

December 28, 1990

Docket Nos. 50-280
and 50-281

DISTRIBUTION
See attached sheet

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

Dear Mr. Stewart:

SUBJECT: SURRY UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: MONTHLY FLUSH
REQUIREMENTS (TAC NOS. 77803 AND 77804)

The Commission has issued the enclosed Amendment No. 150 to Facility Operating License No. DPR-32 and Amendment No. 147 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 March 8, 1990.

These amendments eliminate the monthly flush requirements for the sensitized stainless steel piping installed in the safety injection and containment spray systems.

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. 150 to DPR-32
- 2. Amendment No. 147 to DPR-37
- 3. Safety Evaluation

cc w/enclosures:
See next page

Concerned on routing slip

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Virginia Electric and Power Company

Surry Power Station

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DATED: December 28, 1990

AMENDMENT NO. 150 TO FACILITY OPERATING LICENSE NO. DPR-32 - SURRY UNIT 1
AMENDMENT NO. 147 TO FACILITY OPERATING LICENSE NO. DPR-37 - SURRY UNIT 2

Docket File

NRC & Local PDRs

PDII-2 Reading

S. Varga, 14/E/4

G. Lainas, 14/H/3

H. Berkow

D. Miller

B. Buckley

OGC-WF

D. Hagan, 3302 MNBB

E. Jordan, 3302 MNBB

B. Grimes, 9/A/2

G. Hill (8), P-137

Wanda Jones, P-130A

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K. Parczewski, 7/D/4

ACRS (10)

GPA/PA

OC/LFMB

M. Sinkule, R-II

Others as required

cc: Plant Service list



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
December 28, 1990

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 150
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 March 8, 1990, 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:

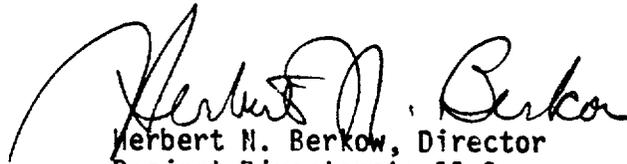
December 28, 1990

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 150, 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



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: December 28, 1990



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
December 28, 1990

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 147
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 March 8, 1990, 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:

December 28, 1990

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 147, 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



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: December 28, 1990

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 150 FACILITY OPERATING LICENSE NO. DPR-32

AMENDMENT NO. 147 FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NOS. 50-280 AND 50-281

Revise Appendix A as follows:

Remove Pages

TS 4.1-1a
TS 4.1-2
TS 4.1-4
- -
TS 4.1-5
TS 4.1-10
TS 4.1-11
TS 4.1-12

Insert Pages

TS 4.1-1a
TS 4.1-2
TS 4.1-4
TS 4.1-4a
TS 4.1-5
TS 4.1-10
TS 4.1-11
TS 4.1-12

3. The pressurizer water volume shall be determined to be within its limit as defined in Specification 2.3.A.3.a at least once per 12 hours whenever the reactor is not subcritical by at least 1% $\Delta k/k$.
4. Each Reactor Vessel Head vent path remote operating isolation valve not required to be closed by Specification 3.1.A.7a or 3.1.A.7b shall be demonstrated operable at each cold shutdown but not more often than once per 92 days by operating the valve through one complete cycle of full travel from the control room.
5. Each Reactor Vessel Head vent path shall be demonstrated operable following each refueling by:
 - a. Verifying the manual isolation valves in each vent path are locked in the open position.
 - b. Cycling each remote operating isolation valve through at least one complete cycle of full travel from the control room.
 - c. Verifying flow through the reactor vessel head vent system vent paths.
- C. Sampling tests shall be conducted as detailed in Table 4.1-2B.
- D. Whenever containment integrity is not required, only the asterisked items in Table 4.1-1 and 4.1-2A and 4.1-2B are applicable.
- E. Flushing of wetted sensitized stainless steel pipe sections as identified in the Basis Section shall be conducted only if the RWST Water Chemistry exceeds 0.15 PPM chlorides and/or fluorides (Cl^- and/or F^-). Flushing shall be conducted as detailed in TS Table 4.1-3A and 4.1-3B.

