ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES FOR NORTH ANNA UNIT 2

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

BASES

SECTION | PAGE

3/4.2 POWER DISTRIBTUION LIMITS

AXIAL FLUX DIFFERENCE (AFD)

LIMITING CONDITION FOR OPERATION

3.2.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within the allowed operational space defined by Figure 3.2-1.

APPLICABILITY: MODE 1 ABOVE 50% RATED THERMAL POWER

ACTION:

a. With the indicated AXIAL FLUX DIFFERENCE outside of the Figure 3.2-1 limits,

   1.) Either restore the indicated AFD to within the Figure 3.2-1 limits within 15 minutes, or

   2.) Reduce THERMAL POWER to less than 50 % of RATED THERMAL POWER within 30 minutes and reduce the Power Range Neutron Flux - High Trip setpoints to less than or equal to 55 percent of RATED THERMAL POWER within the next 4 hours.

b. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD is within the Figure 3.2-1 limits.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AXIAL FLUX DIFFERENCE shall be determined to be within its limits during POWER OPERATION above 50% of RATED THERMAL POWER by:

a. Monitoring the indicated AFD for each OPERABLE excore channel:

   1. At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and

   2. At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.

b. Monitoring and logging the indicated AXIAL FLUX DIFFERENCE for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AXIAL FLUX DIFFERENCE Monitor Alarm is inoperable. The logged values of the indicated AXIAL FLUX DIFFERENCE shall be assumed to exist during the interval preceding each logging.

4.2.1.2 The indicated AFD shall be considered outside of its limit when at lease 2 OPERABLE excore channels are indicating the AFD to be outside of the limit shown in Figure 3.2-1.

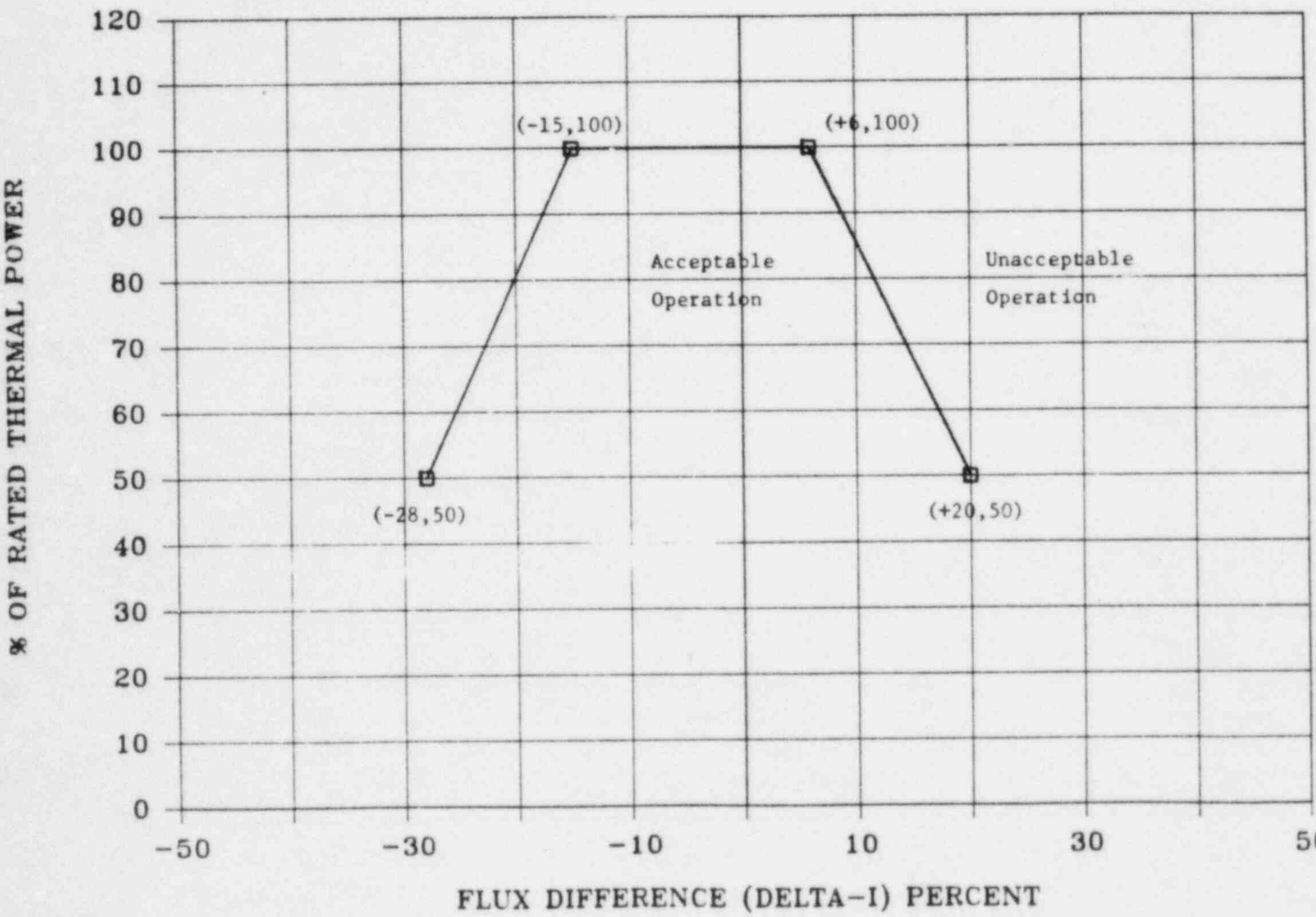

Figure 3.2-1 AXIAL FLUX DIFFERENCE LIMITS AS A FUNCTION OF RATED THERMAL POWER

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HEAT FLUX HOT CHANNEL FACTOR-$F_Q(Z)$

LIMITING CONDITION FOR OPERATION

3.2.2 $F_Q(Z)$ shall be limited by the following relationships:

$$F_Q(Z) \leq \left[\frac{2.20}{P}\right] [K(Z)] \text{ for } P > 0.5$$

$$F_Q(Z) \leq [4.40] [K(Z)] \text{ for } P \leq 0.5$$

$$\text{where } P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$

and K(Z) is the function obtained from Figure 3.2-2 for a given core height location.

