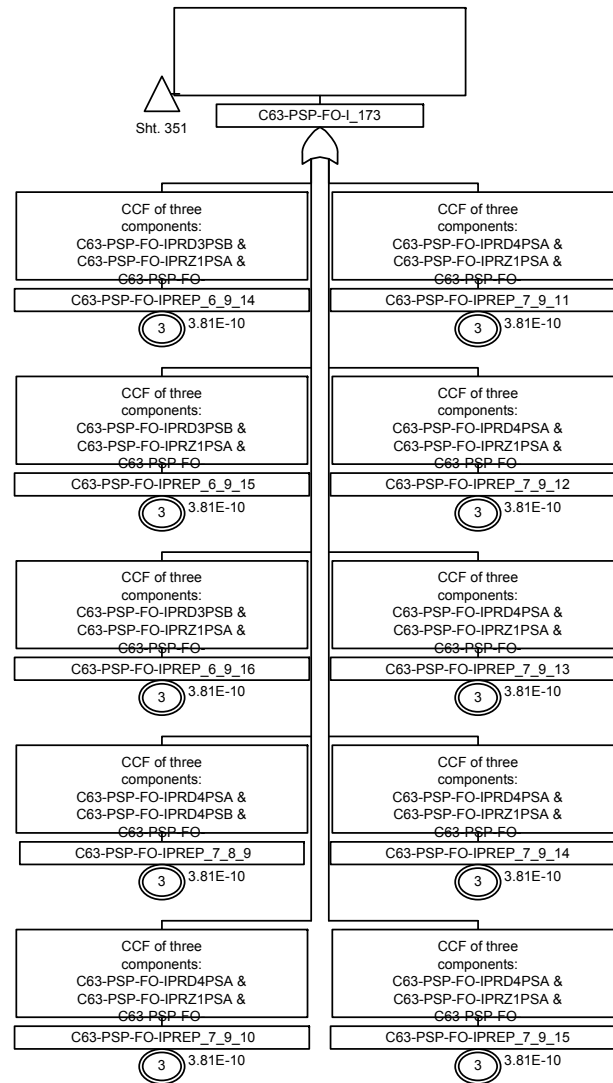


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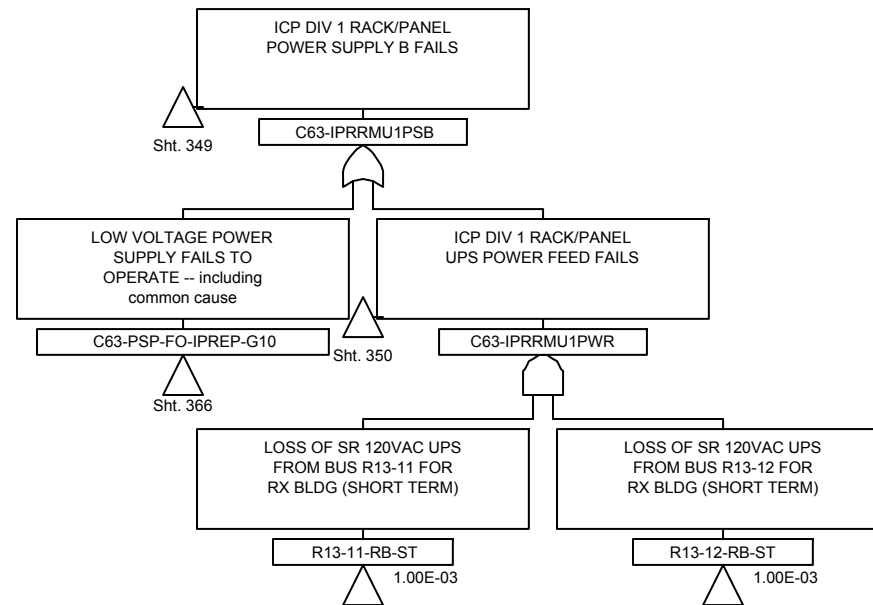


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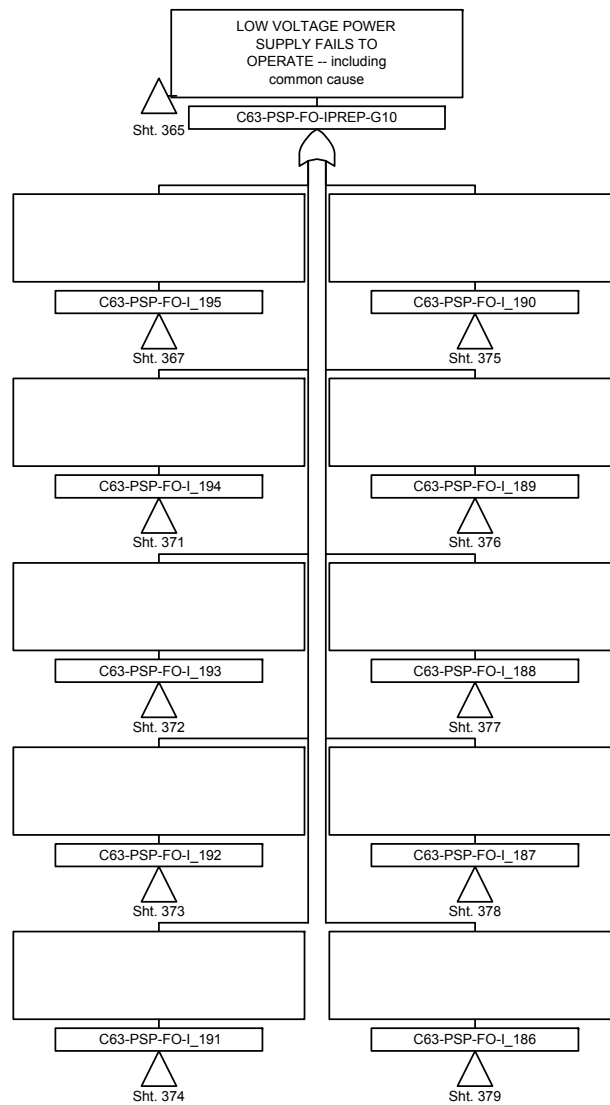


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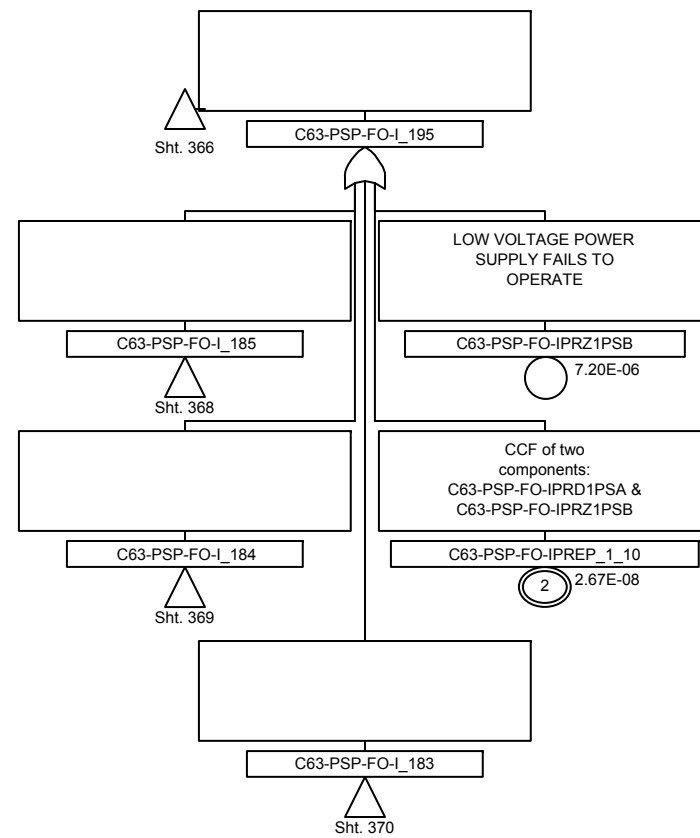


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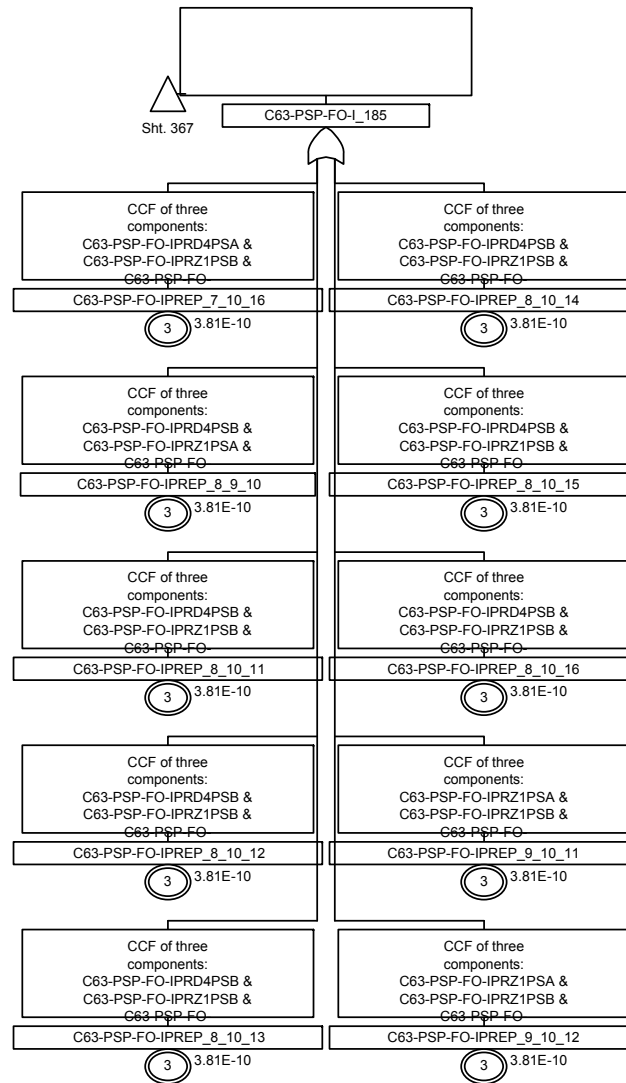


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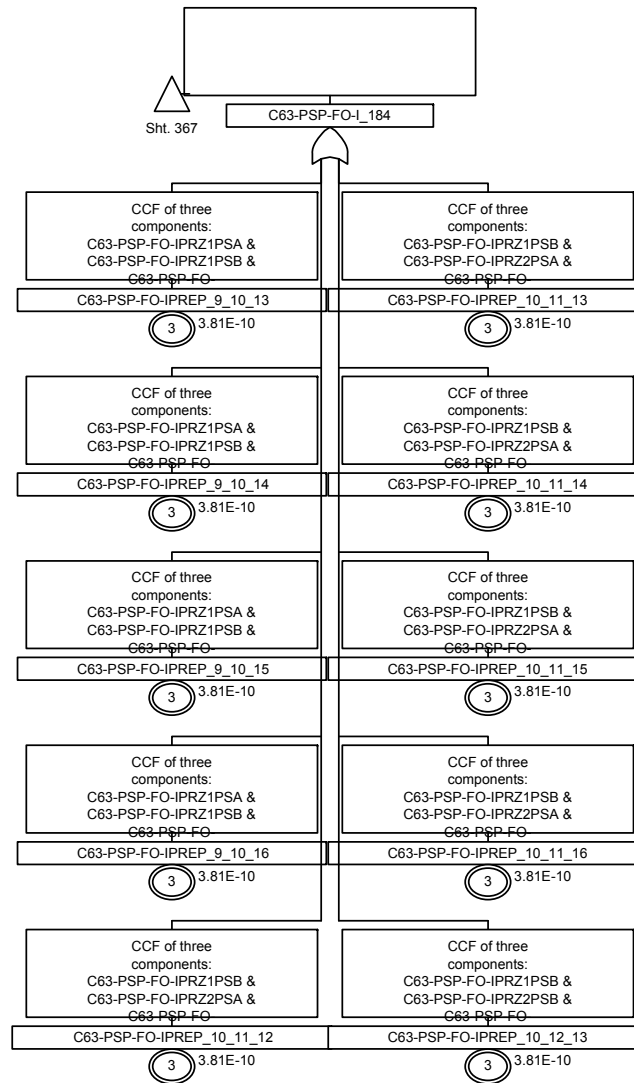


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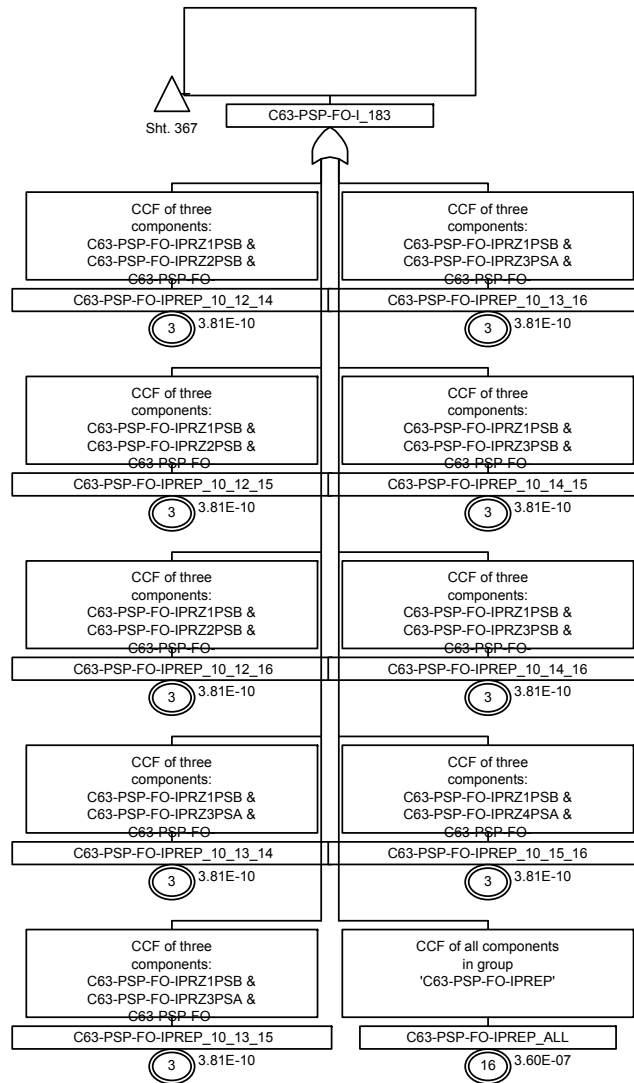


Figure 4.5-3e. Sheet 370 Independent Control Platforms



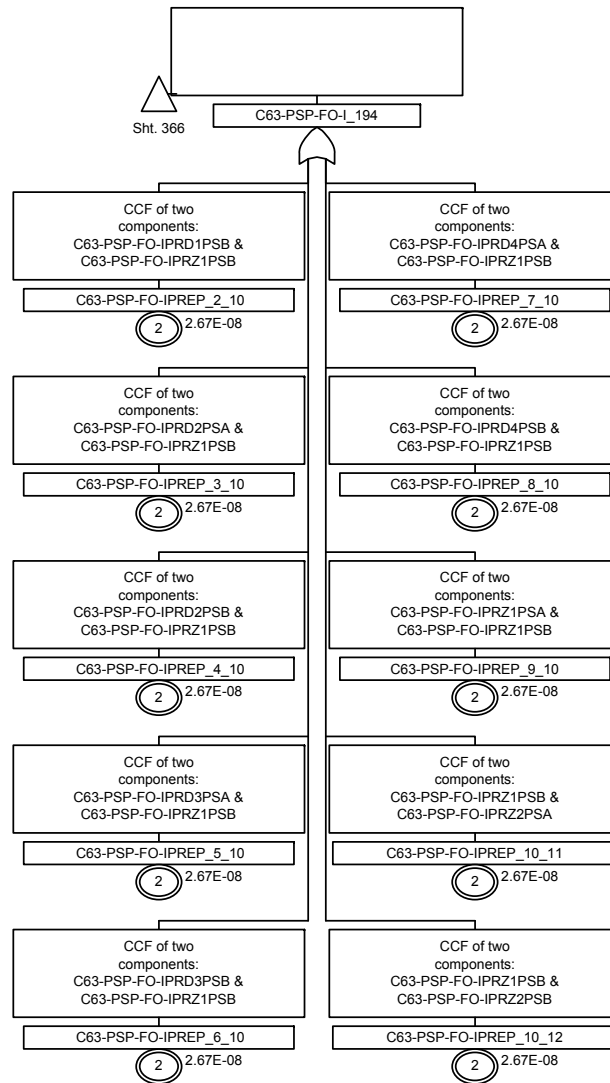


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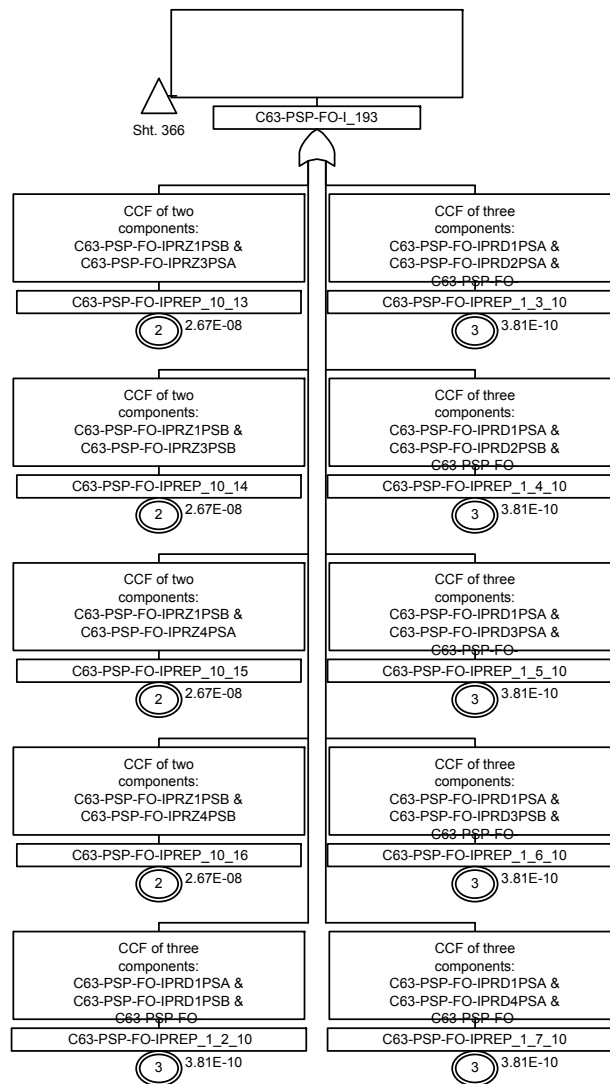


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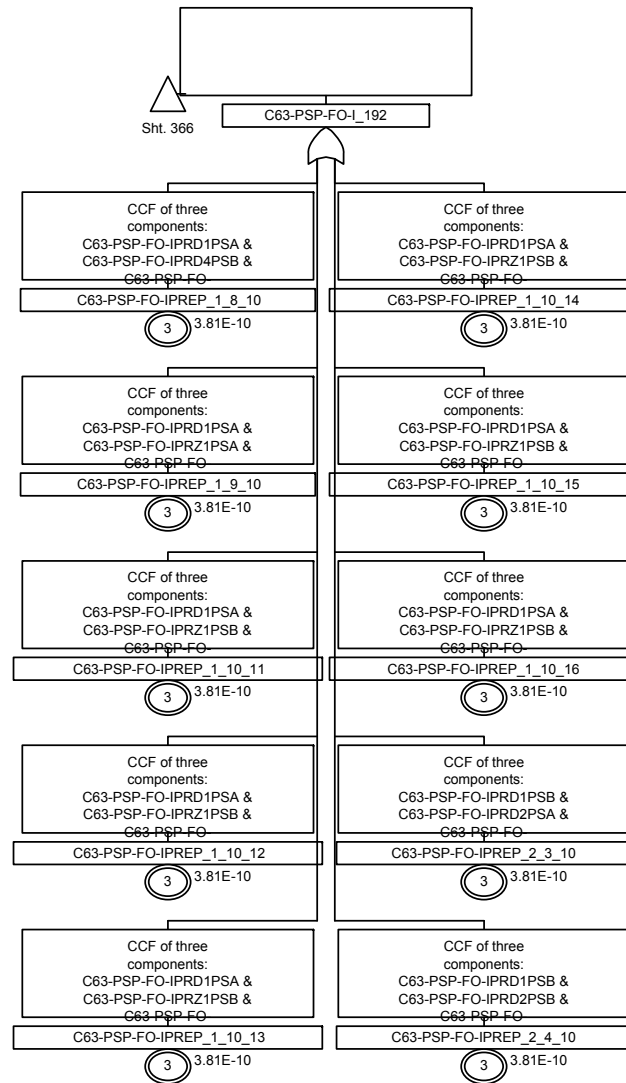


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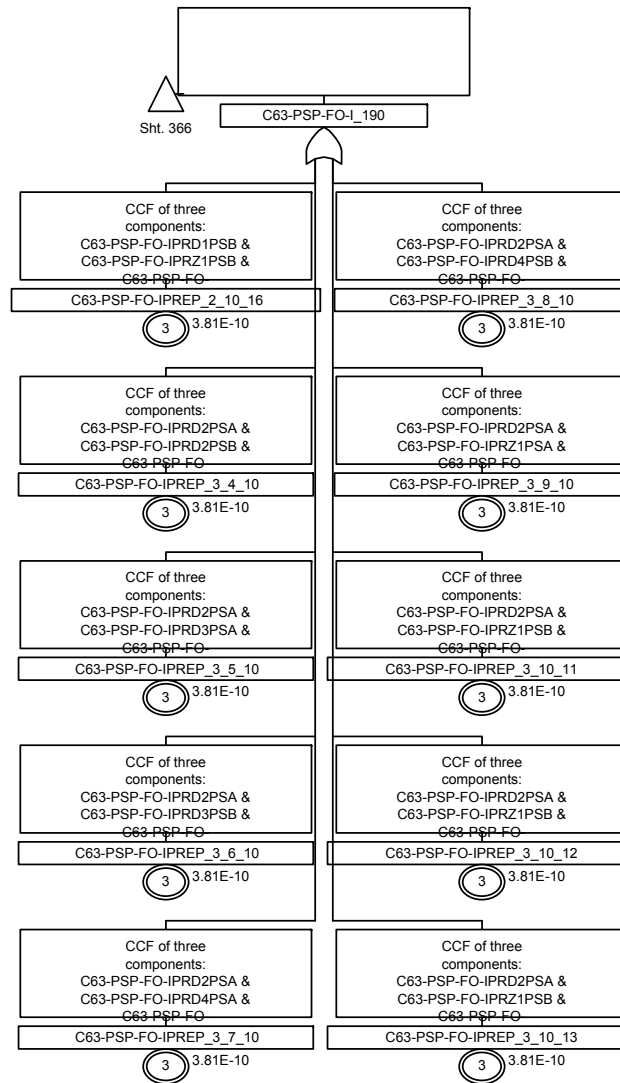


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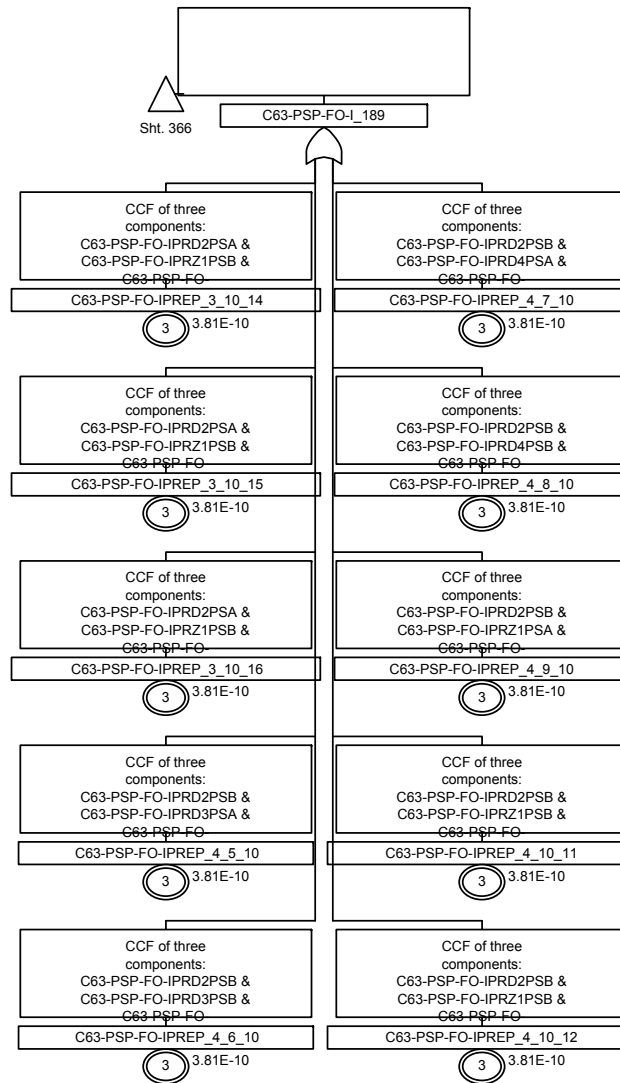


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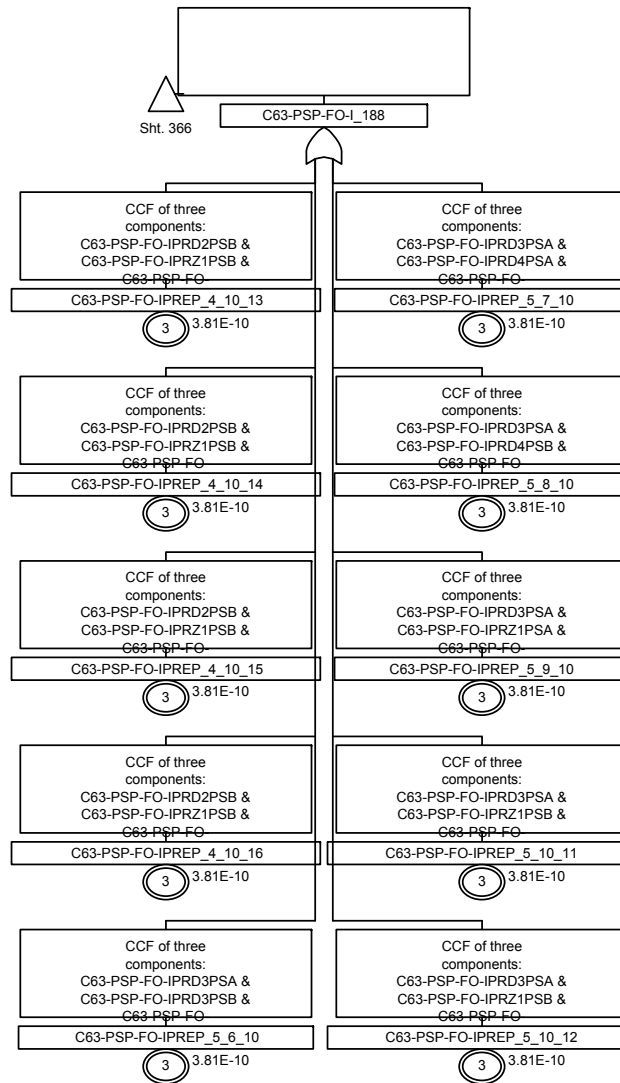


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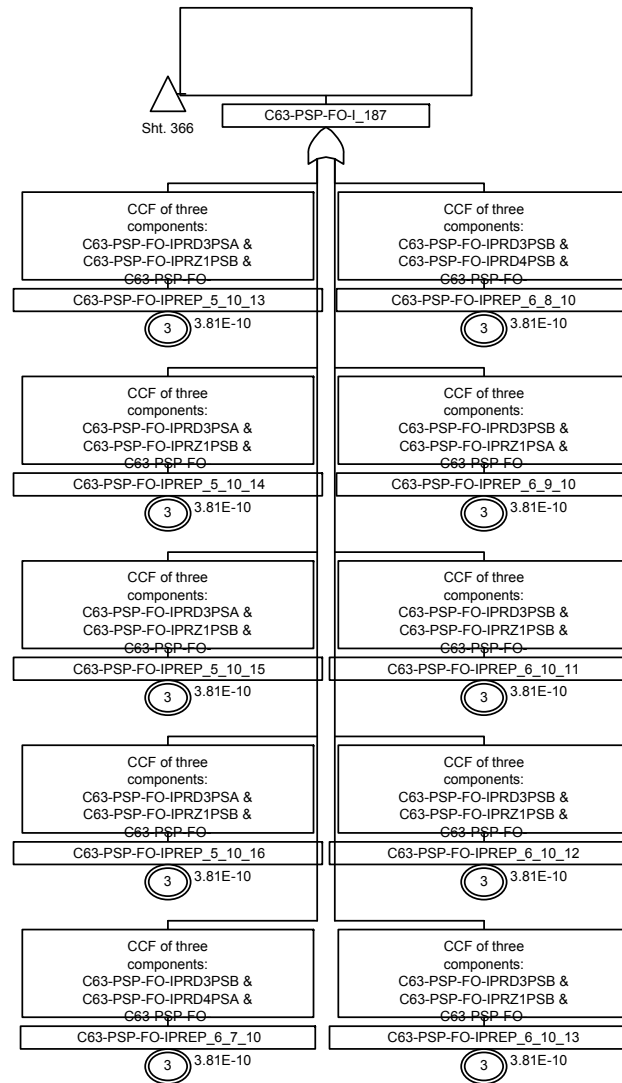


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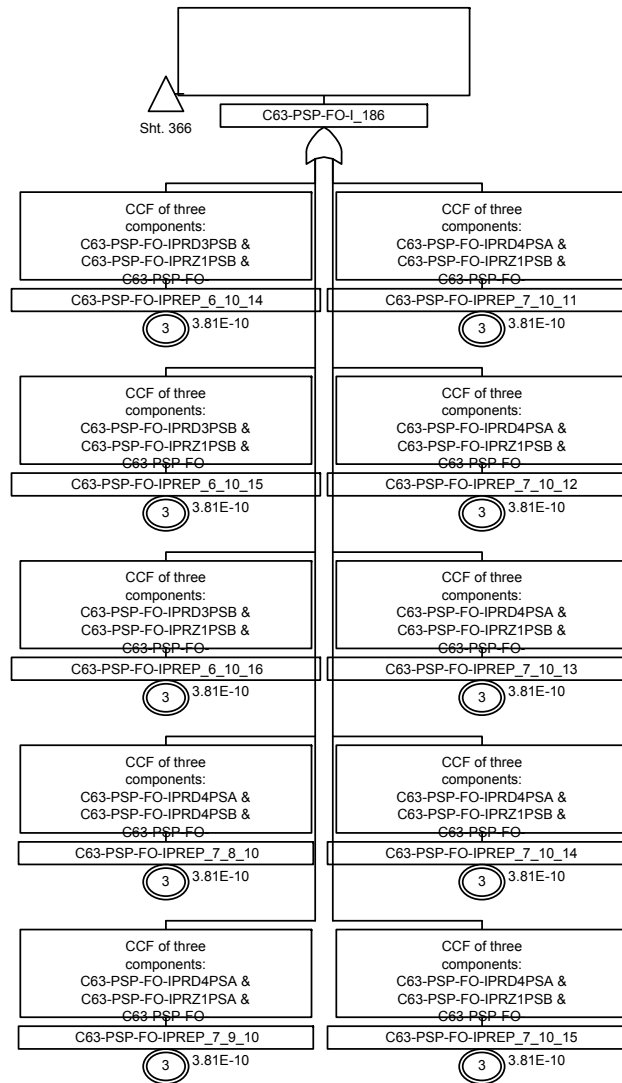


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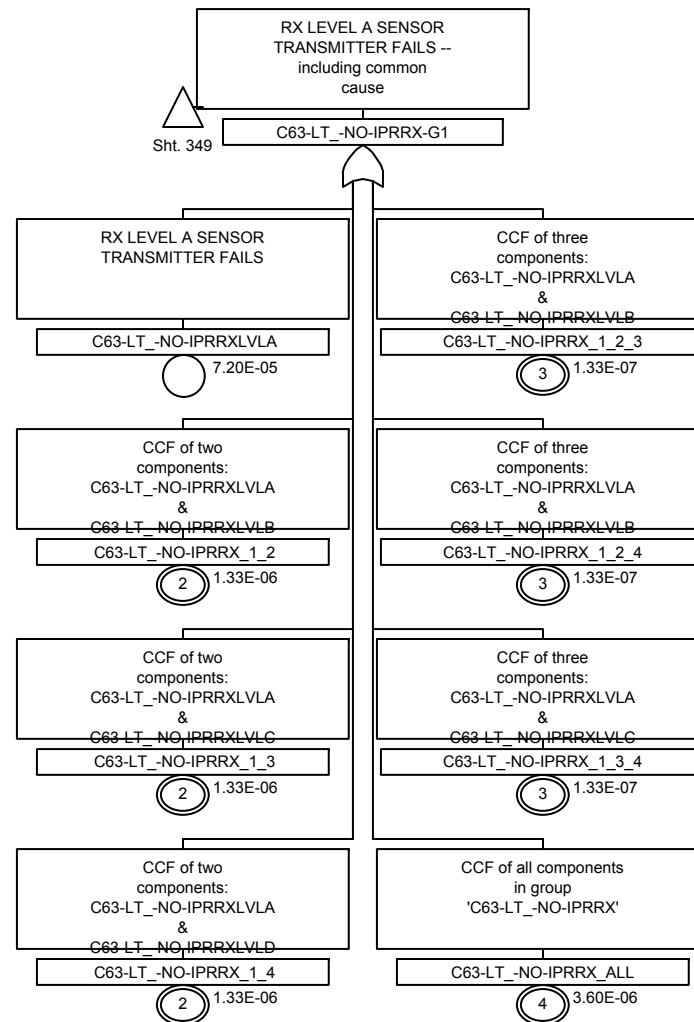


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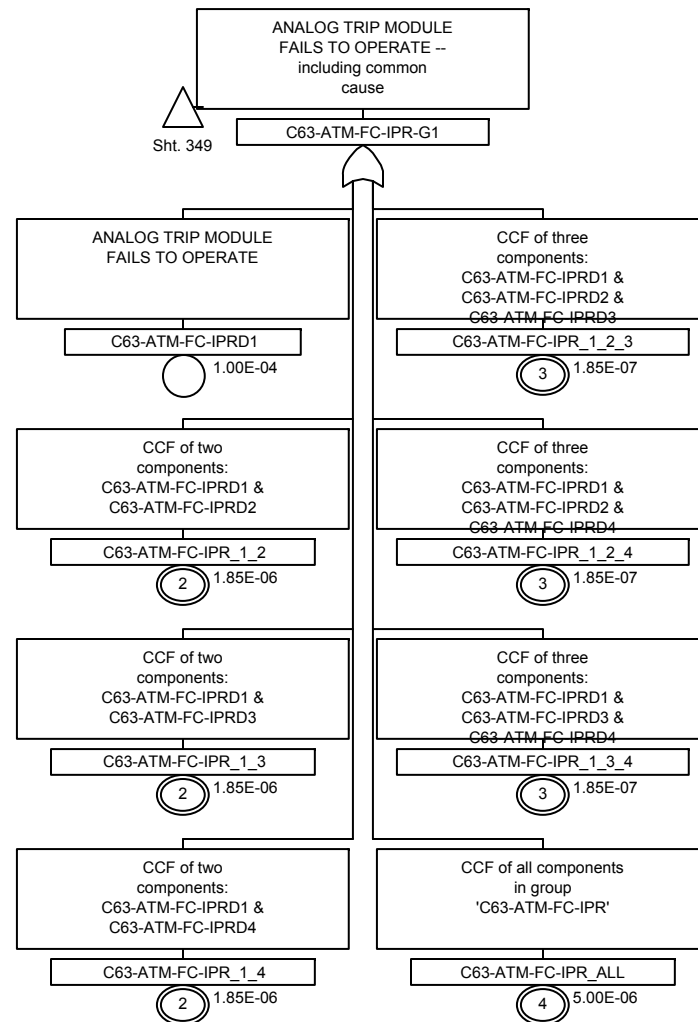


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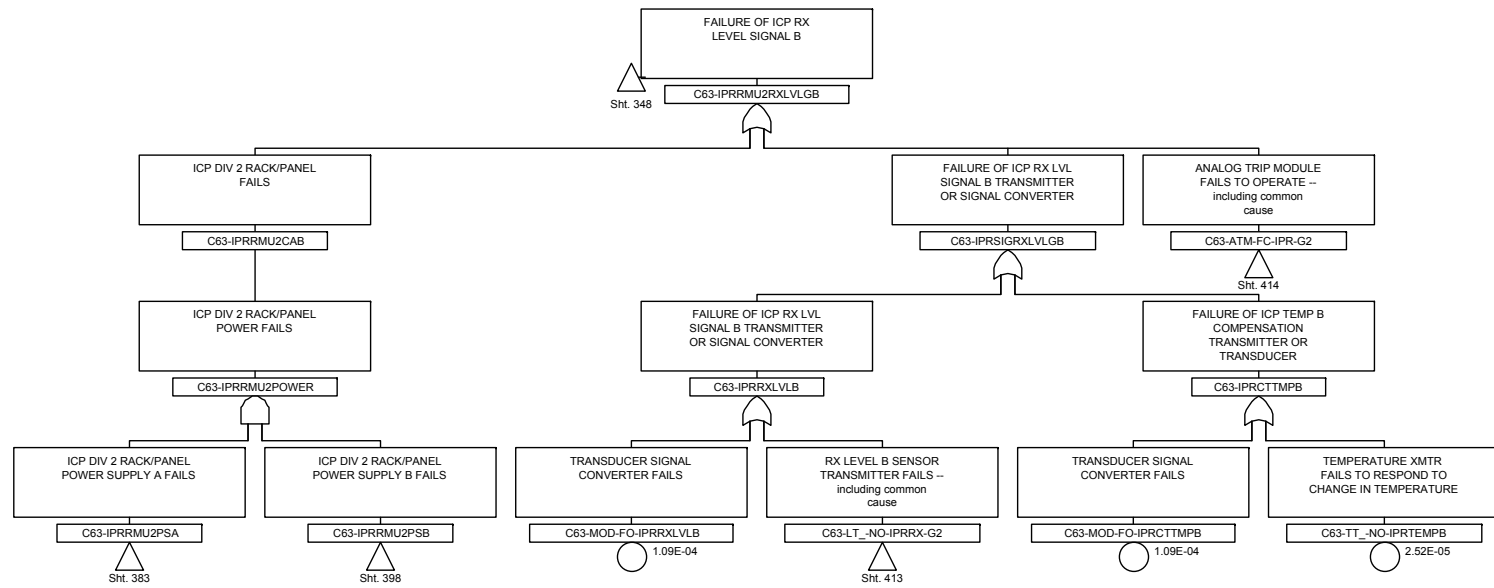


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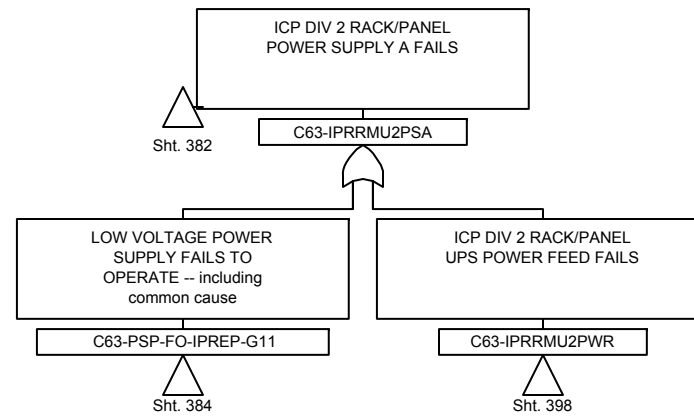


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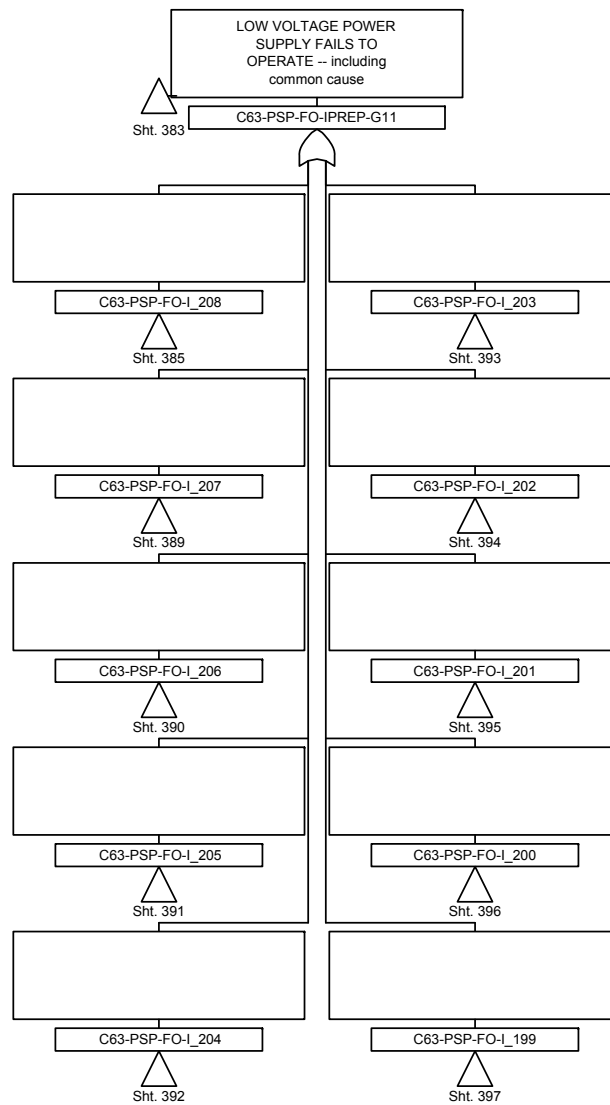


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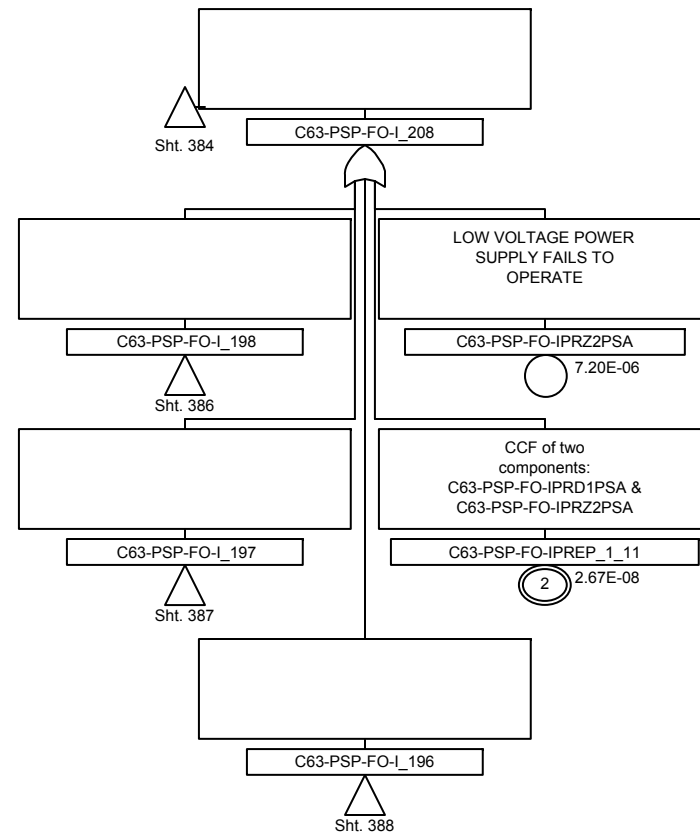


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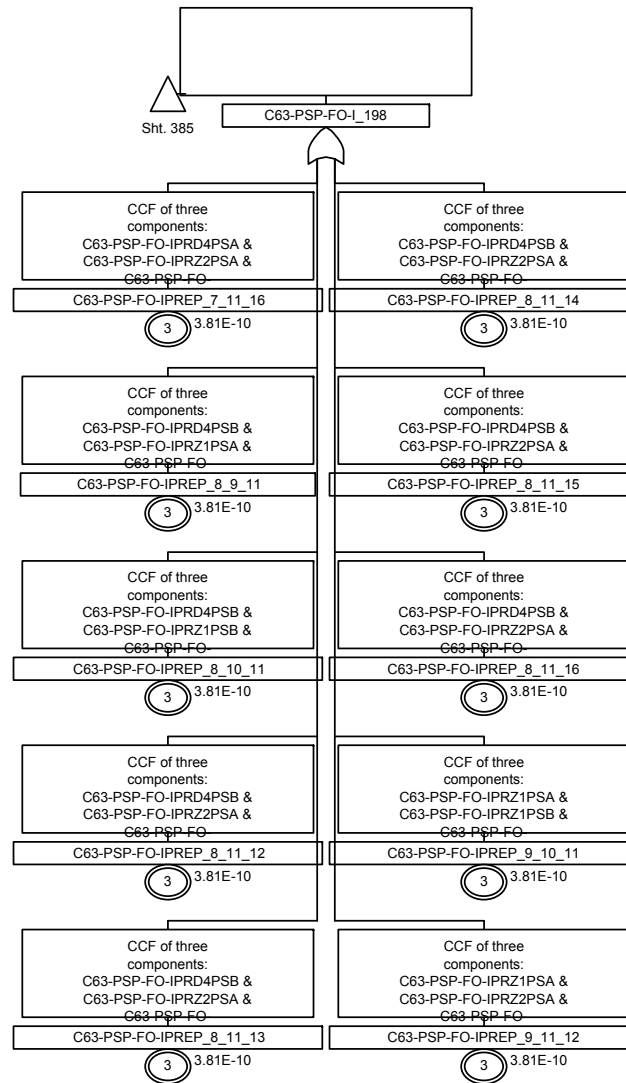


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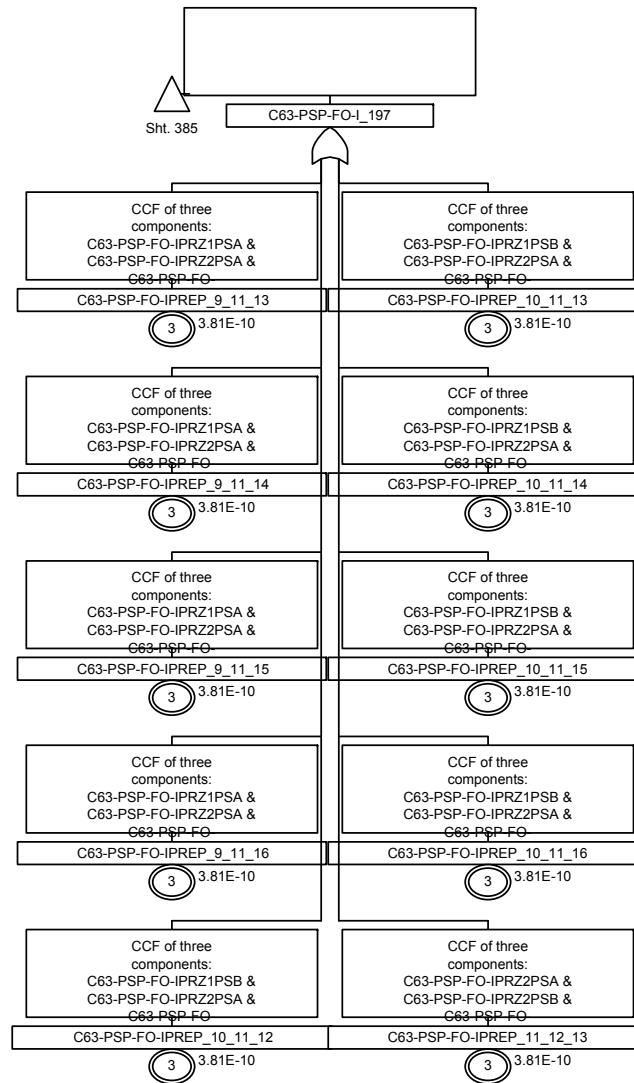


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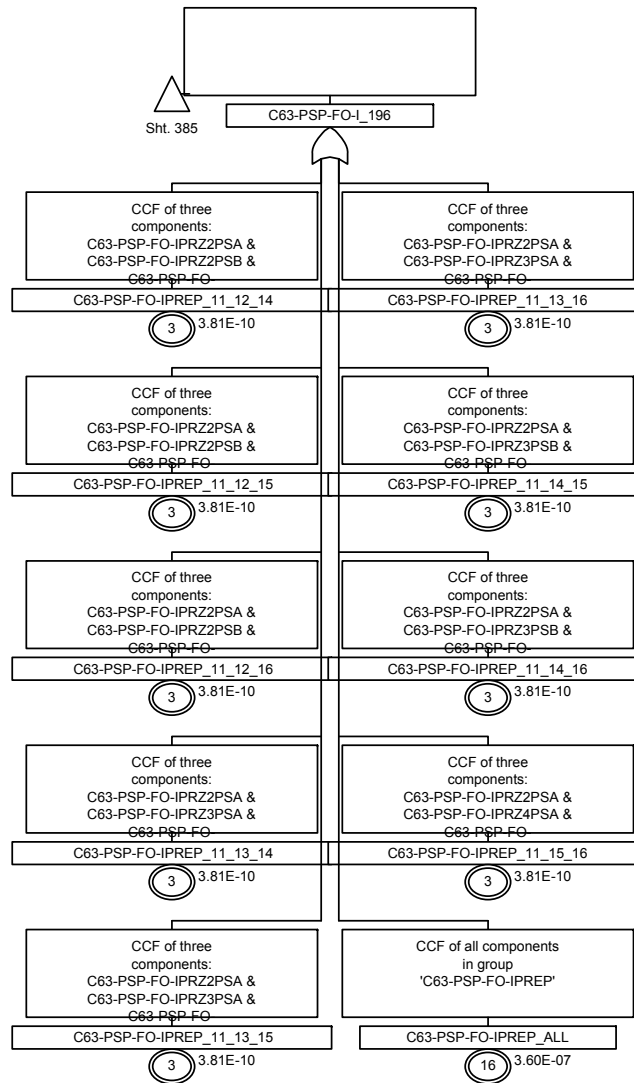


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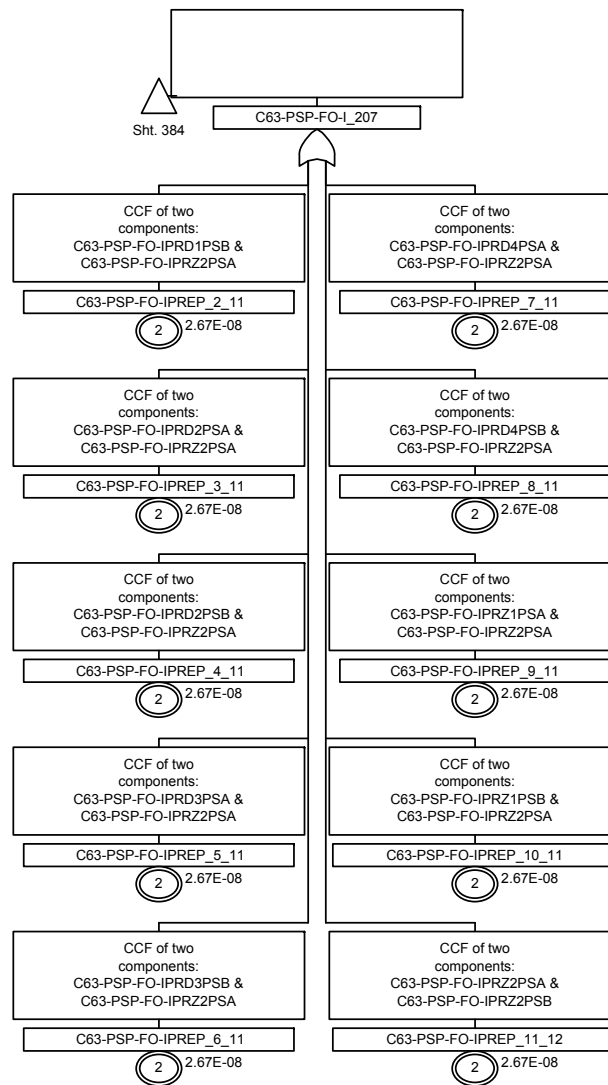


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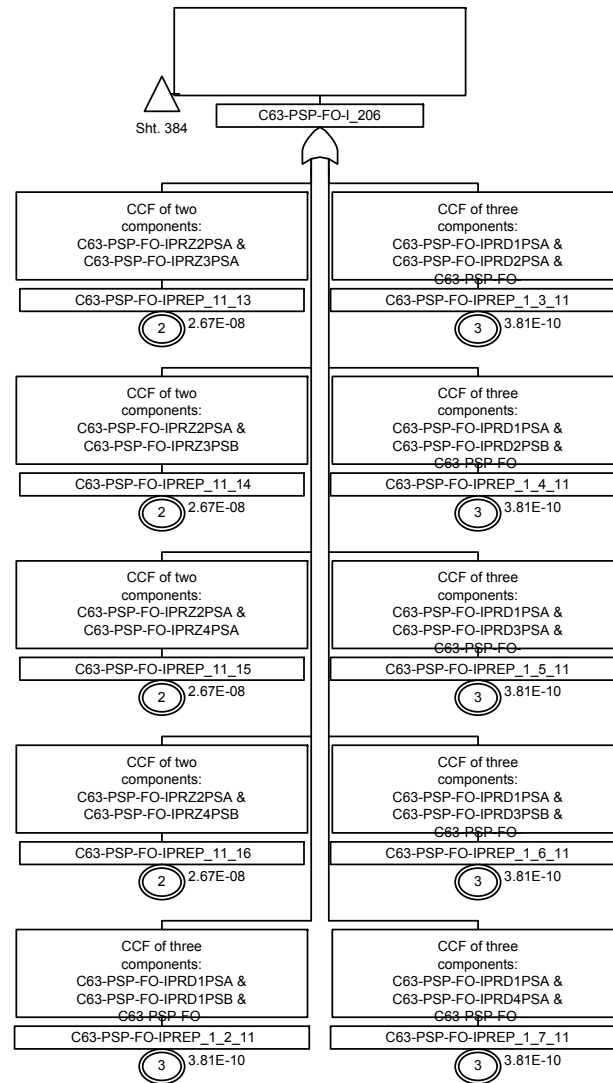


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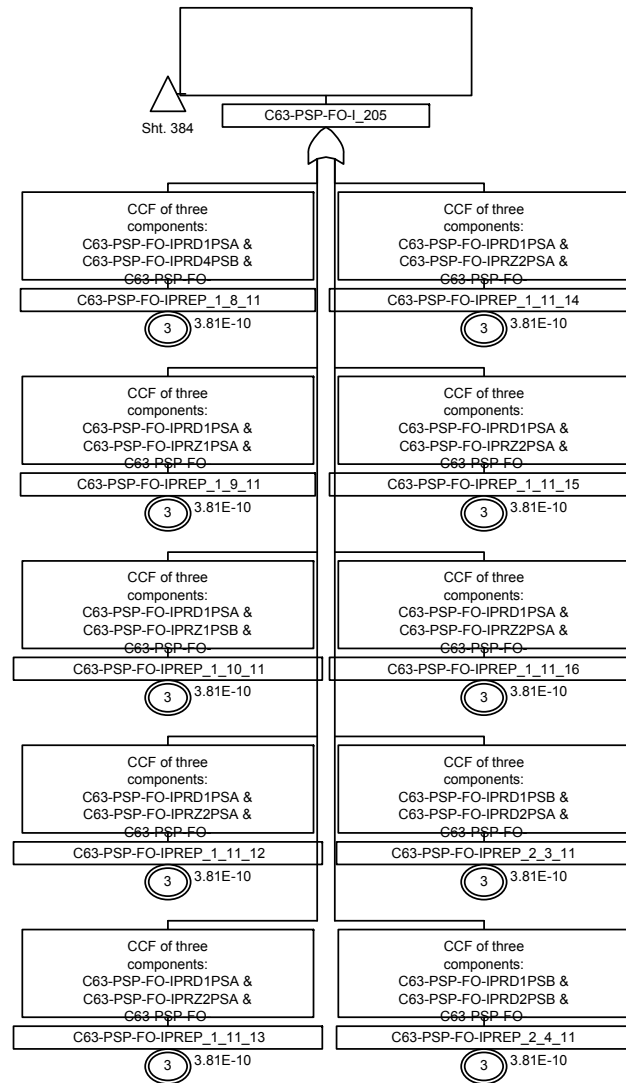


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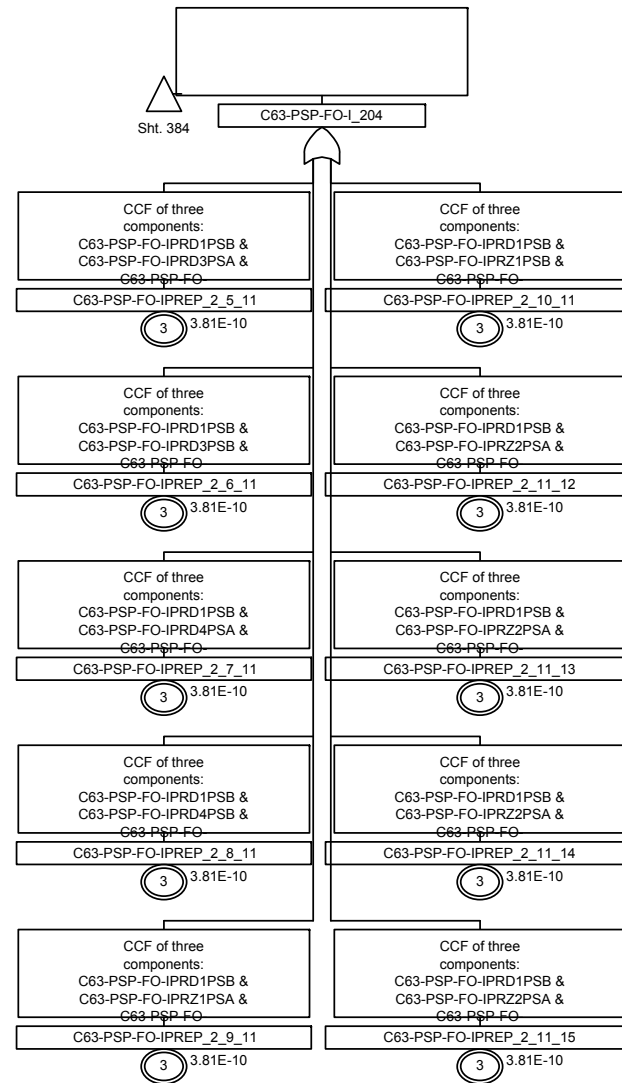


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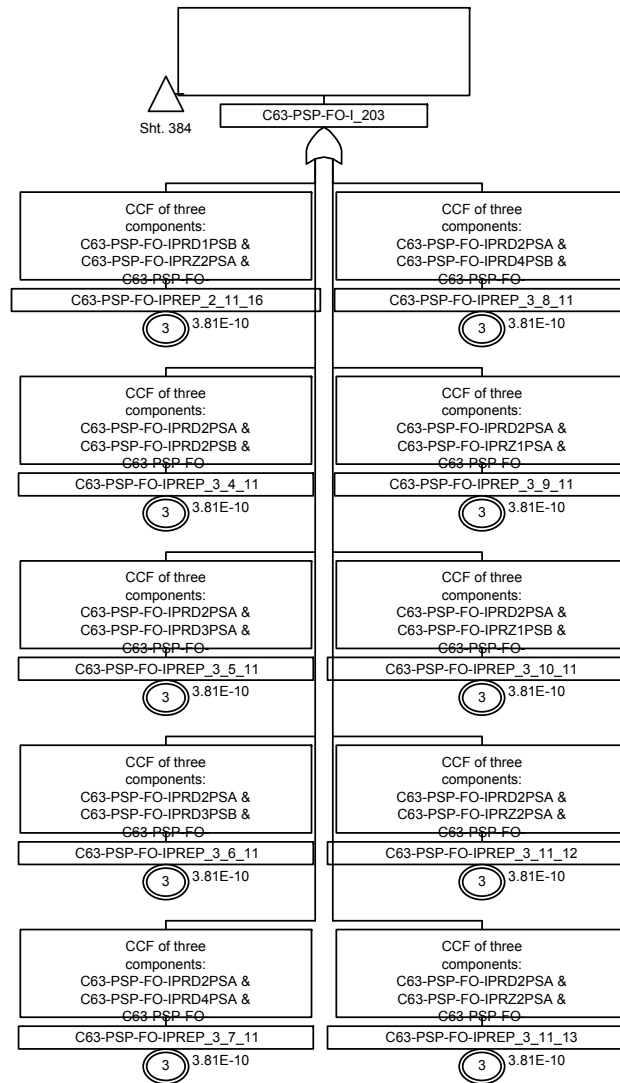


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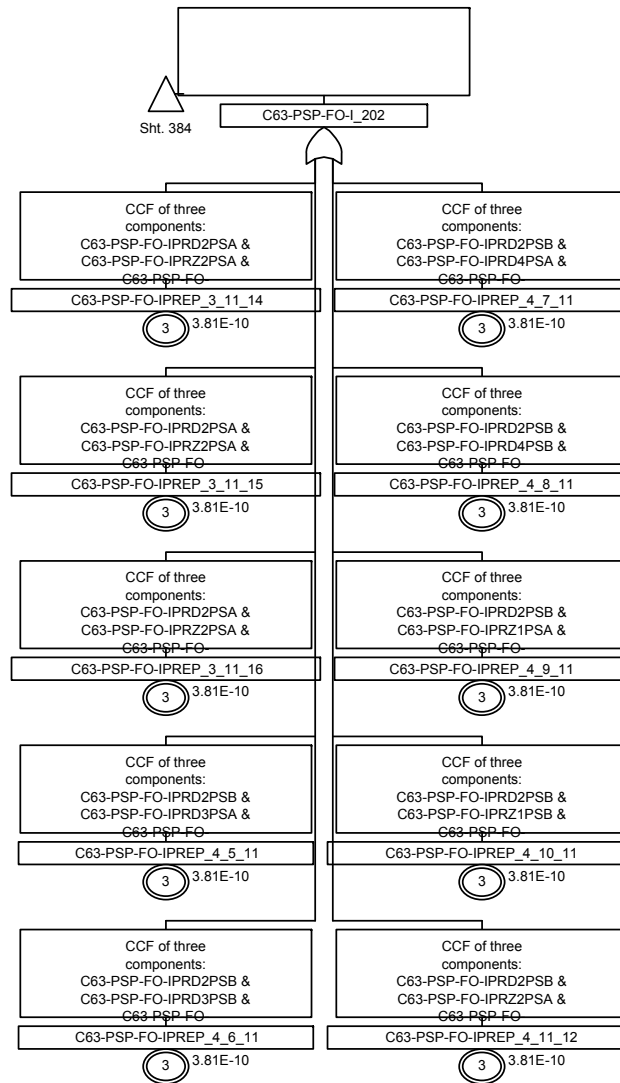


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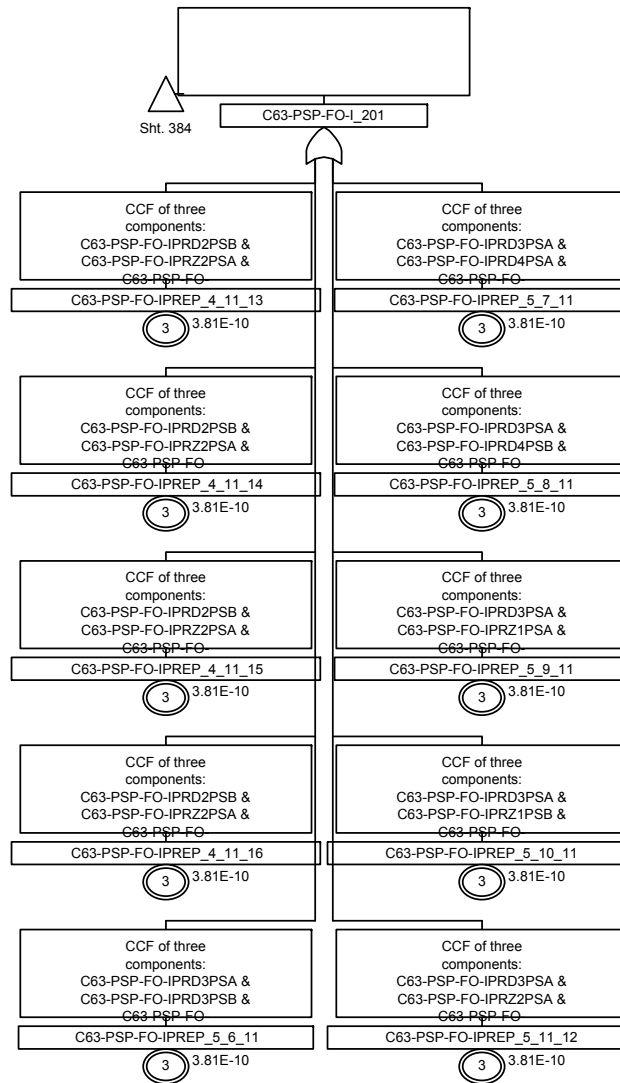


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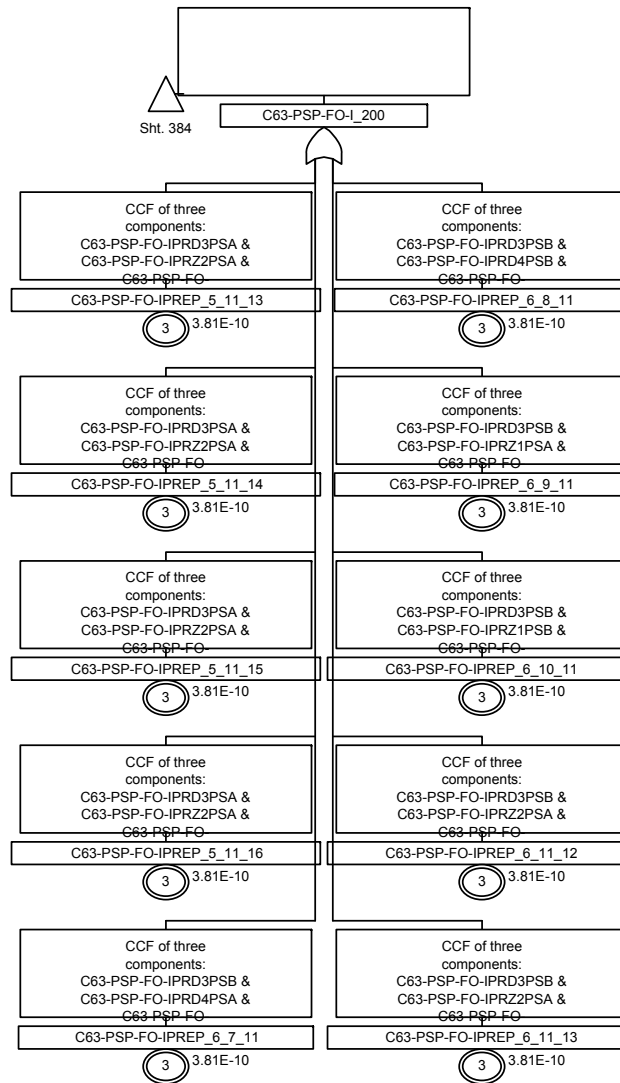


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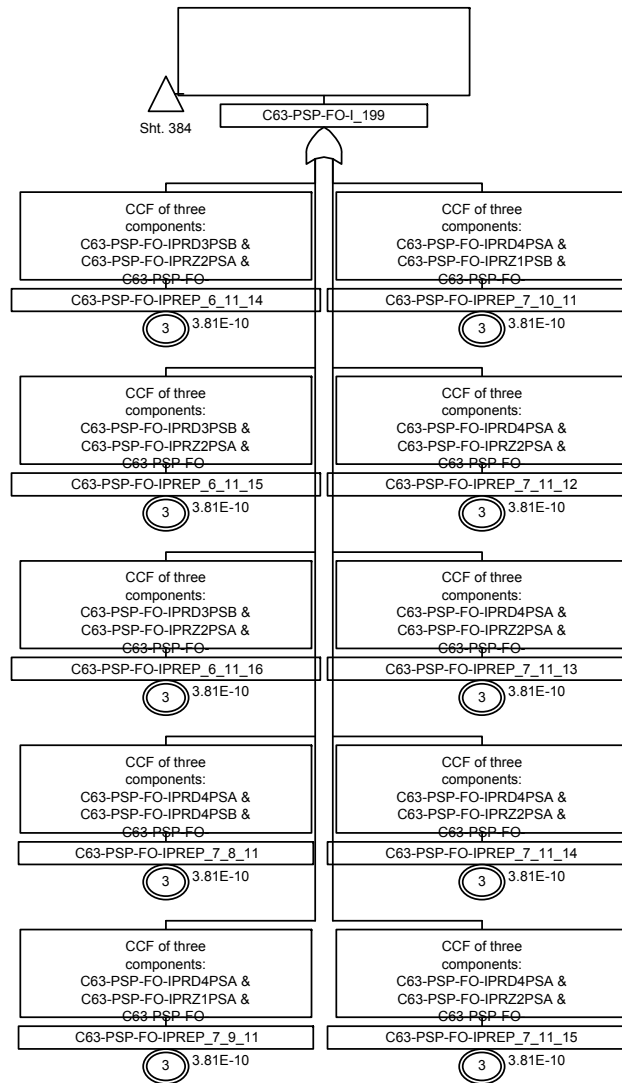


