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10 CFR 50.90

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Salem Nuclear Generating Station, Units 1 and 2
Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: Response to Draft Request for Additional Information - Risk-Informed Relocation of Surveillance Frequency Requirements

Reference (1) Letter from Carl J. Fricker, PSEG Nuclear LLC, to U.S. Nuclear Regulatory Commission, "Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program," dated March 23, 2010 (ADAMS Accession No. ML100910154)

(2) Email from R. Ennis, USNRC to PSEG, "Salem Nuclear Generating Station, Unit Nos. 1 and 2, Draft Request for Additional Information (TAC Nos. ME3574 and ME3575)," dated December 20, 2010 (ADAMS Accession No. ML103540481)

In Reference 1, PSEG Nuclear LLC (PSEG) submitted a license amendment request for the Salem Nuclear Generating Station (Salem). Specifically, the proposed change would modify Salem Technical Specifications (TS) by relocating specific surveillance frequencies to a licensee-controlled program, the Surveillance Frequency Control Program, with the implementation of Nuclear Energy Institute (NEI) 04-10, "Risk Informed Method for Control of Surveillance Frequencies."

In Reference 2 the NRC requested additional information regarding PSEG's license amendment request. The information requested by the NRC and PSEG's responses are in Attachment 1.

PSEG has determined that the information provided in this response does not alter the conclusions reached in the 10 CFR 50.92 no significant hazards determination previously submitted.

There are no new commitments contained in this letter. Should you have any questions, please contact Paul Duke at (856) 339-1466.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 31, 2011
(date)

Sincerely,

Carl J. Fricker
Site Vice President - Salem
PSEG Nuclear LLC

Attachment

1. Response to draft request for additional information

cc: W. Dean, Regional Administrator - NRC Region I
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector - Salem
P. Mulligan, Manager IV, NJBNE
L. Marabella, Corporate Commitment Tracking Coordinator
H. Berrick, Salem Commitment Tracking Coordinator

Response to Draft Request for Additional Information

Salem Nuclear Generating Station - Units 1 and 2
NRC Docket Nos. 50-272 and 50-311

In Reference 1, PSEG Nuclear LLC (PSEG) submitted an amendment request for Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. The proposed amendment would modify the Technical Specifications by relocating specific surveillance frequencies to a licensee-controlled document. The proposed amendment is based on Nuclear Regulatory Commission (NRC)-approved Technical Specification Task Force (TSTF) Traveler TSTF-425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control - RITSTF [Risk-Informed TSTF] Initiative 5b." The NRC reviewed the license amendment request and identified the need for additional information.

A draft request for additional information (RAI) was electronically transmitted to PSEG on December 20, 2010 (Reference 2). The questions are restated below along with PSEG's response.

1. Finding IE-A5-01: Describe how events occurring during plant shutdown or which resulted in a controlled plant shutdown are addressed in the development of initiating events, and confirm that the supporting requirement of the standard is met except for adequacy of the documentation.

   Response:
   All plant shutdowns were reviewed in the development of the scope of initiating events for the Salem PRA model. The documentation for initiating events currently only lists reactor trips that contribute to the initiating event frequencies in the model; the controlled shutdowns reviewed for the scope of initiating events were not included in the documentation. There were no new initiators identified that were not already accounted for in the PRA model based on the review of previous manual reactor shutdowns and events during plant shutdowns for the Salem plant.

   Therefore, the Salem PRA model is technically adequate with respect to Supporting Requirement (SR) IE-A5; this is a documentation issue.

2. Finding AS-A7-01: Describe how subsuming of non-minimal sequences in the single-top fault tree model has been determined not to result in a loss of risk insights or masking of importance of non-standard configurations, and confirm that the supporting requirement of the standard is met except for adequacy of the documentation.

   Response:
   The peer review finding in question involved an instance where it appeared that non-minimal sequences were erroneously subsumed, thus prompting the reviewer to suspect that risk insights could possibly be masked. However, the instance involved incorporating legacy sequences involving the status of containment isolation from previous PRA models into a description of a particular transient event tree logic gate, in which the core damage end-state was identical between the two legacy end-states. The condition for determining the state of containment isolation is now addressed using separate Level 2 PRA model logic with this particular transient CDF sequence serving as an input, thus preserving the delineation among post-CDF Level 2 end-states. This also applies to other similar CDF end-states in the Salem PRA model.

Therefore, the Salem PRA model is technically adequate with respect to SR AS-A7; this is a documentation issue.

