



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 72 TO FACILITY OPERATING LICENSE NO. DPR-28
VERMONT YANKEE NUCLEAR POWER CORPORATION
VERMONT YANKEE NUCLEAR POWER STATION
DOCKET NO. 50-271

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1.0 Introduction

By letter dated August 19, 1982 (Reference 1) Vermont Yankee Nuclear Power Corporation (VYNPC or licensee) has proposed changes to the Technical Specifications of the Vermont Yankee Nuclear Power Station (VY), as supported by Reference 2. The proposed changes modify the Limiting Conditions of Operation pertaining to the reactor core during the present fuel cycle (Cycle 9). These changes are:

1. New values for operating limits related to Minimum Critical Power Ratio (MCPR) or operating Limit MCPR (OLMCPR).
2. Removal of certain operational constraints on core exposure and the equation for determining the rod block monitoring (RBM) setpoints. These operational constraints had been imposed by License Amendment No. 70 to limit plant operation in accordance with the previous OLMCPRs that were found acceptable by the staff.

2.0 Evaluation

2.1 New OLMCPRs

The new values for OLMCPRs were calculated by the licensee using the RETRAN-TCPYAO1 transient hot channel CPR methodology. The RETRAN-TCPYAO1 transient hot channel Critical Power Ratio methodology has been reviewed and approved by the staff (Reference 3) as an acceptable method for CPR calculation provided that conservative values are used for input parameters to account for their uncertainties.

In the course of our review of the application of the approved methodology to establish fuel cycle specific Limiting Conditions of Operation, questions arose as to the conservatism of the constant value of fuel pellet - cladding gap conductance used by the licensee. Further discussions with the licensee and additional information provided by the licensee (Reference 2) satisfied the staff as to the conservatism of the value of gap conductance (1000 BTU/hr. ft²-°F) used by the licensee. The following considerations led us to conclude that the value used was conservative:

1. The value of conductance used is higher than either the power-weighted or volume-weighted hot channel average gap conductance.
2. Even though the departure from nucleate boiling (DNB) occurs locally at the location or downstream of the peak power node, the integrated thermal hydraulic effect strongly influences DNB in a BWR core. The use of the GEXL critical quality-boiling length correlation accounts for the integrated upstream thermal-hydraulic conditions. Therefore, the use of an average value of gap conductance, even though non-conservative for the peak power nodes, leads to a conservative accounting of the integrated upstream effects, since most of the upstream gap conductances are lower than the average.
3. The licensee has performed a sensitivity study (Reference 2) using axially-varying nodal gap conductance for the limiting transient (generator load rejection without bypass), the result shows a slightly lower Δ CPR than does the analysis with a constant gap conductance of 1000 BTU/hr-ft²-°F. We therefore, conclude that the value of gap conductance used by the licensee is acceptable.

The M CPR operating limits in the proposed Technical Specifications, Table 3.11-2, were obtained from the maximum Δ CPRs, corresponding to various fuel types for all anticipated transients. We have reviewed the proposed OLM CPRs. Because acceptable methodology, conservative input assumptions, and appropriate transients have been used in calculating the OLM CPRs we have found them acceptable for use during Cycle 9 operation.

2.2 Removal of Operational Constraints

The operational constraints pertaining to core exposure and the equation used for determining the RBM setpoints had been imposed to limit plant operation to the previous OLM CPRs that had been found acceptable to the staff. The new OLM CPRs were calculated without using the plant operational constraints with respect to core exposure or the RBM setpoint equation limitation. Because the OLM CPRs, so calculated, were found to be acceptable (as discussed above) the operational constraints can be removed from the Technical Specifications.

2.3 Summary

Based on our review of the licensee's submittals, we conclude that the proposed Technical Specifications for Cycle 9 operation are acceptable.

3.0 Environmental Considerations

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

4.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a margin of safety, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) 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.

Dated: September 16, 1982

References:

1. Letter, L. H. Heider (VYNPC) to USNRC, FVY 82-93, "Supplement 2 to Reload 8 Licensing Submittal", August 19, 1982
2. Letter, J. Sinclair (VYNPC) to D. Vassallo (USNRC), FVY 82-02, September 10, 1982.
3. Letter, D. Vassallo (USNRC) to J. Sinclair (VYNPC), dated September 15, 1982