



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

WISCONSIN ELECTRIC POWER COMPANY

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-266 AND 50-301

EXEMPTION FROM SECTION III.G OF 10 CFR PART 50, APPENDIX R

INTRODUCTION

By letter dated June 30, 1982 and supplemented by letters dated April 28 and October 26, 1983, Wisconsin Electric Power Company (the licensee) requested an exemption from the requirements of 10 CFR Part 50, Appendix R, for the containment spray additive and monitor tank area which contains redundant trains of safe shutdown instrument cables for Units 1 and 2 of the Point Beach Nuclear Plant. The cables are required to provide indication in the control room. The October submittal proposed alternate shutdown capability independent of the zone of concern. The exemption was granted July 3, 1985.

The implementation of TMI-related modifications subsequent to the licensee's 1983 submittal included the rerouting of several of the safe shutdown instrument cables from the monitor tank area through fire zones 237 (Component Cooling Water Heat Exchanger and Boric Acid Tank Room) and 336 (Computer and Instrument Rack Room) to the control room. By letter dated June 11, 1986, the licensee stated that the previously proposed alternate shutdown capability is also independent of the revised cable route. The licensee further stated that alternate shutdown capability is provided for fire zones 237 and 336 since the redundant instrumentation cables for safe shutdown in these areas do not satisfy the separation criteria specified in Appendix R, Section III.G.2.

As a result of these modifications, the component cooling water heat exchanger and boric acid tank room and the computer and instrument rack room are not in compliance with Section III.G.3.b of Appendix R, which requires fixed suppression for areas which alternate shutdown capability is provided. By the above letter dated June 11, 1986 as supplemented by letter dated October 10, 1986, the licensee requested exemptions due to the aforementioned noncompliance.

The safety evaluation that follows is based on Franklin Research Center's (NRC contractor for this task) Technical Evaluation Report (TER-C5506-667 dated May 11, 1987) on the above exemption requests.

DISCUSSION

Component Cooling Water Heat Exchanger and Boric Acid Tank Room (Fire Zone 237)

The licensee requested an exemption from the requirements of Section III.G.3.b of Appendix R to the extent that it requires fixed suppression to be provided throughout the fire area, room, or zone under consideration.

The licensee stated, in Enclosure 1 to the June 11, 1986 submittal, that Fire Zone 237 does not meet the requirements of Section III.G.3.b because although alternate shutdown capability has been provided, automatic suppression has not been provided for this zone.

This fire zone is located on the 46-foot elevation of the auxiliary building. The zone is separated from other areas by 2-foot-thick non-fire-rated concrete walls on three sides and one 18-inch-thick wall on the west side. All walls, the ceiling, and the floor are provided with 3-hour fire-rated penetration seals. The zone is accessed from the west through one 3-foot x 7-foot and one 12-foot x 13-foot doorless entranceways and from the 26-foot elevation via an open stairway.

The zone contains the component cooling water heat exchangers and redundant channels of required primary and secondary instrumentation of both units.

The redundant instrument cables rise through the floor from the containment spray additive and monitor tank area and exit through the east wall to the computer and instrument rack room. Cables of each train for each unit are routed in separate conduits. Conduit separation, however, is not in compliance with the requirements of Appendix R.

Section 4.3.2 of the licensee's October 26, 1983 submittal describes modifications made to provide safe shutdown monitoring instrumentation independent of the control room, cable-spreading room, and containment spray additive and monitor tank area. These modifications also provided alternate shutdown capability for the above instrumentation for Fire Zone 237 independent of the component cooling water heat exchanger and boric acid tank room.

The zone is provided with six photoelectric smoke detectors located within the room. There is no automatic suppression system. Two 1-1/2 inch hose reel stations are located outside the room near the west wall entranceways for manual fire suppression capability. Portable fire extinguishers suitable for the hazards present are also available.

A summer 1986 modification increased the number of component cooling water heat exchangers from three to four. Normally, one heat exchanger is used for cold shutdown of each unit. One heat exchanger can, however, provide cold shutdown capability for both units over a longer period of time. The two outermost heat exchangers are separated by a center-to-center distance of 21 ft 6 inches. The combustible in the zone is cable insulation comprising an approximate fuel load of 22,500 Btu/ft².

