Conte, Richard

From: r1scan@nrc.gov
Sent: Tuesday, July 06, 2010 7:36 AM
To: Conte, Richard
Subject: Attached Image
Attachments: 0815_001.pdf

C/173

Conte, Richard

From: Cahill, Christopher
Sent: Friday, July 02, 2010 2:28 PM
To: Conte, Richard
Subject: Feeder Review

Rich,

I completed my review of the feeder. I made a separate marked-up copy I'll leave with you. Here are my general comments:

more like observations - which I pointed out in early draft

1) The scope section included assessment which is not in accordance with 0612.

2) The finding 1R08 was missing the SDP used and cross cutting aspects. Additionally, there was no basis established in the description section to demonstrate that the issue did not result in a loss of function/operability. Per 0612-06.02 " Include a description of any positive licensee performance that mitigated a potential problem and influenced the significance of the finding or severity level of the TE violation. The description content must be complete because the addition of new information is not permitted in the Analysis and Enforcement Sections." Why it is safe/operable/functional needs to be included in the description.

3) After consulation with TSAB, Section 4OA2, does not seem to be appropriatly formatted. Recommend discussing with TSAB.

4) Section 4OA7 - I agree that it is a LIV, however it is not documented IAW 0612 - 10 Licensee Identified Violations. Specifically, the section requires that for "Green Violation – If the finding involves a violation of very low safety significance (Green) and the licensee has correctly evaluated the finding and developed appropriate corrective actions, than it should be briefly described in Section 4OA7"

5) A list of items opened/closed as described in 0612-14.08 was not included.

6) List of Acronyms had many items missing and several items included that were in the report.

7) Style point - The write-up often said therm like "the inspector decided it was a violation". This sounds subjective. A better way to express the thought might be "the inspector determined or concluded".

I'm trying to take a few days off next week but I expect to be in on at least onTuesday so we can discuss or I can be reached ny cell/email.

Chris Cahill, PE
Senior Reactor Analyst
USNRC Region 1
Division of Reactor Safety
610-337-5108 (w)
610-334-9676 (c)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

MEMORANDUM TO: Arthur L. Burritt, Chief
Projects Branch 3
Division of Reactor Projects

THRU: Richard J. Conte, Chief
Engineering Branch 1
Division of Reactor Safety

FROM: Timothy L. OHara, Reactor Inspector
Engineering Branch 1
Division of Reactor Safety

SUBJECT: INSERVICE INSPECTION ACTIVITIES INSPECTION FEEDER FOR SALEM UNIT 1, INSPECTION REPORT 05000272/2010003

The enclosed feeder contains input for the subject report resulting from inspection of Inservice Inspection (ISI) activities during the period from April 5, 2010 to June 28, 2010, at Salem Unit 1. The inspection was conducted using Inspection Procedure 71111.08, Inservice Inspection Activities and Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds. The results of this inspection were presented to Mr. Ed Eilola, Salem Plant Manager, at an exit meeting on June 28, 2010.

Cover Letter Input

No input.

Enclosure: Feeder for Salem Unit 1, Inspection Report No. 05000272/2010003

SUMMARY OF FINDINGS

Reactor Safety

Cornerstone: Mitigating Systems

- Green. The inspector identified a non-cited violation (NCV) of very low safety significance (Green) for the PSEG failure to perform Auxiliary Feedwater System (AFW) discharge piping pressure tests on buried piping components as required by 10 CFR 50.55a(g)(4) and the referenced American Society of Mechanical Engineers Code (ASME), Section XI, paragraph IWA-5244 for Salem Unit 1 and Salem Unit 2. The required tests are intended to demonstrate the structural integrity of the buried piping portions of the system. The affected buried piping is not inspected via other non-destructive examination (NDE) techniques. The affected piping is safety related, ASME Class 3, Seismic Class 1 piping. This performance deficiency is more than minor because the condition affected the Equipment Performance attribute (availability and reliability) of the mitigating systems cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

- Green. PSEG identified a condition which is a non-cited violation (NCV) of very low safety significance (Green) for PSEG's failure to protect the Unit 1 buried AFW system piping with an effective protective coating system. This condition is a violation of 10 CFR 50, Appendix B, Criterion III, Design Control. This performance deficiency resulted in significant corrosion (significantly below minimum wall thickness) on a large portion of the buried AFW system piping on Salem Unit 1. This issue is more than minor because, if left uncorrected, could lead to a more significant condition, i.e. failure of the risk significant AFW piping. The affected piping is safety related, ASME Class 3, Seismic Class 1 piping. This violation is being documented in Section 4OA7 because the issue is directly related to an agency-wide concern on buried piping.

Format Problem per 0612

Tim - do you frequently consult with 0612 on format?

REPORT DETAILS

1R08 Inservice Inspection (ISI) (7111108 - 1 Sample)

a. Inspection Scope

The inspector observed a selected sample of nondestructive examination (NDE) activities in process. Also, the inspector reviewed the records of selected additional samples of completed NDE and repair/replacement activities. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The observations and documentation reviews were performed to verify that the activities inspected were performed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements.

The inspector observed the performance of a visual inspection (VT) of the Unit 1 Reactor Vessel Closure Head (RVCH) and the installed upper head penetrations. The visual inspection was performed with an approved procedure by qualified technicians and was accurately documented. Also, the inspector reviewed the data sheets for the penetrant tests completed on 3 of the penetration welds of the RVCH.

The inspector reviewed records of ultrasonic testing (UT), visual testing (VT), penetrant testing (PT) and magnetic particle testing (MT) NDE processes. PSEG did not perform any radiographic testing (RT) during this outage. The inspector reviewed inspection data sheets and documentation for these activities to verify the effectiveness of the examiner, process, and equipment in identifying degradation of risk significant systems, structures and components and to evaluate the activities for compliance with the requirements of ASME Code, Section XI.

Steam Generator Inspection Activities

The inspectors reviewed a sample of the Salem Unit 1 steam generator Eddy Current Testing (ECT) tube examinations, and applicable procedures for monitoring degradation of steam generator tubes to verify that the steam generator examination activities were performed in accordance with the rules and regulations of the steam generator examination program, Salem Unit 1 steam generator examination guidelines, NRC Generic Letters, Code of Federal Regulations 10CFR50, Technical Specifications for Salem Unit 1, Nuclear Energy Institute 97-06, EPRI PWR steam generator examination guidelines, and the ASME Boiler and Pressure Vessel Code Sections V and XI. The review also included the Salem Unit 1 steam generator degradation assessment and steam generator Cycle 21 and 22 operational assessment. The inspector also reviewed and verified the personnel certifications of the personnel participating in the SG ECT inspections during the 1R20 refueling outage.

PSEG identified wear degradation to the tubing in the four SGs at Salem U1. The majority of these wear indications was attributed to Anti Vibration Bar (AVB) wear in the u bend regions of the four SGs. After conducting the appropriate analyses and evaluations, a total of 14 SG tubes were removed from service by plugging.

Looks like observations

Cc Not not written in as "scope"

Boris Acid Corrosion Control Program Activities

The inspector reviewed the PSEG boric acid corrosion control program. The resident inspectors observed PSEG personnel performing boric acid walkdown inspections, inside containment, and in other affected areas outside of containment, at the beginning of the Unit 1 refueling outage. The walkdown inspections were thorough, well organized and indications of boric acid leakage were recorded and evaluated in accordance with the PSEG program for documentation in the corrective action (Notification) process. Additionally, the inspector reviewed a sample of Notifications for correct evaluation and/or further engineering analysis and/or final resolution.

CC No observations not scope

Section XI Repair/Replacement Samples:

AFW System Piping, Control Air & Station Air: The inspector monitored PSEG's discovery, reporting, evaluation and the repair/replacement of Unit 1 AFW piping which had been excavated for inspection during the April 2010 Unit 1 refueling outage (1R20). This inspection was accomplished in accordance with PSEGs Buried Piping Inspection Program.

PSEG replaced the degraded buried piping with new piping between the fuel transfer tube area (FTTA) building and the Outer Penetration Area building. After installation this portion of the piping was successfully pressure tested, coated with a protective coating and the excavated area was backfilled. This piping was replaced under the ASME, Section XI program as a replacement.

The remainder of the originally buried, uninspected piping (approximately 340 ft.) was abandoned in place and new piping was installed, above ground, inside the fuel transfer tube area (FTTA) building. The rerouting of this portion of the piping was completed as a plant modification under 10 CFR 50.59. After replacement this portion of the piping was successfully pressure tested and returned to service.

The excavation also inspected the condition of two, 2" buried Station Air (SA) pipes and two, 1" buried Control Air (CA) pipes which are buried in the vicinity of the #12 and #14 AFW buried piping. The SA pipes are non-Code, non-safety related and the CA pipes are non-Code, safety related. During inspection, one of the CA pipes was discovered to be leaking and was repaired and tested satisfactorily. All of the accessable buried SA and CA piping was visually inspected, coating was repaired and the piping was backfilled when the AFW piping was backfilled.

