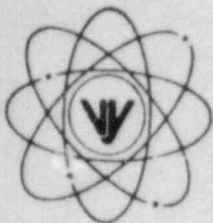


VERMONT YANKEE NUCLEAR POWER CORPORATION



RD 5, Box 169, Ferry Road, Brattleboro, VT 05301

FVY 84-53

REPLY TO:

ENGINEERING OFFICE

1671 WORCESTER ROAD

FRAMINGHAM, MASSACHUSETTS 01701

TELEPHONE 617-672-8100

May 21, 1984

U.S. Nuclear Regulatory Commission
Office of Inspection & Enforcement
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Dr. Thomas E. Murley
Regional Administrator

References:

- a) License No. DPR-28 (Docket No. 50-271)
- b) Letter, USNRC to VYNPC, I&E Inspection Report No. 50-271/83-26, dated 11/2/83
- c) Letter, USNRC to VYNPC, I&E Inspection Report No. 50-271/83-26, "Meeting on Safety Significance of Findings, dated 1/10/84
- d) Letter, USNRC to VYNPC, I&E Inspection Report No. 50-271/83-26, "Enforcement Conference Findings", dated 3/13/84
- e) Letter, VYNPC to USNRC, Fire Hazards Analysis Report, dated 1/31/77
- f) Letter, USNRC to VYNPC, Fire Protection Safety Evaluation Report, dated 1/13/78
- g) Letter, VYNPC to USNRC, FVY 84-24, dated 3/14/84
- h) Letter, USNRC to All Licensees, Generic Letter 83-33, dated 10/19/83
- i) Letter, USNRC to VYNPC, I&E Information Notice 84-09, dated 2/13/84
- j) Letter, VYNPC to USNRC, FVY 84-48, dated 5/18/84

Dear Sir:

Subject: Response to Findings Associated with I&E Inspection
Report No. 50-271/83-26

By Reference b) [Inspection Report No. 50-271/83-26], you forwarded your findings for an inspection conducted at our facility during the week of August 29, 1983, the purpose of which was to review our efforts to comply with certain requirements of 10CFR50, Appendix R. Specifically, this inspection reviewed our efforts to provide fire protection features for equipment necessary to achieve and maintain safe shutdown in accordance with the provisions of Section III.G to Appendix R. The results of your inspection indicate that we have not fully complied with the provisions of Section III.G and, specifically, that we have not provided the protection required by Section III.G.2 for redundant safe shutdown equipment located primarily in the Reactor Building.

8407310159 840726
PDR ADOCK 05000271
Q PDR

VERMONT YANKEE NUCLEAR POWER CORPORATION

We subsequently met on two occasions with members of your staff and Nuclear Reactor Regulation (NRR) to discuss the significance of your findings. The first meeting, held on November 22, 1983 in King of Prussia, addressed the safety significance of the findings with respect to four (4) specific areas in the Reactor Building which were not in explicit compliance with Section III.G.2 separation criteria. The NRC concluded three of these areas had been addressed by Vermont Yankee in our pre-Appendix R Fire Hazards Analysis [Reference e)] and had been found acceptable by the NRC in their pre-Appendix R Fire Protection Safety Evaluation Report [Reference f)]. The remaining items, relating to the potential loss of function of the High Pressure Coolant Injection (HPCI) or Reactor Core Isolation Cooling (RCIC) Systems, was not specifically addressed in the pre-Appendix R Fire Hazards Analysis. However, we provided technical information at the meeting to assure the NRC that this area does not constitute a safety concern. The minutes of this meeting are documented in Reference c).

A second meeting was held on January 10, 1984, in King of Prussia to discuss the overall findings of the I&E Inspection Report. At this meeting, we discussed our overall fire protection program and various NRC letters which indicated to us that to comply with Section III.G. to Appendix R, we need only provide alternate safe shutdown capability for the Control Room, Cable Vault and Switchgear Room. This correspondence, discussed in detail in Reference d), was the basis for our conclusion that our overall fire protection program satisfied the intent of Section III.G with respect to our Reactor Building.

Based on our review of the findings of the Inspection Report and consideration of recent NRC clarification of the intent of the final Appendix R Rule, we have committed necessary engineering resources to compliment our existing fire protection capability. This effort initiated, in part, immediately following the August 1983 NRC inspection, is as follows:

RESPONSE TO NRC INSPECTION REPORT FINDINGS

In responding to the Inspection Report findings, we summarized our Requests for Exemption previously submitted to the NRC by letter dated March 14, 1984, Reference g). A copy of this letter is provided as Enclosure 1.

Item (1) - Reactor Building, Northwest Corner Room, Elevation 232'

- o Finding: The power cables for both trains of the Residual Heat Removal (RHR), RHR Service Water, and Core Spray pumps enter the Reactor Building in the Northwest Corner Room at Elevation 232' and are enclosed in conduit which is separated by approximately four (4) feet. The licensee has an Exemption Request, dated August 16, 1983, pending for this area. Both trains of power cables pass through a wall into the torus area where the cables are routed in divergent cable trays to their respective trains of equipment located in the Northwest and Southeast Corner Rooms.

