

July 7, 2008

Mr. David A. Christian  
President and Chief Nuclear Officer  
Virginia Electric and Power Company  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS  
REGARDING CONTROL ROOM HABITABILITY (TAC NOS. MD6139 AND  
MD6140)

Dear Mr. Christian:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 260 to Renewed Facility Operating License No. DPR-32 and Amendment No. 260 to Renewed Facility Operating License No. DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The amendments change the Technical Specifications (TSs) in response to your application dated July 13, 2007, as supplemented by letter dated August 20, 2007.

These amendments revise Technical Specifications (TSs) requirements related to main control room and emergency switchgear room envelope habitability. These changes are consistent with the NRC-approved Revision 3 of Technical Specification Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-448, "Control Room Habitability."

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,

**/RA/**

Siva P. Lingam, Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosures:

1. Amendment No. 260 to DPR-32
2. Amendment No. 260 to DPR-37
3. Safety Evaluation

cc w/encls: See next page

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Package No.: ML081750687

Amendment No.: ML081750690

Tech Spec No.: ML081750699

\*\* signed by G. Lappert

\*\*transmitted by memo dated

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	NRR/DIRS/ITSB/BC	NRR/LPL2-1/BC
NAME	SLingam	MO'Brien	RElliott	MWong
DATE	6/18/08	7/2/08**	6/9/08*	7/3/08

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VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 260  
Renewed 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 July 13, 2007, as supplemented by letter dated August 20, 2007, 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 Renewed Facility Operating License No. DPR-32 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 260, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Facility Operating License No. DPR-32 will be amended to add license condition 3.S., to read as follows:

3.S. Upon implementation of Amendment No. 260 adopting TSTF-448, Revision 3, the determination of Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope unfiltered air inleakage as required by TS SR 4.18 in accordance with TS 6.4.R.3.a, the assessment of MCR/ESGR envelope habitability as required by Specification 6.4.R.3.b, and the measurement of MCR/ESGR envelope pressure as required by Specification 6.4.R.4, shall be considered met. Following implementation:

- (1) The first performance of SR 4.18, in accordance with Specification 6.4.R.3.a, shall be within the specified frequency of 6 years plus the 18-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (2) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 6.4.R.3.b, shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
- (3) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 6.4.R.4, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from January 19, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

4. This license amendment is effective as of its date of issuance and shall be implemented within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

***/RA/***

Melanie C. Wong, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to License No. DPR-32  
and the Technical Specifications

Date of Issuance: July 7, 2008

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 260  
Renewed 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 13, 2007, as supplemented by letter dated August 20, 2007, 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 Renewed Facility Operating License No. DPR-37 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 260, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Facility Operating License No. DPR-37 will be amended to add license condition 3.S., to read as follows:

3.S. Upon implementation of Amendment No. 260 adopting TSTF-448, Revision 3, the determination of Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope unfiltered air inleakage as required by TS SR 4.18 in accordance with TS 6.4.R.3.a, the assessment of MCR/ESGR envelope habitability as required by Specification 6.4.R.3.b, and the measurement of MCR/ESGR envelope pressure as required by Specification 6.4.R.4, shall be considered met. Following implementation:

- (1) The first performance of SR 4.18, in accordance with Specification 6.4.R.3.a, shall be within the specified frequency of 6 years plus the 18-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (2) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 6.4.R.3.b, shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
- (3) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 6.4.R.4, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from January 19, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

4. This license amendment is effective as of its date of issuance and shall be implemented within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

***/RA/***

Melanie C. Wong, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes License No. DPR-37  
and the Technical Specifications

Date of Issuance: July 7, 2008

ATTACHMENT

TO LICENSE AMENDMENT NO. 260

RENEWED FACILITY OPERATING LICENSE NO. DPR-32

DOCKET NO. 50-280

AND

TO LICENSE AMENDMENT NO. 260

RENEWED FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NO. 50-281

Replace the following pages of the Licenses and the Appendix A Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

License

License No. DPR-32, page 3  
License No. DPR-32, page 6  
License No. DPR-37, page 3  
License No. DPR-37, page 6

TSs

ii  
iii  
3.10-4  
3.10-4a  
3.10-5  
3.10-6  
3.10-6a  
3.10-7  
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3.19-1  
3.19-2  
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Insert Pages

License

License No. DPR-32, page 3  
License No. DPR-32, page 6  
License No. DPR-37, page 3  
License No. DPR-37, page 6

TSs

ii  
iii  
3.10-4  
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3.10-5  
3.10-6  
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3.10-7  
3.10-8  
3.10-9  
3.10-10  
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TSs (cont'd.)

