

December 31, 1986

Docket Nos. 50-280
and 50-281

Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

DISTRIBUTION

Docket File	J. Partlow
NRC PDR	T. Barnhart (8)
Local PDR	W. Jones
PAD#2 Rdg	E. Butcher
T. Novak	N. Thompson
D. Miller	V. Benaroya
C. Patel	Tech Branch
OGC-Bethesda	ACRS (10)
L. Harmon	C. Miles, OPA
E. Jordan	L. Tremper, LFMB
B. Grimes	Gray File

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment No. 111 to Facility Operating License No. DPR-32 and Amendment No. 111 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 in response to your application transmitted by letter dated August 22, 1986, as supplemented December 5, December 10, and December 23, 1986.

These amendments change the expiration date for the Unit 1 Facility Operating License, DPR-32, from June 25, 2008, to May 25, 2012, and change the expiration date for the Unit 2 Facility Operation License, DPR-37, from June 25, 2008, to January 29, 2013.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

/s/
Chandu P. Patel, Project Manager
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 111 to DPR-32
2. Amendment No. 111 to DPR-37
3. Safety Evaluation

cc: w/enclosures
See next page

LA:PAD#2
DMiller
12/15/86

CPR
PM:PAD#2
CPatel:hc
12/16/86

OGC
12/30/86

PD:PAD#2
LRubenstein
12/29/86

Concurred in by
T Novak 12/30/86 Aj

8701120046 861231
PDR ADOCK 05000280
P PDR

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



December 31, 1986

Docket Nos. 50-280
and 50-281

Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment No. 111 to Facility Operating License No. DPR-32 and Amendment No. 111 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 in response to your application transmitted by letter dated August 22, 1986, as supplemented December 5, December 10, and December 23, 1986.

These amendments change the expiration date for the Unit 1 Facility Operating License, DPR-32, from June 25, 2008, to May 25, 2012, and change the expiration date for the Unit 2 Facility Operation License, DPR-37, from June 25, 2008, to January 29, 2013.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

Chandu P. Patel

Chandu P. Patel, Project Manager
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 111 to DPR-32
2. Amendment No. 111 to DPR-37
3. Safety Evaluation

cc: w/enclosures
See next page

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

Surry Power Station

cc:

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

Attorney General
Supreme Court Building
101 North 8th Street -
Richmond, Virginia 23219

Mr. Robert F. Saunders, Manager
Surry Power Station
Post Office Box 315
Surry, Virginia 23883

Resident Inspector
Surry Power Station
U.S. Nuclear Regulatory Commission
Post Office Box 166, Route 1
Surry, Virginia 23883

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

W. T. Lough
Virginia Corporation Commission
Division of Energy Regulation
Post Office Box 1197
Richmond, Virginia 23209

Mr. J. T. Rhodes
Senior Vice President - Power Ops.
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, Georgia 30323

James B. Kenley, M.D., Commissioner
Department of Health
109 Governor Street
Richmond, Virginia 23219

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

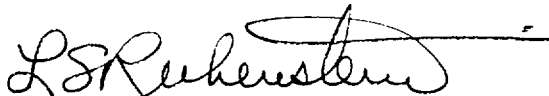
Amendment No. 111
License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated August 22, 1986, as supplemented December 5, December 10, and December 23, 1986, 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, item 4 of License No. DPR-32 is amended to read as follows:
 - "4. This license is effective as of the date of issuance, and shall expire at midnight on May 25, 2012."

8701120051 861231
PDR ADDCK 05000280
P PDR

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

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, appearing to read "L. S. Rubenstein", with a horizontal line extending to the right from the end of the signature.

Lester S. Rubenstein, Director
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Date of Issuance: December 31, 1986



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. 111
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 August 22, 1986, as supplemented December 5, December 10, and December 23, 1986, 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, item 4 of License No. DPR-37 is amended to read as follows:
 - "4. This license is effective as of the date of issuance, and shall expire at midnight on January 29, 2013."

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

FOR THE NUCLEAR REGULATORY COMMISSION



Lester S. Rubenstein, Director
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Date of Issuance: December 31, 1986



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 111 TO FACILITY OPERATING LICENSE NO. DPR-32
AND AMENDMENT NO. 111 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 application dated August 22, 1986, and as supplemented by letters dated December 5, December 10, and December 23, 1986, the Virginia Electric and Power Company (the licensee) requested amendments to Facility Operating Licenses No. DPR-32 and No. DPR-37 for the Surry Power Station, Units No. 1 and No. 2, respectively. The proposed amendments would change the license expiration date for Surry Unit 1 from June 25, 2008, to May 25, 2012, and change the expiration date for Surry Unit 2 from June 25, 2008, to January 29, 2013.

