

March 1, 1995

Docket Nos. 50-338
and 50-339

DISTRIBUTION
See attached sheet

Mr. W. L. Stewart
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Dear Mr. Stewart:

SUBJECT: NORTH ANNA UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: CONTROL ROD
ROD URGENT FAILURE CONDITION (TAC NOS. M86040 AND M86041)

The Commission has issued the enclosed Amendment Nos. 179 and 160 to Facility
Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units
No. 1 and No. 2 (NA-1&2). The amendments revise the Technical Specifications
(TS) in response to your letters dated March 18, 1993 and December 9, 1993

The amendments revise the NA-1&2 TS which will allow plant personnel to effect
repairs to the Rod Control System in an orderly manner while continuing to
ensure that the control and shutdown banks are capable of performing their
designated safety function.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will
be included in the Commission's biweekly Federal Register notice.

Sincerely,
(Original Signed By)

Leon B. Engle, Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 179 to NPF-4
2. Amendment No. 160 to NPF-7
3. Safety Evaluation

080011

CP-1

cc w/enclosures:
See next page

OFFICE	LA:PDII-2	PM:PDII-2	D:PDII-2	OGC	JH
NAME	ETana ETT	LEngle JF	HBerlow	EHoller	
DATE	02/7/94	02/8/94	02/8/94	02/14/94	

OFFICIAL RECORD COPY - DOCUMENT NAME: C:\AUTOS\WPDOCS\NOANNA\NA86040.AMD

9403090205 940301
PDR ADDCK 05000338
P PDR

OFFICIAL RECORD COPY

DF01

Document Name: C: AUTOS/WPDOCS/NOANNA/NA86040.AMD
DATED: March 1, 1994

AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. NPF-4-NORTH ANNA UNIT 1
AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. NPF-7-NORTH ANNA UNIT 2

Docket File

NRC & Local PDRs

PDII-2 Reading

S. Varga, 14/E/4

H. Berkow

E. Tana (2)

L. Engle

OGC

D. Hagan

G. Hill (4), P-137

C. Grimes, 11/F/23

ACRS (10)

OPA

OC/LFDCB

M. Sinkule, R-II

Mr. W. L. Stewart
Virginia Electric & Power Company

North Anna Power Station
Units 1 and 2

cc:

Mr. William C. Porter, Jr.
County Administrator
Louisa County
P.O. Box 160
Louisa, Virginia 23093

Robert B. Strobe, M.D., M.P.H.
State Health Commissioner
Office of the Commissioner
Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218

Michael W. Maupin, Esq.
Hunton and Williams
Riverfront Plaza, East Tower
951 E. Byrd Street
Richmond, Virginia 23219

Regional Administrator, RII
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30323

Dr. W. T. Lough
Virginia State Corporation Commission
Division of Energy Regulation
P.O. Box 1197
Richmond, Virginia 23209

Mr. G. E. Kane, Manager
North Anna Power Station
P.O. Box 402
Mineral, Virginia 23117

Old Dominion Electric Cooperative
4201 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. M. L. Bowling, Manager
Nuclear Licensing & Programs
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Office of the Attorney General
Supreme Court Building
101 North 8th Street
Richmond, Virginia 23219

Senior Resident Inspector
North Anna Power Station
U.S. Nuclear Regulatory Commission
Route 2, Box 78
Mineral, Virginia 23117



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 179
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 March 18, 1993, as supplemented by letter dated December 9, 1993, 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.

9403090210 940301
PDR ADOCK 05000338
P PDR

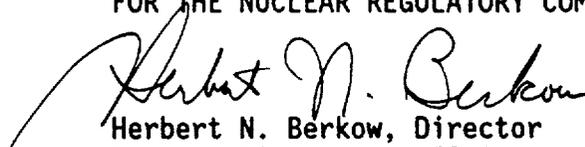
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 179, 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 its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



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: March 1, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 179

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.

<u>Remove Pages</u>	<u>Insert Pages</u>
3/4 1-18	3/4 1-18
3/4 1-24	3/4 1-24
---	3/4 1-24a
3/4 1-25	3/4 1-25
---	3/4 1-25a
B 3/4 1-4a	B 3/4 1-4a

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- a. At least once per 7 days by:
 - 1. Verifying the boron concentration in each water source,
 - 2. Verifying the contained borated water volume of each water source, and
 - 3. Verifying the boric acid storage system solution temperature.