VERMONT YANKEE NUCLEAR POWER CORPORATION

- o Response: By Reference g), we submitted a revised Request for Exemption to address this finding. We stated that it is our intent to install an area pre-action water suppression system to cover the Northwest Corner Room, Elevation 232', using existing detectors to activate the system. We believe this modification, in conjunction with the limited access to this area, the low combustible loading, the existing detection system, and the absence of intervening combustibles, provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.

The modification described above will be installed by the end of 1984.

Item (2) - Reactor Building, Torus Area

- o Finding: Within the torus area, the redundant cable trays are separated by greater than 20 feet. The fire loading in the torus area appeared low, and numerous fire detection sensors are located throughout the area; however, no automatic suppression system has been provided.
- o Response: By Reference g), we submitted a Request for Exemption to address this finding. We performed an engineering evaluation of this area to demonstrate that the inherent cable separation in the torus area, coupled with the low combustible loadings and existing fire protection measures, insure that a fire in one particular section of the torus area will not progress to other sections, and thus provides protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2. Therefore, no modifications are proposed for the torus area to address this finding.

Item (3) - Reactor Building, Northeast and Southeast Corner Rooms

- o Finding: Similarly, the corner rooms containing the redundant RHR, RHR Service Water, and Core Spray pumps are separated by an open distance of greater than 100 feet and are provided with fire detection; however, no automatic suppression has been provided.
- o Response: By Reference g), we submitted a Request for Exemption to address this finding. We performed an engineering evaluation of these areas to demonstrate that the existing separation within the Reactor Building, coupled with the absence of intervening combustibles, provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2. Therefore, no modifications are proposed for these areas to address this finding.

VERMONT YANKEE NUCLEAR POWER CORPORATION

Item (4) - Reactor Building, Northwest Corner, Elevation 252'

- o Finding: Control and instrumentation cables associated with both trains and selected power cables are routed from the control structure into the Reactor Building through the northwest corner at Elevation 252'. This area was of particular interest in that a very heavy concentration of cables of both trains are located there. In addition, several cables associated with the licensee's alternate shutdown design are routed in this vicinity. The two trains are separated by approximately 20 feet; smoke detection has been provided in the area, and an automatic sprinkler system is installed beneath the lowest level of cable trays. The cables installed in the trays are not qualified as fire resistant per IEEE-383. The inspection determined that a fire originating outside the fire area covered by the sprinkler system could rapidly spread horizontally to the area containing redundant cables at a level above the sprinkler system.

Because the sprinkler system does not provide a means of prompt extinguishment of a fire in the overhead cable trays, the inspector considered the protection provided in this area as unacceptable in complying with Section III.G.2 requirements.

- o Response: By Reference g), we submitted a Request for Exemption to address this finding. We stated that it is our intent to expand the pre-action automatic sprinkler system to cover the floor area in this corner as far as the steam tunnel wall. In addition, we will install a second level of sprinkler heads at the ceiling over this same floor area. We believe that these modifications, in conjunction with the low combustible loading and the absence of intervening combustibles, provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.

The modifications described above will be installed by the end of 1984.

Item (5) - Reactor Building, Northeast HPCI/RCIC Inboard Containment Isolation Valves Control Cable Separation, Elevation 252'

- o Finding: The control cables for the valve operators of the HPCI and RCIC inboard containment isolation valves were traced for separation. These valves are of concern because they are located inside the inerted primary containment and are not readily accessible for manual operation. The valves are designated V13-15 for RCIC and V23-15 HPCI. These valves are powered from MCC (Motor Control Center) 89B and MCC 9D, both of which are located on the east wall of the Reactor Building at Elevation 252'. The valve operators are both ac motors. When the cables were traced from the Reactor Building electrical penetration area to their respective MCC's, the

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control circuits were found to be routed such that the HPCI control cable, located in cable tray R330SII, passed within several feet of the RCIC control cable, located in conduit 11188JSIIX. Although these valves are normally open, the rule requires protection be provided to ensure that fire induced failure will not prevent operation of safe shutdown equipment. The inspector reviewed the Control Wiring Diagrams (CWD's) for the two valves with licensee representatives and determined that, for each valve, a hot short of the proper two conductors could result in valve closure. The inspector concluded that the two specific control cables were inadequately protected in that a rated fire barrier did not separate the cables, the cables were routed within 20 feet of each other, and fire detection and automatic suppression were not provided.

- o Response: The RCIC control cable will be rerouted to preclude the situation described above. This modification will be installed prior to startup from our 1984 refueling outage.

Item (6) - Reactor Building, East Side, Instrument Racks, Elevation 280'

- o Finding: The instrument racks for the reactor vessel level and pressure transmitters are primarily located on the 280 foot elevation of the Reactor Building, although several level transmitters are also located on Elevation 252'. This instrumentation was observed to have 20 feet of horizontal separation with no intervening combustibles; however, detection and automatic suppression were not provided.
- o Response: By Reference (g), we submitted a Request for Exemption to address this finding. This situation was previously evaluated in our pre-Appendix R Fire Hazard Survey and reviewed by the NRC in their pre-Appendix R Fire Protection SER. Numerous fire protection modifications were installed in the vicinity of these instrument racks at that time. We believe these modifications, coupled with the availability of redundant instrumentation in other areas of the Reactor Building and the inherent separation between the racks, provide for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2. Therefore, no additional modifications are proposed for these areas.

