

Maine Yankee

RELIABLE ELECTRICITY FOR MAINE SINCE 1972

EDISON DRIVE • AUGUSTA, MAINE 04336 • (207) 622-4868

10 CFR 50.73

November 21, 1990
MN-90-116

SEN-90-320

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, D. C. 20555

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

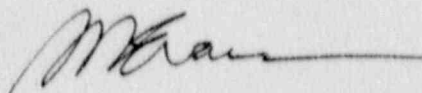
Subject: Maine Yankee Licensee Event Report 90-009-00 - Engineered Safeguards
Feature Light Box Design Deficiency

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 90-009-00. This report is submitted in accordance with the requirements of 10 CFR 50.73(a)(2)(ii).

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

Very truly yours,



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

SEN:SJJ

Enclosure

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

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LICENSEE EVENT REPORT (LER)

Facility Name(1) Maine Yankee Atomic Power Company	Docket Number(2) 0 15 10 10 10 13 10 19 1 of 21	Page(3)
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Title(4) CONTAINMENT ISOLATION VALVE POSITION INDICATION SYSTEM DESIGN DEFICIENCY

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)
10	20	1990	1990	009	000	11	21	1990		

This Report is Submitted Pursuant to the Requirements of 10 CFR § (Check one or more of the following) (1)

Operating Mode (9)	5	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
Power Level (10)	0	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)	X 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 PETER EBERT - NUCLEAR SAFETY ENGINEER	Telephone Number Area Code 2 0 7 8 8 12 16 3 2 1
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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
B	I P R I E C I T	X	9 9 9	N					

Supplemental Report Expected (14)

(If yes, complete Expected Submission Date)	Yes	No	Expected Submission Date(15)	Month	Day	Year
		X				

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

On October 20, 1990 while in a hot shutdown condition, operators observed that all of the Engineered Safeguards Feature (ESF) containment isolation valve position indicator lights on both the channel A and channel B ESF light boxes were dimly illuminated with the exception of the shut valves, which were brightly illuminated as was normal. Normal indication for an open containment isolation valve is an unilluminated light. The ESF light boxes provide position indication for 30 of the 57 control room operated containment isolation valves.

An investigation was conducted to determine why a single component failure had an effect on both light boxes. The investigation revealed that although the valve position indicating circuits were separately mounted on the ESF panel, all the light box indications were powered from a common Non Nuclear Safety (NNS) power source. Due to cognitive error, it had been previously concluded that the containment isolation valve position indicator display met the requirements of Regulatory Guide 1.97.

Containment isolation valve position can be manually verified by alternate methods. Administrative controls have been instituted to periodically verify operability of the light boxes and, in the event of a light box failure during an accident requiring containment isolation, to manually verify valve position. A design change to resolve this condition will be accomplished during the next refueling shutdown.

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	0150103019	9 10	- 0 0 9	- 0 0	2 of 2

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

On October 20, 1990 at 0600 while in a hot shutdown condition, operators observed that all of the Engineered Safeguards Feature (ESF) containment isolation (JM) valve position indicator lights on both channel A and channel B ESF light boxes were dimly illuminated with the exception of the shut valves, which were brightly illuminated as was normal. Since the normal state for an open containment isolation valve's light is unilluminated, their dimly lit status constituted an abnormal condition. The ESF light boxes provide position indication for 30 of the 57 control room operated containment isolation valves. The Emergency Core Cooling System (ECCS) light box provides an additional control room indication of the position of all 57 containment isolation valves.

Each of the ESF light box indications for its respective containment isolation valve is used as one means of determining that containment isolation has been established whenever it is required. At the time the ESF light box anomaly was observed, the plant was operating in condition 5 (hot shutdown). When the light box malfunction was first identified, additional valves were stroked to determine the operability of the panel. In each case the dim light box indication went to its normal bright indication as the valve stroked shut. Subsequently it was determined that the cause of the malfunction was a failed biasing diode (RECT) in the B train light box valve position indicating circuitry. When the failed diode was replaced, normal light box indications were restored. The light box is Part 3742-12 manufactured by ROTO-Tellite, Inc.

Further investigation was conducted to determine why a single component failure had an identical effect on both valve position indication light boxes. The investigation revealed that although the valve position indicating circuits were separately mounted on the ESF panel, all the light box indications were powered from a common Non-Nuclear Safety (NNS) power source. The investigation indicated that the light box design was not intended to meet Regulatory Guide 1.97. The deviation between the as installed configuration and Regulatory Guide 1.97 was attributed to a personnel error by the engineer who performed the assessment of conformance with the Regulatory Guide. A procedure is being developed to provide guidance for the performance of similar assessments in the future. This procedure will also require that an independent technical review be performed for such assessments.

Failure of any portion of the light box or associated indication systems does not effect any associated valve's safety function since the light box circuits are electrically independent from all safety related valve control circuits and actuation logic. Light box system failure is detectable in both the energized and de-energized states. Should such a failure occur containment isolation valve position can be verified by operator inspection for those valves outside containment. Administrative controls have been instituted to verify operability of the light boxes on a once per shift basis and in the event of an accident requiring containment isolation to verify shut the outside containment isolation valves. Justification for continued operation was provided by MYAPC letters MN-90-108 dated October 24, 1990 and MN-90-109 dated October 30, 1990.

A design change to resolve this condition will be accomplished during the next refueling shutdown. In addition, a comprehensive design review of other Regulatory Guide 1.97 installations will be completed prior to the next refueling shutdown to ensure that no similar deficiencies exist.