

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
CS-A4-01	A		
CS-A9-01			See PRA RAIs 01.a and 03.
CS-B1-01		See PRA RAI 01.b. Acceptable to the NRC staff because the licensee clarified that power sources for which coordination was not verified were modified according to Table S-2 of the LAR, treated as failed by the FPRA, or verified as not supporting a function modeled in the FPRA.	
CS-C1-01			See PRA RAIs 01.c and 03.
CS-C2-01	A		
CS-C4-01		See PRA RAI 01.b. Acceptable to the NRC staff because the licensee clarified that power sources for which coordination was not verified were modified according to Table S-2 of the LAR, treated as failed by the FPRA, or verified as not supporting a function modeled in the FPRA.	
ES-A2-01			See PRA RAI 01.d.
ES-A3-01	B		
ES-A5-01	B		See PRA RAIs 01.e and 01.e.01 (regarding primary coolant pump seal failure model).
ES-C1-01			See PRA RAIs 01.f and 01.f.01.
ES-C2-01			See PRA RAIs 01.g and 31.
ES-D1-01	A		
FQ-A4-01	A		
FQ-B1-01	A		
FQ-C1-01			See PRA RAIs 01.h, 01.h.01, 01.h.02, 03, 30.01 and 30.a.01.
FQ-E1-01		See PRA RAI 01.i. Acceptable to the NRC staff because the licensee confirmed that reviews of both dominant and non-dominant cutsets were performed at the scenario level during quantification and that the aggregate results were also reviewed for reasonableness based on the dominant contributors to CDF and LERF. The licensee further clarified that the importance analysis included the individual contributions from both	

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
		fire- and non-fire related parameters.	
FSS-A1-01			See PRA RAIs 01.j, 01.j.01, and 01.j.01.01.
FSS-A3-01	A		
FSS-B1-01			See PRA RAIs 01.k and 01.k.01.
FSS-B2-01			See PRA RAIs 01.l and 01.l.01.
FSS-C3-01			See PRA RAIs 01.m, 01.q, 01.q.01, 07, 08 and 11 as well as FM RAIs 01.f, 01.g, 01.k, 01.l, 07 and 09.
FSS-C4-01		See PRA RAI 01.n. Acceptable to the NRC staff because the licensee's disposition to the F&O states that the 0.01 severity factor for hotwork is no longer applied. The licensee further clarified in response to PRA RAI 01.n that hotwork fire scenarios in the FPRA were reviewed and confirmed to not credit prompt suppression.	
FSS-C5-01			See PRA RAIs 01.o and 11.
FSS-C7-01		See PRA RAI 01.p. Acceptable to the NRC staff because the licensee states that the FPRA accounts for dependencies between automatic detection and suppression; active fire barriers and automatic suppression; safe shutdown capability and automatic suppression; manual and automatic suppression; and manual fire detection and suppression.	
FSS-C8-01	A		
FSS-D1-01			See PRA RAIs 01.q and 01.q.01.
FSS-D2-01		See PRA RAI 01.u. Acceptable to the NRC staff because the licensee states that fixed suppression systems are only credited to prevent (1) a hot gas layer given actuation temperatures are below HGL temperatures, (2) damage to targets in the cable spreading room beyond the ZOI of the ignition source, and (3) widespread damage and loss of structural integrity in the turbine building due to a turbine-generator	See PRA RAIs 01.r and 01.r.01 (regarding time to detection).

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
		fire.	
FSS-D4-01			See PRA RAI 01.s.
FSS-D7-01			See PRA RAI 01.t.
FSS-D8-01		See PRA RAI 01.u. Acceptable to the NRC staff because the licensee states that the assessment of the effectiveness of the fire suppression and detection systems credited in the FPRA considered (a) system design compliance with applicable codes and standards as well as current fire protection engineering practice (b) the time available to suppress the fire prior to target damage (c) specific features of physical analysis unit and fire scenario under analysis, and (d) suitability of the installed system given the nature of the fire source being analyzed.	
FSS-E3-01			See FM RAI 06.
FSS-F1-01		See PRA RAI 01.v. Acceptable to the NRC staff because the licensee states that the FPRA model addresses the possibility of effects of pooling, the flaming oil traversing multiple levels, and spraying from continued main turbine lube-oil pump operation consistent with the guidance in Appendix O.2.3 to NUREG/CR-6850. Additionally, the licensee further clarifies that the FPRA model includes scenarios involving other high hazard sources (e.g., hydrogen storage tanks and piping, oil storage tanks, and mineral oil filled transformers) consistent with the relevant guidance in NUREG/CR-6850.	
FSS-F2-01			See FM RAIs 01.q and 01.01.
FSS-F3-01			See PRA RAI 01.w.
FSS-G2-01			See PRA RAI 01.x.
FSS-G2-02	C		
FSS-G4-01			See PRA RAIs 01.y and 01.y.01.
FSS-G5-01		See PRA RAI 01.z. Acceptable to the	