- b. At least once per 24 hours by verifying the RWST temperature.

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All shutdown and control rods shall be OPERABLE and positioned within ± 12 steps* of their group step counter demand position.

APPLICABILITY: MODES 1** and 2**.

ACTION:

- a. With one or more rods untrippable, determine within one hour that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied and be in HOT STANDBY within 6 hours.
- b. With more than one rod misaligned from the group step counter demand position by more than the above alignment requirements, determine within one hour that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied and be in HOT STANDBY within 6 hours.
- c. With a maximum of one rod misaligned from the group step counter demand position by more than the above alignment requirements, POWER OPERATION may continue provided that within one hour, either:
 1. The rod is restored to OPERABLE status within the above alignment requirements, or
 2. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days. This reevaluation shall confirm that the previous analyzed results of these accidents remain valid for the duration of operation under these conditions, and

* For power levels below 50% of RATED THERMAL POWER, the position of each rod as determined by its individual rod position indicator may be more than ± 12 steps from its group step counter demand position for a maximum of one hour in every 24. During this hour, the indicated position of each rod may be no more than ± 24 steps from its demand position. The ± 24 step/hour limit is not applicable when control rod position is known to be greater than 12 steps from the rod group step counter demand position indication.

** See Special Test Exceptions 3.10.2 and 3.10.3.

REACTIVITY CONTROL SYSTEMS

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.4 The individual full length (shutdown and control) rod drop time from the 229 STEP withdrawn position shall be ≤ 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

- a. $T_{avg} \geq 500^{\circ}\text{F}$, and
- b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.
- b. With the rod drop times within limits but determined with 2 reactor coolant pumps operating, operation may proceed provided THERMAL POWER is restricted to:
 1. $\leq 66\%$ of RATED THERMAL POWER when the reactor coolant stop valves in the nonoperating loop are open, or
 2. $\leq 71\%$ of RATED THERMAL POWER when the reactor coolant stop valves in the nonoperating loop are closed.

SURVEILLANCE REQUIREMENTS

4.1.3.4 The rod drop time of full length rods shall be demonstrated through measurement prior to reactor criticality:

- a. For all rods following each removal of the reactor vessel head,
- b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and
- c. At least once per 18 months.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit specified in the CORE OPERATING LIMITS REPORT

- a. Within 15 minutes prior to initial control rod bank withdrawal during an approach to reactor criticality, and**
- b. At least once per 12 hours thereafter.**

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

- a. With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, either:
 1. Restore the control banks to within the insertion limits within two hours, or
 2. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the rod group step counter demand position using the insertion limits specified in the CORE OPERATING LIMITS REPORT, or
 3. Be in HOT STANDBY within 6 hours.
- b. With a maximum of one control bank inserted beyond the insertion limit specified in the CORE OPERATING LIMITS REPORT during surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system, POWER OPERATION## may continue provided that:
 1. the control bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,
 2. the affected bank is trippable,
 3. each shutdown and control rod is aligned to within ± 12 steps of its respective group step counter demand position,
 4. the insertion limits of Specification 3.1.3.5 are met for each shutdown bank,

* See Special Test Exceptions 3.10.2 and 3.10.3.

With $K_{eff} \geq 1.0$.

Provision for continued POWER OPERATION does not apply to Control Bank D inserted beyond the insertion limit.

LIMITING CONDITION FOR OPERATION (cont'd.)

5. the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours, and
6. the control bank is restored to within the insertion limit specified in the CORE OPERATING LIMITS REPORT within 72 hours.

Otherwise, be in HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify either the individual rod positions (indicated positions) or the group step counter demand position of each rod group to be within the insertion limits at least once per 4 hours.

