

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 5
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TITLE (4)
Reactor Trip From B Reactor Trip Breaker Opening Due To Unknown (Spurious) Causes

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(S)																																																																																																
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LICENSEE CONTACT FOR THIS LER (12)

NAME Vere R. Joseph - Associate Engineer, Extension 5113	TELEPHONE NUMBER 2 0 3 4 4 7 - 1 7 9 1
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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)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

On May 14, 1987 at 1007 hours, while operating in Mode 1 at 69% power, a reactor trip occurred due to the opening of the Train B Reactor Trip Breaker (3RPS*ACB-RTB). The signal that caused 3RPS*ACB-RTB to open has not been determined and is concluded to be spurious. All equipment operated as expected in response to the trip and the plant was stable in Mode 3 (Hot Standby) at approximately 1035 hours.

At the time of the trip, surveillance testing was in progress on the Train A Reactor Trip Breaker (3RPS*ACB-RTA). Based on interviews with personnel involved with the test, a review and walkdown of the procedure, and successful past performances of the surveillance at power, it was concluded that the opening of 3RPS*ACB-RTB was not the result of the surveillance in progress.

Extensive post trip testing and inspection of the reactor trip breakers as well as associated Solid State Protection System (SSPS) components and wiring indicated that these systems are fully functional and operating according to their intended design.

The investigation has determined the trip to be spurious. The testing and investigation complete the corrective action.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

I. Description of Event

On May 14, 1987 at 1007 hours, while operating in Mode 1 at 69% power, a reactor trip occurred due to a spurious trip signal to the Train B Reactor Trip Breaker (3RPS*ACB-RTB). The following A Train safety systems were out of service for preventive maintenance: A Motor Driven Auxiliary Feedwater pump (3FWA*P1A), A Auxiliary Building Filter unit (3HVR*FLT1A), A Quench Spray pump (3QSS*P1A), A Containment Recirculation pump (3RSS*P1A), and A Safety Injection pump (3SIH*P1A).

At the time of the trip, surveillance testing was in progress on the Train A Reactor Trip Breaker (3RPS*ACB-RTA). 3RPS*ACB-RTA was in the test position with the A Reactor Trip Bypass Breaker (3RPS*ACB-BYA) closed, as directed by the surveillance procedure. 3RPS*ACB-RTB was closed with the B Reactor Trip Bypass Breaker (3RPS*ACB-BYB) open, in normal alignment. The surveillance procedure required cycling of 3RPS*ACB-RTA open and closed while measuring breaker response time. In this test configuration Train A Solid State Protection System (SSPS) could not cause a reactor trip when 3RPS*ACB-RTA was cycled. Due to the independent and redundant design of the plant, Train B SSPS was capable of providing protective function by generating a reactor trip signal to open its corresponding breakers 3RPS*ACB-RTB and 3RPS*ACB-BYA if an input to SSPS reached its trip setpoint.

After the trip occurred, immediate operator action was to verify that the reactor trip and bypass breakers had opened, that all control rods were fully inserted and that neutron flux was decreasing. 3RPS*ACB-RTA did not open because it was in the test position. This was an expected response and did not affect full reactor protection system actuation. The operators then verified that all other responses of the automatic protection systems had been carried out, per instructions from the applicable emergency operating procedures. The first-out annunciator trip signal for the reactor trip was a turbine trip signal. The initiating signal for the turbine trip was a reactor trip.

Train B Feedwater Isolation occurred due to low reactor coolant system temperature in conjunction with the reactor trip. With 3RPS*ACB-RTA in the test position, a reactor trip signal (P-4) was not generated from Train A SSPS. As a result Train A Feedwater Isolation did not occur. The Turbine Driven Auxiliary Feedwater pump (3FWA*P2) and B Motor Driven Auxiliary Feedwater pump (3FWS*P1B) started. No other Engineered Safety Features Actuations were required or initiated, and the plant was stable in Mode 3 (Hot Standby) at approximately 1035 hours.

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

II. Cause of Event

The cause of the event was the opening of the Train B Reactor Trip Breaker deenergizing power to the rod control system resulting in the reactor trip. The reason 3RPS*ACB-RTB opened is unknown and is concluded to be caused by a spurious signal.

The Sequence of Events (SOE) report was reviewed to determine the initiating trip signal and plant conditions prior to the trip. This review indicated that the trip occurred as a result of the opening of 3RPS*ACB-RTB without any initiating signal, or evidence of undervoltage problems.

All personnel involved with the 3RPS*ACB-RTA testing were interviewed to determine if any testing activities could have resulted in a trip signal to 3RPS*ACB-RTB. Based on the interviews, and a walkdown of the steps performed with the individuals involved, it was concluded that the opening of 3RPS*ACB-RTB was not due to personnel error. The reactor trip breaker testing procedure was reviewed for adequacy and no deficiencies were identified.