APPLICABILITY: MODE 1.

ACTION:

With $F_Q(Z)$ exceeding its limit:

a. Reduce THERMAL POWER at least 1% for each 1% $F_Q(Z)$ exceeds the limit within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours; POWER OPERATION may proceed for up to a total of 72 hours; subsequent POWER OPERATION may proceed provided the Overpower ΔT Trip Setpoints have been reduced at least 1% for each 1% $F_Q(Z)$ exceeds the limit.

b. Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER above the reduced limit required by a, above; THERMAL POWER may then be increased provided $F_Q(Z)$ is demonstrated through incore mapping to be within its limit.

SURVEILLANCE REQUIREMENTS

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 $F_Q(z)$ shall be evaluated to determine if $F_Q(z)$ is within its limit by:

a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5 percent of RATED THERMAL POWER.

b. Increasing the measured $F_Q(z)$ component of the power distribution map by 3 percent to account for manufacturing tolerances and further increasing the value by 5 percent to account for measurement uncertainties.

c. Satisfying the following relationship:

$$F_Q^M(z) \leq \frac{2.20}{P \times N(z)} \times K(z) \text{ for } P > 0.5$$

$$F_Q^M(z) \leq \frac{2.20}{N(z) \times 0.5} \times K(z) \text{ for } P \leq 0.5$$

where $F_Q^M(z)$ is the measured $F_Q(z)$ increased by the allowances for manufacturing tolerances and measurement uncertainty, 2.20 is the F_Q limit, K(z) is given in Figure 3.2-2, P is the relative THERMAL POWER, and N(z) is the cycle dependent function that accounts for power distribution transients encountered during normal operation. This function is given in the Core Surveillance Report as per Specification 6.9.1.7.

d. Measuring $F_Q^M(z)$ according to the following schedule:

1. Upon achieving equilibrium conditions after exceeding the THERMAL POWER at which $F_Q(z)$ was last determined by 10 percent or more of RATED THERMAL POWER*, or

2. At least once per 31 effective full power days, whichever occurs first.

*During power escalation, the power level may be increased until a power level for extended operation has been achieved and a power distribution map obtained.

SURVEILLANCE REQUIREMENTS (Con't.)

e. With measurements indicating

$$\underset{\text{over } z}{\text{maximum}} \left(\frac{F_Q^M(z)}{K(z)} \right)$$

has increased since the previous determination of $F_Q^M(z)$ either of the following actions shall be taken:

1. $F_Q^M(z)$ shall be increased by 2 percent over that specified in 4.2.2.2.c, or

2. $F_Q^M(z)$ shall be measured at least once per 7 effective full power days until 2 successive maps indicate that

$$\underset{\text{over } z}{\text{maximum}} \left(\frac{F_Q^M(z)}{K(z)} \right) \text{ is not increasing.}$$

f. With the relationships specified in 4.2.2.2.c above not being satisfied:

1. Calculate the percent $F_Q(z)$ exceeds its limit by subtracting one from the measurement/limit ratio and multiplying by 100:

$$\left\{ \underset{\text{over } z}{\text{maximum}} \left(\frac{F_Q^M(z)}{\frac{2.20}{P \times N(z)} \times K(z)} \right) -1 \right\} \times 100 \quad \text{for } P \geq 0.5$$

$$\left\{ \underset{\text{over } z}{\text{maximum}} \left(\frac{F_Q^M(z)}{\frac{2.20}{0.5 \times N(z)} \times K(z)} \right) -1 \right\} \times 100 \quad \text{for } P < 0.5$$

2. Either of the following actions shall be taken:

   a. Power operation may continue provided the AFD limits of Figure 3.2-1 are reduced 1% AFD for each percent $F_Q(z)$ exceeded its limit, or

   b. Comply with the requirements of Specification 3.2.2 for $F_Q(z)$ exceeding its limit by the percent calculated above.

SURVEILLANCE REQUIREMENTS (Con't.)

g. The limits specified in 4.2.2.2.c, 4.2.2.2.e, and 4.2.2.2.f above are not applicable in the following core plane regions:

1. Lower core region 0 to 15 percent inclusive.

2. Upper core region 85 to 100 percent inclusive.

3. Grid plane regions at 17.8±2%, 32.1±2%, 46.4±2%, 60.6±2% and 74.9±2%, inclusive (17x17 fuel elements).

4. Core plane regions within ±2% of core height (±2.88 inches) about the bank demand position of the bank "D" control rods.

4.2.2.3 When $F_Q(z)$ is measured for reasons other than meeting the requirements of Specification 4.2.2.2 an overall measured $F_Q(z)$ shall be obtained from a power distribution map and increased by 3 percent to account for manufacturing tolerances and further increased by 5 percent to account for measurement uncertainty.

Pages 3/4 2-17 through 3/4 2-20 are to be deleted.

