Attachment 3

Risk Assessment of Turbine Driven Auxiliary Feedwater P-8B Trip

236 Pages Follow

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	Date: 11/14/2011	
	Number of Pages: 237 (including signature page, only, and attachments)	
Title: Assessment of Steam Driven Auxiliary Feedwater P-8B Trip on May 10th, 2011		
Approval: See signature page.		

Purpose

The purpose of this engineering analysis is to assess the increase in risk that could result given failure of P-8B to start and run on 5/10/2011.

Background

During performance of Tech Spec Surveillance Procedure RO-97, Auxiliary Feedwater System Automatic Initiation Test Procedure, P-8B, Steam Driven Auxiliary Feedwater Pump, tripped on overspeed (5/10/11). After the initial actuation of auxiliary feedwater P-8B, the pump was running for 5 minutes prior to taking data at which time the pump tripped on overspeed. During the short period that P-8B was running, it was noted that small amounts of debris and mung were being discharged from the steam trap drain lines to the floor drain that produced a foul odor (CR PLP -2011-02350).

Conclusion

Given that the current engineering assessment has not identified any causal factors that were present at the time of failure, the failure of P-8B can be considered a random event. Per pump performance review since 2005 to the present, no additional failures have been identified other than that observed on May 10th, 2011. Using this information, sensitivity calculations show that the ΔCDF is less than 1E-06/yr when considering the event is random and therefore is colored green.

If it is assumed a pre-existing condition existed, the results show that the full power internal events CDF plus the IPEEE recreated fire analysis CDF, given the observed P-8B failure, produces an aggregate ΔCDF of 4.81E-07/yr when crediting recovery of P-8B.

If recovery is not credited, the aggregate ΔCDF is estimated to be 4.37E-05/yr.

When considering the event as a random failure or a pre-existing condition, with recovery, the condition is colored green.

If considering the event as a pre-existing condition and assuming no recovery, the ΔCDF is greater than 1E-05 and is colored yellow.

Recall in either case the B.5.b pump is not credited (however, if directed by the Technical Support Center (TSC), today, the pump would be deployed) and that the re-created IPEEE analysis does not include the supplemental diesel.

Note: This engineering analysis is not a 10 CFR 50.2 design basis analysis and the results and conclusions of this analysis do not supersede those of any design basis analyses of record. The biases

and degree of conservatism embodied in the methods, inputs and assumptions of this analysis may not be appropriate to support all plant activities. An appropriate level of engineering rigor commensurate with the safety significance of the topic under consideration is ensured in this analysis by conformance with all applicable Entergy procedures.

Table of Contents

1.0 PURPOSE

The purpose of this engineering analysis is to assess the consequences of P-8B failing to start and run. A Phase 3 Significance Determination Process (SDP) analysis was performed.

2.0 BACKGROUND

2.1 CR-PLP-2011-02350

During performance of Tech Spec Surveillance Procedure RO-97, Auxiliary Feedwater System Automatic Initiation Test Procedure, P-8B, Steam Driven Auxiliary Feedwater Pump, tripped on overspeed. After the initial actuation of auxiliary feedwater, P-8B was being run for 5 minutes prior to taking data at which time the pump tripped on overspeed. During the short period that P-8B was running, it was noted that small amounts of debris and mung were being discharged from the steam trap drain lines to the floor drain that produced a foul odor.

The test was stopped and placed in a safe condition. Initiated work request WR# 236481.

2.2 CR-PLP-2011-02364

During investigation of P-8B, Auxiliary Feedwater Pump, overspeed event as documented in CR-PLP-2011-02350, it was noted that the knife edge on the overspeed trip mechanism had been inappropriately greased. An investigation into the work that was performed during 1R21 revealed that WO 214219 was performed to overhaul the turbine of P-8B. Work instruction FWS-M-6, Auxiliary Feedwater Turbine Maintenance, was performed and step 5.40.3 states to grease Pin(12) by referring to Attachments 4 and 5. Pin(12) is in Attachment 4. The step was inappropriately changed to say knife edge which is part(12) of Attachment 5. It appears pin 12 was never greased.

2.3 CR-PLP-2011-03368

During preparation and presentation of LER-2011-004 for the inadvertent trip of the Turbine Driven Aux Feed Water Pump P-8B on 5/10/11, it was determined that other possible causes for the trip were not addressed or eliminated as "potential causes" under C-PAL-2011-2350. In order to ensure that the apparent cause evaluation of C-PAL-2011-2350 is complete for the overspeed trip event, this condition report was generated and these new possible causes, to be discussed, will be added to the apparent cause discussion. The Op Evaluation for this new CR is due at 2000 7/8/2011.

Discussion with the turbine OEM/vendor on 6/22/11 by the system engineer led to discovery that relaxation of the trip reset lever springs and or maladjustments of the overspeed trip valve could lead to a spurious turbine and associated pump trip. The probability of either being the sole cause of a turbine trip is considered low for the following reasons:

- Relaxation of the springs, per vendor discussion typically is only seen when the springs are subjected to high operating temperatures on a continuous basis. Since the turbine at Palisades is only run for testing for short periods of time, sustained, elevated temperatures are rarely seen. The turbine has been run for a total of less than 110 hours in the last 20 years (when the springs were installed as new).
- Similarly, the overspeed trip valve, rebuilt and reassembled by contract workers was done according to plant procedure FWS-M-6 "Auxiliary Feedwater Turbine Maintenance". Our assembly process closely matches the guidelines presented by the OEM/Vendor. All

critical steps were properly executed. No deviations were noted in the affected completed portions of the maintenance procedure.

Based on these facts there is a low probability that these two conditions were the apparent cause of the pump trip that occurred on 5/10/11. Greasing of the components that are not normally or should be greased (e.g. knife edge of the reset lever) is still under consideration as the contributor to the pump trip.

3.0 INTRODUCTION TO ISSUE SIGNIFICANCE

The following presents two perceptions regarding the significance of the P-8B trip. The first perspective being that the event can be characterized as a random failure. The second point of view is that the event should be characterized as finding.

Per the NRC Inspection Manual Chapter (IMC) 0612, Power Reactor Inspection Reports, defines a finding as, "An issue of concern that is related to a Licensee's performance deficiency. Findings may or may not be related to Regulatory requirements."

3.1 As a Random Failure

Two principal considerations are important factors in determining the significance of this issue as a random failure;

- First is the question of P-8B operability,
- The second is, given the assumption of the cause of the postulated inoperability, whether or not operation of P-8B was recoverable within the time available to establish successful mitigation of the event.

First the issue of inoperability is predicated on the available information which suggests that an inappropriate maintenance activity created a condition for which it could reasonably be inferred that the pump would not be able to operate for its mission time. The initial root cause analysis identified greasing of the interface (knife edge) of the trip lever surface and the mating surface on the trip resetting lever as the cause of failure. Greasing of this surface is not a normal maintenance practice and not required by the maintenance procedures. This original determination of root cause was submitted to external review to determine the appropriateness of the determination. The recently completed vendor report [30] (summarized below) concluded that the application of grease to the knife edge of the trip and reset levers could not have been the root cause of the problem.

Subsequent discussion with the turbine OEM/vendor on 6/22/11 by the system engineer led to discovery that relaxation of the trip reset lever springs and or maladjustment of the overspeed trip valve could lead to a spurious turbine and associated pump trip (noted in CR-PLP-2011-03368 above).

The probability of either being the sole cause of a turbine trip is considered low for the following reasons;

- Relaxation of the springs, per vendor discussion typically is only seen when the springs are subjected to high operating temperatures on a continuous basis. Since the Palisades P-8B turbine is only run for testing for short periods of time, sustained, and elevated temperatures are rarely seen. The turbine has been run for a total of less than 110 hours in the last 20 years (when the springs were installed as new).
- Similarly, the overspeed trip valve, rebuilt and reassembled by contract workers was

performed according to plant procedure FWS-M-6 "Auxiliary Feedwater Turbine Maintenance". The Palisades assembly process closely matches the guidelines presented by the OEM/Vendor. All critical steps were properly executed. No deviations were noted in the affected completed portions of the maintenance procedure. The current evaluation of these potential causes has failed to identify any indication that either condition currently exists and therefore not considered to be the root cause of the pump trip.

The review of industry experience and other pump vendor information also suggest that it is not unexpected for turbine-driven pumps of this type to experience random spurious actuation of the overspeed trip mechanism. The current plant operating history from 2005 to the present of operating approximately 50 hours with 0 failures of pump P-8B until the May 10th event could be argued as supporting the conclusion that the occurrence of a random failure of the pump could occur and not be outside the expected failure rate of the pump. Moreover, given that the pump successfully ran after the trip was reset and that the trip could not be repeated provides a stronger basis that the event was random. In 1994 P-8B tripped [31]. The most probable cause was believed to be improper latching of the trip mechanism. However, a vibration induced trip was not ruled out. The proposed corrective actions included;

1) P-8B testing frequency should be increased over the next 3 months.
2) Incorporate, as appropriate, trip resetting procedures into the Operating, Maintenance and Testing Procedures.
3) Consider incorporation of the trip latch observations into the MO-38 testing procedure.

Given the following, one could conclude that P-8B experienced a random failure;

1) The evaluation of the root cause by industry experts [30], has concluded that the application of grease to the trip lever knife edge may not have been the root cause. The MPR report further assessed what variables and their values that could affect whether or not the vibratory inertial forces are sufficient to cause the Hand Trip Level to disengage from the Resetting Lever springs causing the turbine to trip.

   Per Reference [30];

   "In summary, the geometry of the linkage is such that large accelerations are needed to cause it to trip, the actual measured accelerations are small relative to those required to cause trip and the measured displacements on the order of 0.007 inches are too small to move the Hand Trip Lever the approximate 0.100 to 0.125" required to cause it to trip."

2) To date, the analysis of other possible causes has determined that there is currently no evidence that identified causal factors were present at the time of failure.
3) The pump is currently considered operable since there have been no identified problems to correct and that the pump has continued to operate for approximately three and a half hours with no indication of a condition that would cause spurious actuation of the overspeed trip.

Since no root cause has yet been identified and in particular no condition specifically related to the occurrence of an overspeed condition or spurious actuation of the overspeed device, the current information would support a conclusion that the pump did not become inoperable until it failed to continue to operate during the conduct of the test.

3.2 As a Finding

As mentioned above, a finding is, "An issue of concern that is related to a Licensee's performance deficiency. Findings may or may not be related to Regulatory requirements." Findings are categorized by significance as follows:

- Green Findings – IMC 0612 defines a Green Finding as, "A finding of very low safety significance."
- White Findings – IMC 0612 defines a White Finding as, "A finding of low to moderate safety significance." A White Finding will typically result in a Supplemental Inspection; the level of Supplemental Inspection depends on the number and significance of any other non-Green findings or Performance Indicators in the Licensee's Performance Assessment Matrix (PAM).
- Yellow Findings – IMC 0612 defines a Yellow Finding as, "A finding of substantial safety significance." A Yellow Finding will typically result in a Supplemental Inspection; the level of Supplemental Inspection depends on the number of significance of any other non-Green findings or Performance Indicators in the Licensee's Performance Assessment Matrix (PAM).
- Red Findings – IMC 0612 defines a Red Finding as, "A finding of high safety significance." A Red Finding will typically result in a Supplemental Inspection per NRC Inspection Procedure (IP) 95003.

3.2.1 NRC's Significance Determination Process (SDP)

The SDP as defined in NRC Inspection Manual Chapter (IMC) 0612 consists of three phases:

Phase 1 – Characterization and Initial Screening of Findings: This phase is used by the NRC to screen very low-significance findings for disposition by the Licensee's Corrective Action Program.

Phase 2 – Initial Approximation and Basis for Risk Significance: Initial approximation of risk significance of the finding and development of the basis for this determination for those findings that filter through the Phase 1 screening process.

Phase 3 – Finalized Determination and Basis of Risk Significance: Review and perform as-needed refinement of the risk significance estimation results from Phase 2 or perform any risk significance analysis outside of NRC Phase 2 guidance.

Most findings screen with a low significance during Phase 1 of the NRC's process. For those that do not, either the Inspector or the NRC's Senior Reactor Analyst (SRA) will perform a Phase 2 evaluation. At this stage, the station should communicate with the Inspector and/or SRA to assist with the Phase 2 evaluation and determine if the results are reasonable and realistic.

Upon completion of an NRC Phase 2 evaluation that is greater than Green, the NRC will provide written notification to the station of the initial determination of safety significance and enter Phase 3 of the evaluation. However, the NRC will allow the Licensee to provide detailed PRA (Probabilistic Risk Analysis) input for their evaluation prior to entering into Phase 3.

If the Licensee can adequately demonstrate lower risk significance, the NRC will stop at the Phase 2 evaluation. The Phase 3 assessment involves employing the detailed plant risk model to address the issue.

A Phase 3 SDP evaluation was performed presuming a performance deficiency. In this instance, the Phase 3 full power internal events (FPIE) analysis was employed using the Palisades current analysis-of-record PSAR2c [9.6]. Given that Palisades is currently undergoing the transition to NFPA-805, the Individual Plant Examination of External Events (IPEEE) [3] was resurrected as

well to evaluate the fire risk.

4.0 INPUT

Inputs in this evaluation are separated into several categories: those involving the PRA software tools and existing PRA models and evaluations, and those involving the configuration of the plant during the planned maintenance activities. PRA tools and models input define the starting point of the evaluation. Plant configuration inputs define critical configuration that exists during the maintenance activities.

In this analysis, the full power internal events (FPIE) analysis evaluates the current analysis-of-record [2].

Given the current transition to NFPA-805 with a planned submittal date in October of 2012, the fire external events evaluation is based on recreating the Individual Plant Examination of External Events (IPEEE) [3] and that was augmented by the Reference [5] and [16] work as well.

4.1 PRA Tools and Models

4.1.1 The SAPHIRE software application used for both the IPEEE and FPIE PRA model quantification in this analysis is listed in Table 4.1.1.

Table 4.1.1 [1]

Filename	Date	Time	Size
SAPHIRE-7-27-852878059.exe	6/24/2008	11:48a	18,303 KB

4.1.2 The CAFTA software application is used for creating and viewing PRA model logic. The baseline CAFTA model serves as the starting point of the core damage fault tree model evaluated in this analysis. Table 4.1.2 below lists the baseline CAFTA files used in the FPIE analysis.

Table 4.1.2 [2]

Filename	Description	Date	Time	Size - KB
PSAR2c.be	PSAR2c CAFTA Basic Event File	6/26/2006	1:42p	1,248
PSAR2c.caf	PSAR2c CAFTA Fault Tree File	6/26/2006	1:36p	449
PSAR2c.gt	PSAR2c CAFTA Gate Type File	6/24/2006	1:31p	1,024
PSAR2c.tc	PSAR2c CAFTA Type Code File	5/27/2004	9:03a	30
PSAR2c CAFTA Files.zip	PSAR2c CAFTA zip file	6/29/2006	8:47a	289

4.1.3 The SAPHIRE project model is used for PRA model quantification. Table 4.1.3 lists the PSAR2c SAPHIRE project files used as the initial data set for the FPIE analysis.

Table 4.1.3 [2]

Filename	Date	Time	Size - KB	Description
Caf2Sap PSAR2c.txt	6/29/2006	8:59a	11	Text rules file used by caf2sap.exe to create MAR-D files.
Caf2Sap.exe	3/24/2003	8:16a	28	Visual basic application for creating SAPHIRE MAR-D fault tree files.
Creation of Rules File PSAR2c.xls	6/26/2006	2:42p	2,162	EXCEL spreadsheet that creates the *.txt rules file for SAPHIRE MAR-D fault tree assembly.
PSAR2c FTree Logic.ftl	6/29/2006	9:16a	3,421	MAR-D fault tree file created from the PSAR2c CAFTA master fault tree.
SAPHIRE v7.26 PSAR2c Ftree Files.zip	6/29/2006	9:43a	1,099	Above listed supporting files.

4.1.4 Table 4.1.4 defines the house event configuration used in the FPIE evaluation:

Table 4.1.4

House Event		House Event	
A-HSE-CST-MAKEUP	F	I-HSE-M2LEFT-INS	T
C-HSE-P-52A-STBY	T	I-HSE-M2RGHT-INS	F
C-HSE-P-52B-STBY	T	M-HSE-P-2A-TRIP	T
C-HSE-P-52C-STBY	F	M-HSE-P-2B-TRIP	F
D-HSE-CHGR1-INS	T	M-HSE-SJAE1-INS	T
D-HSE-CHGR2-INS	T	M-HSE-SJAE2-INS	F
D-HSE-CHGR3-INS	F	U-HSE-P-7A-STBY	F
D-HSE-CHGR4-INS	F	U-HSE-P-7B-STBY	F
E-HSE-AIR-GT-75F	T	U-HSE-P-7C-STBY	T
E-HSE-AIR-LT-75F	F	X-HSE-2SG-BLDN	1
E-HSE-BYPASS-REG	T	X-HSE-2SG-BLDN-A	1
E-HSE-EDG11-DEM	T	X-HSE-2SG-BLDN-B	1
E-HSE-EDG11-RUN	T	X-HSE-SGA-BLDN	1
E-HSE-EDG12-DEM	T	X-HSE-SGB-BLDN	1
E-HSE-EDG12-RUN	T	Y-HSE-LOOP1A-BRK	T
I-HSE-C-2AC-INS	T	Y-HSE-LOOP1B-BRK	F
I-HSE-C-2B-INS	F	Y-HSE-LOOP2A-BRK	F
I-HSE-F-12A-INS	T	Y-HSE-LOOP2B-BRK	F
I-HSE-F-12B-INS	F	Y-HSE-RAS-POST	F
I-HSE-F-5A-INS	T	Y-HSE-RAS-PRE	F
I-HSE-F-5B-INS	F	X-HSE-DOOR-167B	T
X-HSE-DOOR-167	T		

4.1.5 The individual plant evaluation of external events (IPEEE) [3] provided is the major input to this evaluation. The input includes;

- Modeling methodology,
- Modeling assumptions,
- Fire detection, suppression, growth and propagation,
- Fire area definitions, combustible loads, ignition sources, etc.

4.1.6 The SAPHIRE project used to support the creation of the re-created IPEEE fire model described in references [4], [5] and [16] is listed below in Table 4.1.6.

Table 4.1.6

Filename	Description	Date	Time	Size - KB
PSAR2-fire-r5 V1A sensitivity 101210.zip	SAPHIRE IPEEE Fire Project	12/11/2010	12:00a	9,831

5.0 ASSUMPTIONS

Assumptions in this evaluation are classified as major or minor. These assumptions are specific to this evaluation. All assumptions of other risk evaluations (e.g., full power internal events, flooding, etc.) are applicable unless specifically noted.

5.1 Major Assumptions

5.1.1 The B.5.b pump is NOT credited in this analysis.

Basis:

While pump alignment is proceduralized, tested quarterly and that training occurs annually, the pump is currently not modeled in the analysis of record and per RIS 2008-15 cannot be credited in recovery.

Bias:

This assumption is conservative. Crediting the B.5.b pump would likely result in a factor of 10 reduction in the estimated ΔCDF. And given that if an event were to occur today and if directed by the Technical Support Center (TSC), the pump would be deployed.

5.1.2 The exposure period considered in this analysis was estimated to be 85 days.

Basis:

85 days is the applied exposure time based on successful QO-21B testing on 2/15/11 to the observed May 10th failure.

Bias:

This assumption is considered neutral.

5.1.3 Recovery Diagnosis and Execution Time

Basis:

The calculated recovery action is predicated on the time to reach -84% in both steam generators which is the cue to commence once-through-cooling. Therefore, this analysis uses 84 minutes as the total time available to diagnose and execute P-8B recovery.

Bias:

This assumption is conservative. For example, past calculations have cited 2 hours and 2.5 hours as the time at which either OTC recovery must occur or steam generator heat removal shall be re-established. Moreover, current MAAP analyses [11] show that at least 3 hours are now available to prevent core damage by either recovering OTC or re-establishing steam generator heat removal.

5.1.4 Other P-8B Random Failures

Basis:

This analysis only considers the P-8B trip reset as the explicit modeled recovery. Other pump failure modes are not explicitly treated nor are their recoveries modeled. However, the pump failure to run probability is added to the estimated trip recovery term (Attachment 5) to account for other non-explicit random failures.

Bias:

This assumption is considered neutral given that random failure is included in the recovery term.

5.2 Minor Assumptions

5.2.1 The fire model does not include the full power internal events credited supplemental diesel.

Basis:

The fire model employed in this analysis is based on the IPEEE dated 1995 [3]. The supplemental diesel was declared operation on June 30th, 2006.

Bias:

The fire model is conservative with respect to the current plant configuration.

5.2.2 Large Early Release Frequency (LERF).

Basis:

Though not quantified it is considered that LERF would be a couple of orders of magnitude less than the estimated CDF cited herein.

Bias:

This assumption is neutral.

5.2.3 Reliability Evaluation

Basis:

In performing the ΔCDF sensitivity analysis with the full power internal events model, the May 10th failure is added to both the failure to start and failure to run counts.

Bias:

This assumption is conservative.

6.0 METHODOLOGY

This evaluation employs the analytical procedures defined in References [2], [3], [4], [5], [6], [7], [8], [9] and [10].

6.1 Acceptance Criteria

The Reactor Oversight Process (ROP) acceptance criteria based on quantitative results is presented below:

Evaluated Configuration	Color
$\Delta CDF < 10^{-6}$	Green
$\Delta CDF > 10^{-6}$	White
$\Delta CDF > 10^{-5}$	Yellow
$\Delta CDF > 10^{-4}$	Red

7.0 ANALYSIS/EVALUATION

This section describes the analysis, assessment and evaluation employed. Discussion of procedures, event timelines, the B.5.b hi-level design functions, the quantified exposure time, the key aspects of the fire modeling, applied recovery actions, P-8B reliability data etc. are presented.

Results are included when appropriate. Summary results are presented in Section 8.

7.1 B.5.b

As noted in Assumption 5.1.1, the B.5.b is not credited in this evaluation. However, if an event were to occur and if directed by the Technical Support Center (TSC), the pump would be deployed. Nevertheless, an overview of pump operation is presented.

NEI-06-012, "B.5.b Phase 2 & 3 Submittal Guideline" [10], was developed to assist licensees with regulatory submittals describing their proposed strategies for closing Phases 2 and 3 of Section B.5.b of the 2002 Interim Compensatory Measure (ICM). In the security area, nuclear power plant licensees are responsible for providing assurance that their sites are taking reasonable measures to ensure that available resources are used effectively in responding to beyond design-basis threats. Site-specific assessments have demonstrated that a flexible response capability is desirable, and the following is an example of some components that have been identified for implementation:

- Diverse Spent Fuel Pool (SFP) Makeup Source (Internal Strategy) – Phase 2
- Flexible, Power-Independent SFP Makeup/Spray Source (External Strategy) – Phase 2, and
- Enhanced response Strategies for PWR's – Phase 3

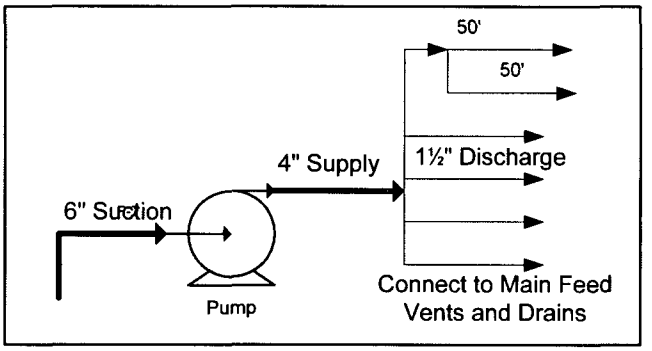
Interim Compensatory Measure (ICM) B.5.b, Phase 3 included the following requirements which are non-concurrent [12, 13]:

- Supplying 200 gpm in steam generator makeup flow to the feedwater heaters 6A and 6B given a steam generator pressure of 50 psig.
- Supplying 300 gpm flow to containment spray.

The equipment procured to perform this function consists of a trailer mounted portable diesel driven pump (P-990), hoses, and fittings. The trailer is stored in the B.5.b equipment building, which is a climate controlled NEIL rated enclosure, adjacent to the Palisades dry fuel storage building parking lot and is towed to the plant protected area via pick-up truck if needed.

For purposes of providing an alternate water supply to the steam generators, the analysis [13] demonstrates that the pump is capable of drawing suction from the intake structure, Lake Michigan beach front, the cooling tower basin, or the municipal water supply and discharging at least 220 gpm to the steam generators.

The pump's operation, and hose routing for the various suction points is described in Attachment 13 of the EI Plan Alternate Resources Document. This procedure would be implemented on recommendation of the technical support center. Step 'e' of the procedure instructs the pump operators to depressurize the steam generators per EOP Supplement 23, isolate or vent the safety injection tanks prior to PCS pressure lowering below 300 psia and to align the pump discharge to the feedwater heater vents and drains as shown in the figure below:



The portable pump is tested quarterly per model work order number 00155644, "B5B Strategy PM for Inspection and Testing", by operating it for 30 minutes with a minimum flow rate of 500 gpm. The pump was tested satisfactorily in December 2010 (WO# 52283989) and March 2011 (WO# 52303204).

Per Reference [11], typically the operator has 3 hours to align S/G makeup to prevent core damage when assuming 165 gpm design flow to each generator. Moreover, sensitivity analyses have shown that 50 gpm to each generator is sufficient to meet the 1800 °F hot core node temperature success criterion. A 2008 test using the Hale pumper with suction from a static source showed that alignment with the pumper running and all hoses pressurized and flowing water took some 75 minutes. After completing the pump alignment, the operators are instructed to match feed flow to decay heat generation in accordance with EOP Supplement 19 [21].

7.2 P-8B Trip

7.2.1 Background

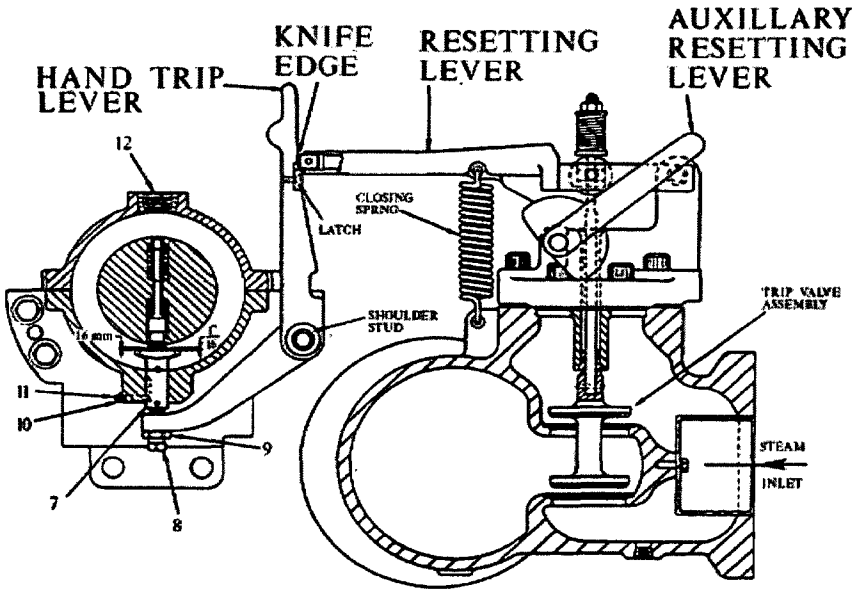
EOP Supplement 19 Rev. 10, "Alternate Auxiliary Feedwater Methods", is referenced from EOP-3.0 Rev. 14, "Station Blackout Recovery", EOP-7.0 Rev13, "Loss of All Feedwater Recovery", and EOP-9.0 HR-1 Rev. 19, HR-2 Rev. 22, HR-3 Rev. 22, "Functional Recovery Procedure", ONP-25.1 Rev. 20, "Fire which Threatens Safety–Related Equipment", and ONP-25.2 Rev. 26, "Alternate Safe Shutdown Procedure", when local actions are necessary to restore the auxiliary feedwater system. Section 4.0 of the supplement provides direction for restoration of the steam supply to auxiliary feedwater pump P-8B. Step 2.c. directs the Operators to verify the pump's turbine driver, K-8, is latched and subsequently lists instructions for resetting the trip lever. The procedure states:

> c. ***CHECK*** Turbine Driver K-8 is latched as follows:
>
> ***NOTE***: The knife edge should overlap the latch.
>
> 1) ***ENSURE*** the end of resetting lever (knife edge) is in contact with hand trip lever (can NOT slip a sheet of paper between). Refer to Figure 1. (Page 20)
>
> 2) IF Turbine Driver K-8 is NOT latched, *THEN* ***RELATCH*** as follows:
>
> > a) ***ENSURE CLOSED*** CV-0522B, K-8 Normal Steam Supply.
> >
> > b) ***RESET*** the overspeed trip lever on Turbine Driver K-8 using the Auxiliary Reset lever.

Figure 1 from page 20 of EOP-Supplement 19 is shown below

Figure 1

TRTP VALVE LINKAGE



7.3 Exposure Time

85 days is the applied exposure time based on successful QO-21B testing on 2/15/11.
A time line of P-8B activities is presented in Table 7.3 below. Following Table 7.4 provides a "run log" since the end of REFOUT 21.

Table 7.3: P-8B Auxiliary Feedwater Pump - Overspeed Trip CR-PLP-2011-02350		
Date	**Activity**	**Run time, hrs**
10/06/10-10/20/10	WO214219 - K-8 Overhaul per FWS-M-6; Auxiliary Feedwater Turbine Maintenance. ***Worn carbon seal rings, and axial indication identified. Determined cracks on rotor will require use of spare rotor. Ref. CR-PLP-2010-04631.*** ***Resetting Lever knife-edge inadvertently lubricated per procedure Step 5.40.3 (write-in)***	
10/06/10	WO201016 - RV-0521B, K-8 steam supply relief valve removed. Sent offsite.	
10/11/10	WO208306 - Performed FWS-I-17, Lo Suction Trip test for P-8A, P-8B.	
10/15/10-10/16/10	WO214382 - K-8 Overspeed Trip test per T-186. Requires SSTM. ***Acceptance criteria not met for overspeed trip. TTOD device showed trip at 3793 rpm.*** ***Criteria: 3845 - 3916 rpm.*** ***Action: Use old rotor spring and shim washer, screw adjustment to 4 1/2 turns. Retest resulted in SAT trip test. Ref. CR-PLP-2010-05113.***	
10/17/10	WO214219 - Recoupled K-8 to P-8B and aligned.	
10/22/10	1R21-1 / AFW - P-8B Tags cleared and verified.	
10/25/10	WR216703 - Packing adjustment to MV-FW146.	
10/28/10	WO255002 - PMT complete; RO-145B, Comprehensive Pump Test. ***Verified overspeed trip resetting lever positioned correctly prior to pump testing.*** ***Required feed flow rates (165 gpm in cascade) were not met. Could not perform speed adjustment per RO-145 (procedure use issue). Performed speed adjustment following SOP-12 pump start. Ref. CR-PLP-2010-05796.*** ***Verified overspeed trip resetting lever operated SAT following pump testing. No observations noted.***	***0.33 (RO-145B)*** ***0.73 (SOP-12)*** ***1.17 (RO-145B)***
	Report of steam leak from CK-MS402, Steam Supply Check. Removed insulation verified NO leak.	
10/29/10	Report of excessive steam exiting from steam traps ST-0512, ST-0513 during RO-145. Ref. CR-PLP-2010-05812.	
10/29/10	WR217303 - Repair packing gland leak MV-FW710, Discharge vent. Ref. CR-PLP-2010-05811.	
02/14/11	WO52243399 - QO-5X1 - Valve Test procedure (includes CIS valves) for CV-0522B.	
02/15/11	WO52293482 - QO-21B - In-service Test. ***Verified overspeed trip resetting lever positioned correctly prior to pump testing.*** ***Verified overspeed trip resetting lever operated SAT following pump***	0.78 (QO-21B)

Table 7.3: P-8B Auxiliary Feedwater Pump - Overspeed Trip
CR-PLP-2011-02350

Date	Activity	Run time, hrs
	testing. No observations noted.	
02/15/11	WR204330 - K-8 Turbine Driver, severity level 2 oil leak. Ref. CR-PLP-2011-02413. WR025156 - CK-FW743, P-8B Discharge valve, 20 gpm leak.	
02/23/11	RO-145C, Comprehensive Pump Test for Pump P-8C.	
03/15/11	RO-145A, Comprehensive Pump Test for Pump P-8A.	
05/10/11	RI-95A, AFW Flow FT-0727 Instrument Loop Calibration. WO251496 - Replace HIC-0749, AFW P-8B to Stm Gen E-50A Flow Controller. WO52235979 - AFW Control to E-50A CV-0749, P-8A/B Flow Control to E-50A calibration. WO52235978 - AFW Flow Control to E-50B calibration. WO52235982 - AFW P-8B Steam Supply CV-0522B, grease.	0.08
05/10/11 (2154)	WO52289689 - RO-97 - AFW Auto Initiation Test, for P-8A, P-8B. ***Verified overspeed trip resetting lever positioned correctly prior to pump testing.*** ***Pump P-8B inoperable due to trip on overspeed during RO-97. Ref. CR-PLP-2011-2350*** Pump P-8B available for maintenance rule following reset of over-speed trip device. Pump P-8B unavailable for maintenance rule. HS-0522B to CLOSED for overspeed trip T/S. Pump P-8B tripped using manual trip lever. Pump P-8B reset manual trip lever. SOP-12, Attachment 7.	***0.05 (RO-97)***
05/11/11 (1248)	WO52322759 - QO-21B - In-service Test. Performed to support T/S. ***Verified overspeed trip resetting lever positioned correctly prior to pump testing.*** ***Verified overspeed trip resetting lever operated SAT following pump testing. No observations noted.***	0.72 (QO-21B)
05/11/11 (1356) 05/11/11 (1456)	Pump P-8B unavailable for maintenance rule. HS-0522B to CLOSED to support maintenance. Pump P-8B tripped using manual trip lever.	
05/11/11 (1559) 05/11/11 (1832)	WO276614 - ***Clean lube off knife-edge/latch edge of overspeed trip. Ref. CR-PLP-2011-2364.*** Pump P-8B reset manual trip lever. SOP-12 Attachment 7. HS-0522B to AUTO. WO52289689 - RO-97 - AFW Auto Initiation Test for P-8B completed SAT.	***0.32 (RO-97)***

Table 7.3: P-8B Auxiliary Feedwater Pump - Overspeed Trip CR-PLP-2011-02350		
Date	**Activity**	**Run time, hrs**
	Pump OPERABLE. ***Verified overspeed trip resetting lever positioned correctly prior to pump testing.***	
05/11/11 (1937)	P-8B declared INOPERABLE to perform inspection of steam traps following test RO-97.	
05/12/11 (0548)	WO00276751 - QO-21B - In-service Test. Completed UNSAT. ***Verified overspeed trip resetting lever positioned correctly prior to pump testing.*** ***Verified overspeed trip resetting lever operated SAT following pump testing. No observations noted.*** ***Pump P-8B inoperable during and following test due to not discharging condensate from ST-0514, and ST-0523. Ref. CR-PLP-2011-02380.***	1.32 (QO-21B)
05/12/11 (1412) 05/12/11 (2010)	Pump P-8B operated for >60 minutes in recirculation mode to verify operability of steam traps. P-8B declared OPERABLE following completion of EC reply documenting basis for no steam trap discharge.	1.03 (test)
Shiftly (2x/day)	eSOMS - Check trip valve latched, governor oil level, shaft not rotating when NIS.	
		6.53 (TOTAL)
	Comments in bold-italic are adverse conditions and/or conditions related to the overspeed trip mechanism. All run-times are with P-8B on recirc, and annotated in bold-italic means that both S/Gs are receiving flow.	

Table 7.4: P-8B Run Log

Equip ID	Record Type	Start Date	Start Time	End Date	End Time	Run Time	Comments	Reference Document
P-8B	Run Time	5/12/2011	13:11	5/12/2011	14:13	1:02	Pump ran in recirc mode to verify proper and continuous operation of the turbine casing and exhaust steam traps i.e. ST-0514 & ST-0523 respectively.	Ops Log
P-8B	Run Time	5/12/2011	3:29	5/12/2011	4:46	1:17	Pump ran in support of QO-21B used as PMT for strainer trap ST-0514 & ST-0523 inspection.	QO-21B
P-8B	Run Time	5/11/2011	16:24	5/11/2011	16:44	0:20	Pump auto sequence started per RO-97 (118s delay time recorded).	RO-97B
P-8B	Run Time	5/11/2011	8:57	5/11/2011	9:39	0:42	Ran pump in support of QO-21B test spec test	QO-21B
P-8B	Run Time	5/10/2011	22:32	5/10/2011	22:35	0:03	Pump auto sequence started per RO-97 (117.72s delay time recorded).	RO-97B
P-8B	Run Time	2/14/2011	22:07	2/14/2011	22:54	0:47	Pump ran for quarterly surveillance test QO-21B (retest).	QO-21B
P-8B	Run Time	10/28/2010	18:40	10/28/2010	19:49	1:09	Pump ran for PMT using Surveillance Test RO-145	RO-145 Comprehensive surveillance pump test
P-8B	Run Time	10/28/2010	18:17	10/28/2010	18:19	0:02	Pump started to verify speed adjustment using SOP-12	PPC Data Link, Ops Log
P-8B	Run Time	10/28/2010	17:41	10/28/2010	18:09	0:28	Pump started to make initial speed adjustment after turbine maintenance (e.g. 10 yr inspection).	PPC Data Link, Ops Log

7.4 Additional P-8B Reliability Data

The following describes the review of past P-8B performance data from 2005 to the present.

7.4.1 Data Collection Background

Data for auxiliary feedwater pump start demands and run-time was obtained from the PI data archive. PI is a classified category "C" (important to business) system in accordance with Entergy procedure EN-IT-104, "Software Quality Assurance Program". The plant process computer (PPC) is its source of data which is a SQA category "B" system (regulatory commitment). Most PPC points are calibrated via technical specification surveillance procedure or by preventive maintenance and controlled calibration sheets.

Part of the PI server system runs on the plant process computer (PPC). This portion monitors selected points every second to test against the exception threshold change value. If the change value is exceeded, the data is passed to the PI server and recorded. The PI server also compares the new value against previous values to see if it still fits on a line within the compression limit. If yes, the data is discarded, otherwise it is added to the archive. For pump starts, the compression limit is simply a change in state (on-off or start-stopped), if 8 hours have passed without an archive update, one is made regardless. PI will generally provide accurate long term values and greater amounts of data when events are changing rapidly.

For this analysis, PI server tag YSP8B_D (Turb Driven Aux Fwtr Pump P-8B) was used to extract sampled data from the PI archive for the period from 7-25-05 to 7-28-2011. The data was imported into a common commercial spreadsheet application, Microsoft Excel™ 2007, using the PI DataLink add-on module. A visual basic macro was then developed to count the pump starts and stops and accumulated run time between the dates of 7-25-2005 and 7-28-2011. The macro processed each data point in chronological order to find when the pump state changed from "Off" to "On". When a change in state was found, a pump start (demand) was recorded as well as the date- time stamp and the cell shaded yellow. The macro then determined when the pump state was changed from "On" to "Off", calculated the run time for the demand and shaded the cell light blue. If the calculated run time was less than one minute, the data was considered erroneous, and the demand as well as the run-time was not counted; in these cases the cell color was changed from light blue to green. A one minute threshold for including the data was based on a review of manually recorded information by the AFW system engineer that documented run times as short as 0.01 hours. These short runs are valid and were performed occasionally for system testing or maintenance. Discarded erroneous runs were typically on the order seconds in duration.

7.4.2 Data Validation

As validation of the final accumulated data, the results were reviewed against system engineering records. It was noted that several additional start demands were recorded in the PI archive data, but this is expected as the PI server records a start each time the pump's steam admission valve is opened; whereas the plant and system engineer logs lump several post maintenance test steam admission valve cycles into a single record for a pump run. Other than the increased number of pump demands, there was excellent agreement between the macro data and the manually recorded data.

Based on the 19,000 data points extracted from the PI data archive, AFW pump P-8B received 142 start demands and operated for 52.3 hours between 7-25-05 and 7-28-2011. A review of maintenance rule records was performed for this period and no failures were recorded other than

the May 2011 event. Based on this information, the failure probability of the turbine driven feedwater pump to start, and to run, was updated per the Bayesian methodology described in Section 8.1 of Palisades Safety Assessment Notebook [15]. Probabilities were calculated assuming 0, 1, and 2 pump start and run failures as presented in Table 7.4.1 below. Note both failure to start and failure to run calculations applied the May 10th failure.

Table 7.4.1: Auxiliary Feedwater Pump P-8B Failure Probability Data

Basic Event ID	Basic Event Desc	No of Failures	Units Dem (d) / Hrs (h)	Exposure (dem run hrs)	Prior Mean	Prior Error Factor	Prior Dist	Prior Alpha	Prior Beta	New Post Mean	Error Factor	Reference / Notes
AFW-PMME-P-8B	Pump Fails to Start	0	d	142	9.52E-03	5.65	B	0.57	5.98E+01	2.84E-03	10.3	Prior data NUREG/CR-6928
AFW-PMME-P-8B	Pump Fails to Start	1	d	142	9.52E-03	5.65	B	0.57	5.98E+01	7.78E-03	5.1	
AFW-PMME-P-8B	Pump Fails to Start	2	d	142	9.52E-03	5.65	B	0.57	5.98E+01	1.27E-02	3.8	
AFW-PMMG-P-8B	Pump Fails to Run	0	h	52.3	7.35E-05	8.4	G	0.5	6.80E+03	7.30E-05	11.5	
AFW-PMMG-P-8B	Pump Fails to Run	1	h	52.3	7.35E-05	8.4	G	0.5	6.80E+03	2.19E-04	5.3	
AFW-PMMG-P-8B	Pump Fails to Run	2	h	52.3	7.35E-05	8.4	G	0.5	6.80E+03	3.65E-04	3.9	

7.5 Human Reliability Analysis Recovery Modeling

The recovery model developed for this assessment began with the A-AVOA-AFWSTEAM term which was part of the PSAR2 model and subsequently used in the Reference [5] analysis as well. The initial human failure event (HFE) (A-AVOA-AFWSTEAM) modeled failure to take local manual control of P-8B by opening CV-0522B.

This operator action is based on implementation of EOP Supplement 19 for cases where all AFW pumps fail to auto start and fail to start from the control room. Consequently the HFE development includes the step EOP Supplement 19 to verify that the turbine is latched (overspeed mechanism not tripped).

The initial Human Error Probability (HEP) was based on the ASEP methodology.

The current HEP development is included in the latest HRA notebook [17] was developed using the EPRI HRA calculator [18]. Attachment 5 provides the input used in the HRA calculator.

The performance shaping factors impacting the HEP development were reviewed to verify they were appropriate to support implementation in the fire analysis (Attachment 5). The HEP calculated using the HRA calculator is lower than the value used in analysis of the impact of the performance deficiency. Therefore the value used is conservative.

7.5.1 EOP Supplement 19 Background

The implementation of EOP Supplement 19 is part of routine operator training. Section 4 of the supplement for local operation of P-8B via manual operation of CV-0522B is specifically addressed in training via a job performance measure (JPM) PL-OPS-ONP-010J (Start AFW Pump P-8B locally using CV-0522B). The operator is required to demonstrate each step which includes re-latching the turbine and controlling steam pressure via manual operation of CV-0522B. The JPM requires the actions be completed within a validation time of 15 minutes. The off normal procedures for fire (ONP-25.1 [19] and ONP-25.2 [20]) require completion of the action to have AFW in service based on the implementation of EOP Supplement 19.

This analysis includes credit for once through cooling (OTC), if available, for a given fire area. Therefore the time available to the operator to recover AFW prior initiation of OTC is the time for the steam generator level to lower to -84%. The supporting hydraulic analysis indicated that this level occurs at 1.4 hours (84 minutes) for the station blackout (SBO) case. Should the fire make OTC unavailable then again at least 3 hours (Attachment 5) are available for the operator to complete the restoration of P-8B operation.

The HFE was originally developed for use in station blackout sequences and the stress factor was originally set to HIGH stress and the performance shaping factor for lighting was set to EMERGENCY LIGHTING. The other stress factors for heat/humidity, radiation and atmosphere were reassessed for appropriateness given the action is being implemented in fire scenarios. The heat/humidity factor was changed from NORMAL to HOT/HUMID. The shaping factor for atmosphere was changed from NORMAL to SMOKE. The shaping factor for radiation was left unchanged since this action occurs in the AFW pump room. These changes to the performance shaping factors influence the stress factor used by the calculator. Assignment of these factors would be considered conservative as the action as indicated is implemented in the AFW pump room away from the fire except for fires in the turbine building where the action is not credited in the AFW pump. However, the assignment of 'Emergency Lighting' for the lighting factor already altered the stress factor and the changes to the other performance shaping factors do not further impact the stress factor. For the AFW pump room the pump would already be considered failed

by the fire and inaccessible. With stress set to HIGH, lighting set to EMERGENCY, environment set to HOT and atmosphere set to SMOKE the original calculated HEP was 1.2E-02. A sensitivity analysis was conducted by changing the shaping factor for complexity of response from SIMPLE to COMPLEX in addition to the changes listed above. This change had no impact on the calculated HEP.

This value is subsequently added to the pump failure to run failure mode to account for other pump random failures. Since this action is intended to address recovery from a spurious pump trip as a consequence of the performance deficiency (a specific cause of pump failure) the HEP was combined numerically with the probability of pump fail to run. This combination provides for the analysis of recovery of the specific cause (performance deficiency with a probability of 1.0) while retaining the probability of pump failure to run from other causes without recovery.

From Table 7.4.1, the pump failure to run λ value is estimated to be 7.3E-05/hr. Therefore,

7.3E-05/hr x 24 hr = 1.75E-03 and 1.2E-02 + 1.75E-03 = 1.38E-02

The value 1.38E-02 was used in the "credited recovery" cases.

Subsequent review, ERIN Engineering Memorandum - Attachment 8 and resolution of comments (included in the EN-DC-134-ATT-9.7 document) regarding the HEP development, resulted in removing some conservative assumptions input to the calculation. The conservatism removed focused on the recovery of cognitive and execution errors. The impact was a reduction of the calculated HEP from 1.38E-02 to 5.9E-03. Since this value is lower than the value used in the significance determination the value used is considered conservative. The 1.38E-02 value was employed in this evaluation.

7.6 Full Power Internal Events at Power (PSAR2c)

The current analysis-of-record [2] model was employed to evaluate the significance of failing P-B with respect to the full power internal events analyses. Attachment 6 provides a high level PRA model history description since the IPE submittal.

To support the risk evaluation, the SAPHIRE code [1] was employed to evaluate P-8B failed for all full power internal events. The following change set data was prepared:

7.6.1 FPIE Random Failure Analysis

To support the full power internal events random failure analysis, the following SAPHIRE change set data were employed;

PSAR2c.csd

PSAR2C=

P-8B,	PSAR2c Reliability - FTR and FTS With No Failures Using Updated Data
P-8B(1),	PSAR2c Reliability - Case 1 FTR and FTS w/1 Failure
P-8B(2),	PSAR2c Reliability - Case 2 FTR and FTS w/2 Failures
P-8B(SDP-NO-RECOVERY),	PSAR2c Reliability - with FTR Set to 1.0
P-8B(SDP-RECOVERY),	P-8B FTS wUpdated Data FTR wRecovery & Pump Random Failure

PSAR2c.csi

PSAR2C, P-8B =

^PROBABILITY
A-PMMG-P-8B , , , 7.300E-005, , , , , ,
A-PMME-P-8B , , 2.840E-003, , , , , , ,
^CLASS
^EOS
PSAR2C, P-8B(1) =
^PROBABILITY
A-PMMG-P-8B , , , 2.190E-004, , , , , ,
A-PMME-P-8B , , 7.780E-003, , , , , , ,
^CLASS
^EOS
PSAR2C, P-8B(2) =
^PROBABILITY
A-PMMG-P-8B , , , 3.650E-004, , , , , ,
A-PMME-P-8B , , 1.270E-002, , , , , , ,
^CLASS
^EOS
PSAR2C, P-8B(SDP-NO-RECOVERY) =
^PROBABILITY
A-PMMG-P-8B , , , 1.000E+000, , , , , ,
A-PMME-P-8B , , 2.840E-003, , , , , , ,
^CLASS
^EOS
PSAR2C, P-8B(SDP-RECOVERY) =
^PROBABILITY
A-PMME-P-8B , 1, , 2.840E-003, , , , , , ,
A-PMMG-P-8B , 1, , 1.380E-002, , , , , , ,
^CLASS
^EOS

7.6.2 Re-Created IPEEE Analysis

To evaluate the re-created IPEEE analysis, the following SAPHIRE change set data were employed;

PSAR2c.csd

P-8B(FIRE-SDP-LOGICAL),	SDP with Recovery- A-HSE-P8B-RECOVERY Event if Set to "T" (Re-created IPEEE)
P-8B(FIRE-SDP-NO-RECVRY),	SDP Failure Random FTS and FTR set to 1 (Re-created IPEEE)
P-8B(FIRE-SDP-RECVRY),	SDP Failure Random FTS and FTR wRecovery & P-8B Random Failures (Re-created IPEEE)
P-8B(FIRE-SDP-TRUE),	SDP Random Failure FTS and FTR set to True (Re-created IPEEE)
P-8B(FIRE-SDP),	SDP P8B with Random FTS and FTR data (Re-created IPEEE)

PSAR2c.csi

FIRE-PSAR2-P8B(1), P-8B(FIRE-SDP-LOGICAL) =
^PROBABILITY
A-HSE-P8B-RECOVERY , T, , , , , , , ,
^CLASS
^EOS
FIRE-PSAR2-P8B(1), P-8B(FIRE-SDP-NO-RECVRY) =
^PROBABILITY
A-PMME-P-8B , 1, , 2.840E-003, , , , , ,
A-PMMG-P-8B , 1, , 1.000E+000, , , , , ,
^CLASS
^EOS
FIRE-PSAR2-P8B(1), P-8B(FIRE-SDP-RECVRY) =
^PROBABILITY
A-PMME-P-8B , 1, , 2.840E-003, , , , , ,
A-PMMG-P-8B , 1, , 1.380E-002, , , , , ,
^CLASS
^EOS
FIRE-PSAR2-P8B(1), P-8B(FIRE-SDP-TRUE) =
^PROBABILITY
A-PMMG-P-8B , T, , , , , , , ,
A-PMME-P-8B , , , 2.840E-003, , , , , ,
^CLASS
^EOS
FIRE-PSAR2-P8B(1), P8B(FIRE-SDP) =
^PROBABILITY
A-PMME-P-8B , , , 2.840E-003, , , , , ,
A-PMMG-P-8B , , , , 7.300E-005, , , , ,
^CLASS
^EOS

7.6.3 Equipment Rotation

The assumed plant configuration cited in Reference [2] and is repeated below;

PSAR2c.csd

PSAR2C=
HEVENTS (LGCLS-NRML-CNF), House Events w/Normal Plant Rotation Set to True

PSAR2c.csi

C-HSE-P-52A-STBY , T, , , , , , , ,
C-HSE-P-52B-STBY , T, , , , , , , ,

C-HSE-P-52C-STBY , F, , , , , , , , ,
D-HSE-CHGR1-INS , T, , , , , , , , ,
D-HSE-CHGR2-INS , T, , , , , , , , ,
D-HSE-CHGR3-INS , F, , , , , , , , ,
D-HSE-CHGR4-INS , F, , , , , , , , ,
E-HSE-AIR-LT-75F , F, , , , , , , , ,
E-HSE-AIR-GT-75F , T, , , , , , , , ,
I-HSE-M2LEFT-INS , T, , , , , , , , ,
I-HSE-M2RGHT-INS , F, , , , , , , , ,
I-HSE-F-12A-INS , T, , , , , , , , ,
I-HSE-F-12B-INS , F, , , , , , , , ,
I-HSE-F-5A-INS , T, , , , , , , , ,
I-HSE-F-5B-INS , F, , , , , , , , ,
I-HSE-C-2AC-INS , T, , , , , , , , ,
I-HSE-C-2B-INS , F, , , , , , , , ,
M-HSE-P-2A-TRIP , T, , , , , , , , ,
M-HSE-P-2B-TRIP , F, , , , , , , , ,
M-HSE-SJAE1-INS , T, , , , , , , , ,
M-HSE-SJAE2-INS , F, , , , , , , , ,
U-HSE-P-7A-STBY , T, , , , , , , , ,
U-HSE-P-7B-STBY , F, , , , , , , , ,
U-HSE-P-7C-STBY , F, , , , , , , , ,
X-HSE-SGA-BLDN , 1, , 1.000E+000, , , , , ,
X-HSE-SGB-BLDN , 1, , 1.000E+000, , , , , ,
X-HSE-2SG-BLDN , 1, , 1.000E+000, , , , , ,
X-HSE-2SG-BLDN-A , 1, , 1.000E+000, , , , , ,
X-HSE-2SG-BLDN-B , 1, , 1.000E+000, , , , , ,
Y-HSE-LOOP1A-BRK , T, , , , , , , , ,
Y-HSE-LOOP1B-BRK , F, , , , , , , , ,
Y-HSE-LOOP2A-BRK , F, , , , , , , , ,
Y-HSE-LOOP2B-BRK , F, , , , , , , , ,
Y-HSE-RAS-PRE , F, , , , , , , , ,
Y-HSE-RAS-POST , F, , , , , , , , ,
A-HSE-CST-MAKEUP , F, , , , , , , , ,
X-HSE-DOOR-167B , T, , , , , , , , ,
X-HSE-DOOR-167 , T, , , , , , , , ,
^CLASS
^EOS

7.7 External Events Fire Modeling

This section describes the steps taken to re-create the IPEEE fire analysis. The recreated IPEEE analysis is built upon the Palisades 2004 PSAR2 model [16] as well as that documented in Reference [5].