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4.20-4  
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TSs (cont'd.)

3.21-4  
3.21-5  
3.21-6  
3.23-1  
3.23-3  
3.23-4  
4.18-1  
4.18-2  
4.20-4  
4.20-5  
6.4-14  
6.4-15

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 260 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-32

AND

AMENDMENT NO. 260 TO RENEWED 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

1.0 INTRODUCTION

By letter dated July 13, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML071970301), as supplemented by letter dated August 20, 2007 (ADAMS Accession No. ML072330098), Virginia Electric and Power Company (the licensee) submitted a request for changes to the Surry Power Station, Unit Nos. 1 and 2 (Surry 1 and 2) Technical Specifications (TSs). These amendments revise TSs requirements related to main control room (MCR) and emergency switchgear room (ESGR) envelope habitability. These changes are consistent with the U.S. Nuclear Regulatory Commission (NRC) approved Revision 3 of Technical Specification Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-448, "Control Room Habitability." The supplement dated August 20, 2007, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff original proposed no significant hazards consideration determination as published in the *Federal Register* on August 14, 2007 (72 FR 45463).

On August 8, 2006, the commercial nuclear electrical power generation industry owners group TSTF submitted a proposed change, TSTF-448, Revision 3, to the improved STS (NUREGs 1430-1434) on behalf of the industry (TSTF-448, Revisions 0, 1, and 2 were prior draft iterations). TSTF-448, Revision 3, is a proposal to establish more effective and appropriate action, surveillance, and administrative STS requirements related to ensuring the habitability of the control room envelope (CRE).

In NRC Generic Letter (GL) 2003-01 (Reference 1), licensees were alerted to findings at facilities that existing TS surveillance requirements (SR) for the Control Room Envelope Emergency Ventilation System (CREEVS) may not be adequate. Specifically, the results of American Society for Testing and Materials (ASTM) E741 (Reference 2) tracer gas tests to measure CRE unfiltered inleakage at facilities indicated that the differential pressure surveillance is not a reliable method

for demonstrating CRE boundary operability. Licensees were requested to address existing TS as follows:

*Provide confirmation that your technical specifications verify the integrity [i.e., operability] of the CRE [boundary], and the assumed [unfiltered] inleakage rates of potentially contaminated air. If you currently have a  $\Delta P$  [differential pressure] surveillance requirement to demonstrate CRE [boundary] integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of the ASTM E741 testing results. If you conclude that your  $\Delta P$  surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E741), and 2) making any necessary modifications to your CRE boundary so that compliance with your new surveillance requirement can be demonstrated.*

*If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.*

To promote standardization and to minimize the resources that would be needed to create and process plant-specific amendment applications in response to the concerns described in the GL, the industry and the NRC proposed revisions to CRE habitability system requirements contained in the STS, using the STS change traveler process. This effort culminated in Revision 3 to TSTF-448, "Control Room Habitability," which the NRC staff approved on January 17, 2007.

Consistent with the TSTF-448 as incorporated into NUREG-1431, the licensee proposed revising action requirements in TS 3.10, "Refueling;" 3.19, "Main Control Room Bottled Air System;" and 3.23, "Main Control Room and Emergency Switchgear Room Air Conditioning System" (formerly titled "Control and Relay Room Ventilation Supply Filter Trains"). The licensee proposed adding a new TS Section 3.21, "Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)." The licensee proposed revising surveillance requirements in TS 4.18, "Main Control Room/Emergency Switchgear Room (MCR/ESGR), Emergency Ventilation System (EVS) Testing" and adding a new administrative controls program, TS Section 6.4.R, "Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Habitability Program." The purpose of the changes is to ensure that MCR/ESGR envelope boundary operability is maintained and verified through effective surveillance and programmatic requirements, and that appropriate remedial actions are taken in the event of an inoperable MCR/ESGR envelope boundary.

Some editorial and plant specific changes were incorporated into this safety evaluation resulting in minor deviations from the model safety evaluation text in TSTF-448, Revision 3.