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SPECIAL TEST EXCEPTIONS

GROUP HEIGHT, INSERTION AND POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION

3.10.2 The group height, insertion and power distribution limits of Specifications 3.1.3.1, 3.1.3.5, 3.1.3.6, and 3.2.4 may be suspended during the performance of PHYSICS TESTS provided:

a. The THERMAL POWER is maintained less than or equal to 85% of RATED THERMAL POWER, and

b. The limits of Specifications 3.2.2 and 3.2.3 are maintained and determined at the frequencies specified in Specification 4.10.2.2. below.

APPLICABILITY: MODE 1.

ACTION:

With any of the limits of Specifications 3.2.2 or 3.2.3 being exceeded while the requirements of Specifications 3.1.3.1, 3.1.3.5, 3.1.3.6, and 3.2.4 are suspended, either:

a. Reduce THERMAL POWER sufficient to satisfy the ACTION requirements of Specifications 3.2.2 and 3.2.3, or

b. Be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.10.2.1 The THERMAL POWER shall be determined to be less than or equal to 85% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.2.2 The Surveillance Requirements of the below listed Specifications shall be performed at least once per 12 hours during PHYSICS TESTS.

a. Specification 4.2.2.2 and 4.2.2.3.

b. Specification 4.2.3.1 and 4.2.3.2.

The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (a) maintaining the minimum DNBR in the core greater than or equal to 1.30 during normal operation and in short term transients, and (b) limiting the fission gas release, fuel pellet temperature & cladding mechanical properties to within assumed design criteria. In addition, limiting the peak linear power density during Condition I events provides assurance that the initial conditions assumed for the LOCA analyses are met and the ECCS acceptance criteria limit of 2200°F is not exceeded.

The definitions of certain hot channel and peaking factors as used in these specifications are as follows:

$F_Q(Z)$ Heat Flux Hot Channel Factor, is defined as the maximum local heat flux on the surface of a fuel rod at core elevation Z divided by the average fuel rod heat flux, allowing for manufacturing tolerances on fuel pellets and rods.

$F^N_{\Delta H}$ Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod with the highest integrated power to the average rod power.

3/4.2.1 AXIAL FLUX DIFFERENCE (AFD)

The limits on AXIAL FLUX DIFFERENCE assure that the $F_Q(Z)$ upper bound envelope, as given in Specification 3.2.2, is not exceeded during either normal operation or in the event of xenon redistribution following power changes.

Provisions for monitoring the AFD on an automatic basis are derived from the plant process computer through the AFD Monitor Alarm. The computer determines the one minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for at least 2 of 4 or 2 of 3 OPERABLE excore channels are outside the allowed ΔI-power operating space and the THERMAL POWER is greater than 50% of RATED THERMAL POWER.

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When $F^N_{\Delta H}$ is measured, 4% is the appropriate experimental error allowance for a full core map taken with the incore detection system. The specified limit for $F^N_{\Delta H}$ also contains an 8% allowance for uncertainties which means that normal operation will result in $F^N_{\Delta H}$ less than or equal to 1.55/1.08. The 8% allowance is based on the following considerations:

a. abnormal perturbations in the radial power shape, such as from rod misalignment, effect $F^N_{\Delta H}$ more directly than F_Q,

b. although rod movement has a direct influence upon limiting F_Q to within its limit, such control is not readily available to limit $F^N_{\Delta H}$, and

c. errors in prediction for control power shape detected during startup physics tests can be compensated for in F_Q by restricting axial flux distributions. This compensation for $F^N_{\Delta H}$ is less readily available.

The hot channel factor $F^M_{Q(Z)}$ is measured periodically and increased by a cycle and height dependent power factor, N(Z), to provide assurance that the limit on the hot channel factor, $F_Q(Z)$, is met. N(Z) accounts for the non-equilibrium effects of normal operation transients and was determined from expected power control maneuvers over the full range of burnup conditions in the core. The N(Z) function for normal operation is provided in the Core Surveillance Report per Specification 6.9.1.7.

3/4.2.4 QUADRANT POWER TILT RATIO

The quadrant power tilt ratio limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during startup testing and periodically during power operation.

The limit of 1.02 at which corrective action is required provides DNB and linear heat generation rate protection with x-y plane power tilts.

The two hour time allowance for operation with a tilt condition greater than 1.02 but less than 1.09 is provided to allow identification and correction of a dropped or misaligned rod. In the event such action does not correct the tilt, the margin for uncertainty on F_Q is reinstated by reducing the power by 3 percent for each percent of tilt in excess of 1.0.

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the QUADRANT POWER TILT RATIO. The incore detector monitoring is done with a full incore flux map or two sets of 4 symmetric thimbles. The two sets of 4 symmetric thimbles is a unique set of 8 detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, and N-8.

3/4.2.5 DNB PARAMETERS

The limits on the DNB related parameters assure that each of the parameters are maintained within the normal steady state envelope of operation assumed in the transient and accident analyses. The limits are consistent with the initial FSAR assumptions and have been analytically demonstrated adequate to maintain a minimum DNBR of 1.30 throughout each analyzed transient.

The 12 hour periodic surveillance of these parameters thru instrument readout is sufficient to ensure that the parameters are restored within their limits following load changes and other expected transient operation. The 18 month periodic measurement of the RCS total flow rate is adequate to detect flow degradation and ensure correlation of the flow indication channels with measured flow such that the indicated percent flow will provide sufficient verification of flow rate on a 12 hour basis.

3/4.3.3.7 FIRE DETECTION INSTRUMENTATION

OPERABILITY of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early stages. Prompt detection of fires will reduce the potential for damage to safety related equipment and is an integral element in the overall facility fire protection program.

In the event that a portion of the fire detection instrumentation is inoperable, the establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is restored to OPERABILITY.

3/4.3.3.8 This section has been deleted.