This analysis resurrected the Reference [5] and [16] analyses and applied the IPEEE data, fault tree and event tree logic.

Below a summary description that describes how the IPEEE model was changed. This is followed by a discussion of the operator recovery action to reset P-8B.

To create the IPEEE fire model using PSAR2, the Reference [5] analysis performed the following:

1. Converted the basic events representing component fire damage in the fire IPEEE to basic event names currently used in the PSAR2 analysis.
2. Modify the PSAR2 fault tree logic to reflect assumptions made in the fire IPEEE.
3. Add fire related failure modes to the PSAR2 fault tree logic.
4. Recreated fire area initiating events.
5. Developed fire accident sequences (1,776).

7.7.1 Basic Event Conversion

The fire IPEEE was based on a Palisades internal events PSA model that was current as of 1995. Updates to the 1995 PSA model have been performed since the IPEEE submittal. Among the changes was a restructuring of the format of the basic event names.

Attachment 1 provides a listing of the basic event names that were selected in the fire IPEEE to represent component failures that would occur as a result of fire damage in the various fire areas of the plant.

7.7.2 Modifications to the PSAR2 [16] Fault Trees [5]

As noted above, the fire IPEEE was based on a Palisades internal events PSA model that was current as of 1995 and updates subsequently have been made to the PSA models. These updates reflect plant design that have occurred since the fire IPEEE, modifications to the models to address comments by external peer reviewers, changes resulting from a technical adequacy self assessment performed in accordance with Regulatory Guide 1.200 and updates to reliability data have been addressed. Attachment 6 provides an overview of PRA model changes since the IPEEE submittal.

Changes made to PSAR2 logic to recreate the IPEEE are summarized below and in Attachment 2.

Modifications to Reflect Logic in the Fire IPEEE

A number of local operator actions were credited in the fire IPEEE that are not included in the internal events PSA fault tree logic. These operator actions generally take place as a result of loss of power or control circuits due to fire damage in specific fire areas. These recovery actions generally include local closure of breakers or operation of control valves. Attachment 2 provides a complete listing.

Modifications to the PSAR2 logic to reflect logic in the fire IPEEE were implemented in a manner

that the fault trees could be quantified in one of three ways:

- Implement the fire IPEEE logic specifically for the fire area for which the change was intended. For example, local closure of the breaker for P7B was credited in the fire IPEEE only for control room fires. Gate U973-DG-FIRE was developed to include a local operator action (U-PMOE-PUMP) for closure of this breaker ANDed with all control room fires (gate A69A5-FIRE under OR gate U973-DGA2-FIRE). By setting any of the control room cabinet fire initiating event house events to True, this recovery logic is enabled.
- Implement the fire IPEEE logic for all fire areas. This is performed using a house event created for this purpose. For example, HSE-ANYFIRE is set to True enabling the U-PMOE-PUMP logic under gate U973-DGA2-FIRE. The HSE-ANYFIRE house event appears ANDed with all fire IPEEE logic incorporated in the PSAR2 fault tree and enables the fire IPEEE logic for all fire areas.
- Disable the fire IPEEE logic in the quantification of the fire accident sequences using the PSAR2 logic. This is performed using the HSE-NOTANY house event. By setting this event to True and the HSE-ANYFIRE to False, fire IPEEE changes are disabled and the fault trees quantified without this recovery logic. The purpose of the HSE-NOTANY house event was to facilitate comparison of the effects of the fire IPEEE changes with the PSAR2 logic.

Modifications to Assure Logic Reflects Correct Plant Transient Response to a Fire

The PSAR2 fault tree models include house events to activate fault tree logic associated with plant response to transient initiators. As fire initiators are not a part of the list of internal events in PSAR2, a house event is added to the list of transient initiators representing plant trip due to a fire initiator.

Addition of Fire Areas Initiators to the Fault Tree Logic

The Palisades PSA models are quantified using house events to represent the various initiating events. For a given initiating event, setting its house event to True and all other initiator related house events to False enables the appropriate logic in the fault trees for that given initiating event.

Fire initiator house events were added to the PSAR2 model using the information in Attachment 1. Each basic event listed as representing a component failure for a given fire area in Attachment 1 was ORed with a house event representing that fire area. The AddEvent program [14] was used to incorporate the house events into the fault trees. The following files were created as input to the AddEvent program for this purpose. AddEvent was executed to incorporate the effects of fire initiators from the IPEEE (Attachment 1).

Quantification of the fault trees for a given fire area can then be performed by setting a selected fire area house event to True and all other fire area house events to False.

Attachment 3, lists the IPEEE Ignition Frequencies, Fault Tree Names/Frequencies and Fire Area Assigned/Associated Logical Event.

Event Tree Diagrams

Two types of event trees were developed. The first type of event tree simply distributes a given fire area into the different sub areas that were developed for that fire area in the Fire IPEEE. For example, the Control Room can be distributed among 18 different control cabinets or an exposure fire that, if unsuppressed, can affect equipment in the entire room. Attachment 4, Figure 4.1 is an

example of the event tree that distributes the fires among the various sub areas for the Control Room. The second event tree type defines plant accident sequence response to a given fire and includes important functions and system logic that are developed by the fault trees.

This second linked event tree transfers to the appropriate sub area. Figures 4.8 is an example of an event tree used to quantify control room fires.

Event Tree Rules

Attachment 4, Tables 4.1 through 4.10 list rules for quantification of the accident sequences for each fire area.

Accident Sequence Generation and Solution

Three steps were performed to quantify the event tree accident sequences.

- Convert the PSAR2 fire fault tree to SAPHIRE format
- Develop Change Sets to perform the accident sequence quantification
- Generate accident sequences using the SAPHIRE "link" command
- Quantify all the accident sequences

First conversion of the PSAR2 fire CAFTA fault tree to a MAR-D format described in the above steps was performed using the Caf2sap program [14].

Modifications to Incorporate P-8B Recovery

Given the HFE developed recovery factor (1.38E-02), a SAPHIRE change set was created to zero out the P-8B failure to start event and use the recovery factor as the failure to run value for P-8B (again, this recovery factor included pump failure to run random failures). The 1,776 IPEEE recreated sequences were subsequently solved.

7.8 Internal Flood at Power

From the Individual Plant Examination [28] Appendix A for internal floods, the total core damage frequency for internal flooding events by flood zone was 3.0E-7 per year.

A sensitivity analysis [29] was performed failing P-8B (with no recovery) and resulted in a ΔCDF/yr of (9.5E-07 – 2.43E-07)/yr using a truncation limit of 1E-10. The ΔCDF applying the 85 day exposure period was 1.65E-07.

From the above, flooding is not considered a threat to P-8B operability. Moreover, given the May 10th event and taking into account that the ΔCDF/yr (Table 8.2) when including the May 10th trip as a failure is less than 1E-06, the Reference [28] and [29] conclusions will not change when evaluating P-8B importance in mitigating the consequences of internal flooding zones as confirmed by the above discussed sensitivity analysis.

7.9 Seismic Events at Power

In the Palisades IPEEE (Individual Plant Examination of External Events), a seismic risk assessment was used to assess risks due to seismic events. The risk assessment was a hybrid of the conventional PSA and seismic margins analysis.

The seismic analysis has not been updated since that originally developed for the Individual Plant Examination of External Events (IPEEE) submittal [3]. A review of the results of the IPEEE submittal indicated that the core damage frequency was 8.88E-06 with a high confidence low probability of failure (HCLPF) of 0.217g PGA (peak ground acceleration). There were no specific seismic events identified as dominant contributors to the core damage frequency. Important

seismic induced failures identified were; the Fire Protection System, Main Steam Isolation Valves, Diesel Generator Fuel Oil Supply, and an under voltage relay for 2400 volt ac Bus 1D. Several important random failures were identified in the report as important because of their contribution in combination with seismically induced failures. The important random failures (not seismically induced) identified in the report were: diesel generator 1-2, auxiliary feedwater (AFW) pump, P-8C, and atmospheric dump valves.

As noted, the fire protection system is an important contributor to seismic analysis due to the probability of seismically induced failure of fire protection system components and the condensate storage tank (CST). Seismically induced failure of the condensate storage tank results in an earlier need for alignment of an alternate suction source for the operating auxiliary feedwater pump. The fire protection system provides an alternate suction source to AFW pumps P-8A and P-8B. The seismically induced failures of the fire protection system result in long term failure of auxiliary feedwater pumps P-8A and P-8B due to the unavailability of a suction source. Auxiliary feedwater pump P-8C is important to long term makeup to the steam generators should the fire system become unavailable following a seismic event (as discussed in the results for Accident Classes IA & IB, Section 3.6.5.3.1 [3].

The fire protection system has a low fragility and is a significant contributor to seismic risk once the contents of the condensate storage tank (T-2) are depleted and a long term suction source is required for continued operation of the AFW pumps. The seismically induced failure of the fire protection system represents a higher probability of failure of the long term suction to motor-driven auxiliary feedwater pump P-8A and turbine-driven auxiliary feedwater pump P-8B after the depletion of the available tank T-2 inventory. This increased probability of failure of heat removal via the A and B pump trains results in an increased importance of motor-driven auxiliary feedwater pump P-8C. The importance of pump P-8C is a consequence of the fact that service water (a much more seismically rugged system) is more likely to remain available as a long term suction source to pump P-8C.

In summary, P-8B unreliability in of itself is not a significant contributor to the seismic results. Moreover, given the May 10th event and considering the ΔCDF/yr (Table 8.2) when including the May 10th trip as a failure is less than 1E-07, the IPEEE conclusions will not change.

7.10 Other Hazards

There were no other external events identified that have an impact on the core damage frequency at Palisades. All of the screening criteria used from NUREG-1407 [22] and Generic Letter 88-20, Supplement 4 [23] were satisfied. Results of the Palisades Systematic Evaluation Program (SEP) [24] were used, whenever possible, to complete the evaluation of other external events.

8.0 RESULTS

The following results are presented in this section;

- First, validation of the re-created IPEEE fire modeling results is presented.
- Next, considering the event as a random failure, the delta risk results are listed.
- Finally, considering that a performance deficiency exists, the results with and without recovery is shown.

8.1 Validation of Re-Creating the IPEEE Analysis

Prior to evaluating the significance of the P-8B trip, validation analysis comparing the Fire IPEEE

from Table 4.11-1 [3], PSAR2 and this analysis were performed.

Table 8.1-1 below, compares the results of the IPEEE, the updated fire PSAR2 model [5] & [16] and this analysis.

The biggest difference in the results lays in the selection of the worst cabinet/junction box fire for areas 1 and 2, the control and cable spreading rooms. Both the IPEEE and PSAR2 analyses applied engineering judgment in selecting the worst cabinet fire before any quantification was conducted.

However, this analysis solved all cabinet fires and sequences to ascertain the worst case. Consequently the EC-13 and EB-11 results were found to be more limiting. Though inconsequential, the FA-9-9B results were found to be slightly more limiting than the PSAR2 results.

Consequently the overall CDF for this analysis was about a factor of 2 larger than that reported in the IPEEE principally due to the FA-1 analyzed cabinet and junction box sequences.

With exception of the control and cable spreading rooms, the CDF results for other areas are similar to the original IPEEE results. The exceptions are fire areas 13A1[1] (Aux Bldg Corridor) and 23E (East turbine building). For fire area 13A1, the Fire IPEEE credited repair of AFW components that failed due to random (non-fire related) causes. Were this repair and recovery action taken in the reference [5] and this analysis, the CDF for this area would be within a factor of about 2.5 of the Fire IPEEE.

In fire area 23E, supporting equipment for demineralized water makeup to the CST is found. Loss of this makeup source leaves service water and the fire protection system available for long term makeup to the CST. However, the difference between the Fire IPEEE and the reference [5] (and this analysis) models is that the T-81 is no longer credited as a means of making up to the CST (in the Fire IPEEE the Primary Makeup Tank was considered to be redundant to the CST).

In addition, conditional human error model modeling has been incorporated into PSAR2 [16], [5] and this analysis, which introduced some dependencies between service water and the fire protection system that were not considered in the Fire IPEEE.

Following Table 8.1-1, Table 8.1-2 compares selected accident class CDF results. Similar to the overall CDF for each fire area, a comparison of Fire IPEEE with the updated PSAR2 Fire PSA results [5] and this analysis shows the dominant accident classes are similar.

The exceptions are fire areas 13A1, 23E (for the reasons described above) and accident class IB for each of the fire areas in general. Accident class IB are those accident sequences in which auxiliary feedwater fails, but once-through-cooling (OTC) is successfully initiated. Core damage occurs as a result of failure to switchover to recirculation from the containment sump.

In the Fire IPEEE, manual action to align containment spray pumps to the suction of the HPSI pumps was considered to be required to assure adequate subcooling and NPSH during recirculation. The PSAR2 models reflect a plant modification that makes this alignment automatic. A dominant contributor to CDF prior to this modification, elimination of this operator

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1 There are two entries for fire area 13A, Auxiliary Building Corridor. The walkdown for the IPEEE recognized that there were potentially significant ignition sources in the 590' Aux Building Corridor as well as cables for important mitigating equipment. However, it noted that there was a large horizontal span between the ignition sources and the location of the cables with no intervening combustibles. Given this configuration, the area was subdivided into 13A1 (containing the cables) and 13A2 (containing the potentially significant ignition sources).

action reduces the CDF for accident class IB by a factor of 5 to 10 for some of the fire areas in this analysis.

Regarding Class 1B, also recognize that the FPIE analysis-of-record, PSAR2c (2006), includes credit for the supplemental diesel whereas the IPEEE (1995) and PSAR2 (2004) do not.

In summary, it is considered that the developed re-created IPEEE model accurately reflects the reference [5] re-creation of the IPEEE and moreover improves upon the solution given that all cabinet/junction box fires are evaluated when compared to Reference [3].

Table 8.1-1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS							IPEEE Total CDF/yr	Ref [5] Analysis (Using IPEEE Cabinets for FA-1 and FA-2)			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class 1A	Class 1B	Class II	Total CDF/yr		Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure CDF	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr
1	Control Room	Cabinet Fire 9.50E-3 Exp. Fire 2.43E-3	5.93E-7 4.33E-6	7.12E-7 2.46E-6	N/A N/A	1.30E-6 6.79E-6	8.10E-06	EC-03R	8.13E-07	2.59E-06	FA-1	EC-13L	3.52E-05	3.38E-06	3.55E-05
2	Cable Spreading Room	Cabinet Fire 3.20E-3 Exp. Fire 3.19E-3	1.91E-7 7.48E-6	2.06E-7 3.23E-6	N/A N/A	3.98E-7 1.07E-6	1.11E-05	EJ-575	1.71E-07	6.57E-06	FA-2	EB-11	4.09E-07	4.35E-07	8.44E-07
9B	Intake Structure - FPS'	7.20E-03	N/A	N/A	N/A	N/A		FA-9-9B	1.54E-08		FA-9-9B			1.46E-08	1.46E-08
CDF/yr Total			1.97E-5	1.31E-5	3.48E-7	3.31E-5	3.33E-05			3.00E-05					5.09E-05

NOTES:

1) Fire Zone 9A is the worst case fire for this fire area and, therefore, Fire Zone 9B is not included in the results since they are mutually exclusive events.

2) Fire Zone 21B is the worst case fire for this fire area and, therefore, Fire Zone 21A is not included in the results since they are mutually exclusive events.

3) Manual or automatic suppression credited for FA-1, FA-2, FA-3 and FA-4

Table 8.1-2: Plant Damage State for FA-1 and FA-2 Comparison of IPEEE [3], Reference [5] and This Analysis (EC-03R and EJ-575)

		Fire IPEEE [3] CDF/yr				Updated PSAR2 Fire PSA [5]/This Analysis[1] CDF/yr			
		IA	IB	II	IV	IA	IB	II	IV
FA-1 Control Room	Exposure Fire (Unsuppressed)	1.35E-06	-	-		4.38E-06/4.14E-06			1.17E-10
	Exposure Fire (Suppressed)	2.98E-06	2.46E-06	-		1.4E-06/1.382E-06	3.79E-07/3.327E-07	2.18E-09	3.33E-09
	Worst Cabinet Fire (EC-03R)	5.93E-07	7.12E-07	-		3.48E-07/3.479E-07	4.51E-07/4.514E-07	-	1.37E-08/1.369E-08
		Fire IPEEE [3] CDF/yr				Updated PSAR2 Fire PSA [5]/This Analysis[1] CDF/yr			
		IA	IB	II	IV	IA	IB	II	IV
FA-2 Cable Spreading	Exposure Fire (Unsuppressed)	3.56E-06	-	-		1.47E-05/1.456E-05			2.98E-10
	Exposure Fire (Suppressed)	3.91E-06	3.23E-06	-		1.77E-06/1.75E-06	4.86E-07/4.4E-07	2.75E-09	4.33E-09
	Worst Cabinet/Junction Box Fire (EJ-575)	1.91E-07	2.06E-07	-		1.01E-07/1.006E-07	6.58E-08/6.595E-08	-	4.56E-09/4.56E-09

Notes: 1] EC-03R and EJ-575 were used for the comparison

8.2 Random Failure (Assumed) – Results

8.2.1 Full Power Internal Events (FPIE)

As described in Section 7.4, P-8B past performance was evaluated from 2005 to the present. Based on the data update, the ΔCDF between the baseline and the 0, 1 and 2 pump failure to start and run cases was less than 1E-07/yr. No recovery was credited in this calculation. These sensitivity calculations are shown below.

Table 8.2.1: Review of FPIE P-8B Reliability Data

Model	P-8B Fail to Start	P-8B Fail to Run (λ)	CDF/yr & ΔCDF/yr (Truncation @ 1E-10)	# Cutsets	Comments
PSAR2c baseline	2.84E-03/demand	7.3E-05/hr	2.804E-05/2.668E-05	10,200/ 8,463	Updated data with no failures
PSAR2c w/1 Failure	7.78E-03/demand	2.19E-04/hr	2.808E-05/2.672E-05	10,265/ 8,492	Updated data with 1 failure (from 5/10/11) assigned to both fail to start and run failure modes.
PSAR2c w/2 Failures	1.27E-02/demand	3.65E-04/hr	2.811E-05/2.676E-05	10,373/ 8,515	Updated data with 2 failures.
ΔCDF/yr			(2.672E-05 - 2.668E-05) = 4E-08		1 failure – baseline.
ΔCDF/yr			(2.676E-05 - 2.668E-05) = 8E-08		2 failures – baseline.
ΔCDF/yr			(2.676E-05 - 2.672E-05) = 4E-08		2 failures – 1 failure (this assumes the 1 failure case is the new baseline).

8.3 SDP Analysis (Assumed Performance Deficiency) – Results

8.3.1 Full Power Internal Events (FPIE)

Table 8.3.1 summarizes the FPIE results. In this instance the baseline case includes the P-8B May 10 observed failure, in the failure to start and run counts. Recovery was included in these data.

Table 8.3.1: Review of FPIE P-8B SDP Data

Model	P-8B Fail to Start	P-8B Fail to Run (λ)	CDF/yr & ΔCDF/yr (Truncation @ 1E-10)	# Cutsets	Comments
PSAR2c baseline	2.84E-03/demand	7.3E-05/hr	2.804E-05/2.668E-05	10,200/ 8,463	Updated data with no failures
	7.78E-03/demand	2.19E-04/hr	2.808E-05/2.672E-05	10,265 10,265/ 8,492	Updated data with 1 failure (5/10/11)
PSAR2c SDP w/o recovery	2.84E-03/demand	1.0	3.324E-05/3.184E-05	13,920/ 10,025	
PSAR2c SDP w/recovery	2.84E-03/demand	1.38E-02[1] (probability)	2.809E-05/2.674E-05	10,336/ 8,499	
ΔCDF/yr SDP w/o recovery			(3.184E-05 - 2.668E-05) = 5.16E-06		
ΔCDF/yr SDP w/ recovery			(2.674E-05 - 2.668E-05) = 6E-08		
ΔCDF/yr x 85/365 days w/o recovery			5.16E-06 x 85/365 = 1.202E-06		No Recovery: exposure time from 2/15/11 to 5/10/11 – 85 days (Section 7.3).
ΔCDF/yr x 85/365 days w/ recovery			6E-08 x 85/365 = 1.397E-08		With Recovery: exposure time from 2/15/11 to 5/10/11 – 85

Table 8.3.1: Review of FPIE P-8B SDP Data					
Model	**P-8B Fail to Start**	**P-8B Fail to Run (λ)**	**CDF/yr & ΔCDF/yr (Truncation @ 1E-10)**	**# Cutsets**	**Comments**
					days (Section 7.3).

Notes: 1] recovery = failure to run random faults + recovery.

8.3.2 IPEEE Fire

The PSAR2 model created to replicate the IPEEE fire analysis was solved twice, with and without recovery. Attachment 7 provides a detailed list of the first 100 cutsets for selected fire cases.

Table 8.3.2: SDP Evaluation w/Recreated IPEEE Model					
	P-8B Fail to Start	**P-8B Fail to Run (λ)**	**CDF/yr & ΔCDF/yr (Truncation @ 1E-10)**	**# Cutsets**	**Comments**
Recreated IPEEE baseline	2.84E-03/demand	7.3E-05/hr	5.09E-05	10,200	Updated data with no failures
Recreated IPEEE w/o recovery	2.84E-03/demand	True	2.33E-04	61,132	
Recreated IPEEE w/ recovery	2.84E-03/demand	1.38E-02[1] (probability)	5.29E-05	27,227	
ΔCDF/yr w/o recovery	2.84E-03/demand	True	(2.33E-04 – 5.09E-05) = 1.82E-04		
ΔCDF/yr SDP w/o recovery x 85/365 days			1.82E-04 x 85/365 = 4.24E-05		With Recovery: exposure time from 2/15/11 to 5/10/11 – 85 days (Section 7.3).
ΔCDF/yr SDP w/ recovery			(5.29E-05 – 5.09E-05) = 2.00E-06		
ΔCDF/yr SDP w/ recovery x 85/365 days			2.00E-06 x 85/365 = 4.69E-07		With Recovery: exposure time from 2/15/11 to 5/10/11 – 85 days (Section 7.3).
ΔCDF/yr (FPIE + Fire) w/o recovery			1.20E-06 + 4.24E-05 = 4.37E-05		Summation of FPIE and Fire ΔCDF
ΔCDF/yr (FPIE + Fire) w/ recovery			1.40E-08 + 4.69E-07 = 4.81E-07		Summation of FPIE and Fire ΔCDF

Notes: 1] recovery = failure to run random faults + recovery.

9.0 CONCLUSION

Given that the current engineering assessment has not identified any causal factors that were present at the time of failure, the failure of P-8B can be considered a random event. Per pump performance review since 2005 to the present, no additional failures have been identified other than that observed on May 10th, 2011. Using this information, sensitivity calculations show that the ΔCDF is less than 1E-06/yr when considering the event is random and therefore is colored green.

If it is assumed a pre-existing condition, the results show that the full power internal events CDF plus the IPEEE recreated fire analysis CDF, given the observed P-8B failure, produces an aggregate ΔCDF of 4.81E-07/yr when crediting recovery of P-8B.

If recovery is not credited, the aggregate ΔCDF is estimated to be 4.37E-05/yr.

When considering the event as a random failure or a pre-existing condition, with recovery, the condition is colored green.

If considering the event as a pre-existing condition and assuming no recovery, the ΔCDF is greater than 1E-05 and is colored yellow.

Recall in either case the B.5.b pump is not credited (however, if directed by the Technical Support Center (TSC), today, the pump would be deployed) and that the re-created IPEEE analysis does not include the supplemental diesel.

10.0 REFERENCES

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11.0 ATTACHMENTS

Attachment 1:	Fire IPEEE to PSAR2 Basic Event Translation (66 pgs)
Attachment 2:	Modifications to PSAR2 Fault Tree Logic (18 pgs)
Attachment 3:	IPEEE Ignition Frequencies, Fault Tree Names/Frequencies and Fire Area Assigned Logical Event (10 pgs)
Attachment 4:	Event Tree Accident Sequences (22 pgs)
Attachment 5:	HRA Analysis (18 pgs)
Attachment 6:	PRA Model History (6 pgs)
Attachment 7:	Fire Results (51 pgs)
Attachment 8:	E-Mail Memorandum "Local AFW Operation HRA Evaluation for Palisades SDP" (4 pgs)

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
EC-01L	A38	AKVMA0522G	A-KVMA-SV-0522G	
	AHSMB0522B	AHSMB0522B	A-HSMB-HS-0522B	
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	DFUMKW006D	DFUMKW006D	D-FUMK-W006-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0501A	GHSMB0501A	-	No credit for manual closure of MSIVs
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	GPBMBE50A	GPBMBE50A	M-PBMB-HS-LPE50A	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GREMBXE50A	GREMBXE50A	M-REMB-LPXE50A	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	IST-11	FAVMC0729	-	CST makeup from hotwell not modeled
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-164	PC1MCY3001	P-C1MC-EY-30-01	
	IST-166	ZCEPO0751C	M-PCMT-PIC-0751C	
	IST-170	ZCEPO0752C	M-PCMT-PIC-0752C	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-183	GMVMA0510	M-HSMB-0510C	
	IST-184	GHSMB0510C	M-HSMB-0510C	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MOD A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-252	FCSMC105	M-CSMB-252-105CS	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-6	ACNMDSX741	A-REMD-PSX-0741	
	PFUMK3006	PFUMK3006	P-FUMK-Y3006-1	
EC-01R	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0501A	GHSMB0501A	-	No credit for manual closure of MSIVs
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	GPBMBE50B	GPBMBE50B	M-PBMB-HS-LPE50B	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GREMBXE50B	GREMBXE50B	M-REMB-LPXE50B	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-11	FAVMC0729	-	CST makeup from hotwell not modeled
	IST-165	PC1MCY4001	P-C1MC-EY-40-01	
	IST-169	ZCEPO0751D	M-PCMT-PIC-0751D	
	IST-173	ZCEPO0752D	M-PCMT-PIC-0752D	
	IST-187	GMVMA0501	-	SGB no longer supplies steam to TDAFW
	IST-188	GHSMB0501C	-	SGB no longer supplies steam to TDAFW
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-253	FCSMB205	M-CBMB-252-205	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
EC-02L	IST-143	SREMBX161	G-REMB-42-161	
	IST-273	BMVMA2169	G-MVMA-MO-2169	
	IST-275	SCSMB127C1	G-CSMB-42-127CS1	
	IST-276	SCSMB187C1	G-CSMB-42-187CS1	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-279	BCVMA2139	G-PMME-P-56B	
	IST-281	BMVMA2170	G-MVMA-MO-2170	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-318	SHCMT3025A	L-HCMT-HIC-3025A	
	IST-376	DCBMC72109	D-CBMC-72-109	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	S42161MAN	SCSMB161CS	G-CSMB-42-161CS1	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
	SCBA19A	SCSMB42191	G-CSMB-42-191CS	
	SHSMB3025B	SHSMB3025B	L-HSMB-HS-3025B	
	SREMB127-O	SREMB127-O	G-REMB-42-127	
	SREMBR-191	SREMBR-191	-	auto start of P-56B no longer modeled in PSAR2
EC-02R	IST-274	BCVMA2138	G-PMME-P-56A	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-278	BMVMA2140	G-MVMA-MO-2140	
	IST-280	SCSMB227C1	G-CSMB-42-227CS1	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-377	PB2MKMCC26	P-B2MK-EB-26	
	IST-377	PB2MKMCC26	P-B2MK-EB-26	
	IST-391	DFUMKS55B	D-FUMK-S55-2	
	IST-395	PCBMCC1205	G-C2MC-52-1205	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-400	DFUMK72205	D-FUMK-B1205-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-404	SCNMBA0101	D-FUMK-B1206-1	
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2
	S55A-H	SCSMB1205	G-CSMB-52-1205CS	
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	SCSMB207C1	SCSMB207C1	G-CSMB-42-207CS1	
	SCSMB207C2	SCSMB207C2	G-CSMB-42-207CS1	
	SREMBR-287	SREMBR-287	-	auto start of P-56A no longer modeled in

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment PSAR2
EC-03L	DFUMKS09	DFUMKS09	D-FUMK-S09-1	
	DFUMKS13A	DFUMKS13A	D-FUMK-S13-2	
	IST-296	PCBMCC-147	L-C2MC-52-147	
	IST-300	DFUMK1111A	D-FUMK-A1111-1	
	IST-307	PCBMCB-111	L-C2MB-152-111	
	IST-308	HPVMD3030B	Q-PVMD-PCV-3030B	
	IST-310	SMVMA3190	L-MVMA-MO-3190	
	IST-311	SCNMBX147	L-REMB-42X-147	
	IST-328	PCBMCC-141	L-C2MC-52-141	
	IST-329	SCNMBX141	L-REMB-42X-141	
	IST-331	PBSMTMCC23	P-B2MK-EB-23	
	IST-337	DFUMK1114A	D-FUMK-A1114-1	
	IST-338	DFUMK1112A	D-FUMK-A1112-1	
	IST-340	PCNMC52112	S-REMB-144-112	
	IST-341	PCNMC52114	S-REMB-144-114	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-346	DFUMK1113A	D-FUMK-A1113-1	
	IST-350	HFLMK3018	-	Flow path not modeled in PSAR2
	IST-351	PCBMCC-137	H-C2MC-52-137	
	IST-352	PCBMCC-197	H-C2MC-52-197	
	IST-353	PCBMCC-157	H-C2MC-52-157	
	IST-354	PCBMCC-151	H-C2MC-52-151	
	IST-363	HFLMK3070	I-FLMK-F-319	
	PCBMBB-111	PCBMBB-111	L-C2MB-152-111	
	SCNMA43111	SCNMA43111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMA52111	SCSMA52111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB111	SCSMB111	L-HSMB-HS-111	
	SCSMB112	SCSMB112	S-CSMB-152-112CS	
	SCSMB114	SCSMB114	S-CSMB-152-114CS	
	SH117	SCSMB1571	H-CSMB-42-157CS1	
	SH157	SCSMB1511	H-CSMB-42-151CS1	
	SH207	SHSMB3018A	-	Flow path not modeled in PSAR2
	SH25	SCSMB1371	H-CSMB-42-137CS1	
	SH314A	SCSMB113	H-CSMB-152-113CS	
	SH77	SCSMB1971	H-CSMB-42-197CS1	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SHSMB3018A	SHSMB3018A	-	Flow path not modeled in PSAR2
	SHSMB3018B	SHSMB3018B	-	Flow path not modeled in PSAR2
	SHSMB3059A	SHSMB3059A	-	Failure to close failure mode not modeled in PSAR2
	SHSMB3059B	SHSMB3059B	-	Failure to close failure mode not modeled in PSAR2
	SKVMA3018	SKVMA3018	-	Flow path not modeled in PSAR2
	SKVMB3030A	SKVMB3030A	Z-KVMB-SV-3030A	
	SKVMB3059	SKVMB3059	-	Failure to close failure mode not modeled in PSAR2
	SL54	SCSMB1411	L-HSMB-HS-141-1	
	SL64	SCSMB1471	L-HSMB-HS-147-1	
	SPMME67B	SPMME67B	L-PMME-P-67B	
	SSD40	SLMMB23395	L-REMB-42-2339	
	SSD41	SQSMB2339	L-REMB-42-2339	
	SU28	SHSMB3030A	-	Manual operation of CV-3030 not in PSAR2
EC-03R	DFUMK1206A	DFUMK1206A	D-FUMK-A1206-1	
	DFUMKS10	DFUMKS10	D-FUMK-S10-1	
	DFUMKS14A	DFUMKS14A	D-FUMK-S14-2	
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-295	PCBMCC-251	L-C2MC-52-251	
	IST-297	PCBMCC-247	L-C2MC-52-247	
	IST-305	PCBMCB-206	L-C2MB-152-206	
	IST-306	SAVMA3029	Z-AVMA-CV-3029	
	IST-309	SMVMA3199	L-MVMA-MO-3199	
	IST-312	SCNMBX247	L-REMB-42X-247	
	IST-313	SCNMBX251	L-REMB-42X-251	
	IST-330	PBSMTMCC24	P-B2MK-EB-24	
	IST-336	PCBMBB-210	S-CBMB-152-210	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-347	HFLMK3037	-	Flow path not modeled in PSAR2
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-349	DFUMK1207A	D-FUMK-A1207-2	
	IST-355	PCBMCC-261	H-C2MC-52-261	
	IST-356	PCBMCC-257	H-C2MC-52-257	
	IST-357	PCBMCC-237	H-C2MC-52-237	
	IST-358	PCBMCC-241	H-C2MC-52-241	
	IST-362	HFLMK3071	I-FLMK-F-321	
	IST-392	PCBMCC5221	H-REMT-3072IC	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	PCBMBB-206	PCBMBB-206	L-C2MB-152-206	
	SCNMA43206	SCNMA43206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMA52206	SCSMA52206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB206	SCSMB206	L-HSMB-HS-206	
	SCSMB210	SCSMB210	S-CSMB-152-210CS	
	SH135	SCSMB2371	H-CSMB-42-237CS1	
	SH175	SCSMB2411	H-CSMB-42-241CS1	
	SH194	SHSMB3037A	-	Flow path not modeled in PSAR2
	SH233A	SCSMB207	H-CSMB-152-207CS	
	SH49	SCSMB2611	H-CSMB-42-261CS1	
	SH95	SCSMB2571	H-CSMB-42-257CS1	
	SKVMB3029A	SKVMB3029A	Z-KVMB-SV-3029A	
	SL74	SCSMB2471	L-REMB-42-247	
	SL84	SCSMB2511	L-REMB-42-251	
	SPMME67A	SPMME67A	L-PMME-P-67A	
	SSD30	SLMMB24395	L-REMB-42-2439	
	SSD31	SQSMB2439	L-REMB-42-2439	
	SU11	SHSMB3029A	-	Manual operation of CV-3029 not in PSAR2
EC-04L	DC6	DCBMC72112	P-CBMA-152-106	
	DFUDK1105A	DFUDK1105A	D-FUMK-B1105-1	
	DFUDK1106A	DFUDK1106A	D-FUMK-B1106-1	
	DFUDK1302A	DFUDK1302A	-	backfeed power not modeled in PSAR2.
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	IST-140	PC1MCY3003	P-C1MC-EY-30-03	
	IST-141	SCNMBSISX1	R-REMB-SIS-X1	
	IST-142	SCNMBSISX3	R-REMB-SIS-X3	
	IST-146	SCNMASIS5	R-REMB-SIS-5	
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-471	DCBDC72111	D-CBMC-72-111	
	IST-483	EDGME11	E-DGME-K-6A	
	IST-486	PCBMBB-106	P-CBMB-152-106	
	IST-490	DCBDC72308	D-CBMC-72-308	
	IST-491	PREMB1275	P-CBMA-152-106	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-509	EKVMA1470	E-KVMB-SV-1470	
	P252B	PCNMB303CS	-	Manual trip of CB-152-302 not modeled in PSAR2
	PBS1F-08	PCNMB1FCS	-	No manual actuation of 252-302 modeled in PSAR2
	PCBMAB-105	PCBMAB-105	P-CBMA-152-105	
	PCBMAB-106	PCBMAB-106	P-CBMA-152-106	
	PCBMBC1103	PCBMBC1103	P-CBMB-52-1103	
	PCSMBA-301	PCSMBA-301	-	Closure of CB-252-302 not modeled
	PREMB1271	PREMB1271	P-REMA-127-1	
	PREMB271X1	PREMB271X1	P-REMB-127-1-X1	
	PREMB271X2	PREMB271X2	P-REMB-127-1-X2	
	PREMB38311	PREMB38311	P-REMB-383-11	
	PREMB8612	PREMB8612	-	Circuitry for 152-202 failing to trip not modeled in PSAR2
	PREMB8612X	PREMB8612X	-	Circuitry for 152-106 failing to trip not

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SCNMBSISX5	SCNMBSISX5	R-REMB-SIS-X5	modeled in PSAR2
	SPBMB1-1	SPBMB1-1	-	manual initiation of sis relays not modeled in PSAR2
	SREMBSIS1	SREMBSIS1	R-REMB-SIS-1	
	SREMBSIS5	SREMBSIS5	R-REMB-SIS-5	
	SREMBSISX5	SREMBSISX5	R-REMB-SIS-X5	
	SREMBSISX7	SREMBSISX7	R-REMB-SIS-X7	
	ZCNMB34510	ZCNMB34510	R-CEPO-MC-34L105	
	ZCNMB3453	ZCNMB3453	R-CEPO-MC-34L105	
	ZCNMB3455	ZCNMB3455	R-CEPO-MC-34L106	
	ZCNMB3459	ZCNMB3459	R-CEPO-MC-34L105	
	ZSEMT34-5	ZSEMT34-5	R-CEPO-MC-34L105	
EC-04R	DFUDK1203A	DFUDK1203A	P-CBMA-152-203	
	DFUDK1302A	DFUDK1302A	-	backfeed not modeled in PSAR2
	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	GHSMB0501A	GHSMB0501A	-	No credit for manual action to close MSIVs in PSAR2
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	IST-137	PC1MCY2003	P-C1MC-EY-20-03	
	IST-138	SCNMBSISX2	R-REMB-SIS-X2	
	IST-139	SCNMBSISX4	R-REMB-SIS-X4	
	IST-149	SCNMASIS8	R-REMB-SIS-8	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-259	DCBDC72201	D-CBMC-72-201	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-492	EDGME12	E-DGME-K-6B	
	IST-494	PCBMBB-202	P-CBMB-152-202	
	IST-496	DFUDK1202A	D-FUMK-A1202-1	
	IST-497	DCBDC72403	D-CBMC-72-403	
	IST-498	PREMB1276	P-CBMA-152-202	
	IST-499	DCBDC72211	D-CBMC-72-211	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-510	EKVMA1471	E-KVMB-SV-1471	
	P252B	PCNMB303CS	-	Manual trip of CB-152-302 not modeled in PSAR2
	PBS1G-08	PCNMB1GCS	-	No manual actuation of 252-302 modeled in PSAR2
	PCBMAB-203	PCBMAB-203	P-CBMA-152-203	
	PCBMBC1201	PCBMBC1201	P-C2MB-52-1201	
	PREMB1272	PREMB1272	P-REMA-127-1	
	PREMB272X1	PREMB272X1	P-REMB-127-2-X1	
	PREMB272X2	PREMB272X2	P-REMB-127-2-X2	
	PREMB38312	PREMB38312	P-REMB-383-12	
	PREMB38323	PREMB38323	P-REMB-383-23	
	SCNMBSISX6	SCNMBSISX6	R-REMB-SIS-X6	
	SPBMB1-2	SPBMB1-2	-	manual initiation of sis relays not modeled in PSAR2
	SREMBSIS2	SREMBSIS2	R-REMB-SIS-2	
	SREMBSIS6	SREMBSIS6	R-REMB-SIS-6	
	SREMBSIS8	SREMBSIS8	R-REMB-SIS-8	
	SREMBSISX6	SREMBSISX6	R-REMB-SIS-X6	
	SREMBSISX8	SREMBSISX8	R-REMB-SIS-X8	
	ZCNMB34610	ZCNMB34610	R-CEPO-MC-34R106	
	ZCNMB3463	ZCNMB3463	R-CEPO-MC-34R105	
	ZCNMB3468	ZCNMB3468	R-CEPO-MC-34R106	
	ZSEMT34-6	ZSEMT34-6	R-CEPO-MC-34R106	
EC-08L	CCSMB1094	CCSMB1094	-	manual start of CCW pumps not modeled in PSAR2
	CCSMB1164	CCSMB1164	-	manual start of CCW pumps not modeled in PSAR2
	IST-53	CCSMD1092	C-CSMD-152-109CS	
	IST-55	CCSMD1162	C-CSMD-152-116CS	
	IST-63	CCVMA0944	C-CVMA-CK-CC944	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-75	DFUMKA1103	D-FUMK-A1103-1	
	IST-84	UCNMB44103	U-REMB-144-103	
	UCSMB103	UCSMB103	-	manual start of SWS pumps not modeled in PSAR2
	UPSMB1318	UPSMB1318	U-PSMB-PS-1318	
	UPSMB1325	UPSMB1325	U-PSMB-PS-1325	
EC-08R	C200	CANMT0917	-	Isolation of CCW leaks not modeled
	CCSMB2084	CCSMB2084	-	manual start of CCW pumps not modeled in PSAR2
	IST-54	CCSMD2082	C-CSMD-152-208CS	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-65	CCVMA0943	C-CVMA-CK-CC943	
	IST-74	PCBMCB-204	U-C2MC-152-204	
	IST-76	PCBMCB-205	P-CBMC-152-205	
	IST-77	DFUMKA1205	D-FUMK-A1205-1	
	IST-79	DFUMKA1204	D-FUMK-A1204-1	
	UCSMB204	UCSMB204	-	manual start of SWS pumps not modeled in PSAR2
	UCSMB205	UCSMB205	-	manual start of SWS pumps not modeled in PSAR2
EC-11L	C517	CPSMB0918	C-PSMB-PS-0918	
	CHP50	ZPSMT83A	R-PSMD-PS-1803A	
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	GHSMB0510A	GHSMB0510A	-	No credit for manual action to close MSIVs in PSAR2
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-156	ZPSMA811	R-PSMA-PS1801SW1	
	IST-157	ZPSMA831	R-PSMA-PS1803SW1	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MOD A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-30	AFSMB0727A	A-FSMA-FS-0727A	
	IST-31	AFSMB0749A	A-FSMA-FS-0749A	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	SCNMBX0327	SCNMBX0327	Z-REMA-LSX-0327	
	SCNMBX0329	SCNMBX0329	Z-REMA-LSX-0329	
	SCNMBY0327	SCNMBY0327	Z-REMA-LSY-0327	
	SCNMBY0329	SCNMBY0329	Z-REMA-LSY-0329	
	SLSMA0327	SLSMA0327	Z-LSMA-LS-0327	
	SLSMA0329	SLSMA0329	Z-LSMA-LS-0329	
	SREMAX0327	SREMAX0327	Z-REMA-LSX-0327	
	SREMAX0329	SREMAX0329	Z-REMA-LSX-0329	
	SREMAY0327	SREMAY0327	Z-REMA-LSY-0327	
	SREMAY0329	SREMAY0329	Z-REMA-LSY-0329	
	ZPSMB83A1	ZPSMB83A1	R-PSMB-PS-1803A1	
	ZPSMB83A2	ZPSMB83A2	R-PSMB-PS-1803A2	
EC-11R	CHP46	ZPSMT81A	R-PSMT-PS-1801A	
	CHP49	ZPSMT84A	R-PSMT-PS-1804A	
	CREMBEX5P4	CREMBEX5P4	R-REMB-5P-4	
	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	GHSMB0501A	GHSMB0501A	-	No credit for manual action to close MSIVs in PSAR2
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	GREMB5P8	GREMB5P8	R-REMB-5P-8	
	IST-152	ZPSMA821	R-PSMA-PS1802SW1	
	IST-153	ZPSMA841	R-PSMA-PS1804SW1	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-335	GCNMA5P8	R-REMB-5P-8	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-46	AFSMB0737	A-FSMA-FS-0737	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-47	AFSMB0736	A-FSMA-FS-0736	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	PFUMKS04	PFUMKS04	P-FUMK-S04-1	
	PREMB5P8	PREMB5P8	R-REMB-5P-8	
	SCNMBX0328	SCNMBX0328	Z-REMA-LSX-0328	
	SCNMBX0330	SCNMBX0330	Z-REMA-LSX-0330	
	SCNMBY0328	SCNMBY0328	Z-REMA-LSY-0328	
	SCNMBY0330	SCNMBY0330	Z-REMA-LSY-0330	
	SLSMA0328	SLSMA0328	Z-LSMA-LS-0328	
	SLSMA0330	SLSMA0330	Z-LSMA-LS-0330	
	SREMAX0328	SREMAX0328	Z-REMA-LSX-0328	
	SREMAX0330	SREMAX0330	Z-REMA-LSX-0330	
	SREMAY0328	SREMAY0328	Z-REMA-LSY-0328	
	SREMAY0330	SREMAY0330	Z-REMA-LSY-0330	
	ZPSMB81A1	ZPSMB81A1	R-PSMB-PS-1801A1	
	ZPSMB81A2	ZPSMB81A2	R-PSMB-PS-1801A2	
	ZPSMB84A1	ZPSMB84A1	R-PSMB-PS-1804A1	
	ZPSMB84A2	ZPSMB84A2	R-PSMB-PS-1804A2	
EC-12L	ABIOPASCA	ABIOPASCA	A-BIPO-LS-0751A	
	ABIOPASCC	ABIOPASCC	A-BIPO-LS-0751C	
	ABIOPBSCA	ABIOPBSCA	A-BIPO-LS-0752A	
	ABIOPBSCC	ABIOPBSCC	A-BIPO-LS-0752C	
	ATLMT0751A	ATLMT0751A	A-TLMT-LT-0751A	
	ATLMT0751C	ATLMT0751C	A-TLMT-LT-0751C	
	ATLMT0752A	ATLMT0752A	A-TLMT-LT-0752A	
	ATLMT0752C	ATLMT0752C	A-TLMT-LT-0752C	
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	GPBMBE50A	GPBMBE50A	M-PBMB-HS-LPE50A	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	GREMBXE50A	GREMBXE50A	M-REMB-LPXE50A	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	IST-143	SREMBX161	G-REMB-42-161	
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-164	PC1MCY3001	P-C1MC-EY-30-01	
	IST-166	ZCEPO0751C	M-PCMT-PIC-0751C	
	IST-166	ZCEPO0751C	M-PCMT-PIC-0751C	
	IST-168	ZCEPO0751A	M-PCMT-PIC-0751A	
	IST-168	ZCEPO0751A	M-PCMT-PIC-0751A	
	IST-170	ZCEPO0752C	M-PCMT-PIC-0752C	
	IST-170	ZCEPO0752C	M-PCMT-PIC-0752C	
	IST-172	ZCEPO0752A	M-PCMT-PIC-0752A	
	IST-172	ZCEPO0752A	M-PCMT-PIC-0752A	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-30	AFSMB0727A	A-FSMA-FS-0727A	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	S42161MAN	SCSMB161CS	G-CSMB-42-161CS1	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
	SPCMT102A	SPCMT102A	P-DCPO-PS-0102A	
	SPCMT102C	SPCMT102C	P-DCPO-PS-0102C	
	SREMAXPA1	SREMAXPA1	R-REMA-XPA1	
	SREMAXPA2	SREMAXPA2	R-REMA-XPA2	
	SREMAXPC1	SREMAXPC1	R-REMA-XPC1	
	SREMAXPC2	SREMAXPC2	R-REMA-XPC2	
EC-12R	ABIOPASCB	ABIOPASCB	A-BIPO-LS-0751B	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	ABIOPASCD	ABIOPASCD	A-BIPO-LS-0751D	
	ABIOPBSCB	ABIOPBSCB	A-BIPO-LS-0752B	
	ABIOPBSCD	ABIOPBSCD	A-BIPO-LS-0752D	
	ATLMT0751B	ATLMT0751B	A-TLMT-LT-0751B	
	ATLMT0751D	ATLMT0751D	A-TLMT-LT-0751D	
	ATLMT0752B	ATLMT0752B	A-TLMT-LT-0752B	
	ATLMT0752D	ATLMT0752D	A-TLMT-LT-0752D	
	C200	CANMT0917	-	Isolation of CCW leakage not modeled
	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0501A	GHSMB0501A	-	No credit for manual action to close MSIVs in PSAR2
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	GPBMBE50B	GPBMBE50B	M-PBMB-HS-LPE50B	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GREMBXE50B	GREMBXE50B	M-REMB-LPXE50B	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	IST-165	PC1MCY4001	P-C1MC-EY-40-01	
	IST-167	ZCEPO0751B	M-PCMT-PIC-0751B	
	IST-167	ZCEPO0751B	M-PCMT-PIC-0751B	
	IST-169	ZCEPO0751D	M-PCMT-PIC-0751D	
	IST-169	ZCEPO0751D	M-PCMT-PIC-0751D	
	IST-171	ZCEPO0752B	M-PCMT-PIC-0752B	
	IST-171	ZCEPO0752B	M-PCMT-PIC-0752B	
	IST-173	ZCEPO0752D	M-PCMT-PIC-0752D	
	IST-173	ZCEPO0752D	M-PCMT-PIC-0752D	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-274	BCVMA2138	G-PMME-P-56A	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-314	PCBMCC-167	L-C2MC-52-167	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-377	PB2MKMCC26	P-B2MK-EB-26	
	IST-391	DFUMKS55B	D-FUMK-S55-2	
	IST-395	PCBMCC1205	G-C2MC-52-1205	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-400	DFUMK72205	D-FUMK-B1205-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-404	SCNMBA0101	-	Auto start of P55B not modeled
	IST-46	AFSMB0737	A-FSMA-FS-0737	
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2
	S55A-H	SCSMB1205	G-CSMB-52-1205CS	
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	SCSMB207C1	SCSMB207C1	G-CSMB-42-207CS1	
	SCSMB207C2	SCSMB207C2	G-CSMB-42-207CS1	
	SPCMT102B	SPCMT102B	P-DCPO-PS-0102B	
	SPCMT102D	SPCMT102D	P-DCPO-PS-0102D	
	SREMAXPB1	SREMAXPB1	R-REMA-XPB1	
	SREMAXPB2	SREMAXPB2	R-REMA-XPB2	
	SREMAXPD1	SREMAXPD1	R-REMA-XPD1	
	SREMAXPD2	SREMAXPD2	R-REMA-XPD2	
	SREMBR-287	SREMBR-287	-	auto start of P-56A no longer modeled in PSAR2
EC-13L	C517	CPSMB0918	C-PSMB-PS-0918	
	CCSMB1094	CCSMB1094	-	manual start of CCW pumps not modeled in PSAR2
	CCSMB1164	CCSMB1164	-	manual start of CCW pumps not modeled in PSAR2
	CHP50	ZPSMT83A	R-PSMT-PS-1803A	
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	DFUDK1302A	DFUDK1302A	-	Backfeed power to Bus 1C,D&E not modeled in PSAR2
	DFUMKS13A	DFUMKS13A	D-FUMK-S13-2	
	DFUMKS13B	DFUMKS13B	D-FUMK-S13-1	
	GCNMBHPX1L	GCNMBHPX1L	S-AVMA-CV-3002	
	IST-100	ICMME2C	I-CMME-C-2C	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-100	ICMME2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-140	PC1MCY3003	P-C1MC-EY-30-03	
	IST-141	SCNMBSISX1	R-REMB-SIS-X1	
	IST-142	SCNMBSISX3	R-REMB-SIS-X3	
	IST-143	SREMBX161	G-REMB-42-161	
	IST-146	SCNMASIS5	R-REMB-SIS-5	
	IST-156	ZPSMA811	R-PSMA-PS1801SW1	
	IST-157	ZPSMA831	R-PSMA-PS1803SW1	
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-174	XAVMA2008	-	T81 makeup to CST no longer modeled
	IST-176	XAVMA2010	A-AVMA-CV-2010	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-192	DCBMC72119	D-CBMC-72-119	
	IST-20	AMLMACHA	A-CEPO-AFAS-MOD A	
	IST-273	BMVMA2169	G-MVMA-MO-2169	
	IST-275	SCSMB127C1	G-CSMB-42-127CS1	
	IST-276	SCSMB187C1	G-CSMB-42-187CS1	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-279	BCVMA2139	G-PMME-P-56B	
	IST-281	BMVMA2170	G-MVMA-MO-2170	
	IST-283	PCBMCC-131	-	ESF room cooling no longer modeled
	IST-285	VTSFC1850	-	ESF room cooling no longer modeled
	IST-288	PCBMCC-133	-	ESF room cooling no longer modeled
	IST-290	VTSFC1857	-	ESF room cooling no longer modeled

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-296	PCBMCC-147	L-C2MC-52-147	
	IST-300	DFUMK1111A	D-FUMK-A1111-1	
	IST-307	PCBMCB-111	L-C2MB-152-111	
	IST-308	HPVMD3030B	Q-PVMD-PCV-3030B	
	IST-311	SCNMBX147	L-REMB-42X-147	
	IST-328	PCBMCC-141	L-C2MC-52-141	
	IST-329	SCNMBX141	L-REMB-42X-141	
	IST-337	DFUMK1114A	D-FUMK-A1114-1	
	IST-338	DFUMK1112A	D-FUMK-A1112-1	
	IST-340	PCNMC52112	S-REMB-144-112	
	IST-341	PCNMC52114	S-REMB-144-114	
	IST-346	DFUMK1113A	D-FUMK-A1113-1	
	IST-351	PCBMCC-137	H-C2MC-52-137	
	IST-352	PCBMCC-197	H-C2MC-52-197	
	IST-353	PCBMCC-157	H-C2MC-52-157	
	IST-354	PCBMCC-151	H-C2MC-52-151	
	IST-366	PCBMBC1305	F-C2MC-52-1305	
	IST-369	QCXMTC1305	F-C2MC-P-9ALOCAL	
	IST-371	QCNMBPS2	F-PSMB-PS-1310	
	IST-378	IST-378	Z-REMB-4L1	
	IST-380	IST-380	Z-REMB-4L3	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-53	CCSMD1092	C-CSMD-152-109CS	
	IST-55	CCSMD1162	C-CSMD-152-116CS	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-63	CCVMA0944	C-CVMA-CK-CC944	
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-69	UKVMA0801	-	Compressors no longer require SW cooling