DISCUSSION

Section 103.c of the Atomic Energy Act of 1954 provides that a license is to be issued for a specified period not exceeding 40 years. 10 CFR 50.51 specifies that each license will be issued for a fixed period of time not to exceed 40 years from date of issuance. 10 CFR 50.56 and 10 CFR 50.57 allow the issuance of an operating license pursuant to 10 CFR 50.51 after the construction of the facility has been substantially completed, in conformity with the construction permit and when other provisions specified in 10 CFR 50.57 are met.

The currently licensed term for Surry Units 1 and 2 is 40 years from the date of issuance of the construction permits (June 25, 2008). Accounting for the time that was required for plant construction, this represents an effective operating license term of approximately 36 years for Surry Unit 1 and 35½ years for Surry Unit 2. Consistent with Section 103.c of the Atomic Energy Act and Sections 50.51, 50.56 and 50.57 of the Commission's regulations, the licensee, by its application of August 22, 1986, as supplemented December 5, December 10, and December 23, 1986, seeks extensions of the operating license terms for Surry Units 1 and 2 such that the fixed period of the licenses would be 40 years from the date of operating license issuance.

EVALUATION

The Commission has reviewed the licensee's application for amendments and previous licensing documents, including the Surry Updated Final Safety Analysis Report (UFSAR), the Surry Safety Evaluation Report (SER), and more recent

Commission policy and documents, to determine the effects of the requested extension upon safety. The Commission's evaluation considered the potential effects to systems and equipment, including effects due to aging of electrical equipment important to safety and changes in the fracture toughness properties of reactor vessel beltline materials due to neutron irradiation. The evaluation also included the effects of updated population estimates upon the previous determination of exclusion area, low population zone (LPZ) and population center distance, in accordance with 10 CFR 100. Other areas of the Commission's previous safety review of the Surry Power Station are not affected by the requested extension. The Surry Power Station was originally designed and constructed on the basis of a 40 year service life.

A. Updated Population Estimates

NRC's February 23, 1972 Safety Evaluation Report, Section 3.1, discussed NRC findings regarding the 10 CFR Part 100 siting criteria for the Surry 1 and 2 Exclusion Area, Low Population Zone, and nearest population centers. The effects on these three criteria of the licensee's request to extend the license periods for Surry 1 and 2 are discussed below.

The Exclusion Area consists of the licensee-owned property in approximately a 1650 ft. (0.3 mile) radius of the station. The licensee owns all of the land within the Exclusion Area. The licensee has the authority to control activities within the Exclusion Area and anticipates no changes to the Exclusion Area boundary during the extended license period.

The Surry LPZ has an outer radius of three miles. As stated in the Surry SER, the 1966 population in the LPZ was 122. Although no current population data is available specifically for the LPZ, the area remains predominantly rural and is expected to remain so during the extended license period. Relevant information is available (Commonwealth of Virginia data, October 1986) for two counties in which the LPZ is located. The annual population growth rate for these counties in the period from 1970 to 2000 ranges from 0.3 to 1.7%. It is reasonable to assume that this modest growth rate would continue during the additional license period (years 2008-2013). Based on this modest growth rate, we would expect no significant increase in LPZ population during the extended license period.

In addition, the licensee has established a 10 mile radius Emergency Planning Zone, enveloping the LPZ, over which there continues to be reasonable assurance that protective measures could be taken on behalf of the population in the event of an accident.

The current nearest major population center as defined in 10 CFR Part 100 (containing more than 25,000 residents), is Newport News, VA, located approximately 4.7 miles southeast of the site. This is considered as the nearest major population center distance although significant population density does not occur for several more miles from the site. Thus, the nearest population center remains the same as that identified in Section 3.1.2 of the Surry SER and the nearest population center distance continues to be greater than one and one-third times the distance from the reactor to the outer boundary of the LPZ.

Based on the Commonwealth of Virginia's population growth rate estimates (October 1986), Newport News is expected to remain the nearest population center throughout the extended license period for Surry and therefore the conclusions in Section 3.1.2 of the SER remain unchanged.

Accordingly, the Commission's conclusions in SER Section 3.1 that the exclusion area, low population zone and population center distance meet the guidelines of 10 CFR 100, are not changed by the proposed extension, and the Surry site continues to be acceptable.

B. Effects Upon Systems and Equipment

The licensee's request for extension of the operating licenses is based on the fact that a 40-year service life was considered during the design and construction of the plant. Although this does not mean that some components will not wear out during the plant lifetime, design features were incorporated which maximize the inspectability of structures, systems and equipment.

The surveillance, inspection, testing and maintenance practices which have been implemented in accordance with the applicable codes, standards and the facility Technical Specifications provide assurance that any unexpected degradation in plant equipment will be identified and corrected. See Attachment 1 for significance of the December 9, 1986, pipe rupture at Surry Unit 2 relative to operating license extension.

