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St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
License Renewal One-Time Inspection of Class 1 Small Bore Piping
Revised Commitments and Revised Inspection Plan

References:

1. Safety Evaluation Report Related to the License Renewal of St. Lucie Nuclear Plant, Units 1 and 2, NUREG-1779, September 2003.
2. Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev. 2, December 2010.
3. FPL Letter L-2014-059, License Renewal One-Time Inspection of Class 1 Small Bore Piping Revised Commitments, dated March 19, 2014.
4. FPL Letter L-2014-265, License Renewal One-Time Inspection of Class 1 Small Bore Piping Inspection Plan Submittal, dated September 3, 2014.
5. EPRI MRP Letter to the NRC, No. MRP-2008-054, St. Lucie Unit 1 Retired PZR Safety "A" Nozzle DM Weld Destructive Examination Report, dated August 15, 2008.

The purpose of this letter is to update the Nuclear Regulatory Commission (NRC) that FPL has revised the commitments to inspect the butt welds in small bore piping by destructive examination, if an opportunity presents itself.

Florida Power and Light Company (FPL) has License Renewal (LR) commitments for St. Lucie Units 1 and 2 to perform a one-time inspection of Class 1 Small Bore Piping prior to the end of the initial operating license term. Specifically, for St. Lucie Unit 1, Commitment 7 listed in Appendix D, Table 1 of Reference 1 and for St. Lucie Unit 2, Commitment 6 listed in Appendix D, Table 2 of Reference 1; state that volumetric inspections of a sample of small bore Class 1 piping will be performed prior to the end of the initial operating license term.

In accordance with Reference (3), FPL revised these commitments such that this one-time inspection will follow the guidance provided in the Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev 2, Section AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping" (Reference 2). Specifically, as identified above, Commitment 7 for St. Lucie Unit 1 and Commitment 6 for St. Lucie Unit 2 were revised to clarify that based on the guidance provided in the GALL Report, a destructive examination may be performed in lieu of volumetric examination for socket welds.

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GALL Report Revision 2 states that for butt welds, for a one time inspection to detect cracking resulting from thermal and mechanical loading or inter-granular stress corrosion of full penetration welds (butt welds), volumetric examination should be performed. The option of using the destructive examination, if an opportunity presents itself, was not specified for butt welds in the GALL Report.

St. Lucie Unit 1 has recently completed refueling outage SL1-26, and has completed the examination of the butt welds and socket welds in small bore piping. As a result of installing a modification for replacing a valve, a section of small bore piping was removed which contains a butt weld, which has presented a unique opportunity to perform destructive examination of a butt weld as part of the small bore piping examination. Therefore, FPL is submitting to the NRC (a) a revised commitment change (Attachment 1) and (b) a revised small bore inspection plan (Attachment 2).

Destructive Examination (DE) provides more information on the potentially developing cracks than a volumetric examination. DE is useful in the determination of a specific flaw mechanism, if a flaw is present in the weld. This has been proven previously, when a DE was performed on the retired pressurizer safety valve from St. Lucie Unit 1 during the pressurizer replacement. The destructive evaluation confirmed the indications and flaws found within the retired pressurizer safety "A" nozzle were fabrication defects with no evidence of PWSCC. The flaws were also confirmed to be non-safety significant and did not challenge the structural integrity of the component (Reference 5).

The revised commitments and inspection plan are provided herein in Attachments 1 and 2, respectively.

Should you have any questions, please contact Mr. Eric Katzman, Licensing Manager, at 772-467-7734.