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-70	UKVMA0803	-	Compressors no longer require SW cooling
	IST-75	DFUMKA1103	D-FUMK-A1103-1	
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2
	IST-84	UCNMB44103	U-REMB-144-103	
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	PCBMBB-111	PCBMBB-111	L-C2MB-152-111	
	QCNMB5TR1C	QCNMB5TR1C	F-PSMB-PS-1310	
	S42161MAN	SCSMB161CS	G-CSMB-42-161CS1	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
	SCBA19A	SCSMB42191	G-CSMB-42-191CS	
	SCNMA43111	SCNMA43111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMA4L1	SCNMA4L1	Z-REMB-4L1	
	SCNMBSISX5	SCNMBSISX5	R-REMB-SIS-X5	
	SCNMBX0327	SCNMBX0327	Z-REMA-LSX-0327	
	SCNMBX0329	SCNMBX0329	Z-REMA-LSX-0329	
	SCNMBY0327	SCNMBY0327	Z-REMA-LSY-0327	
	SCNMBY0329	SCNMBY0329	Z-REMA-LSY-0329	
	SCSMA52111	SCSMA52111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB111	SCSMB111	L-HSMB-HS-111	
	SCSMB112	SCSMB112	S-CSMB-152-112CS	
	SCSMB114	SCSMB114	S-CSMB-152-114CS	
	SH117	SCSMB1571	H-CSMB-42-157CS1	
	SH157	SCSMB1511	H-CSMB-42-151CS1	
	SH25	SCSMB1371	H-CSMB-42-137CS1	
	SH314A	SCSMB113	H-CSMB-152-113CS	
	SH77	SCSMB1971	H-CSMB-42-197CS1	
	SKVMB3030A	SKVMB3030A	Z-KVMB-SV-3030A	
	SL54	SCSMB1411	L-HSMB-HS-141-1	
	SL64	SCSMB1471	L-HSMB-HS-147-1	
	SLSMA0327	SLSMA0327	Z-LSMA-LS-0327	
	SLSMA0329	SLSMA0329	Z-LSMA-LS-0329	
	SPBMB1-1	SPBMB1-1	-	manual initiation of sis relays not modeled in PSAR2
	SPMME67B	SPMME67B	L-PMME-P-67B	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SREMAX0327	SREMAX0327	Z-REMA-LSX-0327	
	SREMAX0329	SREMAX0329	Z-REMA-LSX-0329	
	SREMAY0327	SREMAY0327	Z-REMA-LSY-0327	
	SREMAY0329	SREMAY0329	Z-REMA-LSY-0329	
	SREMB127-O	SREMB127-O	G-REMB-42-127	
	SREMB4L1	SREMB4L1	Z-REMB-4L1	
	SREMBR-191	SREMBR-191	-	auto start of P-56B no longer modeled in PSAR2
	SREMBSIS1	SREMBSIS1	R-REMB-SIS-1	
	SREMBSIS5	SREMBSIS5	R-REMB-SIS-5	
	SREMBSISX5	SREMBSISX5	R-REMB-SIS-X5	
	SREMBSISX7	SREMBSISX7	R-REMB-SIS-X7	
	SU28	SHSMB3030A	-	Manual operation of CV-3030 not in PSAR2
	UCSMB103	UCSMB103	-	manual start of SWS pumps not modeled in PSAR2
	UPSMB1318	UPSMB1318	U-PSMB-PS-1318	
	UPSMB1325	UPSMB1325	U-PSMB-PS-1325	
	V22	VCSMB131	-	ESF room cooling no longer modeled
	V48	VCSMB133	-	ESF room cooling no longer modeled
	ZCNMB34510	ZCNMB34510	R-CEPO-MC-34L105	
	ZCNMB3453	ZCNMB3453	R-CEPO-MC-34L105	
	ZCNMB3455	ZCNMB3455	R-CEPO-MC-34L106	
	ZCNMB3459	ZCNMB3459	R-CEPO-MC-34L105	
	ZPSMB83A1	ZPSMB83A1	R-PSMB-PS-1803A1	
	ZPSMB83A2	ZPSMB83A2	R-PSMB-PS-1803A2	
	ZSEMT34-5	ZSEMT34-5	R-CEPO-MC-34L105	
EC-13R	CCSMB2084	CCSMB2084	-	manual start of CCW pumps not modeled in PSAR2
	CHP46	ZPSMT81A	R-PSMT-PS-1801A	
	CHP49	ZPSMT84A	R-PSMT-PS-1804A	
	CHSMB0940	CHSMB0940	-	Isolation of CCW to containment not modeled in PSAR2
	CREMBEX5P4	CREMBEX5P4	R-REMB-5P-4	
	DFUDK1302A	DFUDK1302A	-	Backfeed power to Bus 1C,D&E not modeled in PSAR2
	DFUMK1206A	DFUMK1206A	D-FUMK-A1206-1	
	DFUMKS14A	DFUMKS14A	D-FUMK-S14-2	
	DFUMKS14B	#N/A	D-FUMK-S14-1	
	GREMB5P8	GREMB5P8	R-REMB-5P-8	
	ICNMAK24	ICNMAK24	I-CMME-C-2B	
	ICNMBK21	ICNMBK21	I-CMME-C-2B	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	ICNMBK22	ICNMBK22	I-CMME-C-2B	
	IFUMKF3	IFUMKF3	I-CMME-C-2B	
	IREMBK22	IREMBK22	I-CMME-C-2B	
	IREMBK24	IREMBK24	I-CMME-C-2B	
	IST-103	ICNMAK22	I-CMME-C-2C	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-106	ICNMCK23	I-CMME-C-2B	
	IST-107	ICNMBK23	I-CMME-C-2B	
	IST-137	PC1MCY2003	P-C1MC-EY-20-03	
	IST-138	SCNMBSISX2	R-REMB-SIS-X2	
	IST-139	SCNMBSISX4	R-REMB-SIS-X4	
	IST-149	SCNMASIS8	R-REMB-SIS-8	
	IST-152	ZPSMA821	R-PSMA-PS1802SW1	
	IST-153	ZPSMA841	R-PSMA-PS1804SW1	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-174	XAVMA2008	-	T81 makeup to CST no longer modeled
	IST-175	PB2MKBUS91	P-B2MK-EB-91	
	IST-176	XAVMA2010	A-AVMA-CV-2010	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-274	BCVMA2138	G-PMME-P-56A	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-278	BMVMA2140	G-MVMA-MO-2140	
	IST-280	SCSMB227C1	G-CSMB-42-227CS1	
	IST-284	PCBMCC-211	-	ESF room cooling no longer modeled
	IST-286	VTSFC1851	-	ESF room cooling no longer modeled
	IST-289	PCBMCC-221	-	ESF room cooling no longer modeled
	IST-291	VTSFC1858	-	ESF room cooling no longer modeled
	IST-295	PCBMCC-251	L-C2MC-52-251	
	IST-297	PCBMCC-247	L-C2MC-52-247	
	IST-305	PCBMCB-206	L-C2MB-152-206	
	IST-306	SAVMA3029	Z-AVMA-CV-3029	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-312	SCNMBX247	L-REMB-42X-247	
	IST-313	SCNMBX251	L-REMB-42X-251	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-335	GCNMA5P8	R-REMB-5P-8	
	IST-336	PCBMBB-210	S-CBMB-152-210	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-349	DFUMK1207A	D-FUMK-A1207-2	
	IST-355	PCBMCC-261	H-C2MC-52-261	
	IST-356	PCBMCC-257	H-C2MC-52-257	
	IST-357	PCBMCC-237	H-C2MC-52-237	
	IST-358	PCBMCC-241	H-C2MC-52-241	
	IST-371	QCNMBPS2	F-PSMB-PS-1310	
	IST-381	IST-381	Z-REMB-4L2	
	IST-383	IST-383	Z-REMB-4L4	
	IST-395	PCBMCC1205	G-C2MC-52-1205	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-400	DFUMK72205	D-FUMK-B1205-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-54	CCSMD2082	C-CSMD-152-208CS	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-65	CCVMA0943	C-CVMA-CK-CC943	
	IST-67	CAVMB0940	-	containment CCW isolation not modeled in PSAR2
	IST-74	PCBMCB-204	U-C2MC-152-204	
	IST-76	PCBMCB-205	P-CBMC-152-205	
	IST-77	DFUMKA1205	D-FUMK-A1205-1	
	IST-79	DFUMKA1204	D-FUMK-A1204-1	
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	ISWFCS3	ISWFCS3	-	Failure of logic to unload compressor and prevent RV actuation not modeled in PSAR2
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2
	PCBMBB-206	PCBMBB-206	L-C2MB-152-206	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	PFUMKS04	PFUMKS04	P-FUMK-S04-1	
	PREMB5P8	PREMB5P8	R-REMB-5P-8	
	QCNMB5TR1C	QCNMB5TR1C	F-PSMB-PS-1310	
	S55A-H	SCSMB1205	G-CSMB-52-1205CS	
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	SCNMA43206	SCNMA43206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMA4L2	SCNMA4L2	Z-REMB-4L2	
	SCNMBSISX6	SCNMBSISX6	R-REMB-SIS-X6	
	SCNMBX0328	SCNMBX0328	Z-REMA-LSX-0328	
	SCNMBX0330	SCNMBX0330	Z-REMA-LSX-0330	
	SCNMBY0328	SCNMBY0328	Z-REMA-LSY-0328	
	SCNMBY0330	SCNMBY0330	Z-REMA-LSY-0330	
	SCSMA52206	SCSMA52206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB206	SCSMB206	L-HSMB-HS-206	
	SCSMB210	SCSMB210	S-CSMB-152-210CS	
	SH135	SCSMB2371	H-CSMB-42-237CS1	
	SH175	SCSMB2411	H-CSMB-42-241CS1	
	SH233A	SCSMB207	H-CSMB-152-207CS	
	SH49	SCSMB2611	H-CSMB-42-261CS1	
	SH95	SCSMB2571	H-CSMB-42-257CS1	
	SKVMB3029A	SKVMB3029A	Z-KVMB-SV-3029A	
	SL74	SCSMB2471	L-REMB-42-247	
	SL84	SCSMB2511	L-REMB-42-251	
	SLSMA0328	SLSMA0328	Z-LSMA-LS-0328	
	SLSMA0330	SLSMA0330	Z-LSMA-LS-0330	
	SPBMB1-2	SPBMB1-2	-	manual initiation of sis relays not modeled in PSAR2
	SPMME67A	SPMME67A	L-PMME-P-67A	
	SREMAX0328	SREMAX0328	Z-REMA-LSX-0328	
	SREMAX0330	SREMAX0330	Z-REMA-LSX-0330	
	SREMAY0328	SREMAY0328	Z-REMA-LSY-0328	
	SREMAY0330	SREMAY0330	Z-REMA-LSY-0330	
	SREMB4L2	SREMB4L2	Z-REMB-4L2	
	SREMBR-287	SREMBR-287	-	auto start of P-56A no longer modeled in PSAR2
	SREMBSIS2	SREMBSIS2	R-REMB-SIS-2	
	SREMBSIS6	SREMBSIS6	R-REMB-SIS-6	
	SREMBSIS8	SREMBSIS8	R-REMB-SIS-8	

Fire Area 1 - Control Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SREMBSISX6	SREMBSISX6	R-REMB-SIS-X6	
	SREMBSISX8	SREMBSISX8	R-REMB-SIS-X8	
	SU11	SHSMB3029A	-	Manual operation of CV-3029 not in PSAR2
	UCSMB204	UCSMB204	-	manual start of SWS pumps not modeled in PSAR2
	UCSMB205	UCSMB205	-	manual start of SWS pumps not modeled in PSAR2
	V25	VCSMB211	-	ESF room cooling no longer modeled
	V51	VCSMB221	-	ESF room cooling no longer modeled
	X32	XCNMB9631A	A-PBMC-PB-P936	
	X33	XHSMB8950A	A-HSMC-HS-8950A	
	ZCNMB34610	ZCNMB34610	R-CEPO-MC-34R106	
	ZCNMB3463	ZCNMB3463	R-CEPO-MC-34R105	
	ZCNMB3468	ZCNMB3468	R-CEPO-MC-34R106	
	ZPSMB81A1	ZPSMB81A1	R-PSMB-PS-1801A1	
	ZPSMB81A2	ZPSMB81A2	R-PSMB-PS-1801A2	
	ZPSMB84A1	ZPSMB84A1	R-PSMB-PS-1804A1	
	ZPSMB84A2	ZPSMB84A2	R-PSMB-PS-1804A2	
	ZSEMT34-6	ZSEMT34-6	R-CEPO-MC-34R106	
EC-106	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-519	PCNMD52402	P-CBMA-252-401	
	PBS1F-08	PCNMB1FCS	-	No manual actuation of 252-302 modeled in PSAR2
	PBS1G-08	PCNMB1GCS	-	No manual actuation of 252-402 modeled in PSAR2
	PCSMBA-301	PCSMBA-301	-	No manual actuation of 252-301 modeled in PSAR2
EC-126	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-374	QCNMBP41PS	F-PSMB-PS-5350	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
Exposure fire	A197	APSMD0762A	A-TPMT-PT-0762A	
	A199	APSMD0762B	A-TPMT-PT-0762B	
	A201	APSMD0762C	A-TPMT-PT-0762C	
	A38	AKVMA0522G	A-KVMA-SV-0522G	
	ABIOPASCA	ABIOPASCA	A-BIPO-LS-0751A	
	ABIOPASCB	ABIOPASCB	A-BIPO-LS-0751B	
	ABIOPASCC	ABIOPASCC	A-BIPO-LS-0751C	
	ABIOPASCD	ABIOPASCD	A-BIPO-LS-0751D	
	ABIOPBSCA	ABIOPBSCA	A-BIPO-LS-0752A	
	ABIOPBSCB	ABIOPBSCB	A-BIPO-LS-0752B	
	ABIOPBSCC	ABIOPBSCC	A-BIPO-LS-0752C	
	ABIOPBSCD	ABIOPBSCD	A-BIPO-LS-0752D	
	AHSMB0522B	AHSMB0522B	A-HSMB-HS-0522B	
	ATLMT0751A	ATLMT0751A	A-TLMT-LT-0751A	
	ATLMT0751B	ATLMT0751B	A-TLMT-LT-0751B	
	ATLMT0751C	ATLMT0751C	A-TLMT-LT-0751C	
	ATLMT0751D	ATLMT0751D	A-TLMT-LT-0751D	
	ATLMT0752A	ATLMT0752A	A-TLMT-LT-0752A	
	ATLMT0752B	ATLMT0752B	A-TLMT-LT-0752B	
	ATLMT0752C	ATLMT0752C	A-TLMT-LT-0752C	
	ATLMT0752D	ATLMT0752D	A-TLMT-LT-0752D	
	C200	CANMT0917	-	Isolation of CCW leaks not modeled
	C517	CPSMB0918	C-PSMB-PS-0918	
	CCSMB1094	CCSMB1094	-	Manual start of CCW pumps not modeled
	CCSMB1164	CCSMB1164	-	Manual start of CCW pumps not modeled
	CCSMB2084	CCSMB2084	-	Manual start of CCW pumps not modeled
	CHP46	ZPSMT81A	R-PSMT-PS-1801A	
	CHP49	ZPSMT84A	R-PSMT-PS-1804A	
	CHP50	ZPSMT83A	R-PSMT-PS-1803A	
	CREMBEX5P4	CREMBEX5P4	R-REMB-5P-4	
	DC6	DCBMC72112	P-CBMA-152-106	
	DFUDK1105A	DFUDK1105A	D-FUMK-B1105-1	
	DFUDK1106A	DFUDK1106A	D-FUMK-B1106-1	
	DFUDK1203A	DFUDK1203A	P-CBMA-152-203	
	DFUMK1206A	DFUMK1206A	D-FUMK-A1206-1	
	DFUMKS09	DFUMKS09	D-FUMK-S09-1	
	DFUMKS10	DFUMKS10	D-FUMK-S10-1	
	DFUMKS13A	DFUMKS13A	D-FUMK-S13-2	
	DFUMKS14A	DFUMKS14A	D-FUMK-S14-2	
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	DFUMKW006D	DFUMKW006D	D-FUMK-W006-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GCNMBHPX1L	GCNMBHPX1L	S-AVMA-CV-3002	
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0501A	GHSMB0501A	-	No credit for manual closure of MSIVs
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	GPBMBE50A	GPBMBE50A	M-PBMB-HS-LPE50A	
	GPBMBE50B	GPBMBE50B	M-PBMB-HS-LPE50B	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GREMB5P8	GREMB5P8	R-REMB-5P-8	
	GREMBXE50A	GREMBXE50A	M-REMB-LPXE50A	
	GREMBXE50B	GREMBXE50B	M-REMB-LPXE50B	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-11	FAVMC0729	-	CST makeup from hotwell not modeled
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-152	ZPSMA821	R-PSMA-PS1802SW1	
	IST-153	ZPSMA841	R-PSMA-PS1804SW1	
	IST-156	ZPSMA811	R-PSMA-PS1801SW1	
	IST-157	ZPSMA831	R-PSMA-PS1803SW1	
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-164	PC1MCY3001	P-C1MC-EY-30-01	
	IST-165	PC1MCY4001	P-C1MC-EY-40-01	
	IST-166	ZCEPO0751C	M-PCMT-PIC-0751C	
	IST-167	ZCEPO0751B	M-PCMT-PIC-0751B	
	IST-168	ZCEPO0751A	M-PCMT-PIC-0751A	
	IST-169	ZCEPO0751D	M-PCMT-PIC-0751D	
	IST-170	ZCEPO0752C	M-PCMT-PIC-0752C	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-171	ZCEPO0752B	M-PCMT-PIC-0752B	
	IST-172	ZCEPO0752A	M-PCMT-PIC-0752A	
	IST-173	ZCEPO0752D	M-PCMT-PIC-0752D	
	IST-174	XAVMA2008	-	T81 makeup to CST no longer modeled
	IST-175	PB2MKBUS91	P-B2MK-EB-91	
	IST-176	XAVMA2010	A-AVMA-CV-2010	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-183	GMVMA0510	M-HSMB-0510C	
	IST-184	GHSMB0510C	M-HSMB-0510C	
	IST-187	GMVMA0501	-	SGB no longer supplies steam to TDAFW
	IST-188	GHSMB0501C	-	SGB no longer supplies steam to TDAFW
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MODA	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-252	FCSMC105	M-CSMB-252-105CS	
	IST-253	FCSMB205	M-CBMB-252-205	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-30	AFSMB0727A	A-FSMA-FS-0727A	
	IST-300	DFUMK1111A	D-FUMK-A1111-1	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-305	PCBMCB-206	L-C2MB-152-206	
	IST-306	SAVMA3029	Z-AVMA-CV-3029	
	IST-307	PCBMCB-111	L-C2MB-152-111	
	IST-308	HPVMD3030B	Q-PVMD-PCV-3030B	
	IST-31	AFSMB0749A	A-FSMA-FS-0749A	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-335	GCNMA5P8	R-REMB-5P-8	
	IST-336	PCBMBB-210	S-CBMB-152-210	
	IST-337	DFUMK1114A	D-FUMK-A1114-1	
	IST-338	DFUMK1112A	D-FUMK-A1112-1	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-340	PCNMC52112	S-REMB-144-112	
	IST-341	PCNMC52114	S-REMB-144-114	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-346	DFUMK1113A	D-FUMK-A1113-1	
	IST-347	HFLMK3037	-	Flow path not modeled in PSAR2
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-349	DFUMK1207A	D-FUMK-A1207-2	
	IST-350	HFLMK3018	-	Flow path not modeled in PSAR2
	IST-362	HFLMK3071	I-FLMK-F-321	
	IST-363	HFLMK3070	I-FLMK-F-319	
	IST-366	PCBMBC1305	F-C2MC-52-1305	
	IST-369	QCXMTC1305	F-C2MC-P-9ALOCAL	
	IST-371	QCNMBPS2	F-PSMB-PS-1310	
	IST-374	QCNMBP41PS	F-PSMB-PS-5350	
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-377	PB2MKMCC26	P-B2MK-EB-26	
	IST-391	DFUMKS55B	D-FUMK-S55-2	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-40	APSMD0741A	A-PSMD-PS-0741A	
	IST-404	SCNMBA0101	D-FUMK-B1206-1	
	IST-41	APSMD0741B	A-PSMD-PS-0741B	
	IST-42	APSMD741DD	A-PSMD-PS-0741DD	
	IST-43	PC1MCY1014	P-C1MC-EY-10-14	
	IST-46	AFSMB0737	A-FSMA-FS-0737	
	IST-47	AFSMB0736	A-FSMA-FS-0736	
	IST-471	DCBDC72111	D-CBMC-72-111	
	IST-486	PCBMBB-106	P-CBMB-152-106	
	IST-491	PREMB1275	P-CBMA-152-106	
	IST-494	PCBMBB-202	P-CBMB-152-202	
	IST-496	DFUDK1202A	D-FUMK-A1202-1	
	IST-498	PREMB1276	P-CBMA-152-202	
	IST-499	DCBDC72211	D-CBMC-72-211	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-519	PCNMD52402	P-CBMA-252-401	
	IST-53	CCSMD1092	C-CSMD-152-109CS	
	IST-54	CCSMD2082	C-CSMD-152-208CS	
	IST-55	CCSMD1162	C-CSMD-152-116CS	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-6	ACNMDSX741	A-REMD-PSX-0741	
	IST-63	CCVMA0944	C-CVMA-CK-CC944	
	IST-65	CCVMA0943	C-CVMA-CK-CC943	
	IST-75	DFUMKA1103	D-FUMK-A1103-1	
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-84	UCNMB44103	U-REMB-144-103	
	PBS1F-08	PCNMB1FCS	-	No manual actuation of 252-302 modeled in PSAR2
	PBS1G-08	PCNMB1GCS	-	No manual actuation of 252-402 modeled in PSAR2
	PCBMAB-105	PCBMAB-105	P-CBMA-152-105	
	PCBMAB-106	PCBMAB-106	P-CBMA-152-106	
	PCBMAB-203	PCBMAB-203	P-CBMA-152-203	
	PCBMBB-111	PCBMBB-111	L-C2MB-152-111	
	PCBMBB-206	PCBMBB-206	L-C2MB-152-206	
	PCSMBA-301	PCSMBA-301	-	Closure of CB-252-302 not modeled
	PFUMKS04	PFUMKS04	P-FUMK-S04-1	
	PREMB38311	PREMB38311	P-REMB-383-11	
	PREMB38312	PREMB38312	P-REMB-383-12	
	PREMB38323	PREMB38323	P-REMB-383-23	
	PREMB5P8	PREMB5P8	R-REMB-5P-8	
	PREMB8612	PREMB8612	-	Circuitry for 152-202 failing to trip not modeled in PSAR2
	PREMB8612X	PREMB8612X	-	Circuitry for 152-202 failing to trip not modeled in PSAR2
	QCNMB5TR1C	QCNMB5TR1C	F-PSMB-PS-1310	
	SCNMA43111	SCNMA43111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMA43206	SCNMA43206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMBX0327	SCNMBX0327	Z-REMA-LSX-0327	
	SCNMBX0328	SCNMBX0328	Z-REMA-LSX-0328	
	SCNMBX0329	SCNMBX0329	Z-REMA-LSX-0329	
	SCNMBX0330	SCNMBX0330	Z-REMA-LSX-0330	
	SCNMBY0327	SCNMBY0327	Z-REMA-LSY-0327	
	SCNMBY0328	SCNMBY0328	Z-REMA-LSY-0328	
	SCNMBY0329	SCNMBY0329	Z-REMA-LSY-0329	
	SCNMBY0330	SCNMBY0330	Z-REMA-LSY-0330	
	SCSMA52111	SCSMA52111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMA52206	SCSMA52206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB111	SCSMB111	L-HSMB-HS-111	
	SCSMB112	SCSMB112	S-CSMB-152-112CS	
	SCSMB114	SCSMB114	S-CSMB-152-114CS	
	SCSMB206	SCSMB206	L-HSMB-HS-206	
	SCSMB210	SCSMB210	S-CSMB-152-210CS	
	SH194	SHSMB3037A	-	Flow path not modeled in PSAR2
	SH207	SHSMB3018A	-	Flow path not modeled in PSAR2
	SH233A	SCSMB207	H-CSMB-152-207CS	
	SH314A	SCSMB113	H-CSMB-152-113CS	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SHSMB3018A	SHSMB3018A	-	Flow path not modeled in PSAR2
	SHSMB3018B	SHSMB3018B	-	Flow path not modeled in PSAR2
	SHSMB3059A	SHSMB3059A	-	Failure to close failure mode not modeled in PSAR2
	SHSMB3059B	SHSMB3059B	-	Failure to close failure mode not modeled in PSAR2
	SKVMA3018	SKVMA3018	-	Flow path not modeled in PSAR2
	SKVMB3029A	SKVMB3029A	Z-KVMB-SV-3029A	
	SKVMB3030A	SKVMB3030A	Z-KVMB-SV-3030A	
	SKVMB3059	SKVMB3059	-	Failure to close failure mode not modeled in PSAR2
	SLSMA0327	SLSMA0327	Z-LSMA-LS-0327	
	SLSMA0328	SLSMA0328	Z-LSMA-LS-0328	
	SLSMA0329	SLSMA0329	Z-LSMA-LS-0329	
	SLSMA0330	SLSMA0330	Z-LSMA-LS-0330	
	SPCMT102A	SPCMT102A	P-DCPO-PS-0102A	
	SPCMT102B	SPCMT102B	P-DCPO-PS-0102B	
	SPCMT102C	SPCMT102C	P-DCPO-PS-0102C	
	SPCMT102D	SPCMT102D	P-DCPO-PS-0102D	
	SPMME67A	SPMME67A	L-PMME-P-67A	
	SPMME67B	SPMME67B	L-PMME-P-67B	
	SREMAX0327	SREMAX0327	Z-REMA-LSX-0327	
	SREMAX0328	SREMAX0328	Z-REMA-LSX-0328	
	SREMAX0329	SREMAX0329	Z-REMA-LSX-0329	
	SREMAX0330	SREMAX0330	Z-REMA-LSX-0330	
	SREMAY0327	SREMAY0327	Z-REMA-LSY-0327	
	SREMAY0328	SREMAY0328	Z-REMA-LSY-0328	
	SREMAY0329	SREMAY0329	Z-REMA-LSY-0329	
	SREMAY0330	SREMAY0330	Z-REMA-LSY-0330	
	SU11	SHSMB3029A	-	Manual operation of CV-3029 not in PSAR2
	SU28	SHSMB3030A	-	Manual operation of CV-3030 not in PSAR2
	UCSMB103	UCSMB103	-	manual start of SWS pumps not modeled in PSAR2
	UPSMB1318	UPSMB1318	U-PSMB-PS-1318	
	UPSMB1325	UPSMB1325	U-PSMB-PS-1325	
	X32	XCNMB9631A	A-PBMC-PB-P936	
	X33	XHSMB8950A	A-HSMC-HS-8950A	
	ZPSMB81A1	ZPSMB81A1	R-PSMB-PS-1801A1	
	ZPSMB81A2	ZPSMB81A2	R-PSMB-PS-1801A2	
	ZPSMB83A1	ZPSMB83A1	R-PSMB-PS-1803A1	
	ZPSMB83A2	ZPSMB83A2	R-PSMB-PS-1803A2	
	ZPSMB84A1	ZPSMB84A1	R-PSMB-PS-1804A1	
	ZPSMB84A2	ZPSMB84A2	R-PSMB-PS-1804A2	
EB-01	IST-143	SREMBX161	G-REMB-42-161	
	IST-273	BMVMA2169	G-MVMA-MO-2169	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-275	SCSMB127C1	G-CSMB-42-127CS1	
	IST-276	SCSMB187C1	G-CSMB-42-187CS1	
	IST-279	BCVMA2139	G-PMME-P-56B	
	IST-281	BMVMA2170	G-MVMA-MO-2170	
	IST-283	PCBMCC-131	ESF room cooling no longer modeled	
	IST-285	VTSFC1850	ESF room cooling no longer modeled	
	IST-288	PCBMCC-133	ESF room cooling no longer modeled	
	IST-290	VTSFC1857	ESF room cooling no longer modeled	
	IST-296	PCBMCC-147	L-C2MC-52-147	
	IST-311	SCNMBX147	L-REMB-42X-147	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-328	PCBMCC-141	L-C2MC-52-141	
	IST-329	SCNMBX141	L-REMB-42X-141	
	IST-351	PCBMCC-137	H-C2MC-52-137	
	IST-352	PCBMCC-197	H-C2MC-52-197	
	IST-353	PCBMCC-157	H-C2MC-52-157	
	IST-354	PCBMCC-151	H-C2MC-52-151	
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-470	DBCMTCHG4	D-BCMT-ED-18	
	IST-477	PCBMCC-145	P-C1MC-52-145	
	IST-483	EDGME11	E-DGME-K-6A	
	IST-509	EKVMA1470	E-KVMB-SV-1470	
	PB2MKMCC1	PB2MKMCC1	P-B2MK-EB-01	
	S42161MAN	SCSMB161CS	G-CSMB-42-161CS1	
	SCBA19A	SCSMB42191	G-CSMB-42-191CS	
	SH117	SCSMB1571	H-CSMB-42-157CS1	
	SH157	SCSMB1511	H-CSMB-42-151CS1	
	SH25	SCSMB1371	H-CSMB-42-137CS1	
	SH77	SCSMB1971	H-CSMB-42-197CS1	
	SL54	SCSMB1411	L-HSMB-HS-141-1	
	SL64	SCSMB1471	L-HSMB-HS-147-1	
	SREMB127-O	SREMB127-O	G-REMB-42-127	
	SREMBR-191	SREMBR-191	-	auto start of P-56B no longer modeled in PSAR2
	V22	VCSMB131	-	ESF room cooling no longer modeled
	V48	VCSMB133	-	ESF room cooling no longer modeled
EY-01	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-318	SHCMT3025A	L-HCMT-HIC-3025A	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-476	PC1MBY0141	-	Bypass regulator not modeled in PSAR2
	IST-477	PCBMCC-145	P-C1MC-52-145	
	IST-478	PCBMCC-236	P-C1MC-52-236	
	PB3MKY01	PB3MKY01	P-PAMK-EY-01	
	PREFAC-LCO	PREFAC-LCO	-	normal alignment of power from bypass regulator not modeled in PSAR2
	SHSMB3025B	SHSMB3025B	L-HSMB-HS-3025B	
EY-10	IST-474	DCBMC72016	P-C1MC-72-16	
	IST-475	PC1MBIV1	P-C1MC-CB-INV1	
	PPAMKY10	PPAMKY10	P-PAMK-EY-10	
	PREFAC-LCO	PREFAC-LCO	-	normal alignment of power from bypass regulator not modeled in PSAR2
EY-20	IST-44	DCBMC72026	P-C1MC-72-26	
	PREFAC-LCO	PREFAC-LCO	-	normal alignment of power from bypass regulator not modeled in PSAR2
EY-30	IST-144	DCBMC72011	P-C1MC-72-11	
	PFUMK3006	PFUMK3006	P-FUMK-Y3006-1	
	PREFAC-LCO	PREFAC-LCO	-	normal alignment of power from bypass regulator not modeled in PSAR2
EY-40	DFUDKD21	DFUDKD21	D-FUMK-D21-1	
	DFUMKD21	DFUMKD21	D-FUMK-D21-2	
	IST-135	DCBMC72021	P-C1MC-72-21	
	PREFAC-LCO	PREFAC-LCO	-	normal alignment of power from bypass regulator not modeled in PSAR2
EY-50	IST-476	PC1MBY0141	-	Bypass regulator not modeled in PSAR2
	IST-478	PCBMCC-236	P-C1MC-52-236	
EB-02	IST-274	BCVMA2138	G-PMME-P-56A	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-278	BMVMA2140	G-MVMA-MO-2140	
	IST-280	SCSMB227C1	G-CSMB-42-227CS1	
	IST-284	PCBMCC-211	-	ESF room cooling no longer modeled
	IST-286	VTSFC1851	-	ESF room cooling no longer modeled
	IST-289	PCBMCC-221	-	ESF room cooling no longer modeled
	IST-291	VTSFC1858	-	ESF room cooling no longer modeled
	IST-295	PCBMCC-251	L-C2MC-52-251	
	IST-297	PCBMCC-247	L-C2MC-52-247	
	IST-312	SCNMBX247	L-REMB-42X-247	
	IST-313	SCNMBX251	L-REMB-42X-251	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-355	PCBMCC-261	H-C2MC-52-261	
	IST-356	PCBMCC-257	H-C2MC-52-257	
	IST-357	PCBMCC-237	H-C2MC-52-237	
	IST-358	PCBMCC-241	H-C2MC-52-241	
	IST-392	PCBMCC5221	H-REMT-3072IC	
	IST-399	PCBMC52207	G-C2MC-52-207	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-469	DBCMTCHG2	D-BCMT-ED-16	
	IST-478	PCBMCC-236	P-C1MC-52-236	
	IST-492	EDGME12	E-DGME-K-6B	
	IST-510	EKVMA1471	E-KVMB-SV-1471	
	PB2MKMCC2	PB2MKMCC2	P-B2MK-EB-02	
	SCSMB207C1	SCSMB207C1	G-CSMB-42-207CS1	
	SCSMB207C2	SCSMB207C2	G-CSMB-42-207CS1	
	SH135	SCSMB2371	H-CSMB-42-237CS1	
	SH175	SCSMB2411	H-CSMB-42-241CS1	
	SH49	SCSMB2611	H-CSMB-42-261CS1	
	SH95	SCSMB2571	H-CSMB-42-257CS1	
	SL74	SCSMB2471	L-REMB-42-247	
	SL84	SCSMB2511	L-REMB-42-251	
	SREMBR-287	SREMBR-287	-	auto start of P-56A no longer modeled in PSAR2
	V25	VCSMB211	-	ESF room cooling no longer modeled
	V51	VCSMB221	-	ESF room cooling no longer modeled
EB-11	IST-100	ICMME2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-192	DCBMC72119	D-CBMC-72-119	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	IST-490	DCBDC72308	D-CBMC-72-308	
	IST-69	UKVMA0801	-	Compressors no longer require SW cooling
	IST-70	UKVMA0803	-	Compressors no longer require SW cooling
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	PB2MKBUS11	PB2MKBUS11	P-B2MK-EB-11	
	PCBMBC1103	PCBMBC1103	P-CBMB-52-1103	
	PREMB1271	PREMB1271	P-REMA-127-1	
	PREMB271X1	PREMB271X1	P-REMB-127-1-X1	
	PREMB271X2	PREMB271X2	P-REMB-127-1-X2	
	PT2MT11	PT2MT11	P-T2MT-EX-11	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
EB-12	ICNMAK24	ICNMAK24	I-CMME-C-2B	
	ICNMBK21	ICNMBK21	I-CMME-C-2B	
	ICNMBK22	ICNMBK22	I-CMME-C-2B	
	IFUMKF3	IFUMKF3	I-CMME-C-2B	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IREMBK22	IREMBK22	I-CMME-C-2B	
	IREMBK24	IREMBK24	I-CMME-C-2B	
	IST-100	ICMME2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-103	ICNMAK22	I-CMME-C-2C	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-106	ICNMCK23	I-CMME-C-2B	
	IST-107	ICNMBK23	I-CMME-C-2B	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-192	DCBMC72119	D-CBMC-72-119	
	IST-395	PCBMCC1205	G-C2MC-52-1205	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-400	DFUMK72205	D-FUMK-B1205-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-497	DCBDC72403	D-CBMC-72-403	
	IST-69	UKVMA0801	-	Compressors no longer require SW cooling
	IST-70	UKVMA0803	-	Compressors no longer require SW cooling
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	ISWFCS3	ISWFCS3	-	Failure of logic to unload compressor and prevent RV actuation not modeled in PSAR2
	PB2MKBUS12	PB2MKBUS12	P-B2MK-EB-12	
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2
	PCBMBC1201	PCBMBC1201	P-C2MB-52-1201	
	PREMB1272	PREMB1272	P-REMA-127-1	
	PREMB272X1	PREMB272X1	P-REMB-127-2-X1	
	PREMB272X2	PREMB272X2	P-REMB-127-2-X2	
	PT2MT12	PT2MT12	P-T2MT-EX-12	
	S55A-H	SCSMB1205	G-CSMB-52-1205CS	
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
EB-21	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-503	PCBMCC2111	-	Battery room ventillation not needed in PSAR2
	PB2MKMCC21	PB2MKMCC21	P-B2MK-EB-21	
EB-23	IST-310	SMVMA3190	L-MVMA-MO-3190	
	IST-331	PBSMTMCC23	P-B2MK-EB-23	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	SSD40	SLMMB23395	L-REMB-42-2339	
	SSD41	SQSMB2339	L-REMB-42-2339	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
EB-24	293AUTO	VTSFC1822	E-TSFC-TS-1822	
	861AUTO	VTSFC1820	E-TSFC-TS-1820	
	IST-309	SMVMA3199	L-MVMA-MO-3199	
	IST-330	PBSMTMCC24	P-B2MK-EB-24	
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-492	EDGME12	E-DGME-K-6B	
	IST-504	PCBMCC2411	-	Battery room ventillation not needed in PSAR2
	IST-507	VCNMB2931	-	Manual start of EDG fans not modeled in PSAR2
	IST-508	VCNMB8611	-	Manual start of EDG fans not modeled in PSAR2
	PB2MKMCC24	PB2MKMCC24	P-B2MK-EB-24	
	SSD30	SLMMB24395	L-REMB-42-2439	
	SSD31	SQSMB2439	L-REMB-42-2439	
ED-06	IST-474	DCBMC72016	P-C1MC-72-16	
	IST-475	PC1MBIV1	P-C1MC-CB-INV1	
ED-07	IST-44	DCBMC72026	P-C1MC-72-26	
ED-08	IST-144	DCBMC72011	P-C1MC-72-11	
ED-09	IST-135	DCBMC72021	P-C1MC-72-21	
ED-10	DCB7218MOD	DCBMC72018	D-CBMC-72-18	
	DFUDKD11	DFUDKD11	D-FUMK-D11-1	
	DFUDKD11A	DFUDKD11A	D-FUMK-D018-1	
	DFUMKD11	DFUMKD11	D-FUMK-D11-1	
	DFUMKD11A	DFUMKD11A	D-FUMK-D018-1	
	IST-144	DCBMC72011	P-C1MC-72-11	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-472	DBCMTCHG1	D-BCMT-ED-15	
	IST-473	DBCMTCHG3	D-BCMT-ED-17	
	IST-474	DCBMC72016	P-C1MC-72-16	
	IST-475	PC1MBIV1	P-C1MC-CB-INV1	
ED-15	IST-472	DBCMTCHG1	D-BCMT-ED-15	
ED-16	IST-469	DBCMTCHG2	D-BCMT-ED-16	
ED-17	IST-473	DBCMTCHG3	D-BCMT-ED-17	
ED-18	IST-470	DBCMTCHG4	D-BCMT-ED-18	
ED-20	DCB7228MOD	DCBMC72028	D-CBMC-72-28	
	DFUDKD21	DFUDKD21	D-FUMK-D21-1	
	DFUMKD21	DFUMKD21	D-FUMK-D21-2	
	IST-135	DCBMC72021	P-C1MC-72-21	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-44	DCBMC72026	P-C1MC-72-26	
	IST-470	DBCMTCHG4	D-BCMT-ED-18	
EJ-14A	IST-74	PCBMCB-204	U-C2MC-152-204	
	IST-76	PCBMCB-205	P-CBMC-152-205	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-77	DFUMKA1205	D-FUMK-A1205-1	
	IST-79	DFUMKA1204	D-FUMK-A1204-1	
	UCSMB204	UCSMB204	-	manual start of SWS pumps not modeled in PSAR2
	UCSMB205	UCSMB205	-	manual start of SWS pumps not modeled in PSAR2
EJ-542	CHSMB0940	CHSMB0940	-	Isolation of CCW to containment not modeled in PSAR2
	DFUDK1302A	DFUDK1302A	-	backfeed power not modeled in PSAR2.
	IST-137	PC1MCY2003	P-C1MC-EY-20-03	
	IST-138	SCNMBSISX2	R-REMB-SIS-X2	
	IST-139	SCNMBSISX4	R-REMB-SIS-X4	
	IST-149	SCNMASIS8	R-REMB-SIS-8	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-67	CAVMB0940	-	containment CCW isolation not modeled in PSAR2
	P252B	PCNMB303CS	-	Manual trip of CB-152-302 not modeled in PSAR2
	SCNMBSISX6	SCNMBSISX6	R-REMB-SIS-X6	
	SPBMB1-2	SPBMB1-2	-	manual initiation of sis relays not modeled in PSAR2
	SREMBSIS2	SREMBSIS2	R-REMB-SIS-2	
	SREMBSIS6	SREMBSIS6	R-REMB-SIS-6	
	SREMBSIS8	SREMBSIS8	R-REMB-SIS-8	
	SREMBSISX6	SREMBSISX6	R-REMB-SIS-X6	
	SREMBSISX8	SREMBSISX8	R-REMB-SIS-X8	
	ZCNMB34610	ZCNMB34610	R-CEPO-MC-34R106	
	ZCNMB3463	ZCNMB3463	R-CEPO-MC-34R105	
	ZCNMB3468	ZCNMB3468	R-CEPO-MC-34R106	
	ZSEMT34-6	ZSEMT34-6	R-CEPO-MC-34R106	
EJ-543	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	DFUDK1302A	DFUDK1302A	-	backfeed power not modeled in PSAR2.
	IST-140	PC1MCY3003	P-C1MC-EY-30-03	
	IST-141	SCNMBSISX1	R-REMB-SIS-X1	
	IST-142	SCNMBSISX3	R-REMB-SIS-X3	
	IST-146	SCNMASIS5	R-REMB-SIS-5	
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	

Fire Area 2 - Cable Spreading Room

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	P252B	PCNMB303CS	-	Manual trip of CB-152-302 not modeled in PSAR2
	SCNMBSISX5	SCNMBSISX5	R-REMB-SIS-X5	
	SPBMB1-1	SPBMB1-1	-	manual initiation of sis relays not modeled in PSAR2
	SREMBSIS1	SREMBSIS1	R-REMB-SIS-1	
	SREMBSIS5	SREMBSIS5	R-REMB-SIS-5	
	SREMBSISX5	SREMBSISX5	R-REMB-SIS-X5	
	SREMBSISX7	SREMBSISX7	R-REMB-SIS-X7	
	ZCNMB34510	ZCNMB34510	R-CEPO-MC-34L105	
	ZCNMB3453	ZCNMB3453	R-CEPO-MC-34L105	
	ZCNMB3455	ZCNMB3455	R-CEPO-MC-34L106	
	ZCNMB3459	ZCNMB3459	R-CEPO-MC-34L105	
	ZSEMT34-5	ZSEMT34-5	R-CEPO-MC-34L105	
EJ-575	DCB7218MOD	DCBMC72018	D-CBMC-72-18	
	DFUDKD11A	DFUDKD11A	D-FUMK-D018-1	
	DFUMKD11A	DFUMKD11A	D-FUMK-D018-1	
EJ-576	DCB7228MOD	DCBMC72028	D-CBMC-72-28	

Fire Area 3 - Bus 1D Switchgear

Area/ Cabinet Exposure fire	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	C200	CANMT0917	-	Isolation of CCW leaks not modeled
	C517	CPSMB0918	C-PSMB-PS-0918	
	CHP49	ZPSMT84A	R-PSMT-PS-1804A	
	CHP50	ZPSMT83A	R-PSMT-PS-1803A	
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0940	CHSMB0940	-	Isolation of CCW to containment not modeled in PSAR2
	IST-152	ZPSMA821	R-PSMA-PS1802SW1	
	IST-153	ZPSMA841	R-PSMA-PS1804SW1	
	IST-156	ZPSMA811	R-PSMA-PS1801SW1	
	IST-157	ZPSMA831	R-PSMA-PS1803SW1	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-295	PCBMCC-251	L-C2MC-52-251	
	IST-297	PCBMCC-247	L-C2MC-52-247	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-312	SCNMBX247	L-REMB-42X-247	
	IST-313	SCNMBX251	L-REMB-42X-251	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-355	PCBMCC-261	H-C2MC-52-261	
	IST-356	PCBMCC-257	H-C2MC-52-257	
	IST-357	PCBMCC-237	H-C2MC-52-237	
	IST-358	PCBMCC-241	H-C2MC-52-241	
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-377	PB2MKMCC26	P-B2MK-EB-26	
	IST-391	DFUMKS55B	D-FUMK-S55-2	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-67	CAVMB0940	-	Isolation of CCW to containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW to containment not modeled in PSAR2
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2

Fire Area 3 - Bus 1D Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	SCNMBX0327	SCNMBX0327	Z-REMA-LSX-0327	
	SCNMBX0328	SCNMBX0328	Z-REMA-LSX-0328	
	SCNMBX0329	SCNMBX0329	Z-REMA-LSX-0329	
	SCNMBX0330	SCNMBX0330	Z-REMA-LSX-0330	
	SCNMBY0327	SCNMBY0327	Z-REMA-LSY-0327	
	SCNMBY0328	SCNMBY0328	Z-REMA-LSY-0328	
	SCNMBY0329	SCNMBY0329	Z-REMA-LSY-0329	
	SCNMBY0330	SCNMBY0330	Z-REMA-LSY-0330	
	SH135	SCSMB2371	H-CSMB-42-237CS1	
	SH175	SCSMB2411	H-CSMB-42-241CS1	
	SH49	SCSMB2611	H-CSMB-42-261CS1	
	SH95	SCSMB2571	H-CSMB-42-257CS1	
	SL74	SCSMB2471	L-REMB-42-247	
	SL84	SCSMB2511	L-REMB-42-251	
	SLSMA0327	SLSMA0327	Z-LSMA-LS-0327	
	SLSMA0328	SLSMA0328	Z-LSMA-LS-0328	
	SLSMA0329	SLSMA0329	Z-LSMA-LS-0329	
	SLSMA0330	SLSMA0330	Z-LSMA-LS-0330	
	SPCMT102B	SPCMT102B	P-DCPO-PS-0102B	
	SPCMT102D	SPCMT102D	P-DCPO-PS-0102D	
	SREMAX0327	SREMAX0327	Z-REMA-LSX-0327	
	SREMAX0328	SREMAX0328	Z-REMA-LSX-0328	
	SREMAX0329	SREMAX0329	Z-REMA-LSX-0329	
	SREMAX0330	SREMAX0330	Z-REMA-LSX-0330	
	SREMAY0327	SREMAY0327	Z-REMA-LSY-0327	
	SREMAY0328	SREMAY0328	Z-REMA-LSY-0328	
	SREMAY0329	SREMAY0329	Z-REMA-LSY-0329	
	SREMAY0330	SREMAY0330	Z-REMA-LSY-0330	
	ZPSMB83A1	ZPSMB83A1	R-PSMB-PS-1803A1	
	ZPSMB83A2	ZPSMB83A2	R-PSMB-PS-1803A2	
	ZPSMB84A1	ZPSMB84A1	R-PSMB-PS-1804A1	
	ZPSMB84A2	ZPSMB84A2	R-PSMB-PS-1804A2	
EA-12	CCSMB2084	CCSMB2084	-	manual start of CCW pumps not modeled in PSAR2
	DFUDK1203A	DFUDK1203A	P-CBMA-152-203	
	DFUMK1206A	DFUMK1206A	D-FUMK-A1206-1	
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-137	PC1MCY2003	P-C1MC-EY-20-03	
	IST-138	SCNMBSISX2	R-REMB-SIS-X2	
	IST-139	SCNMBSISX4	R-REMB-SIS-X4	
	IST-149	SCNMASIS8	R-REMB-SIS-8	
	IST-161	PCNMB213AB	P-CBMB-152-213	

Fire Area 3 - Bus 1D Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-305	PCBMCB-206	L-C2MB-152-206	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-336	PCBMBB-210	S-CBMB-152-210	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-349	DFUMK1207A	D-FUMK-A1207-2	
	IST-492	EDGME12	E-DGME-K-6B	
	IST-494	PCBMBB-202	P-CBMB-152-202	
	IST-496	DFUDK1202A	D-FUMK-A1202-1	
	IST-497	DCBDC72403	D-CBMC-72-403	
	IST-498	PREMB1276	P-CBMA-152-202	
	IST-499	DCBDC72211	D-CBMC-72-211	
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-510	EKVMA1471	E-KVMB-SV-1471	
	IST-54	CCSMD2082	C-CSMD-152-208CS	
	IST-65	CCVMA0943	C-CVMA-CK-CC943	
	IST-74	PCBMCB-204	U-C2MC-152-204	
	IST-76	PCBMCB-205	P-CBMC-152-205	
	IST-77	DFUMKA1205	D-FUMK-A1205-1	
	IST-79	DFUMKA1204	D-FUMK-A1204-1	
	PB1MKBUS1D	PB1MKBUS1D	P-B1MK-EA-12	
	PCBMAB-203	PCBMAB-203	P-CBMA-152-203	
	PCBMBB-206	PCBMBB-206	L-C2MB-152-206	
	PREMB1272	PREMB1272	P-REMA-127-1	
	PREMB272X1	PREMB272X1	P-REMB-127-2-X1	
	PREMB272X2	PREMB272X2	P-REMB-127-2-X2	
	PREMB38312	PREMB38312	P-REMB-383-12	
	PREMB38323	PREMB38323	P-REMB-383-23	
	SCNMA43206	SCNMA43206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMBSISX6	SCNMBSISX6	R-REMB-SIS-X6	
	SCSMA52206	SCSMA52206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB206	SCSMB206	L-HSMB-HS-206	
	SCSMB210	SCSMB210	S-CSMB-152-210CS	
	SH233A	SCSMB207	H-CSMB-152-207CS	
	SPBMB1-2	SPBMB1-2	-	manual initiation of sis relays not modeled in PSAR2
	SPMME67A	SPMME67A	L-PMME-P-67A	
	SREMBSIS2	SREMBSIS2	R-REMB-SIS-2	
	SREMBSIS6	SREMBSIS6	R-REMB-SIS-6	

Fire Area 3 - Bus 1D Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SREMBSIS8	SREMBSIS8	R-REMB-SIS-8	
	SREMBSISX6	SREMBSISX6	R-REMB-SIS-X6	
	SREMBSISX8	SREMBSISX8	R-REMB-SIS-X8	
	UCSMB204	UCSMB204	-	manual start of SWS pumps not modeled in PSAR2
	UCSMB205	UCSMB205	-	manual start of SWS pumps not modeled in PSAR2
	ZCNMB34610	ZCNMB34610	R-CEPO-MC-34R106	
	ZCNMB3463	ZCNMB3463	R-CEPO-MC-34R105	
	ZCNMB3468	ZCNMB3468	R-CEPO-MC-34R10	
	ZSEMT34-6	ZSEMT34-6	R-CEPO-MC-34R106	
EB-22	IST-348	PB2MKMCC22	P-B2MK-EB-22	
EC-181	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	GHSMB0501A	GHSMB0501A	-	No credit for manual closure of MSIVs
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
EC-187	ABIOPASCA	ABIOPASCA	A-BIPO-LS-0751A	
	ABIOPASCB	ABIOPASCB	A-BIPO-LS-0751B	
	ABIOPASCC	ABIOPASCC	A-BIPO-LS-0751C	
	ABIOPASCD	ABIOPASCD	A-BIPO-LS-0751D	
	ABIOPBSCA	ABIOPBSCA	A-BIPO-LS-0752A	
	ABIOPBSCB	ABIOPBSCB	A-BIPO-LS-0752B	
	ABIOPBSCC	ABIOPBSCC	A-BIPO-LS-0752C	
	ABIOPBSCD	ABIOPBSCD	A-BIPO-LS-0752D	
	ATLMT0751A	ATLMT0751A	A-TLMT-LT-0751A	
	ATLMT0751B	ATLMT0751B	A-TLMT-LT-0751B	
	ATLMT0751C	ATLMT0751C	A-TLMT-LT-0751C	
	ATLMT0751D	ATLMT0751D	A-TLMT-LT-0751D	
	ATLMT0752A	ATLMT0752A	A-TLMT-LT-0752A	
	ATLMT0752B	ATLMT0752B	A-TLMT-LT-0752B	
	ATLMT0752C	ATLMT0752C	A-TLMT-LT-0752C	
	ATLMT0752D	ATLMT0752D	A-TLMT-LT-0752D	
	IST-166	ZCEPO0751C	M-PCMT-PIC-0751C	
	IST-167	ZCEPO0751B	M-PCMT-PIC-0751B	
	IST-168	ZCEPO0751A	M-PCMT-PIC-0751A	
	IST-169	ZCEPO0751D	M-PCMT-PIC-0751D	
	IST-170	ZCEPO0752C	M-PCMT-PIC-0752C	
	IST-171	ZCEPO0752B	M-PCMT-PIC-0752B	
	IST-172	ZCEPO0752A	M-PCMT-PIC-0752A	
	IST-173	ZCEPO0752D	M-PCMT-PIC-0752D	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	

