



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

April 8, 2009

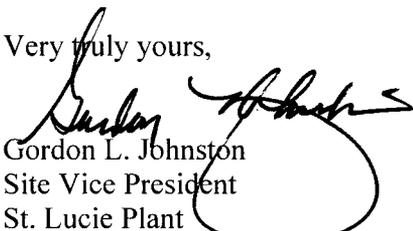
L-2009-075
10 CFR 50.73

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

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 2009-001
Date of Event: March 19, 2009
Unit 2 Main Feedwater Isolation Valves Stroke Time Potentially Affected by Temperature

The attached Licensee Event Report 2009-001 is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,


Gordon L. Johnston
Site Vice President
St. Lucie Plant

GLJ/dlc

Attachment

1E22
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 infocollect@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.

1. FACILITY NAME St. Lucie Unit 2	2. DOCKET NUMBER 05000389	3. PAGE 1 OF 4
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4. TITLE
Unit 2 Main Feedwater Isolation Valves Stroke Time Potentially Affected by Temperature

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
03	19	2009	2009	001	00	04	08	2009	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 100%	<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)						
	<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 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 checked="" 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	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
X	SJ	ISV	A391	NO					

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

On March 19, 2009, St. Lucie Unit 2 was operating in Mode 1 at 100% power when the Onsite Review Group (ORG) concluded the Seabrook Station's Operating Experience Report "Adverse Effect On Feed Water Isolation Valve Stroke Test Due To Unusual Conditions Encountered During A Forced Outage," identified on December 18, 2008, was a reportable condition for St Lucie Unit 2. A review of available plant data and documents determined that St. Lucie Unit 2 main feedwater isolation valves (MFIVS) stroke times could potentially not meet plant technical specification (TS) of 5.15 seconds if the temperature of the hydraulic fluid in these valve actuators falls below 60°F.

An evaluation of available vendor data concluded the inability to meet TS closure times could result from increased hydraulic fluid viscosity caused by low ambient temperatures. Contributing factors included inadequate design specification, operating procedures, and latent design weaknesses. Immediate corrective actions included monitoring ambient temperature in the steam trestle. Longer term corrective actions included MFIV replacement and shiftly temperature checks.

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NARRATIVE

Description of the Event

A review was completed of a Seabrook Station Operating Experience Report involving the affects of low ambient air temperatures on the operation of the main feedwater isolation valve (MFIV) stroke times. Seabrook's OE Report 26387, "Adverse Effect On Feed Water Isolation Valve Stroke Test Due To Unusual Conditions Encountered During A Forced Outage," identified conditions that ambient air temperatures at or below 60°F would potentially increase stroke times for MFIVs [EIS:SJ] that have actuators that are hydraulic/pneumatic. St Lucie Unit 2 MFIVs are hydraulic/pneumatic actuated valves similar to those at Seabrook using the same hydraulic fluid. An investigation by the vendor has shown that an increase in viscosity of the hydraulic fluid in the actuators at temperatures of 60 degrees or below may create an environment within the valve actuator that increases the valve closure time above the technical specification limit of 5.15 seconds. St Lucie Unit 1 MFIVs use a nitrogen medium for actuation of the valves and are not affected by low ambient temperature conditions.

Cause of the Event

An evaluation of the event concluded the increased hydraulic fluid viscosity caused by low ambient temperatures could have resulted in slower than required stroke time of the MFIVs on Unit 2. Contributing factors included; lack of a minimum operating temperature for the MFIVs in design specifications allowing the vendor to select 60°F as the minimum design temperature; inadequate operating procedures allowing the MFIVs to operate at temperatures below 60°F; inadequate temperature monitoring; and latent design weaknesses.

Analysis of the Event

Based on a review of available vendor data and documents it was concluded that at temperatures below 60°F the Unit 2 MFIVs could potentially be considered inoperable as a result of the slower than permitted stroke times by plant Technical specification (TS) of 5.15 seconds and therefore reportable in accordance with 10CFR50.73 (a) (2) (i) (B), as a condition prohibited by Unit 2 technical specifications.

