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The Northeast Utilities System

Ted C. Feigenbaum
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July 31, 1995

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Reference: Facility Operating License No. NPF-86, Docket No. 50-443

Subject: Licensee Event Report (LER) No. 95-004-00: "Non-Compliance with Technical Specification Surveillance Requirements for Inoperable AFD Monitor Alarm"

Gentlemen:

Enclosed please find Licensee Event Report (LER) No. 95-003-00 for Seabrook Station This submittal documents an event which occurred on July 1, 1995. This event is being reported pursuant to 10CFR50.73(a)(2)(i).

Should you require further information regarding this matter, please contact Mr. James M. Peschel, Regulatory Compliance Manager, at (603) 474-9521, extension 3772.

Very truly yours,

Ted C. Feigenbaum

TCF:EWM/act

Enclosures: NRC Forms 366/366A

080021

IE22
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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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)
Seabrook Station	05000443	1 OF 4

TITLE (4)
Non-Compliance with Tech Spec Surveillance Requirements for Inoperable AFD Monitor Alarm

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
07	01	95	95	-- 004 --	00	07	31	95		05000
									FACILITY NAME	DOCKET NUMBER 05000

		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
OPERATING MODE (9)	1		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)	15		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
			20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
James M. Peschel, Regulatory Compliance Manager	(603) 474-9521

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 15 single-spaced typewritten lines) (16)

Technical Specification Surveillance Requirement 4.2.1.1 requires indicated AFD be determined within its limits during power operation above 15% of rated thermal power by either monitoring the indicated AFD for each OPERABLE excore channel at least once per 7 days when the AFD Monitor Alarm is OPERABLE, or monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AFD Monitor is inoperable.

Contrary to this requirement, the indicated AFD was not monitored and logged as required by Technical Specifications, with the AFD monitor alarm inoperable. On June 30, 1995 and July 1, 1995 the unit operated above 15% power with the AFD Monitor inoperable due to an inaccurate thermal power calculation. Inoperability of the AFD Monitor was not recognized until 1313 on July 1, 1995 at which time manual logging of AFD commenced on an hourly basis.

There were no adverse safety consequences as a result of this event.

The root cause of this event was determined to be personnel error on the part of the vendor, Science Applications International Corporation (SAIC) that supplied the replacement main plant computer. In the process of correcting a sequencing error, on an unrelated problem, a line of computer code was inadvertently deleted. This line of computer code functioned to provide the feedwater flow reliability check for information inputting into the calorimetric.

Corrective actions taken upon the identification of this condition were to monitor and log AFD on an hourly basis. Additional corrective actions will include: revising the secondary heat balance, reviewing computer problem reports generated against the secondary heat balance and reviewing Adverse Condition Reports (ACR) to identify any potential similar computer related problems.

DESCRIPTION OF CONDITION

Technical Specification 3.2.1, Axial Flux Difference, requires that indicated Axial Flux Difference (AFD) be maintained within the target band, as specified in the Core Operating Limits Report (COLR). This specification is applicable in MODE 1, above 15% RATED THERMAL POWER. Technical Specification Surveillance Requirement 4.2.1.1 requires:

> The indicated AFD shall be determined to be within its limits during POWER OPERATION-above 15% of RATED THERMAL POWER by:
>
> a. monitoring the indicated AFD for each OPERABLE excore channel at least once per 7 days when the AFD Monitor Alarm is OPERABLE, and
>
> b. monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AFD Monitor Alarm is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.

Contrary to this requirement, the indicated AFD was not monitored and logged as required by Technical Specifications, with the AFD monitor alarm inoperable. On June 30, 1995 and July 1, 1995 the unit operated above 15% power with the AFD Monitor inoperable due to an inaccurate thermal power calculation, as discussed below. Inoperability of the AFD Monitor was not recognized until 1313 on July 1, 1995 at which time manual logging of AFD commenced on an hourly basis.

On June 30, 1995, while conducting a plant startup, it was identified by the operating crew that a larger than expected discrepancy existed between reactor power, as determined by the secondary heat balance, and the Nuclear Instrumentation (NI) system. Subsequent investigation determined that the secondary heat balance calculation was allowing an unreliable feedwater flow value to be used in the calculation of core thermal power. This resulted in an inaccurate indicated thermal power value. The unreliable feedwater flow existed on steam generator loop D due to both feedwater flow values being less than the minimum required for calculating thermal power (10% full flow).

The thermal power as determined by the secondary heat balance calculation inputs to the AFD monitor. Above 1% power AFD is required to be monitored by Technical Specifications. The secondary heat balance is a determination of core thermal power based on various secondary plants parameters such as temperatures, pressures and flow. One of these various inputs into the secondary heat balance is feedwater flow.

