NORTHEAST UTILITIES
The Connecticut Light And Power Company
Western Massachusetts Electric Company
Holyoke Water Power Company
Northeast Utilities Service Company
Northeast Nuclear Energy Company

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November 17, 1989
MP-13745

Re: 10CFR50.73(a)(2)(iv)
10CFR50.73(a)(2)(v)

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

Reference: Facility Operating License No. DPR-21
Docket No. 50-245
Licensee Event Report 89-021-00

Gentlemen:

This letter forwards Licensee Event Report 89-021-00 required to be submitted within thirty (30) days pursuant to the requirements of 10CFR50.73(a)(2)(iv) and 10CFR50.73(a)(2)(v).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace
Station Superintendent
Millstone Nuclear Power Station

SES/EA:tp

Attachment: LER 89-021-00

cc: W. T. Russell, Region 1 Administrator
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3
M. Boyle, NRC Project Manager, Millstone Unit No. 1

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NRC Form 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

Estimated burden per response to comply with this information collection request: 50.0 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (p-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Millstone Nuclear Power Station Unit 1	0 5 0 0 0 2 4 5	1 OF 0 3

TITLE (4)
Reactor Scram on Turbine Stop Valve Closure

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 NAMES	
1 0	1 9	8 9	8 9	0 2 1	0 0	1 1	1 7	8 9		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.402(c)	X 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 7 0	20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Eliot Abolafia, Senior Engineer Tel: 203-447-1791	AREA CODE 2 0 3 4 4 7 - 1 7 9 1

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	
X	S J	F C V	C 6 3 5	Y							
B	S J	V	C 6 6 5	Y							

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On October 19, 1989 at 1515 hours with the plant at 70% power (530 degrees Fahrenheit and 1000 psig) a full reactor scram occurred as a result of a Main Turbine Trip (Turbine Stop Valves greater than 10% closure). The Main Turbine Trip was the result of a high reactor water level turbine trip signal (+48"). The high reactor water condition was the result of "A" Feedwater Regulating Valve becoming stuck in the open position which occurred while returning "B" Feedwater Regulating Valve to service. During the level decrease which followed the scram, Standby Gas Treatment system initiated as expected. All systems functioned as expected. No safety consequences resulted from this event.

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

I. Description of Event

On October 19, 1989 at 1515 hours with the plant at 70% power, a full reactor scram occurred as a result of a Main Turbine Trip (Turbine Stop Valves greater than 10% closure). The Main Turbine Trip was the result of a high reactor water level turbine trip signal (+48"). The high reactor water condition was the result of "A" Feedwater Regulating Valve becoming stuck in the open position which occurred while returning "B" Feedwater Regulating Valve to service. During the reactor water level decrease which followed the scram, Standby Gas Treatment system initiated as expected. Recovery was initiated by executing ONP-502, Scram Recovery. All systems functioned as expected. No safety consequences resulted from this event.

II. Cause of Event

An investigation began into the cause of the failure of the "A" Feedwater Regulating Valve. Time History plots of the event provided from the plant process computer were reviewed in conjunction with the post trip logs and sequence of events data. Operations personnel were interviewed regarding the event. Disassembly of the "A" Feedwater Regulating valve was undertaken with the resulting discovery of a bolt wedged in the "A" valve's disk-cage-seat ring internal assembly. No damage was indicated to the feed water regulating valve itself. The bolt was too large to pass freely through the feedwater regulating valve. It is postulated that while returning the "B" Feedwater Regulating Valve to service, the "A" valve failed in the open position.

The bolt was identified as belonging to the retaining assembly of a Crane Check Valve (16"-model 1573) which is used in the Feed Pump Discharge Check Valves. Station management immediately made a decision to place the unit in cold shutdown and to open, disassemble and inspect all three Feedwater Pump Discharge Check Valves. The bolt was found to originate from the "A" Feedwater Pump Discharge Check Valve. Investigation revealed that one bolt and retaining assembly was found missing from the "A" Feed Pump Discharge Check Valve. Additionally, the valve's disc and seat assembly was misaligned due to the missing retaining assembly.

III. Analysis of Event

The turbine trip which resulted from the reactor water level increasing to a level of +48" caused the actuation of a reactor protection system, and therefore is reportable in accordance with 10CFR50.73(A)(2)(iv). The decrease in reactor water level as a result of the normal response to the reactor scram caused the initiation of standby gas treatment system which is reportable under 10CFR50.73(A)(2)(iv).

The Feedwater Regulating Valve stuck in the open position and the misalignment of the "A" Feedpump Check Valve assembly could have caused the Feedwater Coolant Injection (FWCI) to be unavailable if needed. Other systems (Isolation Condenser, Auto Depressurization and Low Pressure Emergency Core Cooling) continued to be available to perform the emergency core cooling functions. This condition is reportable under 10CFR50.73(A)(2)(v).

IV. Corrective Action

The immediate cause of the event was failure of the Feedwater Regulating Valve in the open position. The root cause is attributable to a flaw in the design of the Feed Pump Discharge Check Valve retaining assemblies. A similar event occurred on December 5, 1984 (PIR 50-84) when the "B" Feedwater Regulating Valve failed in the intermediate position due to a bolt which originated from the "C" Feed Pump Discharge Check Valve. Since previous corrective action did not correct the problem, several failure mechanisms were considered to be possible and the Unit therefore determined that a complete redesign was warranted.

The unit committed to a redesign effort for the retaining assembly before commencing reassembly of the valves and unit start up. A full plant design change was implemented using the guidance of the EPRI Check Valve Application Guidelines and concurrence of the check valve vendor. The redesigned configuration increased the design stress safety margins of the original design by several orders of magnitude. The unit also committed to disassembly of the valves and inspection of the new retaining assemblies during the next scheduled refueling outage.

A loose parts analysis was undertaken after the October 19th event to identify whether the failure could cause unidentified parts to enter and have an adverse effect on the reactor internals. The result of the analysis concluded that the parts would be retained upstream of the high pressure feedwater heaters and therefore would not enter the reactor coolant system nor cause any damage.

On November 9, 1989 with the Unit at 80% power, while reducing reactor power, the "A" Feedwater Regulating Valve would not close past the 50% position. Upon disassembly of the valve, the original retaining block belonging to the "A" Feedpump Discharge Check valve was found. The retaining block had become wedged in the "A" Feedwater Regulatory Valve during the downpower maneuver.

The loose parts analysis was subsequently updated after the November 9th event to reflect the discovery of the retaining block. All parts which have the potential to affect Feedwater Regulating Valve operability have been accounted for.

There were no immediate safety consequences of the event. Reactor level continued to be maintained without reliance upon safety systems.

V. Additional Information

A review was also performed to identify similar applications of Crane check valves in other important applications. It was found that this particular retention design was used frequently in check valves through out the Reactor Water Cleanup System. Records indicate that these valves were of a smaller size and have proven to be more reliable (as there were no previous failures) than the valves installed in the feed system. However, maintenance will be evaluated for cleanup system check valves.