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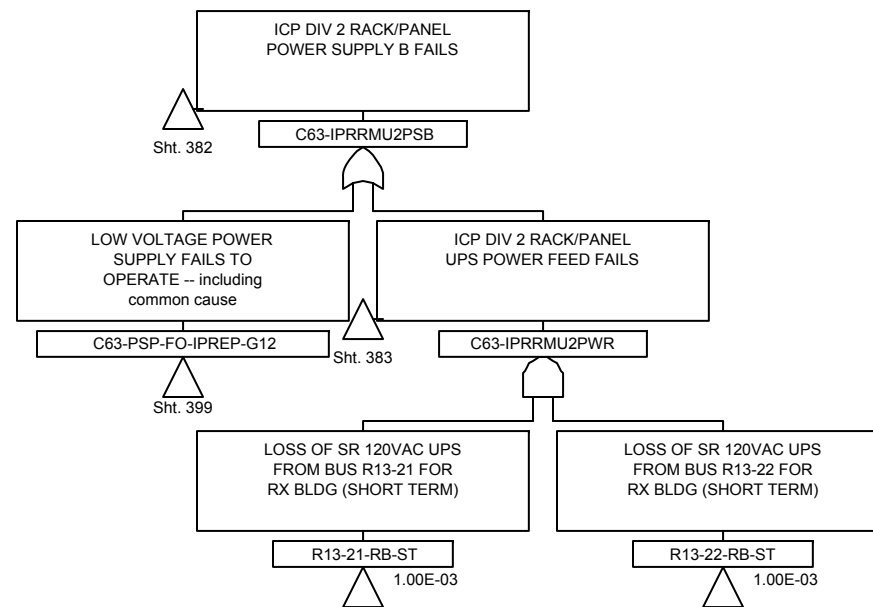


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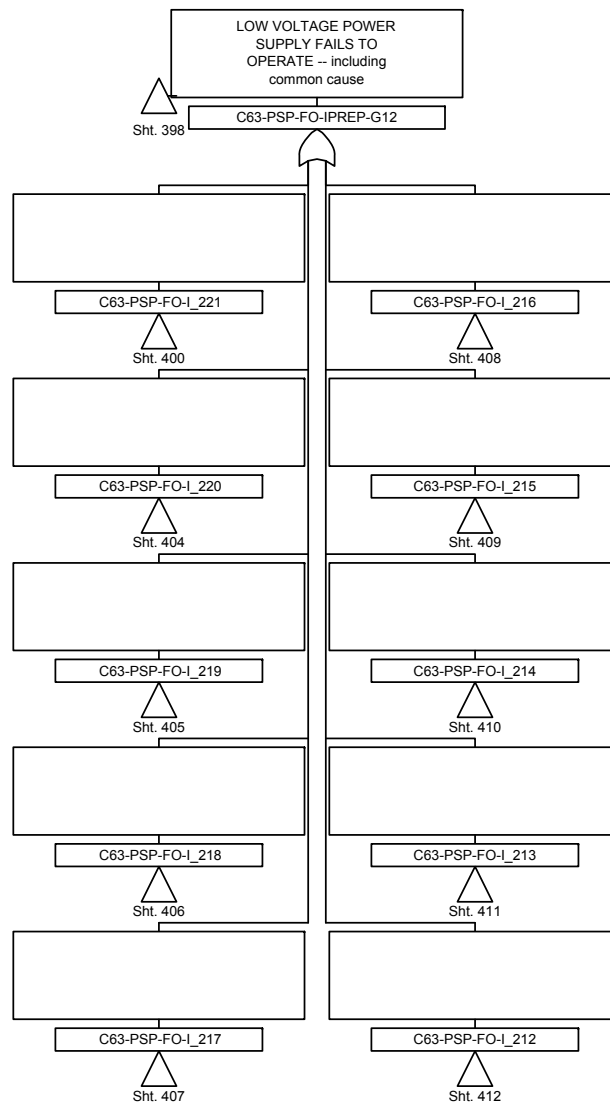


Figure 4.5-3e. Sheet 399 Independent Control Platforms

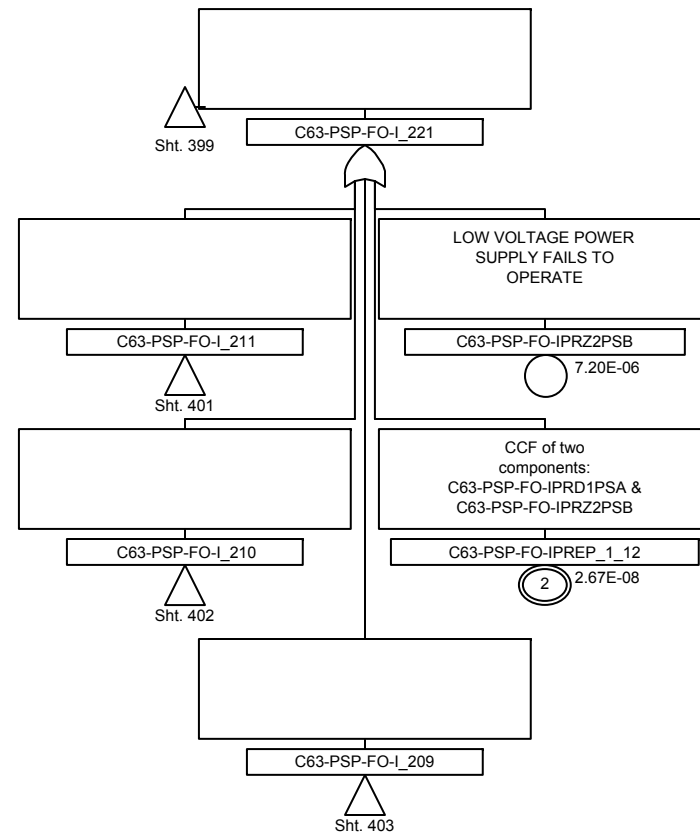


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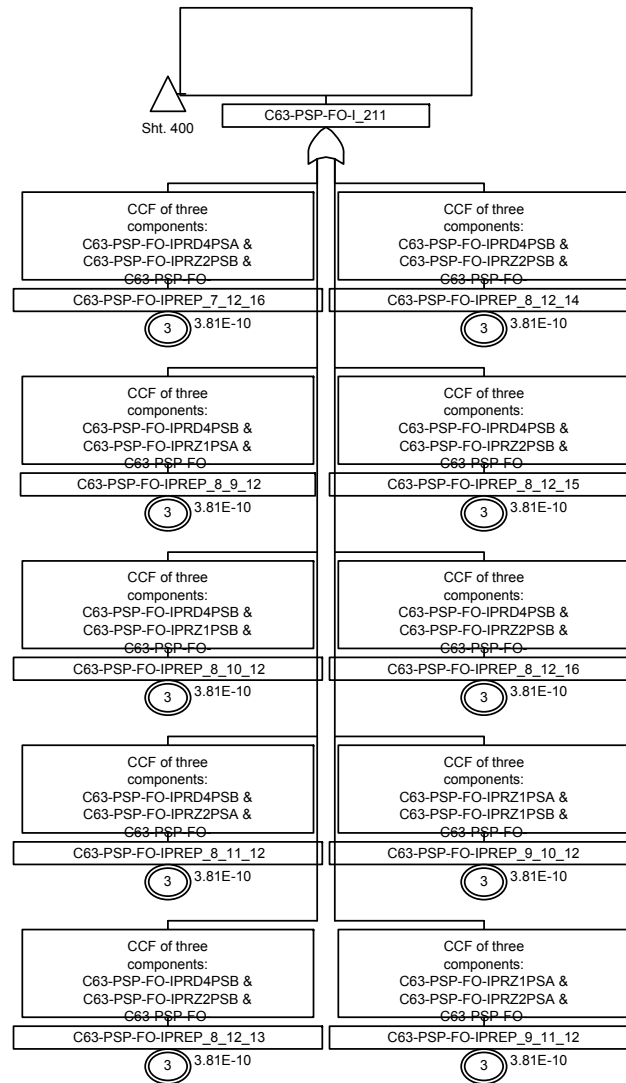


Figure 4.5-3e. Sheet 401 Independent Control Platforms

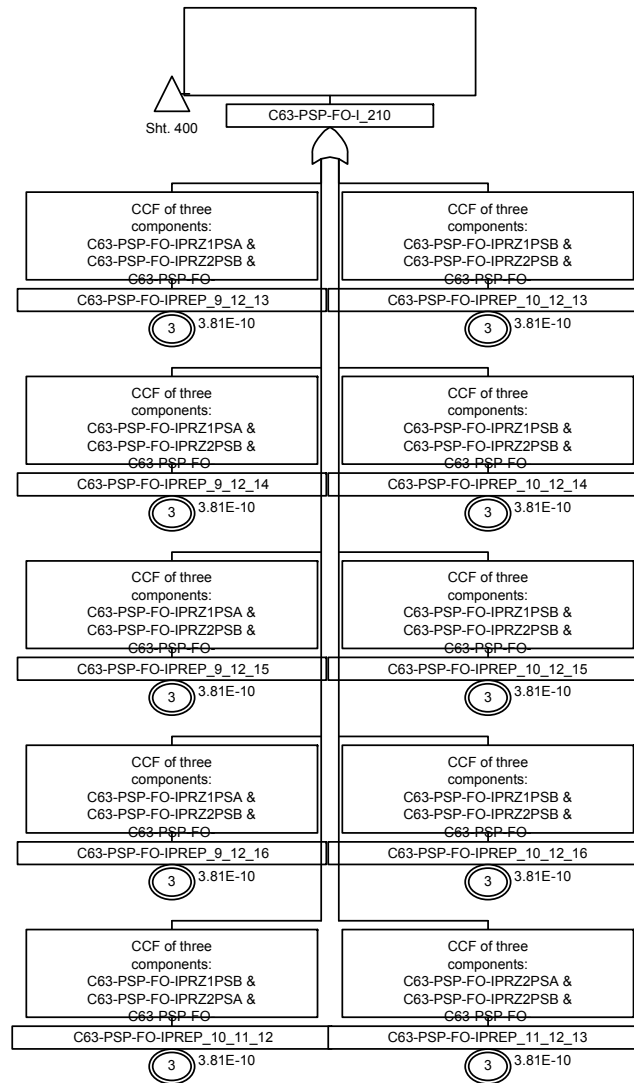


Figure 4.5-3e. Sheet 402 Independent Control Platforms



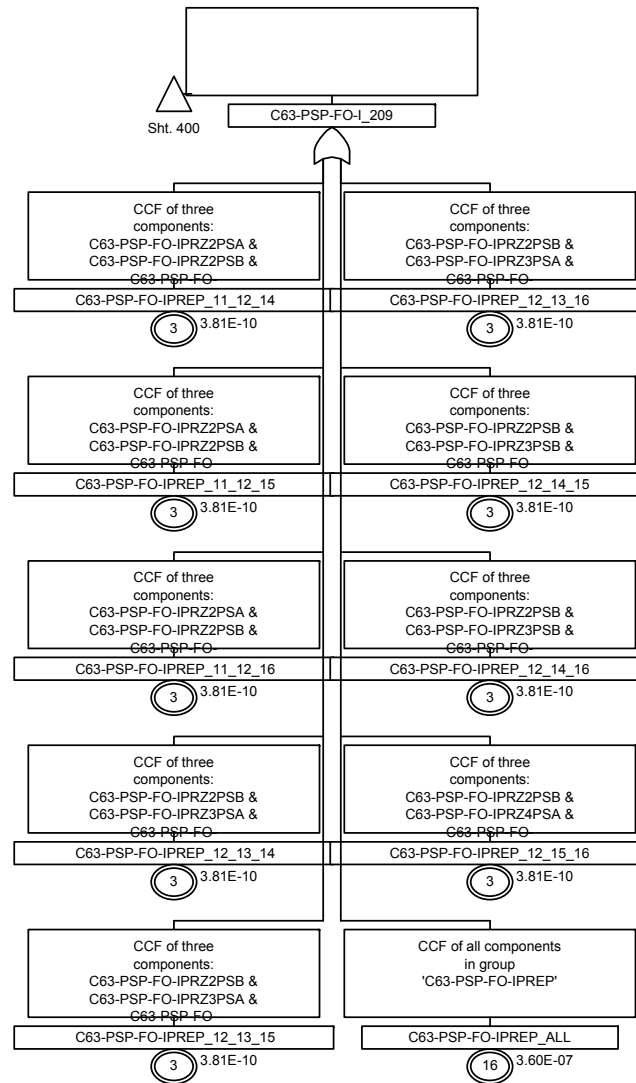


Figure 4.5-3e. Sheet 403 Independent Control Platforms

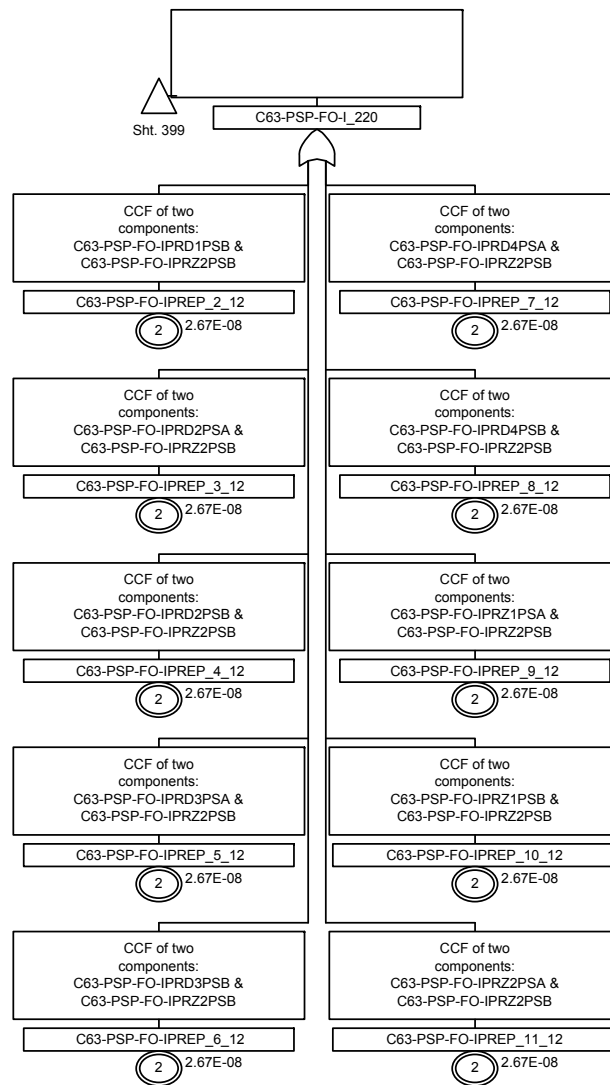


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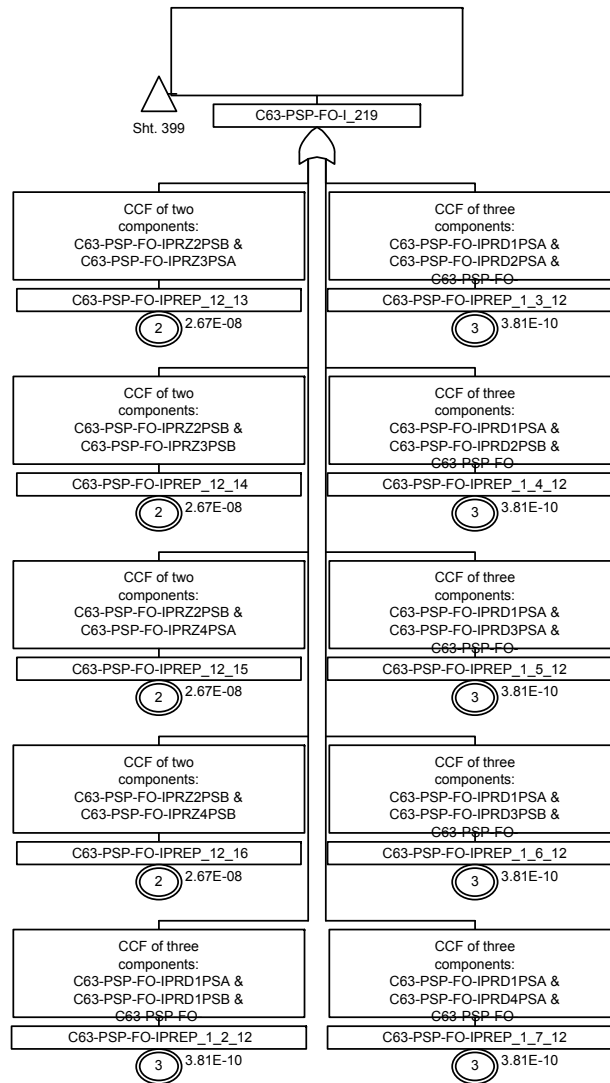


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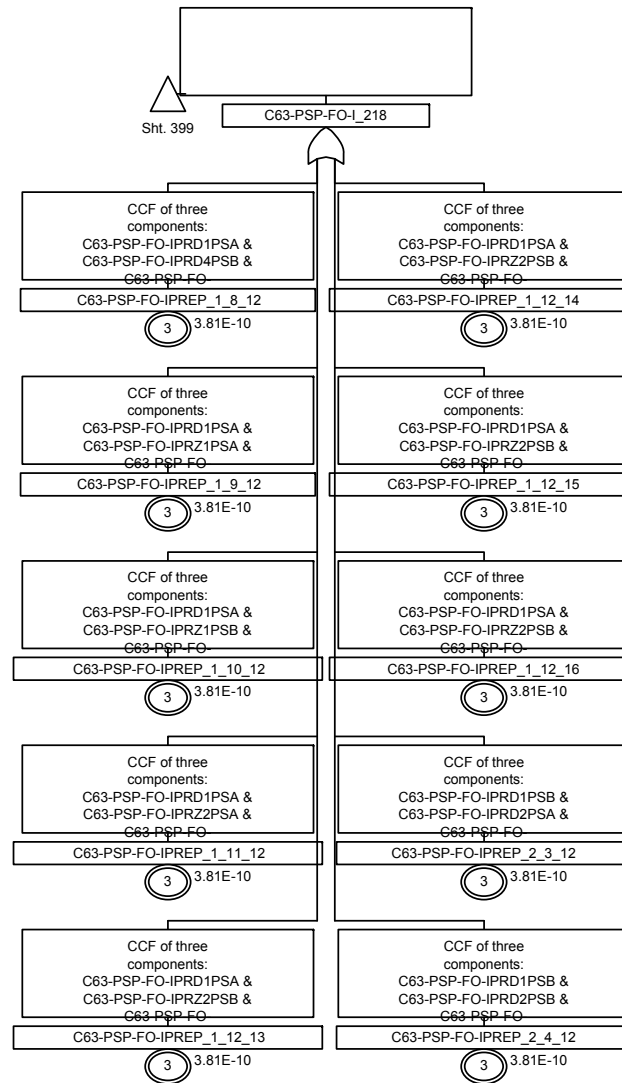


Figure 4.5-3e. Sheet 406 Independent Control Platforms



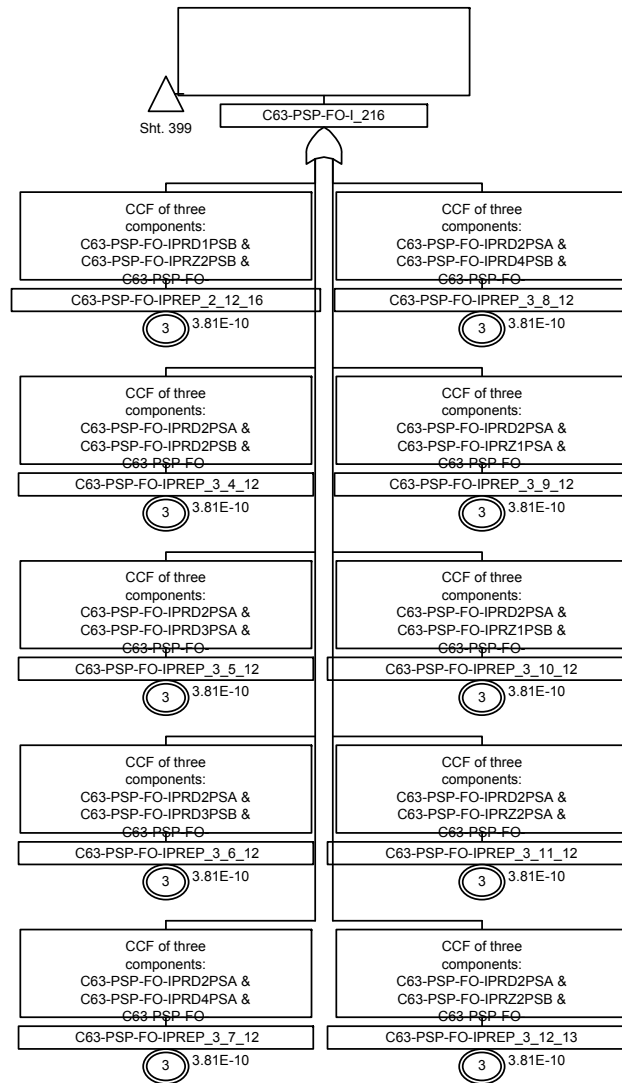


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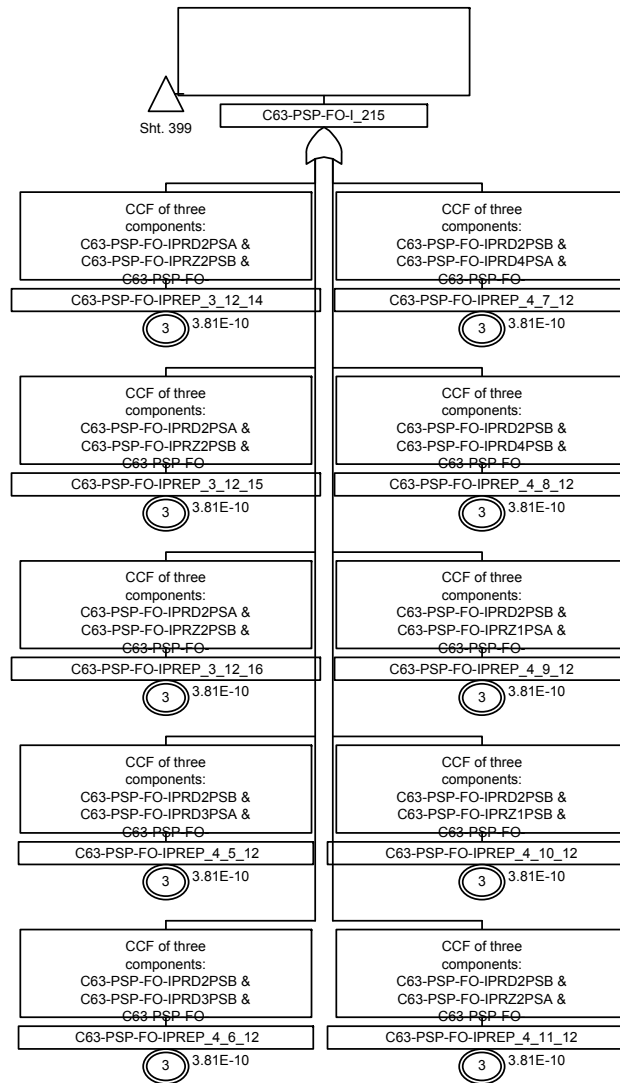


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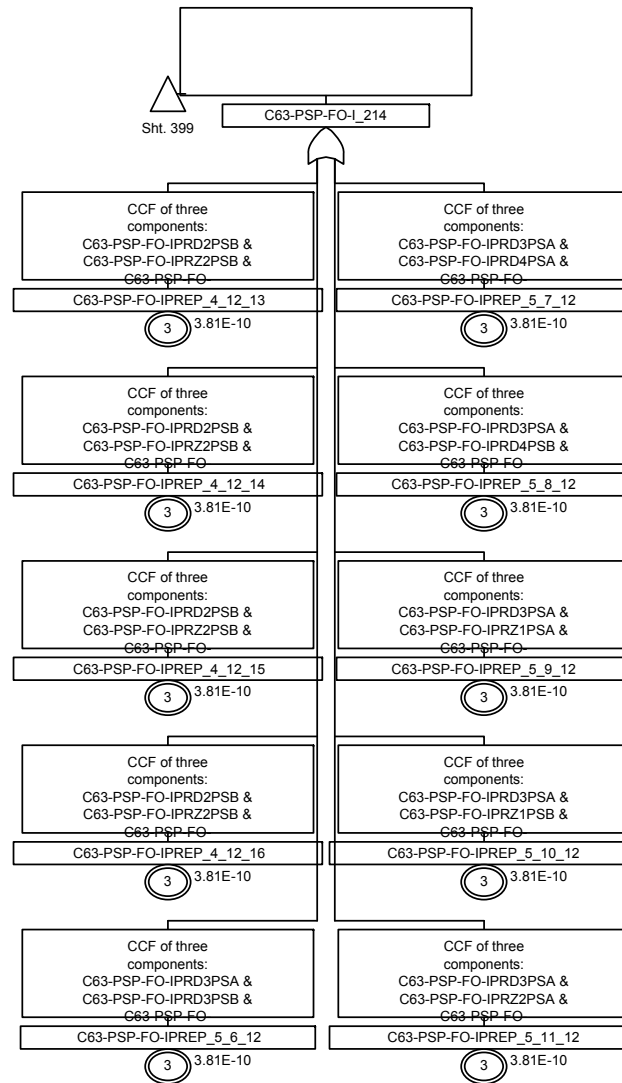


Figure 4.5-3e. Sheet 410 Independent Control Platforms



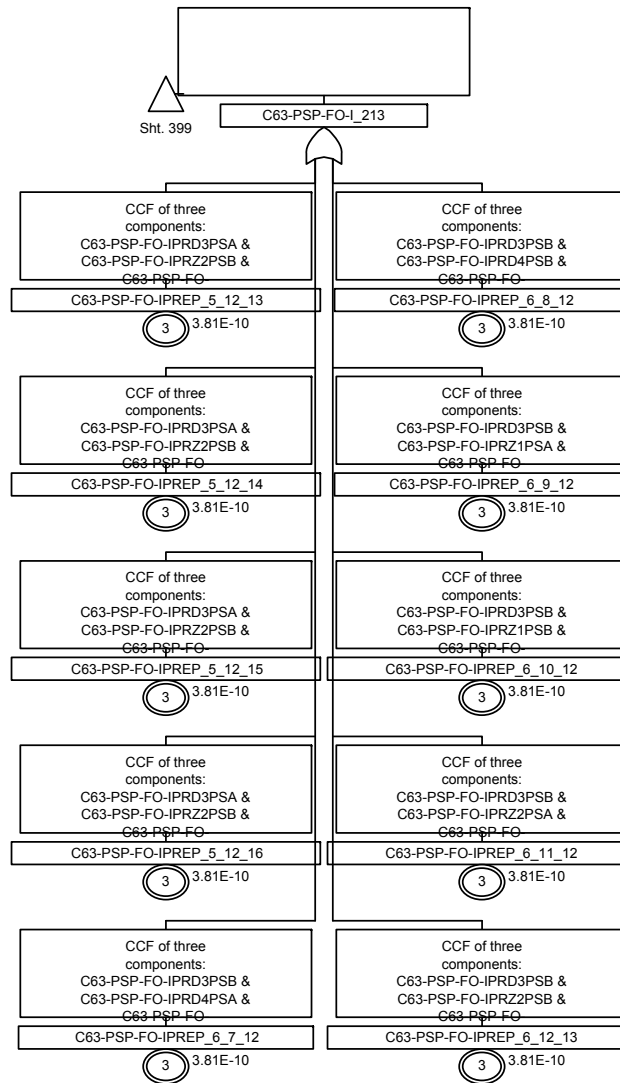


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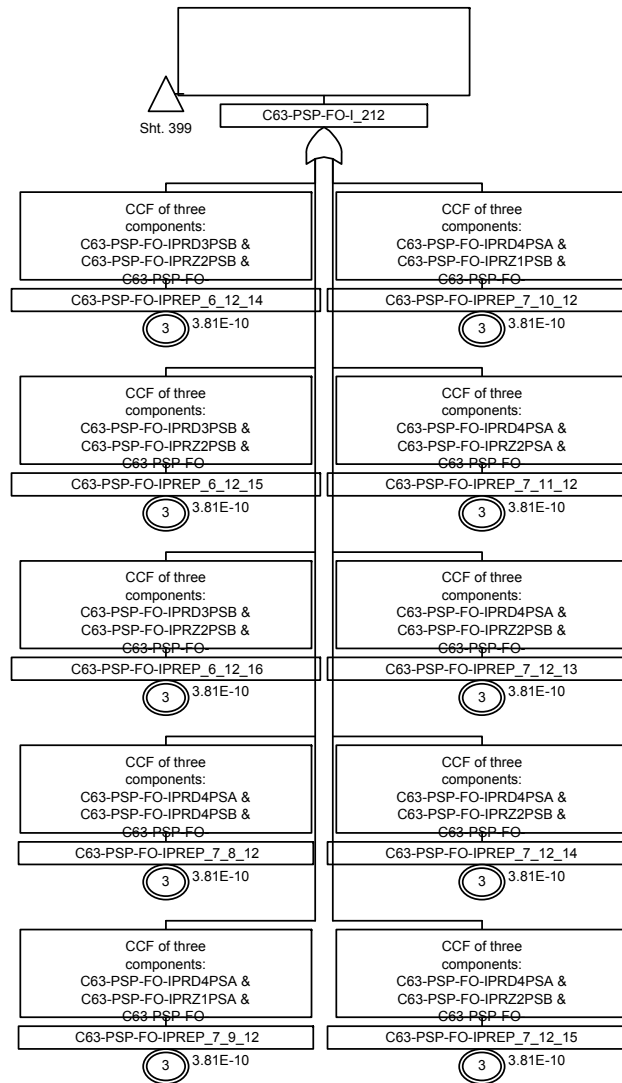


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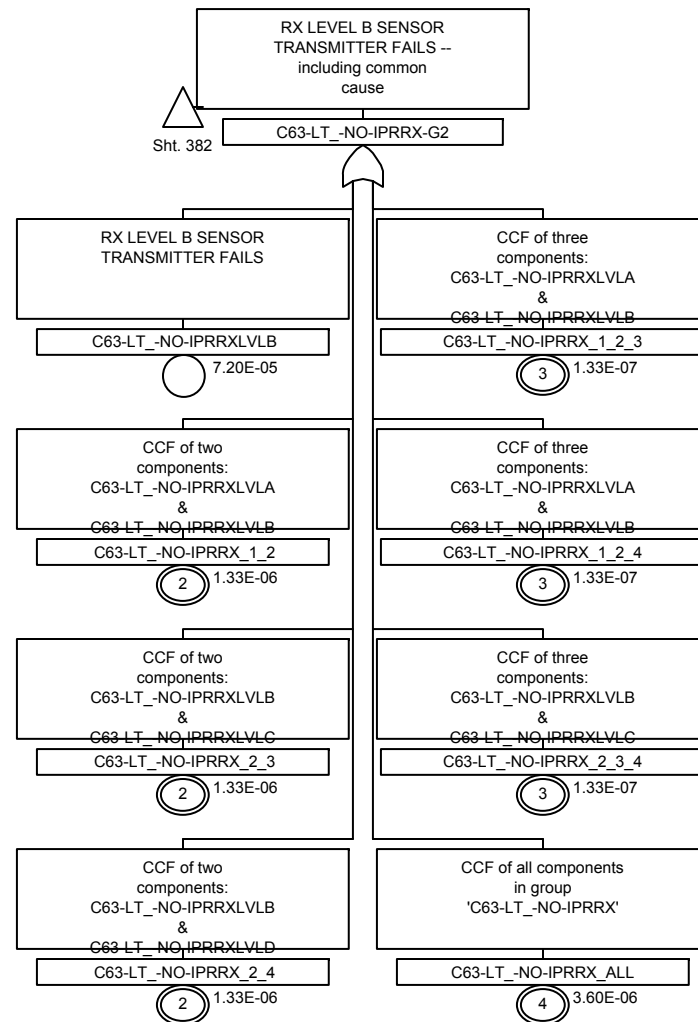


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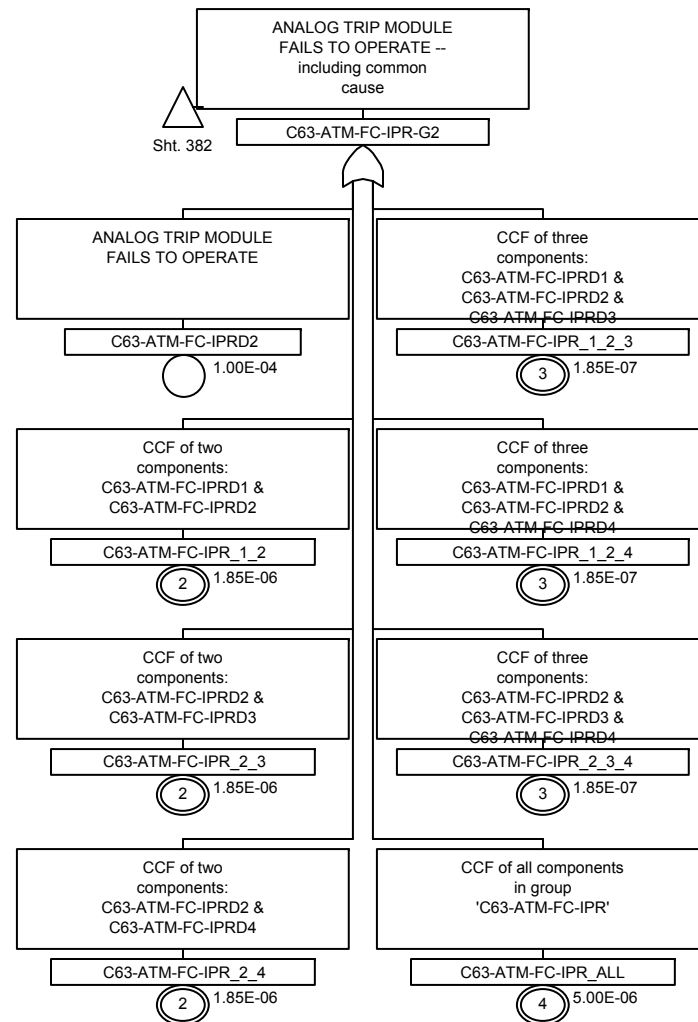


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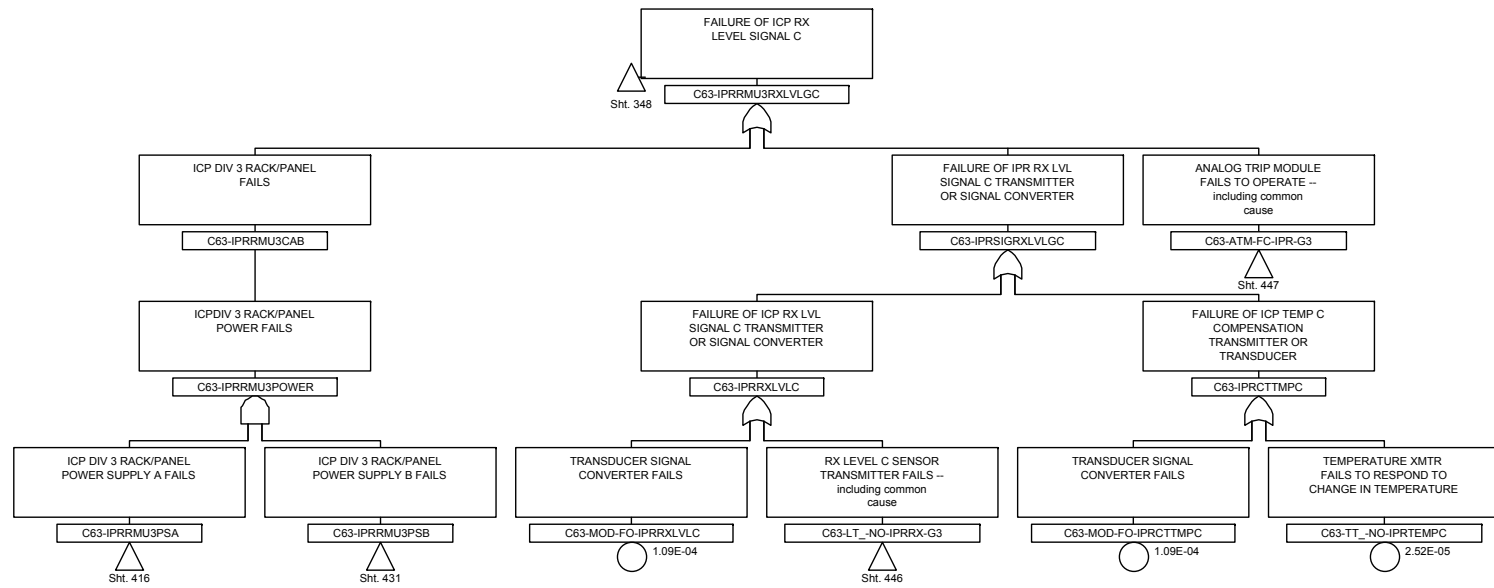


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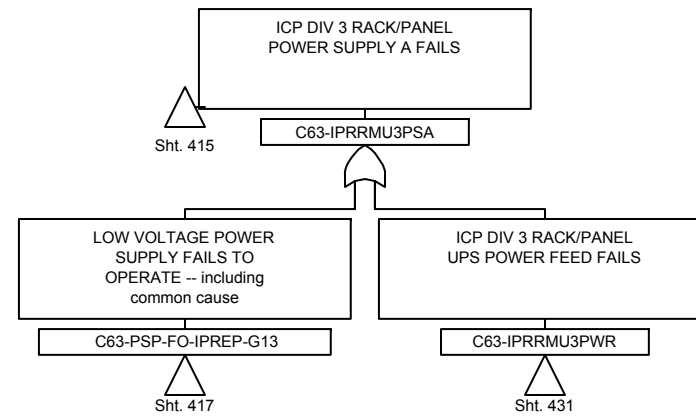


Figure 4.5-3e. Sheet 416 Independent Control Platforms

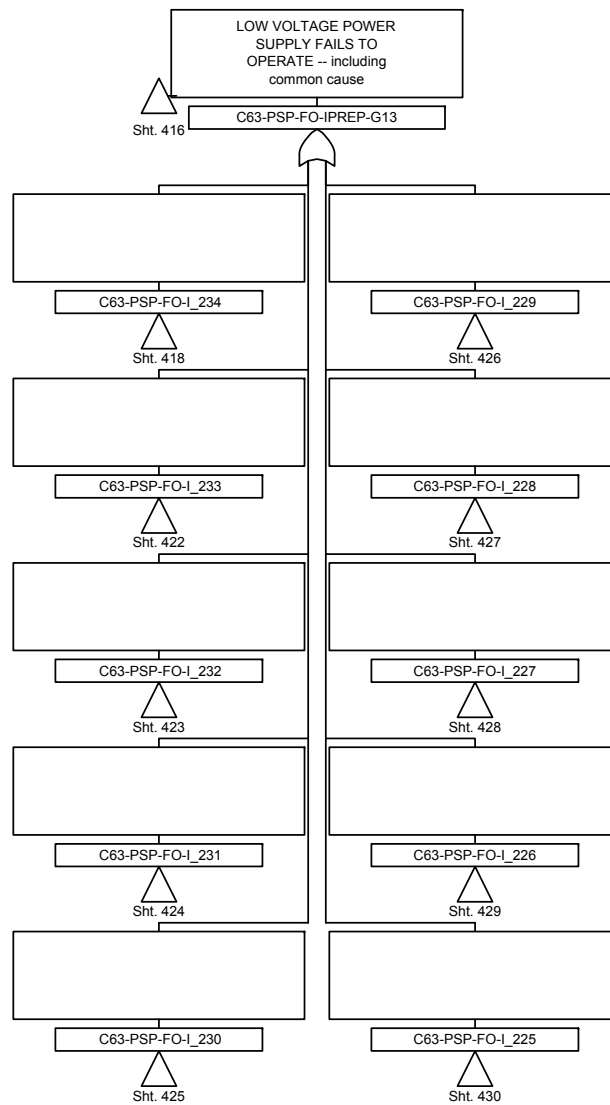


Figure 4.5-3e. Sheet 417 Independent Control Platforms

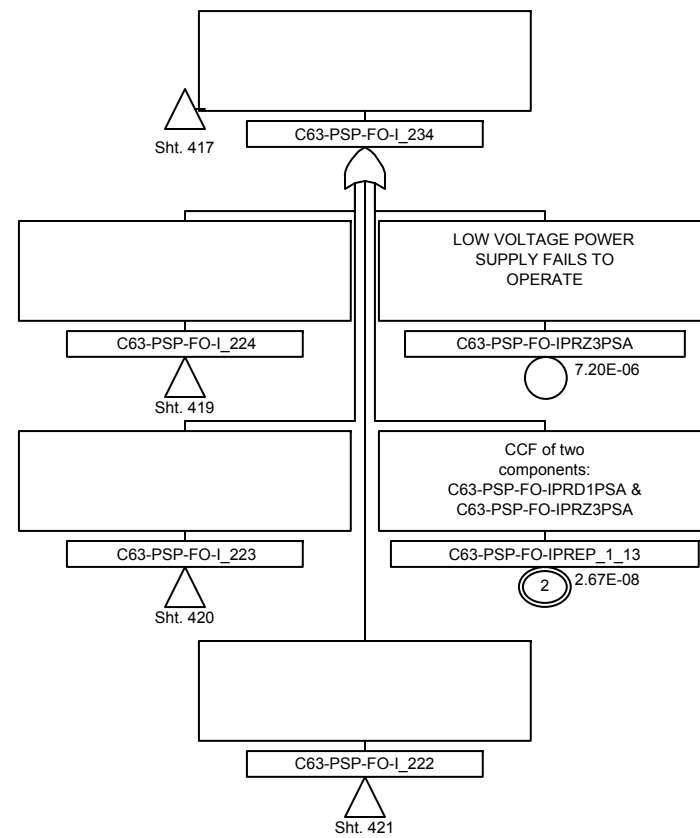


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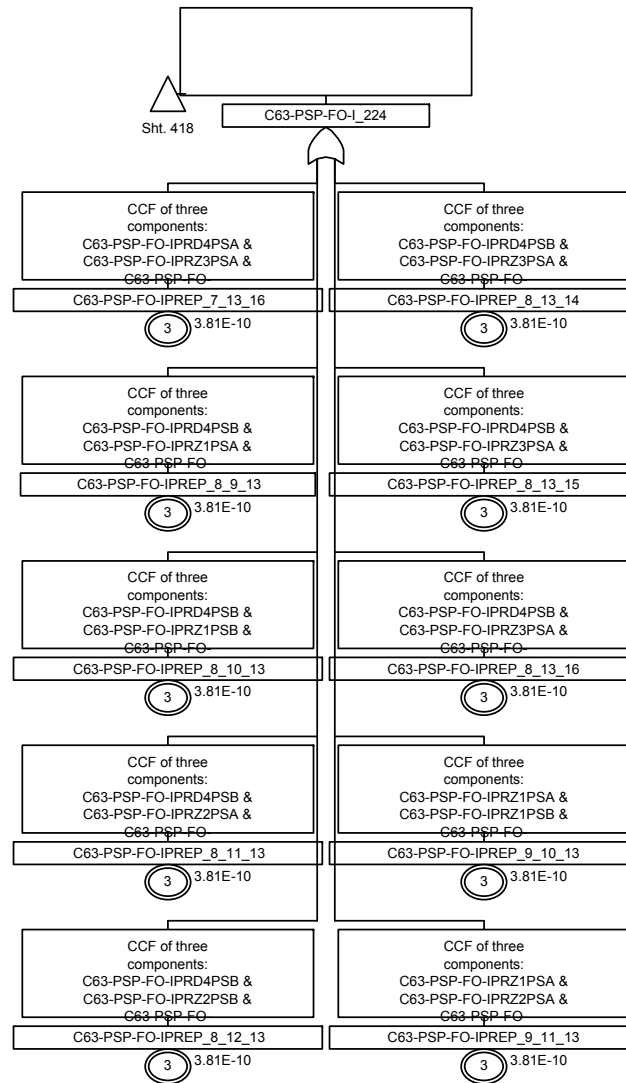


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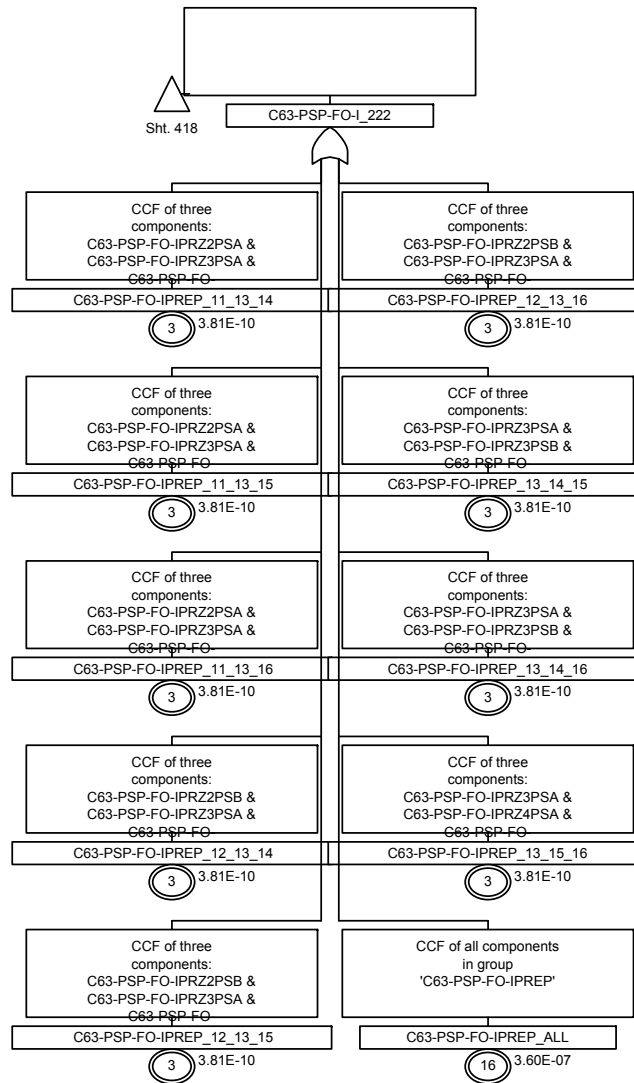


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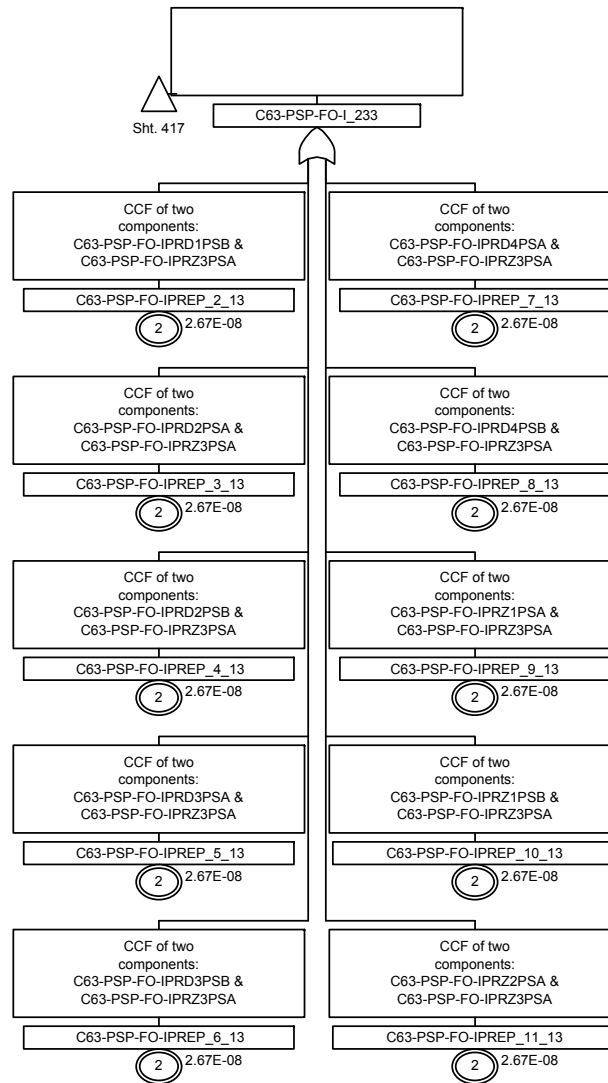


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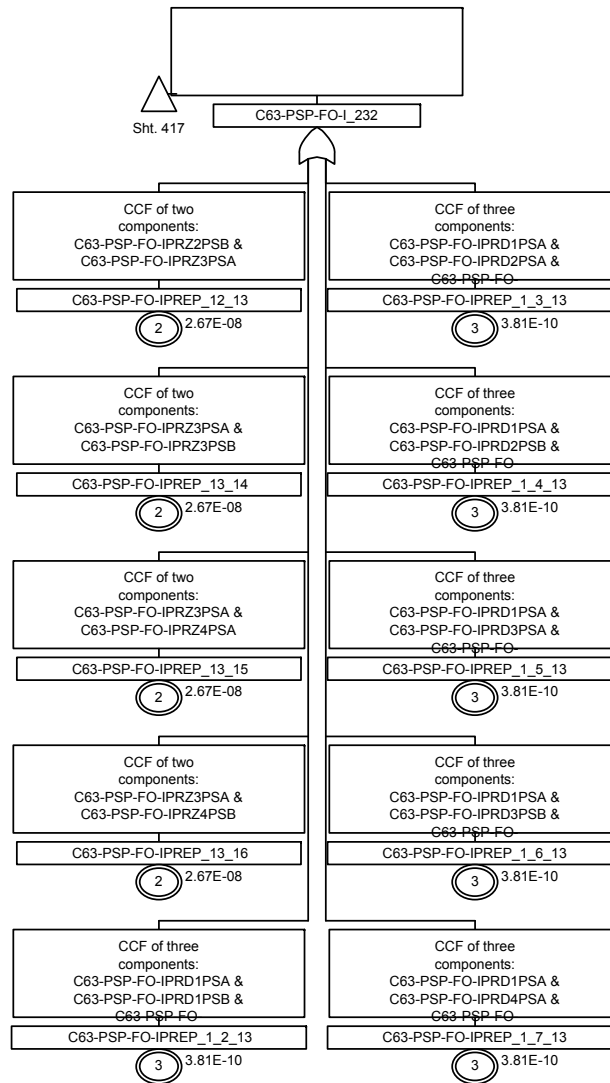


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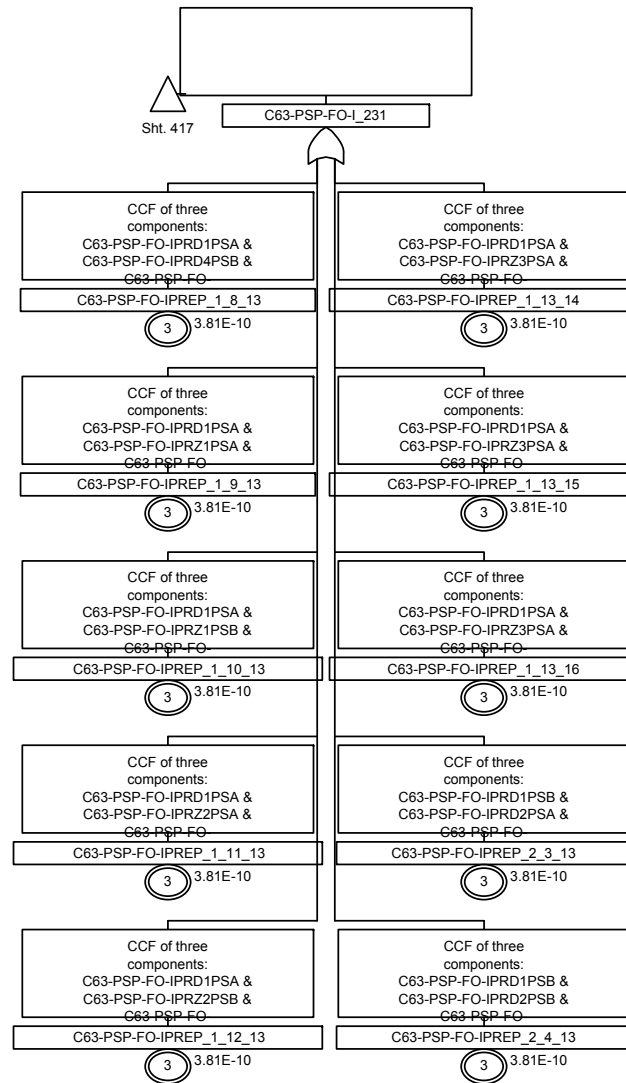


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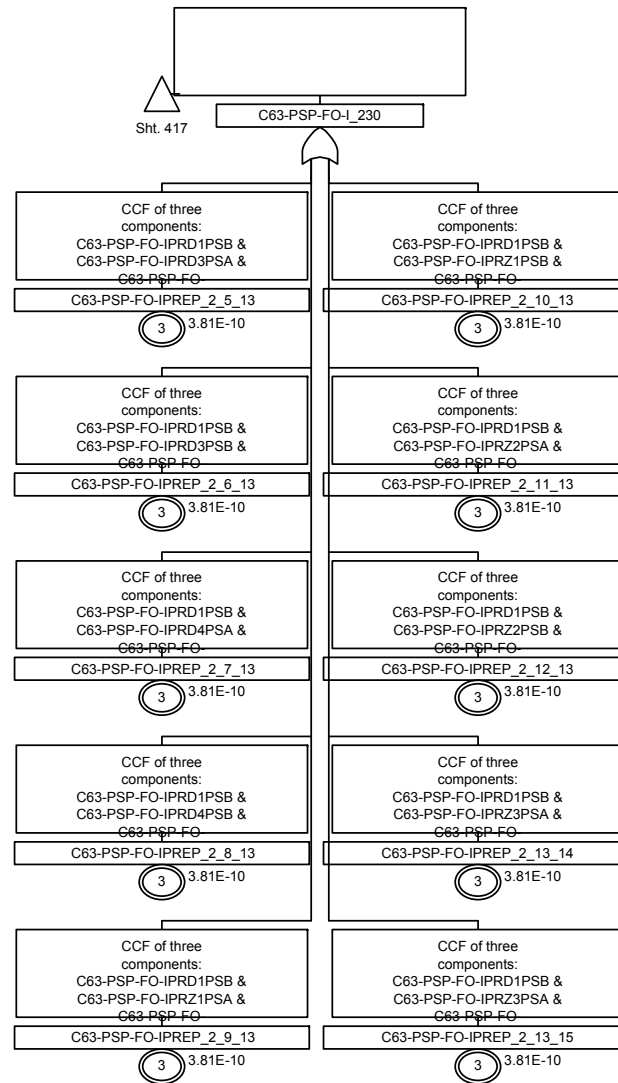


Figure 4.5-3e. Sheet 425 Independent Control Platforms





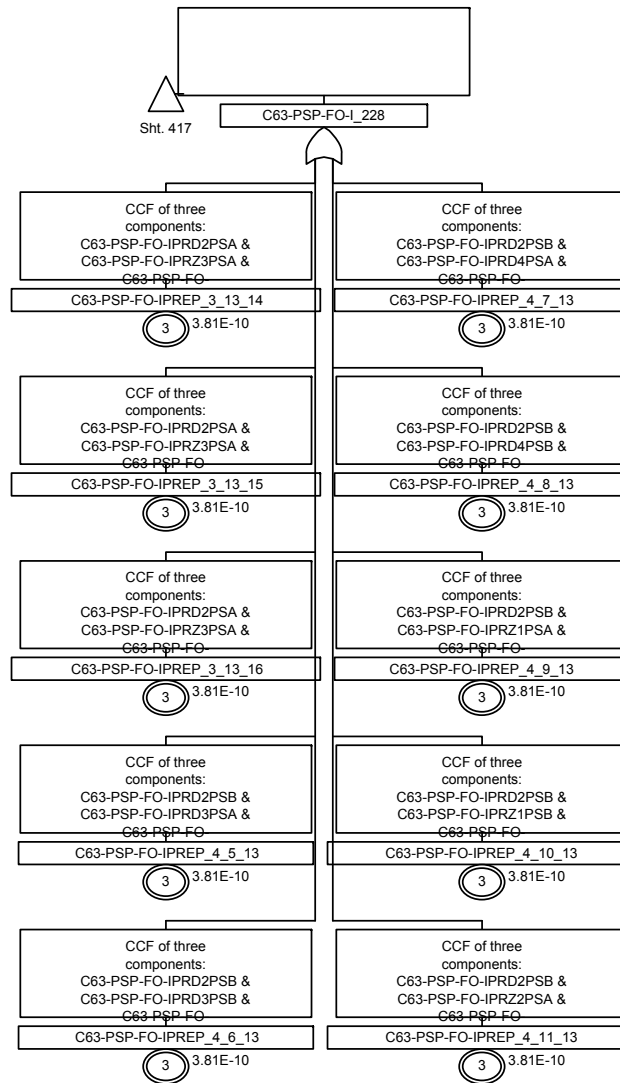


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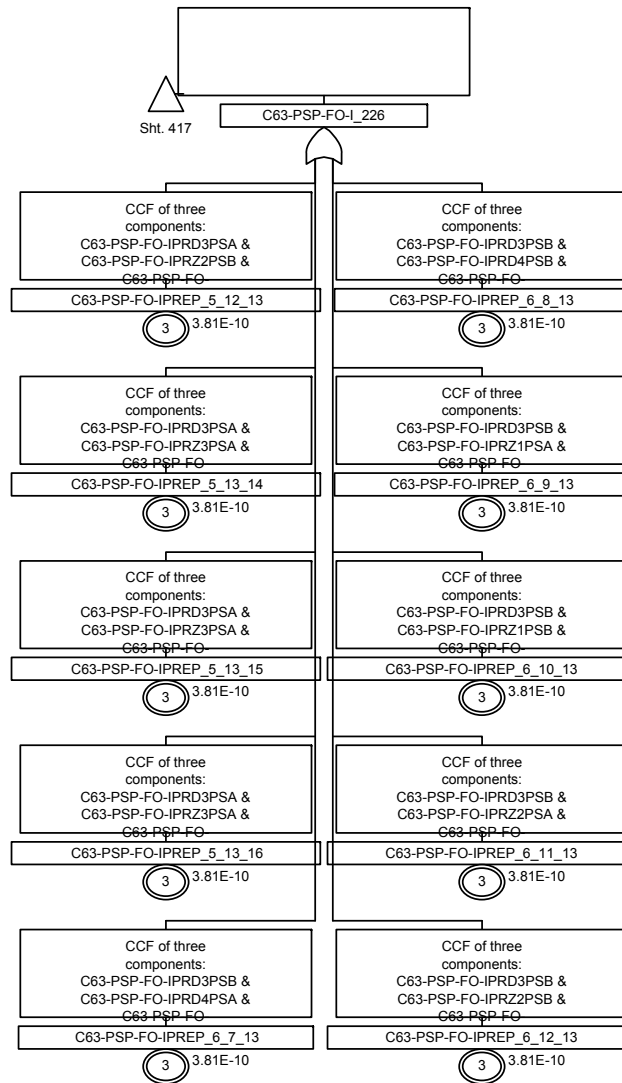


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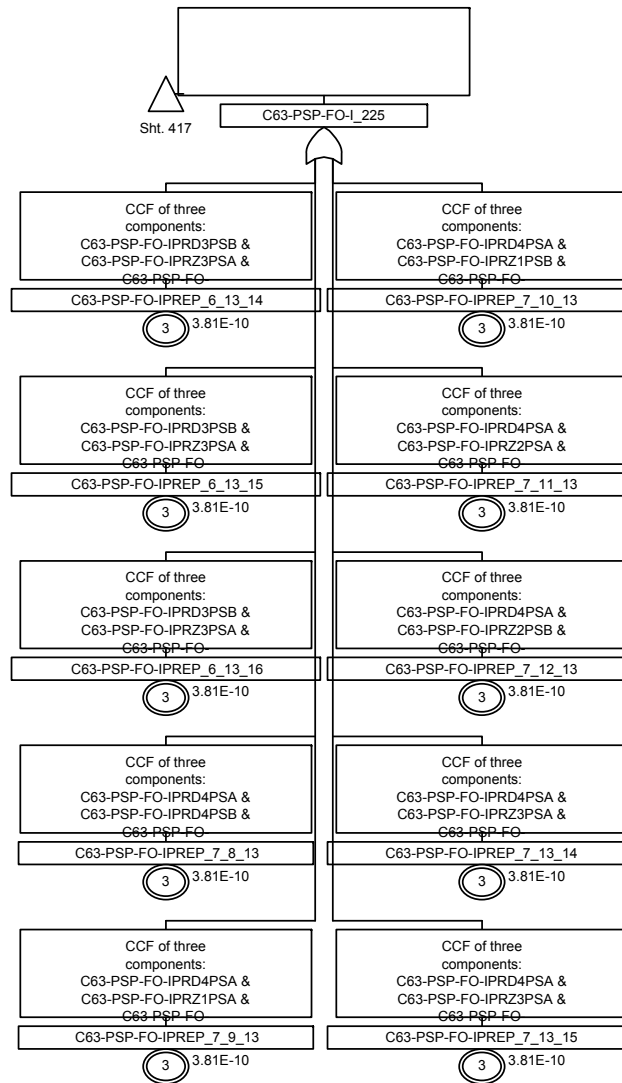


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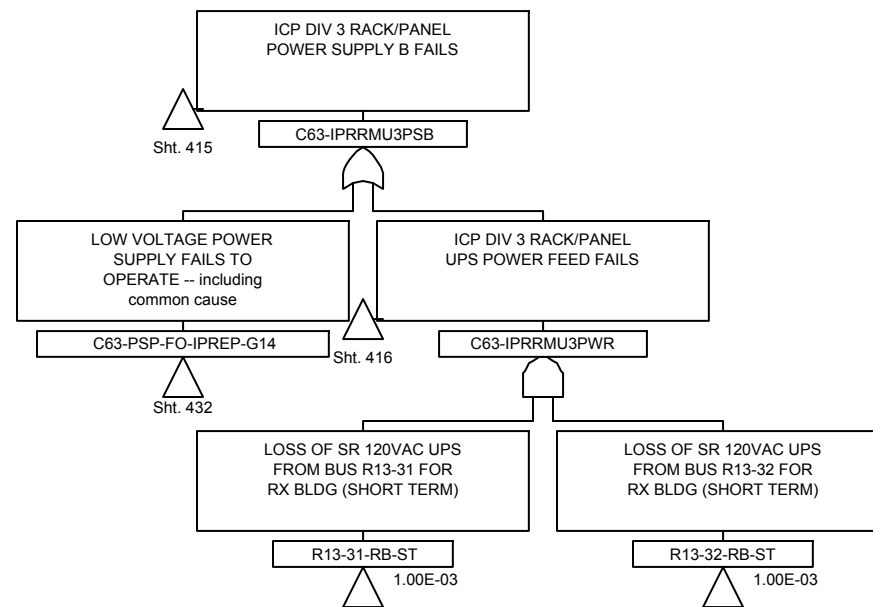


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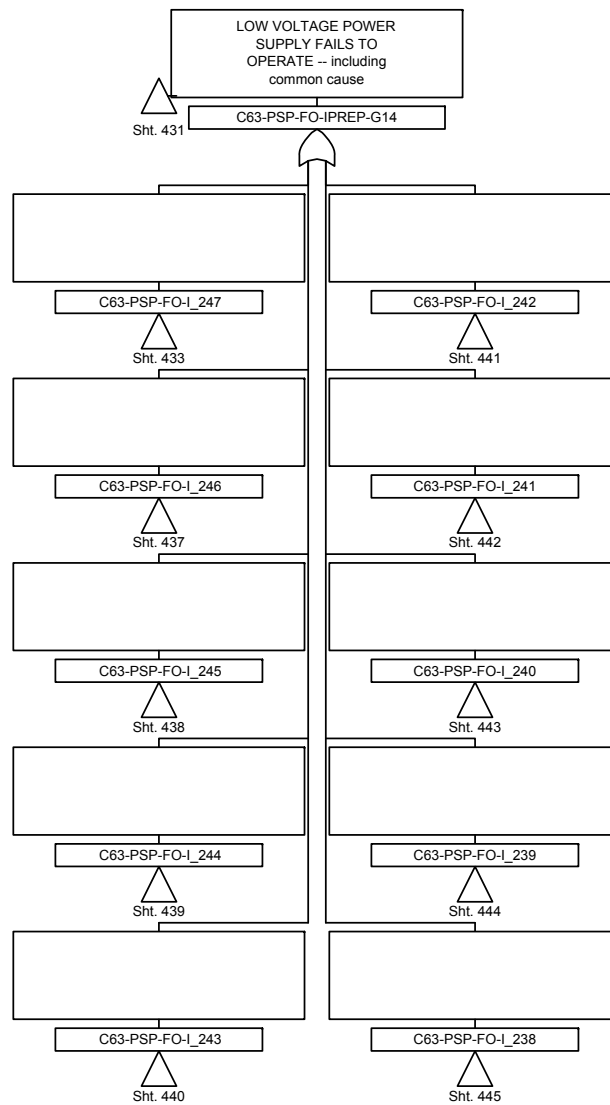


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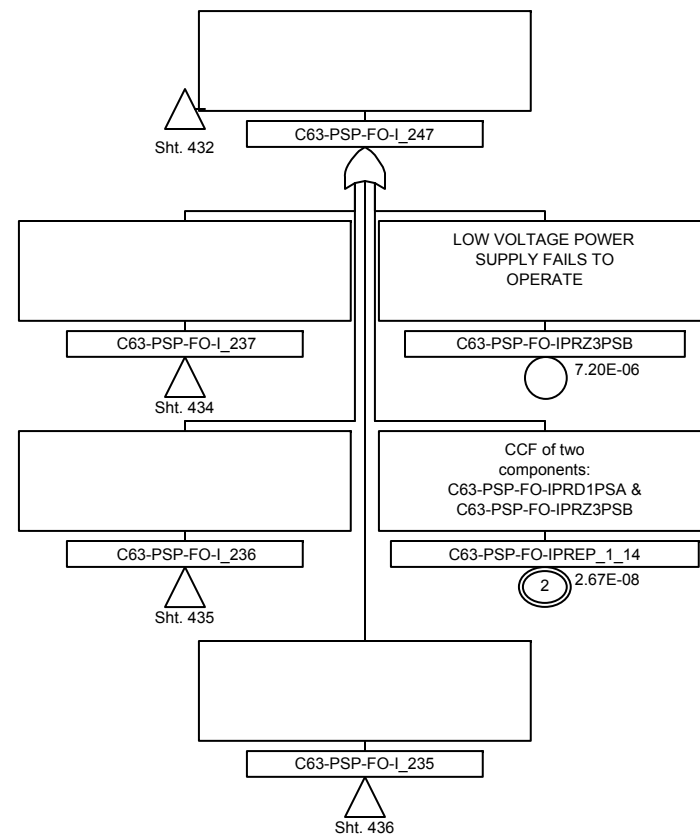


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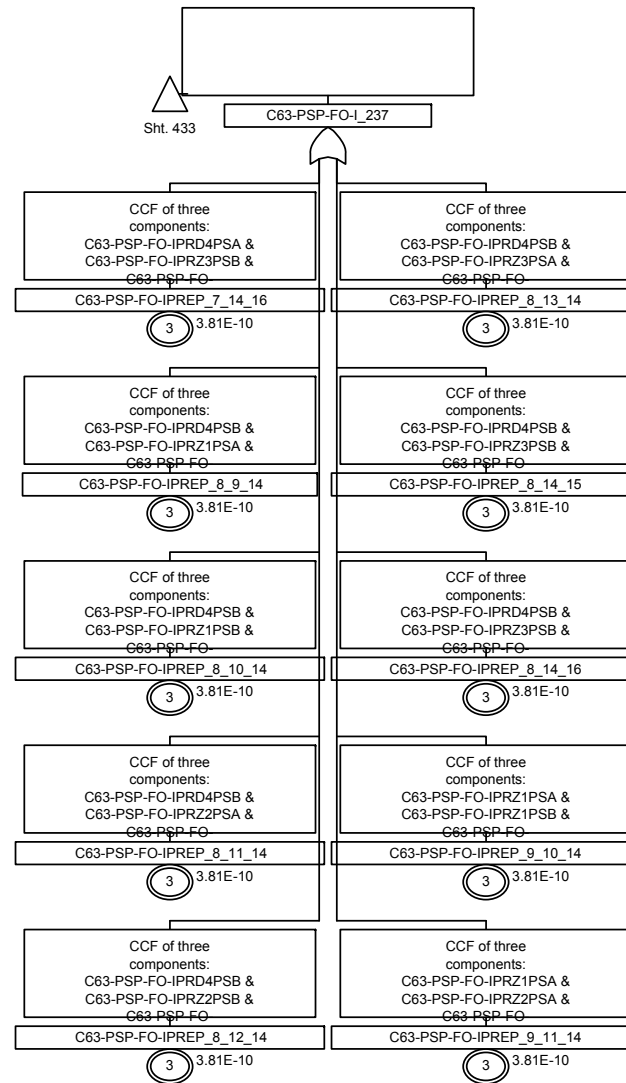


