VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

October 1, 1999

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.: 99-492
NCM/RPC
Docket Nos.: 50-280/281
License Nos.: DPR-32/37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
UPDATED FINAL SAFETY ANALYSIS REPORT
REVISION 31

Pursuant to 10 CFR 50.71(e), Virginia Electric and Power Company submits Revision 31 to the Updated Final Safety Analysis Report (UFSAR) for Surry Power Station. This revision also includes updates to Chapter 17 of the UFSAR, which contains the Operational Quality Assurance (QA) Program. The changes to the program description do not reduce the commitments contained therein.

One signed original, one paper copy, and four CD-ROM copies of Revision 31 to the UFSAR are enclosed. Each paper revision package contains replacement instructions and four volumes of Revision 31 pages. The Revision 31 pages replace the existing text, tables, figures, and tabs as described in the instructions. Each CD-ROM copy includes the entire UFSAR in portable document format (PDF), UFSAR reference drawings in PDF, installation software that consists of Adobe Acrobat Reader (to access the PDF files) and an ASCII text README file that provides installation information.

As a duly authorized officer of the Virginia Electric and Power Company, I hereby certify that the information given in the enclosed Revision 31 of the UFSAR accurately presents changes prepared pursuant to Commission requirements.

Very truly yours,

Leslie N. Hartz
Vice President - Nuclear Engineering and Services

Enclosures

Commitments made in this letter: None.

A053
1 1/2 Hard Copies
4 CD Roms

cc: U.S. Nuclear Regulatory Commission (w/ one CD-ROM copy)
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23 T85
Atlanta, GA 30303-3415

Mr. R. A. Musser (w/ one CD-ROM copy)
NRC Sr. Resident Inspector
Surry Power Station

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Leslie N. Hartz, who is Vice President - Nuclear Engineering & Services, of Virginia Electric and Power Company. She has affirmed before me that she is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of her knowledge and belief.

Acknowledged before me this 1st day of October, 1999.

My Commission Expires: 3/31/2000.

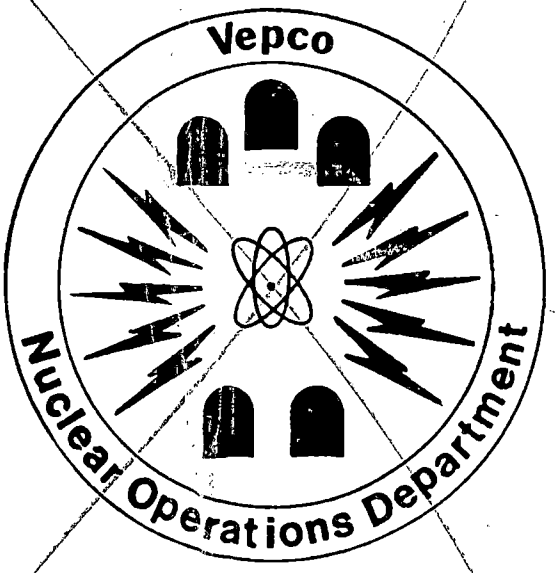
Maggie McCleese
Notary Public

(SEAL)

50-280 Superseded Per Rev 31 To USFSAR dtd 10/1/99 #9910080070

Vepco

SURRY POWER STATION
UNITS 1 & 2



VOLUME I

UPDATED FINAL
SAFETY ANALYSIS REPORT

VIRGINIA ELECTRIC AND POWER COMPANY

Assignment Sheet Goes Here

REVISION SUMMARY

Revision 29

Section	Changes
17.2, 17.2.1.2, 17.2.2.1, 17.2.3, 17.2.4, 17.2.5, Figure 17.2.1-1, and Table 17.2-0	Deleted reference to the Nuclear Operations Department Standards and replace with Nuclear Business Unit Standard. Added position of Project Manager (Configuration Management).
17.2.1.1 and 17.2.1.2	Clarified organizational position descriptions by noting responsibilities for the ISFSI as they already exist.
17.2.1.2, Figure 17.2.1-2, and Figure 17.2.1-3	Deleted the position of Supervisor Administrative Services in the Nuclear Management organization and assigned duties and responsibilities to other positions.
17.2.2.6 and 17.2.2.8	Provided clarification of Quality Inspection Coordinator qualifications.
17.2.17, Tables 17.2-2 and 17.2-3	Added Generic Letter 88-18 commitment regarding storage of quality assurance records on optical disk media.
Table 17.2.0	Added provision for storage of quality assurance records in an approved offsite facility.
Table 17.2-0	Provided an additional alternative to ANSI/ANS 3.1.
Tables 17.2-2 and 17.2-3	Clarified the description of onsite and offsite nuclear safety review committees.

