February 3, 2005

Mr. Michael Kansler
President
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - AMENDMENT RE: CYCLE 17 MINIMUM CRITICAL POWER RATIO SAFETY LIMITS (TAC NO. MC3391)

Dear Mr. Kansler:

The Commission has issued the enclosed Amendment No. 281 to Facility Operating License No. DPR-59 for the James A. FitzPatrick Nuclear Power Plant. The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated June 4, 2004, as supplemented by letters dated July 27, September 27, and December 14, 2004.

The amendment revises the safety limit values in TS 2.1.1.2 for the minimum critical power ratio for both single and two recirculation loop operation.

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

Sincerely,

/RA/

Patrick D. Milano, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosures: 1. Amendment No. 281 to DPR-59
2. Safety Evaluation

cc w/encls: See next page

February 3, 2005

Mr. Michael Kansler
President
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - AMENDMENT RE: REVISION TO TECHNICAL SPECIFICATIONS FOR CYCLE 17 MINIMUM CRITICAL POWER RATIO SAFETY LIMITS (TAC NO. MC3391)

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Accession Number: ML050340224

OFFICE	PDI-1\PM	PDI-1\LA	DSSA:SRXB	OGC	PDI-1\SC
NAME	PMilano	SLittle	FAkstulewicz	TSmith	RLaufer
DATE	01/24/05	01/24/05	02/01/05	2/01/05	02/03/05

Official Record Copy

DATED: February 3, 2005

AMENDMENT NO. 281 TO FACILITY OPERATING LICENSE NO. DPR-59 FITZPATRICK

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FitzPatrick Nuclear Power Plant

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ENTERGY NUCLEAR OPERATIONS, INC.

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 281
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Entergy Nuclear Operations, Inc. (the licensee) dated June 4, 2004, as supplemented on July 27, September 27, and December 14, 2004, complies 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. DPR-59 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 281, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 3, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 281

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove Page	Insert Page
2.0-1	2.0-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 281 TO FACILITY OPERATING LICENSE NO. DPR-59

ENTERGY NUCLEAR OPERATIONS, INC.

JAMES A. FITZPATRICK NUCLEAR POWER PLANT (JAFNPP)

DOCKET NO. 50-333

1.0 INTRODUCTION

By letter dated June 4, 2004 (Reference 1), as supplemented on July 27 (Reference 2), September 27 (Reference 3), and December 14, 2004 (Reference 4), Entergy Nuclear Operations, Inc. (the licensee) submitted a request for changes to the James A. FitzPatrick Nuclear Power Plant Technical Specifications (TSs). The requested changes would revise the safety limit for minimum critical power ratio (SLMCPR) value in TS 2.1.1.2 for Cycle 17 operation. The July 27, September 27, and December 14, 2004, letters provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on July 20, 2004 (69 FR 43459).

2.0 REGULATORY EVALUATION

Operation above the boundary of the nucleate boiling regime could result in excessive cladding temperature because of the onset of transition boiling and the resultant sharp reduction in heat transfer coefficient. Thus, operating limits are specified to maintain adequate margin before the onset of transition boiling. The critical power ratio is defined as the ratio of the critical power (bundle power at which some point within the fuel assembly experiences onset of transition boiling) to the operating bundle power. Thermal margin is stated in terms of the minimum value of the critical power ration (MCPR), which corresponds to the most limiting fuel assembly in the core. As described in JAFNPP Final Safety Analysis Report, Section 3.7, "Thermal and Hydraulic Design," the SLMCPR is calculated for each operating cycle based on NRC-approved methodology, using actual core loading, fuel bundle peaking parameters, and the full cycle exposure range. The SLMCPR is set such that no significant fuel damage is calculated to occur if the limit is not violated. The SLMCPR ensures that during normal operation and during abnormal operational transients, at least 99.9% of the fuel rods in the core do not experience transition boiling.

General Design Criterion (GDC) 10, "Reactor design," of Appendix A to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR Part 50) requires that the reactor core and associated coolant, control, and protective system be designed with appropriate margin to

assure that specified acceptable fuel design limits are not exceeded during steady state operation, normal operational transients, and anticipated operational occurrences.

The Nuclear Regulatory Commission (NRC) staff evaluates the licensee's plant-specific SLMCPR analyses as prescribed in Section 4.4, "Thermal and Hydraulic Design," of NUREG-0800, "Standard Review Plan (SRP)." SRP Section 4.4 specifies the SLMCPR to have an appropriate margin in the operating MCPR limit such that, in the event of an anticipated operational occurrence, at least 99.9% of the fuel rods in the core does not experience a departure from nucleate boiling or boiling transition for the power distribution within the core including all uncertainties.

3.0 TECHNICAL EVALUATION

The core design for Cycle 17 at JAFNPP has 560 fuel assemblies, of which there are 204 fresh GE14 fuel bundles, 196 once-burned GE14 fuel bundles, and 160 twice-burned GE12 fuel bundles.