CC No observations or corr. actions

The inspector reviewed the repair/replacement work orders for the AFW, CA and SA piping. The inspector monitored the fabrication of the replacement piping, reviewed the documentation of the welding and NDE of the replacement piping and reviewed the pressure tests used to certify the replacement piping. Additionally, the inspector reviewed the specified replacement coating, the application of the replacement coating and the backfill of the excavated area after the piping had been tested.

The inspector reviewed what was Notification 20459689, prompted by the inspector's questioning and reported the failure to perform the IWA-5244 required pressure tests on the buried AFW piping on both Salem Unit 1 and Unit 2. PSEG performed a limited excavation of the buried piping to #22 SG and the #24 SG AFW piping in the Unit 2 fuel transfer tube area (FTTA) building. When?

Limited UT testing was performed on the AFW piping and no significant degradation of the Unit 2 piping was observed.

Main Feedwater Piping Elbow Erosion:

The inspector also reviewed the record of a rejectable wall thickness measurement taken on the #11 SG Feedwater elbow during 1R20. The licensee recorded additional wall thickness data to further define the condition and performed a finite element analysis (FEA) which verified that sufficient wall thickness remained to operate the component until the next refueling outage when it will be replaced.

b. Findings

The inspector identified the following violation for the Unit 1 buried AFW piping.

Do we normally use version of code 2004?)

Introduction The inspector identified a GREEN non-cited violation (NCV) of 10 CFR 50.55a(g)(4) and the referenced American Society of Mechanical Engineers (ASME) Code, Section XI, paragraph IWA-5244 for PSEG's failure to perform required pressure tests of buried components. The AFW piping supplying water to SG #12 and SG #14 of Salem Unit 1 and for SG #22 and #24 for Salem Unit 2. This piping is safety related, 4.0" ID, ASME Class 3, Seismic Class 1 piping.

Description Portions of the Unit 1 and Unit 2 Auxiliary Feedwater (AFW) System piping is buried piping and has not been visually inspected since the plant began operation in 1977 for Unit 1 and since 1979 for Salem Unit 2. In April 2010, approximately 680 ft. (340 ft. of the #12 SG AFW supply and 340 ft. of the #14 SG AFW supply) of piping between the pump discharge manifold and the connection to the Main Feedwater piping to the affected SGs was discovered to be corroded to below minimum wall thickness (0.278") for the 1950 psi design pressure of the AFW System. The lowest wall thickness measured in the affected piping was 0.077". PSEG plans on excavating the Unit 2 buried piping to inspect the condition during the next Unit 2 outage in 2011. the spring of

10 CFR 50.55(a)(g)(4)(ii) requires licensees to follow the in-service requirements of the ASME Code, Section XI. Paragraph IWA-5244 requires licensees to perform pressure tests on buried components to demonstrate structural integrity of the tested piping. The pressure test required by IWA-5244 is considered to be an inservice inspection and is part of Section XI. Section XI and IWA-5244 do not specify any other non-destructive examinations (NDE) on buried components to ensure structural ~~integrity.~~ Thus, PSEG neglected to perform the only inservice inspection, intended to demonstrate the structural integrity of this safety related buried piping. PSEG did not perform the required tests for Unit 1 during the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) periods of the 3rd In Service Inspection Interval, and for Unit 2 for the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) of the 3rd In Service Inspection Interval.

monitor? better word

PSEG sought relief, from the NRC, from the previous Code required pressure testing in 1988 for Unit 1 only. Relief was granted to PSEG, by the NRC, to perform an alternate flow test in 1991 for Unit 1, however, PSEG did not perform the proposed alternate tests during the 2nd inservice interval and during the 1st (5/19/01 to 6/3/04) and 2nd (6/24/04 to 5/20/08) periods of the 3rd In Service Inspection Interval for Unit 1. Also, PSEG did not

CC No. 2

the AFW safety related buried piping for both units

perform the proposed alternate tests during the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) of the 3rd In Service Inspection Interval for Unit 2. Thus, PSEG missed an opportunity to identify and correct this performance deficiency.

A second opportunity to identify and correct this performance deficiency was missed in 2002 when a similar condition (failure to perform buried piping pressure tests) was reported by Indian Point Unit 3. PSEG's review of operating experience reports did not identify that the same condition potentially existed at Salem Unit 1 and Unit 2.

CC was the summary of the risk assessment (a licensing position)

Unit 2 summary

Unit 1 Regarding to risk

Analysis The inspector decided that the licensee's failure to perform the required pressure test on this ~~safety related piping~~ was a performance deficiency ~~because~~ This is due to condition ~~was~~ the result of the licensee's failure to meet the regulatory requirements of 10 CFR 50.55a(g)(4) and the ASME Code, Section XI, paragraph IWA-5244. ~~Additionally, the inspector decided that~~ this performance deficiency was reasonably within the licensee's ability to forsee and correct and should have been prevented.

CC No. 2

The inspector determined that the performance deficiency was more than minor because this condition affected the Equipment Performance attribute (availability and reliability) of the mitigating systems cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

Looking back why was it functional (plain language) CC No. 2

This finding affects the mitigating systems cornerstone by affecting the secondary, short term decay heat removal. Because the finding did not result in loss of operability or functionality the inspector determined that the finding was of very low safety significance, Green.

Enforcement 10 CFR 50.55a(g)(4) ~~says~~ states, in part: "Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components ...which are classified as ASME Code Class 1, Class 2 and Class 3 must meet the requirements, ... , set forth in Section XI of editions of the ASME Boiler and Pressure Vessel Code". Paragraph IWA-5244, Buried Components, of Section XI says, in part,

(Version 2004?)

> "(b) For buried components where a VT-2 visual examination cannot be performed , the examination requirement is satisfied by the following: (1) The system pressure test for buried components that are isolable by means of valves shall consist of a test that determines the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components. ..."

Contrary to these requirements, PSEG did not perform the required pressure tests of the buried AFW piping to the #12 SG and #14 SG at Salem Unit 1 during the 2nd In Service Inspection Interval (2/27/88 to 5/19/01) and during the 1st (5/19/01 to 6/3/04) and 2nd (6/24/04 to 5/20/08) periods of the 3rd In Service Inspection Interval (5/19/01 to 5/19/11). Also, contrary to these requirements, PSEG did not perform the required pressure tests of the buried piping to the #22 SG and #24 SG for Unit 2 for the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) of the 3rd In Service Inspection Interval. Consequently, from 2/27/88 to 4/20/07) the required pressure tests were not performed to demonstrate structural integrity on the affected buried Unit 1 AFW piping.

Because PSEG entered this condition into the corrective action process (Notification 20459686) and because it is is of very low safety significance (Green), it is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 50-272/2010-?? and NCV 50-311/2010-??**

4OA2 Identification and Resolution of Problems (71152) CC NO. 3 Formatting

a. Inspection Scope

The inspectors reviewed a sample of corrective action reports (Notifications), listed in Attachment 2 which involved in-service inspection related issues, to ensure that issues are being promptly identified, reported and resolved. The sample of Notifications selected did demonstrate that non-conformances are being identified, evaluated and appropriately addressed.

b. Findings

No findings of significance were identified. ? or Findings / Observations

c. Observations

(1) The inspector noted that the PSEG buried piping inspection procedure did not document how a representative inspection sample is selected and did not enumerate the basis for the inspection sample selection.

(2) The inspector noted that PSEG buried piping inspection procedure does not provide a threshold criteria for inspection conditions which are to be entered into the corrective action process for evaluation, potential resolution and/or tracking.

(3) PSEG has not defined a design life for the new coating on the new buried AFW piping for Unit 1. Also, PSEG has not determined an inspection frequency for the newly coated, replaced Unit 1 buried piping.

(4) Notification 20459689 reported the failure to perform the IWA-5244 required pressure tests on the buried AFW piping. This Notification ~~says~~ states, "The system pressure test boundary drawing (S2-SPT-336-0) identifies the piping as YARD piping not buried piping." It is not clear what PSEG is doing to ensure that other system drawings which contain the same YARD markings and are potentially not being treated as buried piping and components.

(5) The PSEG Buried Piping Program assumes that buried piping is protected by a coating system to protect from degradation for the plant life. However, the Unit 1 AFW piping was discovered to not have been coated or protected. It is not clear what PSEG is doing to confirm or verify that buried piping is protected with an effective coating which will protect the piping for the plant life.

4OA5 Temporary Instruction (TI) 2515/172

a. Inspection Scope

The Temporary Instruction (TI), 2515/172 provides for confirmation that owners of pressurized-water reactors (PWRs) have implemented the industry guidelines of the Materials Reliability Program (MRP) -139 regarding nondestructive examination and evaluation of certain dissimilar metal welds in the RCS containing nickel based Alloys 600/82/182.

