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Docket No. 50-280

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

Dear Mr. Proffitt:

As discussed with your staff, the date of issuance of Amendment No. 55 to the Surry Unit No. 2 Operating License was February 5, 1980. Through clerical error and administrative oversight, the date of issuance had not been affixed to the amendment at the time of issuance.

In order to correct this, and to avoid a possible future confusion, we are reissuing Amendment No. 55 with the date of issuance properly affixed.

I apologize for any inconvenience this oversight may have caused.

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

Sincerely,

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

Enclosures:

1. Amendment No. 55 to DPR-32
2. Safety Evaluation
3. Federal Register Notice

cc: See next page

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

March 19, 1980

Docket No. 50-280

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

Dear Mr. Proffitt:

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Sincerely,

A handwritten signature in black ink, appearing to read "A. Schwencer".

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

Enclosures:

1. Amendment No. 55 to DPR-32
2. Safety Evaluation
3. Federal Register Notice

cc: See next page

March 19, 1980

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

cc: Mr. Michael W. Maupin
Hunton and Williams
Post Office Box 1535
Richmond, Virginia 23213

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College of William and Mary
Williamsburg, Virginia 23185

Donald J. Burke
U. S. Nuclear Regulatory Commission
Region II
Office of Inspection and Enforcement
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

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

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

Attorney General
1101 East Broad Street
Richmond, Virginia 23219

Mr. James R. Wittine
Commonwealth of Virginia
State Corporation Commission
Post Office-Box 1197
Richmond, Virginia 23209

Director, Technical Assessment Division
Office of Radiation Programs (AW-459)
U. S. Environmental Protection Agency
Crystal Mall #2
Arlington, Virginia 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. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 55
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 6, 1979, as supplemented May 31, 1979, 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.

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2. Revise paragraph 3.E as follows:

E. Steam Generator Inspection

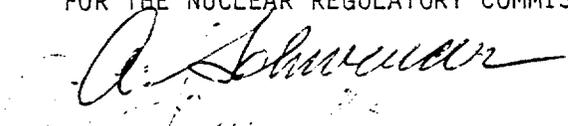
- (1) Unit No. 1 shall be brought to the cold shutdown condition in order to perform an inspection of the steam generators within six months of equivalent operation from October 25, 1979.

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 May 6, 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 two 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 μ Ci/gram during normal operation and to 10 μ Ci/gram during power transients as defined in Appendix A-1 to the Technical Specifications of the license. Appendix A-1 was issued with the May 6, 1977 Order and shall remain in effect for six equivalent months from October 25, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION


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

Date of Issuance: February 5, 1980



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 55 TO LICENSE NO. DPR-32

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION UNIT NO. 1

DOCKET NO. 50-280

Introduction

By letters dated April 6, 1979 and May 31, 1979, Virginia Electric and Power Company (licensee) submitted results of a steam generator inspection performed in April 1979 (during the March 15, 1979 outage) and requested a license amendment to allow seven months of equivalent operation from the date of this inspection after which the unit would be shut down for steam generator replacement. Following telephone discussions with the NRC staff the licensee agreed to reduce this to six months of equivalent operation. Surry Unit 1 returned to power October 25, 1979, following the March 16, 1979 shutdown.

Amendment No. 45 to Operating License DPR-32 for Surry Unit 1 authorized six months of equivalent operation (above 350°F) from December 29, 1978 following which the unit was to be brought to a cold shutdown for steam generator inspection. Seventy One (71) days of the authorized operating interval had been completed at the time the unit was shut down on March 15, 1979 as a result of the seismic related Show Cause Order issued by the NRC. Therefore, the April 1979 inspection was based on somewhat less than half of the authorized interval.