CORE SURVEILLANCE REPORT

6.9.1.7

The N(Z) function for normal operation shall be provided to the Regional Administrator, Region II, with a copy to:

Director, Office of Nuclear Reactor Regulation
Attention: Chief, Core Performance Branch
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

at least 60 days prior to cycle initial criticality. In the event that the limits would be submitted at some other time during the core life, they shall be submitted 60 days prior to the date the limits would become effective unless approved by the Commission.

Any information needed to support N(Z) will be by request from the NRC and need not be included in this report.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.8 Routine Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following initial criticality.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison (as appropriate) with preoperational studies, operational controls, and previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by Specification 3.12.2.

The Annual Radiological Environmental Operating Reports shall include the results of analysis of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the Table and Figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

The reports shall also include the following: a summary description of the radiological environmental monitoring program; at least two legible maps** covering all sampling locations keyed to a table giving distances and directions from the centerline of one reactor; the results of licensee participation in the Interlaboratory Comparison Program, required by Specification 3.12.3; discussion of all deviations from the sampling schedule of Table 4.12-1 and discussion of all analyses in which the LLD required by Table 4.12-3 was not achievable.

*A single submittal may be made for a multiple unit station.

**One map shall cover stations near the SITE BOUNDARY; a second shall include the more distant stations.

ATTACHMENT 2

DISCUSSION OF PROPOSED CHANGES

DISCUSSION OF PROPOSED CHANGES

INTRODUCTION

The heat flux hot channel factor (FQ) operating limit specified in the North Anna Technical Specifications is established by LOCA/ECCS analyses performed in accordance with 10 CFR 50 Appendix K. These analyses show that if the FQ limit is not exceeded, the predicted LOCA peak clad temperature will not exceed the 2200°F limit specified in the Final ECCS Acceptance Criteria. The Technical Specifications also establish the required method for verification that the actual peaking factor realized during operation will not exceed the axially dependent peaking factor (FQ(Z)) limit.

This verification is currently performed by combining the axially dependent radial peaking factor, Fxy(Z), which is determined by periodic surveillance with the core flux monitoring system, with an analytically determined axial peaking factor (PZ(Z), Refs. 1-2). The determination of PZ(Z) involves evaluating various plant operating manuevers such as load following. The analysis currently assumes the Constant Axial Offset Control (CAOC) operating strategy discussed in Reference 1. During CAOC operation, the measured core axial flux difference (AFD) is maintained within a fixed band (+ or - 5%) of a target value. The target AFD is established by equilibrium operating conditions.

The proposed changes will replace the CAOC AFD limits with a set of limits established by the Relaxed Power Distribution Control (RPDC) methodology discussed in Reference 2. The important feature of the RPDC strategy is that, instead of analytically verifying the peaking factor (FQ) margin for a fixed AFD limit band, the AFD band is varied until the available FQ margin, which increases as power decreases, is utilized. Because a wider range of axial shapes can be realized under RPDC normal operation, additional analyses must be performed to verify that the overtemperature delta-T (OTDT) and overpower delta-T trips continue to provide adequate DNB and local overpower (high kw/ft) protection over the entire range of anticipated Condition II events. In addition, the shapes are evaluated as potential preconditions for the Complete Loss of Flow accident, to ensure that no DNB violations would occur during the bounding, non-OTDT-protected accident. The methodology for performing this verification is discussed in further detail in Reference 2.

Additionally, the current requirement for monitoring the axially dependent radial peaking factor, Fxy(Z), is being replaced by a requirement to monitor the total peaking factor FQ(Z). This is accomplished by taking a full core flux map under equilibrium and increasing the measured value by appropriate factors to account for manufacturing tolerances and measurement uncertainties. Finally, since the FQ(Z) is measured under equilibrium conditions, a nonequilibrium factor, N(Z), is applied. N(Z) accounts for the maximum potential increase in local peaking which could occur during transient, nonequilibrium operation. In accounting for transient effects, N(Z) thus has a function which is similar to PZ(Z) in the current approach. The difference is that where PZ(Z) is a nonequilibrium axial peaking factor, N(Z) envelopes the potential equilibrium-to-nonequilibrium FQ increase and accounts for both axial and radial xenon and power redistribution effects.

ITEM-BY ITEM DISCUSSION OF CHANGES

1. Replacement of CAOC Axial Flux Difference (AFD) Limits with RPDC Limits (Sections 3.2.1, 4.2.1, B3/4.2.1 and 3.10.2)

All references to the indicated AFD target and operating band have been deleted, replacing them with AFD limits consistent with the RPDC methodology of Reference 2. In the Action Statement associated with the Limiting Condition for Operation (LCO), the requirement to restore the indicated AFD to within the limits within 15 minutes has been retained. If this requirement is not met, power must be reduced to less than 50% of rated within 30 minutes. As discussed in Reference 2, maintaining the AFD within the prescribed limits will ensure that: 1) the maximum expected FQ(Z) will not exceed the limit specified in Section 3.2.2; 2) the axial power distribution in the core will not fall outside the range of preconditions used to ensure that the overtemperature delta-T and overpower delta-T functions provide adequate core protection ; and 3) the UFSAR analysis of the Complete Loss of Flow event remains limiting. The lower limit of 50% power on imposing AFD limits is consistent with the current Technical Specifications.

Reference to the Special Test Exception of Section 3.10.2 has been removed from Section 3.2.1. Thus the specified axial flux difference limits will apply during the performance of physics tests.

2. Deletion of the Requirement to Place the Reactor in at least Hot Standby to Reduce the Overpower Delta-T Trip Setpoint (Section 3.2.2, Action a) -

The requirement to place the unit in Hot Standby in order to reduce the Overpower delta-T trip setpoint has been deleted since the reduction can be performed, one channel at a time, while at power.

