

August 6, 1987

Docket No. 50-339

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Docket File

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OGC-Bethesda  
D. Hagan  
E. Jordan

Dear Mr. Stewart:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 65868)

The Commission has issued the enclosed Amendment No. 81 to Facility Operating License No. NPF-7 for the North Anna Power Station, Unit No. 2 (NA-2). The amendment revises the Technical Specifications (TS) in response to your letter dated July 30, 1987.

This amendment suspends the surveillance testing requirements of TS 3.7.1.7 and 4.7.1.7.2.a relating to turbine governor valves for the remainder of Cycle 5 operation for NA-2.

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

Sincerely,

/s/

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

Enclosures:

- 1. Amendment No. 81 to NPF-7
- 2. Safety Evaluation

cc w/enclosures:

See next page

\*See previous concurrence

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\*PM:PD22  
LEngle:hc  
8/ /87

\*OGC  
8/ /87

\*D:PD22  
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Vice President - Nuclear Operations  
Virginia Electric and Power Company  
Post Office Box 26666  
Richmond, Virginia 23261

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See next page

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Mr. W. L. Stewart  
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North Anna Power Station  
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 81  
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 July 30, 1987, 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.

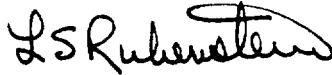
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-7 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 81, 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



Lester S. Rubenstein, 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: August 6, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 81

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.

Remove Page

3/4 7-12

Insert Page

3/4 7-12

## PLANT SYSTEMS

### STEAM TURBINE ASSEMBLY

#### LIMITING CONDITION FOR OPERATION

---

3.7.1.6 The structural integrity of the steam turbine assembly shall be maintained.

APPLICABILITY: MODES 1 and 2

ACTION: With the structural integrity of the steam turbine assembly not conforming to the above requirement restore the structural integrity of the steam turbine prior to placing it in service.

#### SURVEILLANCE REQUIREMENTS

---

4.7.1.6 The structural integrity of the steam turbine assembly shall be demonstrated;

- a. At least once per 40 months, during shutdown, by a visual and surface inspection of the steam turbine assembly at all accessible locations, and
- b. At least once per 10 years, during shutdown, by disassembly of the turbine and performing a visual, surface and volumetric inspection of all normally inaccessible parts.

## PLANT SYSTEMS

### TURBINE OVERSPEED

#### LIMITING CONDITION FOR OPERATION

---

3.7.1.7 At least one turbine overspeed system shall be OPERABLE.

APPLICABILITY: MODE 1, 2 and 3

ACTION: With the above required turbine overspeed protection system inoperable, within 6 hours either restore the system to OPERABLE status or isolate the turbine from the steam supply.

#### SURVEILLANCE REQUIREMENT

---

4.7.1.7.1 The provisions of Specification 4.0.4 are not applicable.

4.7.1.7.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

- a. At least once per 31 days by cycling each of the following valves through one complete cycle.
  1. 4 Turbine Throttle valves
  2. 4 Turbine Governor valves\*
  3. 4 Turbine Reheat Stop valves
  4. 4 Turbine Reheat Intercept valves
- b. At least once per 31 days by direct observation of the movement of each of the above valves through one complete cycle.\*
- c. At least once per 18 months, by performance of CHANNEL CALIBRATION on the turbine overspeed protection instruments.
- d. At least once per 40 months, by disassembly of at least one of each of the above valves and performing a visual and surface inspection of all valve seats, disks and stems and verifying no unacceptable flaws or corrosion.

\*For cycle 5 only, further testing of the turbine governor valves may be suspended during power coastdown operation between 196 and 835 MWe.





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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 81 TO  
FACILITY OPERATING LICENSE NO. NPF-7  
VIRGINIA ELECTRIC AND POWER COMPANY  
OLD DOMINION ELECTRIC COOPERATIVE  
NORTH ANNA POWER STATION, UNIT NO. 2  
DOCKET NO. 50-339

I. INTRODUCTION

By letter dated July 30, 1987, the Virginia Electric and Power Company (the licensee) requested that the Technical Specifications (TS) for the North Anna Power Station, Unit No. 2 (NA-2) be amended on an emergency basis. The request is for a one-time extension of the existing surveillance requirements of TS 3.7.1.7 and 4.7.1.7.2.a which would exempt the cycling of the turbine governor valves for the remainder of Cycle 5 operation.

The Commonwealth of Virginia was advised of this request on August 4, 1987, and had no comment regarding the subject request.

Prior to July 15, 1987, NA-1 had just completed a refueling outage and was at 100% power. NA-1 was scheduled to remain on line for an 18 month period. On July 15, 1987, NA-1 experienced a steam generator tube rupture which will now require an extended outage. Prior to the NA-1 steam generator tube rupture event, NA-2 was scheduled to begin a refueling outage on July 31, 1987 following a planned power coastdown to approximately 70% of rated full power. Because NA-1 is now in an extended outage and system load demands are high, the licensee desires to delay the start of the NA-2 refueling outage until September 7, 1987.