Computer and Instrument Rack Room (Fire Zone 336)

The licensee requested an exemption from the requirements of Section III.G.3.b of Appendix R to the extent that it requires fixed-fire suppression to be provided throughout the fire area, room or zone under consideration.

The licensee stated, in Enclosure 2 to the June 11, 1986 submittal, that Fire Zone 336 does not meet the requirements of Section III.G.3.b because although alternate shutdown capability has been provided, automatic suppression has not been provided for this zone.

This fire zone is located on the 60-foot elevation of the control building. The zone boundaries are reinforced concrete walls, floor, and ceiling. All boundaries are provided with 3-hour fire-rated penetration seals. The zone is accessed from the north and south through Class A fire doors.

The zone contains cable and instrument racks for redundant channels of required primary and secondary instrumentation for both units.

The zone is provided with eight photoelectric smoke detectors located within the zone. There is no automatic suppression system. Hose reel stations are located at the foot of the stairway on the 46-foot elevation for manual fire suppression capability. Portable fire extinguishers are also available.

The redundant instrument cables enter the zone through the west wall and are routed to the instrument racks in rigid steel conduits across the ceiling. They are, however, exposed for a short distance in cable trays above the instrument racks. Cable tray and instrument rack separation is not in compliance with Appendix R. Combustibles in this fire zone are cable insulation and paper products which present a fuel load of approximately 20,000 Btu/ft².

Section 4.3.2 of the licensee's October 26, 1983 report describes modifications to provide safe shutdown monitoring instrumentation independent of the control room, cable-spreading room, and the containment spray additive and monitor tank area. These modifications also provide alternate shutdown capability for the above instrumentation for Fire Zone 336 independent of the computer and instrument rack room.

EVALUATION

Component Cooling Water Heat Exchanger and Boric Acid Tank Room (Fire Zone 237)

The fire protection in the component cooling water heat exchanger and boric acid tank room does not comply with the technical requirements of Section III.G.3 of Appendix R because a fixed fire suppression system is not installed.

There was a concern that because an automatic suppression system is not installed, a fire of significant magnitude could develop and damage redundant component cooling water heat exchangers and/or redundant channels of required instrumentation. However, the combustible loading in the area is low, having an equivalent fire severity of less than 1/2 hour. The heat exchangers are of heavy metal construction and contain water when the plant is operating. There is reasonable assurance that a fire would not damage a heat exchanger sufficiently to prevent it from performing its safe-shutdown function. In addition, the zone is provided with early warning smoke detectors. It would be expected that if a fire were to occur, it would be detected in its incipient stages and the plant fire brigade would be summoned. The fire brigade would control the fire using installed hoses or extinguishers.

Although the redundant instrumentation cables are not provided with separation per Appendix R, a modification has been provided for the necessary safe shutdown monitoring, independent of the component cooling water heat exchanger and boric acid tank room.

With the fire protection features described above, there is reasonable assurance that a fire in Fire Zone 237 will not prevent safe shutdown of the plant.

Computer and Instrument Rack Room (Fire Zone 336)

The fire protection in the computer and instrument rack room does not comply with the technical requirements of Section III.G.3 of Appendix R because a fixed fire suppression system is not installed.

There was a concern that because an automatic suppression system is not installed, a fire of significant magnitude could develop and damage redundant trains of required instrumentation racks and associated cables. However, the combustible loading in the area is low, having an equivalent fire severity of less than 1/2 hour. If a fire were to occur, it is expected that it would develop slowly with initial low heat release and slow rise in room temperature. Because of the presence of smoke detectors, a fire in the area should be detected in its incipient stage. The fire brigade would be dispatched to extinguish the fire manually, using the hose lines or portable extinguisher.

In addition, the licensee has provided for safe shutdown monitoring instrumentation and circuitry, independent of the zone of concern.

With the fire protection features described above, there is reasonable assurance that a fire in Fire Zone 336 will not prevent safe shutdown of the plant.

CONCLUSION

Based on the above evaluation, the staff concludes that the existing fire protection features, together with alternate shutdown capability for the Component Cooling Water Heat Exchanger and Boric Acid Tank Room, and the Computer and Instrument Rack Room, provide a level of fire protection equivalent to the technical requirements of Section III.G.3.b of Appendix R of 10 CFR Part 50. Therefore, the exemption from providing fixed fire suppression for these rooms is acceptable and should be granted.

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