

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

May 29, 2007

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 07-0361
NL&OS/ETS R0
Docket Nos. 50-338/339
License Nos. NPF-4/7

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED LICENSE AMENDMENT REQUEST
CONTROL ROOM ENVELOPE HABITABILITY IN ACCORDANCE WITH
TSTF-448, REVISION 3, USING THE CONSOLIDATED LINE ITEM
IMPROVEMENT PROCESS

Pursuant to 10 CFR 50.90, Dominion requests amendments, in the form of changes to the Technical Specifications to Facility Operating License Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed amendment would modify TS requirements related to control room envelope habitability in accordance with TSTF-448, Revision 3.

The availability of this TS improvement was announced in the Federal Register on January 17, 2007 (72 FR 2022) as part of the consolidated line item improvement process (CLIIP). Attachment 1 provides a description of the proposed change, the requested confirmation of applicability, and plant-specific verifications. The marked-up and proposed Technical Specifications pages are provided in Attachments 2 and 3, respectively. The associated marked-up Bases changes are provided in Attachment 4 for information only and will be implemented in accordance with the Technical Specification Bases Control Program and 10 CFR 50.59.

The proposed changes have been reviewed and approved by the Station Nuclear Safety and Operating Committee.

Dominion requests approval of the license amendments by October 31, 2007 with a 180-day implementation period to complete the development of a common Control Room Habitability Program for the Dominion nuclear plants.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the appropriate designated officials of Virginia.

If you have any questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,

A handwritten signature in black ink, appearing to read "Gerald T. Bischof", with a stylized flourish at the end.

Gerald T. Bischof
Vice President – Nuclear Engineering

Attachments

1. Discussion of Change
2. Marked-up Technical Specifications Changes
3. Proposed Technical Specifications Pages
4. Marked-up Technical Specifications Bases Changes

Commitments made in this letter: None

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COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Gerald T. Bischof, who is Vice President – Nuclear Engineering, of Virginia Electric and Power Company. He has affirmed before me that he 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 his knowledge and belief.

Acknowledged before me this 29th day of May, 2007.

My Commission Expires: May 31, 2010.

Vicki L. Hull
Notary Public

(SEAL)

Attachment 1
(Serial No. 07-0360)
Discussion of Change

North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)

Description and Assessment

1.0 DESCRIPTION

The proposed amendment modifies the North Anna Power Station Units 1 and 2 Technical Specifications (TS) requirements related to control room envelope habitability. The changes are consistent with Nuclear Regulatory Commission (NRC) approved Industry/Technical Specification Task Force (TSTF) STS change TSTF-448, Revision 3. The availability of this TS improvement was published in the Federal Register on January 17, 2007 as part of the consolidated line item improvement process (CLIIP).

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

Virginia Electric and Power Company (Dominion) has reviewed the safety evaluation dated January 17, 2007 as part of the CLIIP. This review included a review of the NRC staff's evaluation, as well as the supporting information provided to support TSTF-448. Dominion has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to North Anna Units 1 and 2 and justify this amendment for the incorporation of the changes to the North Anna Units 1 and 2 TS.

2.2 Optional Changes and Variations

The following sections of the Model SE are applicable to North Anna design and current TS requirements.

- Section 3.0 - TS 3.7.[10] [CREEVS] Evaluations 1, 4, and 6 are applicable to North Anna

In addition, the North Anna plant design currently includes a pressurized Main Control Room/Emergency Switchgear Room (MCR/ESGR) design, which uses the Bottled Air System and the Emergency Ventilation System (EVS) to pressurize the MCR/ESGR envelope. The North Anna TSs address the operability requirements for the EVS and MCR/ESGR envelope boundary in three different specifications. Therefore, to incorporate TSTF-448, Revision 3, the specifications listed below will be modified.

- 3.7.10, Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)
- 3.7.13, Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System
- 3.7.14 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) - During Movement of Recently Irradiated Fuel Assemblies

The following exception to the Section C.1 and C.2 of Regulatory guide 1.197 is being taken:

- C.2.1 Licensing Bases -Vulnerability assessments for radiological, hazardous chemical and smoke, and emergency ventilation system testing were completed as documented in the UFSAR. The exceptions to the Regulatory Guides (RG) referenced in RG 1.196 (i.e., RG 1.52, RG 1.78, and RG 1.183), which were considered in completing the vulnerability assessments, are documented in the UFSAR/current licensing basis. Compliance with these RGs is consistent with the current licensing basis as described in the UFSAR.

This general exception does not affect the periodic testing and evaluation of the MCR/ESGR envelope boundary. Periodic testing and evaluation of the MCR/ESGR envelope boundary will be performed consistent with the regulatory positions described in Sections C.1 and C.2 of RG 1.197. This exception identifies how the North Anna control room habitability licensing basis was developed, which is consistent with the intent of RG 1.196 and the regulatory guides referenced therein, but is not in verbatim compliance with the regulatory positions established in each RG. North Anna's commitment to the following regulatory guides is described in the following UFSAR Sections:

- RG 1.52, Rev. 2, 1978 - UFSAR 6.2.3
- RG 1.78, Rev. 0, 1974 - UFSAR 6.4.1.3.3
- RG 1.95, Rev. 1, 1977 - UFSAR 6.4.1.3.3
- RG 1.183, July 2000 - UFSAR 15.4

2.3 License Condition Regarding Initial Performance of New Surveillance and Assessment Requirements

Dominion proposes the following as a license condition to support implementation of the proposed TS changes:

Upon implementation of Amendment No. xxx 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 3.7.10.4 in accordance with TS 5.5.16.c(i), the assessment of MCR/ESGR envelope habitability as required by TS 5.5.16.c(ii), and the measurement of MCR/ESGR envelope pressure as required by TS 5.5.16.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.10.4 in accordance with Specification 5.5.16.c(i), shall be within the specified frequency of 6 years plus the 18-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 30, 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.

- (b) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 5.5.16.c(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 31, 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.
- (c) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 5.5.16.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from February 27, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Determination

Dominion has reviewed the proposed no significant hazards consideration determination (NSHCD) published in the Federal Register as part of the CLIIP. Dominion has concluded that the proposed NSHCD presented in the Federal Register notice is applicable to North Anna Power Station Units 1 and 2 and is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

4.0 ENVIRONMENTAL EVALUATION

Dominion has reviewed the environmental evaluation included in the model safety evaluation dated January 17, 2007 as part of the CLIIP. Dominion has concluded that the staff's findings presented in that evaluation are applicable to North Anna Power Station Units 1 and 2 and the evaluation is hereby incorporated by reference for this application.

Attachment 2

(Serial No. 07-0360)

Marked-up Technical Specifications Changes

**North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)**

For SRs that existed prior to this amendment that have modified acceptance criteria, the first performance subject to the modified acceptance criteria is due at the end of the first surveillance interval that began on the date the surveillance was last performed prior to the implementation of this amendment.

For SRs that existed prior to this amendment whose intervals of performance are being extended, the first extended surveillance interval begins upon completion of the last surveillance performed prior to implementation of this amendment.

This license condition is effective as of its date of issuance.

f. Upon implementation of Amendment No. XXX 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 3.7.10.4 in accordance with TS 5.5.16.c(i), the assessment of MCR/ESGR envelope habitability as required by Specification 5.5.16.c(ii), and the measurement of MCR/ESGR envelope pressure as required by Specification 5.5.16.d, shall be considered met. Following implementation:

- (i) The first performance of SR 3.7.10.4 in accordance with Specification 5.5.16.c(i), shall be within the specified frequency of 6 years plus the 18-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 30, 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.
- (ii) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 5.5.16.c(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 31, 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.
- (iii) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 5.5.16.d shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from February 27, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

interval begins upon completion of the last surveillance performed prior to implementation of this amendment.

This license condition is effective as of its date of issuance.