3. Removal of all References to the Axial Power Distribution Monitoring System (APDMS) (Section 3.2.2, Action a.2, Sections 3.2.6, B 3/4.2.6, 6.9.1.7)-

Under the existing Specifications, use of APDMS is required at or above power levels for which the product of the analytically predicted FQ (from the load follow analysis dicussed previously) and power exceeds the current LOCA limit. Under the RPDC philosophy, the operating limits on axial offset are established to ensure that the FQ LOCA limit is not exceeded. Thus the cycle-to-cycle variations in analytically predicted maximum FQ (and therefore APDMS turn-on power level) which occur under the existing specifications will be eliminated. Rather, the delta-I (Axial Flux Difference) envelope is now the important analysis output variable that is subject to cycle-by-cycle analytic verification. The revised Specifications provide a method for compensating for any FQ violations that could potentially occur under nonequilibrium conditions by narrowing the Delta-I limits. APDMS is a redundant measure and therefore not required for operation with RPDC/FQ surveillance.

4. Replacment of Fxy Surveillance Requirement with FQ Surveillance (Sections 4.2.2, B3/4.2, B3/4.2.3, 6.9.1.7) -

The existing specifications require periodic verification that FQ(Z) remains below its limit by monitoring the radial peaking factor Fxy(Z) and comparing to a cycle-specific limit. This limit is established such that the maximum product of the Fxy(Z) limit and the analytically predicted nonequilibrium axial peaking factor PZ(Z) remains below the FQ(Z) limit (Ref. 1). The revised specifications require a direct measurement of FQ at least once per 31 effective full power days. The measured FQ is then increased by the nonequilibrium factor N(Z) to account for power distribution transients during normal operation. Development of the cycle-specific N(Z) factor negates the requirement to generate the axial peaking factor (PZ(Z)) for each reload cycle. Since FQ is measured directly, the requirement for cycle-dependent Fxy surveillance is no longer necessary. The surveillance requirement exclusion at the grids and the "D" bank demand position which had been allowed for Fxy surveillance has been retained for FQ surveillance. Measurement uncertainty is sufficiently high in this relatively small fraction of the core to justify the exclusion of surveillance therein.

5. Modification of the Core Surveillance Report (Section 6.9.1.7)

As discussed previously, FQ surveillance requires the use of the N(Z) function as a cycle specific multiplier on FQ(measured) in order to incorporate nonequilibrium effects. The Core Surveillance Report provides this function to the Commission on a cycle-by-cycle basis, replacing the current requirement to provide the Fxy limit, the surveillance power level and the FQ flyspeck.

SAFETY EVALUATION RESULTS

Virginia Electric and Power Company has performed a detailed review of the impact of operation with Relaxed Power Distribution Control/FQ Surveillance on the various accident scenarios discussed in Chapter 15 of the North Anna UFSAR. Specifically, the impact of the wider axial flux difference on key safety parameters which could influence accident analysis results has been assessed. Among those parameters considered are: trip reactivity, both total value and reactivity as a function of rod insertion; shutdown margin; reactivity insertion rates due to rod withdrawal from subcritical and at power; and rod worths and/or peaking factors for ejected, dropped or misaligned control rods.

This review has demonstrated that, apart from the RPDC limit generation procedures discussed in detail in Reference 2, no changes will be required to the other safety analysis methods described in Reference 3 to incorporate the effect of the widened delta-I band resulting from the RPDC methodology. The current analysis methods used by Virginia Electric and Power Company already employ a conservative method for incorporating the effects of skewed axial power distributions. As is currently the practice, the accident analyses will continue to be evaluated on a reload basis for RPDC operation to ensure that the key input parameters remain bounding. Should an accident analysis be determined to be impacted by a specific reload design, that accident will be evaluated or reanalyzed, as appropriate.

APPLICATION TO UNIT 2, CYCLE 4

The North Anna Unit 2 Cycle 4 (N2C4) reload core design has been evaluated for operation under the proposed RPDC Technical Specifications in accordance with the methodology presented in Reference 2. The analysis included examination of the LOCA and complete Loss of Flow Accident (LOFA) preconditions, the peak linear power (kw/ft), the overtemperature delta-T f(delta-I) function and the fuel rod design criteria. Each analysis was performed at beginning, middle and end of cycle. The analysis results yielded two conclusions: 1) none of the normal operation conditions allowed by RPDC were found to violate the key safety criteria, and 2) all of the Condition II events examined in the FSAR were shown to yield acceptable results when initiated from any of these normal operation conditions. The RPDC bands were thus found to be an acceptable operating space.

10 CFR 50.59 SAFETY REVIEW

Based on a detailed safety evaluation, Virginia Electric and Power Company has concluded that implementation of the proposed Relaxed Power Distribution Control/ FQ Surveillance Technical Specifications will not introduce an unreviewed safety question as defined in 10 CFR 50.59. Specifically:

1. Since the proposed changes involve only a relaxation of the limits in axial power distribution skewing, neither the probability of occurrence nor the consequences of any accident or malfunction of equipment important to safety previously evaluated in the safety analysis report is increased by these proposed changes. Furthermore, the RPDC analysis procedures and continued application of current reload design and safety analysis methodology will ensure that the UFSAR accident analyses remain bounding.

2. The proposed changes do not involve any alterations to the physical plant which introduce any new or unique operational modes or accident precursors. Thus the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report is not being created

by these proposed changes.

