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Docket Nos. 50-348
50-364

Director, Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. S. A. Varga

Joseph M. Farley Nuclear Plant - Units 1 and 2
Fire Protection Upgrade Response to 10CFR50.48
and 10CFR50 Appendix R Requirements

Gentlemen:

In letter dated June 18, 1982, Item D, Alabama Power Company submitted an exemption request from the requirements of Section III.G.2 of 10CFR50 Appendix R to preclude modifications to the present containment fire protection measures for both Units 1 and 2. Attachment 3 to that letter summarized the present containment fire protection measures and specifically requested and justified the exemption.

Alabama Power Company provides herewith additional information that will aid the NRC Staff review and concurrence of the exemption request as to the adequacy of the present containment fire protection measures employed at Farley Nuclear Plant. Specifically, in the improbable occurrence of a containment fire, at no time would the capability to achieve and maintain a safe shutdown condition be jeopardized, and the implementation of modifications required by Section III.G.2 to cable and equipment located in the containments of Units 1 and 2 would not enhance fire protection safety at Farley Nuclear Plant. A006

Alabama Power Company has evaluated the locations of cable and equipment in the containment necessary to achieve and maintain a safe shutdown condition and has identified areas where redundant trains are not separated by a horizontal distance of more than 20 feet. Attachment 1 identifies the affected equipment and verifies that a postulated fire would not impair safe shutdown capability.

Attachment 2 presents additional information regarding the adequacy of the present containment fire protection measures.

Alabama Power Company requests that the additional information provided herewith be considered in the review of the exemption request, Item D, of letter dated June 18, 1982.

Yours very truly,

F. L. Clayton, Jr.

FLCJr/MAL:lsh-D20
Attachments
cc: Mr. R. A. Thomas
Mr. G. F. Trowbridge
Mr. J. P. O'Reilly
Mr. E. A. Reeves
Mr. W. H. Bradford

ATTACHMENT 1

EVALUATION OF PRESENT DESIGN OF CABLE AND EQUIPMENT

Alabama Power Company has evalulated the locations of cable and equipment in containment necessary to achieve and maintain a safe shutdown and has identified areas where redundant trains are not horizontally separated by more than 20 feet. The cabling without more than 20 feet of horizontal separation is associated with the pressurizer power operated relief valves and block valves, reactor vessel head vent valves, and instrumentation for the pressurizer pressure and level indications.

Each valve and associated cables were analyzed to assess the safe shutdown cabability considering:

1) The designed fail position of the valve

2) The need to modulate or reposition the valve

3) The effects of hot shorts on the valve cables in a single enclosure

The instrumentation was analyzed to determine other redundant or diverse indications not affected by the postulated fire. These analyses and results are summarized below:

Pressurizer Power Operated Relief Valves (PORV) and Block Valves

In a limited number of locations in the containment, the cabling of the PORV's and block valves of both trains are not separated by a horizontal distance of more than 20 feet. The pressurizer is equipped with two parallel vent paths each having a PORV and block valve. The PORV's are solenoid operated valves, are normally closed, and fail by design in a closed position. The block valves are motor operated valves, are normally open, and fail by design in an "as-is" position. The PORV's and block valves provide for reactor coolant system depressurization and are essential to maintain the integrity of the reactor coolant pressure boundary.

As discussed in letter dated September 27, 1980, response to request 3 of Reactor Systems Branch Question 210.3, Alabama Power Company describes two methods for depressurization of the reactor coolant system: 1) the two redundant PORV's and 2) the pressurizer auxiliary spray. The auxiliary spray cabling and equipment are separated by a horizontal distance of more than 20 feet from either of the cabling and equipment of the redundant PORV's and block valves; consequently, the auxiliary spray would be available to provide for depressurization of the reactor coolant system and no modulation or repositioning of the PORV's or block valves is necessary.

In order to maintain the integrity of the reactor coolant pressure boundary, either the PORV or block valves in both redundant trains would be required to be in a closed position. This is accomplished by the PORV normally being and failing by design in a closed position.

A review of cables within each of the enclosures containing the PORV cables was performed to assess the effects of hot shorts and the possible inadvertant opening of the PORV's cables. Each PORV cable is routed in separate enclosures. The review shows that the only energized cables within the enclosures containing the PORV cables are associated with control room indicating lights. In the unlikely occurrence of a hot short between the control room indicating light cable and PORV cable, the low power of the control room indicating light cable would not be sufficient to inadvertently open the PORV's. Since the PORV's would remain in the closed position, inadvertant operation of the pressurizer block valves would not be significant.

Consequently, a total review of the operational requirements of the PORV's and block valves and the consequences of a containment fire concludes that alternative methods of providing depressurization are available having more than 20 feet of horizontal separation and the PORV's would remain closed to maintain the integrity of the reactor coolant pressure boundary and, therefore, the installation of modifications to containment cable and equipment to satisfy Section III.G.2 of 10CFR40 Appendix R would not enhance fire protection safety at Farley Nuclear Plant. The present design of cable and equipment in the containment provides adequate assurance that the capability to achieve and maintain a safe shutdown condition is unchallenged in the highly improbable occurrence of a containment fire.

