

April 1, 1977

Dockets Nos.: 50-280 ✓
and 50-281

Virginia Electric & Power Company
ATTN: Mr. W. L. Proffitt
Senior Vice President - Power
P. O. Box 26666
Richmond, Virginia 23261

Gentlemen:

The Commission has issued the enclosed Amendments Nos. 31 and 30 to Facility Operating Licenses Nos. DPR-32 and DPR-37 for the Surry Power Station, Units Nos. 1 and 2. These amendments are in response to your letter dated March 4, 1977, as supplemented March 31, 1977, submitting additional information relating to the evaluation of a loss-of-coolant accident (LOCA) assuming a uniform steam generator tube plugging level of 20%.

These amendments add a condition to the licenses relating to the LOCA reanalysis with 20% of the steam generator tubes plugged.

Copies of the Safety Evaluation and the Federal Register Notice are also enclosed.

Sincerely,

Original Signed by

McFairtile

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Enclosures:

1. Amendment No. 31 to DPR-32
2. Amendment No. 30 to DPR-37
3. Safety Evaluation
4. Federal Register Notice

cc w/enclosures: See next page

*SEE PREVIOUS YELLOW FOR CONCURRENCES

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Dockets Nos.: 50-280
 and 50-281 ✓

Virginia Electric & Power Company
 ATTN: Mr. W. L. Proffitt
 Senior Vice President - Power
 P. O. Box 26666
 Richmond, Virginia 23261

Gentlemen:

Your letter dated March 4, 1977, as supplemented March 31, 1977, submitted for the Surry Power Station, Units Nos. 1 and 2, additional information relating to the evaluation of a loss-of-coolant accident (LOCA) assuming a uniform steam generator tube plugging level of 20 percent. Amendment No. 26 to Facility Operating Licenses Nos. DPR-32 and DPR-37 previously approved a plugging level of 15 percent.

We have reviewed and evaluated the LOCA reanalysis with 20 percent of the tubes plugged and conclude the reanalysis is acceptable within the current conditions of the License. A copy of our Safety Evaluation is enclosed.

Sincerely,

Robert W. Reid, Chief
 Operating Reactors Branch #4
 Division of Operating Reactors

Enclosure:
 Safety Evaluation

cc w/enclosure:
 See next page

*Requires Amendment
 from (enclosure with MF)
 Boilerplate lost
 Para for
 not [unclear]*

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| DATE ▶ | 3/3/77 | 3/3/77 | 3/ /77 | 3/31/77 | |

Virginia Electric & Power Company

cc w/enclosure(s):

Michael W. Maupin, Esq.
Hunton, Williams, Gay & Gibson
P. O. Box 1535
Richmond, Virginia 23213

Swem Library
College of William & Mary
Williamsburg, Virginia 23185

Mr. Sherlock Holmes, Chairman
Board of Supervisors of Surry County
Surry County Courthouse
Surry, Virginia 23683

Chief, Energy Systems
Analyses Branch (AW-459)
Office of Radiation Programs
U. S. Environmental Protection Agency
Room 645, East Tower
401 M Street, S.W.
Washington, D.C. 20460

U. S. Environmental Protection Agency
Region III Office
ATTN: EIS COORDINATOR
Curtis Building (Sixth Floor)
6th and Walnut Streets
Philadelphia, Pennsylvania 19106

cc w/enclosures and incoming
dtd.: 3/4/77 & 3/31/77

Commonwealth of Virginia
Council on the Environment
903 9th Street Office Building
Richmond, Virginia 23219



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

VIRGINIA ELECTRIC & POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION UNIT NO.1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 31
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The facility will operate in conformity with the provisions of the Atomic Energy Act of 1954, as amended, and the rules and regulations of the Commission;
 - B. 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;
 - C. 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
 - D. 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 adding a new Paragraph 3.F. as follows:

F. Steam Generator Tube Plugging

The licensee is authorized to operate the facility with steam generator tubes plugged in conformance with their submittal dated March 4, 1977, as supplemented March 31, 1977, and in accordance with all applicable Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Morton B. Savitille for

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Date of Issuance: April 1, 1977



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

VIRGINIA ELECTRIC & POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 30
License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The facility will operate in conformity with the provisions of the Atomic Energy Act of 1954, as amended, and the rules and regulations of the Commission;
 - B. 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;
 - C. 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
 - D. 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 adding a new Paragraph 3.F. as follows:

F. Steam Generator Tube Plugging

The licensee is authorized to operate the facility with steam generator tubes plugged in conformance with their submittal dated March 4, 1977, as supplemented March 31, 1977, and in accordance with all applicable Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Morton B. Fairtilof

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Date of Issuance: April 1, 1977



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENTS NOS. 31 AND 30 TO
LICENSES NOS. DPR-32 AND DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS NOS. 1 AND 2
DOCKETS NOS. 50-280 AND 50-281

Introduction

By letter dated March 4, 1977, Virginia Electric and Power Company (the licensee), submitted additional loss-of-coolant accident (LOCA) emergency core cooling system (ECCS) information assuming a uniform steam generator tube plugging level of 20 percent.

Background

We issued a Safety Evaluation (SE) on November 26, 1976, supporting License Amendments No. 26 for the Surry Power Station Units Nos. 1 and 2 for the LOCA reanalysis submitted by the licensee on October 29, 1976 which included up to 12% of steam generator tubes plugged. The licensee on January 3, 1977, submitted an amended LOCA analysis for 15% of the steam generator tubes assumed plugged. In our License Amendments No. 28 of January 19, 1977, we concluded that the analysis was acceptable and would permit safe operation of the plant. On March 4, 1977, the licensee submitted a third LOCA reanalysis with 20% of steam generator tubes assumed plugged. This Safety Evaluation assesses the LOCA analysis assuming 20% steam generator tubes plugged.

