

North
Atlantic

North Atlantic Energy Service Corporation
P.O. Box 300
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The Northeast Utilities System

May 29, 1997

Docket No. 50-443
NYN-97059

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

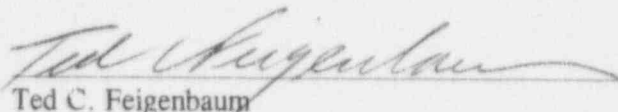
Seabrook Station
Licensee Event Report (LER) 97-005-01
Misposition of Main Steam Line Radiation Monitor

Enclosed, please find Supplemental Licensee Event Report (LER) No. 97-005-01 for Seabrook Station for an event which occurred on March 14, 1997. This event is being reported pursuant to 10 CFR 50.73(a)(2)(i).

Should you require further information regarding this matter, please contact Mr. Terry L. Harpster, Director of Licensing Services, at (603) 773-7765.

Very truly yours,

NORTH ATLANTIC ENERGY SERVICE CORP.



Ted C. Feigenbaum
Executive Vice President and
Chief Nuclear Officer

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
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Atlanta, GA 30339

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LICENSEE EVENT REPORT (LER)

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digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED BURDEN
LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FEED
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ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-
6 P33), 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)

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TITLE (4)

MISPOSITION OF MAIN STEAM LINE RADIATION MONITORS

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
03	14	97	97	005	01	05	27	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	20.2201(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)		<input type="checkbox"/> 50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		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 366A	
			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)

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

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

On March 14, 1997 North Atlantic Energy Service Corporation (North Atlantic) discovered that the four Main Steam Line Radiation Monitors (MSLRM) were positioned downstream of the pipe branches to the atmospheric steam dump valves (ASDV) contrary to the UFSAR piping and instrumentation diagrams for the Main Steam System. With the MSLRMs located downstream of the ASDV pipe branches, radioactive steam releases through these valves under steam generator tube rupture accident conditions would not have been correctly quantified and non-conservative input data could have been used by the emergency plan dose projection models. For the period from full power license issuance in March 1990 to March 20, 1997, as a result of the mispositioning of the MSLRMs, non-conservative input data could have been used by the dose projection models which could have resulted in an underestimation of offsite radiation doses, and inappropriate protective action recommendations. The condition described in this LER is limited to a steam generator tube rupture accident. It would not have affected emergency classifications or protective action recommendations initiated based on plant Critical Safety Function conditions, field monitoring results, or radioactive releases from the plant vent. During normal operation, steam releases from the ASDVs are quantified as to radiological content by sampling and analysis of the Main Steam System. This condition was discovered during a system walkdown performed as part of operator training. This event is being reported pursuant to 10 CFR 50.73(a)(2)(i).

The causes of this event are attributed to (1) human errors involving inadequate instrument plan drawings, installation details and P&ID walkdowns and (2) misjudgment errors during the preparation of a minor modification. The MSLRMs were declared inoperable on March 14, 1997.

The MSLRMs were repositioned upstream of the pipe branches to the ASDVs and the dose projection models revised to reflect the new location. The MSLRMs were declared operable at 1750 on March 20, 1997.

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)				PAGE (3)
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		97	--	005	--	01
Seabrook Station	05000443					2 of 5

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

I. Description of Event

On March 14, 1997 North Atlantic Energy Service Corporation (North Atlantic) discovered that the four Main Steam Line Radiation Monitors [IL] (MSLRM) were positioned downstream of the pipe branches to the atmospheric steam dump valves (ASDV) contrary to the UFSAR piping and instrumentation diagrams (P&IDs) for the Main Steam System. With the MSLRMs located downstream of the ASDV pipe branches, radioactive steam releases through these valves under steam generator tube rupture accident conditions would not have been correctly quantified and non-conservative input data could have been used by the emergency plan dose projection models. For the period from full power license issuance in March 1990 to March 20, 1997, as a result of the mispositioning of the MSLRMs, non-conservative input data could have been used by the dose projection models which could have resulted in an underestimation of offsite radiation doses, and inappropriate protective action recommendations. The condition described in this LER is limited to a steam generator tube rupture accident. It would not have affected emergency classifications or protective action recommendations initiated based on plant Critical Safety Function conditions, field monitoring results, or radioactive releases from the plant vent. During normal operation, steam releases from the ASDVs are quantified as to radiological content by sampling and analysis of the Main Steam System. Normal operational steam releases from the ASDVs constitute a very small fraction of the Technical Specification radioactive effluent limit. This condition was discovered during a system walkdown performed as part of operator training. This event is being reported pursuant to 10 CFR 50.73(a)(2)(i) as a condition prohibited by Technical Specifications.

