CATEGORY 1

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ACCESSION NBR:9710200200 DOC.DATE: 97/10/17 NOTARIZED: NO DOCKET #
FACIL:50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
AUTH.NAME AUTHOR AFFILIATION
FREHAFER,K.W. Florida Power & Light Co.
STALL,J.A. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-009-00:on 970917,inoperable PORV block valve resulted in operation prohibited by Tech Specs occurred.Caused by plant GL 89-10 program plan to review plant manager action item sys.PORV block valve V-1403 restored.W/971017 ltr.

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Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957

FPL

October 17, 1997

L-97-263
10 CFR 50.73

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

Re: St. Lucie Unit 1
Docket No. 50-335
Reportable Event: 97-009
Date of Event: September 17, 1997
Inoperable PORV Block Valve Resulted in
Operation Prohibited by Technical Specifications

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,

J. Scarola for

J. A. Stall
Vice President
St. Lucie Plant

IE22

JAS/KWF

Attachment

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

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: 50.0 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 (T-6 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)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4)

Inoperable PORV Block Valve Resulted in Operation Prohibited by Technical Specifications

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 NAME	DOCKET NUMBER
9	17	97	97	-- 009 --	0	10	17	97	N/A	05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
K. W. Frehafer, Licensing Engineer	(561) 468-4284

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
E	AB	20	L200	No						

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 15 single-spaced typewritten lines) (16)

On September 17, 1997, St. Lucie Unit 1 was at 100% power. During Generic Letter 89-10 self-assessment activities, utility personnel determined that the initial Motor Operated Valve Load Sensitive Behavior (LSB) assumptions used in the St. Lucie MOV program were non-conservative. When plant specific LSB was applied to V-1403, a Power Operated Relief Valve (PORV) block valve, the valve's ability to close at design differential pressure could not be analytically confirmed. Therefore, PORV block valve V-1403 was declared inoperable, the valve was closed, and its power removed pursuant to Technical Specification 3/4.4.12 ACTION statement requirements.

The apparent cause of this event was that the St. Lucie Plant GL 89-10 program plan to review plant specific differential pressure test results and incorporate changes into the GL 89-10 program documentation was not being formally tracked. The present day St. Lucie corrective action follow up program, the Plant Manager Action Item (PMAI) system, did not exist at the time the GL 89-10 program was established. All GL 89-10 program requirements and improvements identified during the self assessment are now tracked in the PMAI system. Corrective actions to restore V-1403 to operable status include implementation of maintenance and modifications scheduled for the upcoming St. Lucie Unit 1 SL1-15 refueling outage. Additionally, all GL 89-10 program documentation for V-1403 will be updated.

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

DESCRIPTION OF THE EVENT

On September 17, 1997, St. Lucie Unit 1 was at 100% power. During Generic Letter (GL) 89-10 self-assessment activities, utility personnel determined that the initial Motor Operated Valve (MOV) Load Sensitive Behavior (LSB) assumptions used in the St. Lucie MOV program were non-conservative. Actual MOV dynamic test results have shown that LSB is in excess of the generic value originally assumed in the MOV program. The St. Lucie Plant specific LSB was quantified based on the dynamic test results and EPRI Performance Prediction Methodology (PPM). When plant specific LSB margin values were applied to V-1403, a Power Operated Relief Valve (PORV) block valve [EIIS: AB:20], the valve's ability to close at design differential pressure could not be analytically confirmed. Therefore, PORV block valve V-1403 was declared inoperable, the valve was closed, and its power removed pursuant to Technical Specification 3/4.4.12 ACTION statement requirements.

CAUSE OF THE EVENT

The original GL 89-10 MOV program recognized the potential effects of LSB and included a 10.5% margin for potential LSB effects in the MOV closing stroke calculations. This 10.5% margin was established early in the development of the GL 89-10 program and was based on the best available industry information at the time. As part of GL 89-10 program closure, the plan was to review plant specific DP test results, determine plant specific LSB effects and incorporate any potential changes into the GL 89-10 program documentation.

A summary was developed for each MOV included in the GL 89-10 program scope. These summaries include a description of the specific valve, valve safety significance, justification for valve performance and a discussion of valve design margins. However, selected summaries included follow-up actions that were to be completed. For example, if a specific valve was tested under differential pressure conditions and the required thrust obtained from the test exceeded that originally calculated, the affected calculations should have been updated to include the increased thrust.

The mechanisms in place to provide feedback to the GL 89-10 program were informal, and not captured during implementation of the MOV program. The apparent cause of this event was the failure to effectively track feedback within the GL 89-10 program.

ANALYSIS OF THE EVENT

This event is considered reportable under 10 CFR 50.73(a)(2)(i)(B) as "Any operation or condition prohibited by the plant's Technical Specifications." The Technical Specification 3/4.4.12 Limiting Condition for Operation (LCO) requires that the PORV block valves be OPERABLE in MODES 1, 2, and 3. The ACTION statement for Technical Specification LCO 3/4.4.12 allows continued operation of the plant providing the INOPERABLE PORV block valve is closed and power removed. Contrary to the above, in the past the plant was operated with V-1403 INOPERABLE without entering the applicable ACTION statement.