During 1R20 PSEG inspected the dissimilar metal weld on the 1" reactor vessel drain piping with no detected indications. Salem Unit 1 has dissimilar metal welds in the eight reactor coolant system piping to reactor vessel nozzle safe end welds. No additional inspections or MSIP applications were performed during 1R20.

This TI requires documentation of specific questions in an inspection report. The questions and responses for the IR 05000272/2010003 section 4OA5 are included in this report as Attachment "B-1".

b. Findings

This makes it look like an NRC id - self revealing finding

No findings of significance were identified.

4OA6 Meetings, including Exit

The inspectors presented the ISI inspection and TI 2515/172 inspection results to Mr. Ed Eilola, Salem Plant Manager, and other members of the PSEG staff at the conclusion of the inspection at an exit meeting on June 28, 2010 for Salem Unit 1. The licensee acknowledged the conclusions and observations presented. Some proprietary information was reviewed during this inspection and was properly destroyed. No proprietary information is contained in this report.

4OA7 Licensee Identified Violations

CC No 4

a. Inspection Scope

I thought we agreed LIV do you have alt. view?

During the Unit 1 refueling outage in April 2010, PSEG conducted an excavation of buried AFW piping. After limited guided wave and ultrasonic inspections a degraded condition of the piping became self-revealing.

conflicting terminology with LIV

b. Finding

CC No 4

~~Introduction~~ PSEG identified a condition which is a non-cited violation (NCV) of very low safety significance (Green) for PSEG's failure to protect the Unit 1 buried AFW system piping with an effective protective coating system. This performance deficiency is a violation of 10 CFR 50, Appendix B, Criterion III Design Control. This performance deficiency resulted in significant corrosion (significantly below minimum wall thickness)

I need to talk to DRP on how generic issue has been addressed?

on a large portion of the buried AFW discharge piping to SG# 12 and SG#14. This buried piping is not inspected via other non-destructive examination (NDE) techniques as part of the inservice inspection program. This piping is safety related, ASME Class 3, Seismic Class 1 piping.

~~Description.~~ Portions of the Unit 1 Auxiliary Feedwater (AFW) System piping is buried piping and had not been inspected by any NDE methodology since the plant began operation in 1977. In April 2010, approximately 680 ft. (340 ft. of the #12 SG AFW supply and 340 ft. of the #14 SG AFW supply) of buried piping between the pump discharge manifold in the Auxiliary Building and Mechanical Penetration Building was discovered to be corroded to below minimum wall thickness (0.278") for the 1950 psi design pressure of the AFW System. The area of the worst corrosion resulted in a wall thickness of 0.077".

The affected AFW piping was to have met Specification S-C-MPOC-MGS-0001 and piping schedule SPS54. Page II-190 of Piping Schedule SPS54 says, "For protection of underground piping in the yard see page II-88 of Piping Schedule SPS28 of this specification. "X-tru-coat" may be used." Page II-88 specifies two (2) coats of Bitumastic No. 50 paint applied cold after installation (special coating for portions of lines as specified on drawing). Auxiliary Feedwater drawing 207483A8923-11 contains a Note directing that a "plastic coat is to be removed prior to welding, with the protection of that section to be done in the field by appropriate application of two (2) coats of Bitumastic 50 applied cold." Despite these detailed specifications PSEG had not provided ~~written~~ records showing what coating had actually been applied to this buried piping. Also, upon inspection, after excavation, there was very little evidence of the existence of a protective coating on the buried AFW piping.

PSEG ~~did not provide~~ engineering evaluations, testing data, vendor certification, QC/QA records documenting application of coating(s) or other details of the design life of the specified coating, ~~PSEG did not provide~~ appropriate testing to demonstrate that the coating would provide protection to the buried piping for the design life of the plant. Also, ~~PSEG did not specify~~ an inspection periodicity for interim visual inspections to verify that the coating was providing protection against corrosion of the piping.

~~Analysis~~ The inspector ~~decided~~ determined that the licensee's failure to protect the Unit 1 AFW piping with an effective coating system was a performance deficiency because this condition was the result of the licensee's failure to meet the regulatory requirements of 10 CFR 50, Appendix B, Criterion III, Design Control. Additionally, the inspector decided that this performance deficiency was reasonably within the licensee's ability to forsee and correct and should have been prevented.

The inspector determined that the performance deficiency was more than minor because this condition affected the Equipment Performance attribute (availability and reliability) of the mitigating systems cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Additionally, this issue is more than minor because if left uncorrected, could lead to a more significant condition, failure of the buried safety related, risk significant, ASME Class 3, Seismic Class 1 AFW piping.

Enforcement 10 CFR 50, Appendix B, Criterion III, Design Control, states, in part "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components."

Contrary to these requirements, PSEG did not provide engineering evaluations, vendor certification, or testing data to demonstrate that the specified coating would protect the buried AFW piping for the design lifetime of the plant. Also, PSEG did not assure appropriate quality standards which assure that deviations from such standards were controlled. Additionally, PSEG did not provide measures for the selection and review for suitability of the coating materials for the buried AFW piping application, for periodic inspections to ensure that the applied coating was protecting the buried AFW piping, and did not provide engineering details demonstrating the ability of the coating to protect the buried AFW piping for the life of the plant.

Because PSEG entered this condition into the corrective action process (Notification 20456999) and because the issue is of very low safety significance (Green), this issue is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 50-272/2010003-??**

Summarize per 4OA7 guidance

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY CONTACTS

Licensee Personnel:

Howard Berrick, PSEG
Pat Fabian, PSEG
Mohammad Ahmed, PSEG
Tony Oliveri, PSEG
Tom Roberts, PSEG
Ali Fakhar, PSEG
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Dave Mora, PSEG
Edley Giles, PSEG
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Bill Mattingly, PSEG
Pat Van Horn, PSEG
Jim Barnes, PSEG
Justin Werne, PSEG
Rick Villar, PSEG
Matthew Murray, PSEG

CC No. 5

LIST OF DOCUMENTS REVIEWED

Notifications:

20457869, Control Air Piping Leak*
20462034, Basis AFW Discharge Line Design Pressure*
20461785, Untimely retrieval of Design Documents*
20461255, U2 Containment Liner Blisters*
20459259, U2 Containment Liner Blisters*
20459689, failure to do IWA-5244 pressure tests*
20456999, Guided Wave (GW) pipe wall loss 20% to 44%*, in Equipment Apparent Cause Evaluation (EQ;ACE) Charter
20457854, see Equipment Apparent Cause Evaluation (EQ: ACE) Charter
20457869, Air Line Leak, in Equipment Apparent Cause Evaluation EQ: ACE Charter
20458147, see Equipment Apparent Cause Evaluation (EQ: ACE) Charter
20458148, see Equipment Apparent Cause Evaluation (EQ: ACE) Charter
20458568, see Equipment Apparent Cause Evaluation (EQ: ACE) Charter
20458554, 11 CA HDR Line In Fuel Xfer Area Degraded*
20458761, 1R20 CA Buried Pipe Coating Repair*
20458925, 1R20 SA Buried Pipe Coating Repair*
20457262, (88) 1R20 AF Buried Pipe Inspection Results*
20460624, Need Heat Trace on AF lines in FFT Area
20457877, U1 Containment Liner Corrosion at 78' El.*

