

Mr. Joseph J. Hagan
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 Entergy Operations, Inc.
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May 8, 1998

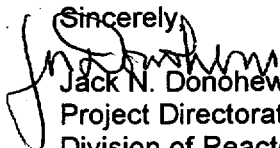
SUBJECT: ISSUANCE OF AMENDMENT NO. 136 TO FACILITY OPERATING LICENSE
 NO. NPF-29 - GRAND GULF NUCLEAR STATION, UNIT 1 (TAC NO. M99639)

Dear Mr. Hagan:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 136 to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1 (GGNS). This amendment revises the Technical Specifications (TSs) in response to your application dated September 18, 1997 (GNRO-97/00087), and supplemented by letter dated February 24, 1998 (GNRO-98/00019).

The amendment decreases the safety limit minimum critical power ratio (SLMCPR) from 1.12 to 1.11 for two recirculation loop operation and from 1.14 to 1.12 for single recirculation loop operation in TS 2.1.1.2. Because the amendment is for Cycle 10 operation, the footnotes to TS 2.1.1.2 and TS 5.6.5 are revised to state that the M CPR values and the items 19 and 20, two topical reports being added to TS 5.6.5, are "applicable only for Cycle 10 operation." Cycle 10 operation begins at the restart from the current refueling Outage No. 9. There are no commitments associated with this amendment.

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

 Jack N. Donohew, Senior Project Manager 5/8/98
 Project Directorate IV-1
 Division of Reactor Projects III/IV
 Office of Nuclear Reactor Regulation

Docket No. 50-416

- Enclosures: 1. Amendment No. 136 to NPF-29
 2. Safety Evaluation

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Document Name: GG99639.AMD (SRXB Memo dated April 16, 1998)

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 8, 1998

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Sincerely,

A handwritten signature in black ink, appearing to read "Jack N. Donohew".

Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures: 1. Amendment No. 136 to NPF-29
2. Safety Evaluation

cc w/encls: See next page

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Entergy Operations, Inc.

Grand Gulf Nuclear Station

cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENTERGY OPERATIONS, INC.

SYSTEM ENERGY RESOURCES, INC.

SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION

ENTERGY MISSISSIPPI, INC.

DOCKET NO. 50-416

GRAND GULF NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 136
License No. NPF-29

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Entergy Operations, Inc. (the licensee) dated September 18, 1997, and supplemented by letter dated February 24, 1998, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

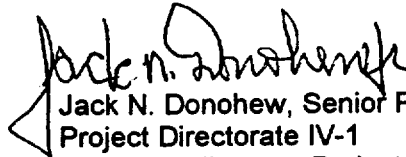
2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Facility Operating License No. NPF-29 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 136, are hereby incorporated into this license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Jack N. Donohew, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: May 8, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 136

FACILITY OPERATING LICENSE NO. NPF-29

DOCKET NO. 50-416

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

REMOVE

2.0-1
5.0-20
B2.0-3
B3.2-8

INSERT

2.0-1
5.0-20
B2.0-3
B3.2-8

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be \leq 25% RTP.

*2.1.1.2 With the reactor steam dome pressure \geq 785 psig and core flow \geq 10% rated core flow:

MCPR shall be \geq 1.11 for two recirculation loop operation or \geq 1.12 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be \leq 1325 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed:

2.2.1 Within 1 hour, notify the NRC Operations Center, in accordance with 10 CFR 50.72.

2.2.2 Within 2 hours:

2.2.2.1 Restore compliance with all SLs; and

2.2.2.2 Insert all insertable control rods.

2.2.3 Within 24 hours, notify the plant manager and the corporate executive responsible for overall plant nuclear safety.

*MCPR values in T.S. 2.1.1.2 are applicable only for cycle 10 operation.