Fire Area 3 - Bus 1D Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MODA	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
EJ-1005	A38	AKVMA0522G	A-KVMA-SV-0522G	
	AHSMB0522B	AHSMB0522B	A-HSMB-HS-0522B	
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	DFUMKW006D	DFUMKW006D	D-FUMK-W006-1	
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MODA	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-6	ACNMDSX741	A-REMD-PSX-0741	
EJ-1006	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
EJ-1051	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MODA	
	IST-30	AFSMB0727A	A-FSMA-FS-0727A	
	IST-31	AFSMB0749A	A-FSMA-FS-0749A	
	IST-40	APSMD0741A	A-PSMD-PS-0741A	
	IST-41	APSMD0741B	A-PSMD-PS-0741B	
	IST-42	APSMD741DD	A-PSMD-PS-0741DD	
	IST-43	PC1MCY1014	P-C1MC-EY-10-14	
EJ-1052	A197	APSMD0762A	A-TPMT-PT-0762A	
	A199	APSMD0762B	A-TPMT-PT-0762B	
	A201	APSMD0762C	A-TPMT-PT-0762C	
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-46	AFSMB0737	A-FSMA-FS-0737	
	IST-47	AFSMB0736	A-FSMA-FS-0736	
EJ-9401	DFUDK1203A	DFUDK1203A	P-CBMA-152-203	
	IST-137	PC1MCY2003	P-C1MC-EY-20-03	
	IST-138	SCNMBSISX2	R-REMB-SIS-X2	

Fire Area 3 - Bus 1D Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-139	SCNMBSISX4	R-REMB-SIS-X4	
	IST-149	SCNMASIS8	R-REMB-SIS-8	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-162	DFUDK1213A	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-494	PCBMBB-202	P-CBMB-152-202	
	IST-496	DFUDK1202A	D-FUMK-A1202-1	
	IST-497	DCBDC72403	D-CBMC-72-403	
	PCBMAB-203	PCBMAB-203	P-CBMA-152-203	
	PREMB1272	PREMB1272	P-REMA-127-1	
	PREMB272X1	PREMB272X1	P-REMB-127-2-X1	
	PREMB272X2	PREMB272X2	P-REMB-127-2-X2	
	SCNMBSISX6	SCNMBSISX6	R-REMB-SIS-X6	
	SPBMB1-2	SPBMB1-2	-	manual initiation of sis relays not modeled in PSAR2
	SREMBSIS2	SREMBSIS2	R-REMB-SIS-2	
	SREMBSIS6	SREMBSIS6	R-REMB-SIS-6	
	SREMBSIS8	SREMBSIS8	R-REMB-SIS-8	
	SREMBSISX6	SREMBSISX6	R-REMB-SIS-X6	
	SREMBSISX8	SREMBSISX8	R-REMB-SIS-X8	
	ZCNMB34610	ZCNMB34610	R-CEPO-MC-34R106	
	ZCNMB3463	ZCNMB3463	R-CEPO-MC-34R105	
	ZCNMB3468	ZCNMB3468	R-CEPO-MC-34R106	
	ZSEMT34-6	ZSEMT34-6	R-CEPO-MC-34R106	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet Exposure fire	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	A197	APSMD0762A	A-TPMT-PT-0762A	
	A199	APSMD0762B	A-TPMT-PT-0762B	
	A201	APSMD0762C	A-TPMT-PT-0762C	
	A38	AKVMA0522G	A-KVMA-SV-0522G	
	ABIOPASCA	ABIOPASCA	A-BIPO-LS-0751A	
	ABIOPASCB	ABIOPASCB	A-BIPO-LS-0751B	
	ABIOPASCC	ABIOPASCC	A-BIPO-LS-0751C	
	ABIOPBSCA	ABIOPBSCA	A-BIPO-LS-0752A	
	ABIOPBSCB	ABIOPBSCB	A-BIPO-LS-0752B	
	ABIOPBSCC	ABIOPBSCC	A-BIPO-LS-0752C	
	AHSMB0522B	AHSMB0522B	A-HSMB-HS-0522B	
	ATLMT0751A	ATLMT0751A	A-TLMT-LT-0751A	
	ATLMT0751B	ATLMT0751B	A-TLMT-LT-0751B	
	ATLMT0751C	ATLMT0751C	A-TLMT-LT-0751C	
	ATLMT0752A	ATLMT0752A	A-TLMT-LT-0752A	
	ATLMT0752B	ATLMT0752B	A-TLMT-LT-0752B	
	ATLMT0752C	ATLMT0752C	A-TLMT-LT-0752C	
	C200	CANMT0917	-	Isolation of CCW leaks not modeled
	C517	CPSMB0918	C-PSMB-PS-0918	
	CCSMB2084	CCSMB2084	-	manual start of CCW pumps not modeled in PSAR2
	CHP46	ZPSMT81A	R-PSMT-PS-1801A	
	CHP49	ZPSMT84A	R-PSMT-PS-1804A	
	CHP50	ZPSMT83A	R-PSMT-PS-1803A	
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0940	CHSMB0940	-	Isolation of CCW to containment not modeled in PSAR2
	CREMBEX5P4	CREMBEX5P4	R-REMB-5P-4	
	DC6	DCBMC72112	P-CBMA-152-106	
	DFUDK1302A	DFUDK1302A	-	backfeed power not modeled in PSAR2.
	DFUMK1206A	DFUMK1206A	D-FUMK-A1206-1	
	DFUMKS09	DFUMKS09	D-FUMK-S09-1	
	DFUMKS10	DFUMKS10	D-FUMK-S10-1	
	DFUMKS13A	DFUMKS13A	D-FUMK-S13-2	
	DFUMKS14A	DFUMKS14A	D-FUMK-S14-2	
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	DFUMKW006D	DFUMKW006D	D-FUMK-W006-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
				energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GCNMBHPX1L	GCNMBHPX1L	S-AVMA-CV-3002	
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0501A	GHSMB0501A	-	No credit for manual closure of MSIVs
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GREMB5P8	GREMB5P8	R-REMB-5P-8	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	ICNMAK24	ICNMAK24	I-CMME-C-2B	
	ICNMBK21	ICNMBK21	I-CMME-C-2B	
	ICNMBK22	ICNMBK22	I-CMME-C-2B	
	IFUMKF3	IFUMKF3	I-CMME-C-2B	
	IREMBK22	IREMBK22	I-CMME-C-2B	
	IREMBK24	IREMBK24	I-CMME-C-2B	
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-100	ICMME2C	I-CMME-C-2C	
	IST-100	ICMME2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-103	ICNMAK22	I-CMME-C-2C	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-106	ICNMCK23	I-CMME-C-2B	
	IST-107	ICNMBK23	I-CMME-C-2B	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-11	FAVMC0729	-	Hotwell reject to CST not credited in PSAR2
	IST-137	PC1MCY2003	P-C1MC-EY-20-03	
	IST-138	SCNMBSISX2	R-REMB-SIS-X2	
	IST-139	SCNMBSISX4	R-REMB-SIS-X4	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-143	SREMBX161	G-REMB-42-161	
	IST-149	SCNMASIS8	R-REMB-SIS-8	
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-15	AAVMA0521	-	SGB no longer supplies steam to TDAFW
	IST-152	ZPSMA821	R-PSMA-PS1802SW1	
	IST-153	ZPSMA841	R-PSMA-PS1804SW1	
	IST-156	ZPSMA811	R-PSMA-PS1801SW1	
	IST-157	ZPSMA831	R-PSMA-PS1803SW1	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-166	ZCEPO0751C	M-PCMT-PIC-0751C	
	IST-167	ZCEPO0751B	M-PCMT-PIC-0751B	
	IST-168	ZCEPO0751A	M-PCMT-PIC-0751A	
	IST-170	ZCEPO0752C	M-PCMT-PIC-0752C	
	IST-171	ZCEPO0752B	M-PCMT-PIC-0752B	
	IST-172	ZCEPO0752A	M-PCMT-PIC-0752A	
	IST-174	XAVMA2008	-	T81 makeup to CST no longer modeled
	IST-176	XAVMA2010	A-AVMA-CV-2010	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-183	GMVMA0510	M-HSMB-0510C	
	IST-184	GHSMB0510C	M-HSMB-0510C	
	IST-187	GMVMA0501	-	SGB no longer supplies steam to TDAFW
	IST-188	GHSMB0501C	-	SGB no longer supplies steam to TDAFW
	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-192	DCBMC72119	D-CBMC-72-119	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-21	ACNMD1C2-6	A-REMB-62-1P8C	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-252	FCSMC105	M-CSMB-252-105CS	
	IST-253	FCSMB205	M-CBMB-252-205	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-259	DCBDC72201	D-CBMC-72-201	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-273	BMVMA2169	G-MVMA-MO-2169	
	IST-274	BCVMA2138	G-PMME-P-56A	
	IST-275	SCSMB127C1	G-CSMB-42-127CS1	
	IST-276	SCSMB187C1	G-CSMB-42-187CS1	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-278	BMVMA2140	G-MVMA-MO-2140	
	IST-279	BCVMA2139	G-PMME-P-56B	
	IST-280	SCSMB227C1	G-CSMB-42-227CS1	
	IST-281	BMVMA2170	G-MVMA-MO-2170	
	IST-283	PCBMCC-131	-	ESF room cooling no longer modeled
	IST-284	PCBMCC-211	-	ESF room cooling no longer modeled
	IST-285	VTSFC1850	-	ESF room cooling no longer modeled
	IST-286	VTSFC1851	-	ESF room cooling no longer modeled
	IST-288	PCBMCC-133	-	ESF room cooling no longer modeled
	IST-289	PCBMCC-221	-	ESF room cooling no longer modeled
	IST-290	VTSFC1857	-	ESF room cooling no longer modeled
	IST-291	VTSFC1858	-	ESF room cooling no longer modeled
	IST-295	PCBMCC-251	L-C2MC-52-251	
	IST-296	PCBMCC-147	L-C2MC-52-147	
	IST-297	PCBMCC-247	L-C2MC-52-247	
	IST-30	AFSMB0727A	A-FSMA-FS-0727A	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-305	PCBMCB-206	L-C2MB-152-206	
	IST-306	SAVMA3029	Z-AVMA-CV-3029	
	IST-308	HPVMD3030B	Q-PVMD-PCV-3030B	
	IST-309	SMVMA3199	L-MVMA-MO-3199	
	IST-31	AFSMB0749A	A-FSMA-FS-0749A	
	IST-310	SMVMA3190	L-MVMA-MO-3190	
	IST-311	SCNMBX147	L-REMB-42X-147	
	IST-312	SCNMBX247	L-REMB-42X-247	
	IST-313	SCNMBX251	L-REMB-42X-251	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-318	SHCMT3025A	L-HCMT-HIC-3025A	
	IST-32	AREMB22P8B	A-REMB-62-2P8B	
	IST-328	PCBMCC-141	L-C2MC-52-141	
	IST-329	SCNMBX141	L-REMB-42X-141	
	IST-330	PBSMTMCC24	P-B2MK-EB-24	
	IST-331	PBSMTMCC23	P-B2MK-EB-23	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-335	GCNMA5P8	R-REMB-5P-8	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-347	HFLMK3037	-	Flow path not modeled in PSAR2
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-350	HFLMK3018	-	Flow path not modeled in PSAR2
	IST-351	PCBMCC-137	H-C2MC-52-137	
	IST-352	PCBMCC-197	H-C2MC-52-197	
	IST-353	PCBMCC-157	H-C2MC-52-157	
	IST-354	PCBMCC-151	H-C2MC-52-151	
	IST-355	PCBMCC-261	H-C2MC-52-261	
	IST-356	PCBMCC-257	H-C2MC-52-257	
	IST-357	PCBMCC-237	H-C2MC-52-237	
	IST-358	PCBMCC-241	H-C2MC-52-241	
	IST-362	HFLMK3071	I-FLMK-F-321	
	IST-363	HFLMK3070	I-FLMK-F-319	
	IST-366	PCBMBC1305	F-C2MC-52-1305	
	IST-369	QCXMTC1305	F-C2MC-P-9ALOCAL	
	IST-371	QCNMBPS2	F-PSMB-PS-1310	
	IST-374	QCNMBP41PS	F-PSMB-PS-5350	
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-376	DCBMC72109	D-CBMC-72-109	
	IST-391	DFUMKS55B	D-FUMK-S55-2	
	IST-392	PCBMCC5221	H-REMT-3072IC	
	IST-395	PCBMCC1205	G-C2MC-52-1205	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-400	DFUMK72205	D-FUMK-B1205-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-404	SCNMBA0101	D-FUMK-B1206-1	
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	IST-46	AFSMB0737	A-FSMA-FS-0737	
	IST-47	AFSMB0736	A-FSMA-FS-0736	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-519	PCNMD52402	P-CBMA-252-401	
	IST-54	CCSMD2082	C-CSMD-152-208CS	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-65	CCVMA0943	C-CVMA-CK-CC943	
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-67	CAVMB0940	-	containment CCW isolation not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-69	UKVMA0801	-	Compressors no longer require SW cooling
	IST-70	UKVMA0803	-	Compressors no longer require SW cooling
	IST-76	PCBMCB-205	P-CBMC-152-205	
	IST-77	DFUMKA1205	D-FUMK-A1205-1	
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	ISWFCS3	ISWFCS3	-	Failure of logic to unload compressor and prevent RV actuation not modeled in PSAR2
	P252B	PCNMB303CS	-	Manual trip of CB-152-302 not modeled in PSAR2
	PBS1G-08	PCNMB1GCS	-	No manual actuation of 252-302 modeled in PSAR2
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2
	PCBMBB-206	PCBMBB-206	L-C2MB-152-206	
	PCBMBC1103	PCBMBC1103	P-CBMB-52-1103	
	PCBMBC1201	PCBMBC1201	P-C2MB-52-1201	
	PFUMKS04	PFUMKS04	P-FUMK-S04-1	
	PREMB5P8	PREMB5P8	R-REMB-5P-8	
	PREMB8612	PREMB8612	-	Circuitry for 152-202 failing to trip not modeled in PSAR2
	PREMB8612X	PREMB8612X	-	Circuitry for 152-106 failing to trip not modeled in PSAR2
	QCNMB5TR1C	QCNMB5TR1C	F-PSMB-PS-1310	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	S42161MAN	SCSMB161CS	G-CSMB-42-161CS1	
	S55A-H	SCSMB1205	G-CSMB-52-1205CS	
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
	SCBA19A	SCSMB42191	G-CSMB-42-191CS	
	SCNMA43206	SCNMA43206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMBSISX6	SCNMBSISX6	R-REMB-SIS-X6	
	SCNMBX0327	SCNMBX0327	Z-REMA-LSX-0327	
	SCNMBX0328	SCNMBX0328	Z-REMA-LSX-0328	
	SCNMBX0329	SCNMBX0329	Z-REMA-LSX-0329	
	SCNMBX0330	SCNMBX0330	Z-REMA-LSX-0330	
	SCNMBY0327	SCNMBY0327	Z-REMA-LSY-0327	
	SCNMBY0328	SCNMBY0328	Z-REMA-LSY-0328	
	SCNMBY0329	SCNMBY0329	Z-REMA-LSY-0329	
	SCNMBY0330	SCNMBY0330	Z-REMA-LSY-0330	
	SCSMA52206	SCSMA52206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB206	SCSMB206	L-HSMB-HS-206	
	SCSMB207C1	SCSMB207C1	G-CSMB-42-207CS1	
	SCSMB207C2	SCSMB207C2	G-CSMB-42-207CS1	
	SH117	SCSMB1571	H-CSMB-42-157CS1	
	SH135	SCSMB2371	H-CSMB-42-237CS1	
	SH157	SCSMB1511	H-CSMB-42-151CS1	
	SH175	SCSMB2411	H-CSMB-42-241CS1	
	SH194	SHSMB3037A	-	Flow path not modeled in PSAR2
	SH207	SHSMB3018A	-	Flow path not modeled in PSAR2
	SH25	SCSMB1371	H-CSMB-42-137CS1	
	SH49	SCSMB2611	H-CSMB-42-261CS1	
	SH77	SCSMB1971	H-CSMB-42-197CS1	
	SH95	SCSMB2571	H-CSMB-42-257CS1	
	SHSMB3018A	SHSMB3018A	-	Flow path not modeled in PSAR2
	SHSMB3018B	SHSMB3018B	-	Flow path not modeled in PSAR2
	SHSMB3025B	SHSMB3025B	L-HSMB-HS-3025B	
	SHSMB3059A	SHSMB3059A	-	Failure to close failure mode not modeled in PSAR2
	SHSMB3059B	SHSMB3059B	-	Failure to close failure mode not modeled in PSAR2
	SKVMA3018	SKVMA3018	-	Flow path not modeled in PSAR2
	SKVMB3029A	SKVMB3029A	Z-KVMB-SV-3029A	
	SKVMB3030A	SKVMB3030A	Z-KVMB-SV-3030A	
	SKVMB3059	SKVMB3059	-	Failure to close failure mode not modeled in PSAR2
	SL54	SCSMB1411	L-HSMB-HS-141-1	
	SL64	SCSMB1471	L-HSMB-HS-147-1	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SL74	SCSMB2471	L-REMB-42-247	
	SL84	SCSMB2511	L-REMB-42-251	
	SLSMA0327	SLSMA0327	Z-LSMA-LS-0327	
	SLSMA0328	SLSMA0328	Z-LSMA-LS-0328	
	SLSMA0329	SLSMA0329	Z-LSMA-LS-0329	
	SLSMA0330	SLSMA0330	Z-LSMA-LS-0330	
	SPBMB1-2	SPBMB1-2	-	manual initiation of sis relays not modeled in PSAR2
	SPCMT102A	SPCMT102A	P-DCPO-PS-0102A	
	SPCMT102C	SPCMT102C	P-DCPO-PS-0102C	
	SPMME67A	SPMME67A	L-PMME-P-67A	
	SREMAX0327	SREMAX0327	Z-REMA-LSX-0327	
	SREMAX0328	SREMAX0328	Z-REMA-LSX-0328	
	SREMAX0329	SREMAX0329	Z-REMA-LSX-0329	
	SREMAX0330	SREMAX0330	Z-REMA-LSX-0330	
	SREMAY0327	SREMAY0327	Z-REMA-LSY-0327	
	SREMAY0328	SREMAY0328	Z-REMA-LSY-0328	
	SREMAY0329	SREMAY0329	Z-REMA-LSY-0329	
	SREMAY0330	SREMAY0330	Z-REMA-LSY-0330	
	SREMB127-O	SREMB127-O	G-REMB-42-127	
	SREMBR-191	SREMBR-191	-	auto start of P-56B no longer modeled in PSAR2
	SREMBR-287	SREMBR-287	-	auto start of P-56A no longer modeled in PSAR2
	SREMBSIS2	SREMBSIS2	R-REMB-SIS-2	
	SREMBSIS6	SREMBSIS6	R-REMB-SIS-6	
	SREMBSIS8	SREMBSIS8	R-REMB-SIS-8	
	SREMBSISX6	SREMBSISX6	R-REMB-SIS-X6	
	SREMBSISX8	SREMBSISX8	R-REMB-SIS-X8	
	SSD30	SLMMB24395	L-REMB-42-2439	
	SSD31	SQSMB2439	L-REMB-42-2439	
	SSD40	SLMMB23395	L-REMB-42-2339	
	SSD41	SQSMB2339	L-REMB-42-2339	
	SU11	SHSMB3029A	-	Manual operation of CV-3029 not in PSAR2
	SU28	SHSMB3030A	-	Manual operation of CV-3029 not in PSAR2
	UCSMB205	UCSMB205	-	manual start of SWS pumps not modeled in PSAR2
	V22	VCSMB131	-	ESF room cooling no longer modeled
	V25	VCSMB211	-	ESF room cooling no longer modeled
	V48	VCSMB133	-	ESF room cooling no longer modeled
	V51	VCSMB221	-	ESF room cooling no longer modeled
	ZCNMB34610	ZCNMB34610	R-CEPO-MC-34R106	
	ZCNMB3463	ZCNMB3463	R-CEPO-MC-34R105	
	ZCNMB3468	ZCNMB3468	R-CEPO-MC-34R106	
	ZPSMB81A1	ZPSMB81A1	R-PSMB-PS-1801A1	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	ZPSMB81A2	ZPSMB81A2	R-PSMB-PS-1801A2	
	ZPSMB83A1	ZPSMB83A1	R-PSMB-PS-1803A1	
	ZPSMB83A2	ZPSMB83A2	R-PSMB-PS-1803A2	
	ZPSMB84A1	ZPSMB84A1	R-PSMB-PS-1804A1	
	ZPSMB84A2	ZPSMB84A2	R-PSMB-PS-1804A2	
	ZSEMT34-6	ZSEMT34-6	R-CEPO-MC-34R106	
EA-11	CCSMB1094	CCSMB1094	-	manual start of CCW pumps not modeled in PSAR2
	CCSMB1164	CCSMB1164	-	manual start of CCW pumps not modeled in PSAR2
	DFUDK1105A	DFUDK1105A	D-FUMK-B1105-1	
	DFUDK1106A	DFUDK1106A	D-FUMK-B1106-1	
	IST-140	PC1MCY3003	P-C1MC-EY-30-03	
	IST-141	SCNMBSISX1	R-REMB-SIS-X1	
	IST-142	SCNMBSISX3	R-REMB-SIS-X3	
	IST-146	SCNMASIS5	R-REMB-SIS-5	
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-158	PCNMB107AB	-	shutdown sequencer not modeled in PSAR2
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-19	ACNMC62-2A	A-REMD-62-2P8A	
	IST-20	AMLMACHA	A-CEPO-AFAS-MODA	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-300	DFUMK1111A	D-FUMK-A1111-1	
	IST-307	PCBMCB-111	L-C2MB-152-111	
	IST-337	DFUMK1114A	D-FUMK-A1114-1	
	IST-338	DFUMK1112A	D-FUMK-A1112-1	
	IST-340	PCNMC52112	S-REMB-144-112	
	IST-341	PCNMC52114	S-REMB-144-114	
	IST-346	DFUMK1113A	D-FUMK-A1113-1	
	IST-471	DCBDC72111	D-CBMC-72-111	
	IST-483	EDGME11	E-DGME-K-6A	
	IST-486	PCBMBB-106	P-CBMB-152-106	
	IST-490	DCBDC72308	D-CBMC-72-308	
	IST-490	DCBDC72308	D-CBMC-72-308	
	IST-491	PREMB1275	P-CBMB-152-106	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-509	EKVMA1470	E-KVMB-SV-1470	
	IST-53	CCSMD1092	C-CSMD-152-109CS	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-55	CCSMD1162	C-CSMD-152-116CS	
	IST-6	ACNMDSX741	A-REMD-PSX-0741	
	IST-63	CCVMA0944	C-CVMA-CK-CC944	
	IST-75	DFUMKA1103	D-FUMK-A1103-1	
	IST-84	UCNMB44103	U-REMB-144-103	
	PB1MKBUS1C	PB1MKBUS1C	P-B1MK-EA-11	
	PCBMAB-105	PCBMAB-105	P-CBMA-152-105	
	PCBMAB-106	PCBMAB-106	P-CBMA-152-106	
	PCBMBB-111	PCBMBB-111	L-C2MB-152-111	
	PREMB1271	PREMB1271	P-REMA-127-1	
	PREMB271X1	PREMB271X1	P-REMB-127-1-X1	
	PREMB271X2	PREMB271X2	P-REMB-127-1-X2	
	PREMB38311	PREMB38311	P-REMB-383-11	
	SCNMA43111	SCNMA43111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMBSISX5	SCNMBSISX5	R-REMB-SIS-X5	
	SCSMA52111	SCSMA52111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB111	SCSMB111	L-HSMB-HS-111	
	SCSMB112	SCSMB112	S-CSMB-152-112CS	
	SCSMB114	SCSMB114	S-CSMB-152-114CS	
	SH314A	SCSMB113	H-CSMB-152-113CS	
	SPBMB1-1	SPBMB1-1	-	manual initiation of sis relays not modeled in PSAR2
	SPMME67B	SPMME67B	L-PMME-P-67B	
	SREMBSIS1	SREMBSIS1	R-REMB-SIS-1	
	SREMBSIS5	SREMBSIS5	R-REMB-SIS-5	
	SREMBSISX5	SREMBSISX5	R-REMB-SIS-X5	
	SREMBSISX7	SREMBSISX7	R-REMB-SIS-X7	
	UCSMB103	UCSMB103	-	manual start of SWS pumps not modeled in PSAR2
	UPSMB1318	UPSMB1318	U-PSMB-PS-1318	
	UPSMB1325	UPSMB1325	U-PSMB-PS-1325	
	ZCNMB34510	ZCNMB34510	R-CEPO-MC-34L105	
	ZCNMB3453	ZCNMB3453	R-CEPO-MC-34L105	
	ZCNMB3455	ZCNMB3455	R-CEPO-MC-34L106	
	ZCNMB3459	ZCNMB3459	R-CEPO-MC-34L105	
	ZSEMT34-5	ZSEMT34-5	R-CEPO-MC-34L105	
ED-11A	DCB7218MOD	DCBMC72018	D-CBMC-72-18	
	DFUDKD11A	DFUDKD11A	D-FUMK-D018-1	
	DFUMKD11A	DFUMKD11A	D-FUMK-D018-1	
	IST-490	DCBDC72308	D-CBMC-72-308	
EJ-9400	DFUDK1105A	DFUDK1105A	D-FUMK-B1105-1	
	DFUDK1106A	DFUDK1106A	D-FUMK-B1106-1	

Fire Area 4 - Bus 1C Switchgear

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-159	DFUDK1107A	D-FUMK-A1107-1	
	IST-160	DCBDC72136	D-CBMC-72-136	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-471	DCBDC72111	D-CBMC-72-111	
	IST-486	PCBMBB-106	P-CBMB-152-106	
	IST-490	DCBDC72308	D-CBMC-72-308	
	IST-491	PREMB1275	P-CBMB-152-106	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	PCBMAB-105	PCBMAB-105	P-CBMA-152-105	
	PCBMAB-106	PCBMAB-106	P-CBMA-152-106	
	PREMB1271	PREMB1271	P-REMA-127-1	
	PREMB271X1	PREMB271X1	P-REMB-127-1-X1	
	PREMB271X2	PREMB271X2	P-REMB-127-1-X2	
	PREMB38311	PREMB38311	P-REMB-383-11	

Fire Area 13A1 - Aux Building Corridor

Area/ Cabinet Exposure Fire	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	C517	CPSMB0918	C-PSMB-PS-0918	
	CCSMB1164	CCSMB1164	-	manual start of P52c not modeled in PSAR2
	CCSMB2084	CCSMB2084	-	manual start of P52c not modeled in PSAR2
	CHP46	ZPSMT81A	R-PSMT-PS-1801A	
	CHP50	ZPSMT83A	R-PSMT-PS-1803A	
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0940	CHSMB0940	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CREMBEX5P4	CREMBEX5P4	R-REMB-5P-4	
	DFUMK1206A	DFUMK1206A	D-FUMK-A1206-1	
	DFUMKS09	DFUMKS09	D-FUMK-S09-1	
	DFUMKS10	DFUMKS10	D-FUMK-S10-1	
	DFUMKS13A	DFUMKS13A	D-FUMK-S13-2	
	DFUMKS14A	DFUMKS14A	D-FUMK-S14-2	
	GCNMBHPX1L	GCNMBHPX1L	S-AVMA-CV-3002	
	GREMB5P8	GREMB5P8	R-REMB-5P-8	
	HC6A-MST	HHSMB771	-	manual start of compressors not modeled in PSAR2
	HC6B-MST	HHSMB811	-	manual start of compressors not modeled in PSAR2
	IST-1	ACNMD23P8C	A-REMD-62-3P8C	
	IST-100	ICMME2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-104	ICSMB1207	I-C2MB-52-1207	
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-114	HADMTM9B	Q-ADMK-M-9B	
	IST-121	HADMTM9A	Q-ADMK-M-9A	
	IST-131	HPSMB0440	Q-PSMB-PS-0440	
	IST-133	HPSMB0442	Q-PSMB-PS-0442	
	IST-143	SREMBX161	G-REMB-42-161	
	IST-152	ZPSMA821	R-PSMA-PS1802SW1	
	IST-156	ZPSMA811	R-PSMA-PS1801SW1	
	IST-157	ZPSMA831	R-PSMA-PS1803SW1	
	IST-161	PCNMB213AB	P-CBMB-152-213	
	IST-163	DCBDC72238	D-CBMC-72-236	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-192	DCBMC72119	D-CBMC-72-119	
	IST-273	BMVMA2169	G-MVMA-MO-2169	
	IST-275	SCSMB127C1	G-CSMB-42-127CS1	

Fire Area 13A1 - Aux Building Corridor

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-276	SCSMB187C1	G-CSMB-42-187CS1	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-278	BMVMA2140	G-MVMA-MO-2140	
	IST-280	SCSMB227C1	G-CSMB-42-227CS1	
	IST-281	BMVMA2170	G-MVMA-MO-2170	
	IST-283	PCBMCC-131	-	ESF room cooling no longer modeled
	IST-284	PCBMCC-211	-	ESF room cooling no longer modeled
	IST-285	VTSFC1850	-	ESF room cooling no longer modeled
	IST-286	VTSFC1851	-	ESF room cooling no longer modeled
	IST-288	PCBMCC-133	-	ESF room cooling no longer modeled
	IST-289	PCBMCC-221	-	ESF room cooling no longer modeled
	IST-290	VTSFC1857	-	ESF room cooling no longer modeled
	IST-291	VTSFC1858	-	ESF room cooling no longer modeled
	IST-295	PCBMCC-251	L-C2MC-52-251	
	IST-296	PCBMCC-147	L-C2MC-52-147	
	IST-297	PCBMCC-247	L-C2MC-52-247	
	IST-300	DFUMK1111A	D-FUMK-A1111-1	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-305	PCBMCB-206	L-C2MB-152-206	
	IST-306	SAVMA3029	Z-AVMA-CV-3029	
	IST-307	PCBMCB-111	L-C2MB-152-111	
	IST-308	HPVMD3030B	Q-PVMD-PCV-3030B	
	IST-309	SMVMA3199	L-MVMA-MO-3199	
	IST-310	SMVMA3190	L-MVMA-MO-3190	
	IST-311	SCNMBX147	L-REMB-42X-147	
	IST-312	SCNMBX247	L-REMB-42X-247	
	IST-313	SCNMBX251	L-REMB-42X-251	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-318	SHCMT3025A	L-HCMT-HIC-3025A	
	IST-328	PCBMCC-141	L-C2MC-52-141	
	IST-329	SCNMBX141	L-REMB-42X-141	
	IST-330	PBSMTMCC24	P-B2MK-EB-24	
	IST-331	PBSMTMCC23	P-B2MK-EB-23	
	IST-335	GCNMA5P8	R-REMB-5P-8	
	IST-339	GCNMB5P8	R-REMB-5P-8	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-347	HFLMK3037	-	Flow path not modeled in PSAR2
	IST-348	PB2MKMCC22	P-B2MK-EB-22	
	IST-350	HFLMK3018	-	Flow path not modeled in PSAR2
	IST-351	PCBMCC-137	H-C2MC-52-137	
	IST-352	PCBMCC-197	H-C2MC-52-197	
	IST-353	PCBMCC-157	H-C2MC-52-157	

Fire Area 13A1 - Aux Building Corridor

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-354	PCBMCC-151	H-C2MC-52-151	
	IST-355	PCBMCC-261	H-C2MC-52-261	
	IST-356	PCBMCC-257	H-C2MC-52-257	
	IST-357	PCBMCC-237	H-C2MC-52-237	
	IST-358	PCBMCC-241	H-C2MC-52-241	
	IST-362	HFLMK3071	I-FLMK-F-321	
	IST-363	HFLMK3070	I-FLMK-F-319	
	IST-391	DFUMKS55B	D-FUMK-S55-2	
	IST-392	PCBMCC5221	H-REMT-3072IC	
	IST-395	PCBMCC1205	G-C2MC-52-1205	
	IST-396	SC2MCC-161	G-C2MC-52-161	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-399	PCBMC52207	G-C2MC-52-207	
	IST-400	DFUMK72205	D-FUMK-B1205-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-404	SCNMBA0101	-	Auto start of P55B not modeled
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	IST-46	AFSMB0737	A-FSMA-FS-0737	
	IST-54	CCSMD2082	C-CSMD-152-208CS	
	IST-55	CCSMD1162	C-CSMD-152-116CS	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-63	CCVMA0944	C-CVMA-CK-CC944	
	IST-65	CCVMA0943	C-CVMA-CK-CC943	
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-67	CAVMB0940	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-69	UKVMA0801	-	Compressors no longer require SW cooling
	IST-70	UKVMA0803	-	Compressors no longer require SW cooling
	IST-74	PCBMCB-204	U-C2MC-152-204	
	IST-76	PCBMCB-205	P-CBMC-152-205	
	IST-77	DFUMKA1205	D-FUMK-A1205-1	
	IST-79	DFUMKA1204	D-FUMK-A1204-1	
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	PC2MA1206	PC2MA1206	-	Alternate power source for charging pumps no longer modeled in PSAR2

Fire Area 13A1 - Aux Building Corridor

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	PCBMBB-111	PCBMBB-111	L-C2MB-152-111	
	PCBMBB-206	PCBMBB-206	L-C2MB-152-206	
	PCBMBC1103	PCBMBC1103	PCBMBC1103	
	PCBMBC1201	PCBMBC1201	P-C2MB-52-1201	
	PFUMKS04	PFUMKS04	P-FUMK-S04-1	
	PREMB5P8	PREMB5P8	R-REMB-5P-8	
	S42161MAN	SCSMB161CS	G-CSMB-42-161CS1	
	S55A-H	SCSMB1205	G-CSMB-52-1205CS	
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
	SCNMA43111	SCNMA43111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMA43206	SCNMA43206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCNMBX0327	SCNMBX0327	Z-REMA-LSX-0327	
	SCNMBX0328	SCNMBX0328	Z-REMA-LSX-0328	
	SCNMBX0329	SCNMBX0329	Z-REMA-LSX-0329	
	SCNMBY0327	SCNMBY0327	Z-REMA-LSY-0327	
	SCNMBY0328	SCNMBY0328	Z-REMA-LSY-0328	
	SCNMBY0329	SCNMBY0329	Z-REMA-LSY-0329	
	SCSMA52111	SCSMA52111	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMA52206	SCSMA52206	-	blocking LPSI trip on RAS not modeled in PSAR2
	SCSMB111	SCSMB111	L-HSMB-HS-111	
	SCSMB206	SCSMB206	L-HSMB-HS-206	
	SCSMB207C1	SCSMB207C1	G-CSMB-42-207CS1	
	SCSMB207C2	SCSMB207C2	G-CSMB-42-207CS1	
	SH117	SCSMB1571	H-CSMB-42-157CS1	
	SH135	SCSMB2371	H-CSMB-42-237CS1	
	SH157	SCSMB1511	H-CSMB-42-151CS1	
	SH175	SCSMB2411	H-CSMB-42-241CS1	
	SH194	SHSMB3037A	-	Flow path not modeled in PSAR2
	SH207	SHSMB3018A	-	Flow path not modeled in PSAR2
	SH25	SCSMB1371	H-CSMB-42-137CS1	
	SH49	SCSMB2611	H-CSMB-42-261CS1	
	SH77	SCSMB1971	H-CSMB-42-197CS1	
	SH95	SCSMB2571	H-CSMB-42-257CS1	
	SHSMB3018A	SHSMB3018A	-	Flow path not modeled in PSAR2
	SHSMB3018B	SHSMB3018B	-	Flow path not modeled in PSAR2
	SHSMB3025B	SHSMB3025B	L-HSMB-HS-3025B	
	SHSMB3059A	SHSMB3059A	-	Failure to close failure mode not modeled in PSAR2
	SHSMB3059B	SHSMB3059B	-	Failure to close failure mode not modeled in PSAR2

Fire Area 13A1 - Aux Building Corridor

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	SKVMA3018	SKVMA3018	-	Flow path not modeled in PSAR2
	SKVMB3029A	SKVMB3029A	Z-KVMB-SV-3029A	
	SKVMB3030A	SKVMB3030A	Z-KVMB-SV-3030A	
	SKVMB3059	SKVMB3059	-	Failure to close failure mode not modeled in PSAR2
	SL54	SCSMB1411	L-HSMB-HS-141-1	
	SL64	SCSMB1471	L-HSMB-HS-147-1	
	SL74	SCSMB2471	L-REMB-42-247	
	SL84	SCSMB2511	L-REMB-42-251	
	SLSMA0327	SLSMA0327	Z-LSMA-LS-0327	
	SLSMA0328	SLSMA0328	Z-LSMA-LS-0328	
	SLSMA0329	SLSMA0329	Z-LSMA-LS-0329	
	SPMME67A	SPMME67A	L-PMME-P-67A	
	SPMME67B	SPMME67B	L-PMME-P-67B	
	SREMAX0327	SREMAX0327	Z-REMA-LSX-0327	
	SREMAX0328	SREMAX0328	Z-REMA-LSX-0328	
	SREMAX0329	SREMAX0329	Z-REMA-LSX-0329	
	SREMAY0327	SREMAY0327	Z-REMA-LSY-0327	
	SREMAY0328	SREMAY0328	Z-REMA-LSY-0328	
	SREMAY0329	SREMAY0329	Z-REMA-LSY-0329	
	SREMB127-O	SREMB127-O	G-REMB-42-127	
	SSD30	SLMMB24395	L-REMB-42-2439	
	SSD31	SQSMB2439	L-REMB-42-2439	
	SSD40	SLMMB23395	L-REMB-42-2339	
	SSD41	SQSMB2339	L-REMB-42-2339	
	SU11	SHSMB3029A	-	Manual operation of CV-3029 not in PSAR2
	SU28	SHSMB3030A	-	Manual operation of CV-3030 not in PSAR2
	UCSMB204	UCSMB204	-	manual start of SWS pumps not modeled in PSAR2
	UCSMB205	UCSMB205	-	manual start of SWS pumps not modeled in PSAR2
	V22	VCSMB131	-	ESF room cooling no longer modeled
	V25	VCSMB211	-	ESF room cooling no longer modeled
	V48	VCSMB133	-	ESF room cooling no longer modeled
	V51	VCSMB221	-	ESF room cooling no longer modeled
	ZPSMB81A1	ZPSMB81A1	R-PSMB-PS-1801A1	
	ZPSMB81A2	ZPSMB81A2	R-PSMB-PS-1801A2	
	ZPSMB83A1	ZPSMB83A1	R-PSMB-PS-1803A1	

Fire Area 13A2 - Aux Building Corridor

Area/ Cabinet Exposure Fire	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB091ire1	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	GCNMBHPX1L	GCNMBHPX1L	S-AVMA-CV-3002	
	IST-273	BMVMA2169	G-MVMA-MO-2169	
	IST-274	BCVMA2138	G-PMME-P-56A	
	IST-275	SCSMB127C1	G-CSMB-42-127CS1	
	IST-276	SCSMB187C1	G-CSMB-42-187CS1	
	IST-277	42-2425/CS	G-CSMB-42-287CS	
	IST-279	BCVMA2139	G-PMME-P-56Bure	
	IST-281	BMVMA2170	G-MVMA-MO-2170	
	IST-301	DFUMKS17A	D-FUMK-S17-1	
	IST-318	SHCMT3025A	L-HCMT-HIC-3025A	
	IST-397	SCNMA0101	G-C2MC-52-1206	
	IST-398	DFUMKB1105	D-FUMK-B1105-1	
	IST-401	PCBMB1206	G-C2MB-52-1206	
	IST-402	PC2MA1105C	G-C2MC-52-1105C	
	IST-405	PCBMBC1105	G-C2MB-52-1105	
	IST-60	CAVMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	IST-66	CAVMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	IST-82	SCNMA16-3	-	CV-1359 sis test contacts not modeled in PSAR2
	PC2MA1206	PC2MA1206	-	Bus 11 is not an alternate power source for Bus 12 in PSAR2
	S55B-I	SCSMB1206	G-CSMB-52-1206CS	
	S55C-I	SCSMB1105	G-CSMB-52-1105CS	
	SCBA19A	SCSMB42191	G-CSMB-42-191CS	
	SHSMB3025B	SHSMB3025B	L-HSMB-HS-3025B	
	SREMB127-O	SREMB127-O	G-REMB-42-127	
	SREMBR-191	SREMBR-191	-	auto start of P-56B no longer modeled in PSAR2
	SREMBR-287	SREMBR-287	-	auto start of P-56A no longer modeled in PSAR2

Fire Area 23B - East Turbine Building

Area/ Cabinet Exposure Fire	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	A38	AKVMA0522G	A-KVMA-SV-0522G	
	AHSMB0522B	AHSMB0522B	A-HSMB-HS-0522B	
	CHSMB0910	CHSMB0910	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	CHSMB0911	CHSMB0911	-	Isolation of loss of CCW inside containment not modeled in PSAR2
	DC6	DCBMC72112	P-CBMA-152-106	
	DFUDK1302A	DFUDK1302A	-	Backfeed power to Bus 1C,D&E not modeled in PSAR2
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	DFUMKW002A	DFUMKW002A	D-FUMK-W002-1	
	DFUMKW006D	DFUMKW006D	D-FUMK-W006-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0501A	GHSMB0501A	-	No credit for manual closure of MSIVs
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMA0508	GKVMA0508	M-KVMB-SV-0508	
	GKVMA0514	GKVMA0514	M-KVMB-SV-0514	
	GKVMB0502	GKVMB0502	M-KVMB-SV-0502	
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	GKVMB0513	GKVMB0513	M-KVMB-SV-0513	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	I15A	IRVMB1200	I-RVMC-RV-1200	
	I15B	IRVMB1204	I-RVMC-RV-1204	
	I15C	IRVMB1202	I-RVMC-RV-1202	
	ICNMAK24	ICNMAK24	I-CMME-C-2B	
	ICNMBK21	ICNMBK21	I-CMME-C-2B	
	ICNMBK22	ICNMBK22	I-CMME-C-2B	
	IFUMKF3	IFUMKF3	I-CMME-C-2B	
	IREMBK22	IREMBK22	I-CMME-C-2B	
	IREMBK24	IREMBK24	I-CMME-C-2B	
	IST-100	ICMME2C	I-CMME-C-2C	
	IST-101	ICMMTC2C	I-CMME-C-2C	
	IST-102	ICMME2A	I-CMME-C-2A	
	IST-103	ICNMAK22	I-CMME-C-2C	
	IST-104	ICSMB1207	I-C2MB-52-1207	

Fire Area 23B - East Turbine Building

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-105	ICNMBCR4	I-REMB-CR-4	
	IST-106	ICNMCK23	I-CMME-C-2B	
	IST-107	ICNMBK23	I-CMME-C-2B	
	IST-109	ICMMTC2A	I-CMME-C-2A	
	IST-11	FAVMC0729	-	CST makeup from hotwell not modeled
	IST-117	HADMTM9C	Q-ADMK-M-9C	
	IST-134	PB2MKMCC4	P-B2MK-EB-04	
	IST-15	AAVMA0521	-	TDAFW pump no longer gets steam from SGB
	IST-17	AHSMB0102A	A-HSMB-HS-0102A	
	IST-174	XAVMA2008	-	T-81 no longer modeled as redundant to other CST makeup sources
	IST-175	PB2MKBUS91	P-B2MK-EB-91	
	IST-176	XAVMA2010	A-AVMA-CV-2010	
	IST-177	PBSMTL03	P-BSMK-EL-22	
	IST-179	MCNMB42615	M-REMB-52-615	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-183	GMVMA0510	M-HSMB-0510C	
	IST-184	GHSMB0510C	M-HSMB-0510C	
	IST-185	PB2MKMCC3	P-B2MK-EB-03	
	IST-187	GMVMA0501	-	SGB no longer supplies steam to TDAFW
	IST-188	GHSMB0501C	-	SGB no longer supplies steam to TDAFW
	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-192	DCBMC72119	D-CBMC-72-119	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-252	FCSMC105	M-CSMB-252-105CS	
	IST-253	FCSMB205	M-CBMB-252-205	
	IST-257	DCBDC72101	D-CBMC-72-101	
	IST-259	DCBDC72201	D-CBMC-72-201	
	IST-296	PCBMCC-147	L-C2MC-52-147	
	IST-30	AFSMB0727A	A-FSMA-FS-0727A	
	IST-31	AFSMB0749A	A-FSMA-FS-0749A	
	IST-311	SCNMBX147	L-REMB-42X-147	
	IST-314	PCBMCC-167	L-C2MC-52-167	
	IST-328	PCBMCC-141	L-C2MC-52-141	
	IST-329	SCNMBX141	L-REMB-42X-141	
	IST-345	PB2MKMCC23	P-B2MK-EB-23	
	IST-351	PCBMCC-137	H-C2MC-52-137	

Fire Area 23B - East Turbine Building

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-352	PCBMCC-197	H-C2MC-52-197	
	IST-353	PCBMCC-157	H-C2MC-52-157	
	IST-354	PCBMCC-151	H-C2MC-52-151	
	IST-366	PCBMBC1305	F-C2MC-52-1305	
	IST-369	QCXMTC1305	F-C2MC-P-9ALOCAL	
	IST-371	QCNMBPS2	F-PSMB-PS-1310	
	IST-374	QCNMBP41PS	F-PSMB-PS-5350	
	IST-40	APSMD0741A	A-PSMD-PS-0741A	
	IST-403	PCBMB1206B	D-FUMK-B1206-1	
	IST-406	PCBMBC105B	D-FUMK-B1105-1	
	IST-41	APSMD0741B	A-PSMD-PS-0741B	
	IST-42	APSMD741DD	A-PSMD-PS-0741DD	
	IST-43	PC1MCY1014	P-C1MC-EY-10-14	
	IST-491	PREMB1275	P-CBMD-152-106	
	IST-498	PREMB1276	P-CBMA-152-202	
	IST-500	DFUDK1303A	D-FUMK-A1303-1	
	IST-501	PCBMBB-302	-	backfeed power not modeled in PSAR2.
	IST-502	PCBMAB-302	P-CBMA-152-302	
	IST-503	PCBMCC2111	-	Battery room ventilation not needed in PSAR2
	IST-504	PCBMCC2411	-	Battery room ventilation not needed in PSAR2
	IST-516	PGNMTMAIN	-	Main xfrmr not modeled in PSAR2
	IST-519	PCNMD52402	P-CBMA-252-401	
	IST-57	CAVMA0918	-	Makeup to CCW not modeled
	IST-60	CAVMB0910	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-66	CAVMB0911	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-68	DFUMKS027A	-	Isolation of CCW leaks inside containment not modeled in PSAR2
	IST-69	UKVMA0801	-	Compressors no longer require SWS
	IST-70	UKVMA0803	-	Compressors no longer require SWS
	IST-98	DFUMKB1207	D-FUMK-B1207-1	
	IST-99	DFUMKB1106	D-FUMK-B1106-1	
	ISWFCS3	ISWFCS3	-	Failure of logic to unload compressor and prevent RV actuation not modeled in PSAR2
	P252B	PCNMB303CS	-	Manual trip of CB-152-302 not modeled in PSAR2
	PBS1F-08	PCNMB1FCS	-	No manual actuation of 252-302 modeled in PSAR2
	PBS1G-08	PCNMB1GCS	-	No manual actuation of 252-402 modeled in PSAR2
	PCSMBA-301	PCSMBA-301	P-CBMA-252-301	
	PREMB38311	PREMB38311	P-REMB-383-11	
	PREMB38312	PREMB38312	P-REMB-383-12	
	PREMB38323	PREMB38323	P-REMB-383-23	

Fire Area 23B - East Turbine Building

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	PREMB8612	PREMB8612	-	Circuitry for 152-202 failing to trip not modeled in PSAR2
	PREMB8612X	PREMB8612X	-	Circuitry for 152-106 failing to trip not modeled in PSAR2
	QCNMB5TR1C	QCNMB5TR1C	F-PSMB-PS-1310	
	SH117	SCSMB1571	H-CSMB-42-157CS1	
	SH157	SCSMB1511	H-CSMB-42-151CS1	
	SH25	SCSMB1371	H-CSMB-42-137CS1	
	SH77	SCSMB1971	H-CSMB-42-197CS1	
	SL54	SCSMB1411	L-HSMB-HS-141-1	
	SL64	SCSMB1471	L-HSMB-HS-147-1	
	X32	XCNMB9631A	A-PBMC-PB-P936	
	X33	XHSMB8950A	A-HSMC-HS-8950A	

Fire Area 23D - West Turbine Building

Area/ Cabinet Exposure Fire	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	A38	AKVMA0522G	A-KVMA-SV-0522G	
	AHSMB0522B	AHSMB0522B	A-HSMB-HS-0522B	
	DFUMKW001A	DFUMKW001A	D-FUMK-W001-1	
	DFUMKW006D	DFUMKW006D	D-FUMK-W006-1	
	G113B	GCNMA386A8	-	This relay must energize to cause ADVs to open (the TBV solenoids must spuriously energize to open valve)
	G322B	GCNMA386A3	-	This relay must energize to cause ADVs to open
	G332B	GCNMA386A5	-	This relay must energize to cause ADVs to open
	GEPMT0511	GEPMT0511	B-EPMT-EP-0511	
	GHSMB0510A	GHSMB0510A	-	No credit for manual closure of MSIVs
	GKVMB0505A	GKVMB0505A	M-KVMB-SV-0505A	
	GKVMB0505B	GKVMB0505B	M-KVMB-SV-0505B	
	GPCMT0511	GPCMT0511	B-PCMT-PIC-0511	
	GSCMT0511	GSCMT0511	B-CEPO-PM-0511	
	IST-11	FAVMC0729	-	No longer considered a condensate flow diversion path
	IST-117	HADMTM9C	Q-ADMK-M-9C	
	IST-14	AAVMA0522B	A-AVMA-CV-0522B	
	IST-15	AAVMA0521	-	TDAFW pump no longer gets steam from SGB
	IST-17	AHSMB0102A	A-HSMB-HS-0102A	
	IST-174	XAVMA2008	-	T-81 no longer modeled as redundant to other CST makeup sources
	IST-175	PB2MKBUS91	P-B2MK-EB-91	
	IST-176	XAVMA2010	A-AVMA-CV-2010	
	IST-179	MCNMB42615	M-REMB-52-615	
	IST-18	AKVMA0522B	A-KVMB-SV-0522B	
	IST-180	MAEMTHOGGR	M-AEMT-C-4	
	IST-189	IXVMD180CA	I-XVMD-MV-CA180	
	IST-190	DCBDC72104	D-CBMC-72-104	
	IST-191	DCBDC72207	D-CBMC-72-207	
	IST-196	FAVMA0730	M-AVMA-CV-0730	
	IST-198	GKVMA0507B	M-KVMB-SV-0507B	
	IST-199	GKVMA0507A	M-KVMB-SV-0507A	
	IST-203	GTPMT0510	B-TPMT-PT-0510	
	IST-228	GAVMA0511	B-AVMA-CV-0511	
	IST-252	FCSMC105	M-CSMB-252-105CS	
	IST-253	FCSMB205	M-CBMB-252-205	
	IST-364	PCBMB1306	U-PMME-P5	
	IST-366	PCBMBC1305	F-C2MC-52-1305	
	IST-369	QCXMTC1305	F-C2MC-P-9ALOCAL	
	IST-371	QCNMBPS2	F-PSMB-PS-1310	
	IST-374	QCNMBP41PS	F-PSMB-PS-5350	

Fire Area 23D - West Turbine Building

Area/ Cabinet	BE/IST (Fire IPEEE)	Orig BE	New BE (PSAR2)	Comment
	IST-40	APSMD0741A	A-PSMD-PS-0741A	
	IST-41	APSMD0741B	A-PSMD-PS-0741B	
	IST-42	APSMD741DD	A-PSMD-PS-0741DD	
	IST-43	PC1MCY1014	P-C1MC-EY-10-14	
	IST-516	PGNMTMAIN	-	Main xfrmr not modeled in PSAR2
	PCBMB1306	PCBMB1306	U-PMME-P5	
	QCNMB5TR1C	QCNMB5TR1C	F-PSMB-PS-1310	
	X32	XCNMB9631A	A-PBMC-PB-P936	
	X33	XHSMB8950A	A-HSMC-HS-8950A	

Table 2.1: Modifications Made to Reflect Fire IPEEE Logic	
Gate	**Description**
A24-Fire	Local closure of P8C breaker
A47-Fire	Local closure of P8A breaker
A69A-Fire	Local opening of CV-0749
A89-Fire	Local opening of CV-0727
F39-Fire	Manual action to start fire pump 9A
F40-Fire	Manual action to start fire pump 9B
F52-Fire	Manual action to start fire pump P41
P106B4A-Fire	Local closure of fast transfer breaker 152-106
P202B4-Fire	Local closure of fast transfer breaker 152-202
U973-DGA-Fire	Local closure of breaker to P7B
UGT020-Fire	Alignment of warm water recirc pump (parallel to traveling screens)
H334A-Fire	Local operation of MO-3070

Table 2.2: Modifications Made to Logic to Assure Correct Modeling of Plant Response to Fire Initiators	
Gate	**Description**
The following logic adds a house event to reflect that fire initiating events do not cause conditions that would generate an automatic SIS	
NONSISINT-Fire	Add HSE-FA-INIT as a flag to indicate that a non-SIS fire initiating event has occurred
The following four changes are directed at preventing a dual SG blowdown from disabling all flow paths to the SGs even though AFW is still available	
AHDR1-1-Fire	Disable ESDE failing flow path through CV-0749
AHDR2-1-Fire	Disable ESDE failing flow path through CV-0727
AHDR3-1-Fire	Disable ESDE failing flow path through CV-0736A
AHDR4-1-Fire	Disable ESDE failing flow path through CV-0737A
The following change disables logic that assumes HPSI flow diversion will occur on hot short of MO-3072 (it appears the flow diversion will be back to the PCS)	
H079-Fire	Disable HPSI flow diversion through MO-3072

Table 2.3: Modifications to Logic to Allow Evaluation of MOV Functions not Currently in the Models (not used in this analysis)

Gate	Description
GS02-Fire	Add charging to PCS flow path through MO-3072
LSDC45-Fire	Add CK-3240 as means of preventing flow downstream of MO-3198 to SIRWT
LSDC57-Fire	Add CK-3239 as means of preventing flow downstream of MO-3189 to SIRWT
XADVA-FTO-Fire	Alignment of hogger as means of preventing demands on SGA SRVs
XESDE-DA1-Fire	Addition of TBV & ADVs on SGB as means of blowing down SGA
XESDE-DA2-Fire	Isolation of SGA including MO-0510 FTRC
X1001-FIRE	Operator action to trip closed CV-0510 locally (without credit for this action, MO-0510 would not be important as SGA MSIV would be failed open for many Fire Areas - see Ref 2.1.8).

