February 21, 1985

Docket No. 50-271

Mr. R. W. Capstick
Licensing Engineer
Vermont Yankee Nuclear Power Corporation
1671 Worcester Road
Framingham, Massachusetts 01701

Dear Mr. Capstick:

The Commission has issued the enclosed Amendment No. 86 to Facility Operating License No. DPR-28 for the Vermont Yankee Nuclear Power Station. The amendment consists of changes to the Technical Specifications in response to your application dated March 26, 1984 with clarifying information provided by letter dated September 7, 1984.

The amendment revises the Technical Specifications to reflect a change from 120% to 140% in the main steam line high flow setpoint. In addition, the reactor power limit for quarterly MSIV full closure testing is increased from 50% to 75% of rated power.

A copy of the Safety Evaluation is also enclosed.

Sincerely,

Original signed by/

Vernon L. Rooney, Project Manager
Operating Reactors Branch #2
Division of Licensing

Enclosures:
1. Amendment No. 86 to License No. DPR-28
2. Safety Evaluation

cc w/enclosure:
See next page

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Mr. R. W. Capstick
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Vermont Yankee Nuclear Power Station

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

VERMONT YANKEE NUCLEAR POWER CORPORATION

DOCKET NO. 50-271

VERMONT YANKEE NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 86
License No. DPR-28

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Vermont Yankee Nuclear Power Corporation (the licensee) dated March 26, 1984, as supplemented September 7, 1984, 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-28 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 86, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 21, 1985

ATTACHMENT TO LICENSE AMENDMENT NO. 86

FACILITY OPERATING LICENSE NO. DPR-28

DOCKET NO. 50-271

Revise the Technical Specifications as follows:

Remove	Insert
41	41
63	63
133	133

TABLE 3.2.2

PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

Minimum Number of Operable Instrument Channels per Trip System	Trip Function	Trip Setting	Required Action When Minimum Conditions for Operations are Not Satisfied (Note 2)
2	Low-Low Reactor Vessel Water Level	≥82.5" above the top of enriched fuel	A
2 of 4 in each of 2 channels	High Main Steam Line Area Temperature	≤212°F	B
2/steam line	High Main Steam Line Flow	≤140% of rated flow	B
2/(Note 1)	Low Main Steam Line Pressure	≥850 psig	B
2/(Note 6)	High Main Steam Line Flow	≤40% of rated flow	B
2	Low Reactor Vessel Water Level	Same as Reactor Protection System	A
2	High Main Steam Line Radiation (7) (8)	≤3 X background at rated power (9)	B
2	High Drywell Pressure	Same as Reactor Protection System	A
2/(Note 10)	Condenser Low Vacuum	≥12" Hg absolute	A
1	Trip System Logic	--	A

3.2 (Cont'd)

The low-low reactor water level instrumentation is set to trip when reactor water level is 82.5" H_2O indicated on the reactor water level instrumentation above the top of the enriched fuel. This trip initiates closure of the Group 1 primary containment isolation valves and also activates the ECCS and starts the standby diesel generator system. This trip setting level was chosen to be low enough to prevent spurious operation, but high enough to initiate ECCS operation and primary system isolation so that no melting of the fuel cladding will occur and so that post-accident cooling can be accomplished and the limits of 10CFR100 will not be violated. For the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, ECCS initiation and primary system isolation are initiated in time to meet the above criteria. The instrumentation also covers the full range of spectrum of breaks and meets the above criteria.

The high drywell pressure instrumentation is a backup to the water level instrumentation and in addition to initiating ECCS it causes isolation of Group 2, 3, and 4 isolation valves. For the complete circumferential break discussed above, this instrumentation will initiate ECCS operation at about the same time as the low-low water level instrumentation, thus the results given above are applicable here also. Group 2 isolation valves include the drywell vent, purge, and sump isolation valves. High drywell pressure activates only these valves because high drywell pressure could occur as the result of non-safety-related causes such as not purging the drywell air during startup. Total system isolation is not desirable for these conditions and only the valves in Group 2 are required to close. The water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes a trip of all primary system isolation valves.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. In addition to monitoring steam flow, instrumentation is provided which causes a trip of Group 1 isolation valves. The primary function of the instrumentation is to detect a break in the main steam line, thus only Group 1 valves are closed. For the worst case accident, main steam line break outside the drywell, this trip setting of 140 percent of rated steam flow in conjunction with the flow limiters and main steam line valve closure limit the mass inventory loss such that fuel is not uncovered, cladding temperatures remain less than 1295°F and release of radioactivity to the environs is well below 10CFR100.

Temperature monitoring instrumentation is provided in the main steam line tunnel to detect leaks in this area. Trips are provided on this instrumentation and when exceeded cause closure of Group 1 isolation valves. Its setting of ambient plus 95°F is low enough to detect leaks of the order of 5 to 10 gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, it is a backup to high steam flow instrumentation discussed above, and for small breaks with the resultant small release of radioactivity, gives isolation before the limits of 10CFR100 are exceeded.

3.7 LIMITING CONDITIONS FOR OPERATION

2. In the event any isolation valve specified in Table 4.7.2 becomes inoperable, reactor power operation may continue provided at least one valve in each line having an inoperable valve is in the mode corresponding to the isolated condition.