Evaluation

We have determined that all analysis parameters submitted March 4, 1977 are identical to the LOCA analysis submitted on October 29, 1976 with 12% tubes plugged and on January 3, 1977 with 15% of tubes plugged except that the tube plugging was increased to 20%. Analysis results indicate a peak clad temperature of 2186°F, a local metal-water reaction of 7.9 percent and a total metal-water reaction of less than 0.3 percent.

Only one large LOCA was considered which was the previously determined worst case break ($C_D = 0.4$ DECLG). Table 1 presents the time sequence of events for the previously analyzed cases with 12% and 15% tubes plugged and the new case with 20% of tubes plugged. Table 2 compares the results of the three cases. Reflood mass and energy releases were recalculated with 20% plugging and are presented in Table 3.

We conclude that the ECCS reanalysis with up to 20% of the steam generator tubes plugged is acceptable and in conformance with paragraph 50.46 of 10 CFR 50. Surry Power Station Units Nos. 1 and 2 may operate, within the constraints of the current Technical Specifications. We have considered the effect of dents in unplugged tubes and our review of the licensee's March 31, 1977 submittal indicates that the effect of denting on the course of an accident is inconsequential. A conservative dent distribution throughout the bundle, using up to a 0.233 mil dent, was used in the analysis.

Environmental Conclusions

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do not involve a significant hazards consideration, (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 these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Dated: April 1, 1977

TABLE 1

TIME SEQUENCE OF EVENTS

| | <u>12% Plugging</u> | <u>15% Plugging</u> | <u>20% Plugging</u> |
|-------------------------|---------------------|---------------------|---------------------|
| START | 0.0 (sec.) | 0.0 (sec.) | 0.0 (sec.) |
| Reactor Trip Signal | 0.648 | 0.648 | 0.648 |
| S. I. Signal | 2.23 | 2.23 | 2.23 |
| Acc. Injection | 16.2 | 16.1 | 15.8 |
| End of Bypass | 24.26 | 24.05 | 23.69 |
| End of Blowdown | 27.81 | 26.97 | 26.77 |
| Bottom of Core Recovery | 37.88 | 37.66 | 37.38 |
| Acc. Empty | 55.99 | 55.71 | 55.31 |
| Pump Injection | 27.23 | 27.23 | 27.23 |

TABLE 2
ANALYSIS RESULTS

| | <u>12% Plugging</u> | <u>15% Plugging</u> | <u>20% Plugging</u> |
|--|---------------------|---------------------|---------------------|
| Peak Clad Temp., °F | 2107 | 2120 | 2186 |
| Peak Clad Location, ft. | 9.0 | 9.0 | 9.0 |
| Local Zr/H ₂ O Rxn (max,) % | 6.234 | 6.704 | 7.932 |
| Local Zr/H ₂ O Location ft. | 9.0 | 9.0 | 9.0 |
| Total Zr/H ₂ O Rxn, % | <0.3 | <0.3 | <0.3 |
| Hot Rod Burst Time, sec. | 28.2 | 28.6 | 27.0 |
| Hot Rod Burst Location, Ft. | 6.0 | 6.25 | 6.0 |

Initial Conditions

| | |
|---|------------------------|
| Core Power, Mwt, 102% of | 2441 |
| Peak Linear Power, kw/ft 102% of | 12.49 |
| Peaking Factor | 2.00 |
| Accumulator Water Volume (ft ³) | 1075 (per accumulator) |

TABLE 3

REFLOOD MASS AND ENERGY RELEASES FOR THE DECLG ($C_D=0.4$)
BREAK AND 20% STEAM GENERATOR TUBE PLUGGING

| <u>Time</u> <u>(sec)</u> | <u>Total Mass Flow Rate</u> <u>(lbm/Sec)</u> | <u>Total Energy Flowrate</u> <u>(10^5 Btu/Sec)</u> |
|-----------------------------|---|--|
| 37.38 | 0.0 | 0.0 |
| 38.30 | 0.0 | 0.0 |
| 38.45 | 1.076 | 0.014 |
| 43.81 | 33.69 | 0.438 |
| 51.4 | 33.69 | 0.438 |
| 51.46 | 2894. | 3.07 |
| 53.51 | 2894. | 3.07 |
| 53.55 | 250.8 | 1.42 |
| 67.66 | 250.8 | 1.42 |
| 84.66 | 261.8 | 1.39 |
| 103.67 | 268.9 | 1.36 |
| 124.26 | 275.1 | 1.32 |
| 170.26 | 291.4 | 1.19 |
| 225.26 | 308.8 | 1.06 |
| 294.16 | 232.9 | 0.925 |
| 392.76 | 337.4 | 0.827 |

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKETS NOS. 50-280 AND 50-281

VIRGINIA ELECTRIC & POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY
OPERATING LICENSES

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendments Nos. 31 and 30 to Facility Operating Licenses Nos. DPR-32 and DPR-37 issued to Virginia Electric & Power Company (the licensee), for operation of the Surry Power Station Units Nos. 1 and 2 (the facilities), located in Surry County, Virginia. The amendments are effective as of the date of issuance.

These amendments add a condition to the licenses relating to the loss-of-coolant accident (LOCA) reanalysis with 20% of the steam generator tubes plugged.

The Commission has made appropriate findings as required by the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the licensee's filings dated March 4, 1977, as supplemented March 31, 1977, (2) Amendments Nos. 31 and 30 to Licenses Nos. DPR-32 and DPR-37, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Swem Library, College of William and Mary, Williamsburg, Virginia.

A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 1st day of April, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION

Morton B. Fairtile

Morton B. Fairtile, Acting Chief
Operating Reactors Branch #4
Division of Operating Reactors