Item (7) - Reactor Building, Northeast Corner, MCC 9D and MCC 89B, Elevation 252'

- o Finding: The separation of MCC 9D and MCC 89B was also observed to be insufficient. Although these MCCs are greater than 20 feet apart, there are intervening combustibles in the form of open cable trays which reduce the distance between the MCCs. In addition, there is no automatic suppression system in the area and a significant loading of combustible material exists in close proximity to the MCCs consisting of cotton anti-contamination clothing, plastic clothing, wooden benches, and shelving.

VERMONT YANKEE NUCLEAR POWER CORPORATION

- o Response: By Reference g), we submitted a Request for Exemption to address this finding. We stated that it is our intent to seal the conduits running between the MCCs to insure that a cable fire will not propagate through the conduits, thereby decreasing the probability of a fire damaging the MCCs. In addition, we intend to install a radiant heat shield between MCC 89A and 89B. The combustible materials referred to in the finding have been removed. We believe that these modifications, coupled with the low combustible loading and existing fire protection features (i.e., hose stations and extinguishers) in this area, provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirement of Section III.G.2.

The modifications described above are scheduled to be installed by the end of 1984.

Item (8) - Power Cables in Personnel Corridor

- o Finding: One deficiency was noted external to the Switchgear Room. The power cables to MCC 8B and 9B are routed in conduits which are separated by approximately 19 feet and pass together through the personnel corridor leading to the northwest corner of the Reactor Building. No detection or automatic suppression is provided in this area. The MCCs provide power to various loads inside the Reactor Building, including motor-operated valves for the RHR System. The licensee has provided protection for the power cables to MCC 9B inside the Switchgear Room and cable vault; however, not in the personnel corridor. The team determined that the installation was a further example of failure to provide the fire protection features required of Appendix R, Section III.G.2.
- o Response: By Reference g), we submitted a Request for Exemption to address this finding. We stated that it is our intent to wrap both sets of conduits with an accepted one-hour fire wrap, thereby decreasing the probability of a fire. We believe this modification, coupled with low combustible loading in this area, provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2

The modification described above will be installed by the end of 1984.

Item (9) - Reactor Building

- o Finding: The Reactor Building is considered under the rule to be one fire area in that the various elevations of the building and the rooms located on any given elevation are not separated by fire barriers having a three-hour rating.

VERMONT YANKEE NUCLEAR POWER CORPORATION

- o Response: By Reference g), we submitted a Request for Exemption to address this finding. As discussed in our 1977 Fire Hazard Survey, we consider the Reactor Building to be technically one large fire area, separated into zones by floors, walls, and inherent spatial separation. Numerous and extensive modifications and fire protection measures have been implemented to insure that a fire in one particular area of the Reactor Building could not spread to other areas. Based on the above, we believe that our existing Reactor Building provides protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2

In addition to addressing the specific findings of the Inspection Report, we initiated a resurvey of our Reactor Building to determine whether any additional areas did not conform to the technical requirements of Section III.G.2 and performed breaker coordination studies. Discrepancies identified as a result of these studies will be resolved by the end of 1984.

As discussed above, subsequent to the Appendix R Inspection, the NRC issued clarification with respect to the compliance provisions of Appendix R [see References h) and i)]. In addition, I&E held regional workshops to provide licensees with a forum to discuss compliance criteria. Based on our evaluation of this information, we have decided to expand the scope of our resurvey effort to include consideration for a random loss of off-site power. As discussed in Reference b), Vermont Yankee included a fire caused loss of off-site power as a design basis for our Alternate Safe Shutdown System. Our decision to accept a random loss of off-site power as a design basis will require that we perform a supplemental associated circuits study as part of our resurvey effort. Although we do not expect to identify any significant deviations from the Section III.G separation criteria, there is a possibility that modifications to our existing Alternate Safe Shutdown System design will be necessary. In addition, the ongoing resurvey effort may result in certain areas within the Reactor Building that do not meet the specific technical requirements of Section III.G.

To address the possibility of modifications being necessary for our existing Alternate Safe Shutdown System we will file a formal request for scheduler relief from the provisions of 10CFR50.48(c). In accordance with 10CFR50.48, we are required to have our Alternate Safe Shutdown System installed and operational prior to startup from the 1984 refueling outage. Although we intend to complete the installation of our existing design [which has been approved per the NRC Safety Evaluation Report (SER), dated January 13, 1984, Reference g)] during the upcoming refueling outage, the scheduler extension request is necessary to address the possibility of design modifications resulting from the associated circuits study discussed above.

VERMONT YANKEE NUCLEAR POWER CORPORATION

Based on the results of our resurvey and associated circuits efforts, additional modifications/exemption requests may be warranted. Should any such areas be identified, it is our intent to notify you of our plans for dispositioning in a timely manner. Disposition could consist of:

- o Modifications to meet the technical requirements of Section III.G;
- o Filing of a Request for Exemption from the technical requirements of Section III.G; or
- o A combination of a partial modification and the filing of a Request for Exemption.

Schedules for any necessary modifications will be determined following the completion of our resurvey and associated circuits study. Both efforts are presently scheduled to be completed in August 1984.

