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Subject:     **Transmittal of LTR NEDO-33411, "Risk Significance of Structures, Systems and Components for the Design Phase of the ESBWR," Revision 1**

The purpose of this letter is to transmit GE Hitachi Nuclear Energy (GEH) Licensing Topical Report (LTR) NEDO-33411, Revision 1 "Risk Significance of Structures, Systems and Components for the Design Phase of the ESBWR," dated July 2009 (Enclosure 1). This LTR determines the structures, systems and components that are considered risk significant in the design phase of the ESBWR.

Enclosure 2 is the list of changes from Revision 0 to Revision 1 and Enclosure 3 is a roadmap of these changes.

If you have any questions or require additional information, please contact me.

Sincerely,

*lee F. Dougherty for*

Richard E. Kingston
Vice President, ESBWR Licensing

References:

1. MFN 08-277, *Transmittal of LTR NEDO-33411, "Risk Significance of Structures, Systems and Components for the Design Phase of the ESBWR* , dated March 26,2008

2. *MFN 08-384 ",* Acceptance Of NEDO-33411, "Risk Significance Of Structures, Systems And Components For The Design Phase Of The ESBWR," Revision 0, For Review, dated April 11, 2008.

Enclosures:

1. Licensing Topical Report NEDO-33411, "Risk Significance of Structures, Systems and Components for the Design Phase of the ESBWR," Revision 1, dated July 2009.
2. Change List NEDO-33411 Revision 1 Changes
3. Roadmap for Understanding NEDO-33411 Revision 1 Changes

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**MFN 08-277, Supplement 1**

**Enclosure 1**


**Licensing Topical Report**
**NEDO-33411**
**Risk Significance of Structures, Systems**
**and Components for the**
**Design Phase of the ESBWR**

**Revision 1**
**July 2009**

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# GE-Hitachi Nuclear Energy Americas, LLC

**NEDO-33411**
**Revision 1**
**Class I**
**eDRF Section-0000-0104-2238**
**July, 2009**

**Licensing Topical Report**

## RISK SIGNIFICANCE OF STRUCTURES, SYSTEMS AND COMPONENTS FOR THE DESIGN PHASE OF THE ESBWR

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Gary Miller

# Legal Notice

The information contained in this document is furnished as reference to the NRC Staff for the purpose of obtaining NRC approval of the ESBWR Certification and implementation. The only undertakings of GE-Hitachi Nuclear Energy (GEH) with respect to information in this document are contained in contracts between GEH and participating utilities, and nothing contained in this document shall be construed as changing those contracts. The use of this information by anyone other than that for which it is intended is not authorized; and with respect to any unauthorized use, GEH makes no representation or warranty, and assumes no liability as to the completeness, accuracy, or usefulness of the information contained in this document.

# Acknowledgments

This document is the result of technical contributions of many individuals and organizations in addition to the principal author of this document. Many individuals also contributed by providing the initial concept and continuous comments, suggestions, and guidance. The following individuals (in alphabetical order) significantly contributed to the development of this document:

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# 1.0   INTRODUCTION

## 1.1   Objective

The objective of this report is to determine the structures, systems and components (SSCs) that are considered risk significant in the design phase of the ESBWR.  The list of these SSCs is required for the Design Phase Reliability Assurance Program, described in DCD Tier 2, Section 17.4.

## 1.2   Scope

The scope of this assessment is in accordance with Phase I of the Reliability Assurance Program, as described in DCD Tier 2, Section 17.4 and NEDO-33289.  A blended approach is used for identifying and prioritizing risk significant SSCs.  The analysis is comprehensive because it is based on operating and shutdown conditions for internal and external events resulting in core damage and large radiological releases to the environment.  Risk significance is defined relative to the importance of SSCs to core damage frequency (CDF) and large release frequency (LRF), and is defined qualitatively for seismic risk based on the Seismic Margins Analysis.  Although the qualitatively-derived SSCs do not have specific reliability values, they are retained in the Reliability Assurance Program because reliability performance monitoring can be accomplished without the need for statistically verifying reliability values.

Review of operating experience from currently operating reactors is also in the scope of this assessment as it applies to identifying additional initiating events or operator errors that may have a significant effect on the Probabilistic Risk Assessment (PRA) results.

The sources of information for this assessment are the PRA models for at-power and shutdown; Seismic Margins Analysis; DCD Tier 2, Chapter 19, Table 19.2-3, "PRA Insights and Assumptions;" NEDO-33201 Section 2.0, "Initiating Events"; Operating Experience Reports – INPO Databases; and DCD Tier 2 Chapter 19 Appendix A, "Regulatory Treatment of Non-Safety Systems."

# 2.0    RISK SIGNIFICANCE METHODOLOGY

This report identifies the SSCs that are considered risk significant in the ESBWR design phase. As illustrated in Figure 1, the methodology for determining risk significance relies on several factors to provide a comprehensive assessment. In addition to the quantitative results from each PRA model that are evaluated relative to risk significant thresholds, several qualitative factors are considered. This includes the focused analyses that are performed to identify Regulatory Treatment of Non Safety Systems (RTNSS) SSCs. The insights from the Seismic Margins Analysis are considered for risk significance. The key insights from the PRA and industry operating experience are also evaluated to identify SSCs that should be risk significant. This compilation of information is evaluated by an expert panel to validate the results. The steps in the identification process are described below.

## 2.1    Risk Significant Thresholds

The comprehensive PRA model results (at-power and shutdown; internal, fire, flooding, high winds; CDF and LRF) are compared to the threshold values of Fussell-Vesely (F-V) and Risk Achievement Worth (RAW) importance. These results are based on NEDO-33201 Revision 4. The common industry practice is to apply recommended thresholds for plants with CDFs in the 1E-4/yr to 1E-6/yr range (F-V greater than or equal to 0.005 at the component level, 0.05 at the system level, and RAW greater than or equal to 2.0). However, this practice does not apply to plants with significantly lower CDF and LRF values. Instead, the criteria for defining risk significance should be a function of the baseline CDF and LRF. For the purpose of this study, the method described in NEDO-33201 Subsection 17.1.2 is used to apply the following thresholds for identifying potentially risk significant basic events:

- F-V greater than or equal to 0.01
- RAW greater than or equal to 5.0 for individual events
- RAW greater than or equal to 50 for common cause failures

In addition, F-V values for basic events representing the same component are summed and then compared to the threshold. Basic events that do not meet the threshold values are considered not risk significant. The issue of identifying the appropriate numerical range of risk significance continues to be examined and, as such, is subject to refinement as more experience is gathered in this area.

## 2.1.1    Identifying Applicable SSCs

Applying these risk significance thresholds to the PRA results yields the basic events in Table 1 that are used to determine the final list of risk significant SSCs. Each basic event is evaluated to identify the specific SSCs that it represents. Some SSCs have a higher importance for one train than the other because of PRA modeling conventions. For example, if the PRA model assumes that train A is always operating and train B is in standby, then the risk significance will be different between the two trains because failure to start is only modeled on the standby train. In these cases, the identical SSCs are treated with the same, highest risk significant value.

Human error basic events are evaluated to identify failure modes of SSCs that might be implicitly assumed in the failure probabilities. These SSCs are then evaluated to determine if

they play a significant role in the failure mode for basic events meeting the risk thresholds. If the human error failure probability is not affected by the associated SSCs, then the event is not in scope because applying reliability assurance would have no benefit. For example, valve mispositioning errors are not dependent upon the valve condition. In some cases, mispositioning errors may be caused by valve conditions such as a broken valve position indicator. For the purpose of this assessment, these are not considered to be risk significant.

Initiating events are also evaluated to identify failure modes of SSCs that might be implicitly assumed in the failure probabilities. These SSCs are then evaluated to determine if they play a significant role in the failure mode for basic events meeting the F-V threshold. The RAW value measures the increase in risk if a basic event failure probability is taken to 1.0, and thus does not apply to initiating event frequencies.

If a basic event is found to be not risk significant, it is deleted from the list with a justification in Table 4. For example, the PRA model includes low probability component failures, such as tank ruptures, in some sequences to account for losses of water inventory or flooding. These vented tanks are inherently reliable, and are inspected and maintained through appropriate programs for monitoring piping and pressure vessels. Because they have prescribed levels of monitoring and their failure probabilities are low, they are considered not risk significant.

### 2.1.2    Evaluating Undeveloped Events

The design phase PRA model uses undeveloped basic events to provide high-level functional information for SSCs that do not yet have design details available. As such, these undeveloped events often represent more than a single component and their importance values are therefore not consistent with the other basic events. Undeveloped events will initially be evaluated against the single failure risk importance thresholds for RAW and F-V to ensure that all potentially significant events are identified. Once identified, the undeveloped events are evaluated on a case-by-case basis to determine risk significance. For example, undeveloped events that require multiple failures may be measured against the CCF risk significance thresholds. The most updated design information will be used by the expert panel to make the final risk significance determination.

### 2.2    Seismic Margins Analysis

The Seismic Margins Analysis results are detailed in NEDO-33201 Section 15. The SSCs in Table 2 are considered significant in the SMA and are based on deterministic criteria identifying SSCs that must maintain a high confidence low probability of failure (HCLPF) to withstand a safe shutdown earthquake. Due to lack of numerical results to compare against risk thresholds, components requiring a HCLPF value in the SMA are conservatively included as risk significant, except for piping and tanks, which are passive in nature and are inspected and tested in accordance with ASME requirements.

### 2.3    Regulatory Treatment of Non Safety Systems

Two of the RTNSS criteria, described in DCD Tier 2, Chapter 19, Appendix A, are based on probabilistic criteria. Criterion C pertains to SSC functions relied upon under power-operating and shutdown conditions to meet the NRC safety goal guidelines of a CDF of less than 1.0E-4/year and LRF of less than 1.0E-6/year. Criterion D pertains to SSC functions needed to meet the containment performance goal, including containment bypass, during severe accidents.

For the purpose of this report, SSCs meeting RTNSS Criterion C or D are considered risk significant. Table 3 is a list of RTNSS Criteria C and D systems and functions, based on NEDO-33201 Revision 4, and applicable SSCs. Several SSCs are listed at the train level because design details are not available. In these cases, the components that fulfill the RTNSS functions will be RTNSS (and risk significant) components.

## 2.4    PRA and Severe Accident Insights

These risk insights and assumptions are provided in DCD Tier 2 Chapter 19, Table 19.2-3. They are qualitative attributes that describe important aspects of the PRA model and severe accident analysis. They are evaluated by the Expert Panel to identify failure modes of SSCs that might be implicit within the insight or assumption, and thus should be considered risk significant.

## 2.5    Operating Experience

Operating experience is collected from the INPO Operating experience databases to determine if there are SSCs that are not modeled explicitly, but could contribute significantly to either initiating a core damage event, or causing an adverse operator interaction at an ESBWR. A collection of relevant operating experience is evaluated by the Expert Panel to identify failure modes or human errors that could produce risk significant results.

## 2.6    Expert Panel Process

An expert panel is assembled to assess the collective information for this analysis. The team members have experience in the areas of operations, engineering, and PRA and have been selected to provide a thorough review of the analysis.

The Expert Panel uses their collective experience to evaluate information from the inputs described in Sections 2.1 through 2.5. In addition, SSCs that are initially determined to not be risk significant are re-evaluated by the Expert Panel from an overview perspective. The Expert Panel reaches consensus on the outcome of the inputs as either risk significant, or not risk significant with a justification provided. The findings and conclusions are presented in Section 3 below.

# 3.0   EXPERT PANEL REVIEW

## 3.1   Review Findings

The Expert Panel assessed the potentially risk significant basic events for reasonableness and completeness in accordance with the process described in this report.  The major findings and discussions are presented below.

### 3.1.1   PRA Review

The panel reviewed the descriptions in NEDO-33201 Section 2 on initiating events, and identified a discussion where the failure of one ICS valve from the lower vent header to the suppression pool produces a small LOCA.  This failure is included in the small LOCA initiating event frequency calculation.  However, upon review of the current design of the ICS vent line it was determined that there are two valves in series that must fail, therefore, the lower vent valves are not considered risk significant.

The panel concurred with assigning Seismic Margins SSCs that require a HCLPF, and RTNSS Criterion C and D SSCs as risk significant.

The panel reviewed DCD Tier 2 Chapter 19, Table 19.2-3, "Risk Insights and Assumptions," which is the list of the significant PRA insights and assumptions that support the quantified results.  The PRA insights contain some assumptions that are related to the reliability of specific SSCs.  It is assumed that the doors that connect the Control Building and the Reactor Building with the Electrical Building galleries are watertight.  These barriers are required to be watertight in the design specifications.  Failure of one of these doors during an internal flooding event in the Reactor or Control Building could lead to equipment damage in multiple divisions of mitigation equipment.  These doors are not risk significant from a numerical result because the flooding frequencies for these specific scenarios are low.  However, it is uncertain whether sufficient controls will be imposed upon the closure of these doors during shutdown conditions, when there is a lot of maintenance activity associated with an outage.  Therefore, these doors are considered Risk Significant, as shown in Table 6.

Another potential flooding concern is the automatic tripping of the Circulating Water Pumps upon detection of high water level in the condenser pit.  It is uncertain whether the design of the water level detection and trip circuitry will have sufficient reliability because it is a balance-of-plant function.  The panel decided that it would be premature at this stage of the design to assume that this circuitry is risk significant and the probability of a catastrophic circulating water pipe break in the Turbine Building is sufficiently low that the likelihood of detection and isolation appears to be acceptable.

### 3.1.2   Operating Experience Review

The INPO Operating Experience databases were searched to identify potentially significant SSCs or conditions that have not already been considered in the ESBWR design.  The scope of the search was focused on events causing scrams because they would have the most direct impact on the ESBWR.  Events involving failure of Feedwater flow control were evaluated because of their

potential for affecting an initiating event or a reactivity control event for the ESBWR. The panel determined that the reliability of the feedwater controls is sufficient such that no additional SSCs from this system should be considered risk significant. Plant scram operating experience was also reviewed and the events were appropriately captured within the initiating events analysis of NEDO-33201 Section 2.0.

## 3.2 Expert Panel Conclusions

The team reviewed the list of potentially risk significant basic events in Table 1 and the items that were evaluated as not risk significant in Table 4 and found the results to be reasonable. The team evaluated initiating events with high importance and found no additional SSC failures that should be considered risk significant.

The review of the PRA risk insights and assumptions determined that the doors between the Control Building and Reactor Building should be added to Table 6 based on their importance in separation during internal flooding events. Industry operating experience events were reviewed and it was determined that the current PRA model and results contain a reasonable accounting for likely initiating events and operator actions that have played a role in events at currently operating plants. In addition, basic events representing operator actions were reviewed by the team to determine if any significant SSCs were implicitly assumed but not implicitly modeled. The team determined that the PRA models were reasonable in this respect, and no additional risk significant SSCs were included.

The conclusion of the panel is that Table 6 contains a reasonable summary of SSCs that have risk significance for the design phase of the ESBWR.

## 4.0    ESBWR DESIGN PHASE RISK SIGNIFICANT SSCS

A blended approach is used for identifying and prioritizing risk significant SSCs.  The analysis considers at-power and shutdown modes of operation for internal and external events, including a seismic margins analysis.  Review of RTNSS findings; PRA and severe accident insights; as well as operating experience from currently operating reactors is used to identify additional initiating events or operator errors that have a significant effect on the PRA results.  Table 6 provides the final list of risk significant SSCs.

## 5.0　REFERENCES

1.  GE Hitachi Nuclear Energy, "ESBWR Probabilistic Risk Assessment," NEDO-33201, Revision 4, June 2009.

2.  GE Hitachi Nuclear Energy, "ESBWR Reliability Assurance Program," NEDO-33289, Revision 1, December 2007.

3.  26A6642BN, ESBWR Design Control Document Tier 2.