- H. If the RWST Water Chemistry exceeds 0.15 PPM for Cl^- and/or F^- , flushing of sensitized stainless steel piping as required by 4.1.E will be performed once the RWST Water Chemistry has been brought within specification limit of less than 0.15 PPM chlorides and/or fluorides. Samples will be taken periodically until the sample indicates the Cl^- and/or F^- and levels are below 0.15 PPM.

BASIS

Check

Failures such as blown instrument fuses, defective indicators, and faulted amplifiers which result in "upscale" or "downscale" indication can be easily recognized by simple observation of the functioning of an instrument or system. Furthermore, such failures are, in many cases, revealed by alarm or annunciator action, and a periodic check supplements this type of built-in surveillance.

Based on experience in operation of both conventional and nuclear unit systems, when the unit is in operation, the minimum checking frequencies set forth are deemed adequate for reactor and steam system instrumentation.

Calibration

Calibration shall be performed to ensure the presentation and acquisition of accurate information.

The nuclear flux (power level) channels shall be calibrated daily against a heat balance standard to account for errors induced by changing rod patterns and core physics parameters.

For the specified one month test interval, the average unprotected time is 360 hrs in case of a failure occurring between test intervals. Thus, the probability of failure of one channel between test intervals is $360 \times 2.5 \times 10^{-6}$ or $.9 \times 10^{-3}$. Since two channels must fail in order to negate the safety function, the probability of simultaneous failure of two-out-of-three channels is $3(.9 \times 10^{-3})^2 = 2.4 \times 10^{-6}$. This represents the fraction of time in which each three-channel system would have one operable and two inoperable channels and equals $2.4 \times 10^{-6} \times 8760$ hours per year, or (approximately) 1 minute/year.

It must also be noted that to thoroughly and correctly test a channel, the channel components must be made to respond in the same manner and to the same type of input as they would be expected to respond to during their normal operation. This, of necessity, requires that during the test the channel be made inoperable for a short period of time. This factor must be, and has been, taken into consideration in determining testing frequencies.

Because of their greater degree of redundancy, the 2/4 logic arrays provide an even greater measure of protection and are thereby acceptable for the same testing interval. Those items specified for monthly testing are associated with process components where other means of verification provide additional assurance that the channel is operable, thereby requiring less frequent testing.

Flushing

During construction of the facility, stress relieving of some of the cold bent stainless steel piping resulted in the piping becoming sensitized to potential stress corrosion cracking under certain conditions, e.g. low pH in conjunction with high chlorides. The subsystems containing the sensitized piping were identified in Stone & Webster Report SW-MER-1A dated July 6, 1971 and further evaluated in Virginia Power Technical Report ME-0009, Rev. 1, dated December 9, 1987. The sensitized piping was either not wetted, reheat treated, or is justified as acceptable because it is in a wetted system with adequate chemistry control i.e., chlorides and/or fluorides (Cl^- and/or F^-) less than 0.15 ppm. These subsystems are as follows:

<u>Subsystem</u>	<u>Remarks</u>
1) Recirc. spray inside containment	Not Wetted
2) Recirc. spray outside containment	Not Wetted
3) Containment spray inside containment	Not Wetted
4) Containment spray outside containment	Wetted
5) Low hd. SI pump discharge	Wetted
6) Low hd. SI pump to 1st iso. valve	Wetted
7) High hd. SI inside containment	Wetted
8) High hd. SI pump discharge	Wetted
9) RHR	Wetted
10) Charging and letdown system in containment	Flowing System
11) Pressurizer relief lines	Reheat Treated Prior to Operation
12) Pressurizer spray & surge lines	Flowing System

