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

Docket Nos. 50-416
and 50-417

DEC 1 8 1979

Mr. N. L. Stampley, Vice President
Production and Engineering
Mississippi Power and Light Company
P. O. Box 1640
Jackson, Mississippi 39205

Dear Mr. Stampley:

SUBJECT: REQUESTS 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, we have developed the enclosed requests for additional information.

We request that you amend your Final Safety Analysis Report to reflect your responses to the enclosed requests by February 28, 1980. If you cannot meet this date, please advise us of the date you can meet as soon as possible so that we may consider the need to revise our review schedule.

Please contact us if you desire any discussion or clarification of the enclosed requests.

Sincerely,

Robert L. Baer

Robert L. Baer, Chief
Light Water Reactors Branch No. 2
Division of Project Management

Enclosure:
Requests for Additional
Information

ccs: See next page

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Mr. N. L. Stampley
Vice President - Production
Mississippi Power and Light Company
P. O. Box 1640
Jackson, Mississippi 39205

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ccs: Mr. Robert B. McGehee, Attorney
Wise, Carter, Child, Steen and
Caraway
P. O. Box 651
Jackson, Mississippi 39205

Troy B. Conner, Jr., Esq.
Conner, Moore and Corber
1747 Pennsylvania Avenue, N. W.
Washington, D. C. 20006

Mr. Adrian Zaccaria, Project Engineer
Grand Gulf Nuclear Station
Bechtel Power Corporation
Gaithersburg, Maryland 20760

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031.48 - Inconsistencies in section 7.2 make it impractical, if not impossible, to determine whether the RPS is in compliance with NRC requirements. The following illustrations of types and magnitudes of inconsistencies are provided as examples:

(1) In the introduction to the RPS, the instrumentation is identified as being a part of either sensor trip channels, trip logic divisions, or actuator output logic divisions. In the remainder of 7.2 at least 20 variations (including some commutations and permutations) are used in identifying some portion of the instrumentation.

(2) Protection system cabling is discussed in 7.2.1.1.4.2, 7.2.1.1.4.7, 7.2.1.1.7, 7.2.2.1.1.1, 7.2.2.1.2.1.10, 7.2.2.1.2.3.1.2 and 7.2.2.1.2.3.1.7. At various places in these sections the same cable run is purported to be in: (1) wireways, (2) conduit, (3) separate conduit for each division, (4) separate conduit for each device, (5) separately from any other cabling, and (6) in conduit and wireways. In a few individual instrument descriptions cabling is identified only as being "routed from the transmitters to the main control room".

(3) Your response to question 031.031 indicates that you utilize one of three different isolation devices (two digital and one analog) to isolate each protective system signal that interfaces to nonprotective system

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Circuits. Each of these isolation devices is identified as utilizing optical isolators as the isolation barrier. In section 7.2 the following terms are used to describe isolation devices in the RPS:

(1) electronic isolators

(2) electronic isolation devices

(3) electrical isolation

Revise section 7.2 to make it self-consistent and correct. In the case of isolation devices we would prefer to refer to all three devices described in section 7.1 as optical isolation; additional or alternate isolation, such as separate relay contacts should be specifically identified.

031.49 - Provide a discussion of the mode switch in section 7.2.1.1.4.2. Provide at least the same detail as provided for other RPS initiating circuits. Figure 7.2-2 (the reference drawing for section 7.2.1.1.4.2) shows the mode switch as both an initiator and a modifier of other initiators of the RPS. The discussion should include as a minimum:

(1) The design features used to maintain separation of trip logic divisions and to isolate RPS functions of the switch from non-RPS functions.

(2) The mechanism used to introduce a scram with the mode switch and the mechanism used to bypass this scram.

(3) The specific way that the mode switch interacts with the individual initiator channels shown in Figure 7.2-2 as having the mode switch as a modifying agent.

