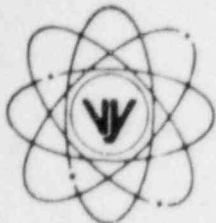


# VERMONT YANKEE NUCLEAR POWER CORPORATION



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

REPLY TO  
ENGINEERING OFFICE

1671 WORCESTER ROAD  
FRAMINGHAM, MASSACHUSETTS 01701  
TELEPHONE 617-872-8100

August 16, 1985  
FVY 85-73

Mr. Robert Hermann  
United States Nuclear Regulatory Commission  
Old Phillips Building  
7920 Norfolk Avenue  
Bethesda, Maryland 20014

References: (a) License No. DPR-28 (Docket No. 50-271)  
(b) Letter, W. D. Hinkle to R. Hermann, dated July 26, 1985  
(c) Letter, W. D. Hinkle to R. Hermann, dated August 2, 1985

Dear Mr. Hermann:

The attachments to this letter provide the last of three (3) submittals pursuant to our July 16, 1985 meeting in Bethesda, Maryland relating to Vermont Yankee's Appendix R, Section III.G exemption requests. The enclosed attachments provide the proposed resolution for those remaining concerns not addressed in the prior submittals [References (b) and (c)].

If you have any questions concerning this or the prior submittals, please let us know.

Very truly yours,

*W. D. Hinkle for*

W. D. Hinkle  
Assistant Project Manager

WDH/dps

Attachments

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ATTACHMENT 1  
(continued)

Exemption No. 8 (Reactor Building-WEST, Elevation 280')

NRR Concern

Detection and (if possible) suppression should be installed. If suppression is not installed, a consequence assessment needs to be developed showing that a loss of equipment in the area is acceptable.

Resolution

The resolution is that no equipment in the immediate vicinity of the separation zone is required for shutdown. Exemption 8 will be withdrawn and incorporated in Exemption 7.

## ATTACHMENT 2

### Revised Versions of Exemption Requests Nos. 4, 5, 7/8

#### 4. Reactor Building, Northeast and Southeast Corner Rooms

Vermont Yankee requests exemptions from the requirements of Section III.G.2 of Appendix R for both the Northeast and Southeast Corner Rooms. Section III.G.2.b defines a possible means of compliance to III.G.2 as follows:

"Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an Automatic Fire Suppression System shall be installed in the fire area."

The Northeast and Southeast Corner Rooms each contain a core spray pump, two RHR pumps, two RHR service water pumps, associated piping, valves and cable. The Corner Rooms are triangular in shape and run from Elevation 252' down to Elevation 213'. As shown in attached Figures 2, 3, 4, 6, 7 and 8, the Northeast Corner Room is considered part of Zone RB-1 and the Southeast Corner Room is considered part of Zone RB-2. Redundant trains of equipment are separated by a horizontal distance of more than twenty feet with no intervening combustibles. Detection exists in the torus area between the rooms, and will be installed on Elevation 252' between the rooms; however, an Automatic Fire Suppression System is not provided within the Corner Rooms. Further, a Fire Suppression System is not provided between the stairs at Elevation 252' and the Corner Room areas. Exemption is requested from the specific requirements of Section III.G.2 in that the provisions of III.G.2.b are met with the exception that automatic suppression is not provided in the Corner Rooms and suppression is not installed between the stairs at Elevation 252' and the Corner Room areas.

The entrances to these two corner rooms are separated by approximately 100 feet with 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 and will be provided on Elevation 252'. Manual hose stations and fire extinguishers are also available throughout this area. Although transient combustibles could be present in these areas to support maintenance activities, such combustibles are not admitted unless an evaluation of the area is performed and appropriate compensatory fire protection measures are instituted. These compensatory measures would include one or more of the following actions: (1) control of the amount of a particular material allowed into the area; (2) control of ignition sources in the area; (3) additional fire extinguishers; (4) use of noncombustible storage containers and/or; (5) a continuous fire watch in the area.

ATTACHMENT 2  
(continued)

Based upon the above, we believe that the existing separation within the Reactor Building and the absence of intervening in situ combustibles provide protection for the public health and safety in a fashion equivalent to that resulting from literal compliance with the specific technical requirements of Section III.G.2.b to Appendix R for automatic suppression in the Corner Rooms and automatic fire suppression between the stairs at Elevation 252' and the Corner Room areas. Therefore, we request an exemption from the specific requirements of Section III.G.2.b of Appendix R for these Corner Rooms.