II. EVALUATION

Presently, the NA-2 TS 4.7.1.7.2.a requires that at least once per 31 days the four turbine throttle valves, four turbine governor valves, four turbine reheat stop valves, and four turbine reheat intercept valves be cycled through one complete cycle. The proposed emergency TS change would permit a one-time extension for cycling the turbine governor valves. The turbine valve freedom test for the other turbine valves (throttle, reheat stop, and reheat intercept valves) will be performed to satisfy the TS surveillance requirements. By the next scheduled performance of the turbine valve freedom test, the turbine should be operating with only two governor valves open and would continue to be operated in this configuration throughout the remainder of the power coastdown. As a result, the concern to verify proper overspeed protection is reduced from four to two governor valves. It should be noted

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that the operability of the turbine governor valves can be demonstrated on an ongoing basis (i.e., every few days) as turbine load is periodically adjusted downward to match reactor power during the power coastdown. This can be confirmed by monitoring the changes in governor valve position as turbine power is adjusted. The possibility of either of the two open governor valves failing to close upon demand is extremely remote based on the reliability of these valves as demonstrated during previous testing and operation during the power coastdown. Prior to 1984, the turbine valves on both units were tested weekly. Since that time, the turbine valves have been tested monthly without any failures to close. In addition, the valves have not failed to close in response to turbine trip demand. This high level of reliability is also assured, in part, by the all volatile chemical treatment of the feedwater system which essentially eliminates valve failure due to scale buildup on the valve surfaces.

In the event either of the two open turbine governor valves failed to close following a turbine trip demand, the turbine throttle valves, which will continue to be verified operable per TS surveillance requirements, would serve as a backup means to isolate steam from the turbine in this case. It should be noted that the turbine throttle valves are the valves taken credit for in the Reactor Protection System for tripping the turbine. The operator can take other manual actions to isolate steam from the turbine, and, in fact, is provided the necessary guidance by an Emergency Operating Procedure (EOP) to ensure the turbine is tripped. In the event that the turbine does not trip on a valid signal, the EOP (EP-1, Revision 1) provides specific actions to be taken. These actions include manually closing the main steam trip valves (MSTVs) to isolate the turbine.

The NA-2 turbines are of heavy hub design. This design reduces the probability that turbine missiles would be produced before the turbine could be isolated in the event of turbine overspeeding and subsequent disk failure.

NA-2 is at end of fuel cycle with zero boron and in a power coastdown. To preclude the possibility of damaging the turbine's first stage blading, Westinghouse recommends that the governor valves not be cycled at the current power level. Only if power is reduced to less than approximately 196 MWe or increased to approximately 835 MWe could the governor valves be cycled without subjecting the turbine blading to excessive loading. To enable Unit 2 to return to power after performing such a test at low power, control rods would have to be used to lower power. This condition would induce a xenon transient in the core because of the lack of excess reactivity in the core and could affect core stability. Core peaking factors would also be adversely affected by the xenon redistribution. A decision to perform the test at the lower power level would also result in an extended reduction in power in order to minimize the effects of any transient on the core and to ensure the secondary plant performance is controlled and monitored closely. Not only would the power reduction result in lost generation, but it would also subject the plant to increased risk of a severe transient such as a reactor trip. It is noted that lost generation is a crucial factor at this time since new peak generation loads have been occurring on a regular basis in late July 1987 and are forecast for August 1987.

Rather than subject the unit to a potentially severe transient, justification exists to request a one-time suspension from cycling the turbine governor valves for the remainder of Cycle 5 operation. The operability of the other turbine valves will be verified, and the demonstrated high reliability of the governor valves and the monitoring of the governor valve position changes during the coastdown provide assurance that the turbine overspeed protection system will operate as designed, if needed, until the NA-2 refueling outage which is now currently scheduled to begin on September 7, 1987.

### III. SAFETY SUMMARY

Based upon the above considerations, the staff believes that it is acceptable to revise the NA-2 TS on a one-time basis to suspend the surveillance requirement for cycling the turbine governor valves to the new extended NA-2 refueling outage scheduled to commence September 7, 1987. Past history of these turbine governor valves has shown a high level of reliability and the valves have not failed to close in response to turbine trip demand. Therefore, the probability of an accident occurring for the short period of time of the relief request is low.

### IV. FINDING ON EXISTENCE OF EMERGENCY SITUATION

10 CFR 50.91(a)(5) provides the necessary requirements for issuing an amendment when the Commission finds that an emergency situation exists and failure to act in a timely way would result in derating or shutdown of a nuclear plant. The Commission expects its licensees to: apply for license amendments in a timely fashion; not abuse the emergency provisions by failing to make a timely application for the amendment and thus itself creating the emergency; provide an explanation as to why the emergency situation occurred; and why it could not have been avoided.

