

October 25, 1985

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Docket Nos. 50-338
and 50-339

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Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment No. 70 and No. 56 to Facility Operating License No. NPF-4 and No. NPF-7 for the North Anna Power Station, Specifications (TS) in response to your letters dated March 29, 1985 and July 1, 1985. The amendments are effective as of the date of issuance.

The amendments revise the allowable time that one of the redundant service water headers can be inoperable from 72 hours to 168 hours provided 3 out of 4 service water pumps and 1 out of 2 auxiliary service water pumps are operable during the 168 hour Action Statement. The applicability for the 168 hour action statement applies only to that period of time required for completing the NA-1&2 Service Water System upgrade programs.

A copy of the Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,

/S/

Leon B. Engle, Project Manager
Operating Reactors Branch #3
Division of Licensing

Enclosure:

1. Amendment No. 70 to NPF-4
2. Amendment No. 56 to NPF-7
3. Safety Evaluation

cc w/enclosures:
See next page

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

North Anna Power Station
Units 1 and 2

cc:

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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. 70
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 29 and July 1, 1985, 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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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. 70, 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 its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Edward J. Butcher, Acting Chief
Operating Reactors Branch #3
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 25, 1985

ATTACHMENT TO LICENSE AMENDMENT NO. 70

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.

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PLANT SYSTEMS

3/4.7.3 COMPONENT COOLING WATER SUBSYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1 At least two component cooling water subsystems (shared with Unit 2) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one component cooling water subsystem OPERABLE, restore at least two subsystems to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water subsystems shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

PLANT SYSTEMS

3/4.7.4 SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 At least two service water loops (shared with Unit 2) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. The allowable time that one of the two service water loops can be inoperable as specified in Action Statement a. may be extended beyond 72 hours up to 168 hours as part of service water system upgrades* provided 3 out of 4 service water pumps and 1 out of 2 auxiliary service water pumps have been operable since initial entry into the action statement and remain operable during the extended action statement or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two service water loops shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.
- b. At least once per 6 months by measurement of the movement of the pumphouse and wing walls.
- c. At least once per 18 months during shutdown, by:
 1. Verifying that each automatic valve servicing safety related equipment actuates to its correct position on a safety injection signal.
 2. Verifying that each containment isolation valve actuates to its correct position on a containment high-high signal.

* Isolation of one service water loop for up to 168 hours is permitted only as part of service water system upgrades. System upgrades include modification and maintenance activities associated with the installation of new discharge headers and spray arrays, mechanical and chemical cleaning of service water piping and valves, pipe repair and replacement, valve repair and replacement, installation of corrosion mitigation measures and inspections of and repairs to buried piping interior coatings and pump house components.



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.56
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 29 and July 1, 1985, 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. 56, 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 its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Edward J. Butcher, Acting Chief
Operating Reactors Branch #3
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 25, 1985

ATTACHMENT TO LICENSE AMENDMENT NO. 56

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.

Page

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PLANT SYSTEMS

3/4.7.4 SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 At least two service water loops (shared with Unit 1) shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. The allowable time that one of the two service water loops can be inoperable as specified in Action Statement a. may be extended beyond 72 hours up to 168 hours as part of service water system upgrades* provided 3 out of 4 service water pumps and 1 out of 2 auxiliary service water pumps have been operable since initial entry into the action statement and remain operable during the extended action statement or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two service water loops shall be demonstrated OPERABLE:

- a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.
- b. At least once per 6 months by measurement of the movement of the pumphouse and wing walls.
- c. At least once per 18 months during shutdown, by:
 1. Verifying that each automatic valve servicing safety related equipment actuates to its correct position on a safety injection signal.
 2. Verifying that each containment isolation valve actuates to its correct position on a containment high-high signal.

* Isolation of one service water loop for up to 168 hours is permitted only as part of service water system upgrades. System upgrades include modification and maintenance activities associated with the installation of new discharge headers and spray arrays, mechanical and chemical cleaning of service water piping and valves, pipe repair and replacement, valve repair and replacement, installation of corrosion mitigation measures and inspections of and repairs to buried piping interior coatings and pump house components.