THIS PAGE DELETED

REACTIVITY CONTROL SYSTEMS

BASES (Continued)

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors or a restriction in THERMAL POWER: either of these restrictions provides assurance of fuel rod integrity during continued operation. In addition those accident analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

Continuous monitoring of rod position with respect to insertion limits and rod deviation is provided by the rod insertion limit monitor and rod position deviation monitor, respectively. OPERABILITY of the rod position deviation monitor is verified by a functional test at least once per 7 days and by comparison of the indicated positions versus the respective demand position indicators at least once per 12 hours. If the rod position deviation monitor or the rod insertion limit monitor is inoperable, the frequency of manual comparison of indicated rod (or bank) position is increased to an interval of at least once per 4 hours.

In the event that a malfunction of the Rod Control System renders control rods immovable, provision is made for continued operation provided:

- the affected control rods remain trippable, and
- the individual control rod alignment limits are met.

In the event that a malfunction of the Rod Control System renders control rod banks immovable during surveillance testing, provision is made for 72 hours of continued operation provided:

- the affected control rod banks remain trippable,
- the individual control rod alignment limits are met,
- a maximum of one control or shutdown bank is inserted no more than 18 steps below the insertion limit, and
- the SHUTDOWN MARGIN requirements are verified every 12 hours during the period the insertion limit is not met.

Control Bank D is excluded from the 72 hour provision since insertion of D Bank below the insertion limit is not required for control rod assembly surveillance testing.

Checks are performed for each reload core to ensure that bank insertions of up to 18 steps will not result in power distributions which violate the DNB criterion for ANS Condition II transients (moderate frequency transients analyzed in Section 15.2 of the UFSAR) or in a violation of the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 during the repair period.

The 72 hour period for a control rod assembly bank to be inserted below its insertion limit restricts the likelihood of a more severe (i.e., ANS Condition III or IV) accident or transient condition occurring concurrently with the insertion limit violation.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the accident analyses. Measurement with $T_{avg} \geq 500^{\circ}\text{F}$ and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 160
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 March 18, 1993, as supplemented by letter dated December 9, 1993, 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.

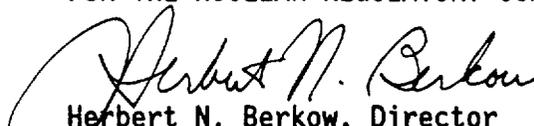
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-7 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 160 , 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 its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



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: March 1, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 160

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.

Remove Pages

3/4 1-16

3/4 1-22

3/4 1-23

B 3/4 1-4a

Insert Pages

3/4 1-16

3/4 1-22

3/4 1-22a

3/4 1-23

3/4 1-23a

B 3/4 1-4a

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

- 4.1.2.8 Each borated water source shall be demonstrated OPERABLE:
- a. At least once per 7 days by:
 1. Verifying the boron concentration in each water source,
 2. Verifying the contained borated water volume of each water source, and
 3. Verifying the boric acid storage system solution temperature.
 - b. At least once per 24 hours by verifying the RWST temperature.

REACTIVITY CONTROL SYSTEMS

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All shutdown and control rods shall be OPERABLE and positioned within ± 12 steps* of their group step counter demand position.

APPLICABILITY: MODES 1** and 2**.

ACTION:

- a. With one or more rods untrippable, determine within one hour that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied and be in HOT STANDBY within 6 hours.
- b. With more than one rod misaligned from the group step counter demand position by more than the above alignment requirements, determine within one hour that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied and be in HOT STANDBY within 6 hours.
- c. With a maximum of one rod misaligned from the group step counter demand position by more than the above alignment requirements, POWER OPERATION may continue provided that within one hour, either:
 1. The rod is restored to OPERABLE status within the above alignment requirements, or
 2. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days. This reevaluation shall confirm that the previous analyzed results of these accidents remain valid for the duration of operation under these conditions, and

* For power levels below 50% of RATED THERMAL POWER, the position of each rod as determined by its individual rod position indicator may be more than ± 12 steps from its group step counter demand position for a maximum of one hour in every 24. During this hour, the indicated position of each rod may be no more than ± 24 steps from its demand position. The ± 24 step/hour limit is not applicable when control rod position is known to be greater than 12 steps from the rod group step counter demand position indication.