- e. VEPCO may operate one lead test assembly containing advanced zirconium-based alloys for one cycle, to a lead rod burnup not exceeding 75,000 MWD/MTU, as described in the licensee's submittal dated February 11, 2002.
- f. Upon implementation of Amendment No. XXX 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 3.7.10.4 in accordance with TS 5.5.16.c(i), the assessment of MCR/ESGR envelope habitability as required by Specification 5.5.16.c(ii), and the measurement of MCR/ESGR envelope pressure as required by Specification 5.5.16.d, shall be considered met. Following implementation:
 - (i) The first performance of SR 3.7.10.4 in accordance with Specification 5.5.16.c(i), shall be within the specified frequency of 6 years plus the 18-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 30, 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.
 - (ii) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 5.5.16.c(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 31, 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.
 - (iii) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 5.5.16.d shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from February 27, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

3.7 PLANT SYSTEMS

3.7.10 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) - Modes 1, 2, 3, and 4

LCO 3.7.10 Two MCR/ESGR EVS trains shall be OPERABLE.

-----NOTE-----
The MCR/ESGR envelope boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR EVS train inoperable <u>for reasons other than Condition B.</u>	A.1 Restore MCR/ESGR EVS train to OPERABLE status.	7 days
B. Two One or more required MCR/ESGR EVS trains inoperable due to inoperable MCR/ESGR <u>envelope</u> boundary.	<p>B.1 <u>Initiate action to implement mitigating actions.</u></p> <p><u>AND</u></p> <p>B.2 <u>Verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.</u></p> <p><u>AND</u></p> <p>B.13 Restore MCR/ESGR <u>envelope</u> boundary to OPERABLE status.</p>	<p><u>Immediately</u></p> <p><u>24 hours</u></p> <p><u>90 days</u>24 hours</p>
C. Required Action and associated Completion Time of Condition A or B not met.	<p>C.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>C.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>
D. Two required MCR/ESGR EVS trains inoperable for reasons other than Condition B.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each required MCR/ESGR EVS train for ≥ 10 continuous hours with the heaters operating.	31 days
SR 3.7.10.2	Perform required MCR/ESGR EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.10.3	Not Used	
SR 3.7.10.4	<p><u>Perform required MCR/ESGR Envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.</u></p> <p>Verify each required MCR/ESGR EVS train can maintain a positive pressures of ≥ 0.04 inches water guage, relative to the adjacent areas, during the pressurization mode of operation at a makeup flow of ≥ 900 cfm and ≤ 1100 cfm.</p>	<p><u>In accordance with the MCR/ESGR Envelope Habitability Program</u></p> <p>18 month on a STAGGERD TEST BASIS</p>

3.7 PLANT SYSTEMS

3.7.13 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System

LCO 3.7.13 Three MCR/ESGR bottled air system trains shall be OPERABLE.

-----NOTE-----

The MCR/ESGR envelope boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR bottled air system train inoperable <u>for reasons other than Condition B.</u>	A.1 Restore MCR/ESGR bottled air system train to OPERABLE status.	7 days
B. Two One or more required MCR/ESGR bottled air system trains inoperable due to inoperable MCR/ESGR <u>envelope</u> boundary in Mode 1, 2, 3 or 4.	<p>B.1 <u>Initiate action to implement mitigating actions.</u></p> <p><u>AND</u></p> <p>B.2 <u>Verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.</u></p> <p><u>AND</u></p> <p>B.13 Restore MCR/ESGR <u>envelope</u> boundary to OPERABLE status.</p>	<p><u>Immediately</u></p> <p><u>24 hours</u></p> <p><u>90 days</u>24 hours</p>
C Two or more required MCR/ESGR bottled air system trains inoperable in Mode 1, 2, 3 or 4 for reasons other than Condition B.	<p>C.1 <u>Initiate action to implement mitigating actions.</u></p> <p><u>AND</u></p> <p>C.24 Restore at least two MCR/ESGR bottled air system trains to OPERABLE status.</p>	<p><u>Immediately</u></p> <p>24 hours</p>

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3.	6 hours
	<u>AND</u> D.2 Be in MODE 5.	36 hours
E. Required Action and associated Completion Time of Condition A, not met during movement of recently irradiated fuel assemblies. <u>OR</u> Two or more required MCR/ESGR bottled air system trains inoperable during movement of recently irradiated fuel assemblies. <u>OR</u> <u>One or more required bottled air system trains inoperable due to an inoperable MCR/ESGR envelope boundary during movement of recently irradiated fuel assemblies.</u>	E.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Verify each required MCR/ESGR bottled air bank is pressurized to ≥ 2300 psig.	31 days
SR 3.7.13.2	Verify each required MCR/ESGR bottled air bank manual valve not locked, sealed, or otherwise secured and required to be open during accident conditions is open.	31 days
SR 3.7.13.3	Verify each required MCR/ESGR bottled air system train actuates on an actual or simulated actuation signal.	18 months

SURVEILLANCE REQUIREMENTS

SR 3.7.13.4	Verify two required MCR/ESGR bottled air system trains can maintain a positive pressure of ≥ 0.05 inches water gauge, relative to the adjacent areas for at least 60 minutes	18 months on a STAGGERED TEST BASIS
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3.7 PLANT SYSTEMS

3.7.14 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) - During Movement of Recently Irradiated fuel Assemblies

LCO 3.7.14 Two MCR/ESGR EVS trains shall be OPERABLE.

-----NOTE-----
The MCR/ESGR envelope boundary may be opened intermittently under administrative control.

APPLICABILITY: During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR EVS train inoperable <u>for reasons other than inoperable MCR/ESGR envelope boundary.</u>	A.1 Restore MCR/ESGR EVS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met <u>OR</u> Two required MCR/ESGR EVS trains inoperable. <u>OR</u> <u>One or more required MCR/ESGR EVS trains inoperable due to inoperable MCR/ESGR envelope boundary.</u>	B.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR	3.7.14.1	Operate each required MCR/ESGR EVS train for ≥ 10 hours continuous hours with the heaters operating.	31 days
SR	3.7.14.2	Perform required MCR/ESGR EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP.

MCR/ESGR EVS - During Movement of Recently Irradiated Fuel Assemblies
3.7.14

SURVEILLANCE	FREQUENCY
<p>3.7.14.3 <u>Perform required MCR/ESGR envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.</u></p> <p>Verify each required MCR/ESGR EVS train can maintain a positive pressure of > 0.04 inches water guage, relative to the adjacent areas, during the pressurization mode of operation at a makeup flow of \geq 900 cfm and < 100 cfm</p>	<p><u>In accordance with the MCR/ESGR Envelope Habitability Program</u></p> <p>In accordance with the VFTP.</p>

5.5 Programs and Manuals

5.5.15 Containment Leakage Rate Testing Program (continued)

d. Leakage Rate acceptance criteria are:

1. Prior to entering a MODE where containment OPERABILITY is required, the containment leakage rate acceptance criteria are:

$\leq 0.60 L_a$ for the Type B and Type C tests on a Maximum Path Basis and $\leq 0.75 L_a$ for Type A tests.

During operation where containment OPERABILITY is required, the containment leakage rate acceptance criteria are:

$\leq 1.0 L_a$ for overall containment leakage rate and $\leq 0.60 L_a$ for the Type B and Type C tests on a Minimum Path Basis.

2. Overall air lock leakage rate testing acceptance criterion is $\leq 0.05 L_a$ when tested at $\geq P_a$.

- e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.
- f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.16 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Habitability Program

A MCR/ESGR Envelope Habitability Program shall be established and implemented to ensure that MCR/ESGR envelope habitability is maintained such that, with an OPERABLE Emergency Habitability System (i.e., MCR/ESGR EVS and MCR/ESGR Bottled Air System), MCR/ESGR envelope 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 design basis accident conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent for the duration of the accident. The program shall include the following elements:

- a. The definition of the MCR/ESGR envelope and the MCR/ESGR envelope boundary.
- b. Requirements for maintaining the MCR/ESGR envelope boundary in its design condition including configuration control and preventive maintenance.

