

October 1, 1999

Mr. Robert J. Wanczyk
Acting Director of Operations
Vermont Yankee Nuclear Power Corporation
185 Old Ferry Road
Brattleboro, VT 05301

SUBJECT: VERMONT YANKEE NUCLEAR POWER STATION - ISSUANCE OF
AMENDMENT RE: MAIN STEAM LINE ISOLATION VALVE LEAKAGE
(TAC NO. MA6028)

Dear Mr. Wanczyk:

The Commission has issued the enclosed Amendment No. 178 to Facility Operating License DPR-28 for the Vermont Yankee Nuclear Power Station, in response to your application dated June 29, 1999.

The amendment revises the leak rate requirements for the main steam line isolation valves. Specifically, a total allowable leakage rate for the sum of the four main steam lines is established that is equal to four times the current allowable individual main steam line isolation valve leakage rate. The allowable individual main steam line isolation valve leakage rate is revised to be one half of the allowable total leakage rate.

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,
/s/

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. 178 to License No. DPR-28
- 2. Safety Evaluation

cc w/ encls: See next page

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

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Mr. Robert J. Wanczyk
Acting Director of Operations
Vermont Yankee Nuclear Power Corporation
185 Old Ferry Road
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Sincerely,

A handwritten signature in cursive script, appearing to read "R. Croteau".

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.178 to
License No. DPR-28
2. Safety Evaluation

cc w/ encls: See next page

Vermont Yankee Nuclear Power Station

cc:

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

VERMONT YANKEE NUCLEAR POWER CORPORATION

DOCKET NO. 50-271

VERMONT YANKEE NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 178
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 June 29, 1999, 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.

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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. 178, 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 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



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: October 1, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 178

FACILITY OPERATING LICENSE NO. DPR-28

DOCKET NO. 50-271

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove

Insert

147

147

3.7 LIMITING CONDITIONS FOR OPERATION

- at normal cooldown rates if the torus water temperature exceeds 120°F.
- e. Minimum Water Volume
- 68,000 cubic feet
 - f. Maximum Water Volume
- 70,000 cubic feet
2. Primary containment integrity shall be maintained at all times when the reactor is critical or when the reactor water temperature is above 212°F and fuel is in the reactor vessel except while performing low power physics tests at atmospheric pressure at power levels not to exceed 5 Mw(t).
 3. If a portion of a system that is considered to be an extension of primary containment is to be opened, isolate the affected penetration flow path by use of at least one closed and deactivated automatic valve, closed manual valve or blind flange.
 4. Whenever primary containment integrity is required, the leakage from any one main steam line isolation valve shall not exceed 31 scf/hr at 44 psig (P_a), and the combined leakage from all four main steam lines shall not exceed 62 scf/hr at 44 psig (P_a).

4.7 SURVEILLANCE REQUIREMENTS

2. The primary containment integrity shall be demonstrated as required by the Primary Containment Leak Rate Testing Program (PCLRTP).
3. (Blank)
4. Verify leakage rate through each main steam line isolation valve is ≤ 23 scf/hr and that the combined maximum pathway leakage rate for all four main steam lines is ≤ 46 scf/hr when tested at ≥ 24 psig (P_t).

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 178 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 June 29, 1999, the Vermont Yankee Nuclear Power Corporation (the licensee) submitted a request to amend the Vermont Yankee Nuclear Power Station (VY) Technical Specifications (TSs). The proposed amendment would revise the leak rate requirements for the main steam line isolation valves (MSIVs). A new allowable total leakage rate for the sum of the four main steam lines is established that is equal to four times the allowable current individual main steam line isolation valve leakage rate. The allowable individual main steam line isolation valve leakage rate is revised to be one half of the allowable total leakage rate.

2.0 EVALUATION

Four steam lines direct steam from the reactor to the turbine. Two MSIVs, arranged in a series, in each main steam line close automatically upon receipt of certain isolation signals. The safety objectives of the MSIVs are to (1) prevent fuel barrier damage by limiting the loss of reactor cooling water in case of a major leak from the steam piping outside the primary containment, (2) limit release of radioactive materials by closing the nuclear system barrier in case of gross release of radioactive materials from the reactor fuel to the reactor cooling water and steam, and (3) limit release of radioactive materials by closing the primary containment barrier in case of a major leak from the nuclear system inside the primary containment. The MSIVs are 18-inch globe valves which form a part of the primary containment barrier when closed. The MSIVs are leak tested in accordance with Option B to 10 CFR 50 Appendix J.

Current TS 3.7.4 states:

"Whenever primary containment is required, the leakage from any one main steam line isolation valve shall not exceed 15.5 scf/hr at 44 psig (Pa)."