Additional Appendix R Related Actions

1) Change to 72 Hour Cold Shutdown

By letter, dated May 18, 1984 [Reference j)], we filed a letter to NRR which identifies certain changes with respect to our Alternate Safe Shutdown System. As discussed during the August 1983 inspection, we were in the process of performing calculations to verify our ability to achieve cold shutdown within 72 hours, consistent with the requirements of Section III.L to Appendix R, given our existing system design. The results of our calculations necessitated a minor modification to our method which requires operator action, in conjunction with a minor repair, to assure achieving cold shutdown within 72 hours. The details of this change are described in Reference j).

The associated procedures are being finalized and will be in place prior to startup from the 1984 refueling outage. Appropriate plant personnel training will also be completed prior to this startup.

2) Emergency Lighting

The August 1983 inspection also included consideration of our compliance to Section III.J to Appendix R, "Emergency Lighting". It should be noted that the resurvey discussed above could result in the need for additional emergency lighting. At the present time, we have satisfied this criteria by the installation of emergency lighting associated with our Alternate Shutdown System. The need and subsequent schedule for installing additional lighting will be determined upon completion of our resurvey effort.

VERMONT YANKEE NUCLEAR POWER CORPORATION

3) Interim Compensatory Measures

In the interim, for those areas presently identified, or areas discovered during the performance of the engineering review of associated circuits, which do not meet the applicable criteria of 10CFR Part 50, Appendix R and for which improved fire protection features and/or modifications are to be implemented, Vermont Yankee will institute the following compensatory measures:

- 1) The Fire Brigade Commanders (Shift Engineers) will be cognizant of those plant areas for which improved fire protection features and/or modifications are to be implemented. The Shift Engineers will be directed to be particularly sensitive when issuing fire permits in these areas to minimize the potential fire hazard.
- 2) The Plant Fire Protection Coordinator or his alternate will tour the subject areas three times per week to determine if any unnecessary fire hazards or combustibles exist. Any situations so identified will be promptly corrected.
- 3) Vermont Yankee will implement these interim measures commencing May 23, 1984.

Summary

We believe these interim measures adequately ensure the health and safety of the general public until we complete the activities described above.

It should be noted that the scope of our additional efforts is based on our present understanding of the requirements of Appendix R to 10CFR Part 50. Additional NRC clarification may impact certain aspects of our present plans. Therefore, we are prepared to discuss any aspects of our overall Fire Protection Program with your staff to ensure that our program meets the intent of Appendix R to 10CFR Part 50.

We trust that this information adequately addresses the findings of the subject inspection; however, should you have any questions regarding this matter, please contact us.

Very truly yours,

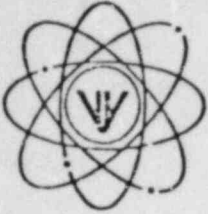
VERMONT YANKEE NUCLEAR POWER CORPORATION

Richard W. Burke for

Warren P. Murphy
Vice President and
Manager of Operations

WPM/dm
Enclosure
cc: Mr. Domenic B. Vassallo, NRR

VERMONT YANKEE NUCLEAR POWER CORPORATION



RD 5, Box 169, Ferry Road, Brattleboro, VT 05301

March 14, 1984

FVY 84-24

REPLY TO:

ENGINEERING OFFICE

1671 WORCESTER ROAD

FRAMINGHAM, MASSACHUSETTS 01701

TELEPHONE 617-872-8100

United States Nuclear Regulatory Commission
Washington, D. C. 20555

RESPONSIBILITY

E. A. SAWYER
LAI NO. 317 (see pg 2)
DUE: TBD

Attention: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

- References:
- (a) License No. DPR-28 (Docket No. 50-271)
 - (b) Letter, VYNPC to USNRC, FVY 83-92, dated August 16, 1983
 - (c) Letter, USNRC to VYNPC, Inspection Report 50-271/83-26, dated November 2, 1983
 - (d) Letter, USNRC to All Licensees and Applicants of Nuclear Power Reactors, Generic Letter 83-33, dated October 19, 1983
 - (e) Letter, USNRC to All Licensees and Applicants of Nuclear Power Reactors, I&E Information Notice 84-09, dated February 13, 1984
 - (f) Letter, VYNPC to USNR, WVY 77-8, dated January 31, 1977
 - (g) Letter, USNRC to VYNPC, Amendment No. 43 to Facility Operating License DPR-28, dated January 13, 1978

Subject: Request for Exemption - 10CFR Part 50, Appendix R, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979

Dear Sir:

In accordance with the provisions of 10CFR Part 50.12, Vermont Yankee Nuclear Power Corporation hereby requests eight exemptions from the requirements of 10CFR Part 50, Appendix R. Specifically, we are seeking exemptions from the provisions of Appendix R, Section III.G.2, Fire Protection of Safe Shutdown Capability. Approval of these exemption requests will subsequently negate the need to provide for alternate shutdown capability in accordance with Section III.G.3 of Appendix R. Our requests for exemption are provided as Enclosure 1 to this letter.

By Reference (b), we submitted an exemption request for our Reactor Building Northwest Corner Room (Elevation 232'). Exemption No. 1 to Enclosure 1 supersedes Reference (b) in its entirety. Reference (b) is hereby withdrawn from consideration.