As stated above, the NA-2 TS 3.7.1.7 requires that a turbine valve freedom test be performed every 31 days in order to demonstrate operability of the turbine overspeed protection system per Surveillance Requirement 4.7.1.7.2.a. The test is scheduled to be performed on August 2, 1987 and must be completed by August 9, 1987. However, with the extended power coastdown, the projected power level at the time of the test will be within the range that Westinghouse recommends that the governor valves not be cycled. This recommendation is to preclude subjecting the first stage blades of the high pressure turbine to loadings which exceed design conditions. Reducing turbine power to a level below the restricted range may induce a transient based on the effects of xenon at this point in core life which could affect core stability. A decision to perform the test at the lower power level would also result in an extended reduction in power in order to minimize the effects of any transient on the core and to ensure the secondary plant performance is controlled and monitored closely. Not only would the power reduction result in lost generation, but it would also subject the plant to increased risk of a severe transient such as a reactor trip.

By August 2, 1987, the turbine should be operating with only two of the four governor valves partially open. The other two valves are normally closed at this and lower turbine power levels. The closed governor valve position is in the safe position for overspeed protection. A one-time suspension from cycling the turbine governor valves through one complete cycle, to be in effect for the remainder of Cycle 5 operation, is necessary in order to assure that

NA-2 will continue to operate until its refueling outage which is now scheduled to begin on September 7, 1987. The turbine valve freedom test for other turbine valves (throttle, reheat stop, and reheat intercept valves) will be completed by August 9, 1987.

The licensee has requested the change, as described above, be processed on an emergency basis by August 7, 1987, in order to preclude the risk of a transient and possible plant shutdown and resultant loss of plant generation at a time when the licensee is experiencing peak load generation. The need for the TS change could not be recognized in time to permit a normal NRC review and public notice period. The need to extend the current NA-2 Cycle 5 operation past the previously scheduled shutdown date of July 31, 1987 could not be identified until after the licensee had completed an assessment of the full impact of the NA-1 steam generator tube rupture event (July 15, 1987).

Based on the above, the Commission has determined that the licensee has not abused the emergency provisions of 10 CFR 50.91(a)(5); failure for the Commission to act on the licensee's request would result in a high probability of a shutdown; and therefore, the request should be processed under the emergency provisions of 10 CFR 50.91(a)(5).

#### V. FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed changes to the NA-2 TS are Section 3.7.1.7, TS Surveillance Requirement 4.7.1.7.2 wherein the cycling of the four Turbine Throttle Valves at least once per 31 days through one complete cycle is suspended for Cycle 5 only and further testing of the turbine governor valves may be suspended during power coastdown operation between 196 and 835 MegaWatts electrical (MWe).

The Commission has provided standards for determining whether a significant hazards consideration exists (10 CFR 50.92(c)). A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences or an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from an accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The following evaluation in relation to the three standards demonstrates that the proposed amendment in support of suspending the cycling of the turbine throttle valves for Cycle 5 only does not involve a significant hazards consideration.

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis is not increased. The testing of the turbine governor valves performed to date has demonstrated the reliability of these valves. The operability of the turbine governor valves will be demonstrated on an ongoing basis as turbine load is periodically adjusted to match reactor power during the power coastdown. This can be confirmed by monitoring the changes in governor valve position as turbine power is adjusted. A one-time suspension from testing the governor valves for the remainder of Cycle 5 operation will not degrade the reliability of

the turbine overspeed protection system. The design of the turbine rotors and the existence of procedures to manually backup automatic initiation of the turbine trip provide further assurance that the probability of the generation of destructive missiles remains minimal.

2. The possibility for an accident or malfunction of a different type than any evaluated in the safety analysis is not created since the design and operation of the turbine protection and control systems are not being changed.
3. The margin of safety as defined in the Bases for any Technical Specification is not reduced since the design and operation of the turbine protection and control system is not being changed and the operability of the turbine governor valves will be demonstrated on an ongoing basis as turbine load is periodically adjusted as discussed previously. Further, past testing of the turbine governor valves has shown the valves to be highly reliable.

Based on the foregoing, the Commission has concluded that the standards of 10 CFR 50.92 are satisfied. Therefore, the Commission has made a final determination that the proposed amendment does not involve a significant hazards consideration.

#### VI. ENVIRONMENTAL CONSIDERATION

This amendment involves a change in a surveillance requirement and use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves 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. Accordingly, the amendment meets 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 amendment.

#### VII. CONCLUSION

We have concluded, based on the considerations discussed above, that (1) this amendment will not (a) significantly increase the probability or consequences of accidents previously evaluated, (b) create the possibility of a new or different accident from any previously evaluated, or (c) significantly reduce a margin of safety and, therefore, the amendment does not involve significant hazards considerations, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: August 6, 1987

Principal Contributor:

Leon Engle