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

ANALYSIS OF THE EVENT (cont'd)

NRC Generic Letter 89-10 requires licensees to select and set MOV switch settings and to verify that the switch settings are sufficient by performing in-situ static and dynamic testing. Such testing has been performed at St. Lucie. Significant changes in delivered actuator thrust at torque switch trip can occur between static and dynamic testing conditions, and is attributed to changes in the stem coefficient of friction (COF) between static and dynamic conditions. This phenomenon is referred to as Load Sensitive Behavior (LSB). This condition is of concern since MOV torque switches are set under static conditions. If the valve is subsequently required to operate under design basis conditions, premature torque switch trip could occur.

The St. Lucie philosophy at the start of the GL 89-10 program was to initially provide design thrust margin for all program MOVs. Margin was established in the form of conservative design basis differential pressure assumptions, and a design LSB margin of 10.5% was selected based on industry knowledge at that time. An evaluation of the St. Lucie Units 1 and 2 GL 89-10 MOV differential pressure test results was recently completed. A quantification of plant specific LSB was determined from a review of the test results and the evaluation concluded that the overall LSB margin to be utilized in the GL 89-10 program should be 22.5%. This LSB value was determined in accordance with the methodology prescribed by EPRI in EPRI TR-103226, November 1994, "Methods to Address Rate of Loading in Torque Switch Controlled MOVs."

FPL evaluated operability of MOVs considering increased LSB for the opening and closing stroke. Only one valve was determined to be an operability concern, and that was the ability of the Unit 1 PORV block valve, V-1403, to close.

The design closing stroke differential pressure value originally established for V-1403 was 2155 psid. This differential pressure was based on depressurization of the pressurizer due to a stuck open PORV. A finite time interval was assumed for the operators to recognize a stuck open PORV and take manual action to close the PORV block valve. This assumption was revisited to add additional conservatism to the assumed differential pressure such that the revised design closing stroke differential pressure value is 2245 psid. Using the EPRI PPM results for V-1403, a revised required closing thrust of 7705 lbs for V-1403 was established. This revised closing thrust requirement, including uncertainties and revised LSB, is above the as-left minimum Control Switch Trip (CST) closing for V-1403 by 8%. As such, operability of V-1403 for the closing stroke was considered indeterminate until additional analyses can be performed, and the valve was declared INOPERABLE. The Technical Specification LCO 3/4.4.12 ACTION statement requires that the PORV block valve be closed and power removed. These actions were performed on September 17, 1997.

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

ASSESSMENT OF SAFETY SIGNIFICANCE

The St. Lucie Unit 1 UFSAR contains an analysis of the depressurization of the reactor coolant system event initiated by an accidental opening of the PORVs. The inadvertent opening can be caused by a mechanical failure, a spurious actuation signal, or unanticipated operator action. The two half capacity PORVs are designed to relieve sufficient pressurizer steam during any operational transient and most of the anticipated transients to prevent opening of the pressurizer safety valves. The event postulates that both PORVs fully open and fail to reclose. The analysis concludes that the core is protected from a Departure from Nucleate Boiling (DNB) condition by the thermal margin/low pressure trip of the reactor protection system. Operator action to close the PORVs or block valves is not credited during this event.

Although FPL determined that PORV block valve V-1403 may not completely close at design differential pressure conditions, it would close sufficiently to significantly limit any resultant blowdown. Therefore, actual conditions would be conservatively bounded by the analyzed case of two PORVs fully open. Additionally, operator action to reclose the PORV block valve would be possible once the differential pressure was reduced below design conditions. In order for operators to subsequently fully close the valve, the valve would have to be reopened to reset the close torque switch, and then closed.

FPL concludes that the consequences of an inoperable PORV block valve are bounded by the safety analyses. Additionally, this condition would not preclude future attempts to reclose the valve. Therefore, this event had no adverse affect on the health and safety of the public.

CORRECTIVE ACTIONS

The present day St. Lucie corrective action follow up program (the PMAI system) did not exist at the time the GL 89-10 program was completed. The original methods used to track feedback to the GL program were not as rigorous and formal as the present day PMAI system. All GL 89-10 program requirements and improvements identified during the self assessment are now tracked in the PMAI system. Therefore, there are no new corrective actions required to ensure that test results are fed back within the GL 89-10 program documentation.

1. The Unit 1 PORV block valve V-1403 and motor operator will be restored to OPERABLE status at the completion of the upcoming SL1-15 refueling outage. Outage work scope includes stem and wedge replacement, and other potential modifications to the actuator gearbox, torque switch, and control switch logic.

2. All GL 89-10 program documentation for V-1403 will be updated by March 31, 1998.

The FPL self-assessment of the St. Lucie Plant GL 89-10 program resulted in several corrective actions to strengthen implementation of the MOV program. These actions will be docketed in response to the recent NRC close out inspection of the St. Lucie GL 89-10 program.

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

ADDITIONAL INFORMATION

Failed Components Identified

Equipment: Unit 1 PORV Block Valve Motor Operator
Manufacturer: LIMITORQUE
Model: SMB-00 (353888C)

Previous Similar Events

None