



Northeast
Utilities System

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October 10, 1996

Docket No. 50-245
B15926

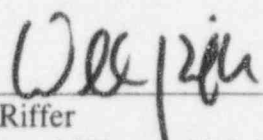
Re: 10CFR50.73(a)(2)(i)

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

This letter forwards Licensee Event Report (LER) 96-050-00, documenting an event that occurred at Millstone Nuclear Power Station, Unit No. 1 on September 12, 1996. This LER is submitted pursuant to 10CFR50.73(a)(2)(i).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



W. J. Riffer
Director - Millstone Unit No. 1

Attachment: LER 96-050-00

cc: H. J. Miller, Region I Administrator
T. A. Easlick, Senior Resident Inspector, Millstone Unit No. 1
J. W. Andersen, NRC Project Manager, Millstone Unit No. 1

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PDR ADDCK 05000245
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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 (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.

FACILITY NAME (1)

Millstone Nuclear Power Station Unit 1

DOCKET NUMBER (2)

05000245

PAGE (3)

1 of 4

TITLE (4)

LOCA Concurrent with LNP, and Loss of DC Power Prevents Closure of LPCI Torus Test Return Valves

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
09	12	96	96	050	00	10	10	96	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		000	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 checked="" type="checkbox"/> 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: Robert W. Walpole, Nuclear Licensing Supervisor
TELEPHONE NUMBER (Include Area Code): (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

SUPPLEMENTAL REPORT EXPECTED (14)

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input type="checkbox"/> NO	EXPECTED SUBMISSION	MONTH	DAY	YEAR
			10	30	97

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

On September 12, 1996, with the plant shutdown and the reactor in COLD SHUTDOWN condition, it was identified that past operation of the plant with the low pressure coolant injection (LPCI) torus test return valves (two valves in series) in the open position, with a postulated single failure, would prevent closure of both LPCI torus test return valves. Specifically, a loss of coolant accident (LOCA) concurrent with loss of normal power (LNP), and the single failure of a loss S1 or S2 DC power to the respective S1 or S2 LPCI subsystem would prevent closure of both LPCI torus test return valves. Thus a flow path would remain open for LPCI flow diversion to the torus. This condition would have prevented the LPCI system from injecting its maximum reactor coolant flow assumed in the LOCA analysis. This event is reportable pursuant to 10 CFR 50.73(a)(2)(ii)(A) as an event that resulted in the plant being in an unanalyzed condition that significantly compromised plant safety, since the LOCA analysis did not consider the impact of a failure of the DC bus with the torus test return valves in the open position. Thus, this event is also reportable, pursuant to 10 CFR 50.73(a)(2)(i)(B), as a condition prohibited by the plant's Technical Specification, since the LPCI system was not declared inoperable when the torus test return valves were in the open position. No immediate operator actions were required at the time of discovery. The LPCI system, LOCA and containment cooling function are not required while in the COLD SHUTDOWN condition. There were no safety consequences as a result of this event.

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

I. Description of Event

On September 12, 1996, with the plant shutdown and the reactor in COLD SHUTDOWN condition, it was identified that past operation of the plant with low pressure coolant injection system (LPCI) torus test return valves (two valves in series) in the open position, placed the plant in condition outside its design basis and a prompt report was made in pursuant to 10 CFR 50.72(b)(1)(ii)(B). Subsequent investigation revealed this event was not reportable as a condition that is outside Millstone Unit No. 1's design basis. On October 3, 1996, this notification was reclassified as an unanalyzed condition that significantly compromises plant safety pursuant to 10 CFR 50.72(b)(2)(i). Specifically, a loss of coolant accident (LOCA) concurrent with an loss of normal power (LNP), and the single failure of a loss S1 or S2 DC power to the respective S1 or S2 LPCI subsystem would prevent closure of both LPCI torus test return valves in the subsystem. In this scenario the control signal for auto closure of both valves in the LPCI subsystem is generated from the same division of DC power. In addition, the DC control signal for auto closure of the AC emergency power source (for the respective division) onto the emergency bus is generated from the same division of DC power. Thus a flow path would remain open for LPCI flow diversion to the torus. This condition would have prevented the LPCI system from injecting its maximum reactor coolant flow assumed in the LOCA analysis. This event has also been determined to be reportable for operation or condition prohibited by the plant's Technical Specifications pursuant to 10 CFR 50.73(a)(2)(i)(B) since the LPCI system was not declared inoperable when the torus test return valves were in the open position, and a Technical Specification action statement was not entered.

II. Cause of Event

The LOCA analysis did not consider the limiting single failure for a LOCA concurrent with an LNP. Selection of the limiting single failure was done assuming the torus test return valves were in their normal position i.e. closed at the time of the event. The potential single failure of a loss of DC power when the LPCI torus test return valves are in the open position (for surveillance testing, non-routine tests and normal torus cooling) was not recognized as more limiting. This condition has existed since the initial operation of the plant.

