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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Re: 10CFR50.73(a)(2)(iv)
May 24, 1991
MP-91-435

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

Reference: Facility Operating License No. DPR-65
Docket No. 50-336
Licensee Event Report 91-001-01

Gentlemen:

This letter forwards update Licensee Event Report 91-001-01.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace
Director, Millstone Station

SES/PHB:ljs

Attachment: LER 91-001-01

cc: T. T. Martin, Region I Administrator
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2

Cust No.
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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 (6-630), 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 2	0 5 0 0 0 3 3 6	1 OF 0 3

TITLE (4): Electro-Hydraulic Control System Failure Caused Reactor Trip

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	DOCKET NUMBER
0 1	1 0	9 1	9 1	– 0 0 1	– 0 1	0 5	2 4	9 1		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 9 2	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	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
Philipp H. Baumann Jr. Ext. 5211	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
B	T G	P	D 1 2 2	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 January 2, 1991 at 1612 hours, with the unit operating at 92% power, the main turbine tripped on low Electro-Hydraulic Control (EHC) pressure. The Reactor Protection System initiated a Reactor trip following the turbine trip. Normal post-trip procedures were followed. There were no safety implications since the unit experienced a normal Reactor trip shutdown.

I. Description of Event

On January 10, 1991 with the unit operating at 92% power, the 'A' EHC pump was in operation and the 'B' EHC pump was in standby. The 'A' pump discharge filter pressure alarm annunciated, indicating that the discharge filter was plugging. At 1430 the 'A' pump discharge pressure dropped to 1350 psig, causing the 'B' pump to auto-start. When started, the 'B' pump could not maintain stable discharge pressure due to severe vibration, and would only maintain system pressure at 1400 psig, (normal system pressure is 1600 psig). Both pumps were required to operate to maintain system pressure at 1450 psig. After several adjustments were made to the compensator control on the 'B' pump, system pressure was stabilized at 1475 psig. At 1500 hrs a decision was made to leave the system operating in its existing configuration ('B' pump running, 'A' pump in auto-start) for a minimum of 1 hour to prove reliability of the 'B' pump, so that the discharge filter of the 'A' pump could be changed out. At 1550 hrs the 'B' pumps performance showed continuous satisfactory discharge pressure of 1475 psig. At 1555 hrs the job supervisor completed his pre-job briefing and verified that the mechanics were ready to begin the change out of the 'A' pump discharge filter. The mechanics mistakenly believed that they had authorization to begin work on the pump. When the job supervisor left the job site, the mechanics began disassembling the 'A' pump filter. At 1605 the 'B' pump experienced a vibrational transient and system manifold pressure decreased to 1350 psig. The auto-start function of the 'A' pump picked up and the 'A' pump auto-started. The operator at the EHC skid called the control room to stop the 'A' pump, while the mechanics reassembled the filter housing. The EHC system pressure continued to drop causing a turbine trip and corresponding reactor trip, before the 'A' filter and pump could be restored to service.

II. Cause of Event

The Reactor trip was caused by a turbine trip. The root cause of the turbine trip was the failure of the Electro-Hydraulic Control (EHC) system pumps. The EHC system could not maintain adequate system pressure with the 'B' pump in operation, due to high vibration and pressure fluctuations. It was necessary to change out the discharge filter of the 'A' pump because the 'A' pump discharge pressure was decreasing below the 'B' pump auto-start setpoint. The 'B' pump had been operating erratically but after a one hour run, it was observed that the pump was able to maintain adequate system pressure. After the 'A' pump had been removed from service the 'B' pump subsequently experienced erratic operation and the system pressure degraded significantly enough to cause the low EHC pressure turbine trip. There were 2 major factors contributing to the failure of the pump, cavitation and failure of the holddown spring retainer sleeve assembly. While the pump was operating, air in-leakage past the o-ring seating surfaces on the suction strainer caused the cavitation. Coincidentally there was heavy corrosion/oxidation within the holddown spring assembly retainer bore. This oxidation film would not allow the assembly to operate properly. The combination of these two factors eventually led to the complete failure of the pump. Additional contributing factors to the plant trip were: 1) Work was performed on the 'A' filter with an erratically operating 'B' pump. 2) A misunderstanding between the mechanics and the job supervisor led to the premature disassembly of the 'A' pump discharge filter. 3) The failed pump was in storage for approximately two years. The lack of fluid in the pump casing allowed the oxidized film to build up on the retainer bore.

III. Analysis of Event

This report is being submitted pursuant to the requirements of 10CFR 50.73(a)(2)(iv), "Any event or condition that resulted in the manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)". There were no safety consequences resulting from this event since normal post trip procedures were followed.

IV. Corrective Action

During the shutdown following the trip, both EHC pump discharge filters were changed out and the 'B' pump was replaced with a spare pump. The o-rings on the suction strainer were replaced and the pump was completely overhauled. All worn or damaged parts were replaced, the pump was reinstalled and then returned to service. To prevent oxidation, all future pumps will be stored with their pump casings filled with EHC fluid.

V. Additional Information

Similar LER'S: None.