

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

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NC. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Agendment No.120 License No. NPF-4

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company et al., (the licensee) dated May 23, 1989, 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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- Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:
 - (2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 120, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

 This license amenument is effective as of the date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

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Herbert N. Berkow, Director Project Directorate II-2 Division of Reactor Projects-I/II Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: July 31, 1989

ATTACHMENT TO LICENSE AMENDMENT NC. 120

TO FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Page

3/4 2-15 B 3/4 2-6 TABLE 3.2-1

DNB PARAMETERS

LIMITS

PARAMETER	3 Loops in Operation	<pre>2 Loops in Operation** & Loop Stop Valves Open</pre>	2 Loops in Operation** & Isolated Loop Stop Valves Closed
Reactor Coolant System Tavg	≤ 591 ⁰ F		
Pressurizer Pressure	<pre>2 2205 psig*</pre>		
Reactor Coolant System Total Flow Rate	284,000 gpm		

* Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% RATED THERMAL POWER per minute or a THERMAL POWER step increase in excess of 10% RATED THERMAL POWER.

**Values dependent on NRC approval of ECCS evaluation for these conditions.

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MORTH ANNA - UNIT 1

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Amendment Ho, 3,8,78,22, 37,39,45,84, 105

BASES

- a. abnormal perturbations in the radial power shape, such as from rod misalignment, effect $F_{\Delta H}$ more direct than $F_{\rm O}$,
- b. although rod movement has a direct influence upon limiting F_0 to within its limit, such control is not readily available to limit $F_{\Delta H}$, and
- c. errors in prediction for control power shape detected during startup physics tests can be compensated for in ${\rm F}_{\rm O}$ by restricting axial flux

distributions. This compensation for $F_{\Delta H}^{N}$ is less readily available.

Fuel rod bowing reduces the value of the DNB ratio. Credit is available to offset this reduction in the margin available between the safety analysis design DNBR values (1.46 for Virginia Electric and Power Company statistical methods) and the limiting design DNBR value (1.26 for Virginia Electric and Power Company statistical methods). A discussion of the rod bow penalty is presented in the FSAR.

Le hot channel factor $F_0^{M}(Z)$ 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, $F_0(Z)$, 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_0 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.

BASES

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 have been analytically demonstrated to be adequate to maintain a minimum DNBR greater than the design limit throughout each analyzed transient. Measurement uncertainties are accounted for in the DNB design margin.

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.

NORTH ANNA - UNIT 1

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Amendment No. 3,5,22,37,84,105,1120



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

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.104 License No. NPF-7

- 1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company, et al., (the licensee) dated May 23, 1989, 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 () 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.

- 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. NPF-7 is hereby amended to read as follows:
 - (2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 104 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

 This license amendment is effective as of the date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

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Herbert N. Berkow, Director Project Directorate II-2 Division of Reactor Projects-I/II Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: July 31, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 104

TO FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

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DNB PARAMETERS

LIMITING CONDITION FOR OPERATION

3.2.5 The following DNB related parameters shall be maintained within the limits shown on Table 3.2-1:

- a. Reactor Coolant System Tavo
- b. Pressurizer Pressure
- c. Reactor Coolant System Total Flow Rate

APPLICABILITY: MODE 1

ACTION:

With any of the above parameters exceeding its limit, restore the parameter to within its limit within 2 hours or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE EQUIREMENTS

4.2.5.1 Each of the parameters of Table 3.2-1 shall be verified to be within their limits at least once per 12 hours.

4.2.5.2 The Reactor Coolant System total flow rate shall be determined to be within its limit by measurement at least once per 18 months.

TABLE 3.2-1

DNB PARAMETERS

LIMITS

PARAMETER	3 Loops in Operation	<pre>2 Loops in Operation** & Loop Stop Valves Open</pre>	2 to period toop & Isolated Loop *p Valves Closed
Reactor Coulant System Tavg	<591°F		
Pressurizer Pressure	>2205 psig*		
Reactor Coolant System Total Flow Rate	>284,000 gpm		

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*Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% RATED THERMAL POWER per minute or a THERMAL POWER step increase in excess of 10% RATED THERMAL POWER.

**Values dependent on NRC approval of ECCS evaluation for these conditions

NORTH ANNA - UNIT 2

CASES.

When F_{AH}^{N} is measured, 4% is the appropriate experimental error allowance for a full fore map taken with the incore detection system. The specified limit for F_{AH} contains a 4% error allowance. Normal operation will result in a measured F_{AH}^{N} less than or equal to 1.49. The 4% 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 $F_0,$
- b. although rod movement has a direct influence upon limiting F_0 to within its limit, such control is not readily available to limit $F_{\Lambda H}^N$, and
- c. errors in prediction for control power shape detected during startup physics tests can be compensated for in F by restricting axial flux distributions. This compensation for $F_{\Delta H}$ is less readily available.

Fuel rod bowing reduces the value of the DNB ratio. Credit is available to offset this reduction in the margin available between the safety analysis design DNBR value (1.46 for Virginia Electric and Power Company statistical methods) and the limiting design DNBR value (1.26 for Virginia Electric and Power Company statistical methods). A discussion of the rod bow penalty is presented in the FSAR.

The hot channel factor $F_0M(Z)$ 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, $F_0(Z)$, 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.

NORTH ANNA - UNIT 2

Amendment No. 18,88,64,77,100

SASES

For purposes of monitoring QUADRANT POWER TILT RATIO when one excore detector is inoperable, the movable 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 have been analytically demonstrated to be adequate to maintain a minimum DNBR greater than the design limit throughout each analyzed transient. Measurement uncertainties must be accounted for during the periodic surveillance.

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.

Amendment No. 17, 6% 11, 144, 104