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B21-ACV-OC-F111A | AIR-TESTABLE CHECK VALVE  F111A FAILS TO REMAIN OPEN | Feedwater Line A,B Check Valves |
| B21-ACV-OC-F111B | AIR-TESTABLE CHECK VALVE  F111B FAILS TO REMAIN OPEN | Feedwater Line A,B Check Valves |
| B21-SQV-CC_1_2_3 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004C | Depressurization Valves |
| B21-SQV-CC_1_2_4 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004D | Depressurization Valves |
| B21-SQV-CC_1_2_5 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_1_2_6 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004B & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_1_3_4 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004D | Depressurization Valves |
| B21-SQV-CC_1_3_5 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_1_3_6 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004C & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_1_4_5 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004D & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_1_4_6 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004D & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_1_5 | CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_1_5_6 | CCF of three components: B21-SQV-CC-F004A & B21-SQV-CC-F004E & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_1_6 | CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_1_7 | CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004G | Depressurization Valves |
| B21-SQV-CC_1_8 | CCF of two components: B21-SQV-CC-F004A & B21-SQV-CC-F004H | Depressurization Valves |
| B21-SQV-CC_2_3_4 | CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004D | Depressurization Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B21-SQV-CC_2_3_5 | CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_2_3_6 | CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004C & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_2_4_5 | CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004D & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_2_4_6 | CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004D & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_2_5 | CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_2_5_6 | CCF of three components: B21-SQV-CC-F004B & B21-SQV-CC-F004E & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_2_6 | CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_2_7 | CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004G | Depressurization Valves |
| B21-SQV-CC_2_8 | CCF of two components: B21-SQV-CC-F004B & B21-SQV-CC-F004H | Depressurization Valves |
| B21-SQV-CC_3_4_5 | CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_3_4_6 | CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004D & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_3_5 | CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_3_5_6 | CCF of three components: B21-SQV-CC-F004C & B21-SQV-CC-F004E & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_3_6 | CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_3_7 | CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004G | Depressurization Valves |
| B21-SQV-CC_3_8 | CCF of two components: B21-SQV-CC-F004C & B21-SQV-CC-F004H | Depressurization Valves |
| B21-SQV-CC_4_5 | CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004E | Depressurization Valves |
| B21-SQV-CC_4_5_6 | CCF of three components: B21-SQV-CC-F004D & B21-SQV-CC-F004E & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_4_6 | CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004F | Depressurization Valves |
| B21-SQV-CC_4_7 | CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004G | Depressurization Valves |
| B21-SQV-CC_4_8 | CCF of two components: B21-SQV-CC-F004D & B21-SQV-CC-F004H | Depressurization Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B21-SQV-CC_ALL | CCF of all components in group 'B21-SQV-CC' | Depressurization Valves |
| B21-SQV-CC-F004A | EXPLOSIVE VALVE DPV F004A FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004B | EXPLOSIVE VALVE DPV B FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004C | EXPLOSIVE VALVE DPV C FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004D | EXPLOSIVE VALVE DPV D FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004E | EXPLOSIVE VALVE DPV E FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004F | EXPLOSIVE VALVE DPV F FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004G | EXPLOSIVE VALVE DPV G FAILS TO OPERATE | Depressurization Valves |
| B21-SQV-CC-F004H | EXPLOSIVE VALVE DPV H FAILS TO OPERATE | Depressurization Valves |
| B21-SRV-OO-ANYSRV1 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV10 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV11 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV12 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV13 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV14 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV15 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV16 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV17 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV18 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV2 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV3 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV4 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV5 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV6 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV7 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV8 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |
| B21-SRV-OO-ANYSRV9 | SAFETY/RELIEF VALVE  FAILS TO RE-CLOSE | Safety Relief Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B21-UV_-CC-F102_1_2 | CCF of two components: B21-UV_-CC-F102A & B21-UV_-CC-F102B | Feedwater Line A,B Check Valves |
| B21-UV_-CC-F102A | CHECK VALVE  F102A FAILS TO OPEN | Feedwater Line A,B Check Valves |
| B21-UV_-CC-F102B | CHECK VALVE  F102B FAILS TO OPEN | Feedwater Line A,B Check Valves |
| B21-UV_-CC-F111_1_2 | CCF of two components: B21-UV_-CC-F111A & B21-UV_-CC-F111B | Feedwater Line A,B Check Valves |
| B21-UV_-CC-F111A | CHECK VALVE  F111A FAILS TO OPEN | Feedwater Line A,B Check Valves |
| B21-UV_-CC-F111B | CHECK VALVE  F111B FAILS TO OPEN | Feedwater Line A,B Check Valves |
| B21-UV_-OC-F102A | CHECK VALVE  F102A FAILS TO REMAIN OPEN | Feedwater Line A,B Check Valves |
| B21-UV_-OC-F102B | CHECK VALVE  F102B FAILS TO REMAIN OPEN | Feedwater Line A,B Check Valves |
| B32-ACC-FO-A105A | Nitrogen or Air Accumulator Fails | N2 Accumulators for IC/PCCS Pool Valves |
| B32-ACC-FO-A105B | Nitrogen or Air Accumulator Fails | N2 Accumulators for IC/PCCS Pool Valves |
| B32-HOV-OC-F001A | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Steam Line Isolation Valves |
| B32-HOV-OC-F001B | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Steam Line Isolation Valves |
| B32-HOV-OC-F001C | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Steam Line Isolation Valves |
| B32-HOV-OC-F001D | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Steam Line Isolation Valves |
| B32-HOV-OC-F004A | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Condensate Return Valves |
| B32-HOV-OC-F004B | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Condensate Return Valves |
| B32-HOV-OC-F004C | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Condensate Return Valves |
| B32-HOV-OC-F004D | ELECTRO-HYDRAULIC VALVE FAILS TO REMAIN OPEN | ICS Condensate Return Valves |
| B32-HX_-PG_1_2 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B | ICS Heat Exchangers |
| B32-HX_-PG_1_2_3 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00 | ICS Heat Exchangers |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-HX_-PG_1_2_4 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_2_5 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_2_6 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_2_7 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_2_8 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_3 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C | ICS Heat Exchangers |
| B32-HX_-PG_1_3_4 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_3_5 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_3_6 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_3_7 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_3_8 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_4 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D | ICS Heat Exchangers |
| B32-HX_-PG_1_4_5 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_4_6 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_4_7 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_4_8 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_5 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A | ICS Heat Exchangers |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-HX_-PG_1_5_6 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_5_7 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_5_8 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_6 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002B | ICS Heat Exchangers |
| B32-HX_-PG_1_6_7 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_6_8 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_7 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002C | ICS Heat Exchangers |
| B32-HX_-PG_1_7_8 | CCF of three components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_1_8 | CCF of two components: B32-HX_-PG-HX001A & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_2_3 | CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C | ICS Heat Exchangers |
| B32-HX_-PG_2_3_4 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_3_5 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_3_6 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_3_7 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_3_8 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_4 | CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D | ICS Heat Exchangers |
| B32-HX_-PG_2_4_5 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_4_6 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-HX_-PG_2_4_7 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_4_8 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_5 | CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A | ICS Heat Exchangers |
| B32-HX_-PG_2_5_6 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_5_7 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_5_8 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_6 | CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002B | ICS Heat Exchangers |
| B32-HX_-PG_2_6_7 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_6_8 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_7 | CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002C | ICS Heat Exchangers |
| B32-HX_-PG_2_7_8 | CCF of three components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_2_8 | CCF of two components: B32-HX_-PG-HX001B & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_3_4 | CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D | ICS Heat Exchangers |
| B32-HX_-PG_3_4_5 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_4_6 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_4_7 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_4_8 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX001D & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_5 | CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A | ICS Heat Exchangers |
| B32-HX_-PG_3_5_6 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-HX_-PG_3_5_7 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_5_8 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_6 | CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002B | ICS Heat Exchangers |
| B32-HX_-PG_3_6_7 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_6_8 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_7 | CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002C | ICS Heat Exchangers |
| B32-HX_-PG_3_7_8 | CCF of three components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_3_8 | CCF of two components: B32-HX_-PG-HX001C & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_4_5 | CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A | ICS Heat Exchangers |
| B32-HX_-PG_4_5_6 | CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_4_5_7 | CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_4_5_8 | CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002A & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_4_6 | CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002B | ICS Heat Exchangers |
| B32-HX_-PG_4_6_7 | CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_4_6_8 | CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_4_7 | CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002C | ICS Heat Exchangers |
| B32-HX_-PG_4_7_8 | CCF of three components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_4_8 | CCF of two components: B32-HX_-PG-HX001D & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_5_6 | CCF of two components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002B | ICS Heat Exchangers |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-HX_-PG_5_6_7 | CCF of three components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_5_6_8 | CCF of three components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002B & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_5_7 | CCF of two components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002C | ICS Heat Exchangers |
| B32-HX_-PG_5_7_8 | CCF of three components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_5_8 | CCF of two components: B32-HX_-PG-HX002A & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_6_7 | CCF of two components: B32-HX_-PG-HX002B & B32-HX_-PG-HX002C | ICS Heat Exchangers |
| B32-HX_-PG_6_7_8 | CCF of three components: B32-HX_-PG-HX002B & B32-HX_-PG-HX002C & B32-HX_-PG-HX00 | ICS Heat Exchangers |
| B32-HX_-PG_6_8 | CCF of two components: B32-HX_-PG-HX002B & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_7_8 | CCF of two components: B32-HX_-PG-HX002C & B32-HX_-PG-HX002D | ICS Heat Exchangers |
| B32-HX_-PG_ALL | CCF of all components in group 'B32-HX_-PG' | ICS Heat Exchangers |
| B32-HX_-PG-HX001A | Heat Exchanger HX001A Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX001B | Heat Exchanger HX001B Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX001C | Heat Exchanger HX001C Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX001D | Heat Exchanger HX001D Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX002A | Heat Exchanger HX002A Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX002B | Heat Exchanger HX002B Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX002C | Heat Exchanger HX002A Plugs | ICS Heat Exchangers |
| B32-HX_-PG-HX002D | Heat Exchanger HX002D Plugs | ICS Heat Exchangers |
| B32-NPO-CC-F105A | F105A Fails to Open | IC/PCCS Pool Valves |
| B32-NPO-CC-F105B | F105B fails to open | IC/PCCS Pool Valves |
| B32-NPO-CC-XCONN_1_2 | CCF of two components: B32-NPO-CC-F105A & B32-NPO-CC-F105B | IC/PCCS Pool Valves |
| B32-NPO-OC-F002A | F002A Spuriously closes | ICS Steam Line Isolation Valves |
| B32-NPO-OC-F002B | F002B Spuriously closes | ICS Steam Line Isolation Valves |
| B32-NPO-OC-F002C | F002C Spuriously closes | ICS Steam Line Isolation Valves |
| B32-NPO-OC-F002D | F002D Spuriously closes | ICS Steam Line Isolation Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-NPO-OC-F003A | F003A Spuriously closes | ICS Condensate Return Valves |
| B32-NPO-OC-F003B | F003B Spuriously closes | ICS Condensate Return Valves |
| B32-NPO-OC-F003C | F003C Spuriously closes | ICS Condensate Return Valves |
| B32-NPO-OC-F003D | F003D Spuriously closes | ICS Condensate Return Valves |
| B32-SOV-FE-09/10_1_2 | CCF of two components: B32-SOV-FE-F009A & B32-SOV-FE-F009B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_2_3 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009B & B32-SOV-FE-F009C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_2_4 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009B & B32-SOV-FE-F009D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_2_5 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009B & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_2_6 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009B & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_2_7 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_2_8 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_3 | CCF of two components: B32-SOV-FE-F009A & B32-SOV-FE-F009C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_3_4 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009C & B32-SOV-FE-F009D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_3_5 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009C & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_3_6 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009C & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_3_7 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009C & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_3_8 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_4 | CCF of two components: B32-SOV-FE-F009A & B32-SOV-FE-F009D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_4_5 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009D & B32-SOV-FE-F010A | ICS Vent Line Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-SOV-FE-09/10_1_4_6 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009D & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_4_7 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009D & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_4_8 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F009D & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_5_6 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F010A & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_5_7 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F010A & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_5_8 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F010A & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_6 | CCF of two components: B32-SOV-FE-F009A & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_6_7 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F010B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_6_8 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F010B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_7 | CCF of two components: B32-SOV-FE-F009A & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_7_8 | CCF of three components: B32-SOV-FE-F009A & B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_1_8 | CCF of two components: B32-SOV-FE-F009A & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_3 | CCF of two components: B32-SOV-FE-F009B & B32-SOV-FE-F009C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_3_4 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009C & B32-SOV-FE-F009D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_3_5 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009C & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_3_6 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009C & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_3_7 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009C & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_3_8 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009C & B32-SOV-FE-F010D | ICS Vent Line Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-SOV-FE-09/10_2_4 | CCF of two components: B32-SOV-FE-F009B & B32-SOV-FE-F009D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_4_5 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009D & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_4_6 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009D & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_4_7 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009D & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_4_8 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F009D & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_5 | CCF of two components: B32-SOV-FE-F009B & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_5_6 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F010A & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_5_7 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F010A & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_5_8 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F010A & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_6_7 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F010B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_6_8 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F010B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_7 | CCF of two components: B32-SOV-FE-F009B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_7_8 | CCF of three components: B32-SOV-FE-F009B & B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_2_8 | CCF of two components: B32-SOV-FE-F009B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_4 | CCF of two components: B32-SOV-FE-F009C & B32-SOV-FE-F009D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_4_5 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F009D & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_4_6 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F009D & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_4_7 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F009D & B32-SOV-FE-F010C | ICS Vent Line Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-SOV-FE-09/10_3_4_8 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F009D & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_5 | CCF of two components: B32-SOV-FE-F009C & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_5_6 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F010A & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_5_7 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F010A & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_5_8 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F010A & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_6 | CCF of two components: B32-SOV-FE-F009C & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_6_7 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F010B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_6_8 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F010B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_7_8 | CCF of three components: B32-SOV-FE-F009C & B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_3_8 | CCF of two components: B32-SOV-FE-F009C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_5 | CCF of two components: B32-SOV-FE-F009D & B32-SOV-FE-F010A | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_5_6 | CCF of three components: B32-SOV-FE-F009D & B32-SOV-FE-F010A & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_5_7 | CCF of three components: B32-SOV-FE-F009D & B32-SOV-FE-F010A & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_5_8 | CCF of three components: B32-SOV-FE-F009D & B32-SOV-FE-F010A & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_6 | CCF of two components: B32-SOV-FE-F009D & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_6_7 | CCF of three components: B32-SOV-FE-F009D & B32-SOV-FE-F010B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_6_8 | CCF of three components: B32-SOV-FE-F009D & B32-SOV-FE-F010B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_7 | CCF of two components: B32-SOV-FE-F009D & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_4_7_8 | CCF of three components: B32-SOV-FE-F009D & B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-SOV-FE-09/10_5_6 | CCF of two components: B32-SOV-FE-F010A & B32-SOV-FE-F010B | ICS Vent Line Valves |
| B32-SOV-FE-09/10_5_6_7 | CCF of three components: B32-SOV-FE-F010A & B32-SOV-FE-F010B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_5_6_8 | CCF of three components: B32-SOV-FE-F010A & B32-SOV-FE-F010B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_5_7 | CCF of two components: B32-SOV-FE-F010A & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_5_7_8 | CCF of three components: B32-SOV-FE-F010A & B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_5_8 | CCF of two components: B32-SOV-FE-F010A & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_6_7 | CCF of two components: B32-SOV-FE-F010B & B32-SOV-FE-F010C | ICS Vent Line Valves |
| B32-SOV-FE-09/10_6_7_8 | CCF of three components: B32-SOV-FE-F010B & B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_6_8 | CCF of two components: B32-SOV-FE-F010B & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_7_8 | CCF of two components: B32-SOV-FE-F010C & B32-SOV-FE-F010D | ICS Vent Line Valves |
| B32-SOV-FE-09/10_ALL | CCF of all components in group 'B32-SOV-FE-09/10' | ICS Vent Line Valves |
| B32-SOV-FE-F009A | F009A fails to open on demand | ICS Vent Line Valves |
| B32-SOV-FE-F009B | SOLENOID VALVE (FAILURE TO ENERGIZE) | ICS Vent Line Valves |
| B32-SOV-FE-F009C | SOLENOID VALVE (FAILURE TO ENERGIZE) | ICS Vent Line Valves |
| B32-SOV-FE-F009D | SOLENOID VALVE (FAILURE TO ENERGIZE) | ICS Vent Line Valves |
| B32-SOV-FE-F010A | F010A fails to open on demand | ICS Vent Line Valves |
| B32-SOV-FE-F010B | SOLENOID VALVE (FAILURE TO ENERGIZE) | ICS Vent Line Valves |
| B32-SOV-FE-F010C | SOLENOID VALVE (FAILURE TO ENERGIZE) | ICS Vent Line Valves |
| B32-SOV-FE-F010D | SOLENOID VALVE (FAILURE TO ENERGIZE) | ICS Vent Line Valves |
| B32-SQV-CC-F104A | F104A FAILS TO OPEN | IC/PCCS Pool Valves |
| B32-SQV-CC-F104B | F104B FAILS TO OPEN | IC/PCCS Pool Valves |
| B32-SQV-CC-XCONN_1_2 | CCF of two components: B32-SQV-CC-F104A & B32-SQV-CC-F104B | IC/PCCS Pool Valves |
| B32-TM-LOOPA-IND | ICS LOOP A IN TEST OR MAINTENANCE BY ITSELF | ICS Loop A |
| B32-TM-LOOPB-IND | ICS LOOP B IN TEST OR MAINTENANCE BY ITSELF | ICS Loop B |
| B32-TM-LOOPC-IND | ICS LOOP C IN TEST OR MAINTENANCE BY ITSELF | ICS Loop C |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| B32-TM-LOOPD-IND | ICS LOOP D IN TEST OR MAINTENANCE BY ITSELF | ICS Loop D |
| B32-UV_-OO-F105A | CHECK VALVE FAILS TO CLOSE | IC/PCCS Pool Valve Accum. Check Valves |
| B32-UV_-OO-F105B | CHECK VALVE FAILS TO CLOSE | IC/PCCS Pool Valve Accum. Check Valves |
| B32-UV_-OO-XCONN-ACC_1_2 | CCF of two components: B32-UV_-OO-F105A & B32-UV_-OO-F105B | IC/PCCS Pool Valve Accum. Check Valves |
| B32-UV_-RL-F105A | CHECK VALVE REVERSE LEAKAGE | IC/PCCS Pool Valve Accum. Check Valves |
| B32-UV_-RL-F105B | CHECK VALVE REVERSE LEAKAGE | IC/PCCS Pool Valve Accum. Check Valves |
| B32-XHE-FO-VENT | OPERATOR FAILS TO OPEN VENT | Vent Valves |
| C11-LOG-FC-CHNLA | LOGIC UNIT FAILS TO FUNCTION | RPS Logic Unit Channel A |
| C11-LOG-FC-CHNLB | LOGIC UNIT FAILS TO FUNCTION | RPS Logic Unit Channel B |
| C12-ACV-CC-SCRV126 | CCF TO OPEN OF AIR OPERATED SCRAM VALVE AOV-126 | Scram Valves to FMCRDs |
| C12-ACV-CO-F012 | AIR OPERATED VALVE F012 FAILS TO REMAIN CLOSED | Purge Water Header Isolation Valves |
| C12-ACV-CO-F030 | AIR OPERATED VALVE F030 FAILS TO REMAIN CLOSED | Charging Water Header Isolation Valves |
| C12-ACV-OO-F012 | AIR OPERATED VALVE F012 FAILS TO CLOSE | Purge Water Header Isolation Valves |
| C12-ACV-OO-F030 | AIR OPERATED VALVE F030 FAILS TO CLOSE | Charging Water Header Isolation Valves |
| C12-BV_-RE-F003B | MISPOSITION OF VALVE F003B | Operator Error CRD Valve F003B |
| C12-BV_-RE-F013A | MISPOSITION OF VALVE F013A | Operator Error CRD Valve F013A |
| C12-BV_-RE-F013B | MISPOSITION OF VALVE F013B | Operator Error CRD Valve F013B |
| C12-BV_-RE-F015A | MISPOSITION OF VALVE F015A | Operator Error CRD Valve F015A |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C12-BV_-RE-F015B | MISPOSITION OF VALVE F015B | Operator Error CRD Valve F015B |
| C12-BV_-RE-F018A | MISPOSITION OF VALVE F018A | Operator Error CRD Valve F018A |
| C12-BV_-RE-F018B | MISPOSITION OF VALVE FO18B | Operator Error CRD Valve F018B |
| C12-BV_-RE-F021A | MISPOSITION OF VALVE F021A | Operator Error CRD Valve F021A |
| C12-BV_-RE-F021B | MISPOSITION OF VALVE F021B | Operator Error CRD Valve F021B |
| C12-BV_-RE-F064 | MISPOSITION OF OPEN VALVE F064 | Operator Error CRD Valve F064 |
| C12-MOV-CC-F023 | MOTOR OPERATED VALVE F023 FAILS TO OPEN | HPCRD Injection Line Isolation Valves |
| C12-MOV-CO-F024 | MOTOR OPERATED VALVE F024 FAILS TO REMAIN CLOSED | CRD Test Return Line Valves |
| C12-MOV-CO-F062A | MOTOR OPERATED VALVE F062A FAILS TO REMAIN CLOSE | CRD Minimum Flow Isolation Valves |
| C12-MOV-CO-F062B | MOTOR OPERATED VALVE F062B FAILS TO REMAIN CLOSED | CRD Minimum Flow Isolation Valves |
| C12-MOV-OC-F023 | MOTOR OPERATED VALVE F023 FAILS TO REMAIN OPEN | HPCRD Injection Line Isolation Valves |
| C12-MOV-OO-F024 | MOTOR OPERATED VALVE F024 FAILS TO CLOSE | CRD Test Return Line Valves |
| C12-MOV-OO-F062A | MOTOR OPERATED VALVE F062A FAILS TO CLOSE | CRD Minimum Flow Isolation Valves |
| C12-MOV-OO-F062B | MOTOR OPERATED VALVE F062B FAILS TO CLOSE | CRD Minimum Flow Isolation Valves |
| C12-ROD-CF-SCRAM | CCF OF CONTROL RODS TO INSERT | Control Rods |
| C12-SOV-FD-SCRV139 | CCF TO OPEN (VENT) 0F SCRAM PILOT SOLENOID VALVES SOV-139 | Scram Pilot Solenoid Valves |
| C12-UV_-CC-F022 | CHECK VALVE F022 FAILS TO OPEN | CRD to RWCU/SDC Check Valves |
| C12-UV_-OC-F022 | CHECK VALVE F022 FAILS TO REMAIN OPEN | CRD to RWCU/SDC Check Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C12-XHE-FO-LEVEL2 | OPERATOR FAILS TO BACK-UP CRD ACTUATION | Operator Error HPCRD Actuation |
| C41-ACV-OC-F002A | AIR OPERATED VALVE F002A FAILS TO REMAIN OPEN | SLC Discharge Isolation Valves |
| C41-ACV-OC-F002B | AIR OPERATED VALVE F002B FAILS TO REMAIN OPEN | SLC Discharge Isolation Valves |
| C41-ACV-OC-F002C | AIR OPERATED VALVE F002C FAILS TO REMAIN OPEN | SLC Discharge Isolation Valves |
| C41-ACV-OC-F002D | AIR OPERATED VALVE F002D FAILS TO REMAIN OPEN | SLC Discharge Isolation Valves |
| C41-BV_-OC-F001A | MAINTENANCE VALVE F001A PLUGS/TRANSFERS CLOSED | SLC Accum. Manual Isolation Valves |
| C41-BV_-OC-F001B | MAINTENANCE VALVE F001B PLUGS/TRANSFERS CLOSED | SLC Accum. Manual Isolation Valves |
| C41-BV_-OC-F006A | MAINTENANCE VALVE F006A PLUGS/TRANSFERS CLOSED | SLC Inboard Manual Isolation Valves |
| C41-BV_-OC-F006B | MAINTENANCE VALVE F006B PLUGS/TRANSFERS CLOSED | SLC Inboard Manual Isolation Valves |
| C41-TNK-RP-A001A | ACCUMULATOR A001A FAILS CATASTROPHICALLY | SLC Accumulators |
| C41-TNK-RP-A001B | ACCUMULATOR A001B FAILS CATASTROPHICALLY | SLC Accumulators |
| C41-UV_-CC-F004A | CHECK VALVE F004A FAILS TO OPEN | SLC Discharge Outboard Check Valves |
| C41-UV_-CC-F004B | CHECK VALVE F004B FAILS TO OPEN | SLC Discharge Outboard Check Valves |
| C41-UV_-CC-F005A | CHECK VALVE F005A FAILS TO OPEN | SLC Discharge Inboard Check Valves |
| C41-UV_-CC-F005B | CHECK VALVE F005B FAILS TO OPEN | SLC Discharge Inboard Check Valves |
| C62-CCFSOFTWARE | N-DCIS COMMON CAUSE SOFTWARE FAILURE | N-DCIS Software |
| C62-CCFSOFTWARE_S | N-DCIS SPURIOUS COMMON CAUSE SOFTWARE FAILURE | N-DCIS Software |
| C62-DTM-FC-PIPMP_1_2 | CCF of two components: C62-DTM-FC-PIPA & C62-DTM-FC-PIPB | N-DCIS Hardware |
| C62-LDD-FC-LOADS | COMMON CAUSE FAILURE OF REMAINING NDCIS LOAD DRIVERS | N-DCIS Hardware |
| C62-LOG-FC-PIPMP_ALL | CCF of all components in group 'C62-LOG-FC-PIPMP' | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_2 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB | N-DCIS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C62-LT_-NO-NDCRX_1_2_3 | CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_2_4 | CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLV | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_3 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_3_4 | CCF of three components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_4 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLD | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_5 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLE | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_6 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLF | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_7 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLG | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_1_8 | CCF of two components: C62-LT_-NO-RXLVLA & C62-LT_-NO-RXLVLH | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_3 | CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_3_4 | CCF of three components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLV | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_4 | CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLD | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_5 | CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLE | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_6 | CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLF | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_7 | CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLG | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_2_8 | CCF of two components: C62-LT_-NO-RXLVLB & C62-LT_-NO-RXLVLH | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_3_4 | CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLD | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_3_5 | CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLE | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_3_6 | CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLF | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_3_7 | CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLG | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_3_8 | CCF of two components: C62-LT_-NO-RXLVLC & C62-LT_-NO-RXLVLH | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_4_5 | CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLE | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_4_6 | CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLF | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_4_7 | CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLG | N-DCIS Hardware |
| C62-LT_-NO-NDCRX_4_8 | CCF of two components: C62-LT_-NO-RXLVLD & C62-LT_-NO-RXLVLH | N-DCIS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C62-LT_-NO-NDCRX_ALL | CCF of all components in group 'C62-LT_-NO-NDCRX' | N-DCIS Hardware |
| C62-LT_-NO-RXLVLA | NDCIS RX LEVEL A SENSOR TRANSMITTER FAILS | N-DCIS Hardware |
| C62-LT_-NO-RXLVLB | NDCIS RX LEVEL B SENSOR TRANSMITTER FAILS | N-DCIS Hardware |
| C62-LT_-NO-RXLVLC | NDCIS RX LEVEL C SENSOR TRANSMITTER FAILS | N-DCIS Hardware |
| C62-LT_-NO-RXLVLD | NDCIS RX LEVEL D SENSOR TRANSMITTER FAILS | N-DCIS Hardware |
| C62-MOD-FO-CTTMPA | TRANSDUCER SIGNAL CONVERTR FAILS | N-DCIS Hardware |
| C62-MOD-FO-CTTMPB | TRANSDUCER SIGNAL CONVERTER FAILURE | N-DCIS Hardware |
| C62-MOD-FO-CTTMPC | TRANSDUCER SIGNAL CONVERTER FAILURE | N-DCIS Hardware |
| C62-MOD-FO-CTTMPD | TRANSDUCER SIGNAL CONVERTER FAILURE | N-DCIS Hardware |
| C62-MOD-FO-RXLVLA | TRANSDUCER SIGNAL CONVERTR FAILS | N-DCIS Hardware |
| C62-MOD-FO-RXLVLB | TRANSDUCER SIGNAL CONVERTER FAILURE | N-DCIS Hardware |
| C62-MOD-FO-RXLVLC | TRANSDUCER SIGNAL CONVERTER FAILURE | N-DCIS Hardware |
| C62-MOD-FO-RXLVLD | TRANSDUCER SIGNAL CONVERTER FAILURE | N-DCIS Hardware |
| C62-MOD-FO-RXPRSA | TRANSDUCER SIGNAL PROCESSOR FAILS | N-DCIS Hardware |
| C62-MOD-FO-RXPRSC | TRANSDUCER SIGNAL PROCESSOR FAILS | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_1_2 | CCF of two components: C62-PSP-FO-DPSAPSA & C62-PSP-FO-DPSAPSB | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_1_5_6 | CCF of three components: C62-PSP-FO-DPSAPSA & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO- | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_2_5_6 | CCF of three components: C62-PSP-FO-DPSAPSB & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO- | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_3_4 | CCF of two components: C62-PSP-FO-DPSBPSA & C62-PSP-FO-DPSBPSB | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_3_5_6 | CCF of three components: C62-PSP-FO-DPSBPSA & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO- | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_4_5_6 | CCF of three components: C62-PSP-FO-DPSBPSB & C72-PSP-FO-DPSCNTPSA & C72-PSP-FO- | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_5_6 | CCF of two components: C72-PSP-FO-DPSCNTPSA & C72-PSP-FO-DPSCNTPSB | N-DCIS Hardware |
| C62-PSP-FO-DPSEP_ALL | CCF of all components in group 'C62-PSP-FO-DPSEP' | N-DCIS Hardware |
| C62-PSP-FO-PIPEP_ALL | CCF of all components in group 'C62-PSP-FO-PIPEP' | N-DCIS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C62-PT_-NO-RXPRSA | NDCIS RX PRESSURE SENSOR TRANSMITTER A FAILS | N-DCIS Hardware |
