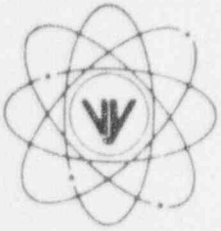


VERMONT YANKEE NUCLEAR POWER CORPORATION



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June 28, 1996
BVY 96-84

United States Nuclear Regulatory Commission
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Washington, DC 20555

References: (a) License No. DPR-28 (Docket No. 50-271)
(b) Licensee Event Report 95-05, Supplement 1, (BVY 95-92) dated 8/22/95
(c) Improved Standard Technical Specifications, BWR/4 Plants, NUREG-1433 Rev.1

Subject: Proposed Change No. 187, Core Shutdown Margin

Pursuant to Section 50.90 of the Commission's Rule and Regulations, Vermont Yankee Nuclear Power Corporation hereby proposes the following change to the facility Operating License [Reference (a)].

Proposed Change

This proposed change incorporates standard language for the shutdown margin (SDM) specifications to allow calculational determination of highest worth control rod. These changes are proposed as a result of the long-term corrective actions identified in Reference (b), and are based on the Improved Standard Technical Specifications, Reference (c).

Specifically, the changes proposed are as follows:

- (1) Page 81, Specification 3.3.A.1 and 4.3.A.1. Revised to include new limits for SDM in the LCO which incorporate a new minimum value and an additional higher value to be used as the limit if the highest worth control rod is analytically determined. The higher value provides conservative margin in consideration of the additional uncertainty that is introduced when the highest worth rod is not determined by actual measurement. Included in this change are the appropriate actions for various plant operating conditions and surveillances.
- (2) Page 88, Specification 3.3.E and F. Revised units of reactivity from Δk to $\Delta k/k$ for consistency with the units in 1 above. Revised applicability of the shutdown action in 3.3.F to omit Specification 3.3.A, since new, appropriate actions are included in the proposed Specification 3.3.A.
- (3) Page 89, Bases for Specification 3.3.A. Revised Bases to incorporate additional information consistent with the incorporation of items 1 and 2 above.

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- (4) Page 91, Bases for Specification 3.3.E. Revised units of reactivity to be consistent with item 2 above.
- (5) Page 232, Specification 3.12.D. Revised the applicability of this section from "a maximum of two non-adjacent control rods separated by more than two control cells in any direction" to "one control rod". Editorial changes are also included.
- (6) Page 232, Specification 4.12.D.1 and 4.12.D.2. Revised to provide consistent language as per change (1) above, for these surveillances as they relate to core shutdown margin determination.
- (7) Page 233, Specification 3.12.E. Revised the applicability of this section from "more than two" to "one or more".
- (8) Page 238, Bases for Specification 3.12.D and 4.12.D. Revised Bases to incorporate additional information consistent with items 5 through 7 above.

Reason/Basis for Change

This proposed change will provide alternative, more restrictive shutdown margin requirements and provide additional flexibility in refueling outage operations which require a shutdown margin demonstration.

The proposed limit for minimum shutdown margin is more conservative than existing requirements and is consistent with what is specified in Reference (c).

Allowing determination of the highest worth rod by calculation will allow flexibility in the performance of maintenance during a refueling outage for those systems that require a SDM demonstration. This flexibility in performing maintenance eliminates, for example, the need to completely remove all fuel from a maintenance cell to perform a CRD replacement. This will reduce the total number of fuel assemblies that require off load, saving outage critical path time. In addition, reducing the number of times a fuel bundle is handled reduces the likelihood of fuel mis-handling events.

Limiting Condition for Operation (LCO) 3.12 for control rod drive maintenance will be made more restrictive by reducing the number of control rods in the applicability of section 3.12.D and 3.12.E.

Additionally, administrative changes will be made to specify a consistent unit of measure for reactivity and editorial changes are also included for clarification.

Safety Considerations

The core shutdown margin limit currently specified in section 4.3.A.1 is $0.25\% \Delta k$. The proposed changes raise the minimum SDM to $\geq 0.28\% \Delta k/k$ when the highest worth rod is determined by test and for the more common situation in which the highest worth rod is determined analytically, the proposed change requires $\geq 0.38\% \Delta k/k$ SDM. For SDM determinations that rely on calculation of the highest worth rod, additional margin ($0.10\% \Delta k/k$) must be added to the SDM limit of $0.28\% \Delta k/k$ to account for uncertainties in the calculation. These proposed new limits conservatively exceed the current SDM limit requirement of $0.25\% \Delta k$. Retained in the Bases for this section is a description of an additional SDM penalty for poison settling in any original equipment control rods still present in the

core with inverted tubes. Also added to section 3.3.A.1 are various action statements, which, depending on the plant operating status, will restore the SDM or place the reactor in a safe condition.

