

**North
Atlantic**

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The Northeast Utilities System

January 10, 1997

Docket No. 50-443
NYN-97005

United States Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, D.C. 20555

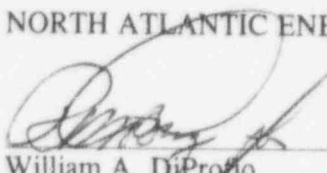
Seabrook Station
Licensee Event Report (LER) 96-009-00
Missed Surveillance PCCW Rate of Change Monitor Alarm

Enclosed, please find Licensee Event Report (LER) No. 96-009-00 for Seabrook Station. This submittal documents an event which occurred on December 12, 1996. This event is being reported pursuant to 10CFR50.73(a)(2)(i).

Should you require further information regarding this matter, please contact Mr. Allen L. Legendre, Jr., Nuclear Licensing Supervisor, at (603) 773-7773.

Very truly yours,

NORTH ATLANTIC ENERGY SERVICE CORP.


William A. DiProffo
Station Director

cc: H. J. Miller, Regional Administrator
A. W. De Agazio, NRC Project Manager, Seabrook Station
J. B. Macdonald, Senior Resident Inspector, Seabrook Station

INPO
Records Center
700 Galleria Parkway
Atlanta, GA 30339

9701210206 970110
PDR ADOCK 05000443
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LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)

Seabrook Station

DOCKET NUMBER (2)

05000443

PAGE (3)

1 of 4

TITLE (4)

MISSED SURVEILLANCE PCCW RATE OF CHANGE 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
12	12	96	96	009	00	01	10	97	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		100	20.2203(a)(1)		20.2203(a)(2)(v)		<input checked="" type="checkbox"/> 50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(ii)		20.2203(a)(3)(iii)		<input type="checkbox"/> 50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(iii)		20.2203(a)(4)		<input type="checkbox"/> 50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		<input type="checkbox"/> 50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366 a	
			20.2203(a)(2)(iv)		50.36(c)(2)		<input type="checkbox"/> 50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Allen L. Legendre, Jr., Nuclear Licensing Supervisor

TELEPHONE NUMBER (Include Area Code)

(603) 773-7773

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)

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION	MONTH	DAY	YEAR
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input type="checkbox"/> NO		04	12	97

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

Technical Specification 4.3.3.9, Table 4.3-5, Item 4a, requires that a Channel Calibration be performed on the Primary Component Cooling Water (PCCW) [CC] Head Tank Rate of Change Monitor on a Refueling Interval. The Seabrook Station design utilizes a PCCW Head Tank Rate of Change Monitor in lieu of Service Water (SW) [BI] Radiation Monitors to detect leakage from the PCCW system to Service Water.

Contrary to this requirement, a complete calibration of the PCCW Head Tank Rate of Change Monitor has not been performed on the required Refueling Interval because the alarm function has not been tested. A licensee-initiated Design Bases Review discovered this condition.

A Work Request was performed on 12/18/96 which successfully verified the alarm function of the PCCW Head Tank Rate of Change Monitor.

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

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1) Seabrook Station	DOCKET NUMBER (2) 05000443	LER NUMBER (6)				PAGE (3) 2 of 4
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		96	--	009	--	00

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

I. Description of Event

The Seabrook Station design utilizes a Primary Component Cooling Water (PCCW) System Head Tank Rate of Change Monitor in lieu of Service Water (SW) Radiation Monitors to detect leakage from the PCCW System to SW. Technical Specification 4.3.3.9, Table 4.3-5, Item 4a, requires that a Channel Calibration be performed on the PCCW Head Tank Rate of Change Monitor on a Refueling Interval. The Technical Specifications define Channel Calibration as "the adjustment, as necessary, of the channel such that it responds within the required range and accuracy to known values of input. The CHANNEL CALIBRATION shall encompass the entire channel including the sensors and alarm, interlock and/or trip functions and may be performed by any series of sequential, overlapping, or total channel steps such that the entire channel is calibrated". A review of the Instrument and Control Department (I&C) calibration procedures intended to satisfy the Channel Calibration Surveillance requirement of Technical Specification 4.3.3.9, Table 4.3-5, Item 4a, identified that the surveillance procedures do not test the alarms associated with the PCCW Head Tank Rate of Change Monitor. This condition was identified as part of a licensee-initiated Design Bases review.

The I&C calibration procedures calibrate the PCCW level transmitters which input to the Rate of Change Monitor, however, these procedures did not include verification of the PCCW Head Tank Rate of Change Monitor alarm function.

Control Room operators perform a Channel Check on the PCCW Head Tank Rate of Change Monitor each shift and document this check on the "Tech Spec and Commitment Log". The Channel Check is performed by an operator manually calculating a PCCW Head Tank Rate of Change and comparing this value to the value generated by the PCCW Head Tank Rate of Change Monitor.