| C62-PT_-NO-RXPRSC | NDCIS RX PRESSURE SENSOR TRANSMITTER C FAILS | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_1_2 | CCF of two components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPB | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_1_2_3 | CCF of three components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPC | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_1_2_4 | CCF of three components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPD | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_1_3 | CCF of two components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPC | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_1_3_4 | CCF of three components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPC & C62-TT_-NO-TEMPD | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_1_4 | CCF of two components: C62-TT_-NO-TEMPA & C62-TT_-NO-TEMPD | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_2_3 | CCF of two components: C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPC | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_2_3_4 | CCF of three components: C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPC & C62-TT_-NO-TEMPD | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_2_4 | CCF of two components: C62-TT_-NO-TEMPB & C62-TT_-NO-TEMPD | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_3_4 | CCF of two components: C62-TT_-NO-TEMPC & C62-TT_-NO-TEMPD | N-DCIS Hardware |
| C62-TT_-NO-NDCRX_ALL | CCF of all components in group 'C62-TT_-NO-NDCRX' | N-DCIS Hardware |
| C62-TT_-NO-TEMPA | TEMPERATURE XMTR  FAILS TO RESPOND TO CHANGE IN TEMPERATURE | N-DCIS Hardware |
| C62-TT_-NO-TEMPB | TEMPERATURE XMTR  FAILS TO RESPOND TO CHANGE IN TEMPERATURE | N-DCIS Hardware |
| C62-TT_-NO-TEMPC | TEMPERATURE XMTR  FAILS TO RESPOND TO CHANGE IN TEMPERATURE | N-DCIS Hardware |
| C62-TT_-NO-TEMPD | TEMPERATURE XMTR  FAILS TO RESPOND TO CHANGE IN TEMPERATURE | N-DCIS Hardware |
| C63-CCFSOFTWARE | Common cause failure of software | Q-DCIS Software |
| C63-CCFSOFTWARE_S | ESF SPURIOUS COMMON CAUSE SOFTWARE FAILURE | Q-DCIS Software |
| C63-DTM-FC-ESFLG_1_2_3 | CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3 | Q-DCIS Hardware |
| C63-DTM-FC-ESFLG_1_2_4 | CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD4 | Q-DCIS Hardware |
| C63-DTM-FC-ESFLG_1_3_4 | CCF of three components: C63-DTM-FC-ESFD1 & C63-DTM-FC-ESFD3 & C63-DTM-FC-ESFD4 | Q-DCIS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C63-DTM-FC-ESFLG_2_3_4 | CCF of three components: C63-DTM-FC-ESFD2 & C63-DTM-FC-ESFD3 & C63-DTM-FC-ESFD4 | Q-DCIS Hardware |
| C63-DTM-FC-ESFLG_ALL | CCF of all components in group 'C63-DTM-FC-ESFLG' | Q-DCIS Hardware |
| C63-LDD-FC-ESFLOADS | CCF OF ALL ESF LOAD DRIVERS | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2 | CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_10 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_11 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_12 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_3 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_4 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_5 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_6 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_7 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_8 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_2_9 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3 | CCF of two components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_10 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_11 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_12 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C63-LOG-FC-ESFLG_1_3_4 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_5 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_6 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_7 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_8 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_1_3_9 | CCF of three components: C63-LOG-FC-ESFD1C1 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3 | CCF of two components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_10 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_11 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_12 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_4 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_5 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_6 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_7 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_8 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_2_3_9 | CCF of three components: C63-LOG-FC-ESFD1C2 & C63-LOG-FC-ESFD1C3 & C63-LOG-FC-ES | Q-DCIS Hardware |
| C63-LOG-FC-ESFLG_ALL | CCF of all components in group 'C63-LOG-FC-ESFLG' | Q-DCIS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C63-LT_-NO-ESFPX_ALL | CCF of all components in group 'C63-LT_-NO-ESFPX' | Q-DCIS Hardware |
| C63-LT_-NO-ESFRX_1_2_3 | CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-ESFRX_1_2_4 | CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLB & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-ESFRX_1_3_4 | CCF of three components: C63-LT_-NO-ESFRXLVLA & C63-LT_-NO-ESFRXLVLC & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-ESFRX_2_3_4 | CCF of three components: C63-LT_-NO-ESFRXLVLB & C63-LT_-NO-ESFRXLVLC & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-ESFRX_ALL | CCF of all components in group 'C63-LT_-NO-ESFRX' | Q-DCIS Hardware |
| C63-LT_-NO-RPSRX_1_2_3 | CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLB & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-RPSRX_1_2_4 | CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLB & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-RPSRX_1_3_4 | CCF of three components: C63-LT_-NO-RPSRXLVLA & C63-LT_-NO-RPSRXLVLC & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-RPSRX_2_3_4 | CCF of three components: C63-LT_-NO-RPSRXLVLB & C63-LT_-NO-RPSRXLVLC & C63-LT_-N | Q-DCIS Hardware |
| C63-LT_-NO-RPSRX_ALL | CCF of all components in group 'C63-LT_-NO-RPSRX' | Q-DCIS Hardware |
| C63-PSP-FO-ESFEP_9_10 | CCF of two components: C63-PSP-FO-ESFD1PSA & C63-PSP-FO-ESFD1PSB | Q-DCIS Hardware |
| C63-PSP-FO-ESFEP_ALL | CCF of all components in group 'C63-PSP-FO-ESFEP' | Q-DCIS Hardware |
| C63-PT_-NO-ESFRX_1_2_3 | CCF of three components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSB & C63-PT_-N | Q-DCIS Hardware |
| C63-PT_-NO-ESFRX_1_2_4 | CCF of three components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSB & C63-PT_-N | Q-DCIS Hardware |
| C63-PT_-NO-ESFRX_1_3_4 | CCF of three components: C63-PT_-NO-ESFRXPRSA & C63-PT_-NO-ESFRXPRSC & C63-PT_-N | Q-DCIS Hardware |
| C63-PT_-NO-ESFRX_2_3_4 | CCF of three components: C63-PT_-NO-ESFRXPRSB & C63-PT_-NO-ESFRXPRSC & C63-PT_-N | Q-DCIS Hardware |
| C63-PT_-NO-ESFRX_ALL | CCF of all components in group 'C63-PT_-NO-ESFRX' | Q-DCIS Hardware |
| C71-CCFSOFTWARE | RPS COMMON CAUSE SOFTWARE FAILURE | RPS Software |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C71-DTM-FC-R_1_2_3 | CCF of three components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RP | RPS Hardware |
| C71-DTM-FC-R_1_2_4 | CCF of three components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RP | RPS Hardware |
| C71-DTM-FC-R_1_3_4 | CCF of three components: C71-DTM-FC-RPSDIV1 & C71-DTM-FC-RPSDIV3 & C71-DTM-FC-RP | RPS Hardware |
| C71-DTM-FC-R_2_3_4 | CCF of three components: C71-DTM-FC-RPSDIV2 & C71-DTM-FC-RPSDIV3 & C71-DTM-FC-RP | RPS Hardware |
| C71-DTM-FC-R_ALL | CCF of all components in group 'C71-DTM-FC-R' | RPS Hardware |
| C71-LDD-FC-2OF4G | CCF LOAD DRIVER (2 or more of 4 GROUPS) | RPS Hardware |
| C71-OLU-FC-R_5_6_7 | CCF of three components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RP | RPS Hardware |
| C71-OLU-FC-R_5_6_8 | CCF of three components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RP | RPS Hardware |
| C71-OLU-FC-R_5_7_8 | CCF of three components: C71-OLU-FC-RPSDIV1 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-RP | RPS Hardware |
| C71-OLU-FC-R_6_7_8 | CCF of three components: C71-OLU-FC-RPSDIV2 & C71-OLU-FC-RPSDIV3 & C71-OLU-FC-RP | RPS Hardware |
| C71-OLU-FC-R_ALL | CCF of all components in group 'C71-OLU-FC-R' | RPS Hardware |
| C71-SLU-FC-R_1_2_3 | CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP | RPS Hardware |
| C71-SLU-FC-R_1_2_4 | CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RP | RPS Hardware |
| C71-SLU-FC-R_1_3_4 | CCF of three components: C71-SLU-FC-RPSDIV1 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP | RPS Hardware |
| C71-SLU-FC-R_2_3_4 | CCF of three components: C71-SLU-FC-RPSDIV2 & C71-SLU-FC-RPSDIV3 & C71-SLU-FC-RP | RPS Hardware |
| C71-SLU-FC-R_ALL | CCF of all components in group 'C71-SLU-FC-R' | RPS Hardware |
| C71-XHE-FO-SCRAM | OPERATOR FAILS TO PERFORM MANUAL SCRAM | Manual Scram Switches |
| C72-CCFSOFTWARE | COMMON CAUSE FAILURE OF DPS PROCESSORS | DPS Software |
| C72-LDD-FC-LOADS | COMMON CAUSE FAILURE OF DPS LOAD DRIVERS | DPS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C72-LDD-FC-S1F004A | F004A FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004B | F004B FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004C | F004C FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004D | F004D FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004E | F004E FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004F | F004F FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004G | F004G FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S1F004H | F004H FIRST SERIES LOAD DRIVER FAILS ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004A | F004A SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004B | F004B SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004C | F004C SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004D | F004D SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004E | F004E SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004F | F004F SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004G | F004G SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S2F004H | F004H SECOND SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004A | F004A THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004B | F004B THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004C | F004C THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004D | F004D THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004E | F004E THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004F | F004F THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004G | F004G THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LDD-FC-S3F004H | F004H THIRD SERIES LOAD DRIVER FAILS TO ACTUATE | DPS Hardware |
| C72-LOG-FC-D_1_2 | CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS | DPS Hardware |
| C72-LOG-FC-D_1_2_3 | CCF of three components: C72-LOG-FC-D1DPS & C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS | DPS Hardware |
| C72-LOG-FC-D_1_3 | CCF of two components: C72-LOG-FC-D1DPS & C72-LOG-FC-D3DPS | DPS Hardware |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| C72-LOG-FC-D_2_3 | CCF of two components: C72-LOG-FC-D2DPS & C72-LOG-FC-D3DPS | DPS Hardware |
| DWH-1 | CLOSE THE LOWER DRYWELL HATCH – RWCU/SDC DRAIN LINE LOCA | Lower Drywell Hatches |
| DWH-2 | DRYWELL HATCH CLOSURE FAILURE | Lower Drywell Hatches |
| DWH-2 | CLOSE THE LOWER DRYWELL HATCH – INSTRUMENT LINE LOCA | Lower Drywell Hatches |
| E50-BV_-OC-F004A | MAINTENANCE VALVE F004A PLUGS/TRANSFERS CLOSED | GDCS Discharge Manual Isolation Valves |
| E50-BV_-OC-F004D | MAINTENANCE VALVE F004D PLUGS/TRANSFERS CLOSED | GDCS Discharge Manual Isolation Valves |
| E50-POL-RP-POOLA | GDCS POOLS A LEAKS CATASTROPHICALLY | GDCS Pools |
| E50-POL-RP-POOLD | GDCS POOL D LEAKS CATASTROPHICALLY | GDCS Pools |
| E50-SQV-CC-EQU_ALL | CCF of all components in group 'E50-SQV-CC-EQU' | GDCS Equalization Squib Valves |
| E50-SQV-CC-INJ_1_2_5 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002B & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_3_5 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002C & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_4_5 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002D & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_4_8 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002D & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_5 | CCF of two components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002E | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_5_6 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002E & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_5_7 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002E & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_1_5_8 | CCF of three components: E50-SQV-CC-INJ-F002A & E50-SQV-CC-INJ-F002E & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_2_4_8 | CCF of three components: E50-SQV-CC-INJ-F002B & E50-SQV-CC-INJ-F002D & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_3_4_8 | CCF of three components: E50-SQV-CC-INJ-F002C & E50-SQV-CC-INJ-F002D & E50-SQV-C | GDCS Injection Squib Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| E50-SQV-CC-INJ_4_5_8 | CCF of three components: E50-SQV-CC-INJ-F002D & E50-SQV-CC-INJ-F002E & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_4_6_8 | CCF of three components: E50-SQV-CC-INJ-F002D & E50-SQV-CC-INJ-F002F & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_4_7_8 | CCF of three components: E50-SQV-CC-INJ-F002D & E50-SQV-CC-INJ-F002G & E50-SQV-C | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_4_8 | CCF of two components: E50-SQV-CC-INJ-F002D & E50-SQV-CC-INJ-F002H | GDCS Injection Squib Valves |
| E50-SQV-CC-INJ_ALL | CCF of all components in group 'E50-SQV-CC-INJ' | GDCS Injection Squib Valves |
| E50-SQV-CO-F009A | SQUIB DELUGE VALVE F009A SPUR. OPENING | GDCS Deluge Squib Valves |
| E50-SQV-CO-F009D | SQUIB DELUGE VALVE F009A SPUR. OPENING | GDCS Deluge Squib Valves |
| E50-SQV-CO-F009E | SQUIB DELUGE VALVE F009A SPUR. OPENING | GDCS Deluge Squib Valves |
| E50-SQV-CO-F009H | SQUIB DELUGE VALVE F009A SPUR. OPENING | GDCS Deluge Squib Valves |
| E50-SQV-CO-F009J | SQUIB DELUGE VALVE F009A SPUR. OPENING | GDCS Deluge Squib Valves |
| E50-SQV-CO-F009M | SQUIB DELUGE VALVE F009A SPUR. OPENING | GDCS Deluge Squib Valves |
| E50-STR-PG_ALL | CCF of all components in group 'E50-STR-PG' | GDCS Pool Strainers |
| E50-UV_-CC-EQU_ALL | CCF of all components in group 'E50-UV_-CC-EQU' | GDCS Equalization Check Valves |
| E50-UV_-CC-INJ_1_2_5 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003B & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_1_3_5 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003C & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_1_4_5 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003D & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_1_4_8 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003D & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_1_5 | CCF of two components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003E | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_1_5_6 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003E & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_1_5_7 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003E & E50-UV_-C | GDCS Injection Check Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| E50-UV_-CC-INJ_1_5_8 | CCF of three components: E50-UV_-CC-INJ-F003A & E50-UV_-CC-INJ-F003E & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_2_4_8 | CCF of three components: E50-UV_-CC-INJ-F003B & E50-UV_-CC-INJ-F003D & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_3_4_8 | CCF of three components: E50-UV_-CC-INJ-F003C & E50-UV_-CC-INJ-F003D & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_4_5_8 | CCF of three components: E50-UV_-CC-INJ-F003D & E50-UV_-CC-INJ-F003E & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_4_6_8 | CCF of three components: E50-UV_-CC-INJ-F003D & E50-UV_-CC-INJ-F003F & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_4_7_8 | CCF of three components: E50-UV_-CC-INJ-F003D & E50-UV_-CC-INJ-F003G & E50-UV_-C | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_4_8 | CCF of two components: E50-UV_-CC-INJ-F003D & E50-UV_-CC-INJ-F003H | GDCS Injection Check Valves |
| E50-UV_-CC-INJ_ALL | CCF of all components in group 'E50-UV_-CC-INJ' | GDCS Injection Check Valves |
| E50-XHE-FO-DLTR2 | OPERATOR FAILS TO ENABLE TRAIN 2 | Operator Error GDCS Manual Actuation |
| G21-BV_-CC-F346 | MANUAL VALVE  FAILS TO OPEN (PLUGGING) | Dedicated LPCI Backup Discharge Valve |
| G21-BV_-OC-F334 | MANUAL VALVE F334 PLUGS-TRANSFERS CLOSED | FAPCS LPCI Manual Valve |
| G21-MOV-CC-2_1_2 | CCF of two components: G21-MOV-CC-F332A & G21-MOV-CC-F332B | FAPCS LPCI Injection Valves |
| G21-MP_-FR-PLP | MOTOR-DRIVEN LPI PUMP  FAILS TO RUN | Dedicated LPCI Backup Pump |
| G21-MP_-FS-PLP | MOTOR-DRIVEN LPI PUMP FAILS TO START | Dedicated LPCI Backup Pump |
| G21-UV_-CC-F347 | CHECK VALVE  F347 FAILS TO OPEN | Dedicated LPCI Backup Check Valve |
| G21-UV_-CC-FU438 | LPI DISCHARGE CHECK VALVE  FAILS TO OPEN | Dedicated LPCI Backup Discharge Check Valve |
| G21-UV_-OO-F331A | CHECK VALVE F331A FAILS TO CLOSE | FAPCS LPCI Check Valves |
| G21-UV_-OO-F331B | CHECK VALVE F331B FAILS TO CLOSE | FAPCS LPCI Check Valves |
| L2-BI_FN-ESTIMATE | BiMAC PIPING PLUGS | BiMAC Device |
| LEAK-ISO (NOTE 1) | OPERATORS IDENTIFY AND ISOLATE RWCU/SDC LEAK | Operator Error Leak Isolation |
| MS-TOP2 | TWO SRVs FAIL TO OPEN (MANUAL) | Operator Error SRV Actuation |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| N21-XHE-FO-FWRERUN | OPERATOR FAILS TO RESTART FDW AFTER RUNBACK - ATWS | Operator Error FW Actuation |
| P21-ACV-OO-F0004 | AIR OPERATED VALVE  F0004 FAILS TO CLOSE | RCCW Discharge Hdr Cross-Connect Valve |
| P21-ACV-OO-F0027 | AIR OPERATED VALVE F0027  FAILS TO CLOSE | RCCW Cooling Hdr Cross-Connect Valve |
| P21-ACV-OO-F0061 | AIR OPERATED VALVE F0061  FAILS TO CLOSE | RCCW Suction Hdr Cross-Connect Valve |
| P21-TRN-RE-HX1A | FAILURE TO RESTORE RCCW TRAIN 1A HX | Operator Error RCCW HX Restoration |
| P21-TRN-RE-HX2A | FAILURE TO RESTORE RCCW TRAIN 2A HX | Operator Error RCCW HX Restoration |
| P21-TRN-RE-HX3A | FAILURE TO RESTORE RCCW TRAIN 3A HX | Operator Error RCCW HX Restoration |
| P21-TRN-RE-PUMP1A | FAILURE TO RESTORE RCCW TRAIN 1A PUMP | Operator Error RCCW Pump Restoration |
| P21-TRN-RE-PUMP2A | FAILURE TO RESTORE RCCW TRAIN 2A PUMP | Operator Error RCCW Pump Restoration |
| P21-TRN-RE-PUMP3A | FAILURE TO RESTORE RCCW TRAIN 3A PUMP | Operator Error RCCW Pump Restoration |
| P30-TNK-RP-A001 | CONDENSATE STORAGE TANK LEAKS CATASTROPHICALLY | Condensate Storage Tank |
| P41-FAN-FR_1_2 | CCF of two components: P41-FAN-FR-0001A & P41-FAN-FR-0001B | Cooling Tower Fans |
| P41-FAN-FR_1_2_3 | CCF of three components: P41-FAN-FR-0001A & P41-FAN-FR-0001B & P41-FAN-FR-0002A | Cooling Tower Fans |
| P41-FAN-FR_1_2_4 | CCF of three components: P41-FAN-FR-0001A & P41-FAN-FR-0001B & P41-FAN-FR-0002B | Cooling Tower Fans |
| P41-FAN-FR_1_3_4 | CCF of three components: P41-FAN-FR-0001A & P41-FAN-FR-0002A & P41-FAN-FR-0002B | Cooling Tower Fans |
| P41-FAN-FR_1_4 | CCF of two components: P41-FAN-FR-0001A & P41-FAN-FR-0002B | Cooling Tower Fans |
| P41-FAN-FR_2_3 | CCF of two components: P41-FAN-FR-0001B & P41-FAN-FR-0002A | Cooling Tower Fans |
