Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

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October 16, 1996
MN-96-151 JRH-96-222

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

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

Subject: Maine Yankee Licensee Event Report 96-026-01, EQ of Cables/Connectors Inside CTMT may not meet requirements for Submergence during DBA

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 96-026-01 . This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii).

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

Very truly yours,

James R. Hebert, Manager
Licensing & Engineering Support Department

mwf

Enclosure

c: Mr. Hubert Miller
Mr. J. T. Yerokun
Mr. D. H. Dorman
Mr. Patrick J. Dostie
Mr. Uldis Vanags

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE
Maine Yankee Atomic Power Company	50-309	1 OF 7

TITLE (4) EQ of Cables/Connectors Inside CTMT may not meet requirements for Submergence during DBA

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 NAME	DOCKET NUMBER
07	24	96	96	-- 026 --	01	10	16	96	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
POWER LEVEL (10)	0%	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
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
		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	TELEPHONE NUMBER (Include Area Code)
Bruce P. Kobel & George N. Stowers, Senior Nuclear Safety Specialist	(207) 882-6321

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)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) q:\nseg\bpk\ler96026.bpk

On July 24, 1996 Maine Yankee was steady state in cold shutdown.

In response to an NRC ISA question, a walkdown of the reactor containment revealed several EQ components not qualified for submergence. Following further evaluation it was determined that numerous components located in the reactor containment are affected by submergence during a DBA.

These EQ items have been declared inoperable and determined to be outside design basis.

Planned corrective actions for Environmental Qualification include:

- Determine possible deficiencies within the EQ Program that allowed this to occur.
- Evaluate adequacy of the flood line (of record) for reactor containment.
- Evaluate the need to validate the EQ Master List.
- Relocate / evaluate the various components identified below the flood plane.

INITIAL PLANT CONDITIONS:

On July 24, 1996 Maine Yankee was steady state in a cold shutdown condition.

EVENT DESCRIPTION:

In response to an NRC, Independent Safety Assessment Team (ISAT) question, it was discovered that several Environmental Qualification components, within the reactor containment, are below the maximum submergence level (elevation 1.7 feet) and not qualified for this environment.

The Maine Yankee EQ Program is required to be in compliance with 10 CFR 50.49 as delineated in FSAR Section 1.3.8. This includes qualification to all environmental conditions that equipment may be subjected to while performing their intended safety function.

It was discovered that the EQ Program documentation (EQ Worksheets and the EQ Database) do not reflect the exact component elevations. Walkdowns were performed to confirm the component elevations of EQ items at the submergence level of the containment for this Design Basis Accident scenario. Submergence levels for the EQ components ranged from 1/4 inch to 31 1/4 inches below the maximum submergence level (1.7 feet).

The following EQ components are located in the reactor containment (NH) and are impacted by the maximum submergence level (1.7 feet):

- Limit switches and seal assemblies
  Quantity: 7
  Type: NAMCO; EA-180 limit switches and EC-210 seal assemblies
  Safety function: Valve position indication (Reg. Guide 1.97)

EVENT DESCRIPTION: (continued)

The following EQ components are located in the reactor containment and are impacted by the maximum submergence level (1.7 feet): (continued)

- Seal assembly pigtails
  Quantity: 17
  Type: NAMCO seal assembly pigtails EC-210
  Safety function: Valve position indication (Reg. Guide 1.97)

- Transmitters
  Quantity: 9
  Type: Rosemount Model 1154 transmitters
  Safety function: Steam Generator level indication; Reactor Protection System and long-term cooling (Reg. Guide 1.97).

- Connectors
  Quantity: 11
  Type: EGS connectors
  Safety function: Steam Generator level indication; Reactor Protection System and long-term cooling (Reg. Guide 1.97).

- Connector pigtails
  Quantity: 14
  Type: EGS (Patel) connector pigtails
  Safety function: Steam Generator level indication; Reactor Protection System and long-term cooling (Reg. Guide 1.97).

EVENT DESCRIPTION: (continued)

The following EQ components are located in the reactor containment and are impacted by the maximum submergence level (1.7 feet): (continued)

- Seal assembly
  Quantity: 1
  Type: CONAX Model 11006-35 electrical conductor seal assembly (ECAS)
  Safety function: Steam Generator level indication; Reactor Protection System and long-term cooling (Reg. Guide 1.97).