Table 2.4: Modifications to credit local operation of MOVs (not used in this analysis)	
Gate	**Description**
G068-HSFire	Local operation of MO-2160
GCBA10-HSFire	Local operation of MO-2140
GS02-HSFire	Local operation of MO-3072
LLSDC-HSFire	Local operation of MO-3012
LLSDC56-HSFire	Local operation of MO-3010
LLSDC76-HSFire	Local operation of MO-3014
LLSDC86-HSFire	Local operation of MO-3008
LLSDC44-HSFire	Local operation of MO-3199
LLSDC46-HSFire	Local operation of MO-3198
LLSDC56-HSFire	Local operation of MO-3190
LLSDC57-HSFire	Local operation of MO-3189
XADVA-FTO7A-HSFire	Local operation of MO-0510
H111A1-Fire	Local operation of MO-3011
H151A1-Fire	Local operation of MO-3013
H19A1-Fire	Local operation of MO-3007

Table 2.4: Modifications to credit local operation of MOVs (not used in this analysis)	
Gate	**Description**
H801A1-Fire	Local operation of MO-3009
HH129A1-Fire	Local operation of MO-3064
HH169A1-Fire	Local operation of MO-3062
HH43A1-Fire	Local operation of MO-3068
HH89A1-Fire	Local operation of MO-3066

Table 2.5: Modifications Adding MOV Hot Short Failure Modes (not used in this analysis)	
Gate	**Description**
G068B-HSFire	Hot short of MO-2160
GCBA10B-HSFire	Hot short of MO-2140
GS02B-HSFire	Hot short of MO-3072
LLSDC66B-HSFire	Hot short of MO-3012
LLSDC56B-HSFire	Hot short of MO-3010
LLSDC76B-HSFire	Hot short of MO-3014
LLSDC86B-HSFire	Hot short of MO-3008
LSDC46-HSFire	Hot short of MO-3199
LSDC50-HSFire	Hot short of MO-3198
LSDC58-HSFire	Hot short of MO-3190
LSDC62-HSFire	Hot short of MO-3189
XADVA-FT08-HSFire	Hot short of MO-0510
H110-HSFire	Hot short of MO-3011
H150-HSFire	Hot short of MO-3013
H18-HSFire	Hot short of MO-3007
H800-HSFire	Hot short of MO-3009
HH128-HSFire	Hot short of MO-3064

Table 2.5: Modifications Adding MOV Hot Short Failure Modes (not used in this analysis)	
Gate	**Description**
HH168-HSFire	Hot short of MO-3062
HH42-HSFire	Hot short of MO-3068
HH88-HSFire	Hot short of MO-3066
CNT-22-LOOP1A-HPSI-HSFIRE	Hot short of MO-3068 leading to ISLOCA
CNT-22-LOOP1B-HPSI-HSFIRE	Hot short of MO-3066 leading to ISLOCA
CNT-22-LOOP2A-HPSI-HSFIRE	Hot short of MO-3064 leading to ISLOCA
CNT-22-LOOP2B-HPSI-HSFIRE	Hot short of MO-3062 leading to ISLOCA
CNT-23-LOOP1A-HPSI-HSFIRE	Hot short of MO-3007 leading to ISLOCA
CNT-23-LOOP1B-HPSI-HSFIRE	Hot short of MO-3009 leading to ISLOCA
CNT-23-LOOP2A-HPSI-HSFIRE	Hot short of MO-3011 leading to ISLOCA
CNT-23-LOOP2B-HPSI-HSFIRE	Hot short of MO-3013 leading to ISLOCA
CNT-32-LOOP1A-LPSI-HSFIRE	Hot short of MO-3008 leading to ISLOCA
CNT-32-LOOP1B-LPSI-HSFIRE	Hot short of MO-3010 leading to ISLOCA
CNT-32-LOOP2A-LPSI-HSFIRE	Hot short of MO-3012 leading to ISLOCA
CNT-32-LOOP2B-LPSI-HSFIRE	Hot short of MO-3014 leading to ISLOCA

Table 2.6: Modifications identifying Unsuppressed Fires Requiring Control From the Hot Shutdown Panel	
Gate	**Description**
FA1SUP	Fire Area 1 exposure fires anded with SUP
FA2SUP	Fire Area 2 exposure fires anded with SUP-AUTO
FA3SUP	Fire Area 3 exposure fires anded with SUP-AUTO
FA4SUP	Fire Area 4 exposure fires anded with SUP-AUTO

Note: These gates are used to distinguish logic differences when unsuppressed fires require manning of the hot shutdown panel.

Table 2.7: House Events Added to Fault Tree Models	
House Event	**Description**
HS-MO-0510	Logic enabling MOV hot short failure mode (T)
HS-MO-2140	"
HS-MO-2160	"
HS-MO-3007	"
HS-MO-3008	"
HS-MO-3009	"
HS-MO-3010	"
HS-MO-3011	"
HS-MO-3012	"
HS-MO-3013	"
HS-MO-3014	"
HS-MO-3062	"
HS-MO-3064	"
HS-MO-3066	"
HS-MO-3068	"
HS-MO-3072	"
HS-MO-3189	"
HS-MO-3190	"
HS-MO-3198	"
HS-MO-3199	"
HSE-3072-FLOWDIV	Disables HPSI flow diversion thru MO-3072 (F)
HSE-AFW-FLOWDIV	Disables AFW flow diversion on SG blowdown (F)
HSE-FA-INIT	Indicates that a non-SIS fire initiator occurred (T)
HSE-ANYFIRE	Enables Fire IPEEE logic changes fall fire areas (T)
HSE-NOTANY	Enables Fire IPEEE logic changes all fire areas (F)
HSE-NOTFA1	Enables logic changes for FA1 (not used)
HSE-NOTFA13A	Enables logic changes for FA13A (not used)
HSE-NOTFA2	Enables logic changes for FA2 (not used)
HSE-NOTFA2-ED-10	Enables logic changes for FA2-ED-10 (not used)
HSE-NOTFA2-ED-20	Enables logic changes for FA2-ED-20 (not used)
HSE-NOTFA23	Enables logic changes for FA23E, S & W (not used)
HSE-NOTFA23ES	Enables logic changes for FA23E & S (not used)
HSE-NOTFA3	Enables logic changes for FA3 (not used)
HSE-NOTFA4	Enables logic changes for FA4 (not used)
HSE-NOTFACR	Enables logic changes for FA1 (not used)
IE-FA-1	Disables components for FA1 exposure fire (T)s
IE-FA-1-EC-01L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-01R	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-02L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-02R	Disables components for FA1 cabinet fire (T)

Table 2.7: House Events Added to Fault Tree Models	
House Event	**Description**
IE-FA-1-EC-03L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-03R	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-04L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-04R	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-08L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-08R	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-106	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-11L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-11R	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-126	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-12L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-12R	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-13L	Disables components for FA1 cabinet fire (T)
IE-FA-1-EC-13R	Disables components for FA1 cabinet fire (T)
IE-FA-2	Disables components for FA1 exposure fire (T)
IE-FA-2-EB-01	Disables components for FA2 cabinet fire (T)
IE-FA-2-EB-02	Disables components for FA2 cabinet fire (T)
IE-FA-2-EB-11	Disables components for FA2 cabinet fire (T)
IE-FA-2-EB-12	Disables components for FA2 cabinet fire (T)
IE-FA-2-EB-21	Disables components for FA2 cabinet fire (T)
IE-FA-2-EB-23	Disables components for FA2 cabinet fire (T)
IE-FA-2-EB-24	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-06	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-07	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-08	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-09	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-10	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-11	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-15	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-16	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-17	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-18	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-20	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-21	Disables components for FA2 cabinet fire (T)
IE-FA-2-ED-576	Disables components for FA2 cabinet fire (T)
IE-FA-2-EJ-14A	Disables components for FA2 cabinet fire (T)
IE-FA-2-EJ-542	Disables components for FA2 cabinet fire (T)
IE-FA-2-EJ-543	Disables components for FA2 cabinet fire (T)
IE-FA-2-EJ-575	Disables components for FA2 cabinet fire (T)
IE-FA-2-EJ-576	Disables components for FA2 cabinet fire (T)
IE-FA-2-EY-01	Disables components for FA2 cabinet fire (T)
IE-FA-2-EY-10	Disables components for FA2 cabinet fire (T)

Table 2.7: House Events Added to Fault Tree Models

House Event	Description
IE-FA-2-EY-20	Disables components for FA2 cabinet fire (T)
IE-FA-2-EY-30	Disables components for FA2 cabinet fire (T)
IE-FA-2-EY-40	Disables components for FA2 cabinet fire (T)
IE-FA-2-EY-50	Disables components for FA2 cabinet fire (T)
IE-FA-2-FZ2	Disables components for FA2 cabinet fire (T)
IE-FA-3	Disables components for FA3 exposure fire (T)
IE-FA-3-EA-12	Disables components for FA3 cabinet fire (T)
IE-FA-3-EB-22	Disables components for FA3 cabinet fire (T)
IE-FA-3-EC-181	Disables components for FA3 cabinet fire (T)
IE-FA-3-EC-187	Disables components for FA3 cabinet fire (T)
IE-FA-3-EJ-1005	Disables components for FA3 cabinet fire (T)
IE-FA-3-EJ-1006	Disables components for FA3 cabinet fire (T)
IE-FA-3-EJ-1051	Disables components for FA3 cabinet fire (T)
IE-FA-3-EJ-1052	Disables components for FA3 cabinet fire (T)
IE-FA-3-EJ-9401	Disables components for FA3 cabinet fire (T)
IE-FA-4	Disables components for FA4 exposure fire (T)
IE-FA-4-EA-11	Disables components for FA4 cabinet fire (T)
IE-FA-4-ED-11A	Disables components for FA4 cabinet fire (T)
IE-FA-4-EJ-9400	Disables components for FA4 cabinet fire (T)
IE-FA-13-13A1	Disables components for FA13A1 exposure fire (T)
IE-FA-13-13A2	Disables components for FA13A2 exposure fire (T)
IE-FA-23-23E	Disables components for FA23E exposure fire (T)
IE-FA-23-23S	Disables components for FA23S exposure fire (T)
IE-FA-23-23W	Disables components for FA23W exposure fire (T)

Table 2.8: Fire Initiating Events Added to Event Tree Logic		
Initiating Event	**Frequency**	**Reference**
FA-1	2.43E-03	Fire IPEEE (Ref 2.1.3)
FA-1-EC-01L	9.50E-03	"
FA-1-EC-01R	9.50E-03	"
FA-1-EC-02L	9.50E-03	"
FA-1-EC-02R	9.50E-03	"
FA-1-EC-03L	9.50E-03	"
FA-1-EC-03R	9.50E-03	"
FA-1-EC-04L	9.50E-03	"
FA-1-EC-04R	9.50E-03	"
FA-1-EC-08L	9.50E-03	"
FA-1-EC-08R	9.50E-03	"
FA-1-EC-106	9.50E-03	"
FA-1-EC-11L	9.50E-03	"
FA-1-EC-11R	9.50E-03	"
FA-1-EC-126	9.50E-03	"
FA-1-EC-12L	9.50E-03	"
FA-1-EC-12R	9.50E-03	"
FA-1-EC-13L	9.50E-03	"
FA-1-EC-13R	9.50E-03	"
FA-2	3.10E-03	"
FA-2-EB-01	3.20E-03	"
FA-2-EB-02	3.20E-03	"
FA-2-EB-11	3.20E-03	"
FA-2-EB-12	3.20E-03	"
FA-2-EB-21	3.20E-03	"
FA-2-EB-23	3.20E-03	"
FA-2-EB-24	3.20E-03	"
FA-2-ED-06	3.20E-03	"
FA-2-ED-07	3.20E-03	"
FA-2-ED-08	3.20E-03	"
FA-2-ED-09	3.20E-03	"
FA-2-ED-10	3.20E-03	"
FA-2-ED-11	3.20E-03	"
FA-2-ED-15	3.20E-03	"
FA-2-ED-16	3.20E-03	"
FA-2-ED-17	3.20E-03	"
FA-2-ED-18	3.20E-03	"
FA-2-ED-20	3.20E-03	"
FA-2-ED-21	3.20E-03	"
FA-2-EJ-14A	3.20E-03	"

Table 2.8: Fire Initiating Events Added to Event Tree Logic		
Initiating Event	**Frequency**	**Reference**
FA-2-EJ-542	3.20E-03	"
FA-2-EJ-543	3.20E-03	"
FA-2-EJ-575	3.20E-03	"
FA-2-EJ-576	3.20E-03	"
FA-2-EY-01	3.20E-03	"
FA-2-EY-10	3.20E-03	"
FA-2-EY-20	3.20E-03	"
FA-2-EY-30	3.20E-03	"
FA-2-EY-40	3.20E-03	"
FA-2-EY-50	3.20E-03	"
FA-3	9.81E-04	"
FA-3-EA-12	3.75E-03	"
FA-3-EB-22	3.75E-03	"
FA-3-EC-181	3.75E-03	"
FA-3-EC-187	3.75E-03	"
FA-3-EJ-1005	3.75E-03	"
FA-3-EJ-1006	3.75E-03	"
FA-3-EJ-1051	3.75E-03	"
FA-3-EJ-1052	3.75E-03	"
FA-3-EJ-9401	3.75E-03	"
FA-4	4.15E-04	"
FA-4-EA-11	3.75E-03	"
FA-4-ED-11A	3.75E-03	"
FA-4-EJ-9400	3.75E-03	"
FA-13-13A1	1.99E-03	"
FA-13-13A2	5.37E-03	"
FA-23-23E	2.94E-02	"
FA-23-23S	6.42E-02	"
FA-23-23W	1.55E-03	"

Table 2.9: Random Failures Added to Fault Trees			
Event	**Prob**	**Reference**	**Description**
B-AVMB-CV-0511	3.64E-03	PSAR2.BE ADV FTRC	Spurious operation of turbine bypass valve
H-CVMC-CK-ES3101HS	5.85E-04	PSAR2.BE Ck Valve FTRC	HPSI injection line check valve FTRC (ISLOCA model)
H-CVMC-CK-ES3103HS	5.85E-04	PSAR2.BE Ck Valve FTRC	HPSI injection line check valve FTRC (ISLOCA model)
H-CVMC-CK-ES3116HS	5.85E-04	PSAR2.BE Ck Valve FTRC	HPSI injection line check valve FTRC (ISLOCA model)
H-CVMC-CK-ES3131HS	5.85E-04	PSAR2.BE Ck Valve FTRC	HPSI injection line check valve FTRC (ISLOCA model)
H-CVMC-CK-ES3146HS	5.85E-04	PSAR2.BE Ck Valve FTRC	HPSI injection line check valve FTRC (ISLOCA model)
H-MVMA-MO-3072	4.18E-03	PSAR2.BE CVCS MOV FTO	CVCS injection to primary system
H-MVMD-MO-3072	2.96E-05	PSAR2.BE CVCS MOV FTRO	CVCS injection to primary system
H-REMT-3072IC	0	NA (used to assign fire areas that will fail the MOV I&C)	I&C failure mode for MO-3072 inj to primary system
L-CVMC-CK-ES3101HS	5.85E-04	PSAR2.BE Ck Valve FTRC	LPSI injection line check valve FTRC (ISLOCA model)
L-CVMC-CK-ES3116HS	5.85E-04	PSAR2.BE Ck Valve FTRC	LPSI injection line check valve FTRC (ISLOCA model)
L-CVMC-CK-ES3131HS	5.85E-04	PSAR2.BE Ck Valve FTRC	LPSI injection line check valve FTRC (ISLOCA model)
L-CVMC-CK-ES3146HS	5.85E-04	PSAR2.BE Ck Valve FTRC	LPSI injection line check valve FTRC (ISLOCA model)
M-FUMK-B389	2.21E-05	PSAR2.BE Fuse failure	MO-0510 control failure
M-HSMB-0510C	6.71E-05	PSAR2.BE Hand switch FTC	MO-0510 remote hand switch failure
M-LMMC-0510A	2.33E-05	PSAR2.BE Limit switch FTRC	MO-0510 control failure
M-MVMA-MO-0510	4.18E-03	PSAR2.BE MOV FTO	MO-0510 FTO to supply steam to hogger
M-MVMC-MO-0510	8.12E-04	PSAR2.BE MOV FTRC	MO-0510 FTRC preventing SGA from depressurizing
M-MVMD-MO-0510	2.96E-05	PSAR2.BE MOV FTRO	MO-0510 FTRO to supply steam to hogger
M-QSMC-0510	2.33E-05	PSAR2.BE Torque sw FTRC	MO-0510 control failure
M-REMB-389O	2.41E-04	PSAR2.BE Relay fail to energize	MO-0510 control failure
M-REMC-389O	2.40E-05	PSAR2.BE Relay FTRE	MO-0510 control failure
M-REMD-389C	2.40E-05	PSAR2.BE Relay FTRDE	MO-0510 control failure
M-REMD-4938	2.40E-05	PSAR2.BE Relay FTRDE	MO-0510 control failure
M-TRMT-B389	3.72E-05	PSAR2.BE Trans fails to function	MO-0510 control failure
P-B2MK-EB-03	1.20E-05	PSAR2.BE Bus fails to function	MCC3 fails to function (power to MO-0510)
P-CBMC-152-110	1.0	NA (conservatively assigned value of 1)	Breaker to Bus 13
P-CBMC-52-389	1.49E-05	PSAR2.BE Breaker FTRC	MO-0510 control failure
U-PMME-P5	1.0	NA (conservatively assigned value of 1)	Warm water recirc pump FTR (bypasses plugged traveling screens)

Table 2.10: Random Failures Changed for the Purpose of Fire PSA Quantification

Event	Prob	Description
M-PMCC-P-2AB-MG	T	Used as a house event to disable Feedwater, condensate and main condenser

Table 2.11: Operator Actions Added to Fault Tree Logic			
Operator Action	**Prob**	**Reference**	**Description**
A-AVOE-AVMAN	3.38E-2	Fire IPEEE	Operator action to open AFW flow control valves on auto signal failure
F-PMOE-FPS	3.40E-2	Fire IPEEE	Operator action to start fire pumps on auto signal failure
G-MVOA-CBALOCAL	1.0	NA (conservatively set to value of 1)	Operator action to open locally MO-2140 or MO-2160
H-AVOA-SUB-LOCAL	1.0	NA (conservatively set to value of 1)	Operator action to open locally CV-3070
H-MVOA-3072LOCAL	1.0	NA (conservatively set to value of 1)	Operator action to bypass MO-3072 I&C failure
H-MVOA-CHG2HPSI	3.40E-2		Operator action to align charging to primary system
H-MVOA-HPSI-LOCAL	1.0E-2	Fire IPEEE	Operator action to align HPSI injection valves locally
M-MVOA-0510LOCAL	1.0	NA (conservatively set to value of 1)	Operator action to open MO-0510 locally
M-CVOA-MSIVLOCAL	0.1	Screening value	Operator action to trip closed MSIVs locally
P-CBOT-TFXFR	1E-2	Fire IPEEE	Operator action to manually align fast transfer
U-PMOE-P5	1.0	NA (conservatively set to value of 1)	Operator action to align warm water recirc pump
U-PMOE-PUMP	1.0	NA (conservatively set to value of 1)	Operator action to start P7B on auto start failure

Table 2.12: Hot Short Failure Modes Added to Fault Trees (not used in this analysis)		
Hot Short	**Prob**	**Description**
G-MVMD-MO-2140HS	1.0	Hot short of MO-2140 FTRO
G-MVMD-MO-2160HS	1.0	Hot short of MO-2160 FTRO
H-MVMC-MO-3007HS	1.0	Hot short of MO-3007 FTRC (ISLOCA)
H-MVMD-MO-3007HS	1.0	Hot short of MO-3007 FTRO
H-MVMC-MO-3009HS	1.0	Hot short of MO-3009 FTRC (ISLOCA)
H-MVMD-MO-3009HS	1.0	Hot short of MO-3009 FTRO
H-MVMC-MO-3011HS	1.0	Hot short of MO-3011 FTRC (ISLOCA)
H-MVMD-MO-3011HS	1.0	Hot short of MO-3011 FTRO
H-MVMC-MO-3013HS	1.0	Hot short of MO-3013 FTRC (ISLOCA)
H-MVMD-MO-3013HS	1.0	Hot short of MO-3013 FTRO
H-MVMC-MO-3062HS	1.0	Hot short of MO-3062 FTRC (ISLOCA)
H-MVMD-MO-3062HS	1.0	Hot short of MO-3062 FTRO
H-MVMC-MO-3064HS	1.0	Hot short of MO-3064 FTRC (ISLOCA)
H-MVMD-MO-3064HS	1.0	Hot short of MO-3064 FTRO
H-MVMC-MO-3066HS	1.0	Hot short of MO-3066 FTRC (ISLOCA)
H-MVMD-MO-3066HS	1.0	Hot short of MO-3066 FTRO
H-MVMC-MO-3068HS	1.0	Hot short of MO-3068 FTRC (ISLOCA)
H-MVMD-MO-3068HS	1.0	Hot short of MO-3068 FTRO
H-MVMD-MO-3072HS	1.0	Hot short of MO-3072 FTRO
L-MVMC-MO-3008HS	1.0	Hot short of MO-3008 FTRC (ISLOCA)
L-MVMD-MO-3008HS	1.0	Hot short of MO-3008 FTRO
L-MVMC-MO-3010HS	1.0	Hot short of MO-3010 FTRC (ISLOCA)
L-MVMD-MO-3010HS	1.0	Hot short of MO-3010 FTRO
L-MVMC-MO-3012HS	1.0	Hot short of MO-3012 FTRC (ISLOCA)
L-MVMD-MO-3012HS	1.0	Hot short of MO-3012 FTRO
L-MVMC-MO-3014HS	1.0	Hot short of MO-3014 FTRC (ISLOCA)
L-MVMD-MO-3014HS	1.0	Hot short of MO-3014 FTRO
L-MVMC-MO-3189HS	1.0	Hot short of MO-3189 FTRC
L-MVMC-MO-3198HS	1.0	Hot short of MO-3198 FTRC
L-MVMD-MO-3190HS	1.0	Hot short of MO-3190 FTRO
L-MVMD-MO-3199HS	1.0	Hot short of MO-3199 FTRO

Table 3.1: IPEEE TABLE 4.7-3
PALISADES IGNITION SOURCE FREQUENCIES
AND COMBUSTIBLE LOADING

FIRE AREA	DESCRIPTION	COMBUSTIBLE LOADING	IGNITION SOURCE FREQUENCY (yr)
1	Control Room Exposure Fire Cabinet Fire	Moderate	2.43E-3 9.50E-3
2	Cable Spreading Room Exposure Fire Cabinet Fire	Moderate	3.19E-3 3.20E-3
3	1D Switchgear Room Exposure Fire Cabinet Fire	Moderate	9.81E-4 3.75E-3
4	1C Switchgear Room Exposure Fire Cabinet Fire	Moderate	4.15E-4 3.75E-3
5	Diesel Generator 1-1	Light	1.69E-2
6	Diesel Generator 1-2	Light	1.72E-2
7 & 8	Diesel Day Tanks	Heavy	N/A - Screened
9A	Intake Structure - East Side (SWS)	Light	7.20E-3
9B	Intake Structure - West Side (FPS)	Light	7.20E-3
10	East Engineered Safeguards	Minimal	2.36E-3

Table 3.1: IPEEE TABLE 4.7-3
PALISADES IGNITION SOURCE FREQUENCIES
AND COMBUSTIBLE LOADING

FIRE AREA	DESCRIPTION	COMBUSTIBLE LOADING	IGNITION SOURCE FREQUENCY (yr)
11	Battery Room #2	Moderate	1.60E-3
12	Battery Room #1	Moderate	1.60E-3
13A1	Auxiliary Building 590' Corridor (CCW to Charging)	Minimal	1.99E-3
13A2	Auxiliary Building 590' Corridor (Except Zone 13A1)	Moderate	5.37E-3
13B	Charging Pump Room	Minimal	2.06E-3
13C	All Other Areas on the 590' Auxiliary Building	Minimal - Moderate	1.15E-2
14	Containment Building	Light	N/A
15	Engineered Safeguards Panel Room	Moderate	1.50E-4
16	Component Cooling Water Pump Room	Minimal	2.36E-3
17	Refueling and Spent Fuel Pool Room	Minimal	N/A - Screened
18	Demineralizer Room	Minimal	N/A - Screened

Table 3.1: IPEEE TABLE 4.7-3
PALISADES IGNITION SOURCE FREQUENCIES
AND COMBUSTIBLE LOADING

FIRE AREA	DESCRIPTION	COMBUSTIBLE LOADING	IGNITION SOURCE FREQUENCY (yr)
19	Compactor Area - Track Alley	Minimal - Moderate	N/A - Screened
20	Spent Fuel Pool Equipment Room	Minimal	6.02E-4
21A	Electric Equipment Room - East Side (Bus 19)	Light	3.80E-3
21B	Electric Equipment Room - West Side (Bus 20)	Light	3.80E-3
22	Turbine Lube Oil Room	Heavy	N/A - Screened
23E	Turbine Building East Side	Moderate	2.94E-2
23S	Turbine Building South Side	Heavy	6.42E-2
23W	Turbine Building West Side	Moderate	1.55E-3
24	Auxiliary Feedwater Pump Room	Minimal	2.27E-4

Table 3.1: IPEEE TABLE 4.7-3
PALISADES IGNITION SOURCE FREQUENCIES
AND COMBUSTIBLE LOADING

FIRE AREA	DESCRIPTION	COMBUSTIBLE LOADING	IGNITION SOURCE FREQUENCY (yr)
25	Heating Boiler Rooms	Moderate	N/A - Screened
26	Southwest Cable Penetration Room	Moderate	6.89E-5
27	Radwaste Addition - VRS	Moderate	N/A - Screened
28	West Engineered Safeguards	Minimal	2.74E-3
29	Center Mechanical Equipment Rooms	Minimal	N/A - Screened
30	East Mechanical Equipment Rooms	Moderate	N/A - Screened
31	West Mechanical Equipment Rooms	Moderate	N/A - Screened
32	SIRW Tank/CCW Roof Area	Minimal	4.85E-5
33	Technical Support Center	Moderate	N/A - Screened

Table 3.1: IPEEE TABLE 4.7-3
PALISADES IGNITION SOURCE FREQUENCIES
AND COMBUSTIBLE LOADING

FIRE AREA	DESCRIPTION	COMBUSTIBLE LOADING	IGNITION SOURCE FREQUENCY (yr)
34	Man Hole #1, #2, #3	Light	3.97E-5

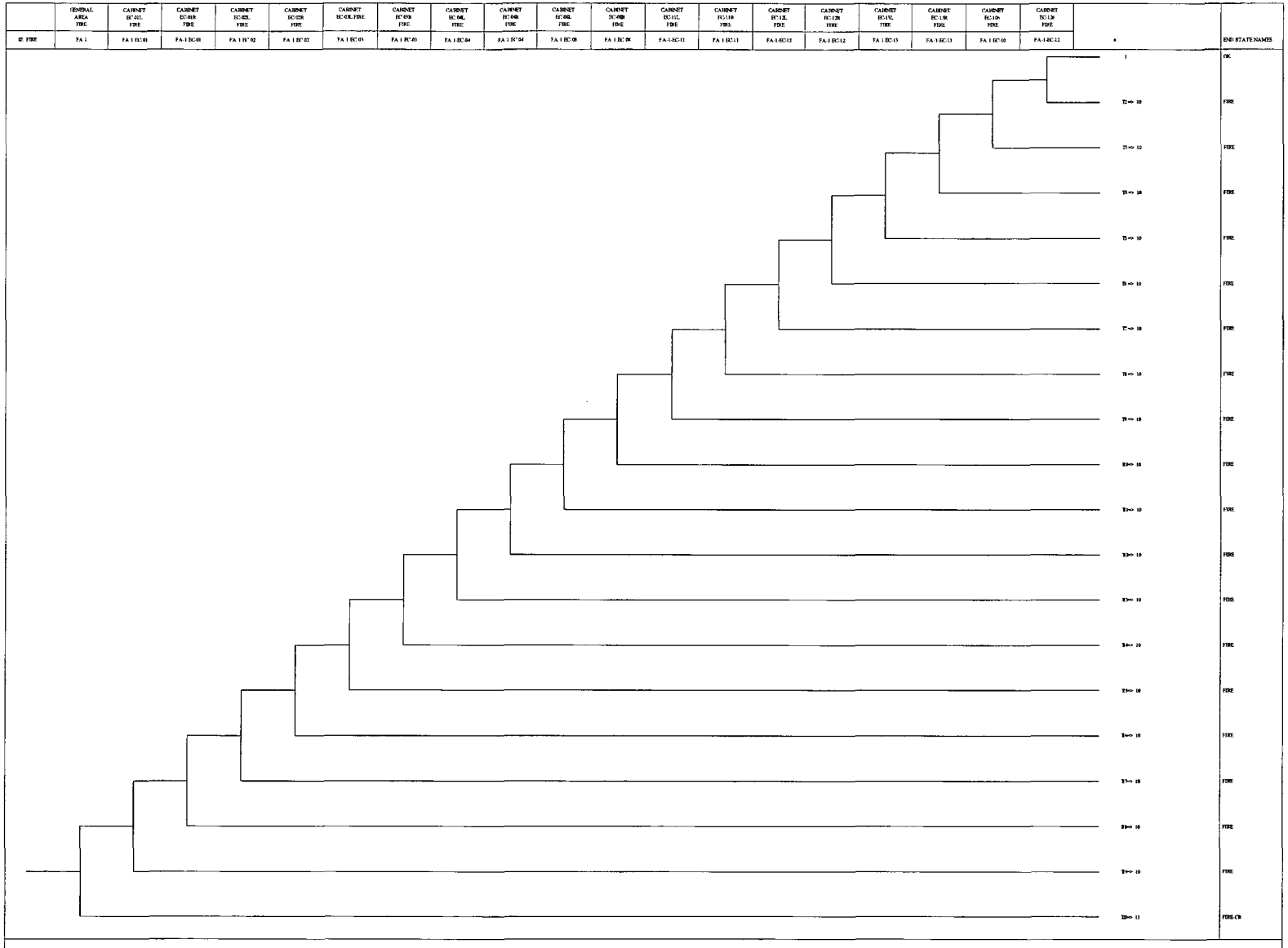
Table 3.2: Fault Tree/Fire Area Frequencies		
Fault Tree	**Frequency/yr**	**Description**
FA-1	2.43E-03	GENERAL AREA FIRE
FA-1-EC-01L	9.50E-03	LEFT CH PANEL EC-01/CONTROL ROOM CAB FIRE
FA-1-EC-01R	9.50E-03	RIGHT CH PANEL EC-01/CONTROL ROOM CAB FIRE
FA-1-EC-02L	9.50E-03	LEFT CH PANEL EC-02/CONTROL ROOM CAB FIRE
FA-1-EC-02R	9.50E-03	RIGHT CH PANEL EC-02/CONTROL ROOM CAB FIRE
FA-1-EC-03L	9.50E-03	LEFT CH PANEL EC-03/CONTROL ROOM CAB FIRE
FA-1-EC-03R	9.50E-03	RIGHT CH PANEL EC-03/CONTROL ROOM CAB FIRE
FA-1-EC-04L	9.50E-03	LEFT CH PANEL EC-04/CONTROL ROOM CAB FIRE
FA-1-EC-04R	9.50E-03	RIGHT CH PANEL EC-04/CONTROL ROOM CAB FIRE
FA-1-EC-08L	9.50E-03	LEFT CH PANEL EC-08/CONTROL ROOM CAB FIRE
FA-1-EC-08R	9.50E-03	RIGHT CH PANEL EC-08/CONTROL ROOM CAB FIRE
FA-1-EC-106	9.50E-03	CLG TWR MASTER SUPRVISORY & CONT CABINET CAB FIRE
FA-1-EC-11L	9.50E-03	LEFT CH RAD/TURBINE AUX MONITOR PANEL CAB FIRE
FA-1-EC-11R	9.50E-03	RIGHT CH RAD/TURBINE AUX MONITOR PANEL CAB FIRE
FA-1-EC-126	9.50E-03	CIRCULATION WATER & IODINE REMOVAL PANEL CAB FIRE
FA-1-EC-12L	9.50E-03	LEFT CH PRIMARY SYSTEM CONTROL PANEL CAB FIRE
FA-1-EC-12R	9.50E-03	RIGHT CH PRIMARY SYSTEM CONTROL PANEL CAB FIRE
FA-1-EC-13L	9.50E-03	L CH DBA/SHTDWN & MISC LOADS CNTRL PNL CAB FIRE
FA-1-EC-13R	9.50E-03	R CH DBA/SHTDWN & MISC LOADS CNTRL PNL CAB FIRE
FA-10	2.36E-03	EAST ENGINEERED SAFEGUARDS EXP FIRE
FA-11	1.60E-03	BATTERY ROOM 2 EXP FIRE
FA-12	1.60E-03	BATTERY ROOM 1 EXP FIRE
FA-13-13A1	1.99E-03	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE
FA-13-13A2	5.37E-03	AUX BLDNG 590' CORRIDR (EXCEPT ZNE 13A1) EXP FIRE
FA-13-13B	2.06E-03	CHARGING PUMP ROOM EXP FIRE
FA-13-13C	1.15E-02	ALL OTHR AREAS AT 590' AUXI BUILDNG EXP FIRE
FA-14	1.00E+00	CONTAINMENT BUILDING
FA-15	1.50E-04	ENGINEERED SAFEGUARDS PANEL ROOM EXP FIRE
FA-16	2.36E-03	COMPONENT COOLING WATER ROOM EXP FIRE
FA-18	1.00E+00	DEMINERALIZER ROOM EXP FIRE
FA-2	3.10E-03	CSR EXP FIRE
FA-2-EB-01	3.20E-03	CSR 480 V MCC NO.1 CAB FIRE
FA-2-EB-02	3.20E-03	CSR 480 V MCC NO.2 CAB FIRE
FA-2-EB-11	3.20E-03	CSR 480 V BUS NO. 11 CAB FIRE
FA-2-EB-12	3.20E-03	CSR 480 V BUS NO. 12 CAB FIRE
FA-2-EB-21	3.20E-03	CSR 480 V MCC #21 CAB FIRE
FA-2-EB-23	3.20E-03	CSR 480 V MCC #23 CAB FIRE
FA-2-EB-24	3.20E-03	CSR 480 V MCC #24 CAB FIRE
FA-2-ED-06	3.20E-03	CSR INVERTER NO. 1 CAB FIRE
FA-2-ED-07	3.20E-03	CSR INVERTER NO. 2 CAB FIRE
FA-2-ED-08	3.20E-03	CSR INVERTER NO. 3 CAB FIRE
FA-2-ED-09	3.20E-03	CSR INVERTER NO. 4 CAB FIRE
FA-2-ED-10	3.20E-03	CSR 125 V BUS NO. 1- LEFT SIDE - TIE BKR CAB FIRE
FA-2-ED-11	3.20E-03	CSR 125 V BUS CAB FIRE
FA-2-ED-15	3.20E-03	CSR BATTERY CHARGER NO. 1 CAB FIRE
FA-2-ED-16	3.20E-03	CSR BATTERY CHARGER NO. 2 CAB FIRE
FA-2-ED-17	3.20E-03	CSR BATTERY CHARGER NO. 3 CAB FIRE
FA-2-ED-18	3.20E-03	CSR BATTERY CHARGER NO. 4 CAB FIRE
FA-2-ED-20	3.20E-03	CSR CSR 125 VDC BUS NO. 2 CAB FIRE

Table 3.2: Fault Tree/Fire Area Frequencies		
Fault Tree	**Frequency/yr**	**Description**
FA-2-ED-21	3.20E-03	CSR CSR 125 VOLTS DC DISTRIBUTION PANEL CAB FIRE
FA-2-EJ-14A	3.20E-03	CSR J BOX EJ-14A CAB FIRE
FA-2-EJ-542	3.20E-03	CSR J BOX EJ-542 CAB FIRE
FA-2-EJ-543	3.20E-03	CSR J BOX EJ-543 CAB FIRE
FA-2-EJ-575	3.20E-03	CSR J BOX EJ-575 CAB FIRE
FA-2-EJ-576	3.20E-03	CSR J BOX EJ-576 CAB FIRE
FA-2-EY-01	3.20E-03	CSR INSTRUMENT AC PANEL CAB FIRE
FA-2-EY-10	3.20E-03	CSR PREFERRED AC BUS NO. 1 INVERTER CAB FIRE
FA-2-EY-20	3.20E-03	CSR PREFERRED AC BUS NO. 2 INVERTER CAB FIRE
FA-2-EY-30	3.20E-03	CSR PREFERRED AC BUS NO. 3 INVERTER CAB FIRE
FA-2-EY-40	3.20E-03	CSR PREFERRED AC BUS NO. 4 INVERTER CAB FIRE
FA-2-EY-50	3.20E-03	CSR EY-01 PANEL TRANSFER SWITCH CAB FIRE
FA-20	6.02E-04	SPENT FUEL POOL EQUIPMENT ROOM EXP FIRE
FA-21-21A	3.80E-03	EEQUIP ROOM - EAST SIDE (BUS 19) EXP FIRE
FA-21-21B	3.80E-03	EEQUIP ROOM - WEST SIDE (BUS 20) EXP FIRE
FA-23-23E	2.94E-02	TURBINE BUILDING EAST SIDE EXP FIRE
FA-23-23S	6.42E-02	TURBINE BUILDING SOUTH SIDE EXP FIRE
FA-23-23W	1.55E-03	TURBINE BUILDING WEST SIDE EXP FIRE
FA-24	2.27E-04	AUXILIARY FEEDWATER PUMP ROOM EXP FIRE
FA-25	1.00E+00	HEATING BOILER ROOMS EXP FIRE
FA-26	6.89E-05	SOUTHWEST CABLE PENETRATION ROOM EXP FIRE
FA-28	2.74E-03	WEST ENGINEERED SAFEGUARDS EXP FIRE
FA-3	9.81E-04	1D SWITCHGR LOGICAL PLACEHOLDER
FA-3-EA-12	3.75E-03	1D SWITCHGR 2400 V BUS 1D CAB FIRE
FA-3-EB-22	3.75E-03	1D SWITCHGR 4160 V BUS 1B CAB FIRE
FA-3-EC-181	3.75E-03	1D SWITCHGR MSIV SOLENOID VALVE PANEL CAB FIRE
FA-3-EC-187	3.75E-03	1D SWITCHGR AFW ACTUATION CABINET CAB FIRE
FA-3-EJ-1005	3.75E-03	1D SWITCHGR J BOX J-1005 CAB FIRE
FA-3-EJ-1006	3.75E-03	1D SWITCHGR J BOX J-1006 CAB FIRE
FA-3-EJ-1051	3.75E-03	1D SWITCHGR J BOX J-1051 CAB FIRE
FA-3-EJ-1052	3.75E-03	1D SWITCHGR J BOX J-1052 CAB FIRE
FA-3-EJ-9401	3.75E-03	1D SWITCHGR J BOX J-9401 CAB FIRE
FA-32	4.85E-05	SIRW TANK/CCW ROOF AREA EXP FIRE
FA-34	3.97E-05	MAN HOLE #1, #2, #3 EXP FIRE
FA-4	4.15E-04	1C SWITCHGR LOGICAL PLACEHOLDER
FA-4-EA-11	3.75E-03	1C SWITCHGR 2400 V BUS 1C CAB FIRE
FA-4-ED-11A	3.75E-03	1C SWITCHGR ED-11A 125 VOLTS DC DIST PANEL CAB FIRE
FA-4-EJ-9400	3.75E-03	1C SWITCHGR J BOX J-9400 CAB FIRE
FA-5	1.69E-02	DIESEL GENERATOR 1-1 (LOGICAL PLACEHOLDER)
FA-6	1.72E-02	DIESEL GENERATOR 1-2 (LOGICAL PLACEHOLDER)
FA-7	1.00E+00	DIESEL GENERATOR 1-1 (LOGICAL PLACEHOLDER)
FA-8	1.00E+00	DIESEL GENERATOR 1-2 (LOGICAL PLACEHOLDER)
FA-9-9A	7.20E-03	INTAKE STRUCTURE - EAST SIDE (SWS) EXP FIRE
FA-9-9B	7.20E-03	INTAKE STRUCTURE - WEST SIDE (FPS) EXP FIRE

Table 3.3: Fire Area Assigned Logical Event and Frequency		
Fire Area Assigned Logical Event	**Frequency/yr**	**Description**
IE-FA-1	1.00E+00	LOGICAL PLACEHOLDER
IE-FA-1-EC-01L	9.50E-03	LEFT CH PANEL EC-01/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-01R	9.50E-03	RIGHT CH PANEL EC-01/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-02L	9.50E-03	LEFT CH PANEL EC-02/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-02R	9.50E-03	RIGHT CH PANEL EC-02/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-03L	9.50E-03	LEFT CH PANEL EC-03/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-03R	9.50E-03	RIGHT CH PANEL EC-03/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-04L	9.50E-03	LEFT CH PANEL EC-04/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-04R	9.50E-03	RIGHT CH PANEL EC-04/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-08L	9.50E-03	LEFT CH PANEL EC-08/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-08R	9.50E-03	RIGHT CH PANEL EC-08/CONTROL ROOM CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-106	9.50E-03	CLG TWR MASTER SUPRVISORY & CONT CABINET CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-11L	9.50E-03	LEFT CH RAD/TURBINE AUX MONITOR PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-11R	9.50E-03	RIGHT CH RAD/TURBINE AUX MONITOR PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-126	9.50E-03	CIRCULATION WATER & IODINE REMOVAL PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-12L	9.50E-03	LEFT CH PRIMARY SYSTEM CONTROL PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-12R	9.50E-03	RIGHT CH PRIMARY SYSTEM CONTROL PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-13L	9.50E-03	L CH DBA/SHTDWN & MISC LOADS CNTRL PNL CAB FIRE (MOD)(IE Freq)
IE-FA-1-EC-13R	9.50E-03	R CH DBA/SHTDWN & MISC LOADS CNTRL PNL CAB FIRE (MOD)(IE Freq)
IE-FA-10	2.36E-03	EAST ENGINEERED SAFEGUARDS EXP FIRE (MINIMAL)(IE Freq)
IE-FA-11	1.60E-03	BATTERY ROOM 2 EXP FIRE (MODERATE)(IE Freq)
IE-FA-12	1.60E-03	BATTERY ROOM 1 EXP FIRE (MODERATE)(IE Freq)
IE-FA-13-13A1	1.99E-03	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (MIN)(IE Freq)
IE-FA-13-13A2	5.37E-03	AUX BLDNG 590' CORRIDR (EXCEPT ZNE 13A1) EXP FIRE (MOD)(IE Freq)
IE-FA-13-13B	2.06E-03	CHARGING PUMP ROOM EXP FIRE (MIN)(IE Freq)
IE-FA-13-13C	1.15E-02	ALL OTHR AREAS AT 590' AUXI BUILDNG EXP FIRE (MIN-MOD)(IE Freq)
IE-FA-14	1.00E+00	CONTAINMENT BUILDING (IE-Freq - N/A)
IE-FA-15	1.50E-04	ENGINEERED SAFEGUARDS PANEL ROOM EXP FIRE (MOD)(IE Freq)
IE-FA-16	2.36E-03	COMPONENT COOLING WATER ROOM EXP FIRE (MIN)(IE Freq)
IE-FA-18	1.00E+00	DEMINERALIZER ROOM EXP FIRE (MIN)(IE-Freq - N/A)
IE-FA-2	3.10E-03	CSR EXP FIRE (MOD)(IE Freq)
IE-FA-2-EB-01	3.20E-03	CSR 480 V MCC NO.1 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EB-02	3.20E-03	CSR 480 V MCC NO.2 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EB-11	3.20E-03	CSR 480 V BUS NO. 11 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EB-12	3.20E-03	CSR 480 V BUS NO. 12 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EB-21	3.20E-03	CSR 480 V MCC #21 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EB-23	3.20E-03	CSR 480 V MCC #23 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EB-24	3.20E-03	CSR 480 V MCC #24 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-06	3.20E-03	CSR INVERTER NO. 1 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-07	3.20E-03	CSR INVERTER NO. 2 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-08	3.20E-03	CSR INVERTER NO. 3 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-09	3.20E-03	CSR INVERTER NO. 4 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-10	3.20E-03	CSR 125 V BUS NO. 1- LEFT SIDE - TIE BKR CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-11	3.20E-03	CSR 125 V BUS CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-15	3.20E-03	CSR BATTERY CHARGER NO. 1 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-16	3.20E-03	CSR BATTERY CHARGER NO. 2 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-17	3.20E-03	CSR BATTERY CHARGER NO. 3 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-18	3.20E-03	CSR BATTERY CHARGER NO. 4 CAB FIRE (MOD)(IE Freq)

Table 3.3: Fire Area Assigned Logical Event and Frequency		
Fire Area Assigned Logical Event	**Frequency/yr**	**Description**
IE-FA-2-ED-20	3.20E-03	CSR CSR 125 VDC BUS NO. 2 CAB FIRE (MOD)(IE Freq)
IE-FA-2-ED-21	3.20E-03	CSR CSR 125 VOLTS DC DISTRIBUTION PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-2-EJ-14A	3.20E-03	CSR J BOX EJ-14A CAB FIRE (MOD)(IE Freq)
IE-FA-2-EJ-542	3.20E-03	CSR J BOX EJ-542 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EJ-543	3.20E-03	CSR J BOX EJ-543 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EJ-575	3.20E-03	CSR J BOX EJ-575 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EJ-576	3.20E-03	CSR J BOX EJ-576 CAB FIRE (MOD)(IE Freq)
IE-FA-2-EY-01	3.20E-03	CSR INSTRUMENT AC PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-2-EY-10	3.20E-03	CSR PREFERRED AC BUS NO. 1 INVERTER CAB FIRE (MOD)(IE Freq)
IE-FA-2-EY-20	3.20E-03	CSR PREFERRED AC BUS NO. 2 INVERTER CAB FIRE (MOD)(IE Freq)
IE-FA-2-EY-30	3.20E-03	CSR PREFERRED AC BUS NO. 3 INVERTER CAB FIRE (MOD)(IE Freq)
IE-FA-2-EY-40	3.20E-03	CSR PREFERRED AC BUS NO. 4 INVERTER CAB FIRE (MOD)(IE Freq)
IE-FA-2-EY-50	3.20E-03	CSR EY-01 PANEL TRANSFER SWITCH CAB FIRE (MOD)(IE Freq)
IE-FA-20	6.02E-04	SPENT FUEL POOL EQUIPMENT ROOM EXP FIRE (MIN)(IE Freq)
IE-FA-21-21A	3.80E-03	EEQUIP ROOM - EAST SIDE (BUS 19) EXP FIRE (LIGHT)(IE Freq)
IE-FA-21-21B	3.80E-03	EEQUIP ROOM - WEST SIDE (BUS 20) EXP FIRE (LIGHT)(IE Freq)
IE-FA-23-23E	2.94E-02	TURBINE BUILDING EAST SIDE EXP FIRE (MOD)(IE Freq)
IE-FA-23-23S	6.42E-02	TURBINE BUILDING SOUTH SIDE EXP FIRE (HEAVY)(IE Freq)
IE-FA-23-23W	1.55E-03	TURBINE BUILDING WEST SIDE EXP FIRE (MOD)(IE Freq)
IE-FA-24	2.27E-04	AUXILIARY FEEDWATER PUMP ROOM EXP FIRE (MIN)(IE Freq)
IE-FA-25	1.00E+00	HEATING BOILER ROOMS EXP FIRE (MOD)(IE-Freq - N/A)
IE-FA-26	6.89E-05	SOUTHWEST CABLE PENETRATION ROOM EXP FIRE (MOD)(IE Freq)
IE-FA-28	2.74E-03	WEST ENGINEERED SAFEGUARDS EXP FIRE (MIN)(IE Freq)
IE-FA-3	1.00E+00	1D SWITCHGR LOGICAL PLACEHOLDER
IE-FA-3-EA-12	3.75E-03	1D SWITCHGR 2400 V BUS 1D CAB FIRE (MOD)(IE Freq)
IE-FA-3-EB-22	3.75E-03	1D SWITCHGR 4160 V BUS 1B CAB FIRE (MOD)(IE Freq)
IE-FA-3-EC-181	3.75E-03	1D SWITCHGR MSIV SOLENOID VALVE PANEL CAB FIRE (MOD)(IE Freq)
IE-FA-3-EC-187	3.75E-03	1D SWITCHGR AFW ACTUATION CABINET CAB FIRE (MOD)(IE Freq)
IE-FA-3-EJ-1005	3.75E-03	1D SWITCHGR J BOX J-1005 CAB FIRE (MOD)(IE Freq)
IE-FA-3-EJ-1006	3.75E-03	1D SWITCHGR J BOX J-1006 CAB FIRE (MOD)(IE Freq)
IE-FA-3-EJ-1051	3.75E-03	1D SWITCHGR J BOX J-1051 CAB FIRE (MOD)(IE Freq)
IE-FA-3-EJ-1052	3.75E-03	1D SWITCHGR J BOX J-1052 CAB FIRE (MOD)(IE Freq)
IE-FA-3-EJ-9401	3.75E-03	1D SWITCHGR J BOX J-9401 CAB FIRE (MOD)(IE Freq)
IE-FA-32	4.85E-05	SIRW TANK/CCW ROOF AREA EXP FIRE (MIN)(IE Freq)
IE-FA-34	3.97E-05	MAN HOLE #1, #2, #3 EXP FIRE (LIGHT)(IE Freq)
IE-FA-4	1.00E+00	1C SWITCHGR LOGICAL PLACEHOLDER
IE-FA-4-EA-11	3.75E-03	1C SWITCHGR 2400 V BUS 1C CAB FIRE (IE Freq)
IE-FA-4-ED-11A	3.75E-03	1C SWITCHGR ED-11A 125 VOLTS DC DIST PANEL CAB FIRE (IE Freq)
IE-FA-4-EJ-9400	3.75E-03	1C SWITCHGR J BOX J-9400 CAB FIRE (MOD)(IE Freq)
IE-FA-5	1.69E-02	DIESEL GENERATOR 1-1 (LOGICAL PLACEHOLDER)
IE-FA-6	1.72E-02	DIESEL GENERATOR 1-2 (LOGICAL PLACEHOLDER)
IE-FA-7	1.00E+00	DIESEL GENERATOR 1-1 (LOGICAL PLACEHOLDER)
IE-FA-8	1.00E+00	DIESEL GENERATOR 1-2 (LOGICAL PLACEHOLDER)
IE-FA-9-9A	7.20E-03	INTAKE STRUCTURE - EAST SIDE (SWS) EXP FIRE (LIGHT)(IE Freq)
IE-FA-9-9B	7.20E-03	INTAKE STRUCTURE - WEST SIDE (FPS) EXP FIRE (LIGHT)(IE Freq)
IE-FA-9A	1.00E+00	LOGICAL PLACEHOLDER
IE-FA-9B	1.00E+00	LOGICAL PLACEHOLDER

