

October 26, 2001

LICENSEE: Exelon Generation Company, LLC (Exelon)

FACILITY: Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3

SUBJECT: SUMMARY OF SEPTEMBER 24-25, 2001, NRC STAFF VISIT TO EXELON OFFICES TO DISCUSS THE SCOPING AND SCREENING METHODOLOGY AND THE ELECTRICAL SECTIONS OF THE PBAPS LICENSE RENEWAL APPLICATION (LRA)

On September 24 and 25, 2001, the U. S. Nuclear Regulatory Commission (NRC) staff visited Exelon offices to discuss and clarify Exelon's scoping and screening methodology and the electrical sections of the PBAPS LRA. The participants in the discussions are listed in the Attachment.

Exelon began by presenting an overview of the PBAPS scoping and screening methodology, which gave the NRC staff an opportunity to raise questions regarding systems and components included in scope of the PBAPS LRA. The participants then broke into two working groups. One group discussed the scoping and screening methodology and the other discussed electrical issues.

The NRC staff said its primary scoping and screening objective was to understand Exelon's approach to compliance with 10 CFR 54.4 Scope, that is, how Exelon evaluated each structure and system, determined whether it was in or out of scope, and ensured the traceability of each component of in-scope systems and structures to appropriate component groups.

The information discussed, the applicant's responses, and the follow-up actions are provided below.

The NRC staff discussed the following scoping and screening issues:

1. The system names used in the Peach Bottom LRA are not identical to those used in the updated final safety analysis report (UFSAR). The discrepancies complicate the task of ensuring traceability from the UFSAR to the LRA and vice versa.

Discussion: The UFSAR does not list all plant system names. Some names (e.g., HPCI) refer to specific systems, but others, like "Radiation Monitoring," are a group of systems. Design basis documents, such as the Component Record List (CRL), identify more than 350 systems. The LRA does not identify systems and components in a manner consistent with the PBAPS UFSAR or with traditional boiling-water reactor (BWR) nomenclature. In many cases, Exelon redefined ("realigned") the boundaries of systems to limit the number of components potentially subject to aging management review (AMR). System scope was reduced to include only that portion of the system required for license renewal (LR) to be subject to AMR, adversely

impacting the clarity, traceability, and scrutability of the scoping and screening documentation provided in the LRA.

2. From looking at the license renewal boundary diagrams, it is difficult to understand which parts of systems are in scope and which are not in scope. The heavy lines on the original drawings are too light on photo copies.

Discussion: Photo copying tends to blur the distinction between heavy and light lines unless great care is taken. Exelon agreed to provide any additional drawings required by the staff. A complete set of drawings was provided to the staff at the meeting.

3. 10 CFR 54.4 requires that each system or structure be determined in or out of the scope of the Rule. Exelon appears to have concluded that some typically in-scope BWR systems (e.g., RWCU), are not in scope. Explain your methodology.

Discussion: Exelon compared each system or structure to the criteria of 10 CFR 54.4. In some cases (e.g., HPSW), the entire system was clearly in scope. In other cases (e.g., Radwaste), the entire system was clearly not in scope. However, for a number of systems, (e.g., Instrument Air), components which performed a license renewal function were “realigned” to an in-scope system.

4. Explain how a reviewer can determine that every realigned component is, in fact, included in the scope of the Rule.

Discussion: A reviewer must use both the LRA and the license renewal boundary diagrams to make this determination. LRA Table 2.2-1, “Mechanical System Scoping Results,” identifies by name (in the Comments column) the system or systems to which components from out-of-scope systems have been realigned. The system descriptions in LRA Section 2.3 “Scoping and Screening Results: Mechanical,” do not specifically mention realigned components, but list applicable license renewal boundary diagrams. The boundary diagrams are created from P&ID drawings, and as such identify functional arrangements of plant system piping and components as well as functional interfaces between systems. The boundary drawings identify, through the use of notes and flags to identify the system or systems to which specific components have been realigned. Every component shown as in-scope belongs to one or more component groups, as described in LRA Sections 2.3, 2.4, and 2.5. However, realigned SSCs are not explicitly referenced in the description of the SSCs to which they have been realigned.

The working group discussed the Scoping Forms for RWCU (not in-scope, LR functions realigned), Fuel Pool Cooling & Cleanup (in-scope, but reduced through realignment), Reactor Building Ventilation (not in-scope, LR functions realigned), Instrument Air (not in-scope, LR functions realigned) and Feedwater Controls & Piping (in-scope, but reduced through realignment). The RWCU Scoping Form was reviewed in detail.

