

50.59 REVIEW COVERSHEET FORM

LS-AA-104-1001

Revision 2

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Station/Unit(s): Salem Unit 1Activity/Document Number: 80101382Revision Number: 2Title: Salem Unit 1 12/14 AF Piping Reroute

NOTE: For 50.59 Evaluations, information on this form will provide the basis for preparing the biennial summary report submitted to the NRC in accordance with the requirements of 10 CFR 50.59(d)(2).

Description of Activity:

(Provide a brief, concise description of what the proposed activity involves.)

The proposed activity replaces and reroutes a section of buried 4" diameter Steam Generator Auxiliary Feedwater supply piping and pipe supports at Salem Unit 1. The subject piping and components are classified as safety related, Nuclear Class 3, Seismic Class 1 per P&ID 205236, Sht 001.

The following provides the overall scope of the proposed activity:

- a) Cut, cap and abandon in-place, the existing buried 4" diameter No. 12 and 14 Steam Generator Auxiliary Feedwater supply piping from the Salem Unit 1 Mechanical Penetration Area through the Fuel Transfer Tube Area (FTTA).
- b) Reroute the existing buried No. 12 and 14 Steam Generator Auxiliary Feedwater supply piping above grade from the Salem Unit 1 Mechanical Penetration Area, El. 78'-0" through the Salem Unit 1 FTFA at El. 100'.
- c) Install one (1) new high point vent valve and relocate the low point drain on each Auxiliary Feedwater header in the FTFA.

Note: The piping being replaced by this DCP will tie-in to the buried Auxiliary Feedwater piping being replaced in-kind under ECP 80101381.

- d) Install two (2) six inch diameter through wall penetrations (S-15437-0011 and S-15437-0012) between the Mechanical Penetration Area and FTFA to route the new piping
- e) Install penetration seals at new wall penetrations S-15437-0011 and S-15437-0012.
- f) Install a tornado missile shield attached to the Fuel Handling Building (FHB) at the vertical seismic gap between FHB and Containment Building and the roof drain on the Fuel Transfer Tube Area.

Reason for Activity:

(Discuss why the proposed activity is being performed.)

Guided Wave and Ultrasonic testing inspections of the buried 4" diameter No. 12 and 14 Auxiliary Feedwater (AF) piping between the Inner Mechanical Piping Penetration Area and Fuel Transfer Tube Area (FTFA) revealed general corrosion and pipe wall thinning below code allowable wall thickness. As such, the proposed activity replaces and reroutes the piping in the mechanical penetration area and routes the piping above ground in the FTFA.

Effect of Activity:

(Discuss how the activity impacts plant operations, design bases, or safety analyses described in the UFSAR.)

Design Functions

Per UFSAR Section 10.4.7.2, the AFW System serves as a backup system for supplying feedwater to secondary side of the steam generators at times when the Main Feedwater System is not available. The AFW System is relied upon to prevent core damage and system overpressurization in the event of accidents such as a loss of normal feedwater or a secondary system pipe rupture, and to provide a means for plant cooldown. The AFW System is capable of functioning for extended periods, allowing time either to restore normal feedwater flow or to proceed with an orderly cooldown of the plant to design temperature of the Residual Heat Removal (RHR) System. The AFW System flow and the water supply capacity is sufficient to remove core decay heat, reactor coolant pump heat, and sensible heat during the plant cooldown.

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Provisions are made to limit or terminate auxiliary feedwater flow to the affected loop 1) in the case of feedwater line break to ensure adequate flow to the effective steam generators and 2) in the case of a steam line break inside containment, to also limit the containment pressure.

Plant conditions which form the basis for AFW System performance requirements are the following:

1. Loss of main feedwater transient (with and without offsite power)
2. Feedline rupture
3. Steamline rupture
4. Loss of all ac power
5. Loss-of-coolant accident (LOCA)
6. Plant cooldown

Effect on Design Functions

The proposed activity does not adversely affect the design basis functions or performance requirements defined above for the Auxiliary Feedwater system.

The operating characteristics of the Auxiliary Feedwater system due to the reroute of the No. 12 and 14 Auxiliary Feedwater headers have been evaluated. The hydraulic calculation (Ref. 1) for the Auxiliary Feedwater system has been updated accordingly to incorporate the piping changes. The proposed activity results in a negligible increase in the hydraulic resistance of the system resulting in an insignificant decrease in the operating margin of the Auxiliary Feedwater system.

The proposed activity reroutes the previously buried No. 12 and 14 Steam Generator Auxiliary Feedwater piping above grade in the FTTA. The existing pipe stress calculations (Ref. 2) have been updated to reflect the new pipe routing. New pipe supports have been designed and evaluated to maintain the Seismic 1 integrity of the Auxiliary Feedwater system. The new pipe supports are to be attached to the Fuel Handling Building (FHB) and Mechanical Penetration area walls. The pipe supports and building interfaces have been evaluated with respect to the pipe support loads to ensure the structural integrity of the buildings is maintained.