In its June 4 submittal, the licensee referenced the NRC-approved methodologies used to calculate the proposed SLMCPR values. The licensee's contractor, Global Nuclear Fuel (GNF), performed the SLMCPR analysis using plant- and cycle-specific fuel and core parameters. In addition, GNF used the NRC-approved methodologies, which include: NEDC-32505P, Revision 1, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel;" NEDO-10958-A, "General Electric Boiling Water Reactor Thermal Analysis Basis" (GETAB); NEDC-32601P, "Methodology and Uncertainties for Safety Limit MCPR Evaluations;" NEDC-32694P, "Power Distribution Uncertainties for Safety Limit MCPR Evaluations;" and Amendment 25 to NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (GESTAR II).

The NRC staff reviewed: (1) the licensee's justification for the change to the SLMCPR from 1.09 to 1.07 for two recirculation loop operation, and from 1.10 to 1.09 for single recirculation loop operation using the approach delineated in Amendment 25 to GESTAR II, (2) the response from GE Nuclear Energy in a 10 CFR Part 21 Report, dated August 24, 2004 (Reference 5), and (3) the adequacy of the SLMCPR calculation with respect to the end-of-cycle (EOC) penalty for a top-peaked power shape.

In its July 27, 2004, letter, the licensee explained the overall reduction of the SLMCPR values for operation during the JAFNPP Cycle 17 as compared to the values for the Cycle 16 operation. The calculated reductions in SLMCPR values from Cycle 16 to Cycle 17 is due to using reduced power and non-power distribution uncertainties to determine the calculated SLMCPR values which are provided in Table 1 of Attachment 4 to Reference 1 and in Tables R-1 through R-4 of Attachment 1 to Reference 3. The licensee also addressed the actions in response to non-conservatism in the methodology (as reported in the 10 CFR Part 21 Report, dated August 24, 2004) in Attachment 5 to Reference 3 and provided the results of the calculation in Tables 1 through 3. An increase of 0.01 in the SLMCPR value over the proposed value in References 1 and 2 is due to an evaluation at the limiting condition of 80% rated flow/rated power at middle of cycle (MOC) and higher plant-cycle-specific uncertainties as listed in Table 2a of Attachment 5 to the licensee's September 27, 2004, letter. In its December 14, 2004, letter, the licensee provided additional information in Table 1 to demonstrate that the SLMCPR evaluation at rated power

for the Reference Loading Pattern in Figure 2 of Reference 1 at the low flow condition of 80% results in an SLMCPR value that is equivalent to or will conservatively bound SLMCPR calculations performed at higher core flow rates of 87% and 100% rated core flow. The licensee indicated that no outlet-peaked power shapes were observed in GE-14 bundles at any of the SLMCPR cycle evaluation point during Cycle 17 (see References 1 and 2).

The NRC staff has reviewed the licensee's justification to address the 0.02 reduction of the SLMCPR values in relation to the nonconservatism discussed in the 10 CFR Part 21 report and the SLMCPR penalty due to an oulet-peaked power shape at the EOC. The staff has concluded that the licensee's justification for those two issues is acceptable because the calculation results based on NRC-approved methodologies indicate that the proposed SLMCPR values are indeed conservative and confirm that there is no top-peaked axial power profile of these bundles at any point in the cycle. The proposed JAFNPP Cycle 17 SLMCPR values will ensure that 99.9% of the fuel rods in the core will not experience boiling transition, which satisfies the requirements of GDC 10 regarding specified acceptable fuel design limits. The NRC staff concludes that the justification for analyzing and determining the SLMCPR values of 1.07, for two recirculation loop operation, and 1.09, for single recirculation loop operation, are acceptable for JAFNPP Cycle 17 because NRC-approved methodologies listed above were used and the values provide sufficient thermal-hydraulic margin.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York 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. 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 (69 FR 43459). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). 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 (JAFP-04-0083) from T. A. Sullivan to USNRC, “Proposed License Amendment to Safety Limit Minimum Critical Power Ratio (SLMCPR),” dated June 4, 2004.

2. Letter (JAFP-04-0117) from T. A. Sullivan to USNRC, “Response to Request for Additional Information Regarding Proposed License Amendment to Safety Limits for Minimum Critical Power Ratio (TAC No. MC3391),” dated July 27, 2004.

3. Letter (JAFP-04-0158) from T. A. Sullivan to USNRC, “Follow-up Response to Request for Additional Information and Revision to Proposed License Amendment to Safety Limit Minimum Critical Power Ratio (SLMCPR) (TAC No. MC3391),” dated September 27, 2004.

4. Letter (JAFP-04-0189) from T. A. Sullivan to USNRC, “Response to Request for Additional Information Regarding Proposed License Amendment to Safety Limit Minimum Critical Power Ratio (SLMCPR) (TAC No. MC3391),” dated December 14, 2004.

5. GE Nuclear Energy Letter to USNRC (MFN 04-081) Part 21 Reportable Condition and 60-Day Interim Report Notification: Non-conservative SLMCPR, dated August 24, 2004.

Principal Contributor: T. Huang

Date: February 3, 2005