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JAN 31 2017

LR-N17-0025

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

Salem Generating Station Unit 1
Renewed Facility Operating License No. DPR-70
NRC Docket No. 50-272

Subject: Request for One-Time Relief for Reactor Vessel Cold Leg Nozzle to Safe-End Weld Examinations Inspection Interval

In accordance with 10 CFR 50.55a, "Codes and standards," PSEG Nuclear LLC (PSEG) hereby requests NRC approval of proposed Relief Request S1-I4R-160 for Salem Unit 1. PSEG proposes to extend the required reactor vessel cold leg nozzle inspections by approximately six months to the Salem Unit 1 S1R26 Refueling Outage in Spring 2019. This would align these examination activities with the currently scheduled Reactor Vessel Internals Materials Reliability Program (MRP-227) and American Society of Mechanical Engineers (ASME) Section XI Reactor Vessel weld examinations with the core barrel removed.

PSEG requests approval of the proposed request by October 6, 2017 to align with the Unit 1 refueling outage S1R25 when the subject examinations would be required to be performed. Relief Request S1-I4R-160 applies to the Unit 1 fourth interval which began on May 20, 2011 and is scheduled to end on December 31, 2020.

The Code of Record for the Salem Unit 1 Fourth 10-year Inservice Inspection Interval is the ASME Code, Section XI, 2004 Edition. The proposed relief request is provided in Attachment 1.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this matter, please contact Mr. Brian Thomas at 856-339-2022.

Sincerely,

Paul R. Duke, Jr.
Manager - Licensing
PSEG Nuclear LLC

Attachment 1: 10CFR 50.55a Relief Request S1-I4R-160

cc: Administrator, Region I, NRC
NRC Senior Resident Inspector, Salem
C. Parker, Project Manager, Salem, USNRC
P. Mulligan, Chief, NJBNE
L. Marabella, Corporate Commitment Tracking Coordinator
T. Cachaza, Salem Commitment Tracking Coordinator

Attachment 1

10CFR 50.55a Relief Request S1-I4R-160

Salem Nuclear Generating Station, Unit No. 1
Renewed Facility Operating License No. DPR-70
NRC Docket No. 50-272

10 CFR 50.55a Request S1-I4R-160

Hardship in Accordance with 10 CFR 50.55a(z)(2)
Hardship Without a Compensating Increase in Quality and Safety

1. ASME Code Component(s) Affected

Code Class:	1
Examination Category:	Code Case N-770-1
Item Number:	Inspection Item D
Description:	Reactor Pressure Vessel (RPV) Cold Leg Nozzle to Safe-End Alloy 600 Welds: Loop 11 – 27.5-RC-1110-5 Loop 12 – 27.5-RC-1120-5 Loop 13 – 27.5-RC-1130-5 Loop 14 – 27.5-RC-1140-5

2. Applicable Code Edition and Addenda

Code Case N-770-1 as referenced in 10 CFR 50.55a(g)(6)(ii)(F). American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection and Testing of Components of Light-Water Cooled Plants," 2004 Edition with no Addenda. For Unit 1 the Fourth 10-Year Interval began on May 20, 2011 and is scheduled to end on December 31, 2020.

3. Applicable Code Requirement

10 CFR 50.55a(g)(6)(ii)(F) requires licensees of existing, operating pressurized-water reactors as of July 21, 2011, to implement the requirements of ASME Code Case N–770–1, subject to the conditions specified in paragraphs (g)(6)(ii)(F)(2) through (10). Table 1 of Code Case N-770-1, as conditioned by 10 CFR 50.55a(g)(6)(ii)(F)(9), requires volumetric examination of all Item D (uncracked butt welds mitigated with stress improvement) welds no sooner than the third refueling outage and no later than 10 years following stress improvement application. Salem Unit 1 performed the mechanical stress improvement process (MSIP) on the 4 RPV Cold Leg Nozzle to Safe-End Alloy 600 welds subject to this relief request. The pre-MSIP and post-MSIP weld volumetric examinations were completed with no recordable flaws. Therefore these welds are classified as Item D

welds in accordance with ASME Code Case N-770-1. The MSIP application was performed in the Fall 2008 refueling outage; therefore, the RPV Cold Leg Nozzle to Safe-End welds volumetric examinations are currently required to be completed by Fall 2018. This would require the examinations to be completed in the Salem Unit 1 S1R25 refueling outage in the Fall of 2017 since the S1R26 refueling outage in the Spring of 2019 would be 6 months beyond the 10-year Inspection Interval.

