



Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

August 27, 1997

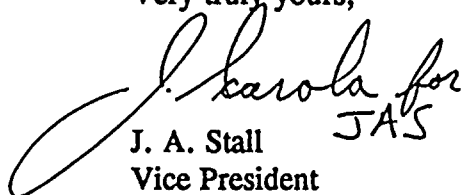
L-97-221
10 CFR 50.73

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: 97-008
Date of Event: July 26, 1997
Inoperable Mechanical Fire Penetrations
Outside Appendix R Design Bases

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,


JAS

J. A. Stall
Vice President
St. Lucie Plant

JAS/KWF

Attachment



cc: Regional Administrator, USNRC Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

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PDR ADDCK 05000335
S PDR
an FPL Group company

NRC FORM 366 (4-95)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 60.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (IT-8 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.	
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)					
FACILITY NAME (1) ST LUCIE UNIT 1				DOCKET NUMBER (2) 05000335	
PAGE (3) 1 OF 4					
TITLE (4) Inoperable Mechanical Fire Penetrations Outside Appendix R Design Bases					
EVENT DATE (5)		LER NUMBER (6)		REPORT DATE (7)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER
7	28	97	97	- 008	- 0
8	27	97			
OTHER FACILITIES INVOLVED (8)					
FACILITY NAME ST LUCIE UNIT 2		DOCKET NUMBER 05000389			
FACILITY NAME		DOCKET NUMBER 05000			
OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)			
POWER LEVEL (10) 100		20.2201(b)		20.2203(a)(2)(v)	
20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(i)	
20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)	
20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iii)	
20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(iv)	
20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(v)	
OTHER		Specify in Abstract below or in NRC Form 366A			
LICENSEE CONTACT FOR THIS LER (12)					
NAME K. W. Frehafer, Licensing Engineer				TELEPHONE NUMBER (include Area Code) (561) 468-4284	
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)					
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE
B	NH	PEN	X999	N	CAUSE
SUPPLEMENTAL REPORT EXPECTED (14)					
YES (If yes, complete EXPECTED SUBMISSION DATE).				X	NO
EXPECTED SUBMISSION DATE (15)				MONTH	DAY
YEAR				YEAR	YEAR
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) On July 28, 1997, St. Lucie Units 1 and 2 were in Mode 1 at 100 percent power. FPL was investigating work backlogs and determined that the corrective actions associated with NRC Information Notice (IN) 94-28, that dealt with fire protection barrier deficiencies, were still pending. The original IN review required the evaluation of 218 mechanical penetration seals because the installed condition did not correlate to fire barrier qualification testing. However, the original review did not establish if the 218 seals were operable. An operability assessment for the 218 penetration seals was performed and of this population, seven penetration seals in Unit 1 and eight penetration seals in Unit 2 are inoperable. The apparent cause of this event was that the seal manufacturer did not provide formal documentation for installed seals that deviated from qualification test configurations. Additionally, the problem identification and corrective action procedure in place during the original IN review was weak in that the requirements and guidance for performing operability assessments were not well defined. Corrective actions include: 1) the existing hourly roving fire watch includes the 15 inoperable seals, 2) Generic Letter 86-10 mechanical fire penetration evaluations will be performed for the 218 mechanical seals that are not bounded by tested configurations, and 3) the inoperable mechanical fire penetrations will be modified to meet three hour fire barrier criterion.					

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL	REVISION	
ST LUCIE UNIT 1	05000335	97	- 008	- 0	2 OF 4

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

DESCRIPTION OF THE EVENT

On July 28, 1997, St. Lucie Units 1 and 2 were in Mode 1 at 100 percent power. FPL was investigating work backlogs and determined that corrective actions associated with fire protection barriers were still pending. NRC Information Notice (IN) 94-28 described situations where installed fire penetration seals did not directly correlate to the fire barrier qualification test configuration. The notice requested all licensees to review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. St. Lucie Plant evaluated the adequacy of the fire penetration seals at both units in January 1995. This evaluation showed that St. Lucie Plant had 365 mechanical penetration seals and that 218 of these seals are not directly bounded by test data. This includes 72 seals for Unit 1 and 146 seals for Unit 2. However, the evaluation did not establish if the discrepant fire penetration seals were operable.

FPL personnel performed an operability assessment for the 218 penetration seals that were not directly bounded by test data. Of this population, the operability assessment has shown that seven penetration seals in Unit 1 and eight penetration seals in Unit 2 are inoperable. These inoperable penetration seals have had Fire Breach Permits generated and posted in the area of the seal and are being monitored by the hourly roving fire watch as required by the Appendix "R" Fire Protection Program at St. Lucie.

CAUSE OF THE EVENT

The apparent cause of this event was due to weaknesses associated with the previous problem identification and corrective action procedure in place during the original IN 94-28 review. The St. Lucie STAR Program was subsequently replaced by the Condition Report (CR) process. An operability assessment on the condition of the 218 fire penetration seals was not performed under the STAR Program. Therefore, the importance of corrective actions specified by the original STAR was not recognized during the STAR to CR conversion. The CR procedure ensures that operability determinations are performed for potentially degraded Systems, Structures, and Components (SSCs), and provides positive tracking mechanisms for required corrective actions.

