

July 18, 2000

Mr. Samuel L. Newton
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SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - ISSUANCE OF
AMENDMENT RE: LOCAL POWER RANGE MONITOR CALIBRATION
FREQUENCY (TAC NO. MA9053)

Dear Mr. Newton:

The Commission has issued the enclosed Amendment No. 191 to Facility Operating License DPR-28 for the Vermont Yankee Nuclear Power Station, in response to your application dated May 23, 2000.

The amendment revises the Technical Specifications (TSs) to increase the interval between Local Power Range Monitor calibrations from 1,000 equivalent full power hours to 2,000 megawatt-days/ton.

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

Sincerely,

/RA/

Richard P. Croteau, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-271

Enclosures: 1. Amendment No. 191 to
License No. DPR-28
2. Safety Evaluation

cc w/encls: See next page

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VERMONT YANKEE NUCLEAR POWER CORPORATION

DOCKET NO. 50-271

VERMONT YANKEE NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 191
License No. DPR-28

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by the Vermont Yankee Nuclear Power Corporation (the licensee) dated May 23, 2000, 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 3.B of Facility Operating License No. DPR-28 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 191, 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 its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: July 18, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 191

FACILITY OPERATING LICENSE NO. DPR-28

DOCKET NO. 50-271

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 vertical lines in the margin indicating the area of change.

<u>Remove</u>	<u>Insert</u>
27	27
28	28
32	32
33	33
--	33a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 191 TO FACILITY OPERATING LICENSE NO. DPR-28
VERMONT YANKEE NUCLEAR POWER CORPORATION
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

1.0 INTRODUCTION

By letter dated May 23, 2000, the Vermont Yankee Nuclear Power Corporation (the licensee) submitted a request to amend the Vermont Yankee Nuclear Power Station (VY) Technical Specifications (TSs). The licensee proposed to change TS Table 4.1.2 to increase the interval between Local Power Range Monitor (LPRM) calibrations from 1,000 equivalent full power hours to 2,000 megawatt-days/ton (MWD/T). In addition, a note would be added to this table to indicate that the specified LPRM calibration frequency is met if the calibration is performed within 1.25 times the interval specified, as measured from the previous performance. Conforming changes were also proposed for the associated TS Bases.

The licensee stated that at rated thermal power (RTP), 1,000 effective full power hours (EFPH) is about 42 days (i.e., 1,000 hours/24 hours/day), and 1,000 MWD/T is about 44 days (i.e., 1,000 MWD/T x 70.659 tons uranium in current cycle divided by 1593 MWt RTP). Typically, during continuous operation at RTP, actual LPRM calibration occurs more frequently. The proposed change to the TSs would approximately double the effective time interval between successive LPRM calibrations.

2.0 BACKGROUND

The LPRM system consists of 20 LPRM assemblies, each containing 4 detectors. The 80 miniature fission chamber-type neutron detectors are positioned at various fixed locations on four horizontal planes throughout the reactor core. The LPRMs provide indication of local neutron flux to the Average Power Range Monitor (APRM) system, the Rod Block Monitor (RBM) system, and the process computer. LPRMs are grouped by axial and radial location to provide a representative indication of neutron flux to the six APRM channels. The APRMs provide indication of core average thermal power, and input to the Reactor Protection System. The RBM system develops indication of average local power from LPRMs around a selected control rod and prevents withdrawal of that rod when local power is above a preset limit. LPRM inputs to the process computer are used to develop core thermal performance indicators to verify that thermal power operation is within established limits.

LPRMs are calibrated periodically because of fuel changes and depletion of the fissile detection media. Through this process, instrument uncertainties in the measurement of core operating parameters may be minimized. Calibration data are obtained from the Traversing Incore Probe

(TIP) system, using the moveable gamma detectors to measure the incore flux distribution for comparison with the LPRM readings.