3. Finding AS-A7-[02]: Describe how the potential for flooding damage prior to isolation of the interfacing system flowpath has been evaluated and determined to not affect the capability to achieve safe shutdown, and confirm that the supporting requirement of the standard is met except for adequacy of the documentation.

Response:
Due to being located at the lowest elevation in the plant on the 45' el., only RHR related equipment would suffer water damage due to flooding effects from an ISLOCA event. A volume of water in excess of the total RCS inventory would be required to cause further damage to any equipment located at higher elevations. The total water inventory in the RCS is approximately 100,000 gallons. However, based on a review of architectural drawings, it was determined that about 300,000 gallons of water would be required in order for water to reach the 64' el. of the Auxiliary Building where other PRA-modeled equipment is located.

Therefore, the intent of this supporting requirement has been met and there is no need for any further re-analysis of ISLOCA scenarios involving additional equipment failures.

4. Finding AS-A8-01: The peer review team identified three technical issues: (1) recovery of mitigating systems following restoration of offsite power; (2) double crediting of offsite power recovery; and (3) mission times of the mitigating systems. Only the third item appears to be addressed directly by the entry in Table 2-1 as a documentation issue. Address the full scope of this finding, and confirm that the supporting requirement of the standard is met except for adequacy of the documentation.

Response:

(1) For those Risk-Informed TSTF Initiative 5b applications where loss of offsite power (LOOP) scenarios are key to the analysis or its results, the SFCP process would direct a sensitivity analysis to address recovery of mitigating systems following restoration of offsite power (post-LOOP) since the current PRA model (Rev. 4.3) does not explicitly address unavailability of mitigating systems following post-LOOP recovery. The core damage frequency contribution attributable to LOOP, recovery of offsite power, and failure to provide necessary mitigation can be estimated as the product of the likelihood of loss of offsite power, the failure of onsite AC systems, and the probability of non-recovery of AC power, plus the conditional core damage probability associated with a transient or, on rare occasions, a small LOCA. Qualitatively, this is estimated to pose a relatively insignificant contribution to risk and is adequately addressed by the NEI 04-10 process.

(2) Double-crediting of offsite power recovery is no longer an issue in the current Salem PRA model. The Diesel Generator mission time no longer relates to the offsite power recovery probability, but instead uses the full PRA mission time of 24 hours.

(3) Unless physical limitations exist, such as battery lifetime, all components currently have a mission success time of 24 hours.

Therefore, the Salem PRA model is technically adequate with respect to SR AS-A8 for this application; these are documentation issues.

5. Findings SY-A6-01, SY-A8-01, SY-A10-01, SY-A12-01, and SY-A13-01: Collectively these findings relate to system and data boundaries and modeled failure modes. Failure modes for some components are specifically identified as excluded or otherwise missing from the model. Describe how these issues were determined not to represent technical deficiencies and confirm that the supporting requirements of the standard are met except for adequacy of the documentation.

5.1 SY-A6-01

Text of finding:
Missing boundary definitions for system models.

The system notebooks do not clearly define the boundaries. The training documentation is not adjusted to be specific to the PRA model. Additionally some systems, such as ac power, do not include discussion of modeled events. The diesel generator and the fuel oil transfer system are not addressed explicitly.

Develop PRA specific illustrations and expand documentation to clearly describe the system boundaries to ensure that no components are double counted or missed.

Response:
As stated in the finding, this is an issue of the level of detail associated with system documentation. The documentation was developed from the PRA models as opposed to being the source of the modeling. Based on extensive application use, components were neither duplicated nor missed. Applications such as MSPI necessitate the evaluation of system flowpaths for required components, and no PRA application has identified any missing components. Also, the information provided in the PRA Model system notebooks, such as the system descriptions and simplified drawings, provide the means whereby system boundaries can be reviewed against the PRA model structure.

Therefore, the Salem PRA model is technically adequate with respect to SR SY-A6; this is a documentation issue.

5.2 SY-A8-01

Text of finding:
Review of notebooks and data notebook did not provide a source for inclusion or exclusion of failure modes based on data boundaries.

No documentation of component boundaries.

Expand the data discussion to provide component definitions.

Response:
Component boundaries used in the system model are consistent with the component boundaries established in the data analysis. Data analysis component boundaries are

based on the boundaries provided in the generic data source, NUREG/CR-6928. A review of basic events was performed during the data analysis to ensure that component boundaries were consistent, although this was not explicitly documented.