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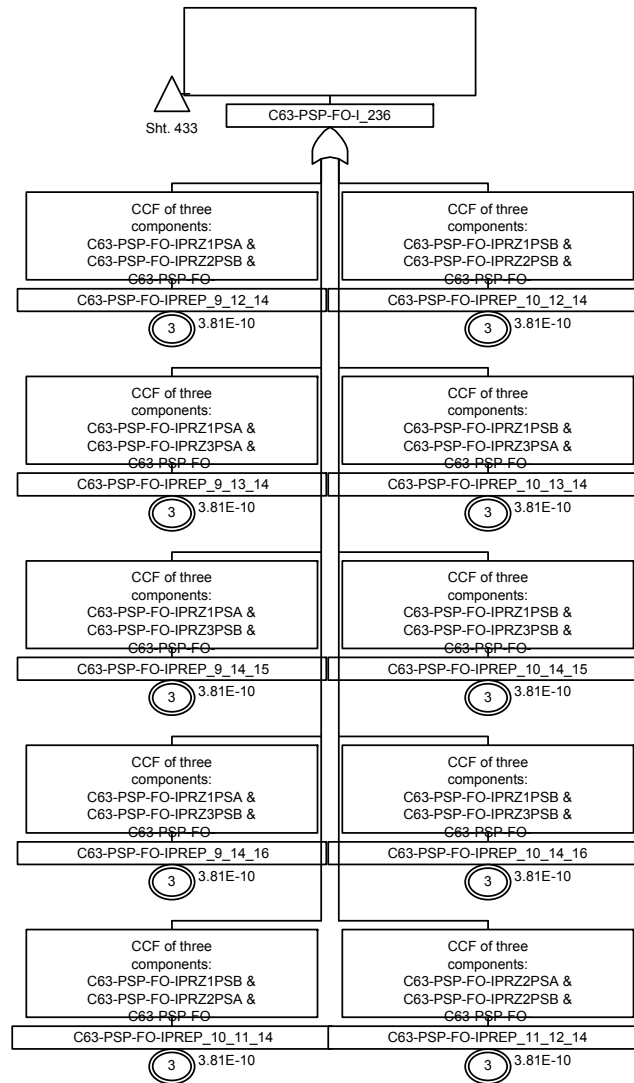


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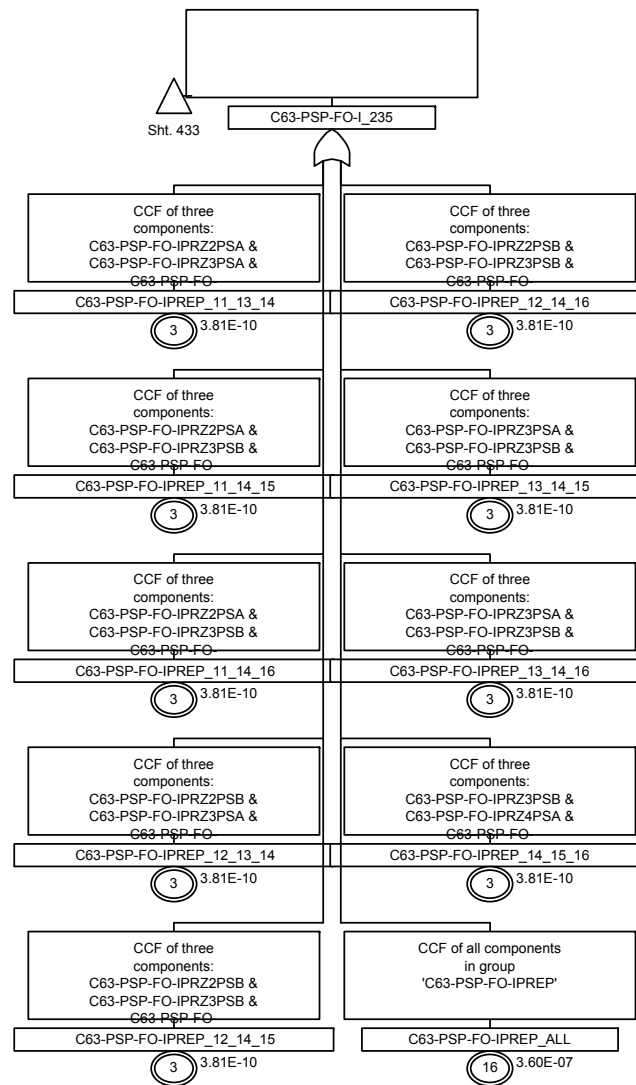


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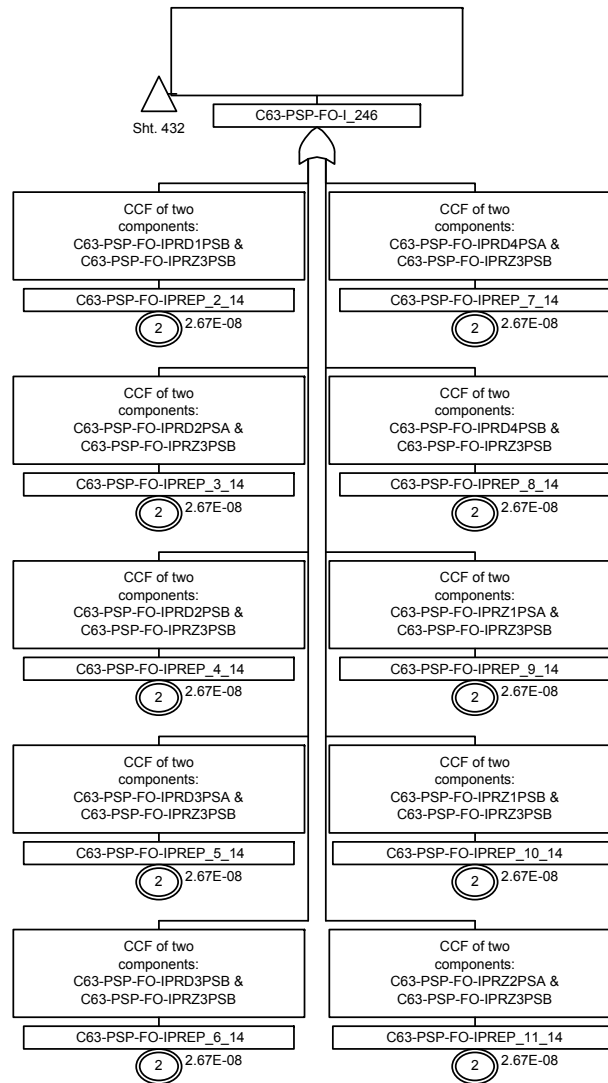


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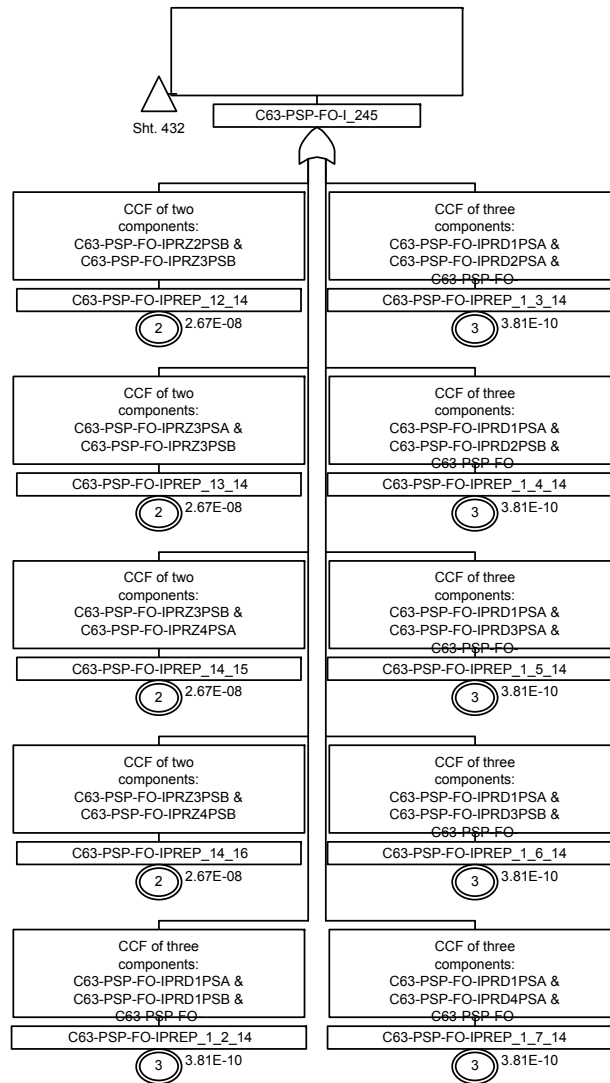


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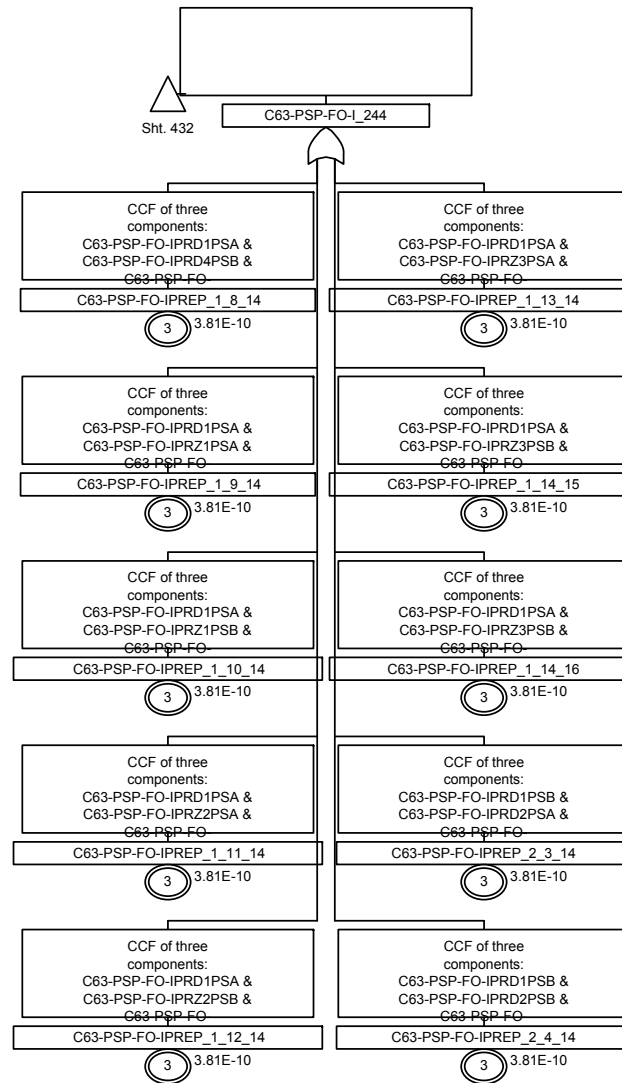


Figure 4.5-3e. Sheet 439 Independent Control Platforms



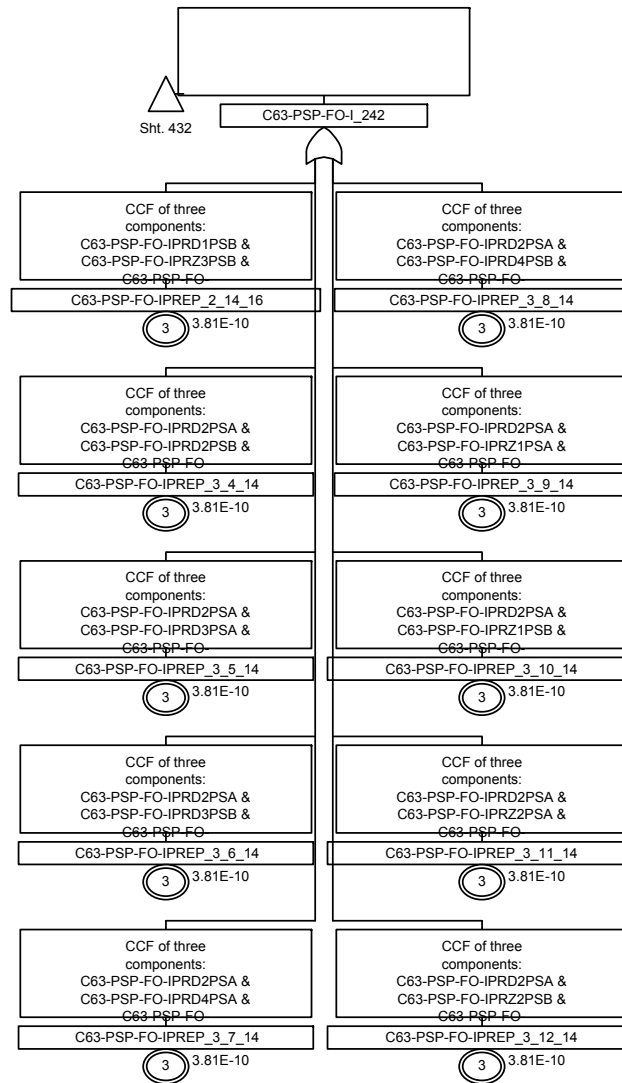


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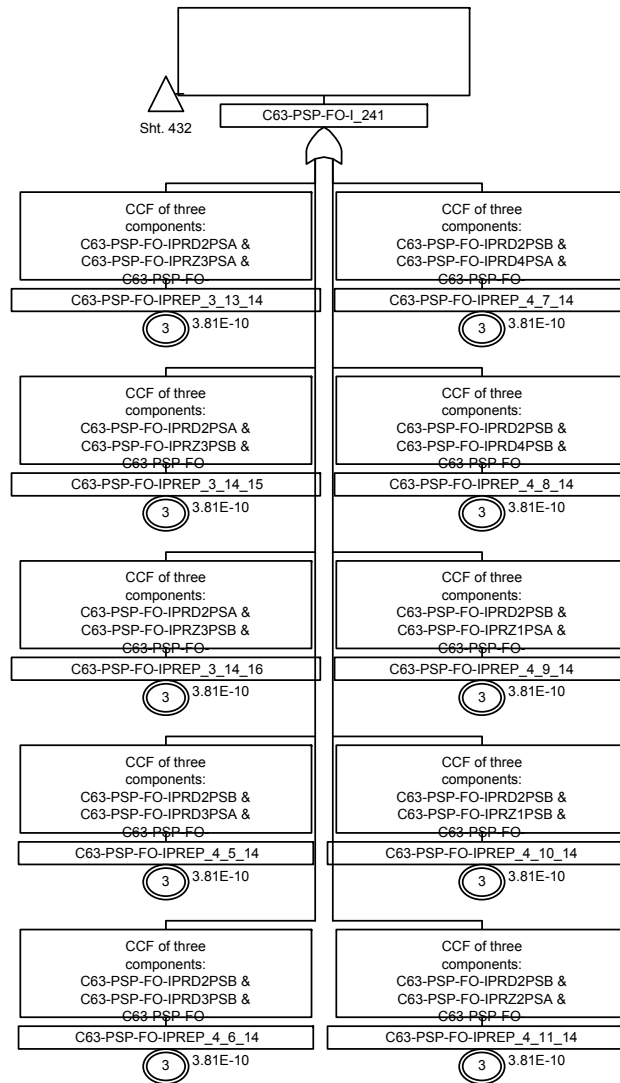


Figure 4.5-3e. Sheet 442 Independent Control Platforms



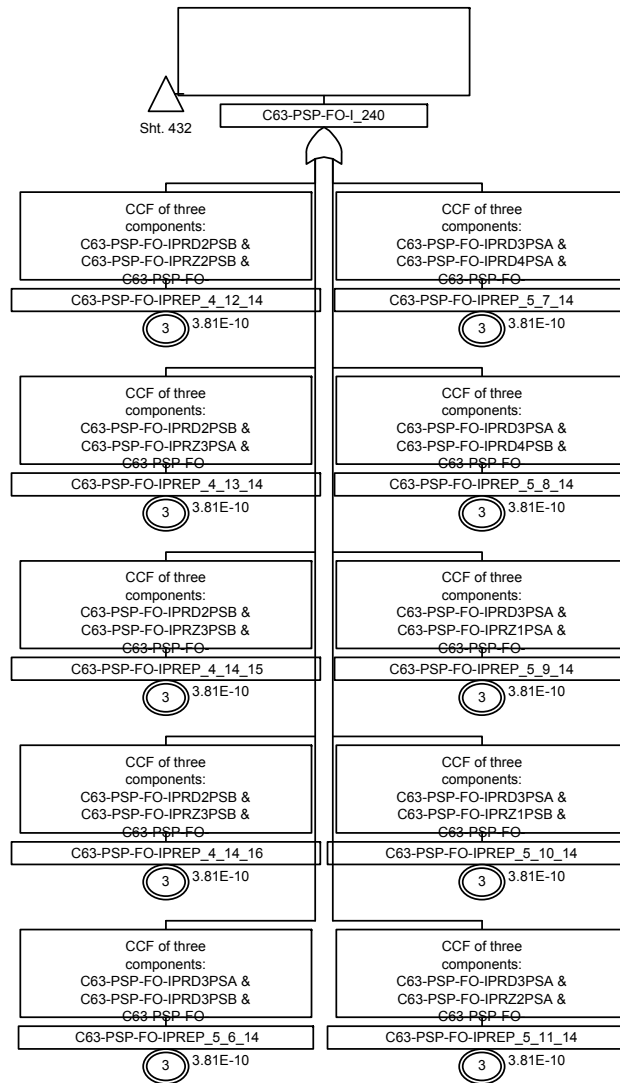


Figure 4.5-3e. Sheet 443 Independent Control Platforms

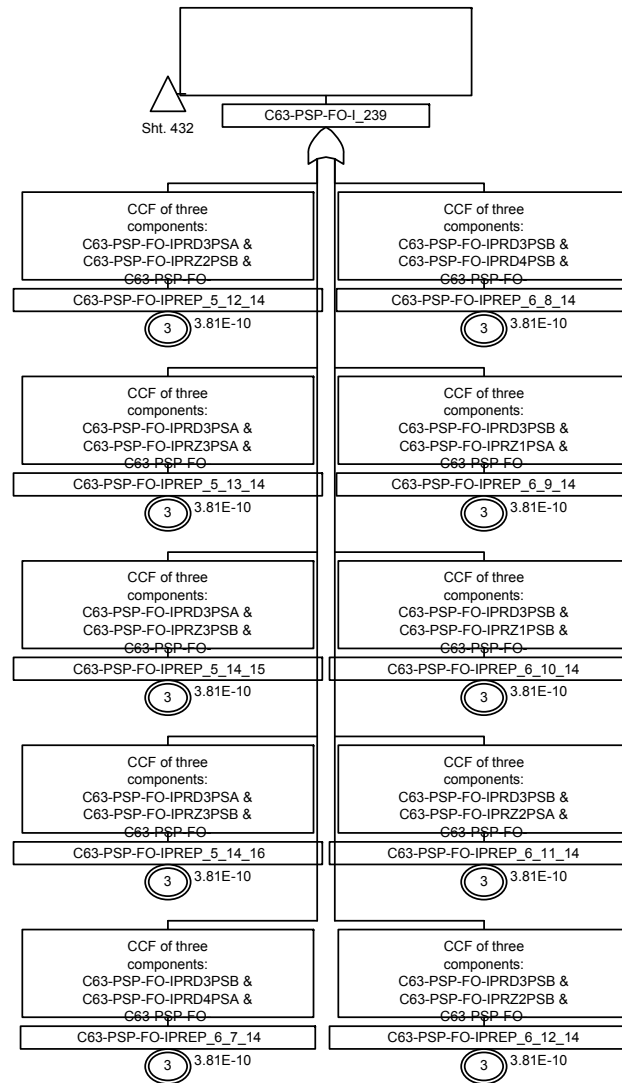


Figure 4.5-3e. Sheet 444 Independent Control Platforms

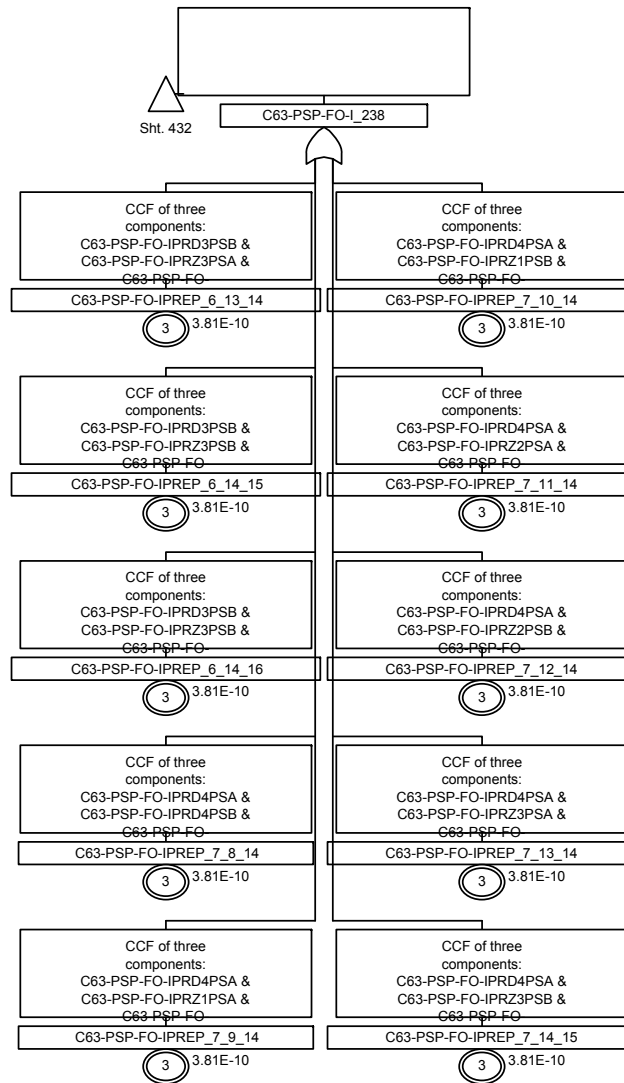


Figure 4.5-3e. Sheet 445 Independent Control Platforms

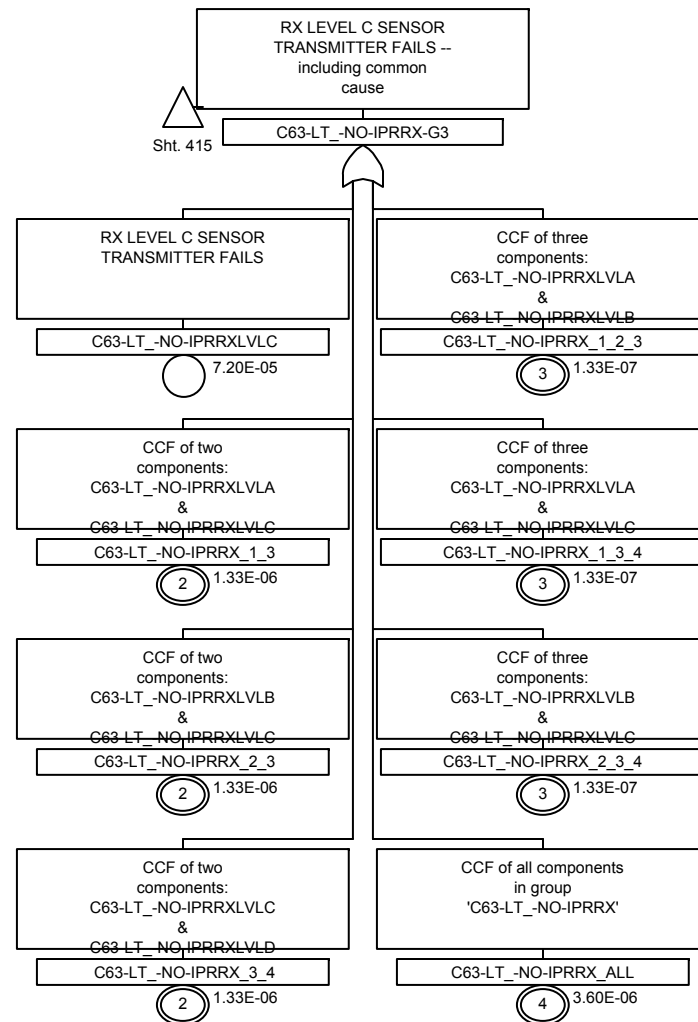


Figure 4.5-3e. Sheet 446 Independent Control Platforms

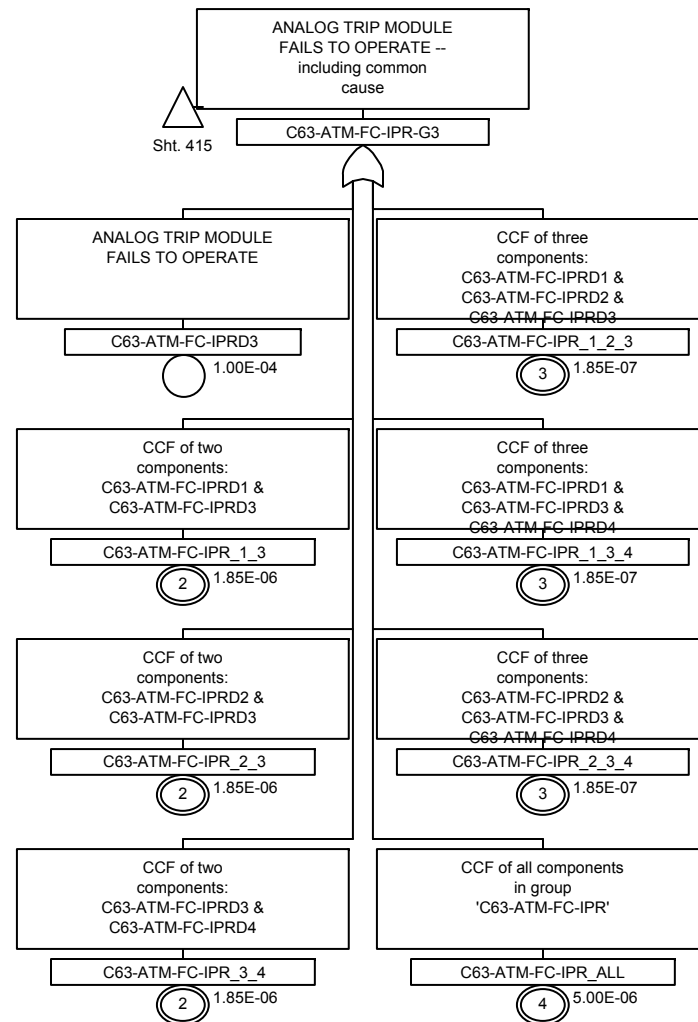


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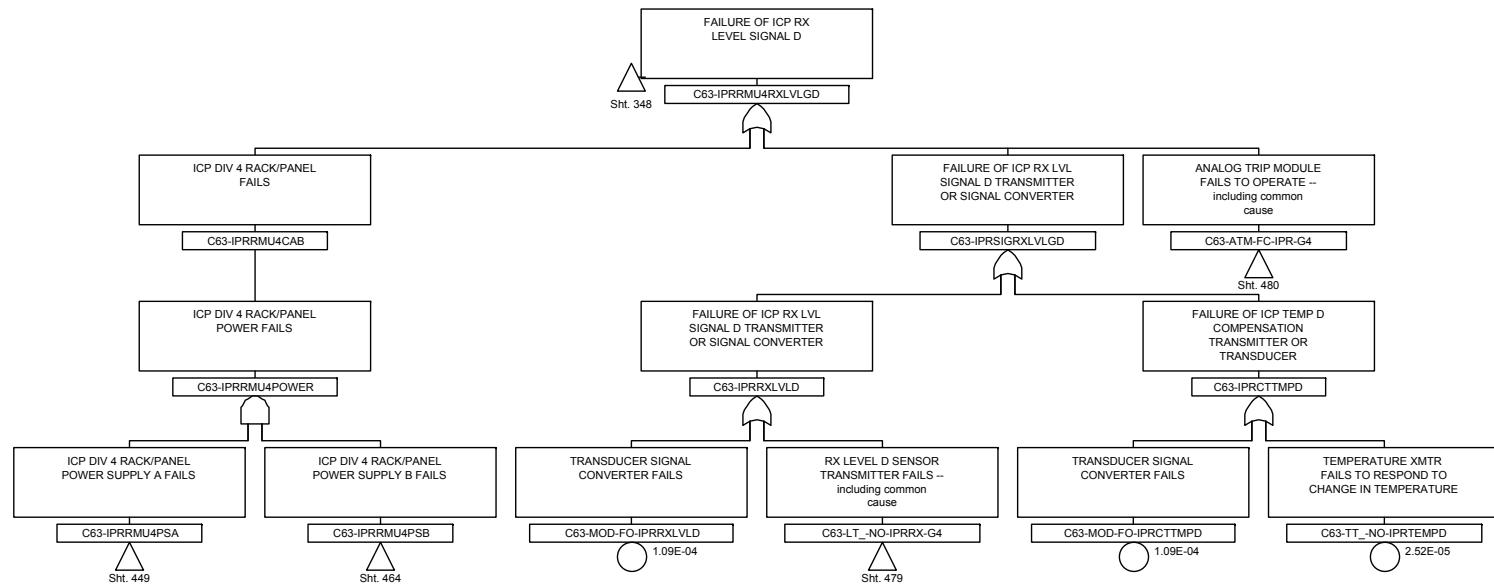


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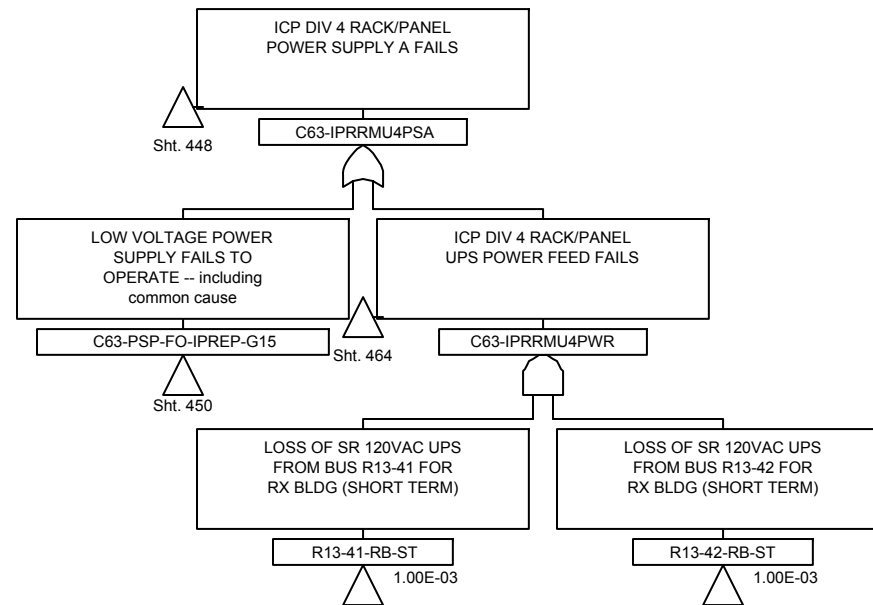


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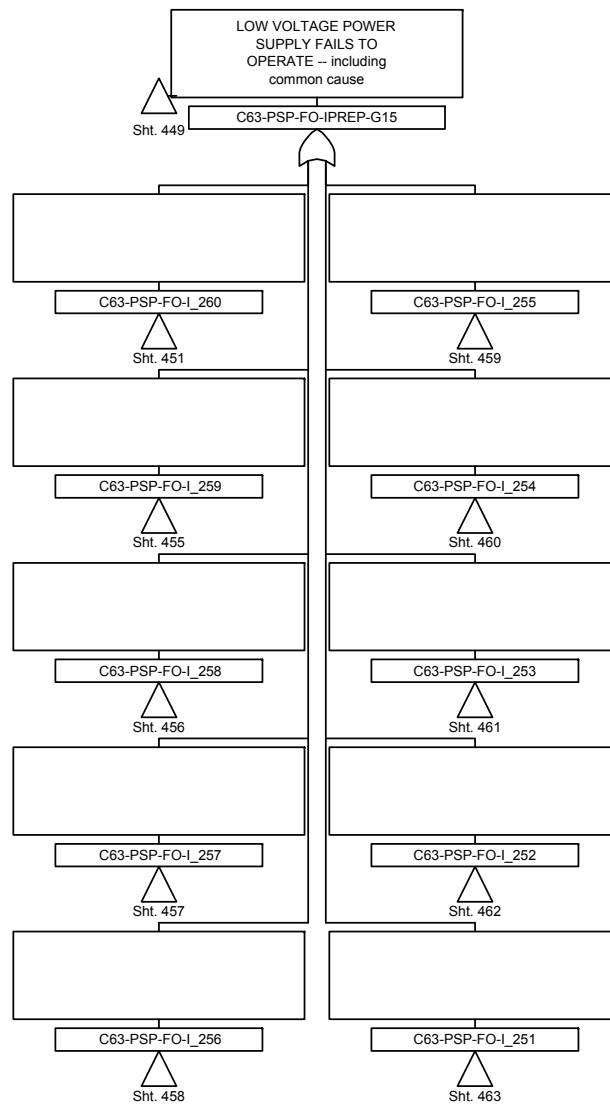


Figure 4.5-3e. Sheet 450 Independent Control Platforms



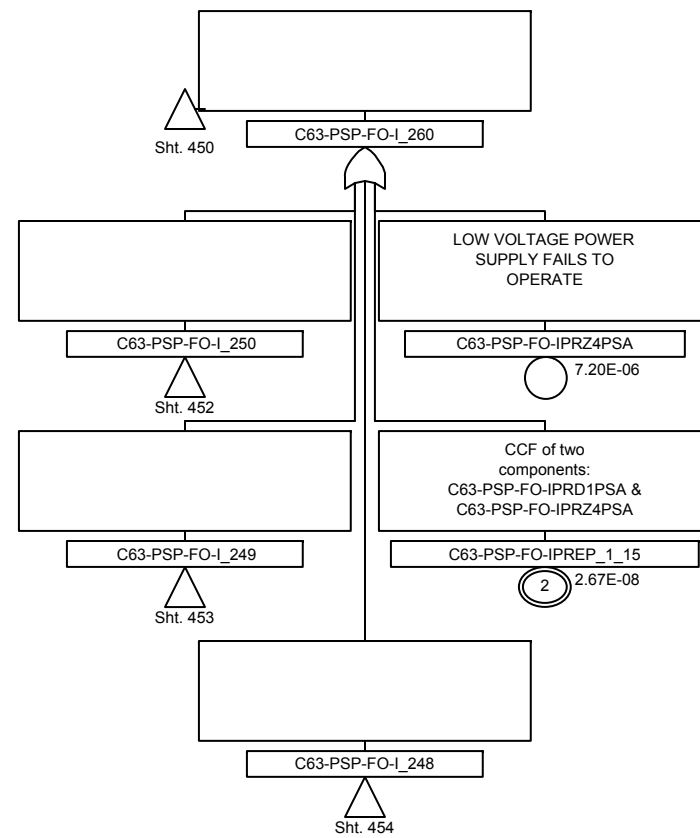


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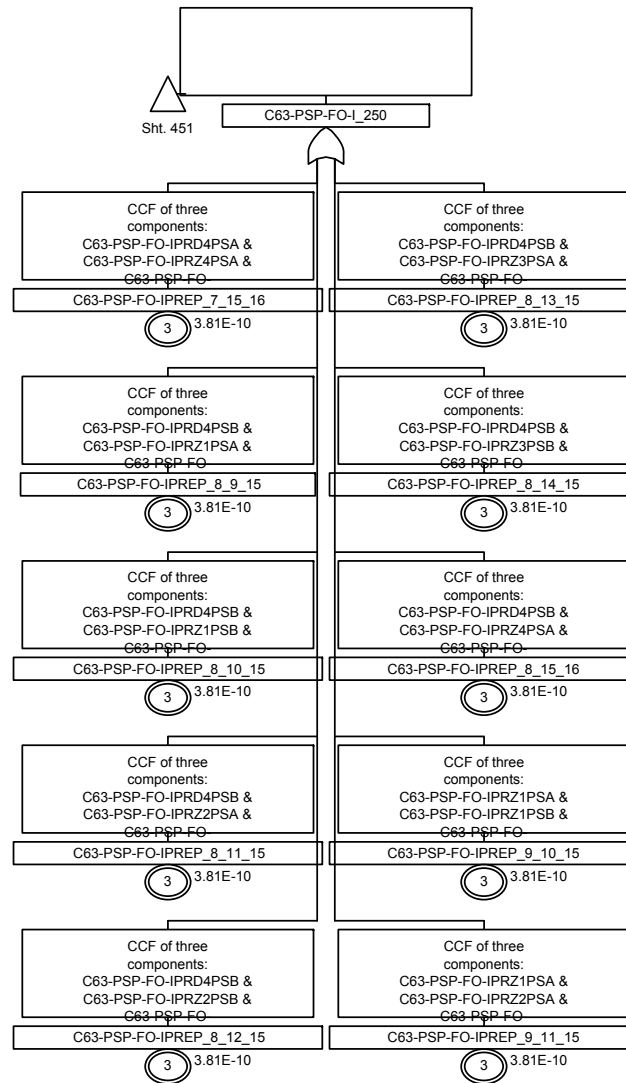


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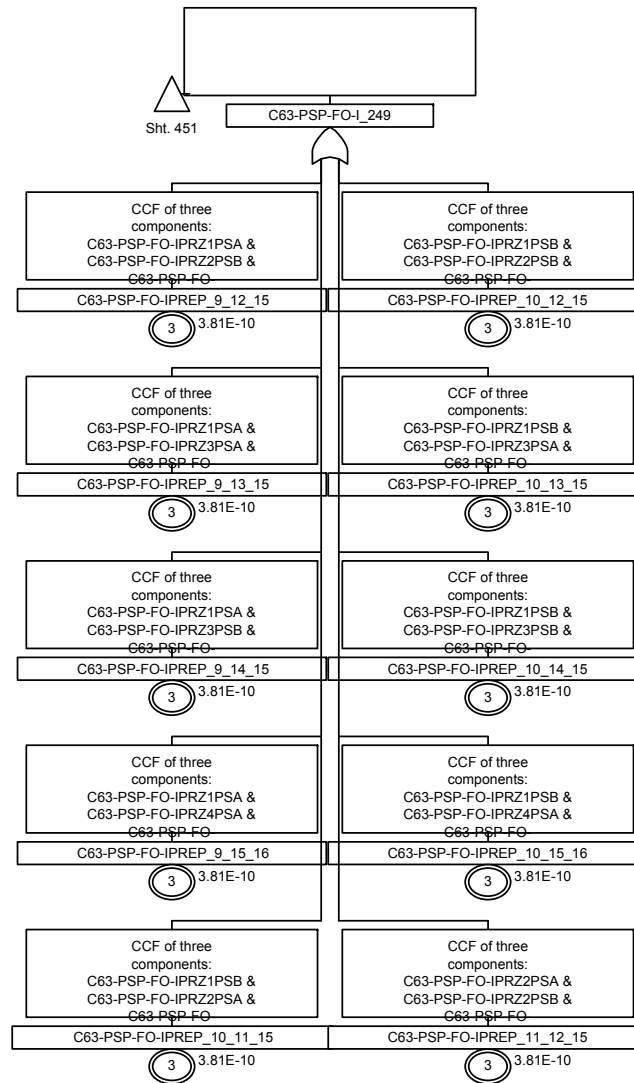


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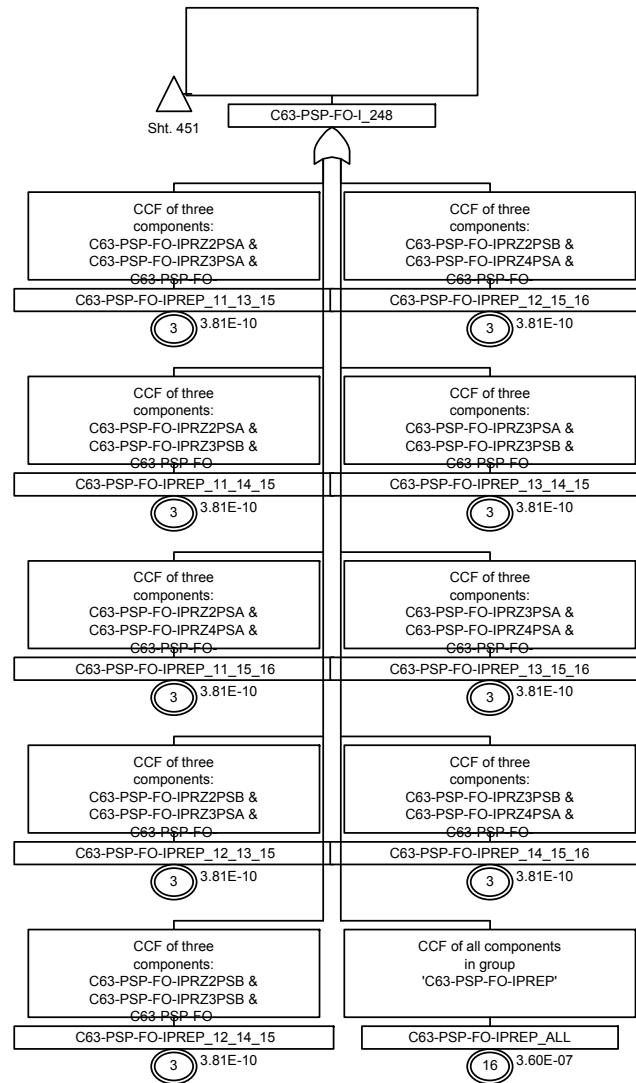


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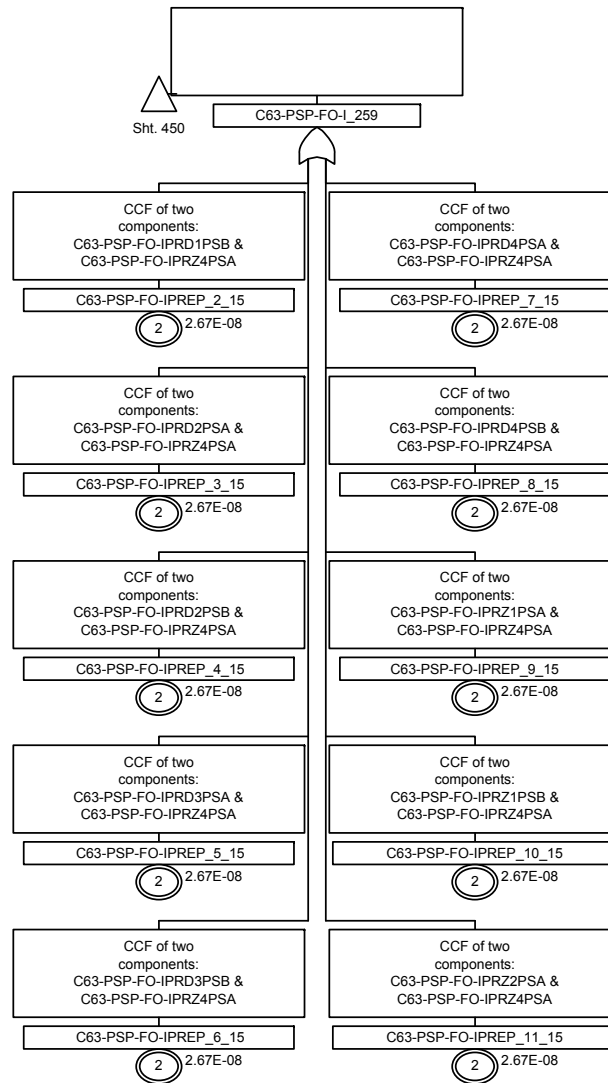


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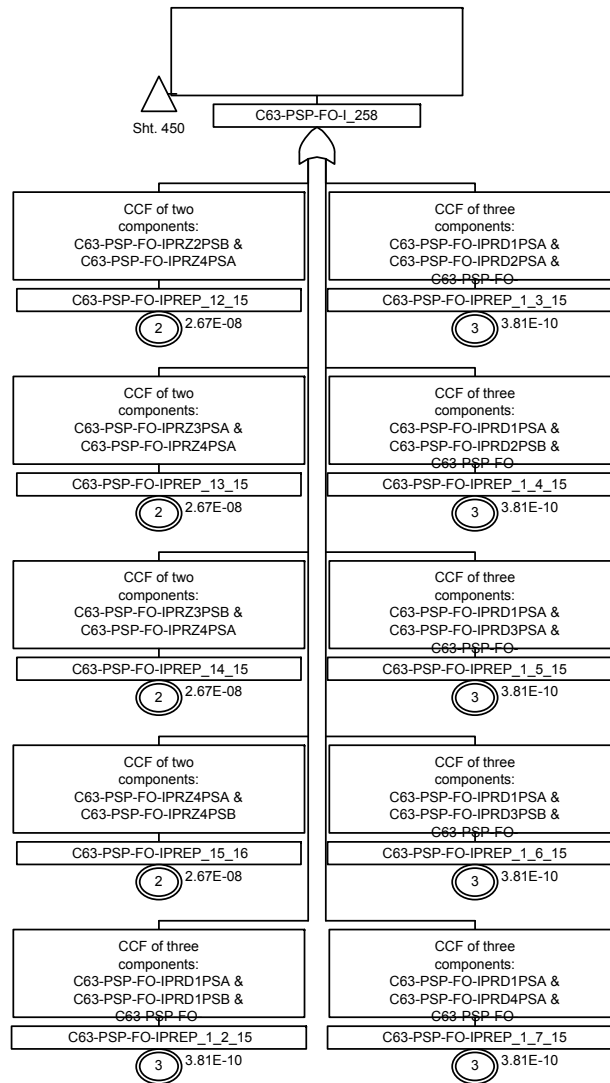


Figure 4.5-3e. Sheet 456 Independent Control Platforms



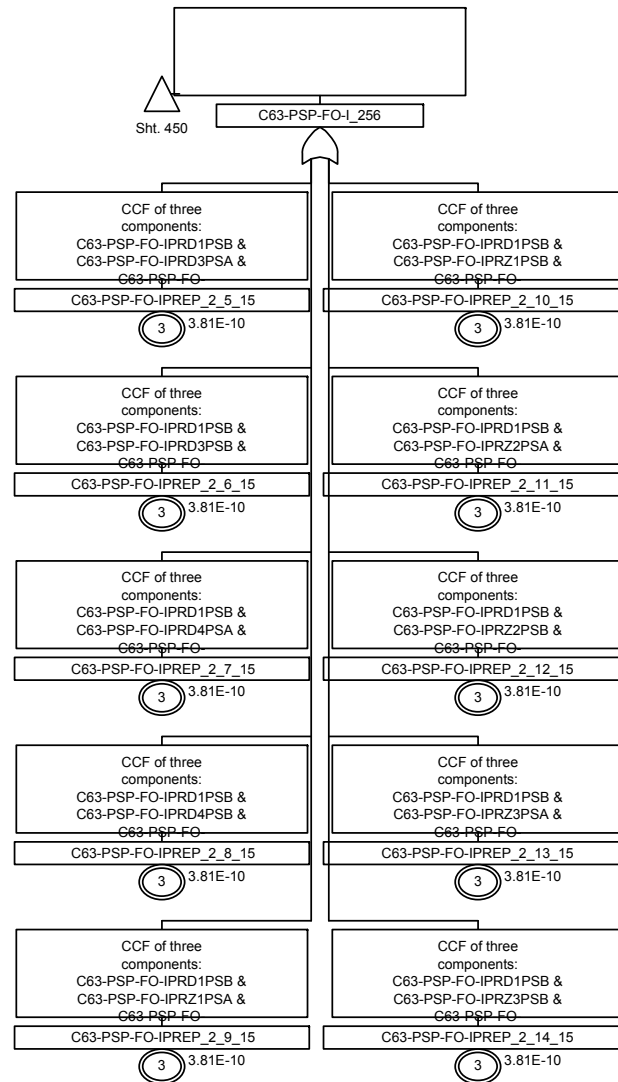


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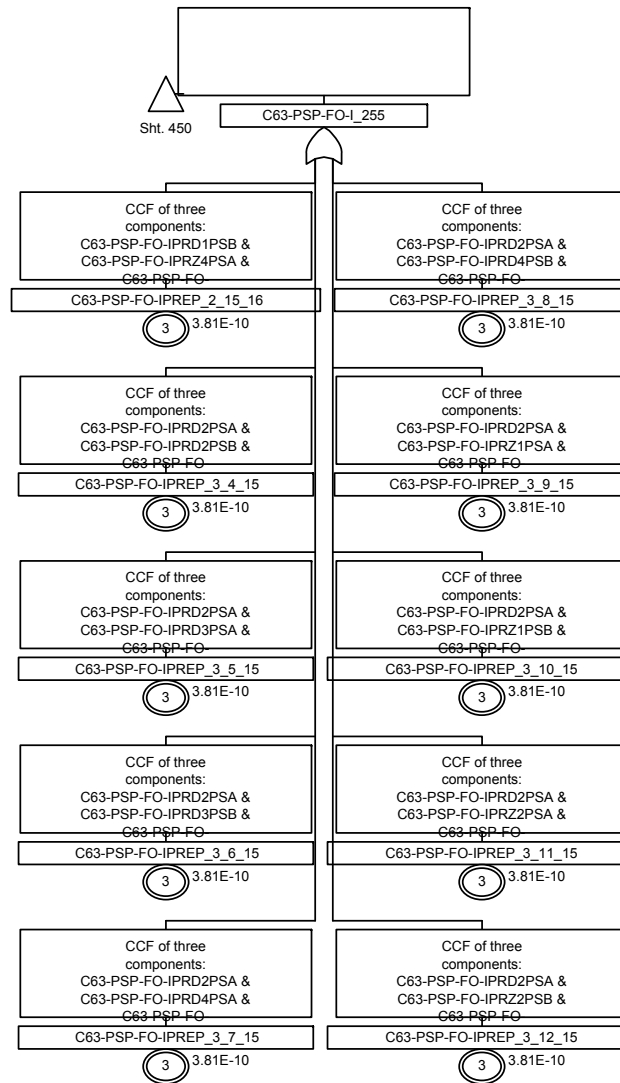


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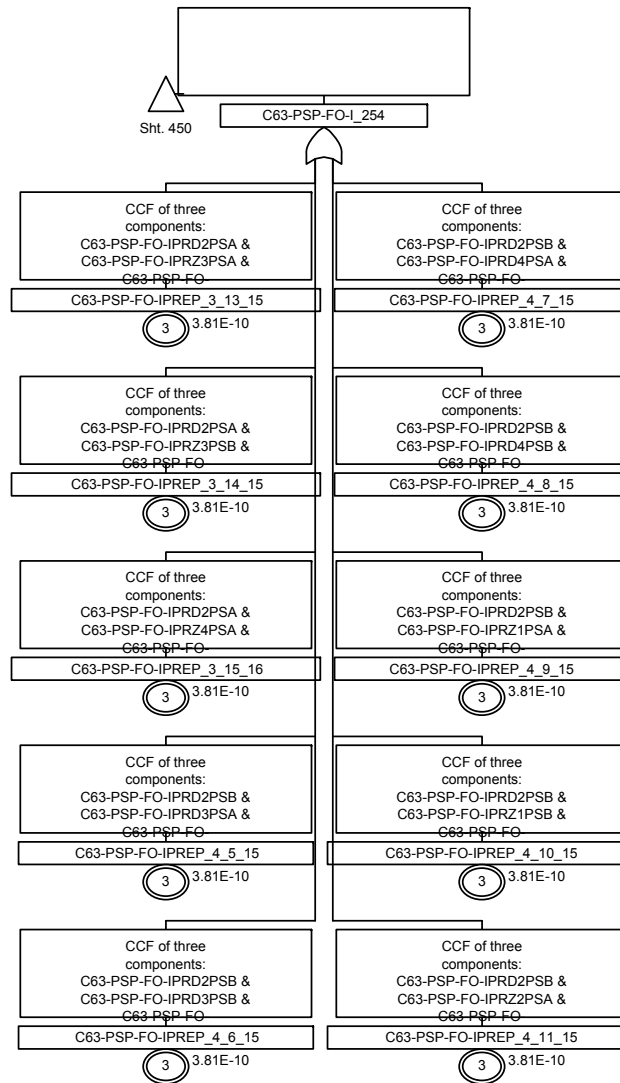


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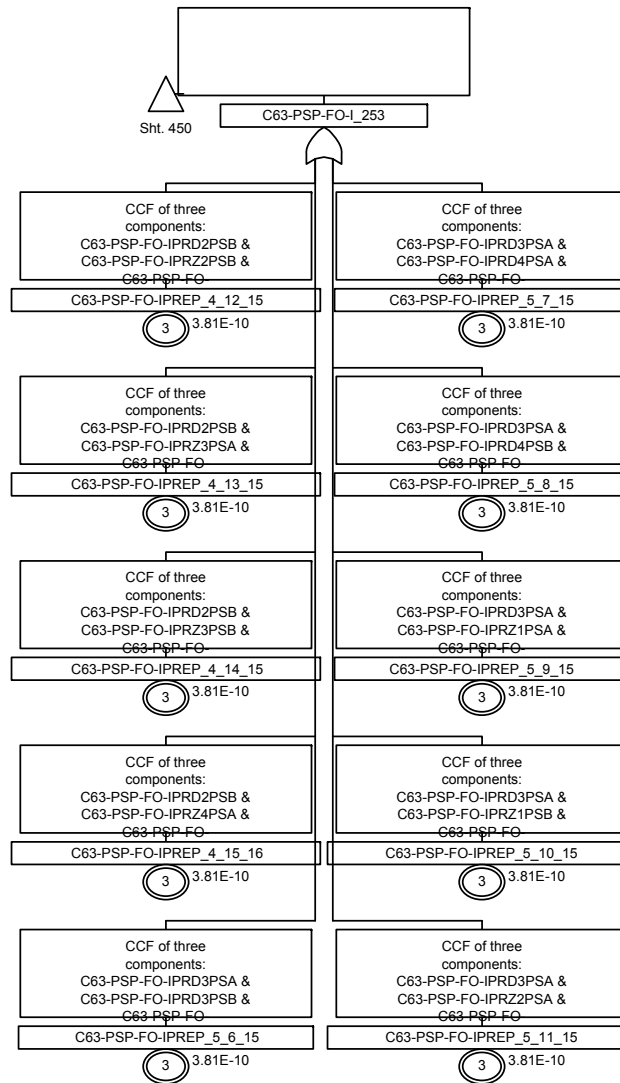


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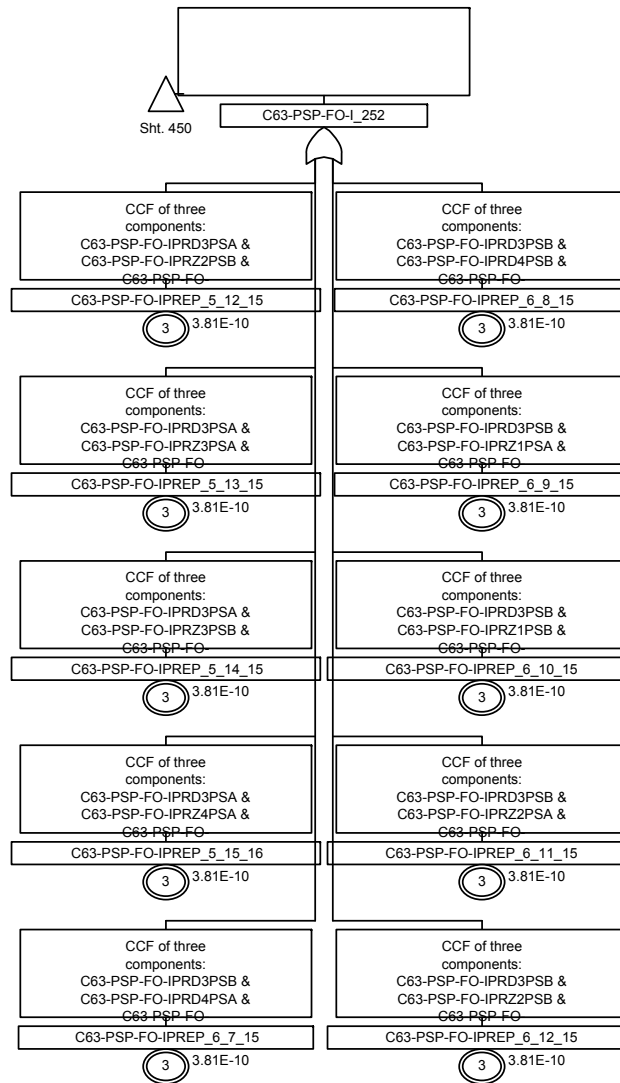


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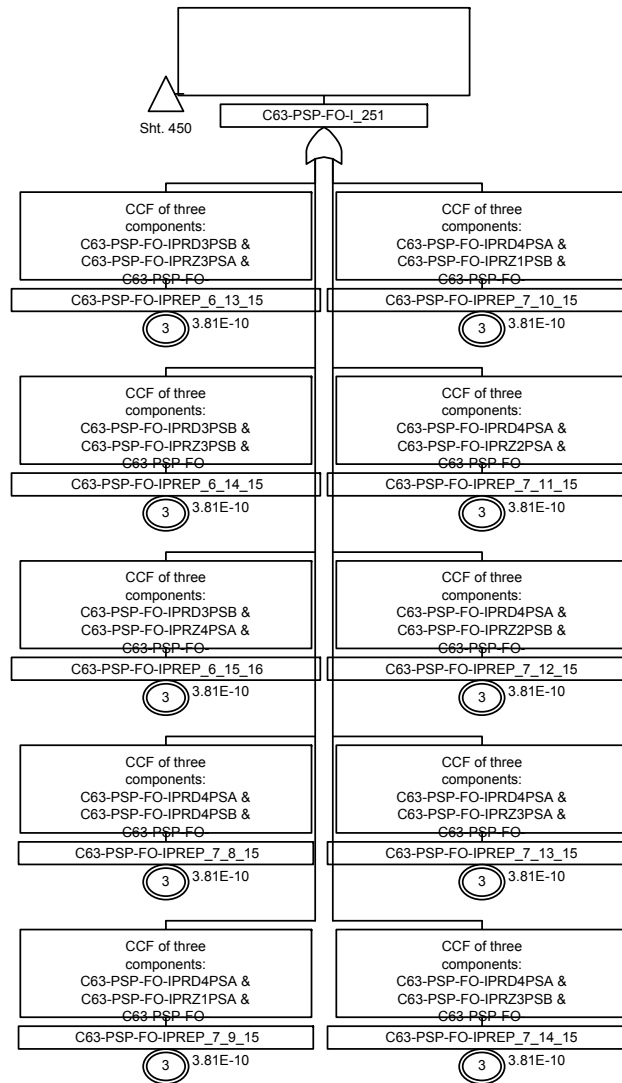


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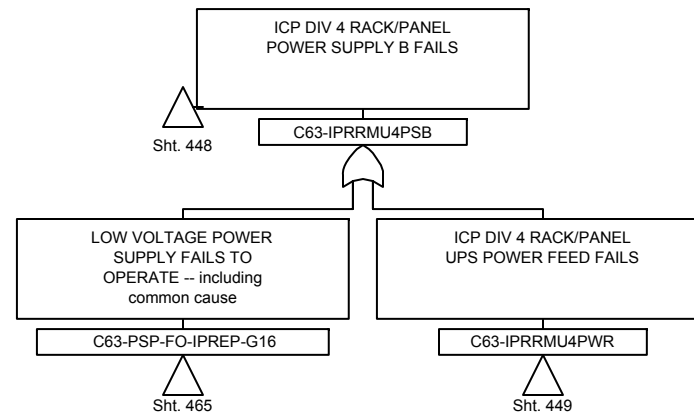


Figure 4.5-3e. Sheet 464 Independent Control Platforms

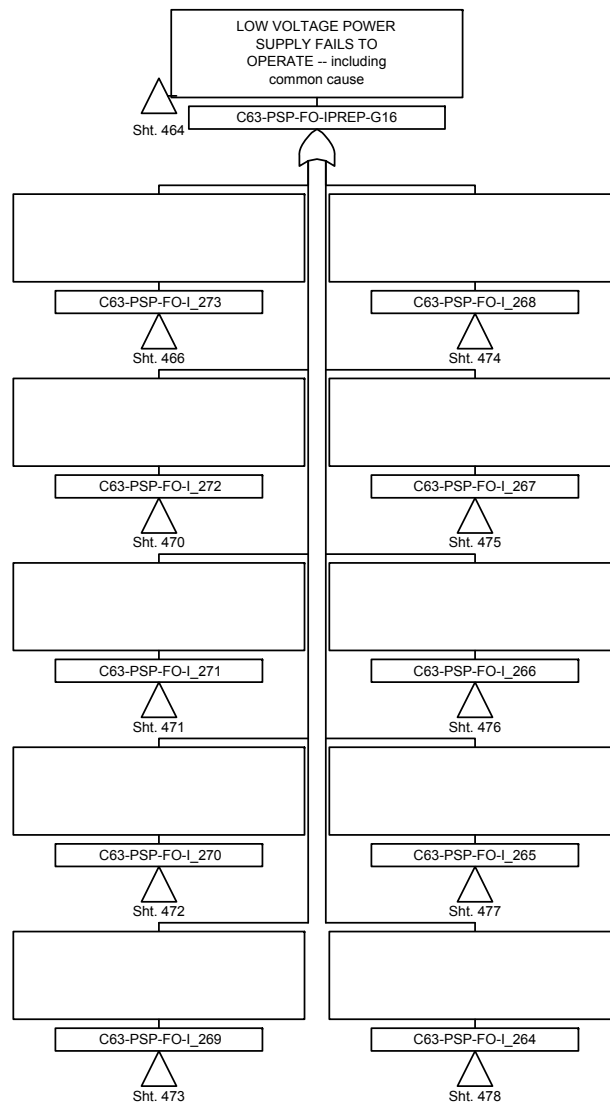


Figure 4.5-3e. Sheet 465 Independent Control Platforms

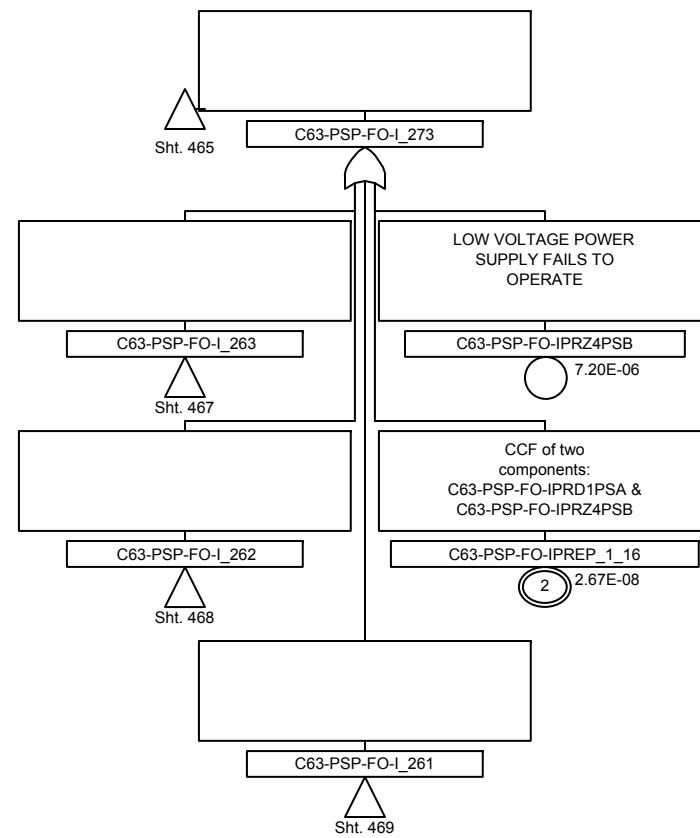


Figure 4.5-3e. Sheet 466 Independent Control Platforms



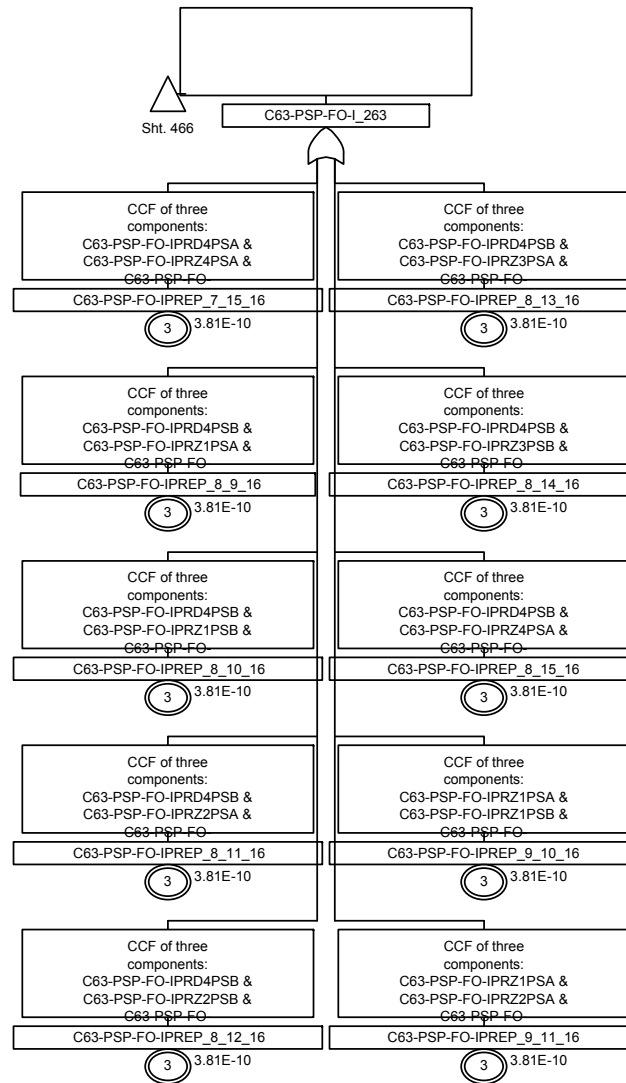


Figure 4.5-3e. Sheet 467 Independent Control Platforms

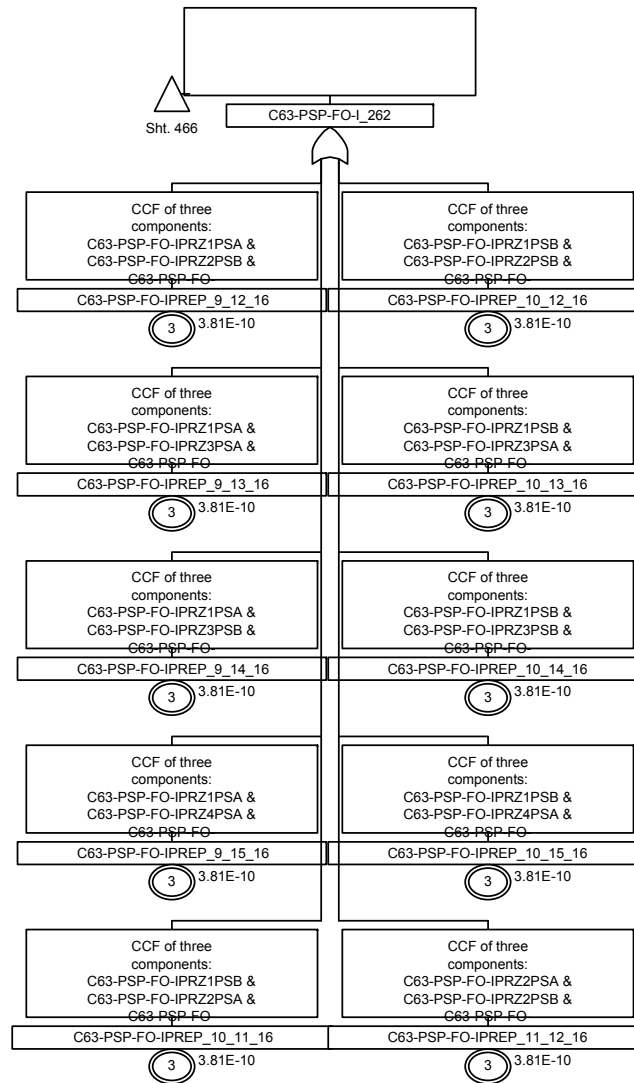


Figure 4.5-3e. Sheet 468 Independent Control Platforms

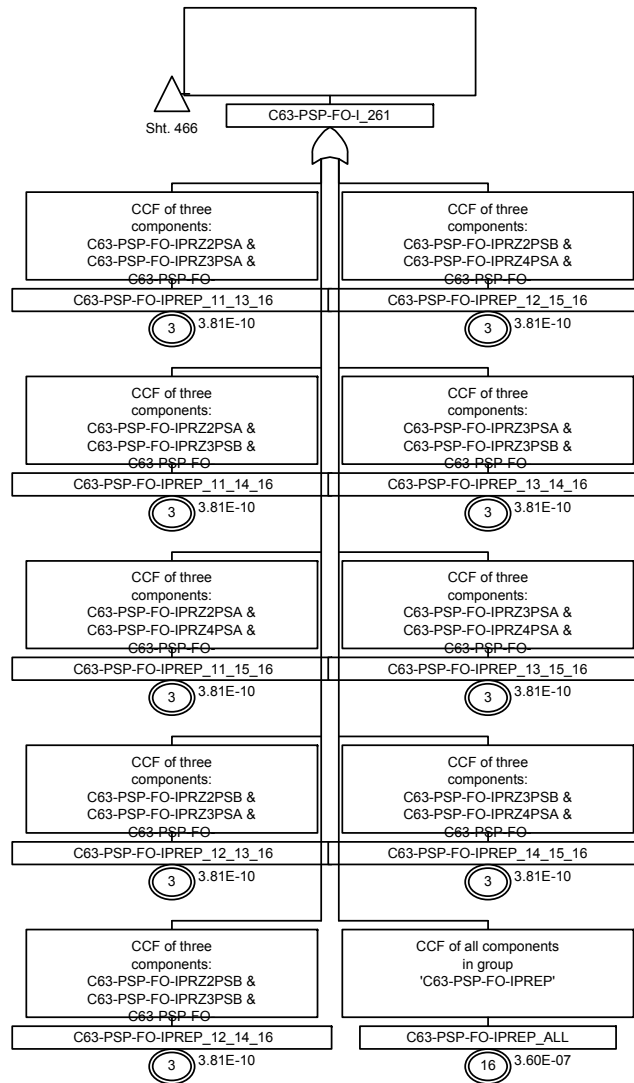


Figure 4.5-3e. Sheet 469 Independent Control Platforms

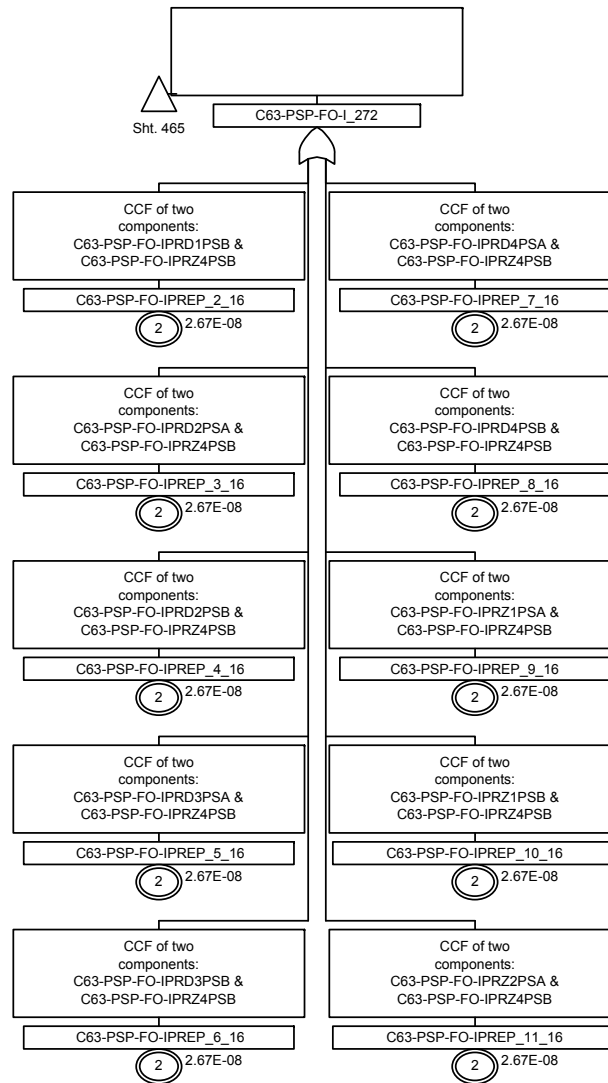


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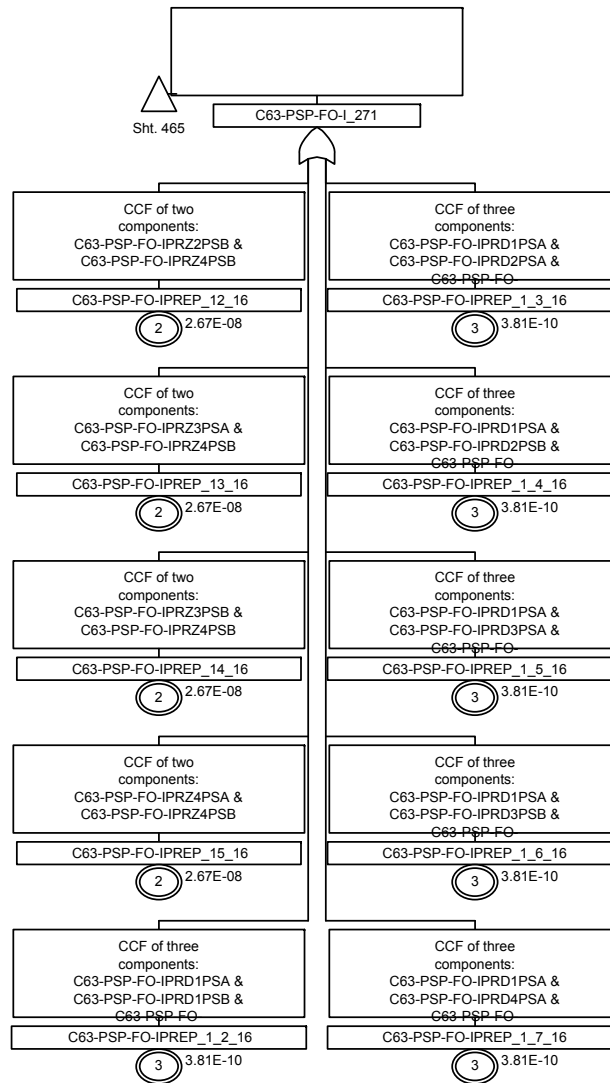


