



**North  
Atlantic**

North Atlantic Energy Service Corporation  
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The Northeast Utilities System

December 3, 1999

Docket No. 50-443

NYN-99102

ACR 99-4488

AR#99015626

United States Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Seabrook Station  
Licensee Event Report (LER) 98-013-01  
Valves Not Included Within the Scope of the Seabrook Station IST Program

Enclosure 1 is Licensee Event Report (LER) 98-013-01 for an event that occurred at Seabrook Station on December 14, 1998. This event is being reported pursuant to 10 CFR 50.73(a)(2)(i). Enclosure 2 is a list of North Atlantic Energy Service Corporation (North Atlantic) commitments made in response to this LER.

Should you require further information regarding this matter, please contact Mr. James M. Peschel, Manager-Regulatory Programs at (603) 773-7194.

Very truly yours,

NORTH ATLANTIC ENERGY SERVICE CORP.

Ted C. Feigenbaum  
Executive Vice President and  
Chief Nuclear Officer

cc: H. J. Miller, NRC Regional Administrator  
R.M. Pulsifer, NRC Project Manager, Project Directorate 1-2  
R. K. Lorson, NRC Senior Resident Inspector

JE22

PAU mdoc 03000443

**ENCLOSURE 1 TO NYN-99102**

# 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 (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.

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**TITLE (4)**  
Valves Not Included Within the Scope of the Seabrook Station IST Program

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	14	98	98	013	01	12	03	99	FACILITY NAME	DOCKET NUMBER
<b>OPERATING MODE (9)</b>		1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b>							
<b>POWER LEVEL (10)</b>		100	20.2201(b)			20.2203(a)(2)(v)			<input checked="" type="checkbox"/> 50.73(a)(2)(i)	50.73(a)(2)(viii)
			20.2203(a)(1)			20.2203(a)(3)(i)			50.73(a)(2)(iii)	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)**

<b>NAME</b> James M. Peschel, Manager - Regulatory Programs	<b>TELEPHONE NUMBER (Include Area Code)</b> (603)773-7194
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**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)**

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/> NO	<b>EXPECTED SUBMISSION</b>	<b>MONTH</b>	<b>DAY</b>	<b>YEAR</b>

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

On December 14, 1998, with the plant at 100% power, it was determined that six American Society of Mechanical Engineering (ASME) Section III Code Class 3 primary component cooling water (PCCW) system valves were incorrectly omitted from the scope of the Inservice Test (IST) program. This condition was discovered as a result of an engineering review of the IST program being performed to support the second ten-year test interval update. This engineering review determined that the subject valves have a safety function to close in order to support operation of the PCCW system. As a result of their safety related function, these valves should have been tested within the scope of the Seabrook Station IST program as required by Technical Specification Surveillance Requirement 4.0.5 and the ASME Section XI Code. On January 8, 1999, as a result of the continuing engineering review of the IST program, 27 additional valves were determined to require testing. Upon further engineering review, it has been determined that 13 of the 27 additional valves previously reported were not required to be included within the scope of the IST program. It has also been determined that 3 other valves should be tested within the scope of the program. Failure to test the subject valves within the scope of the IST program is reportable pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B).

The cause of the event was inadequate preparation and review of the IST program content. There were no adverse safety consequences as a result of this event. A number of corrective actions have been initiated and completed as a result of this event. This is the first event of this type reported by Seabrook Station.

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

I. Description of Event

On December 14, 1998, with the plant at 100% power, it was determined that six American Society of Mechanical Engineering (ASME) Section III Code Class 3 primary component cooling water (PCCW) [CC] system valves were incorrectly omitted from the scope of the Inservice Test (IST) program. This condition was discovered as a result of an engineering review of the IST program being performed to support the second ten-year test interval update. The subject valves are the PCCW radiation monitor inlet air-operated isolation valves (CC-V975 and CC-V986) and the PCCW radiation monitor outlet check valves (CC-V944, CC-V945, CC-V946 and CC-V947). The radiation monitors (RM-RE-6515 and RM-RE-6516) analyze liquid samples from the discharge of the PCCW system pumps and return the liquid to the suction side of the pumps. These valves are located at an ASME Code Class 3 to Non-Nuclear Safety (NNS) boundary. This engineering review determined that the subject valves have a safety function to close to isolate the NNS piping (radiation monitor side) of the subject valves in order to support safe operation of the PCCW system as required by the plant design.

On December 17, 1998 testing of the subject PCCW air-operated valves indicated that they stroked closed erratically and that their remote position indicators did not properly indicate valve position. Testing of the subject PCCW check valves indicated that they exhibited excessive leakage. As a result of the testing, the radiation monitors were isolated, declared inoperable and the appropriate Technical Specification action statements were entered. A subsequent operability determination concluded that the structural integrity of the radiation monitor skirts and associated NNS piping beyond the subject valves would be maintained as a result of a design basis accident.

