VERMONT YANKEE
NUCLEAR POWER CORPORATION

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FVY 84-74

REPLY TO:
ENGINEERING OFFICE
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FRAMINGHAM, MASSACHUSETTS 01701
TELEPHONE 617-872-8100

June 29, 1984

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Office of Nuclear Reactor Regulation
Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing

References: a) License No. DPR-28 (Docket No. 50-271)
b) Letter, VYNPC to USNRC, FVY 84-34, dated 4/11/84
c) Letter, USNRC to VYNPC, NVY 84-114, dated 5/31/84

Dear Sir:

Subject: Vermont Yankee Program for Environmental Qualification of Safety-Related Electrical Equipment

By Reference b), we provided you with our comprehensive upgraded program for Environmental Qualification of safety-related electrical equipment at our facility. We subsequently met, on April 18, 1984, with members of your staff to discuss the status of our compliance with 10CFR50.49, "Environmental Qualification (EQ) of Electrical Equipment Important to Safety for Nuclear Power Plants".

The purpose of this letter is to provide you with additional information to address questions raised by your staff at the April 18 meeting with respect to our upgraded EQ Program. In addition, this letter addresses your recent request for additional information, forwarded to us by Reference c).

Methodology for Identifying Equipment within the Scope of 10CFR50.49 (b)(1), (b)(2), and (b)(3) - Response to Questions 2 and 3 of Reference (c)

At the meeting, your staff requested confirmation that all design basis events at Vermont Yankee (VY), which could result in a potentially harsh environment, including flooding outside containment, were addressed in identifying safety-related electrical equipment which was to be environmentally qualified. The flooding and environmental effects resulting from all postulated design-basis accidents documented in Chapter 14 of the VY Final Safety Analysis Report (FSAR), as well as High Energy Line Breaks (HELBs) outside containment, were considered in identification of safety-related electrical equipment to be environmentally qualified, consistent with the intent of Paragraph (b)(1) to 10CFR50.49.

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The method for identifying electrical equipment within the scope of Paragraphs (b)(1) and (b)(2) of 10CFR50.49 (i.e., safety-related as well as non-safety-related electrical equipment relied upon to remain functional or whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions during and following design basis accidents) is described and documented in Reference b). This included:

1) Identification of General Design Criteria consistent with Vermont Yankee's plant-specific design and 10CFR5049;

2) Defining required safe-shutdown safety functions for design basis accidents utilizing shutdown sequence diagrams based upon existing Emergency Operating Procedures and the Vermont Yankee Final Safety Analysis Reprt (FSAR);

3) Identification of the major electrical components, for each postulated accident, in potentially harsh environments which are relied upon to operate (or not fail) for required safety functions. These components were identified by reviewing plant Piping and Instrumentation Diagrams (P&ID's); and

4) Identification of the remaining electrical components in potentially harsh environments (associated with the major required electrical components) that are relied upon to function, or whose failure could impact any required safety functions or mislead the operator such that required safety functions could be jeopardized. These components were identified by reviewing plant electrical Control Wiring Diagrams (CWD's).

The method used for identifying electrical equipment within the scope of Paragraph (b)(3) of 10CFR50.49 (i.e., "certain post-accident monitoring equipment") included the review of plant LOCA and HELB emergency operating procedures to identify a complete list of associated display instrumentation. This evaluation, performed in 1981, included the review of safety-related and non-safety-related equipment located in a harsh environment which provides information that is desirable for the operation of the plant (i.e., surveillance tests, optimum operation of the system, or use in cross-checking other instruments). The instrumentation necessary to determine that a system is performing its safety function, will be environmentally qualified.

As discussed in Reference b), we have not yet completed our engineering assessment of Post-Accident Monitoring (PAM) equipment associated with Revision 3 of Regulatory Guide 1.97. This assessment is being performed consistent with commitments made by Vermont Yankee in response to NUREG 0737, Supplement 1 (see letter, dated April 19, 1983, FVY 83-30). The results will be reflected as a supplement to our EQ Program.