Figure 4.5-3e. Sheet 471 Independent Control Platforms



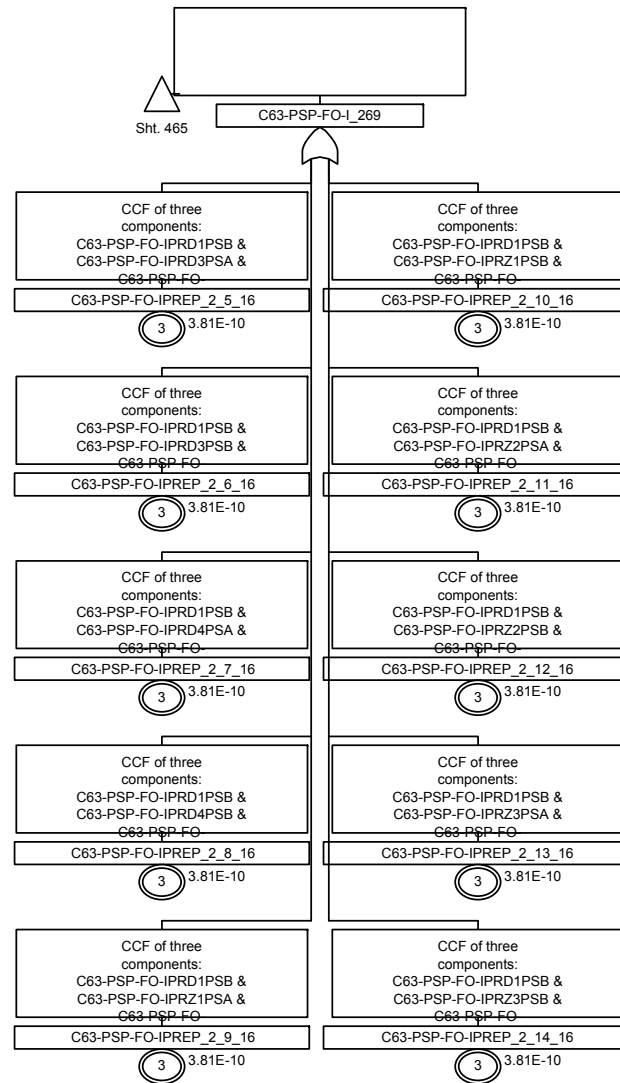


Figure 4.5-3e. Sheet 473 Independent Control Platforms

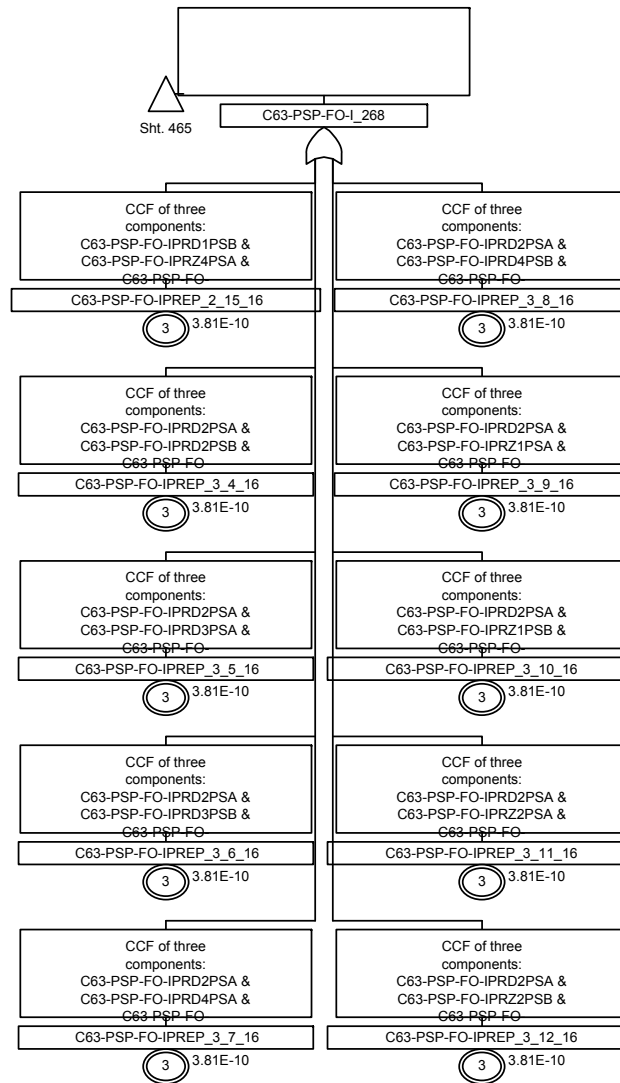


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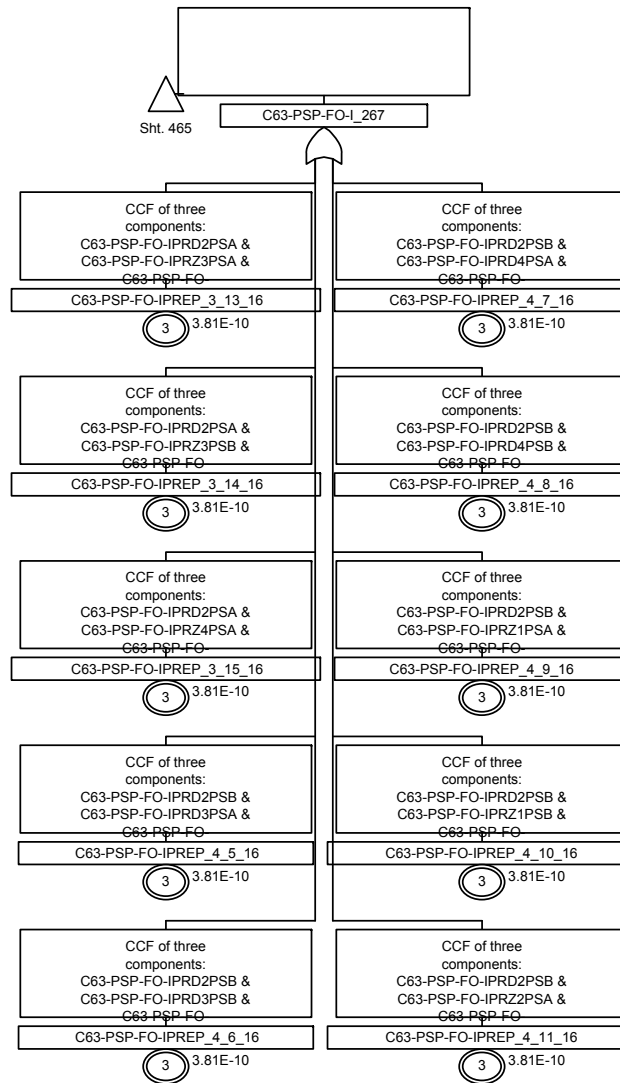


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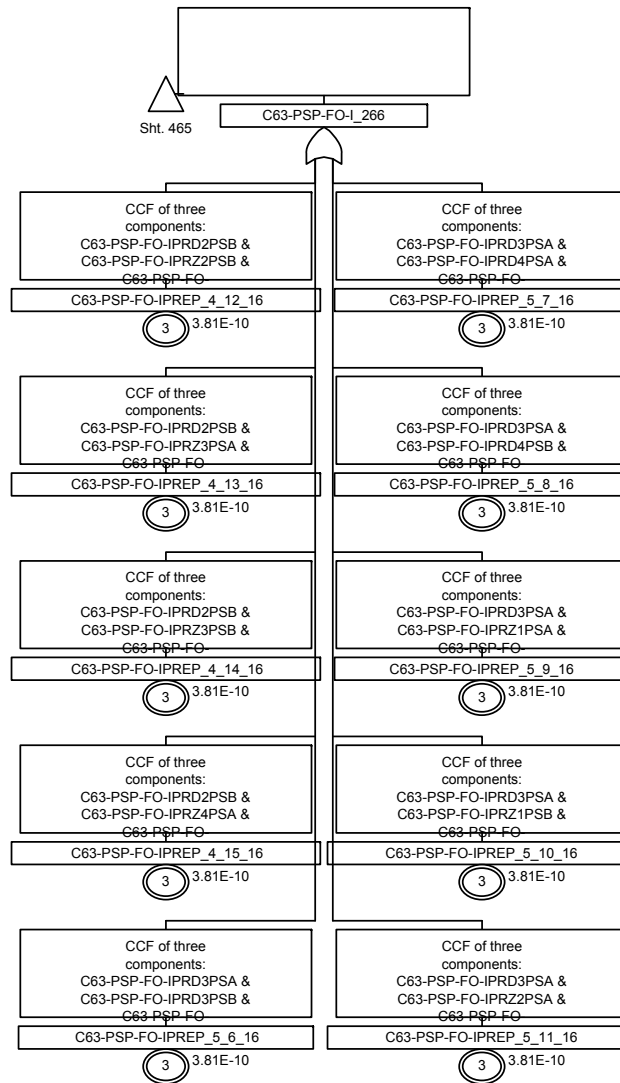


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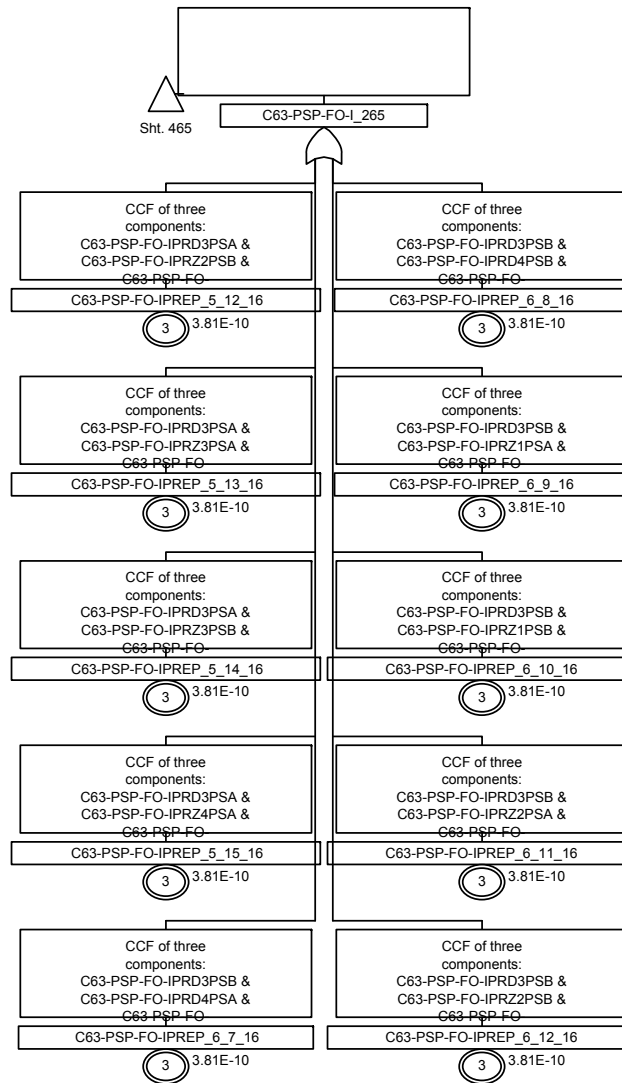


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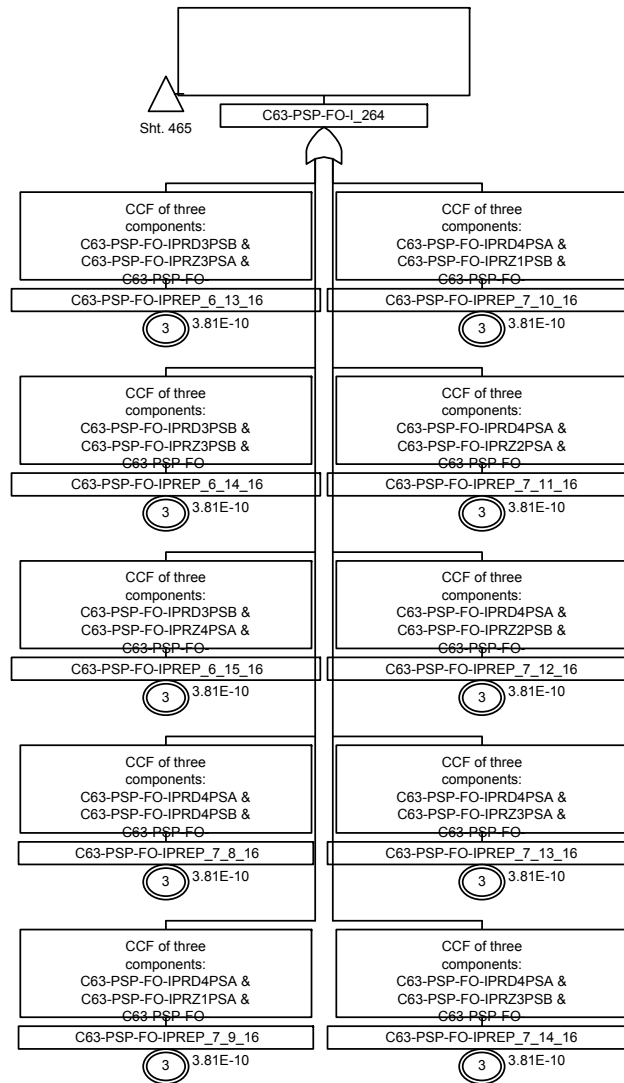


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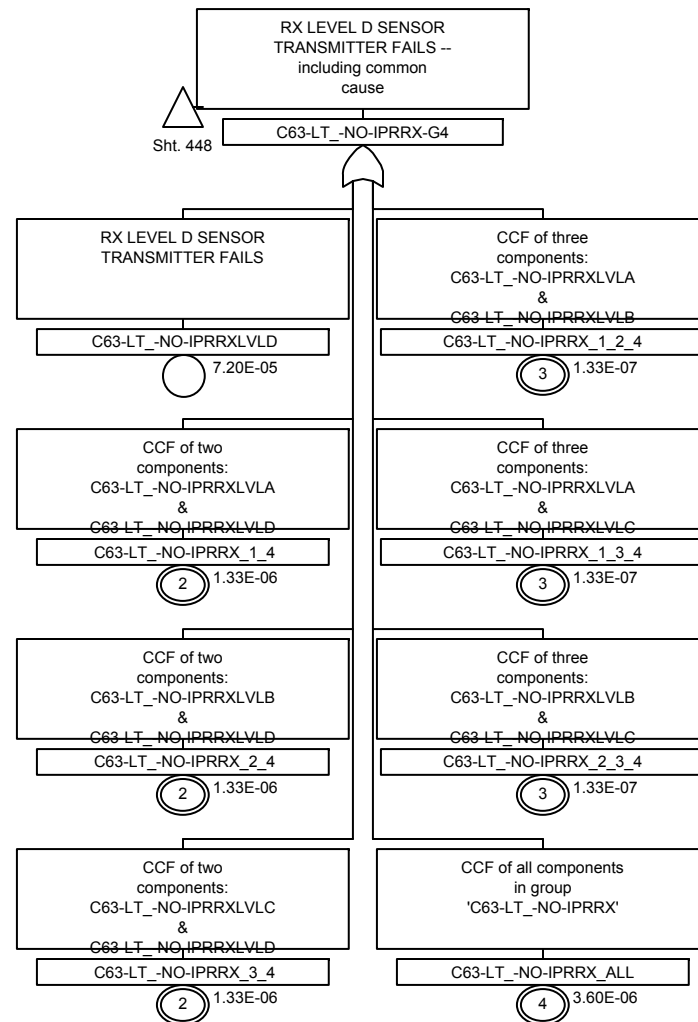


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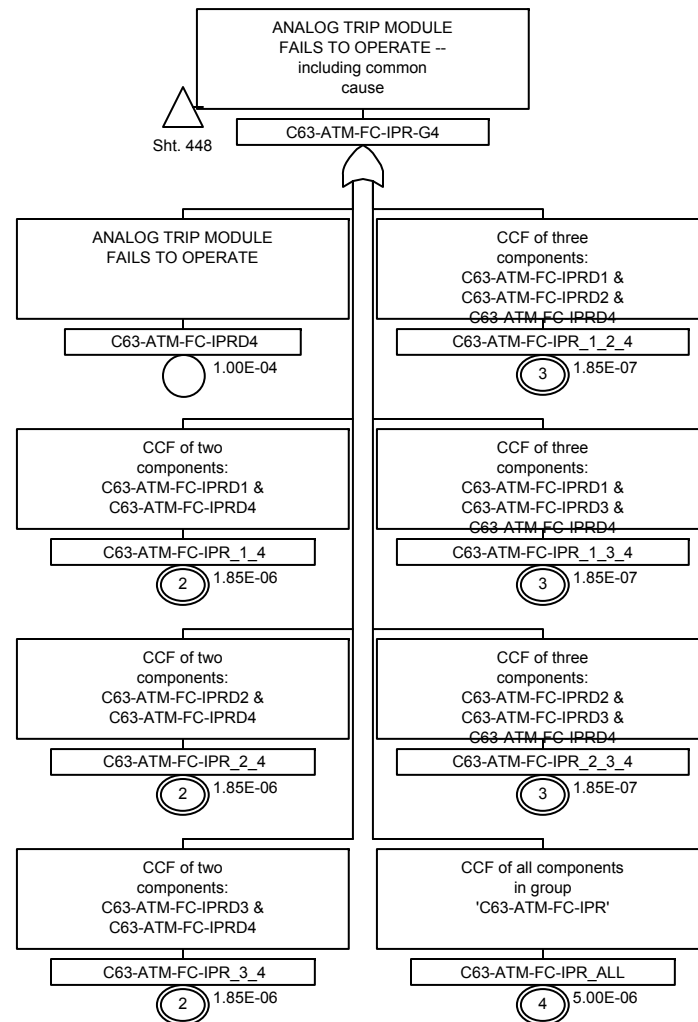


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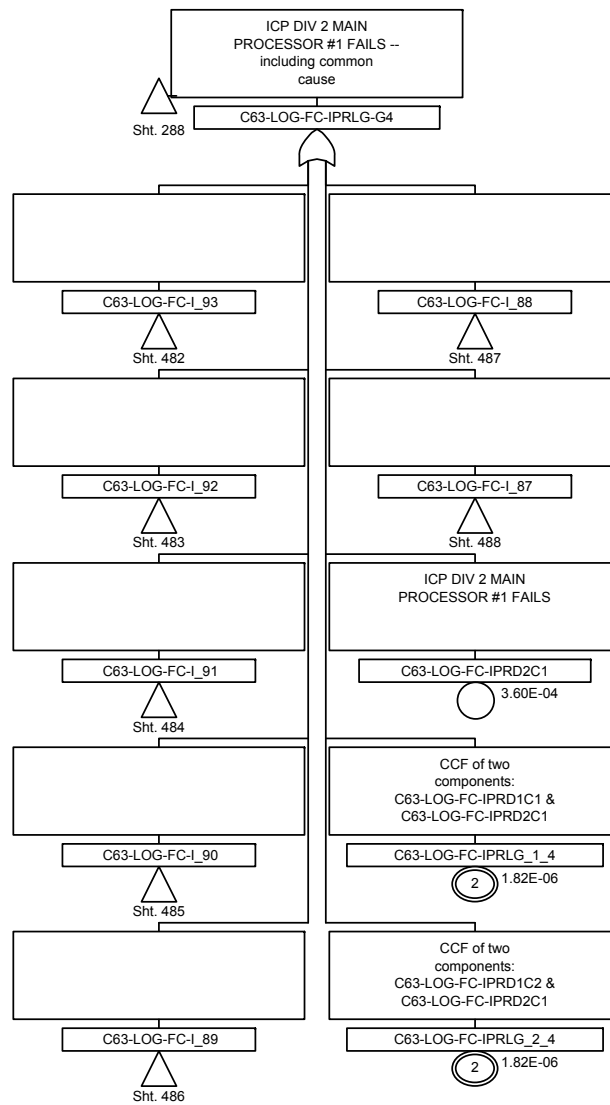


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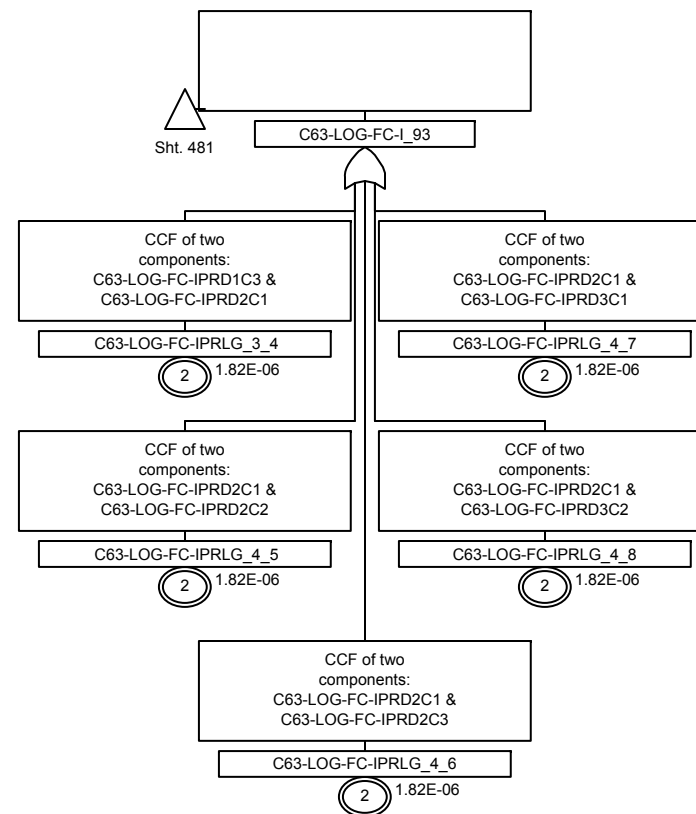


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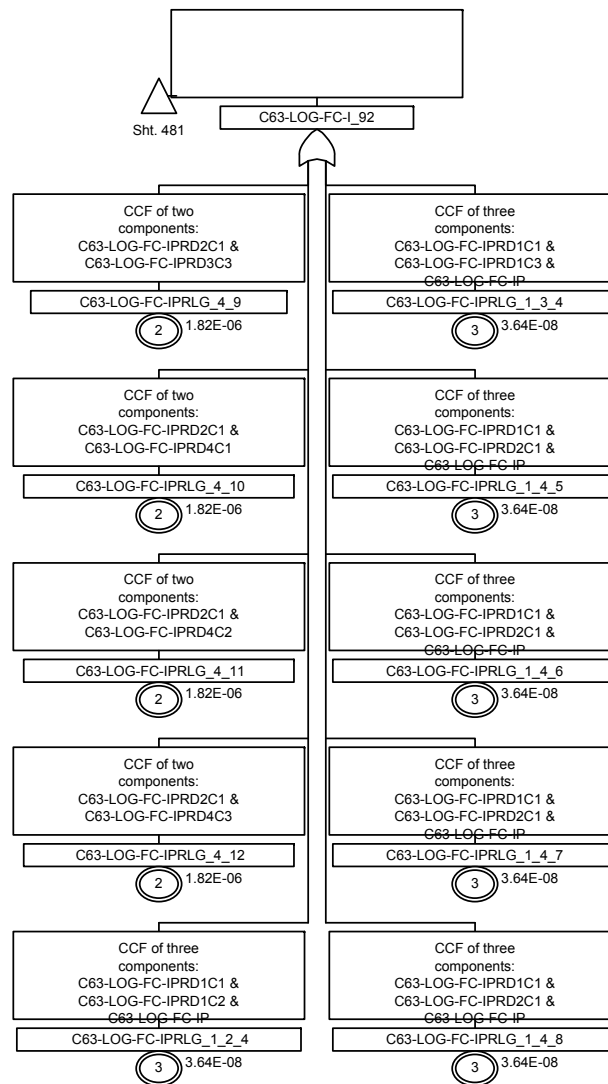


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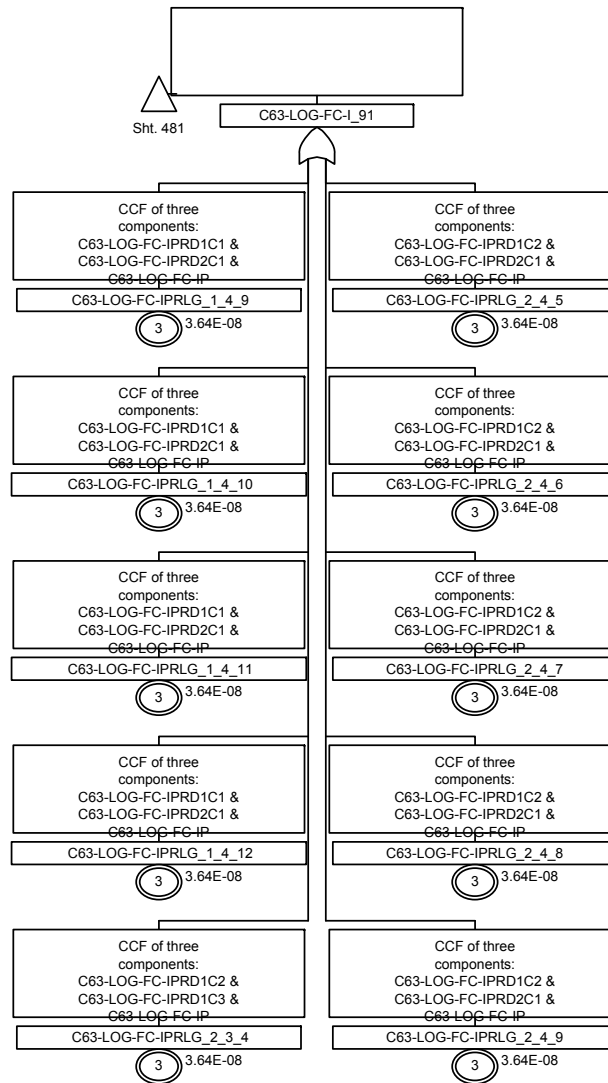


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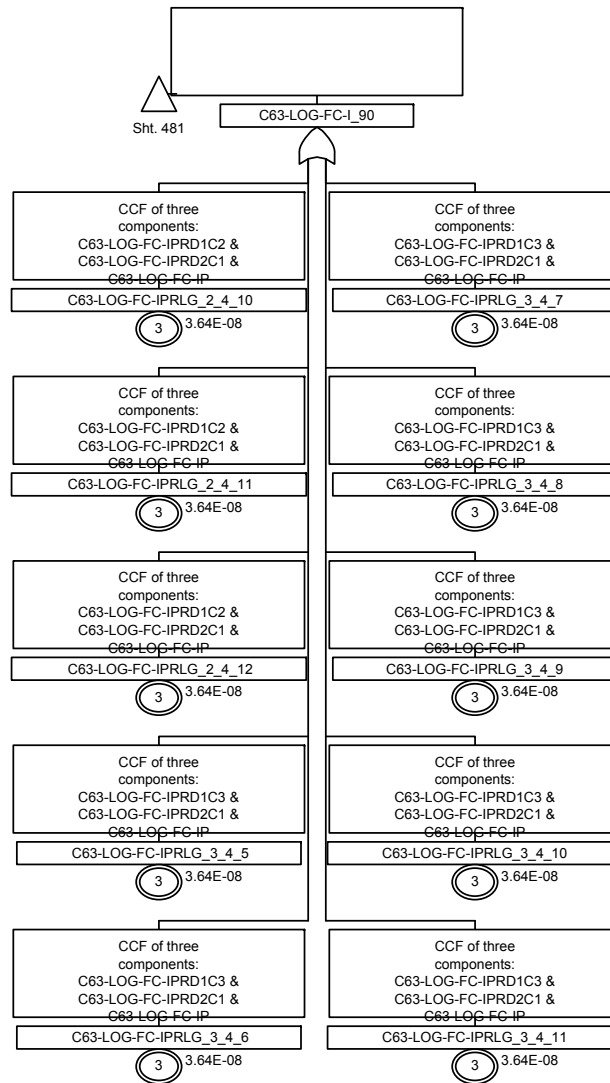


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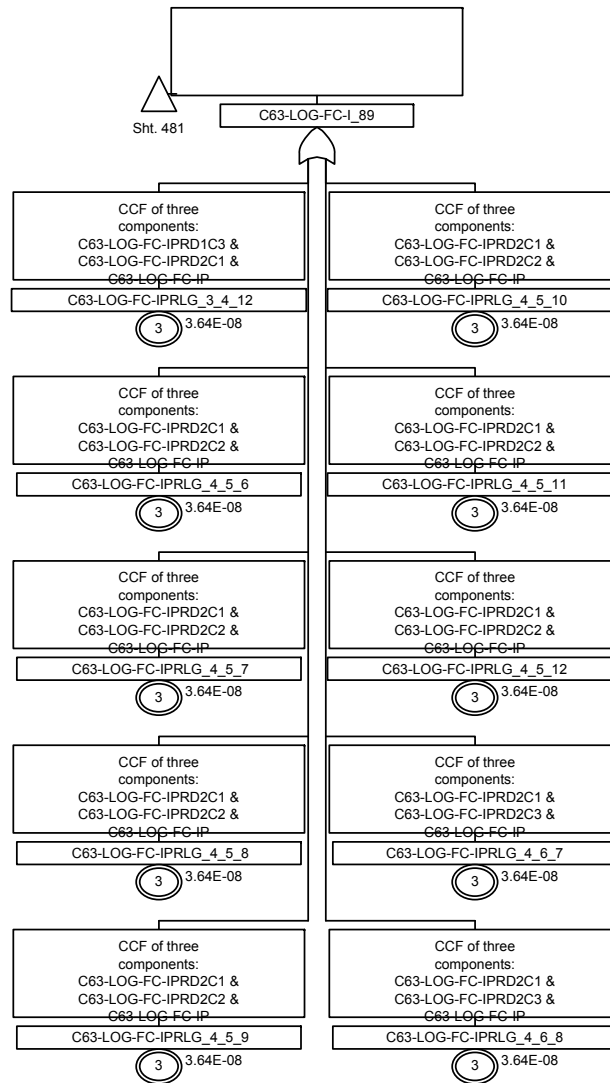


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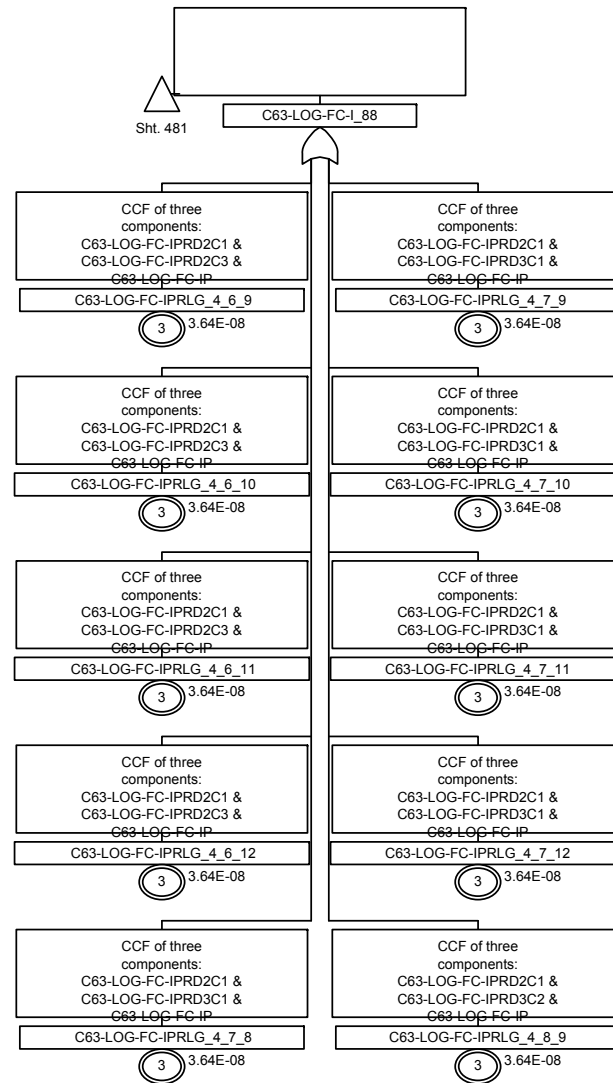


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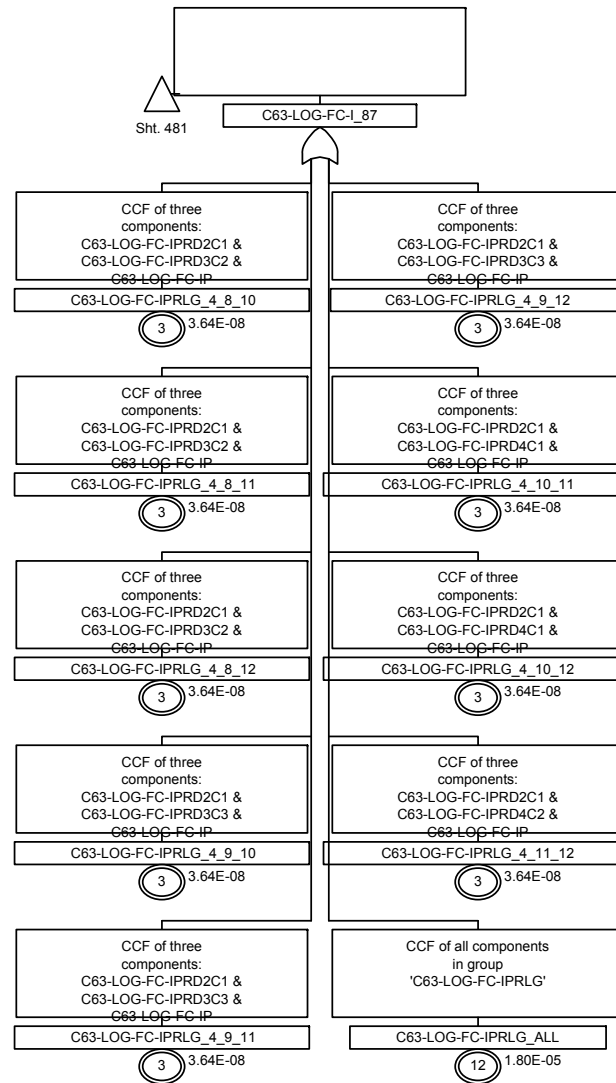


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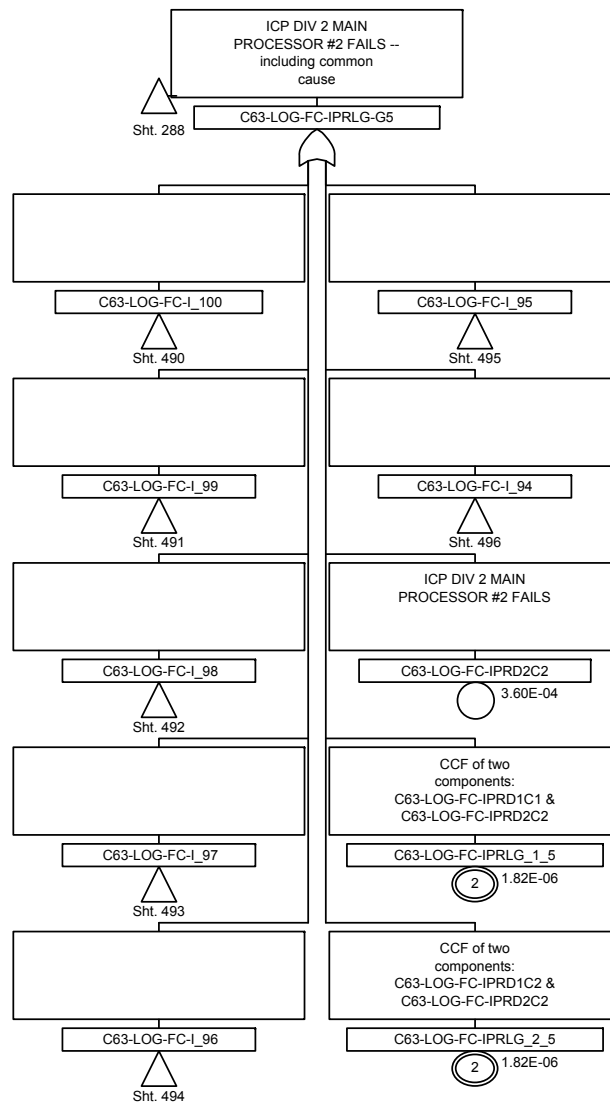


Figure 4.5-3e. Sheet 489 Independent Control Platforms

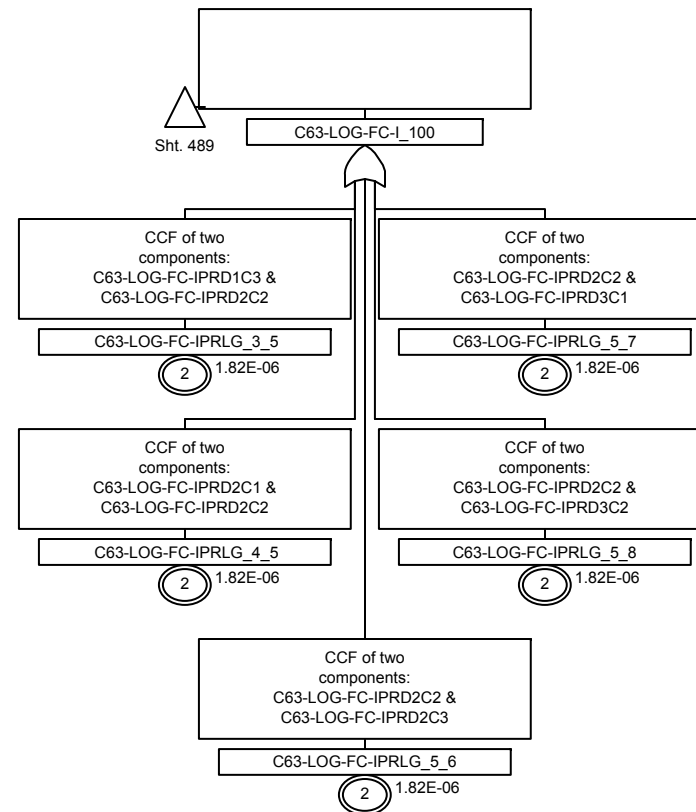


Figure 4.5-3e. Sheet 490 Independent Control Platforms



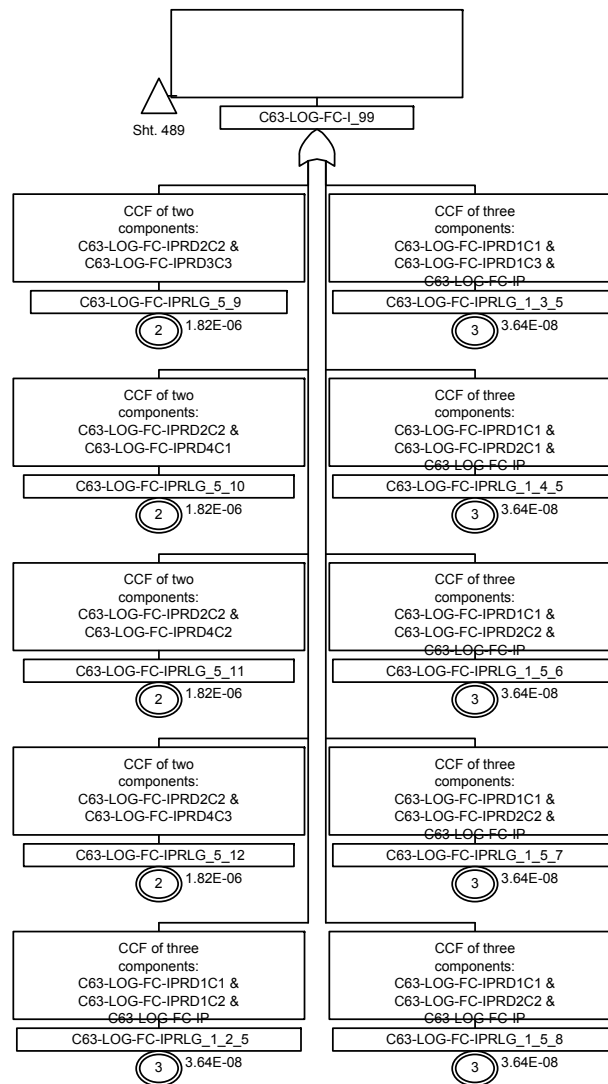


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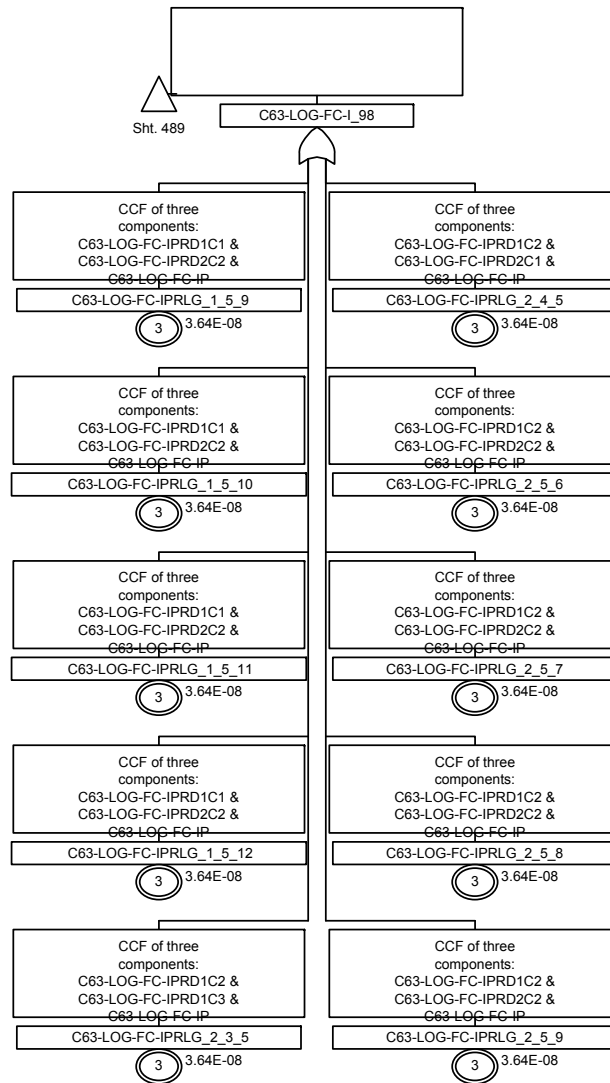


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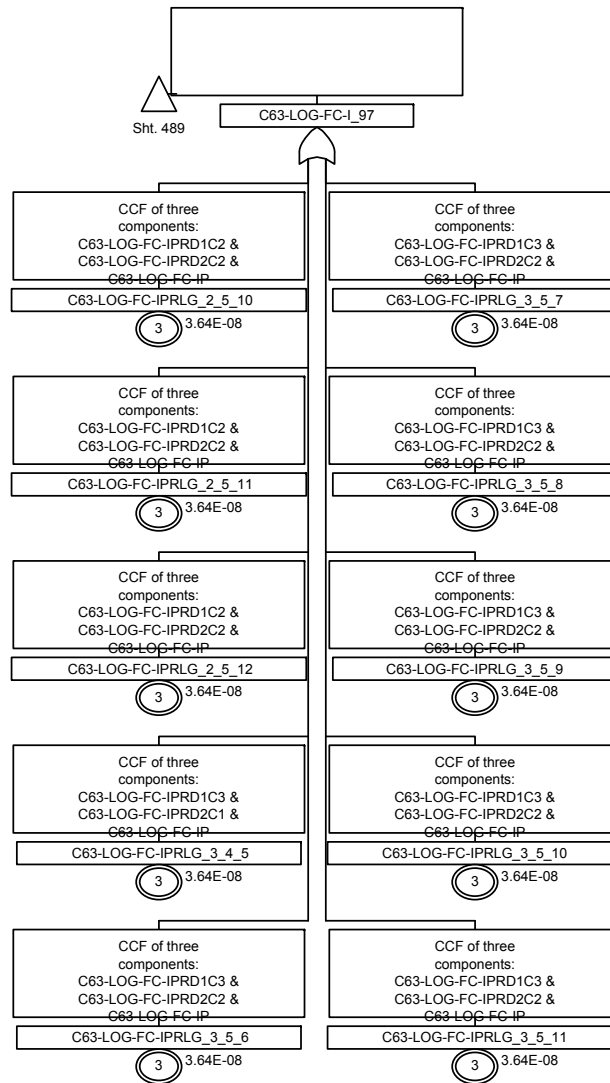


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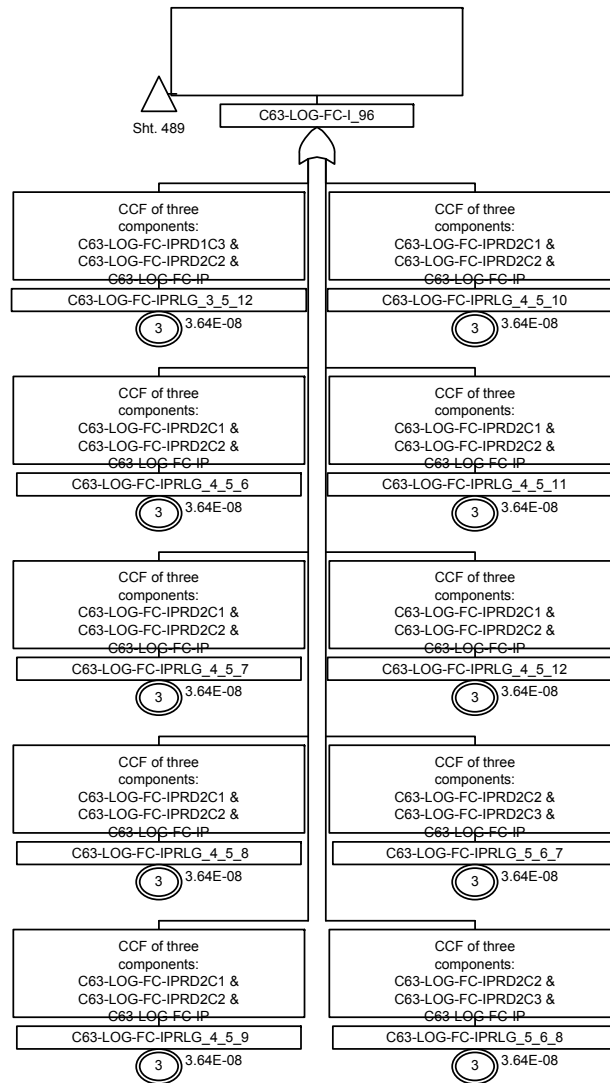


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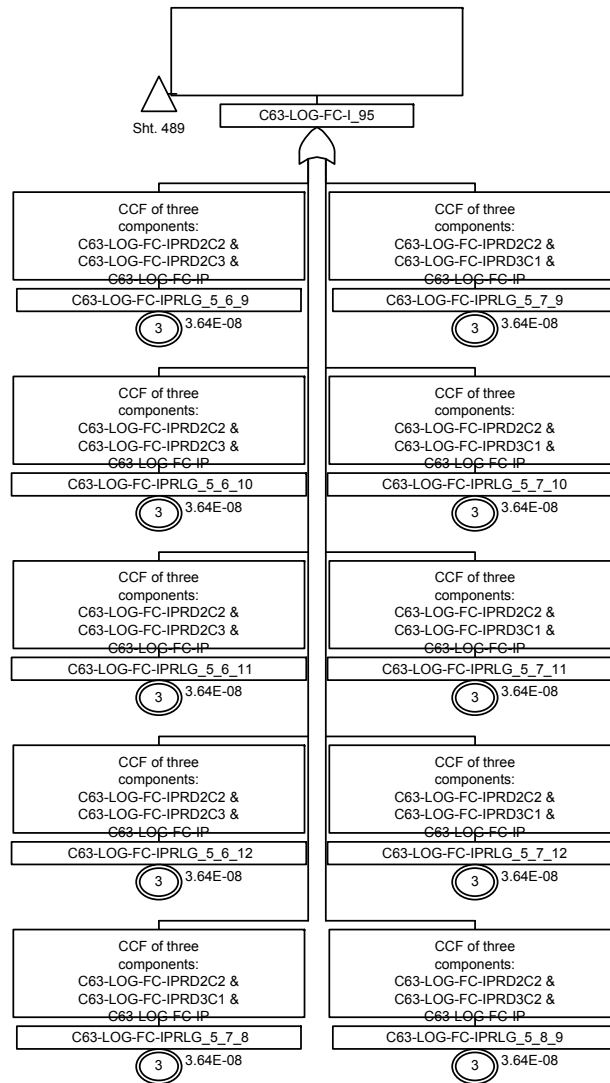


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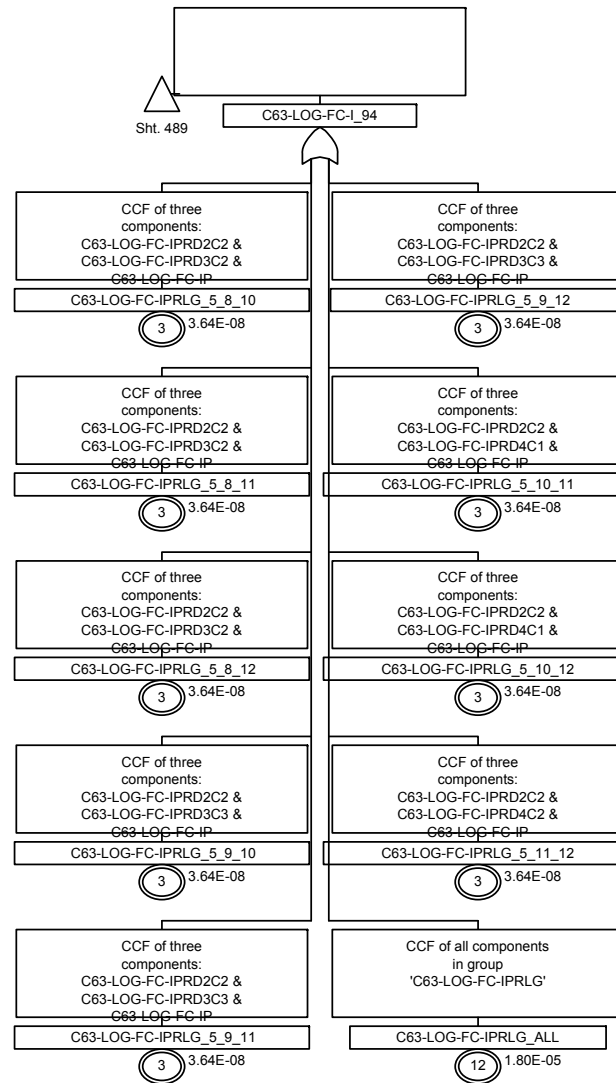


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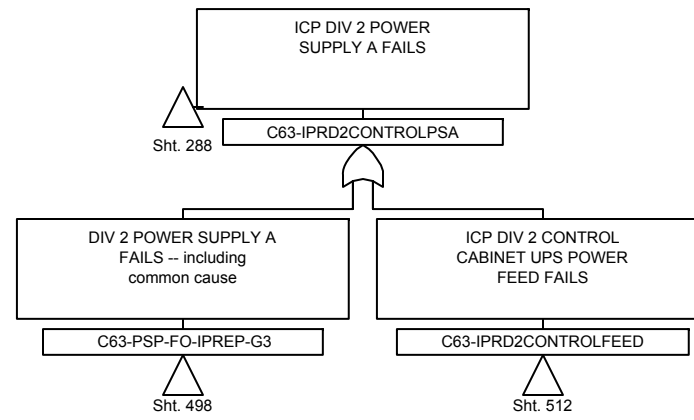


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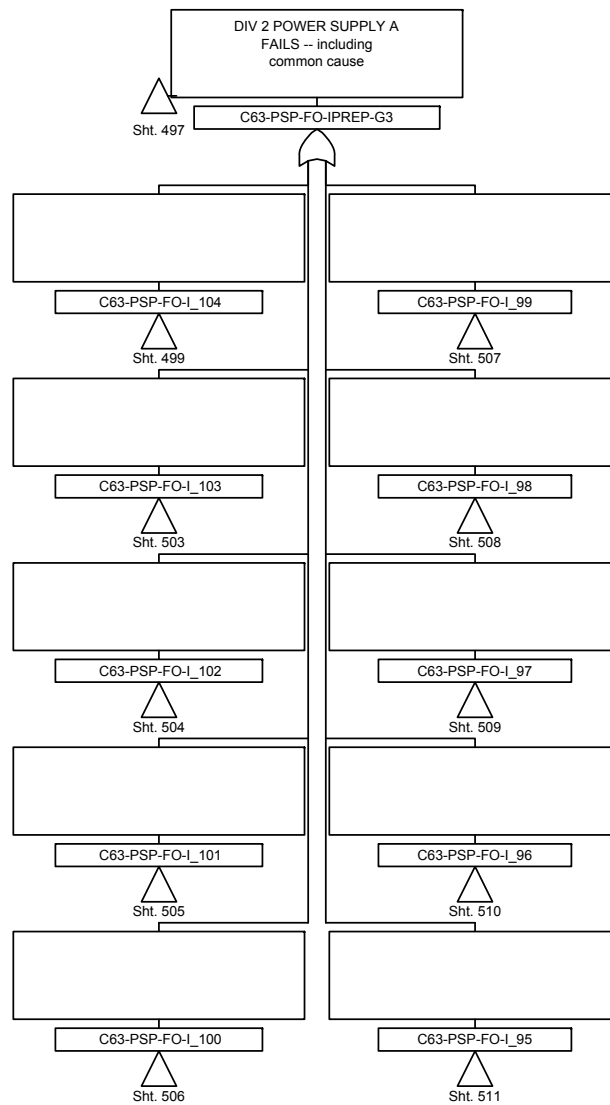


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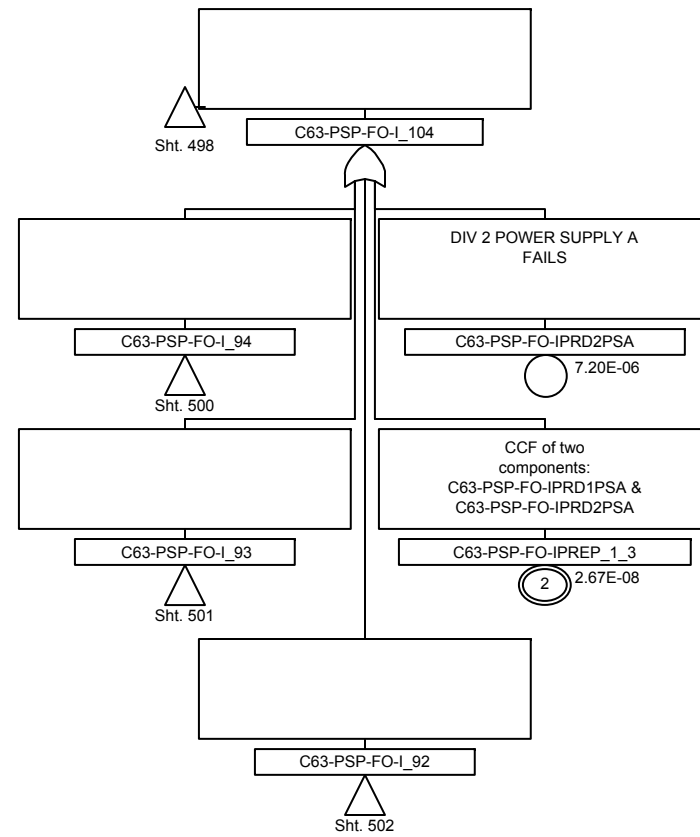


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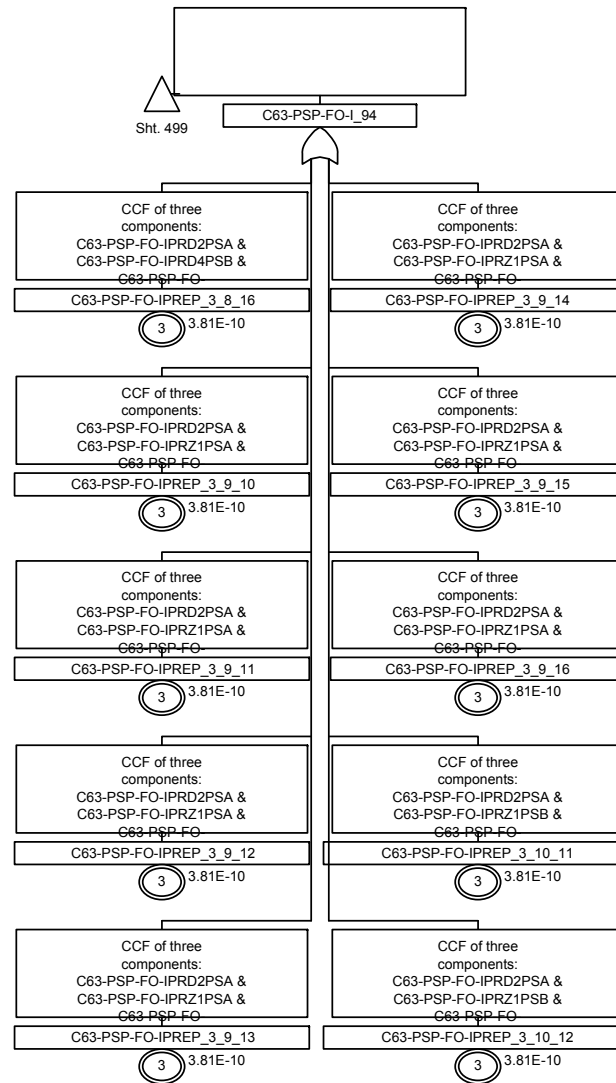


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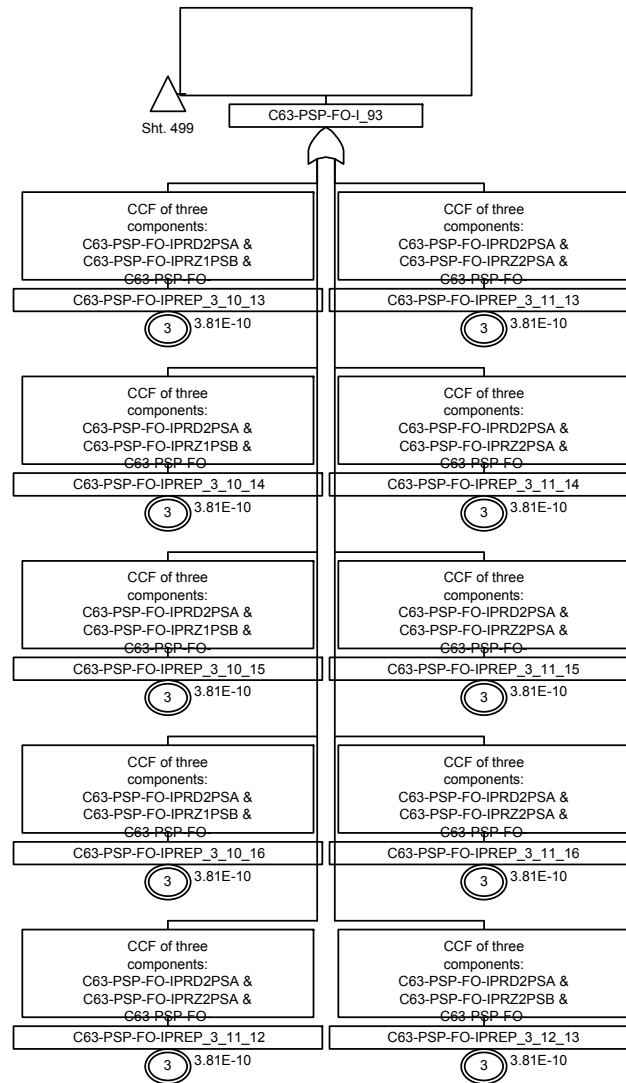


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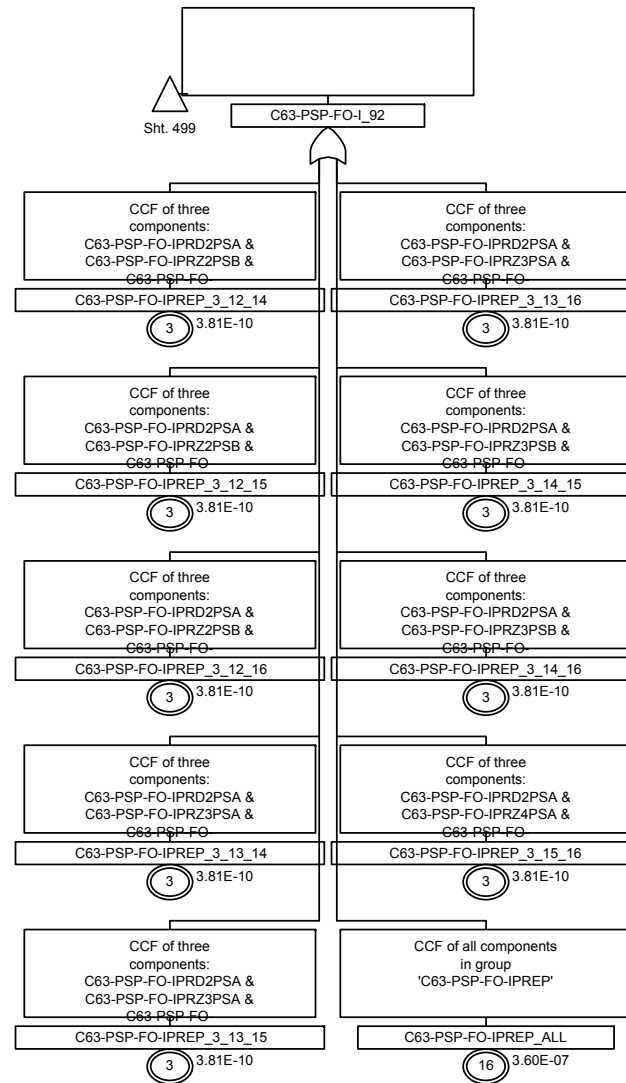


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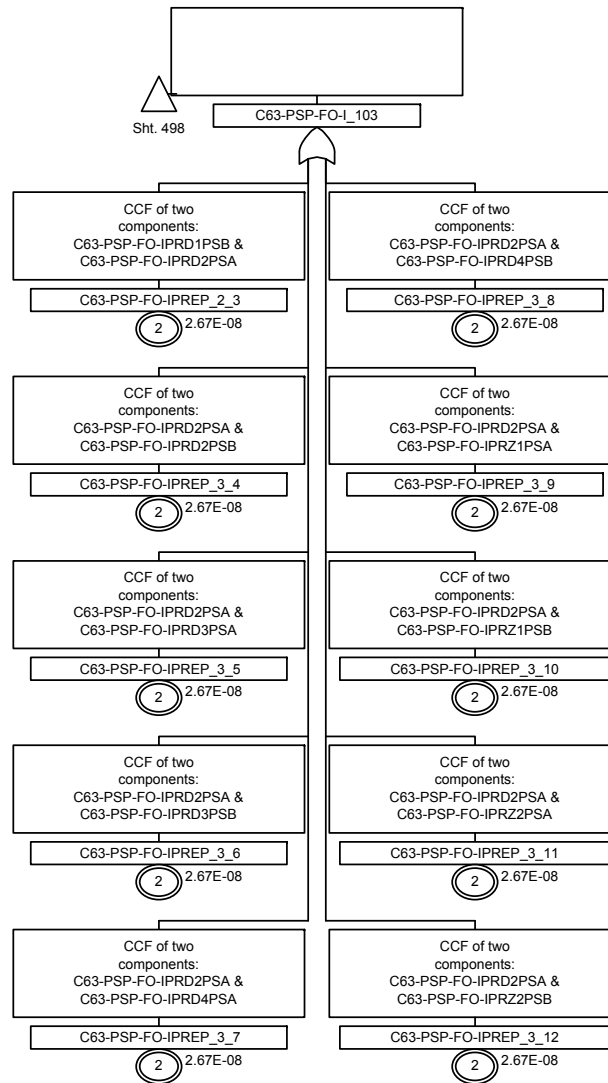


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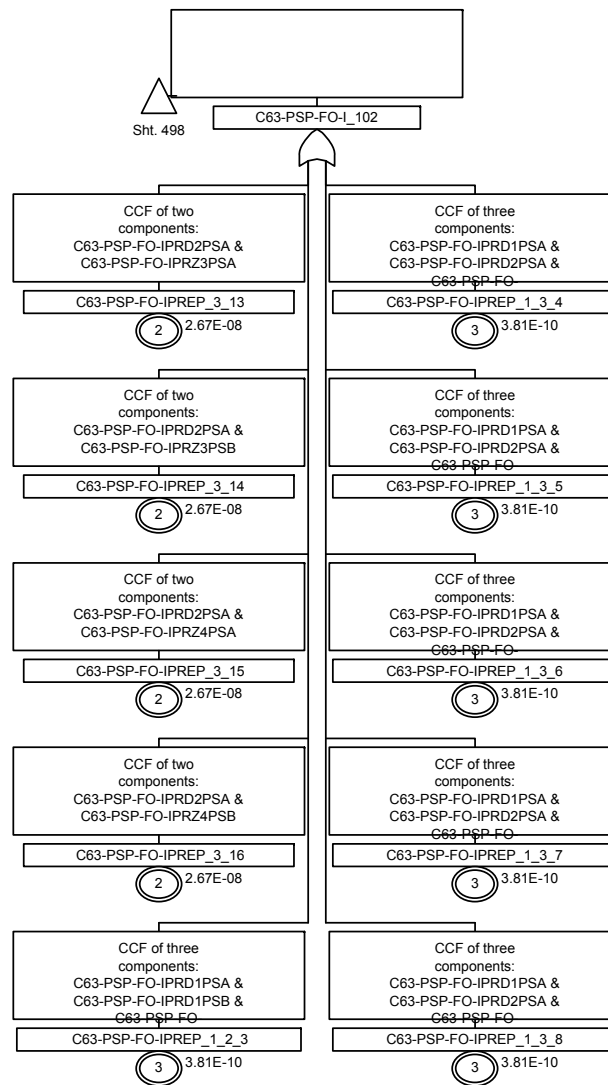