Discussion

Inspection Program

The April 1979 steam generator tube inspection included programs to assess the conditions associated with both the denting and "wastage" phenomena. For denting, tube gauging was performed using .540", .610" and .650" diameter eddy current probes in all three steam generators to assess the extent and pattern of tube denting. On the hot leg side, all tubes near the tube lane which were predicted to be bounded by the 17.5% hoop strain contour were gauged. Surry Unit 1 has operated approximately 18

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equivalent months since full closure of the support plate flow slots was first observed during the April 1977 inspection. The tube hoop strains calculated by finite element analysis for 18 equivalent months were used to determine the 17.5% inspection boundary. The 15% strain boundary which was used as the basis for previous inspections at Surry Unit 1, is predicted to cover almost the entire tubesheet at 18 equivalent months beyond full closure of the flow slots. The licensee maintains that extensive plant specific information for Surry Unit 1 indicates the adequacy of the 17.5% boundary and notes that significant tube restriction activity remains confined to areas immediately adjacent to previous activity.

Gauging within the 17.5% strain boundary was supplemented by additional gauging in the wedge and patch plate regions where significant activity could be expected based on plant experience at this and similar units.

Additionally, when a restricted tube was found near 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.

Eddy current testing (ECT) was performed through the first support plate in the control region of the tube bundle ("kidney" region) in each steam generator where previous inspections have indicated wastage corrosion activity and tube leaks. This inspection was identical to the December 1978 inspection and included all tubes for which the May 1978 Regulatory Guide 1.83 inspection had indicated greater than 20% wastage degradation. In addition, all tubes one and two tubes beyond the May 1978 Regulatory Guide 1.83 inspection boundary were inspected to determine whether the area of significant tube wastage had expanded beyond that boundary.

Using photographs, handhole inspections of visible tube support plates were performed in all three steam generators in order to assess the support plate conditions. Also, wrapper to shell annulus measurements were made in steam generator C to monitor the support plate growth due to the continuing formation of magnetite in the tube/tube support plate crevices.

Inspection Results

Results of the tube gauging inspection did not indicate any increase in rate of tube restriction activity since the previous inspection in December 1978. No tubes in any of the steam generators restricted passage of the .540" eddy current probe. All tubes restricting passage of the .610" and .650" probes were adjacent to areas where denting activity was observed in previous inspections. Tubes inspected on the cold leg side in all steam generators met the gauging criteria with a .610" probe and U-bend inspections revealed no defects.

Two of the tubes with .650" restrictions leaked during hydrotesting. These tubes, (at Row 20, Column 8 and Row 5, Column 75 in the hot leg of steam generator C), showed slow drips at a 200 psi differential pressure. A very small reactor coolant to secondary side leak, estimated in the range of 0.6 to 0.8 gpd had been identified in steam generator C prior to shutdown on March 15, 1979.

The results of the handhole inspections revealed that the condition of the visible support plates had not changed since previous inspections and no new phenomena were observed.

Plugging Program

The plugging criteria for dented tubes implemented by the licensee during the April 1979 inspection were the same as those discussed in the SER attached to the Order of December 3, 1977. These include the plugging of leaking tubes .540" and .610" probe-restricted tubes, .650" probe-restricted tubes in the periphery of the hot leg wedge region, and preventative plugging criteria to preclude tube leaks resulting from the progression of denting. Additionally, those tubes inspected for wastage in the kidney regions that exhibited either significant wastage (not necessarily in excess of the 40% plugging limit) or some wastage in proximity to a dent of sufficient size to mask the defect were plugged.

The plugging totals for the April 1979 inspection were as follows:

	<u>Plugged this Outage</u>		<u>Total Plugged to Date</u>
	<u>Denting Related</u>	<u>Wastage Related</u>	
SG A	3	2	874
SG B	1	0	644
SG C	20	2	986

A total of 2504 or 24.6% of the tubes in the three steam generator tubes have been plugged to date.

Evaluation

Surry Unit No. 1 is one of the six lead PWR facilities that 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 at Surry Unit No. 2. The April 1979 inspection program is the sixth such program for this unit and follows by only 71 days of equivalent operation the previous inspection performed in December 1978. A discussion on the

technical background and safety evaluation of the denting related phenomenon was presented in an SER dated February 11, 1977, in support of the NRC Order for Modification of Facility Operating License No. DPR-32 dated February 8, 1977, and in an SER attached to a later NRC Order affecting Surry Unit No. 1 dated May 6, 1977. The background information contained in the February 11, 1977 and May 6, 1977 SERs remains valid and is incorporated in this Safety Evaluation by reference. This report is an update on the condition of the steam generators at Surry Unit No. 1.