## 2.0 REGULATORY EVALUATION

### 2.1 Control Room and Control Room Envelope

NRC Regulatory Guide 1.196, "Control Room Habitability at Light-water Nuclear Power Reactors," Revision 0, May 2003, (Reference 4) uses the term "control room envelope" in addition to the term "control room" and defines each term as follows:

*Control Room: The plant area, defined in the facility licensing basis, in which actions can be taken to operate the plant safely under normal conditions and to maintain the reactor in a safe condition during accident situations. It encompasses the instrumentation and controls necessary for a safe shutdown of the plant and typically includes the critical document reference file, computer room (if used as an integral part of the emergency response plan), shift supervisor's office, operator wash room and kitchen, and other critical areas to which frequent personnel access or continuous occupancy may be necessary in the event of an accident.*

*Control Room Envelope: The plant area, defined in the facility licensing basis, that in the event of an emergency, can be isolated from the plant areas and the environment external to the CRE. This area is served by an emergency ventilation system, with the intent of maintaining the habitability of the control room. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident.*

NRC Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity At Nuclear Power Reactors," Revision 0, May 2003 (Reference 5), also contains these definitions, but uses the term CRE to mean both these definitions. This is because the protected environment provided for operators varies with the nuclear power facility. At some facilities this environment is limited to the control room; at others, it is the CRE. For consistency, facilities should use the term CRE with an appropriate facility-specific definition derived from the above CRE definition. In this safety evaluation, consistent with the proposed changes to the STS and because Surry 1 and 2 TSs are custom TSs, the term CRE used in the STS and TSTF-448 is expressed as the "Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope in the Surry 1 and 2 custom TSs. This variation in nomenclature is an equivalent interpretation of the "Control Room Envelope," and is therefore an acceptable difference.

## 2.2 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Habitability System (EHS)

The MCR/ESGR EHS provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The MCR/ESGR EHS consists of the MCR Bottled Air System and the MCR/ESGR Emergency Ventilation System (EVS) (TS 3.21)

The ECR/ESGR EHS (the term used at Surry 1 and 2, for the Control Room Envelope Emergency Ventilation System, CREEVS) provides a protected environment from which operators can control the unit, during airborne challenges from radioactivity, hazardous chemicals, and fire byproducts, such as fire suppression agents and smoke, during both normal and accident conditions. The MCR/ESGR EHS is designed to maintain a habitable environment in the MCR/ESGR envelope for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem total effective dose equivalent (TEDE).

The MCR/ESGR EVS consists of four full capacity trains that supply filtered air to the MCR/ESGR envelope and a MCR/ESGR envelope boundary that limits the inleakage of unfiltered air. One EVS train is capable of performing the safety function of providing outside filtered air for pressurization, and maintaining the habitability of the MCR/ESGR envelope. Two independently powered EVS trains are required for independence and redundancy. Each MCR/ESGR EVS train

is considered operable when the individual components necessary to limit MCR/ESGR envelope occupant exposure are operable in the two required trains of the MCR/ESGR EVS, one train of which is from the other unit. MCR/ESGR EVS train is considered operable when the associated:

- Fan is operable;
- High efficiency particulate air (HEPA) filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and
- Ductwork, valves, and dampers are operable, and air flow can be maintained.

In order for the MCR/ESGR EVS trains to be considered operable, the MCR/ESGR envelope boundary must be maintained such that the MCR/ESGR envelope occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs, and that MCR/ESGR envelope occupants are protected from hazardous chemicals and smoke.

### 2.3 Regulations Applicable to MCR/ESGR Habitability

In Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," General Design Criteria (GDC) 1, 2, 3, 4, 5, and 19 apply to MCR/ESGR habitability. A summary of these GDCs follows.

GDC 1, "Quality Standards and Records," requires that structures, systems, and components (SSCs) important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions performed.

GDC 2, "Design Basis for Protection Against Natural Phenomena," requires that SSCs important to safety be designed to withstand the effects of earthquakes and other natural hazards.

GDC 3, "Fire Protection," requires SSCs important to safety be designed and located to minimize the effects of fires and explosions.

GDC 4, "Environmental and Dynamic Effects Design Bases," requires SSCs important to safety to be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents (LOCAs).

GDC 5, "Sharing of Structures, Systems, and Components," requires that SSCs important to safety not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, the orderly shutdown and cooldown of the remaining units.