AN.

~~8403230063~~

March 14, 1984
Page 2

LAI 317

—Very truly yours,

W. P. Murphy

Enclosures

STATE OF VERMONT)) ss
WINDHAM COUNTY)

DIANE M. McCUE
NOTARY
PUBLIC
FRANKLIN COUNTY, VERMONT


D. M. McCue Notary Public
My Commission Expires February 10, 1987

ENCLOSURE 1

VERMONT YANKEE EXEMPTION REQUESTS FROM
10CFR50, APPENDIX R

1. Reactor Building, Northwest Corner Room, Elevation 232' - Photos 22, 23

Vermont Yankee requests exemption from the requirements of Section III.G.2.b of Appendix R for the northwest corner room, Elevation 232'. Specifically, exemption is requested from the requirement to have redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening fire hazards or combustibles where fixed fire detection and suppression systems are installed.

The technical basis for this exemption request follows here.

Power cables for both safety trains are in this room. These are for redundant safety equipment but are not required for hot shutdown. The cables are XLP/PVC, and they enter the corner room in heavy wall conduit six feet from the ceiling with a separation of approximately three feet. These conduits then quickly diverge (See Sketch SK-FP-1, Attachment A). When the conduits are approximately 26 feet from each other, the cables enter tray. The trays then exit the corner room with a separation of approximately 30 feet. The cables supply power to the Core Spray Pumps A and B; RHR Pumps A through D; and RHR Service Water Pumps A through D.

Note that none of this equipment is assumed in our analysis as being necessary to achieve hot shutdown. The RHR and RHR service water pumps are necessary to reach a cold shutdown condition.

This elevation contains racks and cabinets. The ceiling height is approximately 18 feet. The lower level (213' elevation) contains the steam-driven reactor core isolation coolant pump and related switchgear.

There is an open stairway between the two elevations. The combined combustibles of both elevations consist of lubricants and cable insulation and are calculated to be 12,330 BTU/ft. sq., a low combustible level.

Fire suppression in the area is presently provided by portable wall-mounted extinguishers, and hose stations on the 252' level and in the torus area. Smoke detectors are installed at the 213' and 232' elevations of this corner room.

It should also be noted that this corner room is a restricted area. Controlled access from above is through a locked steel structure; and from below via the torus, through a locked, louvered steel door. These conditions minimize general travel in the area and greatly reduce the probability of the introduction of transient combustibles.

We will install an area pre-action water suppression system to cover the northwest corner room, Elevation 232', using the existing detectors to activate the system.

We believe that the limited access to the area, the low combustible loading, the detection system, the absence of intervening combustibles, and the pre-action water suppression system will provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b of Appendix R for 20 foot horizontal separation with no intervening fire hazards or combustibles. Therefore, we request an exemption from the requirements of Section III.G.2.b of Appendix R for this corner room.

2. Reactor Building, Torus Area

Vermont Yankee requests exemption from the requirements of Section III.G.2.b of Appendix R for the Reactor Building Torus Area.

Specifically, exception is requested from the III.G.2 requirement to have

redundant trains of equipment separated by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards, and with an automatic suppression system installed in the area.

The technical basis for this exemption request follows here.

Redundant power and control cables for the Core Spray, RHR, and RHR service water pumps enter the torus area in the northwest corner. These pumps are not needed for hot shutdown. The cables are separated by approximately 30 feet. They then run in a cable tray in opposite directions around the perimeter of the torus approximately 30 feet off the floor until they reach the northeast and southeast corner rooms, where they either enter the corner rooms or a splice box mounted in the torus wall. This configuration is shown on Sketch SK-FP-1 (Attachment A). Up to this point, they are no closer than the 30 feet where they entered the torus.

Each RHR corner room contains two RHR pumps. Within each corner room, one RHR pump is powered from one power system (SI), and one is powered from another power system (SII). To provide the power to these pumps, a set of cables for one RHR pump from each safety train continues in conduit from the splice boxes at each corner room along the east wall of the torus and into the opposite corner room (See drawing SK-FP-1, Attachment A). These cables run beside each other and are redundant to each other. A fire near these conduits could remove power from one RHR pump in each train. However, because each safety train has two redundant RHR pumps (one in one corner room, one in the other corner room), one pump would be left in each train. A fire outside either corner room could remove power from three RHR pumps, two from one train and one in the other train. However, the second pump in one train would be left to operate.

The Torus Area is a large octagonal area, 140 feet across with a very low combustible loading. The ceiling is approximately 37 feet high. The Primary Containment and the torus itself fill a large volume of the area and preclude a fire from moving across the area. In addition, this area is equipped with numerous smoke detectors and fire extinguishers. Manual hose stations are also available within this area. Although transient combustibles (in the form of clothing, plastic, and wood) could be present in the torus area to support maintenance activities, such combustibles will not be admitted unless an evaluation of the area is performed and appropriate compensatory fire protection measures are instituted. These compensatory measures could include one or more of the following actions: (1) control of the maximum amount of clothing and plastic allowed into the area; (2) additional fire extinguishers; (3) use of non-combustible storage bins; and/or, (4) a continuous fire watch in the area. The inherent separation within this area, coupled with the very low combustible loadings and existing fire protection measures, insure that a fire in one particular section of the torus area will not progress to other sections.