20459259, U1 Corrosion on Containment Liner*
20459303, #14 AF pipe damaged penetration seal*
20459304, #12 AF pipe damaged penetration seal*
20459454, Request for Additional UT Data, 4/18/10 (due to 0.077" reading)*
20344017, Inspect steel liner in 1R19
20235636, NRC noted water running down containment wall
20459189, Question on location of RFO-14 location of a PZR shell weld
20290560, Replace section of 15B FWH shell-S1-R18
20457879, (184) 1R20 FAC(N18) 14# elbow below Tmin
20456828, (66) valve has visible boron buildup 1R20
20459232, Heavy Dry White Boron Vlv Packing (1R20)
20456834, Heavy Dry White Boron Vlv Packing (1R20)
20456840, Medium Dry White Boron Vlv Packing (1R20)
20456839, Medium Dry White Boron Vlv Packing (1R20)
20389147, Recordable ISI Indications on CVC Tank
20344017, Inspect Steel Liner in 1R19 @ Containment Sump
20235636, NRC Noted Water Running Down Containment Wall
20392631, ARMA From ISI Program Audit 2008
20460624, Need Heat Trace on AF lines in FTT Area
20333050, Response to NRC NOV EA-07-149
20322039, 2nd Interval ISI NRC Violation
20397518, A1CVC-1CV180 Chk Vlv Stuck Open - PI&R review
20444514, Boric Acid Leak from Drain Line - PI&R review
20445314, boron leak - PI&R review
20448241, Minor Packing Leak – BAC - PI&R review
20435861, 21SJ313 Has Boric Acid Leakage - PI&R review
20417331, Boric Acid Leak at 11 CV156 - PI&R review
20411151, Tubing leak on 1SS653 - PI&R review
20414343, 12 Charging Pump seal inj. Line - PI&R review
20395346, 12 Bat PP Seal Leak - PI&R review
20450330, Containment Liner Corrosion - PI&R review
20385733, Severe Corrosion on FP Valve - PI&R review
20438320, (217) Op Eval. Of Containment Corrosion - PI&R review
20387897, Significant outlet pipe corrosion - PI&R review
20397225, MIC Corrosion Causing Through Wall Leak - PI&R review
20436836, Repair Cracks in Battery Cells - PI&R review
20392145, Update U1 ISI Relief Request Book - PI&R review
20449447, Update Salem Unit 1 ISI 10 Yr Plan - PI&R review
20449744, Update Salem Unit 1 Containment ISI 10 Yr Plan - PI&R review
20449442, Update Salem Unit 2 Containment ISI 10 Yr Plan - PI&R review
20449554, Salem U2 RFO18 ISI Scope - PI&R review
20416605, INPO PSIRV Alloy 600 Program - PI&R review
20404057, Unit 2 ISI (MSIP) - PI&R review
20392631, ARMA FROM ISI PROGRAM AUDIT 2008 - PI&R review
20388065, Water leaking in decon room - PI&R review
20439023, 23 CFCU Head Leakage - PI&R review
20439022, SW Header Leakage 23 CFCU - PI&R review
20389148, 1R19 ISI Weld Exam Limitations - PI&R review
20416605, INPO PSIRV Alloy 600 Program - PI&R review
20449442, Update Salem 2 Containment ISI 10 yr. Plan - PI&R review
20449554, Salem Unit 2 RFO18 ISI Scope - PI&R review

20449747, Update Salem 2 ISI 10 Yr. Plan - PI&R review
20401542, Perform ISI BMV Exam on RPV Upper Head - PI&R review
20449063, SA U1 Service Inspec – ISI & U1 TI 2515 - PI&R review
20389147, Recordable ISI Indications on CVC Tank - PI&R review
20392145, Update U1 ISI Relief Request Book - PI&R review
20449744, Update Salem U1 Containment ISI 10 Yr. Plan - PI&R review
20409943, NRC RIS 2009-04 SG Tube Insp Rqmts – PI&R review
20459851, Section XI Exams Limited to 90% or Less – PI&R review
20450520, Recoat Affected Areas of Liner 2R18 – PI&R review
20457388, Excavation Issues – PI&R review

*Denotes this Notification was generated as a result of this inspection

Section XI Repair/Replacement Samples:

W.O. 60079414, 14" Carbon Steel Elbow FAC indication below minimum wall
W.O. 60084266, Salem U1 AF Buried Piping Inspection
W.O. 60089561, 80101381: Replace Aux FW U/G Piping
W.O. 60064104, Repair 15B FWH Area
W.O. 60084375, BACC Program repair to 1PS1
W.O. 60089612, BACC Program repair to S1CVC-14CV392
W.O. 60089615, BACC Program repair to S1SJ-13SJ25
W.O. 60089848, 80101382 Advanced Work Authorization #2 FTTA Replace Aux. Feedwater Pipe
W.O. 60089561, 80101381 Advanced Work Authorization – Replace Aux. FW U/G Piping, 4/9/10

Non-Code Repair

W.O. 60089848, Repair Non-nuclear, safety related CA Pipe, Unit 1 FTTA
W.O. 60089757, Test Non-nuclear, safety related CA Pipe Repair, Unit 1 FTTA

Miscellaneous Work Orders:

W.O. 60089917, Penetrations for CA & SA Lines, 4/23/10
W.O. 941017262, Activity 04, Excavate and Examine Auxiliary Feedwater Piping, Unit 2, 12/94
W.O. 941017262, Activity 03, Excavate and Examine Auxiliary Feedwater Piping, Unit 2, 12/94
W.O. 941017262, Activity 02, Excavate and Examine Auxiliary Feedwater Piping, Unit 2, 12/94
W.O. 941017262, Activity 01, Excavate and Examine Auxiliary Feedwater Piping, Unit 2, 12/94
W.O. 60089561, Flush New AFW piping 12 and 14

Drawings & Sketches:

205236A8761-54, Salem Nuclear Generating Station, Unit No. 1, Auxiliary Feedwater
Salem Unit 1 Aux Feed Piping, Allan Johnson, 4/10/10
80101381RO, Buried Pipe, Replaced AFW Piping Arrangement
207483A8923-11, Salem Nuclear Generating Station, Unit No. 1 – Reactor Containment Auxiliary Feedwater, Plans & Sections – Elev. 78' 10" & 100' 0", Mechanical Arrangement, Revision 8, 9/31/86

207483A8923-28, Sheet 1 of 4, Salem Nuclear Generating Station, Unit No. 1 – Reactor Containment Auxiliary Feedwater, Plans & Sections – Elev. 84',Mechanical Arrangement, Revision 8, 9/31/86
207483A8923-31, Sheet 2 of 4, Salem Nuclear Generating Station, Unit No. 1 – Reactor Containment Auxiliary Feedwater, Plans & Sections – Elev. 84', Mechanical Arrangement, Revision 8, 9/31/86
207483A8923-28, Sheet 3 of 4, Salem Nuclear Generating Station, Unit No. 1 – Reactor Containment Auxiliary Feedwater, Plans & Sections – Elev. 84',Mechanical Arrangement, Revision 8, 9/31/86
207483A8923-30, Salem Nuclear Generating Station, Unit No. 1 – Reactor Containment Auxiliary Feedwater, Plans & Sections – Elev. 84',Mechanical Arrangement, Revision 8, 9/31/86
207610A8896-12, Salem Nuclear Generating Station, Unit No. 1 – Auxiliary Building & Reactor Containmnet Compressed Air Piping, Aux. Building El. 84 East & React. Contain. El. 78, Mechanical Arrangement, Revision 8, 9/31/86

Design Change Packages/Equivalent Change Packages

80101382, Revision 2, Replace Salem Unit 1 AFW Piping from the Unit Mechanical Penetration Area El. 78'-0" to the Unit 1 Fuel Transfer Tube Area El. 100'-0"
80101381, Revision 1, Replace in-kind the Salem Unit 1 AF Piping that runs underground from the Unit 1 Fuel Transfer Tube Area to the Unit 1 Main Steam Outer Penetration Area

50.59 Applicability Reviews, Screenings & Evaluations

80101382; Salem Unit 1 12/14 AF Piping Reroute; 4/24/10

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70106830, Salem S1R20 NRC ISI Inspection Check-In Self Assessment
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OAR-1, Owner's Activity Report, #S1RFO19, 1/15/09

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SH.RA - AP.ZZ - 8805(Q) - Revision 4, 8/31/06; Boric Acid Corrosion Management Program
ER - AP - 331, Revision 4, Boric Acid Corrosion Control (BACC) Program
ER - AP - 331 - 1001, Revision 2, Boric Acid Corrosion Control (BACC) Inspection Locations, Implementation And inspection Guidelines
ER - AP - 331 - 1002, Revision 3, Boric Acid Corrosion Control (BACC) Program Identification, Screening, and Evaluation
ER - AP - 331 - 1003, Revision 1, RCS Leakage Monitoring And Action Plan
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LS - AA - 125, Revision 13; Corrective Action Program (CAP) Procedure
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SH.RA-IS.ZZ-0005(Q)-Revision 6; VT-2 Visual Examination Of Nuclear Class 1, 2 and 3 Systems
SH.RA-IS.ZZ-0150(Q) – Revision 8, 10/19/04; Nuclear Class 1, 2, 3 and MC Component Support Visual Examination
OU-AP-335-043, Revision 0; BARE METAL VISUAL EXAMINATION (VE) OF CLASS 1 PWR COMPONENTS CONTAINING ALLOY 600/82/182 AND CLASS 1 PWR REACTOR VESSEL UPPER HEADS
OU-AA-335-015, Revision 0; VT 2 - VISUAL EXAMINATION
Areva NP, Inc., Engineering Information Record 51-9118973-000; Qualified Eddy Current Examination Techniques for Salem Unit 1 Areva Steam Generators, 10/15/09
AREVA NP 03-9123233, Revision 000, 10/13/09; Salem Unit 2 RVCH Flange Repair
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SH.MD-GP.ZZ-0240(Q) – Revision 10, SYSTEM PRESSURE TEST AT NORMAL OPERATING PRESSURE AND TEMPERATURE, 7/29/09
S2.OP-AF-0007(Q)-Revision 20, 12/23/09; INSERVICE TESTING AUXILIARY FEEDWATER VALVES, MODE 3
ER-AA-5400-1002, Revision 1, BURIED PIPING EXAMINATION GUIDE
Specification No. S-C-MPOO-MGS-0001; Piping Schedule SPS54, Auxiliary Feedwater, Revision 6
PSEG Test Procedure 10-H-8-R1, Unit 2 Auxiliary Feedwater 2100/2150 Hydro; 9/21/78

