



**Entergy
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April 26, 1991

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Reactor Protection System Instrumentation
Surveillance Requirements (Table 4.3.1.1-1)
Proposed Amendment to the Operating
License (PCOL-91/03)

GNRG-91/00043

Gentlemen:

Entergy Operations, Inc. is submitting by this letter a proposed amendment to the Grand Gulf Nuclear Station (GGNS) Operating License. The proposed GGNS Technical Specification (TS) amendment deletes the requirement to perform Note (h) daily for the Average Power Range Monitor Flow Biased Simulated Thermal Power-High Functional Unit identified as Item 2.b in TS Table 4.3.1.1-1.

In accordance with the provisions of 10CFR50.4, the signed original of the requested amendment is enclosed. Attachment 2 provides the technical justification and discussion to support the requested amendment. This amendment request has been reviewed and accepted by the Plant Safety Review Committee and the Safety Review Committee.

Based on the guidelines presented in 10CFR50.92, Entergy Operations has concluded that this proposed amendment involves no significant hazards considerations.

Yours truly,

W. T. Cottle

WTC/PRS/ams

attachments: 1. Affirmation per 10CFR50.30
2. GGNS PCOL-91/03

cc: (See Next Page)

G9103051/SNLCFLR - 1
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April 26, 1991

GNRO-91/00043

Page 2 of 3

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BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-29

DOCKET NO. 50-416

IN THE MATTER OF
MISSISSIPPI POWER & LIGHT COMPANY
and
SYSTEM ENERGY RESOURCES, INC.
and
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
and
ENTERGY OPERATIONS, INC.

AFFIRMATION

I, W. T. Cottle, being duly sworn, state that I am Vice President, Operations GGNS of Entergy Operations, Inc.; that on behalf of Entergy Operations, Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this application for amendment of the Operating License of the Grand Gulf Nuclear Station; that I signed this application as Vice President, Operations GGNS of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information and belief.

W. T. Cottle
W. T. Cottle

STATE OF MISSISSIPPI
COUNTY OF CLAIBORNE

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 26 day of April, 1991.

(SEAL)

Patricia McLaughlin
Notary Public

My commission expires:

My Commission Expires July 1, 1993

G9103051/SNLICFLR - 4

A. SUBJECT

1. NL-91/03 Deletion of Daily Requirement to Perform Note (h) for the APRM Flow Biased Simulated Thermal Power-High Functional Unit

2. Affected Technical Specification:

Table 4.3.1.1-1, "Reactor Protection System Instrumentation Surveillance Requirements", Item 2.b and Note (h) - pages 3/4 3-7 and 3/4 3-8

B. DISCUSSION

1. This proposed change to the GGNS Technical Specifications (TS) would delete the requirement to perform Note (h) daily for the Average Power Range Monitor (APRM) Flow Biased Simulated Thermal Power-High scram function identified as item 2.b in Table 4.3.1.1-1.
2. The daily surveillance provides information and protection redundant to other surveillance requirements. GGNS identified the deletion of this surveillance as a TS change beneficial to safety through reduction of operator burden.
3. Through our evaluation of the historical basis for the Daily Channel Check requirement, we have found that the note was incorporated into the draft EWR-6 Standard Technical Specification (STS) (the last official version of the BWR STS for the BWR-5 does not contain the footnote at all) with the following wording:

"Verify measured core flow to be greater than or equal to established core flow at the existing flow control valve position."

4. The wording of the note varies from plant to plant. A review of selected samples of different plant TS has shown how the original intent of the note has been obscured as each of these plants have negotiated their own wording. We believe that the differences in the wording are due to each plant's attempt to rationalize the note or to minimize its effect having determined that the note does not reflect a serious concern or has no basis for being in the Reactor Protection System (RPS) instrumentation TS.
5. GGNS, proposes the following TS changes:
 - a. Delete the daily surveillance specified in Table 4.3.1.1-1 for item 2.b, "Average Power Range Monitor Flow Biased Simulated Thermal Power-High."

- b. Delete the Note (h) Table 4.3.1.1-1 associated with the daily surveillance w. is also being deleted.

Marked up TS pages reflecting the proposed TS changes described above are included.

6. The proposed changes and basis are similar to those granted by the NRC for Fermi-2 in Amendment No. 19 and Clinton Power Station in Amendment No. 30.

