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FACIL:50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
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SUBJECT: LER 87-018-00:on 870131,3 h fire barrier walls found to contain voids in interior grouting due to const practices.
W/8 ltr.

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TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

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NRC Form 366
(9 83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
St. Lucie Unit 1	0 5 0 0 0 3 3 5	1 OF 0 4

TITLE (4) 3 HOUR FIRE BARRIER WALLS FOUND TO CONTAIN VOIDS IN THE INTERIOR GROUTING DUE TO CONSTRUCTION PRACTICES RESULTING IN DERATING OF SOME FIRE WALLS

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 1	3 1	8 7	8 7	— 0 1 8	— 0 0	0 9	1 5	8 8	St. Lucie Unit 2	0 5 0 0 0 3 8 9
									N/A	0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.406(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.406(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text NRC Form 366A)
		20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Voluntary
		20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
M. J. Snyder, Shift Technical Advisor	AREA CODE 4 0 7 — 4 6 5 - 3 3 3 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

In late January, 1987, during the preparation of FSAR Fire Protection Appendices for St. Lucie Units 1 and 2 (PSL 1 & 2), Florida Power and Light identified that specific masonry block walls which were assumed to be 3 hour fire barriers may not have been completely filled with grout. Ungrouted (interior) block walls have a 1.75 hour fire rating versus a 3 hour rating for a filled wall. A 1.75 hour fire rating was determined to provide sufficient capability to contain a fire associated with the identified walls until the fire is extinguished. The root cause was construction practices and procedures at PSL not consistent with Appendix R design requirements. Corrective actions were to maintain a fire watch and to grout fill walls and justify their as found field condition.

The anomaly was evaluated at the time of discovery and determined not to be reportable under Generic Letter 86-10, 10 CFR 50.72 or 50.73. This voluntary report is being submitted for informational purposes.

IE22 1/1

DESCRIPTION OF EVENT

Generic Letter 86-10 recognized problems exist in fire protection programs because of the many submittals that constitute the fire protection program for each plant. The NRC indicated that the best way to resolve these problems was to incorporate the fire protection program and major commitments by reference into the Final Safety Analysis Report (FSAR) for the facility. In preparation of the FSAR Fire Protection Appendices, FPL noted that commitments were made to the NRC that the Fire Protection Program at St. Lucie Plant (PSL) would follow the recommendations set forth in 10 CFR 50, Appendix R (App R). Specifically, App R recommends fire areas to be bounded by 3 hour rated fire barriers, i.e. walls, floors and ceilings.

A standard industry methodology from the National Fire Protection Association's Fire Protection Handbook, 13th ED. 1969 used in computing the fire resistance of masonry block walls shows that a 3 hour rated wall has an equivalent solid wall thickness of 7.625 inches. However, certain masonry block walls at PSL were not uniformly grout filled, thus not solid and therefore could not be rated as a 3 hour fire barrier.

Upon discovery of the potential for a derated fire barrier condition, a Justification for Continued Operation (JCO) supported continued unit power operation at PSL. The JCO conservatively assumed that all masonry fire barrier walls in question were completely void of interior grouting, and calculated an equivalent solid wall thickness of 3.7 inches, which in turn is associated with a 1.75 hour fire barrier rating. (See the section on Analysis of Event for further discussion on the safety significance of this issue.)

CAUSE OF THE EVENT

The root cause of the problem is a combination of changing regulatory requirements on fire protection and PSL specific construction procedures and practices which did not reflect the new rules. Specifically, an incorrect interpretation of PSL drawings was made during the preparation of the Fire Hazards Analysis in 1981 after Appendix R was issued. It was erroneously assumed that the drawings showed that the fire walls were grout filled, and Appendix R was met.

For PSL 1, the design details for seismically designed walls specify that masonry walls are constructed with vertical reinforcement every four feet, and that masonry block cells be filled with grout. Non-seismically designed walls did not include design details specifying vertical reinforcing or filling the cells with grout. However, grout filling was permitted where it would facilitate construction work. For PSL 2, design details specify that masonry block walls were constructed with vertical reinforcement every four feet and that only the cells with reinforcement needed to be grout filled. During PSL 2 construction, the practice of grout filling block walls entirely was followed as was previously

CAUSE OF THE EVENT (continued)

done on PSL 1. However, during some point in the construction of the PSL 2 Reactor Auxiliary Building (RAB), the practice of filling the block walls with grout was terminated. QA records indicating the extent of grouting were not required for the walls in question. Thus, the PSL 2 as-built grouting could not be determined from design records. A similar records situation exists for PSL 1 non seismic walls. There are eight affected block walls in the PSL 1 RAB and fourteen affected walls in the PSL 2 RAB.