The four MSLRMs, RM-RE-6481-1/2 and RM-RE-6482-1/2, were not physically located as specified on the Main Steam System P&IDs, UFSAR Figures 10.3-2, Sheets 1 and 2. The P&IDs specify the location of the MSLRMs as adjacent to the main steam lines upstream of the piping branches to the ASDVs whereas the actual location of the MSLRMs was downstream of the pipe branches to the ASDVs. Additionally, UFSAR Section 11.5.2.1.j. states that the MSLRMs are upstream of the "safety relief valves." The MSLRMs are located upstream of the main steam safety valves. UFSAR Table 7.5-1, Accident Monitoring Instrumentation List (Sheet 29 of 37), lists the MSLRMs as noble gas detectors for monitoring of the vent from the steam generator safety relief valves or the ASDVs.

This discrepancy was identified at 1430 on March 14, 1997, and the monitors were declared inoperable in accordance with Technical Specification (TS) 3.4.3.3. TS 3.3.3.1 requires the initiation of a preplanned alternate method of monitoring the main steam lines in the event that these radiation monitors are inoperable. Additionally, if the monitors are inoperable for greater than 7 days this TS requires the submittal of a Special Report within 14 days. The alternate method for steam line monitoring was conducted per procedure HX0958.12.

The MSLRMs were installed during plant construction in accordance with Engineering Change Authorization (ECA) 05/111374B dated November 4, 1995. Contrary to the FSAR P&IDs (at that time the FSAR had not been updated as required by 10CFR50.71(e)) the MSLRMs were installed adjacent to the main steam lines approximately one foot downstream of the pipe branches to the ASDVs. Subsequently, this location was found to be difficult to access by personnel working on the detectors. Maintenance and calibration of the MSLRMs required personnel to work beyond the walkway grating, creating a potential industrial safety hazard. An engineering minor modification (MMOD 91-556) was initiated in 1991 to relocate the MSLRMs approximately six feet further downstream from the pipe branches to the ASDVs and to install additional floor grating and railings. A walkdown performed in preparation of the modification did not identify the incorrect location of the MSLRMs. The MMOD was subsequently implemented on May 15, 1996.

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		97	--	005	--	01
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

II. Cause of Event

Two causes were identified for this event:

1. Human error/inappropriate action (1) during the plant construction phase resulting in an inadequate instrument plan drawing for the MSLRMs and (2) during P&ID walkdowns for operations.

The instrument plan drawings provided by the architect engineer, United Engineers and Constructors (UE&C), were inadequate since they did not show the location of the MSLRMs in relation to the ASDV pipe branches. Additionally, the installation details (ECA 05/111374B dated November 4, 1985) provided by UE&C did not reference the location of the MSLRMs as specified in the FSAR. Discussions with an engineer involved with the preparation of the instrument location plan indicated that, in retrospect, the location of the MSLRMs in relation to the ASDV pipe branches should have been specified.

The development of New Hampshire Yankee (currently North Atlantic) P&IDs (which were converted from UE&C drawings), included an extensive effort in the 1985 to 1986 time frame to walkdown and verify all P&IDs prior to issuing them for operations. The walkdown verified the relative sequence of components and pipe branches in the line. The walkdown effort did not identify the installation discrepancy of the MSLRMs. A possible reason why the mispositioning was not identified during the walkdown may have been that the MSLRMs are mounted adjacent to the line and are not strapped to the line, nor do they physically penetrate the line. The P&ID walkdown effort, which focused on components attached to the piping, did not identify this installation discrepancy.

2. Misjudgment errors were made by the engineers preparing MMOD 91-556 who failed to identify the incorrect MSLRM location.

The engineers preparing MMOD 91-556 were cognizant of the UFSAR requirement that the MSLRMs must be installed upstream of the ASDVs pipe branches. However, it was not recognized that the MSLRMs were originally incorrectly installed downstream of the ASDV pipe branches. A 10CFR50.59 applicability screening was conducted for the MMOD, however, a safety evaluation was not performed since it was concluded that a change to the facility as defined in the UFSAR was not being made. This conclusion was reached because it was believed that the MSLRMs were only being moved slightly downstream from their original location, but that they were still upstream of the ASDVs.