Reactor Vessel Head Vent Valves

In a limited number of locations in the containment, the cabling of the reactor vessel head vent valves are not separated by a horizontal distance of more than 20 feet. The reactor vessel head vent system is designed to vent non-condensable gases from the reactor vessel and head area. The reactor vessel head vent system consists of two parallel flow paths each having two normally closed, normally de-energized valves in series that fail close by design. One valve in each path is required to remain closed in order to maintain the integrity of the reactor coolant pressure boundary. No modulation or repositioning of the valves would be necessary to achieve a safe shutdown during a containment fire.

Since the valves are in a closed, de-energized position, only inadvertent opening of the valves from hot shorts could violate the integrity of the reactor coolant pressure boundary. A review of cables within each of the enclosures containing the head vent valve cables was performed to assess the effects of hot shorts. Each head vent valve cable is routed in a separate enclosure. As with PORV's, the review shows that the only energized cables within the enclosures containing the head vent valve cables are associated with control room indicating lights. In the unlikely occurrence of a hot short between the control room indicating light cable and the head vent valve cable, the low power of the control room indicating light cable would not be sufficient to inadvertantly open the head vent valves.

Consequently, a total review of the operational requirements of the reactor vessel head vent system and the consequences of a containment fire concludes that the reactor head vent valves would remain closed to maintain the integrity of the reactor coolant pressure boundary and, therefore, the installation of modifications to containment cable and equipment to satisfy Section III.G.2 of 10CFR50 Appendix R would not enhance the fire protection safety at Farley Nuclear Plant. The present design of cable and equipment in the containment provides adequate assurance that the capability to achieve and maintain a safe shutdown condtion is unchallenged in the highly improbable occurrence of a containment fire.

Instrumentation for Pressurizer Pressure and Level Indication

The pressurizer is equipped with multiple methods of determining pressurizer pressure and level. At two locations in the containment, redundant trains of pressurizer level and pressure instrumentation are not separated by a horizontal distance of more than 20 feet. A review of the cable routing of each of the pressure and level methods shows that there is at least one channel of primary system pressure indication whose cables are horizontally separated by more than 20 feet from the cable of its redundant counterpart and that all cables of pressurizer level methods are within 20 feet.

As discussed in Attachment 2 to this letter, a full anlaysis of the fire hazards in the fire areas containing the pressurizer level cables was performed. The results of this analysis shows that the only combustible material is cable insulation. All cable insulation is adequately designed and tested (IEEE-383-1974) as a flame retardant and protected against protractive faulted conditions by overcurrent devices. Additionally, all cables are enclosed in conduit. It is the opinion of Alabama Power Company that it is impossible to ignite and sustain a fire in these areas that would proclude pressurizer level indication from being available to the operator.

Consequently, a total review of the locations of cable and equipment in the containment associated with pressurizer pressure and level indications concludes that the installation of modifications to containment cable and equipment to satisfy Section III.G.2 of 10CFR50 Appendix R would not enhance the fire protection safety at Farley Nuclear Plant. The present design of cable and equipment in the containment associated with pressurizer pressure and level indications provides adequate assurance that the capability to achieve and maintain a safe shutdown condition is unchallenged in the highly improbable occurrence of a containment fire.

ATTACHMENT 2

ASSESSMENT OF PRESENT FIRE PROTECTION MEASURES

In Attachment 3 to letter dated June 18, 1982, Alabama Power Company discussed the following four means of fire protection of cables and equipment located in the containment:

1) A seismically qualified reactor coolant pump oil collection system

2) Flame retardant cables protected against overcurrent conditions

3) Administrative procedures to ensure the removal of all transient combustibles from the containment

4) The locations of containment fire hose stations.

These are augmented by the fire area hazard analysis presented in the Fire Protection Program Re-evaluation Report for Farley Nuclear Plant - Unit 1 and 2. The containment was evaluated to have a low fire load of 39,555 BTU/ft^2 and a maximum fire severity of less than 30 minutes. The in-situ combustibles contributing to the containment fire load are cable insulation (36,421 lbs.), pipe insulation (4,721 lbs.), lube oil (795 gal.), panels (87 lbs.) and charcoal filters (3,750 lbs.)

In those areas where redundant trains of cable and equipment are without horizontal separation of more than 20 feet discussed in Attachment 1 to this letter, the only combustible is cable insulation. Additionally the cables discussed in Attachment 1 are enclosed in conduits. It is the opinion of Alabama Power Company that cable enclosed in conduit would not be imparied by a cable insulation fire.

In the highly improbable occurrence of a containment fire, the following containment fire detection system would alert the Fire Brigade to quick action.

1) Forty-eight ionization smoke detectors for CTMT coolers (i.e., 12 each for four CTMT coolers).

2) Three ionization smoke detectors for steam generators (i.e., one for each steam generator).

3) Eight ionization air duct detectors (i.e., two each for four CTMT venting fans).

4) One polarized alarm bell located near personnel access lock.

5) One manual fire alarm station located near the alarm bell.

6) Temperature detectors in filters.

The quick response of the Fire Brigade and the availability of fire hose stations would ensure that a fire would be contained with minimal fire damage.

Consequently, a total review of the present containment fire protection measures concludes that the installation of modification to containment equipment and cable to satisfy Section III.G.2 of 10CFR50 Appendix R would not enhance fire protection at Farley Nuclear Plant. The present containment fire protection measures provides adequate assurance that the capability to achieve and maintain a safe shutdown condition is unchallenged in the highly improbable occurance of a containment fire.