October 24, 1986

Docket No.: 50-333

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

Dear Mr. Brons:

The Commission has issued the enclosed Amendment No. 101 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 dated July 24, 1986.

The amendment changes Technical Specifications 5.5.B concerning the criterion for storage of nuclear fuel in the spent fule pool.

A copy of the Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

Original signed by

Harvey I. Abelson, Project Manager
BWR Project Directorate #2
Division of BWR Licensing

Enclosures:
1. Amendment No. 101 to
License No. DPR-59
2. Safety Evaluation

cc w/enclosures:
See next page

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Mr. John C. Brons
Power Authority of the State of New York
James A. FitzPatrick Nuclear
Power Plant

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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. 101
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 July 24, 1986, 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. 101 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Daniel R. Muller, Director
BWR Project Directorate #2
Division of BWR Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 24, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 101

FACILITY OPERATING LICENSE NO DPR-59

DOCKET NO. 50-333

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Pages
246
246a - page added

5.5 (Cont'd)

B. The spent fuel storage pool is designed to maintain k_{eff} less than 0.95 under all conditions as described in the Authority's application for spent fuel storage modification transmitted to the NRC July 26, 1978. This k_{eff} value is satisfied if the maximum, exposure dependent, infinite lattice multiplication factor, k_{∞}, of the individual fuel bundle is less than or equal to 1.36. The number of spent fuel assemblies stored in the spent fuel pool shall not exceed 2244.

5.6 SEISMIC DESIGN

The reactor building and all engineered safeguards are designed on a basis of dynamic analysis using acceleration response spectrum curves which are normalized to a ground motion of 0.08 g for the Operating Basis Earthquake and 0.15 g for the Design Basis Earthquake.

5.5.B Bases

The spent fuel pool and high density fuel storage racks are Class I structures designed to store up to 2244 fuel bundles. The storage racks are designed to maintain a subcritical configuration having a multiplication factor (k_{eff}) less than 0.95 for all possible operational and abnormal conditions. The nuclear criticality analysis for the Spent Fuel Racks (Reference 1) concludes that fresh fuel bundles with 3.3 w/o U-235 meet the 0.95 k_{eff} limit with a 3.2% Δ k margin. This design basis bundle was reanalyzed to determine its infinite lattice multiplication factor, k_{∞}, when in a reactor core geometry (Reference 2). This k_{∞} was obtained under conservative calculational assumptions and reduced by 2.33 times the standard deviation in the calculation resulting in the Technical Specification limit of 1.36.

References

1) Increased Spent Fuel Storage Modification, Stone & Webster Engineering Corporation, Boston, Mass. March 15, 1986.

2) General Electric letter, P. Van Dieman to G. Rorke, FitzPatrick Fuel Storage K-infinity Conversion, Revision 1, dated July 10, 1986.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 101 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 July 24, 1986 (Reference 1) Power Authority of the State of New York (the licensee) proposed to amend the Technical Specifications (Appendix A) of the Facility Operating License No. DPR-59 to permit storage of the General Electric Company (GE) 8x8 fuel assemblies in the spent fuel racks. The proposed changes to the Technical Specifications revise the basis for acceptance of fuel assemblies for storage.

The current basis for the storage assemblies in the racks is defined in terms of the U-235 loading per unit length of assembly. The proposed criterion for storage in the racks is defined in terms of the k-infinity value in reactor geometry at the assembly burnup, for which this quantity is greatest. This criterion has been previously approved by the staff for use by General Electric for design of spent fuel racks (Reference 2).

2.0 EVALUATION

The licensee is proposing changes to the Technical Specifications so that its Reload 7 fuel and other fuel having U-235 enrichments above that allowed by the current Technical Specifications can be stored in the FitzPatrick spent fuel pool. The current basis for the storage of fuel assemblies in the racks is defined in terms of the U-235 loading per unit length of assembly (an axial loading of 16.28 gm U-235/axial cm or equivalent). No credit is taken for burnable poison in the assembly. This is unnecessarily conservative, but convenient to calculate. The proposed criteria for fuel storage in the racks is defined in terms of the k-infinity value in reactor geometry at the assembly burnup, for which this quantity is greatest. The proposed k-infinity requirement is satisfied by fuel with U-235 enrichments greater than that currently allowed by the Technical Specifications when burnable poison such as gadolinia is accounted for in the fuel design. The k-infinity limits on fuel assemblies when stored in the spent fuel pool assure that the current required reactivity limits of $k_{eff} \leq 0.95$ in the spent fuel pool are satisfied.

GE provided $k_{eff} \leq 0.95$ limits for GE standard fuel and for rack designs in GESTAR II and related these limits to the U-235 loading. The FitzPatrick racks have different dimensions and material (boron) contents than the GE standard high density racks. Therefore, the

k-infinity limits of these racks are different from those of GE standard high density racks. However, the same methodology has been used by GE to calculate the limits of these racks. The licensee's proposed Technical Specification k-infinity limit of 1.36, calculated by General Electric using its approved code and methodology for the design basis fuel bundle, is equivalent to the current specified fuel enrichment limit. It accounts for calculational and model uncertainties and meets the safety criteria for the spent fuel pool by maintaining the pool subcritical with a k_{eff} of less than or equal to 0.95. We conclude that use of a k-infinity limit based on approved analysis methods is an acceptable control to assure that the required subcritical margin ($k_{eff} \leq$ 0.95) for the spent fuel pool is maintained.

Changing the existing spent fuel storage rack Technical Specification from an enrichment limit to a bundle lattice reactivity limit (k-infinity) does not involve a physical change to the facility. The k-infinity represents the fuel reactivity limit equivalent to the existing allowable design basis fuel bundle enrichment limit, which meets the spent fuel pool reactivity limit, $k_{eff} \leq 0.95$. Therefore, the probability of occurrence or the magnitude of consequences of abnormal occurrences or accidents analyzed in the FSAR and Nuclear Criticality Analysis for the spent fuel racks will not be changed. Also there is no possibility of introduction of a new or different kind of accident or reduction in the margin of safety.

Therefore, based on the above, the staff finds the proposed Technical Specification changes acceptable.

3.0 ENVIRONMENTAL CONSIDERATIONS

This 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 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 on public comment on such finding. 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.

4.0 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Unte Cheh
Dated: October 24, 1986

References

1. Letter, J. C. Brons (New York Power Authority) to D. R. Muller (NRC), James A. FitzPatrick Nuclear Power Plant, Docket No. 50-333, Technical Specification Change No. JPN-86-34

2. General Electric Topical Report, "GESTAR II, General Electric Standard Application for Reactor Fuel" (NEDE 24011-P-A)