REQUEST FOR ADDITIONAL INFORMATION REGARDING
SALEM GENERATING STATION, UNIT 1
REQUEST FOR RELIEF S1-I3R-114
DOCKET NUMBERS: 50-272 (TAC NO. ME8565)

By letter dated April 24, 2012 (Acencywide Document Access and Management System No. ML12125A152), the licensee, PSEG Nuclear LLC (PSEG), submitted Request for Relief (RR) S1-I3R-114 from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components* for Salem Generating Station, Unit 1 (Salem 1). The request for relief applies to the third 10-year inservice inspection interval (ISI), in which the licensee adopted the 1998 Edition through the 2000 Addenda of ASME Code Section XI as the code of record.

The NRC staff has reviewed the information submitted by the licensee, and based on this review, determined the following information is required to complete the evaluation.

General Information Required on Request for Relief S1-I3R-114

RAI 1: Based on the licensee's submittal, it appears that the 1995 Edition through the 1996 Addenda of the ASME Code was used for inspections performed during refueling outage (RFO) 15, and the only item in the subject request inspected during RFO-15 was Examination Category C-B, Item C2.21, Boric Acid Injection Tank Inlet nozzle-to-head Weld 1-BIT-1. Further, all other welds in RR S1-I3R-114 appear to have been inspected in RFO-16 through RFO-20, which were governed by the 1998 Edition through the 2000 Addenda of the ASME Code.

Please confirm these observations, and verify that the code of record for the third 10-year inservice inspection interval was the 1998 Edition through the 2000 Addenda of ASME Code Section XI.

Request for Relief S1-I3R-114, Examination Category B-D, Item B3.120, Full Penetration Welded Nozzles in Vessels

RAI 2: In Attachments A-2 through A-5, the licensee has included multiple photographs and data sheets showing volumetric coverage percentages at different angle beam orientations for inside radius sections on pressurizer (PZR) nozzle welds. However, it is unclear as to what portions, and to what extent, coverage was obtained for the ASME Code-required volumes that have been completed. Please submit cross-sectional drawing showing volumetric coverage for each of the ultrasonic angles applied. Include dimensions, scanning directions, surface conditions, and ultrasonic techniques (longitudinal or shear wave) being used.

ENCLOSURE

Request for Relief S1-I3R-114, Examination Category C-A, Items C1.10 and C1.20, Pressure Retaining Welds in Pressure Vessels

RAI 3: In Table 1 of the licensee's submittal, the Seal Water Injection Filter shell-to-lower head Weld 1CVE18-SWIJ-2 is shown to have approximately 64.0 percent volumetric coverage. However, in Attachment A-10, page 2 of 3 of the licensee's submittal, the listed volumetric coverage is 84.0 percent. Please verify the correct volumetric coverage for Weld 1CVE18-SWIJ-2.

RAI 4: In Table 1 of the licensee's submittal, the No.1 Volume Control Tank (VCT) shell-to-lower head Weld 1-CVCT-2 noted that "indications identified and evaluated in previous exams were identified in this examination with no evidence of growth." In the licensee's Enclosure under section C on page 7, the licensee states that examinations were performed to the maximum extent practical with no recordable indications.

To clarify the contradicting statements, please state whether any indications were discovered as a result of ASME Code-required examinations, and how these indications have been dispositioned.

Request for Relief S1-I3R-114, Examination Category C-B, Item C2.21, Pressure Retaining Nozzle Welds in Vessels

RAI 5: The licensee has provided only general information regarding impracticality of obtaining ASME Code-required volumetric examinations for Boric Acid Injection Tank inlet and outlet nozzle-to-head Welds 1-BIT-1 and 1-BIT-2. Statements such as "nozzle configuration and surface conditions" are inadequate to describe the bases for not obtaining the ASME Code-required examination volumes.

Please submit detailed and specific information on any outside diameter surface feature, such as weld crown, diametrical weld shrinkage, or surface roughness conditions that caused limited volumetric coverage during the subject piping weld examinations. Discuss the efforts that were used to correct these conditions.