| P41-FAN-FR_2_3_4 | CCF of three components: P41-FAN-FR-0001B & P41-FAN-FR-0002A & P41-FAN-FR-0002B | Cooling Tower Fans |
| P41-FAN-FR_3_4 | CCF of two components: P41-FAN-FR-0002A & P41-FAN-FR-0002B | Cooling Tower Fans |
| P41-FAN-FR_ALL | CCF of all components in group 'P41-FAN-FR' | Cooling Tower Fans |
| P41-MPW-FR_ALL | CCF of all components in group 'P41-MPW-FR' | Service Water Pumps |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| P41-STR-PG_1_2_3 | CCF of three components: P41-STR-PG-D01A & P41-STR-PG-D01B & P41-STR-PG-D02A | Service Water Strainers |
| P41-STR-PG_1_2_4 | CCF of three components: P41-STR-PG-D01A & P41-STR-PG-D01B & P41-STR-PG-D02B | Service Water Strainers |
| P41-STR-PG_1_3_4 | CCF of three components: P41-STR-PG-D01A & P41-STR-PG-D02A & P41-STR-PG-D02B | Service Water Strainers |
| P41-STR-PG_2_3_4 | CCF of three components: P41-STR-PG-D01B & P41-STR-PG-D02A & P41-STR-PG-D02B | Service Water Strainers |
| P41-STR-PG_ALL | CCF of all components in group 'P41-STR-PG' | Service Water Strainers |
| P51-XHE-P21-BU | OPERATOR ACTION TO CONNECT ALTERNATE COOLING GIVEN RCCW FAILED | Operator Error RCCW Cooling |
| R10-LOSP-EPRI | CONSEQUENTIAL LOSS OF PREFERRED OFFSITE POWER DUE TO A TRANSIENT | Offsite AC Power |
| R10-SYS-FF-500KV | 500KV SWITCHYARD FAILS DURING OPERATION | Offsite AC Power |
| R11-BAC-LP-100A3 | 6.9 KV AC PIP-A LOADS BUS 1000A3 FAILS DURING OPERATION | 6.9 kV PIP Buses |
| R11-BAC-LP-100B3 | 6.9 KV AC PIP-A LOADS BUS 1000B3 FAILS DURING OPERATION | 6.9 kV PIP Buses |
| R11-BAC-LP-PIP_1_2 | CCF of two components: R11-BAC-LP-100A3 & R11-BAC-LP-100B3 | 6.9 kV PIP Buses |
| R11-BAC-TM-100A3 | 6.9 KV AC PIP-A LOADS BUS 1000A3 IN MAINTENANCE | 6.9 kV PIP Buses |
| R11-BAC-TM-100B3 | 6.9 KV AC PIP-A LOADS BUS 1000B3 IN MAINTENANCE | 6.9 kV PIP Buses |
| R12-BAC-LP-A2-02A | 480 VAC BUS A2-02A FAILS DURING OPERATION | 480V PIP Buses |
| R12-BAC-LP-B2-02B | 480 VAC BUS B2-02B FAILS DURING OPERATION | 480V PIP Buses |
| R12-BAC-TM-A2-02A | 480 VAC BUS A2-02A IN MAINTENANCE | 480V PIP Buses |
| R12-BAC-TM-B2-02B | 480 VAC BUS B2-02B IN MAINTENANCE | 480V PIP Buses |
| R12-LCB-CO-BOA2-02A | R12-A2-02A XMFR OUTPUT CIRCUIT BREAKER TO BUS R12-A2-02A OPEN SPURIOUSLY | 480V PIP Bus Circuit Breakers |
| R12-LCB-CO-BOB2-02B | R12-B2-02B XMFR OUTPUT CIRCUIT BREAKER TO BUS R12-B2-02B OPEN SPURIOUSLY | 480V PIP Bus Circuit Breakers |
| R12-MCB-CO-BIA2-02A | R12-A2-02A XMFR INPUT CIRCUIT BREAKER FROM PIP BUS 1000A3 OPENS SPURIOUSLY | 480V PIP Bus Circuit Breakers |
| R12-MCB-CO-BIB2-02B | R12-B2-02B XMFR INPUT CIRCUIT BREAKER FROM PIP BUS 1000B3 OPENS SPURIOUSLY | 480V PIP Bus Circuit Breakers |
| R12-XFL-LP-XA2-02A | R12-A2-02A XMFR FROM PIP BUS 1000A3 FAILS TO OPERATE | 480V PIP Bus Transformers |
| R12-XFL-LP-XB2-02B | R12-B2-02B XMFR FROM PIP BUS 1000B3 FAILS TO OPERATE | 480V PIP Bus Transformers |
| R13-BAC-LP-R1311 | BUS R13-11 FAILS DURING OPERATION | UPS Buses |
| R13-BAC-LP-R13C | BUS R13-C FAILS DURING OPERATION | UPS Buses |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| R13-BAC-LP-R13CBC | R13 CONTROL BLDG LOAD GROUP C FAILS DURING OPERATION | UPS Buses |
| R13-BAC-LP-R13RBC | R13 REACTOR BLDG LOAD GROUP C FAILS DURING OPERATION | UPS Buses |
| R13-DIO-FC-R16CR13C | DIODE FROM R16-C FAILS TO OPERATE | UPS Inverters |
| R13-INV-FC-CCFNSR_1_2_5 | CCF of three components: R13-INV-FC-R13A1 & R13-INV-FC-R13A2 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_1_3_5 | CCF of three components: R13-INV-FC-R13A1 & R13-INV-FC-R13B1 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_1_4_5 | CCF of three components: R13-INV-FC-R13A1 & R13-INV-FC-R13B2 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_1_5 | CCF of two components: R13-INV-FC-R13A1 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_2_3_5 | CCF of three components: R13-INV-FC-R13A2 & R13-INV-FC-R13B1 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_3_4_5 | CCF of three components: R13-INV-FC-R13B1 & R13-INV-FC-R13B2 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_3_5 | CCF of two components: R13-INV-FC-R13B1 & R13-INV-FC-R13C | UPS Inverters |
| R13-INV-FC-CCFNSR_ALL | CCF of all components in group 'R13-INV-FC-CCFNSR' | UPS Inverters |
| R13-INV-FC-CCFSR_1_2 | CCF of two components: R13-INV-FC-R1311 & R13-INV-FC-R1312 | UPS Inverters |
| R13-INV-FC-CCFSR_1_2_3 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1312 & R13-INV-FC-R1321 | UPS Inverters |
| R13-INV-FC-CCFSR_1_2_4 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1312 & R13-INV-FC-R1322 | UPS Inverters |
| R13-INV-FC-CCFSR_1_2_5 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1312 & R13-INV-FC-R1331 | UPS Inverters |
| R13-INV-FC-CCFSR_1_2_6 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1312 & R13-INV-FC-R1332 | UPS Inverters |
| R13-INV-FC-CCFSR_1_2_7 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1312 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_1_2_8 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1312 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_1_3_5 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1321 & R13-INV-FC-R1331 | UPS Inverters |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| R13-INV-FC-CCFSR_1_3_6 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1321 & R13-INV-FC-R1332 | UPS Inverters |
| R13-INV-FC-CCFSR_1_3_7 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1321 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_1_3_8 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1321 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_1_4_5 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1322 & R13-INV-FC-R1331 | UPS Inverters |
| R13-INV-FC-CCFSR_1_4_6 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1322 & R13-INV-FC-R1332 | UPS Inverters |
| R13-INV-FC-CCFSR_1_4_7 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1322 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_1_4_8 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1322 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_1_5_7 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1331 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_1_5_8 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1331 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_1_6_7 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1332 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_1_6_8 | CCF of three components: R13-INV-FC-R1311 & R13-INV-FC-R1332 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_2_3_5 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1321 & R13-INV-FC-R1331 | UPS Inverters |
| R13-INV-FC-CCFSR_2_3_6 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1321 & R13-INV-FC-R1332 | UPS Inverters |
| R13-INV-FC-CCFSR_2_3_7 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1321 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_2_3_8 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1321 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_2_4_5 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1322 & R13-INV-FC-R1331 | UPS Inverters |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| R13-INV-FC-CCFSR_2_4_6 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1322 & R13-INV-FC-R1332 | UPS Inverters |
| R13-INV-FC-CCFSR_2_4_7 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1322 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_2_4_8 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1322 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_2_5_7 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1331 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_2_5_8 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1331 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_2_6_7 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1332 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_2_6_8 | CCF of three components: R13-INV-FC-R1312 & R13-INV-FC-R1332 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_3_5_7 | CCF of three components: R13-INV-FC-R1321 & R13-INV-FC-R1331 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_3_5_8 | CCF of three components: R13-INV-FC-R1321 & R13-INV-FC-R1331 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_3_6_7 | CCF of three components: R13-INV-FC-R1321 & R13-INV-FC-R1332 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_3_6_8 | CCF of three components: R13-INV-FC-R1321 & R13-INV-FC-R1332 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_4_5_7 | CCF of three components: R13-INV-FC-R1322 & R13-INV-FC-R1331 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_4_5_8 | CCF of three components: R13-INV-FC-R1322 & R13-INV-FC-R1331 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_4_6_7 | CCF of three components: R13-INV-FC-R1322 & R13-INV-FC-R1332 & R13-INV-FC-R1341 | UPS Inverters |
| R13-INV-FC-CCFSR_4_6_8 | CCF of three components: R13-INV-FC-R1322 & R13-INV-FC-R1332 & R13-INV-FC-R1342 | UPS Inverters |
| R13-INV-FC-CCFSR_ALL | CCF of all components in group 'R13-INV-FC-CCFSR' | UPS Inverters |
| R13-INV-FC-R13C | INVERTER TO R13-C FAILS | UPS Inverters |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| R13-LCB-CO-FR13CBC | CIRCUIT BREAKER 1 TO R13-CBC OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-LCB-CO-FR13RBC | CIRCUIT BREAKER 1 TO R13-RBC OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-LCB-CO-R13CBC | CIRCUIT BREAKER 2 TO R13-CBC OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-LCB-CO-R13RBC | CIRCUIT BREAKER 2 TO R13-RBC OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-LCB-CO-R16CR13C | CIRCUIT BREAKER FROM R16-C OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-LCB-CO-TOR1311 | CIRCUIT BREAKER TO R13-11 OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-LCB-CO-TOR13C | CIRCUIT BREAKER TO R13-C OPENS SPURIOUSLY | UPS Circuit Breakers |
| R13-MTS-CO-R13C | MAINTENANCE TRANSFER SWITCH FOR R13-C SPURIOUSLY OPENS | UPS Manual Transfer Switches |
| R13-SXS-CO-R13C | STATIC SWITCH FOR R13-C SPURIOUSLY OPENS | UPS Static Transfer Switches |
| R13-XFL-LP-CCFNSR2_1_2_3 | CCF of three components: R13-XFL-LP-R13CBA & R13-XFL-LP-R13CBB & R13-XFL-LP-R13C | UPS Transformers |
| R13-XFL-LP-CCFNSR2_1_3 | CCF of two components: R13-XFL-LP-R13CBA & R13-XFL-LP-R13CBC | UPS Transformers |
| R13-XFL-LP-CCFNSR2_2_3 | CCF of two components: R13-XFL-LP-R13CBB & R13-XFL-LP-R13CBC | UPS Transformers |
| R13-XFL-LP-CCFNSR2_6_7_8 | CCF of three components: R13-XFL-LP-R13RBA & R13-XFL-LP-R13RBB & R13-XFL-LP-R13R | UPS Transformers |
| R13-XFL-LP-CCFNSR2_6_8 | CCF of two components: R13-XFL-LP-R13RBA & R13-XFL-LP-R13RBC | UPS Transformers |
| R13-XFL-LP-CCFNSR2_7_8 | CCF of two components: R13-XFL-LP-R13RBB & R13-XFL-LP-R13RBC | UPS Transformers |
| R13-XFL-LP-CCFNSR2_ALL | CCF of all components in group 'R13-XFL-LP-CCFNSR2' | UPS Transformers |
| R13-XFL-LP-R13CBC | TRANSFORMER FOR R13-CBC FAILS DURING OPERATION | UPS Transformers |
| R13-XFL-LP-R13RBC | TRANSFORMER FOR R13-RBC FAILS DURING OPERATION | UPS Transformers |
| R13-XHE-FO-ADG | OPERATOR FAILS TO ALIGN THE ADG BUSES TO UPS BUSES | Operator Error ADG Bus Alignment |
| R16-BDC-LP-R16C | DC BUS R16-C FAILS DURING OPERATION | DC Buses |
| R16-BDC-TM-R16C | DC BUS R16-C IN MAINTENANCE | DC Buses |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| R16-BT_-LP-CCFNSR_1_3_5 | CCF of three components: R16-BT_-LP-R16BTA1 & R16-BT_-LP-R16BTB1 & R16-BT_-LP-R1 | DC Batteries |
| R16-BT_-LP-CCFNSR_1_5 | CCF of two components: R16-BT_-LP-R16BTA1 & R16-BT_-LP-R16BTC | DC Batteries |
| R16-BT_-LP-CCFNSR_2_3_5 | CCF of three components: R16-BT_-LP-R16BTA2 & R16-BT_-LP-R16BTB1 & R16-BT_-LP-R1 | DC Batteries |
| R16-BT_-LP-CCFNSR_3_4_5 | CCF of three components: R16-BT_-LP-R16BTB1 & R16-BT_-LP-R16BTB2 & R16-BT_-LP-R1 | DC Batteries |
| R16-BT_-LP-CCFNSR_3_5 | CCF of two components: R16-BT_-LP-R16BTB1 & R16-BT_-LP-R16BTC | DC Batteries |
| R16-BT_-LP-CCFNSR_ALL | CCF of all components in group 'R16-BT_-LP-CCFNSR' | DC Batteries |
| R16-BT_-LP-CCFSR_1_2 | CCF of two components: R16-BT_-LP-R16BT11 & R16-BT_-LP-R16BT12 | DC Batteries |
| R16-BT_-LP-CCFSR_ALL | CCF of all components in group 'R16-BT_-LP-CCFSR' | DC Batteries |
| R16-BT_-LP-R16BTC | BATTERY R16-BTC FAILS TO PROVIDE OUTPUT | DC Batteries |
| R16-BT_-TM-R16BTC | BATTERY R16-BTC IN TEST AND MAINTENANCE | DC Batteries |
| R16-LCB-CO-FROMR16BTC | CIRCUIT BREAKER FROM R16-BTC OPENS SPURIOUSLY | DC Circuit Breakers |
| R21-BAC-LP-ANCA | AC ELECTRICAL BUSWORK  FAILS DURING OPERATION | Ancillary DG Buses |
| R21-DG_-FR-ADG_1_2 | CCF of two components: R21-DG_-FR-ADGA & R21-DG_-FR-ADGB | Ancillary Diesel Generators |
| R21-DG_-FR-ADGA | ADG-A FAILS TO RUN | Ancillary Diesel Generators |
| R21-DG_-FR-ADGB | DIESEL GENERATOR  FAILS TO RUN | Ancillary Diesel Generators |
| R21-DG_-FR-CCF_1_2 | CCF of two components: R21-DG_-FR-DGA & R21-DG_-FR-DGB | Standby Diesel Generators |
| R21-DG_-FR-DGA | DIESEL GENERATOR "A" FAILS TO RUN GIVEN START | Standby Diesel Generators |
| R21-DG_-FR-DGB | DIESEL GENERATOR "B" FAILS TO RUN GIVEN START | Standby Diesel Generators |
| R21-DG_-FS-DGA | DG-A FAILS TO START AND LOAD | Standby Diesel Generators |
| R21-DG_-FS-DGB | DG-B FAILS TO START AND LOAD | Standby Diesel Generators |
| R21-DG_-TM-ADGA | ANCILLARY DG-A IN MAINTENANCE | Ancilllary Diesel Generators |
| R21-DG_-TM-ADGB | ANCILLARY DG-B IN MAINTENANCE | Ancilllary Diesel Generators |
| R21-DG_-TM-DGA | STANDBY DIESEL GENERATOR "A" IN MAINTENANCE | Standby Diesel Generators |
| R21-DG_-TM-DGB | STANDBY DIESEL GENERATOR "B" IN MAINTENANCE | Standby Diesel Generators |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| R21-FLT-PG-DGA | FILTER  PLUGGED | Standby Diesel Generators |
| R21-FLT-PG-DGB | FILTER  PLUGGED | Standby Diesel Generators |
| R21-NSC-TM-ANCA | ADG BUS A IN TEST OR MAINTENANCE | Ancillary DG Buses |
| R21-TRN-RE-FOADGA | FAILURE TO RESTORE FUEL OIL TRANSFER TRAIN FOR ADG-A | ADG Supporting Systems |
| R21-TRN-RE-FOADGB | FAILURE TO RESTORE FUEL OIL TRANSFER TRAIN FOR ADG-A | ADG Supporting Systems |
| R21-XHE-FO-ADG | OPERATOR FAILS TO CONTROL THE LOADS ON ANCILLARY DG BUSES | Operator Error ADG Bus Loading |
| R-M5-G31 | RWCU/SDC RECOVERY IN MODE 5 | RWCU/SDC Pumps |
| R-M5-LOPP (NOTE 1) | OFFSITE POWER RECOVERY IN MODE 5 (INCLUDING MODE 5 AND MODE 5 OPEN) | Offsite AC Power |
| R-M6-G31 (NOTE 1) | RWCU/SDC RECOVERY IN MODE 6 | RWCU/SDC Pumps |
| R-M6-LOPP (NOTE 1) | OFFSITE POWER RECOVERY IN MODE 6 | Offsite AC Power |
| T10-VB_-CC_1_2_3 | CCF of three components: T10-VB_-CC-VB1 & T10-VB_-CC-VB2 & T10-VB_-CC-VB3 | DW to WW Vacuum Breakers |
| T10-VB_-LK-VB1 | PROBABILITY OF LEAK IN  VACUUM BREAKER 1 | DW to WW Vacuum Breakers |
| T10-VB_-LK-VB2 | PROBABILITY OF LEAK IN  VACUUM BREAKER 2 | DW to WW Vacuum Breakers |
| T10-VB_-LK-VB3 | PROBABILITY OF LEAK IN  VACUUM BREAKER 3 | DW to WW Vacuum Breakers |
| T15-FLT-PP_1_2_3 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001B & T15-FLT-PP-D001C | PCCS Filters |
| T15-FLT-PP_1_2_4 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001B & T15-FLT-PP-D001D | PCCS Filters |
| T15-FLT-PP_1_2_5 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001B & T15-FLT-PP-D001E | PCCS Filters |
| T15-FLT-PP_1_2_6 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001B & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_1_3_4 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001C & T15-FLT-PP-D001D | PCCS Filters |
| T15-FLT-PP_1_3_5 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001C & T15-FLT-PP-D001E | PCCS Filters |
| T15-FLT-PP_1_3_6 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001C & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_1_4_5 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001D & T15-FLT-PP-D001E | PCCS Filters |
| T15-FLT-PP_1_4_6 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001D & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_1_5_6 | CCF of three components: T15-FLT-PP-D001A & T15-FLT-PP-D001E & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_2_3_4 | CCF of three components: T15-FLT-PP-D001B & T15-FLT-PP-D001C & T15-FLT-PP-D001D | PCCS Filters |
| T15-FLT-PP_2_3_5 | CCF of three components: T15-FLT-PP-D001B & T15-FLT-PP-D001C & T15-FLT-PP-D001E | PCCS Filters |
| T15-FLT-PP_2_3_6 | CCF of three components: T15-FLT-PP-D001B & T15-FLT-PP-D001C & T15-FLT-PP-D001F | PCCS Filters |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| T15-FLT-PP_2_4_5 | CCF of three components: T15-FLT-PP-D001B & T15-FLT-PP-D001D & T15-FLT-PP-D001E | PCCS Filters |
| T15-FLT-PP_2_4_6 | CCF of three components: T15-FLT-PP-D001B & T15-FLT-PP-D001D & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_2_5_6 | CCF of three components: T15-FLT-PP-D001B & T15-FLT-PP-D001E & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_3_4_5 | CCF of three components: T15-FLT-PP-D001C & T15-FLT-PP-D001D & T15-FLT-PP-D001E | PCCS Filters |
| T15-FLT-PP_3_4_6 | CCF of three components: T15-FLT-PP-D001C & T15-FLT-PP-D001D & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_3_5_6 | CCF of three components: T15-FLT-PP-D001C & T15-FLT-PP-D001E & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_4_5_6 | CCF of three components: T15-FLT-PP-D001D & T15-FLT-PP-D001E & T15-FLT-PP-D001F | PCCS Filters |
| T15-FLT-PP_ALL | CCF of all components in group 'T15-FLT-PP' | PCCS Filters |
| T15-HX_-PP_ALL | CCF of all components in group 'T15-HX_-PP' | PCCS Heat Exchangers |
| T23-POL-RP-SP | SUPPRESSION POOL LEAKS CATASTROPHICALLY | Suppression Pool |
| U43-BV_CC_1_2 | CCF of two components: U43-BV_-CC-F426A & U43-BV_-CC-F426B | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_1_2_3 | CCF of three components: U43-BV_-CC-F426A & U43-BV_-CC-F426B & U43-BV_-CC-FU435A | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_1_2_4 | CCF of three components: U43-BV_-CC-F426A & U43-BV_-CC-F426B & U43-BV_-CC-FU435B | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_1_3_4 | CCF of three components: U43-BV_-CC-F426A & U43-BV_-CC-FU435A & U43-BV_-CC-FU435 | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_1_4 | CCF of two components: U43-BV_-CC-F426A & U43-BV_-CC-FU435B | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_2_3 | CCF of two components: U43-BV_-CC-F426B & U43-BV_-CC-FU435A | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_2_3_4 | CCF of three components: U43-BV_-CC-F426B & U43-BV_-CC-FU435A & U43-BV_-CC-FU435 | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_3_4 | CCF of two components: U43-BV_-CC-FU435A & U43-BV_-CC-FU435B | FPS to IC/PCCS Pool Manual Valve |
| U43-BV_CC_ALL | CCF of all components in group 'U43-BV_CC' | FPS to IC/PCCS Pool Manual Valve |
| U43-TNK-RP-T1A | PRIMARY TANK 1A FAILS CATASTOPHICALLY | FPS Tanks |
| U43-UV_-CC2_1_2 | CCF of two components: G21-UV_-CC-F427A & G21-UV_-CC-F427B | FPS to IC/PCCS Check Valves |