GDC 19, "Control Room," requires that a control room be provided from which actions can be taken to operate the nuclear reactor safely under normal conditions and to maintain the reactor in a safe condition under accident conditions, including a LOCA. Adequate radiation protection is to

be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of specified values.

Prior to incorporation of TSTF-448, Revision 3, the STS requirements addressing CRE boundary operability resided only in the following CRE ventilation system TSs Sections:

- NUREG-1430, TS 3.7.10, "Control Room Emergency Ventilation System (CREVS);"
- NUREG-1431, TS 3.7.10, "Control Room Emergency Filtration System (CREFS);"
- NUREG-1432, TS 3.7.11, "Control Room Emergency Air Cleanup System (CREACS);"
- NUREG-1433, TS 3.7.4, "[Main Control Room Environmental Control (MCREC)] System;" and
- NUREG-1434, TS 3.7.3, "[Control Room Fresh Air (CRFA)] System."

In these TSs Sections, the surveillance requirement associated with demonstrating the operability of the CRE boundary requires verifying that one CREEVS train can maintain a positive pressure relative to the areas adjacent to the CRE during the pressurization mode of operation at a specified makeup flow rate. Facilities that pressurize the CRE during the emergency mode of operation of the CREEVS have similar surveillance requirements. Regardless, the results of ASTM E741 (Reference 2) tracer gas tests to measure CRE unfiltered inleakage at facilities indicated that the differential pressure surveillance is not a reliable method for demonstrating CRE boundary operability. That is, licensees were able to obtain differential pressure and flow measurements that satisfied the SR limits, even though unfiltered inleakage was determined to exceed the value assumed in the safety analyses.

In addition to an inadequate surveillance requirement, the action requirements of these TSs Sections were ambiguous regarding CRE boundary operability in the event CRE unfiltered inleakage is found to exceed the analysis assumption. The ambiguity stemmed from the view that the CRE boundary may be considered operable but degraded in this condition, and that it would be deemed inoperable only if calculated radiological exposure limits for CRE occupants exceeded a licensing basis limit; e.g., as stated in GDC-19, even while crediting compensatory measures.

NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," (AL 98-10) states that "the discovery of an improper or inadequate TS value or required action is considered a degraded or nonconforming condition," which is defined in NRC Inspection Manual Chapter 9900; latest guidance in RIS 2005-20 (Reference 3). "Imposing administrative controls in response to improper or inadequate TS is considered an acceptable short-term corrective action. The NRC staff expects that, following the imposition of administrative controls, an amendment to the inadequate TS, with appropriate justification and schedule, will be submitted in a timely fashion."

Licensees that have found unfiltered inleakage in excess of the limit assumed in the safety analyses and have yet to either reduce the inleakage below the limit or establish a higher bounding limit through re-analysis, have implemented compensatory actions to ensure the safety

of CRE occupants, pending final resolution of the condition, consistent with RIS 2005-20. However, based on GL 2003-01 and AL 98-10, the NRC staff expects each licensee to propose TS changes that include a surveillance to periodically measure CRE unfiltered inleakage in order to satisfy 10 CFR 50.36(d)(3), which requires a facility's TS to include surveillance requirements, which it defines as "requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and *that limiting conditions for operation will be met.*" (Emphasis added.)

The NRC staff also expects facilities to propose unambiguous remedial actions, consistent with 10 CFR 50.36(d)(2), for the condition of not meeting the limiting condition for operation (LCO) due to an inoperable CRE boundary. The action requirements should specify a reasonable completion time to restore conformance to the LCO before requiring a facility to be shut down. This completion time should be based on the benefits of implementing mitigating actions to ensure CRE occupant safety and sufficient time to resolve most problems anticipated with the CRE boundary, while minimizing the chance that operators in the CRE will need to use mitigating actions during accident conditions.

#### 2.4 Adoption of TSTF-448 Revision 3 by the Surry 1 and 2

Adoption of TSTF-448, Revision 3, will assure that the facility's Custom TS (CTS) for the MCR/ESGR envelope EHS is met by demonstrating unfiltered leakage into the MCR/ESGR envelope is within limits; i.e., the operability of the MCR/ESGR envelope boundary. In support of this surveillance, which specifies a test interval (frequency) described in Regulatory Guide 1.197, TSTF-448 also adds TS administrative controls to assure the habitability of the MCR/ESGR envelope between performances of the ASTM E741 test. In addition, adoption of TSTF-448 will establish clearly stated and reasonable required actions in the event MCR/ESGR envelope unfiltered inleakage is found to exceed the analysis assumption.

