

April 22, 1993

Docket Nos. 50-280
and 50-281

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

Dear Mr. Stewart:

SUBJECT: SURRY UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REACTOR COOLANT
LOOP STOP VALVES INTERLOCKS OPERABILITY (TAC NOS. M85192 AND
M85193)

The Commission has issued the enclosed Amendment No. 177 to Facility
Operating License No. DPR-32 and Amendment No. 176 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 (TS) in response to your application transmitted by letter
dated December 11, 1992.

These amendments eliminate the reactor coolant system loop stop valves
interlocks operability requirement.

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)

Bart C. Buckley, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 177 to DPR-32
2. Amendment No. 176 to DPR-37
3. Safety Evaluation

cc w/enclosures:
See next page

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Virginia Electric and Power Company

Surry Power Station

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DATED: April 22, 1993

AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-32 - SURRY UNIT 1
AMENDMENT NO. 176 TO FACILITY OPERATING LICENSE NO. DPR-37 - SURRY UNIT 2

Docket File

NRC & Local PDRs

PDII-2 Reading

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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. 177
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 December 11, 1992, 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.

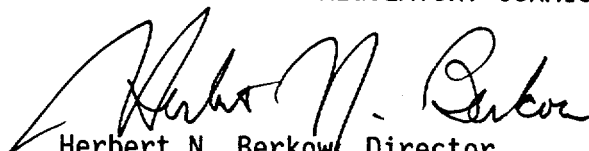
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-32 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 177, 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: April 22, 1993



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. 176
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 December 11, 1992, 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.

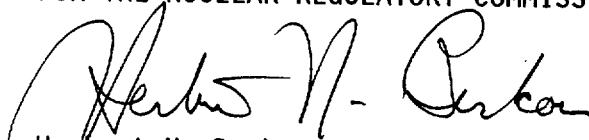
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-37 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 176, 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: April 22, 1993

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-32

AMENDMENT NO. 176 TO 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>
3.17-1	3.17-1
3.17-2	3.17-2
3.17-3	3.17-3
---	3.17-4
---	3.17-5

3.17 LOOP STOP VALVE OPERATION

Applicability

Applies to the operation of the loop stop valves.

Objective

To specify those limiting conditions for operation of the loop stop valves which must be met to ensure safe reactor operation.

Specifications

1. The loop stop valves shall be maintained open unless the reactor is in COLD SHUTDOWN or REFUELING SHUTDOWN.
2. A hot or cold leg stop valve in a reactor coolant loop may be closed in COLD SHUTDOWN or REFUELING SHUTDOWN for up to 2 hours for valve maintenance or testing. If the stop valve is not opened within 2 hours, the loop shall be isolated.
3. Whenever a reactor coolant loop is isolated, the stop valves of the isolated loop shall have their AC power removed and their breakers locked open.*
4. Whenever an isolated and filled reactor coolant loop is returned to service, the following conditions shall be met:
 - a. A source range nuclear instrumentation channel shall be operable and continuously monitored with audible indication in the control room during opening of the hot leg loop stop valve, during relief line flow, and when opening the cold leg stop valve in the isolated loop. Should the count rate increase by more than a factor of two over the initial count rate, the hot and cold leg stop valves shall be re-closed and no attempt made to open the stop valves until the reason for the count rate increase has been determined.

* Power may be restored to a hot or cold leg loop stop valve in an isolated and filled loop provided the requirements of Specifications 4.b or 4.c are met, respectively. Power may be restored to a loop stop valve in an isolated and drained loop provided the requirements of Specifications 5.a and b are met.