Program and Manuals

5.5.16 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Habitability Program (continued)

- c. Requirements for (i) determining the unfiltered air inleakage past the MCR/ESGR envelope 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, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing MCR/ESGR envelope habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following is an exception to Section C.2 of Regulatory Guide 1.197, Revision 0:

- 2.C.1 Licensing Bases - Vulnerability assessments for radiological, hazardous chemical and smoke, and emergency ventilation system testing were completed as documented in the UFSAR. The exceptions to the Regulatory Guides (RG) referenced in RG 1.196 (i.e., RG 1.52, RG 1.78, and RG 1.183), which were considered in completing the vulnerability assessments, are documented in the UFSAR/current licensing basis. Compliance with these RGs is consistent with the current licensing basis as described in the UFSAR.
- d. 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 the VFTP, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 18 month assessment of the MCR/ESGR envelope boundary.
- e. The quantitative limits on unfiltered air inleakage into the MCR/ESGR envelope. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of design basis accident consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of MCR/ESGR envelope occupants to these hazards will be within the assumptions in the licensing basis.
- f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing MCR/ESGR envelope habitability, determining MCR/ESGR envelope unfiltered inleakage, and measuring MCR/ESGR envelope pressure and assessing the MCR/ESGR envelope boundary as required by paragraphs c and d, respectively.
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Attachment 3

(Serial No. 07-0360)

Proposed Technical Specifications Changes

**North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)**

For SRs that existed prior to this amendment that have modified acceptance criteria, the first performance subject to the modified acceptance criteria is due at the end of the first surveillance interval that began on the date the surveillance was last performed prior to the implementation of this amendment.

For SRs that existed prior to this amendment whose intervals of performance are being extended, the first extended surveillance interval begins upon completion of the last surveillance performed prior to implementation of this amendment.

This license condition is effective as of its date of issuance.

- f. Upon implementation of Amendment No. xxx adopting TSTF-448, Revision 3, the determination of Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope unfiltered air leakage as required by TS SR 3.7.10.4 in accordance with TS 5.5.16.c(i), the assessment of MCR/ESGR envelope habitability as required by Specification 5.5.16.c(ii), and the measurement of MCR/ESGR envelope pressure as required by Specification 5.5.16.d, shall be considered met. Following implementation:
 - (i) The first performance of SR 3.7.10.4 in accordance with Specification 5.5.16.c(i), shall be within the specified frequency of 6 years plus the 18-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 30, 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.
 - (ii) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 5.5.16.c(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 31, 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.
 - (iii) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 5.5.16.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from February 27, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

(4) The licensee is authorized to receive from the Surry Power Station, Unit Nos. 1 and 2, possess, and store irradiated Surry Power Station fuel assemblies containing special nuclear material, enriched to not more than 4.1 percent by weight U-235, subject to the following conditions:

- a. Surry Power Station fuel assemblies may not be placed in North Anna Power Station, Unit Nos. 1 and 2, reactors.
- b. Irradiated fuel shipped to North Anna Power Station shall have been removed from the Surry Power Station reactors no less than 730 days prior to shipment.
- c. No more than 500 Surry Power Station irradiated fuel assemblies shall be received for storage at the North Anna Power Station, Unit Nos. 1 and 2, spent fuel pool.

(5) Environmental Protection Plan

The Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 197, is hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Environmental Protection Plan.

D. Fire Protection

VEPCO shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility and as approved in the SER dated February 1979 subject to the following provision:

The licensee may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

E. Physical Protection

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Millstone, North Anna and Surry Power Stations' Security Plan, Training, and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program" with revisions submitted through May 15, 2006.

F. Updated Final Safety Analysis Report

- (1) The licensee's Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on July 25, October 1, November 4, and December 2, 2002, describes certain future inspection activities to be completed before the period of extended operation. The licensee shall complete these activities no later than April 1, 2018, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.
 - (2) The Updated Final Safety Analysis Report supplement as revised on July 25, October 1, November 4, and December 2, 2002, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following the issuance of this renewed license. Until that update is complete, the licensee may make changes to the programs described in such supplement without prior Commission approval, provided that the licensee evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.
- G. This renewed license is effective as of the date of issuance and shall expire at midnight on April 1, 2038.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Attachments:

1. Appendix A, Technical Specifications
2. Appendix B, Environmental Protection Plan

Date of Issuance: March 20, 2003

interval begins upon completion of the last surveillance performed prior to implementation of this amendment.

This license condition is effective as of its date of issuance.

- e. VEPCO may operate one lead test assembly containing advanced zirconium-based alloys for one cycle, to a lead rod burnup not exceeding 75,000 MWD/MTU, as described in the licensee's submittal dated February 11, 2002.
- f. Upon implementation of Amendment No. xxx 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 3.7.10.4 in accordance with TS 5.5.16.c(i), the assessment of MCR/ESGR envelope habitability as required by Specification 5.5.16.c(ii), and the measurement of MCR/ESGR envelope pressure as required by Specification 5.5.16.d, shall be considered met. Following implementation:
 - (i) The first performance of SR 3.7.10.4 in accordance with Specification 5.5.16.c(i), shall be within the specified frequency of 6 years plus the 18-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 30, 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.
 - (ii) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 5.5.16.c(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from September 21, 2003, the date of the most recent successful tracer gas test, as stated in the March 31, 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.
 - (iii) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 5.5.16.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from February 27, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

- (4) The licensee is authorized to receive from the Surry Nuclear Power Station, Unit Nos. 1 and 2, possess, and store irradiated Surry Power Station fuel assemblies containing special nuclear material, enriched to not more than 4.1 percent by weight U-235, subject to the following conditions:
- a. Surry Power Station fuel assemblies may not be placed in North Anna Power Station, Unit Nos. 1 and 2, reactors.
 - b. Irradiated fuel shipped to North Anna Power Station shall have been removed from the Surry Power Station reactors no less than 730 days prior to shipment.
 - c. No more than 500 Surry Power Station irradiated fuel assemblies shall be received for storage at the North Anna Power Station, Unit Nos. 1 and 2, spent fuel pool.

(5) Environmental Protection Plan

The Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 178, is hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Environmental Protection Plan.

D. Fire Protection

VEPCO shall implement and maintain in effect all provisions of the approved fire protection program as described in the licensee's Updated Final Safety Analysis Report for the facility and as approved in the SER dated February 1979 subject to the following provision:

The licensee may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

E. Physical Protection

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Millstone, North Anna and Surry Power Stations' Security Plan, Training, and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program" with revisions submitted through May 15, 2006.

F. Updated Final Safety Analysis Report

- (1) The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on July 25, October 1, November 4, and December 2, 2002, describes certain future inspection activities to be completed before the period of extended operation. The licensee shall complete these activities no later than August 21, 2020, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.
 - (2) The Updated Final Safety Analysis Report supplement as revised on July 25, October 1, November 4, and December 2, 2002, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following the issuance of this renewed license. Until that update is complete, the licensee may make changes to the programs described in such supplement without prior Commission approval, provided that the licensee evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.
- G. This renewed license is effective as of the date of issuance and shall expire at midnight on August 21, 2040.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Attachments:

1. Appendix A, Technical Specifications
2. Appendix B, Environmental Protection Plan

Date of Issuance: March 20, 2003

3.7 PLANT SYSTEMS

3.7.10 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)-MODES 1, 2, 3, and 4

LCO 3.7.10 Two MCR/ESGR EVS trains shall be OPERABLE.

----- NOTE -----
The MCR/ESGR envelope boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR EVS train inoperable for reasons other than Condition B.	A.1 Restore MCR/ESGR EVS train to OPERABLE status.	7 days
B. One or more required MCR/ESGR EVS trains inoperable due to inoperable MCR/ESGR envelope boundary.	B.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u>	
	B.2 Verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	<u>AND</u>	
	B.3 Restore MCR/ESGR envelope boundary to OPERABLE status.	90 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Be in MODE 5.	36 hours
D. Two required MCR/ESGR EVS trains inoperable for reasons other than Condition B.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each required MCR/ESGR EVS train for ≥ 10 continuous hours with the heaters operating.	31 days
SR 3.7.10.2	Perform required MCR/ESGR EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.10.3	Not Used	
SR 3.7.10.4	Perform required MCR/ESGR Envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.	In accordance with the MCR/ESGR Envelope Habitability Program

3.7 PLANT SYSTEMS

3.7.13 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System

LCO 3.7.13 Three MCR/ESGR bottled air system trains shall be OPERABLE.