Revision 28

Section	Changes
Foreword	Updated to reflect recent NRC initiatives regarding UFSAR submittal requirements, and adequacy and consistency of design basis information; and to note Virginia Power's adoption of electronic methods to enhance UFSAR maintenance, and UFSAR distribution in both hardcopy and electronic media.
5.5	Modified leak rate testing discussion to include 10 CFR 50, Appendix J, Option B performance-based leak rate testing rulemaking.

Revision 28 (continued)

Section	Changes
7.5.1.1	Changed low-low pressurizer SI manual block setpoint from 2,000 psia to 2,000 psig.
9.6	• Added introduction and revised subsection headings • Clarified the 3-hour requirement for PASS samples • Deleted references to sampling abandoned flash evaporators • Noted that condenser tube leakage monitoring may be by means other than chlorides monitoring • Deleted superfluous HRSS equipment brand names • Clarified operation of the HRSS waste tank • Clarified remote indication of HRSS parameters • Clarified SS valve isolation on an SI signal • Clarified environmental qualification of HRSS containment sump pump
9.10 & 17.2	Deleted references to the Training Center records vault and associated features.
9.12	Updated to reflect current refueling practices.
14.5.2	Updated to reflect reanalysis of small break loss of coolant accident (SBLOCA), including Tables 14.5-14 thru 16, and Figures 14.5-36, and 38 thru 68.
Table 17.2-3	Corrected typos.
All (no change bars)	• Consolidated 7 volumes to 4 volumes • Referenced Station Drawings previously included in UFSAR; inserted simplified diagrams • Removed notations associated with previously deleted material and renumbered sequentially • Renumbered previously inserted items that had suffixes (e.g., 4A, 4B) • Applied consistent typeface and page layouts • Improved consistency of measurement notation (e.g., time, mass, velocity), including abbreviations

REVISION SUMMARY

Revision 30

Section	Changes Made under the provisions of 10 CFR 50.59 except where indicated in brackets.
1.4, 6.1, 6.2, 6.3.1.5, 7.5.3.5, Tables 5.2-1&2, Tables 5.4-18, 19, & 20, Tables 6.2-2, 3, 4, 5, 6, 10, 11, 12, &13, Figs. 6.1-1 & 6.2-2,	Incorporated technical and editorial corrections and clarifications related to the Safety Injection System.
1.4.59, 5.3.3, 6.2.3, 6.3.1, 7.5.2.2, 11.3.3.10, Tables 6.3-1 & 3, Figs. 6.3-2, 3, & 5	Incorporated technical and editorial corrections and clarifications related to the Recirculation Spray System.
2.2.1.1, Table 2.2-7, 2.5.3.2, 6.1, 6.2.2.1.2, Table 6.2-1, 6.2.3.12.1, 6.2.4.1.4, 6.2 References, 7.4.3.6, Figure 7.5-1, 8.3, 9.6, 9.8, 9.10, 9B.2.1, 9B.2.4.1, 9B.2.4.4, 9B.2.4.7, 9C, 11.2, Tables 11A-6, 7,9 & 10, Table 14.3-15, Table 14.5-11, 15.5.1.8 & Table 16.2-2.	Corrected references, typographical errors, and verb tense; clarified an abbreviated term and illegible text; and corrected format of numbers, upper/lower case usage, and text lists.

Revision 30 (continued)

Section	Changes Made under the provisions of 10 CFR 50.59 except where indicated in brackets.
3.3.3.2.2, 3.5, App. 9A & Tables 3.3-1 & 9.12-1	Increased the maximum fuel enrichment from 4.1 to 4.3 weight percent U-235. [10 CFR 50.90 License Amendment]
4.2.2.3.2	Added a description of the removal of the steam generator channel head drain lines.
5.3.1 & 9.13	Revised description of auxiliary ventilation and containment ventilation systems to reflect changes in these systems design and operation.
5.4 & Tables 5.4-17, 5.4-18, 5.4-19, 5.4-20, 6.2-11, 6.2-12 & 6.2-13	Removed Containment concrete floor plugs and the Pressurizer cubicle roof plug.
6.2.2.1.1 & Table 6.2-2	Updated the description of the Safety Injection control board indication.
6.2.2.1.3	Changed to state that pressure-relieving devices discharge to the liquid waste disposal system.
6.2.2.2.1	Clarified the tanks to which the accumulators may be drained.
6.2.2.2.4 & 6.2 References	Revised description of safety injection valves MOV-1890A/B and MOV-2890A/B to reflect addition of pressure equalization line. Added Reference to NRC Generic Letter 95-07.
6.2.3.3	Changed containment spray and minimum recirculation spray pH ranges.
6.2.3.10, 6.2.4.1.4, 6.3.1.4, 15.5.1.3, 15.5.1.12 & Figure 15.5-1	Revised the description of the Containment ground water control equipment, ground water protection methods, and liquid level alarms.
6.2.3.12	Changed post-LOCA containment hydrogen concentration for new initial conditions.
6.2.3.12.1	Revised valve stroke time for isolation of the volume control tank.
6.2.4.1.3, 6.2.4.1.4	Changed to describe SI system testing as a series of tests during refueling, and to state that accumulator discharge check valves are tested during refueling.