(4) A figure or table identifying the location and use of every contact in one bank of the mode switch. Reference to an existing table or figure is acceptable provided the discussion provided can be understood without reference to the figure or table.

The discussion of the mode switch in other sections of 7.2 should be modified as necessary to be consistent with the discussion provided for section 7.2.1.1.4.2. In particular, if the interaction of the mode switch is at the trip relay level (as indicated in Figure 7.2-5) do not say that the switch connects (and by inference disconnects) "appropriate sensors into the RPS Logic."

031.50 The claims made in the name of "diversity" indicate a misunderstanding of the meaning of diversity. The following mis-statements on diversity are from sections 7.2.1.1.4:

(1) "These variables are independent of one another and provide diverse protective action for this condition." This statement, or almost identical ones, is made four times. In most cases diverse protection is possible because the diverse variables are not independent. Diverse protection is not possible unless the diverse variables are dependent variables of the

incident being protected against. Also "diverse protective action" is not provided; the same protective action, a scram, is provided by all initiators.

(2) "Diversity is achieved with physical separation of the manual reset switches, which requires deliberate operator action to initiate the reset of the RPS logic." If this is diversity, every one of the protective circuits have it.

In addition, two references to diversity discussions are included in the discussion of operating bypasses. In each case the circuit involved is in an interlock function rather than a protective function. In one case the referenced discussion indicates that there is no diversity.

Two conditions are necessary for there to be diversity between two initiator circuits: First, the two initiator circuits must sense the approach to unsafe levels by different means (either by sensing different variables or by sensing the same variable with a sensor of different principle); and second, each of the two initiators must initiate protective action in time to prevent unacceptable results.

Please amend your statements of diversity to identify the specific incidents for which diverse protective action is provided. Also, amend the incident descriptions and transients to include the transients that would exist if the least effective of the diverse circuits was the only circuit to function.

031.51 - In sections 7.2.1.1.4.3 and 7.2.1.1.4.4.5, you claim that redundancy is provided for both the scram reset operation and the automatic scram bypass (active only with mode switch in shutdown) through the use of four separate actuating devices. If redundancy is provided, amend the FSAR to identify: (1) how redundancy is achieved, (2) whether redundancy is provided by an actuator in the same trip division, and (3) the steps taken to isolate the reset (or bypass) action for one trip logic from the other trip logics obtaining redundant reset (or bypass) from the same actuating device. If the circuits are independent rather than redundant, amend the FSAR to indicate independence and compliance with single failure criteria.

Section 7.2.1.1 states that there are four reset switches in the scram reset circuit in one paragraph, but in another paragraph implies a single reset switch (plural reset actions are attributed to operation of a single reset switch). Section 7.2.2.1 also refers to "the RPS reset switch." Resolve this discrepancy and amend the FSAR accordingly. Revise the presentation in 7.2.1.1 to include a discussion of how separation is accomplished within and between trip divisions. Include a schematic diagram or provide reference drawing numbers.

031.52 - Section 7.2.2.1.1.1.6 and Section 15.4.4 identify withdrawal of the maximum worth rod as the limiting control rod withdrawal transient for determining the minimum number and location of LPRM detectors for the APRM channels. Since the maximum worth rod is near the radial center of the core, the flux increase will be fairly near uniform except in the vicinity of the withdrawal control rod. On the other hand, a control rod further from the center will generate a tilt in the power distribution that will result in a higher ratio of local power increase to average power increase since the LPRM's will on the average, be further from the source of the perturbation. Identify the calculations made to support the contention that the maximum worth control rod is the most restrictive control rod transient as far as influencing the number and location of LPRM detectors for an APRM channel.

031.53 - Revise the discussion of compliance with IEEE Std. 279 to identify any portion of the RPS that does not comply. If your analysis indicates that there is full compliance, this should be stated in Section 7.2.2.1.2.3.1 prior to the presentation of the analyses used to determine that individual portions of the RPS comply with specific requirements of IEEE Std. 279.