----- NOTE -----
The MCR/ESGR envelope boundary may be opened intermittently |
under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR bottled air system train inoperable for reasons other than Condition B.	A.1 Restore MCR/ESGR bottled air system train to OPERABLE status.	7 days
B. One or more required MCR/ESGR bottled air system trains inoperable due to inoperable MCR/ESGR envelope boundary in MODE 1, 2, 3, or 4.	B.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u>	
	B.2 Verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	24 hours
	<u>AND</u>	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 Restore MCR/ESGR envelope boundary to OPERABLE status.	90 days
C. Two or more required MCR/ESGR bottled air system trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u> C.2 Restore at least two MCR/ESGR bottled air system trains to OPERABLE status.	24 hours
D. Required Action and associated Completion Time of Condition A, B or C not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3.	6 hours
	<u>AND</u> D.2 Be in MODE 5.	36 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies.</p> <p><u>OR</u></p> <p>Two or more required MCR/ESGR bottled air system trains inoperable during movement of recently irradiated fuel assemblies.</p> <p><u>OR</u></p> <p>One or more required bottled air system trains inoperable due to an inoperable MCR/ESGR envelope boundary during movement of recently irradiated fuel assemblies.</p>	<p>E.1 Suspend movement of recently irradiated fuel assemblies.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.13.1 Verify each required MCR/ESGR bottled air bank is pressurized to ≥ 2300 psig.	31 days
SR 3.7.13.2 Verify each required MCR/ESGR bottled air bank manual valve not locked, sealed, or otherwise secured and required to be open during accident conditions is open.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.3	Verify each required MCR/ESGR bottled air system train actuates on an actual or simulated actuation signal.	18 months
SR 3.7.13.4	Verify two required MCR/ESGR bottled air system trains can maintain a positive pressure of ≥ 0.05 inches water gauge, relative to the adjacent areas for at least 60 minutes.	18 months on a STAGGERED TEST BASIS

MCR/ESGR EVS—During Movement of Recently Irradiated Fuel Assemblies
3.7.14

3.7 PLANT SYSTEMS

3.7.14 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)—During Movement of Recently Irradiated Fuel Assemblies

LCO 3.7.14 Two MCR/ESGR EVS trains shall be OPERABLE.

----- NOTE -----
The MCR/ESGR envelope boundary may be opened intermittently |
under administrative control.

APPLICABILITY: During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR EVS train inoperable for reasons other than inoperable MCR/ESGR envelope boundary.	A.1 Restore MCR/ESGR EVS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Two required MCR/ESGR EVS trains inoperable. <u>OR</u> One or more required MCR/ESGR EVS trains inoperable due to inoperable MCR/ESGR envelope boundary.	B.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

MCR/ESGR EVS—During Movement of Recently Irradiated Fuel Assemblies
3.7.14

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14.1	Operate each required MCR/ESGR EVS train for ≥ 10 continuous hours with the heaters operating.	31 days
SR 3.7.14.2	Perform required MCR/ESGR EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.14.3	Perform required MCR/ESGR envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.	In accordance with the MCR/ESGR Envelope Habitability Program

5.5 Programs and Manuals

5.5.15 Containment Leakage Rate Testing Program (continued)

d. Leakage Rate acceptance criteria are:

1. Prior to entering a MODE where containment OPERABILITY is required, the containment leakage rate acceptance criteria are:

$\leq 0.60 L_a$ for the Type B and Type C tests on a Maximum Path Basis and $\leq 0.75 L_a$ for Type A tests.

During operation where containment OPERABILITY is required, the containment leakage rate acceptance criteria are:

$\leq 1.0 L_a$ for overall containment leakage rate and $\leq 0.60 L_a$ for the Type B and Type C tests on a Minimum Path Basis.

2. Overall air lock leakage rate testing acceptance criterion is $\leq 0.05 L_a$ when tested at $\geq P_a$.

- e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.
- f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.16 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Habitability Program

A MCR/ESGR Envelope Habitability Program shall be established and implemented to ensure that MCR/ESGR envelope habitability is maintained such that, with an OPERABLE Emergency Habitability System (i.e., MCR/ESGR EVS and MCR/ESGR Bottled Air System), MCR/ESGR envelope 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 design basis accident conditions without

(continued)

5.5 Programs and Manuals

5.5.16 Main Control Room/Emergency Switchgear Room Envelope Habitability Program (MCR/ESGR) (continued)

personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent for the duration of the accident. The program shall include the following elements:

- a. The definition of the MCR/ESGR envelope and the MCR/ESGR envelope boundary.
- b. Requirements for maintaining the MCR/ESGR envelope boundary in its design condition including configuration control and preventive maintenance.
- c. Requirements for (i) determining the unfiltered air inleakage past the MCR/ESGR envelope 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, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing MCR/ESGR envelope habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

The following is an exception to Section C.2 of Regulatory Guide 1.197, Revision 0:

- 2.C.1 Licensing Bases - Vulnerability assessments for radiological, hazardous chemical and smoke, and emergency ventilation system testing were completed as documented in the UFSAR. The exceptions to the Regulatory Guides (RG) referenced in RG 1.196 (i.e., RG 1.52, RG 1.78, and RG 1.183), which were considered in completing the vulnerability assessments, are documented in the UFSAR/current licensing basis. Compliance with these RGs is consistent with the current licensing basis as described in the UFSAR.
- d. 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 the VFTP, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 18 month assessment of the MCR/ESGR envelope boundary.

(continued)

5.5 Programs and Manuals

5.5.16 Main Control Room/Emergency Switchgear Room Envelope Habitability Program (MCR/ESGR) (continued)

- e. The quantitative limits on unfiltered air leakage into the MCR/ESGR envelope. These limits shall be stated in a manner to allow direct comparison to the unfiltered air leakage measured by the testing described in paragraph c. The unfiltered air leakage limit for radiological challenges is the leakage flow rate assumed in the licensing basis analyses of design basis accident consequences. Unfiltered air leakage limits for hazardous chemicals must ensure that exposure of MCR/ESGR envelope occupants to these hazards will be within the assumptions in the licensing basis.
 - f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing MCR/ESGR envelope habitability, determining MCR/ESGR envelope unfiltered leakage, and measuring MCR/ESGR envelope pressure and assessing the MCR/ESGR envelope boundary as required by paragraphs c and d, respectively.
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Attachment 4

(Serial No. 07-0360)

Marked-up Technical Specifications Bases Changes

(For Information Only)

**North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)**

B 3.7 PLANT SYSTEMS

B 3.7.10 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)-Modes 1, 2, 3, and 4

BASES

BACKGROUND The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which ~~operators-occupants~~ can control the unit following an uncontrolled release of radioactivity, hazardous chemical, or smoke. The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR EVS (LCO 3.7.10 and LCO 3.7.14).

The MCR/ESGR EVS consists of ~~was designed as~~ four 100% capacity redundant trains (2 per unit) that can filter and recirculate air inside the MCR/ESGR envelope or supply filtered air to the MCR/ESGR envelope, and a MCR/ESGR boundary that limits the inleakage of unfiltered air. Each train consists of a heater, demister filter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves, dampers, doors, barriers and instrumentation also form part of the system. One EVS train is capable of performing the safety function of supplying filtered outside-air ~~for pressurization~~. The two ~~independent and redundant unit~~ MCR/ESGR EVS trains on the accident unit can actuate automatically in recirculation. Either of these trains can also be aligned to provide filtered outside air ~~for pressurization~~ when appropriate. ~~One~~ Either train from the other unit can be manually actuated to provide filtered outside air approximately 60 minutes after the event. ~~One EVS train is capable of performing the safety function of supplying outside filtered air for pressurization.~~ However, due to the location of the air intake for 1-HV-F-41, it can not be used to satisfy the requirements of LCO 3.7.10. Two of the three remaining trains (1-HV-F-42, 2-HV-F-41, and 2-HV-F-42) are required for independence and redundancy.