5.6 Reporting Requirements

5.6.5 Core Operating Limits Report (COLR) (continued)

10. XN-NF-85-74(P)(A), "RODEX2A (BWR): Fuel Rod Thermal-Mechanical Response Evaluation Model," Exxon Nuclear Company, Inc., Richland, WA.
11. XN-CC-33(P)(A), "HUXY: A Generalized Multirod Heatup Code with 10CFR50 Appendix K Heatup Option," Exxon Nuclear Company, Inc., Richland, WA.
12. XN-NF-825(P)(A), "BWR/6 Generic Rod Withdrawal Error Analysis, MCPR_p for Plant Operation Within the Extended Operating Domain," Exxon Nuclear Company, Inc., Richland, WA.
13. XN-NF-81-51(P)(A), "LOCA-Seismic Structural Response of an Exxon Nuclear Company BWR Jet Pump Fuel Assembly," Exxon Nuclear Company, Inc., Richland, WA.
14. XN-NF-84-97(P)(A), "LOCA-Seismic Structural Response of an ENC 9x9 BWR Jet Pump Fuel Assembly," Advanced Nuclear Fuels Corporation, Richland, WA.
15. XN-NF-86-37(P), "Generic LOCA Break Spectrum Analysis for BWR/6 Plants," Exxon Nuclear Company, Inc., Richland, WA.
16. XN-NF-82-07(P)(A), "Exxon Nuclear Company ECCS Cladding Swelling and Rupture Model," Exxon Nuclear Company, Inc., Richland, WA.
17. XN-NF-80-19(A), Volumes 2, 2A, 2B, & 2C, "Exxon Nuclear Methodology for Boiling Water Reactors EXEM BWR ECCS Evaluation Model," Exxon Nuclear Company, Inc., Richland, WA.
18. XN-NF-79-59(P)(A), "Methodology for Calculation for Pressure Drop in BWR Fuel Assemblies," Exxon Nuclear Company, Inc., Richland, WA.
- *19. NEDE-24011-P-A, General Electric Standard Application for Reactor Fuel (GESTAR-II) with exception to the misplaced fuel bundle analyses as discussed in GNRO-96/00087 and the generic MCPR Safety Limit analysis as discussed in the generic MCPR Safety Limit analysis as discussed in GNRO-96/00100, letters from C. R. Hutchinson to USNRC.
- *20. J11-02863SLMCPR, Revision 1, "GGNS Cycle 9 Safety Limit MCPR Analysis."

(continued)

*Items 19 and 20 of TS 5.6.5.b are applicable only for Cycle 10 operation.

BASES

APPLICABLE
SAFETY ANALYSES

2.1.1.1 Fuel Cladding Integrity (continued)

ATLAS test data taken at pressures from 14.7 psia to 800 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 MWt. With the design peaking factors, this corresponds to a THERMAL POWER > 50% RTP. Thus a THERMAL POWER limit of 25% RTP for reactor pressure < 785 psig is conservative. Because of the design thermal hydraulic compatibility of the reload fuel designs with the cycle 1 fuel, this justification and the associated low pressure and low flow limits remain applicable for future cycles of cores containing these fuel designs.

2.1.1.2 MCPR

The MCPR SL ensures sufficient conservatism in the operating MCPR limit that, in the event of an AOO from the limiting condition of operation, at least 99.9% of the fuel rods in the core would be expected to avoid boiling transition. The margin between calculated boiling transition (i.e., MCPR = 1.00) and the MCPR SL is based on a detailed statistical procedure that considers the uncertainties in monitoring the core operating state. One specific uncertainty included in the SL is the uncertainty inherent in the critical power correlation. References 6 and 7 describe the methodology used in determining the MCPR SL.

The calculated MCPR safety limit is reported to the customary three significant digits (i.e., X.XX); the MCPR operating limit is developed based on the calculated MCPR safety limit to ensure that at least 99.9% of the fuel rods in the core are expected to avoid boiling transition.

The fuel vendor's critical power correlations are based on a significant body of practical test data, providing a high degree of assurance that the critical power, as evaluated by the correlation, is within a small percentage of the actual critical power being estimated. As long as the core pressure and flow are within the range of validity of the correlations, the assumed reactor conditions used in defining the SL introduce conservatism into the limit because bounding high radial power factors and bounding flat local peaking distributions are used to estimate the number of rods in boiling transition. These conservatisms and the

(continued)

BASES

APPLICABLE
SAFETY ANALYSES

2.1.1.2 MCPR (continued)

inherent accuracy of the fuel vendor's correlation provide a reasonable degree of assurance that 99.9% of the rods in the core would not be susceptible to transition boiling during sustained operation at the MCPR SL. If boiling transition were to occur, there is reason to believe that the integrity

(continued)

BASES (continued)

SURVEILLANCE
REQUIREMENTS

SR 3.2.2.1

The MCPR is required to be initially calculated within 12 hours after THERMAL POWER is $\geq 25\%$ RTP and then every 24 hours thereafter. It is compared to the specified limits in the COLR to ensure that the reactor is operating within the assumptions of the safety analysis. The 24 hour Frequency is based on both engineering judgment and recognition of the slowness of changes in power distribution during normal operation. The 12 hour allowance after THERMAL POWER reaches $\geq 25\%$ RTP is acceptable given the large inherent margin to operating limits at low power levels.