III. Analysis of Event

During power operation, both valves in the torus test return line are opened to establish LPCI flow back to the torus for either inservice pump surveillance testing, non-surveillance runs or torus cooling. During these evolutions, one LPCI pump is started, one torus test return valve is opened and the second torus test return valve is throttled to establish a flow rate of 5000 gpm.

Inservice surveillance testing of the LPCI system is performed on a quarterly frequency. Each one of the four pumps is operated for approximately 20 minutes to establish operability. Non-surveillance runs for data collection or troubleshooting are performed very infrequently for short durations of typically less than 30 minutes. For torus cooling purposes, the torus test return valves are normally opened for a few hours when there is minimal leakage to the torus, and torus water temperature increases are predominately a result of ambient temperature increases. It should be noted that in the past, during periods with leaking safety relief valves (SRVs), torus cooling was performed more frequently. For example, during the most recent operation with leaking SRVs, approximately 320 hours of torus cooling was performed during a six month period. The average duration of each torus cooling operation was 12 hours, with both LPCI subsystems operating.

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		96	--	050	-- 00	

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

If a LOCA concurrent with an LNP were to occur when the torus test return line was unisolated, one core spray pump at rated flow and partial flow from two LPCI pumps would remain available for core cooling. This combination pump operation assumes the DC power supply for the LPCI subsystem with the unisolatable test return line fails. The remaining LPCI flow from the two operating LPCI pumps will be diverted back to the torus via the failed open torus test return valves. This emergency core cooling systems (ECCS) configuration has not been analyzed.

In addition to the impact of the unanalyzed ECCS configuration on the LOCA, the affects of water hammer on the LPCI system have not been evaluated. In the postulated scenario, one LPCI pump is operating with the torus test return valves open and a LOCA concurrent with a LNP occurs. At time=0 of this accident, the AC buses powering all the LPCI motors are de-energized and any running LPCI pumps stop. The AC buses remain de-energized until its respective emergency power source automatically starts and re-energizes its respective emergency power bus. During this time, the LPCI system is draining down through the unisolated torus test return line to the torus. This drain down will continue until power is restored to the emergency power bus from its respective emergency power source, and the LPCI pumps automatically start (2 pumps for this scenario since only one emergency power source is available). Sections of LPCI piping will be voided at the time LPCI initiates. The extent of the system voiding and consequences as it relates to water hammer are unknown at this time.

This event is reportable pursuant to 10 CFR 50.73(a)(2)(ii)(A) as an event that resulted in the plant being in an unanalyzed condition that significantly compromised plant safety. This event is also reportable pursuant to 10 CFR 50.73(a)(2)(ii)(B) as operation or condition prohibited by the plant's Technical Specifications since the LPCI system was not declared inoperable when the torus test return valves were in the open position, and a Technical Specification action statement was not entered. No immediate operator actions were required at the time of discovery. The LPCI system, LOCA and containment cooling function are not required while in the COLD SHUTDOWN condition. There were no safety consequences as a result of this event.

IV. Corrective Action

As an interim corrective action, any time the torus test return line is unisolated (both valves in the open position), the LPCI system will be declared inoperable and the appropriate Technical Specification action statement entered. Operation procedures will be revised to reflect this requirement prior to startup for operating Cycle 16.

Additionally, an evaluation will be performed to establish operability with the torus test return line unisolated. Based upon the outcome of the evaluation, the next course of action will be determined and this LER will be supplemented prior to startup for operating Cycle 16.

Operability of LPCI will be also ensured by completing a water hammer analysis and any modifications that may be necessary as a result prior to startup for operating Cycle 16.

The limiting single failure for the remaining emergency core cooling systems and the containment isolation functions credited in the safety analysis will be reevaluated taking into account that the valves may not be in their normal position. This will be completed prior to startup for operating Cycle 16.

V. Additional Information

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

Commitments

The following are NNECO's commitments made within this letter. All other statements within this letter are for information only.

- B15926-1 NNECO commits to, as an interim corrective action, that any time the torus test return line is unisolated (both valves in the open position), the LPCI system will be declared inoperable and the appropriate Technical Specification action statement entered. Operation procedures will be revised to reflect this requirement prior to startup for operating Cycle 16.
- B15926-2 NNECO commits to perform an evaluation to establish operability with the torus test return line unisolated. Based upon the outcome of the evaluation, the next course of action will be determined and this LER will be supplemented prior to startup for operating Cycle 16.
- B15926-3 NNECO commits to ensure operability of LPCI by completing a water hammer analysis and any modifications that may be necessary as a result prior to startup for operating Cycle 16.
- B15926-4 NNECO commits to reevaluate the limiting single failure for the remaining emergency core cooling systems and the containment isolation functions credited in the safety analysis, taking into account that the valves may not be in their normal position. This will be completed prior to startup for operating Cycle 16.

Similar Events

None

Manufacturer Data

N/A