



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 257 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 January 15, 1999, as supplemented by letters dated January 18, 1999, and October 22, 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 (TS). The requested changes would revise the TS to modify the description of what constitutes an acceptable Local Power Range Monitor (LPRM) calibration (ref. 1). The January 18, 1999, and October 22, 1999, letters (ref. 2 and 4) provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

There are 31 LPRM tubes in the FitzPatrick reactor with 4 detectors per tube at equally spaced axial levels. These LPRM strings are arranged to provide one eighth core symmetry. These detectors provide a signal to the reactor protection system which is proportional to the magnitude of the neutron flux. Due to several factors (detector burnup, insertion of new detectors, etc.) the relationship between the detector signal and the neutron flux changes and, therefore, a calibration must be periodically performed using a probe that has a well established signal to flux relationship to adjust the signal to flux relationship for the LPRMs. FitzPatrick has three Transversing In-Core Probes (TIP) which are used for LPRM calibration. Each probe is assigned to cover approximately one third of the core and all three can traverse a central channel for cross calibration.

The licensee's submittal was prompted by an event which occurred during the startup from refueling outage 13 where one of their three TIP machines was unable to traverse its channel and was, therefore, inoperable and incapable of calibrating the LPRM strings which were assigned to it. The machine was eventually returned to an operable status, but this raised some questions in the licensee's mind about the calibration methodology currently in use at FitzPatrick which would have required either early plant shutdown or an exigent TS change to avoid early shutdown.

FitzPatrick, like many other boiling-water reactors (BWR) in the United States, uses an online monitoring system known as 3D-MONICORE™. This system has the capability of relying on the symmetry built into the LPRMs to provide a signal for calibration. This method assumes that the core is loaded symmetrically and that the TIP uncertainty is small. The TIPs in use at FitzPatrick rely on the assembly gamma leakage spectrum to determine the local flux and these instruments have a demonstrated accuracy of approximately 2 percent. The impact of using 3D

MONICORE™ to “mirror” a TIP calibration signal (with its associated uncertainty) on the plant’s safety limits has previously been evaluated by the NRC staff through the review and acceptance for referencing of General Electric licensing topical reports NEDC-32601P, NEDC-3294P, and Amendment 25 to NEDE-24011-P-S (Reference 3) and found to be acceptable. The Power Authority of the State of New York (PASNY) calibration methodology is further described in ref. 2.

2.0 EVALUATION

The licensee has specifically requested to modify Table 4.1-2. The existing words “TIP System Traverse” can be interpreted to mean that each LPRM location be scanned with a TIP machine. Obviously, this would require entry into TS 3.0.3 or an exigent TS change if a TIP machine is inoperable for an extended period of time. However, this shutdown would not be justified when it has been shown that “mirroring” a calibration signal from another TIP location using 3D MONICORE in conjunction with computer generated calculational data from previous runs is acceptable (References 2 and 3). Therefore, the “Calibration” method in Table 4.1-2 is left blank since it is implied that “mirroring” a calibration signal from another TIP location using 3D MONICORE™ in conjunction with computer generated calculational data from previous runs would be used as this is the only method of obtaining calibration data for calibrating the LPRM, given one TIP machine being inoperable. Calibration of LPRMs is accomplished in the same manner when individual TIP strings are rejected, or can not be scanned. However, the calibration and frequency of calibration is specified. The proposed modification to Table 4.1-2 would allow the use of 3D MONICORE™ if one out of the three TIP machines were inoperable. Reference 3 does not address the condition if more than one TIP machine were inoperable and, therefore, would find that to be unacceptable. This is further specified in applicable instruction manuals.

The licensee has requested two TS changes. First, the licensee requests to remove the words “TIP System Traverse” from the calibration column. This would remove any ambiguity as to the requirements to have a TIP signal for each LPRM location and allow the use of 3D MONICORE™ to “mirror” calibration signals. Secondly, the licensee has requested to modify the calibration interval from 1000 effective full-power hours (EFPH) to 1000 MWD/T average core exposure. This change is negligible because 1000 EFPH is roughly equal to 1000 MWD/T.

The NRC staff has reviewed the licensee’s request to modify the FitzPatrick TS Table 4.1-2 to remove the words “by TIP traverse” and found the proposal acceptable. The proposal still requires LPRM calibration but allows the use of symmetric TIP calibration signals. The impact of this “mirroring” procedure on the plant’s safety limits was evaluated and determined to be acceptable (Reference 1).

The change to the calibration interval is also 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 (64 FR 11965). 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.

6.0 REFERENCES

1. Letter from James Knubel (PASNY) to USNRC, "Proposed Change to Technical Specifications Regarding LPRM Calibration," January 15, 1999.
2. Letter from Michael J. Colomb to USNRC, "Calibration Methodology of Local Power Range Monitors," January 18, 1999.
3. Letter F. Akstulewicz (USNRC) to G. Watford (GENE), "Acceptance for Referencing of Licensing Topical Reports, NEDC-32601P, NEDC-32694, and Amendment 25 to NEDE-24011-P-A," March 11, 1999.
4. Letter from James Knubel (PASNY) to USNRC, "Response to Verbal Request For Additional Information Regarding Proposed Changes to the Technical Specifications for LPRM Calibration," October 22, 1999.

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Date: November 22, 1999

DATED: November 22, 1999

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