

**Record of Review**  
**Dispositions to Arkansas Nuclear One Unit 2 (ANO-2) Internal Events PRA Facts and**  
**Observations (F&Os)**

Finding/ Suggestion (F&O) ID	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in SE	Discussed in SE
IE-C3-01	A		
IE-C10-01	C		
IE-C12-01	A		
IE-D1-01	A		
AS-A4-01		See PRA RAI 19.a. Acceptable to NRC staff because the licensee explains that modeling of operator actions is based on EOPs, AOPs, system Operating Procedures, and alarm response procedures which were reviewed by Plant Operations as part of an expert review. The licensee also explains that the few manual actions that pertain to the ANO-2 functional events trees are discussed in the Accident Sequence notebook.	
AS-A5-01		See PRA RAI 19.b. Acceptable to NRC staff because the licensee explains that the accident sequence development is based on the Safety Analysis Report and the EOPs, and identifies the procedures that specific safety functions are based on. The licensee also explains that consideration of additional safety functions was not needed for the Fire PRA.	
AS-A10-01		See PRA RAI 19.a. Acceptable to NRC staff because the licensee explains that modeling of operator actions is based on EOPs, AOPs, system Operating Procedures, and alarm response procedures which were reviewed by Plant Operations as part of an expert review. The licensee also explains that the few manual actions that pertain to the ANO-2 functional events trees are discussed in the Accident Sequence notebook.	
AS-B1-01		See PRA RAI 19.c. Acceptable to NRC staff because the licensee explains that special initiators are incorporated into the fault trees at the a level appropriate to functionality that would be lost. The licensee also explains that the Fire PRA is not impacted by placement of special initiators because Fire PRA uses the reactor trip initiator as the default initiator.	
AS-B2-01		See PRA RAI 19.d. Acceptable to NRC staff because the licensee explains that system	

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		dependencies are explicitly modeled in the and Human Error Probability (HEP) dependencies are explicitly treated in the Human Reliability Analysis. iThe licensee also explains that a minimum joint HEP probability (i.e., floor) of 1E-6 is used.	
AS-B3-01		See PRA RAI 19.e. Acceptable to NRC staff because the licensee explicitly identifies the 18 accident sequence phenomena from WCAP-16679, "Accident Sequence Phenomena Considerations" report, and discusses how the impact from these phenomena was considered in the PRA modeling	
AS-B6-01		See PRA RAI 19.f. Acceptable to NRC staff because the licensee clarifies that time-phased dependencies were considered, and described explicitly how they were modeled. In the F&O disposition the licensee that conservative timing was assumed for tripping the RCPs..	
AS-C2-01		See PRA RAI 19.g. Acceptable to NRC staff because the licensee explicitly explains how the Accident Sequence notebook will be improved to better document how the types of dependencies listed in SR AS-C2 were addressed.	
SY-A4-01		See PRA RAI 19.h. Acceptable to NRC staff because the licensee explains that walkdowns and discussions with plant engineers, operators, and trainers were conducted throughout the development of the Internal Events PRA model, and included an expert panel review to check that the as-built, as-operated plant is reflected in the PRA. The licensee also explains the Fire PRA model was reviewed to verify that it reflected the as-built, as-operated plant.	
SY-A8-01	A		
SY-B8-01		See PRA RAI 19.i. Acceptable to NRC staff because the licensee explains that spatial and environmental hazards such as room temperature, seal temperature, insufficient Net Positive Suction Head, debris clogging of screens and heat exchangers are considered in the Internal Events PRA model, Internal flooding, and Fire PRAs.	
HR-C2-01		See PRA RAI 19.j. Acceptable to NRC staff because the licensee explains that ANO-2 condition reports since January 2003 identifying	

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		issues that could be associated with pre-initiators were reviewed, and that system events were reviewed for indication of mis-calibration or mis-positioning problems.	
HR-D3-01		See PRA RAI 19.k. Acceptable to NRC staff because the licensee explains the HRA used Cause-Based Decision Tree (CBDT) analysis described in EPRI TR-100259, to evaluate procedural quality and to ensure performance shaping factors are explicitly addressed. This analysis was supported by talk-throughs and simulator information.	
HR-D6-01		See PRA RAI 19.l. Acceptable to NRC staff because the licensee explains that the conversion equation used to convert a median probability to a mean for a lognormal distribution is from NUREG/CR-1278 and was used for both “pre” and “post” accident operator actions.	
HR-G6-01		See PRA RAI 19.m. Acceptable to NRC staff because the licensee explains that post-accident HEPs were reviewed to verify reasonable-ness and consistency based on the time available, complexity of the task and associated decisions, and that anomalies corrected or could be explained. The licensee also explained that Fire PRA HEPs were corrected for timing and loss of instrumentation.	
HR-G9-01		See PRA RAI 19.l. Acceptable to NRC staff because the licensee explains that the conversion equation used to convert a median probability to a mean for a lognormal distribution is from NUREG/CR-1278 and was used for both “pre” and “post” accident operator actions.	
DA-A1a-01	A		
DA-C10-01		See PRA RAI 19.n. Acceptable to NRC staff because the licensee explains that the procedure for gathering test data was refined to ensure that SR DA-C10 is met, and that most components are addressed correctly already so impact is expected to insignificant. Though PRA RAI 19.n was asked on this topic, the licensee’s response did not help further resolve the finding for impact on the Fire PRA. Staff agrees that if this SR is met at CC-II for most components this impact on the Fire PRA is not likely to be significant.	