Revision 30 (continued)

Section	Changes Made under the provisions of 10 CFR 50.59 except where indicated in brackets.
6.3.1.2.1	Removed the statement that sodium hydroxide solution was only present in the containment spray system during system operation.
6.3.1.4, Tables 6.2-12 & 13	Revised description of NPSH to the recirculation spray pumps to include impact several minor phenomena with impact on post-LOCA sump level.
7.2.3.2.7	Clarified the description of the AMSAC C-20 setpoint.
8.6	Clarified preventive maintenance program requirements by deleting the statement which implies that insulation testing is performed on all electrical equipment.
9.9.1.2 & 9.9.3	Updated the description of Emergency Service Water Pump, 1-SW-P-1A, to indicate the removal of the electric motor drive.
9.9.1.3 & 9.10.4.18	Clarified the description of actions taken prior to the arrival of a hurricane onsite and corrected the classification of the circulating water valves as safety related.
9.9.2 & Table 2.1-4	Updated the description of service water chemical treatment and updated the list of onsite chemicals.
9.10.4.16	Updated the description of Emergency Service Water Pump, 1-SW-P-1A, to indicate the removal of the electric motor drive.
10.3.1.2	Removed the statement that the Main Steam Safety Valves temperature flow probes are required for compliance with Regulatory Guide 1.97.
10.3.5.3, 14.2.11.1.3	Relocated the stated numerical value of auxiliary feedwater (AFW) flowrate from the section describing the AFW system to the section where event analysis is described.
11.2.2, 11.2.5, & Tbl. 11.2-11	Modified descriptions of process vent system to remove implied wind speed limitations for system operation.
12.1.1.2.1, 17.2, & KWI	Updated Station Manager title to Site Vice President and Assistant Station Managers titles to Manager-Station O&M and Manager-Station S&L. [10 CFR 50.90 License Amendment]
14.2.7	Updated the description of the feedwater temperature reduction event.
14.3.1	Revised the steam generator tube rupture accident analysis to reflect the evaluation of the effect of steam generator tube bundle uncovery on radioiodine release.
17.2.1.2.B.1	Identified the Site Vice President as the station position fulfilling the Plant Manager position identified in the ISFSI Technical Specifications.

Revision 30 (continued)

Section	Changes Made under the provisions of 10 CFR 50.59 except where indicated in brackets.
17.2.3	Revised to reflect replacement of A/E Instruction Manual with an Engineering Standard.

Revision 29

Section	Changes
17.2, 17.2.1.2, 17.2.2.1, 17.2.3, 17.2.4, 17.2.5, Figure 17.2.1-1, and Table 17.2-0	Deleted reference to Nuclear Operations Department Standards and replaced with Nuclear Business Unit Standard. Added position of Project Manager (Configuration Management).
17.2.1.1 and 17.2.1.2	Clarified organizational position descriptions by noting responsibilities for the ISFSI as they already exist.
17.2.1.2, Figure 17.2.1-2, and Figure 17.2.1-3	Deleted the position of Supervisor Administrative Services in the Nuclear Management organization and assigned duties and responsibilities to other positions.
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Section	Changes
5.5	Modified leak rate testing discussion to include 10 CFR 50, Appendix J, Option B performance-based leak rate testing rulemaking.
7.5.1.1	Changed low-low pressurizer SI manual block setpoint from 2,000 psia to 2,000 psig.
9.6	• Added introduction and revised subsection headings • Clarified the 3-hour requirement for PASS samples • Deleted references to sampling abandoned flash evaporators • Noted that condenser tube leakage monitoring may be by means other than chlorides monitoring • Deleted superfluous HRSS equipment brand names • Clarified operation of the HRSS waste tank • Clarified remote indication of HRSS parameters • Clarified SS valve isolation on an SI signal • Clarified environmental qualification of HRSS containment sump pump
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Surry Power Station
Updated Final Safety Analysis Report
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FOREWORD

In the May 9, 1980, edition of the Federal Register (45 FR 30614), the NRC published a Final Rule requiring all licensed reactors to periodically update their Final Safety Analysis Reports. The purpose of the Rule was to establish baseline reference documents to be used in recurring safety analyses by licensees, the NRC, or other interested parties.

