



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555

July 15, 1991

Docket Nos. 50-338
and 50-339

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: AUXILIARY
FEEDWATER PUMPS (TAC NOS. 75807 AND 75808)

The Commission has issued the enclosed Amendment Nos. 147 and 131 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 letter dated December 28, 1989, as modified February 14, 1991.

The amendments revise the acceptance criteria for the monthly testing of auxiliary feedwater pumps and allow acceptable discharge pressure and flow rates to be established and periodically reevaluated by ASME Section XI testing.

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,

A handwritten signature in black ink, appearing to read "Leon B. Engle".

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

Enclosures:

1. Amendment No. 147 to NPF-4
2. Amendment No. 131 to NPF-7
3. Safety Evaluation

cc w/enclosures:
See next page

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DISTRIBUTION
See attached sheet

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

Dear Mr. Stewart:

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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. 147 to NPF-4
2. Amendment No. 131 to NPF-7
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cc w/enclosures:
See next page

OFC	: LA: PD22	: PM: PD22	: SPLB: NRR	: C: SPLB: NRR	: D: PDII-2	: OGC	:
NAME	: DM: Wier	: LEngle: KDJ	: WLeFave	: CMcCracken	: HBer	: m208a	:
DATE	: 6/19/91	: 6/20/91	: 6/20/91	: 6/20/91	: 6/25/91	: 6/25/91	:

DATED: July 15, 1991

AMENDMENT NO. 147 TO FACILITY OPERATING LICENSE NO. NPF-4-NORTH ANNA UNIT 1
AMENDMENT NO. 131 TO FACILITY OPERATING LICENSE NO. NPF-7-NORTH ANNA UNIT 2

Docket File

NRC & Local PDRs

PDII-2 Reading

S. Varga, 14/E/4

G. Lainas, 14/H/3

H. Berkow

D. Miller

L. Engle

OGC-WF

D. Hagan, 3302 MNBB

E. Jordan, 3302 MNBB

B. Grimes, 9/A/2

G. Hill (8), P-137

Wanda Jones, P-130A

C. Grimes, 11/F/23

WLeFave, 8-D-1

CMcCracken, 8-D-1

ACRS (10)

GPA/PA

OC/LFMB

PD Plant-specific file [Gray File]

M. Sinkule, R-II

Others as required

cc: Plant Service list

130041

DF01
"

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

C. M. G. Buttery, 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
P. O. Box 1535
Richmond, Virginia 23212

Regional Administrator, Region II
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. J. P. O'Hanlon
Vice President - Nuclear Services
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. E. Wayne Harrell
Vice President - Nuclear Operations
Virginia Electric and Power Co.
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. Martin Bowling
Manager - Nuclear Licensing
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. Patrick A. O'Hare
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

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. 147
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 December 28, 1989, as modified February 14, 1991, 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.

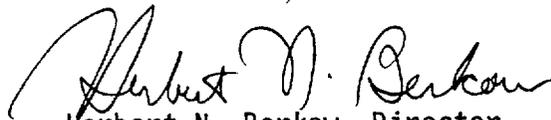
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 147, 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 the 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: July 15, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 147

TO FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

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

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PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

- a. Two motor driven auxiliary feedwater pumps, each capable of being powered from separate emergency busses, and
- b. One steam turbine driven auxiliary feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one auxiliary feedwater pump inoperable, restore the required auxiliary feedwater pumps to an OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the following 6 hours.
- b. With two auxiliary feedwater pumps inoperable be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 In addition to the requirements of Specification 4.0.5, each auxiliary feedwater pump shall be demonstrated OPERABLE:

- a. At least once per 31 days by:
 1. Verifying that each pump develops adequate discharge pressure and flow. The acceptance criterion shall be consistent with Specification 4.0.5. The provisions of Specification 4.0.4 are not applicable to steam turbine driven pump testing.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.
- b. At least once per 18 months during shutdown by:
1. Verifying that each automatic valve in the flow path actuates to its correct position on an auxiliary feedwater actuation test signal.
 2. Verifying that each auxiliary feedwater pump starts automatically upon receipt of an auxiliary feedwater actuation test signal.
- c. The auxiliary feedwater system shall be demonstrated OPERABLE prior to entry into MODE 3 following each COLD SHUTDOWN by performing a flow test to verify the normal flow path from the emergency condensate storage tank through each auxiliary feedwater pump to its associated steam generator.



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. 131
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 December 28, 1989, as modified February 14, 1991, 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.