4. Reason for Request

PSEG is requesting a one-time 6-month extension to the 10-year inspection interval required by Table 1 of Code Case N-770-1, as conditioned by 10 CFR 50.55a(g)(6)(ii)(F)(9), for Item D (uncracked butt welds mitigated with stress improvement). This interval extension is being requested in accordance with 10 CFR 50.55a(z)(2) as a hardship without a compensating increase in quality and safety.

The 6-month extension would allow the four RPV Cold Leg Nozzle to Safe-End weld volumetric examinations to be performed in the subsequent Unit 1 refueling outage (S1R26) in the Spring of 2019. This would align the RPV Cold Leg nozzle to Safe-End weld volumetric examinations with the Reactor Vessel Internals Materials Reliability Program (MRP-227) and ASME Section XI RPV examinations with the core barrel removed. This would allow the volumetric examination of the RPV Cold Leg Nozzle to Safe-End welds from the inside surface (ID) when the core barrel is currently scheduled to be removed. Performance of the RPV Cold Leg Nozzle to Safe-End welds in the S1R25 refueling outage would require the examinations to be performed from the outside surface (OD) of the pipe.

Previous examinations of the RPV Cold Leg Nozzle to Safe-End Alloy 600 welds have been performed from the outside surface of the pipe (OD) at Salem Unit 1. Access to the OD of these welds is inside a "sandbox" which was installed during original plant construction after all welding was completed. Although these examinations can be performed from the OD of the cold leg nozzles for Salem Unit 1, this inspection activity would result in the unnecessary personnel radiation exposure for the personnel performing these examinations without a compensating increase in quality or safety as discussed below.

Based upon a review of dose records for similar RPV Cold Leg Nozzle to Safe-End weld volumetric examinations performed from the OD for most recent inservice inspections at Salem Unit 2, the dose exposure to personnel performing the NDE of four RPV Cold Leg Nozzle to Safe-End weld volumetric examinations was approximately 3.5 REM. This is a conservative estimate of the personnel exposure since it does include any additional dose received by supporting organizations (i.e., maintenance, radiation protection).

Performing the inspections from the ID during the Spring 2019 refueling outage reduces the overall exposure of the weld examinations since this inspection technique is performed remotely and does not require personnel to access the exterior 'sandbox' area of the RPV.

During the Fall 2008 refueling outage for Salem Unit 1, PSEG performed MSIP of both the RPV hot leg and cold leg nozzle to Safe-End alloy 600 welds. Pre-MSIP volumetric examinations of the four RPV Cold Leg Nozzle to Safe-End welds and post-MSIP volumetric examinations were performed. The volumetric ultrasonic examination met ASME Section XI, Appendix VIII requirements, including examination volume of essentially 100%. The pre-MSIP and post-MSIP examinations identified no flaws in the four RPV Cold Leg Nozzle to Safe-End welds. The post MSIP weld examinations were the pre-service baseline examinations for these Code Case N-770-1 Inspection Item D welds (MRP-139 requirements at that time).

NUREG/CR-7187, "Managing PWSCC in Butt Weld by Mitigation and Inspection," discusses the management of Primary Water Stress Corrosion Cracking (PWSCC) by MSIP in Section 4. Section 4.4 of NUREG/CR-7187 assessed the effectiveness of MSIP for mitigating PWSCC and states at the end, "…it is reasonable to conclude that MSIP provides effective mitigation against the initiation of PWSCC and against the growth of any existing PWSCC that has been detected and allowed to remain in service." Section 4.5 of NUREG/CR-7187 performed an assessment of the Code Case N-770-1 inspection requirements and acknowledged that inspection of MSIP welds serves a defense-in-depth monitoring function rather than a degradation management function.