Technical Specification Surveillance Requirement (SR) 4.0.5 requires that IST of ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the Code) and applicable addenda as required by the 10 CFR Part 50, Section 50.55a(g). For the first ten-year inspection and test interval, Seabrook Station is committed to the 1983 Edition of Section XI including addenda through the Summer of 1983. Due to the safety related function of the subject valves to support operation of the PCCW sub-systems, these valves should have been tested within the scope of the Seabrook Station IST program as required by subarticle IWV-1100 of the Code. Failure to test the subject valves within the scope of the IST program and SR 4.0.5 is reportable pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the Technical Specifications.

On January 8, 1999, as a result of the continuing engineering review described above, 27 additional valves were determined to require testing within the scope of the IST program as required by SR 4.0.5 and 10 CFR 50.55a and were included in revision 00 of this LER. Upon further engineering review, it has been determined that 13 of the 27 additional valves previously reported were not required to be included within the scope of the IST program. It has also been determined in this engineering review that 3 other valves should be tested within the scope of the program. The 17 additional valves requiring testing are identified as follows:

PCCW to Centrifugal Charging Pump [CC] (CCP) Oil Cooler Check Valves (CC-V1282 and CC-V1283)

These check valves were determined to have a safety function to open to allow PCCW system flow to pass to the CCP oil coolers.

Reactor Coolant Pump Seal Injection Check Valves [CB] (CS-V2, CS-V18, CS-V34, CS-V50, CS-V471, CS-V472, CS-V473 and CS-V474)

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These check valves were determined to have a safety function to close to isolate reactor coolant flow in the event of a piping break upstream of the subject check valves.

CCP Discharge and Alternate Seal Injection Supply Manual Valves [CB] (CS-V210, CS-V220, CS-V219 and CS-V221)

The CCP discharge manual isolation valves were determined to have an active safety function to close and the Alternate Seal Injection Supply Manual Valves were determined to have an active safety function to open to direct CCP discharge to the reactor coolant pump seal injection header in the event of a failure of the charging line flow control valve (CS-FCV121) in the closed position.

CVCS Letdown Line Relief Valve [CB] (CS-V148)

This valve was determined to have an active safety function to open to provide protection for components upstream of CS-V149 (Containment Penetration X-37A Isolation Valve).

Boric Acid Tank Outlet Isolation Valves [CB] (CS-V410 and CS-V416)

These valves were determined to have an active safety function to open and close to align a flow path from either of the boric acid tanks to the boric acid transfer pumps in order to establish a boration flow path.

Failure to test the additional valves within the scope of the IST program and SR 4.0.5 is also reportable pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the Technical Specifications.

II. Cause of Event

The cause of the IST program scope anomalies was inadequate preparation and review of the IST program content. Certain design and licensing requirements as they pertain to the IST program were not well understood and documented.

III. Analysis of Event

The safety consequences of not testing the subject valves within the scope of the IST program are minimal.

PCCW Radiation Monitor Isolation Valves

The primary functions of the PCCW system are to remove heat from radioactive systems and components and to act as an intermediate barrier between radioactive fluid systems and the environment during normal and emergency plant evolutions. The PCCW system consists of two redundant and independent loops each containing an individual radiation monitor skid with associated piping and isolation valves.

The PCCW radiation monitors analyze PCCW system fluid for radioactivity which may be indicative of a leak from the reactor coolant system or one of the radioactive systems cooled by PCCW. The radiation monitor inlet lines contain normally open (fail close) air-operated valves which are designed to automatically close when the

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PCCW head tank level reaches its low level setpoint. The radiation monitor outlet lines contain two check valves in series which also provide an isolation function. The subject valves are located at an ASME Code Class 3 to Non-Nuclear Safety (NNS) boundary. It was determined that the subject valves had a safety function to close to isolate the NNS piping (radiation monitor side) of the subject valves in order maintain PCCW system inventory to support safe operation of the PCCW system.

A failure of the subject valves to isolate as designed did not significantly impact the operation of the PCCW system to perform its safety related functions. A system operability determination performed as a result of this event concluded that the piping system from the PCCW discharge headers through the radiation monitors and return to the PCCW pump suction headers will maintain its pressure boundary integrity during design basis events even with the failure of the subject valves to isolate. These valves were added to the IST program and successfully tested during refueling outage O6.

**PCCW to Centrifugal Charging Pump (CCP) Oil Cooler Check Valves (CC-V1282 and CC-V1283)**

As identified above, the primary functions of the PCCW system are to remove heat from radioactive systems and components and to act as an intermediate barrier between radioactive fluid systems and the environment during normal and emergency plant evolutions. There was a reasonable expectation that the subject valves would open as required. The charging pump lube oil coolers each require a flow rate of 34 gallons per minute (gpm) to support operation of the CCPs. During the quarterly operability testing of the PCCW pumps, a minimum flow of 34 gpm had been verified through a flow instrument located downstream of the subject valves. Though not credited in the IST program, the subject check valves were being full-stroke exercised to the open position as required by the ASME Code. These valves were added to the IST program and successfully tested during refueling outage O6.

