

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Millstone Nuclear Power Station Unit 3	DOCKET NUMBER (2) 0 5 0 0 0 4 2 3	PAGE (3) 1 OF 0 3
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TITLE (4)  
Reactor Trip Due to Turbine Trip on Low Lube Oil Header Pressure

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											
0	6	1	8	7	8	7	0	3	1	0	1	0	0	5	0	0	0			
													0	5	0	0	0			

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)										
POWER LEVEL (10) 1 0 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(e)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)							
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(a)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)							
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.38(a)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)							
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)								
	<input type="checkbox"/> 20.405(a)(1)(i)(v)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)								
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)								

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER
NAME Paul G. Atkinson, III, Engineer		AREA CODE 2 0 3 4 4 4 - 5 5 1 4

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURE	REPORTABLE TO NPROS
B	T	D R V	G 0 8 4	Y					
B	T	D P	G 0 8 4	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

On June 14, 1987 at 0320 with the plant at 100% power (Mode 1) the reactor tripped as a result of a turbine trip. The turbine tripped on low bearing lube oil header pressure immediately following a trip of the turning gear oil pump (TGOP). The TGOP had been autostarted approximately 9 seconds earlier as part of weekly turbine/generator Preventive Maintenance testing, and was not the primary source of lube oil header pressure. Pressure was primarily supplied by the (turbine) shaft driven oil pump, which was operating correctly.

All equipment operated as expected in response to the trip and the plant returned to power operation (Mode 1) at approximately 2012 hours.

The cause for this event was a defective Bearing Header Relief Valve and an oversized Turning Gear Oil Pump. As corrective action, the Bearing Header Relief Valve was repaired and the impeller on the TGOP was shaved to lower pressure.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 7	0 3 1	0 1	0 2	OF 0 3

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

I. Description of Event

On June 14, 1987 at 0320 with the plant operating at 100% power (Mode 1) the reactor tripped as a result of a turbine trip. The turbine tripped on low bearing lube oil header pressure immediately following a trip of the turning gear oil pump (TGOP). The TGOP had been autostarted approximately 9 seconds earlier as part of the weekly portion of Turbine/Generator Preventive Maintenance testing.

The TGOP was not the primary source of lube oil header pressure during this event. Pressure was primarily supplied by the (turbine) shaft driven oil pump which provides the required lube oil pressure during full speed operation of the turbine. There were no indications of problems with the shaft driven lube oil pump.

Low bearing lube oil header pressure was experienced at the low bearing lube oil header pressure switches (two out of three logic, 12 psi decreasing) on the portion of the lube oil header at the lube oil tank, 25 ft. below the turbine, for approximately 76 milliseconds. Lube oil pressure did not drop below the low header pressure trip setpoint for the low lube oil header pressure switch at the turbine front standard (9 psi decreasing) which is located immediately prior to the bearings.

No turbine bearing damage was experienced as a result of this trip.

Following the reactor trip, a feedwater isolation automatically initiated due to low T avg and the auxiliary feedwater actuation automatically initiated due to low low steam generator level. These ESF actuations are normal plant responses following a 100% power reactor trip. Equipment response to these actuations was in accordance with plant design.

The plant returned to power operation (Mode 1) at 2012 hours on June 14, 1987.

II. Cause of Event

This Preventive Maintenance test has been successfully performed weekly since commercial operation with no similar problems. The TGOP had been started and stopped four minutes prior to the trip. The procedure and operator actions were reviewed and eliminated as a potential cause. The lube oil pressure control valve was adjusted to raise bearing oil pressure several psi. The test was satisfactorily repeated just prior to synchronizing the turbine-generator to the grid. Subsequent testing with additional instrumentation showed the bearing oil pressure under a pump trip transient to be within approximately 4.5 psi of the turbine trip setpoint.

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TEXT (if more space is required, use additional NRC Form 388A's) (17)

II. Cause of Event (Continued)

There are two root causes for this event, an oversized Turning Gear Oil Pump and a defective Bearing Header Relief Valve. First refueling outage lube oil system inspections determined that the Bearing Lube Oil Header Relief Valve, valve disc was offset at a slight angle to the valve seat. This valve is a continually relieving relief designed to maintain bearing header pressure constant during lube oil system transients. It is believed the offset caused degraded valve response during the transient that resulted in the plant trip.

Testing of the Turning Gear Oil Pump (TGOP) and review of design documents determined that the TGOP was oversized 4 to 7 psi. When energized, the TGOP raised bearing lube oil header flow and pressure. When reenergized following testing, system pressure dropped below the trip setpoint before the Bearing Header Relief Valve could adjust to the lower flow.

III. Analysis of Event

There were no adverse safety consequences associated with this event because all safety systems responded correctly in accordance with plant design. No safety systems are or were out of service as a consequence of this event.

This event is reportable pursuant to 10CFR50.73(a)(2)(iv), in that an event occurred resulting in the automatic actuation of an Engineered Safety Feature. The event was reported in accordance with 10CFR50.72(b)(2)(ii).

IV. Corrective Action

As corrective action, the Bearing Header Relief Valve was repaired and the Turning Gear Oil Pump impeller was shaved to lower discharge pressure.

Subsequent testing showed a less severe lube oil system pressure transient with a 9 psi margin between the lowest lube oil header pressure experienced and the low bearing oil pressure turbine trip setpoint.

V. Additional Information

There are no similar events with the same root cause or sequence of events.

EIIS Codes

Systems

Turbine Lube Oil System - TD

Components

Pump - P  
Motor - MO  
Pressure Switch - 63  
Relief Valve - RV

Component Vendors

General Electric, Steam Turbine/Engineered Products, - G084  
General Electric, San Jose Motor Plant, motor - G083  
Morris Pumps, Inc., pump - M443  
Penn Controls, Inc., pressure switch - P129  
General Electric, pressure switch - G080

**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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(203) 865-5000

February 26, 1988  
MP-11564

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

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

Reference: Facility Operating License No. NPF-49  
Docket No. 50-423  
Licensee Event Report 50-423/87-031-01

Gentlemen:

This letter forwards supplemental Licensee Event Report 87-031-01 required to be submitted by February 28, 1988 pursuant to 10CFR50.73(a)(2)(iv), any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS).

Yours truly,

NORTHEAST NUCLEAR ENERGY COMPANY

A handwritten signature in cursive script that reads "Stephen E. Scace".

Stephen E. Scace  
Station Superintendent  
Millstone Nuclear Power Station

SES/PGA:mo

Attachment: LER 87-031-01

cc: W. T. Russell, Region I  
W. J. Raymond, Senior Resident Inspector

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