The changes made by TSTF-448 to the CTS requirements for the MCR/ESGR EHS and the MCR/ESGR envelope boundary conform to 10 CFR 50.36(d)(2) and 10 CFR 50.36(d)(3). Their adoption will better assure that the Surry 1 and 2s' MCR/ESGR envelope will remain habitable during normal operation and design basis accident conditions. These changes are, therefore, considered appropriate for use at Surry 1 and 2.

### 3.0 TECHNICAL EVALUATION

The NRC staff reviewed the proposed changes against the corresponding changes made to the STS by TSTF-448, Revision 3, which the NRC staff found to satisfy applicable regulatory requirements, as described above in Section 2.0. The emergency operational mode of the MCR/ESGR EHS at Surry 1 and 2, pressurizes the MCR/ESGR envelope to minimize unfiltered air inleakage. The proposed changes are consistent with this design.

#### 3.1 Proposed Changes

The proposed amendment would strengthen MCR/ESGR envelope habitability CTS requirements by revising action requirements in TS 3.10, "Refueling;" 3.19, "Main Control Room Bottled Air System;" and 3.23, "Main Control Room and Emergency Switchgear Room Air Conditioning System" (formerly titled "Control and Relay Room Ventilation Supply Filter Trains"). The proposed amendment also adds a new Specification 3.21, "Main Control Room/Emergency Switchgear

Room (MCR/ESGR) Emergency Ventilation System (EVS),” revises surveillance requirements in Specification 4.18, “Main Control Room/Emergency Switchgear Room (MCR/ESGR), Emergency Ventilation System (EVS) Testing,” and adds a new CTS administrative controls program, Specification 6.4.R, “Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Habitability Program.” Accompanying the proposed CTS changes are appropriate conforming technical changes to the CTS Bases. The proposed revisions to the Bases also include editorial and administrative changes to reflect applicable changes to the corresponding STS Bases, which were made to improve clarity, conform to the latest information and references, correct factual errors, and achieve more consistency among the STS NUREGs. Except for plant specific differences, all of these changes are consistent with STS as revised by TSTF-448, Revision 3.

The NRC staff compared the proposed CTS changes to the STS and the STS markups and evaluations in TSTF-448. The NRC staff verified that differences from the STS were adequately justified on the basis of plant-specific design or retention of current licensing basis. The NRC staff also reviewed the proposed changes to the CTS Bases for consistency with the STS Bases and the plant-specific design and licensing bases, although approval of the Bases is not a condition for accepting the proposed amendment. However, CTS 6.4.J, “Technical Specifications (TS) Bases Control Program,” provides assurance that the licensee has established and will maintain the adequacy of the Bases. The proposed Bases for CTS 3.19, 3.21, 3.23, and 4.18 refer to specific guidance in NEI 99-03, “Control Room Habitability Assessment Guidance,” Revision 0, dated June 2001 (Reference 6), which the NRC staff formally endorsed, with exceptions, through Regulatory Guide 1.196, “Control Room Habitability at Light-Water Nuclear Power Reactors,” dated May 2003 (Reference 4).

### 3.2 Editorial Changes

The licensee proposed editorial changes to TS requirements related to MCR/ESGR envelope habitability because the Surry 1 and 2, are CTS. These variations from the STS terminology and format include the following:

- NUREG-1431 STS uses defined terms, such as, CONDITION, REQUIRED ACTION AND COMPLETION TIME and their associated table format. The Surry CTS typically use a more narrative format. The intent of the TSTF-448 wording has been maintained in the proposed CTS changes.
- Surry CTS format separates Limiting Conditions for Operation (LCOs) and Action Statements (AS) from Surveillance Requirements (SR) by placing them in different TS Sections (i.e., Sections 3 and 4, respectively).
- MCR/ESGR EVS requirements during Refueling Operations and when moving irradiated fuel are only included in TS 3.10, “Refueling,” rather than in the MCR/ESGR EVS TS, which only addresses operating conditions above Cold Shutdown.
- Surry CTS 3.19, “Main Control Room Bottled Air System,” is also being revised to reflect the TSTF-448 STS requirements associated with an inoperable MCR/ESGR envelope boundary, as this system works in conjunction with the MCR/ESGR EVS as part of the MCR/ESGR Emergency Habitability System (EHS)

to maintain protection of the MCR/ESGR envelope occupants from radiological, hazardous chemical, and smoke hazards.

