

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
PP-B2-01	PP-B2 PP-B3 PP-B4 PP-C3		See response to PRA RAI 24. Acceptable to the NRC staff because, a barrier failure probability of 1 is used when spatial separation is used in the multicompartment analysis. Thus, no multicompartment scenarios are missed in the quantification.	
ES-A1-01	ES-A1 PRM-B3	B		
ES-A4-01	ES-A4		See response to PRA RAI 36. Acceptable to the NRC staff because the licensee describes the two MSO scenarios involving spurious opening of the pressurizer spray valve(s) and explains that one of these is screened because it would require more than two spurious operations [NRC staff notes that this is consistent with CC-II for SR ES-A5] and that the other MSO scenario is specifically modeled in the fire PRA. The licensee further stated that the F&O was addressing a specific MSO in the analysis, and was not addressing a fundamental issue of linking of components to the CAFTA fault tree.	
ES-A6-01	ES-A5 ES-A6 ES-B2		See response to PRA RAI 25. Acceptable to the NRC staff because the licensee explained that up to three spurious operations were considered when identifying new initiating events leading to containment bypass [NRC staff notes that this is consistent with CC-II for SR ES-A6].	
ES-B1-01	ES-B1 ES-B2 ES-B3		See NRC staff review of F&O ES-B1-03 regarding licensee response to PRA RAI 37.	
ES-B1-03	ES-B1 ES-B2 ES-B3 PRM-B10		See response to PRA RAI 37. Acceptable to the NRC staff because the licensee states that all basic events were reviewed and any remaining unmapped basic events in the model were dispositioned to reflect the reason mapping was not required.	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
ES-B3-01	ES-B3		See response to PRA RAI 38. Acceptable to the NRC staff because the licensee explained that all pipe sizes less than two inches were screened because a) at least three penetrations would have to fail open to cause a LERF, b) each penetration contains two valves in series that fail closed, and c) therefore six spurious operations would be required to open the valves and cause a LERF. Per the PRA standard, up to three spurious is all that must be considered to obtain a CC-II rating for SR ES-A6 for fire-induced failures leading to an ISLOCA.	
ES-B4-01	ES-B4 CS-A3 CS-A4		See response to PRA RAI 39. Acceptable to the NRC staff because the licensee explains that the cited power dependency identified by the peer reviewer as missing from the fire PRA was a singular occurrence or oversight, and that this was confirmed by a complete check of the dependencies in the circuit analysis database.	
ES-D1-01	ES-D1 CS-A1	A		
CS-A8-01	CS-A8		See response to PRA RAI 40. Acceptable to the NRC staff because the licensee explains that a) the "high consequence event," as defined in NUREG/CR-6850, not screened is scenario MSO-16 resulting in an ISLOCA due to spurious opening of two RHR suction valves in series, b) the power cables associated with these valves are thermoset cables and are part of a grounded AC system and therefore, per NUREG/CR-6850, the three-phase proper polarity hot short failure mode for these valves was not included in the fire PRA because it is not considered risk significant, and c) furthermore, the power supply breakers to these valves are locked open during plant operations and a	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
			surveillance is performed each shift to verify that the valves are closed and that the breakers are open and, therefore, these valves cannot spuriously operate due to a fire.	
CS-A10-01	CS-A10		See response to PRA RAI 23. Acceptable to the NRC staff because the licensee stated that no cable routing was assumed. For the case of the 230 kV power system cables, the three zones where 230 kV power was credited were walked down and it was verified that the cables were not in the zones.	
CS-B1-01	CS-B1 CS-C4		See response to PRA RAI 41. Acceptable to the NRC staff because the licensee stated that all of the open items discussed in the F&O, plus additional open items subsequently identified during the closure process, have been resolved such that no breaker coordination issues will exist in the post transition plant. The licensee also stated that no change to the fire PRA was necessary as a result of resolving the open items.	
PRM-A4-01	PRM-A4		See response to PRA RAI 26. Acceptable to the NRC staff because the licensee explained that the fire PRA model initiator selection approach was revised to result in either one specific or multiple initiating events depending on the fire-induced failure. The licensee further explained that this was accomplished by adding a new generic fire initiator (%FIRE) to the specific gates (i.e., turbine trip, consequential small LOCA, medium LOCA, secondary side break, and safety injection signal) that could be initiated by fire-induced equipment failures, which ensures that the effects of these failures are propagated through the model.. The licensee also included a specific example demonstrating the approach	
PRM-A4-02	PRM-A4		See response to PRA RAI 27. Acceptable to the NRC staff because the licensee explained that the MSO-27 logic was updated in the	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
			<p>fault tree model to address this F&O and that additional review of MSO-28 determined that the valves in question are locked open during plant operation and therefore their fire-induced failure was not included in the PRA model since they cannot spurious operate due to a fire. The licensee further explained that after the peer review was complete the MSO panel report was reviewed against the MSOs included in the model to ensure that they were modeled appropriately and concluded that the errors identified during the peer review were the only ones that required correction in the model.</p>	
PRM-A4-03	PRM-A4		<p>See the NRC staff evaluation of the licensee's disposition to F&O ES-B1-03.</p>	