Based upon the above analysis, we believe that the public health and safety will be protected in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b for installation of automatic fire suppression and twenty foot separation throughout the Torus Area. Therefore, we request an exemption from the requirements of Section III.G.2.b of Appendix R for this area.

3. Reactor Building, Northeast and Southeast Corner Rooms - Photos 11, 18, 19, 20, 21

Vermont Yankee requests exemptions from the requirements of Section III.G.2.b of Appendix R for both the northeast and southeast corner rooms. Two exemptions are requested. First, an exemption is requested for the Reactor Building area, Elevation 252', between the stairs down to

the two RHR corner rooms from the requirement to have installed detection and automatic fire suppression between redundant trains of equipment with more than 20 feet of separation. Second, an exemption is requested within each room from the III.G.2.b requirement to have redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening fire hazards or combustibles and with an automatic suppression system installed in the area.

The technical basis for these exemption requests follows here.

With respect to the first exemption request, each of these RHR corner rooms contains a core spray pump, two RHR pumps, and two RHR service water pumps. These redundant corner rooms are separated by approximately 100 feet within the Reactor Building. The equipment in these rooms is not needed to achieve hot shutdown. If a fire occurred in one of the corner rooms, the other room is unaffected.

To communicate between these rooms, a fire must either propagate through the Torus Area, through two (2) fireproofed, watertight doors; or move up and out the steel stairway to Elevation 252', across the 100 feet separating it from the other room, then down the steel stairway into the other room. The path through the Torus Area was previously addressed in Exemption Request Number 2.

There are no intervening combustibles between these two corner rooms at either Elevation 252' or in the Torus Area. In addition, fire detection is provided in each corner room as well as in the Torus Area. Manual hose stations and fire extinguishers are also available throughout this area. Although transient combustibles (in the form of clothing, plastic, and wood) could be present in the torus area to support maintenance activities, such combustibles will not be admitted unless an evaluation of the area is performed and appropriate compensatory fire protection measures are instituted. These compensatory measures could include one

or more of the following actions: (1) control of the maximum amount of clothing and plastic allowed into the area; (2) additional fire extinguishers; (3) use of non-combustible storage bins; and/or, (4) a continuous fire watch in the area.

Based upon the above analysis, we believe that the existing separation within the Reactor Building and the absence of intervening combustibles provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b to Appendix R for installed detection and automatic fire suppression between redundant trains of equipment with more than 20 feet of separation. Therefore, we request an exemption from that requirements of II.G.2.b of Appendix R for this area.

With respect to the second exemption request, each of these corner rooms contains redundant equipment, as described above. Certain equipment could be lost to a single fire in one corner room; however, as addressed above, this loss would not prevent cold shutdown because redundant equipment exists in the opposite corner room. In addition, fire detection is provided within both rooms. As discussed above, we believe the existing separation within the Reactor Building and the absence of intervening combustibles between the two rooms provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b of Appendix R for 20 foot separation and the installation of suppression within each of these rooms. Therefore, we request an exemption from the requirements of III.G.2.b of Appendix R for this area.

4. Reactor Building, Elevation 252', Northwest Corner - Photos 5, 6, 7, 8, 9

Vermont Yankee requests two exemptions from the requirements of Section III.G.2 of Appendix R for the northwest corner, Elevation 252', of the Reactor Building. Specifically, the first exemption is requested from the III.G.2.b requirement to have redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening combustibles or fire hazards.

The technical basis for this first exemption request follows here.

Control and instrumentation cables associated with both trains and selected power cables are routed from the Control Building into the Reactor Building through the northwest corner at Elevation 252'. This area is of particular interest in that a very heavy concentration of cables of both trains are located there. In addition, several cables associated with our alternate shutdown design are routed in conduit in this vicinity, switch controllers are located on a column between the trays, and two valve contactors for HPCI and RCIC are located ten feet apart on the steam tunnel walls. The fire loading near these contactors is very low, with no intervening combustibles. The two trains are separated by approximately 20 feet; smoke detection has been provided in the area, and a pre-action automatic sprinkler system is installed beneath the lowest level of cable trays. It has been determined that a fire originating outside the area covered by the sprinkler system could spread horizontally to the area containing redundant cables at a level above the sprinkler system. Therefore, we will make the following changes in the area.

We will expand the pre-action system to cover the floor area in this corner as far as the steam tunnel wall. We will also add a second level of sprinkler heads at the ceiling over the same floor area. This system will promptly suppress any fire in this area, including those that might result from a fire in other parts of the Reactor Building, and insure that redundant safety systems are preserved.

We believe that these modifications will preclude a fire in this area, as well as one in other parts of the Reactor Building, from preventing the plant reaching hot shutdown and will provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b of Appendix R to have redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening combustibles or fire hazards. Therefore, we request an exemption from the requirements of III.G.2.b for this area.

The second exemption is requested from the III.G.2.c requirement to have redundant trains of equipment separated by a one-hour fire barrier with detection and suppression in the area.

The technical bases for this second exemption request follows here.