- Surry CTS do not use the STS Mode terminology convention for reactor operating conditions. Surry CTS use specific definitions for each operating condition instead, e.g., Power Operation, Hot Shutdown, Intermediate Shutdown, Reactor Critical, Cold Shutdown, and Refueling Shutdown.

These changes improve the usability and quality of the presentation of the CTS, have no adverse impact on safety, and therefore, are acceptable.

### 3.3 TS 3.21, "Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)" and TS 3.19, "Main Control Room Bottle Air System"

The licensee proposed to establish a new Surry CTS Section 3.21, "MCR/ESGR EVS," which incorporates the EVS requirements formerly in Surry CTS 3.23, and addresses an inoperable MCR/ESGR boundary. If two MCR/ESGR EVS trains are determined to be inoperable due to an inoperable MCR/ESGR envelope boundary, the new actions in TS Section 3.21.C would allow 90 days to restore the MCR/ESGR envelope boundary (and consequently, the affected MCR/ESGR EVS train(s) to operable status, provided that mitigating actions are immediately implemented and within 24 hours are verified to ensure, that in the event of a DBA, MCR/ESGR envelope occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that MCR/ESGR occupants are protected from hazardous chemicals and smoke.

The 24-hour Completion Time (CT) of this new action TS Section 3.21.C.2 is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90-day CT of this new action TS Section 3.21.C.3 is reasonable based on the determination that the mitigating actions will ensure protection of MCR/ESGR occupants within analyzed limits while limiting the probability that MCR/ESGR occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. The 90-day CT of this new action TS Section 3.21.C.3 is a reasonable time to diagnose, plan and possibly repair, and test most anticipated problems with the MCR/ESGR envelope boundary. Therefore, the proposed action TS Section 3.21.C is acceptable.

Additionally, due to the design of Surry 1 and 2 in which the MCR/ESG EHS consists of both the MCR Bottle Air System and the MCR/ESGR EVS, Section 3.19, "Main Control Room Bottle Air System" incorporates similar additions as Surry 1 and 2 CTS 3.21.C. The 24-hour CT of this new TS Section 3.19.B.3.b is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90-day CT of this new action TS Section 3.19.B.c is reasonable based on the determination that the mitigating actions will ensure protection of MCR/ESGR occupants within analyzed limits while limiting the probability that MCR/ESGR occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. The 90-day CT of this new action TS Section 3.19.B.3.c is a reasonable time to diagnose, plan and possibly repair, and test most anticipated problems with the MCR/ESGR envelope boundary. Therefore, the proposed action TS Section 3.19.B.3 is acceptable.

The revised MCR/ESGR EVS TS requirements (revised NUREG-1431 STS Condition E) during refueling and during the movement of irradiated fuel have been incorporated into Surry's CTS Section 3.10, "Refueling," for consistency with the current Surry 1 and 2 TS, which keeps all of the TS requirements associated with refueling and movement of irradiated fuel in the same TS Section. MCR Bottled Air System requirements during the movement of irradiated fuel that currently reside in TS 3.10 have also been revised to reflect the revised TS requirements for an inoperable MCR/ESGR envelope boundary. These changes are less restrictive because the required actions allow for a 7-day CT in the event one or two MCR/ESGR EVS trains are inoperable due to an inoperable MCR/ESGR envelope boundary during unit operation while refueling or moving irradiated fuel. This is acceptable because the new required actions in Surry 1 and 2 CTS 3.10.A.11, 3.10.A.12, 3.10.B.4, and 3.10.B.5 establish adequate remedial measures in this condition.

The licensee also proposed to modify Surry 1 and 2 CTS Sections 3.19 and 3.21 by adding a NOTE allowing the MCR/ESGR envelope boundary to be opened intermittently under administrative controls. As stated in the Bases, this NOTE "only applies to openings in the MCR/ESGR envelope boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with operators in the MCR/ESGR envelope. This individual will have a method to rapidly close the opening and to restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR envelope isolation is indicated." The allowance of this NOTE is acceptable because the administrative controls will ensure that the opening will be quickly sealed to maintain the validity of the licensing basis analyses of DBA consequences.