3. If Specification 3.7.D.1 and 3.7.D.2 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

4.7 SURVEILLANCE REQUIREMENTS

(2) The instrument line flow check valves shall be tested for proper operation.

b. At least once per quarter:

(1) All normally open power-operated isolation valves (except for main steam isolation valves) shall be fully closed and reopened.

(2) With the reactor power less than 75 percent of rated, trip all main steam isolation valves (one at a time) and verify closure time.

c. At least twice per week:

(1) The main steam line isolation valves shall be exercised by partial closure and subsequent reopening.

2. Whenever an isolation valve listed in 4.7.2 is inoperable, the position of at least one other valve in each line having an inoperable valve shall be logged daily.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 86 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 March 26, 1984, Vermont Yankee Nuclear Power Corporation (the licensee) requested an amendment to the Technical Specifications, Appendix A, of Facility Operating License No. DPR-28 for the Vermont Yankee Nuclear Power Station. Additional information and clarification were provided by letter dated September 7, 1984 and teleconferences. The amendment would change the trip setting for the high main steam line flow instruments from the present 120% to 140% of rated steam flow. This change will reduce the probability of inadvertent reactor isolations and possible challenges to safety/relief valves. The licensee considers this change as one of the methods to satisfy the requirements of TMI Action II.K.3.16, "Reduction in the Challenges and Failures of Relief Valves." The amendment also would increase the power limit for quarterly main steam isolation valve (MSIV) full closure testing from 50% to 75% of rated power. The change will allow quarterly MSIV testing at 75% power and will minimize the thermal cycling currently required by the reduction to 50% power. This change also provides an economic benefit to the licensee since the power need not be reduced to 50% for testing.

2.0 Evaluation

The primary function of the high flow instrumentation is to detect a main steam line break. The steam flow trip setting, in conjunction with the flow limiters and MSIV closure, limits the mass inventory loss such that the fuel is not uncovered. The analysis for the main steam line break outside containment is given in the FSAR, Section 14.6.5. The analysis assumes that 200% of rated steam flow is passing through the break, which is the maximum permitted by the steam line flow limiters. A 0.5 second delay is assumed before tripping the MSIV closure signal. This 0.5 second delay accounts for the response time required for the MSIV closure. The MSIVs are assumed to be closed within 10 seconds. The assumptions used in the FSAR analysis, which are based on 200% rated steam flow, are still conservative for a 140% high flow isolation setpoint. Even with the instrument uncertainty of ±2%, there is a wide margin between the MSIV isolation setpoint of 140% and the analysis value of 200%.

The high flow isolation signal is generated so quickly that the change in high flow isolation setpoint from 120% to 140% will not significantly affect the assumed 0.5 second delay time. In addition the assumed 10 second MSIV closure time is conservative, since the closure time specified in the plant technical specifications is between 3 and 5 seconds. Thus the 10.5 second assumption used in the FSAR analysis is still conservative with a 140% main steam line high flow setpoint. The proposed change does not impact the FSAR calculated results for the worst case main steam line break outside the primary containment.

The licensee performed the analysis for a spectrum of break sizes. The analysis performed by GE for the licensee indicates that the radiological consequences of the bounding small break are conservatively bounded by the radiological consequences for the design basis main steam line break accident given in the FSAR. The small break analysis assumed that the steam line, takes no credit for high temperature or high steam line flow trip, and assumes a 10 minute operator action time before isolation. NRC approved models were used in the analysis.

Quarterly MSIV testing is performed at present with a 50% power reduction. This reduction was imposed to avoid inadvertent trips with a 120% high flow isolation setpoint. Simulation of a single MSIV closure transient at 75% power showed that testing can be performed without reaching the high steam line flow (140%), high neutron flux, or high pressure trip. To account for the instrument uncertainties, lower limits of the allowable values for high flow, APRM scram and high pressure scram were used. The results showed sufficient margin such that a trip would be avoided.

The margin to an inadvertent trip on high steam flow during a single MSIV closure is reduced from 60% of rated steam flow to 40% of rated flow, with the new 75% power restriction. However, for the weekly testing of MSIVs during full power, the margin is increased from 20% to 40%. According to the licensee, the MSIVs were often closing more than the desired 10% during testing thereby causing pressure fluctuations. The new high flow trip setpoint is expected to reduce main steam system disturbances during the weekly testing.

The 75% power analysis described above was performed with the Vermont Yankee RETRAN model. During the teleconference on October 18, 1984, the licensee stated that their RETRAN model was used for the reload submittal for Cycle-9 and the staff SER was issued subsequently. Results using the same modeling techniques were shown to be conservative for pressurization transients when compared to the Peach Bottom turbine trip test data. Therefore, the use of the RETRAN model for 75% power analysis is acceptable.

3.0 Summary

Based on the analysis provided by the licensee, we have concluded that the proposed changes to reflect a change in the trip setting for the high main steam line flow instruments from the present 120% to 140% of rated steam flow, and the increase in reactor power limit for quarterly MSIV full closure testing from 50% to 75% of rated power are acceptable.

4.0 Environmental Considerations

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 this amendment.

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

Principal Contributor: G. Thomas

Dated: February 21, 1985