The "Supplementary Information" section of the Final Rule notice stated that submittal of an updated FSAR does not constitute a licensing action, but is only intended to provide information. The NRC Staff may review the material submitted, but does not intend to formally approve it. The NRC intends to use the updated FSAR in the future for appropriate applications such as reporting of deviations from conditions stated in the UFSAR.

The Rule became effective July 22, 1980, and established the following basic requirements for Vepco's nuclear power stations:

- A complete Updated FSAR (UFSAR) was required as the initial submittal
- The UFSAR was to reflect information and analyses submitted to the NRC by Vepco, or prepared by Vepco pursuant to NRC requirements, since submission of the original FSAR (or, as appropriate, the last UFSAR)

  NOTE: The "Supplementary Information" section of the Final Rule notice clarifies this requirement by stating that no analyses other than those already prepared or submitted pursuant to NRC requirements are required because of the Rule: however, FSAR analyses that are known to be nonconservative based on new analyses must be updated. Other new analyses not previously included in the FSAR may be incorporated in the UFSAR at the option of the licensee. Furthermore, specialized studies provided in the original FSAR (e.g., seismology, meteorology) should include the latest information developed in response to NRC requirements when these studies are transferred to the UFSAR, and program type material referenced by the UFSAR (e.g., security plan, emergency plan, QA Program) should be referenced accurately. In addition, the level of detail in the UFSAR should be at least the same as but not necessarily greater than that provided in the original FSAR. Information on design changes should not be included until the changes are approved for use and operable.

- The initial UFSAR was due no later than July 22, 1982
- The initial UFSAR was required to be up-to-date as of a maximum of six months prior to the date of filing (January 31, 1982, was chosen by Vepco as the cutoff date)
- Subsequent updates are required at least annually and must reflect changes made up to a maximum of six months prior to the date of filing

- One original and 12 copies of the initial UFSAR and subsequent updates are required to be submitted to the NRC
- The updates are required to be certified by a duly authorized officer of Vepco
- The initial UFSAR should be a clean document without change bars and revision numbers. The subsequent annual revisions should include change indicators and page change identification

In response to the foregoing FSAR update requirements, Vepco and NUS Corporation executed an Agreement for FSAR update services in April 1981, and NUS began work on the project immediately. The project was accomplished in four basic phases:

1. Document Retrieval
2. Change Package Development
3. FSAR Revision
4. Printing

- During the initial document retrieval phase in the Spring of 1981, NUS engineers researched the licensing correspondence files at Vepco offices in Richmond and the design change files at the plant sites. All documents potentially affecting the FSAR were copied and taken to the NUS home office.

  Following the initial document review phase, NUS engineers periodically visited Richmond and the plant sites to acquire newly developed information. NUS was also placed on the distribution list for Vepco/NRC correspondence.

  The document retrieval phase continued until early 1982, at which time sufficient information was available to document changes up to the January 31, 1982, cutoff date.

- The documentation retrieved during the first phase was reviewed in detail during the second phase to determine the particular "two-digit" section or sections of the FSAR that should be revised, i.e., 1.1, 1.2, 1.3, etc. Copies of the document (or of the particular pages of the document that were of interest) were placed in separate files corresponding to the two-digit sections. These files were defined as "change packages." Development of the change packages continued in parallel with the document retrieval phase, with new information being reviewed and assigned to appropriate change packages. The final change packages became a work product delivered to Vepco on conclusion of the update effort and are available for tracing the sources of changes to the original FSARs

- After development of the initial change packages the material filed therein was used in the third phase of the project to make the actual FSAR revisions. The revision process continued in parallel with the continuing development of the change packages.

The revision phase for most FSAR chapters included two cycles of Vepco review and comment. These comments became part of the change packages and were used in the development of the final draft UFSAR.

