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

APR 3 1981

Docket Nos.: 50-416/417

Mr. J. P. McGaughy, Jr.
Assistant Vice President - Nuclear Production
Mississippi Power and Light Company
P. O. Box 1640
Jackson, Mississippi 39205

Dear Mr. McGaughy:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - GRAND GULF NUCLEAR STATION, UNITS 1 AND 2

As a result of our review of the information contained in the Final Safety Analysis Report for the Grand Gulf Nuclear Station, Units 1 and 2, and based on our fire protection site review, we have developed the enclosed request for additional information. Included are questions from the Chemical Engineering Branch.

We request that you amend your Final Safety Analysis Report to reflect your responses to the enclosed requests as soon as possible and to inform the Project Manager, Joseph A. Martore, of the date by which you intend to respond.

Sincerely,

R. Tedesco

Robert L. Tedesco, Assistant Director
for Licensing
Division of Licensing

Enclosure:
As stated

cc: See next page.

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APR 3 1981

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REQUEST FOR ADDITIONAL INFORMATION

GRAND GULF NUCLEAR STATION, UNITS 1 & 2
DOCKET NUMBERS 50-416/417
CHEMICAL ENGINEERING BRANCH
FIRE PROTECTION SECTION

013.18 Your response to item 013.1 is not totally acceptable.

(1) It is our position that the automatic sprinkler systems proposed for the corridor area at elevation 139' of the auxiliary building be extended to provide complete coverage for the corridor area at this elevation.

(2) It is our position that the automatic sprinkler systems proposed to provide protection where redundant shutdown systems are less than 20 feet apart be designed and installed in accordance with NFPA 13 with ceiling level sprinklers, with additional sprinklers as required below obstructions such as ducts, etc.

(3) Indicate the location of redundant safe shutdown system circuits that are closer than 20 feet apart in the containment areas that are accessible during plant operation.

(4) It is our position that the control room and remote shutdown panels be electrically isolated from each other so that a fire in either area that destroys redundant safe shutdown circuits in that area will not affect the safe shutdown capability from the other area. Consider that a postulated fire in the remote shutdown panel area will affect both remote shutdown panels simultaneously. Indicate how you will comply with this position.

(5) Revise your FSAR to reflect your statements during our site visit that redundant safe shutdown circuits are not located in a single cable spreading room or in the Computer and Control Panels room (room 0C403) or indicate how remote shutdown capability will be provided if a fire in either of these areas was to destroy redundant circuits in that room.

013.19 Your response to item 013.2 is not totally acceptable. Demonstrate that safe shutdown capability is maintained if a fire in a transformer at the west wall of the control building was to introduce sufficient smoke into the fresh air intakes to cause shutdown of all ventilation systems with fresh air intakes at the west wall of the control building.

013.20 Your response to item 013.3 is not totally acceptable. Confirm that ventilation air flow monitors are provided for the battery room exhaust systems and that alarms will sound in the control room on loss of ventilation air flow.

013.21 Your response to item 013.5(b) is not totally acceptable.

(1) It is our position that the access door to the concealed ceiling space above the control room be maintained locked at all times. Also, revise your technical specifications to indicate that no work of any kind shall be conducted in the ceiling space unless the plant is in a cold shutdown situation.

013.22 Your response to item 013.6 is not totally acceptable. NEDO 10466 does not exempt Grand Gulf from the requirement to use Tefzel insulated cable in the PGCC system; it only states that all BWR/6 plants use Tefzel insulated cables except Grand Gulf. However, we find your present installation acceptable with the Halon suppression system installed provided you verify your statement made during our site visit that all termination and control cabinets in the control room which contain redundant safety-related systems will be provided with an ionization-type smoke detector which will alarm in the control room. In addition, verify that the Halon system installed to protect the PGCC floor sections is designed to provide a 30% concentration, and is designed to protect the specific PGCC floor layout at Grand Gulf.

013.23 Your response to item 013.7 is not totally acceptable. It is our position that you verify that a crack or rupture of the recirculation pump lube oil system at any point in the system (including the reservoir and bearings) will not allow oil to leak outside of the motor housing. Or, if this cannot be demonstrated than an engineered oil containment and collection system must be installed which will meet Reg. Guide 1.29, paragraph C.2.

013.24 Your response to item 013.8(a) is not totally acceptable.

(a) Provide revised Table 9A-2 and provide revised Figures 9.A (including Figures 9.A-16 thru 9.A-35) so that they reflect your commitment to install automatic fire detection in all areas of the plant which contain safety-related equipment or circuits.