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003753, VT-10-113, PRV nozzle sliding support
003754, VT-10-114, RPV nozzle sliding support
006325, UT-10-041, PZR longitudinal shell weld J (100%)
007500, UT-10-132, PZR surge line nozzle (100%)
007901, UT-10-028, 13 SG lower head to tubesheet weld (67%)
006073, VE-10-026, CRDM TO VESSEL PENETRATION WELD, 4/12/10
008001, VE-10-027, 31-RCN-1130-IRS
008026, VE-10-028, 29-RCN-1130-IRS
009070, VE-10-030, 12-STG Channel Head Drain (100%)
033300, UT-10-027, 4-PS-1131-27 (100%)
033200, UT-10-029, 4-PS-1131-26 (100%)

033100, UT-10-032, 4-PS-1131-25 (100%)
032300, UT-10-033, 4-PS-1131-17 (100%)
031700, UT-10-040, 4-PS-1131-12 (100%)
032600, UT-10-034, 4-PS-1131-20 (100%)
047600, UT-10-045, 29-RC-1140-3 (100%)
051200, UT-10-048, 29-RC-1120-3 (100%)
203901, UT-10-047, 32-MSN-2111-1 (100%)
204001, UT-10-046, 16-BFN-2111-1 (70.64%)
210586, UT-10-025, 14-BF-2141-19 (100%)
210588, UT-10-024, 14-BF-2141-20 (100%)
836300, IWE: VT-10-338, PNL-S1-343-1
836400, IWE: VT-10-333, ALK-S1-100-tubing
840000, IWE: Vert Leak Channels 1 – 14
006073, VE-10-026, RPV Upper Head Inspection
006051, PT-10-004, CRDM Housing Weld Exams, penetrations #66, 67, and 72
Salem Unit 1, VT-2, Visual Examination Record, 12/14 AF FTTA, W.O. 60089848, 4/26/10 (VT)
Salem Unit 1, VT-2, CA Repair Snoop Test, W.O. 60089575, 4/27/10
Salem Unit 1, UT, W.O. 60084266, Yard AF, 4/18/10
Salem Unit 2, UT, W.O.60089851, Exam of containment liner
Salem Unit 1, UT 1-SGF-31-L2 FW elbow below min. wall
Salem Unit 1, UT, W.O. 30176541, 1-SGF-31-L2 FW elbow below min. wall
Salem Unit 1, UT, W.O. 60084266, AFW
Order 50113214, ST 550D, Surveillance: ISI Perform PORV Check
Order 50118090, ST 550D, Surveillance: OPS Perform PORV Check
W.O. 60089848, VT-2 Visual Examination Record, 12/14 AFW in FTTA, 4/26/10
W.O. 941017262, Activity 02; Salem Unit 2, Excavate and Examine Auxiliary Feedwater Piping, 12/2/94
W.O. 60084266, UT Unit 1 AFW (thinnest area), 4/20/10
UT Analysis, Component 1-SGF-31-L2 (14" FW Elbow below Minimum wall), 4/10/10
W.O. 60089851, Unit 2 Containment Liner blister UT measurements, 4/21/10
W.O. 60086175, Unit 1 Containment corrosion 78' elevation
W.O. 60084266, Unit 1 AFW piping UT measurements, 4/12/10
W.O. 30176541, Unit 1 AFW piping UT measurements, 4/12/10
W.O. 60084266, Unit 1 AFW piping UT measurements, 4/7/10
W.O. 60084266, Unit 1 AFW piping UT measurements, 4/5/10
W.O. 60084266, Unit 1 AFW pipe UT measurements at supports, 4/18/10
W.O. 30176541, Unit 1 CA piping UT measurements in FTTA
401600, VE-04-198; Hope Creek system pressure test CST to HPCI/RCIC and Core Spray, 11/5/04
VT-2, Salem Unit 1 AF 12 & 14 Pressure Test, 4/25/10
W.O. 60089661, UT measurements, Unit 2 AFW Piping #24 in FTTA, 4/25/10
W.O. 60089661, UT measurements, Unit 2 AFW Piping #22 in FTTA, 4/26/10

Eddy Current Testing Personnel Qualification Records

A2421
B8731
B0500
B5127
B5128
B2576
F3961
C1560
D7895
D9573
D6502
H2039
K5380
M9460
E0427
M6664
B4260
A3502
J9815
P5436
M6042
B8589
B4014
G2573
V8530
W3368
M4305
B4052
K6975
G3910
H0268
L3025
P1465
B8079
G1756
C8071
6410058746
B5371
H2131
2909965330076

C2028
C4596
C3340
D3858
H6267
H0282
I4048
J1978
2010983302133
P6459
R0830
R1164
S0608
2509981330193
K5858
1007951330114
L9168
L4332
F7460
F0037
3107943330158
6206070744
6507061922
1803983330125
2709977301226
P5304
P4006
R4201

R6452
R8002
S7752
T8251
V3197
R4142
R6279
G3380
B3720
R6900
A9608
N2574
I3805
T2170
N4815
M0945
P2963
M9715
K1903
D5318
W6070
M5096
J1945
L4588
C8042
N5330
L8267
F3453

T5616
R9311
G4943
C5542
F0075
F6623
F3453
G4943
G1311
H7791
J9141
M0950
M2665
M7006
M9459
M7007
M9082
N7035
N9952
R9311
S9098
T5616
T5565
W2639
W7912

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Calculation No. S-C-AF-MDC-1789; Salem Auxiliary Feedwater Thermal Hydraulic Flow Model, 10/4/00
70087436, Steam Generator Degradation & Operational Assessment Validation, Salem Unit 1 Refueling Outage 18 (1R18) & Cycles 19/20, 9/2008
51-9052270-000, Update – Salem Unit 1 SG Operational Assessment At 1R18 For Cycles 19 and 20, 10/1/08
51-9048311-002, Salem Unit 1 SG Condition Monitoring For 1R18 And Preliminary Operational Assessment For Cycles 19 and 20, 10/30/07
701086998-0050, Maximum Pressure in Underground Auxiliary Feedwater Piping
60089575-130, Past Operability Determination for the leak in the one inch air line to air operated valves in Unit 1 South Penetration Area
70109233/20459231; Boric Acid evaluation of leakage from S1CVC-1CV277
70109232/20459230; Boric Acid evaluation of leakage from S1CVC-1CV2
70109230/20459228; Boric Acid evaluation of leakage from S2RC-1PS1
70109234/20459232; Boric Acid evaluation of leakage from S1SJ-13SJ25
70108698/30, Operating Experience Report for degraded Unit 1 AFW piping
51-9135923-000, AREVA; Salem unit 1 SG Condition Monitoring For 1R20 and Preliminary Operational Assessment For Cycles 21 And 22, 4/20/10
SA-SURV-2010-001, Revision 1; Risk Assessment of Missed Surveillance – Auxiliary Feedwater discharge line underground piping pressure testing, 4/23/10
CQ9503151526; SCI-94-0877, EXCAVATED AUXILIARY PIPING WALKDOWN/DISPOSITION OF COATING REQUIREMENTS; 12/16/94
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Structural Integrity Associates, Inc. Calculation File No. 1000494.301, Evaluation of Degraded Underground Auxiliary Feedwater Piping (Between Unit 1 FTTA and OPA), 4/23/10
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Multiple Weld History Record: 74556
Multiple Weld History Record: 74557
Multiple Weld History Record: 74558
Multiple Weld History Record: 74559
Multiple Weld History Record: 74560
Multiple Weld History Record: 74561
Multiple Weld History Record: 74562
Multiple Weld History Record: 74563
Multiple Weld History Record: 74564
Multiple Weld History Record: 74565
Multiple Weld History Record: 74566
Multiple Weld History Record: 74567
Multiple Weld History Record: 74627
Multiple Weld History Record: 74569
Multiple Weld History Record: 74599
Multiple Weld History Record: 74623
Multiple Weld History Record: 74600
Multiple Weld History Record: 74630
Multiple Weld History Record: 74622
Multiple Weld History Record: 74578
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Multiple Weld History Record: 74601
Multiple Weld History Record: 74602
Multiple Weld History Record: 74603
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Multiple Weld History Record: 74598
Multiple Weld History Record: 74606
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Multiple Weld History Record: 74614
Multiple Weld History Record: 74615
Multiple Weld History Record: 74597
Multiple Weld History Record: 74616
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Multiple Weld History Record: 74574
Multiple Weld History Record: 74624
Multiple Weld History Record: 74573
Multiple Weld History Record: 74572
Multiple Weld History Record: 74570
Multiple Weld History Record: 74571
Multiple Weld History Record: 74623
Multiple Weld History Record: 74622
Multiple Weld History Record: 74621
Multiple Weld History Record: 74537
Multiple Weld History Record: 74538
Multiple Weld History Record: 74537
Welder Stamp Number: P-664
Welder Stamp Number: P-65
Welder Stamp Number: P-466
Welder Stamp Number: P-57
Welder Stamp Number: E-64
Welder Stamp Number: P-710
Welder Stamp Number: P-207
Welder Stamp Number: P-666
Welder Stamp Number: P-708
Welder Stamp Number: E-89
Welder Stamp Number: P-84
Welder Stamp Number: P-228
Surface Exam Record: 60089561-0041
Surface Exam Record: 60089848-0001
Surface Exam Record: 60089848-0001
Surface Exam Record: 60089561-0041
Surface Exam Record: 60089561-0860

