Northeast
Utilities System

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Northeast Utilities Service Company
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August 12, 1996

Docket No. 50-423
B15842

Re: 10CFR50.73(a)(2)(ii)(B)

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

This letter forwards a supplement Licensee Event Report 96-005-01, which provides additional information on a condition identified April 25, 1996 for Millstone Unit No. 3. The supplement updates LER 96-005-00 which was submitted pursuant to 10CFR50.73(a)(2)(ii)(B).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

M. H. Brothers
Unit Director, Millstone Unit No. 3

Attachment: LER 96-005-01

cc: H. J. Miller, Region I Administrator
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3

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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)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| Millstone Nuclear Power Station Unit 3 | 05000423 | 1 of 5 |

TITLE (4)

Service Water Booster Pump Auto Start Disabled Due to Design Control Weakness

| 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 | 21 | 96 | 96 | 005 | 01 | 08 | 12 | 96 | FACILITY NAME | DOCKET NUMBER |

| OPERATING MODE (9) | 1 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | |
|---|---|---|---|---|---|
| POWER LEVEL (10) | 100 | 20.2201(b) | 20.2203(a)(2)(v) | 50.73(a)(2)(i) | 50.73(a)(2)(viii) |
| | | 20.2203(a)(1) | 20.2203(a)(3)(i) | [X] 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) |
|---|---|
| R. T. Laudenat, Nuclear Licensing Supervisor | (860)444-5248 |

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 | 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 21, 1996, while the plant was in Mode 1 at 100-percent power, a design noncompliance was identified for the high temperature auto-start feature of the Service Water System (SWP) booster pumps. The Service Water booster pumps provide augmented cooling flow to Motor Control Center (MCC) and Rod Control Area (RCA) air conditioners units (ACU) under emergency conditions.

A decision was made in 1986 to operate the plant with the SWP booster pump outlet valves open due to fire zone and seismic concerns. The original design included opening the outlet valves on a high temperature condition in the ACU duct or on a Loss of Offsite Power (LOP). The pump was interlocked to auto start when the valve opened. In February 1989 due to pump wear, the breakers for the pump were tagged open, disabling the auto-start feature. The breakers were reclosed in January 1990, when the configuration was questioned in an NRC inspection. A Bypass Jumper (BJ) was installed in May 1990, to defeat the pump start on an open valve but still allow a pump start on an LOP signal. It was recently recognized that the BJ also defeated the pump start on high duct temperature. This condition had not been addressed in the BJ or safety evaluation performed in 1990. This condition was determined to be reportable as outside the design basis, and an immediate notification was made April 14, 1996 pursuant to 10CFR50.72(b)(1)(ii)(B). The cause of the condition was weakness in the design control process.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | | | PAGE (3) |
|---|---|---|---|---|---|---|---|
| | | YEAR | SEQUENTIAL NUMBER | | | REVISION | |
| Millstone Nuclear Power Station Unit 3 | 05000423 | 96 | -- | 005 | -- | 01 | 2 of 5 |

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

I. Description of Event

On March 21, 1996, while the plant was in Mode 1 at 100-percent power, during an NRC inspection of Service Water Bypass Jumpers, a design noncompliance was identified for the high temperature automatic start feature of the Service Water System (SWP) booster pumps. The Service Water booster pumps were designed to provide augmented flow for emergency cooling to the Motor Control Center (MCC) and Rod Control Area (RCA) air conditioning units (ACU).

January 1986, it was determined that the B train SWP booster pump discharge isolation valve (MOV) did not meet the separation criteria of Branch Technical Position (BTP) CMEB 9.5-1. A decision was made to correct this condition by leaving the MOV in the open position, with its associated booster pump running. The Service Water System operating procedure was modified to require the MOV to be open and its pump running whenever the B train of Service Water was in operation. In mid-1988, a problem was identified by the valve manufacturer that could have led to the valve operator becoming separated from the valve stem under certain seismic conditions. This was a problem that effected the MOVs in both trains. In response to this concern, the decision was made to also leave the A train MOV in the open position with its associated booster pump running. The Service Water System operating procedure was not modified to reflect this operating configuration. A plant design change in 1988 resolved the seismic concern for both valves.

In response to gradually degrading system performance caused by pump wear, the supply breakers to the booster pumps were opened. This defeated the interlock between the MOV and booster pumps. This action occurred on February 25, 1989, without a safety evaluation or procedure change. Yellow caution tags were placed on the pumps' control switches in the Control Room to notify the Operators that the supply breakers were open. The configuration of the supply breakers was maintained on the Shift Turnover Report with instructions to close the breaker if the pumps were needed to supply cooling water to the ventilation units.

