

# Maine Yankee

RELIABLE ELECTRICITY FOR MAINE SINCE 1972

EDISON DRIVE • AUGUSTA, MAINE 04330 • (207) 622-4868

10 CFR 50.73

November 20, 1990

MN-90-115

SEN-90-319

UNITED STATES NUCLEAR REGULATORY COMMISSION

Attention: Document Control Desk

Washington, D. C. 20555

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

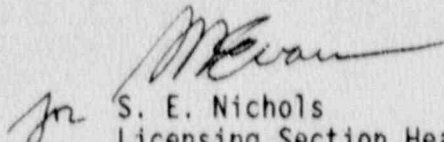
Subject: Maine Yankee Licensee Event Report 90-008-00 - Failure of Environmentally Qualified Limit Switch

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 90-008-00. 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,

  
S. E. Nichols  
Licensing Section Head

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)<br>Maine Yankee Atomic Power Company | Docket Number(2)<br>0 5 10 10 10 3 10 19 1 of 13 | Page(3)<br>1 of 13 |
|-------------------------------------------------------|--------------------------------------------------|--------------------|

Title(4)  
Failure of Environmentally Qualified Limit Switch

| 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) |
| 11            | 0   | 1990 | 1990          | 008               | 00              | 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)<br>7   | <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)                                                     |
| Power Level (10)<br>1 0 0 | <input type="checkbox"/> 20.405(a)(1)(i)   | <input type="checkbox"/> 50.36(c)(1)                | <input 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 type="checkbox"/> 50.73(a)(2)(vii)     | <input type="checkbox"/> Other (Specify in Abstract below and in Text, NRC Form 366A) |
|                           | <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)(iv)  | <input checked="" type="checkbox"/> 50.73(a)(2)(ii) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |                                                                                       |
|                           | <input type="checkbox"/> 20.405(a)(1)(v)   | <input type="checkbox"/> 50.73(a)(2)(iii)           | <input type="checkbox"/> 50.73(a)(2)(x)       |                                                                                       |

LICENSEE CONTACT FOR THIS LER (12)

|                                              |                                                       |
|----------------------------------------------|-------------------------------------------------------|
| NAME<br>Ethan Brand, Nuclear Safety Engineer | Telephone Number<br>Area Code<br>2 0 7 8 8 12 6 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 |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
|       |        |           |              |                     |       |        |           |              |                     |

Supplemental Report Expected (14)

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

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

While operating at 100% power, Maine Yankee identified a failed environmentally qualified (EQ) limit switch located inside the containment. The limit switch provides main control board indication of an isolation valve (PD-A-122) for the containment sump pump discharge line. The valve automatically closes on a Containment Isolation signal, or may be operated from the main control board.

Investigation revealed that moisture entered the limit switch through a conduit seal and corroded a terminal. The limit switch provides closed position indication only, and does not affect valve operation. Maine Yankee Emergency Procedures direct the operator to align the valve to its safeguards position in the case of ambiguous indicated position. The valve is normally in the open position.

Because the subject limit switch failed, despite having passed an inspection during the 1990 refueling outage, plant management concluded that there may be a generic problem with the installation of Scotchcast #9 epoxy conduit seals used in EQ limit switches. The plant was shutdown on October 19, 1990 to replace the remaining Scotchcast seals.

Maine Yankee replaced the remaining EQ Scotchcast #9 conduit seals with new pre-sealed connectors prior to restarting operations on October 26, 1990.

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 | 0510031019       | 910            | - 0 0 8           | - 0 0           | 2 of 3  |

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

While operating at 100% power, Maine Yankee identified a failed environmentally qualified (EQ) limit switch (33) located inside the containment. The limit switch provides main control board indication of one of two automatic isolation valves (ISV) (PD-A-122) for the containment sump pump discharge line containment penetration. The valves automatically close on a Containment Isolation signal, or may be operated from the main control board.

The valve is equipped with one limit switch. The limit switch provides position indication by illuminating a lamp in the Control Room when the valve was closed, and does not affect valve operation. Maine Yankee Emergency Procedures direct the operator to manually align the valve to its safeguards position in the case of ambiguous indicated position. The valve is normally in the open position.

On October 17, 1990, while performing a safeguards valve surveillance procedure, the closed position lamp did not illuminate when the containment sump pump discharge valve was taken to the closed position. The problem was referred to maintenance for repair. On October 17, 1990, an Instrumentation and Controls technician identified a moisture corroded terminal inside the limit switch. Moisture had entered the limit switch due to inadequate sealing of the conduit (CND).

The NAMCO Model EA 180 limit switch entry is sealed with 3M Scotchcast #9 conduit sealer (potting compound), a two part epoxy (refer to attached sketch). The epoxy is injected into the conduit fitting while still liquid, and contained with a dam while curing. In this case the epoxy did not form a tight seal. Moisture entered the fitting and collected in the limit switch, eventually corroding a terminal and causing the switch failure. The conduit orientation with respect to the switch aggravated the problem; the conduit ran vertically down to the limit switch, such that any large amount of moisture in the conduit could collect in the switch should the seal fail.

In February, 1990, an EQ limit switch that provides position indication for a primary sampling system isolation valve (PS-A-20) failed (LER-90-001-01). The root cause of this failure was inadequate reapplication, in 1987, of Scotchcast #9 conduit sealer, resulting in corrosion of a switch terminal due to moisture intrusion. Consequently, all similar limit switches that had been reworked in 1987 (14) were upgraded to a new NAMCO Model EC 210 pre-sealed connector assembly during the 1990 refueling outage. Twenty-two other switch connections were also similarly upgraded, for a total of 36 limit switch connections upgraded with new NAMCO pre-sealed connectors during the 1990 outage. The limit switch for PD-A-122 was found to be in good condition (no trace of moisture) during this 1990 Outage inspection. Maine Yankee had planned to upgrade the remaining 42 Scotchcast #9 conduit seals (including PD-A-122) with pre-sealed NAMCO connector assemblies during the 1991 Refueling outage.

Because the subject limit switch failed, despite having passed an inspection during the 1990 refueling outage, plant management concluded that there may be a generic problem with the installation of Scotchcast #9 conduit seals for EQ limit switches. The plant was shutdown on October 19, 1990 to replace the remaining epoxy seals.

Maine Yankee replaced the remaining 42 EQ conduit seals that used Scotchcast #9 as a moisture seal with the new NAMCO Model EC 210 pre-sealed connectors prior to restarting operations on October 26, 1990. During the replacement program no other limit switches were found with any moisture.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

|                                                       |                                |                |                          |                       |         |        |
|-------------------------------------------------------|--------------------------------|----------------|--------------------------|-----------------------|---------|--------|
| Facility Name(1)<br>Maine Yankee Atomic Power Company | Docket Number(2)<br>0510103109 | LER Number (6) |                          |                       | Page(3) |        |
|                                                       |                                | Year<br>910    | Sequential Number<br>008 | Revision Number<br>00 |         | 3 of 3 |

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

FIGURE 1

SCOTCHCAST NO. 9 SEAL CONFIGURATION