** See Special Test Exceptions 3.10.2 and 3.10.3.

REACTIVITY CONTROL SYSTEMS

ROD DROP TIME

LIMITING CONDITION FOR OPERATION

3.1.3.4 The individual full length (shutdown and control) rod drop time from the 229 STEP withdrawn position shall be less than or equal to 2.7 seconds from beginning of decay of stationary gripper coil voltage to dashpot entry with:

- a. T_{avg} greater than or equal to 500°F, and
- b. All reactor coolant pumps operating.

APPLICABILITY: MODES 1 and 2.

ACTION:

- a. With the drop time of any full length rod determined to exceed the above limit, restore the rod drop time to within the above limit prior to proceeding to MODE 1 or 2.
- b. With the rod drop times within limits but determined with 2 reactor coolant pumps operating, operation may proceed provided THERMAL POWER is restricted to:
 1. Less than or equal to 66% of RATED THERMAL POWER when the reactor coolant stop valves in the nonoperating loop are open, or
 2. Less than or equal to 71% of RATED THERMAL POWER when the reactor coolant stop valves in the nonoperating loop are closed.

SURVEILLANCE REQUIREMENTS

4.1.3.4 The rod drop time of full length rods shall be demonstrated through measurement prior to reactor criticality:

- a. For all rods following each removal of the reactor vessel head,
- b. For specifically affected individual rods following any maintenance on or modification to the control rod drive system which could affect the drop time of those specific rods, and
- c. At least once per 18 months.

REACTIVITY CONTROL SYSTEMS

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

- a. With a maximum of one shutdown rod inserted beyond the insertion limit specified in the CORE OPERATING LIMITS REPORT, except for surveillance testing pursuant to Specification 4.1.3.1.2, within one hour either:
 1. Restore the rod to within the insertion limit specified in the CORE OPERATING LIMITS REPORT, or
 2. Declare the rod to be misaligned and apply Specification 3.1.3.1
- b. With a maximum of one shutdown bank inserted beyond the insertion limit specified in the CORE OPERATING LIMITS REPORT during surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system, POWER OPERATION may continue provided that:
 1. the shutdown bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,
 2. the affected bank is trippable,
 3. each shutdown and control rod is aligned to within ± 12 steps of its respective group step counter demand position,
 4. the insertion limits of Specification 3.1.3.6 are met for each control bank,
 5. the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours, and
 6. the shutdown bank is restored to within the insertion limit specified in the CORE OPERATING LIMITS REPORT within 72 hours.

Otherwise, be in HOT STANDBY within the next 6 hours.

* See Special Test Exceptions 3.10.2 and 3.10.3.

With K_{eff} greater than or equal to 1.0

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit specified in the CORE OPERATING LIMITS REPORT

- a. Within 15 minutes prior to initial control rod bank withdrawal during an approach to reactor criticality, and
- b. At least once per 12 hours thereafter.

REACTIVITY CONTROL SYSTEMS

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#.

ACTION:

- a. With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.2, either:
 1. Restore the control banks to within the insertion limits within two hours, or
 2. Reduce THERMAL POWER within two hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the rod group step counter demand position using the insertion limits specified in the CORE OPERATING LIMITS REPORT, or
 3. Be in HOT STANDBY within 6 hours.
- b. With a maximum of one control bank inserted beyond the insertion limit specified in the CORE OPERATING LIMITS REPORT during surveillance testing pursuant to Specification 4.1.3.1.2 and immovable due to malfunctions in the rod control system, POWER OPERATION## may continue provided that:
 1. the control bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators,
 2. the affected bank is trippable,
 3. each shutdown and control rod is aligned to within ± 12 steps of its respective group step counter demand position,
 4. the insertion limits of Specification 3.1.3.5 are met for each shutdown bank,

* See Special Test Exceptions 3.10.2 and 3.10.3.

With $K_{eff} \geq 1.0$.

Provision for continued POWER OPERATION does not apply to Control Bank D inserted beyond the insertion limit.

LIMITING CONDITION FOR OPERATION (cont'd.)

5. the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined to be met at least once per 12 hours, and
6. the control bank is restored to within the insertion limit specified in the CORE OPERATING LIMITS REPORT within 72 hours.