Extensive post trip testing and inspections have found no problems with the reactor trip breakers (3RPS*ACB-RTA, 3RPS*ACB-RTB, 3RPS*ACB-BYA and 3RPS*ACB-BYB). The following measures were undertaken in order to verify reactor trip breakers operability:

- a) Undervoltage dropout and timed response tests on all four breakers were performed and verification was obtained that the undervoltage coils were operating within acceptable limits.
- b) Train A and Train B shunt trip voltage and timed response tests were performed and verification was obtained that the responses of all four breakers were within acceptable limits.
- c) All four breakers were racked out and all associated breaker components were inspected for abnormalities.
- d) Each breaker was cycled several times and responded as designed.
- e) Each breaker was vibrated and tapped to determine if such actions would cause a breaker to open. None of the breakers opened.
- f) The shunt panels for the reactor trip breakers, including the wiring and terminal connections, were inspected and found to be satisfactory.
- g) Red light indication resistors were checked to verify that a possible short did not exist in any of the panels.

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

II. Cause of Event (Continued)

The surveillance procedure was successfully re-performed (and had been performed at power several times in the past) with no indication of procedural deficiency. Wiring inspections of the Solid State Protection System (SSPS) Cabinets and associated prints were conducted. The one abnormality discovered was a loose shield wire in the Train B Reactor Protection Safeguards Actuation System (RPSAS) logic cabinet. However, the loose shield wire could not have caused 3RPS*ACB-RTB to open.

Another possible scenario examined was the opening of 3RPS*ACB-RTB due to a malfunction in or trip signal generated by, SSPS. Further analysis of the sequence of events report and inspection of the SSPS logic cabinets indicated that all wiring was intact and that any signal from SSPS would have resulted in the deenergization of the undervoltage coils within 3RPS*ACB-RTB and 3RPS*ACB-BYA and the opening of both breakers simultaneously. 3RPS*ACB-BYA and 3RPS*ACB-RTB did not open simultaneously, 3RPS*ACB-BYA opened only after the turbine trip generated a reactor trip signal from SSPS. Moreover, since testing both subsequent and prior to the trip, have indicated SSPS operability in accordance with its intended design, 3RPS*ACB-RTB's opening can not be attributed to SSPS initiation.

The "turbine trip reactor trip first-out" indication received by the operator was a valid plant response. Since the initial reactor trip signal from 3RPS*ACB-RTB opening did not originate from SSPS (which would have resulted in the opening of both 3RPS*ACB-RTB and 3RPS*ACB-BYA simultaneously), no reactor first-out signal could be generated at that instant. When the turbine received the reactor trip signal, the turbine tripped as designed. A reactor trip signal from SSPS was then generated since the criteria of reactor power greater than 50% and a turbine trip, had been satisfied. This second signal therefore generated the first-out indication of reactor trip due to turbine trip, which was received by the operators.

III. Analysis of Event

Based on the conclusion that the reactor trip was caused by the spurious opening of the Train B Reactor Trip Breaker (3RPS*ACB-RTB) coincidental with the Train A Reactor Trip Breaker (3RPS*ACB-RTA) Testing, all plant systems responded in accordance with their design and all protective functions executed properly, given the plant configuration at the time of the trip. At no time during the event was the plant in an unanalysed condition and subsequent testing of all reactor trip breakers and bypass breakers has indicated full operability according to system design.

With all Train B safety systems in service and operable, the Train A equipment configuration did not impact safety system response due to the redundant design of the plant. All plant systems and parameters were normal or within a stable range. All equipment performed as expected and the plant was safely brought to a shutdown condition.

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

III. Analysis of Event (Continued)

This event is reportable under the provisions of 10CFR50.73(a)(2)(iv) and was reported under the provisions on 10CFR50.72(b)(2)(ii) in that the condition of the plant resulted in the actuation of the Reactor Protection System in a way that was not a preplanned sequence. There were no safety implications to the public as all safety systems performed their functions to bring the plant to a stable hot standby condition.

IV. Corrective Action

The loose shield wire that was found, although it did not contribute to the trip, was tightened. All systems associated with the trip have been inspected, tested and proven to perform in accordance with their intended design. The investigation has determined the trip to be spurious. The testing and investigation complete the corrective action.

V. Additional Information

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

EIIS Codes

Systems

Components

Plant Protection System - JC
Solid State Control System/Auxiliary
Logic Control System - JG

Breaker - BKR

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

June 9, 1987
MP-10452
Re: 10CFR50.72(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 50-423/87-026-00

Gentlemen:

This letter forwards Licensee Event Report 87-026-00 required to be submitted within thirty days pursuant to 10CFR50.72(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).

Very truly yours,

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/VRJ:cjh

Attachment: LER 87-026-00

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

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