The apparent cause of installed mechanical fire penetration configurations not being bounded by tested configurations was due to the seal manufacturer not providing details documenting the reason for the selection and acceptability of each mechanical penetration seal. Deviations to the tested configuration were to be reviewed and certified at St. Lucie by the seal manufacturer during installation. However, no formal documentation on the deviations from tested configurations was provided.

ANALYSIS OF THE EVENT

This condition is reportable under 10 CFR 50.73(a)(2)(ii)(B) because the as found condition of 15 fire penetration seals does not meet the three hour fire barrier requirements. The fire barriers are discussed in the Unit 1 and Unit 2 FSARs, Chapter 9.5A. The principal design objective of the three hour fire barrier is to protect plant personnel, the general public, and the environment by ensuring that every fire penetration seal provides a passive three hour fire barrier between the various fire areas of the plant. The fire barrier does not perform any safety related function either during normal plant operation or during accident condition. The fire barrier is a passive device and is part of the plant fire protection system.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL	REVISION	
ST LUCIE UNIT 1	05000335	97	- 008	- 0	3 OF 4

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

ANALYSIS OF THE EVENT (cont'd)

The 218 fire penetration seals that were not directly bounded by test data fell into four general categories: i) the penetrating item is larger than the tested configuration; ii) the seal had more than one penetrating item passing through it and no testing, applicable to this seal material, was conducted with more than one pipe penetrating the seal; iii) some seals did not have conclusive test data exactly per ASTM E-119 requirements; and iv) some seals exceeded the design limitations of operating temperature and or pipe movement.

Operability was established by evaluating the field conditions against the following guidelines:

1. If the design temperature or movement exceeds the allowable design data on the seal drawing the seal was visually examined via walkdown. If the seal was visually acceptable on both sides, that is, no degradation due to shrinkage or pipe movement, the seal is operable if all other criteria are met.
2. If the normal operating conditions has the pipe filled with water, and the maximum temperature of the pipe could not increase above the boiling point of water at a relatively low pressure, the heat flux from a fire to the seal or pipe to the other side of the barrier would be low due to the water acting as a heat sink. Therefore, under these conditions the seal is operable with respect to the fire barrier requirements due to the conduction and convection properties of basic heat transfer. However, seals with piping filled with water where the piping temperature/pipe movement exceeds the design limitations of the seal for normal or intermediate operation are considered inoperable.
3. For seals that do not fall into the above two categories, the rules developed from Tech-Sil, Inc. (Promotec) Document Number TS-TP-0081, Test Report #TS-TP-0081, "Fire and Hose Stream Test for #TS-MS-0080-A Self-Supporting High Density Silicone Gel," Test Date 9/11/81, will be applied.
4. Since penetration seals that have a multiple number of small instrumentation tubes penetrating them are partially grouted and usually transverse thicker than normal barriers, they do not readily fall under the same category as other penetration seals and because an instrumentation tube is small (< 2") they are operable.
5. Test Report #TS-TP-0048-C, "Fire and Hose Stream Test of a Single Penetration Sealed with #TS-MS-0045-B Silicone Elastomer," shows that a 2" pipe with a 6" seal passed the ASTM E-119 testing for M-1 type seals. Therefore, for the M-1 seal design all 2" and smaller penetrants with a 6" seal thickness are operable.
6. For insulated pipes, the insulation will tend to shield the seal from the fire and therefore, any insulated pipe will not be subject to being inoperable due to design temperature limitations.

Fifteen fire penetration seals did not fall into one of the above six guidelines so they were considered inoperable.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL	REVISION	
ST LUCIE UNIT 1	05000335	97	-- 008	-- 0	4 OF 4

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SAFETY SIGNIFICANCE

The 15 inoperable fire penetration seals were evaluated and determined to be not safety significant. Although the as-found condition of these fire penetration seals was not in accordance with the tested configurations, and would probably not meet a three hour fire rating, the installation does provide some resistance to fire propagation. Fire protection defense in depth provides an integrated means for mitigating the consequences of a fire, such as the existing smoke detection systems, automatic water fire suppression systems, hose stations, administrative programs that control combustible loading, and operator actions.

In addition, the location of the inoperable fire seals did not change the route of the existing roving fire watch that has been in place as compensatory measures for inoperable Thermolag. Based on the above, it is concluded that the health and safety of the public was not adversely affected by this event.

CORRECTIVE ACTIONS

1. The 15 inoperable penetration seals have had Fire Breach Permits generated and posted in the area of the seal and are monitored by the existing hourly roving fire watch as required by the Appendix "R" Fire Protection Program at St. Lucie.
2. Generic Letter 86-10 mechanical fire penetration evaluations will be performed for the 218 mechanical seals that are not bounded by tested configurations.
3. The inoperable mechanical fire penetrations will be modified to meet the three hour fire barrier criteria.

ADDITIONAL INFORMATION**Failed Components Identified**

Manufacturer: Promatec, Inc. (formerly Tech-Sil)
Equipment: Elastomer Seals

Previous Similar Events

LER 50-389/97-004-0 described a condition where St. Lucie Unit 2 double sided cable tray fire stops were not installed in accordance with the design drawings.