The design of the reactor vessel and its internals considered the effects of 40 years of operation at full power and a comprehensive vessel material surveillance program is maintained in accordance with 10 CFR Part 50, Appendix H. We have completed our analyses related to the pressurized thermal shock (PTS) rule, 10 CFR 50.61, for both units which shows that the most critical weld materials for both reactor vessels meet the criterion of 10 CFR 50.61 at the end of the 40-year operating life. In addition to these calculations, surveillance capsules placed inside the reactor vessels provide a means of monitoring the cumulative effects of power operation.

Aging analyses have been performed for all safety-related electrical equipment in accordance with 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants," identifying qualified lifetimes for this equipment. These lifetimes will be incorporated into plant equipment maintenance and replacement practices to ensure that all safety-related electrical equipment remains qualified and available to perform its safety function regardless of the overall age of the plant.

C. Findings

Based upon the above, we find that extension of the operating licenses for Surry Units 1 and 2 to allow a 40-year service life is consistent with the safety analyses for the Surry Station and that the Commission's previous safety findings are not changed. All issues associated with plant systems and equipment, including aging and changes in fracture toughness properties of materials, have been addressed and are acceptable for 40 years of operation. The site continues to meet the guidelines of 10 CFR 100. Accordingly, we find the proposed change to the expiration dates of the Surry Units 1 and 2 Facility Operating Licenses to be acceptable.

ENVIRONMENTAL CONSIDERATION

A Notice of Issuance of an Environmental Assessment and Finding of No Significant Impact relating to the proposed extension of facility operating license termination dates for the Surry Unit Nos. 1 and 2 was published in the Federal Register on December 31, 1986 (51 FR 47324).

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 31, 1986

Principal Contributor:

C. Patel

SIGNIFICANCE OF THE DECEMBER 9, 1986, PIPE RUPTURE AT
SURRY UNIT 2 RELATIVE TO OPERATING LICENSE EXTENSION

The purpose of this evaluation is to examine the significance that the December 9, 1986, pipe rupture at Surry Unit 2 has on the operating license extension requests for Surry Units 1 and 2.

The recent pipe rupture at Surry Unit 2 occurred in the feedwater pump suction line and the cause of the event has been attributed to corrosion/erosion phenomena. A summary of this event is contained in IE Information Notice 86-106, "Feed Water Line Break," dated December 16, 1986. Loss of normal feedwater events have been analyzed for Surry and the recent Surry 2 event was bounded by those analyses.

The rate at which this phenomena causes degradation of the feedwater piping is believed to be dependent upon a number of parameters. These parameters include the piping material, process temperature and pressure, fluid velocity, piping layout, and time. The staff believes that where this mechanism is active significant degradation is likely to occur in a time frame that is less than the duration of the original license. This was the experience at Surry Unit 2 and has also been the case with occurrences of corrosion/erosion that we are aware of in fossil plants.

As discussed below, certain steps have been put in place and other actions may be required to examine for this type of degradation in safety-related and non-safety-related piping in these plants. These actions are being undertaken to assure plant safety and would be undertaken regardless of license extension considerations. However, they will provide substantial assurance that the corrosion/erosion process will not result in serious degradation of plant piping during the remainder of the present license period as well as during the extended license period.

Protection against the occurrence of failures from corrosion/erosion is based upon a thorough understanding of the parameters involved and taking any necessary corrective actions. A comprehensive inspection plan has been put into place at Surry to assess safety-related and non-safety-related plant piping for degradation by corrosion/erosion. This plan considers the parameters mentioned above and inspections will be made on piping systems of different materials, piping configurations, as appropriate, and process conditions. It is intended that sufficient inspection of piping will take place to verify under what conditions this type of degradation takes place. Corrective actions may consist of additional plant inspections in the near term and throughout plant life, piping replacement, and redesign, as necessary.

The staff intends to examine the Surry inspection plans to assure that serious degradation of piping is not occurring elsewhere in the plant. The staff will also be reviewing the results of this inspection and developing any generic requirements that are determined to be necessary.

Prior to restart of the Surry Units, the licensee will be required to demonstrate to the satisfaction of the staff that sufficient inspections of the plant piping have been made to assess the extent of corrosion/erosion degradation. Additionally, any piping replacements required because of this assessment will be made, as appropriate. If it is determined that piping redesigns are necessary they will be made in a time frame well before further serious degradation could be anticipated and in any event well before the extension period. Augmented piping inspections, if required by the staff, will be made over the life of the plant.

The staff has concluded that appropriate actions have been taken and will continue to be taken to understand the Surry Unit 2 event and to effect necessary changes in inspections and piping design at Surry Unit 1 and 2, and accordingly the operating license extensions can be granted.