031.54 - Revise the tables and figures in Section 7.2 to remove the errors and inconsistencies noted below:

(1) The title of Table 7.2-1 is incorrect as the table does not specify anything but the trip setting and trip repeatability.

(2) Identify "Trip Setting" in Table 7.2-1 further. Are these settings your expect to use or are they the span of the trip point adjustment? Does the "Normal Range" refer to the "Instrument" or to the normal value during reactor operation? Is the "Trip Setting" related to the transmitter output or to the actual sensed reactor vessel pressure (or level) at the time that trip is generated, with signal changing at the rate indicated under "transient". (Does the setpoint include the change in pressure during the response time of the RPS?) "Trip Setting" is an ambiguous term in relation to bypass functions, "Required Conditions" would be more meaningful. The accuracy figure for the turbine stop and control valve trip bypass should be in % power for consistency.

(3) Resolve the discrepancy in Reactor Vessel High Pressure setpoint between tables 7.2-1 and 7.2-4.

(4) Provide justification for those trip functions in Table 7.2-4 that claim zero (or conservative direction only) instrument and setpoint drift.

(5) Resolve the discrepancies between the transient overshoot claimed in Table 7.2-4 and the values shown in various figures in Chapter 15.

(6) Justify the use of a "Maximum Overall" response time for the APRM that is less than the sum of the "Design" values for the channel and the logic-actuator. Identify the meaning of "Design Response Times" in the context of whether these are maximum acceptable values, nominal values, etc. and how they are related to "transients" in Table 7.2-1. Justify the exclusion of the flow weighted APRM neutron flux trip from the table.

(7) Revise Figure 7.2-2 to show that the APRM trip is not only operable in other modes than Run but that the setpoint is lower if the mode switch is not in Run.

(8) Revise Figure 7.2-5 to correct the error in contact condition for contacts E and G (the contacts should be closed) in the turbine stop valve closure channel. (This error has been noted in a number of other BWR FSAR's.)

(9) Resolve the discrepancy in the APRM trip functions between Figure 7.2-6 and Figure 7.6-12.

/(10) Steam line B, Outboard Valve is misidentified in the key to Figure 7.2-8.

031.55 Your response to Question 031.12 indicates that Table 7.1-3 identifies the applicable safety criteria for Chapter 7, and footnote #3 of this table indicates that the degree of conformance is discussed in the analysis (7.X.2) Sections. Each of the 7.1.2 Sections for individual systems indicates that all requirements identified in Table 7.1-3 are met. Additionally tables 7.1-4 through 7.1-9 present information similar to but not fully in agreement with the information in Table 7.1-3. None of the tables have descriptive titles that indicate any more than the protective system involved (some do not identify the significance of the "X" symbols).

Amend your FSAR as necessary to achieve consistency between the various 7.X.2 Sections and the seven tables. In discussing conformance, distinguish between full conformance and conformance with exceptions. A specific statement of the degree of conformance to the 10 CFR requirements identified in Table 7.1-3 is required. The statement of conformance may be made in the individual 7.X.2 Sections or in 7.1.2 for all systems, but should not replace the supportive discussion currently in 7.X.2 Sections. In addition, the following specific comments are made. (Review of Sections 7.3-7.7 has not been made):

(1) Table 7.1-3 is erroneously referred to as Table 7.3-1 in 7.1.2.

(2) Section 7.2.2.1.2.2.2 presents features that are necessary and desirable, but they do not relate to the subject of GDC 12 (Suppression of reactor power transients) in a readily recognizable manner.

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(3) Section 7.2.2.1.2.2.3 does not commit to having provided adequate instrumentation to follow accident nor to having provided instrumentation with adequate range to monitor the variables over anti-operational occurrences and accident conditions.

(4) Section 7.2.2.1.2.2.11 says a lot of good things, but it does not address the role of the reactor trip system for a "single mälfunction of the reactivity control systems" which is the subject of GDC 25.