The MCR/ESGR envelope is the area within the confines of the MCR/ESGR envelope boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. 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. The MCR/ESGR envelope is protected during normal operation, natural events, and accident conditions. The MCR/ESGR envelope boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the MCR/ESGR envelope. The OPERABILITY of the MCR/ESGR envelope boundary must be maintained to ensure that the inleakage of unfiltered air into the MCR/ESGR envelope will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to MCR/ESGR envelope occupants. The MCR/ESGR envelope and its boundary are defined in the MCR/ESGR envelope Habitability Program.

BASES

BACKGROUND (continued)

Upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, two trains of MCR/ESGR EVS actuate to recirculate air, and airflow from the bottled air banks maintains a positive pressure in the MCR/ESGR envelope. ~~The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR.~~ Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers ~~for pressurization~~. The demisters remove any entrained water droplets present, to prevent excessive moisture loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope ~~prevents~~minimizes infiltration of unfiltered air through the MCR/ESGR envelope boundary from all the surrounding areas adjacent to the MCR/ESGR envelope boundary.

A single train of the MCR/ESGR EVS, operating at a flow rate of < 1100 cfm, will pressurize the MCR/ESGR envelope to ≥ 0.04 inches water gauge relative to external areas adjacent to the MCR/ESGR envelope boundary. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 6.4 (Ref. 1).

Redundant MCR/ESGR EVS supply and recirculation trains provide the required ~~pressurization and~~ filtration should an excessive pressure drop develop across the other filter train. Normally closed isolation dampers are arranged in series pairs so that the failure of one damper to open will not result in an inability of the system to perform the function based on the presence of the redundant train. The MCR/ESGR EHS is designed in accordance with Seismic Category I requirements. The actuation signal will only start the MCR/ESGR EVS trains for the affected unit. Requiring two of the three MCR/ESGR EVS trains provides redundancy, assuring that at least one train is available to be realigned to provide filtered outside air. ~~for pressurization.~~

The MCR/ESGR EHS is designed to maintain a habitable environment in the the control room environment ~~MCR/ESGR envelope~~ for 30 days of continuous occupancy after a DBA without exceeding the control room

BASES

BACKGROUND (continued)	operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 3) for alternative source terms.
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APPLICABLE SAFETY ANALYSIS	<p>The MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The location of most components and ducting within the MCR/ESGR envelope ensures an adequate supply of filtered air to all areas requiring access. The MCR/ESGR EHS provides airborne radiological protection for the control room operators <u>MCR/ESGR envelope occupants</u>, as demonstrated by the control room <u>MCR/ESGR envelope</u> accident dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2). This accident analysis assumes that at least one train is aligned for to provide filtered outside air control room to the MCR/ESGR envelope <u>pressurization</u> approximately 60 minutes after actuation of bottled air, but does not take any credit for automatic start of the trains in the recirculation mode or any filtration of recirculated air. Since, the MCR/ESGR EVS train associated with 1-HV-F-41 can not be used to provide <u>filtered</u> outside air for filtered pressurization (due to the location of its air intake with respect to Vent Stack B) it can not be used to satisfy the requirements of LCO 3.7.10.</p>
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The North Anna UFSAR describes potentially hazardous chemicals stored onsite in quantities greater than 100 lb. These include hydrogen, sulfuric acid, sodium hydroxide, hydrazine, ethanolamine, and sodium hypochlorite. Evaluations for accidental release of these chemicals indicate that the worst-case concentrations at the control room intake would be expected to be less than their respective toxicity limit. (Refs 1 and 4) The assessment assumed no action being taken by the control room operator (i.e., normal or emergency supply system remains operating).

In the event of fire/smoke external to the MCR/ESGR envelope, equipment and procedures are available to maintain habitability of the control room. Smoke detectors are installed in the return ducts to the MCR Air-Handling Units (AHU), in the near vicinity of the ESGR AHUs, and in the MCR/ESGR EVS supply ducts, as well as other numerous locations in the ESGRs and MCR. Smoke detectors are also installed in the MCR/ESGR chiller rooms, which are ventilated with air from the Turbine Building, and the Mechanical Equipment rooms. If smoke is detected, the MCR/ESGR normal and EVS supply can be manually isolated. The fire response procedures provide direction for removing smoke from the MCR or ESGRs. (Ref. 5)

The worst case single active failure of a component of the MCR/ESGR EVS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The MCR/ESGR EVS—MODES 1, 2, 3, and 4 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

Two independent and redundant MCR/ESGR EVS trains are required to be OPERABLE to ensure that at least one train is available to be manually aligned to ~~pressurize and to provide filtered outside air to the MCR/ESGR envelope, if a single active failure disables one of the two required~~ OPERABLE trains. Total system failure, such as from a loss of both EVS trains or from an inoperable MCR/ESGR envelope boundary, could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 3) for alternative source terms, in the event of a large radioactive release.

The MCR/ESGR EVS—MODES 1, 2, 3, and 4 is considered OPERABLE when the individual components necessary to limit ~~operator MCR/ESGR envelope occupant exposure~~ are OPERABLE in the two required trains of the MCR/ESGR EVS—MODES 1, 2, 3, and 4. 1-HV-F-41 can not be used to satisfy the requirements of LCO 3.7.10.

An MCR/ESGR EVS train is OPERABLE when the associated:

- a. Fan is OPERABLE;
- b. Demister filters, HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and
- c. Heater, ductwork, valves, and dampers are OPERABLE, and air flow can be maintained.

The MCR/ESGR EVS is shared by Unit 1 and Unit 2.

~~In addition, the MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.~~

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.

The LCO is modified by a Note allowing the MCR/ESGR envelope boundary to be opened intermittently under administrative controls. 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 the operators in the control room MCR/ESGR envelope. This individual will have a method to rapidly close the opening and restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR isolation is indicated.

BASES

APPLICABILITY In MODES 1, 2, 3, and 4, MCR/ESGR EVS must be OPERABLE to ensure that the MCR/ESGR envelope will remain habitable control operator exposure during and following a DBA.

ACTIONS

A.1

When one required MCR/ESGR EVS train is inoperable, for reasons other than an inoperable MCR/ESGR envelope boundary, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining required OPERABLE MCR/ESGR EVS train is adequate to perform the MCR/ESGR envelope occupant protection function. However, the overall reliability is reduced because a single-failure in the required OPERABLE EVS trains could result in loss of MCR/ESGR EVS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining trains to provide the required capability.

B.1

If the unfiltered inleakage of potentially contaminated air past the MCR/ESGR envelope boundary and into the MCR/ESGR envelope can result in MCR/ESGR envelope occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem Total Effective Dose Equivalent), or inadequate protection of MCR/ESGR envelope occupants from hazardous chemicals or smoke, the MCR/ESGR envelope boundary is inoperable. Actions must be taken to restore an OPERABLE MCR/ESGR envelope boundary within 90 days. During the period that the MCR/ESGR envelope boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on MCR/ESGR envelope occupants from the potential hazards of a radiological or chemical event or a challenge from smoke. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that MCR/ESGR envelope occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that MCR/ESGR envelope occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable MCR/ESGR envelope boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of MCR/ESGR envelope occupants within analyzed limits while limiting the probability that MCR/ESGR envelope 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. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCR/ESGR envelope boundary.

BASES

ACTIONS
(continued)

If the MCR/ESGR boundary is inoperable in MODE 1, 2, 3, or 4 (e.g., excessive control room inleakage or excessive Emergency Core Cooling System leakage), the MCR/ESGR EVS cannot perform its intended function. Actions must be taken to restore an OPERABLE MCR/ESGR boundary within 24 hours. During the period that the MCR/ESGR boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan, and possibly repair, and test most problems with the MCR/ESGR boundary.

C.1 and C.2

In MODE 1, 2, 3, or 4, if the inoperable required MCR/ESGR EVS train or the inoperable MCR/ESGR envelope boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

When two required MCR/ESGR EVS trains are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable MCR/ESGR envelope boundary (i.e., Condition B), the MCR/ESGR EVS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE
REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on the MCR/ESGR EVS are not too severe, testing each required train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal and HEPA filters from humidity in the ambient air. Each required train must be operated for ≥ 10 continuous hours with the heaters energized. The 31 day Frequency is based on the reliability of the equipment and the one train redundancy availability.