RAI 6: For Steam Generator #11 nozzle-to-shell Weld 16-BFN-2111-1, the licensee stated that the limitation was due to the steam generator insulation package support ring. However, no discussion of why this insulation support ring cannot be removed is provided. Please discuss whether the limited volumetric and surface examinations caused by interference from the insulation package support ring cannot be remedied by removal.

RAI 7: In Attachment 13, page 2 of 7, the licensee states that "a UT and PT examination was performed on inlet nozzle-to-shell [weld], 1-BIT-1." In all other documentation provided for the subject weld, the surface examination performed was stated to be a magnetic particle (MT) examination. Please verify which surface examination method was used on Weld 1-BIT-1.

Request for Relief S1-I3R-114, Examination Category R-A, Items R1.11, R1.16, and

R1.20, Risk Informed Piping Examinations

RAI 8: The licensee's submittal states that the pipe-to-tee Weld 2-CV-1175-36, flange-to-pipe Weld 10-SW-2141-5, and elbow-to-flange Weld 10-SW-2183-3 were interrogated with 45- and/or 70-degree shear waves, as applicable. The licensee's submittal further states that examinations were performed in accordance with ASME Code Section XI Appendix VIII (performance demonstration), and consisted of single-sided examinations from the pipe side of the welds.

Confirm the insonification angles and wave modalities used to examine each of the subject welds listed above. Discussions with the industry's Performance Demonstration Initiative (PDI) administrator, the Electric Power Research Institute (EPRI), indicate that Supplement 2 qualifications require refracted longitudinal wave methods to be applied, if possible. If only shear wave techniques were used to examine the subject stainless steel welds, please explain why refracted longitudinal wave techniques were not used as part of a "best effort" examination. The L-wave method has been shown capable of detecting planar inside diameter (ID) surface-breaking flaws on the far-side of wrought stainless steel welds. Recent studies[1,2,3] recommend the use of both shear and L-waves to obtain the best detection results, with minimum false calls, in austenitic welds.

RAI 9: The licensee has requested relief from examining 100% of the ASME Code-required volumes for ten (10) Class 1 and 2 piping welds covered under a risk-informed ISI program.

Please state the total number of Class 1 and 2 piping welds included in the overall risk-informed program so that the 10 limited examinations can be assessed within the scope of all examinations being implemented. Confirm that no other welds in the R-A population are expected to have limited volumetric coverage.

RAI 10: In the submittal, the licensee states that during the fourth interval RI-ISI program update, all except two (Welds 14-PS-1131-2 and 2-CV-1175-36) of the ten welds with limited examinations from the third 10-year inspection interval have been substituted. The two subject welds that remain in the RI-ISI schedule in the fourth ISI interval were maintained due to no suitable substitutions being available.

It is unclear why these substitutions on the other remaining eight welds could not have been performed during the third 10-year inservice inspection interval, or whether additional welds could have been examined to augment the reduced volumetric

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1 Ammirato, F.V., X. Edelmann, and S.M. Walker, *Examination of Dissimilar Metal Welds in BWR Nozzle-to-Safe End Joints*, 8th International Conference on NDE in the Nuclear Industry, ASM International, 1987.

2 Lemaitre, P., T.D. Koble, and S.R. Doctor, *PISC III Capability Study on Wrought-to-Wrought Austenitic Steel Welds: Evaluation at the Level of Procedures and Techniques*, Effectiveness of Nondestructive Examination Systems and Performance Demonstration, PVP-Volume 317, NDE-Volume 14, ASME, 1995.

3 Anderson, M.T., A.A. Diaz, A.D. Cinson, S.L. Crawford, S.E. Cumblidge, S.R Doctor, K.M. Denslow, and S. Ahmed, 2011. *An Assessment of Ultrasonic Techniques for Far-Side Examinations of Austenitic Stainless Steel Piping Welds*, NUREG/CR-7113, PNNL-19353, U. S. Nuclear Regulatory Commission, Washington, DC.

coverage resulting from the limited examinations of the subject welds. Please discuss why this approach could not have been accomplished, thus potentially eliminating the subject welds from requiring relief for limited examination coverage.

RAI 11: In Attachment 15, pages 8 and 9 of 10, the licensee states under limitations that "the longitudinal wave probes are limited to a W distance of 0.80" from weld centerline due to the proximity of the nozzle." Please define the meaning of "W distance."