On January 3, 1990, in response to an ongoing NRC inspection on the above concerns, the yellow caution tags were cleared, and the pump supply breakers were closed. This corrective action was described in a March 23, 1990 response to February 26, 1990 Notice of Violation (NOV). The NOV was based on having removed the auto-start feature as described above, without determining if the change was an unreviewed safety question and without changing the operating procedure.

In May 1990 a Bypass Jumper (BJ) with a safety evaluation was installed to defeat the pump start when the valve opens, and instead allow direct pump start on an LOP signal. It was recognized on March 21, 1996, that a design noncompliance existed, in that the BJ had also defeated the pump automatic start on high temperature in the ACU duct. The deletion of the high temperature auto-start function was not addressed in the BJ or safety evaluation. Additionally, Operator actions that were specified as part of the Bypass Jumper "Special Instructions" were not proceduralized. These instructions directed the Operator to start the booster pumps after reset of an LOP to satisfy the design requirement that two independent actions are required to stop equipment which was started from an LOP signal.

As recently as June 1995, a summary of design basis documentation indicated that the Bypass Jumper had not transferred the high temperature start signal to the booster pumps. This was considered acceptable since the automatic initiation of the pumps was not considered to be required for the air conditioning units to fulfill their safety function.

Upon identifying the design noncompliance with the high temperature auto-start feature being disabled, on March 21, 1996, the booster pumps were started and run continuously to provide the most conservative level of protection to the plant, and action was taken to incorporate procedure changes for appropriate alarm responses to high temperatures in the ACUs. Evaluations indicated that the historical conditions had no adverse impact on plant safety. A determination was made on April 14, 1996, that the condition was reportable as a condition outside the design basis of the plant, and an immediate notification was made pursuant to 10CFR50.72(b)(1)(ii)(B).

The Bypass Jumper has been removed and a permanent plant modification was completed in accordance with an approved plant design change. Specifically, the motor operated valves have been completely removed from the control scheme for the pumps. This modification restores all auto-start design features and does not rely on any operator actions.

II. Cause of Event

The root cause of the LOP start feature and high temperature auto start feature being overridden was weakness in the design control process. Plant personnel involved in making the decision to open the supply breakers did not consider the possibility that opening the supply breakers may have constituted a change to the system that required a safety evaluation pursuant to the provisions of 10CFR50.59. Furthermore, personnel failed to realize that the change to the system configuration required a change to the Service Water System operating procedure.

The cause of the high temperature auto-start of the pump being deleted in the development and implementation of the BJ was weakness in the design control process. The original review of the BJ failed to identify the entire impact of the BJ. A weakness in this process allowed changes without the thorough reviews of all design requirements. Once installed, there was no subsequent requirement to verify the accuracy of the work.

The operating procedure steps at the time of BJ installation in 1990, addressed Operator response to low flow in the ventilation duct which could result in high temperature in the MCC and Rod Control Area ventilation duct. These procedure steps were deleted in subsequent revisions because the relevance to the existing BJ was not understood.

III. Analysis of Event

Plant operation with both the LOP and high temperature start defeated was reviewed and determined to be not reportable in January 1990.

Service Water is the emergency backup system to cool the ACU but it has not been required in this capacity. The temperatures in the Motor Control Center (MCC) and Rod Control Area change slowly and have not challenged the ability of the cooling system to maintain design temperatures. Service Water normally flows through the ACU units because the outlet isolation valves are in the open position.

An evaluation in 1990 determined that sufficient Service Water flow is available to meet all design requirements during an LOP without the booster pumps due to the increased header pressure which occurs when the Service Water system flow to the non-safety related Turbine Plant Component Cooling system is isolated. In the case of a CDA/SIS, Service Water flow alone would have been inadequate to meet design cooling loads if no action were

taken to start the booster pumps. Any other condition which did not isolate the non-safety related flow to the TPCCW could also have resulted in inadequate Service Water flow. The scenarios in which design heat loads might not be met are also based on an assumed complete loss of the non-safety related normal cooling water to the chilled water system.

A test of the ACU cooling coils in December 1995 isolated chilled water to the units and established a heat load in the MCC and Rod Control Area that was approximately equivalent to the design predicted heat load. Testing showed that the area temperature could not be raised above 77 degrees Fahrenheit with Service Water flowing through the coils and no booster pump in operation, and with Chilled Water to the ACUs isolated. This testing supports the position that temperature changes in the area are slow.

