VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

10CFR50.90

July 13, 2007

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

Serial No. 07-0488
NLOS/GDM R1
Docket Nos. 50-280, 281
License Nos. DPR-32, 37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
PROPOSED LICENSE AMENDMENT REQUEST
CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS
TECHNICAL SPECIFICATION IMPROVEMENT
CONTROL ROOM HABITABILITY

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company (Dominion) requests amendments, in the form of changes to the Technical Specifications (TS) to Facility Operating License Numbers DPR-32 and DPR-37 for Surry Power Station Units 1 and 2, respectively. The proposed amendment modifies the Surry Power Station Units 1 and 2 Technical Specifications (TS) requirements related to Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope habitability. The changes are consistent with the NRC-approved Industry/Technical Specification Task Force (TSTF) Traveler TSTF-448, Revision 3, *Control Room Habitability* (TSTF-448). 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). The license amendment request has been prepared in accordance with the NRC's CLIIP. Additional supporting TS and Bases changes are being proposed to facilitate incorporation of the TSTF-448 revisions into Surry's custom TS format. A description and assessment of the proposed amendment is provided in Attachment 1. The marked-up and typed proposed TS pages are provided in Attachments 2 and 3, respectively. The associated Bases changes are provided for information only and will be implemented in accordance with the TS Bases Control Program and 10 CFR 50.59.

It should be noted that the marked-up and proposed pages of the Surry Units 1 and 2 Operating Licenses included in Attachments 2 and 3, respectively, also include License Condition 3.Q that was previously proposed in Dominion's February 26, 2007 (Serial No. 07-0109) license amendment request. That submittal requested temporary 45-day and 14-day allowed outage times to facilitate replacement of MCR/ESGR Air Conditioning System chilled water piping and is currently being reviewed by the NRC.

We have evaluated the proposed amendment and have determined that it does not involve a significant hazards consideration as defined in 10 CFR 50.92. The basis for our determination is included in Attachment 1. The proposed amendment has been reviewed and approved by the Station Nuclear Safety and Operating Committee.

The proposed amendment is also being submitted consistent with Dominion's response to Generic Letter (GL) 2003-001, *Control Room Habitability*. In a letter dated April 22, 2004 (Serial No. 03-373C), Dominion committed to submit a license amendment request to incorporate a control room habitability program into the TS within six months following either the approval of TSTF-448 or TSTF-448 being made available for adoption, whichever was later. This submittal completes that commitment for Surry Power Station.

Dominion requests approval of the license amendments by December 31, 2007 with a 180-day implementation period.

If you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Sincerely,

Gerald T. Bischof
Vice President – Nuclear Engineering

Commitments made in this letter: None

Attachments
1. Description and Assessment
2. Proposed Technical Specifications Pages (Mark-Up)
3. Proposed Technical Specifications Pages (Typed)

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 13TH day of July, 2007.

My Commission Expires: May 31, 2010.

VICKI L. HULL
Notary Public
Commonwealth of Virginia
140542
My Commission Expires May 31, 2010

Vicki L. Hull
Notary Public

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

Mr. E. Riggs
NRC Senior Resident Inspector
Surry Power Station

State Health Commissioner
Virginia Department of Health
James Madison Building – 7th Floor
109 Governor Street
Room 730
Richmond, Virginia 23219

Mr. S. P. Lingam
NRC Project Manager - Surry
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8G9A
Rockville, Maryland 20852

Mr. R. A. Jervey
NRC Project Manager – North Anna
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8G9A
Rockville, Maryland 20852

ATTACHMENT 1

DESCRIPTION AND ASSESSMENT

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

Description and Assessment

1.0 DESCRIPTION

The proposed amendment would modify the Surry Power Station Units 1 and 2 Technical Specifications (TS) requirements related to Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope habitability. The changes are consistent with the Nuclear Regulatory Commission (NRC) approved Industry/Technical Specification Task Force (TSTF) Traveler TSTF-448, Revision 3, *Control Room Habitability* (TSTF-448). 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). The license amendment request has been prepared in accordance with the NRC's CLIIP and pursuant to the requirements of 10 CFR 50.90. Additional supporting TS changes are being proposed to facilitate incorporation of the TSTF-448 revisions into Surry's custom TS format. Associated TS Bases changes are also being made to facilitate incorporation of the TSTF-448 Bases changes, and these changes will be implemented at the same time as the proposed TS changes. The TS Bases changes are provided for the NRC's information.

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 Surry Units 1 and 2 and justify this amendment for the incorporation of the changes into the Surry Units 1 and 2 TS.

2.2 Optional Changes and Variations

Dominion is not proposing any significant variations or deviations from the TS changes described in the TSTF-448 or the applicable parts of the NRC staff's model safety evaluation dated January 17, 2007. Specifically, Evaluations 2 and 4 of Section 3.3 of the Technical Evaluation section of the model safety evaluation are applicable to Surry Units 1 and 2.