Miscellaneous Documents

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UNTAGGING WORKLIST 4274446, 14 AF Underground Piping 1R20, 4/30/10
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LIST OF ACRONYMS

Cc No. 6

ASME	American Society of Mechanical Engineers
BAST	Boric Acid Storage Tank
BWR-VIP	Boiling Water Reactor, Vessel Internals Project
CEA	Control Element Assembly
CEDM	Control Element Drive Mechanism
CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
EPRI	Electric Power Research institute
EQ;ACE	Equipment Apparent Cause Evaluation
EQ	Environmental Qualification
ER	Engineering Request
FTTA	Fuel Transfer Tube Area
GEH	GE - Hitachi
IP	Inspection Procedure
IR	NRC Inspection Report
IVVI	In Vessel Visual Inspection
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
MT	Magnetic Particle Testing
MSIP	Mechanical Stress Improvement Process
NCV	Non-cited Violation
Notification	Corrective Action Notification
NRC	Nuclear Regulatory Commission
NDE	Nondestructive Examination
OE	Operating Experience
OSG	Old Steam Generator
RSG	Replacement Steam Generator
PDI	Performance Demonstration Initiative
PI&R	Problem Identification and Resolution
PPL	Pennsylvania Power & Light Susquehanna
PWSCC	Primary Water Stress Corrosion Cracking
PQR	Procedure Qualification Record (Welding Procedures)
RCS	Reactor Coolant System
RT	Radiographic Test (Radiography)
PT	Dye Penetrant Testing
SDP	Significance Determination Process
SE	Safety Evaluation

SG	Steam Generator
SI	Stress Improvement
SSC	Structure, System, and Component
TS	Technical Specifications
UT	Ultrasonic Test
UFSAR	Updated Final Safety Analysis Report
VT	Visual Examination
WPS	Weld Procedure Specification

INSPECTION SAMPLE COMPLETION STATUS

PROCEDURE or TI	MINIMUM REQUIRED SAMPLES Annual (A) Biennial (B)	CURRENT INSPECTION SAMPLES	RPS TOTAL SAMPLES TO DATE	PROCEDURE STATUS OPEN (O) CLOSED (C)	RPS UPDATED (Y) (N)
7111108 (G)	1				N
2515/172	1				Y

Attachment B-1

TI 172 MSIP Documentation Questions Salem Unit 1

Introduction:

The Temporary Instruction (TI), 2515/172 provides for confirmation that owners of pressurized-water reactors (PWRs) have implemented the industry guidelines of the Materials Reliability Program (MRP) -139 regarding nondestructive examination and evaluation of certain dissimilar metal welds in the RCS containing nickel based Alloys 600/82/182. This TI requires documentation of specific questions in an inspection report. The questions and responses for MSIP for the IR 05000311/2009005 section 4OA5 are included in this Attachment "B-1".

In summary the Salem Units 1 and 2 have MRP-139 applicable Alloy 600/82/182 RCS welds in the four hot and four cold leg piping to reactor pressure vessel nozzle connections for each plant.

For Unit 1 during the 1R20 refueling outage in April 2010 PSEG inspected one dissimilar metal weld, a SG channel head drain line weld. No indications were reported from this inspection. PSEG plans on replacing this valve, and the dissimilar metal weld, during refueling outage 1R22.

TI 2515/172 requires the following questions to be answered for MRP-139 MSIP inspections:

Question 1: For each mechanical stress improvement used by the licensee during the Salem U1 1R20 outage, was the activity performed in accordance with a documented qualification report for stress improvement processes and in accordance with demonstrated procedures?

Response Question 1: No MSIP activities were conducted on U1 during 1R20.

Question d.1: Are the nozzle, weld, safe end, and pipe configurations, as applicable, consistent with the configuration addressed in the stress improvement (SI) qualification report?

Response – Question d.1: No MSIP activities were conducted on U1 during 1R20.

Question d.2.: Does the SI qualification report address the location radial loading is applied, the applied load, and the effect that plastic deformation of the pipe configuration may have on the ability to conduct volumetric examinations?

Response Question d.2: No MSIP activities were conducted on U1 during 1R20.

Question d.3.: Do the licensee's inspection procedure records document that a volumetric examination per the ASME Code, Section XI, Appendix VIII was performed prior to and after the application of the MSIP?

Response: Question d.3.: No MSIP activities were conducted on U1 during 1 R20.

Question d.4.: Does the SI qualification report address limiting flaw sizes that may be found during pre-SI and post-SI inspections and that any flaws identified during the volumetric examination are to be within the limiting flaw sizes established by the SI qualification

report?

Response: Question d.4.: No MSIP activities were conducted on U1 during 1 R20.

Question d.5.: Was the MSIP performed such that deficiencies were identified, dispositioned, and resolved?

Response Question d.5.: No MSIP activities were conducted on U1 during 1 R20.

Chris Cahill Markup

REPORT DETAILS

1R08 Inservice Inspection (ISI) (7111108 - 1 Sample)

a. Inspection Scope

The inspector observed a selected sample of nondestructive examination (NDE) activities in process. Also, the inspector reviewed the records of selected additional samples of completed NDE and repair/replacement activities. The sample selection was based on the inspection procedure objectives and risk priority of those components and systems where degradation would result in a significant increase in risk of core damage. The observations and documentation reviews were performed to verify that the activities inspected were performed in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requirements.

Assessment

The inspector observed the performance of a visual inspection (VT) of the Unit 1 Reactor Vessel Closure Head (RVCH) and the installed upper head penetrations. ~~The visual inspection was performed with an approved procedure by qualified technicians and was accurately documented.~~ Also, the inspector reviewed the data sheets for the penetrant tests completed on 3 of the penetration welds of the RVCH.

The inspector reviewed records of ultrasonic testing (UT), visual testing (VT), penetrant testing (PT) and magnetic particle testing (MT) NDE processes. PSEG did not perform any radiographic testing (RT) during this outage. The inspector reviewed inspection data sheets and documentation for these activities to verify the effectiveness of the examiner, process, and equipment in identifying degradation of risk significant systems, structures and components and to evaluate the activities for compliance with the requirements of ASME Code, Section XI.

Steam Generator Inspection Activities

The inspectors reviewed a sample of the Salem Unit 1 steam generator Eddy Current Testing (ECT) tube examinations, and applicable procedures for monitoring degradation of steam generator tubes to verify that the steam generator examination activities were performed in accordance with the rules and regulations of the steam generator examination program, Salem Unit 1 steam generator examination guidelines, NRC Generic Letters, Code of Federal Regulations 10CFR50, Technical Specifications for Salem Unit 1, Nuclear Energy Institute 97-06, EPRI PWR steam generator examination guidelines, and the ASME Boiler and Pressure Vessel Code Sections V and XI. The review also included the Salem Unit 1 steam generator degradation assessment and steam generator Cycle 21 and 22 operational assessment. The inspector also reviewed and verified the personnel certifications of the personnel participating in the SG ECT inspections during the 1R20 refueling outage.

Assessment

~~PSEG identified wear degradation to the tubing in the four SGs at Salem U1. The majority of these wear indications was attributed to Anti Vibration Bar (AVB) wear in the u-bend regions of the four SGs. After conducting the appropriate analyses and evaluations, a total of 14 SG tubes were removed from service by plugging.~~

Boris Acid Corrosion Control Program Activities

Assessment

The inspector reviewed the PSEG boric acid corrosion control program. The resident inspectors observed PSEG personnel performing boric acid walkdown inspections, inside containment, and in other affected areas outside of containment, at the beginning of the Unit 1 refueling outage. ~~The walkdown inspections were thorough, well organized and indications of boric acid leakage were recorded and evaluated in accordance with the PSEG program for documentation in the corrective action (Notification) process~~. Additionally, the inspector reviewed a sample of Notifications for correct evaluation and/or further engineering analysis and/or final resolution.