PRM-A4-04	PRM-A4		<p>See response to PRA RAI 28. Acceptable to the NRC staff because the licensee stated that the MSO panel report was reviewed against the MSOs included in the model to ensure that they were modeled appropriately and concluded that the errors identified during the peer review were the only ones that required correction in the model.</p>	
PRM-A4-05	PRM-A4		<p>See response to PRA RAI 29. Acceptable to the NRC staff because the licensee explained that logic was added to the safety injection system (SIS) fault tree model to include combinations of components that fail due to spurious operation and cause SIS. The licensee also provided the SIS CAFTA fault tree showing that the cited spurious actuations had been modeled.</p>	
PRM-B9-01	PRM-B9		<p>See NRC staff review of F&O ES-B1-03 regarding licensee response to PRA RAI 37.</p>	
PRM-B9-02	PRM-B9		<p>See NRC staff review of F&O ES-B1-03 regarding licensee response to PRA RAI 37.</p>	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
FSS-A4-01	FSS-A4	A		
FSS-A4-02	FSS-A4		See response to PRA RAI 16. Acceptable to the NRC staff because the licensee explained that each individual fire zone report has a section that discusses the suppression credited in the PRA. Specifically, using Fire Zone CB15 as an example, the licensee a) identifies the detection and suppression features credited in the PRA, b) states that the generic failure probabilities from NUREG/CR-6850 Appendix P are used in the PRA even though plant-specific values for reliability and availability are lower, and c) explains how sprinklers are credited to limit fire damage upon successful actuation.	
FSS-B2-01	FSS-B2			See PRA RAI 66, 66.01, and 66.02 regarding modeling of MCB fire scenarios. See PRA RAI 08, PRA RAI 10.03, PRA RAI 10.04, PRA RAI 95, and PRA RAI 100 regarding main control room abandonment.
FSS-C7-01	FSS-C7		See responses to PRA RAI 17 and 17.01. Acceptable to the NRC staff because the licensee explained that each individual fire zone report has a section that discusses the dependencies between suppression systems and how these are addressed in the PRA. Specifically, using Fire Zone CB15 as an example, the licensee explained that, while there are dependencies between the operation of the sprinkler system and fire brigade actions potentially requiring use of the same fire water source, failures in the fire water system can be isolated and water re-directed from	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
			a number of points within the system to ensure water availability to the fire brigade. Furthermore, the licensee explained that, while the firewater pumps are not explicitly credited in the Fire PRA, review of the cable routing and circuit analysis data for the diesel fire water pump determined that there are no fire areas where fire suppression was credited and the fire would fail the pump.	
FSS-D3-01	FSS-D3		See response to PRA RAI 18. Acceptable to the NRC staff because the licensee demonstrated that detailed fire modeling was done in a particular area of the plant, since the peer review had indicated that conservative treatment of fire modeling remained in the PRA. According to the plant disposition, this more detailed analysis was also performed for other top risk contributors.	
FSS-D7-01	FSS-D7		See response to PRA RAI 84. Acceptable to the NRC staff because the licensee described the review of plant records that was performed, discussed the unavailability of fire detection and suppression systems during plant operations resulting from this review, and determined that outlier behavior is not observed for fire detection and suppression systems that are credited in the FPRA.	
FSS-D8-01	FSS-D8		See response to PRA RAI 19. Acceptable to the NRC staff because the licensee explained that each individual fire zone report has a section that discusses the suppression credited in the PRA. Specifically, using Fire Zone CB15 as an example, the licensee a) identifies the detection and suppression features credited in the PRA, b) states that the generic failure probabilities from NUREG/CR-6850 Appendix P are used in the PRA even though plant-specific values for reliability and availability are lower, and	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
			c) explains how sprinklers are credited to limit fire damage upon successful actuation. The NRC staff also found the licensee's dispositions to related SRs FSS-A2-02, FSS-C7-01, and FSS-D7-01 acceptable.	
FSS-D9-01	FSS-D9		See response to PRA RAI 20. Acceptable to the NRC staff because the licensee states that they followed the guidance in NUREG/CR-6850 Appendix T for evaluating smoke damage in the FPRA and determined that short term damage from smoke is bounded by existing fire-induced failures modeled in the FPRA.	
FSS-G2-01	FSS-G2		See response to PRA RAIs 21 and 21.01. Acceptable to the NRC staff because the licensee states that damage to sensitive electronics was evaluated in accordance with the damage criterion in NUREG/CR-6850 and clarifications in FAQ 13-0004. Furthermore, the licensee identified the switchgear rooms having sensitive electronics, described how the sensitive electronics damage criterion were considered in these rooms, and stated that the consideration of this damage criterion did not impact the Fire PRA because damage to sensitive electronics was bounded by the existing treatment.	
FSS-F3-01	FSS-F3	B		
FSS-H5-01	FSS-H5		See response to PRA RAIs 22 and 22.01 and FM RAI 06. Acceptable to the NRC staff because the licensee explains that both qualitative and quantitative parameter uncertainty evaluations for fire modeling parameters were performed and included in the individual fire modeling zone reports as applicable. Specific examples of parameters for which sensitivity analyses were performed are provided in the RAI responses	
IGN-A5-01	IGN-A5	A		