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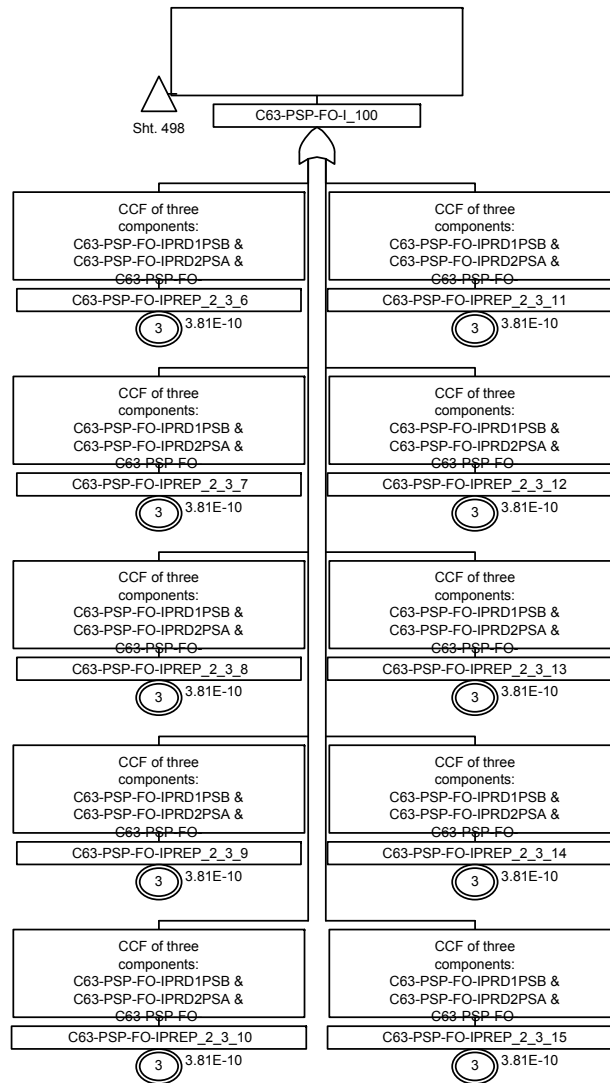


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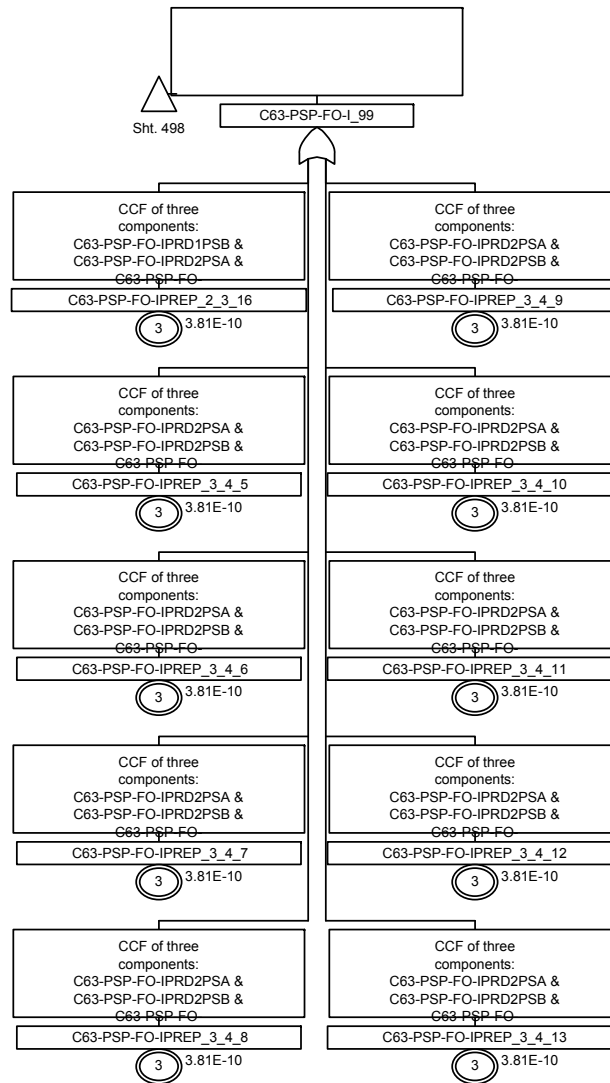


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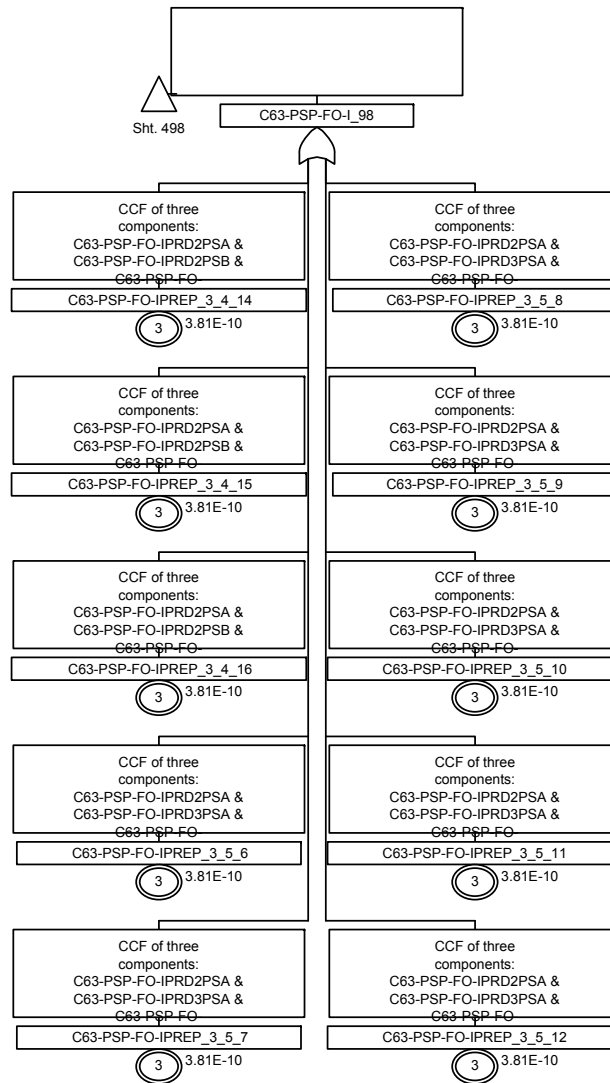


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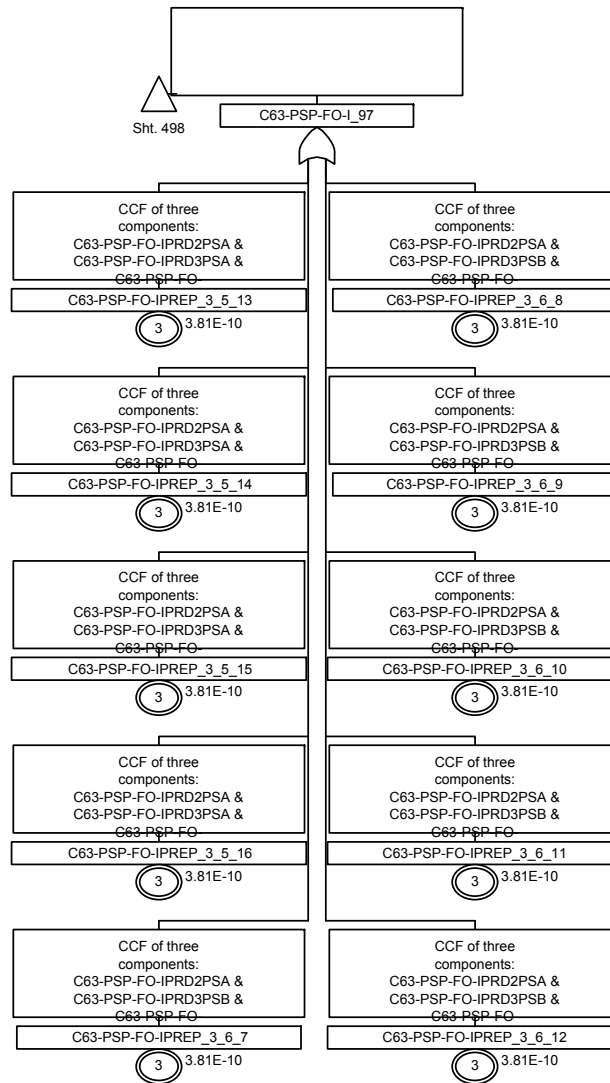


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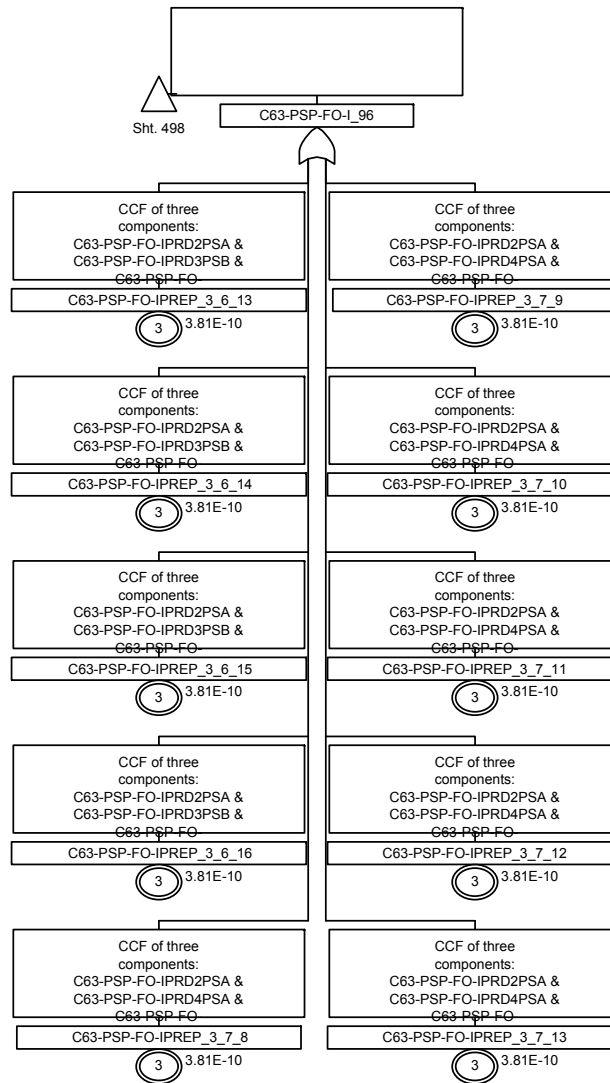


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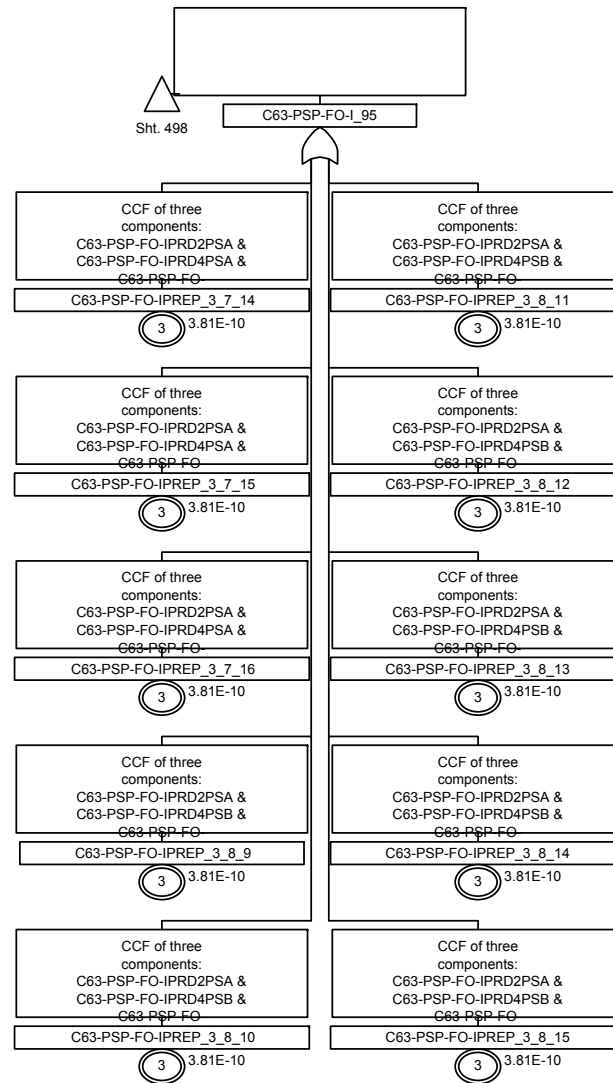


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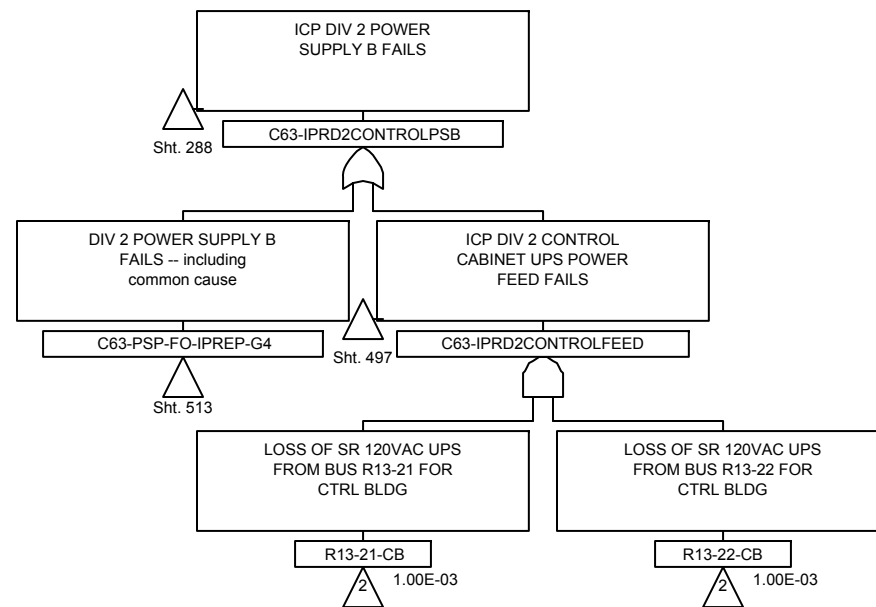


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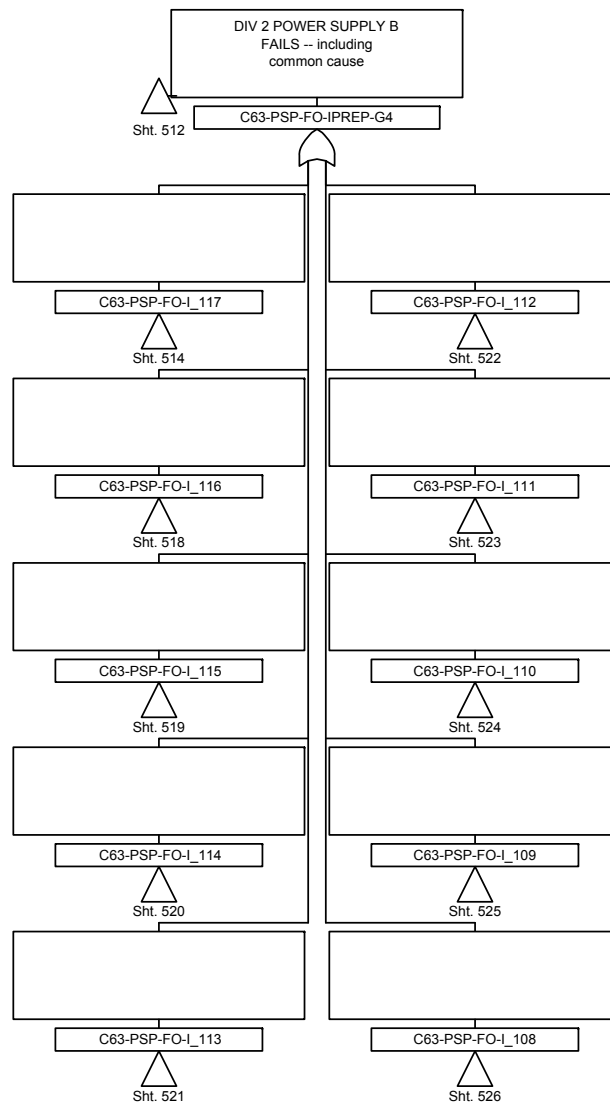


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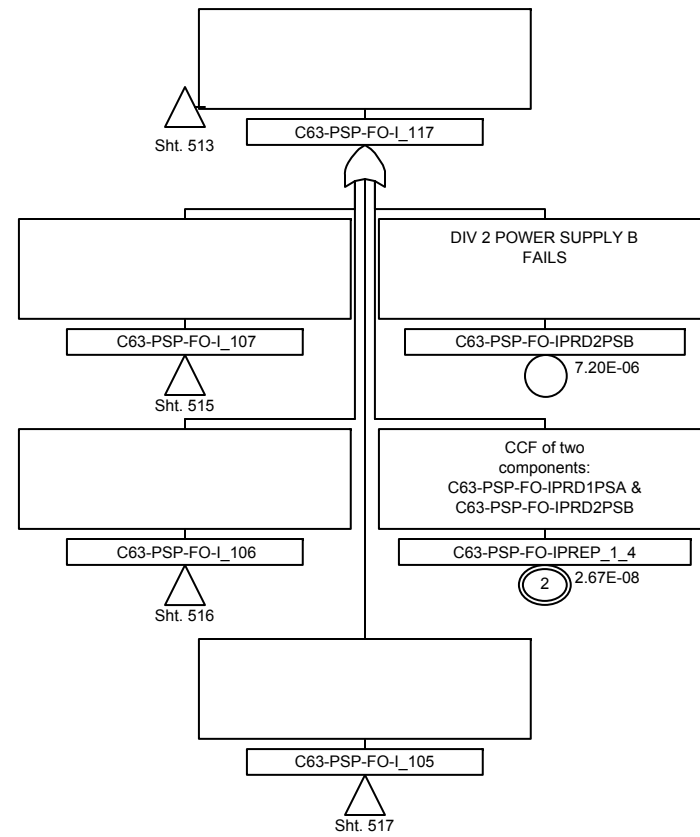


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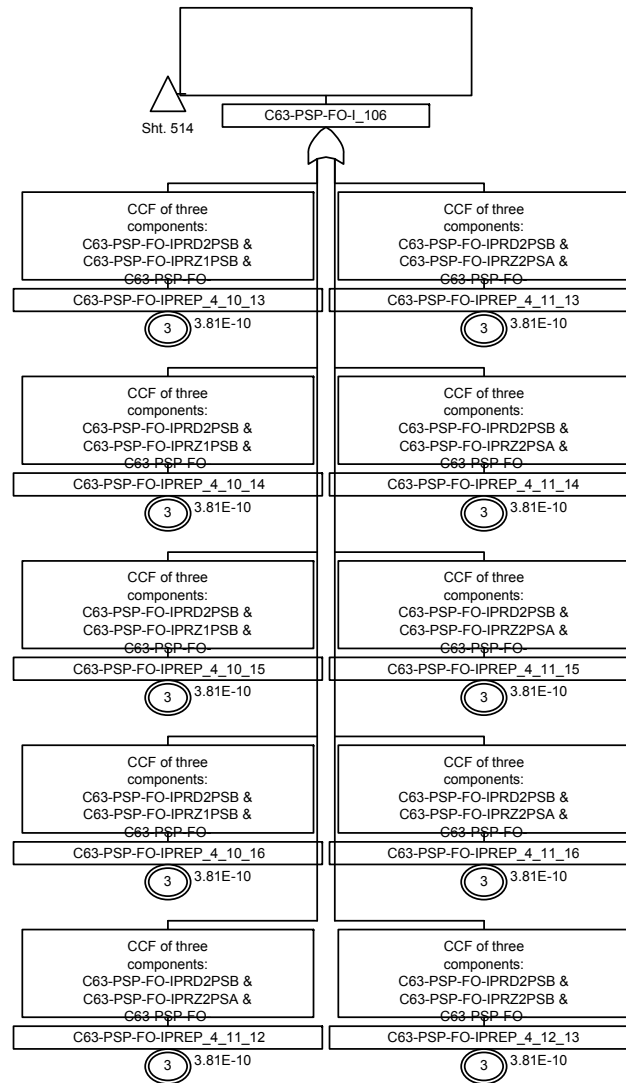


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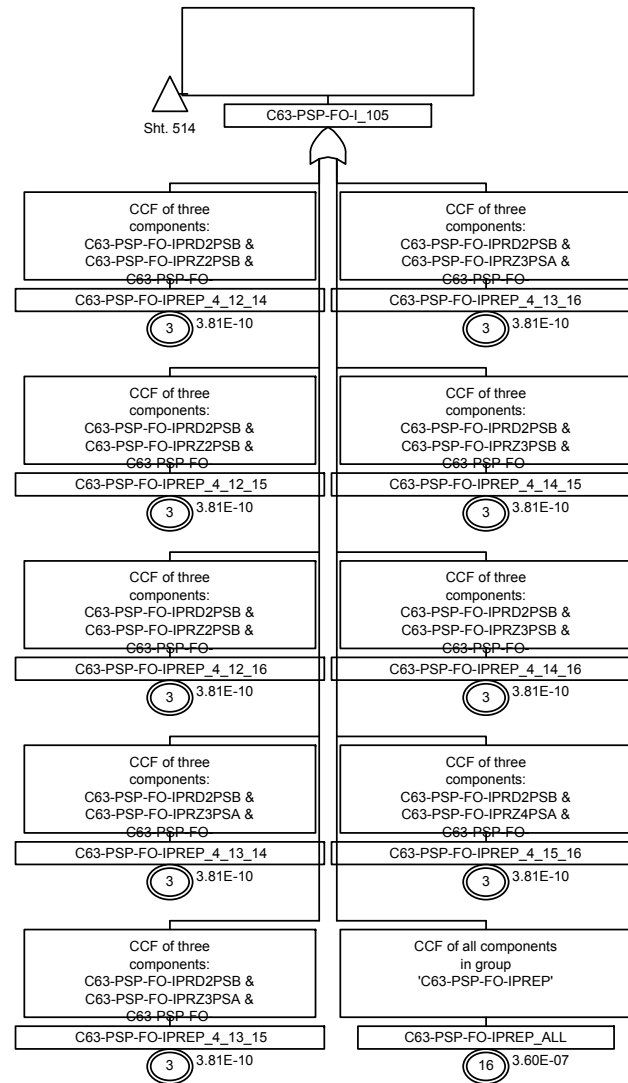


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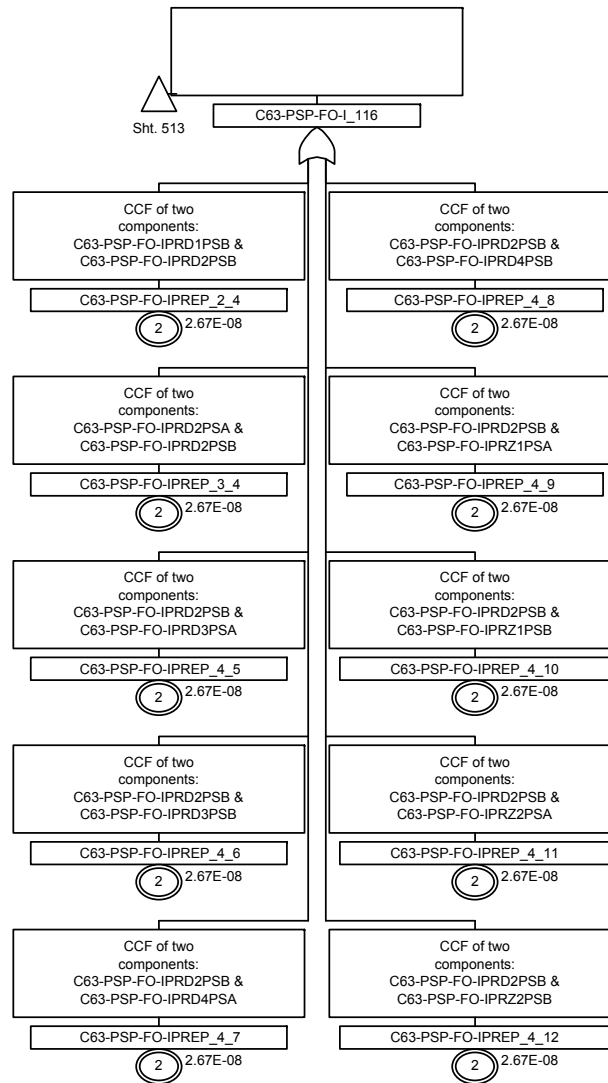


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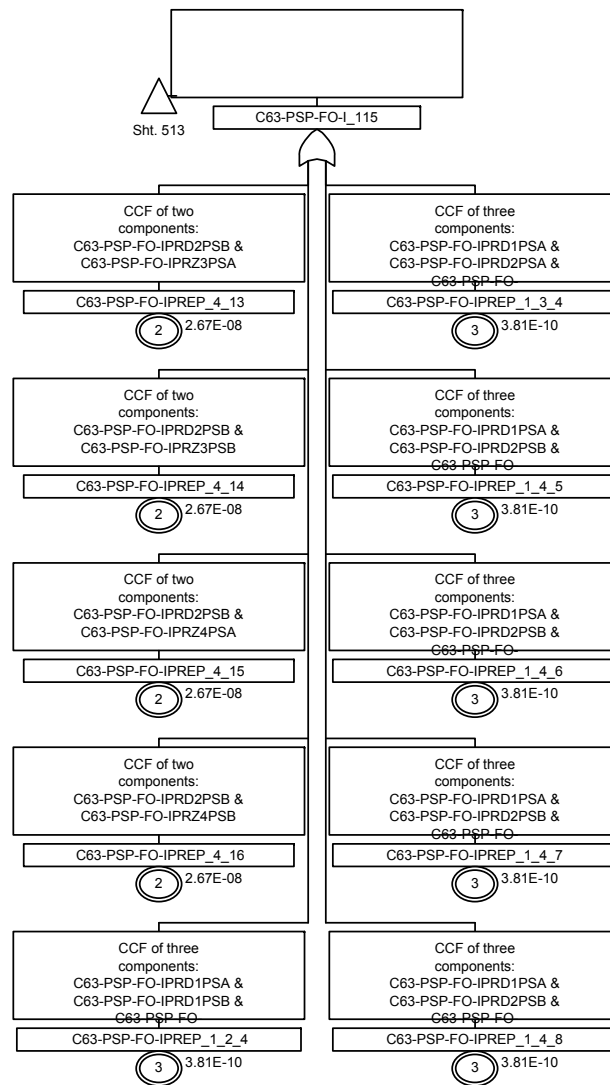


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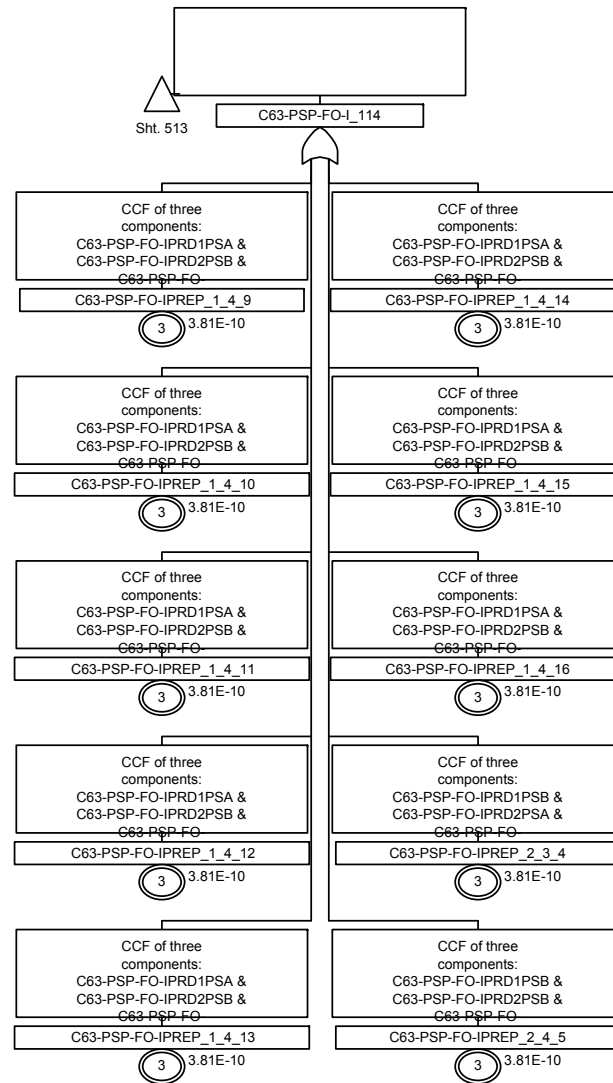


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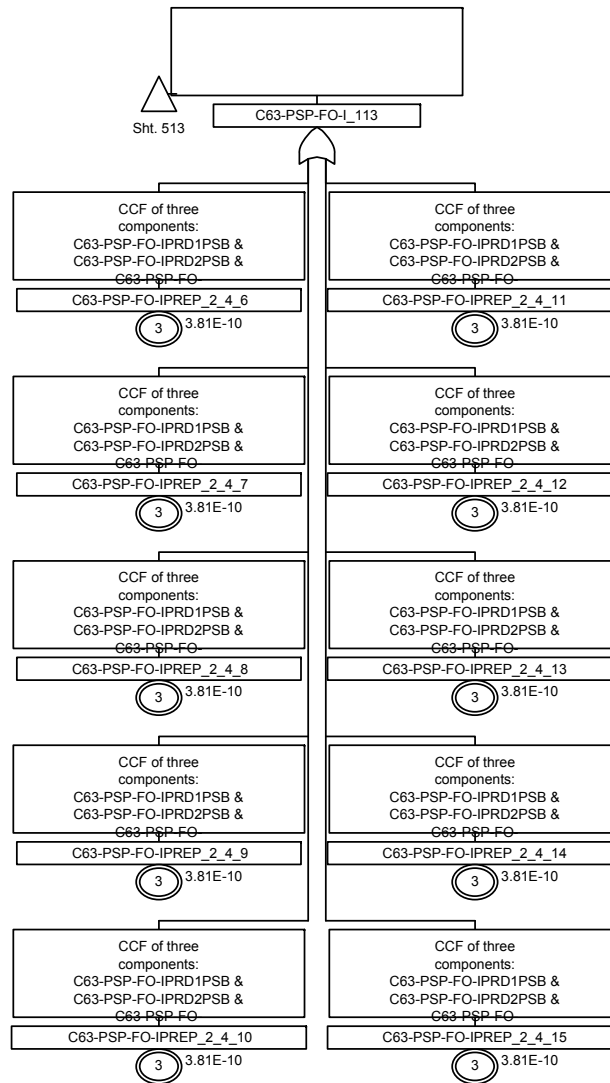


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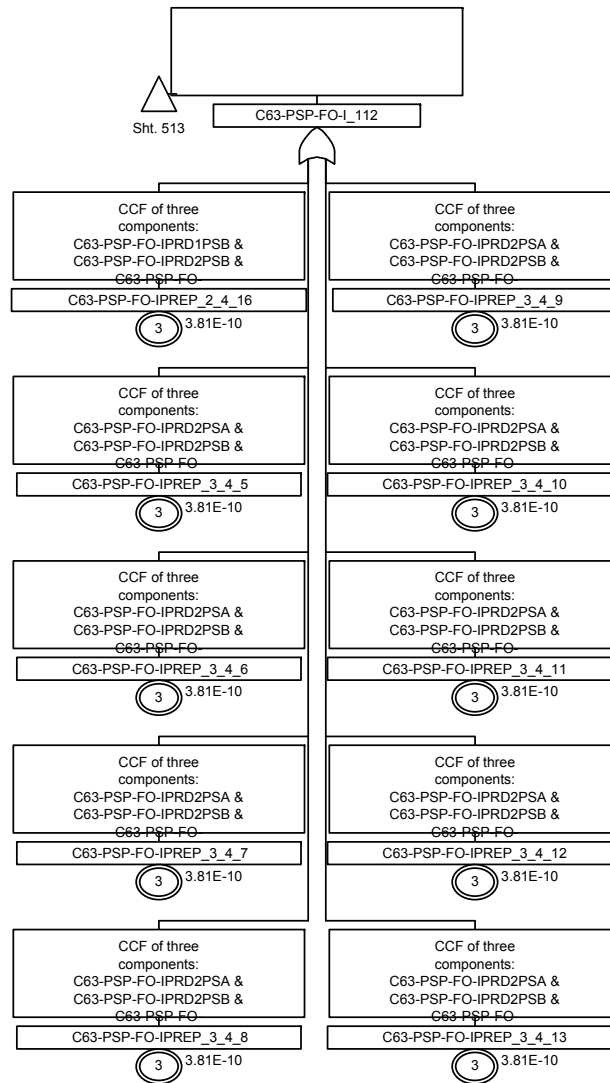


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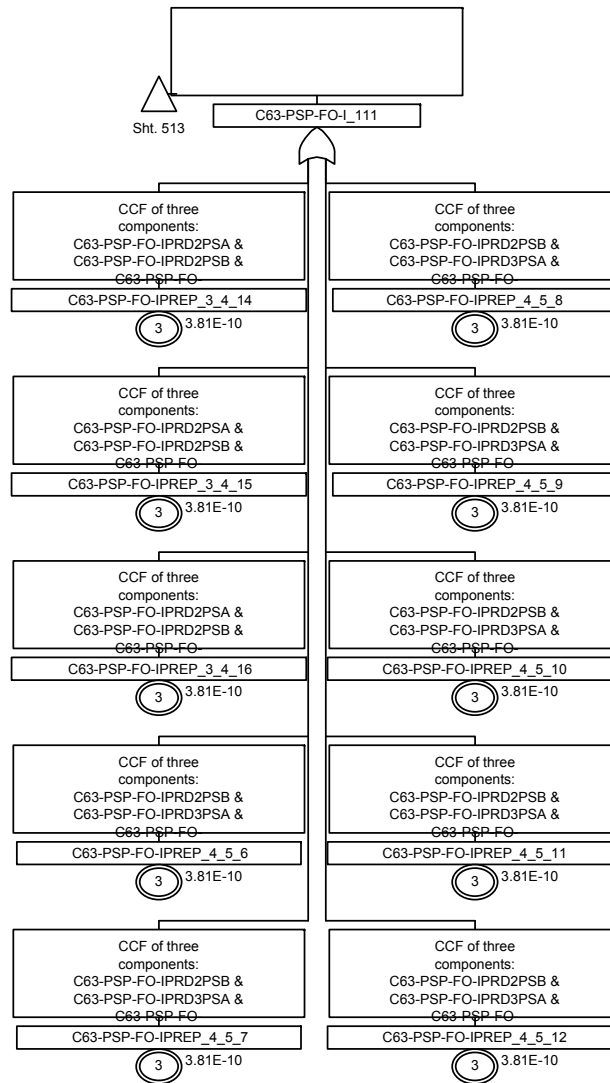


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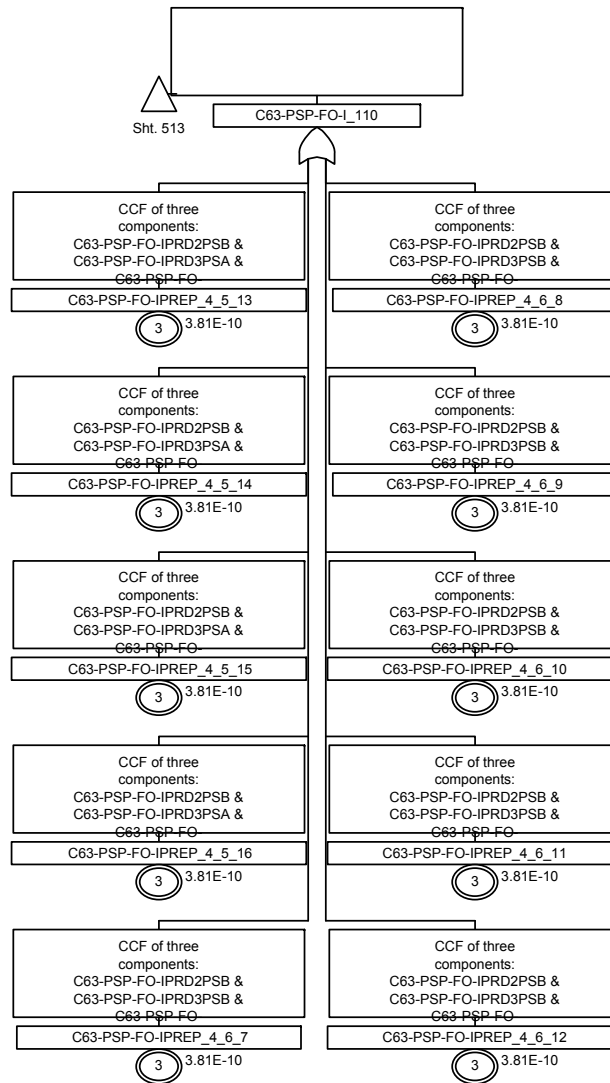


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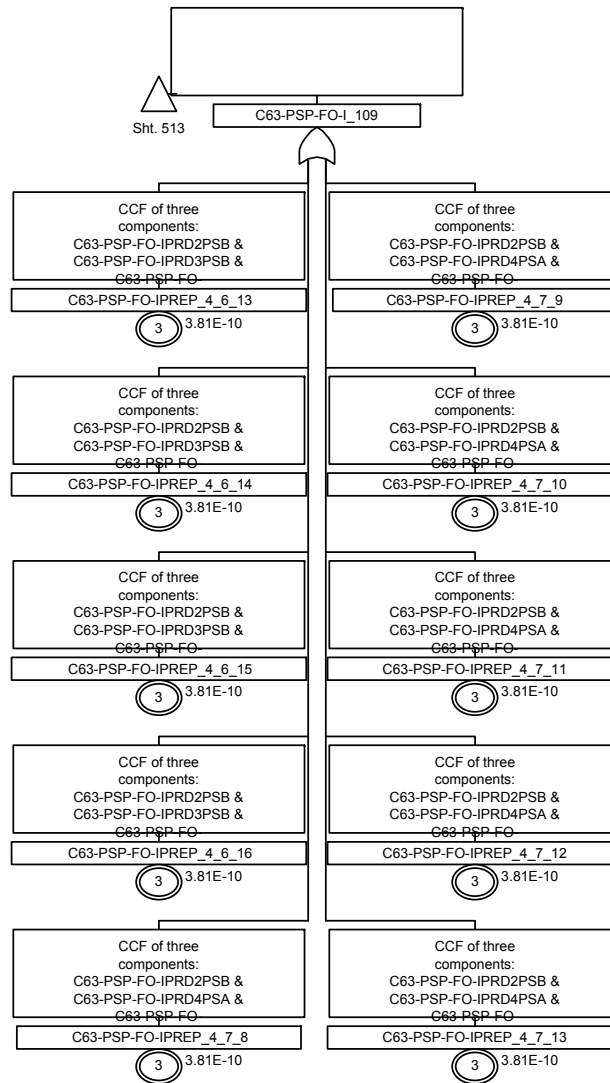


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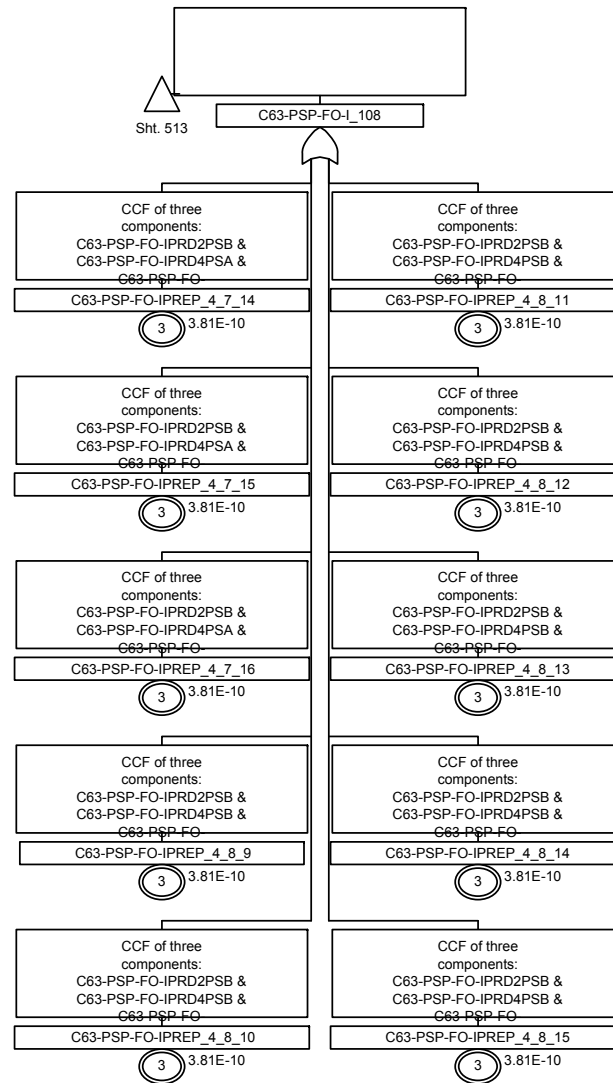


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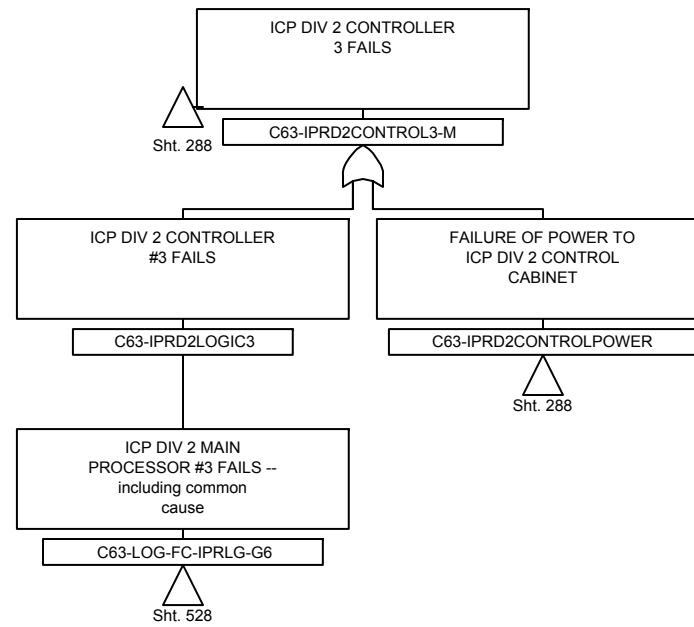


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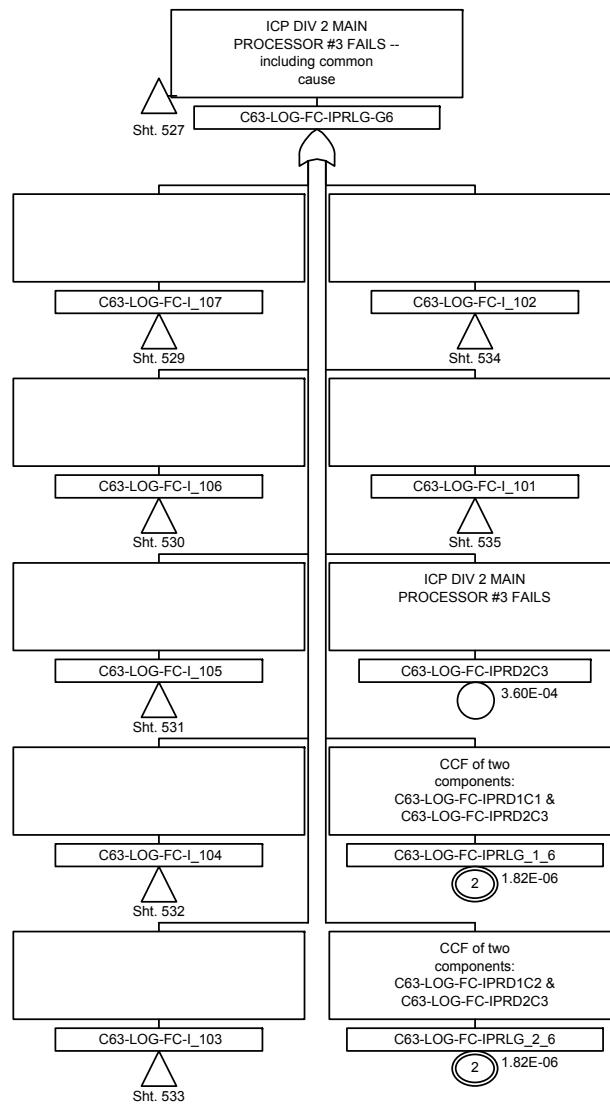


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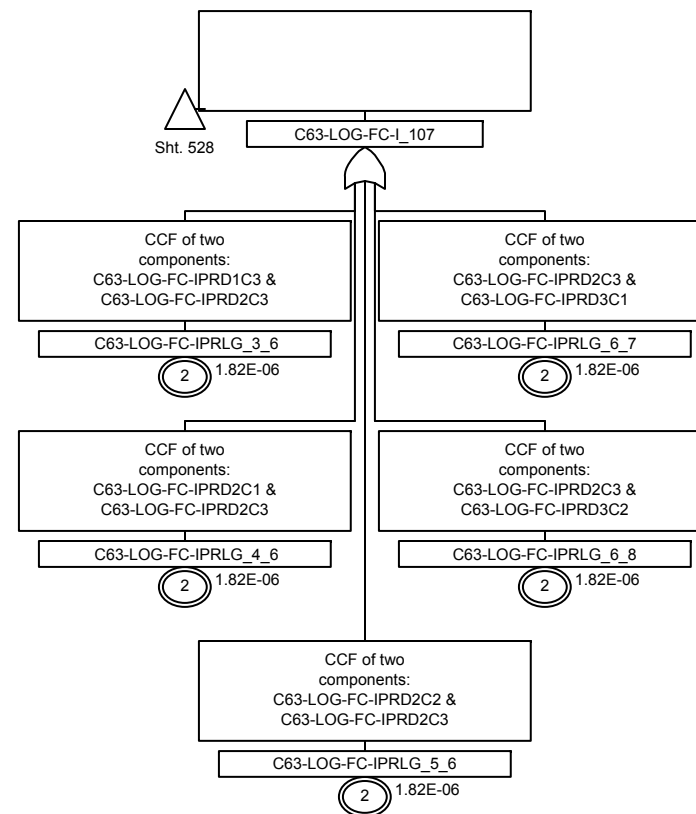


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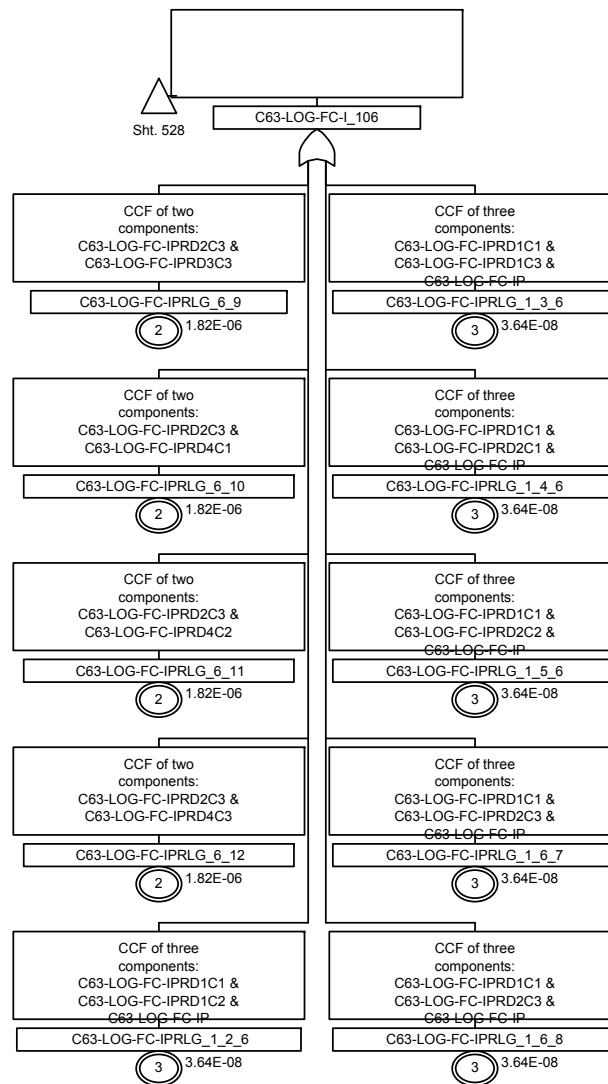


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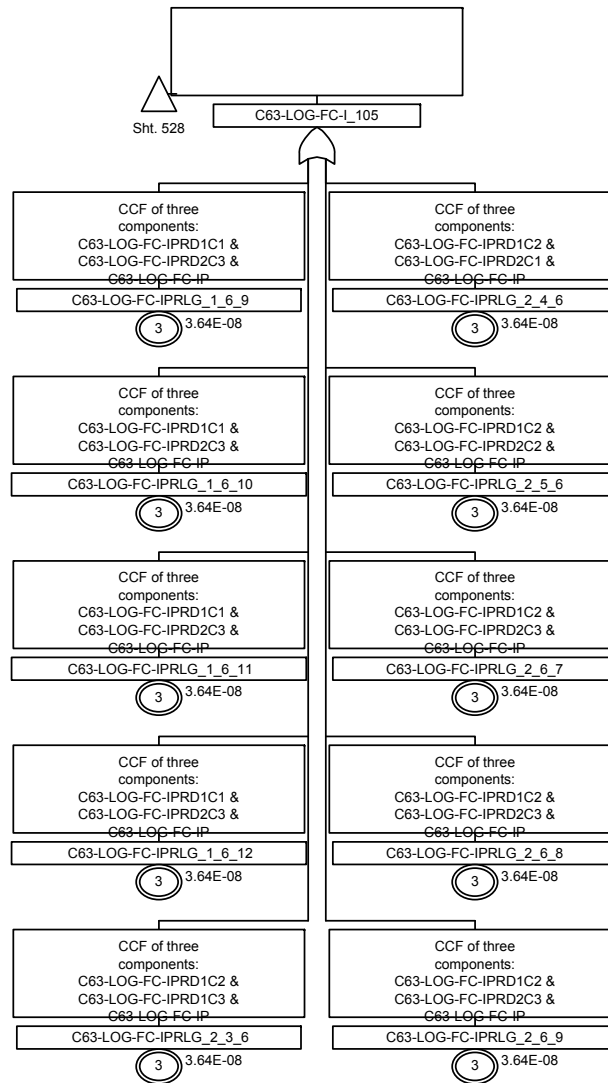


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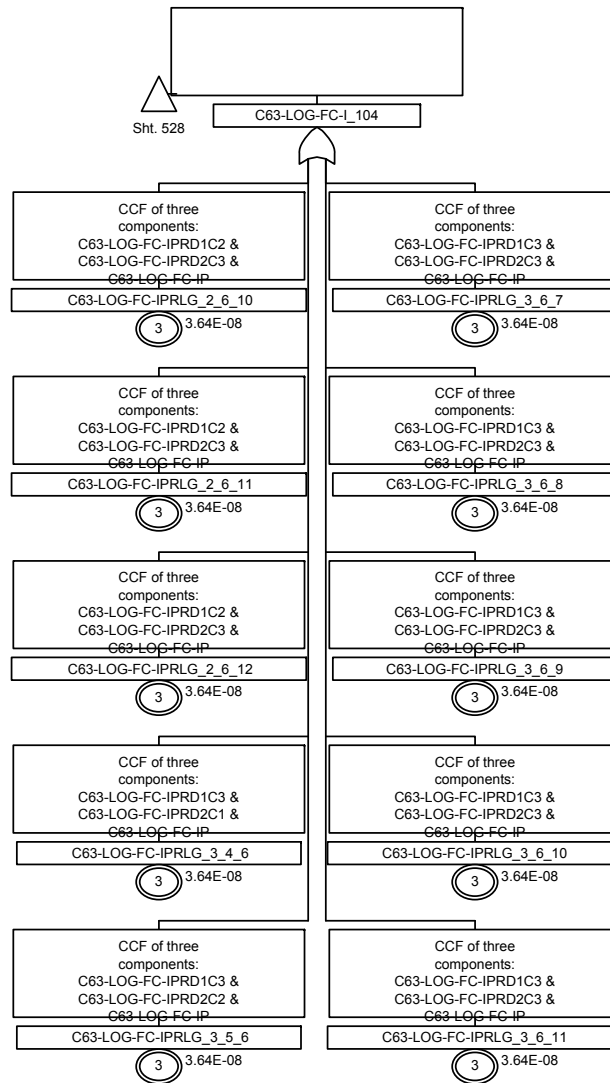


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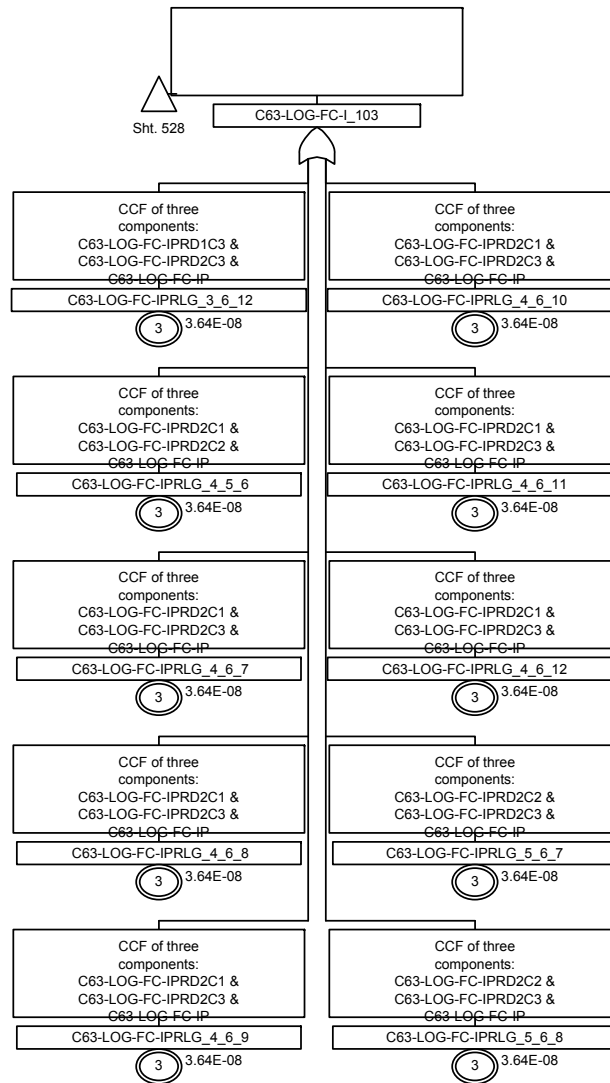


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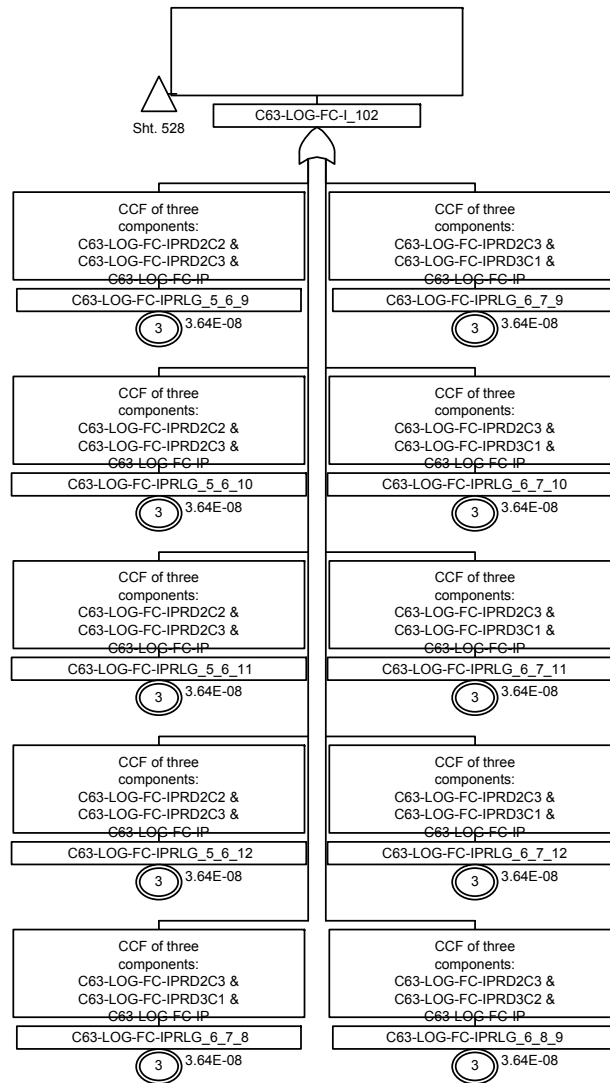


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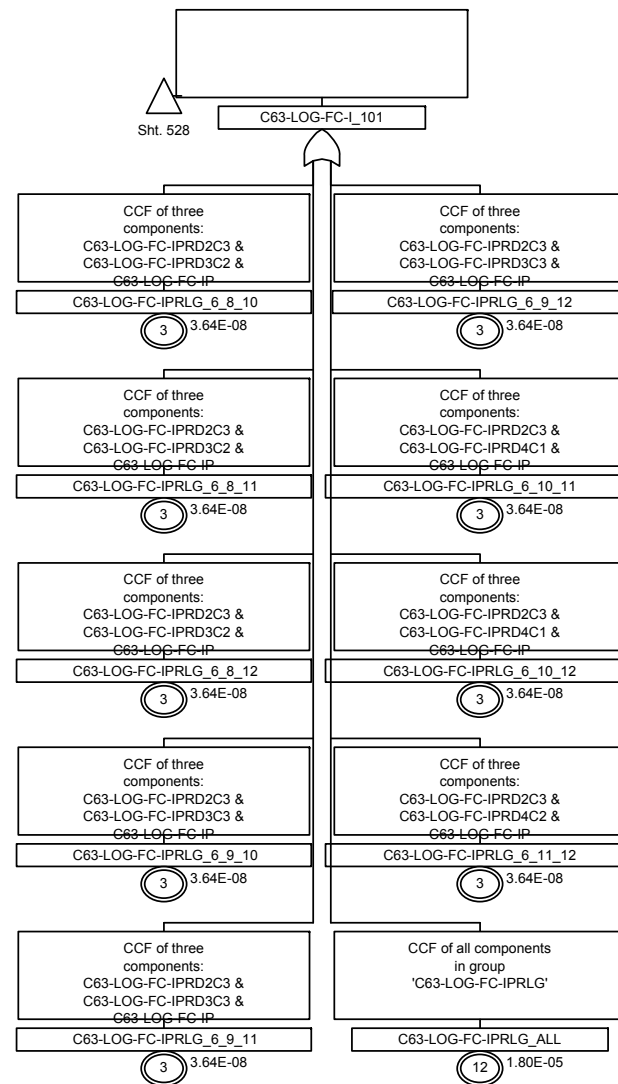


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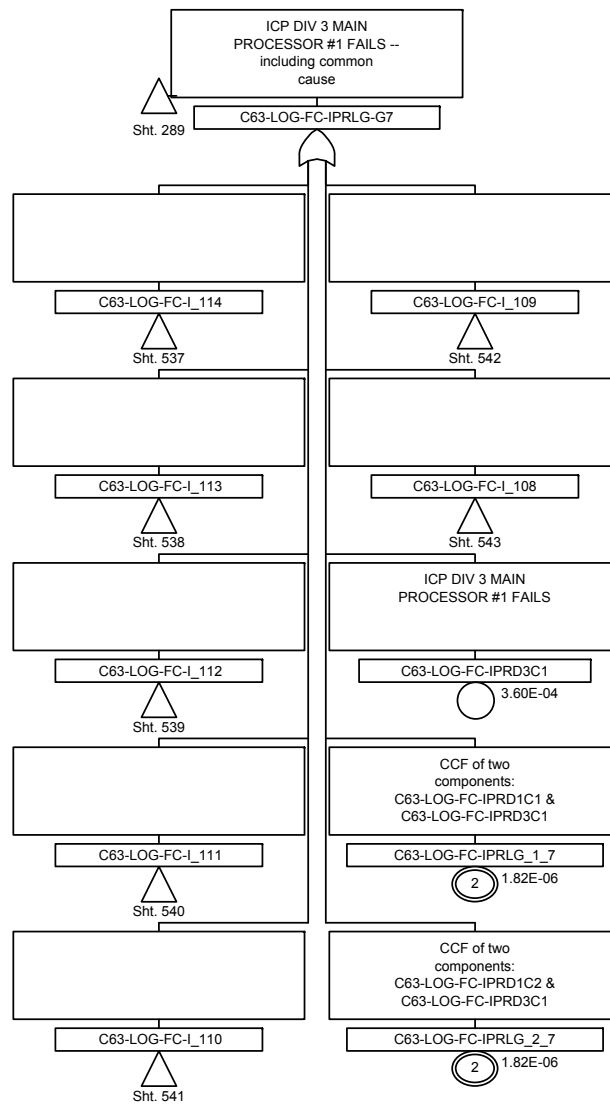


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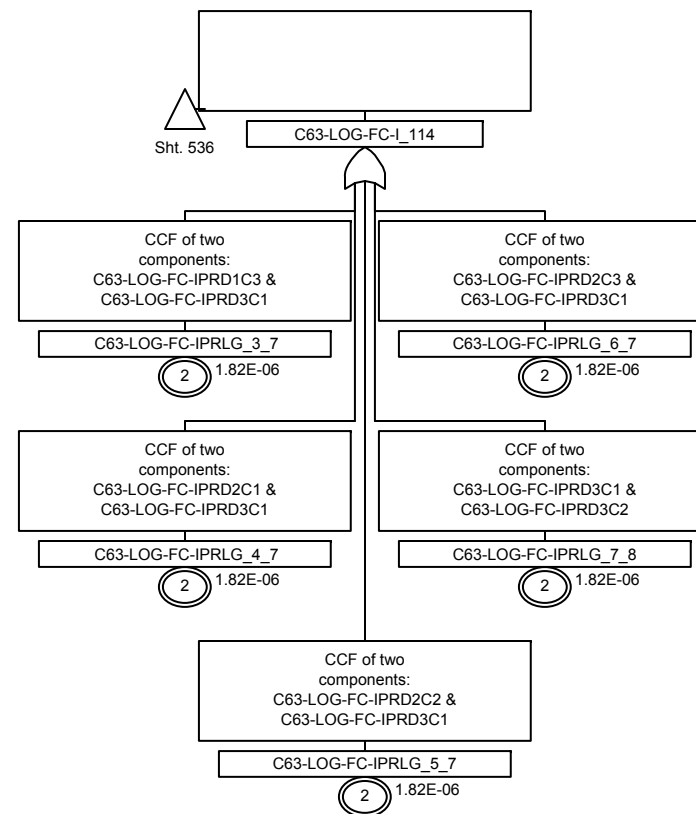


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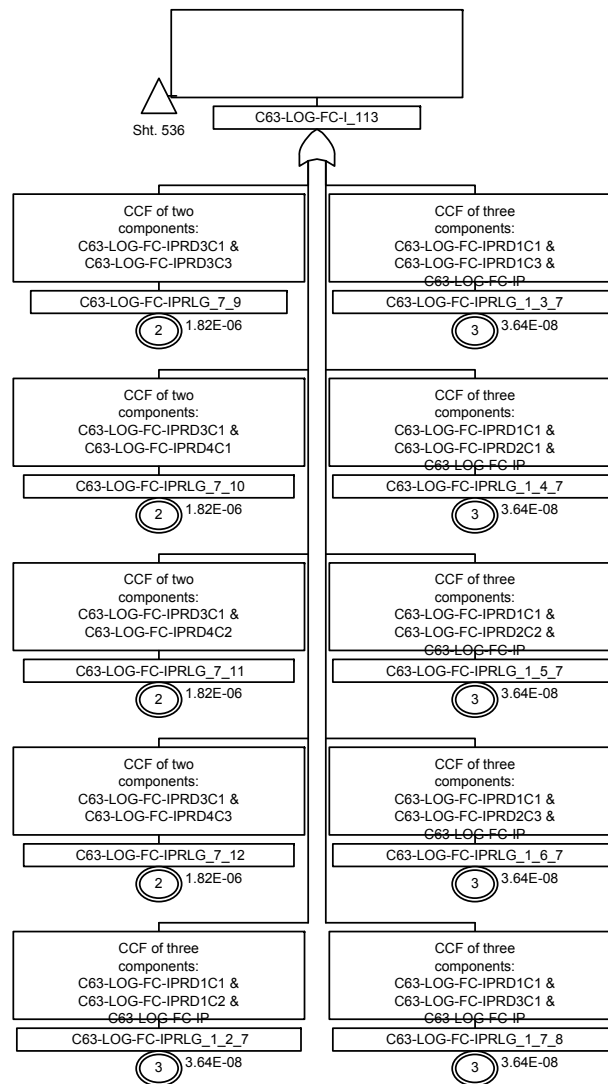


Figure 4.5-3e. Sheet 538 Independent Control Platforms



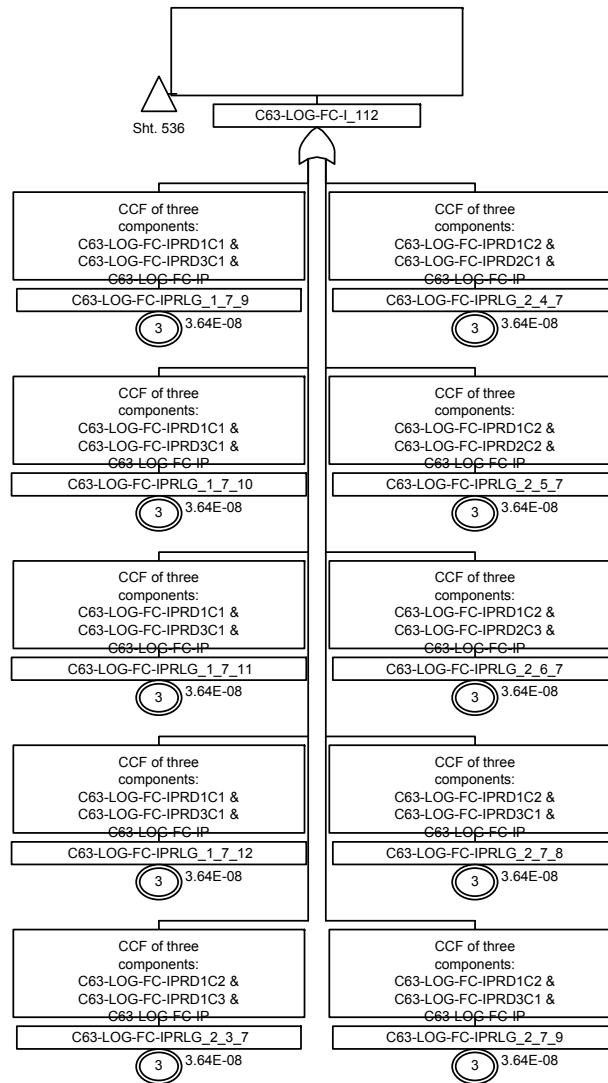


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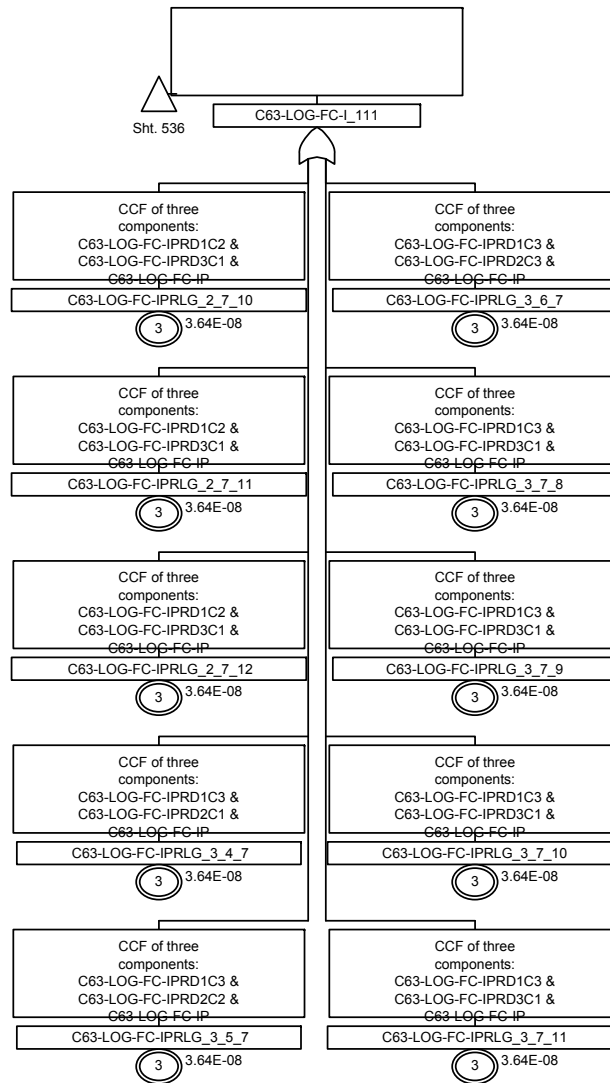