Current TS 4.7.4 states:

"The leakage from any one main steam line isolation valve shall not exceed 11.5 scf/hr at 24 psig (Pt). Repair and retest shall be conducted to insure compliance."

The licensee proposed revising TS 3.7.4 to limit the combined leakage from all four steam lines to 62 scf/hr and 31 scf/hr for any one MSIV at 44 psig (Pa). The 62 scf/hr is the leak rate that

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would exist if the leakage from each main steam line was at the current TS limit of 15.5 scf/hr at 44 psig. Similarly, the licensee proposed changing TS 4.7.4 to limit the combined leakage from all four steam lines to 46 scf/hr and 23 scf/hr for any one MSIV at 24 psig (Pt). The 46 scf/hr is the leak rate that would exist if the leakage from each main steam line was at the current TS limit of 11.5 scf/hr at 24 psig.

The licensee stated that analyses that assume MSIV leakage use either the cumulative leakage rate from the four main steam lines or the total primary containment leakage rate, versus using the individual valve or line leakage rate. The current restrictive individual valve leakage rate allowable value requirement of 11.5 scf/hr results in valve maintenance whenever a leak rate is even slightly above the specific acceptance criterion. Unless the cumulative MSIV leakage rate allowable value or the containment total leakage rate is challenged, this maintenance is unnecessary. The consequences of this unnecessary maintenance are increased worker exposure, increased outage duration, and possibly reduced component service life.

The licensee stated that the following analyses use MSIV leakage as an assumption or input:

The design basis loss of coolant accident (DBA LOCA) analysis assumes a value for total primary containment leakage when determining the consequences. This assumption is validated by the testing in 10 CFR 50 Appendix J. VY adds the main steam line maximum pathway leakage rate to the results of the 10 CFR 50 Appendix J Types B and C tests summation for evaluation and for comparison to the 0.6La maximum and minimum combined leak rate acceptance criteria. Since the proposed changes are still bounded by 0.6La, there is no impact on the DBA LOCA analysis.

Control room radiological habitability was analyzed by assuming each of the four main steam lines leaks at the Technical Specification limit (15.5 scf/hr) for the duration of the accident. The input value for the analysis is $4 \times 15.5 \text{ scf/hr} = 62 \text{ scf/hr}$. Since this proposed change adds a requirement that does not allow the combined leakage from all four main steam lines to exceed 62 scf/hr, there is no impact on the input value for the control room radiological habitability analysis.

TS 6.7.C, "Primary Containment Leak Rate Testing Program," includes the MSIV valve leakage as a component of the combined local leak rate acceptance criteria, adding the MSIV maximum pathway leakage rate results to the Types B and C tests summation for evaluation and for comparison to the 0.6La maximum and minimum combined leak rate acceptance criteria.

The Boiling Water Reactor Owners Group (BWROG) evaluated increasing the TS limit for the MSIV leakage in NEDC-31858P Revision 2, September 1993, "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of Leakage Control Systems" (the report). The report concludes, among other things, that MSIV leakage could be increased to 200 scfh per main steam line without inhibiting the safety function of the valve. The report also states that a leak rate of 200 scfh does not represent abnormal or excessive leakage for a valve of this size and type. The report further states that the BWROG found that disassembly and refurbishment of MSIVs to meet low leakage limits frequently contribute to repeated failures from maintenance-induced defects such as seat cracks, excessive pilot valve seat machining, and mechanical defects induced by assembly and disassembly.

The staff considers the proposed changes to be acceptable because the combined maximum flow path leakage proposed is consistent with the analyses that use MSIV leakage as an assumption or input and the proposed increase in individual MSIV leak rates will not inhibit the safety function of the valves.

3.0 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 questioned whether this change would allow increased overall containment leakage during plant operation because a larger amount of leakage would be allowed through an individual MSIV. The staff reviewed the State official's question and considers that the overall containment leakage will not be increased by allowing increased leakage through an individual MSIV, since the total allowable containment leakage remains unchanged. The staff maintains that the proposed changes are acceptable for the reasons stated previously.

In addition, the State official suggested that the staff evaluate the past leak performance of the MSIVs. Although not part of the staff's basis for acceptance of the proposed change, the staff reviewed Licensee Event Report (LER) 98-009, Revision 1, dated February 10, 1999. This LER reported that two of the main steam lines exceeded the allowable TS leakage limits during the 1998 refueling outage (the other two steam lines met the TS leakage limits). The LER also stated that no similar events had occurred in the preceding five years. The licensee repaired the valves restoring compliance with the TS. This LER did not affect the staff's conclusions that the proposed changes are acceptable.

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 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 40919). 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: R. Croteau

Date: October 1, 1999