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
IGN-B5-01	IGN-B5		See response to PRA RAIs 07, 31, and 85. Acceptable to the NRC staff because the licensee states that the FPRA utilizes the generic fire ignition frequencies, and associated distributions, from NUREG/CR-6850 Supplement 1. The licensee also provided the results of a sensitivity analysis utilizing the fire ignition frequencies from NUREG/CR-6850 in accordance with the guidance in NUREG/CR-6850 Supplement 1	
CF-A1-1	CF-A1		See response to PRA RAI 96. Acceptable to the NRC staff because the licensee stated that, consistent with NRC guidance, Option 2 was not used to determine Circuit Failure Likelihood in the VC Summer Fire PRA.	See PRA RAI 09 regarding removal of PRA credit for CPTs.
CF-A1-02	CF-A1	B		
HRA-B4-01	HRA-B4	B		
HRA-B4-02	HRA-B4	B		
HRA-C1-01	HRA-C1		See response to PRA RAI 33. Acceptable to the NRC staff because the licensee stated that swapping a charging pump and starting service water are performed by different individuals using different cues and different procedures and at most there is a low dependence between the two actions.	
HRA-C1-02	HRA-C1		See response to PRA RAIs 34 and 34.01. Acceptable to the NRC staff because the licensee a) provided the basis for the additional travel time assumed for manual actions performed inside and outside the MCR, respectively, b) confirmed that fire-specific talk-throughs were conducted and that additional talk-throughs/walk-throughs will be conducted as necessary after the fire procedures are revised to implement the NFPA 805 plant changes, and c) provided justification that the assumed additional travel times used in the fire HRA are conservative relative to the final version	

**Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)**

FINDING/ SUGGESTION (F&O) ID	SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
		Review of Plant Disposition (A/B/C)	RAI Response	
			Not Discussed in the SE	Discussed in SE
			of NUREG-1921. The licensee also explained that walk-throughs of the new MCR abandonment procedure have been performed and the results incorporated into the aggregate analysis provided in response to PRA RAI 98.	
HRA-D2-01	HRA-D2	B		
SF-A4-01	SF-A4 SF-A5			See PRA RAI 35 regarding new implementation item to incorporate recommendations on addressing seismic issues in the procedures.
FQ-E1-01	FQ-E1	B		
UNC-A2-01	UNC-A2 FSS-E3		See response to PRA RAI 85. Acceptable to the NRC staff because the licensee described the areas of uncertainty in the PRA model and identified specific areas in which sensitivity analyses were performed to assess the significance of the uncertainties.	See PRA RAI 85.01 and PRA RAI 85.02 regarding propagation of parameter uncertainty and inclusion in the aggregate analysis (PRA RAI 98)
UNC-A2-02	UNC-A2		See NRC staff review of F&O UNC-A2-01 regarding licensee response to PRA RAI 85.	
UNC-A2-03	UNC-A2		See NRC staff review of F&O UNC-A2-01 regarding licensee response to PRA RAI 85.	

A: The NRC staff finds that the disposition of the F&O as described by the licensee in the LAR provides confidence that the issues raised by the F&O have been addressed and, if needed, the PRA has been modified, and therefore the resolution of the F&O is acceptable for this application.

Record of Review
Dispositions to V.C. Summer Fire PRA Facts and Observations (F&Os)

- B: The NRC staff finds that the disposition of the F&O as described by the licensee in the LAR and further clarified during the audit provides confidence that the issues raised by the F&O have been addressed and, if needed, the PRA has been modified, and therefore the resolution of the F&O is acceptable for this application.
- C: The NRC staff finds that the resolution of the F&O, as described by the licensee in the LAR, would have a negligible effect on the evaluations relied upon to support fire risk evaluations and has no impact on the conclusions of the risk assessment and therefore the resolution of the F&O is acceptable for this application. Examples of such F&Os may be suggestions, as well as those F&Os that don't affect the fire PRA. Documentation issues may fall into this category as well.