



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

SAFETY EVALUATION REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

EXEMPTION REQUEST, 10 CFR 50, APPENDIX R

FIRE PROTECTION

RANCHO SECO NUCLEAR GENERATING STATION

DOCKET NO. 50-312

1.0 Introduction

By letters dated March 17, 1981, and May 28, 1982, the licensee requested an exemption from the requirements of Subsection III.G, "Fire Protection of Safe Shutdown Capability" of Appendix R to 10 CFR 50. In addition, in the March 17, 1981 letter, the licensee requested an exemption from Subsection III.J, "Emergency Lighting" of Appendix R to 10 CFR 50. In the May 28, 1982 letter, the licensee withdrew the requested exemption from Subsection III.J. This evaluation addresses the requested exemption from Subsection III.G.2 for the Computer and Control Room and the Electrical Penetration area. For the Computer and Control Room, the licensee requested an exemption from the requirements for one-hour fire rated barriers and automatic fire suppression system to be installed. For the Electrical Penetration area, the licensee requested an exemption from the requirement that redundant trains be separated by a minimum of 20 feet free of intervening combustibles.

2.0 Discussion

2.1 Computer and Control Room

The control room and its peripheral rooms and the computer room form one fire area. The area is separated from all other areas of the plant by three-hour fire rated barriers.

Fire protection is provided by ionization smoke detectors with manual fire suppression provided by standpipe hose stations and portable fire extinguishers. Peripheral rooms in the control room area (offices and corridor) are protected with an automatic sprinkler system.

Combustibles in the area consist of electrical cable insulation and miscellaneous Class A combustibles such as paper. The combustibles comprise a fuel load of approximately 10,500 BTU/sq. ft. which, if totally consumed, corresponds to a fire severity of approximately eight minutes on the ASTM E-119 standard time temperature curve.

Cabling of redundant divisions is located throughout the area with separation to meet Regulatory Guide 1.75 guidelines. These guidelines are adequate for electrically initiated fires, but a single exposure fire may affect both divisions. The licensee justified the exemption based on the following considerations:

- Modifications have been made to isolate redundant circuits located in the same cabinet or console with the ability to take local control of the circuits.

- A fire detection system has been installed in the area.

- Manual fire fighting capability is provided by portable fire extinguishers and standpipe hose stations.

- The area is separated from other areas in the plant by three-hour fire rated barriers.
- Operating personnel occupy the area continuously.

2.2 Electrical Penetration Area

Redundant cables in the area are separated by 70 feet. However, the 70 feet of separation is traversed by intervening combustibles in the form of cables in open cable trays.

The licensee has not provided adequate information for our evaluation on the amount, physical properties, location and installation of all intervening combustibles and safe shutdown cabling in the area.

The licensee's exemption is based on the following:

- Low probability of a fire occurring in this area..
- Low fuel load.
- Current level of fire protection.

3.0 Evaluation

3.1 Computer and Control Room

The objective of the fire protection program at a nuclear power plant is to ensure that at least one means of achieving and maintaining safe shutdown conditions will remain

available during and after any postulated fire in any area of the plant. In our survey of this area we found that redundant circuits located in the same electrical panel can easily be damaged by fires either within the panel or in transient combustibles outside the panel. Redundant circuits located in physically separate panels can also be damaged by exposure fires outside the panels.

Although the licensee has provided capability to take local control for essential systems, the control room is not electrically isolated from the emergency control stations. We find that a fire in the control room or in the area of any emergency control station could affect both areas, thus resulting in the inability to safely shutdown the plant.

Early warning fire detection and manual fire fighting, by themselves, do not provide adequate assurances that an exposure fire will not occur in the area and affect both divisions. For this reason Subsection III.G.2 of Appendix R requires a combination of passive (separation and/or fire barrier) and active (fire suppression/detection) to provide reasonable assurance for safe shutdown capability.

To provide sufficient protection to redundant safe shutdown systems to provide reasonable assurance that at least one system will be unaffected by a fire in this area, the licensee should comply with the requirements of Subsection III.G of Appendix R. Since the nature of the electrical panels in this area make protection in accordance with Subsection III.G.2 of Appendix R impractical, the licensee should provide an alternate shutdown system for the area in accordance with Subsection III.G.3 of Appendix R. The alternate shutdown system should meet the requirements of Subsection III.L of Appendix R. The alternate shutdown capability should be electrically isolated from the control room so that a fire in the control room or in the area of alternate shutdown capability which destroys redundant circuits will not affect the ability to safely shut down the plant from the other area. With the alternate shutdown capability installed, a suppression system is not required in the area.

3.2 Electrical Penetration Area

The objective of the fire protection program is to ensure that at least one means of achieving safe shutdown conditions will remain available during and after any postulated fire in any area of the plant as required by Subsection III.G.2 of Appendix R.

The licensee has not provided the information to compare the level of safety provided by existing arrangements to that required by Appendix R. To complete our evaluation of the existing level of fire protection for safe shutdown capability to the requirements of Subsection III.G.2 of Appendix R, we will need additional information regarding the amount, physical properties, location of intervening combustibles and whether the safe shutdown cabling is installed in horizontal or vertical cable trays, the number of each type of tray and its distance to the floor and ceiling.

4.0 Conclusion

4.1 Computer and Control Room

Based on our evaluation, we conclude that the current level of fire protection provided for safe shutdown capability in the Control and Computer Room is not equivalent to the protection required by Subsection III.G of Appendix R. Therefore, the licensee's request for exemption should be denied.

4.2 Electrical Penetration Area

The licensee has not provided adequate justification that the level of protection afforded by the existing fire protection measures within the Electrical Penetration Area are equivalent to the technical requirements of Appendix R. Therefore, the

licensee's request for exemption cannot be granted because the above information has not been received from the licensee.

Dated:

The following NRC personnel have contributed to this Safety Evaluation: J. Stans, M. Padovan, S. Miner.

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REQUEST FOR ADDITIONAL INFORMATION

1. Plan and evaluation drawings of horizontal and vertical cable trays that contain safe shutdown cabling.
2. A description of the amount, location and physical properties of intervening combustibles (indicate location on above drawings).
3. The number of each type of tray and its distance to the floor and ceiling.