The April 1979 gauging and plugging program performed at Surry Unit 1 was similar to previously implemented programs at this unit, Surry Unit 2, and Turkey Point Units 3 and 4. These gauging programs have been developed over the course of time in consultation with the NRC staff and have been determined adequate to support operation of these facilities for six effective full power months.

Whereas the predicted location of the 15% tube hoop strain contour provided the basis for the gauging boundary used in the December 1978 inspection, the predicted location of the 15% contour at the time of the April 1979 inspection encompassed almost all of the tube support plate. However, significant tube restriction activity occurred well within the implemented inspection boundary based upon the predicted 17.5% strain contour. Therefore, we agree that the inspection results confirm that the 17.5% strain inspection boundary adequately bounded the region of active tube denting.

Based upon our review of gauging results, we find that tube restriction activity has continued to progress in a stable manner at a rate consistent with that observed previously. We also note, however that, in the December 1978 and April 1979 inspections, five tubes identified as leaking tubes were apparently able to pass a .610" eddy current probe, and that two of these were also apparently able to pass a .650" probe.

Past experience (prior to December 1978) had shown that dent related leaks involved only .540" and .610" restricted tubes which are preventively plugged under current criteria. Stress corrosion cracking is a function of time as well as strain level and environment. The recent appearance of leaks in tubes which pass a .610" probe, and which are not otherwise subject to preventative plugging under the current criteria, indicates that the time parameter is becoming significant.

The preventive plugging criteria implemented in April 1979 and in previous inspections has proven successful in removing from service severely restricted tubes which are the most likely candidates to develop inservice leaks. Through-wall cracks which have occurred at dented locations have been small and stable (no rapid failures). The Technical Specification 0.3 gpm leakage rate limit provides adequate assurance that even if through-wall cracks and leaks occur, they will be detected and appropriate corrective action will be taken before any individual crack becomes sufficiently large as to be unstable under normal operating, transient, or accident conditions.

With regard to the wastage phenomenon in the kidney region, the April 1979 wastage inspection and associated plugging criteria were identical to those implemented in the December 1978 inspection. The small number of tubes plugged (two tubes in steam generators A and C, respectively) as a result of wastage is consistent with the short period of operation between the December 1978 and April 1979 inspections. We concluded that the wastage inspection in April 1979 was adequate to establish the current extent and magnitude of wastage in the Surry Unit 1 steam generators and that there is reasonable assurance that unacceptable wastage degradation will not occur during the next operating interval.

Summary

On the basis of the above evaluation, we conclude that Surry Unit 1 may be operated for six (6) equivalent months from the April 1979 inspection without adversely affecting public health or safety and that paragraph 3.E of Facility Operating License No. DPR-32 should be revised accordingly.

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 the 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: February 5, 1980

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-280VIRGINIA ELECTRIC AND POWER COMPANYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 55 to Facility Operating License No. DPR-32, issued to Virginia Electric and Power Company (the licensee), which revised license conditions related to operation of the Surry Power Station, Unit No. 1 (the facility) located in Surry County, Virginia. This amendment is effective as of the date of issuance.

This amendment requires the next steam generator tube inspections for Surry Unit 1 to be conducted within six months of equivalent (reactor coolant above 350°F) operation from October 25, 1979.

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

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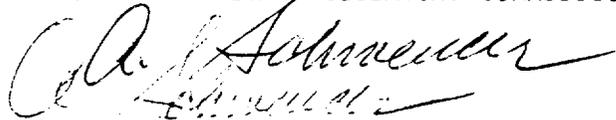
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to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated April 6, 1979 as supplemented May 31, 1979, (2) Amendment No. 55 to License No. DPR-32, 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 5 day of February, 1980

FOR THE NUCLEAR REGULATORY COMMISSION



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