PLANT SYSTEMS

3/4.7.5 ULTIMATE HEAT SINK

LIMITING CONDITION FOR OPERATION

3.7.5.1 The ultimate heat sinks shall be OPERABLE:

a. Service Water Reservoir with:

1. A minimum water level at or above elevation 313 Mean Sea Level, USGS datum, and
2. An average water temperature of less than or equal to 95°F as measured at the service water pump outlet.

b. The North Anna Reservoir with:

1. A minimum water level at or above elevation 244 Mean Sea Level, USGS datum, and
2. An average water temperature of less than or equal to 95°F as measured at the condenser inlet.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the requirements of the above specification not satisfied, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.5.1 The ultimate heat sinks shall be determined OPERABLE at least once per 24 hours by verifying the average water temperature and water level to be within their limits.

4.7.5.2 Data for calculating the leakage from the service water reservoir shall be obtained and recorded at least once per 6 months.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 70 AND 56 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

Introduction:

By letters dated March 29 and July 1, 1985, the Virginia Electric and Power Company (the licensee) requested a temporary change to the Technical Specifications (TS) for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). Specifically, the proposed change would revise the Limiting Condition for Operation (LCO) from 72 hours to 168 hours for which one out of two Service Water System (SWS) headers could be out of service. The licensee is requesting this temporary change in order to expedite and perform a mechanical cleaning and refurbishing program for removal of corrosion products on the inner surfaces of the SWS piping and valves. A detailed description of the proposed mechanical cleaning program was submitted to the NRC by the licensee in a letter dated February 27, 1985. The licensee's safety evaluation supporting the temporary TS change was based on a probabilistic safety assessment of the NA-1&2 SWS. Our discussion and evaluation of the licensee's submittal is provided below.

Discussion:

The licensee's probabilistic safety assessment concluded that increasing the number of SWS pumps and auxiliary SWS pumps required to be operable during the 168 hour LCO provided an increased reliability of the SWS even though the allowable outage time for one SWS header was increased from 72 hours to 168 hours.

The probabilistic safety assessment of the NA-1&2 SWS consisted of a system description and definition of success criteria, and qualitative and quantitative analysis. The quantitative analysis consisted of system fault trees, a data base for the possible hardware failure rates and human errors, common cause failures, and the resultant minimal cut sets for the dominant failure modes of the SWS. The system unavailability for the SWS and those safety-related systems that require SW flow (recirculation spray heat exchangers and the charging pumps) were calculated for four different SWS operating conditions. The four configurations analyzed were: 1) both

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headers in operation; 2) one header out of service for a 72 hour period; 3) one header out of service for a 168 hour period; and 4) one header out of service for a 168 hour period with an increase in the number of SWS pumps required to be operational. Condition 2 above represents the current Technical Specification LCO on SWS header operability and Final Safety Analysis which requires that 2 out of 4 main service water pumps and 1 of 2 auxiliary SWS pumps be operational. The fourth condition mentioned above is based on 3 of 4 main SWS pumps and 1 of 2 auxiliary SWS pumps operational during the proposed mechanical cleaning program. The probabilistic study performed by the licensee showed that the reliability of the SWS and SW supply through the recirculation spray heat exchangers and charging pumps for condition 4 was higher, by approximately 10-50 percent, than for condition 2, which is the current LCO for the NA-1&2 SWS.

The licensee also analyzed the change in reliability of the component cooling water (CCW) heat exchangers which are cooled by the SWS. Although the CCW heat exchangers are not needed to mitigate the consequences of a Design Basis Accident (DBA), they are important to the temperature reduction of the reactor coolant from a hot shutdown state to a cold shutdown state. The reliability decreased somewhat (by approximately 70%) for the SW flow through the CCW heat exchangers from condition 4 described above. When one header is out of service, the cooling flow to the CCW heat exchanger is vulnerable to a blockage failure in either of two valves in the working header. The CCW heat exchanger system reliability decreased because the benefit of the extra SW pump was not enough to overcome the incremental vulnerability to the failure of the two particular valves. The risk contribution of maintaining the plant in a hot shutdown state for the brief period of time until SW can be restored to the CCW heat exchangers is judged to be negligible.

Based on these results, the licensee concluded that the temporary TS request would not result in an overall decrease in plant safety during the mechanical cleaning program.

