

Docket Nos. 50-280    October 12, 1984  
and 50-281

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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. 98 to Facility Operating License No. DPR-32 and Amendment No. 97 to Facility Operating License No. DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application transmitted by letter dated April 5, 1984.

These amendments revise the Technical Specifications to change the status of the opposite unit's auxiliary feedwater pump Limiting Condition for Operation from "operable" to "available" and to add a specification for down time for maintenance and repairs.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular monthly Federal Register notice.

Sincerely,

/s/JDNeighbors

Joseph D. Neighbors, Project Manager  
Operating Reactors Branch #1  
Division of Licensing

Enclosures:

1. Amendment No. 98 to DPR-32
2. Amendment No. 97 to DPR-37
3. Safety Evaluation

cc: w/enclosures  
See next page

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

October 12, 1984

\*\*\* Bucket Nos. 50-280  
and 50-281

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

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A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular monthly Federal Register notice.

Sincerely,

A handwritten signature in cursive script that reads "Joseph D. Neighbors".

Joseph D. Neighbors, Project Manager  
Operating Reactors Branch #1  
Division of Licensing

Enclosures:

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3. Safety Evaluation

cc: w/enclosures  
See next page

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

Surry Power Station  
Units 1 and 2

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Richmond, Virginia 23219



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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 98  
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated April 5, 1984, 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 3.B of Facility Operating License No. DPR-32 is hereby amended to read as follows:

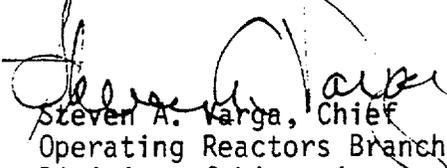
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(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 98, 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

  
Steven A. Varga, Chief  
Operating Reactors Branch #1  
Division of Licensing

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: October 12, 1984



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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 97  
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated April 5, 1984, 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 3.B of Facility Operating License No. DPR-37 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 97, 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

  
Steven A. Varga, Chief  
Operating Reactors Branch #1  
Division of Licensing

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: October 12, 1984

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 98 FACILITY OPERATING LICENSE NO. DPR-32

AMENDMENT NO. 97 FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NOS. 50-280 AND 50-281

Revise Appendix A as follows:

<u>Remove Pages</u>	<u>Insert Pages</u>
3.6-1	3.6-1
3.6-2	3.6-2
3.6-3	3.6-3
3.6-4	3.6-4
3.6-5	3.6-5
3.6-6	3.6-6

### 3.6 TURBINE CYCLE

#### Applicability

Applies to the operating status of the Main Steam and Auxiliary Feed Systems.

#### Objective

To define the conditions required in the Main Steam System and Auxiliary Feed System for protection of the steam generator and to assure the capability to remove residual heat from the core during a loss of station power.

#### Specification

- A. A unit's Reactor Coolant System temperature or pressure shall not exceed 350°F or 450 psig, respectively, or the reactor shall not be critical unless the five main steam line code safety valves associated with each steam generator in unisolated reactor coolant loops are operable.
- B. To assure residual heat removal capabilities, the following conditions shall be met prior to the commencement of any unit operation that would establish reactor coolant system conditions of 350°F and 450 psig which would preclude operation of the Residual Heat Removal System.
  1. Two motor driven auxiliary feedwater pumps shall be operable, and one of three auxiliary feedwater pumps for the opposite unit shall be available\*.

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\*Available means (1) operable except for automatic initiation instrumentation, (2) offsite or emergency power source may be inoperable in cold shutdown, and (3) it is capable of being used with the opening of the cross-connect.

2. A minimum of 96,000 gallons of water shall be available in the tornado missile protected condensate storage tank to supply emergency water to the auxiliary feedwater pump suction. A minimum of 60,000 gallons of water shall be available in the tornado protected condensate storage tank of the opposite unit to supply emergency water to the auxiliary feedwater pump suction of that unit.
  3. All main steam line code safety valves, associated with steam generators in unisolated reactor coolant loops, shall be operable.
- C. Prior to reactor power exceeding 10%, the steam driven auxiliary feedwater pump shall be operable.
- D. System piping, valves, and control board indication required for the operation of the components enumerated in Specifications 3.6.B.1, 3.6.B.2, 3.6.B.3 and 3.6.C shall be operable with the system piping, valves, and control board indication required for the operation of the opposite unit auxiliary feedwater pump available\*.
- E. The iodine - 131 activity in the secondary side of any steam generator, in an unisolated reactor coolant loop, shall not exceed 9 curies. Also, the specific activity of the secondary coolant system shall be  $\leq 0.10 \mu\text{Ci/cc}$  DOSE EQUIVALENT I-131. If the specific activity of the secondary coolant system exceeds  $0.10 \mu\text{Ci/cc}$  DOSE EQUIVALENT I-131, the reactor shall be shut down and cooled to  $500^\circ\text{F}$  or less within 6 hours after detection and in the cold shutdown condition within the following 30 hours.