The requirements for control rod withdrawal for maintenance permit the removal of control rod drives during refueling operations by imposing additional administrative controls that reinforce operational procedures and, along with other required equipment, prevent the reactor from becoming critical during refueling operations. Currently, during refueling operations, two control rods are permitted to be withdrawn from core cells containing fuel assemblies as long as the requirements of section 3.12.D are met. Section 3.12.E applies additional restrictions if more than two control rods will be withdrawn. This proposed change will reduce the number of control rods which can be withdrawn at any one time to "one" control rod in 3.12.D and will extend the requirements of section 3.12.E to "one or more" control rods. These are more restrictive requirements which will result in increased safety margins.

With the reactor mode switch in the REFUEL position, the analyses for control rod withdrawal during refueling are applicable and, provided the assumptions of these analyses are satisfied, these analyses will bound the consequences of accidents. The safety analyses in the FSAR conclude that proper operation of the refueling interlocks and adequate SDM will preclude unacceptable reactivity excursions.

Refueling interlocks restrict the movement of control rods and the operation of the refueling equipment to reinforce operational procedures that prevent the reactor from becoming critical. These interlocks prevent the withdrawal of more than one control rod. Under these conditions, since only one control rod can be withdrawn, the core will always be shutdown even with the highest worth control rod withdrawn, if adequate SDM exists.

This Proposed Change has been reviewed by the Vermont Yankee Plant Operations Review Committee and the Vermont Yankee Nuclear Safety Audit and Review Committee.

Significant Hazards Consideration

The Standards used to arrive at a determination that a request for amendment involves no significant hazards are included in the Commission's regulations (10CFR50.92) which state that the operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. In addition, the Commission has provided guidance in the practical application of these criteria in 51FR7751, dated March 6, 1986.

The discussion below addresses each of these criteria and demonstrates that the proposed amendment involves no significant hazards consideration.

- (1) During refueling, maintenance may be performed on either the control rods or the control rod drive mechanisms. Controls, such as refueling interlocks, are provided to assure inadvertent criticality does not occur during this maintenance. There are no proposed revisions to these controls except to lower the threshold for applicability, which constitutes a more restrictive change.

These controls also continue to assure that the new, higher minimum shutdown margin is maintained to ensure the reactor can be returned to a subcritical condition should an inadvertent criticality occur. The proposed alternate calculational method for highest worth

control rod has additional conservatism to account for any uncertainties in the calculation and provides equivalent margin. Therefore, this change will not significantly increase the probability or consequences of any previously analyzed accident.

- (2) The proposed change does not necessitate a physical alteration of the plant in that no new or different type of equipment will be installed. The proposed change does propose a higher minimum shutdown margin and a lower threshold of applicability for CRD maintenance, both of which are more restrictive. The proposed change will provide effective methods to preserve the safety functions associated with the prevention or automatic mitigation of design basis accidents. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.
- (3) The proposed changes to the controls provided to allow control rod withdrawal for the purposes of maintenance are more restrictive and thus preserve the safety functions associated with the prevention or automatic mitigation of design basis accidents. The addition of a higher minimum shutdown margin requirement and the proposed calculational alternative for highest worth rod, does not decrease any of the safety controls or functions to prevent inadvertent criticalities and provides equivalent or higher margins. Therefore, this change will not significantly reduce a margin of safety.

Based on the above discussion, we have determined that this change does not constitute a significant hazard consideration as defined in 10CFR50.92(c).

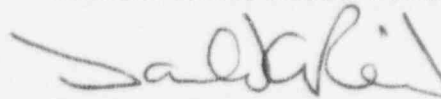
Schedule of Change

The proposed change will be incorporated into Vermont Yankee Technical Specifications as soon as practicable following receipt of your approval.

We trust that the information provided above adequately supports our request. However, should you have any questions in this matter, please do not hesitate to contact us.

Sincerely,

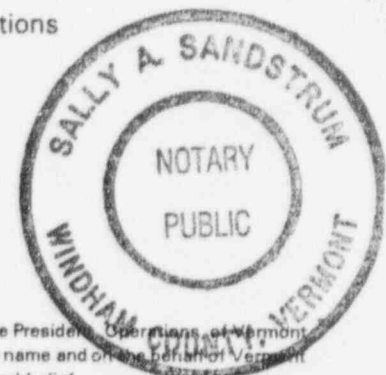
Vermont Yankee Nuclear Power Corporation



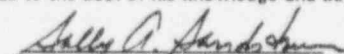
Donald A. Reid
Vice President, Operations

cc: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS

STATE OF VERMONT)
)es
WINDHAM COUNTY)



Then personally appeared before me, Donald A. Reid, who, being duly sworn, did state that he is Vice President, Operations, of Vermont Yankee Nuclear Power Corporation, that he is duly authorized to execute and file the foregoing document in the name and on the behalf of Vermont Yankee Nuclear Power Corporation, and that the statements therein are true to the best of his knowledge and belief.



Sally A. Sandstrum, Notary Public
My Commission Expires 2/10/99