Table of Contents



FA-1 - 2005/08/12 Page 2

Figure 4.1 - FA1 Control Room Fires

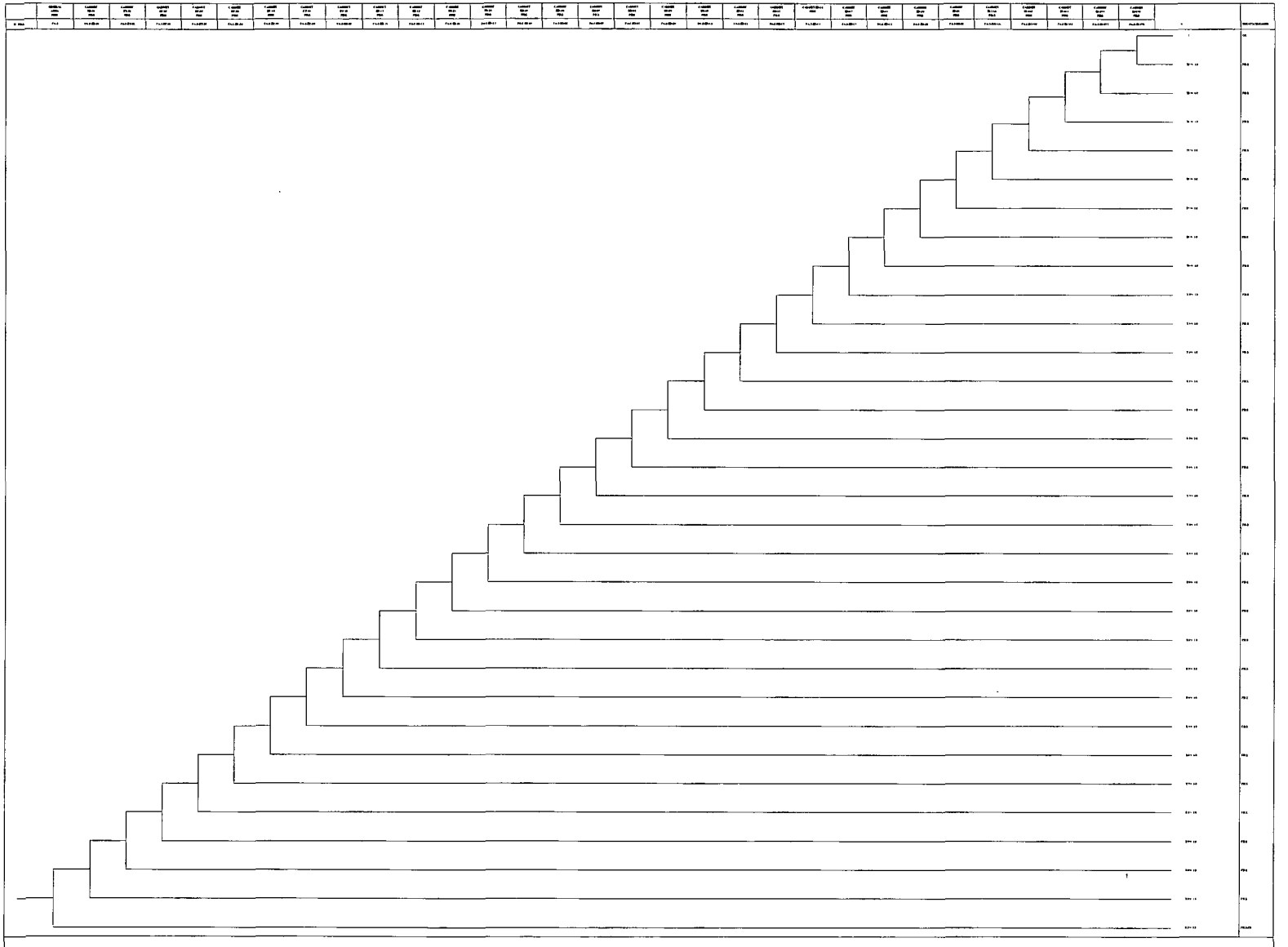


Figure 4.2 - Cable Spreading Room Fires

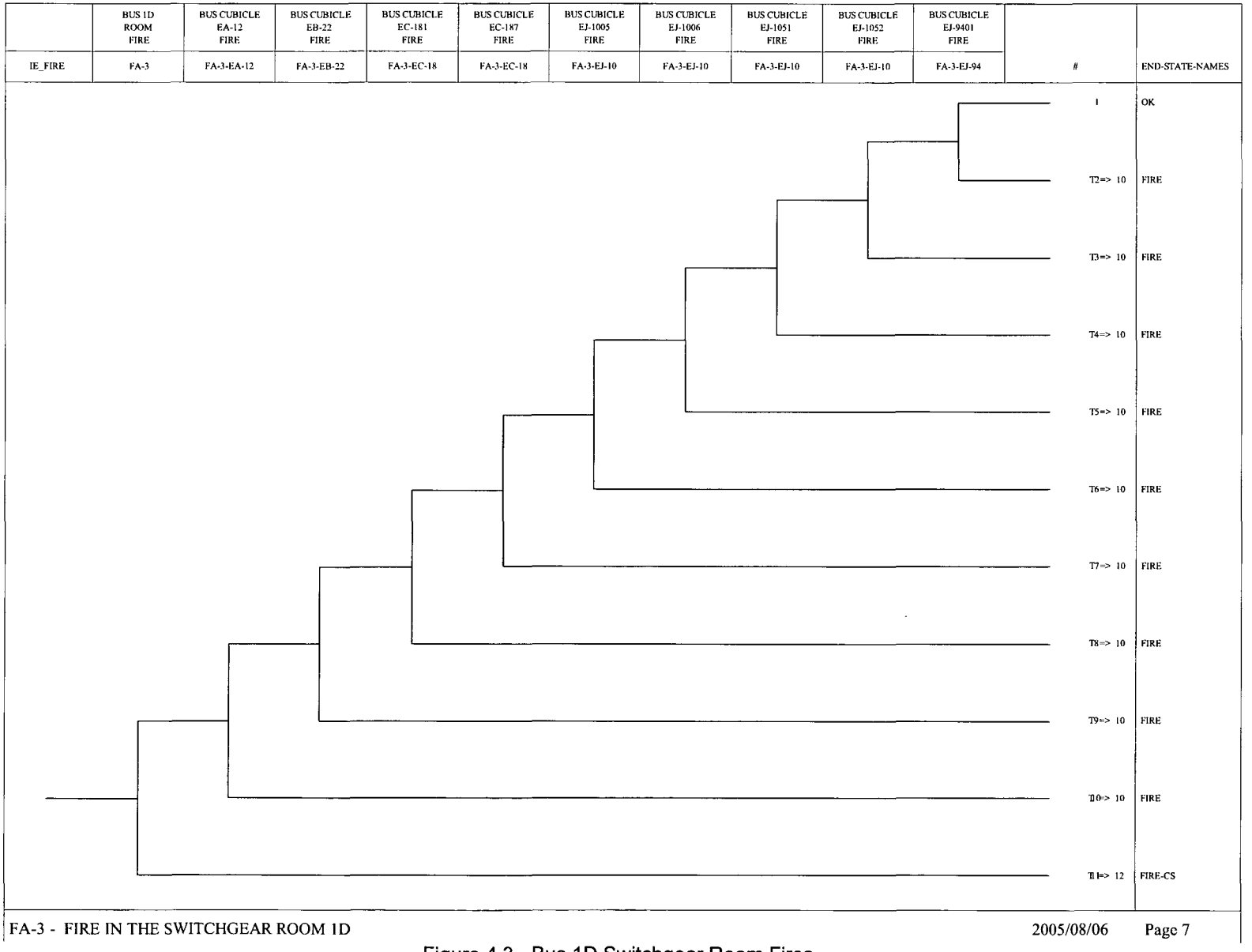


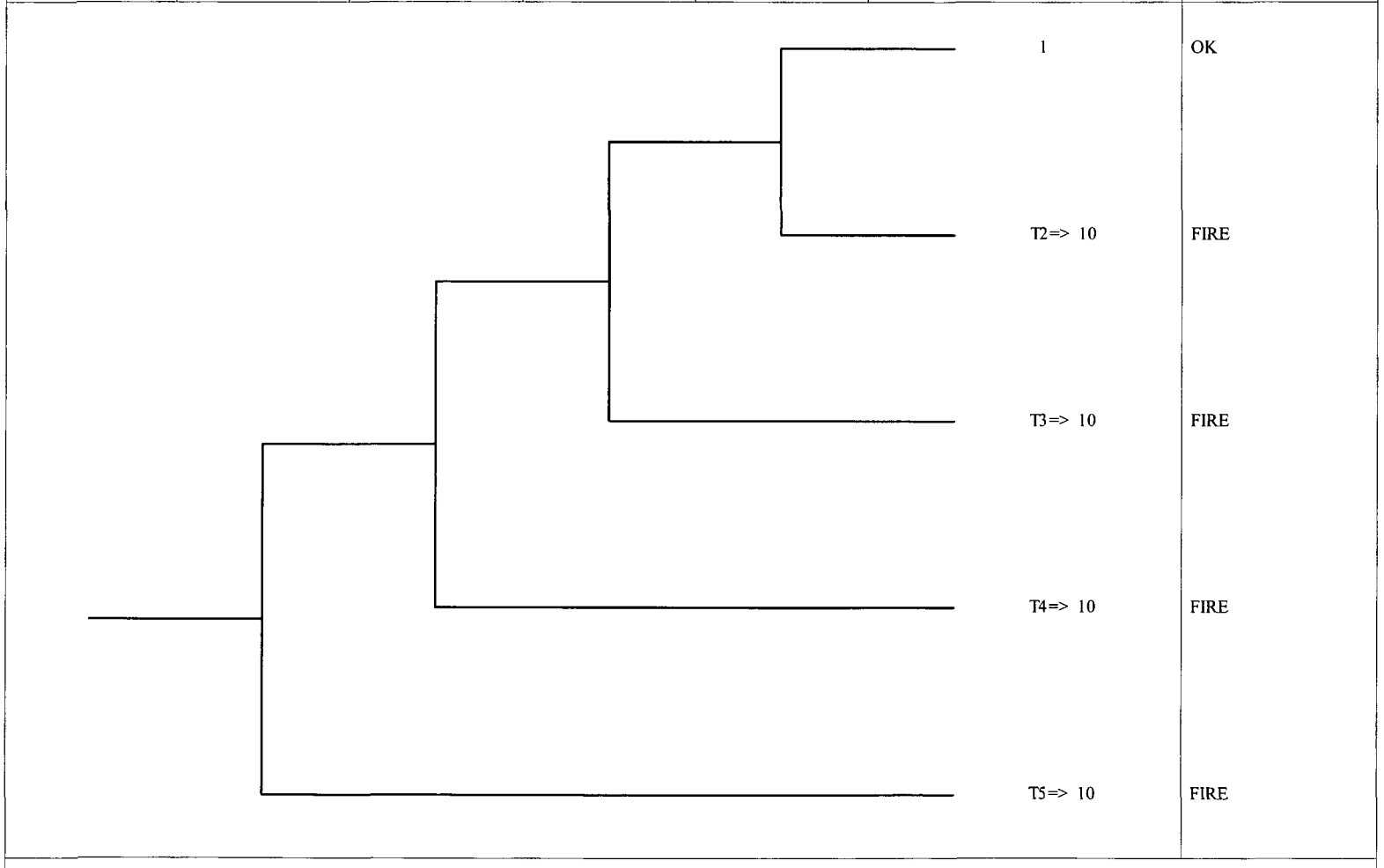
Figure 4.3 - Bus 1D Switchgear Room Fires

	BUS 1C ROOM FIRE	BUS CUBICLE EA-11 FIRE	BUS CUBICLE ED-11A FIRE	BUS CUBICLE EJ-9400 FIRE		
IE_FIRE	FA-4	FA-4-EA-11	FA-4-ED-11	FA-4-EJ-94	#	END-STATE-NAMES
					1	OK
					T2=> 10	FIRE
					T3=> 10	FIRE
					T4=> 10	FIRE
					T5=> 12	FIRE-CS

FA-4 - FIRE IN THE SWITCHGEAR ROOM 1C 2005/08/04 Page 8

Figure 4.4 - Bus 1C Switchgear Room Fires

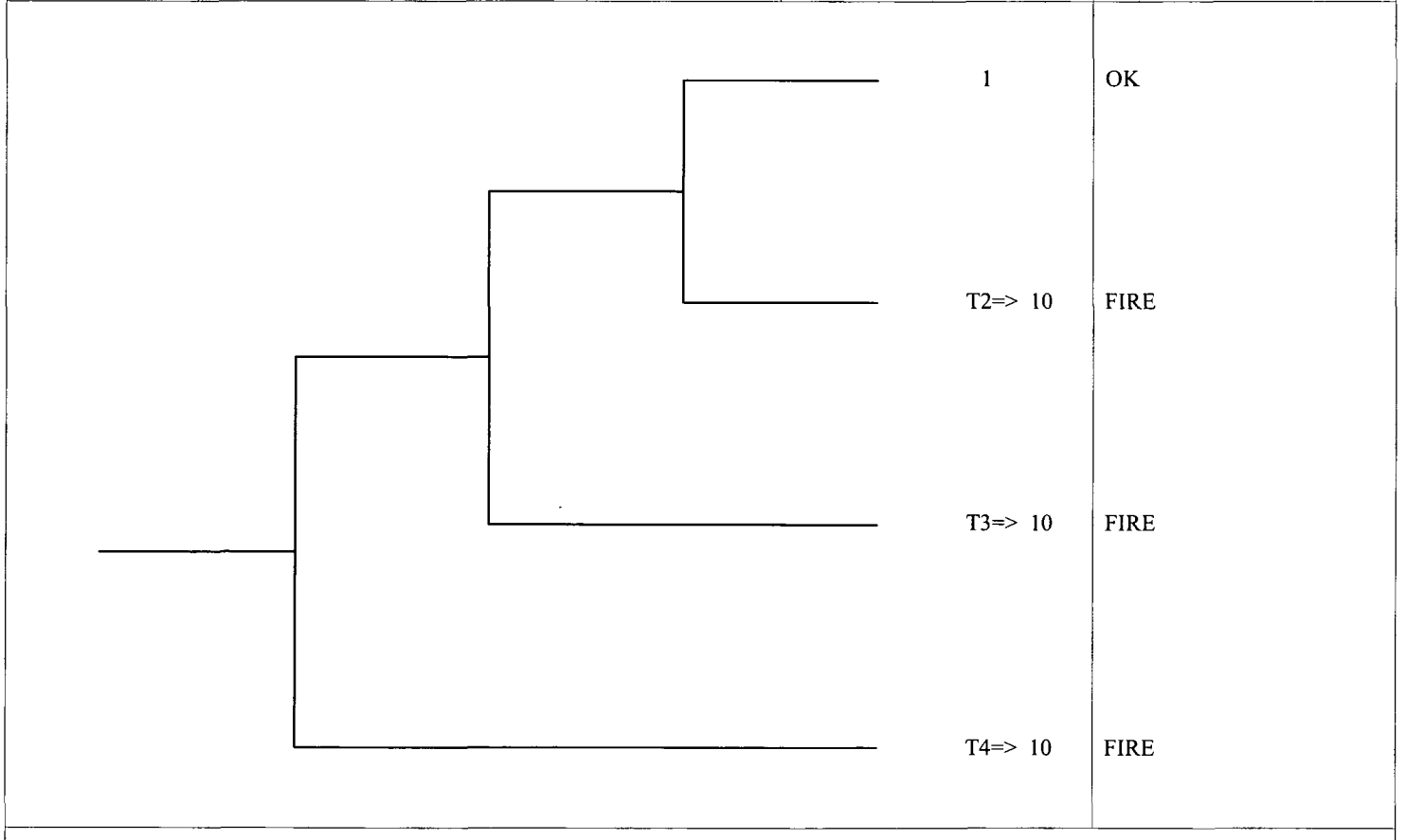
	AUX BLDG 590' CORRIDOR SOUT FINGER FIRE	AUX BLDG 590 CORRIDOR EXCEPT 13A1 FIRE	CHARGING PUMP ROOM FIRE	AUX BLDG 590 ELEV FIRE		
IE_FIRE	FA-13-13A1	FA-13-13A2	FA-13-13B	FA-13-13C	#	END-STATE-NAMES



FA-13 - FIRE IN THE AUX BLDG 590 CORRIDOR 2005/08/08 Page 3

Figure 4.5 - Aux Building Corridor Fires

	TURB BLDG SOUTH FIRE	TURB BLDG EAST FIRE	TURB BLDG WEST FIRE		
IE_FIRE	FA-23-23S	FA-23-23E	FA-23-23W	#	END-STATE-NAMES



FA-23 - FIRE IN THE TURINE BUILDING 2005/08/05 Page 6

Figure 4.6 - Turbine Building Fires

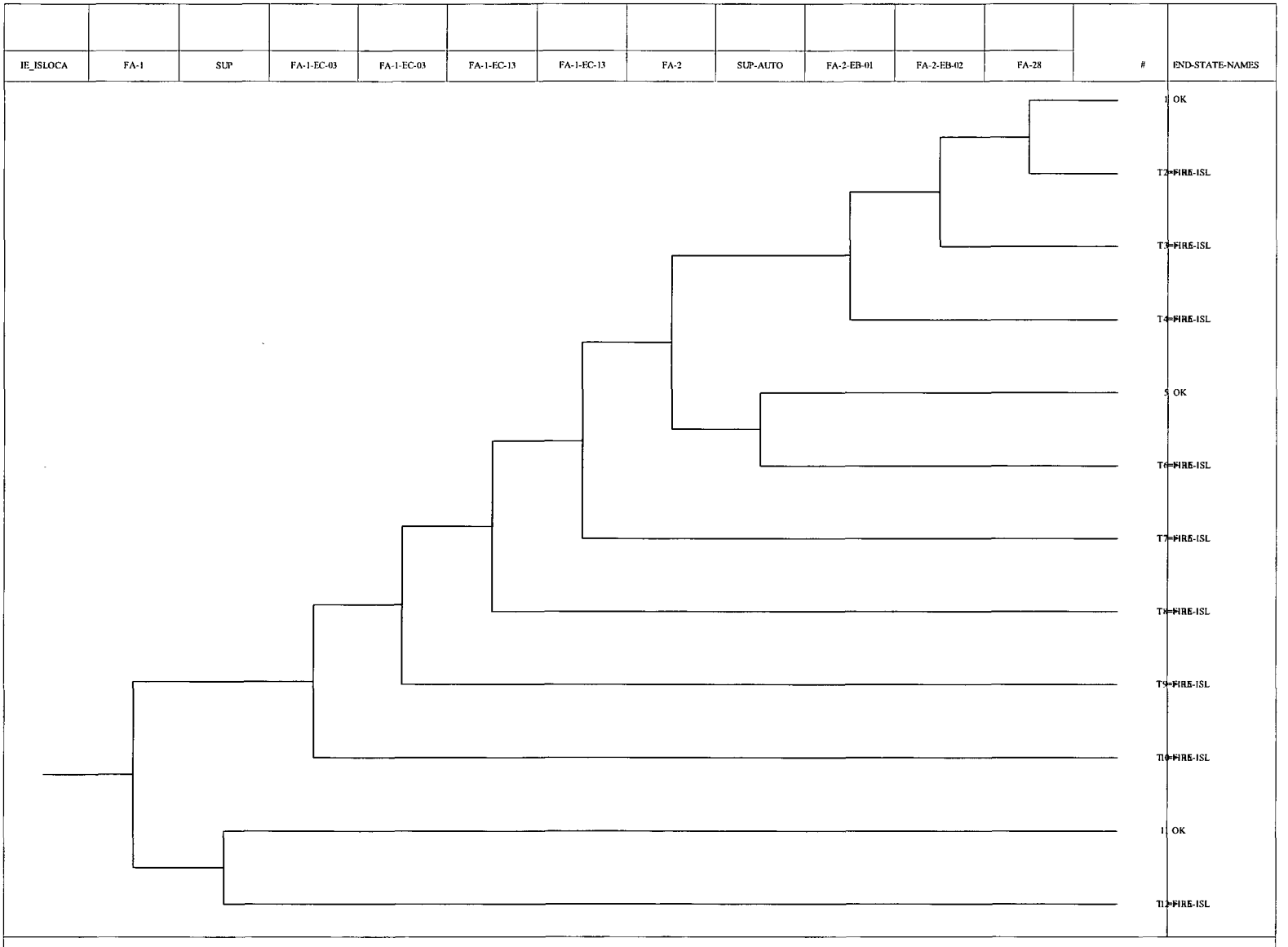
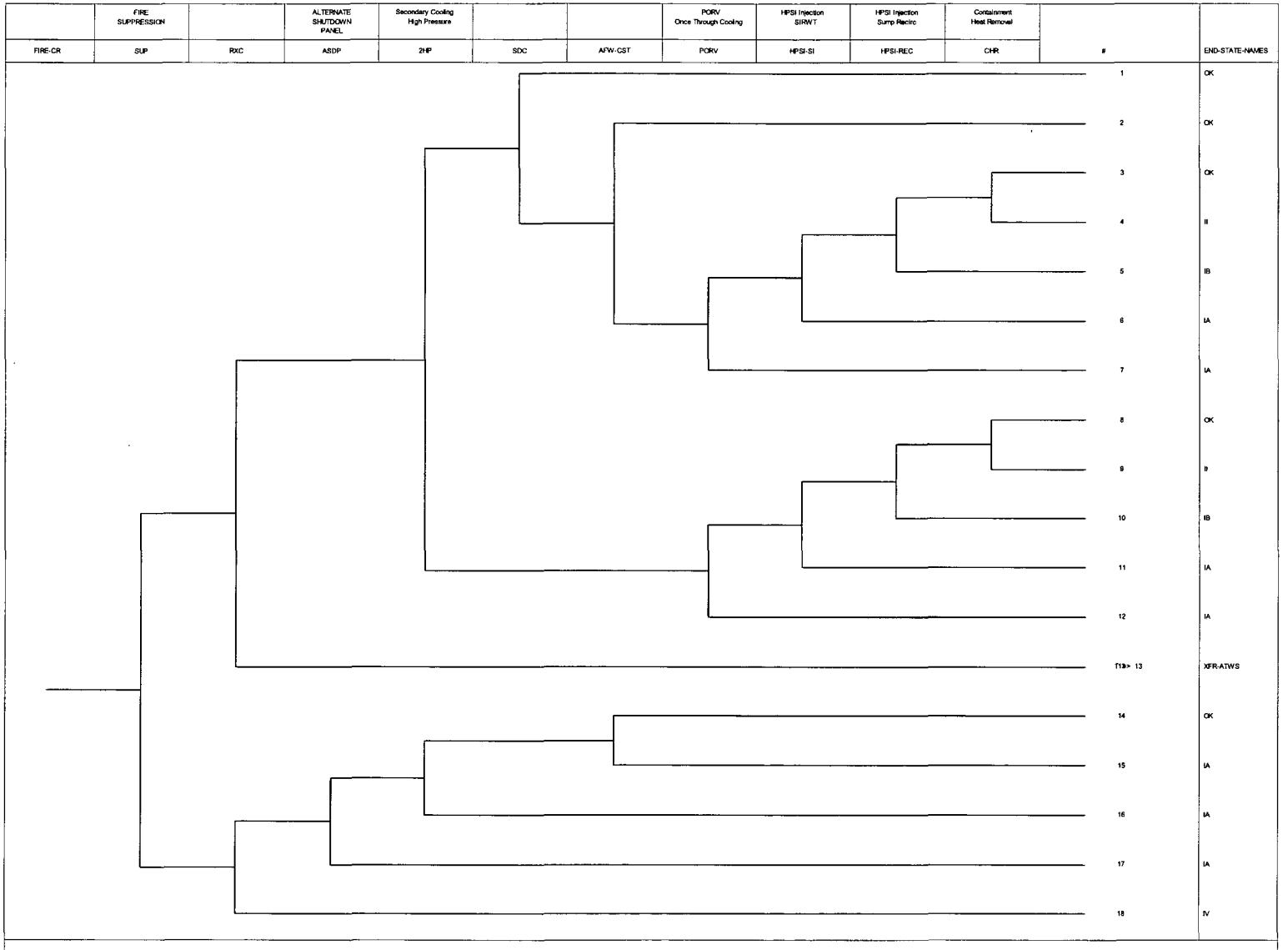
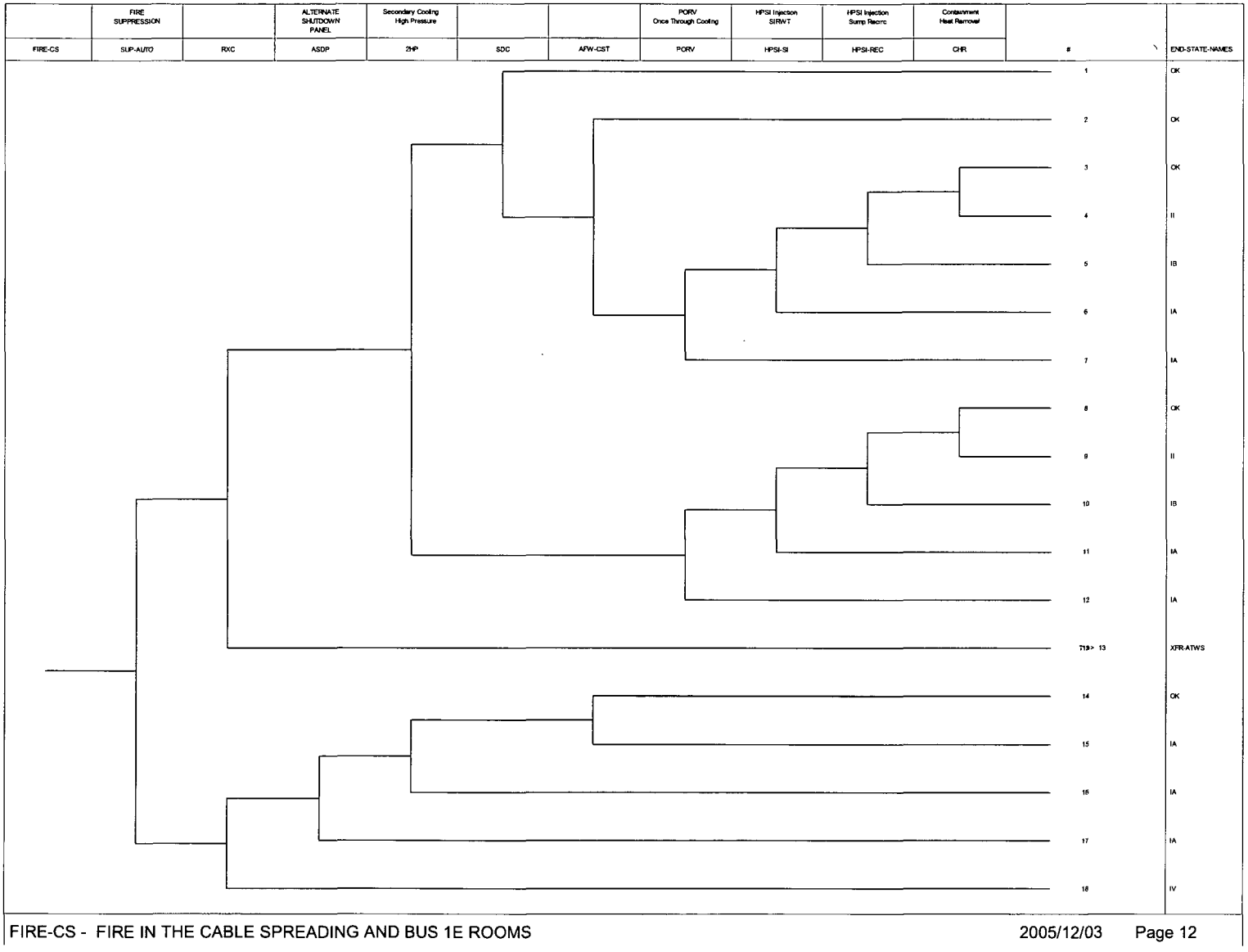


Figure 4.7 - Fires Leading to ISLOCA



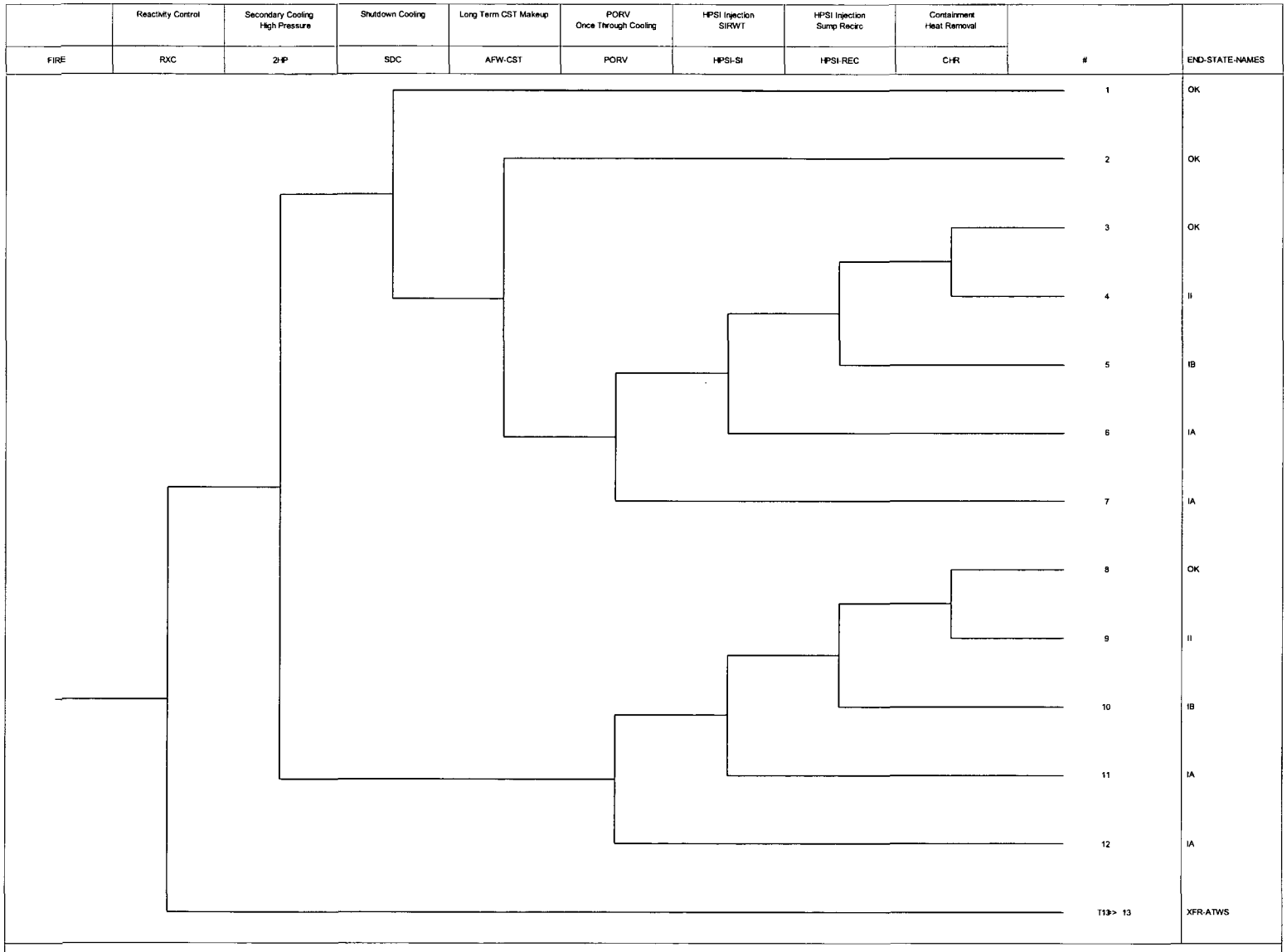
FIRE-CR - UNSUPRESS CONTROL ROOM FIRE 2005/12/03 Page 11

Figure 4.8 - Control Room Fire Accident Sequences



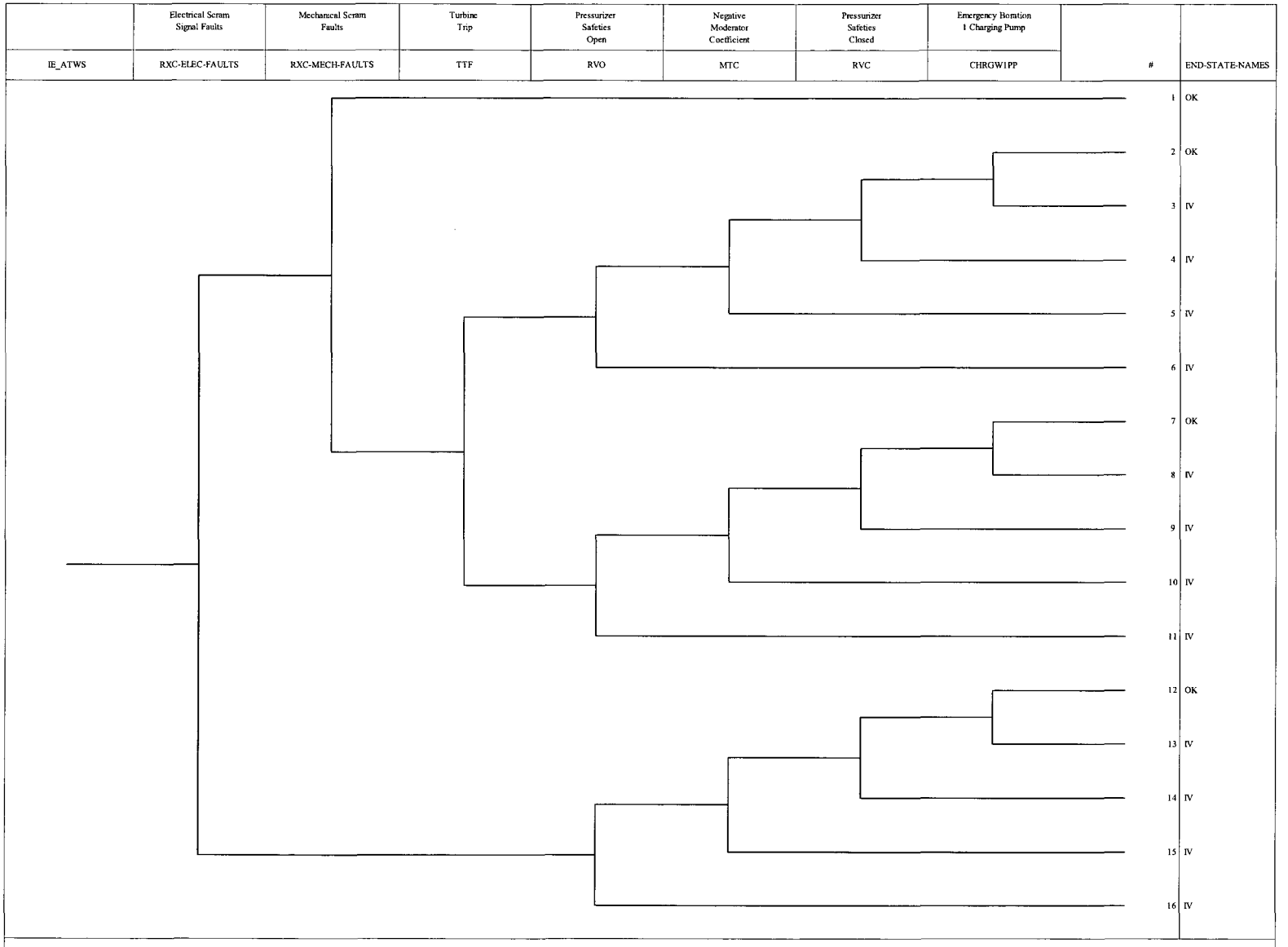
FIRE-CS - FIRE IN THE CABLE SPREADING AND BUS 1E ROOMS 2005/12/03 Page 12

Figure 4.9 - Cable Spreading Room and Emergency Switchgear Room Accident Sequences



FIRE - PLANT RESPONSE TREE TO FIRE 2005/12/03 Page 10

Figure 4.10 - Aux Building Corridor and Turbine Building Fire Accident Sequences



XFR-ATWS - ATWS 2005/12/03 Page 13

Figure 4.11 - Anticipated Transient Without Scram Accident Sequences

Table 4.1

Rules for Fire Area 1

```
if init(FIRE-CR)then
      eventree(FIRE-CR)=FALSE(HSE-NOTFA1);
endif

if FA-1 then eventree( FA-1 )=TRUE(IE-FA-1); endif
if FA-1-EC-01L then eventree( FA-1 )=TRUE(IE-FA-1-EC-01L ); endif
if FA-1-EC-01R then eventree( FA-1 )=TRUE(IE-FA-1-EC-01R ); endif
if FA-1-EC-02L then eventree( FA-1 )=TRUE(IE-FA-1-EC-02L ); endif
if FA-1-EC-02R then eventree( FA-1 )=TRUE(IE-FA-1-EC-02R ); endif
if FA-1-EC-03L then eventree( FA-1 )=TRUE(IE-FA-1-EC-03L ); endif
if FA-1-EC-03R then eventree( FA-1 )=TRUE(IE-FA-1-EC-03R ); endif
if FA-1-EC-04L then eventree( FA-1 )=TRUE(IE-FA-1-EC-04L ); endif
if FA-1-EC-04R then eventree( FA-1 )=TRUE(IE-FA-1-EC-04R ); endif
if FA-1-EC-08L then eventree( FA-1 )=TRUE(IE-FA-1-EC-08L ); endif
if FA-1-EC-08R then eventree( FA-1 )=TRUE(IE-FA-1-EC-08R ); endif
if FA-1-EC-11L then eventree( FA-1 )=TRUE(IE-FA-1-EC-11L ); endif
if FA-1-EC-11R then eventree( FA-1 )=TRUE(IE-FA-1-EC-11R ); endif
if FA-1-EC-12L then eventree( FA-1 )=TRUE(IE-FA-1-EC-12L ); endif
if FA-1-EC-12R then eventree( FA-1 )=TRUE(IE-FA-1-EC-12R ); endif
if FA-1-EC-13L then eventree( FA-1 )=TRUE(IE-FA-1-EC-13L ); endif
if FA-1-EC-13R then eventree( FA-1 )=TRUE(IE-FA-1-EC-13R ); endif
if FA-1-EC-106 then eventree( FA-1 )=TRUE(IE-FA-1-EC-106 ); endif
if FA-1-EC-126 then eventree( FA-1 )=TRUE(IE-FA-1-EC-126 ); endif
```

Table 4.2

Rules for Fire Area 2

```
if init(FIRE-CS)then
      eventree(FIRE-CS)=FALSE(HSE-NOTFA2);
endif

if FA-2 then eventree(FA-2) = TRUE(IE-FA-2); endif
if FA-2-EB-01 then eventree( FA-2 )=TRUE(IE-FA-2-EB-01 ); endif
if FA-2-EB-02 then eventree( FA-2 )=TRUE(IE-FA-2-EB-02 ); endif
if FA-2-EB-11 then eventree( FA-2 )=TRUE(IE-FA-2-EB-11 ); endif
if FA-2-EB-12 then eventree( FA-2 )=TRUE(IE-FA-2-EB-12 ); endif
if FA-2-EB-21 then eventree( FA-2 )=TRUE(IE-FA-2-EB-21 ); endif
if FA-2-EB-23 then eventree( FA-2 )=TRUE(IE-FA-2-EB-23 ); endif
if FA-2-EB-24 then eventree( FA-2 )=TRUE(IE-FA-2-EB-24 ); endif
if FA-2-ED-06 then eventree( FA-2 )=TRUE(IE-FA-2-ED-06 ); endif
if FA-2-ED-07 then eventree( FA-2 )=TRUE(IE-FA-2-ED-07 ); endif
if FA-2-ED-08 then eventree( FA-2 )=TRUE(IE-FA-2-ED-08 ); endif
if FA-2-ED-09 then eventree( FA-2 )=TRUE(IE-FA-2-ED-09 ); endif
if FA-2-ED-10 then
      eventree( FA-2 )=TRUE(IE-FA-2-ED-10 );
      eventree(FA-2)=FALSE(HSE-NOTFA2-ED-10);
      endif
if FA-2-ED-11 then eventree( FA-2 )=TRUE(IE-FA-2-ED-11 ); endif
if FA-2-ED-15 then eventree( FA-2 )=TRUE(IE-FA-2-ED-15 ); endif
if FA-2-ED-16 then eventree( FA-2 )=TRUE(IE-FA-2-ED-16 ); endif
if FA-2-ED-17 then eventree( FA-2 )=TRUE(IE-FA-2-ED-17 ); endif
if FA-2-ED-18 then eventree( FA-2 )=TRUE(IE-FA-2-ED-18 ); endif
if FA-2-ED-20 then
      eventree( FA-2 )=TRUE(IE-FA-2-ED-20 );
      eventree (FA-2) = FALSE(HSE-NOTFA2-ED-20);
endif
if FA-2-ED-21 then eventree( FA-2 )=TRUE(IE-FA-2-ED-21 ); endif
if FA-2-EJ-14A then eventree( FA-2 )=TRUE(IE-FA-2-EJ-14A ); endif
if FA-2-EJ-542 then eventree( FA-2 )=TRUE(IE-FA-2-EJ-542 ); endif
if FA-2-EJ-543 then eventree( FA-2 )=TRUE(IE-FA-2-EJ-543 ); endif
if FA-2-EJ-575 then eventree( FA-2 )=TRUE(IE-FA-2-EJ-575 ); endif
if FA-2-EJ-576 then eventree( FA-2 )=TRUE(IE-FA-2-EJ-576 ); endif
if FA-2-EY-01 then eventree( FA-2 )=TRUE(IE-FA-2-EY-01 ); endif
if FA-2-EY-10 then eventree( FA-2 )=TRUE(IE-FA-2-EY-10 ); endif
if FA-2-EY-20 then eventree( FA-2 )=TRUE(IE-FA-2-EY-20 ); endif
if FA-2-EY-30 then eventree( FA-2 )=TRUE(IE-FA-2-EY-30 ); endif
if FA-2-EY-40 then eventree( FA-2 )=TRUE(IE-FA-2-EY-40 ); endif
if FA-2-EY-50 then eventree( FA-2 )=TRUE(IE-FA-2-EY-50 ); endif
```

Table 4.3

Rules for Fire Area 3

```
if FA-3 then
      eventree(FIRE-CS)=FALSE(HSE-NOTFA3);
endif
if /FA-3 then
      eventree(FIRE)=FALSE(HSE-NOTFA3);
endif

if FA-3-EA-12 then eventree( FA-3 )=TRUE(IE-FA-3-EA-12 ); endif
if FA-3-EB-22 then eventree( FA-3 )=TRUE(IE-FA-3-EB-22 ); endif
if FA-3-EC-181 then eventree( FA-3 )=TRUE(IE-FA-3-EC-181 ); endif
if FA-3-EC-187 then eventree( FA-3 )=TRUE(IE-FA-3-EC-187 ); endif
if FA-3-EJ-1005 then eventree( FA-3 )=TRUE(IE-FA-3-EJ-1005 ); endif
if FA-3-EJ-1006 then eventree( FA-3 )=TRUE(IE-FA-3-EJ-1006 ); endif
if FA-3-EJ-1051 then eventree( FA-3 )=TRUE(IE-FA-3-EJ-1051 ); endif
if FA-3-EJ-1052 then eventree( FA-3 )=TRUE(IE-FA-3-EJ-1052 ); endif
if FA-3-EJ-9401 then eventree( FA-3 )=TRUE(IE-FA-3-EJ-9401 ); endif
```

Table 4.4

Rules for Fire Area 4

```
if FA-4 then eventree(FA-4) = TRUE(IE-FA-4);endif
if FA-4 then
      eventree(FIRE-CS)=FALSE(HSE-NOTFA4);
endif
if /FA-4 then
      eventree(FIRE)=FALSE(HSE-NOTFA4);
endif
if FA-4-EA-11 then eventree( FA-4 )=TRUE(IE-FA-4-EA-11 ); endif
if FA-4-ED-11A then eventree( FA-4 )=TRUE(IE-FA-4-ED-11A ); endif
if FA-4-EJ-9400 then eventree( FA-4 )=TRUE(IE-FA-4-EJ-9400 ); endif
```

Table 4.5

Rules for Fire Area 13

```
if FA-13-13A1 then
      eventree( FA-13 )=TRUE(IE-FA-13-13A1 );
      eventree(FA-13) = FALSE (HSE-NOTFA13A);
endif
if FA-13-13A2 then
      eventree( FA-13 )=TRUE(IE-FA-13-13A2 );
      eventree(FA-13) = FALSE (HSE-NOTFA13A);
endif
if FA-13-13B then eventree( FA-13 )=TRUE(IE-FA-13-13B ); endif
if FA-13-13C then eventree( FA-13 )=TRUE(IE-FA-13-13C ); endif
```

Table 4.6

Rules for Fire Area 23

```
if FA-23-23E then
      eventree( FA-23 ) =TRUE(IE-FA-23-23E );
      eventree (FA-23) = FALSE(HSE-NOTFA23);
      eventree (FA-23) = FALSE(HSE-NOTFA23ES);
endif
if FA-23-23S then
      eventree( FA-23 )=TRUE(IE-FA-23-23S );
      eventree (FA-23) = FALSE(HSE-NOTFA23);
      eventree (FA-23) = FALSE(HSE-NOTFA23ES);
endif
if FA-23-23W then
      eventree( FA-23 )=TRUE(IE-FA-23-23W );
      eventree (FA-23) = FALSE(HSE-NOTFA23);
endif
```

Table 4.7

Rules for Transfers to Control Room Fire Event Tree

```
| Set motor driven AFW pumps and auto start of P8B to failure
if 2HP then
|2HP = AFW-CST;
eventree(FIRE-CR)=TRUE(A-PMMG-P-8A);
eventree(FIRE-CR)=TRUE(A-PMME-P-8A);
eventree(FIRE-CR)=TRUE(A-PMMG-P-8C);
eventree(FIRE-CR)=TRUE(A-PMME-P-8C);
eventree(FIRE-CR)=TRUE(A-REMB-62-2P8B);
endif

if /2HP then
eventree(FIRE-CR)=TRUE(A-PMMG-P-8A);
eventree(FIRE-CR)=TRUE(A-PMME-P-8A);
eventree(FIRE-CR)=TRUE(A-PMMG-P-8C);
eventree(FIRE-CR)=TRUE(A-PMME-P-8C);
eventree(FIRE-CR)=TRUE(A-REMB-62-2P8B);
endif
```

Table 4.8

Rules for Transfers to Cable Spreading Room, Bus 1C and Bus 1D Fire Event Tree

```
| Set motor driven AFW pumps and P8B auto start to failure
if 2HP then
eventree(FIRE-CS)=TRUE(A-PMMG-P-8A);
eventree(FIRE-CS)=TRUE(A-PMMG-P-8C);
eventree(FIRE-CS)=TRUE(A-REMB-62-2P8B);
endif

if /2HP then
eventree(FIRE-CS)=TRUE(A-PMMG-P-8A);
eventree(FIRE-CS)=TRUE(A-PMMG-P-8C);
eventree(FIRE-CS)=TRUE(A-REMB-62-2P8B);
endif
```

Table 4.9

Rules for Aux Building and Turbine Building Fires

None

Table 4.10

Rules for Transfers to ATWS Event Tree

```
|Define Success Boundary Conditions
|
if /TTF then
/MTC = MTC-TTRIP;
MTC = MTC-TTRIP;
endif
|
|Define Failure Boundary Conditions
|
if TTF then
/MTC = MTC-NOTTRIP;
MTC = MTC-NOTTRIP;
endif
if RXC-ELEC-FAULTS then
/MTC = MTC-NOTTRIP;
MTC = MTC-NOTTRIP;
endif
```

Documentation of HEP (AFW-AVOA-AFWSTEAM) Updated for Consideration During Fire Events.

Section	Description
5.1	Discussion of review and revision of inputs to the HRA Calculator considering performance during a fire.
5.2	Discussion of Sensitivity Analysis Performed to Evaluate the Impact of the Availability of Additional Time and Recovery Considerations.
5.3	Conclusions
5.4	Output of the HRA Calculator after Corrections for Use in the Fire Analysis.

5.1 Discussion of review and revision of inputs to the HRA Calculator considering performance during a fire.

This Attachment documents the update to the HEP development for the Operator action to locally control pump P-8B via local operation of the steam admission valve per the procedure guidance in EOP Supplement 19 (Alternate Auxiliary Feedwater Methods) section 4 (P-8B NORMAL STEAM SUPPLY FROM 'A' S/G. The HEP development was reviewed and revised based on consideration of performing the action during a fire.

Changes from the internal events version include;

1) Identification of ONP-25.1 and ONP-25.2 as the fire response procedures and the procedures which direct the use of EOP Supplement 19. These impacts the time at which the action would be directed.

2) Cognitive element for 'Availability of information' (pca) was modified to reflect potential inaccuracy of control room indication,

3) The cues required by the cognitive work for this action were redefined based on the guidance implemented in the relevant fire scenarios,

4) Performance shaping factors for environment 'Heat/Humidity' and 'Atmosphere' were modified to account for the potential of additional heat and smoke to increase the stress impact on the HEP, and

5) Recovery factors were reduced to reflect the dependence levels recommended by the HRA Calculator (HRAC).

5.1.1 Execution Stress Factors

The original HEP development for use in the full power internal events model was the basis for this review and update to generate an HEP for performing this action during a fire. A review of the current development determined that the action as developed was predicated on performing the action in response to a Station Blackout (SBO) event. Consequently the performance shaping factors for execution stress and lighting were already set to "HIGH" stress and "Emergency" was selected for lighting. The other performance shaping factors were reviewed. Heat/Humidity was changed to Hot/Humid and the atmosphere was changed to Smoke.

The radiation stress factor was left unchanged as the area where the action takes place is in the AFW pump room and the surrounding area in the turbine building. The use of the Hot/Humid and Smoke settings if applied independently would be conservative. However, given the prior determination that emergency lighting was required, already precluded the use of 'optimal' stress and the application of additional stress factors do not further alter the stress factor going forward. Therefore the application of the additional factors does not incur any additional negative impact and the application is considered neutral with respect to conservatism in the analysis.

5.1.2 Recovery Considerations

The current full power internal events (FPIE) HEP did not credit recovery actions for the cognitive elements. In this calculation recovery via self checking was credited for cognitive errors for 'Availability of information' (pca) and 'Skip a step in procedure' (pce). In addition, recovery by the

Shift Engineer (STA in HRAC) was credited for 'Availability of information' (pca) and Misinterpret decision logic (pcg). The FPIE analysis included consideration of recovery for execution steps but assigned HIGH or COMPLETE dependence to these recovery actions. For this analysis, given the time available as discussed below, these dependency assignments were reduced to LOW dependence. Low is the recommended value of the HRA Calculator for the given inputs.

This action is included in training and is covered by an Operations Job Performance Measure (JPM). The JPM instructs the operator that he is to take local control of the turbine-driven pump (P-8B) as directed in EOP Supplement 19 [21]. This procedural guidance includes a step to verify that the turbine is latched and if NOT to reset the turbine (re-latch the trip lever) to allow local operation of the pump.

The operator being observed is prompted that the steam admission valve is closed to assess his actions to restore pump operation by locally opening the valve which would include verifying the turbine is latched and resetting if not. The JPM requires the actions to establish local control be completed within ten minutes for acceptable performance. The JPM was also included in the 2009 Initial License Exam and allowed fifteen minutes to complete the actions. Fifteen minutes were used as the execution time in this analysis.

This action is specifically directed to be accomplished in the Off Normal procedures that govern response to fires. For areas determined by the Appendix R analysis to be areas in which all Auxiliary Feedwater may be impacted by the fire, the operator is directed to implement EOP Supplement 19.

The Off Normal procedures also specify that AFW flow be established within twenty five minutes. Therefore it is considered that during response to a fire there would be no ambiguity in taking prompt action to implement the EOP Supplement and establish local control of the pump. This analysis assumes ten minutes as a delay time to determine that AFW did not automatically start and attempt manual start of the pumps from the control room.

Currently the time available to complete actions related to the restoration to the recovery of AFW should the system fail on demand is limited to the time at which the steam generator level(s) lower to -84%. At this point the operators are directed to initiate once through cooling (PCS feed and bleed) if available.

The recent updates to the thermal hydraulic analyses [11] were considered in this update. The updated station blackout results show that the time to -84% is 84 minutes (1.4 hours), which is the time interval used in this analysis. The original analysis used an available time of 45 minutes and limited credit for recovery of the cognitive response.

Using these inputs the calculated HEP is 5.9E-03. The output of the HRA Calculator is shown in section 5.3.

5.2 Discussion of Sensitivity Analysis Performed to Evaluate the Impact of the Availability of Additional Time and Recovery Considerations.

The consideration of additional time for recovery of AFW if once through cooling (OTC) fails allows the system window to be extended to two hours. The extra time allows more opportunity for cognitive recovery and reduction of the dependency assigned to execution errors. In this sensitivity case the additional time allows the dependence factors for execution recovery to be lowered to zero dependence. The new result would be a reduction of the HEP to 1.7E-03. Given the time available, the emergency response organization would be in place and functioning.

Allowing credit for ERF review for both 'Failure of attention' (pcb) and 'Skip a step in a procedure' (pce) would further reduce the HEP to 8.6E-4.

5.3 Use of the HEP in the quantification of risk significance.

This HFE was already included in the external events model used to quantify the impacts related to fire. In order to appropriately use the HEP to represent the assumed condition that P-8B would be failed at the time of an event due to the presence of grease; the HEP was combined with the probability of pump fail to run. This HEP was incorporated into the model by using the pump failure to run event as a surrogate.

Recognizing that the HEP is only applicable to a specific cause of pump failure to run, the HEP developed was combined with the existing probability of pump fail to run. This retains the risk associated with the probability of pump fail to run for other reasons. It also represents the implied assumption of pump failure. The pump failure to run probability used in the fire model is 1.75E-03. The combined probability used as the surrogate probability is the current assigned probability of pump fail to run (1.75E-03) + the probability of pump fail to run (1.0) for the specific condition (grease) * the probability of failure to recover pump operation (1.2E-02) = 1.38E-02 (1.75E-03 + 1.0 * 1.2E-02).

Clearly the change in risk will be dominated by the developed human error probability (HEP) for failure to recover pump operation under the assumption the pump failure was guaranteed (1.0). Given the current premise that the application of grease was only a contributing factor and not sufficient to cause pump failure, then another (at least one) as yet not identified condition was required to result in pump failure. This other condition, if not pre-existing (currently appears to be the case) then represents a random contribution to the probability of pump fail to run (i.e. pump failure to run is not 1.0 but is some probability between 1.0 and the current probability of pump fail to run).

The unknown issue in the risk characterization is how much the presence of grease represents as a contributing factor to the probability (1.75E-03) of failure to run. If the application of grease is a contributing cause, then it is one of two or more factors that are required to be combined to determine the probability the pump would fail. If the probability of inappropriate application of grease had a value of 1.0E-02 as a random event, then another contributing factor with a probability of 1.75E-01 would be necessary for pump failure to run as a result of the existence of grease.

Therefore, if the presence of grease is a contributing cause and NOT a SINGULAR root cause then probability of pump failure would still retain an elevated random probability of failure. Using this example the development of the surrogate probability, given the premise, would be (1.75E-03 + 1.75E-01 * 1.2E-02) = 3.85E-03 (slightly more than a factor of two increase over the probability of failure to run and less likely to result in a significant change in risk).

This analysis was completed assuming pump P-8B would fail given a demand. The risk change is characterized by the risk of failure to implement the recovery without considering the probability that recovery is required.

5.3 Conclusions.

The conclusion after considering the results of the baseline fire HEP quantification and the sensitivity analyses are that the HEP applied in the SDP analysis (1.2E-02) is conservative.