**Table 1**

**Potentially Risk Significant Basic Events**

| Basic Event | Description | Applicable SSC |
|---|---|---|
| U43-UV_-CC2_1_2_3 | CCF of three components: G21-UV_-CC-F427A & G21-UV_-CC-F427B & U43-UV_-CC-FU434A | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_1_2_4 | CCF of three components: G21-UV_-CC-F427A & G21-UV_-CC-F427B & U43-UV_-CC-FU434B | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_1_3_4 | CCF of three components: G21-UV_-CC-F427A & U43-UV_-CC-FU434A & U43-UV_-CC-FU434 | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_1_4 | CCF of two components: G21-UV_-CC-F427A & U43-UV_-CC-FU434B | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_2_3 | CCF of two components: G21-UV_-CC-F427B & U43-UV_-CC-FU434A | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_2_3_4 | CCF of three components: G21-UV_-CC-F427B & U43-UV_-CC-FU434A & U43-UV_-CC-FU434 | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_3_4 | CCF of two components: U43-UV_-CC-FU434A & U43-UV_-CC-FU434B | FPS to IC/PCCS Check Valves |
| U43-UV_-CC2_ALL | CCF of all components in group 'U43-UV_-CC2' | FPS to IC/PCCS Check Valves |
| U43-XHE-FO-LPCI | OPERATOR FAILS TO ACTUATE U43 IN LPCI MODE | Operator Error Dedicated LPCI Backup Pump Actuation |
| U43-XHE-FO-MAKEUP | OPERATOR FAILS TO ACTUATE U43 IN MAKE UP MODE | Operator Error LPCI Actuation |
| U43-XHE-FO-PMPTRK | OPERATOR FAIL TO SUPPLY WATER FROM PUMP TRUCKS | FPS Connection for Alternate Water Supply |
| XXX-XHE-FO-DEPRESS | OPERATOR FAILS TO RECOGNIZE NEED OF DEPRESSURIZATION | Operator Error MCR Instrumentation |
| XXX-XHE-FO-ICPCCS | OPERATOR FAILS TO RECOGNIZE THE NEED TO MAKEUP ICS/PCCS POOL LEVEL. | Operator Error MCR Instrumentation |
| XXX-XHE-FO-LPMAKEUP | OP. FAILS TO RECOG. NEED FOR LOW PRESS. MAKEUP AFTER DEPRESSURIZATION | Operator Error MCR Instrumentation |

**Table 2**

**SSCs in the Seismic Margins Analysis**

| PLANT STRUCTURES |
|---|
| Reactor Building |
| Containment |
| RPV Pedestal |
| Control Building |
| RPV Support Brackets |
| Firewater Service Complex |
| **DC POWER SYSTEM** |
| Batteries |
| Cable trays |
| Motor control centers |
| **REACTIVITY CONTROL SYSTEM** |
| Fuel assemblies |
| CRD Guide tubes |
| Shroud supports |
| CRD Housings |
| Hydraulic control units |
| **PRESSURE CONTROL SYSTEM** |
| SRVs |
| DPVs |
| **STANDBY LIQUID CONTROL SYSTEM** |
| Accumulator Tanks |
| Check valves |
| Squib valves |
| Piping |
| Valves (motor operated) |
| **ISOLATION CONDENSER SYSTEM** |
| Piping |
| Heat exchangers |
| Valves (motor operated) |
| Valves (nitrogen operated) |
| **GRAVITY-DRIVEN COOLING SYSTEM** |
| Check valves |
| Squib valves |
| Piping |
| **VACUUM BREAKERS** |
| Vacuum breaker valves |
| **PASSIVE CONTAINMENT COOLING SYSTEM** |
| Heat Exchangers |
| Piping |
| **IC/PCC POOL INTERCONNECTION** |
| Valves (motor operated) |
| **FIRE PROTECTION WATER SYSTEM** |
| Pump (diesel driven) |
| Piping |
| Tanks |

**Table 3**

**RTNSS Criteria C and D SSCs**

| System/Function | Description | Applicable SSCs |
|---|---|---|
| BiMAC Device Basemat Internal Melt Arrest and Coolability | Provide core debris cooling in LDW through deluge valves. | BiMAC Device GDCS Deluge Valves BiMAC Temperature Sensors |
| Nuclear Island Chilled Water System | Provide cooling support for FAPCS. | NICWS Chiller Units A,B |
| Standby Diesel Generators | Provide power for FAPCS and support systems. | Standby DG Train A,B Standby DG Supporting Systems |
| DPS | High Regulatory Oversight DPS Functions: GDCS Actuation, ADS Actuation, IC/PCCS Pool Cross-Connect Valves, RWCU/SDC Isolation. Low Regulatory Oversight DPS Functions: Scram, MSIV Closure, SRV Actuation, FMCRD Actuation, ICS Actuation, SLC Actuation- LOCA | DPS Analog Trip Modules, Load Drivers, Logic Units, Processors |
| EB HVAC | Provide cooling for DGs (DGVS) and 1E Electrical Distribution (EERVS). | EER Train A,B DGVS Train A,B |
| FAPCS Fuel and Auxiliary Pools Cooling | Low pressure coolant injection and suppression pool cooling modes. | FAPCS Train A,B |
| FBGAVS Fuel Building General Area HVAC | Provide cooling support for FAPCS Pumps. | FBGAVS Train A,B |
| Nonsafety-Related DCIS | Portions that support DPS, FAPCS, and supporting equipment. | N-DCIS Hardware N-DCIS Software |
| Plant Investment Protection (PIP) AC Powered Buses | Provide AC power from standby diesel generators to support FAPCS. | PIP 6.9 kV Bus A,B |
| PSW Plant Service Water | Provide cooling for RCCWS and cooling support for FAPCS. | PSW Train A,B |
| RCCWS Reactor Component Cooling Water | Provide cooling for Chillers and DGs. Provide cooling support for FAPCS. | RCCW Train A,B |

**Table 3**

**RTNSS Criteria C and D SSCs**

| System/Function | Description | Applicable SSCs |
|---|---|---|
| RB HVAC | Provide cooling for N-DCIS components that support FAPCS | RB HVAC Train A,B |
| TBVS Turbine Building General Area HVAC | Provide room cooling for RCCW pumps. | TBVS Train A,B |