Two (2) new through wall penetrations (S-15437-0011 and 0012) are to be installed between the Mechanical Penetration Area and FTTA to route the new piping. The cut rebar calculation (Ref. 3) for this wall has been reviewed. Two vertical and two horizontal rebars in each wall face may be cut to support installation of the new corebores. The cut rebar calculation will be updated accordingly, if required, to reflect the as-built cut rebar locations.

The wall between the Mechanical Penetration Area and FTTA is an external flood barrier. Penetration seals (Ref. 4) are installed at the new wall penetrations to maintain the watertight integrity of the Mechanical Penetration area.

Due to the horizontal and vertical seismic gap between the Containment and Fuel Handling Building, the new piping routed above grade in the FTTA was reviewed with respect to tornado missiles as defined in UFSAR Section 3.5.2. Based on this review, two sections of the new Auxiliary Feedwater piping may be vulnerable to a tornado missile strike (1" diameter rod) through the vertical seismic gap and FTTA roof drain. As such, missile protection/shield has been provided (Ref. 5) and is to be installed on the Fuel Handling Building wall and FTTA roof to protect the piping from a potential tornado missile strike.

Reroute of the buried Auxiliary Feedwater piping above grade in the FTTA was reviewed with respect to potential Internal Hazards (Ref. 6). Based on a review of the FTTA, the only systems and components located above grade in the area will be the new piping and component being installed by this Change Package. As such, Internal Hazards are not a concern for the proposed activity.

The proposed activity does not change the design, function or operation of the Auxiliary Feedwater system. There is no change to the Technical Specification requirements associated with the Auxiliary Feedwater system.

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(Provide justification for the conclusion, including sufficient detail to recognize and understand the essential arguments leading to the conclusion. Provide more than a simple statement that a 50.59 Screening, 50.59 Evaluation, or a License Amendment Request, as applicable, is not required.)

All questions to the 50.59 Screening have been answered in the negative. The screening concludes that the proposed Activity described does not adversely affect the UFSAR described design functions of the Auxiliary Feedwater System. Therefore, neither a 50.59 Evaluation or NRC approval is required prior to implementation of the proposed activity.

The proposed activity, as discussed, is consistent with the existing Salem design and licensing basis. As determined on the 10CFR50.59 Screening Form, the proposed activity does not adversely affect any UFSAR described design functions of the SSC described. The proposed activity does not involve a change to a procedure that adversely affects how UFSAR described SSC design functions are performed or controlled. This activity does not involve a adverse change to an element of a UFSAR described evaluation methodology, or the use of an alternative evaluation methodology that is used in establishing the design bases or used in the safety analyses. Testing for this modification will confirm the operation of the described SSCs within the existing established system parameters; therefore this activity does not involve a test or experiment not described in the UFSAR. The proposed activity does not require a Technical Specification or Operating License change to install the modifications described.

Attachments:

Attach all 50.59 Review forms completed, as appropriate.

(NOTE: if both a Screening and Evaluation are completed, no Screening No. is required.)

Forms Attached: (Check all that apply.)

| | | | | |
|-------------------------------------|----------------------|----------------------|-------------------|---------------|
| <input checked="" type="checkbox"/> | Applicability Review | | | |
| <input checked="" type="checkbox"/> | 50.59 Screening | 50.59 Screening No. | <u>S-2010-081</u> | Rev. <u>0</u> |
| <input type="checkbox"/> | 50.59 Evaluation | 50.59 Evaluation No. | _____ | Rev. _____ |

50.59 APPLICABILITY REVIEW FORM

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Address the questions below for all aspects of the Activity. If the answer is yes for any portion of the Activity, apply the identified process(es) to that portion of the Activity. Note that it is not unusual to have more than one process apply to a given Activity. See Section 4 of the Resource Manual (RM) for additional guidance.