- Cables (CBL)
  Quantity: 3
  Type: Rockbestos Firewall III cables
  Safety function: Primary Inventory Trend System (PITS) Reactor Vessel post-accident level indication.; Small - Break LOCA Containment Isolation.

- Actuator
  Quantity: 1
  Type: Limitorque model SMB-00 actuator
  Safety Function: Valve position indication (Reg. Guide 1.97), Containment Isolation.

The EQ components listed above provide the ability to perform post-accident monitoring functions in accordance with Reg. Guide 1.97. The design basis functions of monitoring Steam Generator (SG) level and containment isolation valve position indications can be affected by the submergence. [Alternate methods of determining the adequacy of Steam Generator heat removal capabiltiy are [available which are not impacted by submergence. Also, the containment isolation function is verified by position indication prior to being impacted by submergence.

TEXT *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

EVENT DESCRIPTION: (continued)

The first group of items on the previous list are limit switches and seal (SEAL) assemblies (quantity 7). Maine Yankee uses NAMCO model EA-180 limit switches for containment isolation valve position indications. NAMCO EC-210 seal assemblies are used to connect the limit switch to plant cabling. Junction boxes housing the splices between the plant cables and seal assemblies are above the submergence level.

According to NAMCO, environmental qualification information for submergence of the limit switches and the seal assemblies is not available. It is therefore assumed that these limit switches and associated pigtails fail to perform their intended function. In all cases, the limit switches and pigtail are assumed to be shorted and reliable valve position will be lost on the ECCS lightbox in the main control room.

A containment isolation signal is activated shortly after a LOCA and containment isolation is achieved prior to the submergence of the limit switches or pigtails. Isolation is verified by emergency operating procedures (E-0) which requires verifying all green lights on the ECCS lightbox. It is estimated that this step will be performed within 10 minutes of entering the EOP. Containment isolation valve (ISV) circuits are designed to be maintained in a "tripped" state. In order to reposition valves, their circuits must first be reset through appropriate hand switches on the main control board. Loss of the position indication will not cause the valves to reposition, will not affect valve control, trip and reset functions, and will not impact containment integrity.

SAFETY SIGNIFICANCE:

None of the equipment in question, presently in the EQ Program, have been qualified for submergence. In accordance with the Maine Yankee EQ Program Description Manual, the maximum containment flood level post-LOCA is elevation 1.7 feet. Based on a recent walkdown of all the EQ equipment in the -2 foot elevation, a number of components were found below elevation 1.7 feet. A total of 30 components have EQ parts below the flood line. The components affected fall into three groups; Containment Isolation valve position indication, Steam Generator level (wide range and narrow range indication), and Primary Inventory Trend System (PITS) [RTD] level transmitter cable indication. This condition is outside the Maine Yankee design basis. The safety significance of these items are low based on confirmation of the valve position before the valve switch and cable are submerged. Additionally, submergence does not effect the valve position.

CAUSAL FACTORS:

The apparent proximal casual factors associated with this condition are cognitive errors made by engineering personnel when performing reviews of criteria and design parameters against the Environmental Qualification Program and existing plant (field) conditions. A root cause is ongoing as part of long term corrective actions and the result will determine the specifics of the cognitive errors.

CORRECTIVE ACTIONS:

- These EQ items were declared inoperable and determined to be outside design basis.
- Subsequent immediate corrective actions have made operable many of the EQ items with the remainder scheduled for long-term corrective action.

Planned long-term activities for Environmental Qualification include:

- Determine possible deficiencies within the EQ Program that allowed this to occur.
- Evaluate adequacy of the flood line (of record) for reactor containment.

CORRECTIVE ACTIONS: (continued)

- Evaluate the need to validate the EQ Master List.
- Relocate / evaluate the various components identified below the flood plane.

PREVIOUS SIMILAR EVENTS:

The following LERs discuss previous similar LER reportable events or conditions where cognitive errors resulted in Environmental Qualification discrepancies.

Environmental Qualification:

90-001 Failure of Environmentally Qualified Limit Switch.

90-008 Failure of Environmentally Qualified Limit Switch.

89-002 Environmental Qualification Discrepancies Identified in Containment Cable Connector.

87-005 Reactor Coolant System Loop RTD Environmental Qualification discrepancies.

85-013 Differential Pressure Transmitters Improperly Installed and Maintained for Environmental Qualification.