

April 11, 1990

Docket No. 50-333

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Mr. John C. Brons
Executive Vice President - Nuclear Generation
Power Authority of the State of New York
123 Main Street
White Plains, New York 10601

Dear Mr. Brons:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 75805)

The Commission has issued the enclosed Amendment No. 157 to Facility Operating License No. DPR-59 for the James A. FitzPatrick Nuclear Power Plant. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated January 9, 1990.

The amendment changes the Minimum Critical Power Ratio Safety Limit from the current value of 1.04 to 1.07 for Operating Cycle No. 10.

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

Sincerely,

Original signed by

David E. LaBarge, Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 157 to DPR-59
2. Safety Evaluation

cc: w/enclosures
See next page

PDI-1
CVogan *CV*
3/14/90

PDI-1 *DL*
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3/15/90

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SRXB
RJones
3/16/90

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DL
3/13/90

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PDI-1
RACapra
4/11/90

DOCUMENT NAME: ISSUANCE OF AMENDMENT 75805

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

April 11, 1990

Docket No. 50-333

Mr. John C. Brons
Executive Vice President - Nuclear Generation
Power Authority of the State of New York
123 Main Street
White Plains, New York 10601

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Sincerely,

A handwritten signature in cursive script, appearing to read "D. LaBarge".

David E. LaBarge, Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No.157 to DPR-59
2. Safety Evaluation

cc: w/enclosures
See next page

Mr. JOHN C. SIGGERS
Power Authority of the State of New York

James A. FitzPatrick Nuclear
Power Plant

cc:

Mr. Gerald C. Goldstein
Assistant General Counsel
Power Authority of the State
of New York
1633 Broadway
New York, New York 10019

Ms. Donna Ross
New York State Energy Office
- 2 Empire State Plaza
16th Floor
Albany, New York 12223

Resident Inspector's Office
U. S. Nuclear Regulatory Commission
Post Office Box 136
Lycoming, New York 13093

Regional Administrator, Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Mr. William Fernandez
Resident Manager
James A. FitzPatrick Nuclear
Power Plant
Post Office Box 41
Lycoming, New York 13093

Mr. A. Klausman
Senior Vice President - Appraisal
and Compliance Services
Power Authority of the State
of New York
1633 Broadway
New York, New York 10019

Mr. J. A. Gray, Jr.
Director Nuclear Licensing - BWR
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Mr. George Wilverding, Manager
Nuclear Safety Evaluation
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Supervisor
Town of Scriba
R. D. #4
Oswego, New York 13126

Mr. R. E. Beedle
Vice President Nuclear Support
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Mr. J. P. Bayne, President
Power Authority of the State
of New York
1633 Broadway
New York, New York 10019

Mr. S. S. Zulla
Vice President Nuclear Engineering
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Mr. Richard Patch
Quality Assurance Superintendent
James A. FitzPatrick Nuclear
Power Plant
Post Office Box 41
Lycoming, New York 13093

Mr. William Josiger, Vice President
Operations and Maintenance
Power Authority of the State
of New York
123 Main Street
White Plains, New York 10601

Charlie Donaldson, Esquire
Assistant Attorney General
New York Department of Law
120 Broadway
New York, New York 10271



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

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-333

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 157
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Power Authority of the State of New York (the licensee) dated January 9, 1990, 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:

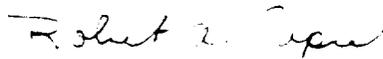
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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 157, 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 to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 11, 1990

ATTACHMENT TO LICENSE AMENDMENT NO. 157

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

Revise Appendix A as follows:

Remove Pages

Insert Pages

7

7

12

12

JAFNPP

1.1 FUEL CLADDING INTEGRITY

Applicability:

The Safety Limits established to preserve the fuel cladding integrity apply to those variables which monitor the fuel thermal behavior.

Objective:

The objective of the Safety Limits is to establish limits below which the integrity of the fuel cladding is preserved.