The licensee proposed to add a new condition to TS Sections 3.10 A and B, that address the added new condition to Action E of STS 3.7.10 that states, "One or more trains inoperable due to an inoperable CRE boundary in Mode 5 or 6, or during movement of irradiated fuel assemblies." Surry 1 and 2 CTS Section 3.10.A addresses the Refueling mode, and does so by incorporating 3.10.A.11.b and 3.10.A.12.b for inoperable MCR/ESGR EVS train(s) and inoperable MCR Bottle Air System train(s), respectively. Surry 1 and 2 CTS Section 3.10.A.11 Condition requires that, "Two MCR/ESGR EVS trains shall be Operable," followed by Required Action 3.10.A.11.b which states, "If two required trains are inoperable or one or more required trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C." Surry CTS Section 3.10.A.12 Condition requires, "Two MCR Bottle Air System trains shall be Operable," followed by Required Action 3.10.12.b which states, "If two trains are inoperable or one or more trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C." The specified Required Action proposed for these conditions are similar to the existing condition of STS Action E, and are in keeping with the licensee's approved licensing basis. This change will ensure that the required actions continue to specify a condition for an inoperable MCR/ESGR envelope boundary during refueling and movement of irradiated fuel. Therefore, this change is administrative and acceptable.

The proposed new Surry CTS Section 4.18, "MCR/ESGR EVS Testing," incorporates inleakage measurement SR which states, "Perform required MCR/ESGR envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program." The MCR/ESGR Envelope Habitability Program TS, proposed CTS 6.4R, requires that the program include

“Requirements for determining the unfiltered air leakage past the MCR/ESGR envelope boundary into the MCR/ESGR envelope in accordance with the testing methods and at the frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0,” (Reference 5). This guidance references ASTM E741 (Reference 2) as an acceptable method for ascertaining the unfiltered leakage into the MCR/ESGR envelope. The licensee has proposed to follow this method. Therefore, the proposed MCR/ESGR envelope leakage measurement SR is acceptable.

### 3.4 Surry CTS 6.4R, “Main Control Room/Emergency Switchgear Room Envelope Habitability Program”

The proposed administrative controls program CTS is consistent with the model program STS in TSTF-448, Revision 3. In combination with proposed new CTS 4.18, this program is intended to ensure the operability of the MCR/ESGR envelope boundary, which as part of an operable MCR/ESGR EHS will ensure that MCR/ESGR envelope habitability is maintained such that MCR/ESGR occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the MCR/ESGR envelope under DBA conditions without personnel receiving radiation exposures in excess of 5 rem TEDE for the duration of the accident.

A MCR/ESGR Envelope Habitability Program TS acceptable to the NRC staff requires the program to contain the following elements:

Definitions of MCR/ESGR envelope and MCR/ESGR envelope boundary: This element is intended to ensure that these definitions accurately describe the plant areas that are within the MCR/ESGR envelope, and also the interfaces that form the MCR/ESGR envelope boundary, and are consistent with the general definitions discussed in Section 2.1 (STS terminology CRE and CRE boundary) of this safety evaluation. Establishing what is meant by the MCR/ESGR envelope and the MCR/ESGR envelope boundary will preclude ambiguity in the implementation of the program.

Configuration control and preventive maintenance of the MCR/ESGR envelope boundary: This element is intended to ensure the MCR/ESGR envelope boundary is maintained in its design condition. Guidance for implementing this element is contained in Regulatory Guide 1.196 (Reference 4), which endorsed, with exceptions, NEI 99-03, Rev. 0 (Reference 6). Maintaining the MCR/ESGR envelope boundary in its design condition provides assurance that its leak-tightness will not significantly degrade between MCR/ESGR envelope leakage determinations.