- Vepco reviewed and approved the final draft chapters of the UFSARs for printing. The printer prepared approximately 125 sets of the UFSARs. NUS delivered one original and 12 copies of the UFSAR directly to the NRC on July 20, 1982, for Surry and July 22, 1982, for North Anna. The original UFSARs were transmitted under cover letter supplied to NUS by Vepco (see the attachment to this foreword). The remaining copies were shipped to Richmond and the plant sites.

The following work products were also delivered to Vepco by NUS and are available for use in producing subsequent annual updates:

- Printer's copy of the UFSARs
- Annotated FSARs (2 copies)
- Final Change Packages (2 sets)
- Plant Drawing Indexes
- Key Word Indexes
- IBM Displaywriter Floppy Discs (2 sets each of the FSAR, Annotated FSAR, and Key Word Index)
- Update Procedures
- Introductory Volumes to the FSARs including this foreword, a list of effective pages, the key word indexes, the plant drawing indexes and a record of changes

Further 10 CFR 50.71(e) rulemaking pertaining to UFSAR requirements for nuclear power stations was promulgated as recently as July 29, 1996 [61 FR 39278]. In particular, the annual revision requirement has been relaxed to six months after each refueling outage provided the interval between successive updates does not exceed 24 months.

The NRC issued a letter to licensees dated October 9, 1996, entitled *Request for Information Pursuant to 10 CFR 50.54(f) Regarding Adequacy and Availability of Design Basis Information*. The letter required submittal of information that will provide the NRC added confidence and assurance that Virginia Electric and Power Company's nuclear plants are operated and maintained within their design bases and that any deviations are reconciled in a timely manner. The Company's response (Serial No. 96-535) dated February 7, 1997, described previously conducted programmatic reviews of the Updated Final Safety Analysis Report (UFSAR). The 1996 UFSAR Project Team examined the exisiting administrative controls for maintaining UFSAR content and usability. Process enhancements to simplify administrative

controls, to increase accountability for technical content, and to improve UFSAR accessibility and usability are promoted by conversion to electronic media.

Under separate cover (Serial No. 97-108) dated May 23, 1997, Virginia Electric and Power Company notified the NRC about its project to address potential regulatory concerns involving the current design and licensing bases for the Surry and North Anna Power Stations. This project scope exceeds the level of scrutiny normally applied to the current licensing basis through routine surveillance and quality assurance activities. In order to facilitate thorough review, exhaustive validation, and a rigorous corrective action process, the recommended conversion to electronic media was implemented in Revision 28 of the Surry UFSAR. The entire text of the UFSAR was entered into electronic media. The conversion was accomplished by a process of augmenting recent UFSAR revision word processing packages with "scanned-in" optical character recognition documents for the balance of text, tables, and figures not previously stored electronically. A 100-percent word-for-word proofing was conducted by comparing a printed version of the entire electronic document with current controlled distribution copies. Thus, the electronic UFSAR was conveyed into service as the quality assurance document of record without introducing any substantive, technical, or non-editorial changes.

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

July 16, 1982

R. H. LEASBURG
VICE PRESIDENT
NUCLEAR OPERATIONS

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No. 424
NO/GSS:acm
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Gentlemen:

UPDATED FINAL SAFETY ANALYSIS REPORT
SURRY POWER STATION UNITS NO. 1 AND 2

Pursuant to 10 CFR 50.71(e), the Virginia Electric and Power Company hereby submits the Updated Final Safety Analysis Report (UFSAR) for the Surry Power Station Units No. 1 and 2. One signed original and twelve additional copies of the UFSAR are enclosed.

The UFSAR contains all the necessary changes since the submission of the original FSAR. This UFSAR is up to date as of February 1, 1982 which is within six months prior to the date of this letter.

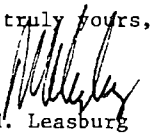
The enclosed UFSAR is a completely new document without the pages from the original FSAR. It is not a revision of the original FSAR but retains all the applicable information from the original FSAR.

This initial UFSAR is a "clean" document without change bars and revision numbers. The subsequent revisions will have the change indicator and change identification.

Future revisions of the UFSAR will be submitted at least annually and will reflect all the changes up to six months prior to the date of submission.

As a duly authorized officer of Vepco, I hereby certify that the information given in the enclosed UFSAR accurately presents changes made since the previous submittal, necessary to reflect information and analyses submitted to the Commission or prepared pursuant to Commission requirement.

Very truly yours,



R. H. Leasburg

Enclosures:

cc: Mr. James P. O'Reilly (w/o enclosures)
Regional Administrator
Region II

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