Very truly yours,



Christopher Costanzo
Site Vice President
St. Lucie Plant

Attachments

**St. Lucie Unit 1 and Unit 2
License Renewal Revised Commitments**

Outstanding Commitments
(Reference 1 , Appendix D, Table 1 and Table 2)

St. Lucie Unit 1 Table 1 Commitment 7
St. Lucie Unit 2 Table 2 Commitment 6

A volumetric inspection of a sample of small bore Class 1 piping and nozzles will be performed

Revised Commitments

St. Lucie Unit 1 Table 1 Commitment 7
St. Lucie Unit 2 Table 2 Commitment 6

1. A volumetric inspection of a sample of small bore Class 1 piping and nozzles will be performed. Based on the guidance provided in the GALL Report, Section AMP XI.M35, a destructive examination may be performed in lieu of the volumetric examination. For each socket weld that is destructively examined credit may be taken as being equivalent to volumetrically examining two socket welds. This one-time inspection will address Class 1 piping less than 4 inches nominal pipe size (less than NPS 4) and greater than or equal to NPS 1.
2. A destructive examination may be performed on a butt weld instead of volumetric examination, if an opportunity presents itself.

Reference Documents:

1. Safety Evaluation Report Related to the License Renewal of St. Lucie Nuclear Plant, Units 1 and 2, NUREG-1779, September 2003.
2. Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev. 2, December 2010.

**St. Lucie Unit 1 ASME Code Class 1 Small-Bore Piping
One Time Inspection Plan, Revision 1**

Plan Description

This plan augments the requirements in American Society of Mechanical Engineers (ASME) Code, Section XI, 1998 edition with Addenda through 2000, and is applicable to small-bore ASME Code Class 1 piping and systems less than 4 inches nominal pipe size (less than NPS 4) and greater than or equal to NPS 1. The plan includes pipes, fittings, branch connections, and all full and partial penetration (socket) welds. This plan was developed using the Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev. 2 XI.M35; One-Time Inspection of ASME Code Class 1 Small-Bore Piping as guidance.

A one-time inspection to detect cracking resulting from thermal and mechanical loading, vibration, or intergranular stress corrosion of full penetration welds will be performed by volumetric or destructive examination. A one-time inspection to detect cracking in socket welds will be performed by either volumetric or destructive examination. The number of welds to be examined will be on a sample basis as described in Section 4 of this plan. The sample of welds to be examined will be selected using the risk-informed approach as approved by the NRC for St. Lucie Nuclear Plant, Units No. 1 and 2 –Fourth 10-Year Interval Inservice Inspection Program Plan Relief Request No. 1 (TAC NO. MD7739)

These inspections will provide additional assurance that either aging of small-bore ASME Code Class 1 piping is not occurring or the aging is insignificant, such that a plant-specific Aging Management Program (AMP) is not warranted. Should evidence of cracking be revealed by the one-time inspection, a periodic inspection plan will be developed and implemented using a plant-specific AMP.

A search of the St. Lucie Corrective Action system and the ASME Section XI, Repair and Replacement Reports over the operating history of St. Lucie Unit 1 was performed to determine if any ASME Code Class 1 Small-Bore Piping greater than or equal to NPS 1 and less than NPS 4 had experienced cracking. No instance of cracking of ASME Code Class 1 Small-Bore Piping greater than or equal to NPS 1 and less than NPS 4 was identified.

Evaluation and Technical Basis

1. **Scope of Plan:** This plan is a one-time inspection of a sample of ASME Code Class 1 piping less than NPS 4 and greater or equal to NPS 1. This plan includes measures to verify that degradation is not occurring, thereby confirming that there is no need to manage age-related degradation. The one-time inspection plan for ASME Code Class 1 small-bore piping includes locations that are susceptible to cracking. The sample of welds will be selected using the risk-informed approach as approved by the NRC for St. Lucie Nuclear Plant, Unit No. 1 - Fourth 10-Year Interval Inservice Inspection Program Plan Relief Request No. 1 (TAC NO. MD7739).

All ASME Class 1 pipe segments less than 4-inch NPS and greater than equal to 1-inch NPS have the same Low Safety Significance Risk Ranking and, as such, all welds were given the same level of consideration.