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\*Available means (1) operable except for automatic initiation instrumentation, (2) offsite or emergency power source may be inoperable in cold shutdown, and (3) it is capable of being used with the opening of the cross-connect.

- F. With one auxiliary feedwater pump inoperable, restore at least three auxiliary feedwater pumps (two motor driven feedwater pumps and one steam driven feedwater pump) to operable status within 72 hours or be in hot shutdown within the following 12 hours.
- G. The requirements of Specifications 3.6.B.1 and 3.6.D above concerning the opposite unit's auxiliary feed water pumps and associated piping, valves, and control board indications may be modified to allow the following components to be unavailable.
1. The opposite unit's auxiliary feed water pumps may be unavailable for a period not to exceed 7 days provided immediate attention is directed to making repairs. If not available within 7 days, be in at least hot shutdown within the next 6 hours and in cold shutdown within the next 30 hours.
  2. The system piping, valves, and control board indication for operation of the opposite unit's auxiliary feed water pumps may be unavailable for a period not to exceed 7 days provided immediate attention is directed toward making repairs. If not available within 7 days, be in at least hot shutdown within the next 6 hours and in cold shutdown within the next 30 hours.
- H. The requirements of Specification 3.6.B.2 above may be modified to allow utilization of protected condensate storage tank water with the auxiliary steam generator feed pumps provided the water level is maintained above 60,000 gallons, sufficient replenishment water is available in the 300,000 gallon condensate storage tank, and replenishment of the protected condensate storage tank is commenced within two hours after the cessation of protected condensate storage tank water consumption.

#### Basis

A reactor which has been shutdown from power requires removal of core residual heat. While reactor coolant temperature or pressure is  $> 350^{\circ}\text{F}$  or 450 psig, respectively, residual heat removal requirements are normal-

The capability to supply feedwater to the generators is normally provided by the operation of the Condensate and Feedwater Systems. In the event of complete loss of electrical power to the station, residual heat removal would continue to be assured by the availability of either the steam driven auxiliary feedwater pump or one of the motor driven auxiliary feedwater pumps and the 110,000-gallon condensate storage tank. In the event of a fire which would render the auxiliary feedwater pumps inoperable, residual heat removal would continue to be assured by the availability of either the steam driven auxiliary feedwater pump or one of the motor driven auxiliary feedwater pumps from the opposite unit.

A minimum of 92,000 gallons of water in the 110,000-gallon condensate tank is sufficient for 8 hours of residual heat removal following a reactor trip and loss of all offsite electrical power. If the protected condensate storage tank level is reduced to 60,000 gallons, the immediately available replenishment water in the 300,000-gallon condensate tank can be gravity-fed to the protected tank if required for residual heat removal. An alternate supply of feedwater to the auxiliary feedwater pump suction is also available from the Fire Protection System Main in the auxiliary feedwater pump cubicle.

The five main steam code safety valves associated with each steam generator have a total combined capacity of 3,725,575 pounds per hour at their individual set pressure; the total combined capacity of all fifteen main steam code safety valves is 11,176,725 pounds per hour. The ultimate power rating steam flow is 11,167,923 pounds per hour. The combined capacity of the safety valves required by Specification 3.6 always exceeds the total steam flow corresponding to the maximum steady state power that can be obtained during one, two, or three reactor coolant loop operation.

The availability of the auxiliary feedwater pumps, the protected condensate storage tank, and the main steam line safety valves adequately assures that sufficient residual heat removal capability will be available when required.

The availability of the auxiliary feedwater pumps, the protected condensate storage tank, and the main steam line safety valves adequately assures that sufficient residual heat removal capability will be available when required.

