

Oconee Nuclear Station, Units 1, 2, and 3  
Docket Numbers 50-269, 50-270, and 50-287.

**DRAFT SPSB RAIS**  
**THESE QUESTIONS ARE LIMITED TO THE PRA EVALUATION AND**  
**DO NOT INCLUDE, FOR EXAMPLE, SEISMIC FRAGILITY DEVELOPMENT**

**Proposed License Amendment Regarding Revisions to the Licensing Basis for the**  
**UFSAR**  
**Section on Water Level (Flood) Design (TSC 2002-06)**  
**November 1, 2002**

- 1) The cover letter states that the request uses the risk-based approach guidelines of Regulatory Guide 1.174, "An approach for Using Probabilistic Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." The three qualitative principles (defense-in-depth, safety monitoring, performance measurement strategies) are, however, not discussed. Please provide a discussion of how the requested change to the licensing basis comports with the qualitative principles of RG 1.174.
- 2) Please confirm that there are no scenarios where a break in the non seismically qualified piping would disable or degrade the operation of the safe shutdown facility (SSF) or the systems used by the SSF. For example, could a ground fault caused by the flood affect an electrical bus relied upon by the SSF if an isolation circuit breaker failed to open? If a flood from the failure of the non seismically qualified piping could disable or degrade the SSF or any of its systems, please describe the scenario.
- 3) What is the fragility of the SSF? What is the probability of the non-seismic failure of the SSF and how was this probability determined?
- 4) How does the scenario included in the evaluation affect the three units? Does the flood fail the same SSCs for all three units simultaneously such that the cuts-sets represent a simultaneous core damage event in all three units? If not, identify the remaining independent SSCs available in each unit?
- 5) Attachment 3 of the submittal provides a very limited description of the screening evaluation and associated screening guidelines. Unlike the flooding analysis in the individual plant examinations that must consider all sources of water, this analysis only includes a specific subset of piping that should be, but are not, seismically qualified. Furthermore, there are a number of statements in the submittal that appear inconsistent with each other and with a risk-informed screening analysis (discussed further in RAI 6). Please describe the screening process used to develop the change in risk estimates for this submittal. This description should include how the initial population of rooms was developed, how the potential risk (i.e., consequence and/or frequency) for each room was estimated or bounded, and the criteria or guideline used to screen out each room out as applicable.

6) The following statements in Attachment 3 of the submittal are not clear.

Page 8        *"Turbine Building floods have been analyzed previously and a licensing basis has been reviewed and accepted by the NRC. Therefore the scope of this evaluation will only look at the possible impact of flooding on safety-related equipment in the Auxiliary building"*

Limiting the scope of review of equipment that could fail to safety-related equipment does not comport with risk-informed evaluations. Please expand the evaluation to include all equipment that could fail due to seismic induced flooding events and whose operation is credited in the CDF and LERF estimates.

Page 9:        *"A critical area is defined as an area where a flood could cause an initiating event, fail the related mitigating systems, or cause both with a high frequency relative to non-flood contributors. This implies that there is a high potential for damage and a credible source of flooding."*

A high frequency relative to non flood contributors is not a contributing factor in the evaluation of the change in risk associated with converting the non seismically qualified piping into seismically qualified piping. The risk associated with the failure of the non seismically qualified piping could be relatively large but still smaller than a non flood contributor. Please expand the evaluation to systematically evaluate the risks caused by seismic induced failure of the non seismically qualified piping.

Page 9:        *"It is possible that motor-operated valves may open when water sprays hit an electrical cabinet. However, Duke determined that more than one cabinet has to be affected to lead to a LOCA through an isolation valve opening (redundant valves with separate power supplies). These cabinets are in the electrical equipment room, and a simultaneous failure of two cabinets is less likely than other adverse events"*

If the electrical room is flooded to sufficient depth to fail one cabinet, the simultaneous failure of all other cabinets the same height above the floor would be highly likely. Additionally, a spray would more than likely strike two or more adjacent cabinets. Comparison of the likelihood of a pipe rupture induced failures to "other adverse events" is not a contributing factor in this evaluation because the other adverse events are not affected by the proposed change. Can the electrical equipment room be flooded if the non seismically qualified piping ruptures? Can a group of cabinets be sprayed following the rupture of the non seismically qualified piping in this room? If the electrical room can be screened out based on a bounding analysis and the guidelines used in your screening evaluation, please provide this evaluation. If the room cannot be screened out, please include it in the change in risk evaluation.

Page 10:        *The equipment room contains load centers X8 and X9, motor control centers XS1, XS2, XS3, XO, and XP, and other vital equipment in the AC and DC Power Systems. However, a review of Oconee equipment rooms shows that none of these rooms contain normally pressurized fluid piping systems."*

Do these equipment rooms contain any of the non seismically qualified piping included in this evaluation? Can any of these rooms be flooded if the non seismically qualified piping ruptures? If the electrical room can be screened out based on a bounding analysis and the guidelines used in your screening evaluation, please provide this evaluation. If the room cannot be screened out, please include it in the change in risk evaluation.

Page 11: *These tanks are significant because they receive runoff from the Auxiliary Building floor drain network, which means that any water spilled in the building will eventually end up in the HPI pump room.*

*Floods could occur on the upper levels of the Auxiliary building and drain down into the LPI [low pressure injection] and RBS [Reactor Building spray pumps] pump room.*

Page 14 *"Postulated Auxiliary Building leaks/floods would be routed to the Auxiliary Building basement and could potentially flood the LPI pumps. The LPI pumps are located in the Auxiliary Building Basement similar the HPI pumps.*

These statements appear to be inconsistent. The first statement implies that all water drains down to, and only drains down to, the HPI room. This statement appears to be the primary basis for screening out all flooding events except the flooding of the HPI room alone. The second two statements imply, however, that water can also drain down to the LPI room. The submittal also states that the HPI and LPI rooms are sealed off from each other so that water the LPI room will not further drain into the HPI room. Is any non seismically qualified piping on the upper levels of the Auxiliary building? Could the failure of any of this piping result in water draining into both the LPI room and the HPI room? What equipment would be lost in such a scenario and what are the CCDP and CLERP for these scenarios?

Page 11 *"However, the probability of a flood at the same time as a transient which requires LPI or RBS is remote."*

The seismic event itself or a flood caused by the failure of the non seismically qualified piping could cause a variety of transient. The likelihood that the transient would develop into a scenario that would require LPI or RBS should be developed from a PRA analysis with the flood damaged equipment assigned to the failed state. Please re-evaluate this statement including the potential dependence between the seismic event, a flood, and the transient which might require LPI or RBS.

7) Page 13 of Attachment 3 states that, "[r]eview of the PRA model reveals that practically all the contribution to [large early release frequency] LERF comes from interfacing system LOCA sequence." The submittal subsequently states that there is no change to the interfacing system LOCA characteristics and concludes that, "there is no change to the LERF value." The observation that practically all the LERF contribution in the base line PRA comes from interfacing LOCAs is not sufficient to support the claim that there is no change to the LERF value caused by seismic induced flooding scenarios. Please provide a description of the types of sequences included in the accident scenarios in this evaluation and provide the likelihood that these types of scenarios will develop into LERF scenarios.