The staff's review of the information contained in the March 29, 1985 submittal resulted in a number of questions regarding the methodology used in developing the fault trees and data base and the results of the minimal cut sets. These questions were transmitted to the licensee in a letter dated August 9, 1985. By letter dated August 26, 1985 the licensee responded to the staff's request for additional information.

With the exception of including in the fault trees the conditional events that alternate SW pumps and emergency diesel generators are not in maintenance, the staff concludes that the methodology utilized in the study is correct. The staff disagrees with the inclusion of this type of condition in fault trees because it leads to minimal cut sets that have events that do not contribute to system failure. However, the staff agrees that this inclusion, calculated by the licensee to be approximately 9%, does not exceed the difference between unavailabilities for conditions 2 and 4 and will not significantly change the final results. Therefore, the staff finds the system fault trees, minimal cut sets, and the data base as used to be acceptable.

For completeness, the staff also examined the potential for other adverse effects that the mechanical cleaning program could have on plant operations beyond those examined by the licensee. The staff examined the potential for adverse effects from the flooding of essential areas and equipment through the open SW train (due to an accidental connection with the intact train). The procedures and steps to be taken by the licensee to prevent and, if necessary, mitigate the effects of flooding during the mechanical cleaning program include the following:

- 1) The licensee will utilize administrative controls such as "tag out" procedures, locking closed those valves (in lines greater than 18" in diameter) that could connect the open SW train with the operating train. Also, constant on-location surveillance by plant personnel will minimize the possibility of a flood occurring.
- 2) The charging pump cubicles will be sealed to the 44 inch level to provide the operators with ample time to isolate the open line before the charging pumps are flooded. The flow through the open train can be terminated by using a blind flange that can be slid over the open end, by re-closing the valve interconnecting the two SWS trains (if inadvertently opened), or by stopping the SW pumps.
- 3) Certain MOVs and pumps in systems used to bring the plant to a cold shutdown state could be damaged by the postulated flood. Analyses and procedures provided by the licensee show that the necessary cold shutdown equipment could be restored to service within approximately two days.

Based on the above information provided by the licensee, the staff concluded that the licensee could successfully maintain the plant safely in a hot shutdown condition, but that the possibility exists of losing certain cold shutdown equipment if a flood should occur.

Evaluation:

The staff concludes that temporarily extending the LCO for one header of the NA-1&2 SWS from 72 hours to 168 hours is acceptable from a probabilistic risk viewpoint. The basis for this conclusion is as follows:

1. The end result of the mechanical cleaning program will be a more reliable and efficient SWS.
2. The temporary TS change request will include a LCO on the SW pumps requiring 3 out of 4 main SW pumps and 1 out of 2 auxiliary SW pumps to be operable while the 168 hour LCO is in effect. This restriction on removing SW pumps from service will more than negate the increase in the allowable header outage time. The above statement is verified by the licensee's probabilistic safety assessment which the staff has reviewed and finds sufficiently complete and reasonably representative to assess the differential system unavailability between the present and proposed SWS arrangements.

3. Although not assessed numerically, the staff considers the incremental probability of plant damage due to flooding through an open service water line during the outage time from 72 hours to 168 hours to be of low order if proper administrative controls on "tag out" of components in conjunction with increased surveillance by plant personnel is implemented. Finally, the risk contribution from maintaining the plant in a hot shutdown state for several days while repairs are made to cold shutdown equipment is judged to be negligible.

Therefore, based on the above, we find acceptable on a temporary basis, the allowable time that one of the two NA-1&2 SWS loops can be inoperable to hereby be revised from 72 hours to 168 hours provided 3 out of 4 service water pumps and 1 out of 2 auxiliary service water pumps are operable during the 168 hour LCO. The period of time permissible for an LCO of 168 hours is applicable for only such time as may be required to complete the NA-1&2 SWS upgrade. Finally, the NRC will monitor the licensee's administrative process and surveillance activities for mitigating the possible occurrence of flooding during the time as may be required to upgrade the NA-1&2 SWS.

Environmental Consideration:

These amendments involve a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The 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 published a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. 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.

Conclusion:

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

Date: October 25, 1985

Principal Contributors:

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