REFERENCES

1. NUREG-0562, "Fuel Failures As A Consequence of Nucleate Boiling or Dry Out," June 1979.
2. NEDE-24011-P-A, General Electric Standard Application for Reactor Fuel (GESTAR-II).
3. UFSAR, Chapter 15, Appendix 15B.
4. UFSAR, Chapter 15, Appendix 15C.
5. UFSAR, Chapter 15, Appendix 15D.
6. NEDE-30130-P-A, Steady State Nuclear Methods.
7. NEDO-24154, Qualification of the One-Dimensional Core Transient Model for Boiling Water Reactors.
8. Deleted
9. GNRI-xx/xxx, Amendment ___ to the Operating License.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 136 TO FACILITY OPERATING LICENSE NO. NPF-29

ENTERGY OPERATIONS, INC., ET AL.
GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

1.0 INTRODUCTION

By letter dated September 18, 1997 (Reference 1), Entergy Operations, Inc. (the licensee) proposed changes to the Technical Specifications (TSs) for the Grand Gulf Nuclear Station, Unit 1 (GGNS). The proposed changes are to (1) the safety limit minimum critical power ratio (SLMCPR) in safety limit TS 2.1.1.2 on the minimum critical power ratio (MCPR) and the footnote to the specification, (2) the documents and footnote listed in administrative controls TS 5.6.5 on the core operating limits report (COLR), and (3) the Bases for TS 2.1.1.2 and TS 3.2.2 on the MCPR. The footnote specifies that the changes to the TSs are applicable only for GGNS Cycle 10 operation. The proposed MCPR value is based on the GGNS cycle-specific analysis of the mixed core of 268 fresh General Electric (GE) GE11 fuel bundles, 272 once burned GE11 fuel bundles, and 260 twice burned Siemens Power Corporation (SPC) 9x9-5 fuel bundles for Cycle 10 operation. The plant is currently in its refueling outage No. 9 and it will be in Cycle 10 operation when it restarts from the refueling outage.

In response to the staff's request for additional information (RAI) dated February 12, 1998, (Reference 2) with respect to the licensee's approach for the mixed-core SLMCPR calculations, the licensee has provided responses and clarifications in its letter dated February 24, 1998, (Reference 3). The letter dated February 24, 1998, provided clarifying information that did not change the initial proposed no significant hazards consideration determination for the proposed amendment.

2.0 EVALUATION

The licensee requested changes to the TSs for GGNS as follows:

2.1 TS 2.1.1.2 Reactor Core Safety Limits

The safety limit MCPR values in TS 2.1.1.2 are proposed to change from 1.12 to 1.11 for two recirculation loop, and to change from 1.14 to 1.12 for single recirculation loop. These MCPR values are for the reactor steam dome pressure greater than or equal to 785 psig and the core flow greater than 10% rated core flow, which are not being changed by the proposed amendment. The applicable cycle number in the footnote to TS 2.1.1.2 would be changed from Cycle "9" operation to Cycle "10" operation.

The licensee described the methodology to calculate the new SLMCPR values for the TSs in its submittals. The Cycle 10 SLMCPR analysis, the plant- and cycle-specific fuel and core parameters, NRC approved methodologies including GESTAR-II (NEDE-14011-P-A-13, Sections

1.15 and 1.2.5), a revised R-factor methodology described in NEDE-32505P, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel," November 1995, and a two-step process incorporated a conservatively derived uncertainty value for mixed core analyses (Topical Report J11-02863SLMCPR, Reference 4). The revised R-factor calculation method uses the same NRC-approved equation stated in GESTAR (Topical Report NEDE-24011-P-A) except for adding the correction factors and substituting rod-integrated powers for the lattice peaking factors to account for the effects of the part-length-rod design. The cycle-specific parameters include the actual loading, conservative projected control blade patterns, the actual bundle parameters, and the full cycle exposure range. Topical Reports J11-02863SLMCPR and NEDE-24011-P-A would be added to the COLR in TS 5.6.5 in this amendment. Appendix A of Topical Report J11-02863SLMCPR contains the revised R-factor calculation method for GGNS.