**RCP Seal Injection Check Valves (CS-V2, CS-V18, CS-V34, CS-V50, CS-V471, CS-V472, CS-V473 and CS-V474)**

The subject check valves are located at the ASME Class 1 to Class 2 boundary in the RCP seal injection lines. These valves had been tested to the full-stroke open position on a quarterly basis within the scope of the IST program. As identified above, these valves also have a function in the closed position as reactor coolant boundary isolation valves. Even though these valves had not been closure tested within the scope of the IST program there was a reasonable expectation that the valves would close as designed. The subject check valves are rugged stainless steel piston style valves which are similar in design to the Safety Injection (SI) Hot and Cold Leg Injection check valves. Operating experience and past open exercise test experience had indicated that these were good performing valves. These valves were added to the IST program and successfully tested during refueling outage O6.

**CCP Discharge and Alternate Seal Injection Supply Manual Valves (CS-V210, CS-V220, CS-V219 and CS-V221)**

The primary functions of the Chemical and Volume Control System are to maintain the programmed water level in the pressurizer, to maintain seal water injection flow to the number 1 seals of the reactor coolant pumps, to control reactor coolant system water chemistry and to provide a source of emergency core cooling. The subject manual valves are manually actuated (CS-V219 or CS-V221 to open) (CS-V210 or CS-V220 to close), in order to establish an alternate charging flow path in the event of a failure of CS-FCV121 to operate. Even though the subject manual valves were not specifically tested within the scope of the IST program, there was a reasonable expectation that they would operate as required. The CCP discharge valves (CS-V210 and CS-V220), although

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not credited in the IST program, were exercised open and closed during the performance of the quarterly CCP performance test. The alternate seal injection supply valves (CS-V219 and CS-V221) are stainless steel globe valves which are normally locked closed and have not been subject to a significant degradation mechanism during system operation. These valves were added to the IST program and successfully tested during refueling outage 06.

**CVCS Letdown Line Relief Valve (CS-V148)**

The primary functions of the CVCS are to maintain a programmed water level in the pressurizer, to maintain seal water injection flow to the number 1 seals of the reactor coolant pumps, to control reactor coolant system water chemistry and to provide a source of emergency core cooling. During normal plant operation, a letdown path from the RCS to the CVCS is in service to assist in providing purification and chemistry control of the RCS.

The subject relief valve is located on the letdown line downstream of letdown flow and pressure control valves (CS-HCV-189 and CS-HCV-190) and is upstream of the inside containment isolation valve (CS-V149). This valve provides protection for components upstream of CS-V149. There is reasonable assurance that the subject valve would operate if required. The subject valve was successfully setpoint tested as part of the Relief/Safety Valve Test Program during refueling outages 04 and 05.

**Boric Acid Tank Outlet Isolation Valves (CS-V410 and CS-V416)**

As described above, one of the functions of the CVCS is to control reactor coolant system water chemistry. The subject manual valves are located at the outlet of the boric acid tanks (CS-TK-4A and CS-TK-4B). These valves are normally maintained open to provide a flow path of borated water to the boric acid transfer (BAT) pumps (CS-P-3A and CS-P-3B). Under certain plant conditions, it is required that both BAT pumps be aligned to take suction from one boric acid tank. In order to attain this alignment, it is necessary that the subject valves be operated to the open or closed position as required. There is reasonable assurance that the subject valves would operate if required. The subject valves are normally maintained open manual valves during normal system operation. A review of the maintenance history of the subject valves indicates that they have not failed to operate when required.

**IV. Corrective Action**

1. The subject PCCW system valves were repaired and tested prior to the completion of the refueling outage 06.
2. The thirty-three valves originally identified as requiring testing within the IST program in revision 00 of this LER were included in the IST program and tested. It has been concluded that 13 of the valves reported in revision 00 did not require testing within the scope of the IST program.
3. A multi-disciplined review to define certain design and licensing requirements used to determine the scope of components included within the IST program has been completed.
4. The additional 3 valves (CS-V148, CS-V410 and CS-V416) identified as a result of the ongoing engineering review will be included and tested within the scope of the IST program prior to the completion of refueling outage (OR07).

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5. The applicable UFSAR sections identified during the engineering review of the IST program will be revised.

V. Additional Information

None.

Similar Events

This is the first event of this type reported by Seabrook Station.

Manufacturer Data

Not applicable.



**ENCLOSURE 2 TO NYN-99102**

## North Atlantic Commitments Contained in NYN-99102

### **Description of Commitment**

- AR#99015626-02** The 3 additional valves (CS-V148, CS-V410 and CS-V416) identified as a result of the on-going engineering review will be included and tested within the scope of the IST program prior to the completion of refueling outage 07.
- AR#99015626-03** The applicable UFSAR sections identified during the engineering review of the IST program will be revised.