Bases

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.7.10.2

This SR verifies that the required MCR/ESGR EVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing the performance of the demister filter, HEPA filter, charcoal adsorber efficiency, minimum and maximum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.3

Not Used

SR 3.7.10.4

This SR verifies the OPERABILITY of the MCR/ESGR envelope boundary by testing for unfiltered air inleakage past the MCR/ESGR envelope boundary and into the MCR/ESGR envelope. The details of the testing are specified in the MCR/ESGR Envelope Habitability Program.

The MCR/ESGR envelope is considered habitable when the radiological dose to MCR/ESGR envelope occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the MCR/ESGR envelope occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the MCR/ESGR envelope is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the MCR/ESGR envelope boundary to OPERABLE status provided mitigating actions can ensure that the MCR/ESGR envelope remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 6) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 7). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 8). Options for restoring the MCR/ESGR envelope boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the MCR/ESGR envelope boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the MCR/ESGR envelope boundary has been restored to OPERABLE status.

~~This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the MCR/ESGR envelope, and the assumed inleakage rates of the potentially contaminated air. The MCR/ESGR envelope positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the MCR/ESGR EVS. During the emergency mode of operation, the MCR/ESGR EVS is designed to pressurize the MCR/ESGR envelope > 0.04 inches water gauge positive~~

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

~~pressure with respect to adjacent areas in order to prevent unfiltered
inleakage. The MCR/ESGR EVS is designed to maintain this positive
pressure with one train at a makeup flow rate of > 900 cfm and < 1100 cfm.
The Frequency of 18 months on a STAGGERED TEST BASIS is consistent
with the guidance provided in NUREG-0800 (Ref. 4).~~

REFERENCES

1. __ UFSAR, Section 6.4.
2. __ UFSAR, Chapter 15.
3. 10 CFR 50, Appendix A.
4. Control Room Habitability Study (Supplement to 1980 Onsite Control Room Habitability Study - North Anna Power Station Units 1 and 2, January 1982)NUREG-0800, Rev. 2, July 1981
5. Letter from L. N. Hartz (Virginia Electric and Power Company) to UNSRC, dated March 31, 2004, Response to Generic Letter 2003-01 Control Room Habitability Control Room testing and Technical Information.
6. Regulatory Guide 1.196
7. NEI 99-03, "Control Room Habitability Assessment," June 2001.
8. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).

B 3.7 PLANT SYSTEMS

B 3.7.13 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System

BASES

BACKGROUND The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which occupants ~~operators~~ can control the unit following an uncontrolled release of radioactivity, hazardous chemical, or smoke. The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR Emergency Ventilation System (EVS) (LCO 3.7.10 and LCO 3.7.14).

The MCR/ESGR bottled air system consists of four trains of bottled air lined up to provide air to the MCR/ESGR envelope and a MCR/ESGR envelope boundary that limits the inleakage of unfiltered air. when the system actuates. The air is provided via four trains which feed a common header, supplying air to the Unit 1 and Unit 2 ESGRs. The header is also capable of being aligned to supply air directly to the MCR. Each train is provided air by one of the bottled air banks. Unit 1 and Unit 2 each provide two trains of bottled air. Two bottled air trains are capable of providing dry air of breathing quality to maintain a positive interior pressure in the MCR/ESGR envelope for Unit 1 and Unit 2 for a period of one hour following a Design Basis Accident (DBA).

The MCR/ESGR envelope is the area within the confines of the MCR/ESGR envelope boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. 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. The MCR/ESGR envelope is protected during normal operation, natural events, and accident conditions. The MCR/ESGR envelope boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the MCR/ESGR envelope. The OPERABILITY of the MCR/ESGR envelope boundary must be maintained to ensure that the inleakage of unfiltered air into the MCR/ESGR envelope will not exceed the inleakage assumed in the licensing basis analysis of DBA consequences to MCR/ESGR envelope occupants. The MCR/ESGR envelope and its boundary are defined in the MCR/ESGR Envelope Habitability Program.

In MODES 1, 2, 3, or 4, upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, two trains of MCR/ESGR EVS actuate to recirculate air, and airflow from the bottled air banks maintains a positive pressure in the MCR/ESGR envelope. In case of a fuel handling accident (FHA) in the fuel building, automatic actuation of bottled air is possible. A FHA in containment can not cause an automatic actuation of bottled air, but manual actuation can be initiated. After 300 hours of decay, actuation

BASES

BACKGROUND
(continued)

of bottled air is not required for a FHA. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through high efficiency particulate air (HEPA) filters and charcoal adsorbers for pressurization.

Pressurization of the MCR/ESGR envelope prevents minimizes infiltration of unfiltered air from the areas adjacent to the MCR/ESGR envelope boundary.

Two trains of the MCR/ESGR bottled air system will pressurize the MCR/ESGR envelope to > 0.05 inches water gauge. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 6.4 (Ref. 1).

The MCR/ESGR EHS is designed in accordance with Seismic Category I requirements.

The MCR/ESGR EHS is designed to maintain a habitable environment in the MCR/ESGR envelope environment for 30 days of continuous occupancy after a DBA without exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19, (Ref. 2) alternative source terms.

APPLICABLE
SAFETY ANALYSES

The MCR/ESGR bottled air system is arranged in redundant, safety related trains providing pressurized air from the required bottled air banks to maintain a habitable environment in the MCR/ESGR envelope.

The MCR/ESGR EHS provides airborne radiological protection for the MCR/ESGR envelope occupant control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 15 (Ref. 4).

The North Anna UFSAR describes potentially hazardous chemicals stored onsite in quantities greater than 100 lb. These include hydrogen, sulfuric acid, sodium hydroxide, hydrazine, ethanolamine, and sodium hypochlorite. Evaluations for accidental release of these chemicals indicate that the worst-case concentrations at the control room intake would be expected to be less than their respective toxicity limit. (Refs 1 and 5) The assessment assumed no action being taken by the control room operator (i.e., normal or emergency supply system remains operating.

In the event of fire/smoke external to the MCR/ESGR envelope, equipment and procedures are available to maintain habitability of the control room. Smoke detectors are installed in the return ducts to the MCR Air-Handling Units (AHU), in the near vicinity of the ESGR AHUs, and in the MCR/ESGR EVS supply ducts, as well as other numerous

BASES	
APPLICABLE	
SAFETY ANALYSES	<u>locations in the ESGRs and MCR. Smoke detectors are also installed in the MCR/ESGR chiller rooms, which are ventilated with air from the Turbine Building, and the Mechanical Equipment rooms. If smoke is detected, the MCR/ESGR normal and EVS supply can be manually isolated. The fire response procedures provide direction for removing smoke from the MCR or ESGRs.(Ref. 6)</u>
(continued)	

The worst case single active failure of a component of the MCR/ESGR bottled air system, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The MCR/ESGR bottled air system satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO	<p>Three independent and redundant MCR/ESGR bottled air system trains are required to be OPERABLE to ensure that at least two are available assuming a single failure disables one train. Total system failure, <u>such as from a loss of two required bottled air system trains or from an inoperable MCR/ESGR envelope boundary</u>, could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2) for alternative source terms, in the event of a large radioactive release.</p>
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Each The MCR/ESGR bottled air system train is considered OPERABLE when the individual components necessary to limit operator MCR/ESGR envelope occupant exposure are OPERABLE in the three required trains of the MCR/ESGR bottled air system.

A MCR/ESGR bottled air system train is OPERABLE when:

- One OPERABLE bottled air bank of 69 bottles is in service;
- A flow path, including associated valves and piping, is OPERABLE; and
- The common exhaust header is OPERABLE.

The MCR/ESGR bottled air system trains are shared by Unit 1 and Unit 2.

~~In addition, the MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.~~

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.

The LCO is modified by a Note allowing the MCR/ESGR envelope boundary to be opened intermittently under administrative controls.