Per Technical Specification 3/4.7.14, operability of the equipment in the affected area does not become a concern until temperatures are in the 120-140 degrees Fahrenheit range for at least eight hours, or until temperatures are greater than 140 degrees Fahrenheit for more then four hours. A high temperature in the area, as sensed in the ACU duct, will trip the ACU at 115 degrees Fahrenheit, resulting in a low flow alarm in the Control Room. Although the booster pump start is not a specified action as a response to this alarm, Control Room personnel would be alerted to the high temperature condition in the area. A temperature increase in this area would be slow in a non-LOP condition and would allow sufficient time for the Operators to take appropriate action to manually start a booster pump if required.

Plant operation from February 1989 to May 1990, with both the LOP automatic start feature and the high temperature start feature of the pump defeated, and from May 1990, to the present with the high temperature start defeated, did not involve any unsafe plant conditions. The NRC review of the conditions in January 1990, also concluded that plant operation with the automatic start feature of the pumps disabled had minimal safety significance. The condition is reported as a condition outside of design basis, pursuant 10CFR50.73(a)(2)(ii)(B), because the deletion of the booster pump auto start feature was not addressed in the original safety evaluation. The result of this action was plant operation without a properly documented design basis change.

IV. Corrective Action

Upon identifying the design noncompliance of the disabled high temperature auto-start feature on March 21, 1996, the booster pumps were started and run continuously to provide the most conservative level of protection to the plant. Operating procedures were also revised to address appropriate alarm response to high temperature in the ACU.

As corrective action, the BJ was removed in May, 1996 and a permanent plant modification was made that restores all auto-start design features, and does not rely on any operator actions.

The programmatic changes and enhancements that have been implemented will minimize the possibility of this type of event recurring. Significant among these is the improved coordination between the Design Engineering organization and the unit. A modification, such as the one implemented on the booster pumps would now typically be developed by Design Engineering. The implementation of the Design Control Manual will help prevent a recurrence of this event. There is a much higher sensitivity towards maintaining the design basis of the plant, and a much lower tolerance for long term temporary modifications performed under the BJ process. Procedures for safety evaluations have been significantly strengthened. A standard form is now used for all safety evaluations, and there is a dedicated subcommittee of the Nuclear Safety Assessment Board that reviews

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | | | PAGE (3) |
|---|---|---|---|---|---|---|---|
| | | YEAR | | SEQUENTIAL NUMBER | | REVISION | |
| Millstone Nuclear Power Station Unit 3 | 05000423 | 96 | -- | 005 | -- | 01 | 5 of 5 |

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

all safety evaluations, and sends substandard evaluations back to the preparer and the Plant Operations Review Committee for revision and review. In addition, changes made to operating procedures now require a review of the procedure basis document.

V. Additional Information

None.

Similar Events

None.

Manufacturer Data

Not applicable.

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE PNO-IV-96-043

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by Region IV staff in Arlington, Texas on this date.

Facility

Western Technologies, Phoenix, Az
Phoenix,Arizona
License No: 07-080

Licensee Emergency Classification
Notification of Unusual Event
Alert
Site Area Emergency
General Emergency
X Not Applicable

Subject: THEFT OF PORTABLE GAUGE FROM ARIZONA LICENSEE

On Friday, August 16, 1996, the licensee reported to the State of Arizona Radiation Regulatory Agency (RRA) the theft of a portable gauge which occurred during the night of August 15-16, 1996. The gauge was subsequently recovered on August 18. The gauge is a Troxler Model 3440 containing 10 millicuries of cesium-137 and 50 millicuries of americium-241.

The truck in which the gauge was stored was stolen from a motel in Mesa, Arizona. The driver had left the truck unlocked and had left the keys to the truck on the seat of the vehicle. The gauge was stored in its case in a locked compartment in the back of the truck. The stolen vehicle was later seen in the vicinity of an attempted burglary in Gilbert, Arizona, the morning of August 16.

At 4:30 p.m. on August 18, a citizen reported to the Maricopa Sheriff Department that he had found the locked and labelled case containing the gauge in the desert near Mesa. The sheriff notified the Arizona RRA who took custody of the device and returned it to the licensee. The Arizona RRA does not believe that anyone opened the case containing the gauge. After the theft occurred, the licensee issued a press release and offered a $500 reward for information leading to the return of the gauge. At the same time, Arizona officials informed Mexico, New Mexico, California, Utah, and Nevada of the vehicle description and that the truck carried the gauge. There was subsequent media interest in the event.

Local police and the Arizona RRA continue to investigate the circumstances of the theft of the truck which is still missing. Enforcement action is planned in regard to the Arizona licensee for failure to secure the material. The Arizona RRA has leak tested the device and found no contamination.

Region IV first received notification of this occurrence by fax from the Arizona RRA at 4:00 p.m. CDT on August 16, 1996. This information is complete as of 10:00 a.m. on August 20, 1996.

Region IV has informed NMSS, OPA, and OSP.

Contact: Charles Cain
(817)860-8186

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