3.0 EVALUATION

The licensee stated that the increase in LPRM surveillance interval is based upon maintaining the uncertainty in power distribution thermal limits within the limits contained in NRC-approved topical report, NEDO-10958-P-A, "General Electric BWR Thermal Analysis Basis (GETAB) Data, Correlation and Design Application," January 1977. The calibration frequency is dependent upon the added uncertainty in the nodal power distribution due to LPRM-based operation between successive runs to collect axial neutron flux data and LPRM calibrations. This uncertainty is limited to the total uncertainty (8.7%) allowed by the GETAB safety limit analyses.

The licensee also stated that allowing 2,000 MWD/T between axial neutron flux data collection and LPRM calibrations is based on detailed statistical evaluations of the uncertainty in LPRM monitoring cases run at exposure intervals, including a case at nearly 3,000 EFPH without axial neutron flux data collection or LPRM calibration relative to the TIP monitoring cases immediately after axial neutron flux data collection. (EFPHs are approximately equal to MWD/T.) The calculations are based upon modern core monitoring systems that utilize nodal diffusion theory coupled with plant data, including improved nuclear instrumentation. The resulting nodal uncertainty combined with the other identified uncertainties must be less than the total uncertainty allowed by the GETAB safety limit. These statistical evaluations have been previously reviewed and found acceptable by the NRC staff as documented in a letter from F. Akstulewicz (NRR) to G.A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, 'Methodology and Uncertainties for Safety Limit MCPR Evaluations'; NEDC-32694P, 'Power Distribution Uncertainties for Safety Limit MCPR Evaluation'; and 'Amendment 25 to NEDE-24011-P-A on Cycle-Specific Safety Limit MCPR' (TAC Nos. M97490, M99069, and M97491)," dated March 11, 1999.

The Licensing Topical Reports (LTRs) considered in NEDO-10958-P-A, as supplemented by NEDC-32694P, provide detailed statistical evaluations of the uncertainty in LPRM-based monitoring cases run at exposure intervals up to 2,991 EFPH (2,688 MWD/T). Based on the data examined, it was shown that this nodal power uncertainty did not significantly deviate with exposure. These evaluations provide the basis that the GETAB equivalent safety limit of 8.7% would not be exceeded. This is because of improved LPRM chambers (VY uses NA300 series), which exhibit consistent LPRM sensitivity throughout their useful nuclear life (up to 40,000 MWD/T), and to improved core monitoring systems. VY uses the improved core monitoring system-GE 3D MONICORE- which utilizes nodal diffusion theory, coupled with plant data and the improved nuclear instrumentation. The 3D-MONICORE models are based on accepted BWR calculational methods used to monitor on-line core performance. The licensee stated that the evaluations show that the equivalent total nodal uncertainty for the increased calibration interval of 2,000 MWD/T would be 7.6% for fission chamber TIPs and less than this for gamma TIPs. For analyzed cases, up to 2,688 MWD/T, the total nodal uncertainty remains less than the original GETAB requirement of 8.7%. The licensee stated that VY conforms to the GETAB analysis criteria and the applicable criteria of the LTRs reviewed per NEDO-10958-P-A.

The staff notes that the provisions to allow the LPRM calibration frequency to be considered met if the calibration is performed within 1.25 times the interval specified, as measured from the previous performance, is not intended to be used repeatedly, but merely as an operational convenience to extend the surveillance interval beyond that specified. This 25 percent extension facilitates surveillance scheduling and considers plant operating conditions that may not be suitable for conducting the surveillance (e.g., transient conditions or other ongoing surveillance or maintenance activities). A 25-percent extension of the specified frequency would result in conducting the surveillance prior to 2,500 MWD/T which is less than the analyzed cases, up to 2,688 MWD/T, therefore the total nodal uncertainty remains less than the original GETAB requirement of 8.7%.

The staff concludes that the proposed changes to TS Table 4.1.2 are acceptable because the total nodal uncertainty will remain within the original GETAB safety limit of 8.7%.

The licensee also proposed corresponding TS Bases changes. The staff does not object to the proposed Bases changes.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Vermont State official was notified of the proposed issuance of the amendment. The State official had no comment.

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 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in 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 37431). 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.

Principal Contributor: R. Croteau

Date: July 18, 2000

Vermont Yankee Nuclear Power Station

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