

Record of Review
Disposition to Cooper Nuclear Station Fire Events PRA Facts and Observations (F&O)

FINDING/ SUGGESTION (F&O) ID	ACCEPTABLE TO THE NRC STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
1-14			See PRA RAI-05 in Section 3.4.2.2.
4-1		See PRA RAI-02.a. Acceptable to the NRC staff because the licensee explains that spatial separation or localized protection were not credited as Fire Compartment boundaries, and non-rated elements were only credited as compartment boundaries provided that they have been included in the Fire Protection Program and justified as acceptable in engineering equivalency evaluations.	
1-15	A		
5-2			See PRA RAI-02.b in Section 3.4.2.2.
1-21	A/B		
2-3		See disposition to this F&O and PRA RAI-02.j and PRA RAI 23. Acceptable to the NRC staff because the licensee explains in the F&O disposition that although documentation of the Fire PRA system modeling does not reside in system notebooks developed parallel to the internal events system notebooks, the Fire-Induced Risk Model report does describe how the internal event models were specifically adjusted to account for fire-induced failures. The licensee also explains in response to PRA RAI-02.j how system boundary definitions used in the Internal Events PRA were adjusted in the Fire PRA for components that needed to be added, in particular instrumentation. The licensee provided a comprehensive list of the kinds of events, including instrumentation related events, added to Internal Events PRA to account fire-induced failures. Additionally, in response to PRA RAI 23 the licensee described and presented the components, failure modes, and success criteria that added or changed from the Internal Events PRA to the Fire PRA.	
2-14	A		
2-15			See PRA RAI-02.o, and PRA RAI-02.o-01.in Section 3.4.2.2.
4-5		See PRA RAI-02.l. Acceptable to the NRC staff because the licensee clarifies that the failure mode “Fails to Remain Open/Closed” was specifically added for the Fire PRA. Staff notes that there is a description of the process for identifying and adding these failures in Section 4.4 of Component Selection report (NEDC 09-078) as cited in the RAI response, and a long list of the kinds of failures modes added in the RAI response.	
4-7	A/B		
4-9	A		
4-10			See PRA RAI-02.c. in Section 3.4.2.2.
4-11			See PRA RAI-02.i in Section 3.4.2.2.
4-12	A/B		
4-13	A		
1-27	A		
1-28	A		
1-29	A		
1-30			See PRA RAI-02.m in Section 3.4.7.
2-21	A		
3-1			See FM RAI-02.e in Section 3.4.2.3.
3-9			See FM RAI-01.f.iii in Section 3.4.2.3.
3-10	B		
3-12			See FM RAI-03 in Section 3.4.2.3.
3-13	B		
3-14	A		
4-18	B		
5-10	A		
5-11	A		
5-12		See PRA RAI-02.d and supporting documentation. Acceptable to the NRC staff because the licensee explains that 1) the updated analysis performed in response to the F&O assumed that the entire length of the unprotected column and steel beams were exposed to direct flame impingement for the duration of an unconfined 100% oil spill and that, even so, temperatures in the beams and columns fell well short of the failure threshold of 1100 °F, that 2) the calculations were revised to include “lumped capacitance” over longer duration fires, and that 3) there are no unprotected steel columns in the Turbine building below the operating floor.	
5-13	A/B		
5-14	A/B		
5-15			See PRA RAI-02.f and PRA RAI-02.f-01 in Section 3.4.2.2.
6-2		See PRA RAI-02.e. Acceptable to the NRC staff because the licensee explains that lack of cable routing was a minor source of uncertainty and usually modeled conservatively. The licensee describes a number of cases is which cables or components were assumed to be failed because of lack of routing information. In other cases the licensee describes how minor gaps in routing information (e.g., within a fire zone) was assumed based on engineering judgment.	
6-4	B		
1-3	A		

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	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
3-6	A		
5-4	A/B		
1-2	A		
1-22	A		
1-23	A/B		
1-24	A/B		
3-5	B		
1-31	A		
1-9			PRA RAI-02.g in Section 3.4.7.
4-22		See PRA RAI 02.n. Acceptable to the NRC staff because the licensee explains that two sets of operator interviews were performed, and that the second interview included “talk-throughs” with plant personnel on procedures and sequences of events as required by ASME/ANS PRA Standard Supporting Requirement (SR) HRA-A4.	
4-25	A/B		
4-26	A		
4-27	A		
7-8		See PRA RAI-02.p, PRA RAI-02.r, and PRA RAI-02.s. Acceptable to the NRC staff because the licensee explains that although not all cutsets were merged into a single file, reasonableness reviews and assessment of significant contributors to risk were performed by examining the scenario cutsets that contributed greater than 1 percent to core damage and large early release. In addition, cutsets of those scenarios with high conditional core damage probabilities and conditional large early release probabilities were reviewed, as well as a subset of non-significant cutsets. Scenarios were discussed by a team of PRA, safe shutdown, and fire modeling experts. The team looked for confirmation of logical cutset construction and any evidence of missing cutsets. Sensitivity studies of human actions were also performed as part of the fire risk evaluation process. Also, although importance analysis on basic events was not performed, the licensee explains that significant basic events can be considered to have been reviewed given that significant cutsets has been reviewed.	
8-3	A		
8-5		See PRA RAI-02.p, PRA RAI-02.r, and PRA RAI-02.s. Acceptable to the NRC staff because the licensee explains that reasonableness reviews and assessment of significant contributors to risk were performed by examining the scenario cutsets that contributed greater than 1 percent to core damage and large early release. In addition, cutsets of those scenarios with high conditional core damage probabilities and conditional large early release probabilities were reviewed, as well as a subset of non-significant cutsets. Also, although importance analysis on basic events was not performed, the licensee explains that significant basic events can be considered to have been reviewed given that significant cutsets has been reviewed.	
8-6		See PRA RAI-02.q. Acceptable to the NRC staff because the licensee explains that no Plant Damage States were identified beyond those used in the Internal Events PRA, and that the relative contribution of phenomena, containment challenges or failure modes to the plant damage states is the same. Accordingly, fire LERF risk contributors were not ranked by Plant Damage State, phenomena, containment challenges or failure modes.	
1-17			See PRA RAI-2.h and PRA RAI-02.h-01 in Section 3.4.7.
1-34	A		

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.

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.