The event is not considered safety significant since the monitor and alarm have been functional since initial plant operation as determined by 1) the Work Request performed on December 18, 1996, 2) a review of alarm archives since initial operation which concluded that the alarm has been functional, and 3) the Channel Check performed by operators each shift.

II. Cause of Event

Evaluation of the cause of this event is continuing. A supplement to this report will provide the results of this evaluation. The supplement is expected to be submitted by April 12, 1997.

III. Analysis of Event

In 1984, Reactor Engineering (RE) developed the PCCW Head Tank Rate of Change Monitor as an algorithm and code on the Main Plant Computer System (MPCS) [ID]. The monitor calculates the volume rate of change for both trains of PCCW Head Tanks and provides an alarm when the programmed rate of change setpoint is exceeded. Development of this software included independent, documented and thorough pre-installation testing, and a test for functionality upon installation on the original MPCS. In addition, this software, including the alarm function, was fully exercised during a portion of the start-up test for the PCCW system, 1-PT-16.1.

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		96	--	009	--	00

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

The original MPCCS was replaced in 1994. All software was factory tested by repeating all original pre-installation test cases on the new MPCCS. This test included the PCCW Head Tank Rate of Change Monitor alarm function. Functional testing of the new MPCCS was performed following installation in the plant.

A typical instrument channel consists of a sensor/transmitter which is connected to various circuit cards which process the electronic signal. The electronic output of these various circuit cards is then connected to output devices such as indicators, recorders, controllers, protection circuits, hardwire alarms and the MPCCS. A typical channel calibration will check all the associated electronic circuitry including the initial computer points. These initial computer points include analog points which provide a process value corresponding to electronic signal and digital points which provide on/off logic based on the comparing the electronic signal to a predetermined setpoint.

The PCCW Head Tank Rate of Change Monitor differs from a typical instrument channel in that the computer analog points are further processed by the computer to determine a process rate of change prior to initiating an alarm function. The computer software that performs the rate of change calculation is not considered traditional I&C circuitry.

Historically, the I&C Department has been responsible for performing instrument channel calibrations up to and including the initial MPCCS datapoints. The PCCW Head Tank Rate of Change Monitor is different because it relies on software that uses the initial MPCCS datapoints to determine a rate of change and corresponding alarms. This difference is suspected to have contributed to oversight of the alarm function.

The I&C Department developed the instrument calibration procedures. No documentation could be found to indicate if the PCCW Head Tank Rate of Change Monitor Technical Specification was considered during the development of the associated calibration procedures.

IV. Corrective Action

Completed Corrective actions include:

- The service water was sampled for radioactivity levels at least once per 12 hours in accordance with the Technical Specification Action Statement requirement for inoperable PCCW Head Tank Rate of Change of Monitors.
- A Work Request was performed on December 18, 1996 and verified the operability of the PCCW Head Tank Rate of Change Monitor and alarm function.
- Computer Engineering conducted an archive review of the PCCW alarm points. This review verified functionality of the PCCW Head Tank Rate of Change monitoring software during Cycles 1 through 4.

Additional corrective actions will be reported in the supplement to this report.

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TEXT CONTINUATION

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

V. Additional Information

Evaluation of this event is continuing. Any changes or additional information resulting from this evaluation will be reported in the supplement to this report.

During evaluation of this event, North Atlantic reviewed the Reactor Engineering Technical Data Book Figure RE-22, *MPCS Monitor Definitions*, to determine if similar circumstances exist for other monitors. One monitor, the Containment Drain Sump In-leakage Monitor, was also found to have a Technical Specification Channel Calibration requirement. This monitor was developed under the same conditions and during the same time frame as the PCCW monitor. Evaluation of this monitor is in progress.

Similar Events

Seabrook Station has experienced other instances in which Technical Specification surveillance requirements have been missed. Of these events, five have some similarity, but are not directly related in that they do not involve the failure to verify alarms generated by computer software.

Two events involved portions of Channel Calibrations which were not surveilled. Both of these instances involved portions of circuitry that were not checked. The cause of these events were determined to be lack of Design Engineering involvement in the initial surveillance procedure development.

Three other events were related to the Main Plant Computer (MPCS).

One involved safety related alarms assigned to the Printer Logger only and not the Video Alarm Screen (VAS). The cause of this event was determined to be design omission or oversight in the original plant design.

The second involved a missed Control Rod Position surveillance when the surveillance frequency was increased due to an inoperable Rod Deviation Monitor. The cause of this event was determined to be due to lack of an Alarm Response Procedure and the misunderstanding of control rod position data as presented by the MPCS.

The third involved a missed Axial Flux Distribution (AFD) surveillance when the surveillance frequency was increased due to an inoperable AFD Monitor. The cause of this event was determined to be due to personnel error on part of the computer vendor. During the process of correcting an unrelated problem, computer code was inadvertently deleted.

Manufacturer Data

Not applicable.