The floor area at Elevation 252' is separated from the rooms below by a steel enclosure and a steel plate covered hatch.

Both the hatch and the enclosure are constructed of heavy steel plate and sit on the 252' Elevation (See Photo 5). Inside the enclosure, the steel stairway descends to the room at Elevation 232'. This room is discussed in detail in Exemption Request No. 1 of this enclosure. We are planning to install a pre-action sprinkler system in this room. Additionally, as discussed above, we plan to expand the pre-action sprinkler on Elevation 252' in this area. Therefore, we will have a heavy steel enclosure and a hatch plate with a pre-action sprinkler on either side of it.

We believe this will provide protection for the public health and safety in a fashion equivalent to that resulting from the specific technical requirements of Section III.G.2.c of Appendix R for provision of a one-hour rated barrier. Therefore, we request an exemption from the requirements of III.G.2.c of Appendix R for these areas.

5. Reactor Building, Elevation 280', East Side, Instrument Racks -
Photos 2, 3

Vermont Yankee requests an exemption from the requirements of Section III.G.2.b of Appendix R for the east side of the Reactor Building, Elevation 280', by Instrument Racks 25-5 and 25-6. Specifically, exemption is requested from the III.G.2.b requirement to have detection and automatic suppression installed between redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening combustibles or fire hazards.

The technical basis for this exemption request follows here.

Level and pressure transmitters are located on the Elevation 280' instrument racks. Redundant level indication is available from two racks located on Elevation 252'. Redundant pressure indication is available from two racks located on Elevation 213'. Therefore, more than adequate redundant indications are provided throughout the Reactor Building.

These racks on Elevation 280' are separated by approximately 30 feet, and their cables in conduit pass in close proximity to each other. There are no intervening combustibles. Additionally, redundant instrumentation exists on Elevation 252', 28 feet below and in another quadrant of the building, and on Elevation 213', 67 feet below and in another quadrant of the Reactor Building. A fire in either of these rack areas will not affect the others.

The relative proximity of the racks on Elevation 280' to the Recirculation MG set area was addressed in the Fire Hazard Survey submitted in January 1977 [Reference (f)], and in the NRC's Safety Evaluation Report [Reference (g)], dated January 1978. As a result of this evaluation, smoke and thermal detection was installed over the nearby MG sets, the berm around the MG set was raised, and an automatic foam suppression system was installed. Manual hose stations and fire extinguishers are also provided in the area. Although transient combustibles (in the form of clothing, plastic, and wood) could be present in the torus area to support maintenance activities, such combustibles will not be admitted unless an evaluation of the area is performed and appropriate compensatory fire protection measures are instituted. These compensatory measures could include one or more of the following actions: (1) control of the maximum amount of clothing and plastic allowed into the area; (2) additional fire extinguishers; (3) use of non-combustible storage bins; and/or, (4) a continuous fire watch in the area.

Based upon the above analysis, we believe that the separation between the racks, the availability of redundant instrumentation in other parts of the Reactor Building, and the fire protection measures presently installed in the vicinity of these instrument racks, provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b of Appendix R to have detection and automatic suppression installed between redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening combustibles or fire hazards. Therefore, we request an exemption from the requirements of III.G.2.b of Appendix R for this area.

6. Reactor Building, Elevation 252', Northeast Corner, Vital MCCs - Photo 10

Vermont Yankee requests an exemption from the requirements of Section III.G.2.b of Appendix R for the northeast corner of Elevation 252' of the Reactor Building, in the vicinity of vital MCCs. Specifically, exemption is requested from the requirement to have redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening fire hazards or combustibles, with fire detection and an automatic suppression system installed in the area.

The basis for this exemption request follows here.

These MCCs contain control and power feeds for redundant ac motor-operated valves, some of which are located inside the inerted containment. There is approximately an 18-foot separation between the vital MCCs in question. The ceiling is approximately 27 feet high. There are two cable trays approximately 18 feet off the floor which run part of the way between the MCCs. The cables then enter conduit for the balance of the distance. There are no other in situ combustibles in the area, as addressed in the Fire Hazard Survey submitted in January 1977 [Reference (f)].

To decrease the probability of fire damaging these MCC's, we intend to install the following modifications:

We will seal the conduits running between the MCCs to insure that a cable fire will not propagate through the conduits. We will also install a radiant heat shield between MCC 89A and 89B. This shield will extend up approximately 14 feet and at least four feet out from the wall.

Little or no in situ combustibles are located in the area. In addition, manual hose stations and extinguishers are available in the area. If a fire does start in one MCC, the shield will prevent the radiant heat from reaching the second MCC.

Although transient combustibles (in the form of clothing, plastic, and wood) could be present in the torus area to support maintenance activities, such combustibles will not be admitted unless an evaluation of the area is performed and appropriate compensatory fire protection measures are instituted. These compensatory measures could include one or more of the following actions: (1) control of the maximum amount of clothing and plastic allowed into the area; (2) additional fire extinguishers; (3) use of non-combustible storage bins; and/or, (4) a continuous fire watch in the area.