Section XI Repair/Replacement Samples:

AFW System Piping, Control Air & Station Air: The inspector monitored PSEG's discovery, reporting, evaluation and the repair/replacement of Unit 1 AFW piping which had been excavated for inspection during the April 2010 Unit 1 refueling outage (1R20). This inspection was accomplished in accordance with PSEGs Buried Piping Inspection Program. You inspected against their plan?

Assessment

~~PSEG replaced the degraded buried piping with new piping between the fuel transfer tube area (FTTA) building and the Outer Penetration Area building. After installation this portion of the piping was successfully pressure tested, coated with a protective coating and the excavated area was backfilled. This piping was replaced under the ASME, Section XI program as a replacement.~~

~~The remainder of the originally buried, uninspected piping (approximately 340 ft.) was abandoned in place and new piping was installed, above ground, inside the fuel transfer tube area (FTTA) building. The rerouting of this portion of the piping was completed as a plant modification under 10 CFR 50.59. After replacement this portion of the piping was successfully pressure tested and returned to service.~~

~~The excavation also inspected the condition of two, 2" buried Station Air (SA) pipes and two, 1" buried Control Air (CA) pipes which are buried in the vicinity of the #12 and #14 AFW buried piping. The SA pipes are non-Code, non-safety related and the CA pipes are non-Code, safety related. During inspection, one of the CA pipes was discovered to be leaking and was repaired and tested satisfactorily. All of the accessable buried SA and CA piping was visually inspected, coating was repaired and the piping was backfilled when the AFW piping was backfilled.~~

The inspector reviewed the repair/replacement work orders for the AFW, CA and SA piping. The inspector monitored the fabrication of the replacement piping, reviewed the documentation of the welding and NDE of the replacement piping and reviewed the pressure tests used to certify the replacement piping. Additionally, the inspector reviewed the specified replacement coating, the application of the replacement coating and the backfill of the excavated area after the piping had been tested.

Is this a Corrective Action Violation?

~~Notification 20459689, prompted by the inspector's questioning, reported the failure to perform the IWA-5244 required pressure tests on the buried AFW piping on both Salem Unit 1 and Unit 2. PSEG performed a limited excavation of the buried piping to #22 SG and the #24 SG AFW piping in the Unit 2 fuel transfer tube area (FTTA) building.~~ Assessment

Limited UT testing was performed on the AFW piping and no significant degradation of the Unit 2 piping was observed. Assessment

Main Feedwater Piping Elbow Erosion:

The inspector also reviewed the record of a rejectable wall thickness measurement taken on the #11 SG Feedwater elbow during 1R20. The licensee recorded additional wall thickness data to further define the condition and performed a finite element analysis (FEA) which verified that sufficient wall thickness remained to operate the component until the next refueling outage when it will be replaced. Assessment

b. Findings

The inspector identified the following violation for the Unit 1 buried AFW piping.

One NRC

Introduction The inspector identified a GREEN non-cited violation (NCV) of 10 CFR 50.55a(g)(4) and the referenced American Society of Mechanical Engineers (ASME) Code, Section XI, paragraph IWA-5244 for PSEG's failure to perform required pressure tests of buried components. (The AFW piping supplying water to SG #12 and SG #14 of Salem Unit 1 and for SG #22 and #24 for Salem Unit 2. This piping is safety related, 4.0" ID, ASME Class 3, Seismic Class 1 piping.) not need per 0612

Description Portions of the Unit 1 and Unit 2 Auxiliary Feedwater (AFW) System piping is buried piping and has not been visually inspected since the plant began operation in 1977 for Unit 1 and since 1979 for Salem Unit 2. In April 2010, approximately 680 ft. (340 ft. of the #12 SG AFW supply and 340 ft. of the #14 SG AFW supply) of piping between the pump discharge manifold and the connection to the Main Feedwater piping to the affected SGs was discovered to be corroded to below minimum wall thickness (0.278") for the 1950 psi design pressure of the AFW System. The lowest wall thickness measured in the affected piping was 0.077". PSEG plans on excavating the Unit 2 buried piping to inspect the condition during the next Unit 2 outage in 2011.

10 CFR 50.55(a)(g)(4)(ii) requires licensees to follow the in-service requirements of the ASME Code, Section XI. Paragraph IWA-5244 requires licensees to perform pressure tests on buried components to demonstrate structural integrity of the tested piping. The pressure test required by IWA-5244 is considered to be an inservice inspection and is part of Section XI. Section XI and IWA-5244 do not specify any other non-destructive examinations (NDE) on buried components to ensure structural integrity. Thus, PSEG neglected to perform the only inservice inspection, intended to demonstrate the structural integrity of this safety related buried piping. PSEG did not perform the required tests for Unit 1 during the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) periods of the 3rd In Service Inspection Interval, and for Unit 2 for the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) of the 3rd In Service Inspection Interval.

PSEG sought relief, from the NRC, from the previous Code required pressure testing in 1988 for Unit 1 only. Relief was granted to PSEG, by the NRC, to perform an alternate flow test in 1991 for Unit 1, however, PSEG did not perform the proposed alternate tests during the 2nd inservice interval and during the 1st (5/19/01 to 6/3/04) and 2nd (6/24/04 to 5/20/08) periods of the 3rd In Service Inspection Interval for Unit 1. Also, PSEG did not

perform the proposed alternate tests during the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) of the 3rd In Service Inspection Interval for Unit 2. Thus, PSEG missed an opportunity to identify and correct this performance deficiency.

A second opportunity to identify and correct this performance deficiency was missed in 2002 when a similar condition (failure to perform buried piping pressure tests) was reported by Indian Point Unit 3. PSEG's review of operating experience reports did not identify that the same condition potentially existed at Salem Unit 1 and Unit 2.

Analysis The inspector decided that the licensee's failure to perform the required pressure test on this safety related piping was a performance deficiency because this condition was the result of the licensee's failure to meet the regulatory requirements of 10 CFR 50.55a(g)(4) and the ASME Code, Section XI, paragraph IWA-5244. Additionally, the inspector decided that this performance deficiency was reasonably within the licensee's ability to forsee and correct and should have been prevented.

"determined" or "Concluded" is a better term

The inspector determined that the performance deficiency was more than minor because this condition affected the Equipment Performance attribute (availability and reliability) of the mitigating systems cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).

IAW MC 0609 Appendix A Phase 1 screening

This must be explained in the description why are they OK?

This finding affects the mitigating systems cornerstone by affecting the secondary, short term decay heat removal. Because the finding did not result in loss of operability or functionality the inspector determined that the finding was of very low safety significance, Green.

Enforcement 10 CFR 50.55a(g)(4) says, in part: "Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components ...which are classified as ASME Code Class 1, Class 2 and Class 3 must meet the requirements, ... , set forth in Section XI of editions of the ASME Boiler and Pressure Vessel Code". Paragraph IWA-5244, Buried Components, of Section XI says, in part,

Cross Cutting Why or Why Not?

> "(b) For buried components where a VT-2 visual examination cannot be performed , the examination requirement is satisfied by the following: (1) The system pressure test for buried components that are isolable by means of valves shall consist of a test that determines the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components. ..."

Contrary to these requirements, PSEG did not perform the required pressure tests of the buried AFW piping to the #12 SG and #14 SG at Salem Unit 1 during the 2nd In Service Inspection Interval (2/27/88 to 5/19/01) and during the 1st (5/19/01 to 6/3/04) and 2nd (6/24/04 to 5/20/08) periods of the 3rd In Service Inspection Interval (5/19/01 to 5/19/11). Also, contrary to these requirements, PSEG did not perform the required pressure tests of the buried piping to the #22 SG and #24 SG for Unit 2 for the 1st period (5/19/01 to 6/3/04) and 2nd period (6/24/04 to 5/20/08) of the 3rd In Service Inspection Interval. Consequently, from 2/27/88 to 4/20/07) the required pressure tests were not performed to demonstrate structural integrity on the affected buried Unit 1 AFW piping.

Because PSEG entered this condition into the corrective action process (Notification 20459686) and because it is is of very low safety significance (Green), it is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 50-272/2010-?? and NCV 50-311/2010-??**

4OA2 Identification and Resolution of Problems (71152)

a. Inspection Scope

The inspectors reviewed a sample of corrective action reports (Notifications), listed in Attachment 2 which involved in-service inspection related issues, to ensure that issues are being promptly identified, reported and resolved. The sample of Notifications selected did demonstrate that non-conformances are being identified, evaluated and appropriately addressed.

b. Findings

No findings of significance were identified.

c. Observations

(1) The inspector noted that the PSEG buried piping inspection procedure did not document how a representative inspection sample is selected and did not enumerate the basis for the inspection sample selection.

(2) The inspector noted that PSEG buried piping inspection procedure does not provide a threshold criteria for inspection conditions which are to be entered into the corrective action process for evaluation, potential resolution and/or tracking.

(3) PSEG has not defined a design life for the new coating on the new buried AFW piping for Unit 1. Also, PSEG has not determined an inspection frequency for the newly coated, replaced Unit 1 buried piping.