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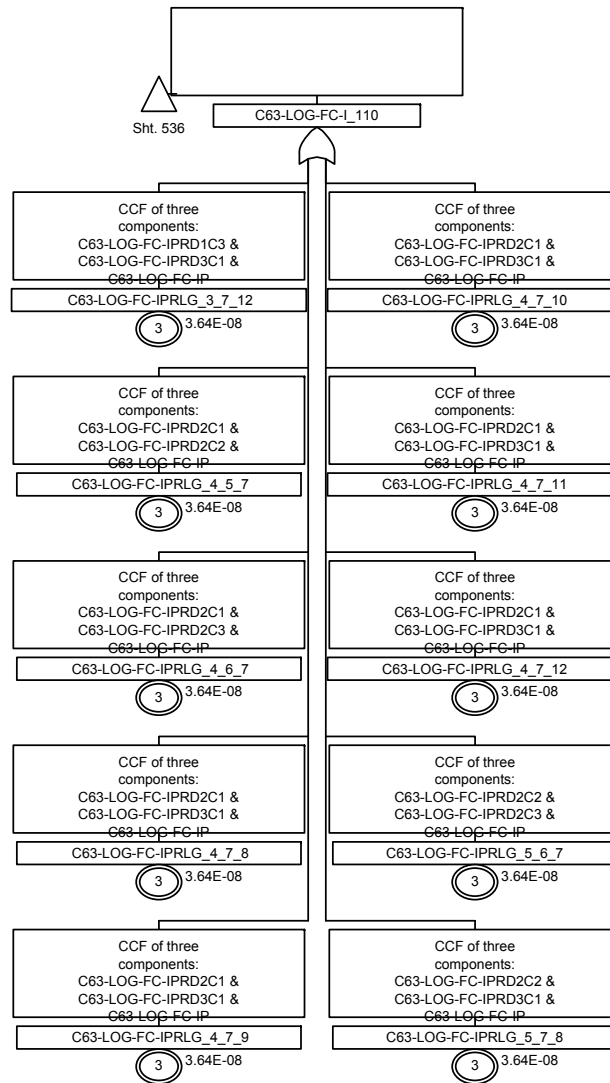


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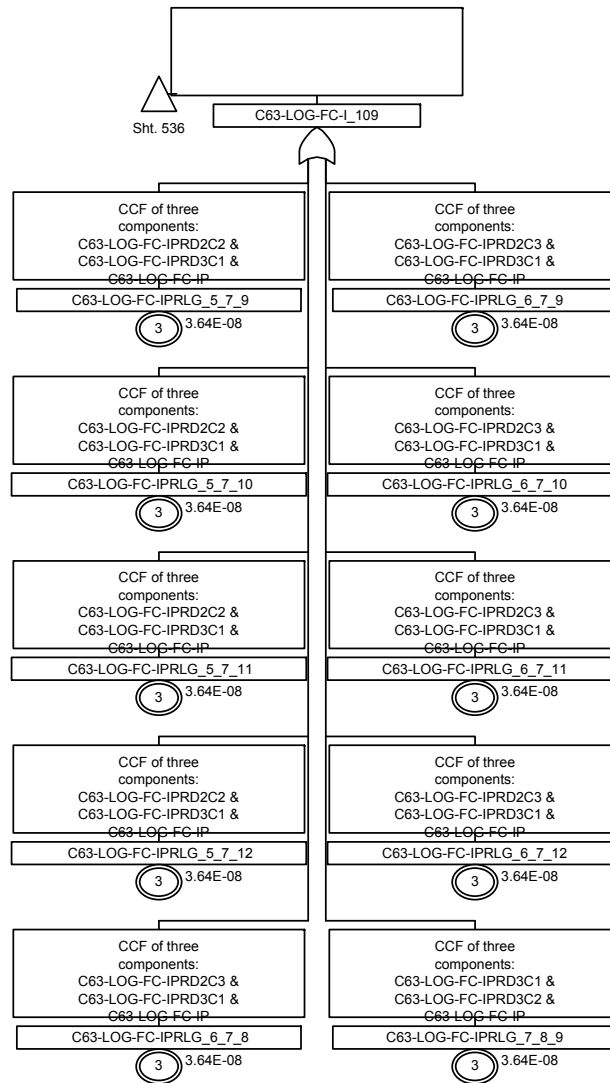


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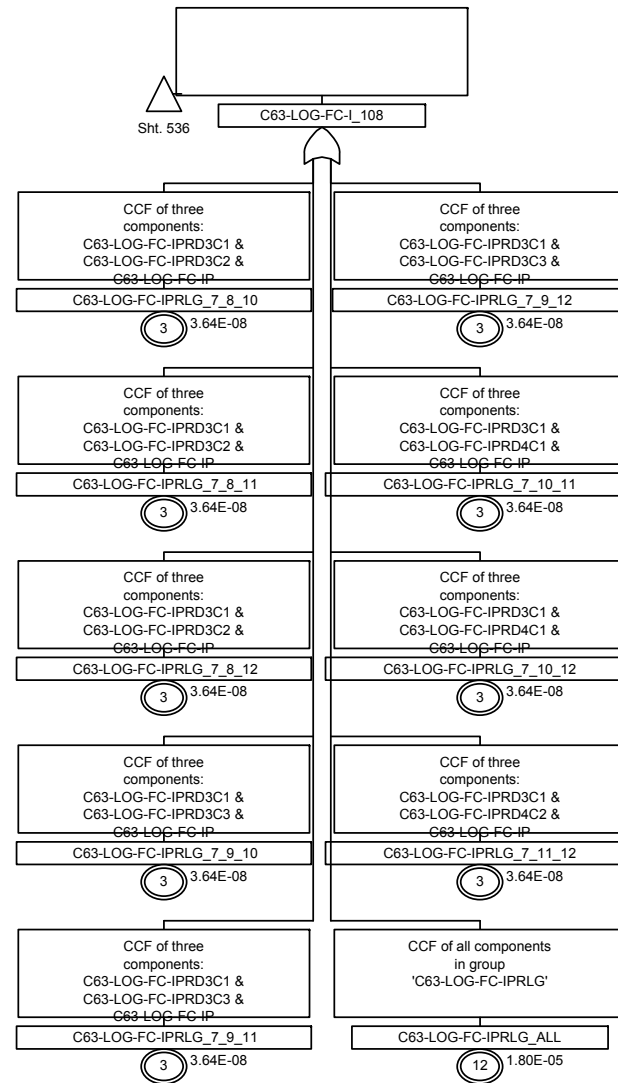


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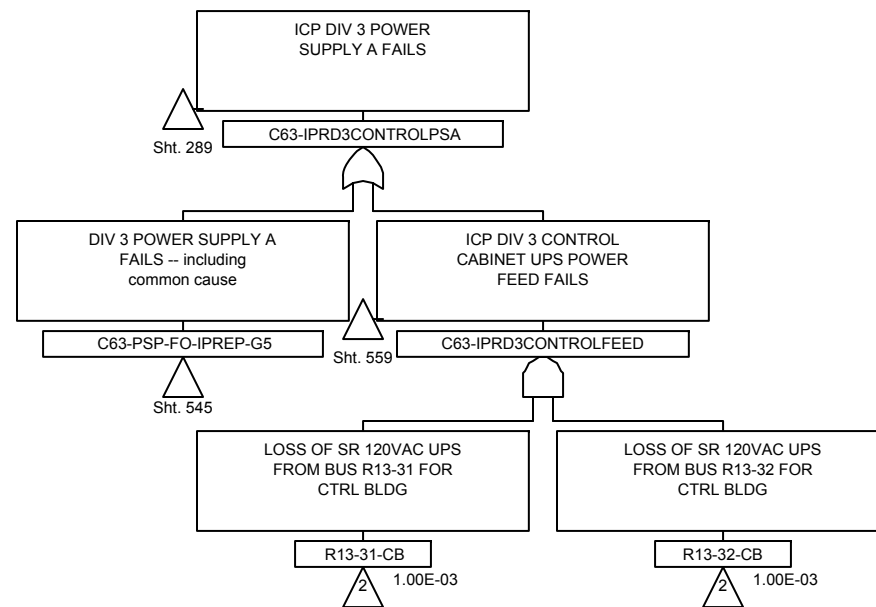


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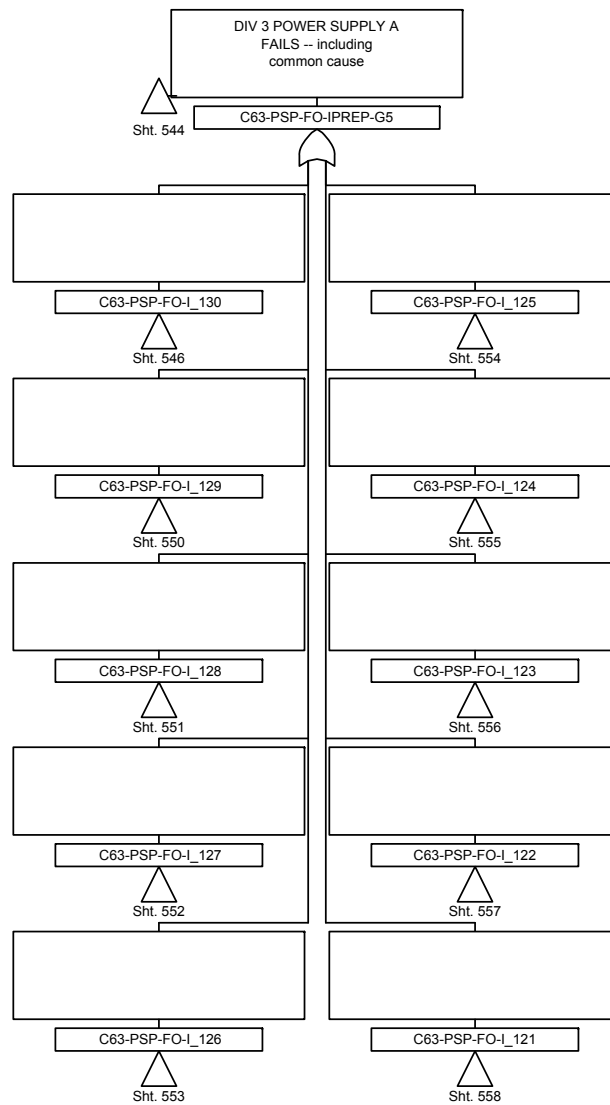


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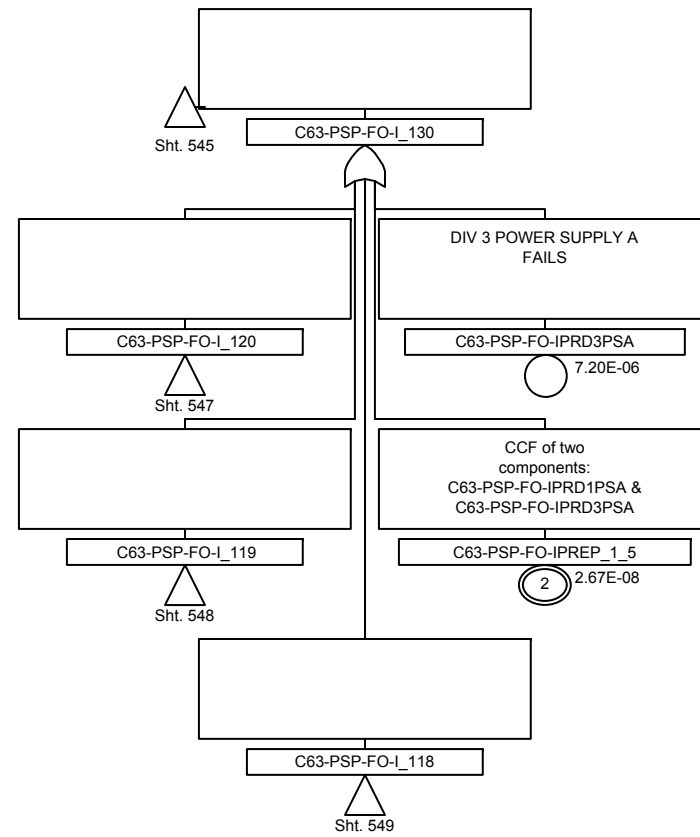


Figure 4.5-3e. Sheet 546 Independent Control Platforms



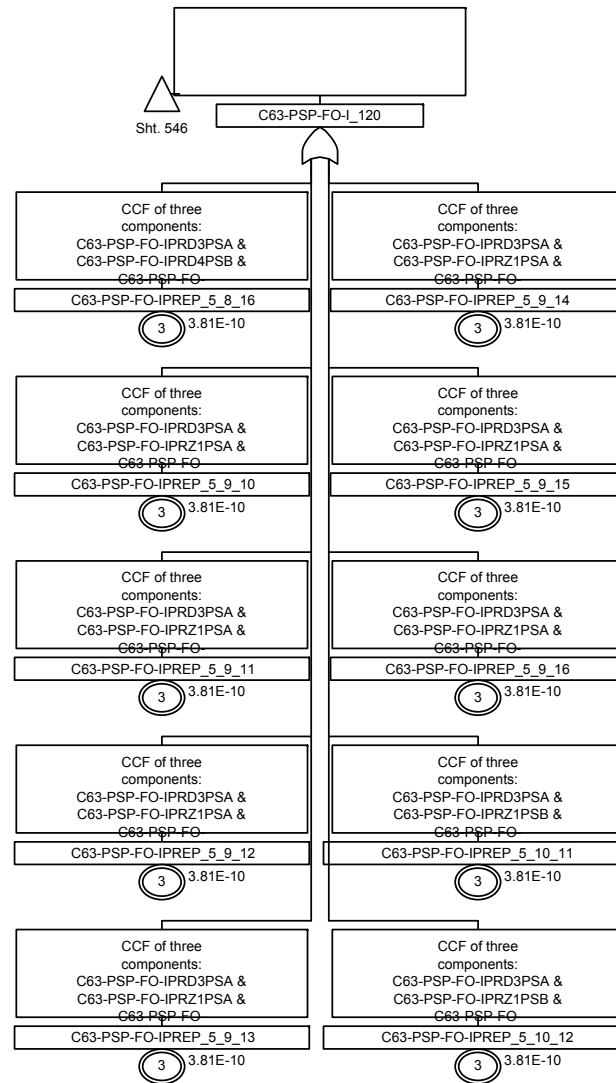


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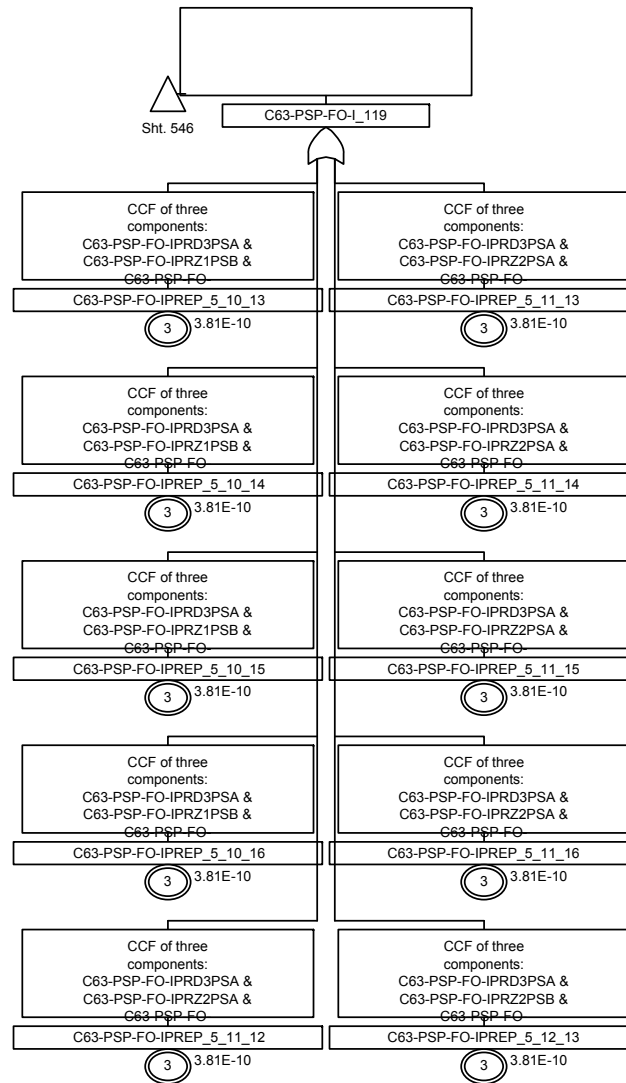


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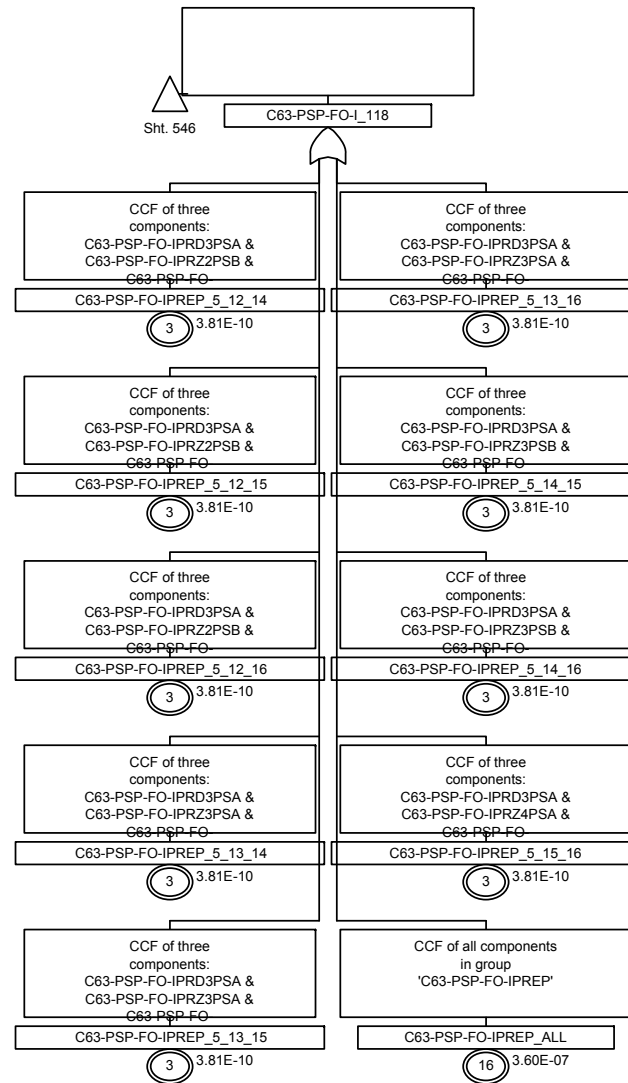


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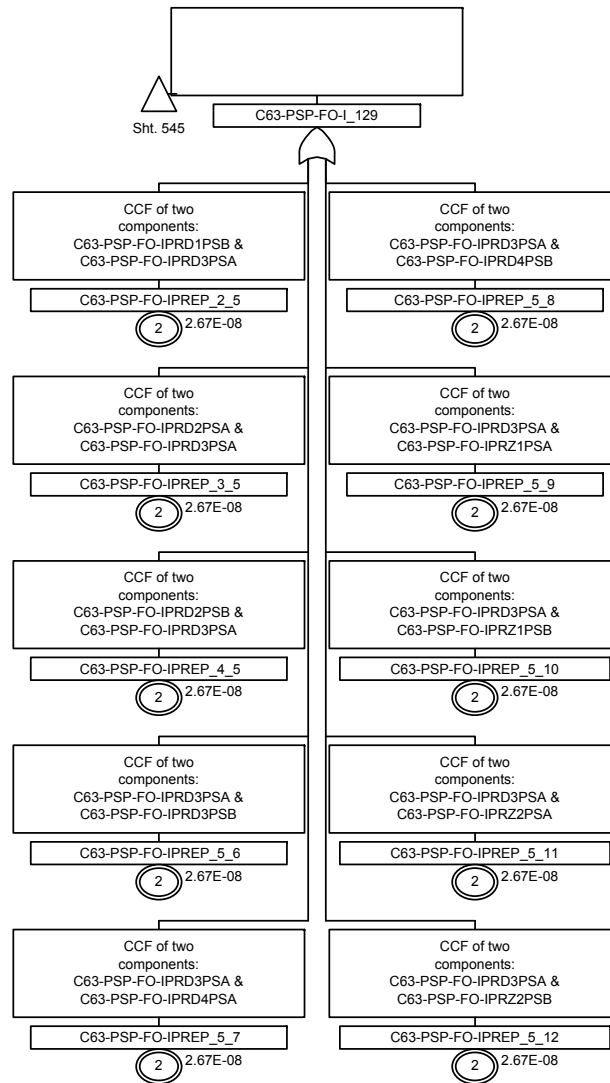


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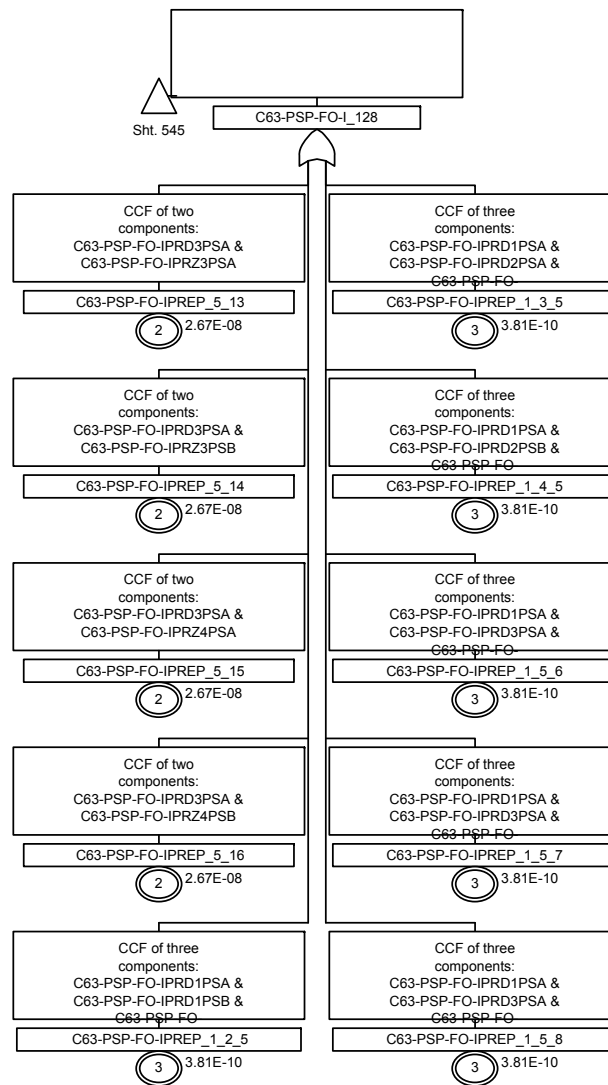


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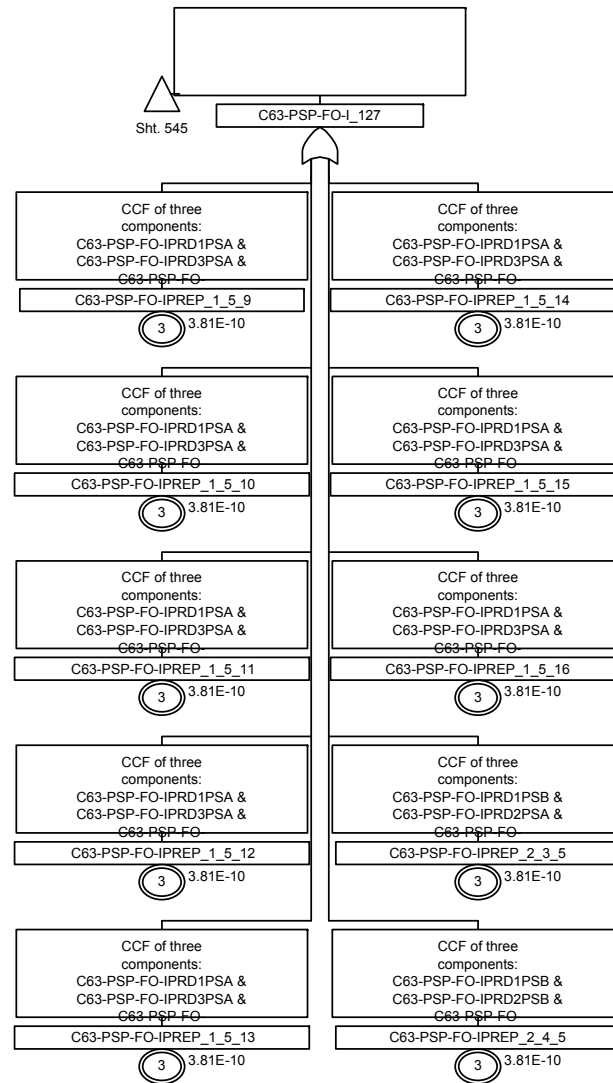


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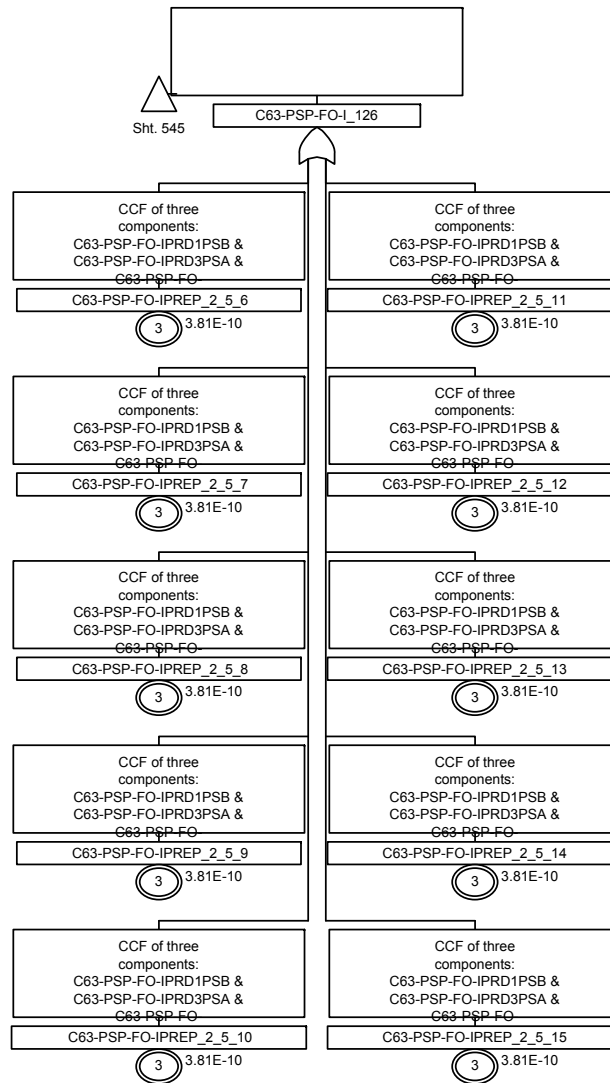


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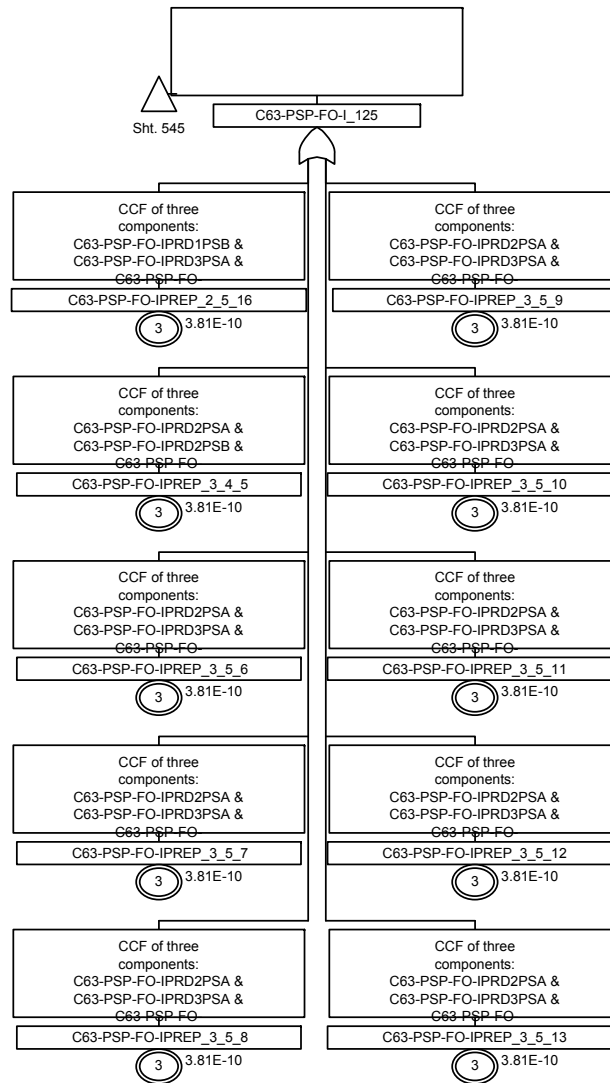


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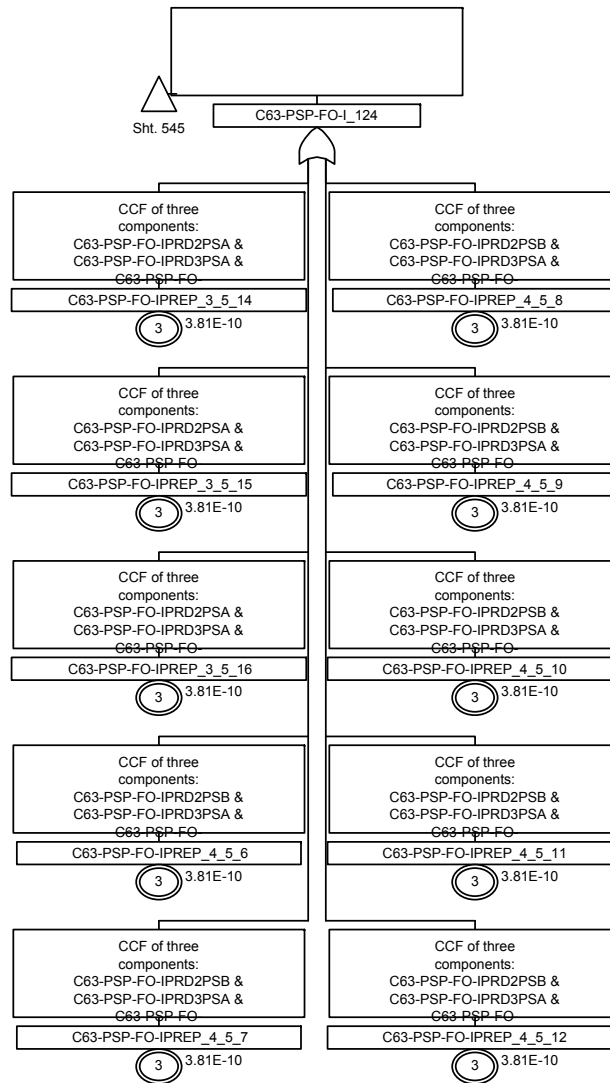


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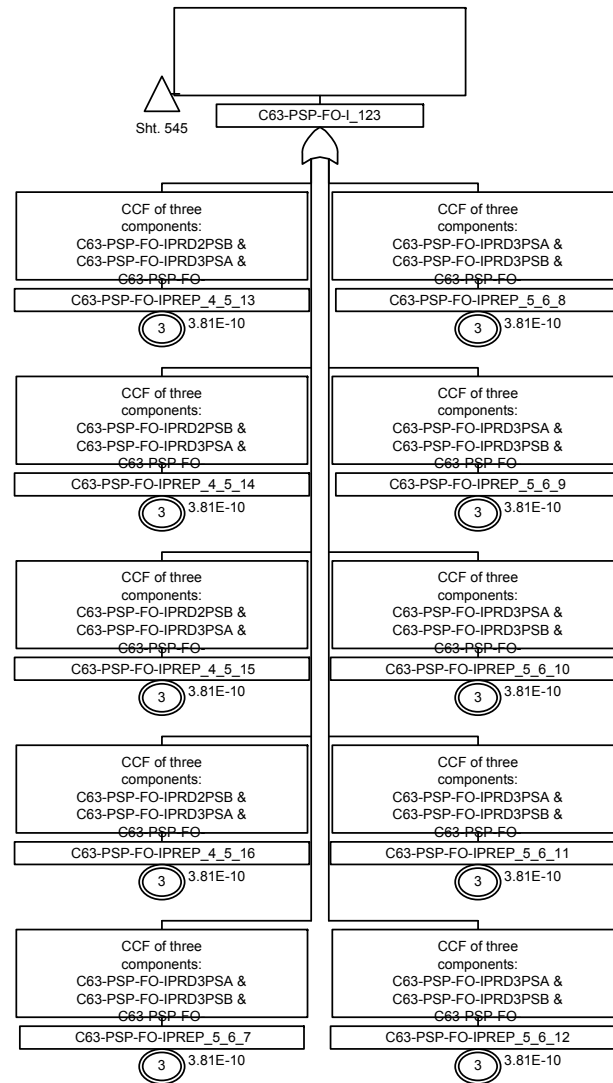


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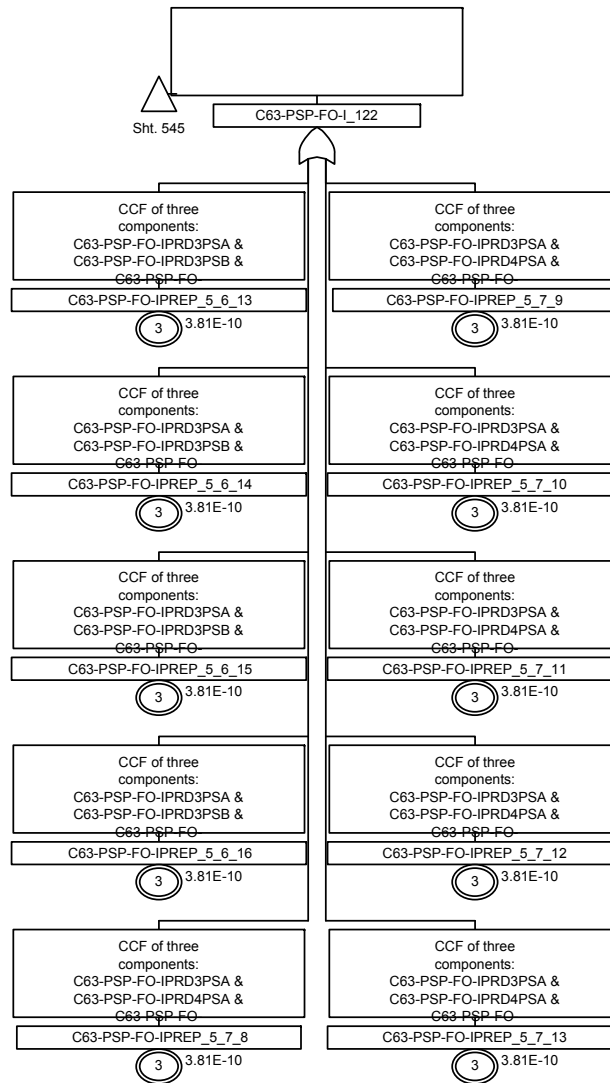


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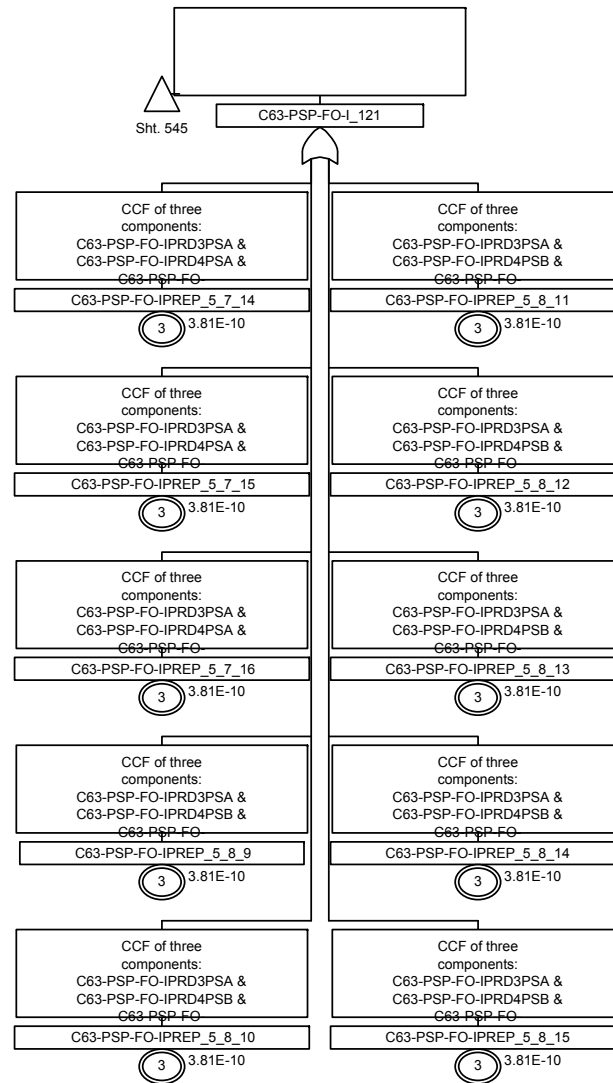


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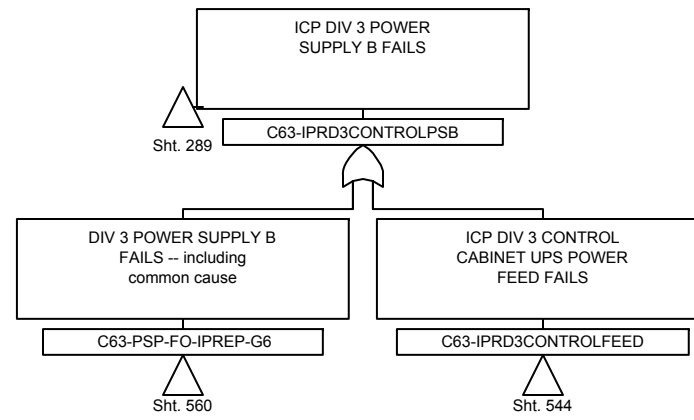


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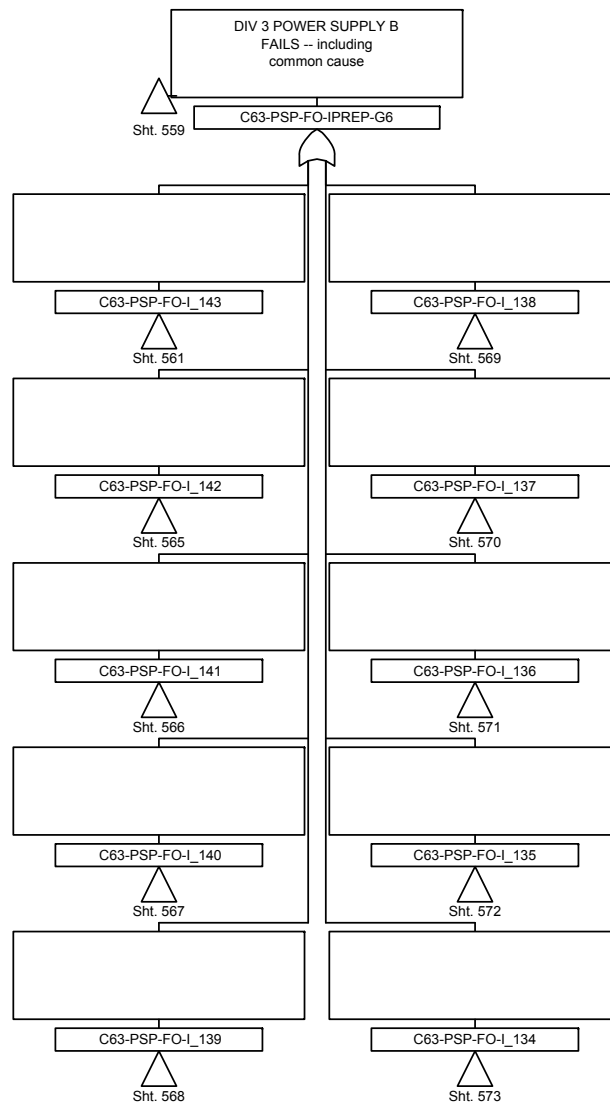


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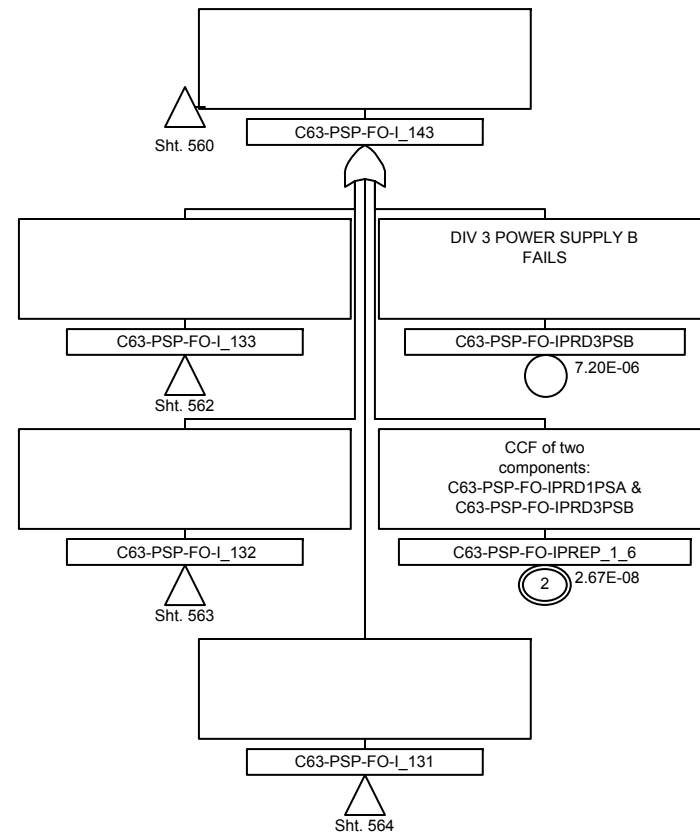


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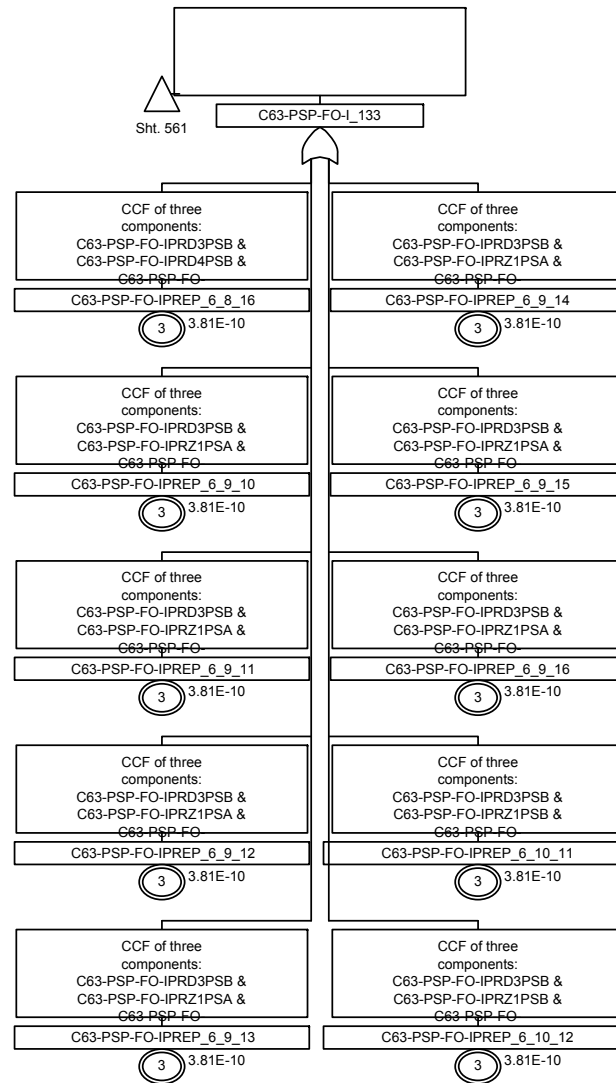


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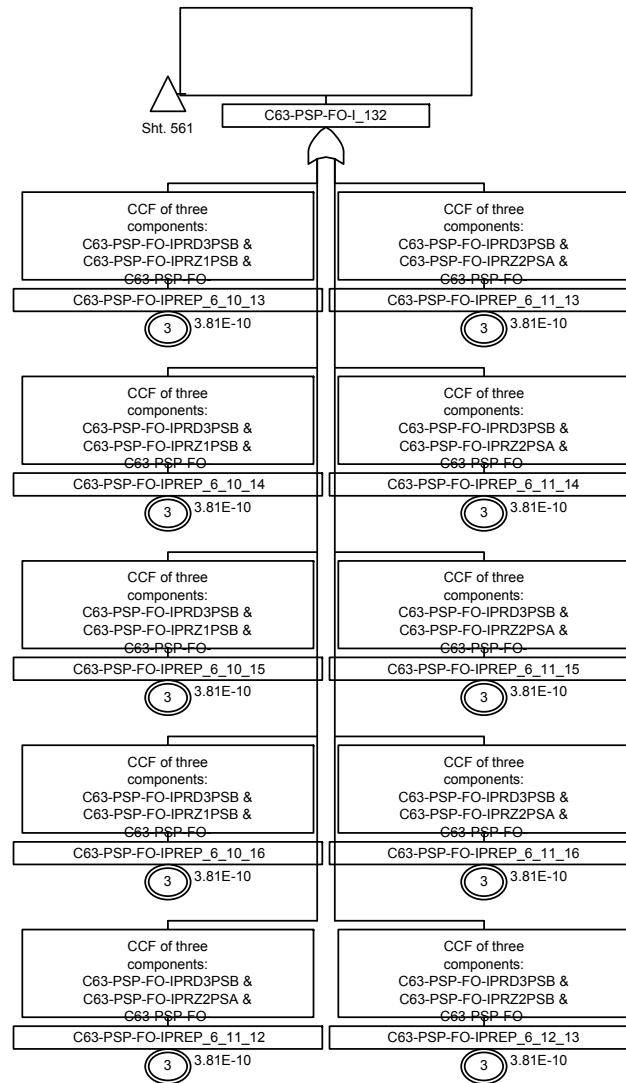


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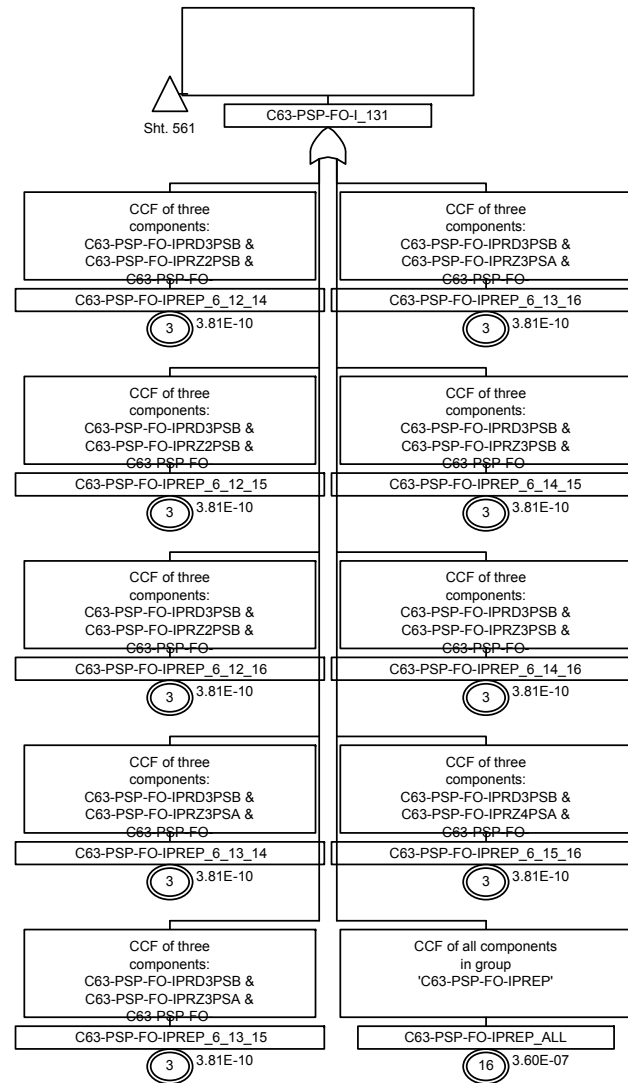


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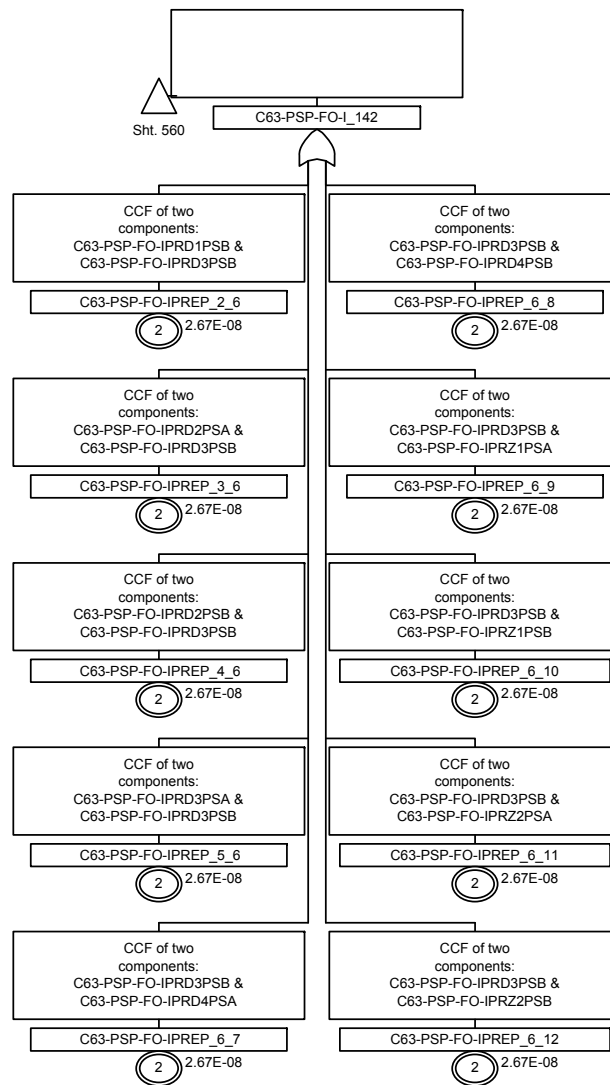


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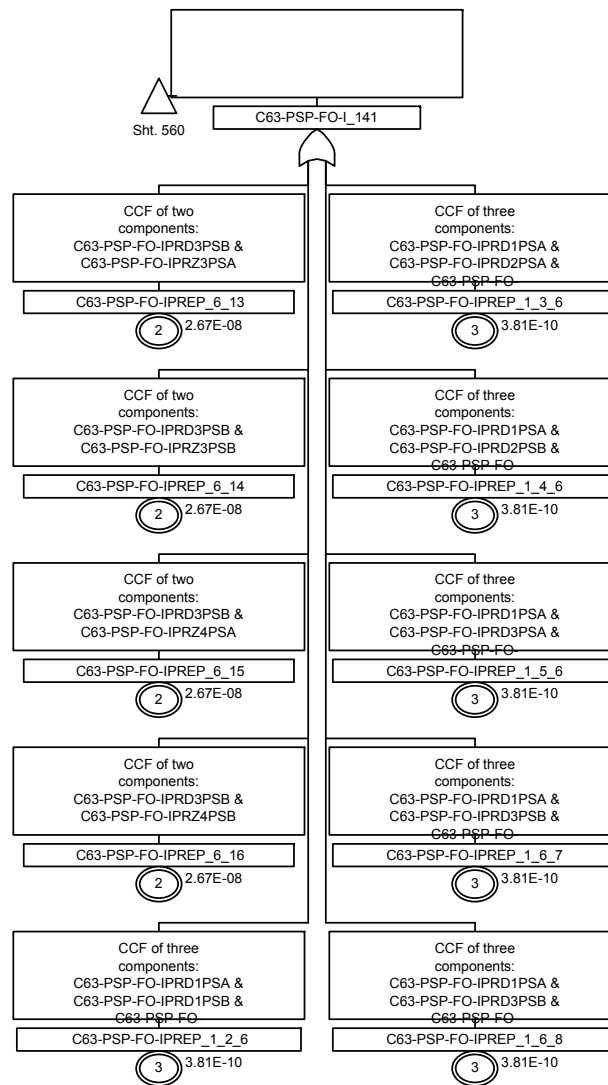


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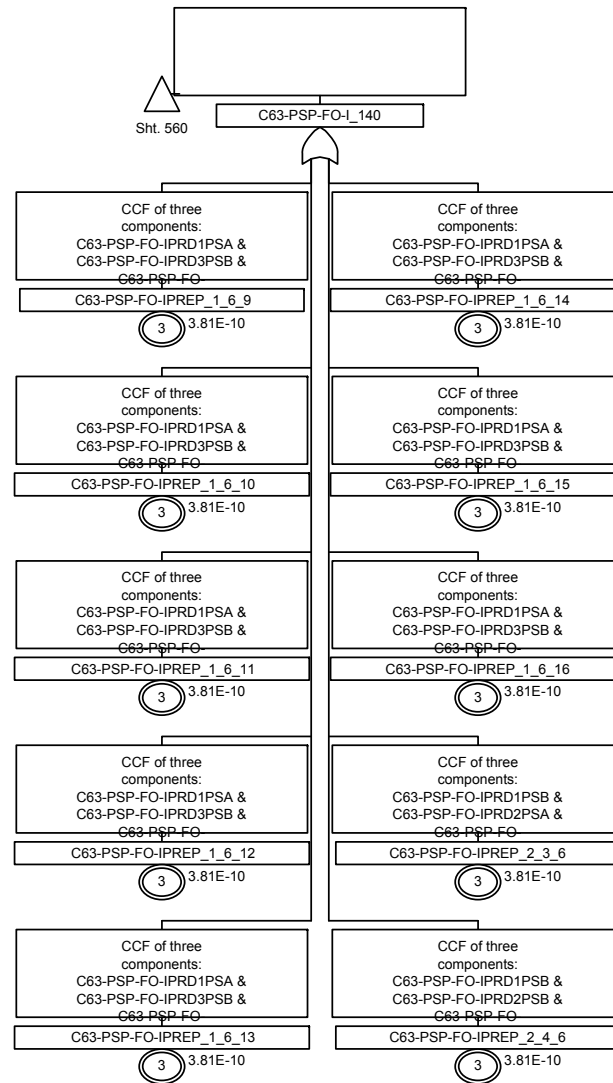


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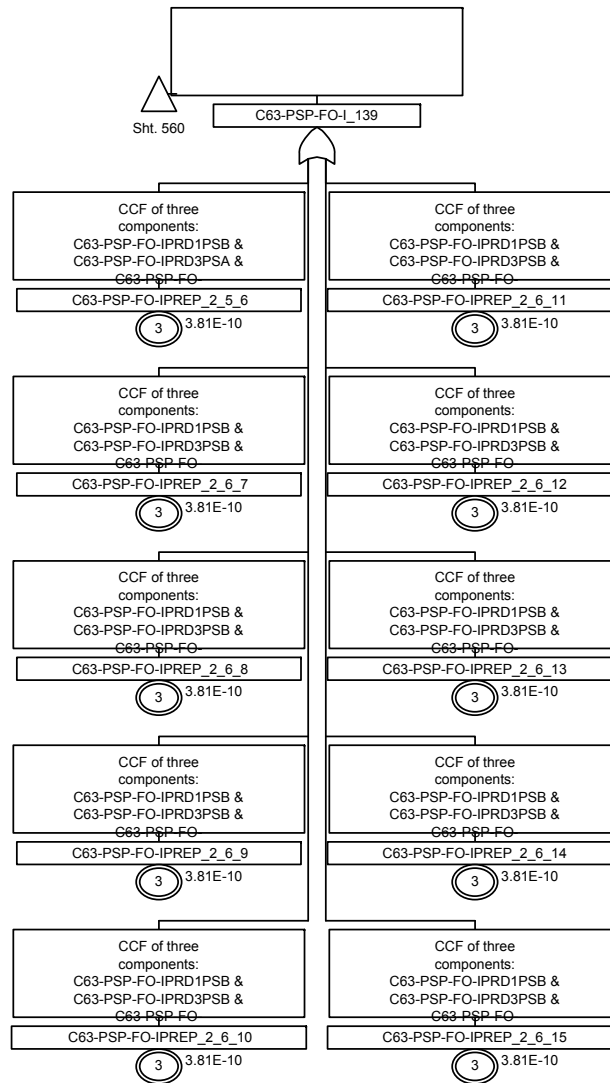


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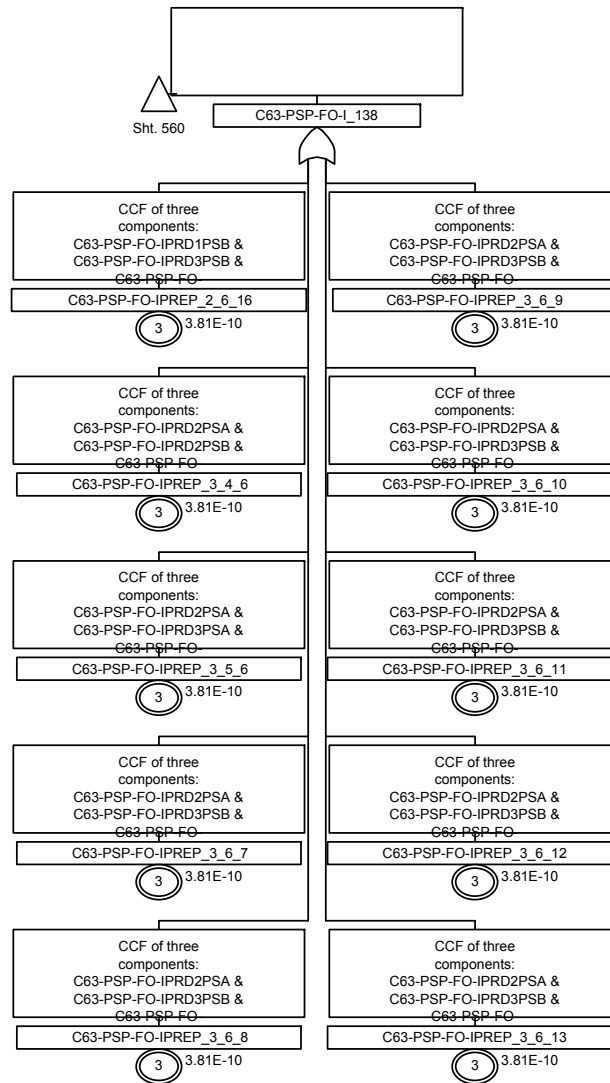


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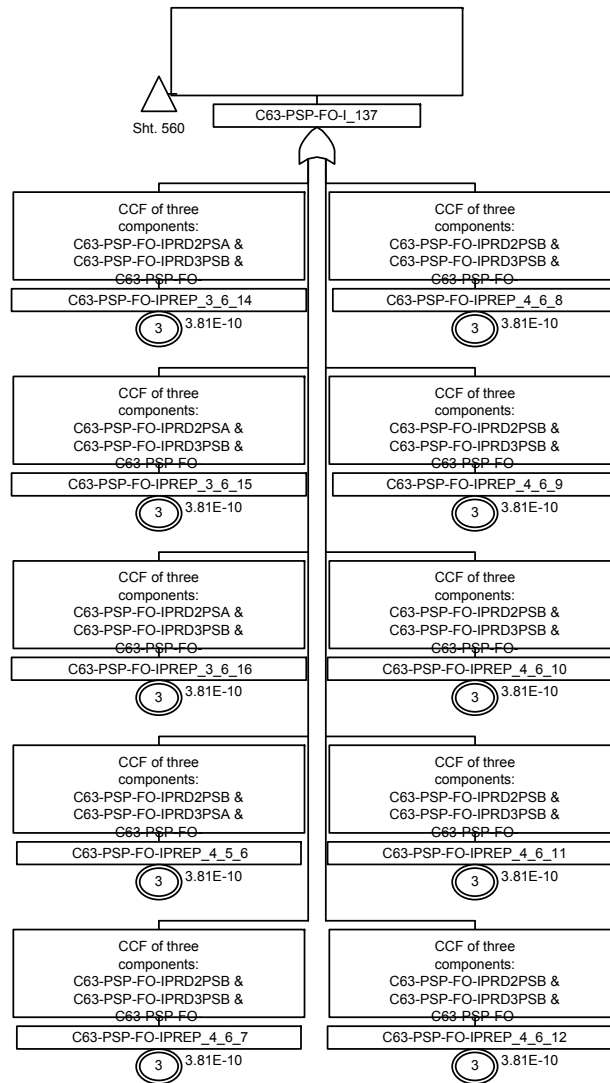


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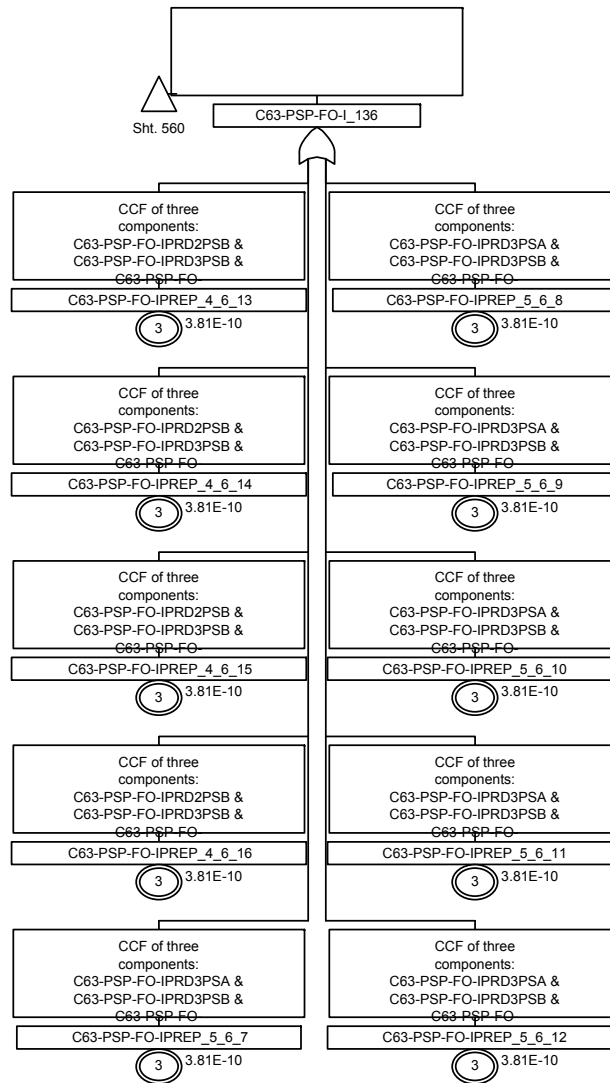


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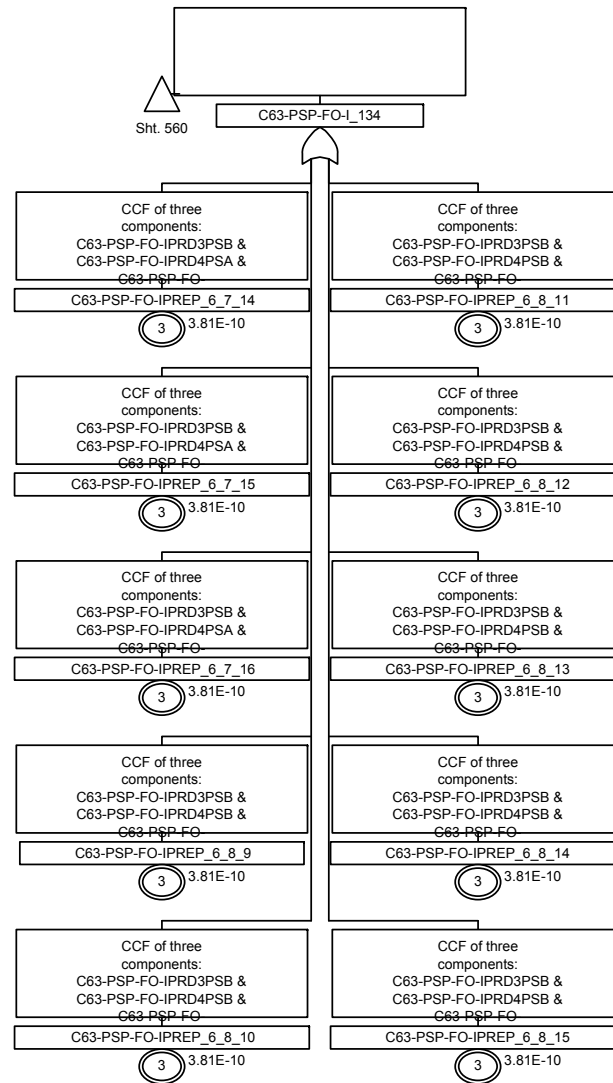


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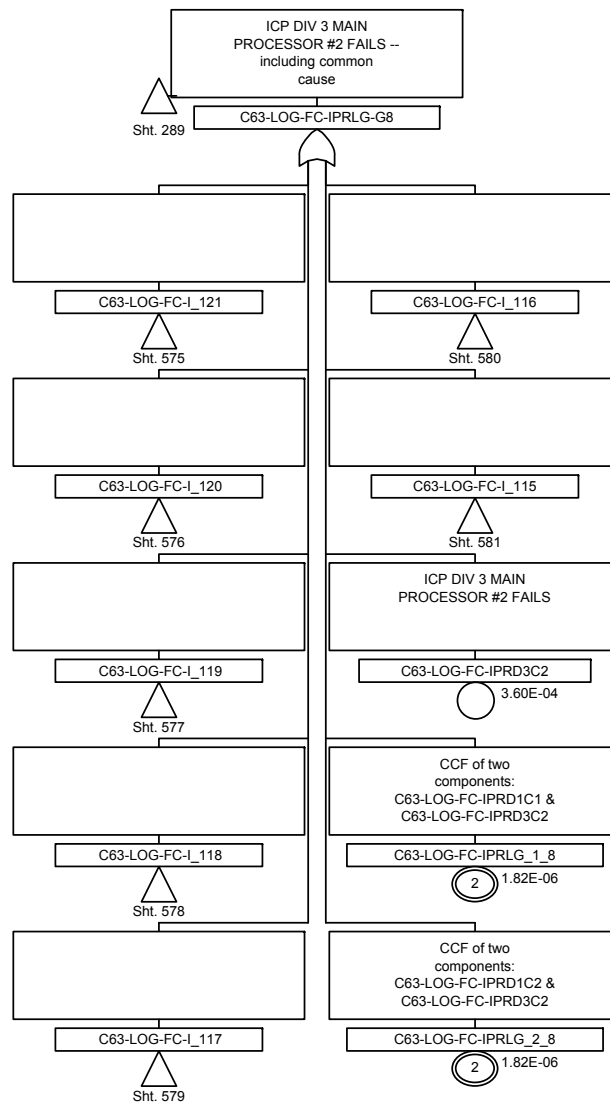


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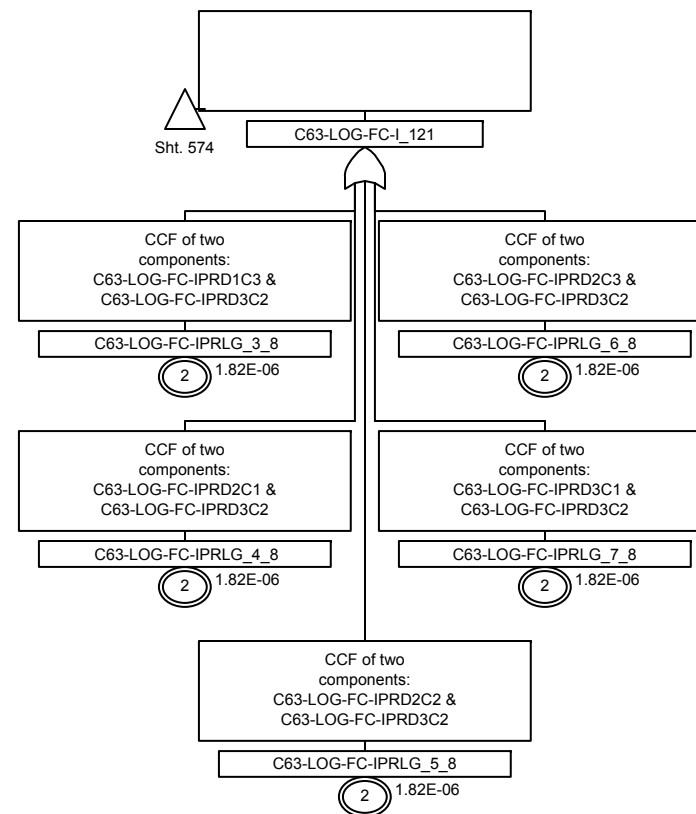