ANALYSIS OF EVENT

Technical Specification 3/4 7.12 for PSL 2 addresses the required actions for Fire Rated Assemblies. If a fire barrier is not OPERABLE, the OPERABILITY of the fire detectors on at least one side of the inoperable assembly shall be verified, and an hourly fire watch patrol shall be established. This is to ensure that the possibility of a single fire involving more than one fire area prior to detection and extinguishment is minimized. FPL's Engineering department performed an assessment on the masonry block walls in question, and concluded that all of the walls were capable of performing their specified function, and therefore were OPERABLE. Nonetheless, the practice of maintaining a roving fire watch and assessing the operability of fire detectors was established prior to the discovery of voids in the masonry block walls and provides additional assurance that the necessary protection for safe shutdown equipment has always been afforded.

The safety significance of the potentially ungrouted block walls has been evaluated. A 1.75 hour fire rating associated with unfilled walls provides sufficient capability to contain a reasonably postulated fire within the 22 walls until such time that the fire extinguishes itself or is identified by plant personnel. The 1.75 hour rating allows adequate time for fire detection and fire fighting actions to mitigate the consequences of a fire. Automatic fire detection is provided in areas that contain or present a fire hazard to equipment essential to safe plant shutdown. The fire detection system gives audible and visual alarms in the Control Room of the affected unit. It has been the practice at PSL to provide supplemental fire detection capability in the form of an hourly roving fire watch.

Fire control and/or suppression equipment is provided for in each fire zone. Automatic fire suppression on PSL 2 in the form of sprinklers is associated with 9 of the affected walls. Primary fire suppression capability consists of portable fire extinguishers and automatic sprinklers; hose stations are provided as a backup or secondary line of defense. There are various types of portable fire extinguishers located throughout the plant, CO2, dry chemical and water types are placed convenient to locations that could have the potential for a fire. Finally, 1-1/2 inch hose lines with electrically safe fog nozzles and continuous flow type hose reels are distributed throughout the units.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
St. Lucie Unit 1	0 5 0 0 0 3 3 5	8 7	— 0 1 8	— 0 0	0 4 OF 0 4

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

ANALYSIS OF EVENT (continued)

Building design normally uses fire load to determine the fire rating required for barriers. The fire load is the average weight of combustible material per square foot of net floor area. In general, a previously specified fire loading increment in a given zone indicates the need for additional time allowance for the associated fire barrier. The combustible loading for each fire zone associated with the 22 walls was evaluated against the 1.75 hour fire barrier rating. All but one (located in PSL 2) of the twenty-two walls have effective fire ratings which can accommodate the fire loading in any adjacent fire zone.

Based on the above, it can be concluded that the health and safety of the public were not affected at any time by the presence of voids in some of the fire barrier walls.

This event is not deemed reportable as per the requirements of 10 CFR 50.73, or of any operation or condition prohibited by PSL's Technical Specifications. However, this report is being submitted for informational purposes.

CORRECTIVE ACTIONS

1. An evaluation was performed to justify the as-found condition of all suspect fire walls and a JCO supported continued unit operation.

2. The practice of having a roving hourly fire watch will be maintained at PSL at least until the full block wall fire protection capability is restored.

3. An inspection program confirmed the existence of voids in 22 fire barrier masonry block walls.

4. For those fire barrier block walls which do contain voids, the walls will be grout filled.

ADDITIONAL INFORMATION

None

PREVIOUS SIMILAR EVENTS

None

BOX 14000, JUNO BEACH, FL

SEPTEMBER 15 1988

L-88-407
10 CFR 50.73

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

Gentlemen:

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 87-18
Date of Event: January 31, 1987
3 Hour Fire Barrier Walls Found to Contain Voids in the Interior Grouting Due to Construction Practices Resulting in Derating of Some Fire Walls

The attached voluntary Licensee Event Report is being submitted to provide notification of the subject event.

Very truly yours,

W. F. Conway
Senior Vice President - Nuclear

WFC/GRM/cm

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

GRM3HFBW

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1/1