BASES

LCO (continued)	<p>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 the control room operators in the MCR/ESGR envelope. This individual will have a method to rapidly close the opening and restore the MCR/ESGR envelope to a condition equivalent to the design condition when a need for MCR/ESGR envelope isolation is indicated.</p>
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APPLICABILITY	<p>In MODES 1, 2, 3, and 4, and during movement of recently irradiated fuel assemblies, MCR/ESGR bottled air system must be OPERABLE to ensure that the MCR/ESGR envelope will remain habitable control operator exposure during and following a DBA.</p> <p>During movement of recently irradiated fuel assemblies, the MCR/ESGR bottled air system must be OPERABLE to respond to the release from a fuel handling accident involving handling recently irradiated fuel. The MCR/ESGR bottled air system is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 300 hours), due to radioactive decay.</p>
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ACTIONS	<p><u>A.I</u></p> <p>When one required MCR/ESGR bottled air system train is inoperable, for reasons other than an inoperable MCR/ESGR envelope boundary, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining required OPERABLE MCR/ESGR bottled air system trains are adequate to perform the MCR/ESGR envelope occupant protection function. However, the overall reliability is reduced because a single failure in one of the remaining required OPERABLE trains could result in loss of MCR/ESGR bottled air system function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining trains to provide the required capability.</p> <p><u>B.I</u></p> <p>If the unfiltered inleakage of potentially contaminated air past the MCR/ESGR envelope boundary and into the MCR/ESGR envelope can result in MCR/ESGR envelope occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem Total Effective Dose Equivalent), or inadequate protection of MCR/ESGR envelope occupants from hazardous</p>
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BASES

ACTIONS
(continued)

chemicals or smoke, the MCR/ESGR envelope boundary is inoperable. Actions must be taken to restore an OPERABLE MCR/ESGR envelope boundary within 90 days.

During the period that the MCR/ESGR envelope boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on MCR/ESGR envelope occupants from the potential hazards of a radiological OR chemical event or a challenge from smoke. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that MCR/ESGR envelope occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that MCR/ESGR envelope occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable MCR/ESGR envelope boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of MCR/ESGR envelope occupants within analyzed limits while limiting the probability that MCR/ESGR envelope 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. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCR/ESGR envelope boundary.

~~If the MCR/ESGR boundary is inoperable in MODE 1, 2, 3, or 4 (e.g., excessive control room leakage or excessive Emergency Core Cooling System leakage), the MCR/ESGR bottled air system cannot perform its intended function. Actions must be taken to restore an OPERABLE MCR/ESGR boundary within 24 hours. During the period that the MCR/ESGR boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan, and possibly repair, and test most problems with the MCR/ESGR boundary.~~

C.I

When two or more required trains of the MCR/ESGR bottled air system are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable MCR/ESGR boundary (i.e., Condition B), action must be taken to restore at least two of the required MCR/ESGR bottled air

BASES

ACTIONS
(continued)

system trains to OPERABLE status within 24 hours. During the period that two or more required trains of the MCR/ESGR bottled air system are inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan, restore, and possibly repair, and test most problems with the MCR/ESGR bottled air system, such as repressurizing the system after an inadvertent actuation.

D.1 and D.2

In MODE 1, 2, 3, or 4, if the inoperable required MCR/ESGR bottled air system trains or the inoperable MCR/ESGR boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

E.1

During movement of recently irradiated fuel assemblies, if the required inoperable MCR/ESGR bottled air system train cannot be restored to OPERABLE status within the required Completion Time, ~~or two or more required MCR/ESGR bottled air system trains are inoperable, or one or more bottled air system trains inoperable due to an inoperable MCR/ESGR envelope boundary,~~ action must be taken to immediately suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE
REQUIREMENTS

SR 3.7.13.1

This SR verifies that each required MCR/ESGR bottled air bank is at the proper pressure. This ensures that when combined with the required number of OPERABLE air bottles, the minimum required air flow will be maintained to ensure the required MCR/ESGR envelope pressurization for approximately 60 minutes when the MCR/ESGR bottled air system is actuated. The 31 day Frequency is based on engineering judgement.

SR 3.7.13.2

This SR verifies that the proper number of MCR/ESGR air bottles are in service, with one bank of 69 air bottles in each required train. This

BASES

SURVEILLANCE SR 3.7.13.2 (continued)

REQUIREMENTS SR requires verification that each bottled air bank manual valve not
(continued) locked, sealed, or otherwise secured and required to be open during accident conditions is open. This SR helps to ensure that the bottled air banks required to be OPERABLE to pressurize the MCR/ESGR boundary are in service. The 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the open position, since these were verified to be in the correct position prior to locking, sealing, or securing.

SR 3.7.13.3

This SR verifies that each required MCR/ESGR bottled air system train actuates by verifying the flow path is opened and that the normal air supply to and exhaust from the MCR/ESGR envelope is isolated on an actual or simulated actuation signal. The Frequency of 18 months is consistent with performing this test on a refueling interval basis.

SR 3.7.13.4

This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the MCR/ESGR envelope, and the assumed inleakage rates of the potentially contaminated air. The MCR/ESGR envelope positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the MCR/ESGR bottled air system. During the emergency mode of operation, the MCR/ESGR bottled air system is designed to pressurize the MCR/ESGR envelope to > 0.05 inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The MCR/ESGR bottled air system is designed to maintain this positive pressure with two trains for at least 60 minutes. Testing two trains at a time at the Frequency of 18 months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 3).

REFERENCES

1. UFSAR, Section 6.4.
2. 10 CFR 50, Appendix A.
3. NUREG-0800, Rev. 2, July 1981
4. UFSAR, Chapter 15
5. Control Room Habitability Study (Supplement to 1980 Onsite Control Room Habitability Study - North Anna Power Station Units 1 and 2, January 1982)
6. Letter from L. N. Hartz (Virginia Electric and Power Company) to UNSRC, dated March 31, 2004, Response to Generic Letter 2003-01 Control Room Habitability Control Room testing and Technical Information.

B 3.7 PLANT SYSTEMS

B 3.7.14 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)-During Movement of Recently Irradiated Fuel Assemblies

BASES

BACKGROUND The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which ~~operators~~ occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR EVS (LCO 3.7.10 and LCO 3.7.14).

The MCR/ESGR EVS ~~was designed as~~ consists of four independent, redundant trains that can filter and recirculate air inside the MCR/ESGR envelope, or supply filtered air to the MCR/ESGR envelope and MCR/ESGR boundary that limits the inleakage of unfiltered air. Each train consists of a heater, demister filter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves and dampers, doors, barriers and instrumentation also form part of the system. One EVS train is capable of performing the safety function of supplying filtered outside air for pressurization. There is no restriction on the use of 1-HV-F-41 in the recirculation mode. However, due to the location of the air intake for 1-HV-F-41, it can not be used to satisfy the requirements of LCO 3.7.14 to supply filtered outside air. Two of the three remaining trains (1-HV-F-42, 2-HV-F-41, and 2-HV-F-42) are required for independence and redundancy.

The MCR/ESGR envelope is the area within the confines of the MCR/ESGR envelope boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions . 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. The MCR/ESGR envelope is protected during normal operation, natural events, and accident conditions. The MCR/ESGR envelope boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the MCR/ESGR envelope. The OPERABILITY of the MCR/ESGR envelope boundary must be maintained to ensure that the inleakage of unfiltered air into the MCR/ESGR envelope will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to MCR/ESGR envelope occupants. The MCR/ESGR envelope and its boundary are defined in the MCR/ESGR Envelope Habitability Program.