5. For systems not in scope due to realignment, LRA Table 2.2-1 provides no rationale for the out-of-scope determination, no description of the license renewal functions of realigned components, and no “link” to the applicable license renewal boundary diagram. It will be extremely time-consuming for the NRC staff to perform the reviews required to

determine compliance with 10 CFR 54.4. Provide a “roadmap” to facilitate the staff’s review. For all systems determined not in scope due to realignment of license renewal functions: (1) provide a description of the license renewal function realigned, (2) identify which system the components were realigned to, (3) identify the associated license renewal diagrams, and (4) provide an UFSAR reference for the out of scope system.

Discussion: Exelon will develop a proposed format for the requested information, populate it with data from a few sample systems, and forward it to the NRC project manager for the staff’s consideration.

6. What is the basis for the component groups described in the LRA?

Discussion: The PBAPS LRA commodity groups are based on those discussed in NEI 95-10, Revision 3.

The NRC staff raised the following electrical issues for discussion:

7. The screening results in Section 2.5 do not include any electrical components listed in NEI 95-10 and (Table 2.1-5) of the Standard Review Plan as associated with the offsite power system (e.g., switchyard bus, transmission conductors, switchyard insulators, and transmission line insulators). Paragraph 54.4(a)(3) requires that all systems, structures, and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission’s regulations for station blackout (10 CFR 50.63) be included within the scope of Part 54. Section 50.63 requires that each light-water-cooled power plant licensed to operate be able to withstand and recover from a station blackout of a specified duration that is based upon factors that include the expected frequency of loss of offsite power and the probable time needed to recover offsite power. At Peach Bottom the specified duration was based on evaluations that followed the guidance in NRC Regulatory Guide 1.155 and NUMARC 87-00 and on the plant’s offsite power characteristics. These characteristics helped determine the probable time needed to recover offsite power (coping duration). The resulting coping duration at Peach Bottom is thus based on the likelihood of recovering offsite power within the coping period. Therefore, provide a justification for screening on the offsite power system components.

Discussion: Recovery from station blackout (SBO) is an emerging issue that is presently being discussed internally by the NRC staff. The issue for PBAPS is currently tabled and will be addressed.

8. The results of the environmental qualification of electrical equipment in Section 4.4 indicate that the aging effects of the environmental qualification (EQ) of electrical equipment identified in the Time-Limited Aging Analysis (TLAA) will be managed during the extended period of operation under 10 CFR 54.21(c)(1)(iii). However, no information is provided in the submittal on the attributes of a reanalysis of an aging evaluation to extend the qualified life of electrical equipment identified in the TLAA. The important attributes of a reanalysis are the analytical methods, the data collection and reduction methods, the underlying assumptions, the acceptance criteria, and corrective actions. Provide information on the important attributes of reanalysis of an aging evaluation of electrical equipment identified in the TLAA to extend the qualification under 10 CFR 50.49(e).

Discussion: The applicant responded that the analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions described in the Generic Aging Lessons Learned (GALL) report are used for PBAPS. Confirming information will be submitted in a letter to the NRC.

9. Section 2.5 is "Scoping and Screening Results". The staff does not understand the relevance of Section 2.5.1. The staff believes that this section belongs in Section 3.6.

Discussion: The NRC staff's safety evaluation report will discuss the content of Section 2.5.1.

10. Did the licensee use any aging management guide (AMG) (e.g., DOE AMG, Sandia Report SAND 96-0344, etc.) to evaluate the aging effect of cables and connections?

Discussion: The applicant responded that SAND 96-0344 was used.

11. The aging effects for cables and connections are due to (a) corrosion of conductor, (b) electrical stresses, (c) water and humidity, (d) temperature, (e) radiation, (f) mechanical stress (insulation damage during installation, vibration), (g) chemical attack, and (h) cables subject to frequent manipulation (connectors and terminal blocks). Not all of the mechanisms are discussed. Provide justification.

Discussion: The applicant stated that the aging management review for PBAPS did consider the stressors identified above and agreed to submit a letter to the NRC on stressors that were considered but found not to apply at PBAPS.

12. Provide details about the cable replacement program to replace "suspected" cables subject to water-treeing. It is not clear why moisture is not an aging effect requiring management at PBAPS.

Discussion: PBAPS does not have any buried cable within the scope of license renewal. PBAPS replaced cables suspected to be susceptible to water-treeing. The replaced cables were identified in the discussion. XLPE cable was replaced with EPR cable. While EPR cable is more resistant than XLPE to water-treeing, the NRC believes that an aging management program is necessary. The applicant agreed either to provide more data to justify why EPR cable does not require an aging management program or to commit to a cable management program.

13. Provide details of radiation aging effects (total radiation dose for different areas, different cable specifications for radiation dose).

Discussion: The applicant agreed to submit, a table showing the bounding radiation dose limits for PBAPS areas and cable material radiation dose data for 60 years plant life.