**Table 4**

**Basic Events Evaluated As Not Risk Significant**

| Basic Event | Description | Justification |
|---|---|---|
| B32-TM-LOOPA-IND | ICS LOOP A IN TEST OR MAINTENANCE | Maintenance unavailability. |
| B32-TM-LOOPB-IND | ICS LOOP B IN TEST OR MAINTENANCE | Maintenance unavailability. |
| B32-TM-LOOPC-IND | ICS LOOP C IN TEST OR MAINTENANCE | Maintenance unavailability. |
| B32-TM-LOOPD-IND | ICS LOOP D IN TEST OR MAINTENANCE | Maintenance unavailability. |
| C11-LOG-FC-CHNLA | RPS LOGIC CHANNEL A | Undeveloped event requires multiple failures. |
| C11-LOG-FC-CHNLB | RPS LOGIC CHANNEL B | Undeveloped event requires multiple failures. |
| C12-BV_-RE-F003B | MISPOSITION OF VALVE F003B | Operator errors. |
| C12-BV_-RE-F013A | MISPOSITION OF VALVE F013A | Operator errors. |
| C12-BV_-RE-F013B | MISPOSITION OF VALVE F013B | Operator errors. |
| C12-BV_-RE-F015A | MISPOSITION OF VALVE F015A | Operator errors. |
| C12-BV_-RE-F015B | MISPOSITION OF VALVE F015B | Operator errors. |
| C12-BV_-RE-F018A | MISPOSITION OF VALVE F018A | Operator errors. |
| C12-BV_-RE-F018B | MISPOSITION OF VALVE FO18B | Operator errors. |
| C12-BV_-RE-F021A | MISPOSITION OF VALVE F021A | Operator errors. |
| C12-BV_-RE-F021B | MISPOSITION OF VALVE F021B | Operator errors. |
| C12-BV_-RE-F064 | MISPOSITION OF OPEN VALVE F064 | Operator errors. |
| C12-XHE-FO-LEVEL2 | Operator fails to back-up CRD actuation | Operator errors. |
| C12-XHE-FO-LEVEL2 | OPERATOR FAILS TO BACK-UP CRD ACTUATION | Operator errors. |
| E50-POL-RP-POOLA | GDCS POOL A LEAKS CATASTROPHICALLY | Passive component. |
| E50-POL-RP-POOLD | GDCS POOL D LEAKS CATASTROPHICALLY | Passive component. |
| E50-XHE-FO-DLTR2 | OPERATOR FAILS TO ENABLE TRAIN 2 | Operator errors. |
| LEAK-ISO | OPERATORS IDENTIFY AND ISOLATE RWCU/SDC LEAK | Operator errors. |
| MS-TOP2 | TWO SRV FAIL TO OPEN (MANUAL) | Operator error. |
| N21-XHE-FO-FWRERUN | OPERATOR FAILS TO RESTART FDW AFTER RUNBACK - ATWS | Operator errors. |
| P21-TRN-RE-HX1A | FAILURE TO RESTORE RCCW TRAIN 1A HX | Operator errors. |
| P21-TRN-RE-HX2A | FAILURE TO RESTORE RCCW TRAIN 2A HX | Operator errors. |
| P21-TRN-RE-HX3A | FAILURE TO RESTORE RCCW TRAIN 3A HX | Operator errors. |
| P21-TRN-RE-PUMP1A | FAILURE TO RESTORE RCCW TRAIN 1A PUMP | Operator errors. |
| P21-TRN-RE-PUMP2A | FAILURE TO RESTORE RCCW TRAIN 2A PUMP | Operator errors. |
| P21-TRN-RE-PUMP3A | FAILURE TO RESTORE RCCW TRAIN 3A PUMP | Operator errors. |

**Table 4**

**Basic Events Evaluated As Not Risk Significant**

| Basic Event | Description | Justification |
|---|---|---|
| P30-TNK-RUP-A001 | CONDENSATE STORAGE TANK LEAKS CATASTROPHICALLY | Passive component. |
| P51-XHE-P21-BU | OPERATOR ACTION TO CONNECT ALTERNATE COOLING GIVEN RCCW FAILED | Operator errors. |
| R10-LOSP-EPRI | CONSEQUENTIAL LOSS OF PREFERRED OFFSITE POWER DUE TO A TRANSIENT | Conditional probability. |
| R10-SYS-FF-500KV | 500KV SWITCHYARD FAILS DURING OPERATION | Offsite Power and Switchyard. |
| R12-BAC-TM-A2-02A | 480 VAC BUS A2-02A IN MAINTENANCE | Maintenance unavailability. |
| R12-BAC-TM-B2-02B | 480 VAC BUS B2-02B IN MAINTENANCE | Maintenance unavailability. |
| R13-XHE-FO-ADG | OPERATOR FAILS TO ALIGN THE ADG BUSES TO UPS BUSES | Operator errors. |
| R16-BDC-TM-R16C | DC BUS R16-C IN MAINTENANCE | Maintenance unavailability. |
| R21-NSC-TM-ANCA | ADG BUS A IN TEST OR MAINTENANCE | Maintenance unavailability. |
| R21-XHE-FO-ADG | OPERATOR FAILS TO CONTROL THE LOADS ON ANCILLARY DG BUSES | Operator errors. |
| R-M5-LOPP | OFFSITE POWER RECOVERY IN MODE 5 (INCLUDING MODE 5 AND MODE 5 OPEN) | Offsite power. |
| R-M6-LOPP | OFFSITE POWER RECOVERY IN MODE 6 | Offsite power. |
| T23-POL-RP-SP | SUPPRESSION POOL LEAKS CATASTROPHICALLY | Passive component. |
| U43-TNK-RUP-T1A | PRIMARY TANK 1A FAILS CATASTROPHICALLY | Passive component. |
| U43-XHE-FO-LPCI | OPERATOR FAILS TO ACTUATE U43 IN LPCI MODE | Operator errors. |
| U43-XHE-FO-MAKEUP | OPERATOR FAILS TO ACTUATE U43 IN MAKE UP MODE | Operator errors. |

**Table 5**

**Expert Panel (DELETED)**

**Table 6**

**Risk Significant SSCs**

| System / Function | Risk Significant SSC | Basis* |
|---|---|---|
| B21 Nuclear Boiler | Depressurization Valves<br>Safety/Relief Valves<br>FDW Line A Check Valves<br>FDW Line B Check Valves | PRA, SMA<br>PRA, SMA<br>PRA<br>PRA |
| B11 Reactor Pressure Vessel | Fuel assemblies<br>RPV Support Brackets<br>RPV Pedestal<br>Shroud supports | SMA<br>SMA<br>SMA<br>SMA |
| B32 Isolation Condenser | ICS Heat Exchangers<br>IC/PCC Pool Isolation Valves<br>ICS Steam Line Isolation Valves<br>ICS Cond. Return Valves<br>ICS Vent Line Isolation Valves<br>FPS Supply to IC/PCCS Pool Ck Valves<br>FPS Supply Manual Isolation Valves<br>Accumulator to IC/PCCS Pool Valves<br>Accum to IC/PCCS Line Check Valves | PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA |
| C12 Control Rod Drive | Control Rods<br>CRD Guide tubes<br>CRD Housings<br>Hydraulic Control Units<br>CRD Injection MOVs A,B<br>CRD to RWCU/SDCS Check Valve<br>Scram Pilot Solenoid Valves<br>Scram Valves to FMCRDs<br>Charging Wtr Hdr Isolation Valves<br>Purge Water Hdr Isolation Valves<br>Min Flow Line Valves<br>Test Return Line Valves | PRA<br>SMA<br>SMA<br>SMA<br>PRA<br>PRA<br>PRA<br>PRA<br>PRA<br>PRA<br>PRA<br>PRA |
| C41 Standby Liquid Control | SLC Discharge Isolation Valves A – D<br>SLC Outboard Check Valves A,B<br>SLC Inboard Check Valves A,B<br>Accumulator Tanks A,B<br>Accumulator Manual Isolation Valves<br>SLC Squib Valves | PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>SMA |
| C62 Nonsafety-Related Distributed Control and Information (DCIS) | N-DCIS Software<br>N-DCIS Hardware | PRA, RTNSS<br>PRA, RTNSS |
| C63 Safety-Related DCIS | Q-DCIS Software<br>Q-DCIS Hardware<br>Main Control Room Displays<br>Remote Shutdown Displays | PRA, RTNSS<br>PRA, RTNSS<br>PRA<br>PRA |

**Table 6**

**Risk Significant SSCs**

| System / Function | Risk Significant SSC | Basis* |
|---|---|---|
| C71 Reactor Protection | RPS Hardware<br>RPS Software<br>Manual Scram Switches | PRA<br>PRA<br>PRA |
| C72 Diverse Protection (DPS) | DPS Hardware<br>DPS Software | PRA, RTNSS<br>PRA, RTNSS |
| E50 Gravity Driven Cooling | Injection Squib Valves<br>Injection Check Valves<br>Deluge Squib Valves<br>GDCS Strainers<br>Equalization Squib Valves<br>Equalization Check Valves<br>GDCS Discharge Manual Isolation Valves | PRA, SMA<br>PRA, SMA<br>PRA, SMA<br>RTNSS<br>PRA, SMA<br>PRA, SMA<br>PRA, SMA |
| G21 Fuel and Auxiliary Pools Cooling | FAPCS LPCI Isolation Valve<br>FAPCS LPCI Manual Valve<br>FAPCS LPCI Check Valve<br>FAPCS Train A,B<br>Dedicated LPCI Backup Discharge Valve<br>Dedicated LPCI Backup Disch Check Valve<br>Dedicated LPCI Backup Check Valve<br>Dedicated LPCI Backup Pump | PRA<br>PRA<br>PRA<br>RTNSS<br>PRA<br>PRA<br>PRA<br>PRA |
| G31 RWCU/SDC | RWCU/SDC Shutdown Cooling Train A,B | PRA |
| P21 Reactor Component Cooling Water | RCCW Inlet to CRD HX Valves A,B<br>RCCW Outlet from CRD HX  Valves A,B<br>RCCW Train A,B<br>RCCW Cross-Connect to HX Valve<br>RCCW Suction Hdr Cross-Conn Valve<br>RCCW Disch Hdr Cross-Connect Valve | PRA<br>PRA<br>RTNSS<br>PRA<br>PRA<br>PRA |
| P25 Chilled Water | NICWS Train A,B | RTNSS |
| P41 Plant Service Water | Cooling Tower Fans<br>Service Water Pumps<br>Service Water Strainers<br>Service Water Train A,B | PRA<br>PRA<br>PRA<br>RTNSS |
| R11 Medium Voltage Distr. | 6.9 kV PIP Bus A,B | PRA, RTNSS |
| R12 Low Voltage Distr. | 480V PIP Bus A,B | PRA, RTNSS |

**Table 6**

**Risk Significant SSCs**

| System / Function | Risk Significant SSC | Basis* |
|---|---|---|
| R13 Uninterruptible AC Power Supply | Nonsafety-Related 480V UPS Buses A,B,C<br>Manual Transfer Switches for Nonsafety-Related 480V UPS Buses A,B,C<br>Nonsafety-Related Transformers from 480V UPS Buses A,B,C to Reactor Building Load Group A,B,C<br>Static Transfer Switches for Nonsafety-Related 480V UPS Buses A,B,C<br>Safety-Related and Nonsafety-Related UPS Inverters<br>Safety-Related and Nonsafety-Related UPS Circuit Breakers | PRA<br>PRA<br><br>PRA<br><br>PRA<br><br>PRA<br>PRA |
| R16 Direct Current Power Supply | DC Batteries<br>DC Cable trays<br>DC Motor control centers<br>DC Buses<br>DC Circuit Breakers | PRA, SMA<br>SMA<br>PRA, SMA<br>PRA<br>PRA |
| R21 Diesel Generators | Standby Diesel Generator A,B<br>SDG Supporting Systems<br>Ancillary Diesel Generator A,B<br>ADG Supporting Systems | PRA, RTNSS<br>PRA, RTNSS<br>PRA, RTNSS<br>PRA, RTNSS |
| T10 Containment | Containment<br>Containment Vent Valves<br>Containment Vacuum Breakers<br>Containment VB Isolation Valves<br>Drywell Hatches<br>BiMAC Device and Temperature Sensors | SMA<br>PRA, SMA<br>PRA<br>Expert Panel<br>RTNSS<br>PRA |
| T15 Primary Containment Cooling | PCCS Filters<br>PCCS Heat Exchangers | PRA<br>PRA, SMA |
| U36 Electrical Building HVAC | EER Train A,B<br>DGVS Train A,B | RTNSS<br>RTNSS |
| U39 Turbine Building HVAC | TBVS Train A,B | RTNSS |
| U40 Reactor Building HVAC | RBHVAC Train A,B | RTNSS |
| U43 Fire Protection | Diesel Driven Fire Pump<br>FPS Connection to Outside Supply<br>Firewater Service Complex | SMA<br>PRA<br>SMA |
| U71 Reactor Building | Reactor Building | SMA |
| U73 Control Building | Control Building<br>Control Building to Reactor Building Doors | SMA<br>Expert Panel |

**Table 6**

**Risk Significant SSCs**

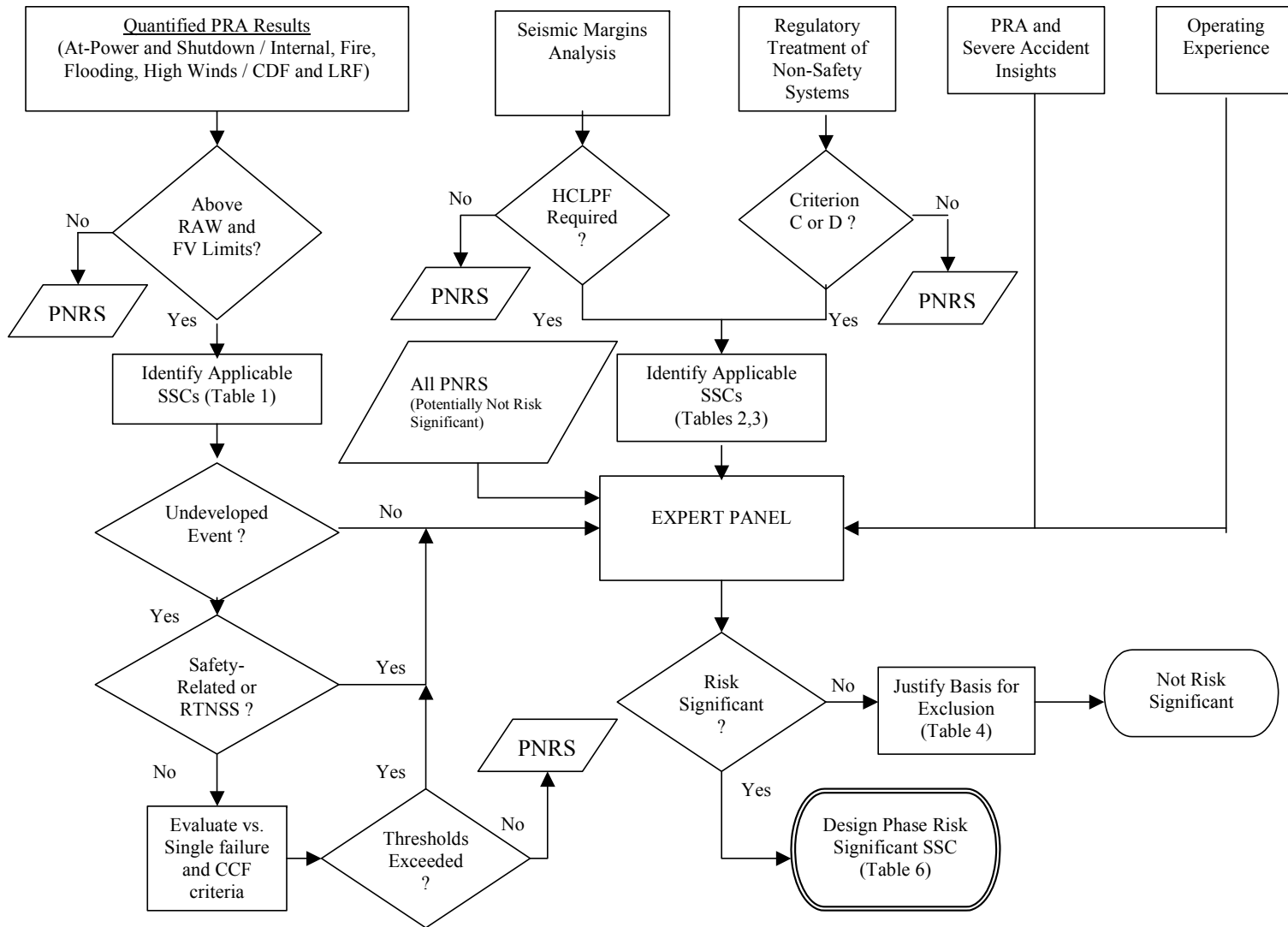| System / Function | Risk Significant SSC | Basis* |
|---|---|---|
| U98 Fuel Building HVAC | FBGAVS Train A,B | RTNSS |