The sensitized piping found in a wetted system is acceptable as long as the fluid in or passing through the piping is less than 0.15 PPM Cl^- and/or F^- . The wetted systems are supplied from the RWST with the exception of the RHR system which communicates directly with the RCS during plant shutdowns. The RHR system does not communicate with the RWST during power operations and therefore, does not require flushing if Cl^- and/or F^- concentration exceeds 0.15 ppm. The acceptance criteria for the piping are based on the RWST Water chemistry staying below 0.15 PPM chlorides and/or fluorides. If the RWST chemistry on chlorides and/or fluorides is out of specification the sensitized piping that is normally supplied by the RWST will be flushed per tables 4.1-3A and 4.1-3B for Units 1 and 2 respectively. Each refueling outage the wetted systems are flow tested, or put in service which will flush the strategic portions of those systems.

The refueling water storage tank is sampled weekly for Cl⁻ and/or F⁻ contaminations. Weekly sampling is adequate to detect any inleakage of contaminated water.

The control room ventilation system is required to establish a positive differential pressure in the control room for one hour following a design basis loss-of-coolant accident using a bottled air supply as the source of air. The ability of the system to meet this requirement is tested by pressurizing the control room using the ventilation system fans and comparing the volume of air required to that stored. The test is conducted each refueling interval (approximately 12 to 18 months), normally coinciding with the refueling outage of either Unit 1 or Unit 2.

TABLE 4.1-2B
MINIMUM FREQUENCIES FOR SAMPLING TESTS

<u>DESCRIPTION</u>	<u>TEST</u>	<u>FREQUENCY</u>	<u>FSAR SECTION REFERENCE</u>
1. Reactor Coolant Liquid Samples	Radio-Chemical Analysis ⁽¹⁾	Monthly ⁽⁵⁾	
	Gross Activity ⁽²⁾	5 days/week ⁽⁵⁾	9.1
	Tritium Activity	Weekly ⁽⁵⁾	9.1
	*Chemistry (CL, F & O ₂)	5 days/week	4
	*Boron Concentration	Twice/week	9.1
	E Determination	Semiannually ⁽³⁾	
	DOSE EQUIVALENT I-131 Radio-iodine Analysis (including I-131, I-133 & I-135)	Once/2 weeks ⁽⁵⁾ Once/4 hours ⁽⁶⁾ and ⁽⁷⁾ below	
2. Refueling Water Storage	Boron Concentration	Weekly	6
	Chemistry (Cl & F)	Weekly	
3. Boric Acid Tanks	*Boron Concentration	Twice/Week	9.1
4. Chemical Additive Tank	NaOH Concentration	Monthly	6
5. Spent Fuel Pit	*Boron Concentration	Monthly	9.5
6. Secondary Coolant	Fifteen minute degassed b and q activity	Once/72 hours	10.3
	DOSE EQUIVALENT I-131	Monthly ⁽⁴⁾	
		Semiannually ⁽⁸⁾	
7. Stack Gas Iodine and Particulate Samples	*I-131 and particulate radioactive releases	Weekly	
8. Accumulator	Boron Concentration	Monthly	6.2

*See Specification 4.1.D

- (1) A radiochemical analysis will be made to evaluate the following corrosion products: Cr-51, Fe-59, Mn-54, Co-58, and Co-60.
- (2) A gross beta-gamma degassed activity analysis shall consist of the quantitative measurement of the total radioactivity of the primary coolant in units of $\mu\text{Ci/cc}$.

TABLE 4.1-3A

UNIT 1

MINIMUM FREQUENCY FOR FINISHING SENSITIZED PIPE

<u>Flush Flow Path General Description</u>	<u>Flush Duration</u>	<u>Frequency</u>
1) Containment Spray Pump Discharge	Note 1	Note 2
2) Low Hd SI Pump Discharge	Note 1	Note 2
3) Low Hd SI Pump up to 1st Iso. Valve	Note 1	Note 2
4) High Hd SI Pump Inside Containment	Note 1	Note 2
5) High Hd SI Pump Discharge	Note 1	Note 2