| | | |
|--|---|-----------------------------------|
| I. Does the proposed Activity involve a change: | | |
| 1. Technical Specifications or Operating License (10CFR50.90)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.1 of the RM |
| 2. Conditions of License Quality Assurance program (10CFR50.54(a))? Security Plan (10CFR50.54(p))? Emergency Plan (10CFR50.54(q))? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.2 of the RM |
| | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | |
| | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | |
| 1. Codes and Standards IST Program Plan (10CFR50.55a(f))? ISI Program Plan (10CFR50.55a(g))? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.3 of the RM |
| | <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES | |
| 4. ECCS Acceptance Criteria (10CFR50.46)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.4 of the RM |
| 5. Specific Exemptions (10CFR50.12)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.5 of the RM |
| 6. Radiation Protection Program (10CFR20)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.6 of the RM |
| 7. Fire Protection Program (applicable UFSAR or operating license condition)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.7 of the RM |
| 8. Programs controlled by the Operating License or the Technical Specifications (such as the ODCM). | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.7 of the RM |
| 9. Environmental Protection Program | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1.7 of the RM |
| 10. Other programs controlled by other regulations. | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.1 of the RM |
| II. Does the proposed Activity involve maintenance which restores SSCs to their original condition or involve a temporary alteration supporting maintenance that will be in effect during at-power operations for 90 days or less? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.2 of the RM |
| III. Does the proposed Activity involve a change to the: | | |
| 1. UFSAR (including documents incorporated by reference) that is excluded from the requirement to perform a 50.59 Review by NEI 96-07 or NEI 98-03? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.3 of the RM |
| 2. Managerial or administrative procedures governing the conduct of facility operations (subject to the control of 10CFR50, Appendix B) | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.4 of the RM |
| 3. Procedures for performing maintenance activities (subject to 10CFR50, Appendix B)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.4 of the RM |
| 4. Regulatory commitment not covered by another regulation based change process (see NEI 99-04)? | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.3/4.2.4 of the RM |
| IV. Does the proposed Activity involve a change to the Independent Spent Fuel Storage Installation (ISFSI) (subject to control by 10 CFR 72.48) | <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES | See Section 4.2.6 of the RM |

Check one of the following:

- If all aspects of the Activity are controlled by one or more of the above processes, then a 50.59 Screening is not required and the Activity may be implemented in accordance with its governing procedure.
- If any portion of the Activity is not controlled by one or more of the above processes, then process a 50.59 Screening for the portion not covered by any of the above processes. The remaining portion of the activity should be implemented in accordance with its governing procedure.

Signoff:

50.59 Screener/ 50.59 Evaluator: J. Gomez (S&L) Sign: 80101382-0062 Date 4/21/10
(Check One) (Print name) (Signature)

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I. 50.59 Screening Questions (Check correct response and provide separate written response providing the basis for the answer to each question)(See Section 5 of the Resource Manual (RM) for additional guidance):

1. Does the proposed Activity involve a change to an SSC that adversely affects an UFSAR described design function? (See Section 5.2.2.1 of the RM). YES NO

As described above, the proposed activity involves safety-related, seismic class 1 mechanical and structural changes associated with the reroute of the No. 12 and No. 14 Auxiliary Feedwater piping in the Mechanical Penetration Area and Fuel transfer Tube Area (FTTA). The proposed activity results in a negligible increase in the hydraulic resistance of the system (Ref. 1) resulting in an insignificant decrease in the operating margin of the Auxiliary Feedwater system. The changes to the safety-related, seismic class 1 systems, structures and components have been appropriately evaluated per PSEG procedures, technical standards and calculations which were determined not to adversely impact any design function of the Auxiliary Feedwater system, Fuel Handling Building or Mechanical Penetration area. As such, the proposed activity will not involve a change to the facility that *adversely* affects a UFSAR described design function.

2. Does the proposed Activity involve a change to a procedure that adversely affects how UFSAR described SSC design functions are performed or controlled? (See Section 5.2.2.2 of the RM). YES NO

This activity involves the reroute and installation safety related Auxiliary Feedwater piping and components. The proposed activity will entail a revision to the operating procedure for venting and draining the Auxiliary Feedwater system due to the installation of high point vents and low point drains. All procedure changes were developed in accordance with existing PSEG standards and procedural requirements. All procedure changes were identified in this Change Package for update. The proposed activity will not involve a change to procedures that *adversely* affects how a UFSAR described system, structure or component (SSC) design functions are performed or controlled.

3. Does the proposed Activity involve an adverse change to an element of a UFSAR described evaluation methodology, or use of an alternative evaluation methodology, that is used in establishing the design bases or used in the safety analyses? (See Section 5.2.2.3 of the RM). YES NO

All changes associated with the proposed activity have been appropriately evaluated and documented in the subject Change Package. All analyses show that the proposed activity will not have an adverse effect on any SSC. The material for the modified Auxiliary Feedwater piping has been appropriately selected in accordance with PSEG Piping Specifications S-C-MPOO-MGS-0001-SPS54. The piping analysis was performed in accordance with ND.DE-PS.ZZ-0007 (Q), PSEG Programmatic Standard for Pipe Stress Analysis. The pipe support analysis was performed in accordance with ND.DE-PS.ZZ-0023 (Q), PSEG Programmatic Standard for Pipe Support Design. New components have been design classified in accordance with SC.DE-AP.ZZ-0061, "Design Classification Methodology for Component Data Module, Functional Locations and Systems". The Fuel Handling Building and Mechanical Penetration Area structures (i.e. walls) have been evaluated using widely accepted standards and specifications (i.e. AISC manual of Steel Design, Salem Structural Design Criteria). The piping routed in the FTFA has been evaluated for tornado missiles utilizing the methodology defined in UFSAR Section 3.5.2. As such, the proposed activity does not revise or replace evaluation methodology described in the UFSAR that either:

