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

November 7, 1978

MEMORANDUM FOR: D. Ziemann, Chief, Operating Reactors Branch #2, DOR

FROM: G. Lainas, Chief, Plant Systems Branch

SUBJECT: SAN ONOFRE FIRE PROTECTION PROGRAM

Enclosed is a summary of open items on the San Onofre Unit 1 fire protection program reevaluation. A response from the licensee is requested for the two staff positions included therewith. The remainder of these items will be left as open items in the Safety Evaluation Report. A draft of this report is in preparation and is scheduled to be issued by December 1, 1978. The licensees response to the enclosed staff position is requested before this date. If a satisfactory response is not provided at this time, these concerns will be left as open items in the draft SER.

G. Lainas, Chief
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SUMMARY OF OPEN ITEMS ON

SAN ONOFRE FIRE PROTECTION REEVALUATION

1. NRC letter dated September 30, 1978:

   Summary of August 29, 1978 Meeting:

   a) Item 27 - We do not find that the response provided by the licensee in the meeting notes is adequate to address the staff concern. Attached is a revised statement of the staff position, PF-27A, which further clarifies our concern.

   b) Item 44 - As indicated, further analysis is required by the licensee on this item.

2. SCEC letter dated September 30, 1978:

   a) As indicated, the results of the evaluation to determine the appropriate fire rating to be assigned to penetration seals will be provided.

   b) As indicated, a conceptual proposal, for an alternate shutdown method not dependent upon the test pump, will be provided by the licensee by January 15, 1979, following an investigation of the systems required for safe shutdown.

3. On October 19, 1978, a site visit was conducted to survey systems located inside containment. The attached staff position, PF-51 was discussed with the licensee at this time.

STAFF POSITION

SAN ONOFRE, UNIT 1

PF-27A Cable Spreading Area

Staff Concern:

The cable spreading area is located in the upper half of the 4160 volt switchgear room which has a ceiling height of approximately 20 feet. Cables for redundant divisions of safety related systems are routed in open ladder cable trays in close proximity. The combustible loading in the area consists of 31,500 lb. of electrical cable insulation consisting of PCV, butyl rubber, neoprene, and other materials that do not meet current flame test requirements. This insulation gives an average fire loading of 172,000 BTU/ft^2 and equates to a fire severity in excess of two hours. Electrical cables consist of instrument, control, and power cables. This area contains both divisions of 4160 volt switchgear and associated power and control cables. The availability of both the normal offsite power and emergency onsite power to all safety-related and shutdown systems is dependent upon systems in this area.

The licensee is completing modifications to provide the capability to shutdown with offsite power, independent of fire damage in this area, by the use of suitable casuality procedures. However, these modifications will not prevent unacceptable consequences on shutdown capability if offsite power was lost as a result of a fire in the cable spreading area and switchgear room.

Fire detection is provided by ceiling mounted smoke detectors. Manual fire fighting is provided by hose stations located outside the area. The effectiveness of manual fire fighting is limited by the following considerations: Access to the upper elevations of the room would be required in order to direct water from hose stations on a cable fire due to the congestion of cable trays which would prevent such operations from the floor below. Visability in this situation would be greatly reduced due to the accumulation of smoke from a fire at the upper elevation of the room. This environment would require the fire brigade to use self contained breathing apparatus which would restrict their mobility in using fire ladders to gain access with a hose line. Water from hose streams if used in large quantities increases the potential of water damage to redundant divisions of essential switchgear.

An automatic total flooding Halon 1301 suppression system is a planned modification for the combined switchgear room and cable spreading area, nowever, additional passive measures are appropriate to prevent a major electrical cable fire in the cable spreading area for the following reasons:

1. The high fire loading due to cable insulation materials.

2. The difficulties which would be encountered in combating a major cable fire in this area by manual means.

3. The vital nature of the area to effect safe shutdown.

Staff Position:

Passive measures should be taken to prevent a major electrical cable fire in the cable spreading areas. These measures should consist of the application of a flame retardant coating to electrical cables or the combination of fire stops in cable trays and the use of suitable fire barriers to prevent fire propagation between adjacent cable trays.

PF-51 Containment

Staff Concern:

Cable trays are routed such that electrical cable insulation provides a continuity of combustibles between redundant divisions of cable trays. This situation would permit an unmitigated fire in one division of safety related cables to propagate to the redundant division of cable trays. Due to the increased difficulty of normally supressing fires within containment, passive measures should be provided to prevent fire propagation between redundant divisions of electrical cables.

Staff Position:

Fire stops should be provided in cable trays to prevent fire propagation between redundant divisions of cable trays.