14. Provide the basis for the temperature rise due to ohmic heating.

Discussion: 13 degrees C was used as the bounding value of ohmic heating for all PBAPS areas. This value is based on Oconee and Hatch reports. The applicant agreed to submit information on the applicability of the Oconee and Hatch Electrical Component/Cable aging management reviews reports.

15. Provide the basis for 60 year limiting service temperature and the area temperatures. How the hot spot is considered.

Discussion: The applicant agreed to submit, a table showing the bounding temperature limits for PBAPS areas and the cable material service temperature limits for 60 year's life. Hot spots were issued. The applicant agreed to provide a letter stating that PBAPS does not have any hot spots outside containment based on walkdown activities. The NRC believes that an aging management program is necessary. Hot spots inside containment need to be addressed.

16. How did you determine that 30 cables for fire safe shutdown (FSSD) require aging management?

Discussion: The applicant reviewed the information in LRA Section 2.5 "Scoping and Screening Results: Electrical and Instrumentation." The applicant will provide additional information clarifying the number of cables per PBAPS units and the sample size of the 30 cables identified as requiring an aging management program.

17. Low-voltage instrument circuits that are sensitive to small variations in impedance were determined to be potentially affected by oxidation of connectors or termination contacts. Based on the above, an aging management program is required at PBAPS.

Discussion: The applicant stated that PBAPS has not experienced this aging effect and agreed to submit documentation PBAP'S operating experience.

18. How is EPR submarine cable shielded? What is the industry experience with the life of this cable? SBO equipment should be covered under a QA program. Is there an inspection program for this cable to meet the QA requirements as required by Section 50.63?

Discussion: The applicant agreed to submit a letter to the NRC stating that the submarine cable has EPR insulation and copper tape shielding. The manufacturer has indicated that this type of submarine cable has not experienced any age-related failure to date. The applicant agreed to request a letter from the manufacturer providing this information and the service life of this cable without degradation, and will forward the letter to the NRC staff.

19. An aging management program for non-EQ cables and connections is required in order to provide a reasonable assurance that the intended functions of non-EQ cables and connections exposed to postulated adverse localized equipment environments caused by heat or radiation will be maintained consistent with the current licensing basis through the period of extended operation. This is consistent with GALL and seven previous LRAs.

Discussion: No agreement was reached. NRC believes an aging management program is required. Based on PBAPS operating experience the applicant doesn't believe an aging management program to be required, except for the 30 FSSD cables. The applicant agreed to provide a more detailed description of the applicable operating experience.

20. Explain why the cable connections (terminations) are not included in the program described in Section B.3.2 of Appendix B.

Discussion: The applicant stated that cable connectors are not used to connect FSSD cables to thermocouples in the drywell and agreed to submit information on how the FSSD cables are connected to thermocouples.

21. In Appendix B, Section B.3.2, do items 7 (Corrective Action), 8 (Confirmation Process), and 9 (Administrative Controls) meet the requirements of 10 CFR Part 50 Appendix B "Quality Assurance Program"?

Discussion: This question is applicable to all PBAPS LRA programs. The applicant will confirm in a letter to the NRC that 10 CFR Part 50, Appendix B requirements are applicable to items 7, 8, and 9 for all programs in Appendix B of the PBAPS LRA.

22. Is the FSSD cable inspection activity for instrumentation circuits?

Discussion: The applicant agreed to submit a description of the function performed by the FSSD cables to show that they do not serve as instrumentation circuits.

23. If the FSSD cable inspection activity is for instrumentation circuits, it does not meet the requirements of NUREG-1801 in the areas of parameter monitored/inspected, detection of aging effects, monitoring and trending, and acceptance criteria.

Discussion: The applicant agreed to submit a description of the FSSD cables to show they do not serve as instrumentation circuits and therefore do not require a change to the FSSD program description. The NRC believes that these cables will carry low-level signals. These circuits are dependent on insulation resistance of the cables. Hence the cable management program as specified is not adequate. The cable aging management program must be consistent with NUREG-1801, XI.E2.

24. Provide the technical basis for the FSSD sample size.

Discussion: The applicant agreed to submit the technical basis for the FSSD sample size.

25. Why is aging management not required for bus bar insulators and the submarine cable?

Discussion: The applicant agreed to request from the submarine cable manufacturer a letter that provides submarine cable failure history and will forward the letter to the NRC. The applicant also agreed to submit a letter to the NRC on why there are no aging effects for Conowingo porcelain insulators.

The scope of the station blackout system was also discussed. The working group agreed that all cables from the generators at Conowingo to the PBAPS Unit 2 startup bus 00A03C are in scope. The applicant agreed to submit a revised station blackout system description that will include all cables and their aging effects.

A draft of this meeting summary was provided to the applicant to allow them the opportunity to comment prior to the summary being issued.

/RA/

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Docket Nos. 50-277 and 50-278

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SEPTEMBER 24-25, 2001

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