The limit on steam generator secondary side iodine - 131 activity is based on limiting inhalation thyroid dose at the site boundary of 1.5 rem after a postulated accident that would result in the release of the entire contents of a unit's steam generators to the atmosphere. In this accident, with the halogen inventories in the steam generator being at equilibrium valves, I-131 would contribute 75% of the resultant thyroid dose at the site boundary; the remaining 25% of the dose is from other isotopes of iodine. In the analysis, one-tenth of the contained iodine is assumed to reach the site boundary, making allowance for plate out and retention in water droplets.

The inhalation thyroid dose at the site boundary is given by:

$$\text{Dose (rem)} = \frac{(C) (X/Q) (D_{\infty}/A_{\tau}) (B.R.)}{(.75) (P.F.)}$$

where: C = steam generator I-131 activity (curies)

$$X/Q = 8.14 \times 10^{-4} \text{ sec/m}^3$$

$$D_{\infty}/A_{\tau} = 1.48 \times 10^6 \text{ rem/Ci for I-131}$$

$$B.R. = \text{breathing rate, } 3.47 \times 10^{-4} \text{ m}^3/\text{sec from TID 14844}$$

$$P.F. = \text{plating factor, } 10$$

Assuming the postulated accident, the resultant thyroid dose is 1.5 rem. The steam generator's specific iodine - 131 activity limit is calculated by dividing the total activity limit of 9 curies by the water volume of a steam generator. At full power, with a steam generator water volume of 47.6 M<sup>3</sup>, the specific iodine - 131 limit would be .18  $\mu\text{Ci/cc}$ ; at zero power, with a steam generator water volume of 101 M<sup>3</sup>, the specific iodine - 131 limit would be .089  $\mu\text{Ci/cc}$ .

The limitation on secondary system specific activity ensures that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture.

REFERENCES

- FSAR Section 4, Reactor Coolant System
- FSAR Section 9.3, Residual Heat Removal System
- FSAR Section 10.3.1, Main Steam System
- FSAR Section 10.3.2, Auxiliary Steam System
- FSAR Section 10.3.5, Auxiliary Feedwater System
- FSAR Section 10.3.8, Vent and Drain Systems
- FSAR Section 14.3.2.5, Environmental Effects of a Steam Line Break



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. <sup>98</sup> TO FACILITY OPERATING LICENSE NO. DPR-32  
AND AMENDMENT NO. <sup>97</sup> TO FACILITY OPERATING LICENSE NO. DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY  
SURRY POWER STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-280 AND 50-281

Introduction

By letter dated April 5, 1984, the Virginia Electric and Power Company (the licensee) requested amendments to the Facility Operating Licenses DPR-32 and DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The proposed amendments would change a limiting condition for operation for the auxiliary feedwater pump from "operable" to "available".

Evaluation

The current Technical Specifications require that two motor driven auxiliary feedwater pumps be operable and one of three auxiliary feedwater pumps for the opposite unit be operable. This proposed change revises the status of the opposite unit's auxiliary feedwater pump from "operable" to "available". In the event of a fire on one unit which would render that unit's auxiliary feedwater pumps inoperable, residual heat removal would continue to be assured by the motor driven auxiliary feedwater pumps from the opposite unit. Available is defined as "(1) operable except for automatic initiation instrumentation, (2) offsite or emergency power may be inoperable in cold shutdown, and (3) it is capable of being used with the opening of the cross-connect."

This proposed change also adds a specification which allows the opposite unit auxiliary feedwater pump down time for maintenance and repairs. Specific action is provided to be in hot shutdown within the next 6 hours and in cold shutdown within the next 30 hours in the event that the opposite unit auxiliary feedwater pumps and associated piping, valves and controls are unavailable for a period of more than seven days.

This proposed change defines the condition where the opposite unit's auxiliary feedwater pump is available and capable of performing its intended function but not required to meet the strict definition of operable as defined in the Technical Specifications. When the requirement for the opposite unit's

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auxiliary feedwater pump was established, it was intended that the pump would be available for use when needed for alternate shutdown. The use of the pump requires that a manual valve be opened in the cross-connect between the two units. It was not intended for the pump to be automatically started; in fact the design does not permit a pump to start by signal from the other unit. Therefore, the use of the word "available" is more appropriate than "operable" in this case.

Based on our review of the proposed Technical Specifications, we conclude that they are acceptable.

#### Environmental Consideration

These amendments involve a change in the installation or use of the facilities components located within the restricted areas as defined in 10 CFR 20. The staff has determined that these 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. Accordingly, these amendments meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: October 12, 1984

#### Principal Contributor:

J. D. Neighbors