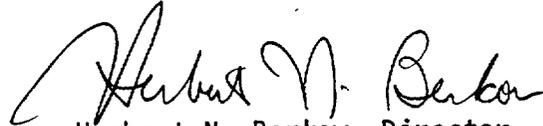
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-7 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 131, 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 the 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: July 15, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 131

TO FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

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

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PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

- a. Two motor driven auxiliary feedwater pumps, each capable of being powered from separate emergency busses, and
- b. One steam turbine driven auxiliary feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With one auxiliary feedwater pump inoperable, restore the required auxiliary feedwater pumps to a OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the following 6 hours.
- b. With two auxiliary feedwater pumps inoperable be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 In addition to the requirements of Specification 4.0.5, each auxiliary feedwater pump shall be demonstrated OPERABLE:

- a. At least once per 31 days by:
 1. Verifying that each pump develops adequate discharge pressure and flow. The acceptance criterion shall be consistent with Specification 4.0.5. The provisions of Specification 4.0.4 are not applicable to steam turbine driven pump testing.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.
- b. At least once per 18 months during shutdown by:
1. Verifying that each automatic valve in the flow path actuates to its correct position on an auxiliary feedwater actuation test signal.
 2. Verifying that each auxiliary feedwater pump starts automatically upon receipt of an auxiliary feedwater actuation test signal.
- c. The auxiliary feedwater system shall be demonstrated OPERABLE prior to entry into MODE 3 following each COLD SHUTDOWN by performing a flow test to verify the normal flow path from the emergency condensate storage tank through each auxiliary feedwater pump to its associated steam generator.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 147 AND 131 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 December 28, 1989, as modified February 14, 1991, the Virginia Electric and Power Company (the licensee) requested a change to the Technical Specifications (TS) for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The change would revise the acceptance criteria for the monthly testing of auxiliary feedwater (AFW) pumps required by the NA-1&2 TS 4.7.1.2.a. Specifically, the change would delete the current specific discharge pressure and flow values of at least 1250 psig at 53 gallons per minute (gpm) (motor-driven pumps) and 1380 psig at 35 gpm (turbine-driven pump). The change would allow acceptance discharge pressure and flow rates to be established and periodically reevaluated through ASME Section XI testing.

2.0 DISCUSSION

The AFW system is used to cool the steam generators, and therefore the reactor, when normal feedwater is lost or after a reactor trip. The AFW system includes two motor-driven pumps and one turbine-driven pump. TS 3.7.1.2 requires all three pumps to be OPERABLE in modes 1, 2 or 3 and TS 4.7.1.2 requires monthly testing on minimum flow recirculation.

The pumps were originally equipped with minimum flow recirculation lines which include orifices just large enough to ensure that the pumps will not overheat when run with all other flow paths closed. This minimum flow was the basis for the specific values of discharge pressure and flow rates specified in the NA-1&2 TS 4.7.1.2.a. The pumps were not designed to run on recirculation for periods of time as currently required by the NA-1&2 TS, and during the recirculation mode of operation, the recirculation line orifices restrict flow to less than 20% of best efficiency point flow and discharge pressure is near the pumps' shut-off head.

NRC Bulletin 88-04, "Safety Related Pump Loss," identified concerns with instability of pumps operating near their shut-off heads. In response to the Bulletin, the licensee committed to disassembling and inspecting the AFW pumps and to minimize operation at low flow. The initial inspections

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at NA-1&2 revealed problems on all six pumps, including diffuser vane cracks, scored bearings and tolerances out of specification. A root-cause evaluation attributed part of these problems to testing in the recirculation mode at the currently specified TS discharge pressure and flow rates. All six pumps were overhauled and new full-flow recirculation lines were added to all six AFW pumps during the latest NA-1&2 refueling outages to allow full-flow testing at power without affecting the steam generators or normal feedwater regulation. New benchmark performance data was gathered for ASME Section XI testing by pumping at full flow to the steam generators and quarterly Section XI testing is now done at flow conditions near the AFW pumps' best efficiency. Therefore, based on the above, the licensee's proposed change would delete the specific discharge pressure and flow rates specified in the current NA-1&2 TS 4.7.1.2.a and allow the monthly test to be conducted under ASME Section XI criteria.

3.0 EVALUATION

In response to NRC Bulletin 88-04, the licensee has implemented a design change which will allow testing of the AFW pumps at power and full-flow conditions. Pump testing under these parameters is similar to conditions under which the pumps would be performing their intended safety function. Monthly testing conducted under the criteria of the licensee's quarterly ASME Section XI testing would allow the pumps to be tested at flow conditions near the AFW pumps' best efficiency point and thereby reduce pump wear. Finally, pump testing enveloped by ASME Section XI criteria would provide more meaningful data for pump performance assessment and periodic reevaluation, as well as increase long-term pump reliability. Based on the above, the staff finds the proposed change 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 amendments. 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 the amendments involve no significant hazards consideration and there has been no public comment on such finding (56 FR 27050). 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 these 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: Leon Engle

Date: July 15, 1991