

NRC Form 366
(9-83)U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 8/31/85

LICENSEE EVENT REPORT (LER)

Facility Name(1) Maine Yankee Atomic Power Company	Docket Number(2) 0 15 10 10 10 13 10 19	Page(3) 1 of 013
---	--	---------------------

Title(4) Root Stop Valves Not Fully Opened on Steam Generator Pressure Sensing Lines																												
Event Date(5) Month Day Year			LER Number(6) Sequential Number			Report Date(7) Month Day Year			Other Facilities Involved(8) Facility Names																			
0	8	10	17	8	15	8	15	-	0	0	9	-	0	0	0	9	0	6	8	5	0	5	10	10	10	10	1	1

Operating Mode (9) 7												This Report is Submitted Pursuant to the Requirements of 10 CFR § (Check one or more of the following) (11)											
Power Level (10) 0 7 8												<input type="checkbox"/> 20.402(b) <input type="checkbox"/> 20.405(c) <input type="checkbox"/> 50.73(a)(2)(iv) <input type="checkbox"/> 73.71(b) <input type="checkbox"/> 20.405(a)(1)(i) <input type="checkbox"/> 50.36(c)(1) <input checked="" type="checkbox"/> 50.73(a)(2)(v) <input type="checkbox"/> 73.71(c) <input type="checkbox"/> 20.405(a)(1)(ii) <input type="checkbox"/> 50.36(c)(2) <input checked="" type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> Other (Specify in <input type="checkbox"/> 20.405(a)(1)(iii) <input checked="" type="checkbox"/> 50.73(a)(2)(i) <input type="checkbox"/> 50.73(a)(2)(viii)(A) Abstract below <input type="checkbox"/> 20.405(a)(1)(iv) <input checked="" type="checkbox"/> 50.73(a)(2)(ii) <input type="checkbox"/> 50.73(a)(2)(viii)(B) and in Text, NRC <input type="checkbox"/> 20.405(a)(1)(v) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(x) Form 366A)											

LICENSEE CONTACT FOR THIS LER (12)

NAME Danny P. McDougold, Nuclear Safety Engineer	Telephone Number Area Code 2 0 7 8 8 2 6 3 2 1
---	--

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

Cause	System	Com- ponent	Manufac- turer	Reportable to NPRDS	Cause	System	Com- ponent	Manufac- turer	Reportable to NPRDS

Supplemental Report Expected (14)

(If yes, complete Expected Submission Date(15))	Expected Month Day Year
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)
On August 7, 1985, while the plant was operating at 78% power level, a licensed operator found nine out of the twelve root stop valves on steam generator (SG) pressure sensing lines not fully opened. The SG pressure sensing lines mitigate a Main Steam Line Break (MSLB) transient by providing inputs to 1) Reactor Protective System (RPS) for reactor trip on low SG pressure, 2) Excess Flow Check Valves for isolating steam line breaks downstream of all three SGs, and 3) Feed Valve Trip System to isolate all feed to the affected steam generator. Immediate action was implemented to fully open all the root stop valves on the SG pressure sensing lines. Temporary administrative controls were established through tagging rules. All other root stop valves on critical instrumentation lines specified in Technical Specification 4.1 (Tables 4.1-1 to 4.1-3) were checked during the present Refueling Shutdown and found to be open. Tests conducted on the plant simulator and best estimate computer analyses both indicate that if all steam generator pressure transmitters are inoperable, a reactor trip occurs early in a MSLB with a substantial margin to recriticality throughout the transient.

To prevent recurrence, procedures have been reviewed and modified to administratively control the root stop and isolation valves on all critical instrumentation lines specified in Technical Specification 4.1.

NRC Form 366A
(9-83)U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 8/31/85

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Facility Name(1)	Docket Number(2)	LER Number (6)						Page(3)	
		Year	Sequential Number	Revision Number					
Maine Yankee Atomic Power Company									
	1051010131019	85	1	0	0	9	1	0	0
								2	of 10

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

On August 7, 1985 an Instrument & Controls (I&C) Technician was troubleshooting a steam generator (SG) #1 Pressure Channel "D" Pre-trip signal on the Reactor Protective System (JC). There are four channels (A,B,C, and D) per steam generator with one pressure sensing line per channel. The pressure transmitter (PT) was initially checked and found to be operating correctly.

At approximately 1930, while the plant was operating at 78% power level, investigation by an I&C Technician and a licensed operator revealed the pressure sensing line to Channel "D" had a root stop valve (RTV) that was not fully opened. When the other steam generator pressure sensing lines were checked, nine out of the twelve root stop valves for the three steam generators were found not fully opened.