013.25 Your response to item 013.9 is not totally acceptable.

(1) It is our position that all floor/ceiling fire barriers in safety-related buildings will have the structural steel protected to provide compliance with the referenced UL design numbers D903 and D916. In addition, identify and justify the fire rating of all floor/ceiling fire barriers in the safety-related buildings that are less than 3-hours.

(2) Indicate where and justify the use of any "non-fire rated penetrations," which you reference in Table 9A-1, sheet 6 of 20, sub-item J.

013.26 Your response to item 013.10 is not totally acceptable. Your response indicates that water spray systems will be installed to avoid direct impingement on Class IE equipment and Class IE cables near such equipment. Indicate how this will be compatible with the use of fire hoses where redundant shutdown systems are located in the same fire areas. In the event that the use of a fire hose can destroy redundant systems, provide an alternate shutdown system.

013.27 Your response to item 013.11 is not totally acceptable. Verify that the control room and the remote shutdown panel area are the only areas that need to be occupied to perform all functions required to achieve a cold shutdown. In addition, our position on 8-hour emergency lighting also applies to access and egress routes to all fire areas that need to be used during safe shutdown. Verify that you will comply with this position.

013.28 Your response to item 013.13 is not totally acceptable.

(1) Provide the results of the field acceptance tests of the fire pumps.

(2) Sections E.2(d) and (e) of Appendix A to BTP 9.5-1 state that fire water supplies should be calculated on the basis of the largest expected flow rate for a period of two hours (but not less than 300 ,000 gallons), and that, if tanks are used to supply the water, two 100% capacity tanks should be provided. The maximum demand at Grand Gulf was given to be 2700 gpm for sprinklers plus 500 gpm for hose streams, or a total of 3200 gpm. The required water supply for a 2-hour duration is 384,000 gallons. Two 300,000 gallon tanks do not meet the Appendix A guidelines. Therefore, indicate how you will comply with our Appendix A guidelines.

On page 9A-17 of your FSAR you state that the fire protection water supply also provides water for construction use. It is our position that you comply with the requirements of Section C.1.e of Appendix A regarding the fire water supply. Indicate your intent to comply with this requirement.

013.29 Your response to item 013.16 is not totally acceptable.

(1) Verify that the five men assigned to the fire brigade on each shift will not be required to perform any other functions (i.e., emergency shutdown) in a fire emergency.

013.30 It is our position that all valves in the fire protection water supply system be provided with electrical supervisory switches arranged to give visual and audible alarm in the control room if the valve position is changed. An acceptable alternate for sectionalizing valves which do not control suppression systems is that the valves be locked open with a strict key control procedure, with periodic verification of the valve position.

013.31 Your fire protection system diagrams indicate that the suppression and standpipe hose systems in containment are not connected to the plant fire water supply system. It is our position that these systems be part of the overall plant fire water system and receive their water supply from that system. As an alternate, demonstrate that the condensate and refueling water storage and transfer system is adequate to supply the required fire flow, assuming loss of off site power, and that it otherwise meets the requirements for reliability and water supply storage reserve expected of fire water supply systems. Also, verify that the functional capability of the condensate and refueling water transfer system would not be de-graded.

013.32 Your fire protection system diagrams indicate that the control building and diesel generator buildings water suppression and standpipe and hose station systems are supplied by a single connection to the looped fire water system from each building. It is our position that you provide additional connections to portions of the looped fire water system and provide sufficient valves so that a single break in the fire water system will not preclude all fire water supply to any areas of the plant.

013.33 Your fire protection system diagrams indicate that the radwaste building fire protection water supply header is not sectionalized by shutoff valves. It is our position that valves be provided in the radwaste building header so that a single break in the header or in the systems connected to the header will not necessitate shutting down the fire protection water supply for the entire building.

013.34 Your analysis states that the north wall of the HPCS pump room, room 1A109 at elevation 93'-0" of the auxiliary building, is non-rated. Your Fire Protection Plan, Figure 9.A-3, indicates that this wall is a 3-hour rated fire wall. Confirm that this wall, including penetration seals, is a 3-hour rated wall.

013.35 It is our position that the unassigned area (room 1A404) on elevation 166'-0" of the auxiliary building be provided with a smoke detection system as a minimum, and that an automatic sprinkler system be provided if the room occupancy causes combustibles to be stored.