Disposition of FRC Technical Evaluation Report

In response to comments made at the meeting, we have updated Enclosure 1 to Reference b), entitled, "Status of Items Addressed in Franklin Research Center TER-C5257-496". This update includes:

1) Clarification of the qualification status of the Franklin Research TER items, and

2) For those TER items which have been or will be replaced, we have identified (to the extent practicable) the associated replacement item.

This update has been reflected in Revision 1 and is provided as an Enclosure 1 to this letter.

Disposition of Components that Function Prior to Harsh Environment

At the meeting, your staff questioned the scope of items included on our EQ Master Equipment List. Enclosure 5 to Reference b), entitled, "Vermont Yankee Master Equipment List", has been updated to reflect the addition of certain electrical equipment, which perform their necessary safety function prior to being exposed to a harsh environment. This equipment, previously identified and dispositioned in Enclosure 3) to Reference b), entitled, "Vermont Yankee Environmental Qualification Electrical Component Matrix Report", was not included on our upgraded EQ Program Master Equipment List, since we believed that such equipment, although in the scope of Paragraph (b)(1) of 10CFR50.49, was exempt from the qualification requirements.

This equipment has been subsequently added to our "Master Equipment List". An updated list is provided in Enclosure 2 to this letter. Documentation that establishes and verifies that these components function before exposure to the harsh environment with adequate time margin applied, and that subsequent failure as a result of the harsh environment does not degrade any safety functions or mislead the operator, is presently included in the "Environmental Qualification Electrical Component Matrix Report". Per the guidance provided in NRC generic Letter 82-09, dated April 20, 1982, the existing plant maintenance, surveillance, and periodic testing programs are deemed to adequately demonstrate and maintain the environmental qualification of these and all other electrical components important to safety that are only relied upon in mild environments. For consistency, however, all components on the Master Equipment List will be included in our enhanced EQ Maintenance and Surveillance Program, described below.

Clarification of EQ Program Documentation Criteria

As discussed above, our Master Equipment List has been updated to reflect the addition of equipment which perform their necessary safety function prior to being exposed to a harsh environment. However, to enable you to better understand the scope of our Master Equipment List and associated qualification documentation, we are providing you with the following information.

Our Master Equipment List is comprised of the following three (3) categories of equipment, as identified in the Electrical Component Matrix Report (Enclosure 3 to Reference b):

Category (A): Equipment that will experience harsh environmental conditions due to one or more design basis accidents in which it must function to accomplish required safety functions associated with the accident(s) creating the harsh environment.

Category (B): Equipment that will experience harsh environmental conditions due to one or more design basis accidents in which it need not function for mitigation of such accidents but through which it must not fail in a manner detrimental to required safety functions associated with the accident(s) creating the harsh environment.

Category (D): Equipment that will experience harsh environmental conditions of one or more design basis accidents in which it is relied upon. But, the time period this equipment is relied upon to function (or not fail) is prior to the time when harsh environmental conditions develop. This equipment need not function in the subsequent harsh environment for mitigation of the associated accident and its failure due to the subsequent harsh environmental conditions will not adversely affect the required safety functions of that accident nor mislead the operator such that satisfactory accomplishment of these required safety functions could be jeopardized.

These three (3) categories of equipment comprise all components within the scope of 10CFR50.49. Our upgraded Environmental Qualification program also documents the review and disposition of the balance of electrical components identified in the Matrix Report but which are not on the Master Equipment List. These components have been categorized for each design basis accident as either Category (C) or (E), according to the following definitions:

Category (C): Equipment that will experience harsh environmental conditions due to that particular design basis accident, but (1) need not function for mitigation of this accident; (2) its failure will not adversely affect the required safety functions for this accident; and (3) its failure will not mislead the operator such that satisfactory accomplishment of these required safety functions would be jeopardized.

Category (E): Equipment that will not experience harsh environmental conditions due to that particular design basis accident.

During a conference call with members of your staff on May 15, 1984, it was agreed that any safety-related component not relied upon for any design basis accident (DBA) is not within the scope of 10CFR50.49; even if it is located in areas that would become harsh during one or more design basis accidents.