Since the Salem Unit 1 RPV Cold Leg Nozzle to Safe-End welds have been mitigated by the application of MSIP and were ultrasonically examined without the detection of any flaws, the subsequent ultrasonic examination of these welds is considered as defense-in-depth monitoring and not for the management of PWSCC degradation. Extending the inspection interval 6-months will continue to provide an adequate level of quality and safety. The inspection of the four RPV Cold Leg Nozzle to Safe-End welds will be performed during the Spring 2019 refueling outage.

PSEG believes that imposition of the 10-year inspection interval would create a hardship in that personnel would unnecessarily receive additional radiation exposure, in the order of 3.5 REM if the examinations were performed during the Fall 2017 refueling outage, without an increase in quality or safety as discussed above.

5. Proposed Alternative and Basis for Use

10CFR50.55a(z)states:

"Alternatives to codes and standards requirements. Alternatives to the requirements of paragraphs (b) through (h) of this section or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation, or Director, Office of New Reactors, as appropriate. A proposed alternative must be submitted and authorized prior to implementation. The applicant or licensee must demonstrate that:

(1) *Acceptable level of quality and safety*. The proposed alternative would provide an acceptable level of quality and safety; or

(2) *Hardship without a compensating increase in quality and safety*. Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

PSEG is requesting a one-time 6-month extension to the 10-year volumetric examination interval required by Table 1 of Code Case N-770-1, as conditioned by 10 CFR 50.55a(g)(6)(ii)(F)(9), for Item D (uncracked butt welds mitigated with stress improvement). This interval extension is being requested in accordance with 10CFR50.55a(z)(2) as a hardship without a compensating increase in quality and safety.

PSEG believes that imposition of the 10-year inspection interval would create a hardship in that personnel would unnecessarily receive additional radiation exposure, in the order of 3.5 REM if the volumetric examinations were performed during the Fall 2017 refueling outage, without an increase in quality or safety as discussed in section 4 of this relief request. The inspection of the four RPV Cold Leg Nozzle to Safe-End welds will be performed during the Spring 2019 refueling outage.

6. Duration of Proposed Alternative

The duration of the request for proposed alternative for Salem Unit 1 is through the Spring 2019 refueling outage, S1R26.

7. Precedents

Relief requests have been previously approved by the NRC for extension of Code Case N-770-1 inspection intervals as listed below; however, the precedents listed below are for Item B unmitigated butt welds as opposed to Item D uncracked butt welds mitigated with stress improvement.

a. NRC letter to NextEra Energy, "Point Beach Nuclear Plant, Unit 2 - Approval of Relief Request 2-RR-11; Steam Generator Nozzle to Safe-End Dissimilar Metal (DM) Weld Inspection RE: (CAC No. MF6615)," dated March 22, 2016 (ADAMS Accession No.· ML16063A058)

b. NRC letter to Luminant Generation Company LLC, "Comanche Peak Nuclear Power Plant, Unit 1 - Relief Request 1B3-3, Alternative to the ASME Code, Section XI, Examination Requirements for Reactor Pressure Vessel Cold-Leg Weld Inspection Frequency (CAC No. MF6125)," dated March 14, 2016 (ADAMS Accession No. ML16074A001)

c. NRC letter to Entergy Nuclear Operations, "Indian Point, Nuclear Generating Unit No. 2 Relief Request No. IP2-ISI-RR-14, Code Case N-770-1, Reactor Coolant System Cold Leg Nozzle Weld Inspection Frequency Extension (TAC No. ME6801)," dated February 2, 2012 (ADAMS Accession No. ML120260090)

d. NRC Letter to Entergy Nuclear Operations, "Indian Point Nuclear Generating Unit No. 3 – Safety Evaluation for Relief Request IP3-ISI-RR-07 for Reactor Vessel Cold Leg Nozzle to Safe-End Weld Examinations (TAC No. MF3346)," dated August 4, 2014 (ADAMS Accession No. ML14199A444)

8. References

1) Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 16 dated October 2010

2) Code Case N-770-1, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities Section XI, Division 1."

3) NUREG/CR-7187, "Managing PWSCC in Butt Welds by Mitigation and Inspection," November 2014