5.4 Output of the HRA Calculator after Corrections for Use in the Fire Analysis.

The HRA Calculator output is shown below.

AFW-AVOA-AFWSTEAM, OP FAILS TO OPERATE P-8B LOCALLY DURING A FIRE (HEP)

Basic Event Summary

Analyst:	LMK (Updated by FJY)
Rev. Date:	09/20/11
Reviewer:	
Cognitive Method:	CBDTM/THERP
Analysis Database:	Palisades Post-Init HRA Database Rev 00.HRA (09/20/11, 5767168 Bytes)

Table 1: AFW-AVOA-AFWSTEAM SUMMARY

Analysis Results:	**without Recovery**	**with Recovery**
P_{cog}	6.0e-03	6.0e-04
P_{exe}	9.0e-02	5.3e-03
Total HEP		5.9e-03
Error Factor		5

Assigned Basic Events:

Related Human Interactions:
AFW-PMOE-PPMAN, OPERATOR FAILS TO START AN AFW PUMP FROM THE CONTROL ROOM
AFW-AVOA-AFWFLADJ, OPERATOR FAILS TO INCREASE AFW FLOW IN THE AVAILABLE SG PATH
AFW-AVOA-THROT-FCV, OPERATOR FAILS TO THROTTLE AFW FCV'S GIVEN LOSS OF PNUEMATICS

Initial Cue:
Action Specifically directed in fire areas in which all AFW pumps were determined to be unavailable due to fire.

Recovery Cue:
Low Steam Generator Level

Cue:
Fire Alarm - Fire System Flow Scheme EK28 on panel EC-47
SG level decreasing
AFW Pump status
No AF flow to S/G
AFAS (AFAS at 30% NR - EK-1601-05, AFAS ACTUATION CHNL TRIP)

EOP-1.0 (STANDARD POST TRIP ACTIONS) Attachment 1 EVENT DIAGNOSTIC FLOW CHART - The action to start the AFW pump is taken in EOP-1.0. The result is then verified during Attachment 1 performance prior to selecting the next appropriate EOP. Additional subsequent recovery steps are provided in EOP-7.0 (if no SBO) or EOP-9.0 (if an SBO is in progress.)

Degree of Clarity of Cues & Indications:
Very Good

Procedures:
Cognitive: ONP-25.1 (FIRE WHICH THREATENS SAFETY RELATED EQUIPMENT) Revision: 19
Execution: EOP SUPPL 19 (ALTERNATE AUX FEEDWATER METHODS) Revision: 9
Other: EOP-7.0 (LOSS OF ALL FEEDWATER RECOVERY) Revision: 13

Cognitive Procedure:
Step: Per Fire Area Attachment
Instruction: Operate P-8B

Procedure Notes:
Given a fire is the initiating event; the operators would also be implementing Off Normal Procedure ONP-25.1 and ONP-25.2 (if required). For fire areas in which it was determined that all AFW pumps are not initially available the guidance in the ONPs specifically directs the operators to operate P-8B using EOP Supplement 19. Procedure ONP-25.1 in the attachment for each fire area includes a status check of 'Decay Heat Removal - Mode 3'. For fire areas in which the defined system status is 'all AFW pumps not initially available' the operators are direct to operate pump P-8B using the guidance of EOP Supplement 19.

NOTE: In parallel the operators would also be implementing applicable emergency operating procedures (EOPs).

EOP-1.0 Step 4.8 has the operator verify feedwater flow available to the S/Gs, and directs "ensuring" that there is at least 165 gpm to one S/G. If this flow rate is not met, EOP-7.0, (LOSS OF ALL FEEDWATER RECOVERY), would be entered or EOP-9.0 (FUNCTIONAL RECOVERY PROCEDURE) if a Station Blackout is also present. EOP-7.0 and EOP-9.0 both direct EOP Supplement 19 performance.

EOP-1.0 step 4.4.a.1) directs verification that buses 1C and 1D are energized. If a SBO also exists, these criteria are not met and EOP-1.0 Attachment 1 directs transition to EOP-9.0. Actions are delayed significantly if an SBO occurs coincidentally with another event (e.g. LOAF, SGTR, etc.) because of the transition to EOP-9.0 and the expectation/requirement that electrical problems be addressed before or along with lower hierarchy safety functions.

The following procedures also provide direction to use EOP Supplement 19 to operate P-8B.

EOP-3.0 STATION BLACKOUT RECOVERY
EOP-7.0 LOSS OF ALL FEEDWATER RECOVERY
EOP-9.0 FUNCTIONAL RECOVERY PROCEDURE HR-1, HR-2, HR-3

Training:
Classroom, Frequency: 0.5 per year
Simulator, Frequency: 0.5 per year

JPM Procedure:
PL-OPS-ONP-010J (START AFW PUMP P-8B LOCALLY USING CV-0522B) Revision: 3

Identification and Definition:
1. Initial Conditions: Steady state, full power operations

2. Initiating Event: Transient

3. Accident Sequence (preceding functional failures and successes):

Reactor successfully tripped.

PCPs trip.

AF fails to start.

TD AFW pump steam inlet valve (CV-0522B) fails to open due to loss of air supply [Backup N2 Station #2 is always valved in and available to supply CV-0522B's operator in the event of a loss of air. The dominant contributor to CV-0522B failure is from SBO. The remainder is an assortment of transient events dominated by controlled shutdown, transient with main condenser available, and loss of bus 1D.]

AFW flow control valves for P-8B have been verified closed.

"A" Steam Generator steam and feed paths to both Steam Generators are available.

Flow to "A" Steam generator cannot be maintained from the control room, or C-150, or C-33.

Subsequent failure to recover offsite power prior to steam generator level reaching the OTC setpoint is considered.

4. Preceding operator errors or successes in sequence: No operator errors or additional successes noted.

5. Operator action success criterion: Success is initiating or restoring AFW flow prior to the time at which once through cooling (OTC) is directed (steam generator level at -84%.

6. Consequences of failure: Initiation of once through cooling is currently assumed to preclude further action to recover AFW due to loss of natural circulation even though additional recovery may be available. Owners Group guidance exists to allow recovery from OTC and restore heat removal via steam generator when a feedwater is available.

Key Assumptions:

Operator Interview Insights:
For SBO conditions, there is insufficient time to complete this action prior to reaching the OTC setpoint as discussed in the Timing section. Actions are delayed significantly if an SBO occurs coincidentally with another event (e.g. LOAF, SGTR, etc.) because of the transition to EOP-9.0 and the expectation/requirement that electrical problems be addressed before or along with lower hierarchy safety functions.

A ladder is needed to access CV-0552B.

Manpower Requirements:

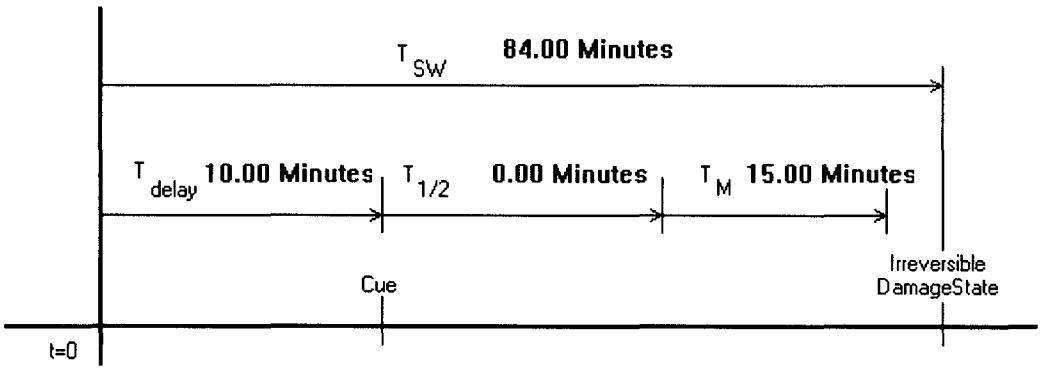
Operations:	Shift Manager	1	0
	Shift Supervisor:	1	1
	STA:	1	1
	Reactor operators:	2	1
	Plant operators:	4	1
Maintenance:	Mechanics:	0	0
	Electricians:	0	0
	I&C Technicians:	0	0
Health Physics:	Technicians:	1	0
Chemistry:	Technicians:	1	0

Execution Performance Shaping Factors:

Environment:	Lighting	Emergency
	Heat/Humidity	Normal
	Radiation	Background
	Atmosphere	Normal
Special Requirements:	Tools	Required
		Adequate
		Available
Complexity of Response:	Cognitive	Simple
	Execution	Simple
Equipment Accessibility:	Control Room	Accessible
	Turbine Building 590' near FW Heater E-4A and Aux Feed Pump Room, Turbine Building 570'	Accessible
Stress:	**High**	
	Plant Response As Expected:	Yes
	Workload:	High
	Performance Shaping Factors:	Negative

Performance Shaping Factor Notes:
Because the scenario for this action involves local actions taken during a fire, workload is considered high and the PSFs are less than optimal. A ladder is needed to access CV-0552B.

Timing:



Timing Analysis:

The system window is based on the time available prior to reaching -84% steam generator level under station blackout conditions. At this time, operators are directed to initiate once through cooling (OTC). Once OTC is initiated, the current model assumes that decay heat removal via steam generators is no longer available as a result of the loss of natural circulation cooling via the steam generators.

MAAP case SBO-002-Base indicates that the steam generator level lower to -84% in 1.4 hours (84 minutes). MAAP case SBO-002-Rec indicates that with recovery of heat removal at three hours core damage does not occur and EA-PSA-SBO01-MAAP indicates that with recovery of heat removal at 2.5 hours core damage does not occur. The MAAP case EA-PSA-SBO01-MAAP times are documented in EA-PSA-PSAR2c-06-10, Appendix D. MAAP cases SBO-002-Base and SBO-002-Rec are documented in the current PSA Thermal Hydraulics Notebook, revision 2, dated 10/20/2009, Appendix A.

Given a fire event the operators would enter ONP-25.1 concurrently with EOP 1.0. For those fire areas where the potential exists for a fire to result in all AFW pumps not initially available the operators are directed to 'Operate P-8B' by implementing EOP Supplement 19. The off normal procedure guidance requires assuring AFW operation by 25 minutes. The step that requires the establishment of heat removal via AFW in natural circulation is a continuous procedure step that is required in all fire areas. The cue time is assumed to be 10 minutes to account for the time required to determine that the AFW pumps did not automatically start and to attempt manual start of the AFW pumps from the control room.

Training for the execution of these steps includes a job performance measure (JPM) which requires completion of the EOP Supplement 19 actions including re-latching the turbine in 15 minutes.

Time available for recovery: 59.00 Minutes

SPAR-H Available time (cognitive): 59.00 Minutes

SPAR-H Available time (execution) ratio: 4.93

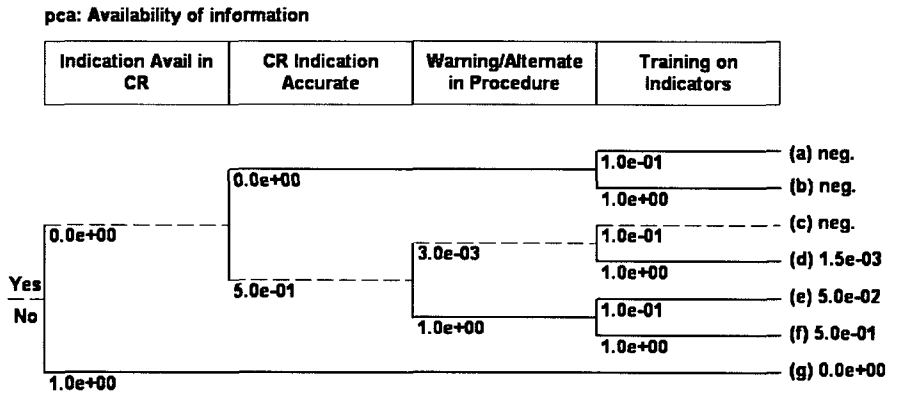
Minimum level of dependence for recovery: LD

Cognitive Unrecovered

AFW-AVOA-AFWSTEAM

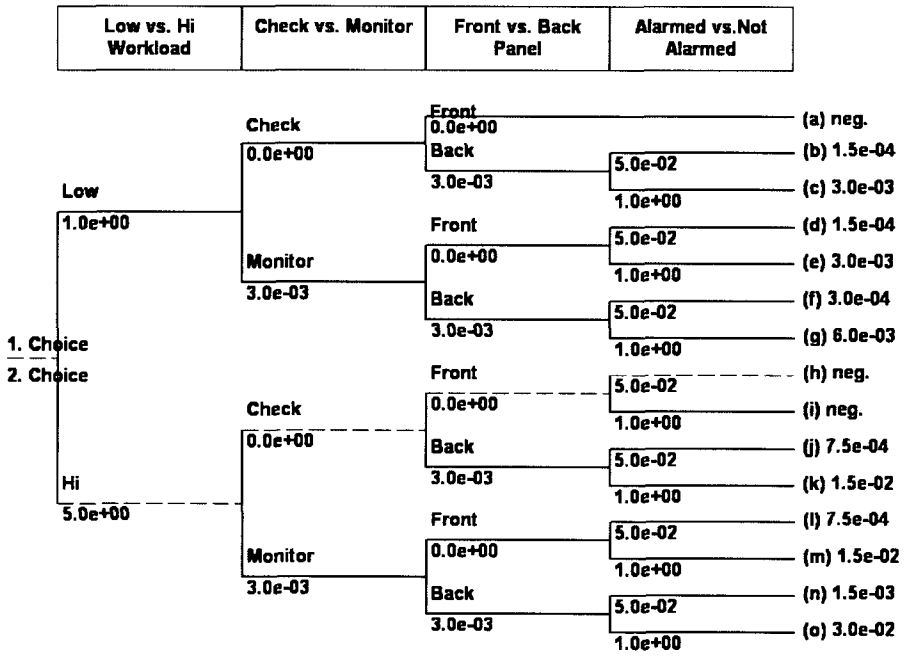
Table 2: AFW-AVOA-AFWSTEAM COGNITIVE UNRECOVERED

Pc Failure Mechanism	Branch	HEP
Pc_a: Availability of Information	c	neg.
Pc_b: Failure of Attention	h	neg.
Pc_c: Misread/miscommunicate data	a	neg.
Pc_d: Information misleading	a	neg.
Pc_e: Skip a step in procedure	g	6.0e-03
Pc_f: Misinterpret instruction	a	neg.
Pc_g: Misinterpret decision logic	k	neg.
Pc_h: Deliberate violation	a	neg.
Sum of Pc_a through Pc_h = Initial Pc =		6.0e-03



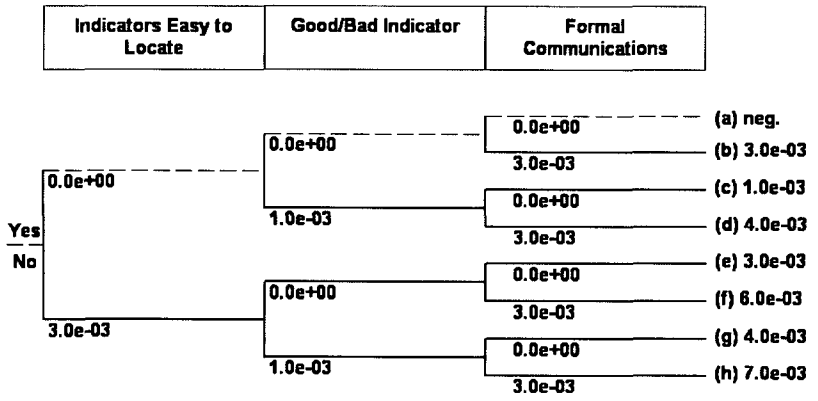
This action is directed based on the determination that a fire is occurring in specific areas (unlike the FPIE action, which is based on other process information). In the important fire areas in which all auxiliary feedwater is considered unavailable due to the fire, the operator is directed by the off normal procedure for fire response to operate P-8B per the guidance of the EOP Supplement (local operation). Indications if available in the control room are accurate. The operators are trained on all control room indications. While the action does not require instrumentation to make a cognitive decision, it is recognized that the fire effects can result in misinformation regarding the status of plant equipment. Therefore the evaluation of this cognitive failure mechanism assumes that the potential inaccuracy of information from instrumentation can negatively impact the performance of this action.

pcb: Failure of attention



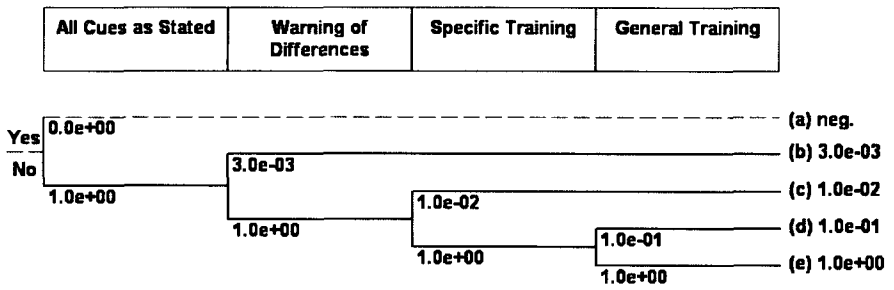
Work load is considered high in the initial response to a fire. This action is directed based on the presence of a fire in a given area, which is a 'check' condition. The fire indication is from a control room annunciator. There is a control room alarm associated with the fire annunciator.

pcc: Misread/miscommunicate data



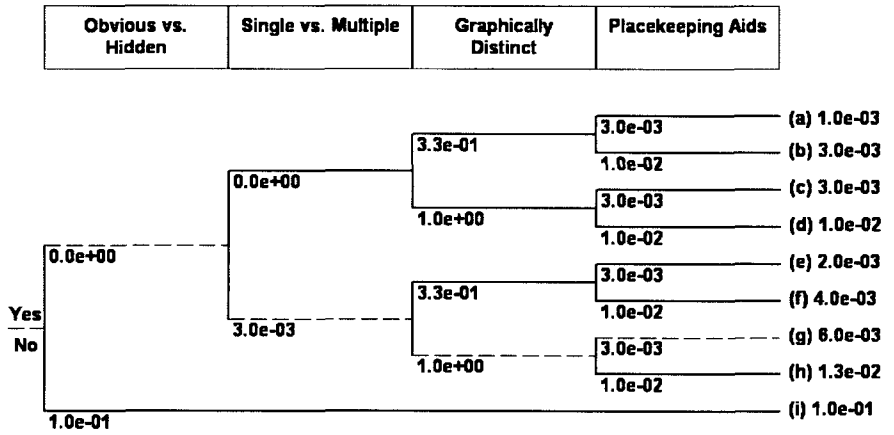
This is a procedurally directed action and control room indications beyond the fire alarm/indication are not required. However, the indications are easy to locate, they do not have human engineering deficiencies, and the operators practice formal three-way communications in the Palisades control room.
Loss of FW/AFW indications are easy to locate, they do not have human engineering deficiencies, and the operators practice formal 3-way communications in the Palisades control room.

pcd: Information misleading



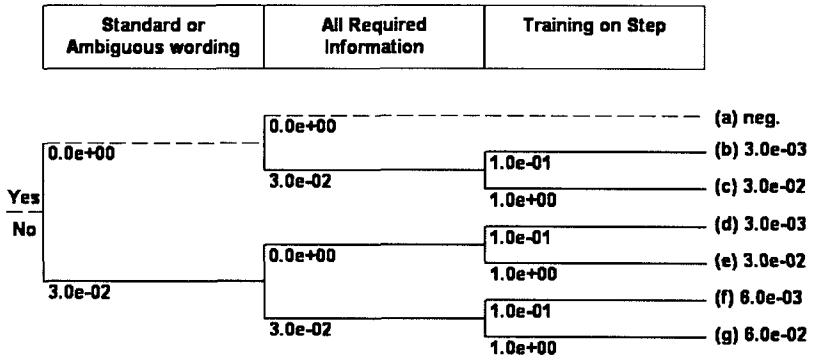
The cues associated with this action are all as stated (fire indication).

pce: Skip a step in procedure



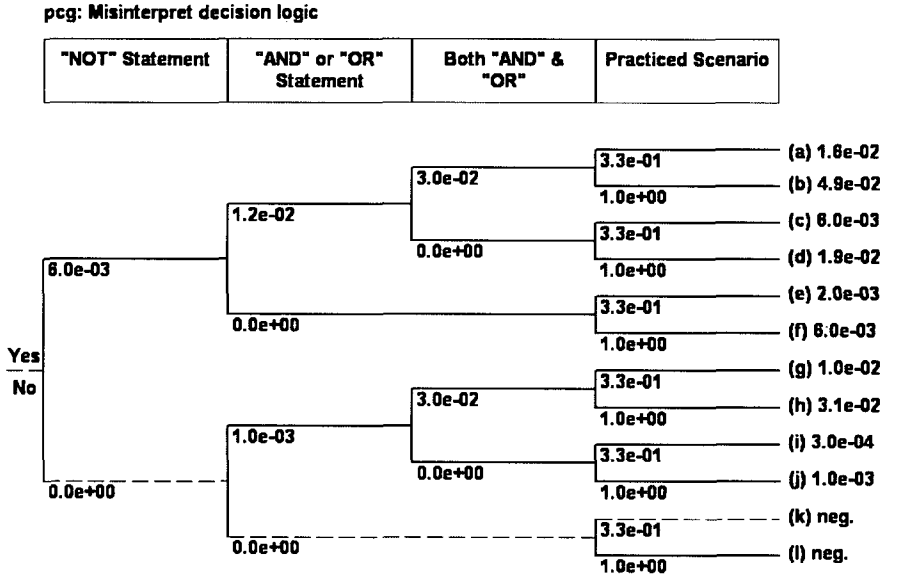
The steps directing the operators to implement EOP Supplement 19 to operate P-8B locally are not hidden in any way. The operators are directed to implement the EOP supplement while still implementing the off normal procedure for fire mitigation. The EOP Supplement is only used for implementing local operation of pump P-8B. All other activities are controlled by the fire off normal procedure (ONP) and applicable emergency operating procedures (EOPs). The associated procedure steps are not graphically distinct. The operators keep place during implementation of the EOPs and ONPs. Therefore this cognitive failure mechanism was left unchanged.

pcf: Misinterpret instruction



For fire response in important fire areas this is directed action. The operators are not provided with an option for diagnosis or determination of applicability of the action (except that there is a fire in the designated area). The applicable procedure steps use standard wording and the operators have all the procedural information they need to complete this action. Therefore this cognitive failure mechanism was left unchanged from the internal events HEP development.

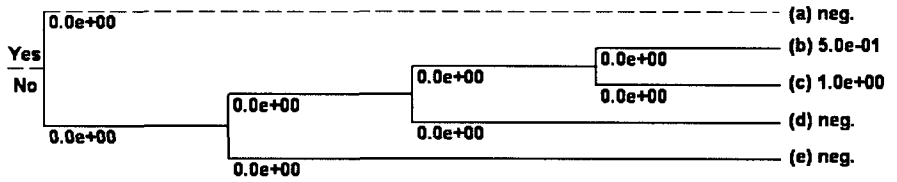
pcg: Misinterpret decision logic



There are no AND, or OR statements in the decision logic for this action. Contrary to the process path for the internal events response there is NO implied NOT statement. The negative contribution for the implied NOT statement in the internal events version of the HEP has been removed from the fire assessment.

pch: Deliberate violation

Belief in Adequacy of Instruction	Adverse Consequence if	Reasonable Alternatives	Policy of "Verbatim"



Based on operator interviews and ongoing discussions with operators, the Palisades operators believe in the adequacy of their instruction.

Cognitive Recovery

AFW-AVOA-AFWSTEAM

Table 3: AFW-AVOA-AFWSTEAM COGNITIVE RECOVERY

	Initial HEP	Self-Review	Extra Crew	STA Review	Shift Change	ERF Review	DF	Multiply HEP By	Override Value	Final Value
Pc_a:	neg.	-	-	-	-	-	-	1.0e+00		
Pc_b:	neg.	X	-	X	-	-	-	1.0e-02		
Pc_c:	neg.	-	-	-	-	-	-	1.0e+00		
Pc_d:	neg.	-	-	-	-	-	-	1.0e+00		
Pc_e:	6.0e-03	X	-	-	-	-	-	1.0e-01		6.0e-04
Pc_f:	neg.	-	-	-	-	-	-	1.0e+00		
Pc_g:	neg.	-	-	-	-	-	-	1.0e+00		
Pc_h:	neg.	-	-	-	-	-	-	1.0e+00		
								Sum of Pc_a through Pc_h = Initial Pc =		6.0e-04

Notes:

Execution Unrecovered

AFW-AVOA-AFWSTEAM

Table 4: AFW-AVOA-AFWSTEAM EXECUTION UNRECOVERED

Procedure: EOP SUPPL 19, ALTERNATE AUX FEEDWATER METHODS		Comment				Stress Factor	Over Ride
Step No.	Instruction/Comment	Error Type	THERP Table	THERP Item	HEP		
EOP Suppl 19, 4.2.a	CLOSE the following valves: MV-CA377, air supply to CV-0522B and MV-N2/268, nitrogen supply to CV-0522B	TB 590' level, near CV-0522B				5	
	--	EOM	20-7b	1	4.3E-4		
		EOC	20-13	1	1.3E-3		
		EOC	20-13	1	1.3E-3		
					Total Step HEP		1.5e-02
EOP Suppl 19, 4.2.b	MANUALLY CLOSE CV-0552B, K-8 Normal Steam Supply					5	
	--	EOM	20-7b	1	4.3E-4		
	Open MV-FW356, CV-0522B Bonnet Isolation.	EOC	20-13	1	1.3E-3		
	Unscrew the coupling from manual override shaft.	EOC	20-13	1	1.3E-3		
	Turn handwheel clockwise until the top of the actuator shaft is exposed sufficiently to engage the coupling.	EOC	20-13	1	1.3E-3		
	Insert the fork of the coupling all the way onto actuator shaft.	EOC	20-13	1	1.3E-3		
	Remove lockwire from MV-FW356, CV-0522B Bonnet Isolation.	EOC	20-13	1	1.3E-3		
					Total Step HEP		3.5e-02
EOP Suppl 19, 4.2.c	Check Turbine Driver K-8 is latched by verifying that the knife edge of the resetting lever is in contact with the hand trip lever.					5	
	--	EOM	20-7b	1	4.3E-4		
		EOC	20-13	1	1.3E-3		
					Total Step HEP		8.7e-03
EOP Supp 19, Step 4.2 d	OPEN MV-FW688, PI-0590 Root Valve	Downstream of CV-0522B, Turbine Building 590'				2	
	--	EOM	20-7b	1	4.3E-4		
	20-13 HEPs cover both selection and manipulation of local valves.	EOC	20-13	1	1.3E-3		
					Total Step HEP		3.5e-03
EOP Supp 19, step 4.2.e	SLOWLY THROTTLE OPEN CV-0552B to maintain between 200-250 psig steam pressure on any of the following PIs	Pressure Indication listed - PI-0590 (just downstream of CV-0552B), PI-0521A (CR Panel C-01), or PI-0521B (at the K-8 turbine inlet). USE OVERRIDE ...INSUFFICIENT TIME TO COMPLETE THE AFW-AVOA-AFWSTEAM ACTION.				5	
	--	EOM	20-7b	1	4.3E-4		
		EOC	20-13	1	1.3E-3		
	It is not known whether the local PI has limit marks.	EOC	20-11	4	3.8E-3		

						Total Step HEP	2.8e-02
EOP-7.0 PK step 8	Evaluate availability of S/G inventory replenishment methods - continuously applicable step	Additional subsequent recovery steps are provided in EOP-7.0 Safety Function Status Check (PCS Heat Removal) or in EOP-9.0 (if an SBO is in progress.)				5	
	--	EOM	20-7b	1	4.3E-4		
		EOC	20-11	2	1.3E-3		
						Total Step HEP	8.7e-03

Execution Recovery

AFW-AVOA-AFWSTEAM

Table 5: AFW-AVOA-AFWSTEAM EXECUTION RECOVERY

Critical Step No.	Recovery Step No.	Action	HEP (Crit)	HEP (Rec)	Dep.	Cond. HEP (Rec)	Total for Step
EOP Suppl 19, 4.2.a		**CLOSE the following valves: MV-CA377, air supply to CV-0522B and MV-N2/268, nitrogen supply to CV-0522B**	**1.5e-02**				**8.7e-04**
	EOP-7.0 PK step 8	Evaluate availability of S/G inventory replenishment methods - continuously applicable step		8.7e-03	LD	5.8e-02	
EOP Suppl 19, 4.2.b		**MANUALLY CLOSE CV-0552B, K-8 Normal Steam Supply**	**3.5e-02**				**2.0e-03**
	EOP-7.0 PK step 8	Evaluate availability of S/G inventory replenishment methods - continuously applicable step		8.7e-03	LD	5.8e-02	
EOP Suppl 19, 4.2.c		**Check Turbine Driver K-8 is latched by verifying that the knife edge of the resetting lever is in contact with the hand trip lever.**	**8.7e-03**				**5.1e-04**
	EOP-7.0 PK step 8	Evaluate availability of S/G inventory replenishment methods - continuously applicable step		8.7e-03	LD	5.8e-02	
EOP Supp 19, Step 4.2 d		**OPEN MV-FW688, PI-0590 Root Valve**	**3.5e-03**				**2.0e-04**
	EOP-7.0 PK step 8	Evaluate availability of S/G inventory replenishment methods - continuously applicable step		8.7e-03	LD	5.8e-02	
EOP Supp 19, step 4.2.e		**SLOWLY THROTTLE OPEN CV-0552B to maintain between 200-250 psig steam pressure on any of the following PIs**	**2.8e-02**				**1.6e-03**
	EOP-7.0 PK step 8	Evaluate availability of S/G inventory replenishment methods - continuously applicable step		8.7e-03	LD	5.8e-02	
		Total Unrecovered:	**9.0e-02**			**Total Recovered:**	**5.3e-03**

Attachment 6: PRA Model Updates Since the Individual Plant Evaluation (IPE)				
Palisades Model (date)	Truncation	CDF/yr	Reference	Hi Level Change Summary
IPE (1993)	1.0E-9	5.07E-05	Palisades IPE (R-0481)[c]	
PSAR1 (1999)	1.0E-9	5.95E-05[a]	EA-PSA-SAPH-99-18 (R-0843)	Switchyard modifications to reduce potential for plant centered loss of offsite power Moved the internal events CDF model from SETS to SAPHIRE.
PSAR1a (2000)	1.0E-9	5.47E-05[a]	EA-PSA-SAPH-00-0011 (R-0479)	The AFW alternate steam supply line to AFW pump P-8B was removed from the model as a result of a plant modification. Updated selected Main Steam Line Break initiating event data as well as the SGTR initiating event value. Selected human error probabilities (HEPs) were updated.

Attachment 6: PRA Model Updates Since the Individual Plant Evaluation (IPE)				
Palisades Model (date)	Truncation	CDF/yr	Reference	Hi Level Change Summary
PSAR1b (2000)	1.0E-9	6.18E-05[a]	EA-PSA-PSAR1B-00-22 (R-0472)	Selected common cause failure logic for control and solenoid valves was updated. A plant modification that swapped High Pressure Air power supplies from MCC-7 to MCC-8 was incorporated. Open circuit bus faults were added to the DC system logic. The summertime EDG HVAC success criteria was set to True for all nominal baseline calculations. The independent ATWS event trees were eliminated. Transfers from all event trees to a single ATWS event tree was created, taking advantage of SAPHIRE's event tree linking options. DC power demand logic was added.
PSAR1b-Modified (2001)	1.0E-9	6.16E-05[a]	EA-PSA-PSAR1B-01-12 (R-0835)	Corrected a conservative Shutdown Cooling Heat Exchanger modeling assumption. Revision of ISLOCA model including realistic low pressure piping capacity.
PSAR1b-Modified w/HELB (2002)	1.0E-9	6.24E-05[b]	EA-PSA-CCW-HELB-02-17 (R-1452)	The model was updated to account for main steam line breaks into the CCW room(s). Steam/feedwater line breaks in the CCW rooms with door 167 or door 167B to CCW room 123 open were included. A new initiating event (IE-MSLB-D-CCW) was created to represent the steam lines downstream of the MSIVs but in the CCW room as separate from remaining lines in the turbine building.

Attachment 6: PRA Model Updates Since the Individual Plant Evaluation (IPE)

Palisades Model (date)	Truncation	CDF/yr	Reference	Hi Level Change Summary
PSAR1c (SAMA; 2004)	1.0E-9	4.05E-05[b]	EA-PSA-PSAR1C-01-003 (R-0703)	Diesel generator repair/recovery logic corrected. PCP seal LOCA model added. The Recirculation Actuation System plant modification was incorporated. HEP dependency modeling was explicitly included. Removed modeling conservatism in the critical SW header valve logic. FPS makeup to P-8C was updated to include tank T-2 failure. Traveling screen logic under FPS was updated. The auto MSIV close logic 'CHP' and 'low SG pressure' were correlated to the correct initiating event categories. Spurious bypass valve opening was added to both single and double steam generator blow down models. The gland seal condenser or air ejector after condenser rupture logic was updated. EQ logic was added to CCW pumps P-52A, P-52B and P-52C. DC bus D11-2 logic was corrected. Diversion path failure modes were added to selected air/N2 sources. Inadvertent PCS safety relief valve opening was added to the model. Failure of the AFW flow control valves to close was added to the system logic. The plant instrument air compressor modification was added to the model. The common cause data were updated.

Attachment 6: PRA Model Updates Since the Individual Plant Evaluation (IPE)				
Palisades Model (date)	Truncation	CDF/yr	Reference	Hi Level Change Summary
PSAR2 (2004)	1.0E-9	4.65E-05[a]	EA-PSA-PSAR2-04-02 (R-1710)	Updated turbine driven AFW pump failure data. Addressed CST flow diversion. Updated Initiating Event data. Updated spurious actuation of MSIV model. Updated of RPS and MTC data. Re-assess the HEP stress evaluation in context of the accident sequences being recovered. Reassessed the Load Shed logic.
PSAR2a (2006)	1.0E-9	4.49E-05[a]	EA-PSA-PSAR2a-05-18 (R-1822)	Added SW containment isolation valves to the SW fault tree to support MSPI. Added additional logic for leg injection (HLI) to support MSPI. Added logic for various equipment recoveries during loss of offsite power events to remove over-conservatism. Modified EDG load/run failures to support MSPI. Added instrument air dryer bypass to remove conservatism in EOOS model. Improved fidelity for AFW model logic. Improved fidelity for diesel start model logic. Added control circuit contact pairs to support MSPI. Added human error modeling to support logic additions above. Added new failure rate and probability models to support the logic additions above.

Attachment 6: PRA Model Updates Since the Individual Plant Evaluation (IPE)				
Palisades Model (date)	Truncation	CDF/yr	Reference	Hi Level Change Summary
PSAR2b (2006)	1.0E-9	4.36E-05[a]	EA-PSA-PSAR2b-06-07 (R-1823)	Added control room and C33 panel hand switches to support MSPI. Added CV-3001 and CV-3002 inline circuit scheme fuses for model improvement. Added new failure rate and probability models to support the logic additions above.
PSAR2c (2006)	1.0E-9	2.49E-05[a]	EA-PSA-PSAR2c-06-10 (R-1706)	Added logic for the non-safety related diesel logic. Addition of time phased offsite power recovery during SBO. Separated the load/run and run logic in the LOOP event tree to better characterize failures. Added operator action for diesel fuel oil recovery to address the proceduralized recovery of fuel oil to T-25A and B. Added bypass regulator model to address AFW low suction pressure trip failure given station battery discharge at 4 hours. Added plant modification automating switchover to RAS. Added credit for containment backpressure for providing HPSI NPSH to reduce conservatism. Added human error modeling to support logic additions above. Added new failure rate and probability models to support the logic additions above. Addition of sump strainer blockage.

Attachment 6: PRA Model Updates Since the Individual Plant Evaluation (IPE)

Palisades Model (date)	Truncation	CDF/yr	Reference	Hi Level Change Summary

a. subsumed cutset solution
b. non-subsumed cutset solution
c. "R-" is an internal reference label

Table 7.1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS								Ref [5] Analysis Using IPEEE Cabinets for FA-1 and FA-2			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B (using updated P-8B Fail to start and fail to run random failure data)				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class IA	Class IB	Class II	Total CDF/yr	IPEEE Total CDF/yr	Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure Fire CDF/yr	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure Fire CDF/yr	Cabinet + Exposure Fire CDF/yr
1[5]	Control Room	Cabinet Fire 9.50E-3 Exp. Fire 2.43E-3	5.93E-7 4.33E-6	7.12E-7 2.46E-6	N/A N/A	1.30E-6 6.79E-6	8.10E-06	EC-03R	8.13E-07	2.59E-06	FA-1	EC-13L	3.52E-05	3.38E-07	3.55E-05
2[5]	Cable Spreading Room	Cabinet Fire 3.20E-3 Exp. Fire 3.19E-3	1.91E-7 7.48E-6	2.06E-7 3.23E-6	N/A N/A	3.98E-7 1.07E-6	1.11E-05	EJ-575	1.71E-07	6.57E-06	FA-2	EB-11	4.09E-07	4.35E-07	8.44E-07
3[5]	ID Switchgear Room	Cabinet Fire 3.75E-3 Exp. Fire 9.81E4	6.95E-7 2.29E-06	6.10E-7 9.83E-7	3.10E-7 N/A	1.61E-6 3.27E-6	4.88E-06	EJ-1005	1.32E-06	2.00E-06	FA-3	EJ-1005	1.29E-06	1.19E-07	1.41E-06
4[5]	1C Switchgear Room	Cabinet Fire 3.75E-3 Exp. Fire 4.15E-4	4.84E-7 9.60E-7	6.53E-7 4.09E-7	N/A N/A	1.14E-6 1.37E-6	2.78E-06	EA-11	2.90E-07	5.64E-07	FA-4	EA-11	5.57E-08	4.57E-08	1.01E-07
5	Diesel Generator 1-1 Room	1.69E-02	4.85E-8	4.69E-8	N/A	9.54E-8	9.54E-08	FA-5		4.14E-08	FA-5			3.62E-08	3.62E-08
6	Diesel Generator 1-2 Room	1.72E-02	5.61E-8	7.56E-8	N/A	1.32E-7	1.32E-07	FA-6		1.30E-06	FA-6			4.88E-07	4.88E-07
7 & 8	Diesel Day Tanks	N/A - Screened	N/A	N/A	N/A	N/A									
9A	Intake Structure - SWS	7.20E-03	4.66E-8	4.12E-7	N/A	4.59E-7	4.59E-07	FA-9-9A	1.53E-08	1.53E-08					

Table 7.1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS								Ref [5] Analysis Using IPEEE Cabinets for FA-1 and FA-2			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B (using updated P-8B Fail to start and fail to run random failure data)				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class IA	Class IB	Class II	Total CDF/yr	IPEEE Total CDF/yr	Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure Fire CDF/yr	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure Fire CDF/yr	Cabinet + Exposure Fire CDF/yr
9B	Intake Structure - FPS'	7.20E-03	N/A	N/A	N/A	N/A		FA-9-9B	1.54E-08		FA-9-9B			1.46E-08	1.46E-08
10	East Engineered Safeguards	2.36E-3	7.58E-9	1.28E-8	N/A	2.04E-8	2.04E-08	FA-10	2.66E-08	2.66E-08	FA-10			2.61E-08	2.61E-08
11	Battery Room #2	1.60E-3	1.24E-7	1.53E-7	N/A	2.77E-7	2.77E-07	FA-11	8.74E-08	8.74E-08	FA-11			2.21E-08	2.21E-08
12	Battery Room #1	1.60E-3	7.77E-8	8.47E-8	N/A	1.62E-7	1.62E-07	FA-12	7.37E-08	7.37E-08	FA-12			8.65E-09	8.65E-09
13A1	Auxiliary Building 590' Corridor (South Finger)	1.99E-3	5.50E-9	6.61E-7	6.05E-9	6.73E-7	6.73E-07	FA-13-13A1	2.67E-06	2.67E-06	FA-13-13A1			1.26E-06	1.26E-06
13A2	Auxiliary Building 590' Corridor (Middle Finger)	5.37E-3	1.09E-8	1.17E-8	N/A	2.26E-8	2.26E-08	FA-13-13A2	1.32E-08	1.32E-08	FA-13-13A2			1.26E-08	1.26E-08
13B	Charging Pump Room	2.06E-3	2.68E-9	2.68E-9	N/A	5.36E-9	5.36E-09	FA-13-13B	1.37E-08	1.37E-08	FA-13-13B			1.36E-08	1.36E-08

Table 7.1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS								Ref [5] Analysis Using IPEEE Cabinets for FA-1 and FA-2			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B (using updated P-8B Fail to start and fail to run random failure data)				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class IA	Class IB	Class II	Total CDF/yr	IPEEE Total CDF/yr	Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure Fire CDF/yr	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure Fire CDF/yr	Cabinet + Exposure Fire CDF/yr
13C	590' Auxiliary Building (all not included in other zones)	1.15E-2	2.94E-8	1.31E-7	N/A	1.60E-7	1.60E-07	FA-13-13C	1.94E-07	1.94E-07	FA-13-13C			1.88E-07	1.88E-07
14	Containment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
15	Engineered Safeguards Panel Room	1.50E-4	N/A	3.35E-8	N/A	3.35E-8	3.35E-8		2.83E-08	2.83E-08	FA-15			2.67E-08	2.67E-08
16	Component Cooling Pump Room	2.36E-3	3.07E-9	6.13E-9	N/A	9.20E-9	9.20E-09		5.02E-07	5.02E-07	FA-16			4.53E-07	4.53E-07
17	Refueling and Spent Fuel Pool Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Demineralizer Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Compactor - Area Track Alley	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Spent Fuel Pool Equipment Room	6.02E-4	N/A	2.19E-8	N/A	2.19E-8	2.19E-08	FA-20	7.84E-07	7.84E-07	FA-20			3.58E-07	3.58E-07

Table 7.1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS								Ref [5] Analysis Using IPEEE Cabinets for FA-1 and FA-2			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B (using updated P-8B Fail to start and fail to run random failure data)				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class IA	Class IB	Class II	Total CDF/yr	IPEEE Total CDF/yr	Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure Fire CDF/yr	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure Fire CDF/yr	Cabinet + Exposure Fire CDF/yr
21A	Electric Equipment Room (Bus 19)[2]	3.80E-3	NfA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21B	Electric Equipment Room (Bus 20)	3.80E-3	3.50E-8	2.33E-8	N/A	5.83E-8	5.83E-08	FA-21-21B	1.71E-08	1.71E-08	FA-21-21B			1.63E-08	1.63E-08
22	Turbine Lube Oil Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23E	Turbine Building (East Side)	2.94E-2	1.27E-6	8.46E-7	3.21E-8	2.15E-6	2.15E-06	FA-23-23E	5.76E-06	5.76E-06	FA-23-23E			5.30E-06	5.30E-06
23S	Turbine Building (South Side)	6.42E-2	7.77E-7	8.74E-8	N/A	8.65E-7	8.64E-07	FA-23-23S	2.83E-06	2.83E-06	FA-23-23S			2.81E-06	2.81E-06
23W	Turbine Building (West Side)	1.55E-3	3.99E-8	3.29E-8	N/A	7.28E-8	7.28E-08	FA-23-23W	2.94E-07	2.94E-07	FA-23-23W			2.94E-07	2.94E-07
24	Auxiliary Feedwater Pump Room	2.27E-4	1.07E-7	8.50E-8	N/A	1.9E-07	1.92E-07	FA-24	3.02E-08	3.02E-08	FA-24			3.02E-08	3.02E-08
25	Boiler Rooms	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS								Ref [5] Analysis Using IPEEE Cabinets for FA-1 and FA-2			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B (using updated P-8B Fail to start and fail to run random failure data)				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class IA	Class IB	Class II	Total CDF/yr	IPEEE Total CDF/yr	Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure Fire CDF/yr	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure Fire CDF/yr	Cabinet + Exposure Fire CDF/yr
26	Southwest Cable Penetration Room	6.89E-5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27	Radwaste Addition - VRS	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	West Engineered Safeguards	2.74E-3	N/A	1.11E-6	N/A	1.11E-6	1.11E-06	FA-28	3.63E-06	3.63E-06	FA-28			1.68E-06	1.68E-06
29	Center Mechanical Equipment Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	East Mechanical Equipment Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	West Mechanical Equipment Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	SIRW Tank/CCW Roof Area	4.85E-5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	Technical Support Area	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.1: Comparison of IPEEE, Reference [5] and This Analysis

IPEEE TABLE 4.11-1 PALISADES PLANT RESPONSE TO SPECIFIC FIRE AREAS								Ref [5] Analysis Using IPEEE Cabinets for FA-1 and FA-2			This Analysis Worst Case Cabinet Fires for FA-1, FA-2, and Exposure Fire for FA-9-9B (using updated P-8B Fail to start and fail to run random failure data)				
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Class IA	Class IB	Class II	Total CDF/yr	IPEEE Total CDF/yr	Cabinet/ Junction Box/ Fire Area	CDF/yr	IPEEE Cabinet + Exposure Fire CDF/yr	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure Fire CDF/yr	Cabinet + Exposure Fire CDF/yr
34	Manholes #1,23	3.97E-5	N/A	1.01E-8	N/A	1.01E-8	1.01E-8	FA-34		0.00E+00	FA-34				0.00
CDF Total			1.97E-5	1.31E-5	3.48E-7	3.31E-5	3.33E-05			3.00E-05					5.09E-05

NOTES:

1) Fire Zone 9A is the worst case fire for this fire area and, therefore, Fire Zone 9B is not included in the results since they are mutually exclusive events.
2) Fire Zone 21B is the worst case fire for this fire area and, therefore, Fire Zone 21A is not included in the results since they are mutually exclusive events.
3) FA-34 cutsets were truncated at E-10.
4) Shaded results are differences between the IPEEE, reference [5] evaluation and this analysis.
5) Manual or automatic suppression credited for FA-1, FA-2, FA-3 and FA-4.
6) SIRW tank/CCW Roof screened given a 3 hour fire barrier, no combustibles and nearby firefighting equipment.

Table 7.2: Plant Damage State for FA-1 and FA-2 Comparison of IPEEE [3], Reference [5] and This Analysis (EC-03R and EJ-575)

		Fire IPEEE [3] CDF/yr				Updated PSAR2 Fire PSA [5]/This Analysis CDF/yr			
		IA	IB	II	IV	IA	IB	II	IV
FA-1 Control Room	Exposure Fire (Unsuppressed)	1.35E-06	-	-		4.38E-06/4.14E-06			1.17E-10
	Exposure Fire (Suppressed)	2.98E-06	2.46E-06	-		1.4E-06/1.382E-06	3.79E-07/3.327E-07	2.18E-09	3.33E-09
	Worst Cabinet Fire (EC-03R)	5.93E-07	7.12E-07	-		3.48E-07/3.479E-07	4.51E-07/4.514E-07	-	1.37E-08/1.369E-08

		Fire IPEEE [3] CDF/yr				Updated PSAR2 Fire PSA [5]/This Analysis CDF/yr			
		IA	IB	II	IV	IA	IB	II	IV
FA-2 Cable Spreading	Exposure Fire (Unsuppressed)	3.56E-06	-	-		1.47E-05/1.456E-05			2.98E-10
	Exposure Fire (Suppressed)	3.91E-06	3.23E-06	-		1.77E-06/1.75E-06	4.86E-07/4.4E-07	2.75E-09	4.33E-09
	Worst Cabinet/Junction Box Fire (EJ-575)	1.91E-07	2.06E-07	-		1.01E-07/1.006E-07	6.58E-08/6.595E-08	-	4.56E-09/4.56E-09

Table 7.3: Recreated IPEEE Fire Results (Base Case & P-8B Failed w/Recovery)

Base Case								P-8B Failed w/Recovery		
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr
1[5]	Control Room	Cabinet Fire 9.50E-3 Exp. Fire 2.43E-3	FA-1	EC-13L	3.52E-05	3.38E-07	3.55E-05	3.53E-05	6.26E-07	3.59E-05
2[5]	Cable Spreading Room	Cabinet Fire 3.20E-3 Exp. Fire 3.19E-3	FA-2	EB-11	4.09E-07	4.35E-07	8.44E-07	4.41E-07	8.00E-07	1.24E-06
3[5]	ID Switchgear Room	Cabinet Fire 3.75E-3 Exp. Fire 9.81E4	FA-3	EJ-1005	1.29E-06	1.19E-07	1.41E-06	1.30E-06	2.29E-07	1.52E-06
4[5]	1C Switchgear Room	Cabinet Fire 3.75E-3 Exp. Fire 4.15E-4	FA-4	EA-11	5.57E-08	4.57E-08	1.01E-07	9.65E-08	8.72E-08	1.84E-07
5	Diesel Generator 1-1 Room	1.69E-02	FA-5			3.62E-08	3.62E-08		3.70E-08	3.70E-08
6	Diesel Generator 1-2 Room	1.72E-02	FA-6			4.88E-07	4.88E-07		6.49E-07	6.49E-07
7 & 8	Diesel Day Tanks	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9A	Intake Structure - SWS	7.20E-03								
9B	Intake Structure - FPS'	7.20E-03	FA-9-9B			1.46E-08	1.46E-08		1.48E-08	1.48E-08
10	East Engineered Safeguards	2.36E-3	FA-10			2.61E-08	2.61E-08	2.61E-08	2.61E-08	2.61E-08
11	Battery Room #2	1.60E-3	FA-11			2.21E-08	2.21E-08	4.12E-08	3.32E-08	3.32E-08
12	Battery Room #1	1.60E-3	FA-12			8.65E-09	8.65E-09	2.69E-08	1.89E-08	1.89E-08
13A1	Auxiliary Building 590' Corridor (South Finger)	1.99E-3	FA-13-13A1			1.26E-06	1.26E-06	1.68E-06	1.55E-06	1.55E-06
13A2	Auxiliary Building 590' Corridor (Middle Finger)	5.37E-3	FA-13-13A2			1.26E-08	1.26E-08	1.27E-08	1.26E-08	1.26E-08
13B	Charging Pump Room	2.06E-3	FA-13-13B			1.36E-08	1.36E-08	1.36E-08	1.36E-08	1.36E-08
13C	590' Auxiliary Building (all not included in other zones)	1.15E-2	FA-13-13C			1.88E-07	1.88E-07	1.90E-07	1.88E-07	1.88E-07
14	Containment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.3: Recreated IPEEE Fire Results (Base Case & P-8B Failed w/Recovery)

Base Case								P-8B Failed w/Recovery		
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr
15	Engineered Safeguards Panel Room	1.50E-4	FA-15			2.67E-08	2.67E-08	2.71E-08	2.69E-08	2.69E-08
16	Component Cooling Pump Room	2.36E-3	FA-16			4.53E-07	4.53E-07	4.68E-07	4.62E-07	4.62E-07
17	Refueling and Spent Fuel Pool Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
18	Demineralizer Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
19	Compactor - Area Track Alley	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	Spent Fuel Pool Equipment Room	6.02E-4	FA-20			3.58E-07	3.58E-07	4.85E-07	4.45E-07	4.45E-07
21A	Electric Equipment Room (Bus 19)[2]	3.80E-3	FA-21-21A							
21B	Electric Equipment Room (Bus 20)	3.80E-3	FA-21-21B			1.63E-08	1.63E-08		1.63E-08	1.63E-08
22	Turbine Lube Oil Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
23E	Turbine Building (East Side)	2.94E-2	FA-23-23E			5.30E-06	5.30E-06	5.42E-06	5.37E-06	5.37E-06
23S	Turbine Building (South Side)	6.42E-2	FA-23-23S			2.81E-06	2.81E-06	2.82E-06	2.82E-06	2.82E-06
23W	Turbine Building (West Side)	1.55E-3	FA-23-23W			2.94E-07	2.94E-07	2.94E-07	2.94E-07	2.94E-07
24	Auxiliary Feedwater Pump Room	2.27E-4	FA-24			3.02E-08	3.02E-08	3.02E-08	3.02E-08	3.02E-08
25	Boiler Rooms	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	Southwest Cable Penetration Room	6.89E-5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27	Radwaste Addition - VRS	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 7.3: Recreated IPEEE Fire Results (Base Case & P-8B Failed w/Recovery)

Base Case								P-8B Failed w/Recovery		
Fire Area/ Zone	Fire Area Description	Ignition Frequency	Fire Area	Cabinet/ Junction Box	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr	Cabinet CDF/yr	Exposure CDF/yr	Cabinet + Exposure CDF/yr
28	West Engineered Safeguards	2.74E-3	FA-28			1.68E-06	1.68E-06		2.08E-06	2.08E-06
29	Center Mechanical Equipment Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	East Mechanical Equipment Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	West Mechanical Equipment Room	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32	SIRW Tank/CCW Roof Area	4.85E-5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
33	Technical Support Area	N/A - Screened	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
34	Manholes #1,23	3.97E-5	FA-34			0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CDF/yr Total							5.09E-05			5.29E-05

Notes:

1) Fire Zone 9A is the worst case fire for this fire area and, therefore, Fire Zone 9B is not included in the results since they are mutually exclusive events.
2) Fire Zone 21B is the worst case fire for this fire area and, therefore, Fire Zone 21A is not included in the results since they are mutually exclusive events.
3) FA 34 cutsets truncated at E-10.
4) SIRW tank/CCW Roof screened given a 3 hour fire barrier, no combustibles and nearby firefighting equipment.
5) Manual or automatic suppression credited.

