



January 27, 2011

L-2011-009  
10 CFR 50.73

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D. C. 20555

Re: St. Lucie Units 1 and 2  
Docket No. 50-335, 50-389  
Reportable Event: 2006-005-01  
Date of Event: December 12, 2006  
Internal Conduit Penetration Seals Outside Appendix R Design Basis - Supplement

The attached Licensee Event Report (LER) 2006-005-01 supplement is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(ii)(B). Added or revised text is marked with revision bars.

This supplement supersedes in its entirety the previously submitted LER 2006-005 by Florida Power & Light (FPL) letter L-2007-019, dated February 9, 2007.

If there are any questions, please call Eric Katzman, Licensing Manager, at (772) 467-7734.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Richard L. Anderson'.

Richard L. Anderson  
Site Vice President  
St. Lucie Plant

RLA/dlc

Attachment

JE22  
A006  
NRR

**LICENSEE EVENT REPORT (LER)**

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>1. FACILITY NAME</b> St. Lucie Unit 1	<b>2. DOCKET NUMBER</b> 05000335	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Internal Conduit Penetration Seals Outside Appendix R Design Basis

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	12	2006	2006	- 005 -	01	01	27	2011	St. Lucie Unit 2	05000389

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)</b>									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
<b>10. POWER LEVEL</b>  100%	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

**12. LICENSEE CONTACT FOR THIS LER**

NAME Donald L. Cecchett - Licensing Engineer	TELEPHONE NUMBER (Include Area Code) 772-467-7155
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	NH	PEN	N/A	NO					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b> MONTH: - DAY: - YEAR: -
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**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)**

On December 12, 2006, St. Lucie Units 1 and 2 were in Mode 1 at 100 percent reactor power. During the normal course of work FPL identified that the penetration seal configuration used for internal conduit penetration seals, although operable, were degraded due to inadequate qualification testing methods. The documented test results do not provide an adequate basis for qualification of the internal conduit penetration seals to perform as a 3-hour fire barrier. Approximately 1050 conduits at St. Lucie Unit 1 and approximately 2500 conduits at St. Lucie Unit 2 may be affected.

The apparent cause was determined to be a legacy issue occurring during the time of the Unit 1 Appendix R modifications, and the original construction of Unit 2. The apparent cause was determined to be misinterpretation of fire test reports and guidelines from the NRC. At the time of discovery a condition report was initiated and general fire barrier impairments logged and issued in accordance with the Fire Protection Program.

Corrective actions completed or planned include the development and implementation of a fire test that will bound the as-installed internal conduit seal design, a walkdown and documentation of the conduits requiring fire rated internal conduit seals, and incorporation of those seals into the inspection program.

**LICENSEE EVENT REPORT (LER)**  
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
St. Lucie Unit 1	05000335	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	Page 2 of 4
		2006	- 005	- 01	

**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

**Description of the Event**

On November 28, 2006, St. Lucie Units 1 and 2 were in Mode 1 at 100 percent reactor power when FPL engineering identified that the penetration seal configuration being used for internal conduit penetration seals [EIIS:PEN] credited a test report that had not adequately demonstrated a 3-hour fire barrier. Subsequent investigations also revealed that the documentation of the design basis of the seal configuration as installed was inadequate. On December 12, 2007, after an extensive investigation failed to identify a bounding test document, the station determined this issue was reportable pursuant to 10 CFR 50.73(a)(2)(ii)(B).

Review of existing fire test documentation, used for qualification of the fire rated penetration seals, proved to be inconclusive in that the conduit used in the test was capped on the fire side of the conduit. This configuration prevented the non-fire side seal configuration from being challenged by either the fire or the hose stream.

A review of FPL plant drawings documenting conduits penetrating Appendix R barriers identified approximately 1050 conduits for St. Lucie Unit 1 and approximately 2500 conduits for St. Lucie Unit 2 that may be affected. The population of conduits in those totals requiring 3-hour fire rated seals is under investigation.

On October 21, 2010, during the normal course of work to restore internal conduit penetration seals, it was identified that one of the penetration seal configurations was not designed correctly for a wall configuration.

Review of existing fire test documentation used for qualification of the fire rated penetration seal configuration with RTV silicone foam identified that the tested configuration was for a conduit sleeve in a floor assembly. The penetration seal design was a six inch depth of RTV Silicone Foam with one inch of ceramic fiber with the fiber being installed on the fire side of the tested assembly.

Symmetrical designs are required for fire barrier penetration seal designs where a fire test for a penetration seal in a floor configuration is used in a wall configuration. Such symmetry is required since a wall configuration could be exposed to fire from either side of the penetration.