3. While a relaxation of the axial offset operating limits is realized, the margin of safety as defined in the basis for any technical specification is not reduced by these proposed changes; the margins of safety are preserved by the imposition of a frequent FQ surveillance requirement and by effectively reducing the limit on measured equilibrium FQ by a conservative nonequilibrium factor, N(Z).

10 CFR 50.92 SIGNIFICANT HAZARDS REVIEW

The proposed changes do not pose a significant hazards consideration as defined in 10CFR50.92. This conclusion is based upon Example vi of those types of license amendments that are considered unlikely to involve significant hazards considerations. Example vi, which was published in the Federal Register, Vol. 48, No. 67, April 6, 1983, p. 14870, "Standards for Determining Whether License Amendments Involve No Significant Hazards Considerations, Interim Final Report," cites "a change which either may result in some increase to the probability or consequences of a previously analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the systems or components specified in the Standard Review

Plan." Virginia Electric and Power Company's evaluation shows that all of the acceptance criteria for the transient analyses presented in the UFSAR are met and the appropriate safety margins are maintained.

REFERENCES

1. Morita, T., et al.: "Topical Report- Power Distribution Control Load Following Procedures," WCAP-8385, Westinghouse Electric Corporation, (September 1974).

2. Basehore, K., et al.: "Relaxed Power Distribution Control Methodology and Associated FQ Surveillance Technical Specifications," VEP-NE-1, Virginia Electric and Power Company, (October 1984).

3. Bordelon, F. M., et al.: "Westinghouse Reload Safety Evaluation Methodology," WCAP-9272, Westinghouse Electric Corporation, (March 1978).

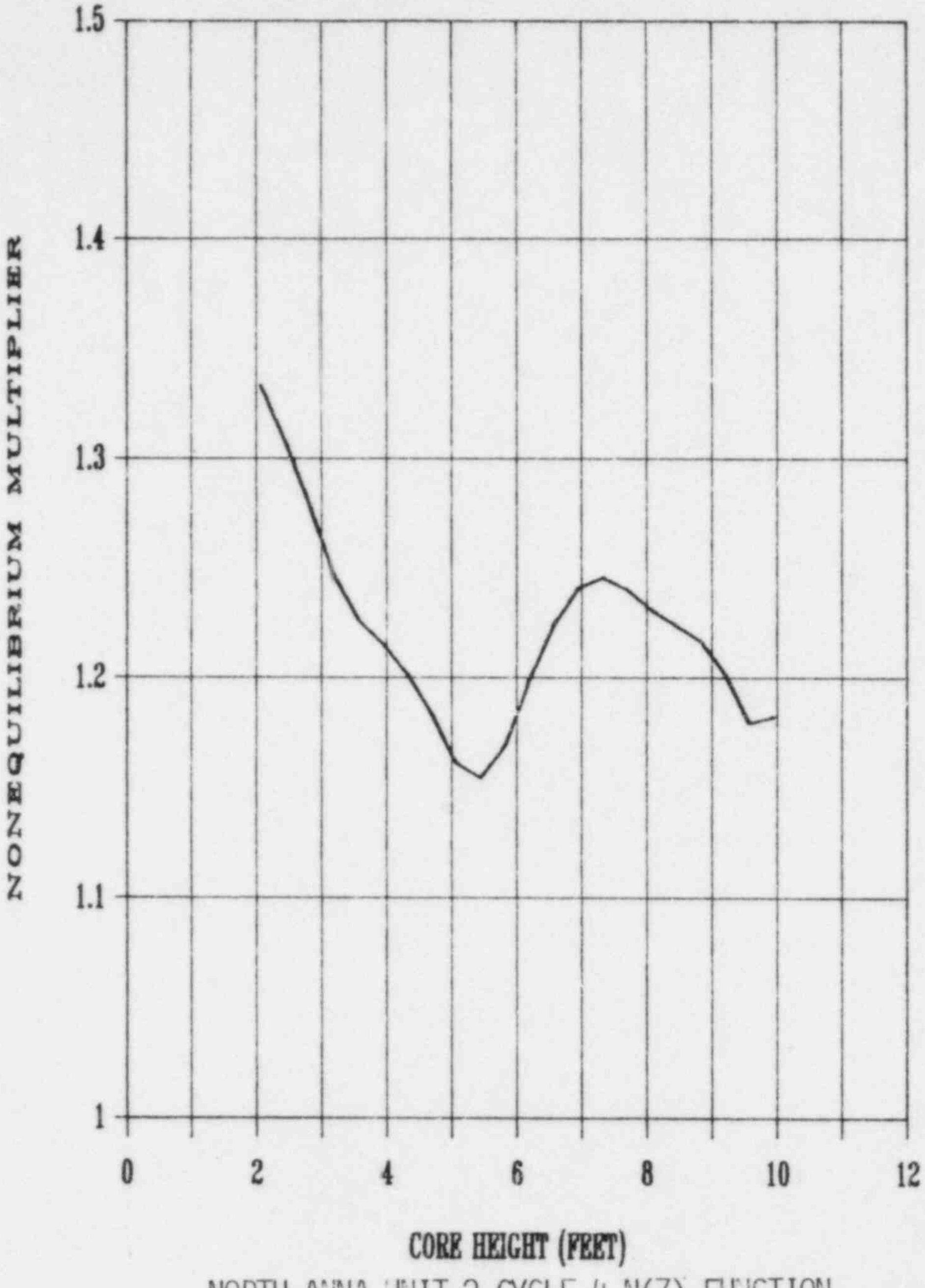
ATTACHMENT 3

CORE SURVEILLANCE REPORT FOR

NORTH ANNA UNIT 2, CYCLE 4

Proposed North Anna Unit No. 2 Technical Specification 6.9.1.7 requires that the cycle- and burnup-dependent N(z) function be provided to the Region II Regional Administrator and to the Core Performance Branch Chief of the Office of Nuclear Reactor Regulation. The N(z) function which is appropriate for North Anna Unit 2, Cycle 4 is attached. The N(z) function was calculated according to the procedure of VEP-NE-1.