At least two field walkdowns were performed to support the development of MMOD 91-556. The initial walkdown was performed by the original design engineer, the system engineer and engineers developing the offsite dose projection model. After MMOD 91-556 was assigned to a new design engineer a second walkdown was performed. The second walkdown was performed by the design engineer as part of the MMOD development process and simply confirmed that there were no pipe branches between the old and the new MSLRM locations. During the review of this MMOD, the system engineering supervisor responsible for this system was also unaware that the MSLRMs were incorrectly positioned and indicated on the review sheet that this modification had no impact on the system drawings or other documents.

The common error made by all of the engineers was the assumption that the MSLRMs were originally installed correctly. This assumption was not correct.

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III. Analysis of Event

The function of the MSLRMs is to monitor steam releases from the Main Steam System for activity and to (1) provide data to the Radiation Data Monitoring System host computer in support of the system alarm, display and documentation functions (2) provide data input to the emergency plan dose projection models, and (3) provide information to the control room operators to assist in the identification and isolation of a ruptured steam generator.

The incorrect MSLRM locations would not have adversely affected the control room operator's ability to identify elevated radiation levels in the main steam lines due to a ruptured steam generator. With the MSLRMs located downstream of the ASDV pipe branches, radioactive steam releases through these valves, under steam generator tube rupture accident conditions, would not have been correctly quantified and non-conservative input data could have been used by the emergency plan dose projection models. For the period from full power license issuance in March 1990 to March 20, 1997, as a result of the mispositioning of the MSLRMs, non-conservative input data could have been used by the dose projection models which could have resulted in an underestimation of offsite radiation doses, and inappropriate protective action recommendations. The condition described in this LER is limited to a steam generator tube rupture accident. It would not have affected emergency classifications or protective action recommendations initiated based on plant Critical Safety Function conditions, field monitoring results, or radioactive releases from the plant vent. During normal operation, steam releases from the ASDVs are quantified as to radiological content by sampling and analysis of the Main Steam System. Normal operational steam releases from the ASDVs constitute a very small fraction of the Technical Specification radioactive effluent limit as confirmed by the effluent monitoring program as described in the Offsite Dose Calculation Manual.

The MSLRM does not function as an effluent monitor as identified in Technical Specifications. Any leakage of radioactive materials into the secondary system is normally monitored by the condenser off-gas radiation monitor which is more sensitive than the MSLRM in identifying increases in secondary system radiological activity. The condenser off-gas effluent flows into the plant vent which is again monitored by the plant vent radiation monitor. The steam generator blowdown liquid radiation monitor will also function to identify increases in secondary system radiological activity.

IV. Corrective Action

- 1) A design change was implemented to relocate the MSLRMs approximately 24 inches upstream of the pipe branches to the ASDVs. Additionally, the software for the emergency plan offsite dose projection models were revised to reflect the new correct location. The MSLRMs were declared operable at 17:50 on March 20, 1997.
- 2) North Atlantic has performed a field walkdown to verify the correct location of other radiation detectors that are located adjacent to piping. This verification was completed on May 9, 1997, prior to the current refueling outage in accessible plant areas.
- 3) North Atlantic will complete the field walkdown to verify the correct location of the remaining radiation detectors located adjacent to piping when the subject locations become accessible. This walkdown will also include radiation detectors identified in the Technical Specifications and other safety related radiation detectors. Currently, this effort has identified a minor discrepancy with the P&ID for the Control Building Air east intake

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radiation detectors. While the four detectors are installed in the proper location in the east air intake, they are in a different order than shown on the P&ID. This is a minor discrepancy and does not adversely affect the operability of the subject detectors.

4) Engineering management will review the causal factors for this event with engineering personnel and stress the importance of identifying the design bases for design changes and the need to adequately perform field walkdowns.

V. Additional Information

MMO 91-556 was issued in October 1995 and was prepared in accordance with the Design Control Manual. The format for design changes as described in the Design Control Manual did not specifically include a section to describe the bases of the current design. A revision to the manual in July 1996 directs design engineers to more thoroughly research the bases for any current design prior to developing changes.

A common cause review of Adverse Condition Reports relating to design and configuration control issues is being performed by North Atlantic. Any programmatic issues that are identified by this review will be addressed by the North Atlantic Corrective Action Program.

Similar Events

None.

Manufacturer Data

None

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DOCKET NUMBER (2)

05000443

PAGE (3)

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TITLE (4)

MISPOSITION OF MAIN STEAM LINE RADIATION MONITORS

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			20.2203(a)(2)(iv)		50.36(c)(2)				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 NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs

SUPPLEMENTAL REPORT EXPECTED (14)

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