013.36 During our site visit we noted that many of the doors identified on your Fire Protection Plan drawings as 3-hour rate fire doors are actually air-tight doors or other doors that have not been tested for fire resistance. Although you have a statement from the manufacturer that these doors are "similar" in design to rated fire doors, it is our position that you provide 3-hour rated, labeled fire doors at all openings from the turbine building to the auxiliary and control buildings.

013.37 During our site visit you indicated that redundant safe shutdown system cable was routed through both the Division I and Division II switchgear areas on elevation 111'-0" of the control building. These areas are presently protected by CO_2 total flooding systems, and you indicated that the redundant train of cables in each area would be wrapped with a one hour fire rated barrier. It is our position that an automatic water suppression system be installed in each area in addition to the one hour fire rated barrier around one division of cable. As an alternate, the cable could be relocated so that it is not routed through the redundant division switchgear room.

013.38 At our site visit, you indicated that the only Division I safe shutdown cable in the HVAC equipment room (room 0C302) on elevation 133'-0" of the control building was along the east wall; verify that no other Division I safe shutdown system cable or equipment is in this room. Otherwise, it is our position that the Division I safe shutdowr cable located in this area be protected by the requirements of 20 feet free separation.

013.39 Verify that all floor openings between the control room and the lower cable spreading room will be sealed to provide a 3-hour fire resistance, including the opening identified on Figure 9.A-36 as "Openings in ceiling above where required for bottom entry to termination cabinets in control room."

013.40 It is our position that you comply with Section F.3 of Appendix A to BTP 9.5-1 by providing a fixed pipe water suppression system in both the upper and lower cable spreading room.

013.41 Indicate the type of floor covering which will be used in the control room. It is our position that carpet not be utilized.

013.42 Verify that the interface between the control room viewing gallery (room 0C 601) and the concealed space above the control room suspended ceiling will be separated with at least a 1-hour fire barrier.

013.43 It is our position that the wall separating the Unit 1 and Unit 2 sides of the control room be replaced with noncombustible material if it is to remain in place when Unit 1 is operating and Unit 2 is under construction.

013.44 It is our position that you comply with Sections D.1(d) of Appendix A to BTP 9.5-1 by replacing all insulation, radiation shielding and sound-proofing materials that are other than noncombustible with noncombustible materials in all safety related areas of the plant.

013.45 It is our position that the diesel generator room outside air fans be arranged to start automatically in the Division I or II diesel generator rooms upon detection of smoke in either of the other two diesel generator room to prevent the smoke from a fire in one room from filtering back into the other rooms through the exhaust openings to the common cooridor, room 1A 301. As an alternate, the fire dampers presently installed in the exhaust openings should be arranged to also close as a smoke damper.

013.46 Verify that the detection systems which are used to actuate fire suppression systems will alarm in the control room independently of the suppression system actuation.

013.47 In Table 9A-1 of your FSAR, you indicate that the normal plant ventilation systems would be used to ventilate smoke and other products of combustion. Since the ventilation equipment may not handle the smoke because of clogged filters, it is our position that portable smoke exhaust fans and ducts be provided. The portable units provided should be designed for such use, should be capable of being used without offsite power, and should be sufficient in number and capacity to provide ventilation for any area of the plant where normal ventilation systems cannot be relied upon.

013.48 Verify that automatic fire detection is being provided in the new and spent fuel pool area.

013.49 It is our position that water type portable fire extinguishers be installed at strategic locations throughout the plant, including the control room and cable spreading rooms. Confirm that you will meet this position.

013.50 It is our position that, due to the large fire load, the miscellaneous equipment area (room 1A 509) at elevation 184'-0" of the containment building be protected with an automatic sprinkler system.

013.51 In accordance with section 9.5.1, Branch Technical Position ASB 9.5-1, position C.4.a.(1) of NRC Standard Review Plan and section III.G of new Appendix R to 10 CFR Part 50, it is the staff's position that cabling for redundant safe shutdown systems should be separated by walls having a three-hour fire rating or equivalent protection (see section III.G.2 of Appendix R). That is, cabling required for or associated with the primary method of shutdown, should be physically separated by the equivalent of a three-hour rated fire barrier from cabling required for or associated with the redundant or alternate method of shutdown. To assure that redundant shutdown cable systems and all other cable systems that are associated with the shutdown cable systems are separated from each other so that both are not subject to damage from a single fire hazard, we require the following information for each system needed to bring the plant to a safe shutdown.