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
		NRC staff because the licensee states that barrier failure probabilities assigned in the multi-compartment analysis to active fire doors are consistent with guidance in NUREG/CR-6850.	
FSS-G6-01	A		
FSS-H2-01			See PRA RAI 01.aa.
FSS-H5-01			See FM RAI 06.
FSS-H9-01		See PRA RAIs 01.mm and 01.mm.01. Acceptable to the NRC staff because the licensee stated that key assumptions and sources of uncertainty for the FPRA model were comprehensively identified, characterized, and documented and further clarified the criteria used for judging their importance. Additionally, for each key assumption or source of uncertainty identified, the licensee assessed the potential quantitative impact as it relates to the FPRA and the NFPA 805 application.	See FM RAI 06 (regarding uncertainty in the fire modeling analysis).
HRA-A2-01	B		
HRA-A3-01			See PRA RAIs 01.g and 31.
HRA-A4-01			See PRA RAIs 01.l, 01.bb, 01.cc, 28.b and 31.
HRA-B2-01	A		
HRA-B3-01			See PRA RAIs 01.f, 01.g and 01.cc.
HRA-C1-01			See PRA RAI 01.dd.
HRA-D1-01			See PRA RAI 01.ee.
HRA-D2-01			PRA RAI 01.h, 01.h.01, 01.h.02, 01.dd, 01.ff, 30.01 and 30.a.01.
HRA-E1-01			See PRA RAIs 01.f, 01.f.01, 01.g, 01.h, 01.h.01, 01.h.02, 01.l, 01.bb, 01.cc, 01.dd, 01.ee, 01.ff, 30.01 and 30.a.01.
IGN-A10-01	A		
IGN-A6-01	A		
IGN-A7-01			See PRA RAI 01.aa.
IGN-A9-01	A		
IGN-B2-01	A		
IGN-B4-01		See PRA RAI 01.gg. Acceptable to	

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
		the NRC staff because the licensee provided justification for the classification of all identified fire events as non-challenging based on an assessment using the established criteria in Appendix C of NUREG/CR-6850.	
MU-A1-01	A		
PP-A1-01	A		
PP-B1-01	A		
PP-B2-01		See PRA RAI 01.hh. Acceptable to the NRC staff because the licensee confirmed that for physical analysis units (PAUs) that do not directly align with the Fire Hazards Analysis, sufficient spatial separation exists, a fire-rated barrier will be added as a result of a modification (e.g., LAR Attachment S, Modification S2-20), or that barriers are sufficient for the hazard.	
PP-B3-01	A		
PP-B4-01	A		
PP-B5-01		See PRA RAI 01.z. Acceptable to the NRC staff because the licensee states that barrier failure probabilities assigned in the multi-compartment analysis to active fire doors are consistent with guidance in NUREG/CR-6850.	
PP-B7-01	A		
PP-C2-01	A		
PRM-B11-01		See PRA RAI 01.ii. Acceptable to the NRC staff because the licensee stated that other than adjustments to HEP values, probability input values neither required reanalysis given the fire context nor were absent from the Internal Events (IE) PRA. The licensee further clarified that the data analysis, as a whole, was performed consistent with the requirements of SRs PRM-B12, PRM-B13 and PRM-C1.	See PRA RAIs 01.f, 01.f.01, 01.g, 01.h, 01.h.01, 01.h.02, 01.i, 01.bb, 01.cc, 01.dd, 01.ee, 01.ff, 30.01 and 30.a.01 (regarding HRA).

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
PRM-B3-01		See PRA RAI 01.jj. Acceptable to the NRC staff because the licensee confirmed the modeling changes made prior to the LAR submittal to include the DC power dependency for the primary coolant pump breaker trip function as well as credit given to Modification S2-5 as an alternate means to trip the pumps.	
PRM-B3-02	A		
PRM-B5-01	A		
PRM-B9-01		See PRA RAI 01.kk. Acceptable to the NRC staff because the licensee stated that the model was updated to include events representing spurious operation of the proportional heater banks not in service, failure of pressurizer spray operation, fire-induced faults that prevent de-energizing heater banks, and operator failure to de-energize heaters, both locally and from the control room.	
QLS-B2-01	A		
SF-A1-01		See PRA RAI 01.ll. Acceptable to the NRC staff because the licensee stated that the seismic-fire interaction analysis has been updated to address the findings from the FPRA peer review and all associated supporting requirements from ASME/ANS RA-Sa-2009. The licensee further confirmed that the assumptions, analysis and system responses documented in the IPEEE, on which the seismic-fire interaction analysis is based, remain valid and bound any changes to seismic and total CDF and LERF resulting from use of the updated USGS hazard curves.	
UNC-A1-01		See PRA RAIs 01.mm and 01.mm.01. Acceptable to the NRC staff because the licensee stated that key assumptions and sources of	

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

FINDING/ SUGGESTION (F&O) ID OR SUPPORTING REQUIREMENT (SR)	ACCEPTABLE TO STAFF VIA		
	Review of Plant Disposition (A/B/C)	RAI Response	
		Not Discussed in the SE	Discussed in the SE
		uncertainty for the FPRA model were comprehensively identified, characterized, and documented and further clarified the criteria used for judging their importance. Additionally, for each key assumption or source of uncertainty identified, the licensee assessed the potential quantitative impact as it relates to the FPRA and the NFPA 805 application.	
UNC-A2-01			See PRA RAI 01.nn.
PRM-A3	B	See PRA RAI 01.i. Acceptable to the NRC staff because the licensee confirmed that reviews of both dominant and non-dominant cutsets were performed at the scenario level during quantification and that the aggregate results were also reviewed for reasonableness based on the dominant contributors to CDF and LERF. The licensee further clarified that the importance analysis included the individual contributions from both fire- and non-fire related parameters.	
PRM-B2	A		
PRM-B4	A		
PRM-B14		See PRA RAI 04. Acceptable to the NRC staff because the licensee stated that all core damage sequences resulting from fire initiating events end in an accident class that could be binned to a plant damage states already defined by the IEPRA.	

A: For F&Os, 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. 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.

Record of Review

Dispositions to Palisades Nuclear Plant (PNP) Fire PRA (FPRA) Facts and Observations (F&Os)

B: For F&Os, 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. 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.

C: For F&Os, 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 FPRA. 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 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 FPRA.