The staff has reviewed the following: (1) the R-factor calculation method for GE11 fuel, (2) the response to the staff's RAI regarding the applicability of the approach used in the Cycle 9 SLMCPR analysis to Cycle 10 SLMCPR analysis since this reload is still involving a mixed core of GE11 and SPC 9x9-5 fuel assemblies, and (3) the relevant information provided in the proposed Amendment 25 to GESTAR II, NEDE-24011 (which is under the staff review).

Based on our review, the staff has found that the Cycle 10 SLMCPR analysis for GGNS using a revised R-factor calculation method in conjunction with the approved methodologies are acceptable for GGNS and will ensure that 99.9% fuel rods in the core will not experience the boiling transition to comply with Appendix A to 10 CFR Part 50 on the general design criteria for nuclear power plants. Therefore, the staff has concluded that the justification for analyzing and determining the SLMCPR values of 1.11 for two recirculation loop operation and 1.12 for single loop operation for the GGNS Cycle 10 operation is acceptable since approved methodologies were used and the SPC bundles contributed no rod subject to boiling transition to the limiting SLMCPR. The proposed change from cycle "9" to cycle "10" is also acceptable to reflect the applicability of the proposed TS changes to the upcoming Cycle 10 operation for GGNS.

2.2 TS 5.6.5 Core Operating Limits Report (COLR)

The licensee has proposed to add two topical reports, identified as numbers 19 and 20 (i.e., NEDE-24011-P-A and J11-02863SLMCPR, Revision 1, respectively) in the licensee's application to TS 5.6.5 on the COLR. The licensee also proposed to change the footnote for these topical reports from referring to Cycle "9" operation to referring to Cycle "10" operation. These changes authorize use of NRC-approved methodologies for the GGNS Cycle 10 mixed core analyses and ensure that values for cycle-specific parameters are determined such that all applicable limits of the plant safety analysis are met. Therefore, the staff concludes that these changes are acceptable. However, the topical reports and the footnote should be revised for next reload because they are applicable for only the Cycle 10 operation.

2.3 Bases TS 2.1.1.2, and 3.2.2

The staff reviewed the proposed changes to the Bases for TS 2.1.1.2 and 3.2.2. The changes are acceptable because they correspond to the proposed TS changes stated above and are administrative in nature.

3.0 CONCLUSION

Based on our review, the staff concludes that the above described TS changes involving the SLMCPRs for both two loop and single loop operation, and the applicable cycle number in the footnotes for both the SLMCPR values in TS 2.1.1.2 and the COLR references 19 and 20 in TS 5.6.5 are acceptable only for the GGNS Cycle 10 operation because the changes were analyzed based on the NRC-approved methods using GGNS cycle-specific inputs and the fuel bundles in the core for Cycle 10 operation. Therefore, based on the above review, the staff concludes that the proposed TS changes to SLMCPR and COLR are acceptable only for the Cycle 10 operation. The footnote for TS 2.1.1.2 and TS 5.6.5 will limit the SLMCPR values and the COLR to only Cycle 10 operation.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (62 FR 54872). The amendment also changes reporting or record keeping requirements. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (c)(10). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Letter (GNRO-97/0087) from Joseph J. Hagan (licensee) to USNRC, "Grand Gulf Nuclear Station, Unit 1 Cycle 10 Reload," September 18, 1997 (includes Proprietary information not publicly available.).

2. Letter from James R. Hall (USNRC) to Joseph J. Hagan (licensee), "Request for Additional Information Regarding Proposed Changes to the Safety Limit Minimum Critical Power Ratio for Cycle 10 Operation- Grand Gulf Nuclear Station," (TAC No. M99639), February 12, 1998.
3. Letter (GNRO-98/00019) from Joseph J. Hagan (licensee) to USNR, "Response to NRC Request for Additional Information regarding Minimum Critical Power Ratio," February 24, 1998 (includes Proprietary information not publicly available.).
4. Attachment 4 to the letter (GNRO-96/0087) from C. R. Hutchinson to USNRC dated July 31, 1996, Licensing Topical Report, "J11-02863SLMCPR, General Electric GGNS Cycle 9 SLMCPR Analysis (Revision 1)," July 1996 (Proprietary information. Not publicly available.).

Principal Contributor: T. Huang

Date: May 8, 1998