Otherwise, be in HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the Rod Insertion Limit Monitor is inoperable, then verify either the individual rod positions (indicated positions) or the group step counter demand position of each rod group to be within the insertion limits at least once per 4 hours.

THIS PAGE DELETED

REACTIVITY CONTROL SYSTEMS

BASES (Continued)

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors or a restriction in THERMAL POWER: either of these restrictions provides assurance of fuel rod integrity during continued operation. In addition those accident analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

Continuous monitoring of rod position with respect to insertion limits and rod deviation is provided by the rod insertion limit monitor and rod position deviation monitor, respectively. OPERABILITY of the rod position deviation monitor is verified by a functional test at least once per 7 days and by comparison of the indicated positions versus the respective demand position indicators at least once per 12 hours. If the rod position deviation monitor or the rod insertion limit monitor is inoperable, the frequency of manual comparison of indicated rod (or bank) position is increased to an interval of at least once per 4 hours.

In the event that a malfunction of the Rod Control System renders control rods immovable, provision is made for continued operation provided:

- the affected control rods remain trippable, and
- the individual control rod alignment limits are met.

In the event that a malfunction of the Rod Control System renders control rod banks immovable during surveillance testing, provision is made for 72 hours of continued operation provided:

- the affected control rod banks remain trippable,
- the individual control rod alignment limits are met,
- a maximum of one control or shutdown bank is inserted no more than 18 steps below the insertion limit, and
- the SHUTDOWN MARGIN requirements are verified every 12 hours during the period the insertion limit is not met.

Control Bank D is excluded from the 72 hour provision since insertion of D Bank below the insertion limit is not required for control rod assembly surveillance testing.

Checks are performed for each reload core to ensure that bank insertions of up to 18 steps will not result in power distributions which violate the DNB criterion for ANS Condition II transients (moderate frequency transients analyzed in Section 15.2 of the UFSAR) or in a violation of the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 during the repair period.

The 72 hour period for a control rod assembly bank to be inserted below its insertion limit restricts the likelihood of a more severe (i.e., ANS Condition III or IV) accident or transient condition occurring concurrently with the insertion limit violation.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the accident analyses. Measurement with $T_{avg} \geq 500^{\circ}\text{F}$ and with all reactor coolant pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 179 AND 160 TO
FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7
VIRGINIA ELECTRIC AND POWER COMPANY
OLD DOMINION ELECTRIC COOPERATIVE
NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2
DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated March 18, 1993, as supplemented by letter dated December 9, 1993, the Virginia Electric and Power Company (the licensee) requested changes to the Technical Specifications (TS) for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The changes address operation with a control rod urgent failure condition including limited operation with one control or shutdown bank inserted slightly below its insertion limit.

The December 9, 1993 letter provided clarification of operation in the urgent failure condition. This clarification did not alter the proposed action or affect the staff's determination of no significant hazards consideration as noticed in the Federal Register on April 14, 1993 (58 FR 19492).

TS require periodic testing of each control and shutdown control rod assembly bank in the core during power operation to ensure that the control rod assemblies are trippable. This testing requires partial movement of each control rod assembly not fully inserted into the core. This is typically done at or near full power, one bank at a time. Current procedures call for sequential insertion and withdrawal of 18 steps for the bank being tested. Special test exceptions allow the rods to be inserted beyond their insertion limits for this test. The length of the test is not prescribed.

On several occasions NA-1&2 have experienced control rod urgent failure alarms during the control rod assembly surveillance testing. This alarm is indicative of an internal failure in the rod control equipment that has affected the ability of the system to move control rod assemblies. These failures have a number of causes and may take some time to diagnose.

These failures in no way impact the trippability of the control rod assemblies.

With an urgent failure alarm the present TS provide 2 hours for troubleshooting and repair prior to bringing the unit to hot shutdown in 6

hours. The proposed changes would allow up to 72 hours for troubleshooting and repair if the rod assembly exceeds the insertion limit.