The inclusion or exclusion of failure modes is not a component boundary issue and is not relevant to SR SY-A8. However, failure modes are addressed in the responses to SY-A12-01 and SY-A13-01.

Therefore, the Salem PRA model is technically adequate with respect to SR SY-A8; this is a documentation issue.

5.3 SY-A10-01

Text of finding:
Some systems do not include expected failure modes and although this may be correct, there is no documentation as to how the data boundaries encompass the expected failures.

One example is the diesel generator model does not include the diesel generator day tank and instrumentation. The response to inquiries was that these components are part of the diesel skid package. This is usually separate modeling to capture miscalibrations.

Define what is included within the diesel generator "box" or expand the model.

Response:
This peer review finding does not address an issue associated with SR SY-A10; instead, the finding addresses failure modes and data boundaries, not the grouping of components or modularization. Modularization was not used in the Salem PRA system models. The finding appears to treat the emergency diesel generator as a module when it was actually treated in a manner consistent with the generic and plant-specific data sources.

Per NUREG/CR-6928, the “EDG boundary includes the diesel engine with all components in the exhaust path, electrical generator, generator exciter, output breaker, combustion air, lube oil systems, fuel oil system, and starting compressed air system, and local instrumentation and control circuitry.” However, as discussed in the response to SY-A8-01 above, the component boundaries could have been more explicitly documented. With respect to the issue of day tank instrumentation miscalibration, a basic event is included in the fuel oil transfer model for common cause miscalibration of the diesel fuel oil day tank level instruments.

This finding raises the issue of modeled systems not including expected failure modes, with no way to determine the validity for other than the cited example due to lack of adequate detail. However, since this is not relevant to SR SY-A10, it is addressed in the responses to SY-A12-01 and SY-A13-01.

Therefore, SR SY-A10 is not considered applicable to the Salem PRA model, as modularization was not utilized.

5.4 SY-A12-01

Text of finding:
Review of system models identified some missing component failure modes.

Required components are not always addressed in the model. For example, the diesel generator day tank and fuel oil check valves are not included. Additionally, restart of some components (such as dampers having to re-open for CAV) are absent in the model.

Define boundaries to show incorporation of failure modes by other events or expand model.

Response:
In the peer review report, the specific items cited were the diesel generator (DG) fuel oil day tank and associated components, as well as some dampers that might need to reposition under some circumstance in the CAV system. The DG components in question are within the supercomponent boundary definition for the EDG at Salem. Note that tank and check valve failures are generally included in the Salem PRA system models, although some failure modes may be screened per SR SY-A14 (see discussion below). CAV dampers, which are checked/repositioned as part of the alignment for off-normal operation, are not modeled for failing to reposition, especially since it is reasonable to assume that they would function satisfactorily a second time following a successful initial demand.

With respect to the general issue of 'missing' component failure modes, SR SY-A14 (RA-Sb-2005) provides screening criteria to allow certain components and failure modes to be excluded in meeting SY-A12 and SY-A13. These screening criteria were used appropriately in the Salem PRA system models; however, individual components and failure modes that were screened were not explicitly documented in the PRA system model notebooks.

Therefore, the Salem PRA model is technically adequate with respect to SR SY-A12; this is a documentation issue.

5.5 SY-A13-01

Text of finding:
The modeling excludes some required component failures without justification.

Some failure modes listed for inclusion in the SR are not found or are excluded from the model. This includes the transfer closed/plugging failure modes for valves and the absence of some check valves and/or tanks.

Justify the exclusion of any failure mode or model the failure mode.

Response:
SR SY-A14 provides screening criteria for excluding certain failure modes. The comment in peer review finding SY-A13-01 regarding check valves and tanks is answered in the response to finding SY-A12-01 above.

The specific failure modes identified in the peer review report pertained to transfer closed/plugging failure modes for manual valves. These failure modes are included under special circumstances, but are not generally modeled throughout the PRA model, which is consistent with the criteria found in SY-A14 (RA-Sb-2005) based on their low probability of occurrence (6E-09 /hr per NUREG/CR-6928). Justification for whether to use or not use this particular failure mode is a documentation issue.

Therefore, the Salem PRA model is technically adequate with respect to SR SY-A13; this is a documentation issue.

References

1. Letter from Carl J. Fricker, PSEG Nuclear LLC, to U.S. Nuclear Regulatory Commission, "Application for Technical Specification Change Regarding Risk-Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program," dated March 23, 2010 (ADAMS Accession No. ML100910154)

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