Minor variations/deviations from the TS terminology used in NUREG-1431, *Standard Technical Specifications – Westinghouse Plants*, and TSTF-448 are required because the Surry Units 1 and 2 TS are custom TS. Consequently, the Surry TS wording and format do not directly correspond to the Standard Technical Specifications (STS) and TSTF-448 wording and format. For example, the term "control room envelope (CRE)" used in STS and TSTF-448 is expressed as the "Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope" in the Surry TS. Also, the Surry TS do not

use the NUREG-1431 STS defined terms, such as, CONDITION, REQUIRED ACTION and COMPLETION TIME or their associated table format. The Surry TS typically use a more narrative format. However, the intent of the CLIIP wording has been maintained in the proposed TS change and has been used verbatim to the extent possible. In addition, the Surry TS format separates Limiting Conditions for Operation (LCOs) and Action Statements (ASs) from Surveillance Requirements (SRs) by placing them in different TS sections (i.e., Sections 3 and 4, respectively). Also, the MCR/ESGR EVS requirements during REFUELING OPERATIONS and when moving recently irradiated fuel are only included in TS 3.10, *Refueling*, rather than in the MCR/ESGR EVS TS, which only addresses operating conditions above COLD SHUTDOWN. TS 3.19, *Main Control Room Bottled Air System*, is also being revised to reflect the TSTF-448 TS requirements associated with an inoperable MCR/ESGR envelope boundary, as this system works in conjunction with the MCR/ESGR EVS as part of the MCR/ESGR Emergency Habitability System (EHS) to maintain protection of the MCR/ESGR envelope occupants from radiological, hazardous chemical and smoke hazards.

Additionally, Surry TS do not use the ITS MODE terminology convention for reactor operating conditions. Surry TS use specific definitions for each operating condition instead, e.g., POWER OPERATION, HOT SHUTDOWN, INTERMEDIATE SHUTDOWN, REACTOR CRITICAL, COLD SHUTDOWN and REFUELING SHUTDOWN. While not identical, the reactor operating MODEs specified in the CLIIP are generally consistent with the defined REACTOR OPERATION conditions used in the Surry TS and the license amendment request.

The minor variations and/or deviations from the specific wording/format provided in the CLIIP do not change the meaning, intent or applicability of the CLIIP. A table summarizing the minor variations and/or deviations from the TS changes described in TSTF-448 is provided in Attachment A for reference.

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 4.18 in accordance with TS 6.4.R.3.a, the assessment of MCR/ESGR envelope habitability as required by Specification 6.4.R.3.b, and the measurement of MCR/ESGR envelope pressure as required by Specification 6.4.R.4, shall be considered met. Following implementation:

(a) The first performance of SR 4.18, in accordance with Specification 6.4.R.3.a, shall be within the specified frequency of 6 years plus the 18-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter

2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.

(b) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 6.4.R.3.b, shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

(c) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 6.4.R.4, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from January 19, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Determination

3.1.1 Incorporation of TSTF-448, Revision 3

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 Surry Power Station Units 1 and 2 and is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

3.1.2 Changes to Accommodate Incorporation of TSTF-448, Revision 3

Dominion has also performed a NSHCD for the TS changes associated with terminology and format differences between the Surry TS and the STS, as well as additional conforming changes to facilitate incorporation of the changes described in TSTF-448. Dominion has concluded that the proposed changes do not involve a significant hazards consideration because the changes do not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes consist of TS wording, format and conforming changes to facilitate incorporation of TSTF-448 into the Surry custom TS and for consistency with NUREG-1431, Revision 3, to the extent practical. The proposed changes are administrative in nature and, as such, do not impact the condition or performance of any plant structure, system or component. The proposed changes do not affect the initiators of any previously analyzed event or the assumed mitigation of accident or transient events. As a result, the proposed administrative changes to the Surry TS do

not involve any increase in the probability or the consequences of any accident or malfunction of equipment important to safety previously evaluated since neither accident probabilities or consequences are being affected by the proposed changes.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes are administrative in nature, and therefore do not involve any changes in station operation or physical modifications to the plant. In addition, no changes are being made in the methods used to respond to plant transients that have been previously analyzed. No changes are being made to plant parameters within which the plant is normally operated or in the setpoints, which initiate protective or mitigative actions, and no new failure modes are being introduced. Therefore, the proposed changes to the Surry Technical Specifications do not create the possibility of a new or different kind of accident or malfunction of equipment important to safety from any previously evaluated.

3. Involve a significant reduction in a margin of safety.

The proposed changes consist of TS wording, format and conforming changes to facilitate incorporation of TSTF-448 into the Surry custom TS and for consistency with NUREG-1431, Revision 3. The proposed changes are administrative in nature, and do not impact station operation or any plant structure, system or component that is relied upon for accident mitigation. Furthermore, the margin of safety assumed in the plant safety analysis is not affected in any way by the proposed changes. Therefore, the proposed administrative changes to the Surry Technical Specifications do not involve a reduction in a margin of safety.

