LICENSE AUTHORITY FILE COPY

B. Jones

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

October 3, 1978

DO NOT REMOVE
Pasted
Am-44 to
DPR-37

Docket No. 50-281

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

Gentlemen:

The Commission has issued the enclosed Amendment No. 44 to Facility Operating License No. DPR-37 for the Surry Power Station, Unit No. 2. This amendment is in response to your application dated July 28, 1978, as supplemented August 16, 1978.

This amendment specifies license conditions related to steam generator tube inspections for Surry Unit 2. Operating limits on these plant parameters were previously governed by NRC Order for Modification of License dated April 7, 1978, which is superceded by the amendment. The only change to the operating limits previously imposed for steam generator tube inspections is the date for the next inspection.

A copy of the Notice of Issuance is also enclosed.

Sincerely,

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. Amendment No. 44 DPR-37
2. Safety Evaluation
3. Notice of Issuance

cc: w/enclosures
See next page

cc: Mr. Michael W. Maupin
Hunton & Williams
Post Office 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, Virginia 23683

Commonwealth of Virginia
Council on the Environment
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Richmond, Virginia 23219

Mr. James R. Wittine
Commonwealth of Virginia
State Corporation Commission
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Chief, Energy Systems
Analyses Branch (AW-459)
Office of Radiation Programs
U.S. Environmental Protection Agency
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Washington, D.C. 20460

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

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

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 44
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 July 28, 1978, as supplemented August 16, 1978, 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. Replace paragraph 3.E in its entirety with the following:

E. Steam Generator Inspection

(1) Unit No. 2 shall be brought to the cold shutdown condition in order to perform an inspection of the steam generators within six months of equivalent operation from August 1, 1978.

Nuclear Regulatory Commission (NRC) approval shall be obtained before resuming power operation following this inspection.

Equivalent operation is defined as operation with the reactor coolant at or above 350°F.

(2) Reactor coolant leakage from the reactor coolant system (RCS) to the secondary system (SS) through the steam generator tubes shall be limited to 0.3 gpm per steam generator, as described in the NRC Safety Evaluation of April 1, 1977. With any steam generator tube leakage greater than this limit the reactor shall be brought to the cold shutdown condition within 24 hours. NRC approval shall be obtained before resuming reactor operation.

(3) Reactor operation shall be terminated if RCS to SS leakage which is attributable to 2 or more steam generator tubes occurs during a 20 day period. NRC approval shall be obtained before resuming reactor operation.

(4) The concentration of radioiodine in the reactor coolant shall be limited to 1 uCi/gram during normal operation and to 10 uCi/gram during power transients as defined in Appendix A-1 to the Technical Specifications of the license. Appendix A-1 was issued with the April 1, 1977 Order and shall remain in effect for six equivalent months from August 1, 1978.

3. The license amendment supercedes the Order for Modification of License dated April 7, 1978, and is effective as of the date of its issuance.

Victor Stello, Jr., Director
Division of Operating Reactors

Date of Issuance: October 3, 1978

7590-01

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-281

VIRGINIA ELECTRIC AND POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 44 to Facility Operating License No. DPR-37, issued to Virginia Electric and Power Company (the licensee), which adds license conditions related to operation of the Surry Power Station, Unit No. 2 (the facility) located in Surry County, Virginia. This amendment is effective as of the date of issuance.

This amendment specifies license conditions related to steam generator tube inspections for Surry Unit 2. Operating limits on these plant parameters were previously governed by NRC Order for Modification of License dated April 7, 1978, which is superceded by the amendment. The only change to the operating limits previously imposed for steam generator tube inspections is the date for the next inspection.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission

has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment 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 this amendment.

For further details with respect to this action, see (1) the application for amendment dated July 28, 1978 as supplemented August 16, 1978; (2) Amendment No. 44 to License No. 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 3rd day of October 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 44 TO LICENSE NO. DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION, UNIT NO. 2

DOCKET NO. 50-281

INTRODUCTION

By letter dated July 28, 1978, as supplemented August 16, 1978, Virginia Electric and Power Company (VEPCO) submitted the results of the steam generator tube inspection performed at Surry Unit No. 2 during July, 1978, including the plugging criteria implemented for the three steam generators. Based on these inspection results, the implemented plugging patterns and previously submitted ECCS analysis, VEPCO concluded that the facility can be returned to operation for another six (6) equivalent months.

Surry Unit No. 2 has been operating under an April 7, 1978, NRC Order for Modification of Facility Operating License No. DPR-37. That Order required that the steam generators be inspected on or before the expiration date of the Order and that NRC approval be obtained prior to resuming power operation. However, because the unit had to be shutdown for snubber inspection and pump repair and maintenance, the licensee elected to perform a steam generator inspection approximately three months prior to the end of the authorized period of operation. That inspection was conducted in accordance with all of the requirements of the Order except that NRC approval was not obtained prior to resumption of power. The purpose of this evaluation is to determine whether the results of that premature inspection qualify the facility to operate another six (6) equivalent months from the date of that inspection and, thereby negate the need to perform an inspection obtaining NRC approval prior to startup as now required under the terms of the Order.