TOP AND BOTTOM 15 PERCENT EXCLUDED AS PER
TECHNICAL SPECIFICATION 4.2.2.2.G

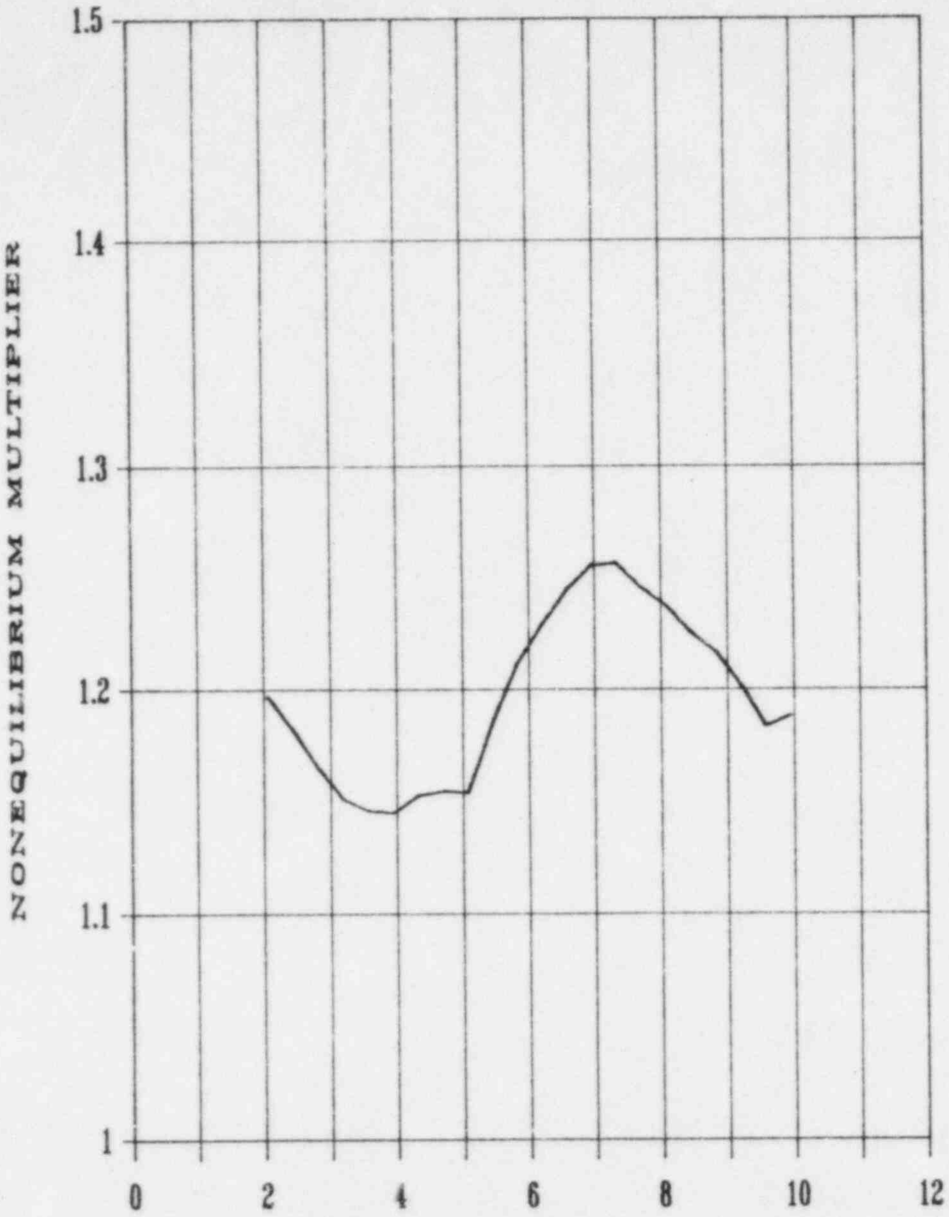


NORTH ANNA UNIT 2 CYCLE 4 N(Z) FUNCTION
FOR BURNUPS LESS THAN 7,000 MWD/MTU

N(Z) FUNCTION
NORTH ANNA UNIT 2 CYCLE 4
BURNUPS LESS THAN 7,000 MWD/MTU

HEIGHT	N(Z)
0.19	.
0.56	.
0.94	.
1.31	.
1.69	.
2.06	1.333
2.44	1.308
2.81	1.279
3.19	1.247
3.56	1.227
3.94	1.215
4.31	1.201
4.69	1.183
5.06	1.161
5.44	1.154
5.81	1.169
6.19	1.200
6.56	1.225
6.94	1.241
7.31	1.246
7.69	1.240
8.06	1.231
8.44	1.224
8.81	1.217
9.19	1.202
9.56	1.180
9.94	1.183
10.31	.
10.69	.
11.06	.
11.44	.
11.81	.