- b. Before opening the hot leg loop stop valve.
 - 1) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration in the active loops. Verification of this condition shall be completed within 2 hours prior to opening the hot leg stop valve in the isolated loop.
 - c. Before opening the cold leg loop stop valve.
 - 1) The hot leg loop stop valve shall be open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm.
 - 2) The cold leg temperature of the isolated loop shall be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. Verification of this condition shall be completed within 30 minutes prior to opening the cold leg stop valve in the isolated loop.
 - 3) The boron concentration of the isolated loop shall be greater than or equal to the boron concentration in the active loops. Verification of this condition shall be completed after relief line flow for at least 90 minutes at greater than or equal to 125 gpm and within 2 hours prior to opening the cold leg stop valve in the isolated loop.
5. Whenever an isolated and drained reactor coolant loop is filled from the active volume of the RCS, the following conditions shall be met:
- a. The isolated loop shall be drained. Verification of this condition shall be completed within 2 hours prior to partially opening the hot or cold leg stop valve in the isolated loop.
 - b. The Reactor Coolant System level shall be at least 18 ft. during opening of the loop stop valves and during the filling of the isolated loop. If Reactor Coolant System level is not maintained at 18 ft. or above, the loop stop valves shall be closed.

- c. The hot and cold leg stop valves shall be fully opened within 2 hours after the isolated loop is filled.
- d. A source range nuclear instrumentation channel shall be operable and continuously monitored with audible indication in the control room during the backfill evolution. Should the count rate increase by more than a factor of two over the initial count rate, the hot and cold leg stop valves shall be re-closed and no attempt made to open the stop valves until the reason for the count rate increase has been determined.

Basis

The Reactor Coolant System may be operated with isolated loops in COLD SHUTDOWN or REFUELING SHUTDOWN in order to perform maintenance. A loop stop valve in any loop can be closed for up to two hours without restriction for testing or maintenance in these operating conditions. While operating with a loop isolated, AC power is removed from the loop stop valves and their breakers locked opened to prevent inadvertent opening. When the isolated loop is returned to service, the coolant in the isolated loop mixes with the coolant in the active loops. This situation has the potential of causing a positive reactivity addition with a corresponding reduction of shutdown margin if:

- a. The temperature in the isolated loop is lower than the temperature in the active loops (cold water accident), or
- b. The boron concentration in the isolated loop is insufficient to maintain the required shutdown margin (boron dilution accident).

The return to service of an isolated and filled loop is done in a controlled manner that virtually eliminates any sudden positive reactivity addition from cold water or boron dilution. A flow path to mix the isolated loop with the active loops is established through the relief line by opening the hot leg stop valve in the isolated loop and starting the reactor coolant pump. The relief line flow is low enough to limit the rate of any reactivity addition due to differences in temperature and boron concentration between the isolated loop and the active loops. In addition, a source range instrument channel is required to be operable and continuously monitored to detect any change in core reactivity.

The limiting conditions for returning an isolated and filled loop to service are as follows:

- a. A hot leg loop stop valve may not be opened unless the boron concentration in the isolated loop is greater than or equal to the boron concentration in the active portion of the Reactor Coolant System.
- b. A cold leg loop stop valve can not be opened unless the hot leg loop stop valve is open with relief line flow established for at least 90 minutes at greater than or equal to 125 gpm. In addition, the cold leg temperature of the isolated loop must be at least 70°F and within 20°F of the highest cold leg temperature of the active loops. The boron concentration in the isolated loop must be verified to be greater than or equal to the boron concentration in the active portion of the Reactor Coolant System.
- c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition during hot or cold leg stop valve opening and during relief line flow.

If an isolated loop is initially drained, the above requirements are not applicable. An initially isolated and drained loop may be returned to service by partially opening the loop stop valves and filling the loop in a controlled manner from the Reactor Coolant System. Prior to partially opening the loop stop valves, the following measures are required to ensure that no sudden positive reactivity addition or loss of Reactor Coolant System inventory occurs:

- a. The isolated loop is verified to be drained, thus preventing dilution of Reactor Coolant System boron concentration by liquid present in the loop.
- b. Reactor Coolant System level is verified to be $\geq 18'$ elevation to ensure Reactor Coolant System inventory is maintained for decay heat removal. Reactor Coolant System inventory is required to be maintained at $\geq 18'$ elevation during the backfill evolution. In addition, the filling evolution is limited to one isolated loop at a time.
- c. A source range nuclear instrument channel is required to be monitored to detect any unexpected positive reactivity addition.