C. JUSTIFICATION

1. The APRM Flow-Biased Simulated Thermal Power (APRM-FBSTP) scram function monitors parameters to approximate the thermal power being transferred to the reactor coolant. The APRM neutron flux is electronically filtered with a time constant representative of the fuel heat transfer dynamics to generate a signal proportional to the thermal power in the reactor. The trip setpoint is varied as a function of recirculation drive flow (i.e., at lower core flows the setpoint is reduced proportional to the reduction in power experienced as core flow is reduced with a fixed control rod pattern) but is clamped at an upper limit. The APRM-FBSTP scram function can provide an added level of protection against transients where thermal power increases slowly. During these type of events, the thermal power increase does not significantly lag the neutron flux response and, because of a lower trip setpoint the APRM-FBSTP function can initiate a scram before the high neutron flux scram. For rapid neutron flux increase events, the thermal power lags the neutron flux and the APRM Neutron Flux - High scram function provides a scram signal before the APRM-FBSTP scram function setpoint is exceeded. The GGNS reload safety analysis does not take credit for the APRM-FBSTP scram function in ensuring the safety limit minimum critical power ratio is not exceeded.
2. The daily surveillance performed to satisfy Note (h) is somewhat in disagreement with the jetpump surveillance contained in TS 4.4.1.2.1.a. The Note (h) surveillance requires the measured drive flow to be less than or equal to the established drive flow while the jetpump surveillance requires the measured drive flow to be within 10% of the established. Thus, in order to ensure compliance to Note (h), the jetpump surveillance is forced to be less than or equal to minus 10% of the established as the instrumentation is the same. This requirement places undue restrictions on the jetpump surveillance. In addition, at measured drive flows greater than approximately 69%, the APRM-FBSTP scram function is clamped and therefore the surveillance provides no useful indication except at reduced flows.

3. A review of the various versions of the note shows that, with minor variations, there are two general versions, neither of which exactly matches the wording appearing in the draft STS:
 - (a) One version of the note requires verifying that indicated or measured reactor recirculation loop drive flow for a given flow control valve position is less than or equal to a previously established reactor recirculation loop drive flow for that flow control valve position. (This is the version that appears in the GGNS and River Bend TS.)
 - (b) The other version requires verifying that measured total core flow (total jet pump flow) for a given indicated reactor recirculation loop drive flow (as sensed by the APRMs) is greater than or equal to a previously established total core flow for that particular reactor recirculation loop drive flow. (This is the version that appears in the Perry and was in the Clinton TS as well as the Nine Mile Point TS except that the latter replaces the "greater than or equal to" with the words "in the range of." LaSalle has a similar note, i.e., the words "greater than or equal to" are not included.)
4. Based on our evaluation, we believe that the following concerns and/or events may have been considered when the note was incorporated in the TS:
 - (a) Flow control valve crudding;
 - (b) Jet pump beam cracking;
 - (c) Jet pump blockage;
 - (d) Core crudding; and
 - (e) Jet pump instrumentation problems.

An evaluation of these concerns is discussed as follows:

Flow Control Valve (FCV) Crudding - Crudding of the flow control valve would result in a trend where recirculation loop drive flow would decrease over time for a given FCV position. Because core flow would also decrease (the core-flow/drive-flow relationship is roughly proportional except at low flow conditions where natural circulation dominates), this situation would not result in a non-conservative condition with respect to the APRM-FBSTP scram function.

Version (a) of the note addresses the drive-flow/FCV-position relationship, but, for the reason discussed above, should not be associated with APRM-FBSTP TS since it would be of limited value from that standpoint. (A check performed in accordance with Version (a) will always be satisfied because the above-noted trend ensures it. The

requirement for ensuring that the APRM-FBSTP instrumentation is sensing the correct drive flow is fully met by performing the required Channel Check, Channel Functional Test and Channel Calibration requirements for this instrumentation.) Version (b) is not applicable to the drive-flow/FCV-position relationship since it only considers changes in the core-flow/drive-flow relationship.

A check of the drive-flow/FCV-position relationship is only appropriate for TS 3/4.4.1.2 (Jet Pump Operability) where a number of daily surveillances are required for the reactor recirculation system. These surveillances are listed below:

- (a) Verify the indicated recirculation loop flow does not differ by more than 10% from the established FCV-position-loop flow characteristics.
- (b) Verify the indicated total core flow does not differ by more than 10% from the established total core flow value derived from recirculation loop flow measurements.
- (c) Verify the indicated diffuser-to-lower plenum differential pressure of any individual jet pump does not differ from established patterns by more than 10%.

It should be noted that relationships addressed by either version of the note are both addressed in these surveillances. Changes in the drive-flow/FCV-position relationship would be revealed by performance of item (a) above.

Jet Pump Beam Cracking - This phenomenon was addressed in GE Service Information Letter (SIL) No. 330. GGNS has evaluated the SIL and a discussion of the GGNS response is found in Supplement 6 to the GGNS Safety Evaluation Report (NUREG-0831). The individual jet pump diffuser-to-lower-plenum differential pressure check, as required per GGNS TS 4.4.1.2.1.c (i.e., the third item on the list presented previously), was identified in the SIL as an acceptable method for identifying this phenomenon. If this event was to occur, this daily surveillance check would recognize it. Failure to meet the acceptance criteria would then require a plant shutdown because the corresponding ACTION under TS 3.4.1.2 states, "With one or more jet pumps inoperable, be in at least HOT SHUTDOWN within 12 hours." Additional ACTION under the RPS instrumentation TS is redundant and unnecessary.

Jet Pump Blockage - In the unlikely event a jet pump becomes blocked or obstructed, the daily jet pump performance surveillances discussed above would reveal this condition as well.