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DA-C12-01		See PRA RAI 19.o. Acceptable to NRC staff because the licensee explains that system unavailability values are based on actual planned and unplanned out-of-service time for risk significant systems. The licensee also explains that for other systems unavailabilities are based on data provided by the system engineer from operator logs and plant operations.	
IF-C2c-01	C		
IF-C3-01	C		
IF-C7	C		
IF-D5a-01	C		
IF-D6-01			
IF-D7	C		
IF-E1	C		
IF-E3	C		
IF-E3a	C		
IF-E4	C		
IF-E5	C		
IF-E5a	C		
IF-E6	C		
IF-E6a	C		
IF-E6b	C		
IF-E7	C		
IF-E8	C		

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QU-D3-01		See PRA RAI 19.q. Acceptable to NRC staff because the licensee, in addition to using the MSPI Cross Comparison report, provides separate comparison tables of PRA modeling elements, initiating events modeled, and results between ANO-2 and Waterford, as well a final table that discusses differences that impact results. Although a full comparison was performed only against Waterford the results appear logical, and staff notes that not meeting CC-II for this SR does not significantly impact the Fire PRA results.	
QU-F4-01	B		
LE-C2b-01	A		
LE-C8a-01	A		
LE-C9a-01	A		
LE-C9b-01	A		
LE-C10-01	A		
LE-D1b-01	A		
LE-D3-01		See PRA RAI 19.r. Acceptable to NRC staff because the licensee explains that the LERF modeling is conservative because it is assumed that low pressure piping will fail if the ISLOCA line opens to allow high pressure fluid into that low pressure pipe. Once the low pressure piping fails outside containment, the equipment in that area will likely fail due to internal flooding or spray or high room temperatures, and unless the ISLOCA can be isolated, the RWT will eventually deplete. The licensee also explained that the Fire PRA, consistent with the MSO report, models multiple electrical shorts causing combinations of MOVs or AOVs to spuriously open due to a fire.	

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LE-D6-01	B		
LE-E4-01		See PRA RAI 19.s. Acceptable to NRC staff because the licensee explains that dependency analysis was performed for pre-core damage actions but not for post-damage actions, but that exclusion of this impact is minimal. The licensee explains a sensitivity study that entirely removed credit for the post-core damage (CD) actions demonstrates only a 0.02% increase in risk. Therefore, any impact of potential dependencies involving post-damage actions is negligible.	
<p>Notes;</p> <p>A: For F&amp;Os, the NRC staff finds that the disposition of the F&amp;O as described by the licensee in the LAR provides confidence that the issues raised by the F&amp;O have been addressed and, if needed, the PRA has been modified, and therefore the resolution of the F&amp;O is acceptable for this application. For Not Met or met at CC-I SRs, the NRC staff finds that the acceptability basis for the capability category of the SR as described by the licensee in the LAR provides confidence that the requirements of the SR have been addressed and, if needed, the PRA has been modified, and therefore the PRA quality with respect to the SR is acceptable for this application. Examples of acceptable Not Met and CC-I SRs are modeling methods that yield conservative FRE and change evaluation results.</p> <p>B: For F&amp;Os, the NRC staff finds that the disposition of the F&amp;O as described by the licensee in the LAR and further clarified during the audit provides confidence that the issues raised by the F&amp;O have been addressed and, if needed, the PRA has been modified, and therefore the resolution of the F&amp;O is acceptable for this application. For Not Met or met at CC-I SRs, the NRC staff finds that the acceptability basis for the capability category of the SR as described by the licensee in the LAR and further clarified during the audit provides confidence that requirements of the SR have been addressed and, if needed, the PRA has been modified, and therefore the PRA quality with respect to the SR is acceptable for this application. Examples of acceptable Not Met and CC-I SRs are modeling methods that yield conservative FRE and change evaluation results.</p> <p>C: For F&amp;Os, the NRC staff finds that the resolution of the F&amp;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&amp;O is acceptable for this application. Examples of such F&amp;Os may be suggestions, as well as those F&amp;Os that don't affect the fire PRA. Documentation issues may fall into this category as well. For Not Met or met at CC-I SRs, the NRC staff finds that the acceptability basis for the capability</p>			

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category of the SR, 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 PRA quality with respect to the SR is acceptable for this application. Examples are those SRs that don't affect the fire PRA.			