CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9901130022 DOC.DATE: 99/01/04 NOTARIZED: NO DOCKET #
FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
AUTH.NAME AUTHOR AFFILIATION
MADDEN,G.R. Florida Power & Light Co.
STALL,J.A. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 98-010-00:on 981207,RCS boron sample frequency required by TS,was exceeded by twelve minutes.Caused by personnel error.Equipment clearance order was lifted to draw required sample & operations procedure was changed.With 990104 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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

January 4, 1999

L-98-320
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: 1998-010-00
Date of Event: December 7, 1998
Failure to Meet RCS Boron
Concentration Sample Frequency

The attached Licensee Event Report 1998-010 is being submitted pursuant to the requirements of 10 CFR § 50.73 to provide notification of the subject event.

Very truly yours,

J. A. Stall
Vice President
St. Lucie Nuclear Plant

JAS/EJW/GRM
Attachment

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

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the 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. If 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.

LICENSEE EVENT REPORT (LER)

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

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TITLE (4)

Failure to Meet RCS Boron Concentration Sample Frequency

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
12	07	1998	1998	- 010 -	00	01	04	1999	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
POWER LEVEL (10)	000	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)
George R. Madden, Principal Engineer	(561) 467 - 7155

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-

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 December 7, 1998, while in Mode 3, starting up from a planned refueling outage, the reactor coolant system (RCS) boron sample frequency required by Technical Specification (TS) 3.1.2.9 was exceeded by twelve minutes. The sample line had been isolated and tagged under an equipment clearance order (ECO) to support the repair of the sample line isolation valve. Additionally, the boronometer was out of service to support work on a chemical and volume control system (CVCS) check valve. The TS required sample frequency was every 40 minutes with two charging pumps operable in Mode 3. The last sample was taken at 0105 hours. At 0147 hours the chemistry technician contacted the control room to notify the control room personnel that he could not draw an RCS sample. The sample was obtained at 0157 hours, twelve minutes beyond the required time.

The root cause of this event was cognitive personnel error by control room supervision in allowing the RCS sample path to be isolated for repair while under the restriction of the required boron sampling frequency. In addition, less than adequate procedural guidance existed to ensure RCS sampling would occur to meet this TS.

The ECO on the sample isolation valve was lifted to draw the required RCS boron sample. Operations personnel reviewed this event at shift turnover meetings to ensure personnel were aware of the event. The operations procedure was changed to require a caution tag to be placed on V5200 and V5203 whenever TS RCS sampling is required.

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

Description of the Event

On December 7, 1998, while in Mode 3, starting up from a planned refueling outage, the required reactor coolant system (RCS) (EIIS:AB) boron sample frequency required by Technical Specification (TS) 3.1.2.9 was exceeded by twelve minutes. The RCS sample line had been isolated on an equipment clearance order (ECO) to support the repair of the RCS sample line isolation valve (V5206). The boronometer was also out of service, having previously been removed from service to support work on chemical and volume control system (CVCS) (EIIS:CB) check valve V2432. The TS required RCS boron sample frequency was every 40 minutes per TS Table 3.1-1 (with two charging pumps OPERABLE in Mode 3). A sample was taken at 0105 hours; at 0147 hours the chemistry technician (utility non-licensed technician) contacted the control room to notify the control room personnel (utility licensed operators) that he could not obtain flow to draw an RCS boron sample. The ECO on the sample line was identified as the cause of the inability to obtain flow. The ECO was removed and the sample was obtained at 0157, twelve minutes in excess of the required sample frequency. The boron dilution alarm system (BDAS) was completely functional during the event.

TS 3.1.2.9.a states:

> Boron concentration shall be verified consistent with SHUTDOWN MARGIN requirements of TS 3.1.1.1, 3.1.1.2, and 3.9.1 in Modes 3,4,and 5 with RCS level above the hot leg centerline by use of the boronometer or sampling per TS Table 3.1-1.

APPLICABILITY a. of TS 3.1.2.9 states that the Limiting Condition for Operation is applicable in:

> MODES 3, 4, and 5 with RCS level above the hot leg centerline by use of boronometer or sampling per Table 3.1-1.

Table 3.1-1 requires sampling for RCS boron every 40 minutes in Mode 3, with two charging pumps operable and the boronometer out of service.

ACTION b. of TS 3.1.2.9 states:

> If unable to determine the RCS boron concentration by the means specified above, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes until one of the means of determining the RCS boron concentration as specified above is restored to OPERABLE status.

Cause of the Event

The root cause of this event was cognitive personnel error by control room supervision (utility licensed personnel) in allowing the RCS sample path to be isolated for repair while under the restrictive boron sampling frequency. Additionally, the requirements of the TS ACTION statement were not immediately complied with as control element assembly (CEA) (EIIS:AA) testing was continued until approximately 0150 hours. The operating crew focused on the recovery of the sample flow path and did not implement the requirements of the ACTION statement when it was identified that the RCS boron sample could not be drawn.

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The following causal factors contributed to this event:

The repair of valve V5206 (a CVCS valve) was seen as an immediate concern since the leakage had recently increased significantly after the packing was adjusted. The impact on RCS boron sampling capability from hanging the ECO was not fully considered. The ECO hung on the RCS hot leg sample isolation valve (V5200) was approved by the control room licensed operators who failed to link the loss of sample capability with the requirement to sample. A less than adequate review of the condition of the plant was performed prior to hanging the clearance.