For example, certain High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) system components are only relied upon for a small break LOCA in which the environment is mild [Category (E)]. These same components could be exposed to harsh environments during a large break LOCA or certain HELB events, but they are not relied upon for these events [Category (C)]. Since these components are not designated as Category (A), (B), or (D) for any accident, they are not considered within the scope of 10CFR50.49.

Documentation that establishes and verifies the technical basis for categorizing each component for each accident is included in the "Environmental Qualification Electrical Component Matrix Report".

Category (A) and (B) components have individual worksheets and reference documentation packages that demonstrate qualification to the design basis accident environment(s) in which they are relied upon.

Individual component worksheets and reference documentation packages have not been prepared for Category (C), (D), or (E) components. Per guidance provided in NRC Generic Letter 82-09, dated April 20, 1982, the existing plant maintenance, surveillance, and periodic testing programs are deemed to adequately demonstrate and maintain the qualification of these and all other electrical components non-safety related that are only relied upon in mild environments.

Justifications for Continued Operation (JCOs) - Response to Question 1 of Reference c)

All Justifications for Continued Operation (JCOs) associated with our upgraded Environmental Qualification Program have been submitted in Reference b). These JCOs show that all required safety functions can be accomplished,

even though some component failures may be assumed. The assumed failure of certain components can result in incorrect information being presented to the Control Room operator. However, in order to assess the potential for adverse consequences on safety from the misinformation, we have considered the other indications available, the time of assumed failure relative to plant conditions, as well as the options available to the operator if he were to react to misinformation. It is our conclusion that where equipment is assumed to fail, no significant degradation of any required safety functions will result, including any significant degradation due to operator action as a result of incorrect information.

NRC Verification of New HELB Environmental Profiles

As discussed in Reference (b), our upgraded EQ Program has resulted in new HELB environmental profiles. At the meeting, members of your staff indicated that the NRC Auxiliary System Branch would need to approve these new profiles and requested that we provide information with respect to the High Pressure Coolant Injection (HPCI) HELB Environmental Analysis. This information was transmitted to Mr. Rooney of your staff from Mr. J. Sinclair by memorandum dated April 23, 1984.

Maintenance and Surveillance Program Criteria

At the meeting, we also discussed the implications of the EQ Program on our existing Maintenance and Surveillance Program. As stated at the meeting, our existing Maintenance and Surveillance Program for safety-related equipment will be enhanced to:

- Ensure that EQ equipment is maintained in a manner which allows continued qualification until it is replaced.
- Ensure that any parts used to replace or repair EQ equipment are of the quality which will not degrade that qualification.
- Provide documentation of the qualification, installation, testing, maintenance, and removal/replacement of EQ equipment or components.
- Ensure changes to the expected life are recognized and compensated for, programmatically.

The enhanced program will be in place in accordance with the schedular provisions of 10CFR50.49.

VERMONT YANKEE NUCLEAR POWER CORPORATION

SUMMARY

As stated in Reference b) and discussed at the April 18 meeting, it is our intent to complete all necessary equipment upgrades during our 1984 refueling outage. However, our ongoing EQ Program includes field verification and independent documentation reviews for program validation. Should any of these ongoing efforts identify new qualification deficiencies, we will provide you with JCOs, as necessary, and a schedule for correcting these deficiencies.

We understand that this information will allow your staff to write a formal Safety Evaluation Report (SER) with respect to Vermont Yankee's compliance to provisions of 10CFR50.49. Based on the documentation submitted by Reference b) and the supplemental information provided herein, we believe that Vermont Yankee Nuclear Power Corporation has demonstrated compliance to the provisions of 10CFR50.49. Also, the Justifications for Continued Operation (JCOs) provided in Reference b), ensure that Vermont Yankee can be safely operated, without undue risk to the health and safety of the general public.

Finally, as discussed in Reference b), we have integrated the FRC applicable technical information which forms the basis of the engineering review into the Reference b) enclosures. Therefore, we request that Reference b), as supplemented by this letter, replace the FRC TER and the basis for future Inspection and Enforcement (I&E) audits of our compliance to 10CFR50.49.

We trust that this information is deemed acceptable; however, should you have any questions, please contact us.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Warren P. Murphy

Warren P. Murphy
Vice President and
Manager of Operations

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