



LR-N03-0277

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U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555-0001

Gentlemen:

**RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING
RISK-INFORMED INSERVICE INSPECTION SUBMITTAL
SALEM GENERATING STATION UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311**

Reference: PSEG Letter LR-N02-0436, Request for Authorization to Use a Risk-Informed Inservice Inspection Alternative to ASME Boiler and Pressure Vessel Code Section XI Requirements for Class 1 and 2 Piping, dated January 21, 2003

In a telephone call on June 19, 2003, NRC reviewers discussed five questions regarding the Salem Units 1 and 2 Risk Informed Inservice Inspection (RI-ISI) submittal (Reference) with PSEG Nuclear staff personnel. These questions were subsequently provided by facsimile on June 20, 2003. Please refer to the enclosure for PSEG's responses.

Should you have any further questions, please contact Carl Berger at (856) 339-1432.

Sincerely,

A handwritten signature in black ink, appearing to read "John Carlin", written over a horizontal line.

John Carlin
Vice President, Engineering

Enclosure

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USNRC Resident Inspector Office (X24)

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Question 1:

In its January 31, 2003 application, PSEG stated that the RI-ISI program for Salem, Unit No. 2, will start during the third period of the second interval. PSEG also stated that the second interval began on May 10, 1992. Therefore, under normal circumstances, the third ISI interval would begin on May 10, 2002. Please clarify the end date for Salem, Unit No. 2, second interval ISI program, and describe the reasons for deviations from the expected 10-year end date.

Response to Question 1:

Salem Unit 2 started the second ten-year ISI inspection interval at the end of the sixth refueling outage on May 10, 1992. This means the third ten-year ISI interval would normally terminate approximately May 9, 2002. However, during the second ten-year interval Salem Unit 2 experienced an extended shutdown of approximately 27 months duration (June 8, 1995 – August 29, 1997). Although ASME XI (1986 Edition) does not address interval extension requirements, it does indicate within IWA-2413 that subsequent Editions or Addenda may be used, provided all related requirements are met. ASME XI (1995 Edition, 1996 Addenda), IWA-2430 (e) indicates that for plants that are continuously out of service for 6 months or more, the inspection interval during which the outage occurred may be extended for a period equivalent to the outage and the original pattern of intervals extended accordingly for successive intervals. This would permit an interval extension until July 2005. Therefore, commencing the Salem Unit 2 third ten-year inspection interval on approximately November 21, 2003 after breaker closure from the Fall 2003 refueling outage (2R13) is well within the allowable range.

Question 2:

Section 3 of PSEG's submittal states that the RI-ISI program for Salem will deviate from the EPRI RI-ISI methodology for the assessment for thermal stratification, cycling and striping (TASCS). Please state if the revised methodology for assessing TASCS potential is in conformance with the updated criteria described in the EPRI letter to the NRC dated March 28, 2001. Also, confirm that, as stated in the March 28, 2001 letter, once the final material reliability program guidance has been developed, the Salem RI-ISI program will be updated for the evaluation susceptibility to TASCS, as appropriate.

Response to Question 2:

The Salem RI-ISI application used the most recent criteria available for the evaluation of thermal stratification, cycling and striping (TASCS). As stated in Section 3 of the submittal template, the Salem RI-ISI application meets the requirements addressed in the letter from EPRI to the NRC, dated March 28, 2001. Final materials reliability

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program (MRP) guidance on the subject of TASCs will be incorporated into the Salem RI-ISI application if different than the criteria used.

Question 3:

In section 3.5, third paragraph, of PSEG's submittal, the licensee states that it decided to add 9 selections in Salem Unit No. 1, and 19 selections in Salem Unit No. 2, in order to increase the overall percentage of Class 1 selections. Please describe the process that was used to select these additional sites. Indicate how many of the welds were socket welds and how many were full penetration welds for each unit.

Response to Question 3:

During development of the risk-informed methodologies, the NRC commented that they preferred the overall percentage of Class 1 piping locations selected for examination be approximately 10%. To address this issue, a paragraph was added to Section 3.6.4.2 of EPRI TR-112657 which states the following:

"If a situation occurs where a very large number of Class 1 piping elements are assigned to low-risk categories (i.e., risk Categories 6 or 7) to the point that Class 1 inspections fall substantially below 10% of the Class 1 piping population, the basis for the low risk ranking should be investigated."

The initial results of the RI-ISI application were that 7.9% of the Class 1 piping welds in Unit 1 and 7.3% in Unit 2 were selected for RI-ISI examination. These resulting percentages were below 10% because approximately 75% of the Class 1 piping population could be isolated in the event of a pipe break. For piping that can be isolated, a postulated break does not result in a loss of coolant accident. This supports a lower risk ranking for isolable welds, which in turn decreases the percentage of Class 1 welds that require risk-informed examination.

Even with this justification, PSEG decided to add nine selections in Unit 1 and nineteen selections in Unit 2 in order to increase the overall percentage of Class 1 selections. These additional selections also support the defense-in-depth philosophy. The additional welds increased the percentage of Class 1 selections to 8.5% for Unit 1 and 8.6% for Unit 2.

The additional selections were made during the element selection meeting using the same process used for the standard RI-ISI selections. During the element selection meeting, there were a number of factors taken into consideration when selecting the additional elements, including:

1. Additional elements were only selected from High and Medium risk segments.

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2. Full penetration butt welds were preferentially selected over socket welds since butt welds are subjected to volumetric examination. Of the nine additional welds selected in Unit 1, only one was a socket weld. For Unit 2, none of the nineteen additional welds were socket welds.
3. A number of the additional selections in both units were the welds in the hot legs near the reactor pressure vessel. These selections addressed another concern that the NRC has had in recent years since flaws were found in the V. C. Summer hot leg to reactor vessel welds.
4. The additional elements were selected such that they represented a variety of the Class 1 systems and pipe sizes.

Question 4:

In section 3.5, fifth paragraph, of the submittal, PSEG states that "(n)o additional credit was taken for any FAC (flow-accelerated corrosion) augmented inspection program locations beyond those selected by the RI-ISI process to meet sampling percentage requirements." Please provide information on those selections made by the RI-ISI process that are also included in the augmented FAC program.

Response to Question 4:

The sentence referenced in the question is a boilerplate statement that was included to make the Salem submittal consistent with numerous RI-ISI submittals that were previously submitted by other stations. For Salem, there are no RI-ISI selections that rely on the FAC Program for examination credit. In those limited instances where both the FAC and RI-ISI Programs apply to a given section of piping, these two programs remain independent such that both FAC and RI-ISI examinations will be performed as identified in the programs.

Question 5:

In section 3.5.1, second paragraph, PSEG states that the additional examinations will be conducted during the current outage. Please clarify the time frame for when a second set of additional sample examinations, if required, [would be performed] under the Salem RI-ISI program.

Response to Question 5:

If flaws are found during a sample expansion as discussed in section 3.5.1 of the RI-ISI template, the second set of additional examinations will also be performed during the current outage.