The pressure sensing lines mitigate a main steam line break (MSLB) transient by providing inputs to: 1) Low Steam Generator Pressure Reactor Protective System trip (485 psig on 2 out of 4 channels), 2) Excess flow check valve closure to isolate downstream breaks on all three steam generators (400 psig on 2 out of 4 channels) and 3) Feed Valve Trip System to isolate all feed to the affected steam generator by closing Main Feed Regulating and Bypass valves along with the Auxiliary Feed Valves (400 psig on 2 out of 4 channels).

Investigation as to the cause for the sensing line root stop valves being mispositioned was undertaken. It was determined that all twelve root stop valves were closed by a temporary procedure during the 1984 refueling shutdown steam generator system hydrostatic tests. Although the temporary procedure governing the hydro test required realigning the affected systems after test completion, no specific requirements were imposed on the root stop valves.

During this same refueling outage, but after the hydrostatic test, the Channel "A" sensing lines were realigned to their proper position for the functional testing of an unrelated design change. This explains why only these root valves were found fully open.

Immediate action was implemented to fully open all the root stop valves on the steam generator pressure sensing lines. Temporary administrative controls were established through tagging rules. All other root stop valves on critical instrumentation lines specified in Technical Specification 4.1 (Tables 4.1-1 to 4.1-3) were checked during the present refueling shutdown and found to be open. All temporary procedures have been reviewed to ensure that they require the root stop valves to be open.

The long term corrective actions to prevent recurrence include: 1) All the root stop and isolation valves of critical instrumentation lines specified in Technical Specification 4.1 will be checked open, including a second verification, prior to startup after each refueling, 2) the Quality Assurance procedure governing procedure preparation will be revised to ensure that procedures governing the manipulation or repositioning of valves on safety-related systems explicitly define, as a final condition, the correct valve position.

NRC Form 366A
(9-83)U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 8/31/85

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Facility Name(1)	Docket Number(2)	LER Number (6)			Page(3)	
		Year	Sequential Number	Revision Number		
Maine Yankee Atomic Power Company						
	01510101319	85	- 0 0 9	- 0 0	3	of 13

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

To assess the safety implications of this event, a study was undertaken to evaluate what effect the loss of the low steam generator pressure signal would have on the severity of a MSLB transient. A review of the Maine Yankee MSLB safety analysis indicated that the reactor typically scrams on low SG pressure within 2 seconds of the occurrence of the worse case double-ended guillotine break. However, this trip is backed up by other RPS trips, including the high flux, delta T overpower, SG level, and RCS pressure trips. A RETRAN model was developed with the SG pressure trip deactivated. This also disabled the main steam and feedwater isolation systems, allowing all three SGs to blow down through the break. The RETRAN results indicated a delta T overpower trip at 3.5 seconds and a high flux trip at 5 seconds. After allowing uncertainties for temperature sensor response time and flux attenuation due to cool water in the downcomer, respectively, both trips are expected to occur within 10 seconds following the break.

If the break were to occur inside the containment, the containment pressure trip would provide earlier protection, actuating within 4 seconds following the worst case double-ended guillotine break. For a break inside containment, the reverse flow check valve would limit blowdown to one steam generator.

A best estimate reactivity balance was performed to determine whether a return to power could be induced by a MSLB with the SG pressure trip disabled. A worst case cooldown was assumed; from 576.4°F to 60°F for the full power case and 532°F to 60°F for the zero power case. No uncertainties were applied to the kinetics parameters or reactivity parameters, however, a maximum worth struck rod was assumed, and no credit was taken for boron injection. The best estimate calculations at zero and full power level show significant margin (greater than 0.3% delta rho) to recriticality.

Plant simulator tests were conducted within a few days of the event and involved initiating several main steam line breaks with the steam generator pressure trip blocked. These tests also indicated that a plant trip occurs from other reactor protective system functions.



ATOMIC POWER COMPANY •

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

September 6, 1985
MN-85-161

GDW-85-236

Director, Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Reference: License No. DPR-36 (Docket 50-309)

Subject: Maine Yankee licensee Event Report 85-009-00 - Root Stop Valves Not
Fully Opened on Steam Generator Pressure Sensing Lines

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 85-009-00. This report is submitted in accordance with the requirements of various subparts of 10 CFR 50.73(a)(2).

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

G. D. Whittier, Manager
Nuclear Engineering and Licensing

GDW:bjp

Enclosure: Three pages

cc: Mr. Edward J. Butcher, Jr.
Dr. Thomas E. Murley
Mr. Cornelius F. Holden

LE22
11