Based on the modifications discussed above, coupled with lack of combustibles and existing fire protection features located in this area, we believe a fire in this area will not prevent the plant from achieving safe shutdown. In addition, we believe these measures provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.b of Appendix R to have redundant trains of equipment separated by a horizontal distance of 20 feet with no intervening combustibles or fire hazards, with fire detection and automatic fire suppression installed in the area. Therefore, we request an exemption from the requirements of III.G.2.b of Appendix R for this area.

7. Power Cables in Personnel Corridor - Photos 16, 17

Vermont Yankee requests an exemption from the requirements of Section III.G.2.c for the personnel corridor leading to the Reactor Building. Specifically, exemption is requested from the III.G.2.c requirements to install fire detectors and an automatic suppression system where redundant trains of equipment are separated by a one-hour fire barrier.

The technical bases for this exemption request follow here.

Redundant power cables in conduit pass through the corridor, separated by approximately 19 feet. Although no detection or automatic suppression in this area, there are no in situ combustibles in the corridor. In addition, manual hose stations are available in this area.

To decrease the probability of a fire, we intend to wrap both sets of conduits with an accepted one-hour fire wrap. With this change, we believe that a fire in the corridor will not prevent the plant from reaching safe shutdown.

We believe that wrapping both cable, coupled with the lack of in situ combustibles during operation will provide protection for the public health and safety in a fashion equivalent to that resulting from compliance with the specific technical requirements of Section III.G.2.c of Appendix R to install fire detection and automatic fire suppression when redundant trains of equipment are separated by a one-hour fire barrier. Therefore, we request an exemption from the requirements of III.G.2.c of Appendix R for this area.

8. Reactor Building - Photos 1, 4, 9, 10, 11, 12, 13, 14, 15

Vermont Yankee requests an exemption from the requirements of Section III.G.2 for the Reactor Building. Specifically, we are requesting an exemption from the general criterion of III.G.2 which states that where

cables or equipment of redundant trains of systems necessary to achieve and maintain safe shutdown are located within the same fire area, the licensee must meet the specific separation criteria of III.G.2.a, b, or c.

The technical basis for the request follows here.

The preceding exemption requests address specific areas within the Reactor Building where we do not meet the strict separation criteria of Section III.G.2 of Appendix R. However, as discussed in our 1977 Fire Hazards Survey [Reference (f)], we consider the Reactor Building to be technically one large fire area, separated into zones by floors, walls, and inherent spatial separation. Our subsequent fire protection program was based on this consideration. Numerous modifications and fire protection measures were implemented to insure that a fire in one particular area of the Reactor Building could not spread to other areas.

The scope of our program is documented in the 1977 Fire Hazards Analysis [Reference (f)] and also in the NRC's 1978 Fire Protection Safety Evaluation Report [Reference (g)], which was issued after the NRC's inspection of our overall Fire Protection Program. In addition, we have implemented various procedures to reduce the likelihood of a fire in any area of our facility and have established a five-man fire brigade to further insure that any fire is contained within a local area.

Our compliance to Sections III.G, III.L, and III.O of Appendix R was reviewed as part of the NRC's most recent fire protection inspection and is documented in Reference (c). The inspection team concluded that although we do not meet the strict separation criterion of III.G.2;

"A review of the physical layout of redundant trains of equipment in the Reactor Building indicated that an inherent general separation exists due to the trains being located on opposite sides of the primary containment. The combustible loading throughout the

building appeared low overall, and the general layout of equipment is such that the building is not congested, and typically has numerous areas on each elevation where little or no combustible material is present. The team concluded that, although, the Licensee had failed to provide the specific fire protection features required by Appendix R, Section III.G., the general configuration of equipment within the Reactor Building tends to minimize the net safety effect of the lack of the specific protection required by the Rule."

We believe that the fire protection modifications and measures implemented to date, coupled with the additional modifications being proposed for specific areas within the Reactor Building (as detailed in Exemption Requests one through seven), meet the intent of Section III.G.2 separation criteria and provide protection equivalent to that provided by the establishment of physically bounded fire areas within the Reactor Building.

Given the existing Reactor Building configuration, any local fire will be contained within a small area by the actuation of fire suppression systems or the lack of intervening combustibles necessary to support the spread of the fire throughout any single elevation or from one elevation to another. In addition, manual hose stations and numerous fire extinguishers are available throughout the Reactor Building.

Although transient combustibles (in the form of clothing, plastic, and wood) could be present in an area of the Reactor Building to support maintenance activities, such combustibles will not be admitted within a particular area unless an evaluation of that area is performed and appropriate compensatory fire protection measures are instituted. These compensatory measures could include one or more of the following actions: (1) control of the maximum amount of clothing and plastic allowed into the area; (2) additional fire extinguishers; (3) use of non-combustible storage bins; (4) control of the exact placement of worker change stations; and/or (5) a continuous fire watch in the area.

We believe that the inherent separation, low combustible loading throughout the Reactor Building, the existing fire protection modifications and measures, and the additional fire protection modifications we have proposed in those specific areas where safe shutdown could have been affected by a fire, provides protection for the public health and safety in a fashion equivalent to that resulting from compliance with the technical requirements of Section III.G.2 of Appendix R. Therefore, we request an exemption from the requirements of Section III.G.2 of Appendix R with respect to the installation of additional fire barriers, detection, and fixed suppression throughout the building.