A review of St. Lucie Unit 1 and 2 plant records identified less than twenty (20) conduits with this seal design installed or yet to be installed in support of restoration of conduit penetration seals being remediated as part of LER 2006-005. These conduits penetrate Appendix R barriers.

**Cause of the Event**

An Apparent Cause evaluation concluded this is a legacy issue stemming from the Unit 1 Appendix R modification, and Unit 2 original construction time frame, in which fire test reports and guidelines from the NRC were misinterpreted.

**Analysis of the Event**

In accordance with NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2, Section 3.2.4, a missing fire barrier, such that the required degree of separation for redundant safe shutdown trains is insufficient, is reportable as an unanalyzed condition that significantly degraded plant safety. At the time of discovery 1-hour roving fire watches for the affected areas were already in place for unrelated reasons. Therefore, this event was not reportable under 10 CFR 50.72, but is reportable under 10 CFR 50.73(a)(2)(ii)(B).

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**Analysis of Safety Significance**

The potentially deficient conduit seals are located in the St. Lucie Unit 1 and St. Lucie Unit 2 Reactor Auxiliary Building and penetrate various fire barriers.

The fire areas which are located on either side of each affected barrier were reviewed to determine the need for initial compensatory measures. As a minimum the Fire Protection Plan requires operable detection on one side of the affected barrier when a barrier feature is inoperable. Those areas where there was no detection present on either side of the barrier were reviewed and it was identified that there were no combustibles located adjacent to the affected conduits or there was a very low or negligible combustible loading in one or both of the affected rooms.

Walkdowns of all conduits will be completed to determine the need for fire rated seals internal to the conduits or the ability to screen out those which do not require a fire rated seal.

FPL's initial assessment of the conduit seals as installed concluded they are expected to be capable of providing a degree of fire resistance based on the materials used in the seal configuration. Considering the active detection on one side of the affected barrier, or analyzed as adequate without detection, and the presence of a one-hour roving fire watch, FPL considers that the safety significance of this issue as low.

An extent of condition was conducted and concluded that there is a unique set of conditions that applies only to internal conduit seals, however, corrective action will be taken that will address the entire population of conduits penetrating Appendix R fire barriers in both units. Electrical penetration seals in fire rated barriers have already been the subject of previous LERs and modifications and were upgraded/replaced with qualified fire rated configurations.

**Corrective Actions**

The proposed corrective actions and supporting actions listed below are entered into the site corrective action program. Any changes to the proposed actions will be managed under the commitment management change program.

The following actions will be tracked within the St. Lucie Corrective Action Program:

1. Develop and perform a fire test to determine the fire rating for the existing conduit seal design.
2. Review results of fire test of the existing conduit seal design (2 inches of cerafiber and ¼ inch of mastic) to determine appropriate corrective actions.
3. Perform walkdowns of Unit 1 and Unit 2 to determine the type of seal the conduits require and identify any additional actions to remediate seals based on this review.
4. Prepare engineering document(s) to revise plant documents/drawings as required to address internal conduit seals.
5. Corrective actions to implement fire watches for fire barrier impairments have been completed.

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**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

**Similar Events**

Although electrical and mechanical penetration seals in fire rated barriers have been the subject of previous LERs, this event is the first occurrence of any issues associated with internal conduit seals in fire rated barriers. This is because electrical and mechanical penetration seals were clearly identified as 3-hour rated fire seals, i.e., identified on penetration schedules and included in the 18-month surveillance program. The current PSL FSARs do not clearly identify internal conduit seals as rated seals but rather fire seals which prevent the passage of flames, smoke, and/or hot gases. Therefore, this issue is not considered a repeatable issue.

A review of St. Lucie Plant's Condition Reports for the past 2-3 years identified one event, LER 2003-03-001, "Fire Seals Inoperable Due to Inadequate Qualification Testing," dated April 5, 2004 (L-2004-073), in which cable tray fire penetration seals (not internal conduit seals) did not have an adequate basis as 3-hour fire barriers. Beyond 3 years two additional LERs were identified, i.e., LER 97-08, "Inoperable Mechanical Fire Penetrations Outside Appendix R Design Bases," dated August 27, 1997 (L-97-221), involving incomplete corrective actions associated with NRC Information Notice (IN) 94-28, and LER 97-004, "Incorrect Original Cable Tray Fire Stop Assembly Outside Appendix R Design," dated July 11, 1997(L-97-179), which involved double-sided cable tray fire stops not being installed in accordance with the design drawings.

**Failed Components**

Manufacturer: Grace Co. (previous owners of the product are International Protective Coatings, and Thomas Betts Corp).

Equipment: Mastic Seal (Flame Safe, formerly Quelcor)

Manufacturer: Dow Corning and Promatec

Equipment: RTV Silicone Foam (Dow Corning 3-6548 and Promatec SF-20)