Figure 4.5-3e. Sheet 575 Independent Control Platforms

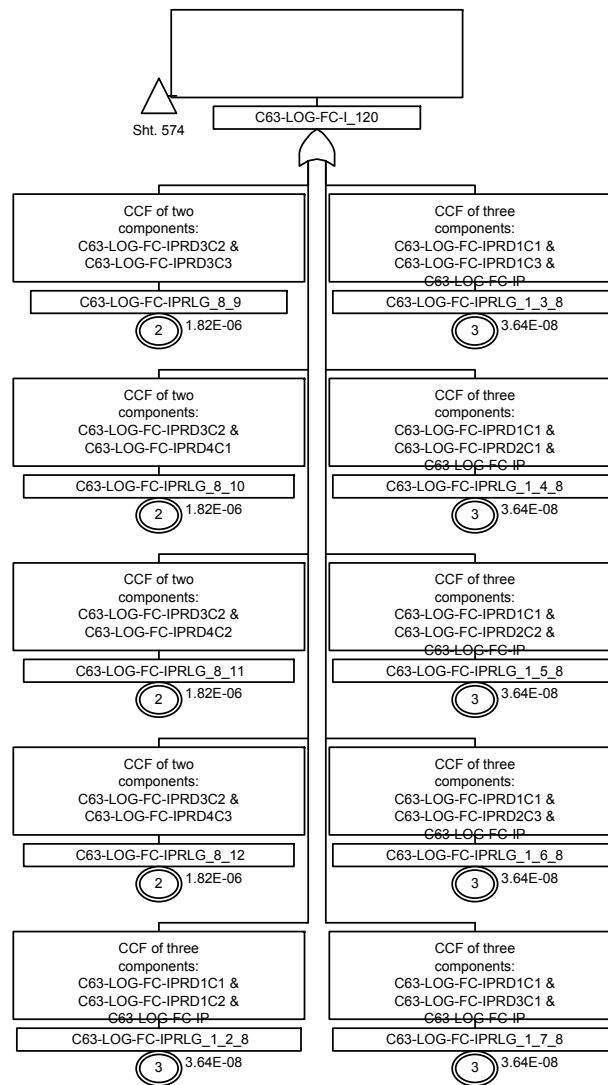


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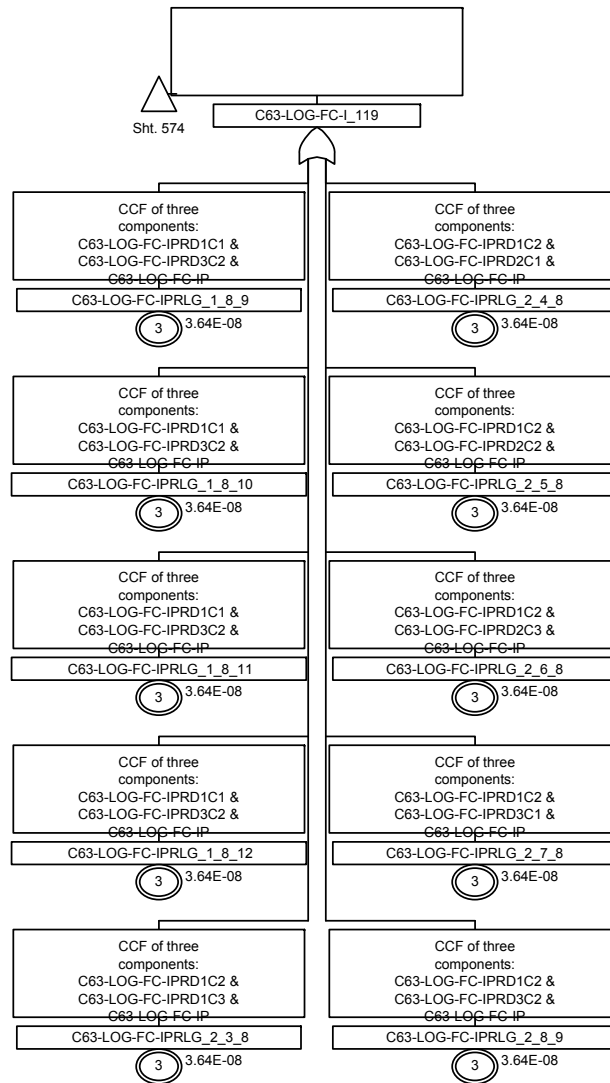


Figure 4.5-3e. Sheet 577 Independent Control Platforms

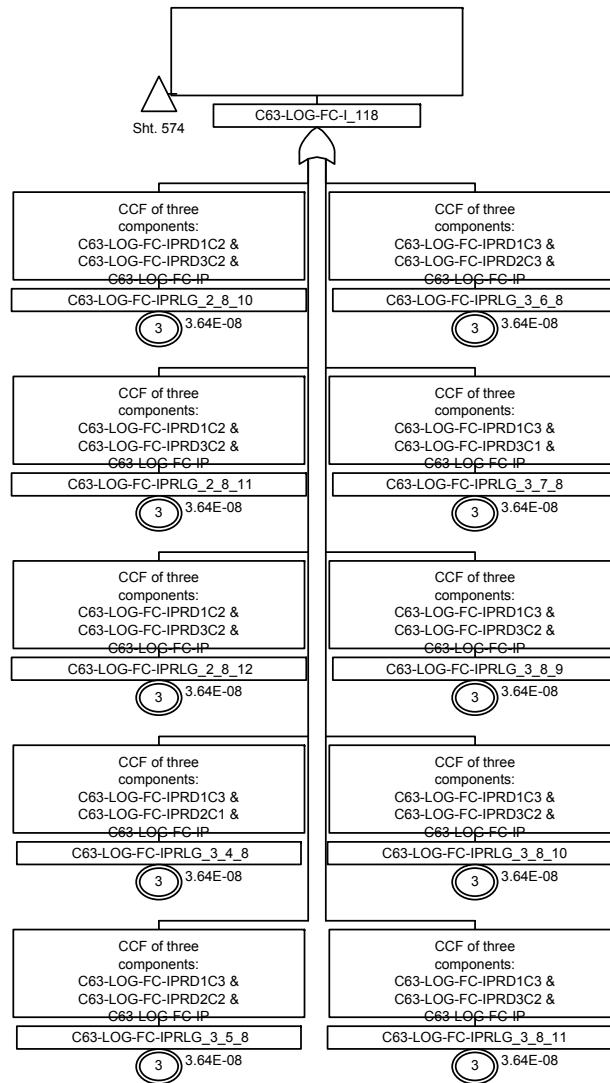


Figure 4.5-3e. Sheet 578 Independent Control Platforms



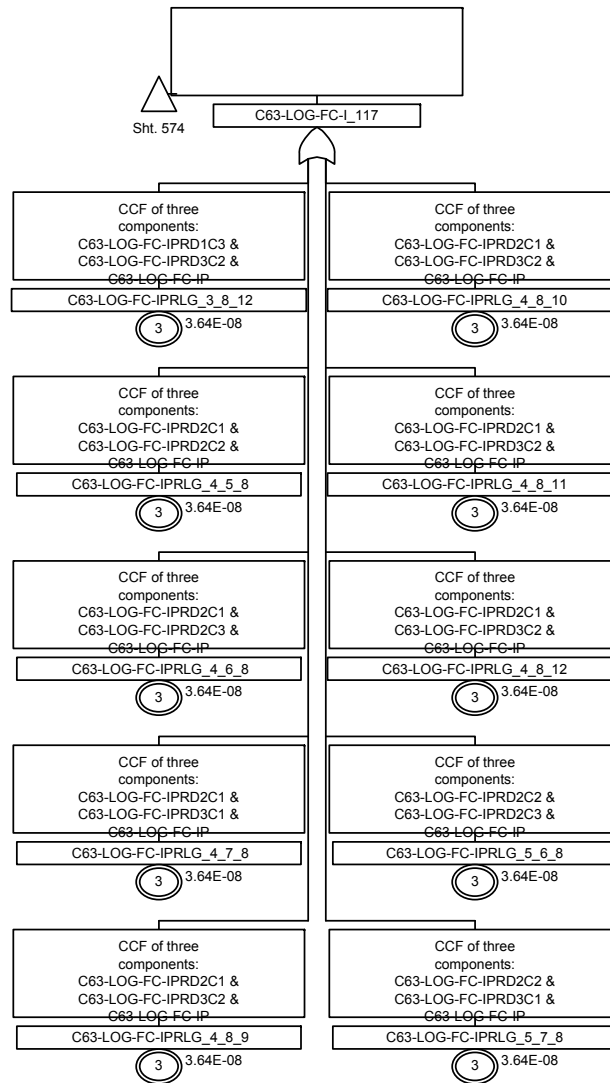


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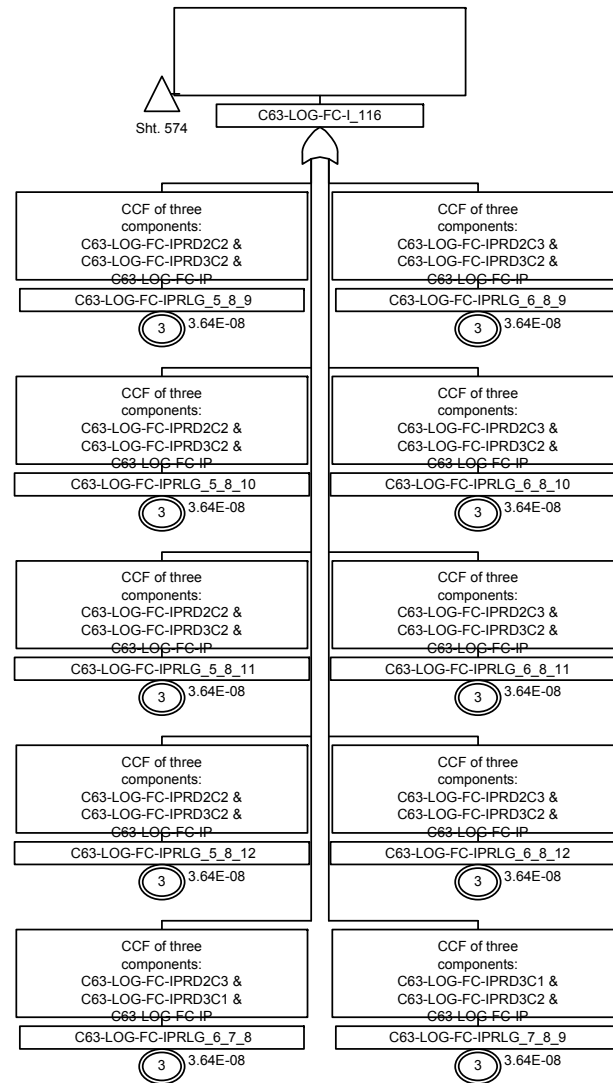


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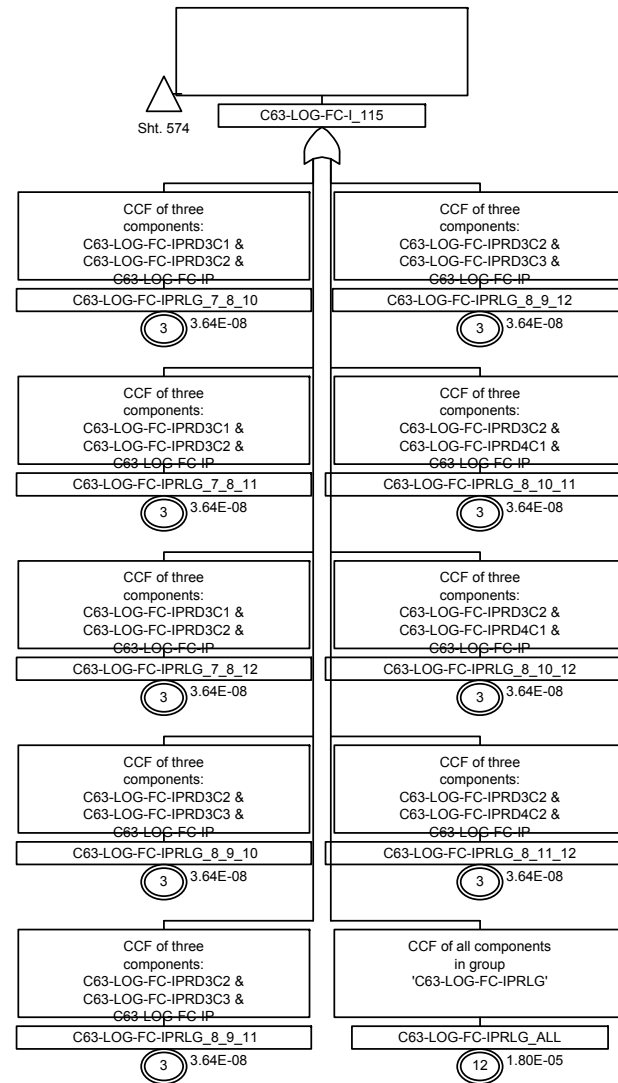


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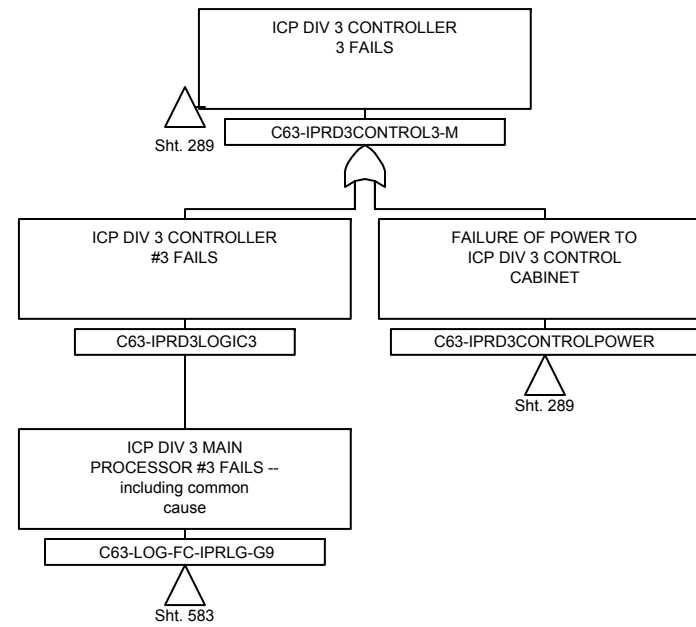


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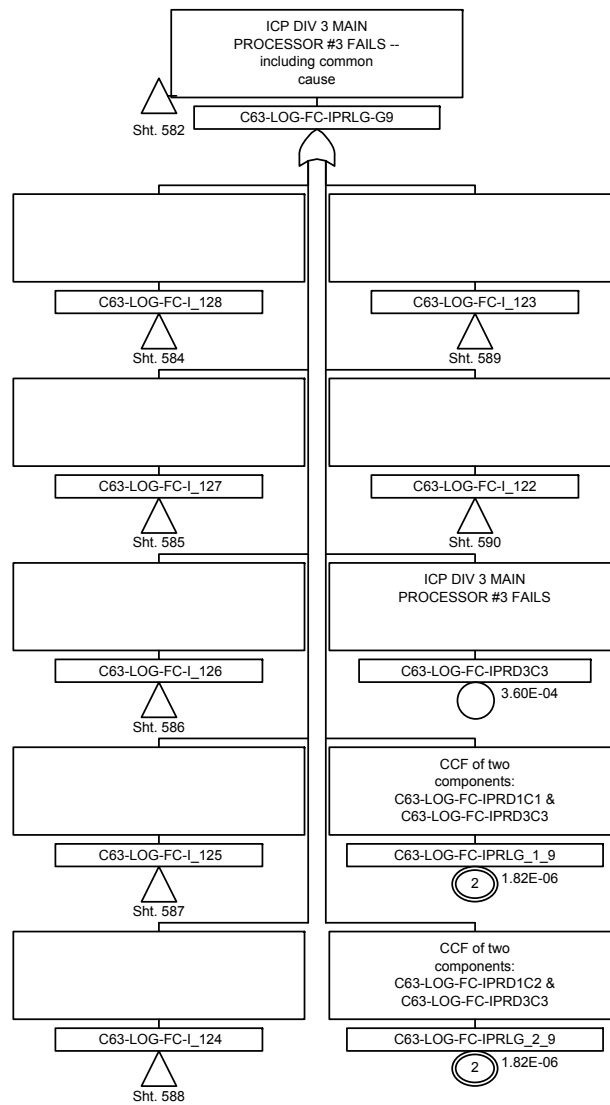


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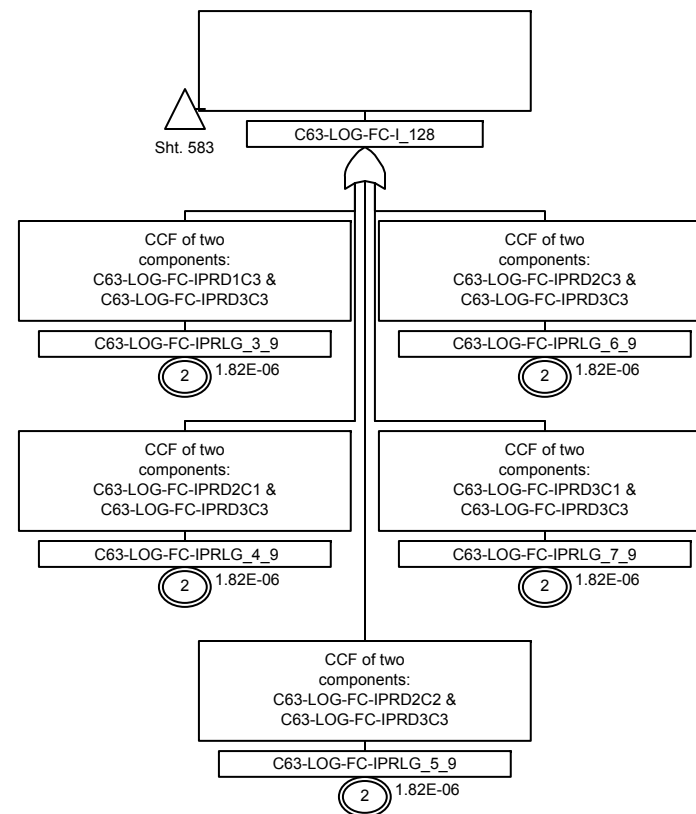


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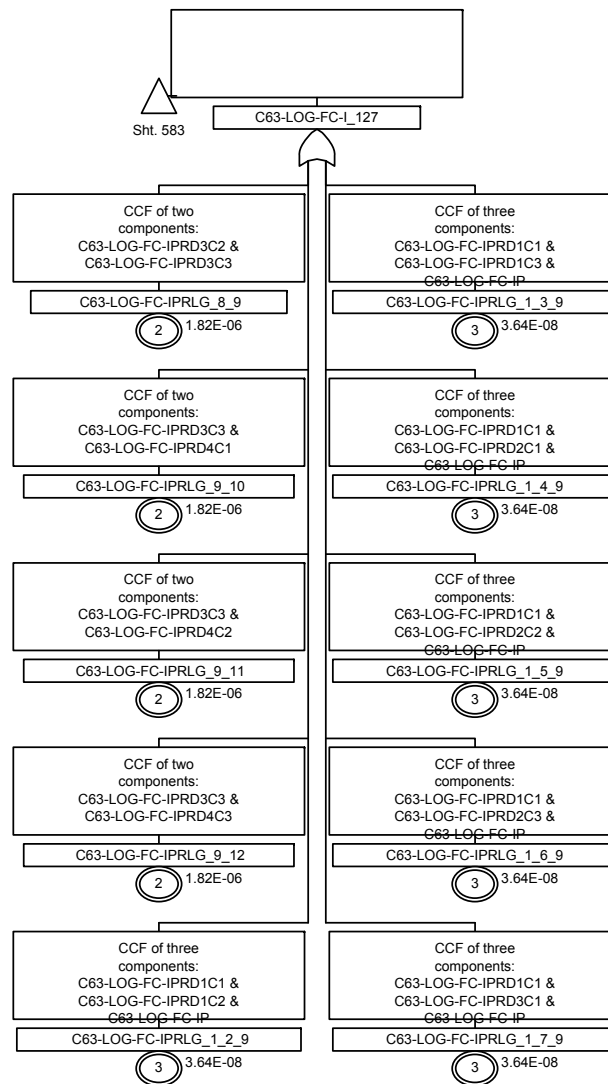


Figure 4.5-3e. Sheet 585 Independent Control Platforms

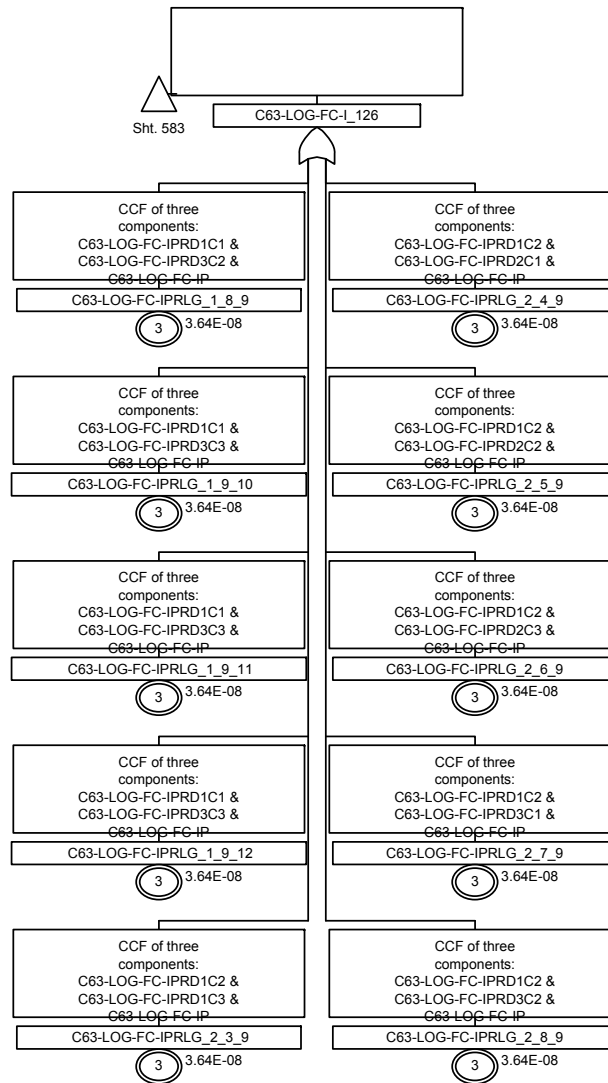


Figure 4.5-3e. Sheet 586 Independent Control Platforms



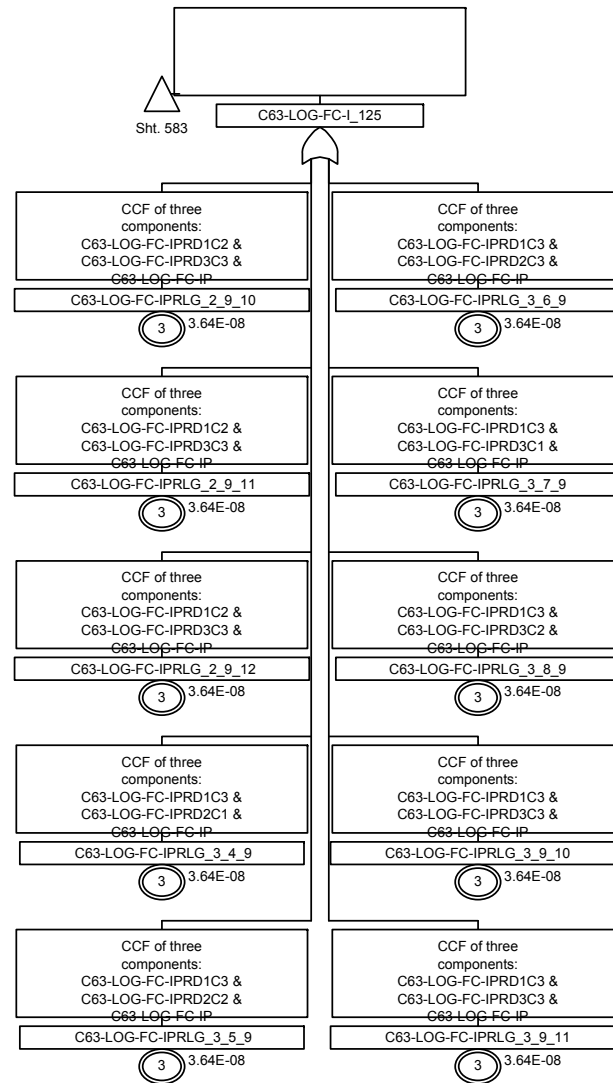


Figure 4.5-3e. Sheet 587 Independent Control Platforms

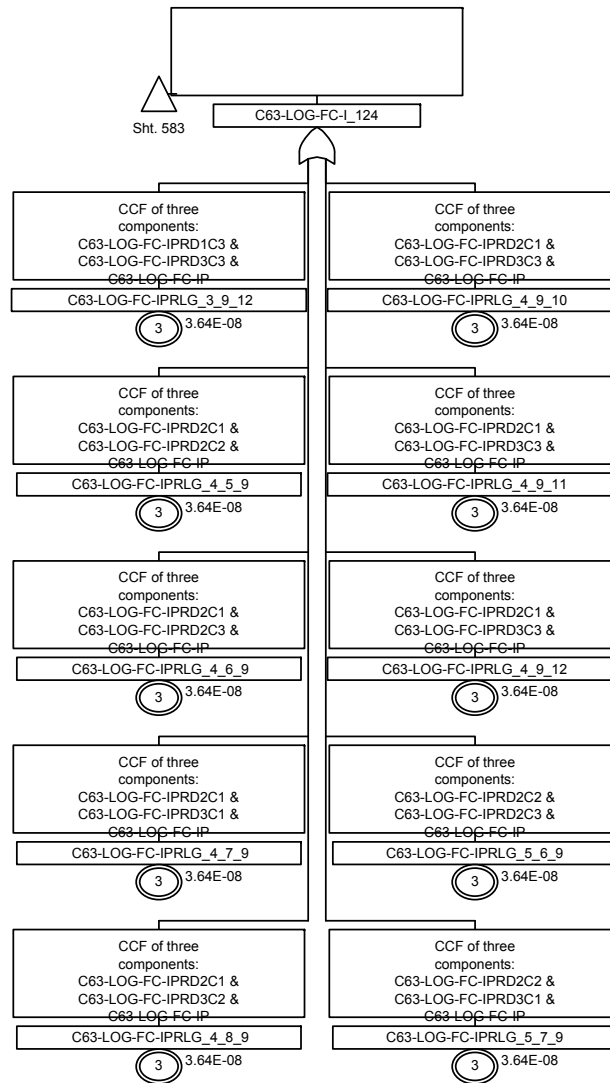


Figure 4.5-3e. Sheet 588 Independent Control Platforms

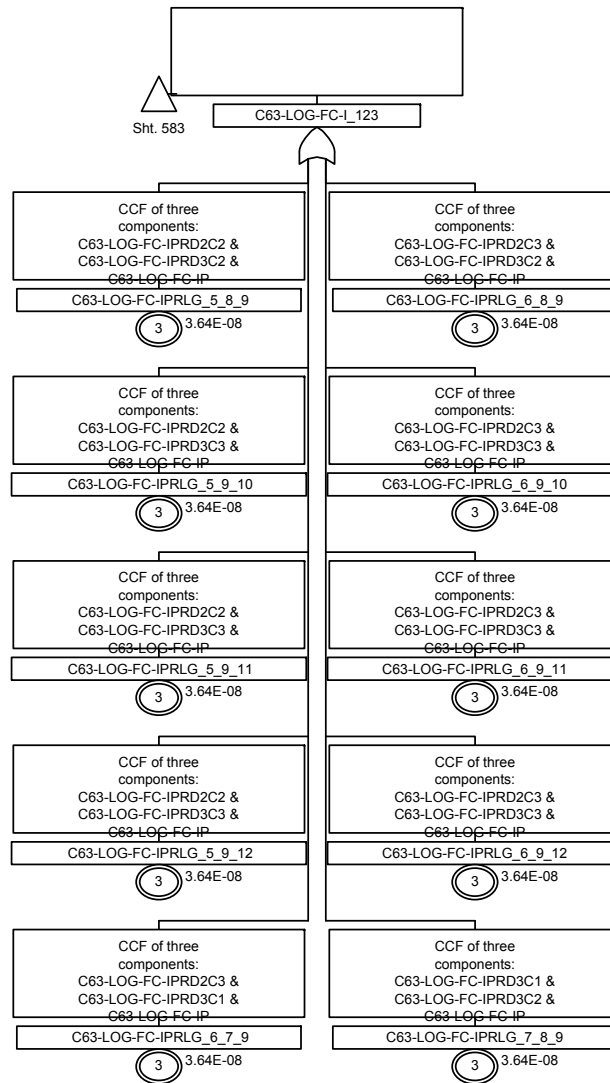


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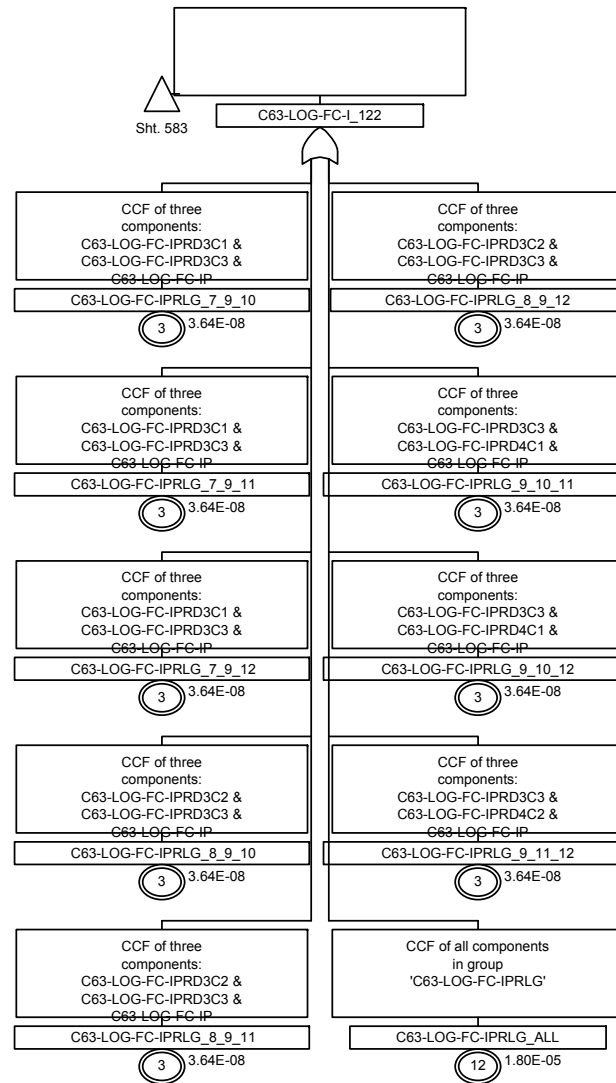


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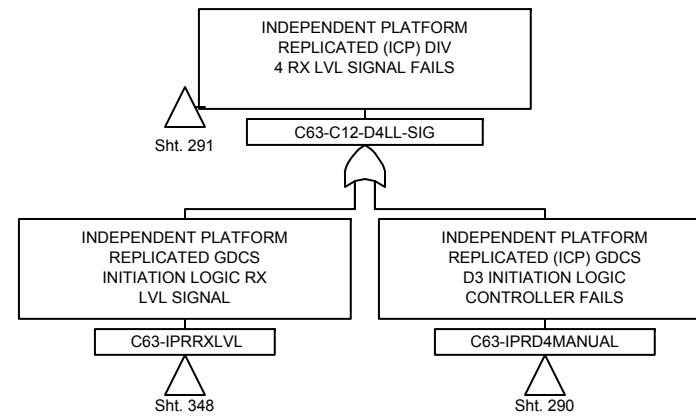


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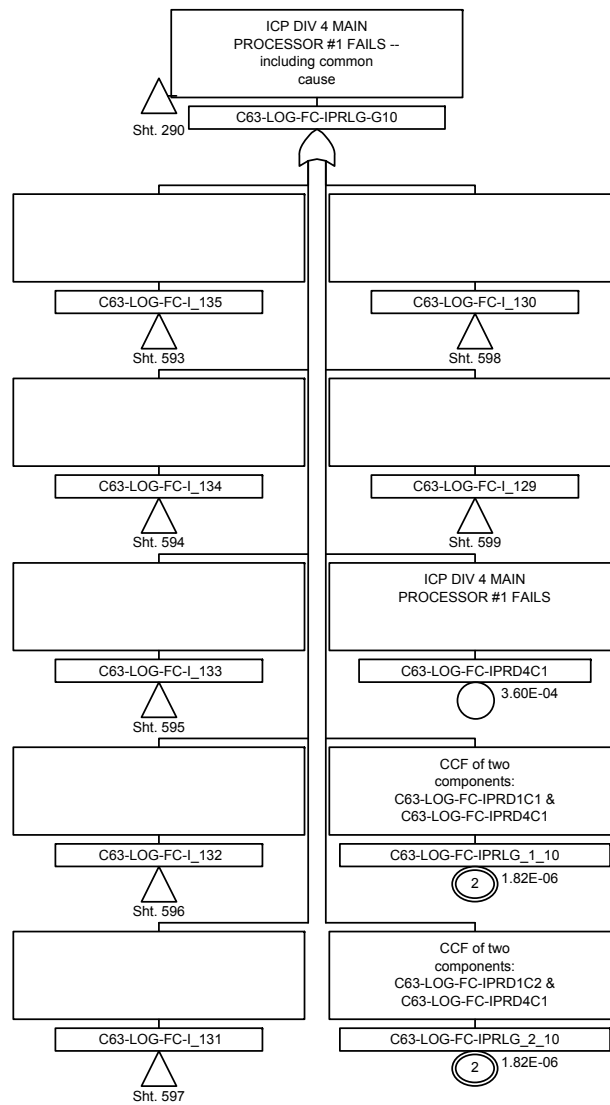


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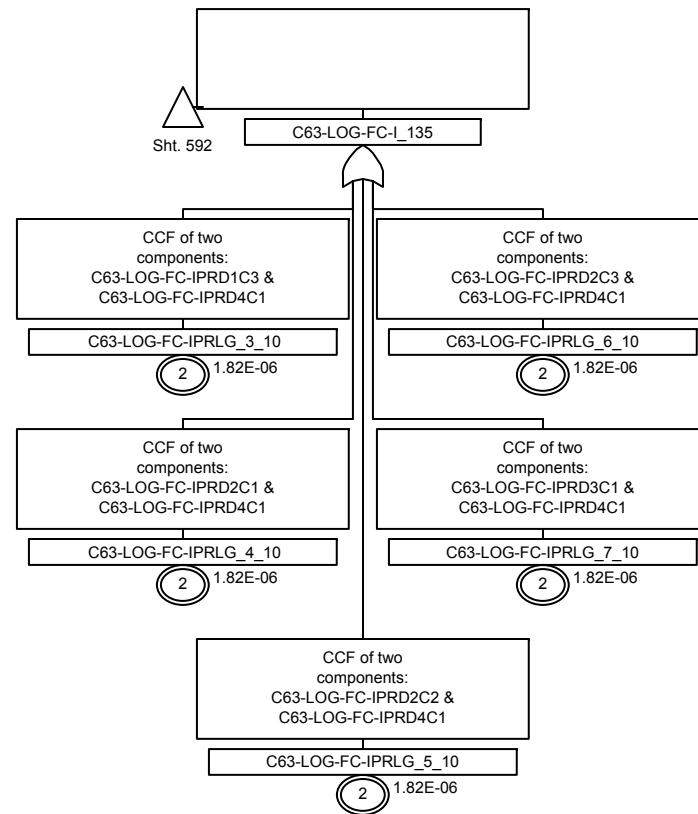


Figure 4.5-3e. Sheet 593 Independent Control Platforms

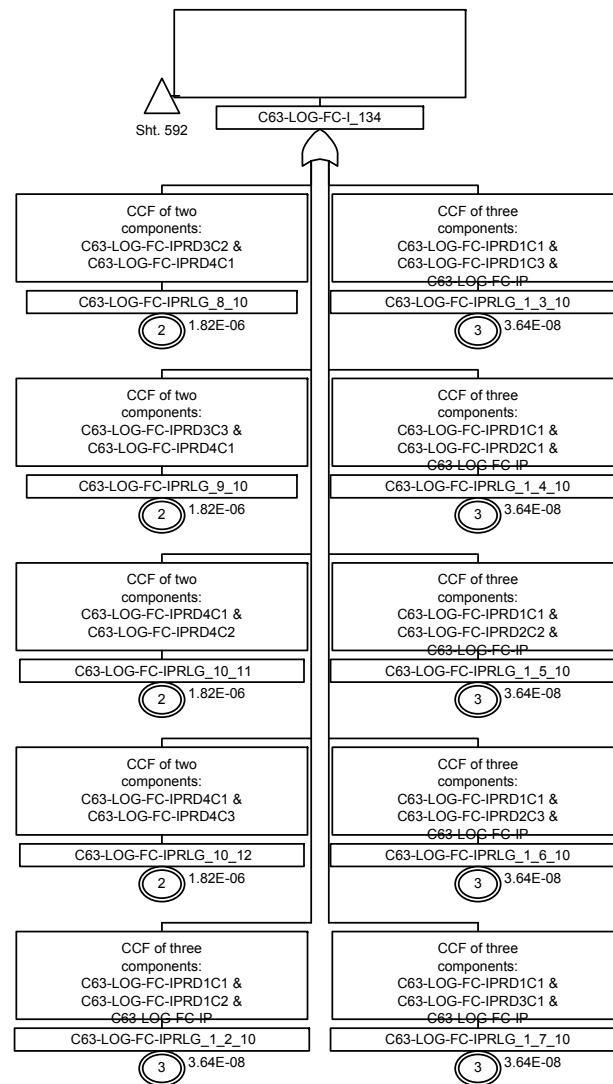


Figure 4.5-3e. Sheet 594 Independent Control Platforms



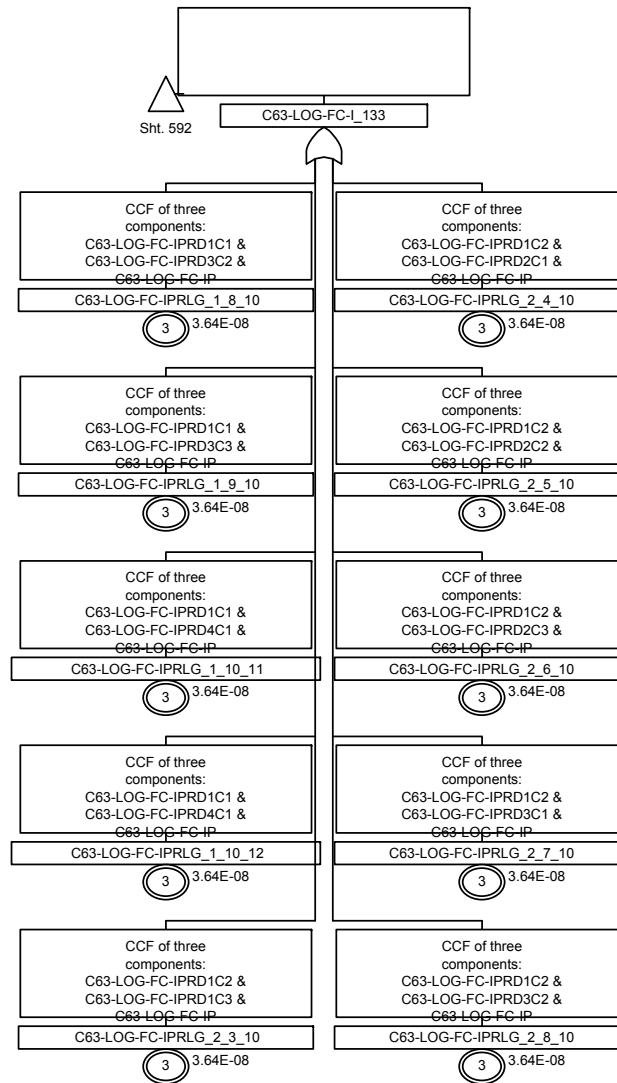


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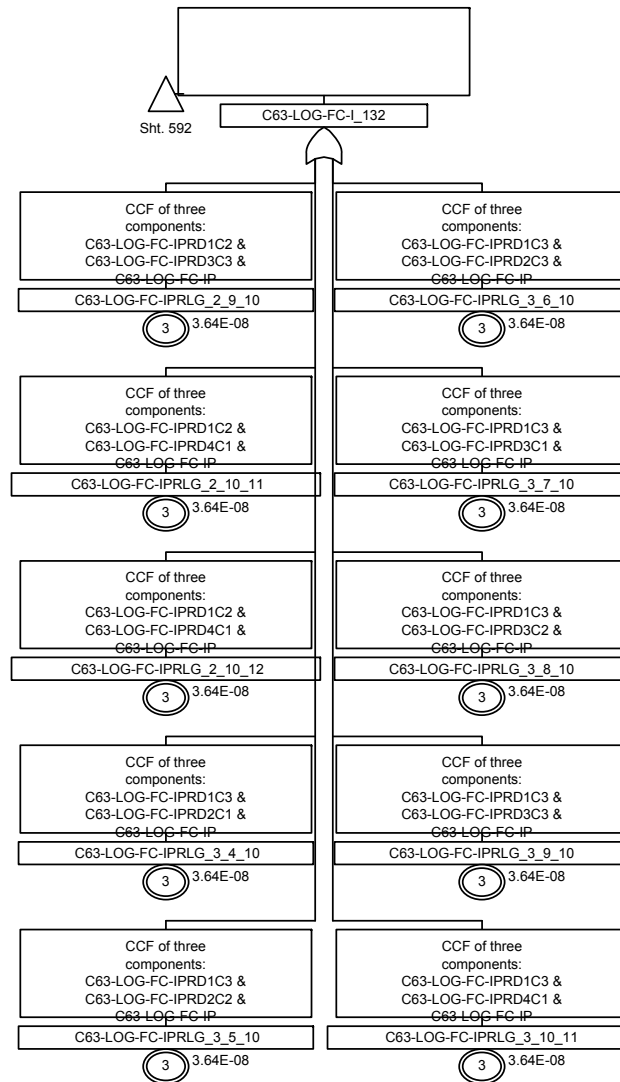


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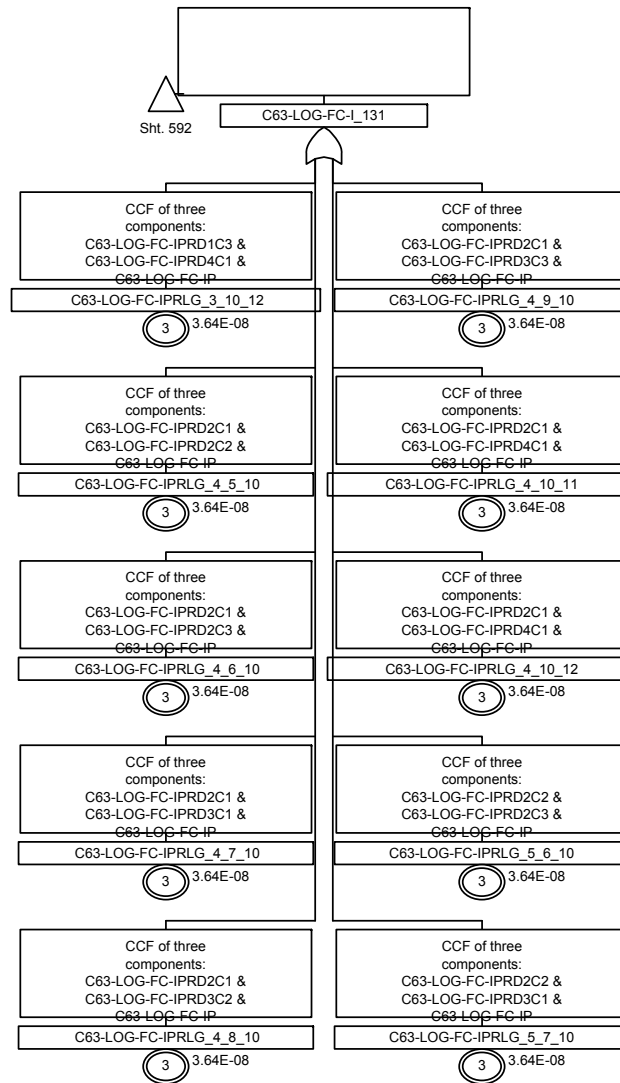


Figure 4.5-3e. Sheet 597 Independent Control Platforms

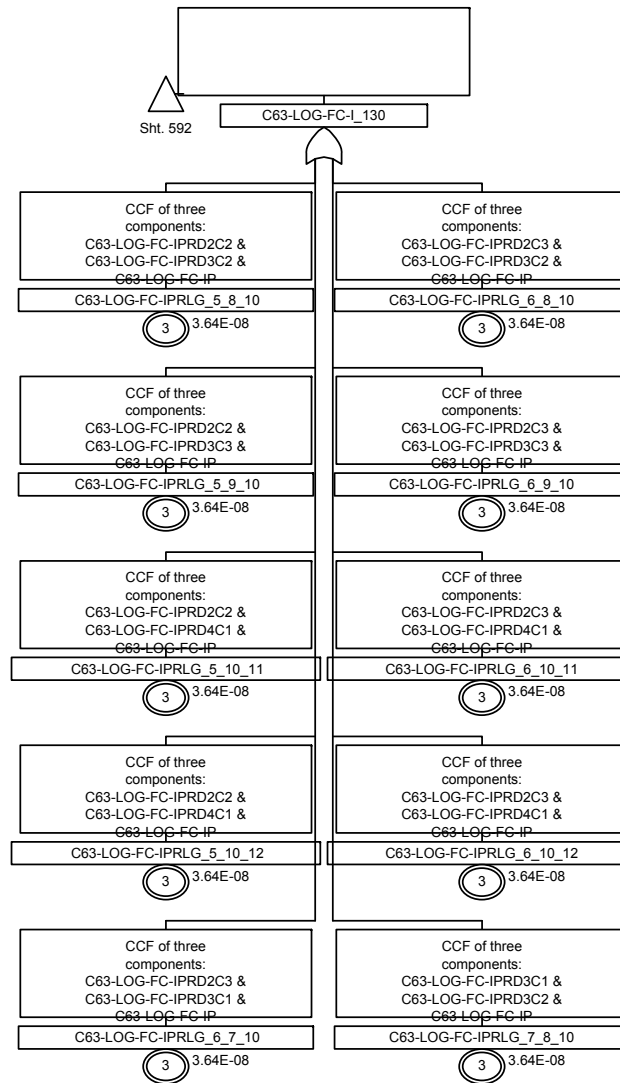


Figure 4.5-3e. Sheet 598 Independent Control Platforms

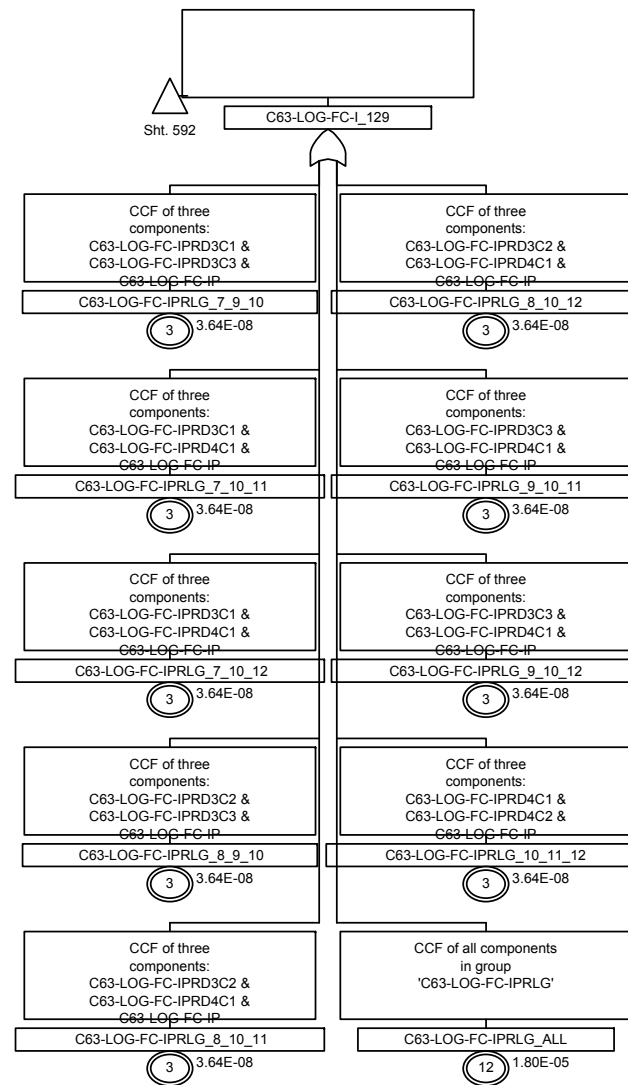


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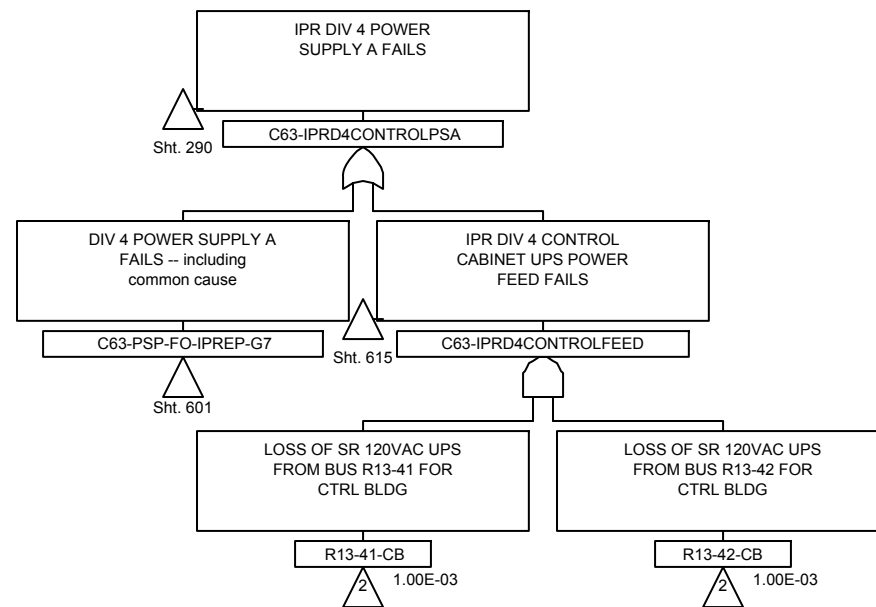


Figure 4.5-3e. Sheet 600 Independent Control Platforms

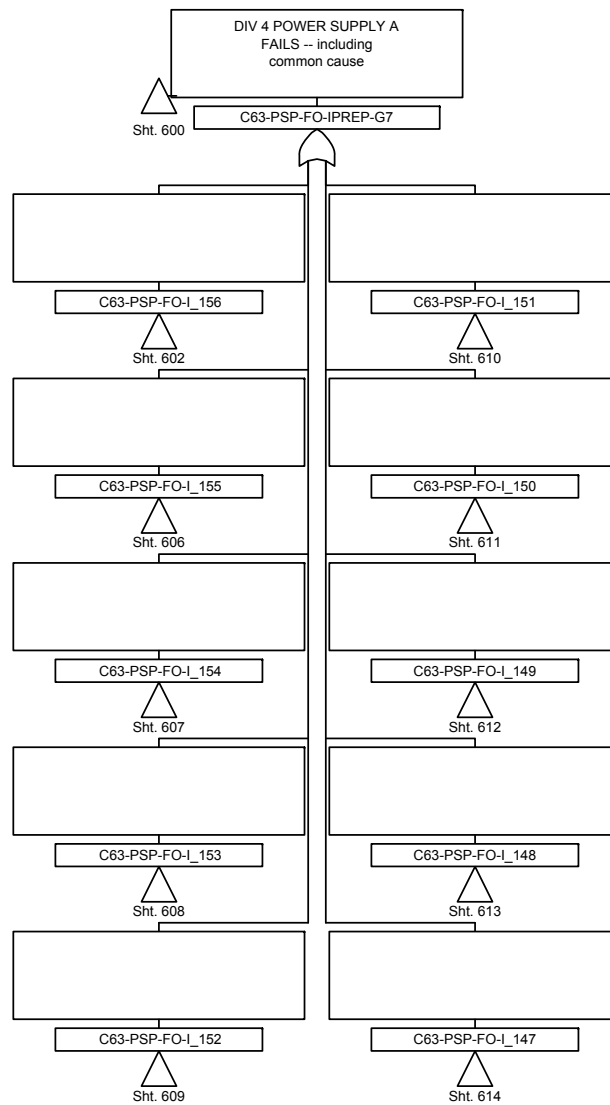


Figure 4.5-3e. Sheet 601 Independent Control Platforms

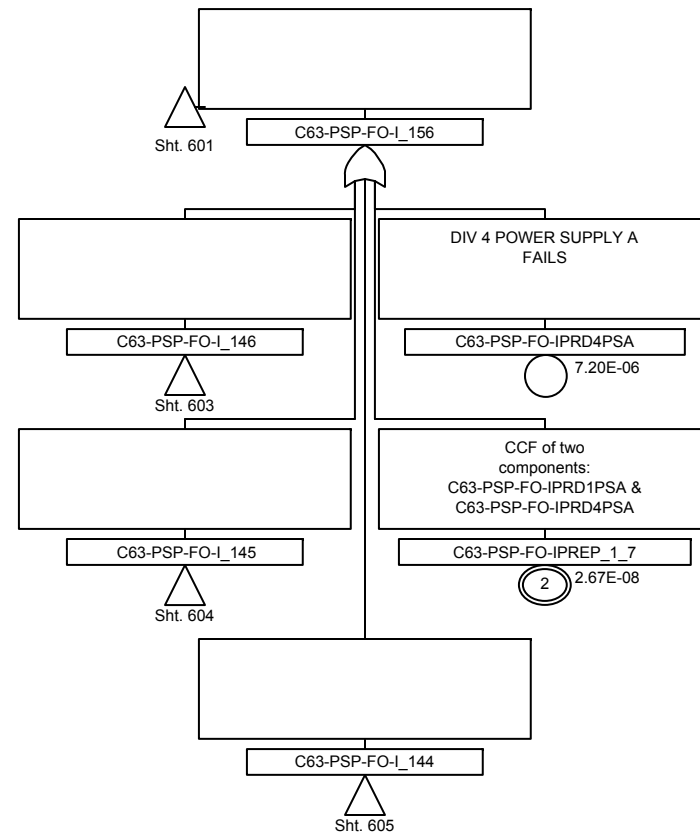


Figure 4.5-3e. Sheet 602 Independent Control Platforms



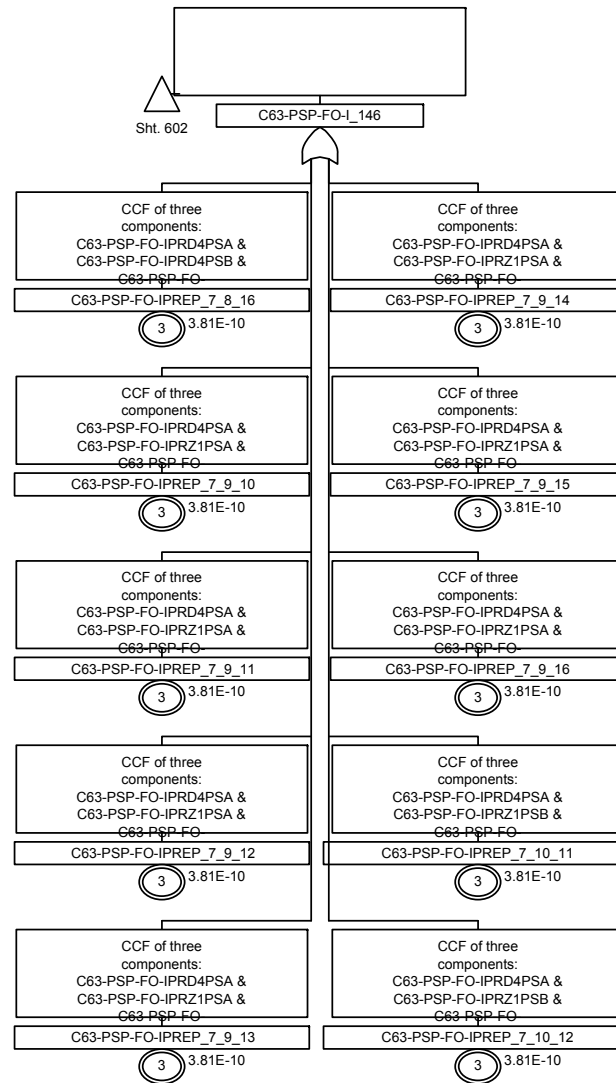


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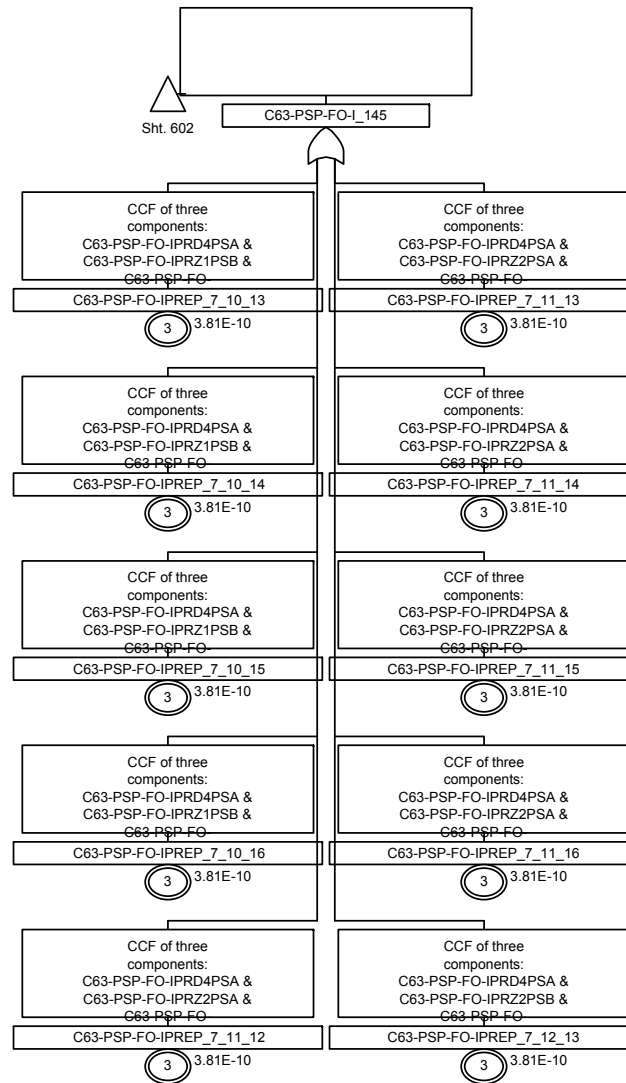


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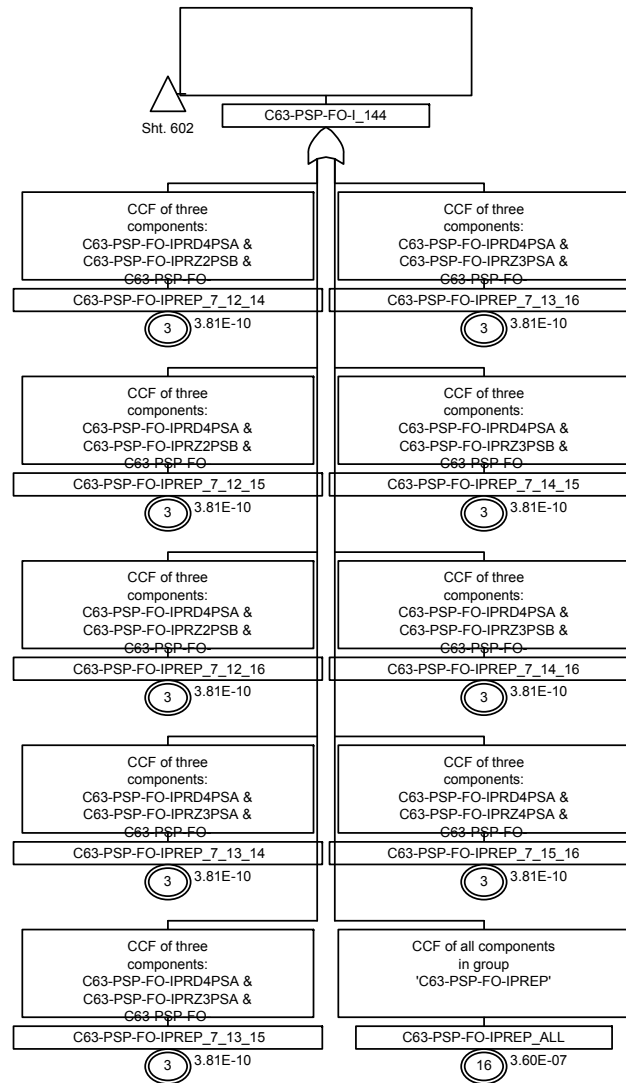


Figure 4.5-3e. Sheet 605 Independent Control Platforms

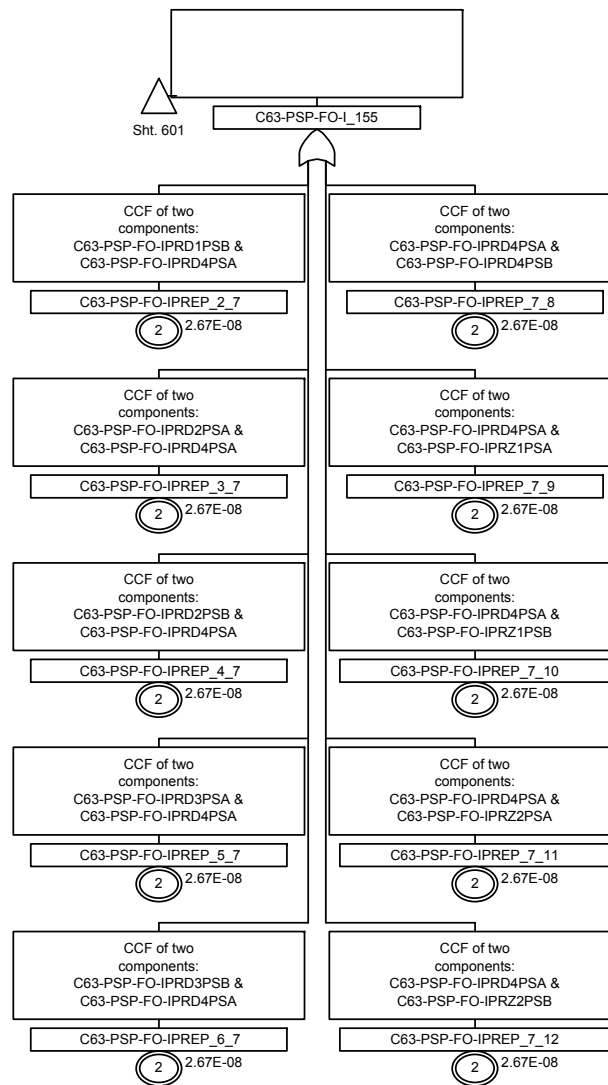


Figure 4.5-3e. Sheet 606 Independent Control Platforms

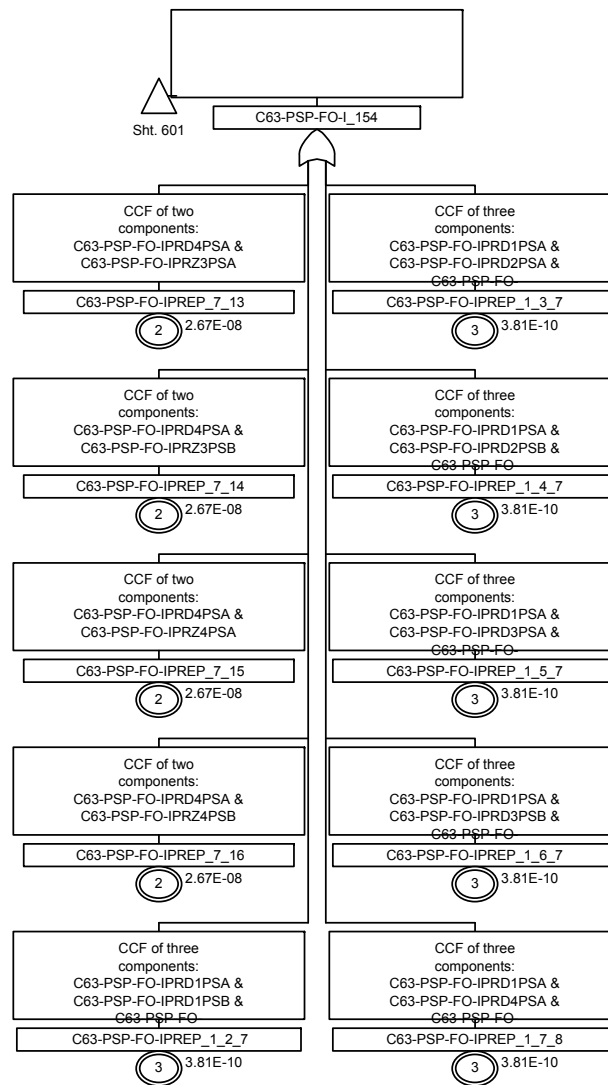


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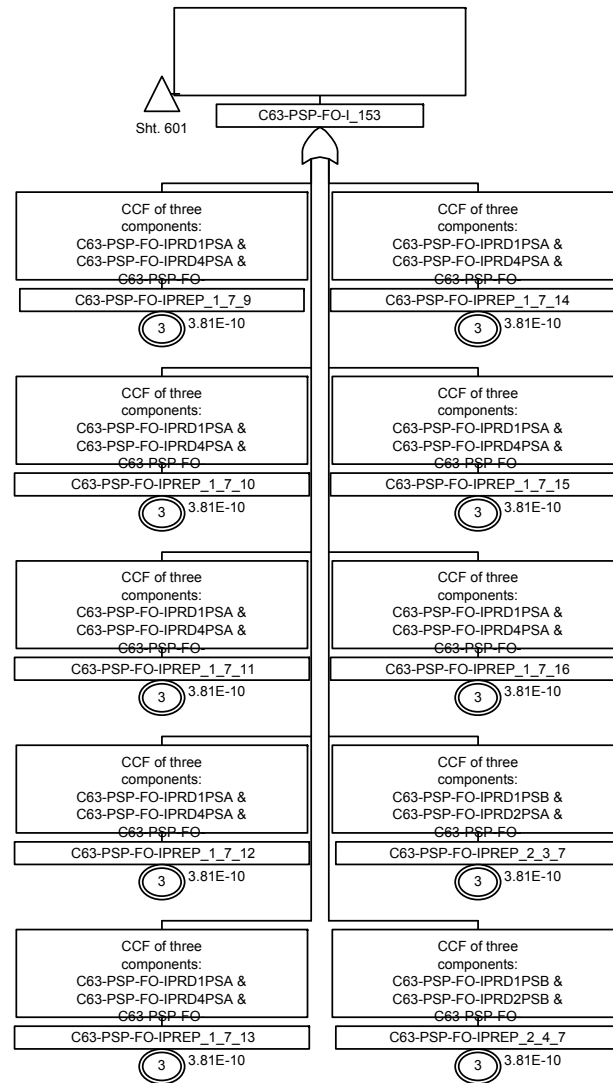


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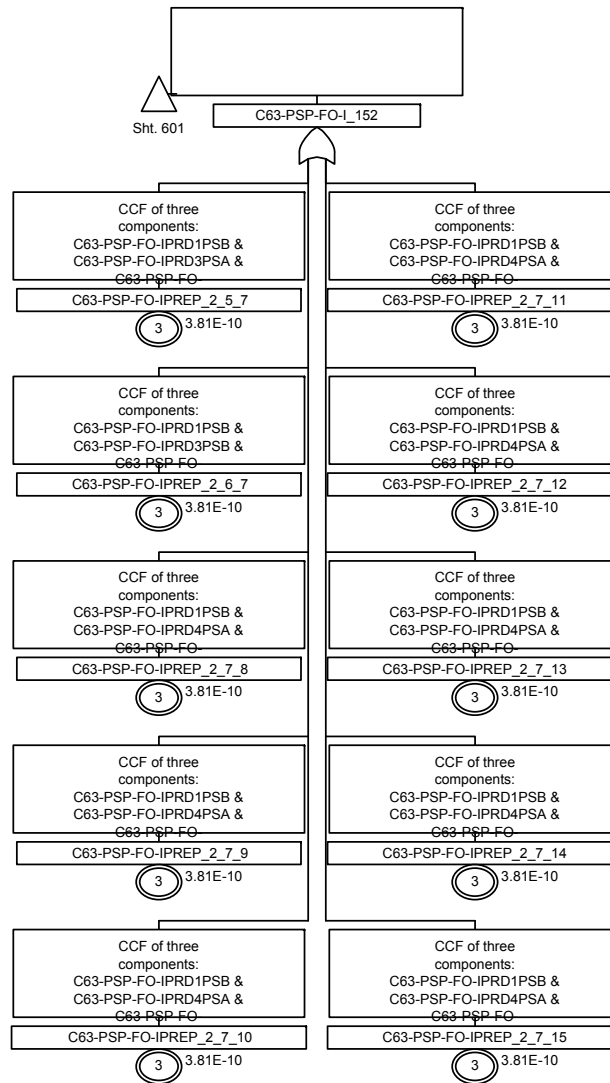