Specifications:

A. Reactor Pressure > 785 psig and Core Flow > 10% of Rated

The existence of a minimum critical power ratio (MCPR) less than 1.07 shall constitute violation of the fuel cladding integrity safety limit, hereafter called the Safety Limit. An MCPR Safety Limit of 1.08 shall apply during single-loop operation.

2.1 FUEL CLADDING INTEGRITY

Applicability:

The Limiting Safety System Settings apply to trip settings of the instruments and devices which are provided to prevent the fuel cladding integrity Safety Limits from being exceeded.

Objective:

The objective of the Limiting Safety System Settings is to define the level of the process variables at which automatic protective action is initiated to prevent the fuel cladding integrity Safety Limits from being exceeded.

Specifications:

A. Trip Settings

The limiting safety system trip settings shall be as specified below:

1. Neutron Flux Trip Settings

- a. IRM - The IRM flux scram setting shall be set at $\leq 120/125$ of full scale.

JAFNPP

1.1 BASES

1.1 FUEL CLADDING INTEGRITY

The fuel cladding integrity limit is set such that no calculated fuel damage would occur as a result of an abnormal operational transient. Because fuel damage is not directly observable, a step-back approach is used to establish a Safety Limit such that the minimum critical power ratio (MCPR) is no less than 1.07. MCPR > 1.07 represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding is one of the physical barriers which separate radioactive materials from the environs. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Although some corrosion or use related cracking may occur during the life of the cladding, fission product migration from this source is incrementally cumulative and continuously measurable. Fuel cladding perforations, however, can result from thermal stresses which occur from reactor operation significantly above design conditions and the protection system safety settings. While fission product migration from cladding perforation is just as measurable as that from use related cracking, the thermally caused cladding perforations signal a threshold, beyond which still greater thermal stresses may cause gross rather than incremental cladding deterioration. Therefore, the fuel cladding Safety Limit is defined with margin to the conditions which would produce onset of transition boiling, (MCPR of 1.00). These conditions represent a significant departure from the condition intended by design for planned operation.

A. Reactor Pressure > 785 psig and Core Flow > 10% of Rated

Onset of transition boiling results in a decrease in heat transfer from the clad and, therefore, elevated clad temperature and the possibility of clad failure. However, the existence of critical power, or boiling transition, is not a directly observable parameter in an operating reactor. Therefore, the margin to boiling transition is calculated from plant operating parameters such as core power, core flow, feedwater temperature, and core power distribution. The margin for each fuel assembly is characterized by the critical power ratio (CPR) which is the ratio of the bundle power which would produce onset of transition boiling divided by the actual bundle power. The minimum value of this ratio for any bundle in the core is the minimum critical power ratio (MCPR). It is assumed that the plant operation is controlled to the nominal protective setpoints via the instrumented variable, i.e., the operating domain. The current load line limit analysis contains the current operating domain map. The Safety Limit (MCPR of 1.07) has sufficient conservatism to assure that in the event of an abnormal operational transient initiated from the MCPR operating conditions in specification 3.1.B, more than 99.9% of the fuel rods in the core are expected to avoid boiling transition. The MCPR fuel cladding safety limit is increased by 0.01 for single-loop operation as discussed in Reference 2. The margin between MCPR of 1.00 (onset of transition boiling) and the Safety Limit is derived from a detailed statistical analysis considering all of the uncertainties in monitoring the core operating state including the uncertainty in the boiling transition correlation as described in Reference 1. The uncertainties employed in deriving the Safety Limit are



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 157 TO FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

INTRODUCTION

By letter dated January 9, 1990, the Power Authority of the State of New York (PASNY or the licensee) submitted a proposed amendment requesting changes to the Technical Specifications (TS) for the James A. FitzPatrick Nuclear Power Plant. The amendment would change the Minimum Critical Power Ratio (MCPR) Safety Limit for normal plant operation above 785 psig reactor pressure and above 10 percent rated core flow from its present value of 1.04 to a new value of 1.07 and revise the MCPR Safety Limit for single loop operation from its present value of 1.05 to a new value of 1.08. These proposed changes reflect the fuel changes being made to the reactor core during the 1990 Refueling Outage (Reload 9) for operation during the subsequent operating cycle (Cycle 10). In addition, the proposed change would replace the MCPR values of "1.0" with "1.00" in Bases 1.1.A to reflect the same number of significant figures used in the safety limit MCPR.