**Figure 1 – Process for Identifying Risk Significant SSCs**

**MFN 08-277, Supplement 1**

**Enclosure 2**


**Change List**
**NEDO-33411 Revision 1 Changes**

# NEDO-33411
## From Revision 0 to Revision 1 Change List

Formatting & editorial changes have been made to improve consistency and readability.  These changes include changing fonts in tables, removing excess spacing, correcting punctuation, & spelling, and correcting grammar.  Acronyms have been spelled out where appropriate.

| Item | Location | Description of Change |
|---|---|---|
| 1. | S 1.2 para 1 | Added for clarification in response to RAI 17.4-20 S01. |
| 2. | S 2.1 para 1 | Updated NEDO-33201 Revision number and revised statement on F-V values at the component  and system levels in response to RAI 17.4-18. |
| 3. | S 2.1 para 2 | Deleted discussion on applying different threshold values based on different CDF values because this no longer applies.  The same threshold values are used for all importance results. |
| 4. | S 2.1.1 | Added clarification on treatment of human errors. |
| 5. | S 2.1.2 | Added clarification on treatment of undeveloped events in response to RAI 17.4-25. |
| 6. | S 2.2 | Clarification that Seismic Margins components, not piping or tanks, are in scope. |
| 7. | S 2.3 | Deleted Revision number because discussion is not specific to a particular revision.  Added clarification on RTNSS criteria and NEDO-33201 Revision 4. |
| 8. | S 2.6 para 1 | Deleted specific information for the Revision 0 expert panel. |
| 9. | S 2.6 para 2 | Added for clarification in response to RAI 17.4-20 S01. |
| 10 | S 3.1.1 para 5 | Deleted specific information from the Revision 0 expert panel that has changed.  Locked open manual valves have position indications and are also addressed in human factors engineering.  Main control room displays are added as risk-significant per the request of RAI 17.4-4 S01. |
| 11 | S 5.0 | Updated to NEDO-33210 Revision 4. |
| 12 | T 1 | Completely updated based on NEDO-33210 Revision 4. |
| 13 | T 2 | Updated based on information in DCD Table 19.2-4. |
| 14 | T 3 | Updated Title for clarification and revised table information based on DCD Table 19A-2. |
| 15 | T 4 | Table 4 is derived from Table 1 and has been completely updated. |
| 16 | T 5 | Deleted.  This panel was specific to Revision 0. |
| 17 | T 6 | Updated to include new results from Tables 1, 2, 3 and 4. |
| 18 | F 1 | Updated for clarification in response to RAI 17.4-24 and |

Formatting & editorial changes have been made to improve consistency and readability.  These changes include changing fonts in tables, removing excess spacing, correcting punctuation, & spelling, and correcting grammar.  Acronyms have been spelled out where appropriate.

| Item | Location | Description of Change |
|------|----------|------------------------|
|      |          | 17.4-25.               |

**MFN 08-277, Supplement 1**

**Enclosure 3**


**Roadmap for Understanding
NEDO-33411 Revision 1 Changes**

**Roadmap for Understanding NEDO-33411 Revision 1 Changes**

The changes from Revision 0 to Revision 1 have been made for two reasons: 1) Response to RAIs, and 2) Updated PRA results from NEDO-33201 Revision 4.

RAI 17.4-20
GEH committed to changes that address items that are not risk significant. Mark-up copies of NEDO-33411 Draft Revision 1 were provided and they addressed changes to the subsections covering the Objectives (1.1), Scope (1.2), and Seismic Margins Analysis (2.2). These changes narrowed the scope of NEDO-33411 to exclude Seismic Margins SSCs from the list of risk-significant SSCs.

RAI 17.4-20 Supplement 1
This RAI requests GEH to include risk-significant SSCs into all phases of D-RAP. GEH agreed and committed to revising NEDO-33411 to revise the scope to include deterministic and other methods within the risk-significant SSCs. The changes from the original RAI 17.4-20 were removed to retain the original scope discussion. GEH also committed to clarify that the expert panel process does review the non risk-significant SSCs. Changes to sections 1.2 and 2.6 were made.

RAI 17.4-25
GEH revised the portion of Figure 1 to clarify the evaluation of undeveloped events.

RAI 17.4-27, 17.4-28, 17.4-29
GEH revised the evaluation so the component cooling water, service water, HVAC, and instrument air events are not treated like undeveloped events. Their basic events are evaluated as single component failures.

RAI 17.4-32
Table 6 clarifies the UPS components.

RAI 17.4-33, 17.4-34
UPS (System R13) includes trains A, B, and C as risk-significant.

RAI 17.4-36
This RAI requests GEH to more clearly describe the risk-significant SSCs in Table 6. GEH responded by providing descriptions based on PRA modeling information. NEDO-33411 Revision 1 Table 6 contains some SSCs with more detailed description; however, other SSCs do not contain detailed identification because final component identifications have not been made. They are labeled with a description of their functions, which are traceable to the PRA basic events and simplified diagrams. This level of detail is considered to be appropriate for Phase I of the D-RAP.

RAI 17.4-37
This RAI requests that GEH include "hardware" of Q-DCIS and N-DCIS in Table 6.

RAI 17.4-44 S01

GEH agreed to include the safety-related (Q-DCIS) main control room and remote shutdown displays within the scope of the risk-significant SSCs.

Updated Results from NEDO-33201 Revision 4

Following is a summary of changes to Table 6.

**Table 1**
**Change Summary NEDO-33411 Table 6**

| System / Function | Risk Significant SSC | Change from Rev 0 to Rev 1 |
|---|---|---|
| B21 Nuclear Boiler | Depressurization Valves<br>Safety/Relief Valves<br>FDW Line A Check Valves<br>FDW Line B Check Valves | No change<br>No change<br>No change<br>No change |
| B11 Reactor Pressure Vessel | Fuel assemblies<br>RPV Support Brackets<br>RPV Pedestal<br>Shroud supports | No change<br>No change<br>No change<br>No change |
| B32 Isolation Condenser | ICS Heat Exchangers<br>IC/PCCS Pool Isolation Valves<br>ICS Steam Line Isolation Valves<br>ICS Cond. Return Valves<br>ICS Vent Line Isolation Valves<br>FPS Supply to IC/PCCS Pool Ck Vlvs<br>FPS Supply Manual Isolation Valves<br>Accumulator to IC/PCCS Pool Vlvs<br>Accum to IC/PCCS Line Check Valves | No Change<br>No Change<br>New (PRA)<br>New (PRA)<br>New (PRA)<br>New (PRA)<br>New (PRA)<br>New (PRA)<br>New (PRA) |
| C12 Control Rod Drive | Control Rods<br>CRD Guide tubes<br>CRD Housings<br>Hydraulic Control Units<br>CRD Injection Manual Valves A,B<br>CRD Injection MOVs A,B<br>CRD to RWCU/SDCS Check Valve<br>CRD Pumps A,B<br>Scram Pilot Solenoid Valves<br>Scram Valves to FMCRDs<br>CRD suction inlet valves A,B<br>CRD suction outlet valves A,B<br>CST supply to CRD<br>Charging Wtr Hdr Isolation Valves<br>Purge Water Hdr Isolation Valves<br>Min Flow Line Valves<br>Test Return Line Valves | No Change<br>No change<br>No change<br>No change<br>Deleted (PRA)<br>No Change<br>No Change<br>Deleted (PRA)<br>No Change<br>No Change<br>Deleted (PRA)<br>Deleted (PRA)<br>Deleted (PRA)<br>New (PRA)<br>New (PRA)<br>New (PRA)<br>New (PRA) |
| C41 Standby Liquid Control | SLC Discharge Isolation Valves A – D<br>SLC Outboard Check Valves A,B<br>SLC Inboard Check Valves A,B<br>Accumulator Tanks A,B<br>Accumulator Manual Isolation Valves<br>SLC Squib Valves | No Change<br>No Change<br>No Change<br>No change<br>New (PRA)<br>New (SMA) |

**Table 1**
**Change Summary NEDO-33411 Table 6**

| System / Function | Risk Significant SSC | Change from Rev 0 to Rev 1 |
|---|---|---|
| C62 Nonsafety-Related Distributed Control and Information (DCIS) | N-DCIS Software<br>N-DCIS Hardware | No Change<br>New (PRA) |
| C63 Safety-Related DCIS | Q-DCIS Software<br>Q-DCIS Hardware<br>Main Control Room Displays<br>Remote Shutdown Displays | No Change<br>New (PRA)<br>New (PRA)<br>New (PRA) |
| C71 Reactor Protection | RPS Digital Trip Module<br>RPS Load Drivers<br>RPS Output Logic Component<br>RPS Trip Logic Unit<br>Manual Scram<br>RPS Software<br>RPS Hardware | No change.  Revised description to include RPS functions and components under Hardware and Software |
| C72 Diverse Protection (DPS) | ATWS/SLC Logic Units (DPS)<br>FW Runback NTB-DIVA,B<br>DPS Analog Trip Module<br>DPS Load Drivers<br>DPS Logic Units<br>DPS Processors | No change.  Revised description to include DPS functions and components under Hardware and Software |
| E50 Gravity Driven Cooling | Injection Squib Valves<br>Injection Check Valves<br>Deluge Squib Valves<br>GDCS Strainers<br>Equalization Squib Valves<br>Equalization Check Valves<br>GDCS Discharge Manual Isolation Valves | No Change<br>No Change<br>No Change<br>No Change<br>New (PRA)<br>New (PRA)<br>New (PRA) |
| G21 Fuel and Auxiliary Pools Cooling | FAPCS Suppression Pool Isolation Valve<br>FAPCS LPCI Isolation Valve<br>FAPCS LPCI Manual Valve<br>FAPCS LPCI Check Valve<br>FAPCS Train A,B<br>Dedicated LPCI Backup Discharge Valve<br>Dedicated LPCI Backup Disch Check Valve<br>Dedicated LPCI Backup Check Valve<br>Dedicated LPCI Backup Pump | Deleted (PRA)<br><br>No Change<br>New (PRA)<br>New (PRA)<br>No Change<br>Changed from U43 to G21<br><br>Changed from U43 to G21<br><br>Changed from U43 to G21<br>New (PRA) |
| G31 RWCU/SDC | RWCU/SDC Shutdown Cooling Train A,B | New (PRA) |
| N21 Condensate | Condensate Bypass Inlet Valve<br>Condensate Header Isolation  Valve<br>Condensate Bypass Outlet Valve | Deleted (PRA)<br>Deleted (PRA)<br>Deleted (PRA) |

**Table 1**
**Change Summary NEDO-33411 Table 6**

| System / Function | Risk Significant SSC | Change from Rev 0 to Rev 1 |
|---|---|---|
| P21 Reactor Component Cooling Water | RCCW Inlet to CRD HX Valves A,B<br>RCCW Outlet from CRD HX Vlvs A,B<br>RCCW Train A,B<br>RCCW Cross-Connect to HX Valve<br>RCCW Suction Hdr Cross-Conn Vlv<br>RCCW Disch Hdr Cross-Connect Vlv | Deleted (PRA)<br>Deleted (PRA)<br>No Change<br>New (Design Detail, PRA)<br>New (Design Detail, PRA)<br>New (Design Detail, PRA) |
| P25 Chilled Water | NICWS Chiller Units A,B | No Change |
| P41 Plant Service Water | Cooling Tower Fans<br>Service Water Pumps<br>Service Water Strainers<br>Service Water Train A,B | No Change<br>No Change<br>No Change<br>No Change |
| R10 Electrical Power Distribution | Reserve Auxiliary Transformer<br>Unit Auxiliary Transformer<br>Switchyard | Deleted (PRA)<br>Deleted (PRA)<br>Deleted (PRA) |
| R11 Medium Voltage Distribution | 6.9 kV PIP Bus A,B | No Change |
| R12 Low Voltage Distribution | 480V PIP Bus A,B | New (Design Detail, PRA) |
| R13 Uninterruptible AC Power Supply | Nonsafety-Related 480V UPS Buses A,B,C<br>Manual Transfer Switches for Nonsafety-Related 480V UPS Buses A,B,C<br>Nonsafety-Related Transformers from 480V UPS Buses A,B,C to Reactor Building Load Group A,B,C<br>Static Transfer Switches for Nonsafety-Related 480V UPS Buses A,B,C<br>Safety-Related and Nonsafety-Related UPS Inverters<br>Safety-Related and Nonsafety-Related UPS Circuit Breakers | No Change<br><br>No Change<br><br><br>No Change<br><br><br>No Change<br><br>No Change<br><br>New (PRA) |
| R16 Direct Current Power Supply | DC Batteries<br>DC Cable trays<br>DC Motor control centers<br>DC Buses<br>DC Circuit Breakers | No Change<br>No change<br>No change<br>No Change<br>No Change |
| R21 Diesel Generators | Standby Diesel Generator A,B<br>SDG Supporting Systems<br>Ancillary Diesel Generator A,B<br>ADG Supporting Systems | No Change (Standby DGs)<br>New (PRA)<br>New (PRA)<br>New (PRA) |

**Table 1**
**Change Summary NEDO-33411 Table 6**

| System / Function | Risk Significant SSC | Change from Rev 0 to Rev 1 |
|---|---|---|
| T10 Containment | Containment<br>Containment Vent Valves<br>Containment Vacuum Breakers<br>Containment VB Isolation Valves<br>Drywell Hatches<br>BiMAC Device and Temperature Sensors | No change<br>New (PRA)<br>No Change<br>No change<br>No Change<br>No Change |
| T15 Primary Containment Cooling | PCCS Filters<br>PCCS Heat Exchangers | No Change<br>No Change |
| U36 Electrical Building HVAC | EER Train A,B<br>DGVS Train A,B | No Change<br>No Change |
| U39 Turbine Building HVAC | TBVS Train A,B | No Change |
| U40 Reactor Building HVAC | RBHVAC Train A,B | New (RTNSS) |
| U 43 Fire Protection | FPS to FAPCS Manual Isolation Valve<br>FPS to FAPCS Check Valve<br>FPS to LPI Manual Isolation Valve<br>FPS to LPI Check Valve<br>Diesel Driven Fire Pump<br>FPS Connection to Outside Supply<br>Firewater Service Complex | Deleted (PRA)<br>Changed from U43 to G21<br>Deleted (PRA)<br>Changed from U43 to G21<br>No Change<br>New (PRA)<br>New (SMA) |
| U71 Reactor Building | Reactor Building | No change |
| U73 Control Building | Control Building<br>Control Building to Reactor Building Doors | No change<br>No Change |
| U98 Fuel Building HVAC | FBGAVS Train A,B | No Change |

Expert Panel

The applicable expert panel conclusions from Revision 0 were retained for Revision 1. The updated portions of Revision 1 include Tables 1, 3, and 4, and a review of changes to DCD Chapter 19 Table 19.2-3. These changes have been peer-reviewed to ensure that they are consistent with the expert panel process.

In summary, a comprehensive assessment for Phase I of the Design Reliability Assurance Program was conducted to provide a list of risk-significant SSCs for the ESBWR.