ATTACHMENT 2  
(continued)

5. Reactor Building, Elevation 252', Northeast Corner, Vital MCCs

Vermont Yankee requests an exemption from the requirements of Section III.G.2 of Appendix R for the northeast corner of Elevation 252' of the Reactor Building, in the vicinity of vital MCCs. Section III.G.2.b defines as possible means of compliance to III.G.2 as follows:

"Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than twenty feet with no intervening combustible or fire hazards. In addition, fire detectors and an Automatic Fire Suppression System shall be installed in the fire area."

As shown in attached Figures 4, 8 and 12, Elevation 252' of the Reactor Building is divided into Zone RB-3 (north side) and RB-4 (south side). Zone RB-3 contains MCC 9D and 89A as well as cables in trays. Zone RB-4 contains MCC 89B as well as cables in trays. There are no other cable trays located between the MCCs.

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. There are two cable trays approximately 18 feet off the floor which run over MCCs 9D and 89A, and extend six feet toward MCC 89B. There are other cables installed in conduit in this overhead region. There are no other in situ combustibles either at the floor elevation or in the overhead region as addressed in the Fire Hazard Survey submitted on January 31, 1977. Exemption is requested from the specific requirements of Section III.G.2 in that the provisions of III.G.2.b to have redundant trains of equipment separated by a horizontal distance of twenty feet with no intervening fire hazards or combustibles, as well as for an Automatic Suppression System to be installed in the area are not met.

A radiant heat shield has been installed between MCC 89A and 89B. This shield extends up approximately fourteen feet and four feet out from the wall. To further decrease the probability of a fire damaging both MCCs at the same time, we installed approved fire stops in all conduits that span the separation zone between the subject MCCs. These stops were installed in those conduits which accept cables from the two cable trays that run part of the way between the MCCs. In addition, any other conduit that shares a common enclosure away from this area was also fire stopped. Finally, we plan to install (1) fire stops in all the cable trays that cross from Zone RB-3 and RB-4, and (2) Ionization-Type Detection System over the MCCs and throughout the separation zone.

ATTACHMENT 2  
(continued)

The radiant heat shield, conduit fire stops, proposed cable tray fire stops and the installation of detectors serve to separate the vital equipment and provide increased assurance that safe shutdown can be achieved if a fire occurs in the vicinity of the subject MCCs. Further, essentially no in situ combustibles are located in the area and manual hose stations and extinguishers are available in the area.

Although transient combustibles could be present in this 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 would include one or more of the following actions: (1) control of the amount of a particular material allowed into the area; (2) control of ignition sources in the area; (3) additional fire extinguishers; (4) use of noncombustible storage containers and/or; (5) a continuous fire watch in the area.

In addition to the information provided above, the following discussion outlines what is expected due to a fire in Zone RB-3 or RB-4.

Fire in RB-3

If a fire starts in or at MCC-9D or 89A in Zone RB-3, it could impact the cable trays over the MCCs. From there it could progress through cable trays until it involved large quantities of cable located in trays near the ceiling throughout the zone; however, the detection, which will be installed, will quickly detect the fire before it has a chance to progress into the cable trays.

The balance of Zone RB-3 does not contain equipment or other in-situ combustibles which would serve as a source of ignition for the cables in tray. If a fire were to start, it would be detected by the detectors installed near the MCCs. The prefire plans for the area will inform the fire brigade as to the correct direction for attack to insure the fire does not progress toward the MCCs.

The separation zone between Zones RB-3 and RB-4 consists of a 20-foot corridor free of in-situ combustibles and contains a radiant heat shield. The one tray of cable which passes through the zone will be barriered so that fire cannot propagate along it. The conduits which pass through the zone are barriered with approved fire stops.

The radiant heat shield keeps the radiant heat from a fire in MCC-9D and/or 89A (in Zone RB-3) from affecting MCC-89A (in Zone RB-4) and vice versa. The fire stops in the tray and in the conduit stop the passage of fire across the separation zone.

ATTACHMENT 2  
(continued)

There is a sufficient fire load in Zone RB-3 so that large quantities of smoke and hot gases could cross the separation zone into Zone RB-4 and could affect MCC-89B. The only required safe shutdown equipment in MCC-89B is MOV 13-15. Electrical or procedural modifications will be implemented to deal with this event.

Once past MCC-89B, the majority of the smoke and hot gases would rise through the large hatch. Any smoke that did remain on this elevation would be very dilute, and should not affect any further equipment in Zone RB-4.