A review of past ambient temperatures has identified several instances in which the ambient temperature at the MFIVs has been below 60°F. Low ambient air temperatures below 60 degrees could result in slower stroke times than those permitted by plant TS of 5.15 seconds. The slower stroke times would not meet current TS requirements to isolate the "Not Nuclear Safety Related" feedwater system from the "safety related" portion of the feedwater piping during a main steamline break (by way of MSIS) or a main feedwater break line break (by way of AFAS).

Further review by Engineering of temperature data (hydraulic fluid temperature vs. ambient temperature) from February 12, 2005 for Unit 2 MFIVs and hydraulic fluid temperature vs. ambient temperature identified no meaningful correlations since temperatures were found to be at 60°F or above. Reviews of available PSL MFIV documents, Chemistry MET temperature and plant data retrieval system (PI), reached similar conclusions. The conclusion reached from these reviews and analysis was the MFIVS could have been inoperable longer than the required TS allowable times and therefore is being reported in accordance with 10CFR50.73(a)(2)(I)(B), a condition prohibited by Unit 2 technical specifications.

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This condition could have been applicable to any or all of the four feedwater isolation valves on Unit 2. Documented stroke times for all four MFIVs have been less than the 5.15 seconds criteria during past testing. There are no other hydraulic/pneumatic valves in the steam trestle. Unit 1 MFIVs are nitrogen medium action valves and are not affected by this condition. This is a legacy issue applicable to Unit 2 MFIVs and therefore is not considered a repeat event.

Analysis of Safety Significance

St. Lucie Unit 2 TS 3.7.1.6 requires four MFIVs to be Operable in Modes 1, 2, and 3 except when the MFIV is closed and deactivated. The loss of all MFIVs would result in entry into TS 3.0.3 for failure to isolate any flow path and require action within one hour for Unit 2 to be placed in a Mode in which TS 3.7.1.6 does not apply (Modes 4, 5, or 6).

Review of records over the last three years show the worst case condition (loss of all MFIVs) for ambient temperatures less than 60°F existed for a 22-hour period, with 39 °F being the lowest temperature reached. During this period, Unit 2 was in a Mode in which TS 3.7.1.6 applied. Based on vendor manual information and Engineering judgment, the TS MFIV stroke time of 5.15 seconds could have been exceeded if automatic closure had been required due to a steamline break or main feedwater line break.

Due to the complexity of the MFIVs a precise closure time could not be calculated, however, the containment analysis used for the installation of replacement steam generators for Unit 2 was revisited to assess the affects on containment, containment pressure, and off-site doses. The new containment analysis used an improved estimate computer code (Gothic) using replacement steam generator conditions, which are conservative with respect to the old steam generators. Results of this review concluded peak containment pressure would have remained below the design pressure limit of 44 psig and containment integrity would not be challenged until an internal containment pressure of approximately 95 psig was reached. Given the worst-case ambient temperature identified 39°F, and assuming the MFIVs fail to stop full main feedwater flow, significant "margin to containment failure" still remained. Site boundary dose was also reviewed and determined not to be impacted for MFIV closure times in excess of 5.15 seconds.

Based on this evaluation, the potential safety consequences of the event are judged to be low and there would have been no significant impact on the health and safety of the public.

Corrective Actions

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

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Corrective Actions Taken

1. Temporarily installed temperature indicators in the steam trestle on MFIVs, on both headers, to monitor MFIV temperatures to ensure they do not go below 60°F.
2. Reviewed MFIVs and trestle design for other covers in lieu of the tarp.
3. Reviewed vendor and design documents of main turbine for applicability.
4. Covered MFIVs with tarps and placed space heaters to maintain ambient temperatures above 60°F
5. Revised procedure ADM-04.03, "Cold Weather Preparation;" to include MFIVs on Unit 2 and guidance for maintaining temperature above 60°F
6. Added MFIV actuator temperature to electronic shift operations management systems (ESOMS) data logger to check and log ambient temperatures each shift to ensure actions are taken; if temperature falls below 65°F.

Long Term Corrective Actions

- Replace MFIV actuators to operate at all temperatures at the site.

Similar Events

A search of the corrective action database for St. Lucie was performed to identify events related to a Main Feedwater Isolation Valves and none were found. This event is not considered a repeat event.

Failed Components

Main Feedwater Isolation Valves, Anchor Darling Valve Co., Model 20"-W7920697