Figure 4.5-3e. Sheet 609 Independent Control Platforms





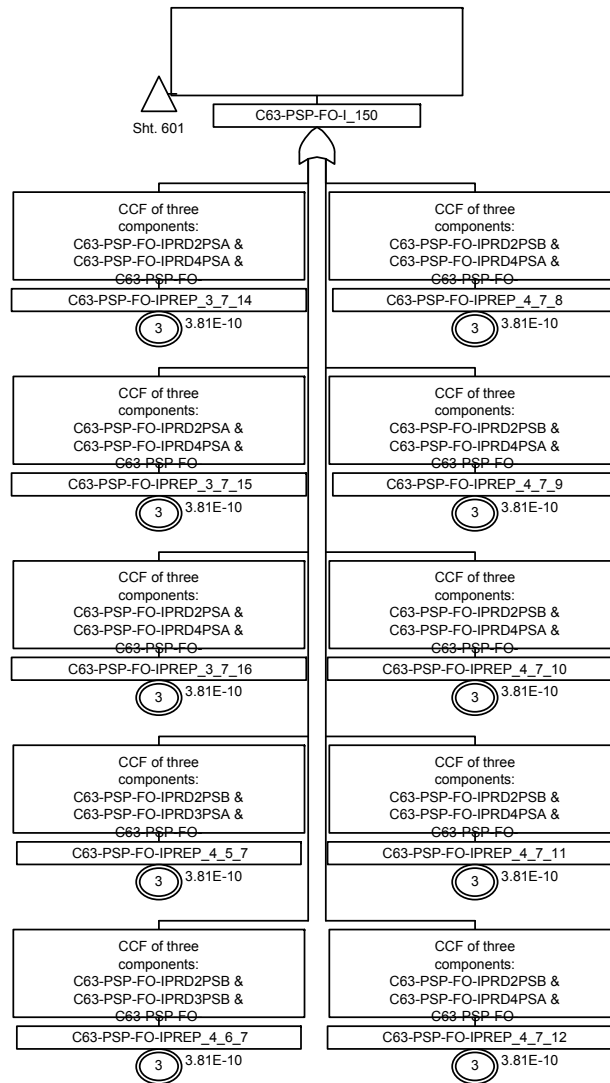


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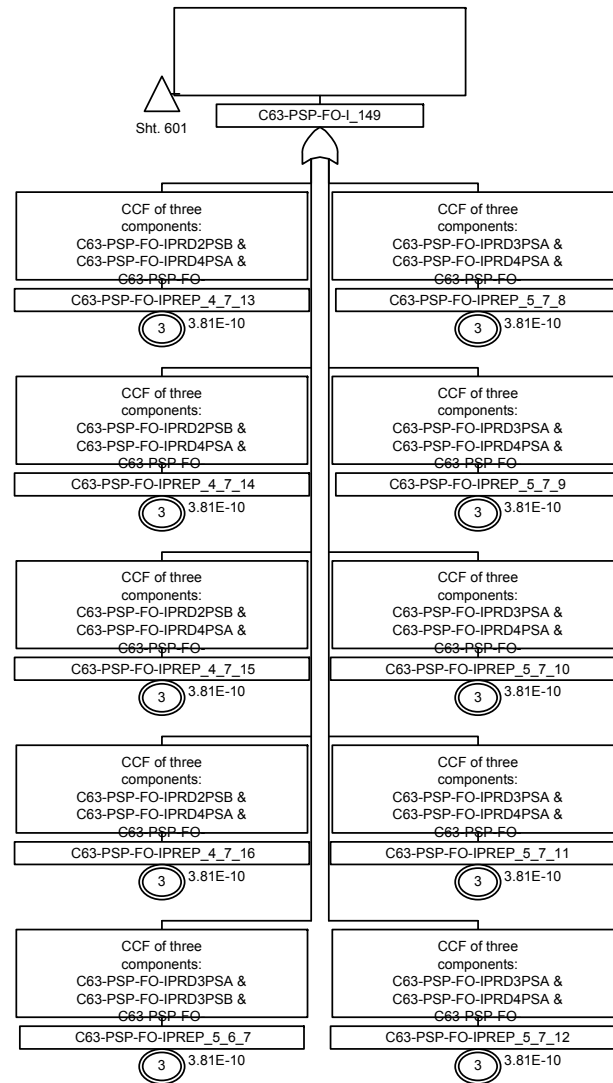


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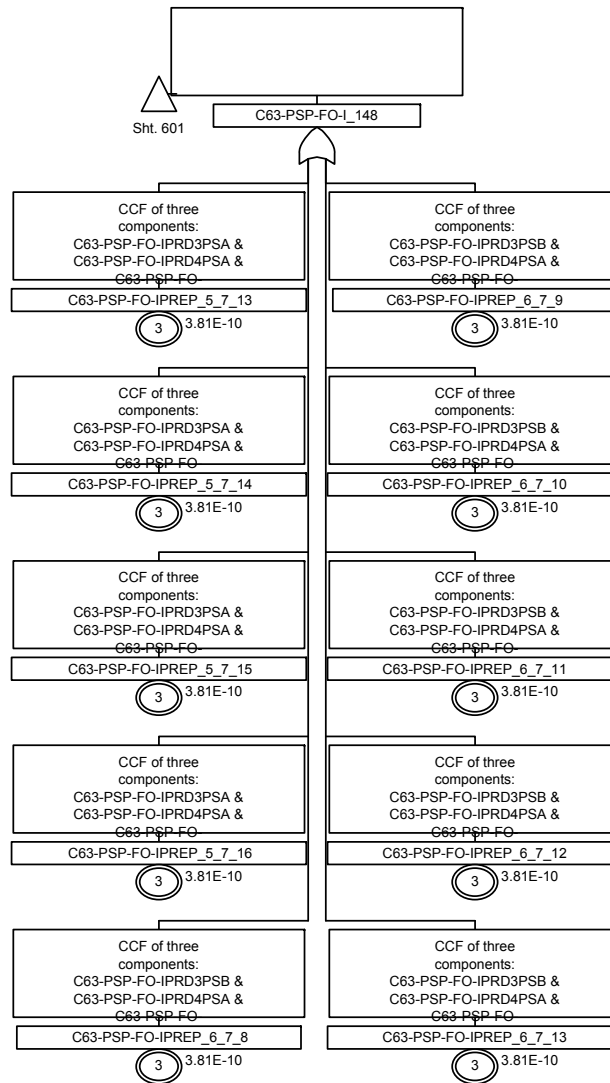


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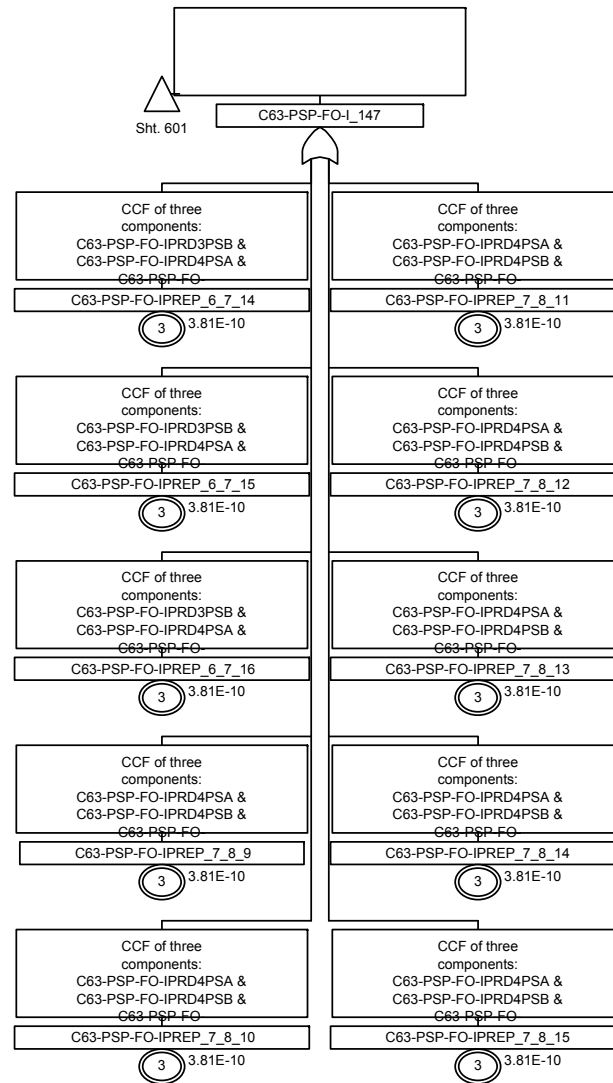


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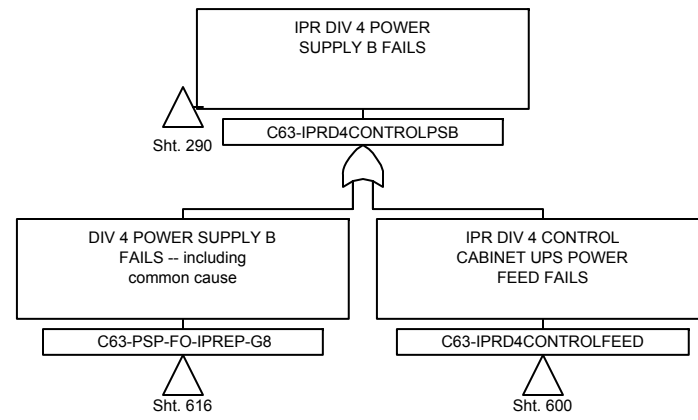


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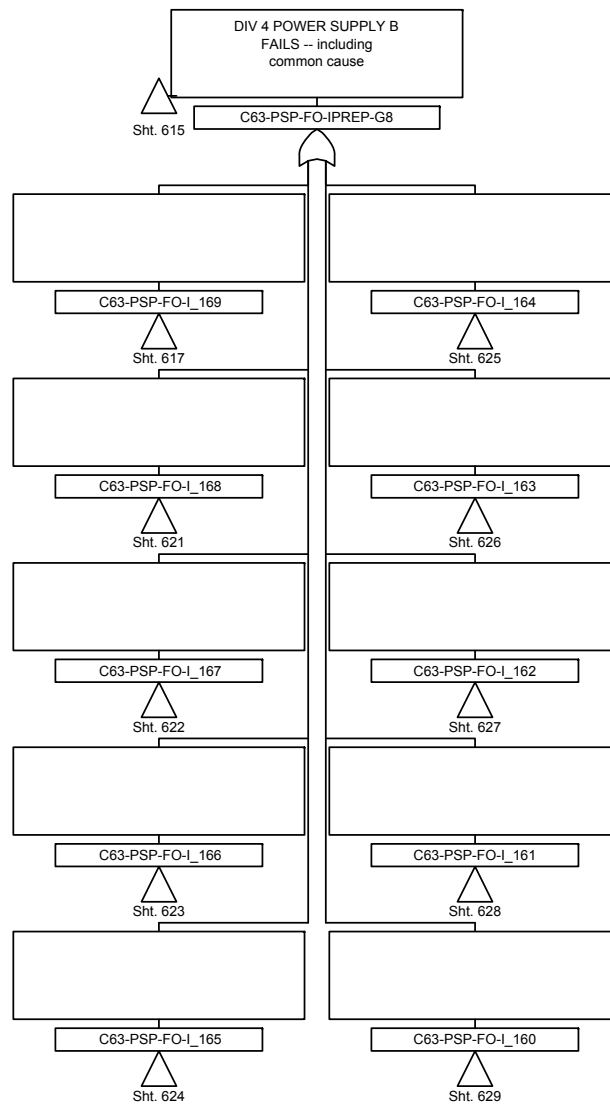


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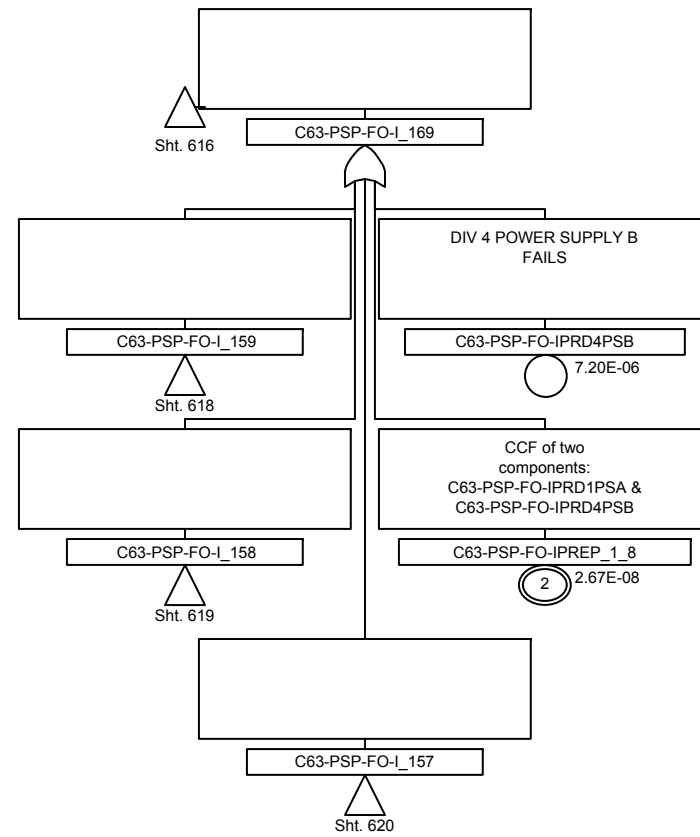


Figure 4.5-3e. Sheet 617 Independent Control Platforms





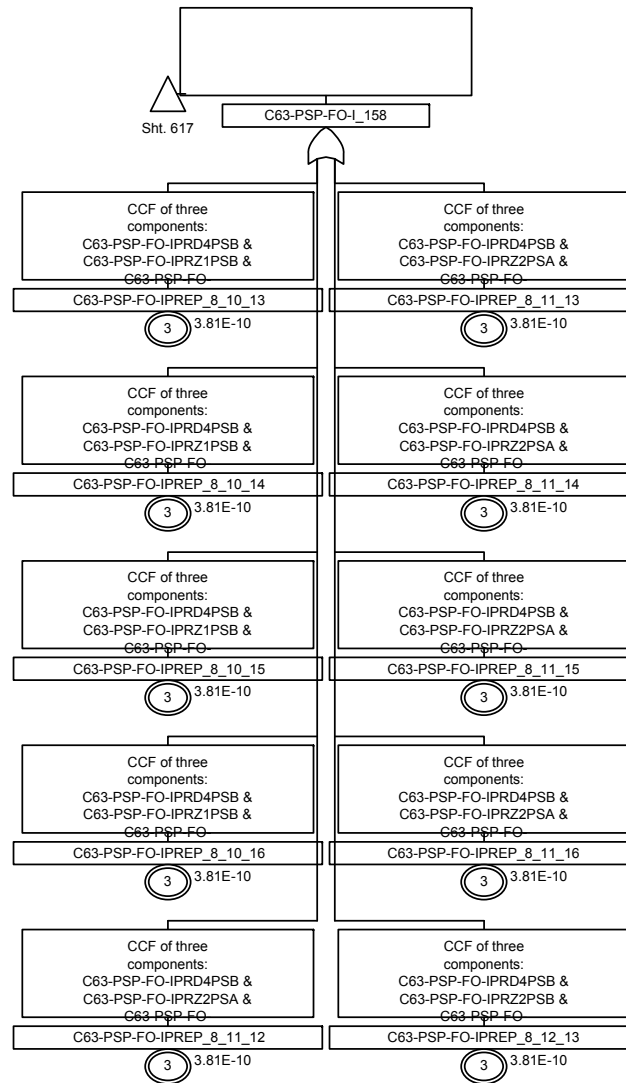


Figure 4.5-3e. Sheet 619 Independent Control Platforms

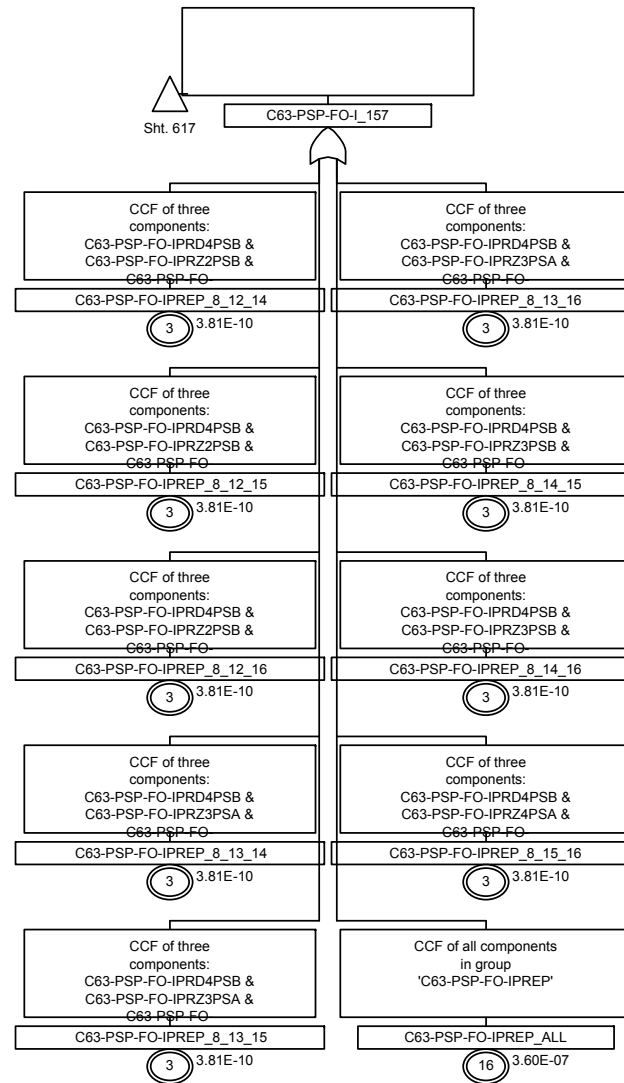


Figure 4.5-3e. Sheet 620 Independent Control Platforms

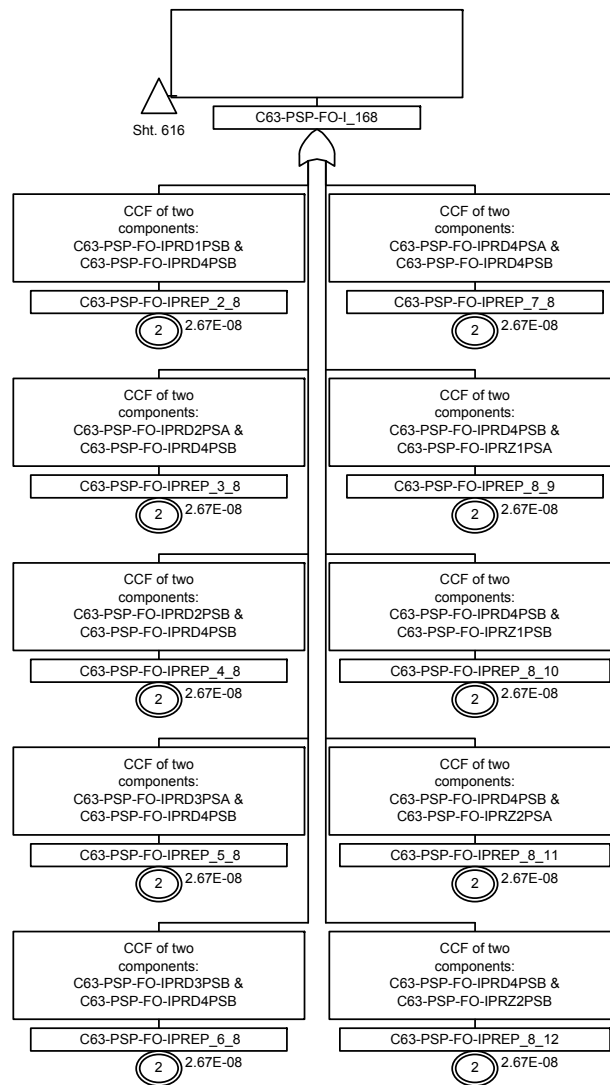


Figure 4.5-3e. Sheet 621 Independent Control Platforms

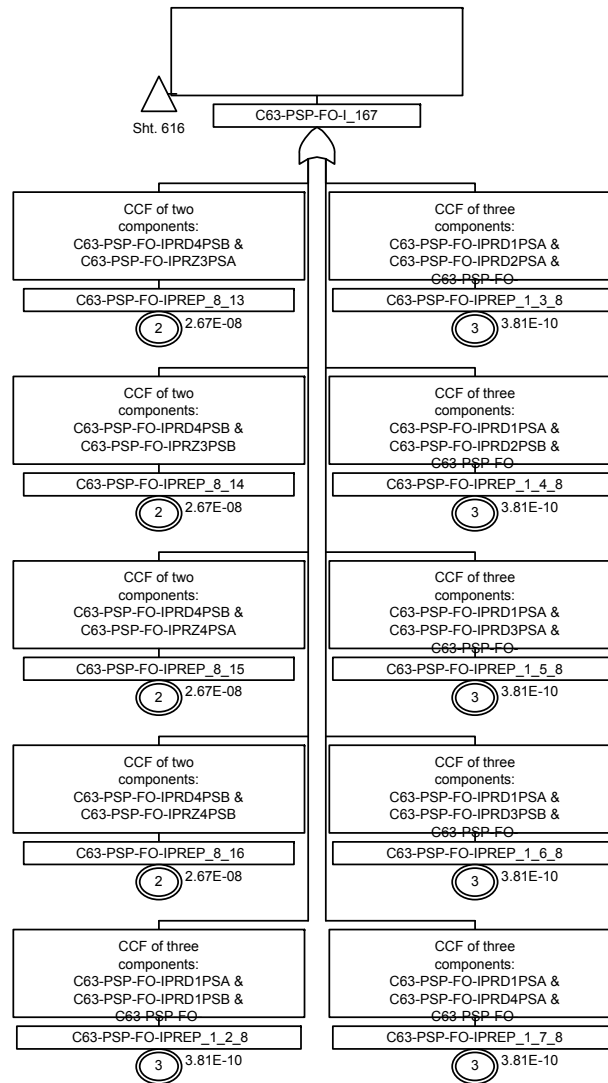


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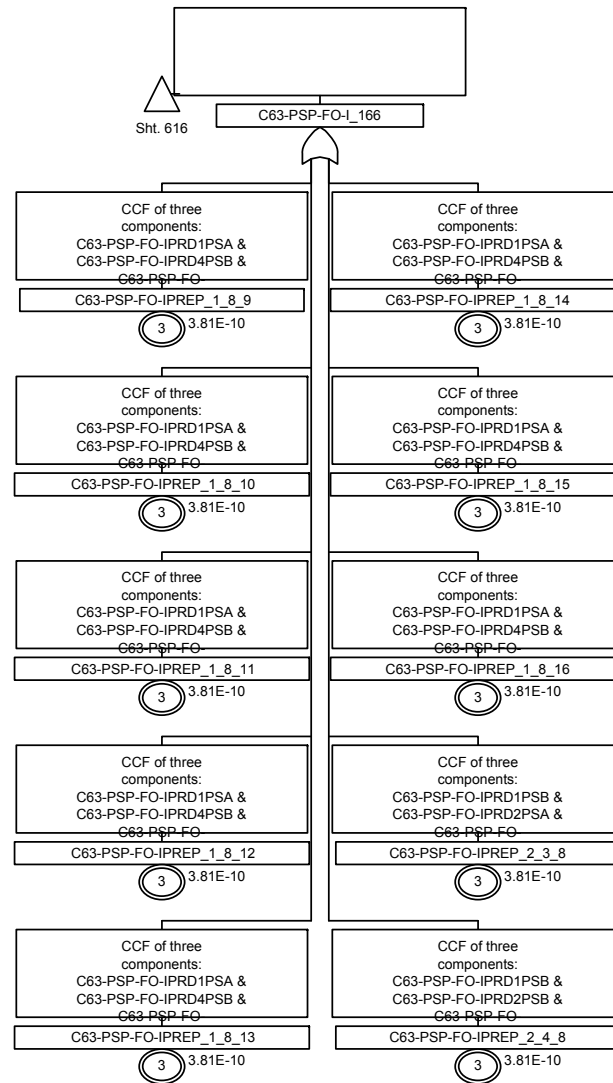


Figure 4.5-3e. Sheet 623 Independent Control Platforms

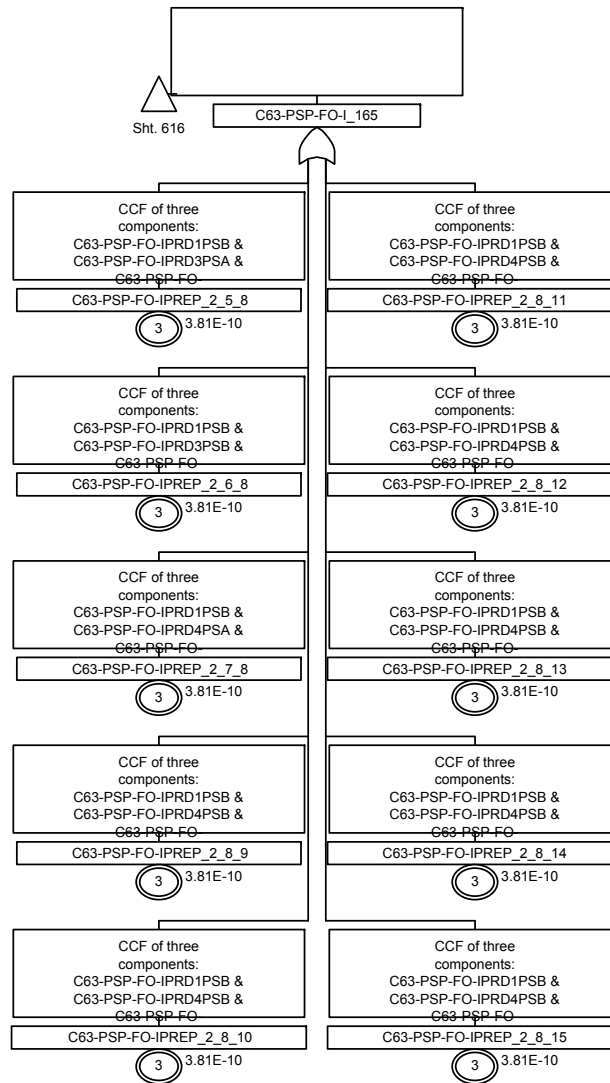


Figure 4.5-3e. Sheet 624 Independent Control Platforms

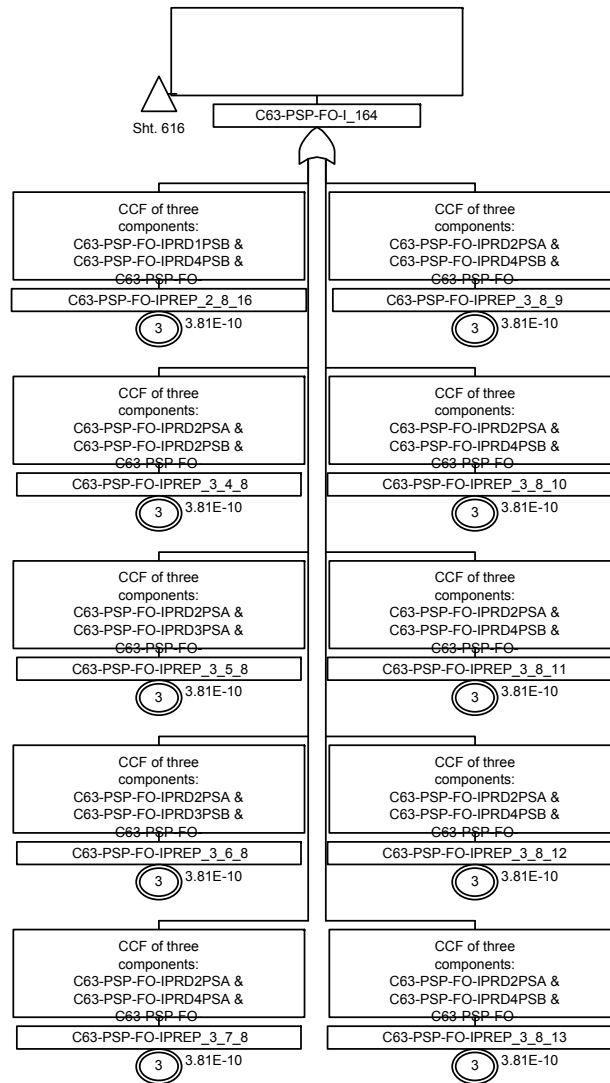


Figure 4.5-3e. Sheet 625 Independent Control Platforms

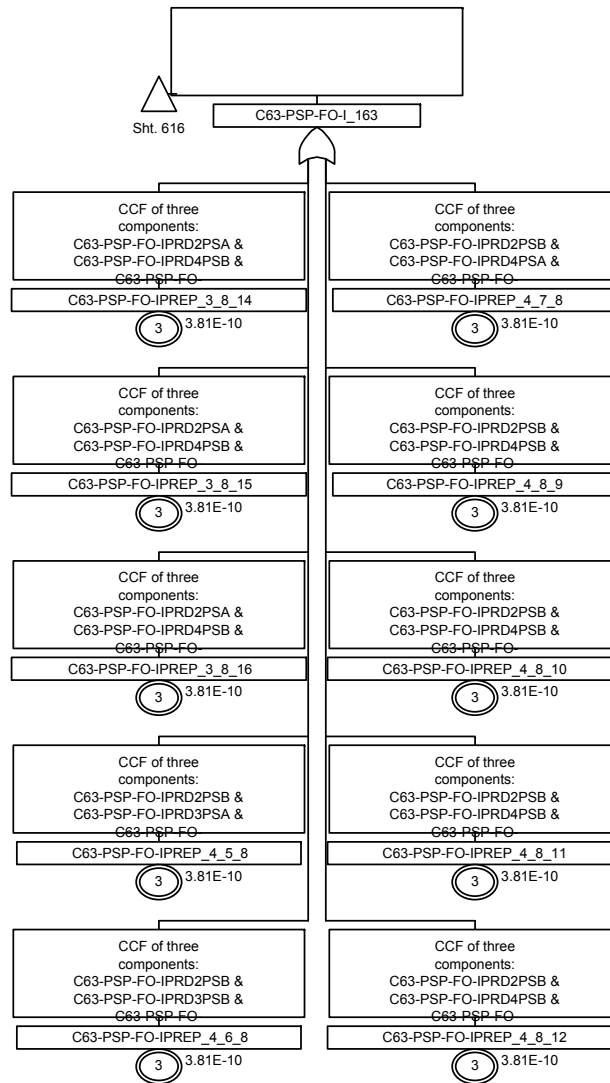


Figure 4.5-3e. Sheet 626 Independent Control Platforms



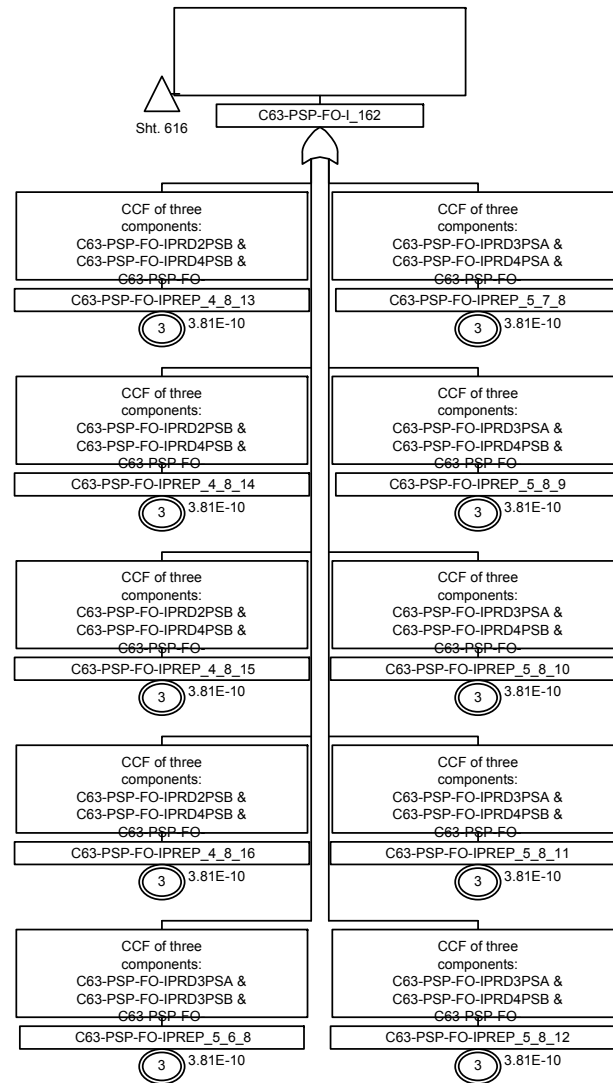


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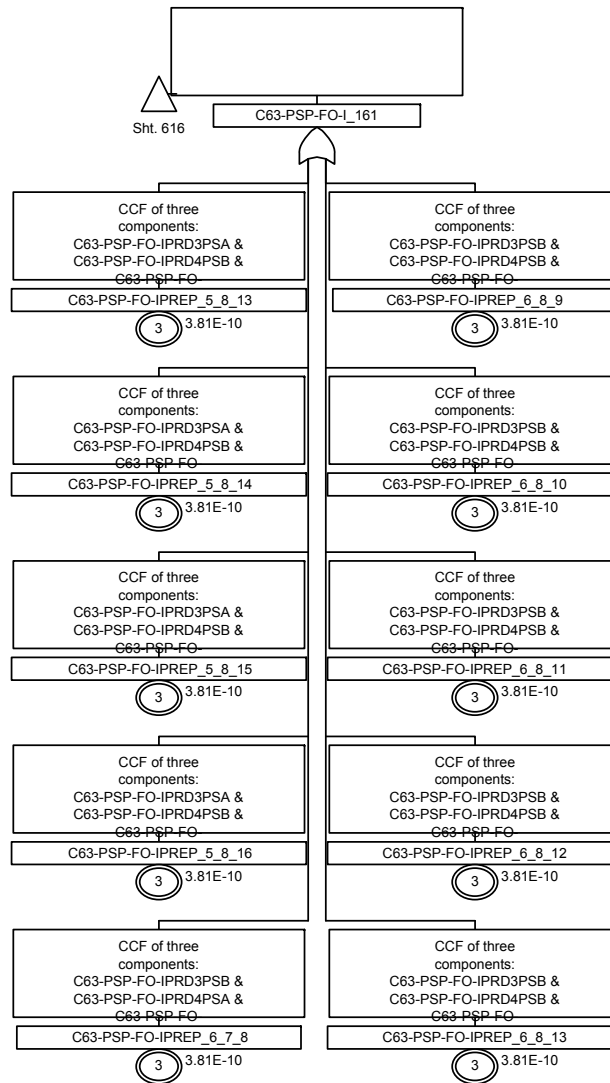


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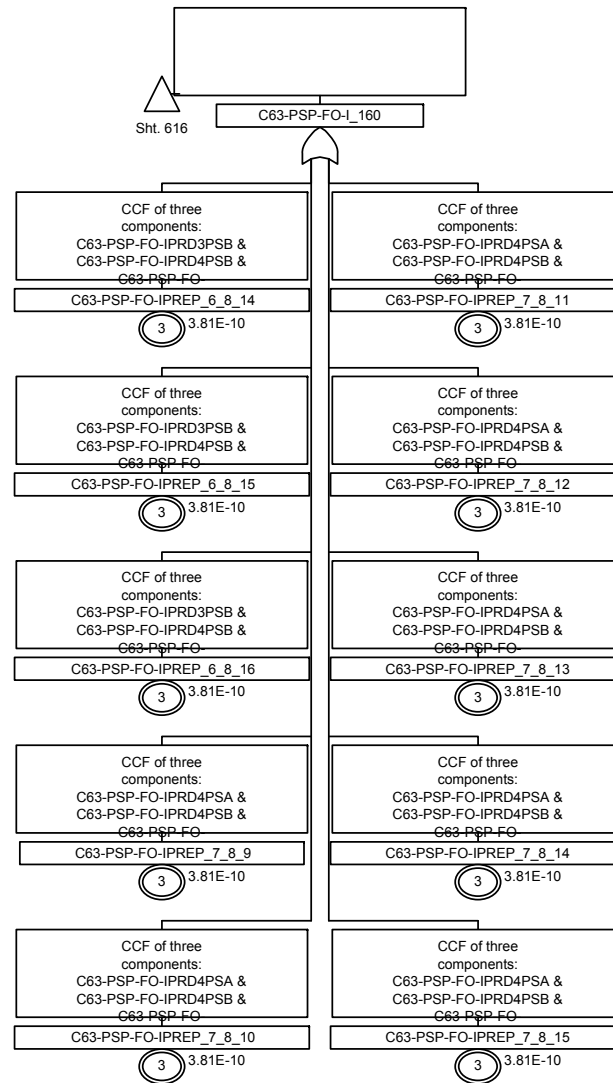


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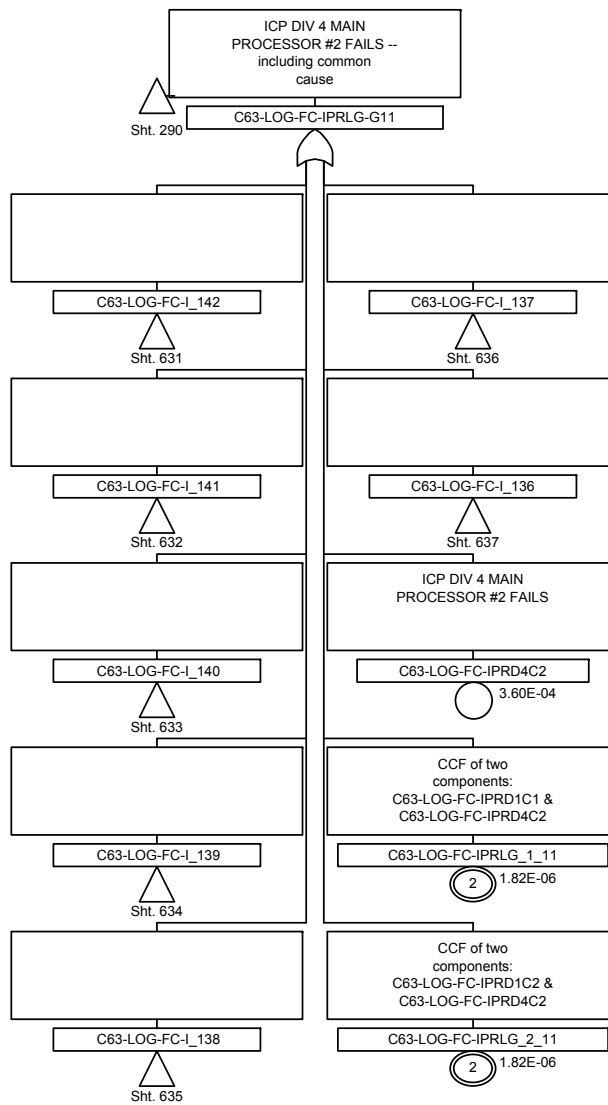


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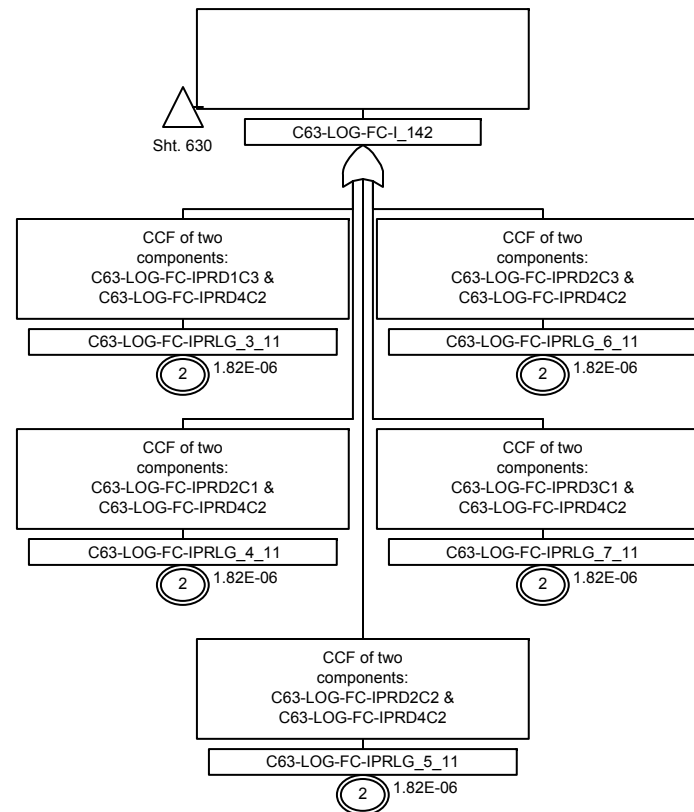


Figure 4.5-3e. Sheet 631 Independent Control Platforms

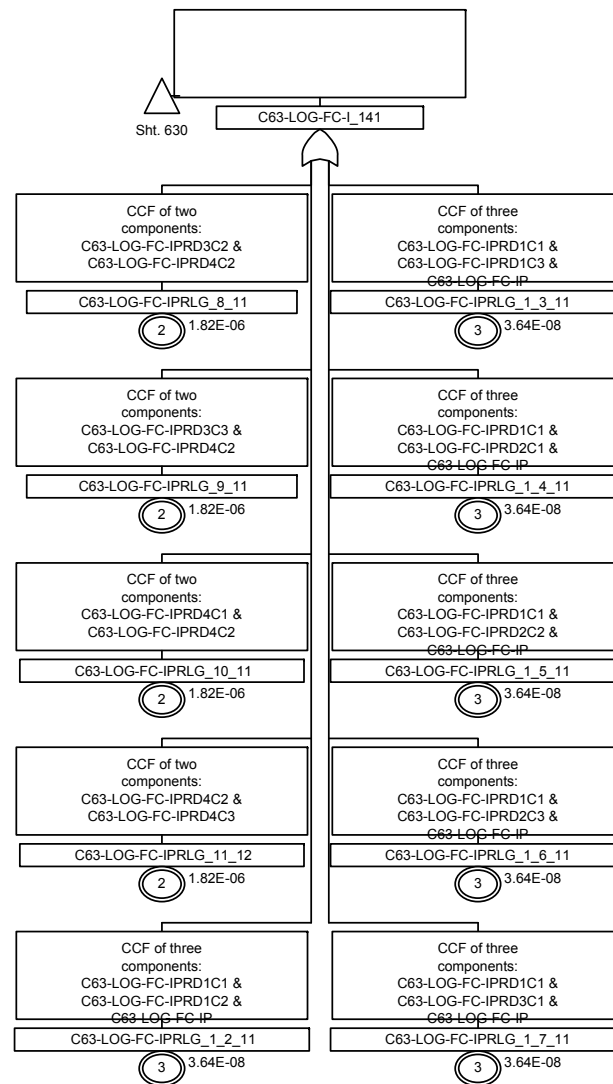


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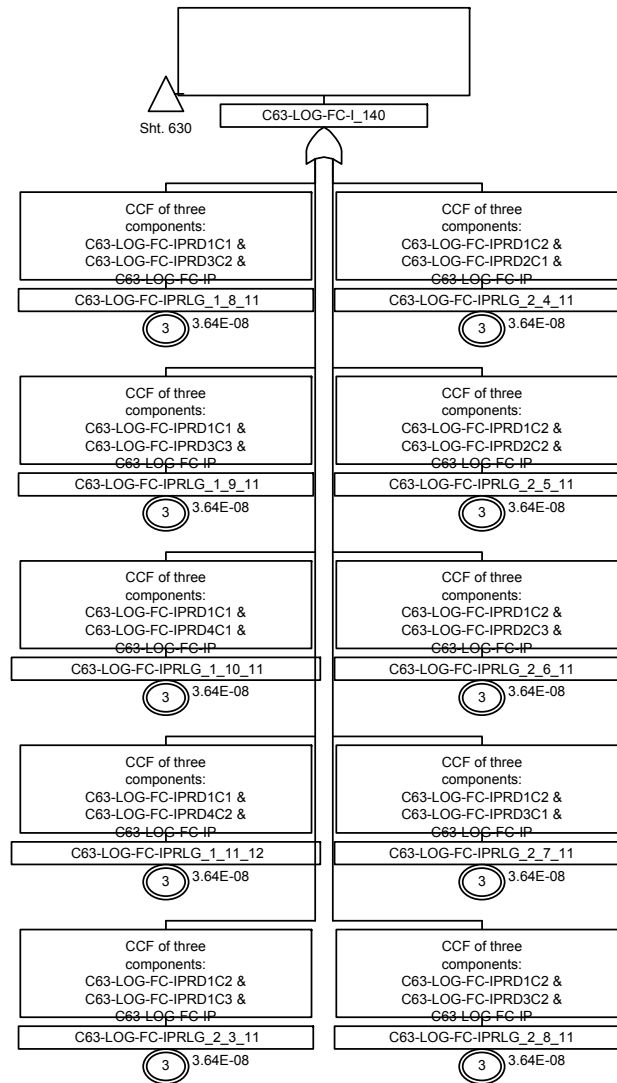


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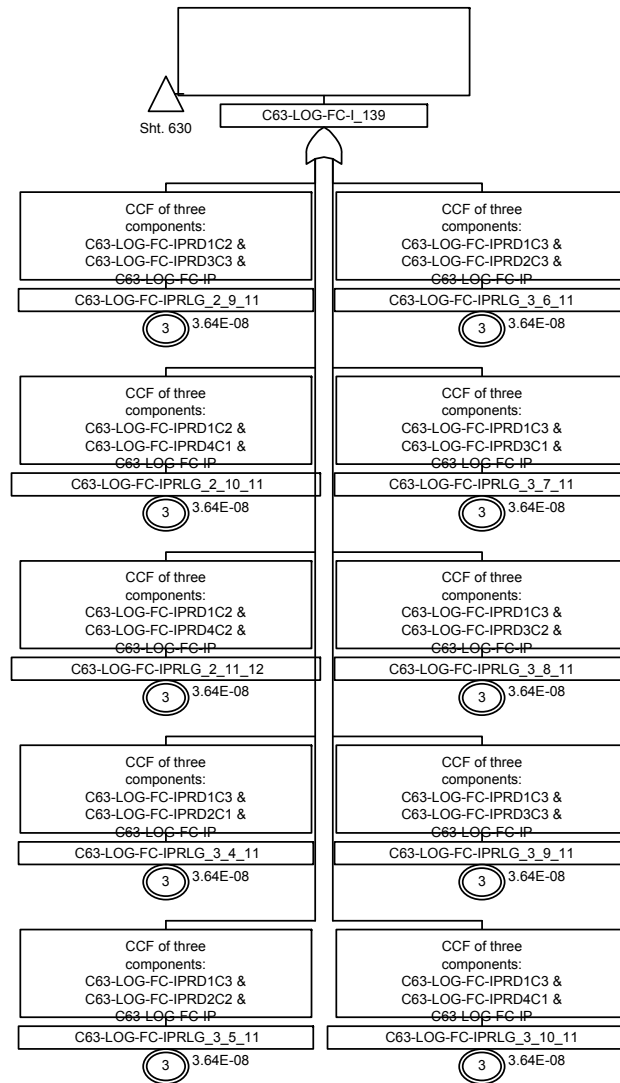


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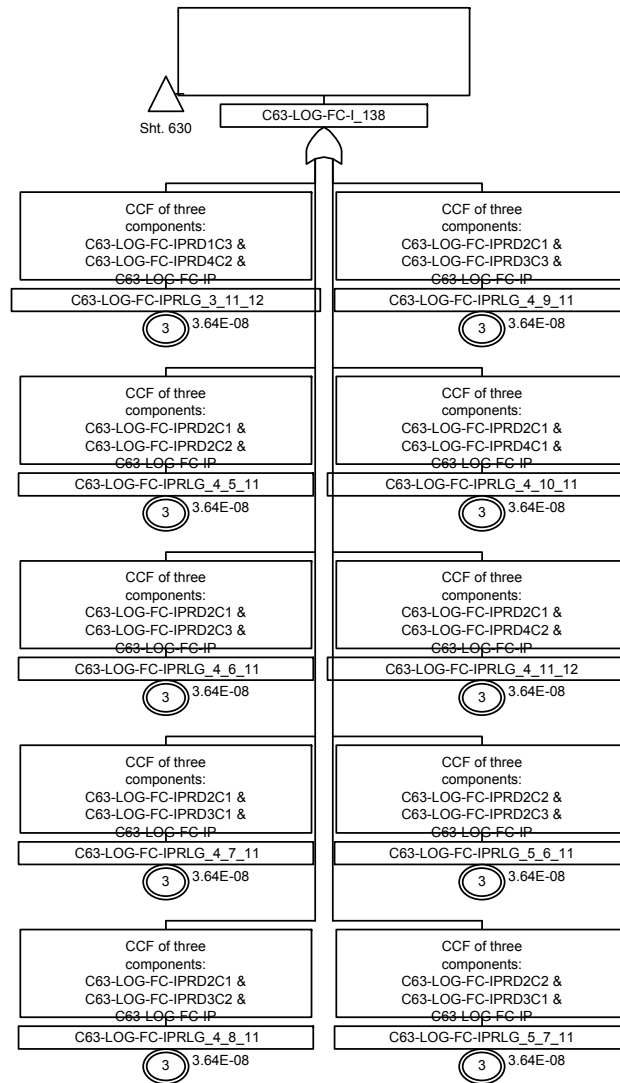


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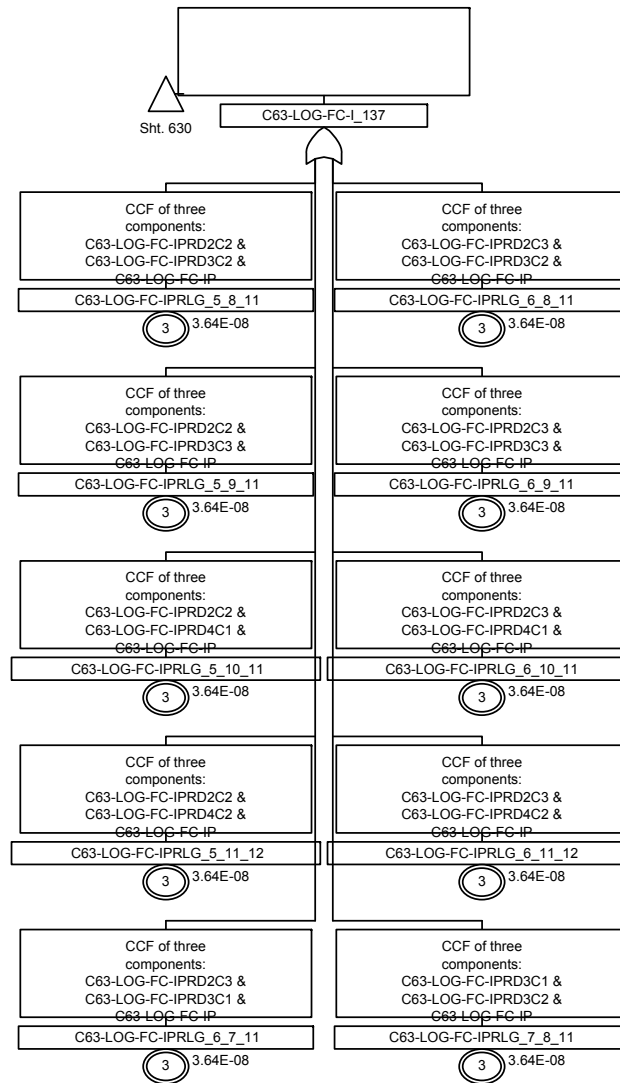


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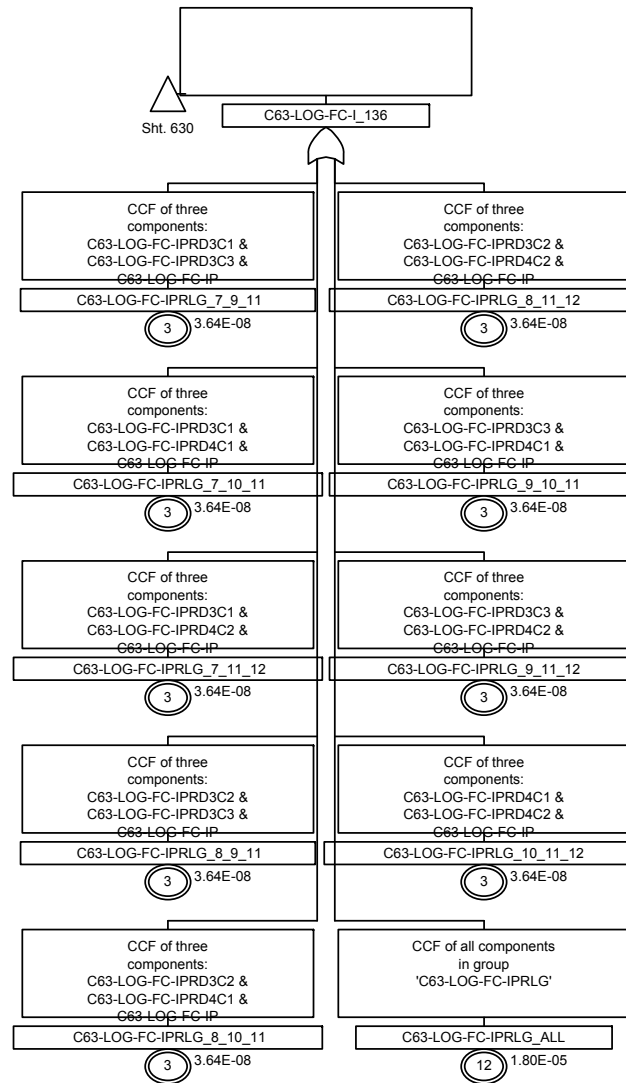


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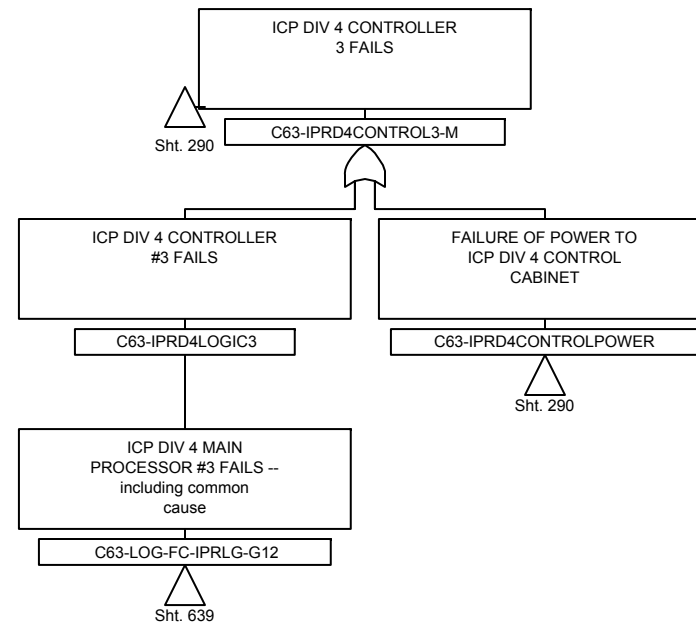


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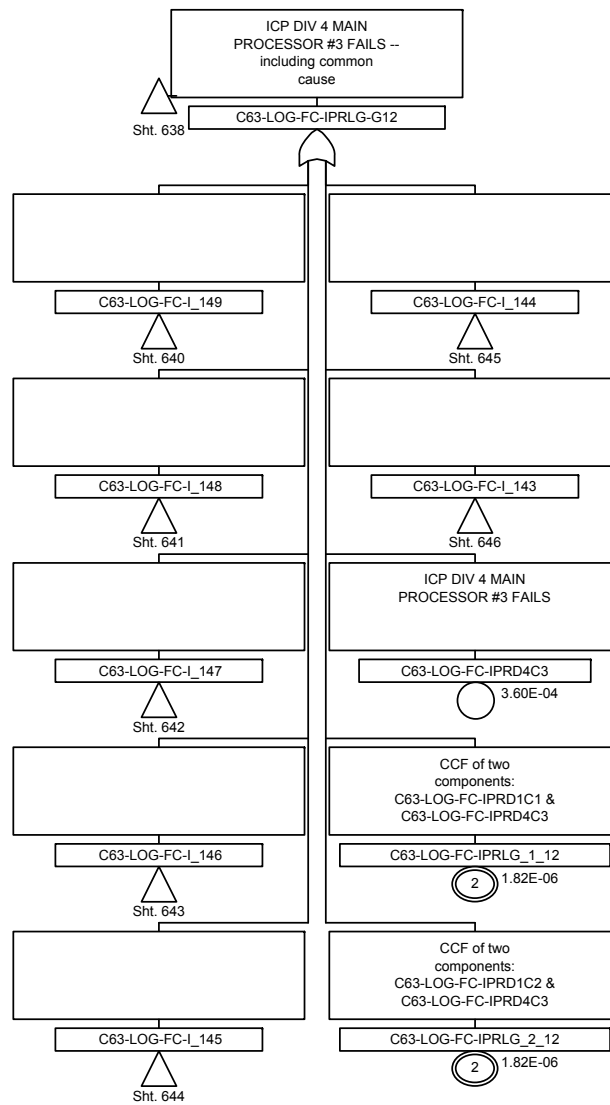


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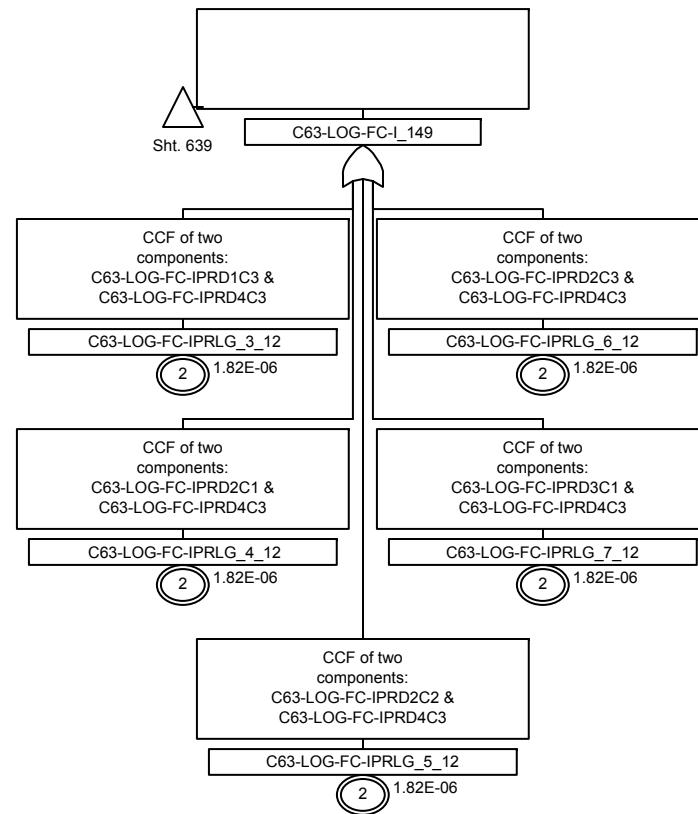


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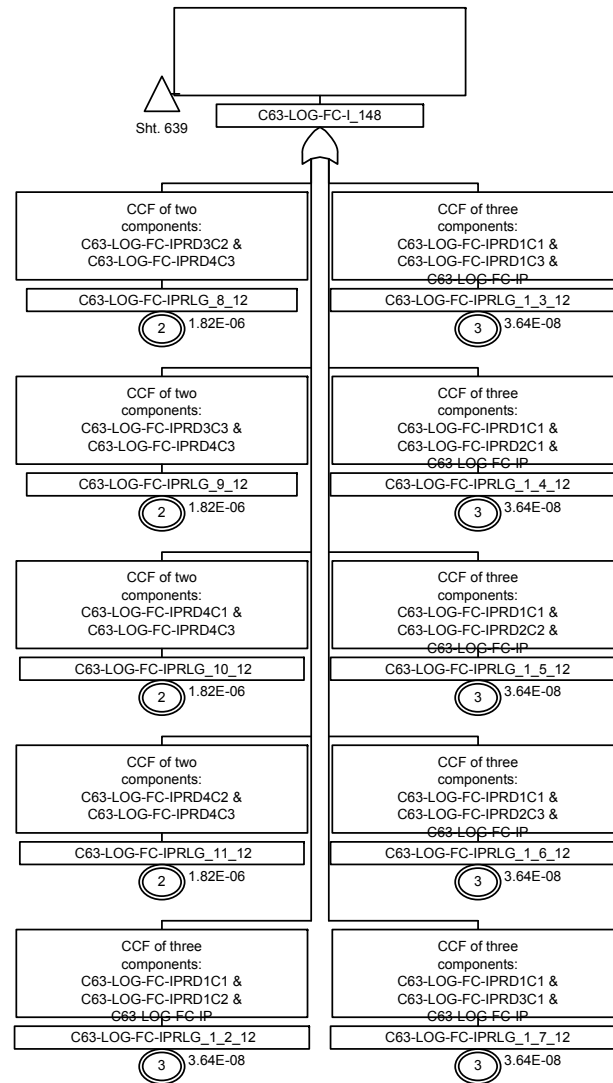


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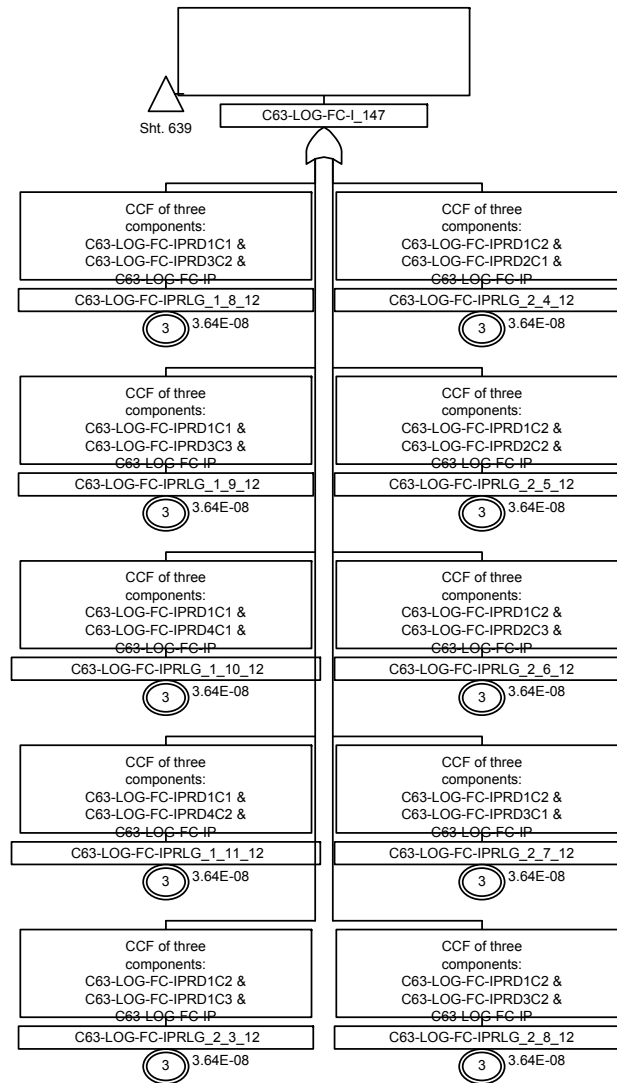


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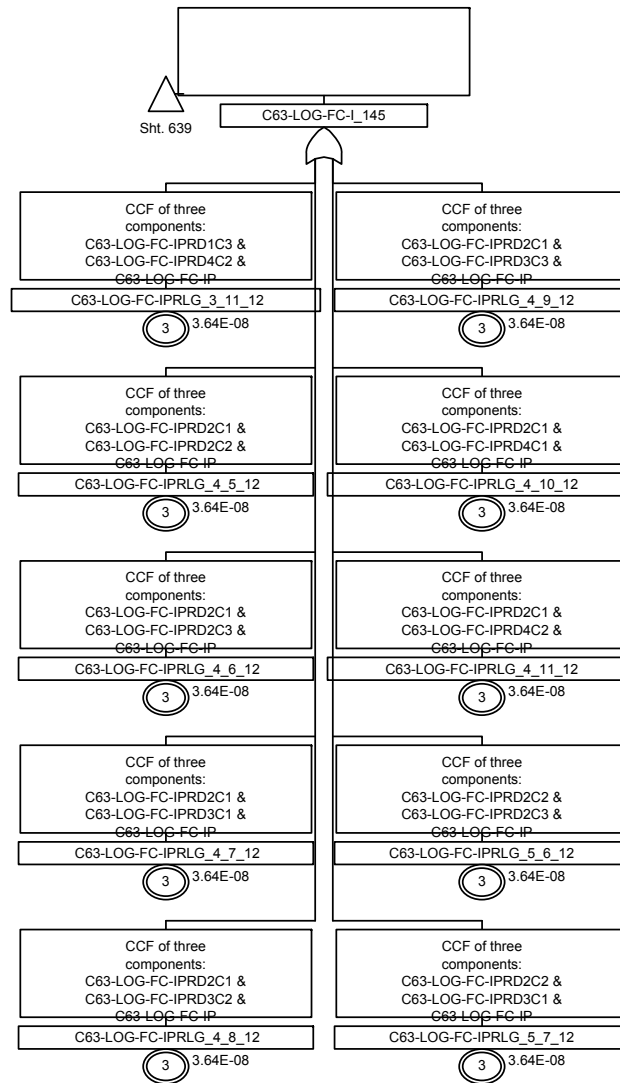


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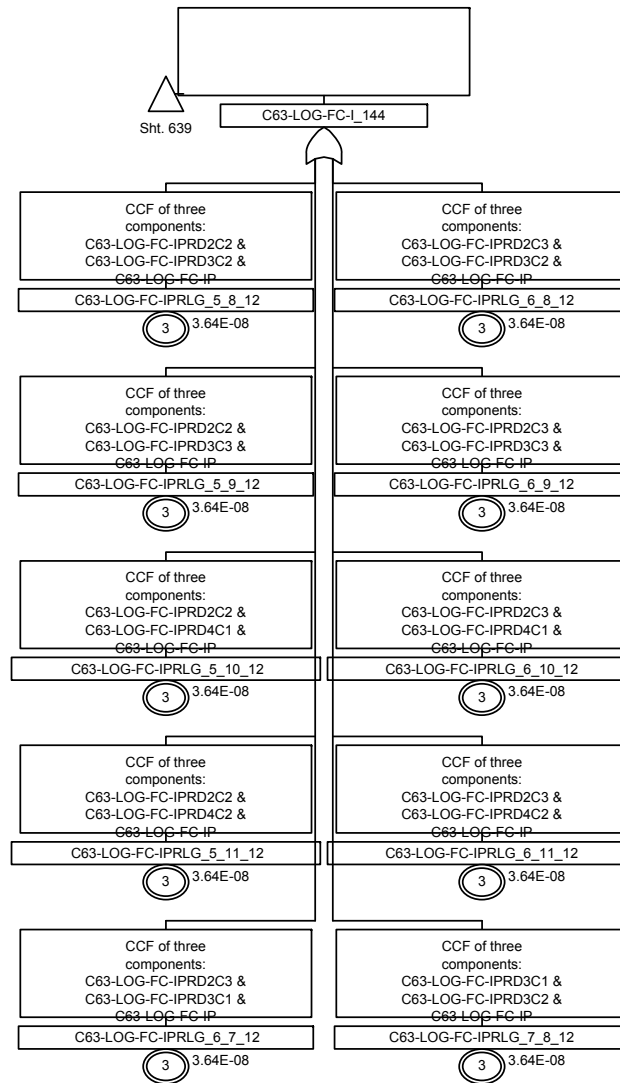


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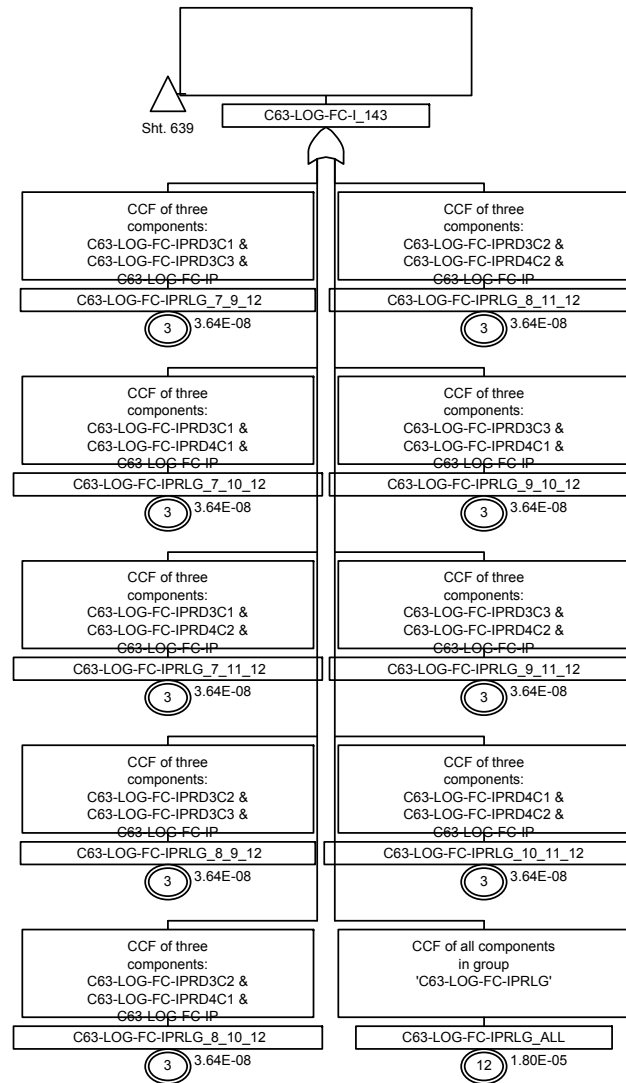


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