The MPCS Replacement Project was completed during the third refueling outage (April to July 1994). This project involved a complete changeout of the Main Plant Process Computer. The replacement system was supplied by an outside vendor, Science Applications International Corporation (SAIC). The specification for the project called for SAIC to convert the existing secondary heat balance into a version that would run on the new system. The Factory

Acceptance Test (FAT) of the converted secondary heat balance was conducted in September of 1993. The FAT of the secondary heat balance was a detailed test of the software package and was designed to test many of the secondary heat balance features. The Site Acceptance Test (SAT) was conducted as part of the installation process during the third refueling outage and involved performing a small subset of the FAT tests, as well as, verifying proper operation of the secondary heat balance during power ascension. Both the FAT and SAT were one time procedures conducted by the vendor and witnessed by North Atlantic.

A review of the secondary heat balance software determined that the reliability check, intended to prevent thermal power calculations with unreliable feedwater flow, did not exist. Subsequent investigation determined that during the MPCS Replacement Project, the reliability check had been removed while conducting the FAT of the secondary heat balance. During the test, a Problem Change Report (PCR) was written against the secondary heat balance to correct a display error in the calculation of average corrected feedwater flow. The error appeared on the secondary heat balance display when Steam Generator Blowdown (SGBD) flow inputs were unreliable. The main feedwater flow information on the display provides additional information but does not impact the critical outputs of the secondary heat balance. In the process of correcting the error, the line of code that performed the main feedwater flow reliability check was inadvertently deleted. A review of the FAT documentation and software change documentation shows that the feedwater reliability check was deleted during the resolution of the PCR. The documentation did not, however, indicate which retests were performed.. It is postulated that the test case that identified the problem (unreliable SGBD inputs) was reperformed. The reperformance of the test case was completed after the tests for unreliable feedwater flow inputs were successfully completed. Thus, the code deletion error was undetected. Subsequent testing conducted during the Site Acceptance Test (SAT) also failed to uncover the error.

SAFETY CONSEQUENCES

There were no adverse safety consequences as a result of this event. The effects of AFD being outside the required target band, with the reactor operating at less than 50% power, are negligble. Operation outside the target band will result in the accumulation of penalty minutes, which will be in the magnitude of one penalty minute for every two minutes of plant operation outside the required band, when less than 50% power. Penalty minutes, in this case, may have placed a restriction on the maximum power level the plant may be operated. Had the plant operated outside the target band and accumulated in excess of 1 hour cumulative penalty time operation would have been restricted by Technical Specifications. The plant would not have been allowed to operate greater 50% power until which time the accumulated penalty minutes had decreased to less than 1 hour total. Thus, the plant could operate indefinately less than 50% power with AFD outside the required target band. The resultant would be the accumulation of penalty minutes and a longer wait prior to raising power above 50%.

CAUSE OF EVENT

The root cause of this event was determined to be personnel error on the part of the vendor during the completion of the replacement main plant computer installation. In the process of correcting a sequencing error, on an unrelated problem, a line of computer code was inadvertently deleted. This line of computer code functioned to provide the feedwater flow reliability check for information inputting into the calorimetric. The absence of this reliability check provided control room operators with inaccurate information regarding the thermal power level.

CORRECTIVE ACTIONS

Corrective actions taken upon the identification of this condition were to monitor and log AFD on an hourly basis. This supplemental monitoring was terminated on July 5, 1995 at which time the steam generator loop D feedwater flow inputs came into its required range and indicated reliable information. The secondary heat balance software will be corrected to include the reliability checking of feedwater flow input. Additional corrective actions will include: reviewing other Problem Change Reports generated against the secondary heat balance, during the time of the MPCS Replacement Project, to ensure the individual problems were properly implemented and tested. Also, a review of Adverse Condition Reports (ACR) will be performed to identify any potential similar computer related problems.

PLANT CONDITIONS

At the time of this event the plant was in MODE 1 at 15% power, with the Reactor Coolant System (RCS) temperature at 563° Fahrenheit and pressure at 2235 psig.

PREVIOUS OCCURRENCES

This is the first event of this type at Seabrook Station. North Atlantic reported to the NRC in LER 95-018-00, an event involving a MPCS software problem for the Rod Deviation Monitor. These events are dissimilar in that the operators did not initiate a rod deviation augmented surveillance based on uncertainty associated with rod deviation computer alarms. The event described in this report involve unreliable information being presented to the operators without normal methods of indicating unreliable data.