

Enclosure 2

Chemical Engineering Branch/Fire Protection Section
Exemption Request
H. B. Robinson, Unit No. 2
Docket No. 50-261

Introduction

By letter dated November 16, 1980, the licensee informed the staff that installation of a fixed fire suppression system had been completed in each reactor coolant pump bay. The system was based on proposed NRC requirements set forth in Section III.P of a proposed Appendix R notice in the Federal Register on May 29, 1980. By letter dated January 19, 1981, the licensee requested an exemption from the requirements of Section III.0 of Appendix R to 10 CFR 50.

Additional information was provided by letters dated November 26, 1980, January 7, 1983, July 30, 1982, June 7, 1983, June 29, 1983 and October 5, 1983.

Exemption Requested

The licensee requests an exemption from Section III.0 of Appendix R to 10 CFR 50 to the extent it requires an oil collection system for the reactor coolant pumps.

Discussion

The containment contains three reactor coolant pumps (A, B and C). These are located in bays (A, B and C). These bays also contain safety related cabling for the reactor coolant loop instrumentation. Bays A and B share a common ceiling; Bay C is isolated from Bays A & B to some extent. The bays are covered by removable concrete blocks. These blocks will cause the plume from an unmitigated fire to be diverted through the steam generator area. This area contains safety related steam flow instrumentation sensing lines.

Oil spilled in Bay A, will be confined to Bay A; however, oil spilled in Bays B and C can flow to adjacent areas. The foundation for the reactor coolant pumps is at the 237.000' level. The foundation for the steam generators is at the 238.33' level. The reactor coolant pump is located between the pressurized portion of the oil system and the steam generator supports, and serves to shield the steam generator supports in the event of an oil system rupture.

The major combustible in each bay is the 200 gallons of oil in each reactor coolant pump.

The existing fire detection system in each reactor coolant pump bay is a two-zone detection system. One zone consists of a single infrared flame detector; the other zone consists of a 325°F fixed-temperature heat detector. Activation of one zone of detection sends an alarm to the control room; activation of the second zone of detection alarms in the control room and also opens the pre-action water deluge valve to the bay. Both detectors are wall mounted.

The existing fire suppression system for each bay, is a preaction sprinkler system. Each bay has its own deluge valve, supply header, and a ring header that encircles the reactor coolant pumps at elevation 239 ft. 4 in. Each of the five risers off the ring header have three 220°F closed head side wall sprinklers at approximately 240 ft., 245 ft. and 252 ft. elevations. These systems are design to meet the minimum residual pressure and flow requirements of NFPA-Std-15.

The suppression system ring header piping in Bay A is designed to withstand an SSE, while Bays B and C are designed such that a seismic event would not impact safety related equipment due to suppression system rupture. The risers are restrained to withstand the nozzle reaction forces. These forces are greater than those anticipated from a seismic event.

The existing containment spray system would be used as an emergency back-up to the bay suppression system if necessary to cool the operating level and containment annulus outside of the RCP bays.

By letter dated June 7, 1983, the licensee proposed to:

- (1) Provide additional ceiling mounted heat detectors to meet the spacing and location requirements of NFPA-STD-72E, "Standard on Automatic Fire Detectors.
- (2) Replace existing closed head sprinklers with special open water spray nozzles and manual actuation from the control room.
- (3) Construct 6 inch dikes at the 231 ft. elevation in Bay B and Bay C.
- (4) Revise operating procedures for the containment spray system to allow its operation as a back up fire suppression system with the sodium hydroxide valved out.

By letter dated October 5, 1983, the licensee committed to maintain an automatically actuated closed-head preaction system in lieu of a manually actuated open-head system.

The licensee has provided the results of analyses of several fire scenarios without the benefit of the fire suppression system and an analysis of the reactor coolant lube oil systems capability to withstand an SSE.

The applicant states that the installation of a reactor coolant system would cost about 517 man-rem.

Evaluation

The technical requirements of Section III.0 of Appendix R are not met because the licensee has not provided a reactor coolant pump oil collection systems.

The licensee has provided several analyses to show that an unmitigated oil fire within one reactor coolant pump bay would not affect components located outside the bay. Our consultant Brookhaven National Laboratory, has reviewed these analyses and concluded that "the analyses are not sufficient, nor extensive enough to support their original thesis. In particular, the pool fire area and the quantity of spilled oil assumed in the scenarios may not bound all possible conditions." We agree. The results of any calculation will depend upon the assumed area of the fire and its duration. There is no way to set these parameters definitively.

In our opinion, the RCP Bay suppression system should be capable of maintaining temperatures within the Bay to reasonable levels if a fire should occur. Therefore, the fire effects should be confined to one Bay. In addition, the containment spray should be capable of maintaining reasonable temperatures outside of the reactor coolant bays.

The components within each Bay are not necessary for maintaining safe shutdown conditions. Components outside of a Bay should not be damaged.

The seismic analysis shows that it is unlikely that a seismic event would rupture the lube oil piping.

In our opinion, installation of a reactor coolant pump oil collection system in this facility would not significantly enhance fire safety.

Conclusion

Based on our evaluation, we conclude that the existing fire protection system in the Reactor Coolant Pump Bays provides an acceptable level of safety to that achieved by compliance with the requirements of Section III.0 of Appendix R to 10 CFR 50. Therefore, the licensee's request for an exemption should be granted.

Dated: March 7, 1985

Principal Contributor:

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