Note 1: Flush until sample is below 0.15 PPM Cl⁻ and/or F⁻

Note 2: When REST Chemistry has exceeded 0.15 PPM Cl⁻ and/or F⁻ (only after restoring the REST Chemistry to spec for Cl⁻ and/or F⁻)

TABLE 4.1-3B

UNIT 2

MINIMUM FREQUENCY FOR FLUSHING SENSITIZED PIPE

Flush Flow Path General Description (Ref. SSM Report SSI-MER-1A)	Flush Duration	Frequency
1) Containment Spray Pump Discharge	Note 1	Note 2
2) Low Hd SI Pump Discharge	Note 1	Note 2
3) Low Hd SI Pump up to 1st Iso. Valve	Note 1	Note 2
4) High Hd SI Pump Inside Containment	Note 1	Note 2
5) High Hd SI Pump Discharge	Note 1	Note 2

Note 1: Flush until sample is below 0.15 ppm Cl⁻ and/or F⁻

Note 2: When HST Chemistry has exceeded 0.15 ppm Cl⁻ and/or F⁻ (only after restoring the HST Chemistry to spec for Cl⁻ and/or F⁻)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 150 TO FACILITY OPERATING LICENSE NO. DPR-32
AND AMENDMENT NO. 147 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 March 8, 1990, the Virginia Electric and Power Company (the licensee), submitted a request for amendments to Technical Specifications (TS) Sections 4.1.E and 4.1.H and to the Bases Section for the Surry Power Station, Units 1 and 2. The amendments would eliminate the monthly flush requirements for the sensitized stainless steel piping installed in the safety injection and containment spray systems. Instead, the systems containing sensitized steel will be flushed whenever the concentration of chlorides and/or fluorides in the refueling water storage tank (RWST) exceeds 0.15 ppm. Also, a requirement would be added to perform weekly sampling of the solution in the RWST for chloride and fluoride contamination. The proposed modifications would simplify the existing operating procedures.

EVALUATION

The Surry plant contains a number of stainless steel pipes which, during the construction phase, became sensitized and prone to intergranular stress corrosion cracking (IGSCC). In order to prevent damage, a special procedure was devised to assure that they would not be exposed to the chemical environment conducive to such type of corrosion. The subsystems containing sensitized stainless steel piping which communicated with the RWST and which contained stagnant water were required by TS Sections 4.1.E and 4.1.H to undergo monthly flushing to assure that chloride and fluoride concentrations remained below 0.15 ppm. The flush flow paths were as follows: containment spray pump discharge, low head safety injection pump discharge, low head safety injection pump up to first isolation valve, high head safety injection pump inside containment, and the high head safety injection pump discharge.

In an effort to upgrade the plant's TS, the licensee proposed that the requirement of TS Sections 4.1.E and 4.1.H for monthly flushing be replaced by flushing only during refueling or whenever the concentrations of chloride and/or fluoride in the RWST exceed 0.15 ppm. Flushing would then be performed long enough to bring the concentration to below the 0.15 ppm limit.

The licensee has provided justification for the proposed changes. The licensee has determined that, under normal operating conditions, these subsystems will always remain filled with water, impurities concentration would remain in the range of 20-25 ppb for chlorides and 1-2 ppb for fluorides, and that there are no identifiable mechanisms which could account for an increase of these concentrations above the 0.15 ppm limit. Therefore, as long as the water in the RWST meets the specifications, the sensitized stainless steel components are not susceptible to damage. To assure that the water in the RWST remains below this limit, the licensee included in Table 4.1-2B a requirement that the RWST water be sampled weekly for chlorides and fluorides. We have reviewed the justifications provided by the licensee and find that they adequately support the proposed TS amendments.

SUMMARY

On the basis of our evaluation, we find that the changes proposed by the licensee to Technical Specification Sections 4.1.E and 4.1.H of the Surry plant are acceptable.

ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have 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. 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.

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: December 28, 1990

Principal Contributor:
K. Parczewski