- Is used in the safety analysis or
- Establishes the design basis

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4. Does the proposed Activity involve a test or experiment not described in the UFSAR, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the UFSAR? (See Section 5.2.2.4 of the RM). YES NO

The testing associated with the proposed activity will involve standard installation, modification, system pressure testing of the new Auxiliary Feedwater system piping and components. All testing will be performed in accordance with approved PSEG plant procedures, PSEG technical standards and industry standards. Existing plant operating procedures required to support the testing of the proposed activity will be updated prior functional testing and turnover to Salem Operations. The testing as described does not involve a test or experiment NOT described in the UFSAR that would utilize or control an SSC in a manner that is outside the reference bounds of its design or inconsistent with analyses or descriptions in the UFSAR.

Therefore the proposed activity does not include a test or experiment not described in the UFSAR.

5. Does the proposed Activity require a change in the Technical Specifications or Operating License? (See Section 5.2.2.5 of the RM) YES NO

The Auxiliary Feedwater is a safety related system governed by Technical Specification 3/4.7.1.2. Per UFSAR Section 10.4.7.2, the Auxiliary Feedwater System serves as a backup system for supplying feedwater to secondary side of the steam generators at times when the Main Feedwater System is not available. The AFW System is relied upon to prevent core damage and system overpressurization in the event of accidents such as a loss of normal feedwater or a secondary system pipe rupture, and to provide a means for plant cooldown. The proposed activity has been appropriately evaluated and determined not to have an adverse impact on any SSC. The proposed activity does not change the design function or operation of the Auxiliary Feedwater system. Therefore, there are no changes required to the Technical Specifications or Operating License due to the proposed activity.

- II. List the documents (e.g., UFSAR, Technical Specifications, other licensing basis, technical, commitments, etc.) reviewed, including sections numbers where relevant information was found (if not identified in the response to each question).

References:

- 1) Calculation S-C-AF-MDC-1789, Rev. 1, "Salem Auxiliary Feedwater Thermal Hydraulic Flow Model
- 2) Pipe Stress Calculations 267274D and 267243DSIM
- 3) Calculation 6S0-1889, Rev. 4, "Design Basis Evaluation of Critical Auxiliary Building Walls"
- 4) Penetration Seal Work Releases (PSWR's) 6387 and 6388
- 5) Calculation 6S0-0767, Rev. 0, "Missile Impact on Fuel Handling Building Roof"
- 6) Procedure ND.DE-PS.ZZ-0010(Q), Rev. 1, "Internal Hazards Program"

UFSAR Sections Reviewed:

- 3.2 Classification of Structure, Components and Systems
- 3.4.3 Flood Protection
- 3.5.1 Internally Generated Missiles
- 3.5.2 Tornado Missiles
- 3.6 Protection Against Dynamic Effects Associated with the Postulated Rupture of Piping
- 10.4.7.2 Auxiliary Feedwater System

Technical Specification Sections Reviewed:Limiting Conditions for Operation:

- 3.7.1.2 – Auxiliary Feedwater System
- 3.7.5.1 – Flood Protection

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Tech. Spec Bases:

- 3/4.7.1.2 – Auxiliary Feedwater System
- 3/ 4.7.5 – Flood Protection

Searched Salem UFSAR and Salem Unit 1 Technical Specifications using full text search for keywords Auxiliary Feedwater.

III. Select the appropriate conditions:

- If all questions are answered NO, then complete the 50.59 Screening and implement the Activity per the applicable governing procedure.
- If question 1, 2, 3, or 4 is answered YES and question 5 is answered NO, then a 50.59 Evaluation shall be performed.
- If questions 1, 2, 3, and 4 are answered NO and question 5 is answered YES, then a License Amendment is required prior to implementation of the Activity.
- If question 5 is answered YES for any portion of an Activity, then a License Amendment is required prior to implementation of that portion of the Activity. In addition, if question 1, 2, 3, or 4 is answered YES for the remaining portions of the Activity, then a 50.59 Evaluation shall be performed for the remaining portions of the Activity.

IV. Screening Signoffs:

| | | | | | |
|-----------------|-------------------------------------|-------|-------------------------------------|------|----------------|
| 50.59 Screener: | <u>J. Gomez</u> (Print name) | Sign: | <u>80101382-0062</u> (Signature) | Date | <u>4/21/10</u> |
| 50.59 Reviewer: | <u>J. MacIntosh</u> (Print name) | Sign: | <u>80101382-0102</u> (Signature) | Date | <u>4/24/10</u> |