1. Provide a table that lists all equipment including instrumentation and vital support system equipment required to achieve and maintain hot and/or cold shutdown. For each equipment listed:

   a. Differentiate between equipment required to achieve and maintain hot shutdown and equipment required to achieve and maintain cold shutdown,

   b. Define each equipment's location by fire area,

   c. Define each equipment's redundant counterpart,

d. Identify each equipment's essential cabling (instrumentation, control, and power). For each cable identified: (1) Describe the cable routing (by fire area) from source to termination, and (2) Identify each fire area location where the cables are separated by less than a wall having a three-hour fire rating from cables for any redundant shutdown system, and

e. List any problem areas identified by item 1.d.(2) above that will be corrected in accordance with Section III.G.3 of Appendix R (i.e., alternate or dedicated shutdown capability).

2. Provide a table that lists Class 1E and Non-Class 1E cables that are associated with the essential safe shutdown systems identified in item 1 above. For each cable listed: (* See note below)

a. Define the cables' association to the safe shutdown system (common power source, common raceway, separation less than IEEE Standard-384 guidelines, cables for equipment whose spurious operation will adversely affect shutdown systems, etc.),

b. Describe each associated cable routing (by fire area) from source to termination, and

c. Identify each location where the associated cables are separated by less than a wall having a three-hour fire rating from cables required for or associated with any redundant shutdown system.

3. Provide one of the following for each of the circuits identified in item 2.c above:

   (a) The results of an analysis that demonstrates that failure caused by open, ground, or hot short of cables will not affect it's associated shutdown system, * Note *

   (b) Identify each circuit requiring a solution in accordance with section III.G.3 of Appendix R, or

   (c) Identify each circuit meeting or that will be modified to meet the requirements of section III.G.2 of Appendix R (i.e., three-hour wall, 20 feet of clear space with automatic fire suppression, or one-hour barrier with automatic fire suppression).

4. To assure compliance with GDC 19, we require the following information be provided for the control room. If credit is to be taken for an alternate or dedicated shutdown method for other fire areas (as identified by item 1.e or 3.b above) in accordance with section III.G.3 of new Appendix R to 10 CFR Part 50, the following information will also be required for each of these plant areas.

   a. A table that lists all equipment including instrumentation and vital support system equipment that are required by the primary method of achieving and maintaining hot and/or cold shutdown.

* NOTE

Option 3a is considered to be one method of meeting the requirements of Section II.G.3 Appendix R. If option 3a is selected the information requested in items 2a and 2c above should be provided in general terms and the information requested by 2b need not be provided.

b. A table that lists all equipment including instrumentation and vital support system equipment that are required by the alternate, dedicated, or remote method of achieving and maintaining hot and/or cold shutdown.

c. Identify each alternate shutdown equipment listed in item 4.b above with essential cables (instrumentation, control, and power) that are located in the fire area containing the primary shutdown equipment. For each equipment listed provide one of the following:

(1) Detailed electrical schematic drawings that show the essential cables that are duplicated elsewhere and are electrically isolated from the subject fire areas, or

(2) The results of an analysis that demonstrates that failure (open, ground, or hot short) of each cable identified will not affect the capability to achieve and maintain hot or cold shutdown.

d. Provide a table that lists Class 1E and Non-Class 1E cables that are associated with the alternate, dedicated, or remote method of shutdown. For each item listed, identify each associated cable located in the fire area containing the primary shutdown equipment. For each cable so identified provide the results of an analysis that demonstrates that failure (open, ground, or hot short) of the associated cable will not adversely affect the alternate, dedicated, or remote method of shutdown.

5. The residual heat removal system is generally a low pressure system that interfaces with the high pressure primary coolant system. To preclude a LOCA through this interface, we require compliance with the recommendations of Branch Technical Position RSB 5-1. Thus, this interface most likely consists of two redundant and independent motor operated valves with diverse interlocks in accordance with Branch Technical Position ICSB 3. These two motor operated valves and their associated cable may be subject to a single fire hazard. It is our concern that this single fire could cause the two valves to open resulting in a fire-initiated LOCA through the subject high-low pressure system interface. To assure that this interface and other high-low pressure interfaces are adequately protected from the effects of a single fire, we require the following information:

a. Identify each high-low pressure interface that uses redundant electrically controlled devices (such as two series motor operated valves) to isolate or preclude rupture of any primary coolant boundary.

b. Identify each device's essential cabling (power and control) and describe the cable routing (by fire area) from source to termination.

c. Identify each location where the identified cables are separated by less than a wall having a three-hour fire rating from cables for the redundant device.

d. For the areas identified in item 5.c above (if any), provide the bases and justification as to the acceptability of the existing design or any proposed modifications.