November 20, 1995

Mr. Donald F. Schnell
Senior Vice President - Nuclear
Union Electric Company
Post Office Box 149
St. Louis, Missouri 63166

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE CALLAWAY INDIVIDUAL PLANT EXAMINATION OF EXTERNAL EVENTS SUBMITTAL (TAC NO. M83602)

Dear Mr. Schnell:

In reviewing the Callaway Individual Plant Examination of External Events (IPEEE) submittal and its associated documentation, the NRC staff has determined that additional information is needed to complete the review. The information needed is detailed in the enclosure. To assist the NRC staff in meeting its review schedule, we request that you respond to this request for additional information in writing within 60 days of receipt of this letter.

The requirements affect nine or fewer respondents and, therefore, are not subject to the Office of Management and Budget review under P.L. 96-511. If you have any questions, please contact me at 301-415-1362.

Sincerely,

Original Signed By

Kristine M. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure: Request for Additional Information

cc w/encl: See next page

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Enclosure

CALLAWAY PLANT, UNIT NO. 1

DOCKET NO. 50-483

REQUEST FOR ADDITIONAL INFORMATION REGARDING IPEEE SUBMITTAL

1. The fire compartment interaction analysis (FCIA) is based on the assumption that fire barriers are effective as rated. For active fire barriers (e.g., a normally open fire door that gets closed by fusible link), the failure probability can be significantly high. Provide a list of compartments with active fire barriers, a description of the active barriers, and a discussion regarding qualitative screening of these (and their adjacent) compartments.

2. The study assumes that passive fire-barrier elements (e.g., walls, floors, ceilings, and penetration seals) are 100 percent reliable. Such an analysis is not valid unless the assumption is adequately justified and it can be demonstrated that there are no paths through the barrier for the spread of damage. Provide such justification and demonstration for high-hazard fire areas, such as the turbine building, diesel generator rooms, cable spreading rooms, switchgear rooms, and lube oil storage areas.

3. Related to Question 1 above, the FCIA screening criteria assumes success of the fire suppression system in controlling a hot gas layer. The probability of suppression system failure can be as high as 5 percent. Provide a list of compartments for which the suppression system is assumed to provide defense against fire propagation to an adjacent compartment. Provide a description of these compartments and of the change in the screening results, assuming suppression system failure or by using the probability of suppression system failure in the quantitative screening.

4. One aspect of the FIVE methodology is to compare predicted times to critical component damage with times for fire suppression. The assessment of component damage times should consider the proximity of critical components to each other, as well as to postulated fire sources. Please provide at least two examples of how these aspects of the analysis were implemented for Callaway.

5. The IPEEE appears to define a hot short as a case "when an energized power cable comes into contact with a control cable conductor...." For hot shorts, it is not necessary for power cables to short to the control circuit. A failure in the cables associated with a control circuit can simulate the effects of a closing switch or relay. Provide a discussion regarding the inclusion of this additional element of hot short phenomena in the fire analysis. Demonstrate the change in the results of screening, and changes in other parts of the analysis, from this expanded version of the hot short phenomenon.

6. Related to Question 5 above, the licensee states (on page 4-68 of the IPEEE submittal report) that air-operated valves (AOVs) are not susceptible to hot short; when power is lost, AOV fails in a safe position. Two issues are important to consider here. First, the time to power loss (i.e., the duration of an AOV staying open), and second, the possibility that an AOV fails to close from causes other than a fire. Provide a discussion regarding the duration that these valves can stay open without irrecoverable adverse effects. Provide a discussion regarding inclusion of the probability of AOV failure to close, and the effect on the results of the fire analysis.

7. Provide a list of dominant scenarios associated with the control room and ESF switchgear rooms, in terms of system trains and human actions, together with their associated frequencies and probabilities.

8. Provide a list of IPE-initiating events used for the analysis of each unscreened fire zone.

9. An assumption of 90 percent reliability for manual suppression within 15 minutes appears highly optimistic. In NUREG-1150, this reliability was assumed to be 0.7 for 15 minutes and 0.9 for 30 minutes. Please provide the basis for assuming that manual suppression is 90 percent reliable within 15 minutes. Specifically, manual suppression reliability should include consideration of detection time, brigade arrival time, and the time required to effectively suppress the fire. Describe how these factors were included in the IPEEE analysis.

10. The control room fire assessment is considered unrealistic based upon the following concerns:

    a. The mean heat release rate utilized in the submittal for control room cabinet fire scenarios (based upon Sandia National Laboratories [SNL] test date) is considered to be significantly too low. The SNL cabinet fire test data reports heat releases, for full mockup electrical panels, in the range of 400 to 1100 BTU/s.

    b. The amount of time for the control room to remain habitable, given an unsuppressed cabinet fire, is highly optimistic. SNL control room test data indicates that control room abandonment will occur in 6 to 8 minutes.

    c. The time estimated for manual suppression is optimistically short and is based upon control room configurations (e.g., in-cabinet smoke detectors) and fire events (e.g., pinching cables while shutting a cabinet door) which are not applicable for Callaway. The SNL NSAC-181 review report (April 1994) recommends a mean suppression time of 2.7 minutes.

    Please provide an assessment of the impact on the core damage frequency contributions of the control room fire scenarios, considering the above factors.

11. Please indicate how GI-103, "Design for Probable Maximum Precipitation," was resolved with respect to roof ponding.