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
1	12.54	12.54	6.14E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
2	17.45	4.91	2.41E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
3	21.75	4.3	2.11E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
4	26.05	4.3	2.11E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
5	30.02	3.97	1.94E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
6	32.55	2.53	1.24E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOO-P-8A	AFW PUMP P-8A OUT OF SERVICE	4.52E-03
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
7	34.39	1.84	8.99E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOO-P-8A	AFW PUMP P-8A OUT OF SERVICE	4.52E-03

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
8	36.19	1.8	8.81E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
9	37.87	1.68	8.22E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
10	39.3	1.43	6.98E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
11	40.49	1.19	5.84E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8A	AFW PUMP P-8A FAILS TO RUN	2.13E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
12	41.41	0.92	4.52E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8A	AFW PUMP P-8A FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
13	42.31	0.9	4.42E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWSTEAM	OP FAIL TO LOCALLY OPEN AFW STEAM SUPPLY CV-0522B (HEP)	7.20E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
14	43.21	0.9	4.41E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-104	AFW PUMP P-8A CIRCUIT BREAKER 152-104 FAILS TO CLOSE	1.61E-03

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
15	44.08	0.87	4.24E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8A	AFW PUMP P-8A FAILS TO RUN	2.13E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
16	44.75	0.67	3.28E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8A	AFW PUMP P-8A FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
17	45.4	0.65	3.20E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-104	AFW PUMP P-8A CIRCUIT BREAKER 152-104 FAILS TO CLOSE	1.61E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
18	45.97	0.57	2.79E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
19	46.53	0.56	2.72E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOO-P-8A	AFW PUMP P-8A OUT OF SERVICE	4.52E-03
				FA-20	SPENT FUEL EQUIPMENT RM FIRE	6.02E-04
20	46.99	0.46	2.27E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
21	47.42	0.43	2.09E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				F-PMOE-FPS	OP FAILS TO START P-9A (HEP)	3.40E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
22	47.84	0.42	2.08E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
23	48.21	0.37	1.81E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				O-RVCC-PORVS-MA	COMMON CAUSE FAILURE OF BOTH PORVS TO NOT OPEN	5.95E-04
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
24	48.58	0.37	1.79E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
25	48.91	0.33	1.61E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
26	49.24	0.33	1.61E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWFLADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
27	49.55	0.31	1.50E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-23-23E	TURBINE BUILDING EAST SIDE EXP FIRE (Fault Tree)	2.94E-02
				Y-PMCC-P8C66ABME	COMMON CAUSE FAILURE OF P-8C	5.10E-05
28	49.85	0.3	1.45E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				A-PMOO-P-8A	AFW PUMP P-8A OUT OF SERVICE	4.52E-03
				FA-1-EC-11R	CABINET EC-11R FIRE (Fault Tree)	9.50E-03
29	50.15	0.3	1.45E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				A-PMOO-P-8A	AFW PUMP P-8A OUT OF SERVICE	4.52E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
30	50.44	0.29	1.43E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				O-RVCC-PORVS-MA	COMMON CAUSE FAILURE OF BOTH PORVS TO NOT OPEN	5.95E-04
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
31	50.73	0.29	1.41E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2-ED-10	CSR 125 V BUS NO. 1- LEFT SIDE - TIE BKR CAB FIRE (Fault Tree)	3.20E-03
				P-IVMT-ED-07	INVERTER #2 FAILS TO FUNCTION	4.39E-04
32	51.01	0.28	1.35E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				Y-AVMD-CV-3027	AIR OPERATED VALVE CV-3027 FAILS TO REMAIN OPEN	4.44E-04
33	51.29	0.28	1.35E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				Y-AVMD-CV-3056	AIR OPERATED VALVE CV-3056 FAILS TO REMAIN OPEN	4.44E-04
34	51.55	0.26	1.28E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8A	AFW PUMP P-8A FAILS TO RUN	2.13E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-20	SPENT FUEL EQUIPMENT RM FIRE	6.02E-04
35	51.81	0.26	1.28E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
36	52.07	0.26	1.28E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWFLADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
37	52.32	0.25	1.24E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PSOH-AFWLOSUC	MISCALIBRATION OF ALL AFW LOW SUCTION PRESSURE SWITCHES (HEP)	1.30E-04
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
38	52.57	0.25	1.24E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PSOH-AFWLOSUC	MISCALIBRATION OF ALL AFW LOW SUCTION PRESSURE SWITCHES (HEP)	1.30E-04
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
39	52.82	0.25	1.24E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PSOH-AFWLOSUC	MISCALIBRATION OF ALL AFW LOW SUCTION PRESSURE SWITCHES (HEP)	1.30E-04
				FA-1-EC-11R	CABINET EC-11R FIRE (Fault Tree)	9.50E-03
40	53.07	0.25	1.24E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PSOH-AFWLOSUC	MISCALIBRATION OF ALL AFW LOW SUCTION PRESSURE SWITCHES (HEP)	1.30E-04
				FA-1-EC-11L	CABINET EC-11L FIRE (Fault Tree)	9.50E-03
41	53.31	0.24	1.18E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
42	53.53	0.22	1.08E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				A-PMOO-P-8C	AFW PUMP P-8C OUT OF SERVICE	3.35E-03
				FA-1-EC-11L	CABINET EC-11L FIRE (Fault Tree)	9.50E-03
43	53.75	0.22	1.08E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				A-PMOO-P-8C	AFW PUMP P-8C OUT OF SERVICE	3.35E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
44	53.97	0.22	1.07E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				Y-AVMD-CV-3027	AIR OPERATED VALVE CV-3027 FAILS TO REMAIN OPEN	4.44E-04
45	54.19	0.22	1.07E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				Y-AVMD-CV-3056	AIR OPERATED VALVE CV-3056 FAILS TO REMAIN OPEN	4.44E-04
46	54.39	0.2	9.93E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8A	AFW PUMP P-8A FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-20	SPENT FUEL EQUIPMENT RM FIRE	6.02E-04
47	54.59	0.2	9.86E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-REMD-PSX-P8A	AFW PUMP P-8A/B LOW SUCTION PRESS RELAY PSX-P8A FTRD	3.60E-04
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
48	54.79	0.2	9.86E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-REMD-PSX-0741	AFW PUMP P-8A LOW SUCTION PRESS RELAY PSX-0741 FTRD	3.60E-04
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
49	54.99	0.2	9.86E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-REMD-62-3P8A	AFW PUMP P-8A/B LOW SUCTION PRESS RELAY 62-3/P8A FTRD	3.60E-04
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
50	55.19	0.2	9.69E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-104	AFW PUMP P-8A CIRCUIT BREAKER 152-104 FAILS TO CLOSE	1.61E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-20	SPENT FUEL EQUIPMENT RM FIRE	6.02E-04
51	55.39	0.2	9.57E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CSMD-152-104CS	152-104/CS FAILS TO REMAIN IN NORMAL POS (XFRS TO TRIP)	3.49E-04
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
52	55.56	0.17	8.18E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				F-PMOE-FPS	OP FAILS TO START P-9A (HEP)	3.40E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
53	55.73	0.17	8.13E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
54	55.89	0.16	7.90E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				Y-AVOB-RAS-VLVS	OP FT ENABLE ESS RECIRC VALVES TO CLOSE ON RAS (FP/FR-CR) (HEP)	2.60E-04
55	56.04	0.15	7.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
56	56.19	0.15	7.16E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-REMD-PSX-0741	AFW PUMP P-8A LOW SUCTION PRESS RELAY PSX-0741 FTRD	3.60E-04
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
57	56.34	0.15	7.16E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-REMD-62-3P8A	AFW PUMP P-8A/B LOW SUCTION PRESS RELAY 62-3/P8A FTRD	3.60E-04
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
58	56.49	0.15	7.16E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-REMD-PSX-P8A	AFW PUMP P-8A/B LOW SUCTION PRESS RELAY PSX-P8A FTRD	3.60E-04
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
59	56.63	0.14	6.95E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CSMD-152-104CS	152-104/CS FAILS TO REMAIN IN NORMAL POS (XFRS TO TRIP)	3.49E-04
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-13-13A1	AUX BLDNG 590' CORRIDR (CCW - CHARGING) EXP FIRE (Fault Tree)	1.99E-03
60	56.77	0.14	6.84E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8A	AFW PUMP P-8A FAILS TO RUN	2.13E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-1-EC-11R	CABINET EC-11R FIRE (Fault Tree)	9.50E-03
61	56.91	0.14	6.84E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8A	AFW PUMP P-8A FAILS TO RUN	2.13E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
62	57.04	0.13	6.57E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
63	57.17	0.13	6.26E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				Y-AVOB-RAS-VLVS	OP FT ENABLE ESS RECIRC VALVES TO CLOSE ON RAS (FP/FR-CR) (HEP)	2.60E-04
64	57.3	0.13	6.20E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	1.00E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
65	57.43	0.13	6.19E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104A	PRESSURE TRANSMITTER PT-0104A FAILS TO FUNCTION	2.45E-02
66	57.56	0.13	6.19E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104A	PRESSURE TRANSMITTER PT-0104A FAILS TO FUNCTION	2.45E-02
67	57.69	0.13	6.19E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				L-TPMT-PT-0104B	PRESSURE TRANSMITTER PT-0104B FAILS TO FUNCTION	2.45E-02
68	57.82	0.13	6.19E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104B	PRESSURE TRANSMITTER PT-0104B FAILS TO FUNCTION	2.45E-02
69	57.94	0.12	5.92E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWSTEAM	OP FAIL TO LOCALLY OPEN AFW STEAM SUPPLY CV-0522B (HEP)	7.20E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
70	58.06	0.12	5.73E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-3	CND HEP- A-AVOA-MISCALADJ M-OOOT-LPF-INIT H-ZZOA-OTC-INIT (HEP)	5.44E-01
				M-OOOT-LPF-CDTNL-HEP-1	CND HEP-A-AVOA-MISCALADJ/ M-OOOT-LPF-INIT/ H-AVOA-HPISUBCLG (HEP)	2.39E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
71	58.18	0.12	5.72E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				O-RVCC-PORVS-MA	COMMON CAUSE FAILURE OF BOTH PORVS TO NOT OPEN	5.95E-04
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
72	58.29	0.11	5.30E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8C	AFW PUMP P-8C FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-11L	CABINET EC-11L FIRE (Fault Tree)	9.50E-03
73	58.4	0.11	5.30E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8A	AFW PUMP P-8A FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-1-EC-11R	CABINET EC-11R FIRE (Fault Tree)	9.50E-03
74	58.51	0.11	5.30E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8A	AFW PUMP P-8A FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
75	58.62	0.11	5.30E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8C	AFW PUMP P-8C FAILS TO START	1.65E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
76	58.73	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMCC-P8ABC-ME	COMMON CAUSE FAILURE OF ALL 3 AFW PUMPS P-8A/B/C TO START	5.45E-05
				FA-1-EC-11L	CABINET EC-11L FIRE (Fault Tree)	9.50E-03
77	58.84	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMCC-P8ABC-ME	COMMON CAUSE FAILURE OF ALL 3 AFW PUMPS P-8A/B/C TO START	5.45E-05
				FA-1-EC-11R	CABINET EC-11R FIRE (Fault Tree)	9.50E-03
78	58.95	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMCC-P8ABC-ME	COMMON CAUSE FAILURE OF ALL 3 AFW PUMPS P-8A/B/C TO START	5.45E-05
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
79	59.06	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMCC-P8ABC-ME	COMMON CAUSE FAILURE OF ALL 3 AFW PUMPS P-8A/B/C TO START	5.45E-05
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
80	59.17	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				O-MVCC-BLKVLV-MA	COMMON CAUSE FAILURE OF BOTH ISOLATION VALVES TO OPEN	1.70E-04
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
81	59.28	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-209	AFW PUMP P-8C CIRCUIT BREAKER 152-209 FAILS TO CLOSE	1.61E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-11L	CABINET EC-11L FIRE (Fault Tree)	9.50E-03
82	59.39	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-104	AFW PUMP P-8A CIRCUIT BREAKER 152-104 FAILS TO CLOSE	1.61E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-11R	CABINET EC-11R FIRE (Fault Tree)	9.50E-03
83	59.5	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-104	AFW PUMP P-8A CIRCUIT BREAKER 152-104 FAILS TO CLOSE	1.61E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
84	59.61	0.11	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-C2MB-152-209	AFW PUMP P-8C CIRCUIT BREAKER 152-209 FAILS TO CLOSE	1.61E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
85	59.71	0.1	5.10E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TFMT-FT-0306	SDC INJECTION LINE FLOW TRANSMITTER FT-0306 FAILURE	2.02E-02
86	59.81	0.1	5.10E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-TFMT-FT-0306	SDC INJECTION LINE FLOW TRANSMITTER FT-0306 FAILURE	2.02E-02
87	59.91	0.1	5.10E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWFLADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
88	60.01	0.1	5.10E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
89	60.11	0.1	5.04E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CVMA-CK-FW741	AFW PUMP P-8A DISCHARGE CHECK VALVE CK-FW0741 FAILS TO OPEN	1.84E-04
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-28	WEST SAFEGUARDS RM FIRE	2.74E-03
90	60.21	0.1	4.84E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1-EC-04L	CABINET EC-04L FIRE (Fault Tree)	9.50E-03
				Y-PMCC-P8C66ABME	COMMON CAUSE FAILURE OF P-8C	5.10E-05
91	60.31	0.1	4.84E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1-EC-01L	CABINET EC-01L FIRE (Fault Tree)	9.50E-03
				Y-PMCC-P8C66ABME	COMMON CAUSE FAILURE OF P-8C	5.10E-05
92	60.4	0.09	4.54E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.00E+00
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-3	CND HEP- A-AVOA-MISCALADJ M-OOOT-LPF-INIT H-ZZOA-OTC-INIT (HEP)	5.44E-01
				M-OOOT-LPF-CDTNL-HEP-1	CND HEP-A-AVOA-MISCALADJ/ M-OOOT-LPF-INIT/ H-AVOA-HPISUBCLG (HEP)	2.39E-01
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
93	60.49	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025B	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025B FAIL	1.70E-02
94	60.58	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03

Table 7-4: P-8B Failed

All Fire Areas (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025B	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025B FAIL	1.70E-02
95	60.67	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-0306	SDC HX BYPASS VALVE HIC-0306B FAILS TO FUNCTION	1.70E-02
96	60.76	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-0306	SDC HX BYPASS VALVE HIC-0306B FAILS TO FUNCTION	1.70E-02
97	60.85	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025A	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025A FAIL	1.70E-02
98	60.94	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025A	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025A FAIL	1.70E-02
99	61.03	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-CEPO-POC-3025	SDC HX DISCHARGE POSITION CONTROLLER POC-3025 FAILS	1.70E-02
100	61.12	0.09	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13R	CABINET EC-13R FIRE (Fault Tree)	9.50E-03
				L-CEPO-POC-3025	SDC HX DISCHARGE POSITION CONTROLLER POC-3025 FAILS	1.70E-02

Table 7.5: P-8B Failed w/Recovery						
Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)						
Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
1	26.12	26.12	2.11E-05	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
2	26.89	0.77	6.19E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104A	PRESSURE TRANSMITTER PT-0104A FAILS TO FUNCTION	2.45E-02
3	27.66	0.77	6.19E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104B	PRESSURE TRANSMITTER PT-0104B FAILS TO FUNCTION	2.45E-02
4	28.3	0.64	5.17E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMCC-P8ABC-ME	COMMON CAUSE FAILURE OF ALL 3 AFW PUMPS P-8A/B/C TO START	5.45E-05
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
5	28.93	0.63	5.10E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TFMT-FT-0306	SDC INJECTION LINE FLOW TRANSMITTER FT-0306 FAILURE	2.02E-02
6	29.46	0.53	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025B	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025B FAIL	1.70E-02
7	29.99	0.53	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-0306	SDC HX BYPASS VALVE HIC-0306B FAILS TO FUNCTION	1.70E-02
8	30.52	0.53	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025A	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025A FAIL	1.70E-02
9	31.05	0.53	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-CEPO-POC-3025	SDC HX DISCHARGE POSITION CONTROLLER POC-3025 FAILS	1.70E-02
10	31.58	0.53	4.29E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-CEPO-POC-0306	SDC HX BYPASS POSITION CONTROLLER POC-0306 FAILS	1.70E-02
11	32.08	0.5	4.00E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				Q-FLMK-F-310	SDC HX INLET VALVE HPA SUPPLY FILTER F-310 PLUGGED	1.58E-02
12	32.58	0.5	4.00E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-FLMK-F-28	CV-3025 LOCAL IA SUPPLY FILTER F28 PLUGGED	1.58E-02
13	33.07	0.49	3.92E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
14	33.44	0.37	3.01E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104A	PRESSURE TRANSMITTER PT-0104A FAILS TO FUNCTION	2.45E-02
15	33.81	0.37	3.01E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TPMT-PT-0104B	PRESSURE TRANSMITTER PT-0104B FAILS TO FUNCTION	2.45E-02
16	34.12	0.31	2.48E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-TFMT-FT-0306	SDC INJECTION LINE FLOW TRANSMITTER FT-0306 FAILURE	2.02E-02
17	34.38	0.26	2.08E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-CEPO-POC-3025	SDC HX DISCHARGE POSITION CONTROLLER POC-3025 FAILS	1.70E-02
18	34.64	0.26	2.08E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-CEPO-POC-0306	SDC HX BYPASS POSITION CONTROLLER POC-0306 FAILS	1.70E-02
19	34.9	0.26	2.08E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025B	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025B FAIL	1.70E-02
20	35.16	0.26	2.08E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-0306	SDC HX BYPASS VALVE HIC-0306B FAILS TO FUNCTION	1.70E-02
21	35.42	0.26	2.08E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-HCMT-HIC-3025A	SDC HX DISCHRG VALVE HAND INDIC CONTROLLER HIC-3025A FAIL	1.70E-02
22	35.66	0.24	1.94E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-FLMK-F-28	CV-3025 LOCAL IA SUPPLY FILTER F28 PLUGGED	1.58E-02
23	35.9	0.24	1.94E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				Q-FLMK-F-310	SDC HX INLET VALVE HPA SUPPLY FILTER F-310 PLUGGED	1.58E-02
24	36.08	0.18	1.48E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-ZZOA-SDC-CDTNL-HEP-2	CONDITIONAL HEP: B-XVOB-ADVS-MAN * L-ZZOA-SDC-INIT (HEP)	1.45E-01
25	36.24	0.16	1.25E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				Q-XVMD-MV-CA234	SDC HX INLET VALVE HPA MANUAL ISOLATION VLVE MV-CA234 FTRO	4.96E-03
26	36.4	0.16	1.25E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-XVMD-MV-CA341	CV-3025 LOCAL IA SUPPLY MANUAL VALVE MV-CA341 FTRO	4.96E-03
27	36.56	0.16	1.25E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-XVMD-MV-CA340	CV-3025 LOCAL IA SUPPLY MANUAL VALVE MV-CA340 FTRO	4.96E-03
28	36.71	0.15	1.25E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-IEMT-IE-0104B	I/E-0104B FAILS TO FUNCTION	4.93E-03
29	36.86	0.15	1.25E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-IEMT-IE-0104A	I/E-0104A FAILS TO FUNCTION	4.93E-03
30	36.99	0.13	1.01E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CVCC-AFWPP3-MA	3 AFW PP CK DSCHRGE CKS-CK-FW726 & CK-FW741 & CK-FW743 CCAUSE FTO	1.07E-05
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
31	37.11	0.12	9.93E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-KVMB-SV-1202	C-2C UNLOADING VALVE SV-1202 FTE	3.93E-03
32	37.23	0.12	9.93E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-KVMA-SV-1202	C-2C UNLOADING VALVE SV-1202 FTD	3.93E-03
33	37.35	0.12	9.93E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-KVMB-SV-3055B	SDC TO HEAT EXCHANGERS AIR SUPPLY SV-3055B FTE	3.93E-03
34	37.47	0.12	9.93E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-KVMB-SV-3055A	SDC TO HEAT EXCHANGERS AIR SUPPLY SV-3055A FTE	3.93E-03
35	37.59	0.12	9.93E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				C-KVMA-SV-0944A	SFP ISOLATION VALVE CV-0944A AIR SUPPLY SV-0944A FTD	3.93E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
36	37.69	0.1	8.22E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CVCC-AFWINJ-MA	4 AFW INJ CK-FW703 & CK-FW704 & CK-FW728 & CK-FW729 VLVS CC FTO	8.65E-06
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
37	37.79	0.1	8.01E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-LMMC-MO-3199	SDC PUMP P-67A SUCTION VALVE MO-3199 LIMIT SWITCH FTRC	3.17E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
38	37.89	0.1	8.01E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-LMMC-LMS-3016	LIMIT SWITCH FOR SDC VALVE MO-3016 FAILS TO REMAIN CLOSED	3.17E-03
39	37.99	0.1	8.01E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				L-LMMC-LMS-3015	LIMIT SWITCH FOR SDC VALVE MO-3015 FAILS TO REMAIN CLOSED	3.17E-03
40	38.09	0.1	7.78E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-AVMB-CV-3006	SDHX BYPASS VALVE CV-3006 FAILS TO CLOSE/CONTROL BYPASS FLOW	3.08E-03
41	38.18	0.09	7.65E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVCC-AFW-4-MA	4 AFW AOV'S CCAUSE FTO CV-0727 & CV-0736 & CV-0736A & CV-0749	8.06E-06
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
42	38.27	0.09	7.60E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-FUMK-B2439-1	FUSE FUZ/B2439-1 FAILS	3.01E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
43	38.36	0.09	7.60E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-OLMK-49-271	LPSI INJ VLVE MO-3016 1OF3 THERM OVERLOAD CONTACTS FAIL FTRC	3.01E-03
44	38.45	0.09	7.60E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-OLMK-49-167	SDC SUCT VLV MO-3015 THERM OVERLOAD CONTACTS FTRC	3.01E-03
45	38.54	0.09	7.60E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-FUMK-B271-1	FUSE FUZ/B271-1 FAILS	3.01E-03
46	38.63	0.09	7.60E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-FUMK-B167-1	FUSE FUZ/B167-1 FAILS	3.01E-03
47	38.72	0.09	7.60E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
				L-OLMK-49-2439	SDC P-67A SUCT VLV MO-3199 THERM OVERLOAD CONTACTS FTRC	3.01E-03
48	38.81	0.09	7.53E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-AVMA-CV-3055	PUMP SUPPLY TO SDC HEAT EXCHANGERS CV-3055 FAILS TO OPEN	2.98E-03
49	38.9	0.09	7.53E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				L-AVMA-CV-3025	SDC HEAT EXCHANGER DISCHARGE CV-3025 FAILS TO OPEN	2.98E-03
50	38.99	0.09	7.18E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-ZZOA-SDC-CDTNL-HEP-2	CONDITIONAL HEP: B-XVOB-ADVS-MAN * L-ZZOA-SDC-INIT (HEP)	1.45E-01
51	39.07	0.08	6.84E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MC-52-2439	SDC P-67A SUCTION VALVE MO-3199 CIRCUIT BRKR 52-2439 FTRE	2.71E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
52	39.15	0.08	6.84E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MC-52-167	SDC SUCTION VALVE MO-3015 CIRCUIT BREAKER 52-167 FTRC	2.71E-03
53	39.23	0.08	6.84E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MC-52-271	SDC SUCTION VALVE MO-3016 CIRCUIT BREAKER 52-271 FTRC	2.71E-03
54	39.31	0.08	6.26E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-PMOO-P-67A	LPSI PUMP P-67A OUT OF SERVICE FOR TESTING OR MAINTENENCE	2.48E-03
55	39.39	0.08	6.20E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMCC-P8ABC-MG	COMMON CAUSE FAILURE OF ALL 3 AFW PUMPS P-8A/B/C TO RUN	6.53E-06
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
56	39.47	0.08	6.11E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
57	39.55	0.08	6.09E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-XVMD-MV-CA341	CV-3025 LOCAL IA SUPPLY MANUAL VALVE MV-CA341 FTRO	4.96E-03
58	39.63	0.08	6.09E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				I-XVMD-MV-CA340	CV-3025 LOCAL IA SUPPLY MANUAL VALVE MV-CA340 FTRO	4.96E-03
59	39.71	0.08	6.09E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				Q-XVMD-MV-CA234	SDC HX INLET VALVE HPA MANUAL ISOLATION VLVE MV-CA234 FTRO	4.96E-03
60	39.79	0.08	6.05E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-IEMT-IE-0104B	I/E-0104B FAILS TO FUNCTION	4.93E-03
61	39.87	0.08	6.05E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-IEMT-IE-0104A	I/E-0104A FAILS TO FUNCTION	4.93E-03
62	39.94	0.07	5.73E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-PVMD-PCV-3025	CV-3025 LOCAL IA SUPPLY PRESSURE CONTROL VALVE PCV-3025 FTRO	2.27E-03
63	40.01	0.07	5.73E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				Q-PVMD-PCV-3055	SDC HX INLET VALVE HPA PR CNTRL VALVE PCV-3055 FTRO	2.27E-03
64	40.08	0.07	5.53E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				H-PMOO-P-66A	HPSI PUMP P-66A OUT OF SERVICE FOR MAINTENANCE	2.63E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
65	40.14	0.06	5.16E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-MVMA-MO-3199	SDC PUMP P-67A SUCTION VALVE MO-3199 FAILS TO OPEN	2.04E-03
66	40.2	0.06	5.16E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-MVMA-MO-3015	SDC SUCTION VALVE MO-3015 FAILS TO OPEN	2.04E-03
67	40.26	0.06	5.16E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-MVMA-MO-3016	SDC SUCTION VALVE MO-3016 FAILS TO OPEN	2.04E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
68	40.32	0.06	4.83E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-KVMB-SV-3055B	SDC TO HEAT EXCHANGERS AIR SUPPLY SV-3055B FTE	3.93E-03
69	40.38	0.06	4.83E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-KVMB-SV-3055A	SDC TO HEAT EXCHANGERS AIR SUPPLY SV-3055A FTE	3.93E-03
70	40.44	0.06	4.83E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-KVMB-SV-1202	C-2C UNLOADING VALVE SV-1202 FTE	3.93E-03
71	40.5	0.06	4.83E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				I-KVMA-SV-1202	C-2C UNLOADING VALVE SV-1202 FTD	3.93E-03
72	40.56	0.06	4.83E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				C-KVMA-SV-0944A	SFP ISOLATION VALVE CV-0944A AIR SUPPLY SV-0944A FTD	3.93E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
73	40.62	0.06	4.57E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-PMME-P-67A	LPSI PUMP P-67A FAILS TO START	1.81E-03
74	40.68	0.06	4.53E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				/RVC	PRESSURIZER SAFETIES CLOSED (FT Top - Dev Event)	9.91E-01
				/RVO	PRESSURIZER SAFETIES OPEN (FT Top - Dev Event)	9.99E-01
				RXC-ELEC-FAULTS	ELECTRICAL SCRAM FAULTS (FTree Top - Dev Event)	4.81E-06
75	40.73	0.05	4.42E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				C-PMOO-P-52B	P-52B OUT OF SERVICE FOR MAINTENANCE	1.75E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
76	40.78	0.05	4.30E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				H-PMME-P-66A	HPSI PUMP P-66A FAILS TO START	2.04E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
77	40.83	0.05	4.19E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-XVMD-MV-CC3276	CCW COOLING INLET TO LPSI PUMP P-67A VALVE MV-CC3276 FTRO	1.66E-03
78	40.88	0.05	4.19E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-XVMD-MV-CC144	CCW COOLING INLET TO LPSI PUMP P-67A VALVE MV-CC144 FRTO	1.66E-03
79	40.93	0.05	4.19E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-XVMD-MV-CC152	CCW COOLING DISCH FROM LPSI PUMP P-67A VALVE MV-CC152 FTRO	1.66E-03
80	40.98	0.05	4.19E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				Q-XVMD-MV-CA290	MANUAL VALVE MV-CA290 FAILS TO REMAIN OPEN	1.66E-03
81	41.03	0.05	4.14E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				C-AVMB-CV-0944A	SFP ISOLATION AIR OPERATED CONTROL VALVE CV-0944A FTC	1.64E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
82	41.08	0.05	4.07E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MB-152-206	LPSI PUMP P-67A 2400VAC BREAKER 152-206 FTC	1.61E-03
83	41.13	0.05	4.07E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				C-C2MB-152-208	2400VAC BREAKER 152-208 TO P-52B FTC	1.61E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
84	41.18	0.05	3.89E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-LMMC-MO-3199	SDC PUMP P-67A SUCTION VALVE MO-3199 LIMIT SWITCH FTRC	3.17E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
85	41.23	0.05	3.89E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-LMMC-LMS-3016	LIMIT SWITCH FOR SDC VALVE MO-3016 FAILS TO REMAIN CLOSED	3.17E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
86	41.28	0.05	3.89E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-LMMC-LMS-3015	LIMIT SWITCH FOR SDC VALVE MO-3015 FAILS TO REMAIN CLOSED	3.17E-03
87	41.33	0.05	3.78E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-AVMB-CV-3006	SDHX BYPASS VALVE CV-3006 FAILS TO CLOSE/CONTROL BYPASS FLOW	3.08E-03
88	41.38	0.05	3.69E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
				L-OLMK-49-2439	SDC P-67A SUCT VLV MO-3199 THERM OVERLOAD CONTACTS FTRC	3.01E-03
89	41.43	0.05	3.69E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-FUMK-B2439-1	FUSE FUZ/B2439-1 FAILS	3.01E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
90	41.48	0.05	3.69E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-FUMK-B167-1	FUSE FUZ/B167-1 FAILS	3.01E-03
91	41.53	0.05	3.69E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-FUMK-B271-1	FUSE FUZ/B271-1 FAILS	3.01E-03
92	41.58	0.05	3.69E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-OLMK-49-271	LPSI INJ VLVE MO-3016 1OF3 THERM OVERLOAD CONTACTS FAIL FTRC	3.01E-03
93	41.63	0.05	3.69E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03

Table 7.5: P-8B Failed w/Recovery

Fire Area 1 Control Room Cabinet EC-13L (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				L-OLMK-49-167	SDC SUCT VLV MO-3015 THERM OVERLOAD CONTACTS FTRC	3.01E-03
94	41.68	0.05	3.66E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-AVMA-CV-3055	PUMP SUPPLY TO SDC HEAT EXCHANGERS CV-3055 FAILS TO OPEN	2.98E-03
95	41.73	0.05	3.66E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-AVMA-CV-3025	SDC HEAT EXCHANGER DISCHARGE CV-3025 FAILS TO OPEN	2.98E-03
96	41.77	0.04	3.39E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				H-C2MB-152-207	AC CIRCUIT BREAKER 152-207 (2400V) FAILS TO CLOSE	1.61E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
97	41.81	0.04	3.32E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MC-52-2439	SDC P-67A SUCTION VALVE MO-3199 CIRCUIT BRKR 52-2439 FTRE	2.71E-03
				L-MVOA-SDCLOCAL	OP FT INITIATE SDC (HEP)	1.00E+00
98	41.85	0.04	3.32E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MC-52-271	SDC SUCTION VALVE MO-3016 CIRCUIT BREAKER 52-271 FTRC	2.71E-03
99	41.89	0.04	3.32E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				L-C2MC-52-167	SDC SUCTION VALVE MO-3015 CIRCUIT BREAKER 52-167 FTRC	2.71E-03
100	41.93	0.04	3.23E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				FA-1-EC-13L	CABINET EC-13L FIRE (Fault Tree)	9.50E-03
				P-DCPO-PS-0550	POWER SUPPLY P/S-0550 FAILS TO PROVIDE PROPER OUTPUT	1.28E-03

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
1	3.89	3.89	4.42E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWSTEAM	OP FAIL TO LOCALLY OPEN AFW STEAM SUPPLY CV-0522B (HEP)	7.20E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
2	5.72	1.83	2.09E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				F-PMOE-FPS	OP FAILS TO START P-9A (HEP)	3.40E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
3	7.54	1.82	2.08E-06	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
4	8.28	0.74	8.47E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
5	9	0.72	8.18E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				F-PMOE-FPS	OP FAILS TO START P-9A (HEP)	3.40E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
6	9.71	0.71	8.13E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
7	10.29	0.58	6.57E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
8	10.84	0.55	6.20E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	1.00E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
9	11.36	0.52	5.92E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWSTEAM	OP FAIL TO LOCALLY OPEN AFW STEAM SUPPLY CV-0522B (HEP)	7.20E-02

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
10	11.67	0.31	3.49E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
11	11.96	0.29	3.32E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
12	12.21	0.25	2.79E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				F-PMOE-FPS	OP FAILS TO START P-9A (HEP)	3.40E-02
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
13	12.45	0.24	2.78E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOE-AFW-PPMAN	OP FT MANUALLY START AN AFW PUMP (FP/FR-CR) (HEP)	3.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
14	12.69	0.24	2.68E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
15	12.9	0.21	2.43E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	1.00E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
16	13.1	0.2	2.27E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-RVMB-SRV-SGA	ONE SAFETY RELIEF VALVE ON SG A FTC	3.69E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
17	13.27	0.17	1.96E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	1.00E-02
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
18	13.42	0.15	1.74E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8B	AFW TURBINE PUMP P-8B FAILS TO START	2.84E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
19	13.57	0.15	1.73E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWSTEAM	OP FAIL TO LOCALLY OPEN AFW STEAM SUPPLY CV-0522B (HEP)	7.20E-02
				A-PMOE-EC-150XFR	OP FT XFR AFW PP START TO C-150 PNL (SCRNING VAL) (FR-LOC) (HEP)	1.00E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
20	13.71	0.14	1.63E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
21	13.83	0.12	1.40E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWSTEAM	OP FAIL TO LOCALLY OPEN AFW STEAM SUPPLY CV-0522B (HEP)	7.20E-02
				A-PMOE-EC-150XFR	OP FT XFR AFW PP START TO C-150 PNL (SCRNING VAL) (FR-LOC) (HEP)	1.00E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
22	13.95	0.12	1.37E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
23	14.07	0.12	1.36E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
24	14.18	0.11	1.22E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
25	14.28	0.1	1.13E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
26	14.38	0.1	1.10E-07	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
27	14.46	0.08	9.63E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
28	14.54	0.08	9.21E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-THROTTLE-FCV	OP FT THRTTLE AFW FCV'S GIVEN LOSS OF PNUEMTICS (FP/FR-LOC) (HEP)	1.50E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
29	14.62	0.08	8.88E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-RVMB-SRV-SGA	ONE SAFETY RELIEF VALVE ON SG A FTC	3.69E-03
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
30	14.69	0.07	8.30E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	1.00E-02
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
31	14.76	0.07	7.93E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
32	14.83	0.07	7.49E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-XVMA-MV-FW775	FPS TO AFW MANUAL VALVE MV-FW775 FAILS TO OPEN	1.22E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
33	14.9	0.07	7.49E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-XVMA-MV-FW774	FPS TO AFW MANUAL VALVE MV-FW774 FAILS TO OPEN	1.22E-03

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
34	14.96	0.06	7.17E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-RVMB-SRV-SGA	ONE SAFETY RELIEF VALVE ON SG A FTC	3.69E-03
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
35	15.02	0.06	6.83E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8B	AFW TURBINE PUMP P-8B FAILS TO START	2.84E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
36	15.08	0.06	6.40E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
37	15.13	0.05	5.52E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8B	AFW TURBINE PUMP P-8B FAILS TO START	2.84E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
38	15.18	0.05	5.33E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
39	15.23	0.05	5.19E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVMA-CV-0522B	AFW STEAM SUPPLY FROM SG A CV-0522B FAILS TO OPEN	8.46E-04
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
40	15.27	0.04	5.00E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
41	15.31	0.04	4.67E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
42	15.34	0.03	3.96E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
43	15.37	0.03	3.85E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
44	15.4	0.03	3.13E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
45	15.43	0.03	3.11E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
46	15.46	0.03	3.03E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-RVMB-SRV-SGA	ONE SAFETY RELIEF VALVE ON SG A FTC	3.69E-03
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
47	15.49	0.03	2.94E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-XVMA-MV-FW775	FPS TO AFW MANUAL VALVE MV-FW775 FAILS TO OPEN	1.22E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
48	15.52	0.03	2.94E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-XVMA-MV-FW774	FPS TO AFW MANUAL VALVE MV-FW774 FAILS TO OPEN	1.22E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
49	15.54	0.02	2.81E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-HCMA-HIC-0780A	SDCR CONTROLLER HIC-0780A FAILS TO DE-ENERGIZE	1.14E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
50	15.56	0.02	2.57E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				B-HCMA-HIC-0780A	SDCR CONTROLLER HIC-0780A FAILS TO DE-ENERGIZE	1.14E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
51	15.58	0.02	2.50E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8B	AFW TURBINE PUMP P-8B FAILS TO START	2.84E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
52	15.6	0.02	2.49E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				O-RVCC-PORVS-MA	COMMON CAUSE FAILURE OF BOTH PORVS TO NOT OPEN	5.95E-04
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
53	15.62	0.02	2.48E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
54	15.64	0.02	2.33E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8B	AFW TURBINE PUMP P-8B FAILS TO START	2.84E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
55	15.66	0.02	2.27E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-RVMB-SRV-SGB	ONE SAFETY RELIEF VALVE ON SG B FTC	3.69E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				M-CVOA-MSIVLOCAL	OPERATOR FAILS TO TRIP CLOSED MSIVS LOCALLY (HEP)	1.00E-01

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
56	15.68	0.02	2.23E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-AVMB-CV-0511	TURBINE BYPASS VALVE CV-0511 FTC	3.64E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				M-CVOA-MSIVLOCAL	OPERATOR FAILS TO TRIP CLOSED MSIVS LOCALLY (HEP)	1.00E-01
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
57	15.7	0.02	2.23E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
58	15.72	0.02	2.23E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWFLADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
59	15.74	0.02	2.19E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMKUP	OP FT MAKEUP TO CST (T-2) (FP/FR-LOC) (HEP)	2.66E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
60	15.76	0.02	2.04E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				B-HCMA-HIC-0780A	SDCR CONTROLLER HIC-0780A FAILS TO DE-ENERGIZE	1.14E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
61	15.78	0.02	2.04E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVMA-CV-0522B	AFW STEAM SUPPLY FROM SG A CV-0522B FAILS TO OPEN	8.46E-04
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
62	15.8	0.02	1.98E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMME-P-8B	AFW TURBINE PUMP P-8B FAILS TO START	2.84E-03
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
63	15.82	0.02	1.97E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				O-RVCC-PORVS-MA	COMMON CAUSE FAILURE OF BOTH PORVS TO NOT OPEN	5.95E-04
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
64	15.84	0.02	1.86E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				Y-AVMD-CV-3027	AIR OPERATED VALVE CV-3027 FAILS TO REMAIN OPEN	4.44E-04
65	15.86	0.02	1.86E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				Y-AVMD-CV-3056	AIR OPERATED VALVE CV-3056 FAILS TO REMAIN OPEN	4.44E-04
66	15.88	0.02	1.82E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-OOOT-CSTMK-CDTNL-HEP-2	CND HEP-L-ZZOA-SDC-INIT * A-OOOT-CSTMKUP * P-CBOB-BUS1E (HEP)	1.43E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				L-ZZOA-SDC-INIT	OP FT INITIATE SDC (FP/FR-LOC) (HEP)	1.55E-02
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
67	15.9	0.02	1.76E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
68	15.92	0.02	1.76E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWFLADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
69	15.93	0.01	1.64E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVMA-CV-0522B	AFW STEAM SUPPLY FROM SG A CV-0522B FAILS TO OPEN	8.46E-04
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
70	15.94	0.01	1.63E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
71	15.95	0.01	1.58E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-INIT	OP FAILS TO INITIATE ONCE THROUGH COOLING (HEP)	2.90E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
72	15.96	0.01	1.47E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				Y-AVMD-CV-3027	AIR OPERATED VALVE CV-3027 FAILS TO REMAIN OPEN	4.44E-04
73	15.97	0.01	1.47E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				Y-AVMD-CV-3056	AIR OPERATED VALVE CV-3056 FAILS TO REMAIN OPEN	4.44E-04
74	15.98	0.01	1.29E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
75	15.99	0.01	1.23E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-THROTTLE-FCV	OP FT THRTTLE AFW FCV'S GIVEN LOSS OF PNUEMTICS (FP/FR-LOC) (HEP)	1.50E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
76	16	0.01	1.13E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CVMA-CK-MS402	AFW STEAM SUPPLY FROM SG A CHECK VALVE CK-MS402 FTO	1.84E-04
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
77	16.01	0.01	1.13E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-CVMA-CK-FW743	AFW PUMP P-8B DISCHARGE CHECK VALVE CK-FW0743 FAILS TO OPEN	1.84E-04
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
78	16.02	0.01	1.10E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-HCMA-HIC-0780A	SDCR CONTROLLER HIC-0780A FAILS TO DE-ENERGIZE	1.14E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
79	16.03	0.01	1.09E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				Y-AVOB-RAS-VLVS	OP FT ENABLE ESS RECIRC VALVES TO CLOSE ON RAS (FP/FR-CR) (HEP)	2.60E-04
80	16.04	0.01	1.06E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-CV-2010	OP FT OPEN CV-2010 FOR T-939 MAKEUP TO CST (FP/FR-CR) (HEP)	2.59E-03
				A-OOOT-CSTMK-CDTNL-HEP-1	CND HEP-A-AVOA-CV-2010 * A-OOOT-CSTMKUP * Y-AVOB-RAS-VLVS (HEP)	4.99E-01
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
81	16.05	0.01	1.03E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				O-RVCC-PORVS-MA	COMMON CAUSE FAILURE OF BOTH PORVS TO NOT OPEN	5.95E-04
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
82	16.06	0.01	1.02E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
83	16.07	0.01	1.00E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-XVMA-MV-FW775	FPS TO AFW MANUAL VALVE MV-FW775 FAILS TO OPEN	1.22E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
84	16.08	0.01	1.00E-08	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-XVMA-MV-FW774	FPS TO AFW MANUAL VALVE MV-FW774 FAILS TO OPEN	1.22E-03
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				FA-4	1C SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	4.15E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
85	16.09	0.01	9.89E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
86	16.1	0.01	9.72E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-KVMA-SV-0781B	ADV CV-0781 AIR SUPPLY SV-0781B FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
87	16.11	0.01	9.72E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-KVMA-SV-0782C	ADV CV-0782 AIR SUPPLY SV-0782C FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
88	16.12	0.01	9.72E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-KVMA-SV-0781C	ADV CV-0781 AIR SUPPLY SV-0781C FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
89	16.13	0.01	9.72E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-KVMA-SV-0782B	ADV CV-0782 AIR SUPPLY SV-0782B FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
90	16.14	0.01	9.15E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-MISCALADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
91	16.15	0.01	9.15E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-AVOA-AFWFLADJ	OP FT ADJ AFW FLOW GIVEN FLOW INSTRUMENT MISC (FP/FR-CR) (HEP)	1.45E-03
				A-PMOO-P-8B	AFW TURBINE PUMP P-8B OUT OF SERVICE	5.68E-03
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				H-ZZOA-OTC-CDTNL-HEP-2	CND HEP- A-AVOA-AFWFLADJ B-XVOB-ADVS-MAN H-ZZOA-OTC-INIT (HEP)	3.66E-01
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
92	16.16	0.01	8.90E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				B-KVMA-SV-0782C	ADV CV-0782 AIR SUPPLY SV-0782C FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
93	16.17	0.01	8.90E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				B-KVMA-SV-0781C	ADV CV-0781 AIR SUPPLY SV-0781C FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
94	16.18	0.01	8.90E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				B-KVMA-SV-0782B	ADV CV-0782 AIR SUPPLY SV-0782B FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
95	16.19	0.01	8.90E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				B-KVMA-SV-0781B	ADV CV-0781 AIR SUPPLY SV-0781B FTD	3.93E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				H-ZZOA-OTC-CDTNL-HEP-4	COND HEP: B-XVOB-ADVS-MAN * H-ZZOA-OTC-INIT (HEP)	1.85E-02
				/SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	9.80E-01
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
96	16.2	0.01	8.89E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-HCMA-HIC-0780A	SDCR CONTROLLER HIC-0780A FAILS TO DE-ENERGIZE	1.14E-02
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-3	1D SWITCHGR LOGICAL PLACEHOLDER (Fault Tree)	9.81E-04
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
97	16.21	0.01	8.88E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-RVMB-SRV-SGB	ONE SAFETY RELIEF VALVE ON SG B FTC	3.69E-03
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03

Table 7.6: P-8B Failed w/Recovery
Exposure Fires: Control Room, CSR, Bus 1C and Bus 1D w/ and w/o Suppression (Top 100 Cutsets)

Cut No.	% Total	% Cut Set	Prob./ Frequency	Basic Event	Description	Event Prob.
				M-CVOA-MSIVLOCAL	OPERATOR FAILS TO TRIP CLOSED MSIVS LOCALLY (HEP)	1.00E-01
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
98	16.22	0.01	8.76E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-AVMB-CV-0511	TURBINE BYPASS VALVE CV-0511 FTC	3.64E-03
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				M-CVOA-MSIVLOCAL	OPERATOR FAILS TO TRIP CLOSED MSIVS LOCALLY (HEP)	1.00E-01
				SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	1.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00
99	16.23	0.01	8.63E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				A-PMMG-P-8B	AFW TURBINE PUMP P-8B FAILS TO RUN	1.38E-02
				FA-1	GENERAL AREA FIRE (Fault Tree)	2.43E-03
				/SUP	MANUAL FIRE SUPPRESSION FAILURE (Dev Event)	9.90E-01
				Y-AVOB-RAS-VLVS	OP FT ENABLE ESS RECIRC VALVES TO CLOSE ON RAS (FP/FR-CR) (HEP)	2.60E-04
100	16.24	0.01	8.26E-09	IE_FIRE	FA EVENT TREE LOGICAL IE PLACE HOLDER	1.00E+00
				/ASDP	ALTERNATE SHUTDOWN PANEL FAILURE	9.90E-01
				B-AVMB-CV-0781	ADV ON SG A CV-0781 FAILS TO CLOSE	3.34E-03
				B-XVOB-ADVS-MAN	OP FT CLOSE MANUAL VALVES TO ISOLATE ADV (FP/FR-LOC) (HEP)	4.03E-02
				FA-2	CSR EXP FIRE (Fault Tree)	3.10E-03
				SUP-AUTO	AUTO FIRE SUPPRESSION FAILURE (Dev Event)	2.00E-02
				X-HSE-SGA-BLDN	SET TO "1" - ESDE ON SG E-50A (House Event)	1.00E+00

Via E-mail

MEMORANDUM

TO:	Brian Brogan Frank Yanik	DATE:	November 14, 2011
FROM:	Don MacLeod	DOC NO:	P0247100005-4028
SUBJECT:	Local AFW Operation HRA Evaluation for Palisades SDP		
Cc:	Don Vanover Lynn Kolonauski		

Review of the assessment of the operator action to locally control the turbine driven AFW pump (AFW-AVOA-AFWSTEAM) indicates that the current quantification is potentially conservative in that it does not credit multiple factors allowed by the HRA methodologies employed by Palisades. Conversely, there are some assumptions made in the evaluation that are potentially non-conservative. These issues are summarized below followed by some editorial suggestions for Section 5 of EA-PSA-SDP-P8B-11-05.

Summary of Potential Conservatisms

- CBDTM Recovery Mechanisms: No recovery mechanisms are applied to the initial probabilities derived from the CBDTs; however, multiple valid mechanisms exist:
  - PcB – Both self review (0.1) and STA review are valid recoveries for this failure mechanism. Some analysts/reviewers attest that only one recovery per failure mechanism should be used while other attest that the recovery mechanisms should be credited if they exist and would be functioning for the relevant scenarios. Even if only one recovery factor is chosen, it represents an order of magnitude reduction the PcB contribution.
  - PcE – Self review is a valid recovery for this failure mechanism and its use would reduce the PcE contribution by an order of magnitude.
  - TSC recovery: This is a recovery mechanism that is potentially available, but for the timing conditions applied in this scenario, it is not clear that credit is appropriate. If the TSC is manned at 60 minutes, then there would be about 9 minutes for them to identify

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a problem and tell the MCR to perform the action (60min TSC ready + 15 minute manip time + 9 min TSC diagnosis = 84 minutes) . That is not much time to become familiar with the situation and begin providing directions. If there was a delay and it was not manned until 90 minutes or they were not ready until 90 minutes, then it would clearly be too late. This appears to only be an issue for this action due to the definition of the system window, which is discussed under the "timing" bullet below.

- Execution recovery dependence level: This HRAC, which uses diagnosis time to determine allowable recovery dependence levels, indicates that the minimum recovery dependence level is LD. MD is used, but no reason is provided for using it in place of LD. Because the recovery is based on a separate procedure step that would be reviewed by a person other than the one taking the action, use of MD is conservative. SG level is a highly visible parameter in the MCR and there would clearly be some independent checking of SG status such that LD would be defendable.
- Sensitivity cases: There are sensitivity cases presented in section 5.2 that separately account for crediting CBDTM recovery and the use of a lower execution dependence level. While Palisades may chose not to take these credits in the base case quantification, a typical analysis would credit both of them simultaneously. The sensitivity analysis should present the results of applying both of these credits together to demonstrate that typical recovery applications could result in a much lower HEP.
- Timing : The quantification appears to be based on a system window that is defined to end at the point where SG level reaches -84% (as stated in section 5.1.2 and by the time used for Tsw in the timing analysis section). There is text in the timing analysis section that appears to indicate that 2 hours, and maybe 3 hours (using an updated MAAP run), would be available prior to core damage; however, no credit is taken for this extended time. I am not familiar with how the operators would approach AFW operation once the cue to start feed and bleed is reached, but if resources would remain committed to starting AFW, expanding the system window would be appropriate. This would make a better case for crediting TSC review in the CBDT analysis and make an even better case for a low or zero execution recovery dependence level.
- The critical task list includes a step to clear all non-essential personnel from the area. While this is an important task, failing to perform it is not a failure mode for this action and it should be removed from the analysis. Retaining it may raise unwanted questions.
- For step 4.2.e, there is a comment that it is not known if the local PI has limit marks and the error for using an unmarked gauge is used. Determining the nature of the local gauge could allow the use of a lower HEP and closing this issue out is recommended. Further, identifying that this information is not known in an evaluation submitted for an SDP may send the NRC the wrong message.

Summary of Potential Non-Conservatisms

- Stress-Factors: This issue is qualitative rather than quantitative, but Section 5.1.1 characterizes the selection of "hot/humid" conditions and a "smoke" atmosphere as "conservative". While it may be true that these conditions would probably not apply to the action, it is not quantitatively conservative because it has no impact on the HRAC quantification. Once a single "off-normal" PSF is chose in the HRAC, the stress tree eliminates "optimal stress" as a choice and addition "off-normal" PSF selections have no additional impact. For the SBO evaluation upon which the fire evaluation was based, "emergency lighting" was selected a as PSF and it was retained for the fire evaluation. Selection of "hot/humid" and "smoke" should, therefore, probably not be characterized as conservative elements of the evaluation.
- PcA: For fires that impact AFW, are you certain that the MCR indication used for this action is accurate? Will some indicators be failed while others are OK? If some are failed, you might consider taking the "no" path on the accuracy question. If the fire procedures say that the indicators could be impacted for the scenario, which they may, then crediting that warning would still yield a "negligible" value for this failure mechanism. This may ultimately not change the HEP, but identifying any instrumentation issue could help avoid some questions.
- PcB: Credit is taken for an alarm for this action, but often, the circuitry associated with the alarms is not traced and the alarms can't be credited. Can you confirm that the alarms credited would be available? If not, the choice of "not alarmed" would be more appropriate. Also, has it been confirmed that the AFW flow indication would be available?
- PcD: For fire, the EPRI guidance for this failure mechanism may be lacking in that it appears to be directed and instruments directly used in the action's diagnosis and execution. PcA generally addresses the instrumentation issues related to the action such that PcD may be better suited to addressing the impacts on other MCR instrumentation (otherwise, the evaluation is double counting impacts on the primary indicators). If there are failures not related to the action specific instruments, a choice of "no" may be more appropriate for the "All Cues as Stated" node.
    - Note: this is an area that is still open to interpretation.

Editorial Remarks

- Section 5.1.1: The title for this section is "stress factors", but it may be more appropriate to call it "Execution Stress Factors". The HRAC stress evaluation only impacts the quantification of the execution contributions.
- Section 5.1.1: Add the word "is" in the second to last sentence: "...where the action takes place is in the AFW pump room ..."

- Section 5.1.2, second paragraph, third sentence: Including the underlined changes may improve clarity: "This procedural guidance includes steps to verify that the turbine is latched and, if it is not, to reset the turbine..."
- Section 5.1.2, third paragraph, second and fourth sentences: Including the underlined changes may improve clarity: "For areas determined by the Appendix R analysis to occur in areas in which all Auxiliary Feedwater may be impacted by the fire, the operator is directed to implement EOP Supplement 19. The Off Normal procedures also specify that AFW flow be established within twenty five minutes. Therefore it is considered that during..."
- In the "Identification and Definition" section of the HRAC output, there is a bulleted list under "Reactor successfully tripped." The entry for the second to last bullet does not appear to be complete.
- In the "Identification and Definition" section of the HRAC output, item number 6 indicates the consequence of failing to perform the action is core damage. If the system window is defined to be -84% SG level, would the consequence actually be transition to OTC, instead?
- Manpower Requirements: These are now understood to be manpower requirements for execution, so they could be adjusted, if desired.
- Timing analysis section: This section is confusing regarding the MAAP cases that are used to support the evaluation and what defines the system window. It would be helpful to clarify what is used and what are only used as points of comparison.
- Execution evaluation, step 4.2.e: Delete the text that indicates there is insufficient time to complete the action.