After an initially drained loop is filled from the Reactor Coolant System by partially opening the loop stop valves, the loop is no longer considered to be isolated. Thus, the requirements for returning an isolated and filled loop to service are not applicable and the loop stop valves may be fully opened without restriction within two hours of completing the loop fill evolution.

The initial Reactor Coolant System level requirement has been established such that, even if the three cold leg stop valves are suddenly opened and no makeup is available, the Reactor Coolant System water level will not drop below mid-nozzle level. This ensures continued adequate suction conditions for the residual heat removal pumps.

The safety analyses assume a minimum shutdown margin as an initial condition. Violation of these limiting conditions could result in the shutdown margin being reduced to less than that assumed in the safety analyses. In addition, violation of these limiting conditions could also cause a loss of shutdown decay heat removal.

Reference

- (1) UFSAR Section 4.2
- (2) UFSAR Section 14.2.5



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-32
AND AMENDMENT NO. 176 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

1.0 INTRODUCTION

By letter dated December 11, 1992, the Virginia Electric and Power Company (the licensee) proposed to change the Surry Power Station Units 1 and 2 Technical Specifications (TS) for the Reactor Coolant System (RCS) Loop Stop Valve Interlocks operability requirement. The licensee proposed to eliminate the RCS loop stop valve interlocks operability requirements and proposed to modify the TS 3.17 to establish TS requirements governing the operation of the RCS loop stop valves. The existing restrictions were created based on the original design basis that included the ability to operate the unit at power with an RCS loop isolated. Although an isolated loop could only be returned to service with the unit shut down, these restrictions and interlocks were established to protect against inadvertent cold water and boron dilution accidents during the startup of an isolated loop. The proposed TS changes restrict the operational modes wherein an RCS loop may be isolated or returned to service to cold shutdown and refueling shutdown only.

2.0 EVALUATION

The existing TS 3.17 was originally primarily directed at precluding the startup of an isolated loop during power operation; however, it has applicability in cold shutdown and refueling shutdown. Since power operation with less than all three loops in service is prohibited by TS 3.A.11, the proposed changes to TS 3.17 would remove the interlock operability requirements while maintaining controls which eliminate the potential for a positive reactivity addition accident when performing maintenance operations during cold shutdown and refueling shutdown. TS requirements are being incorporated to require that the RCS loop stop valves be maintained open unless the unit is in cold shutdown or refueling shutdown. When a loop is isolated the loop stop valves will have their AC power removed and the breakers locked open, thus ensuring that a valve is not inadvertently opened. When returning an isolated loop and a filled loop to service, the revised TS require that the boron concentration of the isolated loop be verified greater than or equal to that of the active loops before opening a hot leg loop stop valve, thus precluding boron dilution. To provide a controlled mixing between the isolated loop and the active loop, the isolated loop will be operated with

relief line flow of at least 125 gpm for 90 minutes, while monitoring neutron flux to identify any unexpected reactivity addition. A minimum water level in the RCS is specified to ensure that a loss of shutdown cooling does not occur during the loop backfill evolution.

3.0 SUMMARY

The proposed TS establishes adequate administrative controls to eliminate the potential for an inadvertent valve opening in an isolated loop, causing a boron dilution or cold water addition accident. Furthermore, startup of an isolated loop is now limited to only cold shutdown or refueling shutdown. Locking closed the stop valves of an isolated loop with power removed prevents inadvertent opening and potential boron dilution or loss of inventory. Thus, the proposed TS administrative controls will meet the operability requirements of the RCS loop stop valves preventing boron dilution and reactivity addition accident.

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 these amendments involve no significant hazards consideration and there has been no public comment on such finding (58 FR 5436). 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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: K. Desai

Date: April 22, 1993