Maine Yankee
RELIABLE ELECTRICITY FOR MAINE SINCE 1972

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February 8, 1991
MN-91-30 SEN-91-50

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, DC 20555

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

Subject: Maine Yankee Licensee Event Report 91-001-00 - Plant Shutdown Due to Failure of Manual Containment Integrity Valve

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 91-001-00. This report is submitted in accordance with the requirements of 10 CFR 50.73(a)(2)(i).

Please contact us should you have any questions regarding this matter.

Very truly yours,

for S. E. Nichols, Manager
Nuclear Engineering & Licensing

SEN/sjj

c: Mr. Thomas T. Martin
Mr. Charles S. Marschall
Mr. E. H. Trottier
Mr. Patrick J. Dost

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NRC Form 366 (9-83)

U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
Expires: 8/31/85

LICENSEE EVENT REPORT (LER)

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Title(4) PLANT SHUTDOWN DUE TO FAILURE OF MANUAL CONTAINMENT INTEGRITY VALVE

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)
0 1	0 8	9 1	9 1	- 0 0 1	- 0 0	0 2	0 8	9 1		

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)	0 1 9	20.402(b)	20.405(c)	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)	X 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
DAVID A. RIVARD, NUCLEAR SAFETY ENGINEER	Area Code 2 0 7 6 8 2 5 3 2 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	S B	I S V	V 1 3 5	YES							

Supplemental Report Expected (14)		Expected Submission Date(15)	Month	Day	Year
X Yes (If yes, complete Expected Submission Date)	No		0 3	2 2	9 1

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

At 2122, on January 8, 1991, Maine Yankee commenced a plant shutdown from 19% reactor power as required by Technical Specifications due to the failure of a manual containment integrity boundary valve (MS-70). During a plant startup, stem and yoke bushing thread damage prevented shutting MS-70, a steam line bypass isolation valve. While attempting on-line repairs which involved replacing the damaged yoke threads, the stem and disc separated and the stem was ejected. It was subsequently determined that the stem had failed previously but this failure was not discovered prior to the attempt to repair the valve. A plant cooldown was required to replace the valve and restore the containment integrity boundary.

The valve failure caused a loss of the containment integrity barrier external to the containment. However, the internal membrane containment integrity barrier, formed by the steam generator was not breached. The previous valve stem failure did not affect valve closure and, therefore, it remained operable as an isolation valve. However, the stem and yoke bushing thread damage that occurred on January 8, prevented the valve from shutting and acting as a containment barrier. Compensatory measures to isolate MS-70 as allowed by the Technical Specification remedial action were implemented.

The valve which failed and one similar steam line bypass isolation valves were replaced and the third valve cleaned and lubricated. The Plant Manager implemented additional administrative controls to govern maintenance activities that can not be adequately isolated by the administrative tagging system. Changes to the administrative tagging procedure and discrepancy reporting procedure to ensure adequate reviews for activities performed without the use of tagging controls are scheduled to be implemented May 1, 1991.

NRC Form 366A
(9-83)

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

On January 8, 1991, Maine Yankee performed a plant shutdown from 19% reactor power, as required by Technical Specifications due to the failure of a containment integrity isolation valve and the inability to adequately isolate the affected containment penetration. During a plant start up, the bypass lines around the main steam system (SB) non-return valves (NRV) and excess flow check valves (EFCV) were opened for steam line warmup. When attempting to shut the bypass isolation valve (MS-70) for the #2 steam line, it was discovered that MS-70 could not be shut due to damage to the valve stem and yoke bushing threads.

MS-70 is a containment integrity barrier isolation valve for the #2 steam line bypass line. When MS-70 could not be shut, additional valves downstream of MS-70 were shut and tagged to rebound the valve as allowed by the Technical Specifications to isolate the bypass line. Technical Specifications require that the rebounded valves must meet the same design criteria as the original containment integrity valve if they remain in effect for longer than 72 hours.

The valves used to isolate the bypass line consisted of a stop check valve (MS-71) downstream and in series with MS-70 and an instrumentation isolation valve (MS-72) for a tap between the two inline valves. (See attached figure.) Valves MS-71 and MS-72 were not designated as safety class and upgrading the valves was believed to be unlikely. Therefore, an on-line repair was attempted on MS-70 within the time constraints of the remedial action. The valve yoke was to be cut and the upper portion of the yoke including the yoke bushing was to be split and replaced with a new section and welded in place.

At 2045, when the existing yoke on MS-70 was cut, a portion of the valve stem and the severed yoke were ejected from the valve. The remaining portion of the valve stem and the disk remained in the valve body, backseated and blocked the stuffing box opening. A "soft patch" made of lead was clamped over the valve to secure a small steam leak that remained.

A plant shutdown and cooldown commenced at 2122 to replace MS-70 and restore the containment integrity boundary. The plant was in Hot Shutdown at 2325 and was cooled to Cold Shutdown at 1020 on January 9.

The valve failure constituted a loss of the containment integrity barrier external to the containment for that penetration. The internal containment integrity barrier, the steam generator u-tubes and associated main steam piping provided an intact membrane barrier between both the reactor coolant system and the containment internal atmosphere. Although the valve stem had previously separated, the disc could be seated by action of the separated stem. The failed component was a 2 inch globe valve, series number SW 2821, manufactured by the Henry Vogt Machine Co. The stem failed at a machined bevel that forms the valve backseat. A failure mechanism is being investigated. A supplement will be submitted following completion of material testing.

After reaching cold shutdown, MS-70 was replaced. Similar valves in the other two steam lines were inspected and their maintenance history reviewed. As a result, MS-50 in the #1 steam line was also replaced due to similar stem thread damage. In the #3 steam line, MS-90 stem and yoke bushing threads were cleaned and lubricated.

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

Administrative controls established for maintenance activities on live or energized equipment without the use of the administrative tagging system were overlooked during the maintenance activity to repair MS-70. In response, a review by the Plant Manager was instituted for all work to be performed without the use of the administrative tagging system. Additionally, a special investigation of the human performance aspect of the event was conducted, and changes to the administrative tagging procedure and the discrepancy reporting procedure were recommended to ensure that activities performed without tagging controls receive the appropriate reviews. These procedure changes will be implemented by May 1, 1991.

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