



March 3, 2006

L-2006-075
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: 2006-001-00
Date of Event: January 5, 2006
Auxiliary Feedwater (AFW) Trip During Surveillance Run

The attached Licensee Event Report 2006-001 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
Acting Vice President
St. Lucie Nuclear Plant

GLJ/dlc

Attachment

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

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.

1. FACILITY NAME

St. Lucie Unit 1

2. DOCKET NUMBER

05000335

3. PAGE

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4. TITLE

Auxiliary Feedwater (AFW) Trip During Surveillance Run

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
01	05	2006	2006	- 001	- 00	03	03	06	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

- | | | | |
|---|---|---|--|
| <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	TELEPHONE NUMBER (Include Area Code)
Donald L. Cecchetti	(772) 467 - 7155

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
-	BA	AFW	T147	YES	-	-	-	-	-

14. SUPPLEMENTAL REPORT EXPECTED

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	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)

While performing a surveillance run of the turbine driven 1C Auxiliary Feedwater (AFW) pump on January 5, 2006, with St. Lucie Unit 1 in Mode 1 at 100 percent power, the mechanical overspeed trip mechanism actuated and tripped the turbine. The turbine trip was caused by the AFW turbine trip lever not being properly re-latched following a previous surveillance on the AFW turbine.

The identified failure mode would not have prevented the operator from re-latching the mechanical overspeed trip device and starting the pump. Given the availability of two other AFW pumps and the ability of the operators to correct the tripped condition within analytical bounds and time frames, the identified pump failure had minimal impact on the health and safety of the public.

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

Description of the Event

While performing a surveillance run of the turbine driven 1C AFW pump [EIIS:BA:PP] on January 5, 2006, with St. Lucie Unit 1 in Mode 1 at 100 percent power, the mechanical overspeed trip mechanism [EIIS:BA:12] actuated and tripped the turbine. The trip mechanism is designed to trip the turbine when the speed exceeds the setpoint of 4500 rpm. This mechanism is a backup to the governor speed control and the electrical overspeed trip device. The mechanical overspeed mechanism must also remain latched during automatic starts in order for the AFW to perform its design basis functions.

The AFW pump was running stable, at a rated speed of 3600 rpm just prior to the trip. Operators reported there was no noticeable increase in speed nor was the electrical overspeed trip coil actuated. Following the trip it was observed that the mechanical trip tappet nut was in the tripped position, which indicated a potential problem with the mechanical overspeed trip mechanism.

In response to this event a root cause team was convened to determine why the trip occurred, corrective actions to prevent recurrence and generic implications.

Cause of the Event

The Root Cause Team concluded the turbine trip was a result of the AFW turbine not being properly latched following a previous surveillance on the AFW turbine completed on December 16, 2005.

A latent procedural weakness existed such that clear direction for re-latching and confirming that the turbine overspeed mechanism was properly latched was not provided with the surveillance procedure. In addition, binding of the tappet nut in the head bracket bore enabled the improper latching of the overspeed mechanism. Prior to the event (December 16, 2005) the AFW turbine was latched following performance of a surveillance (Auxiliary Feedwater Periodic Test, 1-0700050, Data Sheet C). It is postulated that following the turbine trip of December 16, 2005 in accordance with the surveillance procedure, the head lever and emergency trip rod had not been sufficiently retracted to permit the tappet to fully drop to the seated position. Binding of the tappet nut occurred which allowed the overspeed mechanism to remain improperly latched, while giving the appearance of being fully engaged. This condition remained unnoticed until the unexpected trip.

The overspeed trip alarm not being optimally adjusted to alert operators to a improperly latched condition and insufficient training also contributed to the event.

Analysis of the Event

This event is reportable under 10 CFR 50.73(a)(2)(i)(B) as "any operation or condition which was prohibited by the plant's Technical Specifications..." because the trip mechanism was improperly reset for 20 days, exceeding the TS AOT of 72 hours.

Investigation of the event revealed that without clear guidance on how to reset the overspeed mechanism, Operations only performed a cursory check to ensure the mechanical overspeed mechanism was securely latched.

Inspection of the overspeed mechanism found that the tappet nut was binding in the bore of the head bracket. Based on further reviews, differences in manufacturing of

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the tappet nut may have caused the tappet nut to bind. However, further troubleshooting determined that binding of the tappet nut would not have prevented the correct or proper latching of the mechanism if the pump was required after the trip.

Although Unit 1 and Unit 2 are of the same design, the only degraded condition that is related to the current event for Unit 2 was an AFW pump failure to trip due to a binding tappet nut during testing. Corrective actions are being tracked in the site corrective action program. All identified corrective actions for Unit 1 will be applicable to Unit 2.

Analysis of Safety Significance

Given the availability of the other two AFW pumps and the ability of the operators to correct the tripped condition within analytical bounds and time frames, the identified pump failure had minimal impact on the health and safety of the public. The assumed fault exposure time is 20 days based on the time since the last successful start. It is concluded that the identified failure mode would not have prevented the operator from re-latching the mechanical overspeed trip device and starting the pump. The estimated non-recovery probability is $3.47\text{E-}02$. The change in risk over the 20-day exposure time is approximately $4.33\text{E-}08$. A change in risk of less than $1\text{E-}06$ is considered not risk significant.

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.

1. Corrective actions have been taken to address the procedural deficiencies identified in latching and replacement of the tappet nut (Complete).
2. The tappet and nut have been sent to the manufacturer for failure analysis. Upon receipt and review of analysis, determine any additional corrective actions that would be necessary (7/21/06).
3. Adjustments have been made to the overspeed trip switch to provide annunciation if the overspeed mechanism is not properly latched (Complete).

Similar Events

A review of the condition report database since 1995 was performed to identify similar events. Although there were multiple instances of AFW turbine trips due to actual overspeed found, there was no history of similar events, i.e., where improper latching of overspeed trip mechanism resulted in inadvertent trips or functional failures related to the overspeed trip mechanism on either unit.

Failed Components

None