EVALUATION

Fuel cladding is one of the physical barriers designed to prevent fission product release to the environs. The integrity of this barrier is related to the heat flux produced and the resulting heat transfer boiling regime. Since fuel damage is not directly observable, the Minimum Critical Power Ratio (MCPR) limitation is specified in the TS to ensure that plant operation does not result in the flux approaching this condition in the event of an abnormal operational transient. Since fuel damage is assumed to be possible if MCPR decreases to 1.00, it is important that a sufficient margin above this condition be maintained during normal plant operation.

This margin above 1.00 is dependent on fuel design and, for the present operating cycle, the safety limit has been 1.04. As specified in the amendment submittal, the 1990 Refueling Outage core changes will result in installation of General Electric GE-10 fuel assemblies, designated GE8x8NB-3, and four GE-11 Lead Test Assemblies. For this design, a new MCPR Safety Limit of 1.07 is specified by the licensee in the submittal, as explained below. Since this value is greater than the present MCPR, it is in the conservative direction.

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These new fuel assemblies have two unique features: an interactive channel design and an offset lower tie plate. The offset lower tie plate shifts the fuel bundle 40 mils toward the control blade, making the D-lattice structure of the FitzPatrick core more like the C-lattice cores of later BWR plants.

These unique fuel features have been reviewed and approved by the NRC for use in BWRs by NRC letter, A. C. Thadani to J. S. Charnley (of GE), "Acceptance for Referencing of Amendment 21 to General Electric Licensing Topical Report NEDE-24011-P-A, 'General Electric Standard Application for Reactor Fuel,'" dated March 17, 1989. In this letter, the NRC stated that the GE8x8NB C-Lattice safety limit MCPR is acceptable for the GE8x8NB-3 fuel design.

In General Electric's document "Standard Application for Reactor Fuel," Revision 9, dated September 1988, the MCPR value of 1.07 is specified for GE8x8NB fuel in Table 4-2, "Fuel Cladding Integrity Safety Limit MCPR." For the new fuel design, this new safety limit provides the same assurance against clad damage as the safety limit presently applied to the existing fuel design. The limit will also be conservatively applied to the fuel assemblies remaining in the core from the present operating cycle.

The change to the single loop operating MCPR limit from 1.05 to 1.08 is proposed so that the present margin of 0.01 above the normal operating MCPR is maintained if operation in this mode is necessary. This increase in the limit represents a greater margin from the fuel damage threshold.

The change to the number of significant figures used in the Bases is an administrative change which has no effect on the value used in the analysis or explanation.

Although the core reload has an affect on other cycle-specific parameter limits contained in the TS, no other changes were submitted in this amendment application. The licensee is removing the remainder of the cycle-specific limits from the TS in accordance with Generic Letter 88-16 in a separate amendment request. Since the status of either submittal has no affect on the other, each proposed amendment can be processed separately.

SUMMARY

Based on the evaluation as stated above, the information presented in the referenced documents which shows that the MCPR limits have been properly applied to the new core configuration using previously approved methods and procedures, and the conclusion that the core will continue to meet all of the staff's acceptance criteria related to the MCPR limit, the staff concludes that the proposed TS amendment is acceptable.

ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 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 this amendment.

CONCLUSION

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: April 11, 1990

PRINCIPAL CONTRIBUTOR:
D. LaBarge