



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

FEB 6 1984

COISEN

MEMORANDUM FOR: ~~Darrell G. Eisenhut, Director~~
Division of Licensing

FROM: Richard H. Vollmer, Director
Division of Engineering

SUBJECT: BOARD NOTIFICATION REGARDING FIRE RESEARCH
RESULTS CONCERNING FIRES IN ELECTRICAL CABINETS
IN THE CONTROL ROOM

In 1982, the NRC initiated a fire protection research program to determine how electrical equipment in cabinets located in the control room and other plant locations may be affected by fire and fire suppressants. As part of this research effort, Sandia Laboratories conducted two experiments in October 1982 and February 1983 which exposed an aluminum electrical equipment cabinet to fire. The results of these experiments are reported in "Fire Safety of Electrical Cabinets", R. B. Williamson, F. W. Mowrer, and F. L. Fisher, November 1983, revised January 1984. In the Summary of this report the authors state:

"The two experiments described above have demonstrated the potential for serious fires in electrical cabinets resulting from a "typical" transient ignition source. The direct damage to the cabinets and their contents during these experiments suggests the need for greater scrutiny, especially if redundant safety systems are located within the same or adjacent cabinets. The flashover which occurred in the room surrounding the cabinet during the second experiment is considered to have important safety implications for new as well as operating reactors"

Our requirements recognized the difficulty of predicting the magnitude of damage in the control room that may result from a fire or from fire suppressants. To account for this uncertainty, we normally require an alternate shutdown capability independent of the control room.

Our preliminary review of the test report indicates that immediate action is not required, because:

1. The ignition source used for these experiments was a trash fire composed of loosely packed paper in two polyethylene bags, loosely packed paper in a 32-gallon polyethylene waste container, as well as two cardboard boxes with polyethylene foam packing material or loosely packed paper. We consider the accumulation of such combustibles in the control room to be a low probability event because the control room is a restricted area that is continuously manned by licensed operators and administrative controls prohibit the accumulation of unnecessary material in the area.

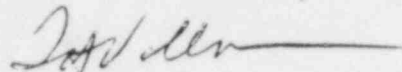
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2. Because the control room is continuously manned, we expect that a fire would be detected and extinguished promptly. The report indicates a light spray of water was applied to the upper part of the cabinet approximately 15 minutes after ignition. This spray resulted in a rapid decrease in heat release rate and temperature. In our opinion, the application of such spray shortly after ignition would control such a fire.
3. The test configuration did not accurately simulate the control room cabinet configuration with regard to cabinet material and construction, ventilation openings and contents. In addition, the size of the test enclosure is small compared to a control room.

In view of the contents in the "Summary" section of the report, there may be a potential safety concern in that the level of fire protection provided for electrical cabinets may not be adequate. There are electrical cabinets in every nuclear power plant. We, therefore, recommend that this information be submitted for board notification pursuant to NRR Office Letter Number 19, dated October 1, 1982. Further evaluation of the test data is required to resolve this matter. To this end, we are working with RES.


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