NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
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.

# LICENSEE EVENT REPORT (LER)

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

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TITLE (4)

Service Water Effluent Not Monitored Per Requirements of Technical Specifications

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|---|---|---|---|---|---|---|---|---|---|---|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 03 | 06 | 97 | 97 | 003 | 00 | 04 | 07 | 97 | FACILITY NAME | DOCKET NUMBER |

| OPERATING MODE (9) | N | 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) |
|---|---|
| Robert W. Walpole, MP1 Nuclear Licensing Manager | (860)440-2191 |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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| SUPPLEMENTAL REPORT EXPECTED (14) | | EXPECTED SUBMISSION | 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 March 6, 1997, a review of plant drawings revealed that the Service Water (SW) System in the Reactor Building has a potential unmonitored release path. At the time of discovery, the plant was in COLD SHUTDOWN, and SW flow to and from the Reactor Building was isolated for maintenance. Spent Fuel Pool cooling was being provided from the Turbine Building Closed Cooling Water (TBCCW) System. An unmonitored release could occur if, Reactor Building Closed Cooling Water (RBCCW) leaked into the SW while the SW continuous vent lines of the RBCCW heat exchanger(s) were in service. The continuous vent lines were installed under a plant design change. The cause of the unmonitored release path was an inadequate design change package. An inadequate review of the design change was performed during the approval process. This resulted in the plant failing to realize that a new discharge path was created. Northeast Nuclear Energy Company (NNECO) will revise procedures to ensure that Service Water effluent from the Reactor Building is operated within design basis and Technical Specifications. There were no safety consequences, since there were no releases that exceeded the release limit. During the period of time when the RBCCW continuous vents were in service, 1987 to 1989, the RBCCW system had detectable contamination levels. This contamination was from a Spent Fuel Pool heat exchanger tube leak. Contamination levels were kept low by a feed and bleed of the RBCCW system. Isotopic sample results for the RBCCW fluid showed that the concentration of radionuclides was maintained below the limits allowed for radioactivity in effluents to unrestricted areas as defined by 10CFR20. In addition, SW flow through the Reactor Building would have provided at least a 10 to 1 dilution for any RBCCW fluid that leaked into the SW system and was discharged through the continuous vents. Therefore, this event has no safety significance.

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

I. Description of Event

On March 6, 1997, a review of plant drawings revealed that the SW System in the Reactor Building has a potential unmonitored release path. At the time of discovery, the plant was in COLD SHUTDOWN, and SW flow to and from the Reactor Building was isolated for maintenance. Spent Fuel Pool cooling was being provided from the TBCCW System.

The SW system design provides for continuous venting of the RBCCW heat exchangers to remove any accumulated gases in the outlet water box. Venting is for both in-service and standby heat exchangers. Liquid flow from these continuous vents bypasses the permanent radiological monitor (RE 1754). Also, this flow is not routinely monitored.

Originally float traps were used to provide a constant vent for the RBCCW heat exchangers. The elevation difference between heat exchangers and the SW discharge header easily creates a slight vacuum in the heat exchangers' outlet water boxes. Float traps require a positive pressure to vent gases, and do not function under a vacuum. Float traps were replaced with rotameters under a design change. Rotameter indication shows water flow or lack of water flow. Water flow indicates that the heat exchanger is vented. When there is no flow indication, operator action (adjustments in the outlet throttle valve) pressurizes the outlet water box. With the outlet water box pressurized, water and any accumulated gas would then be forced out of the continuous vent. Thus, there is indication that heat exchanger tubes are not air bound, and heat exchanger performance is not impaired.

The original float trap design only passed gas. After implementation of the design change, a vented heat exchanger is verified by ensuring water flow from a heat exchanger. The original design did not discharge liquid, thus an unmonitored liquid release path did not exist until after the installation of the rotameters. The design change was installed under a Plant Design Change Request (PDCR) in 1987. Neither the associated 10CFR50.59 Safety Evaluation nor the Radiological Environmental Review for the PDCR addressed the creation of the new liquid discharge path.

II. Cause of Event

The cause of the unmonitored release path was an inadequate design change package. An inadequate review of the design change was performed during the approval process. This resulted in the plant failing to realize that a new discharge path was created.

III. Analysis of Event

Section 3.8 of the Technical Specifications and the Radiological Effluent Monitoring and Offsite Dose Calculation Manual (REMODCM), Table C1, specifies that SW effluent from the Reactor Building is to be monitored. The requirements of the REMODCM are implemented via plant procedure SP 832. This procedure provides two options for sampling Reactor Building SW effluent. The procedure allows the SW sample to be collected from either the in-service heat exchanger(s), or the SW discharge header at the Millstone Unit No. 1 Discharge Structure. Flow from the continuous vents on the standby heat exchanger(s) is not monitored when the SW sample is collected from the in-service heat exchanger(s).

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Manipulation of the valves associated with the continuous vent lines are procedurally controlled. The current revision of these documents isolates the continuous vents. However, revisions of these documents used between 1987 and 1989 aligned the vent valves to continuously vent all RBCCW heat exchangers. While the continuous vents were in service, SW exited the Reactor Building from standby RBCCW heat exchanger(s). An unmonitored release could occur if, RBCCW leaked into the SW while the SW continuous vent lines of the RBCCW heat exchanger(s) were in service. Historical use of the continuous vents violated the monitoring requirements of the REMODCM and Technical Specification Surveillance Requirement 4.8.C.1. Thus, this event is reportable pursuant to 10CFR50.73(a)(2)(i) as any operation or condition prohibited by the plant's Technical Specifications.

The RBCCW heat exchangers and associated fresh water system remove nuclear decay heat from the Shutdown Cooling heat exchangers and from the Spent Fuel Pool heat exchangers. A radioactive liquid release from the SW effluent from the Reactor Building could only be caused by a high activity level in the RBCCW system concurrent with a tube leak in a RBCCW heat exchanger.

The RBCCW system activity is monitored by two methods: 1) a weekly chemistry grab sample isotopic analysis, and 2) a permanent RBCCW radiological monitor. If the RBCCW system were to experience a coolant ingress, the incident would be detected by one of the two above methods and appropriate corrective actions would be taken.

During the period of time when the RBCCW continuous vents were in service, 1987 to 1989, the RBCCW system had detectable contamination levels. This contamination was from a Spent Fuel Pool heat exchanger tube leak. Contamination levels were kept low by a feed and bleed of the RBCCW system. Isotopic sample results for the RBCCW fluid showed that the concentration of radionuclides was maintained below the limits allowed for radioactivity in effluents to unrestricted areas as defined by 10CFR20. In addition, SW flow through the Reactor Building would have provided at least a 10 to 1 dilution for any RBCCW fluid that leaked into the SW system and was discharged through the continuous vents. Therefore, this event has no safety significance. There were no safety consequences, since there were no releases that exceeded the release limit.

IV. Corrective Action

There are no immediate corrective actions required since the current procedures do not permit this unmonitored release path.

NNECO will revise procedures to ensure that SW effluent from the Reactor Building is operated within design basis and Technical Specifications prior to operating Cycle 16.

Additionally, NNECO will perform a review, prior to operating Cycle 16, if system configuration enhancements will be made.

The safety evaluation/screening process and training has been strengthened.

The design control process and the design engineering organization have been strengthened. The design control improvements include a revised Design Control Manual.

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V. Additional Information

Similar Events

97-005-00 Radwaste Storage Building Exhaust Fan Discharges to Atmosphere Without Radiation Monitoring

Manufacturer Data

Not Applicable