Core Crudding - The change in m-ratio (recirculation loop flow minus recirculation loop drive flow divided by recirculation loop drive flow), ie., core flow/drive flow relationship that might occur from beginning-of-cycle to end-of-cycle due to core crudding is so slight that this phenomenon is not a significant concern. The resultant change in the m-ratio would have negligible impact on the APRM-FBSTP trip setpoint. A core flow calibration is performed at least once per cycle using Reactor Engineering procedures to ensure that accuracy is being maintained in the core flow and recirculation flow measurement systems. The recirculation flow units and APRM flow biased scram circuitry is checked periodically per required surveillances. These activities ensure that W (percent of rated recirculation drive flow) as required for RPS instrumentation is accurate. A significant change in core flow or drive flow is more likely to be the result of the phenomena [(b) and (c)] discussed previously.

Jet Pump Instrumentation Problems - A jet pump instrumentation problem is always a possibility, and if any of the surveillances under TS 3/4.4.1.2 yielded unacceptable results, a jet pump instrumentation problem would be suspected. Cross checks against other related instruments associated with the required jet pump would be performed to determine if it is indeed just an instrument problem. If an instrument problem is identified, then necessary actions would be performed to restore the instrumentation to operable status. No concern with respect to the APRM-FBSTP trip exists (assuming the APRM-FBSTP instrumentation is operable as verified by the performance of its associated surveillances) because the jet pump instrument problem does not involve an actual change in jet pump flow.

5. In summary, the above five concerns are adequately addressed by the RPS instrumentation surveillances, the daily jet pump surveillances and the cycle core flow calibration. Jet pump beam cracking or jet pump blockage, which could cause a gross change in core flow and recirculation flow relationships are adequately addressed by specific surveillance requirements. Changes to the core flow due to core crudding would be expected to be minimal over the course of the cycle. The core flow calibration at least once per cycle and the surveillance requirements for RPS and jet pump instrumentation provide assurance that the concerns associated with core crudding are adequately addressed. On the other hand, the multiple burdens placed upon operators in the control room are a continuous concern, particularly unnecessary requirements which serve no safety function. The daily performance of Note (h), therefore, should not be included in the RPS instrumentation TS.

D. NO SIGNIFICANT HAZARDS CONSIDERATIONS

1. Entergy Operations, Inc. is proposing that the TS Surveillance Requirement of Table 4.3.1.1-1 to perform Note (h) daily for the Average Power Range Monitor Flow Biased Simulated Thermal Power-High scram function be deleted. Adequate steps are taken without the Surveillance Requirement and Note (h) to detect and take appropriate action for degradation in the amount of core flow resulting from a given recirculation loop flow.
2. The Commission has provided standards for determining whether a no significant hazards consideration exists as stated in 10CFR50.92(c). A proposed amendment to an operating license involves no significant hazards if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.
3. GGNS has evaluated the no significant hazards considerations in its request for a license amendment. In accordance with 10CFR50.91(a), GGNS is providing the following analysis of the proposed amendment against the three standards in 10CFR50.92:

- a. No significant increase in the probability or consequences of an accident previously evaluated results from this change.

The proposed change to the GGNS TS does not involve an increase in the probability or consequences of an accident previously evaluated because the proposed change only removes a requirement determined to be redundant to existing requirements and has no meaningful value from a safety point of view. With operable RPS instrumentation and periodic core flow calibrations, the accuracy of the APRM-FBSTP trip is assured. Deviations or trends away from established core-flow and drive-flow conditions will continue to be indicated by performance of the surveillances required under TS 3/4.4.1.2. In addition, the proposed change is expected to result in an unquantifiable decrease in the probability of previously evaluated accidents through the resulting reduction in control room operator burden.

- b. This change would not create the possibility of a new or different kind of accident from any previously analyzed.

The proposed change does not create the possibility of a new or different kind of accident from any previously evaluated because no new modes of operation or changes to plant design are involved. The scope of the proposed change is strictly limited to the deletion of the daily surveillance requirement specified by Note (h) which has been determined to involve no significant change to the protection afforded by existing surveillances.

- c. This change would not involve a significant reduction in the margin of safety.

The proposed change does not involve a reduction in a margin of safety because the relationships (under TS 3.2.2) used to establish the APRM Flow-Biased Simulated Thermal Power-High scram and Flow-Biased Neutron Flux-Upscale control rod block trip setpoints will remain unchanged. The APRM-indicated recirculation loop drive flows will continue to be appropriately checked to ensure that their established relationship to total core flow is preserved or accounted for under other TS. All other OPERABILITY and Surveillance Requirements associated with the affected instrumentation remains unchanged. It should also be noted that the current redundancy of surveillance requirements does not reflect a margin of safety but rather a situation which, if carried to extremes, would constitute a serious safety concern.

- 4. Based on the above evaluation, Entergy Operations, Inc. has concluded that operation in accordance with the proposed amendment involves no significant hazards considerations.