DISCUSSION

Inspection Program

The steam generator tube inspection program performed during the July 1978 shutdown was almost entirely devoted to assessing the conditions associated with the "denting" problem. Tube gauging was done in all three steam generators in order to assess the extent and pattern of tube denting. On the hot leg side, all tubes near the tube lane which are predicted to be bounded by the 15% hoop strain contour were gauged. Based on previous leaker history at Surry Unit No. 2 and at similar units, as well as previous gauging results, the gauging program also included wedge and patch plate regions. Additionally, when a restricted tube was found close to the inspection boundary, the inspection was expanded in that area. Gauging was also performed on cold leg tubes in all three steam generators in conjunction with the U-bend inspection program conducted from the cold leg side.

Results of Inspection and Corrective Action

No leaking tubes were observed in any steam generator during this inspection. Also no tube leaks occurred over the previous three months of operation.

Gauging results indicate that any tube near the tube lane which restricted the 0.650" probe was within the 15% hoop strain contour. In addition, tubes restricting the 0.540" probe were within the 17.5% hoop strain contour boundary. In the tube lane region there were five tubes in the three steam generators that restricted the 0.540" eddy current probe. Activity was noted in wedge areas in all steam generators. The growth of magnetite and tube denting is these regions appears consistent with previous experience at other units. Indicated tube restrictions on the cold leg side fell within appropriate strain contour boundaries. The implementation of the plugging criteria discussed below combined with previous plugging for various causes, resulted in a total of approximately 21.5% of the tubes being plugged. This is within the tube plugging limit of 25% that has been approved for Surry Unit No. 2.

Plugging Criteria

The plugging criteria implemented by the licensee are essentially the same as those used at other units with similarly degraded steam generator conditions. As in the previously accepted plugging criteria (e.g., those discussed in the SER attached to the Order of April 7, 1978) VEPCO has performed preventive plugging based on the projected growth of the critical tube hoop strain contours predicted by the finite element analysis. This same approach has been used to establish the extent of preventive plugging necessary for continued operation of Surry Unit No. 1 and Turkey Point Unit Nos. 3 and 4.

The progression of strain contours over the intended operating period is utilized to preventively plug beyond a tube which does not allow passage of a 0.540" probe. The progression of the 17.5% strain contour has been used to define the extent of preventive plugging necessary. This is identical to the criteria applied to Surry Unit No. 2 following the March, 1978, inspection program, to Surry Unit No. 1 following the inspection performed during the April/May refueling outage, and to Turkey Point Unit No. 4 following the inspection performed during the August/September, 1978, refueling outage.

EVALUATION

Surry Unit No. 2 is one of the six lead PWR facilities that were identified to have suffered moderate to extensive tube denting and that have been under close monitoring by the NRC staff following the September 15, 1976 tube failure occurrence. The inspection just completed during the July, 1978, shutdown is the fourth program implemented for this unit. A discussion on the technical background and our safety evaluation of the denting related phenomenon were made in an SER attached to Amendment No. 27 (dated August 16, 1977) to Operating License DPR-31 for Turkey Point Unit No. 3. The background information contained in that August 16, 1977 SER remains valid and is incorporated in this safety evaluation by reference. The information discussed above represents an update on the condition of the steam generators at Surry Unit No. 2.

The steam generator inspection was performed in accordance with a program that is consistent with previously implemented programs at Surry Unit No. 2 and other units. We consider this inspection to be adequate in the establishment of the condition of steam generators at this unit.

The gauging program performed at Surry Unit No.2 was essentially the same as the programs performed at Surry Unit No. 1 and Turkey Point Unit Nos. 3 and 4. As in the gauging program performed during March, 1978, the 15% tube hoop strain contour was used to define the gauging boundary. These gauging programs have been developed over the course of time in consultation with the NRC staff and have been determined to be acceptable. The inspection of the Unit No. 2 steam generators has demonstrated that the tube degradiation which has occurred to date follows the pattern experienced at Surry Unit No. 1 and Turkey Point Unit Nos. 3 and 4. Results of this inspection also indicated that not all tubes within the predicted 17.5% strain boundary restricted the 0.540" probe, which demonstrated quantitatively the conservatism in the tube plugging criteria. Furthermore, the results of this inspection at Surry Unit No. 2 indicates that no unexpected degradation is occurring and no new phenomenon was uncovered.

The preventive plugging pattern bounds those tubes which may be anticipated to attain the level of strain which cold lead to stress corrosion cracking during the next period of operation and maintains the margin of safety according to Regulatory Guide 1.121. The preventive plugging conducted by the licensee during this past inspection justifies operation of the Surry Unit No. 2 steam generators for an additional six (6) equivalent months following the July, 1978, shutdown.

We have concluded based on the considerations discussed above, that (1) Surry Unit No. 2 may be operated for an additional six (6) equivalent months following the July, 1978, shutdown under the restrictions delineated in the Amendment to which this SER is attached; at the end of this period the facility is to be shut down, the steam generators are to be reprobed to determine the extent and pattern of additional tube denting and the results of this gauging program are to be submitted to NRC for review and evaluation prior

the resumption of power operation, and (2) because the results of this inspection indicate that no unexpected degradation is occuring, no new phenomenon was uncovered, and the results were within the bounds of previously established criteria, this change does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, a significant hazards consideration is not involved.

Also, because we have concluded that Surry Unit No. 2 may be operated for an additional six (6) equivalent months from the date of the earlier (July 1978) inspection evaluated above, we find that the inspections, that would otherwise be required by our April 7, 1978 Order, is no longer required.

Environmental Consideration

We have determined that this amendment does 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 amendment involves 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 this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because this amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does 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.