Fire in RB-4

If the fire were to occur in or at MCC-89B in Zone RB-4, it could impact the cables in tray over the MCC and then move along the trays and throughout Zone RB-4; however, detectors would alarm before the fire progressed into the trays. The separation zone would again keep the fire from moving from Zone RB-4 to Zone RB-3.

If the fire started at MCC-89B, there would not be a large quantity of smoke because it would proceed both across the separation zone and back up through the hatch. If the fire started at some other part of Zone RB-4, the majority of the smoke and hot gases would go up through the hatch.

Therefore, what smoke and hot gases that did pass across the separation zone would be diluted; while they might affect MCC-9D and MCC-89A, there are no other components located on this elevation subject to smoke and heat effects.

Based on the modifications discussed above, coupled with the 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 literal 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, and to have automatic fire suppression installed in the area. Therefore, we request an exemption from the specific requirements of Section III.G.2.b of Appendix R for this area.

ATTACHMENT 2  
(continued)

7. Reactor Building, Elevation 280', East and West Sides

Vermont Yankee requests an exemption from the requirements of Section III.G.2 of Appendix R for the east and west sides of the Reactor Building, Elevation 280'. Section III.G.2.b defines a possible means of compliance as follows:

"Separation of cables and equipment and associated nonsafety circuits of redundant trains by a horizontal distance of more than twenty feet with no intervening combustible or fire hazards. In addition, fire detectors and an Automatic Fire Suppression System shall be installed in the fire area."

These areas contain Division I and Division II electrical equipment. Instrument racks on the east side of Elevation 280' provide reactor level and pressure instrumentation. These instrument racks are separated by approximately 30'. The west side of Elevation 280' contains cable which crosses the separation zone between RB-5 and RB-6. Fire detectors will be installed in the vicinity of each separation zone; however, Automatic Fire Suppression Systems are not installed in the fire areas. Exemption is requested from the specific requirements of III.G.2 in that the provisions of III.G.2.b to have an Automatic Fire Suppression System installed in the fire areas are not met.

As shown in attached Figures 5, 9 and 13, these areas are considered the east and west side separation between Zones RB-5 and RB-6. These separation zones of no intervening combustibles will be created by fire-stopping cable trays and conduit that cross the separation zones. The separation zone will extend from the concrete shield wall to the edge of the berm around the Motor Generator (MG) sets on the east side, and from the concrete wall to the Reactor Building wall on the west side.

On the east side, 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 and in the NRC's Safety Evaluation Report, 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 west was raised and an Automatic Foam Suppression System was installed. Manual hose stations and fire extinguishers are also provided in the area. The MG set area is covered by detection and an Automatic Foam System. There are no other in situ combustibles in the area. On the west side, the floor area is closed off by a 7-foot high concrete wall whose purpose is to shield the Standby Gas Treatment System.

In addition to the information provided above, the following discussion outlines what is expected due to a fire in Zone RB-5 or RB-6.

If the 2,200 gallons of lubricating oil contained in the recirculation MG set couplings is not considered (since it is protected by detection, berms and an automatic foam suppression system), the total of

ATTACHMENT 2  
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combustibles on this elevation of the Reactor Building is approximately 70 million Btu. With a remaining floor area of 11,400 square feet, the combustible loading is approximately 6,100 Btu/ft<sup>2</sup>. This is a very low loading.

With a loading this low, it is extremely difficult for a fire, even if started, to progress very rapidly on this elevation. The smoke from the slowly developing fire will be detected by the detection in the separation zones and in the recirc MG set area which will alert the fire brigade. The fire brigade will respond and because of the slowly developing fire, the low loading and the open areas on this elevation will have the time to control and extinguish the fire before a fire on one side of the separation zone can affect equipment on the other side of the separation zone.

There are only two trays going through each separation zone, and they will be fire stopped. The detection in these separation zones and in the recirculation MG Set area will detect and alarm the smoke from a fire on this elevation, allowing the fire brigade to control and extinguish the fire. The fire stops in the trays that penetrate the separation zones will stop the passage of fire through the separation zone.

Although transient combustibles could be present in the Zone RB-5 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 would include one or more of the following actions: (1) control of the amount of a particular material allowed into the area; (2) control of ignition sources in the area; (3) additional fire extinguishers; (4) use of noncombustible storage containers and/or (5) a continuous fire watch in the area.

Based upon the above, we believe that the fire protection measures presently installed and being implemented provide protection for the public health and safety in a fashion equivalent to that resulting from literal compliance with the specific technical requirements of Section III.G.2.b of Appendix R to have automatic suppression installed between redundant trains of equipment separated by a horizontal distance of twenty 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.