

Mr. James Knubel
 Chief Nuclear Officer
 Power Authority of the State of New York
 123 Main Street
 White Plains, NY 10601

Septemb 21, 1999

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - ISSUANCE OF AMENDMENT RE: CHANGES THAT INVOLVE ACTIONS TAKEN WHEN MULTIPLE CONTROL RODS ARE INOPERABLE (TAC NO. M99751)

Dear Mr. Knubel:

The Commission has issued the enclosed Amendment No. 255 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 October 8, 1997.

The amendment revises actions in the TSs to be taken in the event multiple control rods are inoperable.

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,

ORIGINAL SIGNED BY:

Guy S. Vissing, 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. 255 to DPR-59
 2. Safety Evaluation

cc w/encls: See next page

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

September 21, 1999

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Sincerely,

A handwritten signature in cursive script, appearing to read "Guy S. Vissing".

Guy S. Vissing, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-333

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2. Safety Evaluation

cc w/encls: See next page

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DATED: September 21, 1999

AMENDMENT NO. 355 TO FACILITY OPERATING LICENSE NO. DPR-59-FITZPATRICK

Docket File

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

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. 255
License No. DPR-59

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by The Power Authority of the State of New York (the licensee) dated October 8, 1997, 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. 255, 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



S. Singh Bajwa, 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: September 21, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 255

FACILITY OPERATING LICENSE NO. DPR-59

DOCKET NO. 50-333

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

Remove Pages

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Insert Pages

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JAFNPP

3.3.A.2 (cont'd)

- b. The control rod directional control valves for inoperable control rods shall be disarmed electrically.
- c. Control rods with scram times greater than those permitted by Specification 3.3.C.3 are inoperable, but if they can be inserted with control rod drive pressure they need not be disarmed electrically.
- d. Control rods with inoperable accumulators or those whose position cannot be positively determined shall be considered inoperable.
- e. Inoperable control rods shall be positioned such that Specification 3.3.A.1 is met.
 - (1) When operating with two or more inoperable control rods in the Startup/Hot Standby or Run modes at $\leq 10\%$ rated thermal power, control rod patterns shall be equivalent to those prescribed by the Banked Position Withdrawal Sequence (BPWS) or else the inoperable control rods shall be separated by two or more operable control rods. If this condition is not met, restore compliance with the condition within 4 hours. Otherwise be in hot shutdown within the following 12 hours.
 - (2) If nine or more control rods are inoperable, be in hot shutdown within 12 hours.

4.3.A.2 (cont'd)

- e. The scram discharge volume drain and vent valves shall be full-travel cycled at least once per quarter to verify that the valves close in less than 30 seconds and to assure proper valve stroke and operation.
- f. An instrument check of control rod position indication shall be performed once/day.

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3.3 and 4.3 BASES (cont'd)

the control cell geometry and local k_{∞} . Therefore, an additional margin is included in the shutdown margin test to account for the fact that the rod used for the demonstration (the analytically strongest) is not necessarily the strongest rod in the core. Studies have been made which compare experimental criticals with calculated criticals. These studies have shown that actual criticals can be predicted within a given tolerance band. For gadolinia cores the additional margin required due to control cell material manufacturing tolerances and calculational uncertainties has experimentally been determined to be 0.38% Δk . When this additional margin is demonstrated, it assures that the reactivity control requirement is met.

2. Reactivity Margin - Inoperable Control Rods

Specification 3.3.A.2 requires that a rod be taken out of service if it cannot be moved with drive pressure. If the rod is fully inserted, it is in a safe position of maximum contribution to shutdown reactivity. If it is in a non-fully inserted position, that position shall be consistent with the shutdown reactivity limitation stated in Specification 3.3.A.1. This assures that the core can be shut down at all times with the remaining control rods assuming the strongest operable control rod does not insert.

Distribution of inoperable bypassed control rods will be limited to ensure the consequences of a Control Rod Drop Accident are acceptable.