TOP AND BOTTOM 15 PERCENT EXCLUDED AS PER
TECHNICAL SPECIFICATION 4.2.2.2.G

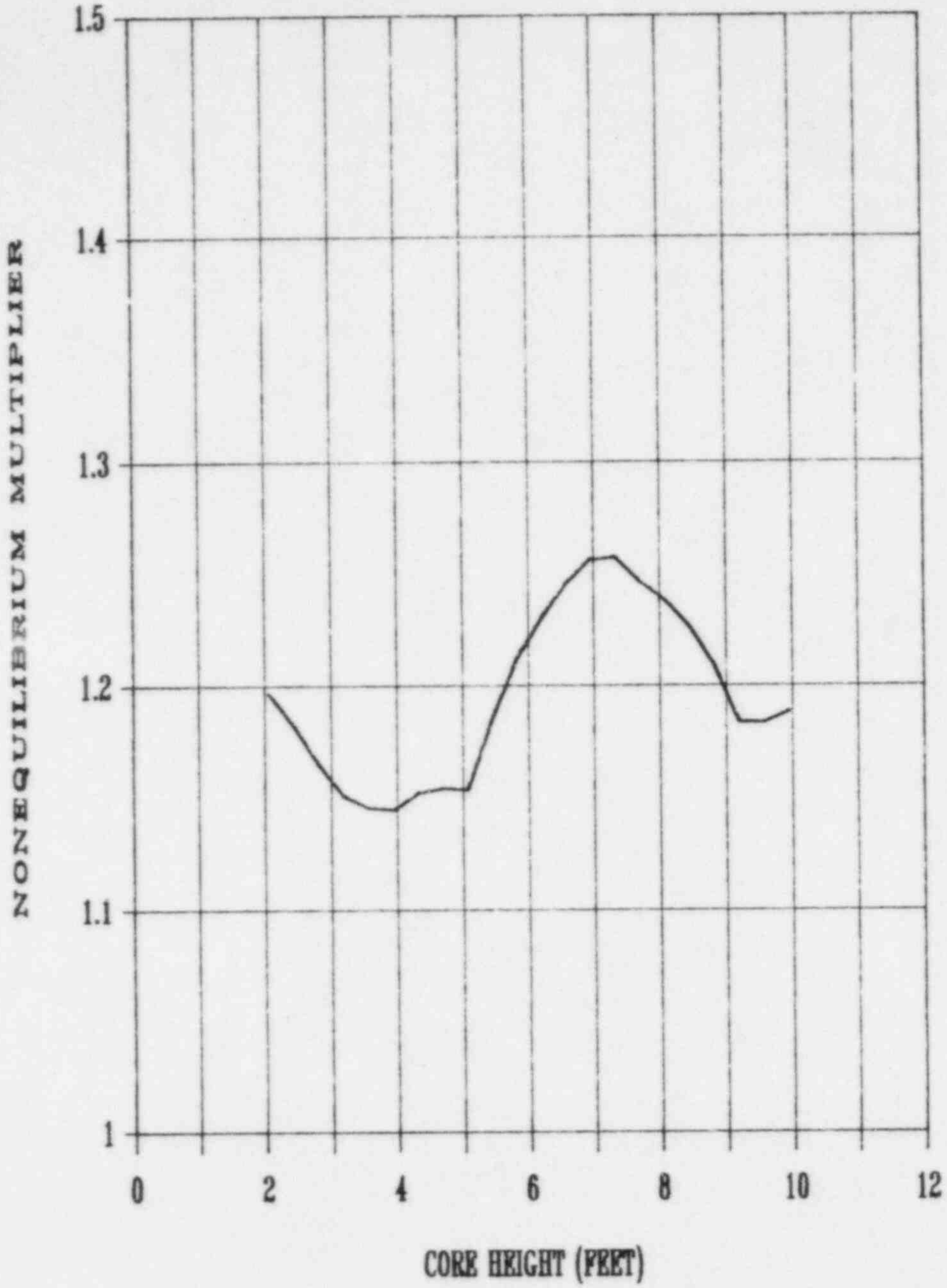


NORTH ANNA UNIT 2 CYCLE 4 (NZ) FUNCTION
FOR BURNUPS BETWEEN 7,000 AND 14,700 MWD/MTU

N(Z) FUNCTION
NORTH ANNA UNIT 2 CYCLE 4
BURNUPS BETWEEN 7,000 AND 14,700 MWD/MTU

HEIGHT	N(Z)
0.19	.
0.56	.
0.94	.
1.31	.
1.69	.
2.06	1.197
2.44	1.182
2.81	1.165
3.19	1.151
3.56	1.146
3.94	1.145
4.31	1.153
4.69	1.155
5.06	1.154
5.44	1.136
5.81	1.212
6.19	1.230
6.56	1.245
6.94	1.257
7.31	1.258
7.69	1.246
8.06	1.238
8.44	1.226
8.81	1.217
9.19	1.202
9.56	1.184
9.94	1.189
10.31	.
10.69	.
11.06	.
11.44	.
11.81	.

TOP AND BOTTOM 15 PERCENT EXCLUDED AS PER
TECHNICAL SPECIFICATION 4.2.2.2.G



NORTH ANNA UNIT 2 CYCLE 4 (NZ) FUNCTION
FOR BURNUPS GREATER THAN 14,700 MWD/MTU

N(Z) FUNCTION
NORTH ANNA UNIT 2 CYCLE 4
BURNUPS GREATER THAN 14,700 MWD/MTU

HEIGHT	N(Z)
0.19	.
0.56	.
0.94	.
1.31	.
1.69	.
2.06	1.197
2.44	1.182
2.81	1.165
3.19	1.151
3.56	1.146
3.94	1.145
4.31	1.153
4.69	1.155
5.06	1.154
5.44	1.186
5.81	1.212
6.19	1.230
6.56	1.245
6.94	1.257
7.31	1.258
7.69	1.246
8.06	1.238
8.44	1.226
8.81	1.209
9.19	1.184
9.56	1.184
9.94	1.139
10.31	.
10.69	.
11.06	.
11.44	.
11.81	.