Less that adequate procedural guidance exists to ensure that measures are in place to prevent similar events from occurring when RCS sampling is required to meet this TS.

Analysis of the Event

This event is reportable per 10 CFR 50.73(a)(2)(I)(C) as any operation prohibited by Technical Specifications. TS 3.1.2.9.a requires, with the boronometer out of service, that RCS boron sampling frequency be taken in accordance with TS Table 3.1-1.

Boron concentration shall be verified consistent with shutdown margin requirements of TS 3.1.1.1, 3.1.1.2, and 3.9.1 in Modes 3, 4, and 5 with RCS level above the hot leg centerline by use of the boronometer or sampling per TS Table 3.1-1. In Mode 3, with two charging pumps operable and the boronometer out of service, the RCS boron sample frequency is 40 minutes.

Assessment of Safety Significance

TS 3/4.1.2.9 requires the boron concentration to be verified consistent with the shutdown margin requirements of Specifications 3.1.1.1, 3.1.1.2, and 3.9.1 once per 8 hours when in operational Modes 3, 4, 5, and 6. In addition, surveillance requirements are specified for the boronometer when used to monitor boron concentration; increased monitoring is required whenever performing a reactor coolant system (RCS) heatup or cooldown, and associated TS Table 3.1-1 prescribes additional monitoring frequencies based on operational Mode and the number of operable charging pumps. For a Mode 5 mid-loop condition, the TS requires two of the three charging pumps to be verified inoperable by racking out their associated motor circuit breakers. TS 3/4.1.2.9 was established to provide diverse and redundant indications of an inadvertent boron dilution event, and allow detection with sufficient time for termination of the event before a complete loss of reactor shutdown margin occurs.

During construction of St. Lucie Unit 2, in the early 1980s, FPL committed to the installation of startup channel flux alarms to detect the occurrence of a boron dilution event in Modes 3 through 6. The NRC staff was informed, however, that due to unit construction schedular demands, the alarm system could not be installed until late in 1983 (subsequent to initial plant startup). FPL provided the staff with a description of interim measures that would be employed, including increased monitoring frequencies based on the safety analyses, to detect occurrences of inadvertent boron dilution until the alarms are installed. The NRC staff review and acceptance of the procedures, analyses, and TS associated with these interim measures is documented in Section 15.6.3 of NUREG-0843, Safety Evaluation Report related to the operation of St. Lucie Plant, Unit No. 2, Docket 50-389: USNRC Office of Nuclear Reactor Regulation; October 1981; and Supplement No. 3, April 1983. The requirements of existing TS 3/4.1.2.9 and associated TS Table 3.1-1 resulted from the interim

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measures that had been proposed by FPL for implementation until the boron dilution alarms could be made completely functional.

The boron dilution alarm system (BDAS) was subsequently installed at St. Lucie Unit 2, is completely functional, and is described in the Updated Final Safety Analysis Report (UFSAR) Section 7.7.1.1.11. It is an on-line microcomputer based system that receives and monitors two neutron flux signals (one per BDAS channel) processed from the start-up channels of nuclear instrumentation. Each channel generates an alarm signal that actuates the plant annunciation system when the neutron flux signal is equal to or greater than a calculated alarm setpoint. In the event of an unplanned boron dilution event when in Modes 3, 4, 5, or 6, the BDAS provides redundant alarms in the control room.

The alarm setpoint is specified as the sum of the last known average neutron flux signal voltage and the incremental setpoint voltage. The BDAS logic, which includes the calculated alarm setpoint, is designed to follow the decreasing neutron flux signal after a reactor shutdown occurs, including decreases in the steady-state levels that may result from changes in core configuration during refueling operations. However, if the neutron flux signal increases, the alarm setpoint will not change until a reset signal is manually actuated from the control panel. This reset capability allows the alarm to be acknowledged and alarm detection to be reset to the current core configuration.

The calculated BDAS alarm setpoints include an allowance for measurement uncertainties, and are based on a minimum analysis setpoint ratio determined by evaluation of the postulated inadvertent boron dilution event. The analysis setpoint ratio is defined as the ratio of the startup channel flux corresponding to the alarm setpoint compared to the startup channel flux prior to the initiation of a boron dilution event. The uncertainty allowance is sufficient to compensate for the effects of RCS temperature variations on the neutron flux signal during the postulated event.

Based on the above discussion, the missed boron sample did not adversely affect the health and safety of the public because the boron sample is redundant to the BDAS alarm. The accident analysis takes credit for the BDAS not the boron sample frequency to prevent a boron dilution event.

Corrective Actions

1. The sample line isolation valve ECO was lifted to allow Chemistry to draw the required RCS boron sample. The sampling was satisfactorily completed by 0157 hours on December 7, 1998, twelve minutes in excess of the required sampling frequency.
2. Operations personnel reviewed the event at shift turnover meetings to ensure that operations personnel were aware of the event.
3. Procedure OP 2-0010125 was changed to require a caution tag to be placed on V5200 and V5203 whenever TS RCS sampling is required. The corrective action required by the caution tag also alerts the operations personnel that any positive reactivity changes must be secured if the sampling capability is lost.
4. FPL will submit a proposed license amendment which will alleviate the unnecessary constraint presently required by the obsolete LCO 3.1.2.9.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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Other Information

Failed components:

None

Similar Events:

None