2.0 TS CHANGES

TS 3.1.3.5 and TS 3.1.3.6 provide a limit on both time and insertion if a bank is immovable due to failures external to the control rod assembly drive mechanism. A maximum of one control or shutdown bank (with the exception of Control Bank D) may be inserted below its insertion limit for up to 12 hours during diagnosis and repair of the Rod Control System provided that:

- 1) the control or shutdown bank is inserted no more than 18 steps below the insertion limit as measured by the group step counter demand position indicators.
- 2) the affected bank is trippable
- 3) each shutdown and control rod is aligned to within ± 12 steps of its respective group step counter demand position
- 4) the shutdown margin requirement of TS 3.1.1.1 is determined to be met at least once per 12 hours.

TS 3.1.3.1 has been changed to treat control banks which cannot be moved by the Rod Control System as operable provided the affected banks are trippable.

3.0 EVALUATION

The proposed TS 3.1.3.1 modifies the wording to clearly define a control rod assembly as OPERABLE if it is trippable. If more than one control rod assembly in a given bank is immovable due to a failure external to the control rod assembly drive mechanism but remains trippable, the current specification allows 2 hours to restore the affected control rod assemblies to operable status. The proposed change would treat control banks which cannot be moved as operable as long as they are trippable and each control rod assembly is aligned with the group step counter. While there is no time limit for correcting such a problem, the licensee has committed in a letter dated December 9, 1993, to take prompt corrective action to return the Control Rod Drive System to service and regain the normal plant control function provided by the control rods. This change is acceptable because rods which are trippable, above the insertion limits, and within the analyzed alignment requirements, are fully capable of performing the intended safety function, even if they cannot be moved by the Rod Control System.

TS 3.1.3.5 and 3.1.3.6 define the shutdown and control bank insertion limits. The present TS allow exemption from the insertion limits for physics testing and periodic exercise of individual control rod assemblies. The exemption for control rod assembly testing is necessary because insertion limits require shutdown banks and control banks A, B, and C to be fully withdrawn for full power operation. In the event that the insertion limit is exceeded, the

present TS provide 2 hours for troubleshooting and repair and, if unsuccessful, the unit must be brought to hot shutdown in 6 hours. The 2-hour time limit does not allow sufficient time for diagnosis and repair and the licensee has had to request enforcement discretion in order to complete diagnosis and repair on several occasions.

The proposed TS 3.1.3.5 and TS 3.1.3.6 define limits of both time and insertion if a bank is immovable due to failures external to the control rod assembly drive mechanism. A maximum of one control or shutdown bank (with the exception of Control Bank D) may be inserted no more than 18 steps below its insertion limit for up to 72 hours during diagnosis and repair of the rod control system provided the bank is trippable and the shutdown margin requirements are satisfied once per 12 hours. Concurrent control rod misalignment (misalignment of individual control rod assemblies from their group step counter demand position by more than ± 12 steps) is not allowed. Because of the misalignment constraints and the 18 step limit, the impact on core reactivity and power distribution is very small. In addition, the shutdown margin is specifically reconfirmed every 12 hours and explicit analytical checks on the radial power distribution are performed as part of the reload safety evaluation process. Furthermore, if the affected bank is not restored to above the insertion limit within the allowed 72 hours, the unit must be placed in hot shutdown within the next 6 hours. This change will allow sufficient time for diagnosis and repairs while maintaining the safety function of the control rods since the affected rods are still trippable. In addition, alignment must be maintained and shutdown margin will be checked.

The changes to TS 3.1.3.5 and TS 3.1.3.6 are acceptable because:

- 1) all control and shutdown rod assemblies are trippable
- 2) all immovable rod assemblies exceed insertion limits by no more than 18 steps
- 3) all immovable rod assemblies are aligned
- 4) shutdown margin is specifically reconfirmed every 12 hours
- 5) explicit analytical checks of radial power distribution are performed as part of the reload safety evaluation and
- 6) if rod assemblies are not restored to within insertion limits within 72 hours, the unit must be placed in hot shutdown within the next 6 hours.

Finally, the proposed changes are consistent with the standard TS. Therefore, based on all of the above, the staff finds the proposed changes to be acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendment. The State official had no comment.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding (58 FR 19492). Accordingly, these amendments meet 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 the amendments.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Chatterton

Date: March 1, 1994