Assessment of MCR/ESGR envelope habitability at the frequencies stated in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0 (Reference 5), and measurement of unfiltered air leakage into the MCR/ESGR envelope in accordance with the testing methods and at the frequencies stated in Sections C.1 and C.2 of Regulatory Guide 1.197. This element is intended to ensure that the plant assesses MCR/ESGR envelope habitability consistent with Sections C.1 and C.2 of Regulatory Guide 1.197. Assessing MCR/ESGR envelope habitability at the frequencies specified in RG 1.197 provides assurance that significant degradation of the MCR/ESGR envelope boundary will not go undetected between MCR/ESGR envelope leakage determinations. Determination of

MCR/ESBR envelope inleakage using test methods specified in RG 1.197 assures that test results are reliable for ascertaining MCR/ESGR envelope boundary operability. Determination of MCR/ESGR envelope inleakage at the frequencies specified in RG 1.197 provides assurance that significant degradation of the MCR/ESGR envelope boundary will not occur between MCR/ESGR envelope inleakage determinations.

Measurement, at designated locations, of the MCR/ESGR envelope pressure relative to all external areas adjacent to the MCR/ESGR envelope boundary during the pressurization mode of operation by one train of the MCR/ESGR EVS, operating at the flow rate required by CTS 4.20, at a Frequency of 18 months on a Staggered Test Basis, will be assessed. This element is intended to ensure that MCR/ESGR envelope differential pressure is regularly measured to identify changes in pressure warranting evaluation of the condition of the MCR/ESGR envelope boundary. Obtaining and trending pressure data provides additional assurance that significant degradation of the MCR/ESGR envelope boundary will not go undetected between MCR/ESGR envelope inleakage determinations.

Quantitative limits on unfiltered inleakage: This element is intended to establish the MCR/ESGR envelope inleakage limit as the MCR/ESGR envelope unfiltered infiltration rate assumed in the MCR/ESGR envelope occupant radiological consequence analyses of design basis accidents. Having an unambiguous criterion for the MCR/ESGR envelope boundary to be considered operable in order to meet the CTS, will ensure that associated action requirements will be consistently applied in the event of MCR/ESGR envelope degradation resulting in inleakage exceeding the limit.

Consistent with TSTF-448, Revision 3, the program states that the provisions of SR 4.0.2 are applicable to the program frequencies for performing the activities required by new CTS Program 6.4R, paragraph numbers 3 and 4, respectively. This statement is needed to avoid confusion. SR 4.0.2 is applicable to the surveillance that references the testing in the MCR/ESGR Envelope Habitability Program. However, SR 4.0.2 is not applicable to Administrative Controls unless specifically invoked. Providing this statement in the program eliminates any confusion regarding whether SR 4.0.2 is applicable, and is acceptable.

Consistent with TSTF-448, Revision 3, proposed CTS 6.4R states that (1) a MCR/ESGR Envelope Habitability Program shall be established and implemented, (2) the program shall include all of the NRC staff required elements, as described above, and (3) the provisions of SR 4.0.2 shall apply to program frequencies. Therefore, CTS 6.4R, which is consistent with the model program TS approved by the NRC staff in TSTF-448, Revision 3, is acceptable.

### 3.5 Implementation of New Surveillance and Assessment Requirements by the Licensee

The licensee has proposed license conditions regarding the initial performance of the new surveillance and assessment requirements. The new license conditions adopted the conditions in Section 2.3 of the model application published in the *Federal Register* on January 17, 2007 (72 FR 2022). Plant specific changes were made to these proposed license conditions. The proposed plant specific license conditions are consistent with the model application, and are acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff 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 the amendments involve no significant hazards consideration, and there has been no public comment on such finding (72 FR 45463). Accordingly, the 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 the amendments.

#### 6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

#### 7.0 REFERENCES

1. NRC Generic Letter 2003-01, "Control Room Habitability," dated June 12, 2003, (GL 2003-01) (ADAMS Accession No. ML031620248).
2. ASTM E 741 - 00, "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution," 2000, (ASTM E741).
3. NRC Regulatory Issue Summary 2005-20: Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability," dated September 26, 2005 (RIS 2005-20) (ADAMS Accession No. ML052020424).
4. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors," Revision 0, dated May 2003, (ADAMS Accession No. ML031490611).
5. Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, (ADAMS Accession No. ML031490664).
6. NEI 99-03, "Control Room Habitability Assessment Guidance," Revision 0, dated June 2001.

7. Dominion, "Surry Power Station Units 1 and 2 Proposed License Amendment Request Consolidated Line Item Improvement process Technical Specification Improvement Control Room Habitability," July 13, 2007, ADAMS Accession No. ML071970301

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