2. ***Preventive Actions:*** This plan is a condition monitoring activity independent of methods to mitigate or prevent degradation.
3. ***Parameters Monitored/Inspected:*** This inspection is intended to detect potential cracking in ASME Code Class 1 small-bore piping.
4. ***Description of Aging Effects:*** This one-time inspection is designed to provide assurance that aging of ASME Code Class 1 small-bore piping is not occurring, or that the effects of aging are not significant. The one-time inspection to detect cracking in socket welds will be either a volumetric or destructive examination. The inspection to detect cracking resulting from thermal and mechanical loading, vibration, or intergranular stress corrosion of full penetration welds will be a volumetric or destructive examination. Volumetric examination will be performed using demonstrated techniques from the ASME Code that are capable of detecting the aging effects in the examination volume of interest. The inspection will be performed at a sufficient number of locations to ensure an adequate sample. This number, or sample size, is based on susceptibility, accessibility, dose considerations, operating experience, and limiting locations of the total population of ASME Code Class 1 small-bore piping inspections.

The inspection sample size will be at least 3%, up to a maximum of 10 welds, of each weld type, for each operating unit using a methodology to select the most susceptible and risk-significant welds from the risk-informed approach as described above. For socket welds, destructive examination may be performed in lieu of volumetric examinations. Because more information can be obtained from a destructive examination than from nondestructive examination, credit will be taken for each weld destructively examined equivalent to having volumetrically examined two welds.

St. Lucie Unit 1					
Weld Type	Approx. Number	3%	Sample Size (Max 10 Welds Each Type)		
			Volumetric	OR	Destructive
Socket (NPS-2 and smaller)	493	15	N/A		5
Full Penetration (Greater than NPS-2 and less than NPS-4)	92	3	3 Less any destructive		See Note 1

Note(s)

- 1) A destructive examination may be performed on a butt weld instead of volumetric examination, if an opportunity presents itself.

Destructive Examination (DE) provides more information on the potentially developing cracks than a volumetric examination. DE is useful in a determination of a specific flaw mechanism, if a flaw is present in the weld. This has been proven previously, when a DE was performed on the retired pressurizer nozzles from St. Lucie Unit 1 pressurizer. (Ref. EPRI Letter MRP 2008-053, "St. Lucie Unit 1 Retired PZR Safety "A" Nozzle DM Weld Destructive Examination Report, ML0824480225).

5. **Monitoring and Trending:** This is a one-time inspection to determine whether cracking in ASME Code Class 1 small-bore piping resulting from stress corrosion, cyclical (including thermal, mechanical, and vibration fatigue) loading, or thermal stratification and thermal turbulence (MRP 146 and MRP 146S) is an issue. Evaluation of the inspection results may indicate the need for additional or periodic examinations (i.e., a plant-specific AMP for Class 1 small-bore piping using volumetric inspection methods consistent with ASME Code, Section XI, Subsection IWB).
6. **Acceptance Criteria:** If flaws or indications exceed the acceptance criteria of ASME Code, Section XI, Paragraph IWB-3400, they are evaluated in accordance with ASME Code, Section XI, Paragraph IWB-3131; additional inspections are performed in accordance with ASME Code, Section XI, Paragraph IWB-2430. Evaluation of flaws

identified during a volumetric examination of socket welds will be in accordance with IWB-3600.

7. **Corrective Actions:** The site corrective action program, quality assurance procedures, site review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. Should evidence of cracking be revealed by the one-time inspection, a periodic inspection will be developed and implemented, using a plant-specific AMP.
8. **Confirmation Process:** The requirements of 10 CFR Part 50, Appendix B are used to address the confirmation process.
9. **Administrative Controls:** The requirements of 10 CFR Part 50, Appendix B are used to address the administrative controls.
10. **Operating Experience:** This one-time inspection plan uses volumetric inspection techniques with demonstrated capability and a proven industry record and/or destructive examinations to detect cracking in piping partial penetration welds and base material. Currently, an industry proven volumetric technique for detection, sizing and performing analytical evaluation of flaws in socket welds has not been established; therefore, a destructive examination will be performed.

EPRI Letter MRP 2008-053, "St. Lucie Unit 1 Retired PZR Safety "A" Nozzle DM Weld Destructive Examination Report, (ML0824480225) shows that destructive examination of full penetrations welds yield results which may be used to validate NDE. As such, destructive examination may be used on full penetration butt welds.