BASES	
BACKGROUND (continued)	<p data-bbox="459 223 1357 442">In case of a Design Basis Accident (DBA), during movement of recently irradiated fuel assemblies, an automatic (signal from the fuel building radiation monitors) or manual actuation of airflow from the bottled air banks is required. Actuation of airflow from the bottled air banks also automatically isolates the MCR/ESGR envelope to maintain positive pressure in the <u>MCR/ESGR</u> envelope and automatically starts all available EVS trains in recirculation mode.</p> <p data-bbox="459 478 1357 1000">The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated or aligned to provide filtered outside air to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers for pressurization. Due to the location of the air intake for 1 HV F 41, it should not be used in pressurization mode during a design basis fuel handling accident. There is no restriction on the use of 1 HV F 41 in the recirculation mode. The demisters remove any entrained water droplets present in the air, to prevent excessive moisture loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the HEPA filters and charcoal adsorbers.</p> <p data-bbox="459 1032 1324 1095">Pressurization of the MCR/ESGR envelope prevents minimize infiltration of unfiltered air from the areas adjacent to the envelope.</p> <p data-bbox="459 1127 1357 1244">A single train of the MCR/ESGR EVS will pressurize the MCR/ESGR envelope to > 0.04 inches water gauge. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 6.4 (Ref. 1).</p> <p data-bbox="459 1276 1357 1489">Redundant MCR/ESGR EVS supply trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally closed isolation dampers are arranged in series pairs so that the failure of one damper to open will not result in an inability of the system to perform the function based on the presence of the redundant train. The MCR/ESGR EHS is designed in accordance with Seismic Category I requirements.</p> <p data-bbox="459 1521 1357 1670">The MCR/ESGR EHS is designed to maintain <u>the a habitable environment in the MCR/ESGR envelope</u>control room for 30 days of continuous occupancy after a DBA without exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2) for alternative source terms.</p>
APPLICABLE SAFETY ANALYSIS	<p data-bbox="459 1734 1357 1885">The MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The location of most components and ducting within the MCR/ESGR envelope ensures an adequate supply of filtered air to all areas requiring access. The MCR/ESGR EHS provides airborne radiological protection for the control room</p>

MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies

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BASES

APPLICABLE SAFETY ANALYSIS (continued)

~~operators~~MCR/ESGR envelope occupants, as demonstrated by the ~~control room~~MCR/ESGR envelope accident dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 15 (Ref. 4).

The North Anna UFSAR describes potentially hazardous chemicals stored onsite in quantities greater than 100 lb. These include hydrogen, sulfuric acid, sodium hydroxide, hydrazine, ethanolamine, and sodium hypochlorite. Evaluations for accidental release of these chemicals indicate that the worst-case concentrations at the control room intake would be expected to be less than their respective toxicity limit. (Refs. 1 and 5) The assessment assumed no action being taken by the control room operator (i.e., normal or emergency supply system remains operating.

In the event of fire/smoke external to the MCR/ESGR envelope, equipment and procedures are available to maintain habitability of the control room. Smoke detectors are installed in the return ducts to the MCR Air-Handling Units (AHU), in the near vicinity of the ESGR AHUs, and in the MCR/ESGR EVS supply ducts, as well as other numerous locations in the ESGRs and MCR. Smoke detectors are also installed in the MCR/ESGR chiller rooms, which are ventilated with air from the Turbine Building, and the Mechanical Equipment rooms. If smoke is detected, the MCR/ESGR normal and EVS supply can be manually isolated. The fire response procedures provide direction for removing smoke from the MCR or ESGRs.(Ref. 9)

The worst case single active failure of a component of MCR/ESGR EVS, assuming a loss of offsite power, does not (continued) impair the ability of the system to perform its design function.

The MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent and redundant MCR/ESGR EVS trains are required to be OPERABLE to ensure that at least one is available if ~~assuming a single active failure~~ disables the other train. Total system failure such as from a loss of both required ventilation trains or from an inoperable MCR/ESGR envelope boundary; could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), for alternative source terms in the event of a large radioactive release.

~~A~~The MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies train is considered OPERABLE when the individual components necessary to limit ~~operator~~MCR/ESGR occupant exposure are OPERABLE, ~~in the two required trains of the MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies.~~

An MCR/ESGR EVS train is OPERABLE when the associated:

- a. Fan is OPERABLE;

MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies
B.3.7.14

BASES

LCO

(continued)

- b. Demister filters, HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and
- c. Heater, ductwork, valves, and dampers are OPERABLE, and air flow can be maintained.

The MCR/ESGR EVS is shared by Unit 1 and Unit 2.

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.

~~In addition, the MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.~~

The LCO is modified by a Note allowing the MCR/ESGR envelope boundary to be opened intermittently under administrative controls. 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 the control room operators in the MCR/ESGR envelope. This individual will have a method to rapidly close the opening and restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR isolation is indicated.

APPLICABILITY

During movement of recently irradiated fuel assemblies, MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies must be OPERABLE to ~~control operator exposure~~ensure that the MCR/ESGR envelope will remain habitable during and following a DBA.

During movement of recently irradiated fuel assemblies, the MCR/ESGR EVS must be OPERABLE to respond to the release from a fuel handling accident involving handling recently irradiated fuel. The MCR/ESGR EVS is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 300 hours), due to radioactive decay.

Regarding the MCR/ESGR EVS, it should be noted that they are required to be OPERABLE by other LCOs in other MODES.

BASES

ACTIONS

A.1

When one required MCR/ESGR EVS train is inoperable, for reasons other than an inoperable MCR/ESGR envelope boundary, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining required OPERABLE MCR/ESGR EVS train is adequate to perform the MCR/ESGR occupant protection function. However, the overall reliability is reduced because a single failure in the required OPERABLE MCR/ESGR EVS train could result in loss of MCR/ESGR EVS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining trains to provide the required capability.

B.1

During movement of recently irradiated fuel assemblies, if the required inoperable MCR/ESGR EVS train cannot be restored to OPERABLE status within the required Completion Time, or two required MCR/ESGR EVS trains are inoperable, or one or more MCR/ESGR EVS trains are inoperable due to an inoperable MCR/ESGR envelope boundary action must be taken to immediately suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE
REQUIREMENTS

SR 3.7.14.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on the MCR/ESGR EVS are not too severe, testing each required train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal and HEPA filters from humidity in the ambient air. Each required train must be operated for > 10 continuous hours with the heaters energized. The 31 day Frequency is based on the reliability of the equipment and the one train redundancy availability.

SR 3.7.14.2

This SR verifies that the required MCR/ESGR EVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing the performance of the demister filter, HEPA filter, charcoal adsorber efficiency, minimum and maximum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.14.3

This SR verifies the OPERABILITY of the MCR/ESGR envelope boundary by testing for unfiltered air inleakage past the MCR/ESGR envelope boundary and into the MCR/ESGR envelope. The details of the testing are specified in the MCR/ESGR Envelope Habitability Program

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

The MCR/ESGR envelope is considered habitable when the radiological dose to MCR/ESGR envelope occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem Total Effective Dose Equivalent and the MCR/ESGR envelope occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air leakage into the MCR/ESGR envelope is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air leakage is greater than the assumed flow rate, Condition B must be entered. Required Action B requires suspending the movement of recently irradiated fuel assemblies immediately to reduce the risk of exposure to the MCR/ESGR envelope occupants during a fuel handling accident

This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the MCR/ESGR envelope, and the assumed leakage rates of the potentially contaminated air. The MCR/ESGR envelope positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the MCR/ESGR EVS. During the emergency mode of operation, the MCR/ESGR EVS is designed to pressurize the MCR/ESGR envelope > 0.04 inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered leakage. The MCR/ESGR EVS is designed to maintain this positive pressure with one train at a makeup flow rate of > 900 cfm and < 1100 cfm. The Frequency of 18 months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 3).

BASES

REFERENCES

1. UFSAR, Section 6.4.
2. 10 CFR 50, Appendix A.
3. NUREG-0800, Rev. 2, July 1981,
4. UFSAR, Chapter 15.
5. Control Room Habitability Study (Supplement to 1980 Onsite Control Room Habitability Study - North Anna Power Station Units 1 and 2, January 1982)
6. Regulatory Guide 1.196
7. NEI 99-03, "Control Room Habitability Assessment," June 2001
8. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).
9. Letter from L. N. Hartz (Virginia Electric and Power Company) to UNSRC, dated March 31, 2004, Response to Generic Letter 2003-01 Control Room Habitability Control Room testing and Technical Information