Also if damage within the control rod drive mechanism and in particular, cracks in drive internal housings, cannot be ruled out, then a generic problem affecting a number of drives cannot be ruled out. Circumferential cracks resulting from stress assisted intergranular corrosion have occurred in the collet housing of drives at several BWRs. This type of cracking could occur in a number of drives and if the cracks propagated until severance of the collet housing occurred, scram could be prevented in the affected rods. Limiting the period of operation with a potentially severed collet housing will assure that the reactor will not be operated with a large number of rods with failed collet housings.

B. Control Rods

1. Coupling verification is performed to ensure the control rod is connected to the Control Rod Drive (CRD). The Surveillance requires demonstrating a CRD does not go to the overtravel position when it is fully withdrawn. The overtravel position feature provides a positive check on the coupling integrity since only an uncoupled CRD can reach the overtravel position. The verification is required to be performed any time a control rod is withdrawn to the "full out" (notch position 48) position or prior to declaring the control rod to be OPERABLE after work on the control rod or CRD System that could affect coupling. This includes control rods inserted one notch and then returned to the



UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 255 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

1.0 INTRODUCTION

By letter dated October 8, 1999, the Power Authority of the State of New York (the licensee) submitted a request for changes to the James A. FitzPatrick Nuclear Power Plant Technical Specifications (TSs). The requested changes would revise the actions to be taken in the event multiple control rods are inoperable.

2.0 EVALUATION

The specific proposed changes are to TS 3.3.A.2 and the corresponding Bases (3.3.A.2). These TS and Bases address actions to be taken when multiple control rods are inoperable. The FitzPatrick TS currently require that during power operation inoperable control rods be positioned such that (1) the TS required shutdown margin can be met, and (2), during operation, no more than one control rod in any 5x5 array may be inoperable. (At least 4 inoperable rods must separate any 2 inoperable ones.) If this condition is not met, the reactor shall be shut down.

The proposed TS changes retain the shut down margin requirement but remove the existing 5x5 array requirement and instead require that with two or more inoperable rods in the Startup Hot Standby or Run modes, and with power less than 10 percent of rated thermal power, the rod pattern shall be equivalent to the Banked Position Withdrawal Sequence (BPWS) or else the inoperable rods shall be separated by two or more operable rods. If this is not met, the reactor must be shut down within 12 hours. For operation above 10 percent power, the restriction on inoperable rods is not required, since in that higher power operation region, the control rod drop analysis (CRDA) has no significant effect. This is because of the more rapid negative reactivity feedback during the higher power operation when the reactor coolant is less dense. The standard generic analysis results of the CRDA do not exceed the current NRC specified 280 calories/gm limit established for this event. The standard generic analysis performed by General Electric has been approved by the NRC staff.

The proposed specification 3.3.A.2.e.2 requires the reactor be in hot shutdown within 12 hours if nine or more control rods are inoperable. Acceptable operation is with up to 8 inoperable control rods which is consistent with the bases of the CRDA analysis and is sufficiently low that the plant will be shutdown if there is a potential systematic problem with the Control Rod Drive system. Thus placing the shutdown action on 9 or more inoperable control rods ensures the

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consequences of the CRDA are acceptable. Therefore, this proposed specification is acceptable.

The requested change is intended to make the TS consistent with the conditions and rod patterns which are assumed to exist for the control rod drop accident analysis. This analysis for FitzPatrick (and most other BWRs) assumes that during startup and low power operation control rod patterns conform to the BPWS which was developed to produce low reactivity worth rods in startup conditions analysis for the rod drop event. Use of these patterns has become a standard approach for this analysis and has been approved by the NRC. This is discussed in References 1 and 2 of the licensee's October 8, 1999, submittal, which are the General Electric Proprietary Reports "NEDO-21231, Blanked Position Withdrawal Sequence, January 1977," and "NEDE-24011-P-A-13, General Electric Standard Application for Reactor Fuel, August 1998." These reports have been reviewed and approved by the NRC. The staff has reviewed the licensee's proposed changes and, since they are consistent with prior approved analyses, the NRC staff has determined the proposed changes to the TSs are acceptable.

3.0 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.

4.0 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 (63 FR 6991). 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.

5.0 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.

Principal Contributor: H. Richings

Date: September 21, 1999