(4) Notification 20459689 reported the failure to perform the IWA-5244 required pressure tests on the buried AFW piping. This Notification says, "The system pressure test boundary drawing (S2-SPT-336-0) identifies the piping as YARD piping not buried piping." It is not clear what PSEG is doing to ensure that other system drawings which contain the same YARD markings and are potentially not being treated as buried piping and components.

(5) The PSEG Buried Piping Program assumes that buried piping is protected by a coating system to protect from degradation for the plant life. However, the Unit 1 AFW piping was discovered to not have been coated or protected. It is not clear what PSEG is doing to confirm or verify that buried piping is protected with an effective coating which will protect the piping for the plant life.

Talking to TSAB this does not seem to be the appropriate format for a feeder 71152

4OA5 Temporary Instruction (TI) 2515/172

a. Inspection Scope

The Temporary Instruction (TI), 2515/172 provides for confirmation that owners of pressurized-water reactors (PWRs) have implemented the industry guidelines of the Materials Reliability Program (MRP) -139 regarding nondestructive examination and evaluation of certain dissimilar metal welds in the RCS containing nickel based Alloys 600/82/182.

During 1R20 PSEG inspected the dissimilar metal weld on the 1" reactor vessel drain piping with no detected indications. Salem Unit 1 has dissimilar metal welds in the eight reactor coolant system piping to reactor vessel nozzle safe end welds. No additional inspections or MSIP applications were performed during 1R20.

This TI requires documentation of specific questions in an inspection report. The questions and responses for the IR 05000272/2010003 section 4OA5 are included in this report as Attachment "B-1".

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

The inspectors presented the ISI inspection and TI 2515/172 inspection results to Mr. Ed Eilola, Salem Plant Manager, and other members of the PSEG staff at the conclusion of the inspection at an exit meeting on June 28, 2010 for Salem Unit 1. The licensee acknowledged the conclusions and observations presented. Some proprietary information was reviewed during this inspection and was properly destroyed. No proprietary information is contained in this report.

4OA7 Licensee Identified Violations

a. Inspection Scope

Not IMW 0612 Ref 0612-10 Licensee-Identified Violations

During the Unit 1 refueling outage in April 2010, PSEG conducted an excavation of buried AFW piping. After limited guided wave and ultrasonic inspections a degraded condition of the piping became self-revealing.

b. Finding

Introduction PSEG identified a condition which is a non-cited violation (NCV) of very low safety significance (Green) for PSEG's failure to protect the Unit 1 buried AFW system piping with an effective protective coating system. This performance deficiency is a violation of 10 CFR 50, Appendix B, Criterion III Design Control. This performance deficiency resulted in significant corrosion (significantly below minimum wall thickness)

on a large portion of the buried AFW discharge piping to SG# 12 and SG#14. This buried piping is not inspected via other non-destructive examination (NDE) techniques as part of the inservice inspection program. This piping is safety related, ASME Class 3, Seismic Class 1 piping.

Description Portions of the Unit 1 Auxiliary Feedwater (AFW) System piping is buried piping and had not been inspected by any NDE methodology since the plant began operation in 1977. In April 2010, approximately 680 ft. (340 ft. of the #12 SG AFW supply and 340 ft. of the #14 SG AFW supply) of buried piping between the pump discharge manifold in the Auxiliary Building and Mechanical Penetration Building was discovered to be corroded to below minimum wall thickness (0.278") for the 1950 psi design pressure of the AFW System. The area of the worst corrosion resulted in a wall thickness of 0.077".

The affected AFW piping was to have met Specification S-C-MPOO-MGS-0001 and piping schedule SPS54. Page II-190 of Piping Schedule SPS54 says, "For protection of underground piping in the yard see page II-88 of Piping Schedule SPS28 of this specification. "X-tru-coat" may be used." Page II-88 specifies two (2) coats of Bitumastic No. 50 paint applied cold after installation (special coating for portions of lines as specified on drawing). Auxiliary Feedwater drawing 207483A8923-11 contains a Note directing that a "plastic coat is to be removed prior to welding, with the protection of that section to be done in the field by appropriate application of two (2) coats of Bitumastic 50 applied cold." Despite these detailed specifications PSEG has not provided written records showing what coating had actually been applied to this buried piping. Also, upon inspection, after excavation, there was very little evidence of the existence of a protective coating on the buried AFW piping.

PSEG did not provide engineering evaluations, testing data, vendor certification, QC/QA records documenting application of coating(s) or other details of the design life of the specified coating. PSEG did not provide appropriate testing to demonstrate that the coating would provide protection to the buried piping for the design life of the plant. Also, PSEG did not specify an inspection periodicity for interim visual inspections to verify that the coating was providing protection against corrosion of the piping.

Analysis The inspector decided that the licensee's failure to protect the Unit 1 AFW piping with an effective coating system was a performance deficiency because this condition was the result of the licensee's failure to meet the regulatory requirements of 10 CFR 50, Appendix B, Criterion III, Design Control. Additionally, the inspector decided that this performance deficiency was reasonably within the licensee's ability to forsee and correct and should have been prevented.

The inspector determined that the performance deficiency was more than minor because this condition affected the Equipment Performance attribute (availability and reliability) of the mitigating systems cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Additionally, this issue is more than minor because if left uncorrected, could lead to a more significant condition, failure of the buried safety related, risk significant, ASME Class 3, Seismic Class 1 AFW piping.

Enforcement 10 CFR 50, Appendix B, Criterion III, Design Control, states, in part "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components."

Contrary to these requirements, PSEG did not provide engineering evaluations, vendor certification, or testing data to demonstrate that the specified coating would protect the buried AFW piping for the design lifetime of the plant. Also, PSEG did not assure appropriate quality standards which assure that deviations from such standards were controlled. Additionally, PSEG did not provide measures for the selection and review for suitability of the coating materials for the buried AFW piping application, for periodic inspections to ensure that the applied coating was protecting the buried AFW piping, and did not provide engineering details demonstrating the ability of the coating to protect the buried AFW piping for the life of the plant.

Because PSEG entered this condition into the corrective action process (Notification 20456999) and because the issue is of very low safety significance (Green), this issue is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy. **NCV 50-272/2010003-??**

MPR Associates Report, Technical Input To Operability of Potential Containment Liner Corrosion, Revision 0, 10/30/09
Transmittal of Design Information #S-TODI-2010-0005, 4/20/2010
Transmittal of Design Information #S-TODI-2010-0004, 4/16/2010
OQ950315126, PSEG ltr. Dated 12/16/94; Excavated Auxiliary Feedwater Piping Walkdown/Disposition of Coating Requirements
PSEG letter LR-N07-0224 dated 9/13/2007; REPLY TO NOTICE OF VIOLATION EA-07-149
UNTAGGING WORKLIST 4274446, 14 AF Underground Piping 1R20, 4/30/10
UNTAGGING WORKLIST 4274351, 12 AF Underground Piping 1R20, 4/30/10

LIST OF ACRONYMS

AVB

ASME	American Society of Mechanical Engineers
BAST	Boric Acid Storage Tank
BWR-VIP	Boiling Water Reactor, Vessel Internals Project
CEA	Control Element Assembly
CEDM	Control Element Drive Mechanism
CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
EPRI	Electric Power Research institute
EQ;ACE	Equipment Apparent Cause Evaluation
EQ	Environmental Qualification
ER	Engineering Request
~~FTTA~~	Fuel Transfer Tube Area
GEH	GE - Hitachi
IP	Inspection Procedure
IR	NRC Inspection Report
IVVI	In Vessel Visual Inspection
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
~~MT~~	Magnetic Particle Testing
MSIP	Mechanical Stress Improvement Process
NCV	Non-cited Violation
Notification	Corrective Action Notification
NRC	Nuclear Regulatory Commission
NDE	Nondestructive Examination
OE	Operating Experience
OSG	Old Steam Generator
RSG	Replacement Steam Generator
PDI	Performance Demonstration Initiative
PI&R	Problem Identification and Resolution
PPL	Pennsylvania Power & Light Susquehanna
PWSCC	Primary Water Stress Corrosion Cracking
PQR	Procedure Qualification Record (Welding Procedures)
RCS	Reactor Coolant System
~~RT~~	Radiographic Test (Radiography)
PT	Dye Penetrant Testing
SDP	Significance Determination Process
SE	Safety Evaluation

CA
ECT
MRP
RCS
PWR
SA
RVCH

Check — many items missing & some don't apply such as PPL & BWR-VIP, EDG - - -

SG	Steam Generator
SI	Stress Improvement
SSC	Structure, System, and Component
TS	Technical Specifications
~~UT~~	Ultrasonic Test
UFSAR	Updated Final Safety Analysis Report
~~VT~~	Visual Examination
WPS	Weld Procedure Specification