4.0 ENVIRONMENTAL EVALUATION

4.1 Incorporation of TSTF-448, Revision 3

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 Surry Power Station Units 1 and 2 and the evaluation is hereby incorporated by reference for this application.

4.2 Changes to Accommodate Incorporation of TSTF-448, Revision 3

Dominion has further determined that the TS changes associated with terminology, format and other differences between the Surry TS and the STS to facilitate incorporation of the changes described in TSTF-448 will not result in any significant increases in the amounts of any effluents that may be released offsite or any significant increases in individual or cumulative occupational radiation exposure.

The proposed changes are administrative in nature and, as such, do not affect the operation of the plant. Therefore, the proposed changes are eligible for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is needed in connection with the approval of the proposed changes since the changes will not result in an undue risk to the health and safety of the public.

Attachment A

STS Section	Surry TS Section	Variation from Improved STS and/or the TSTF-448 Wording for Surry Power Station Units 1 and 2 Custom TS
	Table of Contents	The Surry Technical Specifications (TS) Table of Contents has been revised to reflect the new TS sections 3.21, *Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)* and 4.18, *Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) Testing,* as well as the revised TS 3.23 section title, *Main Control Room (MCR) and Emergency Switchgear Room (ESGR) Air Conditioning System*, which is being revised for terminology consistency.
LCO 3.7.10 ACTION B	**3.19.B.3 and 5**	• The TSTF-448 TS requirements for an inoperable control room envelope (CRE) are being included in TS 3.19, *Main Control Room Bottled Air System*, for consistency with new TS 3.21 (see below), since TS 3.19 currently contains an 8-hours to HOT SHUTDOWN requirement for an inoperable CRE. The term "control room envelope (CRE)" has been changed to the term "Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope" or "MCR/ESGR envelope" for consistency with Surry's system terminology. • The applicability statement for the Main Control Room Bottled Air System has also been revised to note that the TS applies whenever either unit is above COLD SHUTDOWN, since the system requirements during Refueling and the movement of recently irradiated fuel are included in TS 3.10, *Refueling*.
LCO 3.7.10 ACTIONS D and E	**3.10**	The revised MCR/ESGR EVS TS requirements during refueling and during the movement of irradiated fuel have been incorporated into Surry TS 3.10, *Refueling*, for consistency with the current Surry TS, which keeps all of the TS requirements associated with refueling and movement of irradiated fuel in the same TS section. MCR Bottled Air System requirements during the movement of recently irradiated fuel that currently reside in TS 3.10 have also been revised to reflect the revised TS requirements for an inoperable MCR/ESGR envelope boundary. The current term "irradiated fuel" has been changed to "recently irradiated fuel" for consistency with TSTF-448 and Standard TS. The associated TS 3.10 Basis revision defines recently irradiated fuel as follows: "The MCR/ESGR EVS and the MCR Bottled Air System are 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 a time frame established by analysis), due to radioactive decay. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time." Therefore, adding the word "recently" to the term "irradiated fuel" in TS 3.10, together with the definition of "recently irradiated fuel" that is being added to the TS 3.10 Basis, does not change the way irradiated fuel assemblies are handled at Surry.

Attachment A

LCO 3.7.10 ACTIONS A B, C and F	**3.21 (new)** **3.23**	The Surry TS format separates Limiting Conditions for Operation (LCOs) and Action Statements (ASs) from Surveillance Requirements (SRs) by placing them in different TS sections (i.e., Sections 3 and 4, respectively). Therefore: • The STS 3.7.10 LCO, Conditions, Required Actions and Completion Times, as revised by TSTF-448 have been incorporated, for the most part, into the Surry TS as TS 3.21. The plant system name, *Control Room Emergency Filtration System (CREFS),* is changed to the comparable Surry plant system name *Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS).* In addition, Surry's TS format and reactor operating condition terminology is retained vs. the format and MODE terminology used in the improved STS. • Surry TS 3.23, *Main Control Room and Emergency Switchgear Room Ventilation and Air Conditioning System*, has been revised to delete the current TS requirements associated with the MCR/ESGR EVS. TS 3.23 will now only address the MCR and ESGR Air Conditioning System, since the EVS requirements will now be included in new TS 3.21.
SR 3.7.10	**4.18 (new)**	• The STS 3.7.10 SRs, as revised by TSTF-448, have been incorporated into the Surry TS as TS 4.18, *Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) Testing.* The plant system name, *Control Room Emergency Filtration System (CREFS),* is changed to the comparable Surry plant system name *Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS).* • STS Surveillance Requirement SR 3.7.10.3 that requires verification of MCR/ESGR EVS train actuation is not included in the SPS TS since the system is not required to automatically actuate. The MCR/ESGR EVS is manually started approximately one hour after the discharge of the MCR Bottled Air System, and the manual actuation of the EVS is verified by SR 3.7.10.1 (SPS TS SR 4.18.A).
B3.7.10 Bases	**Basis/Bases** **3.10** **3.19** **3.21**	• STS B3.7.10, as modified by TSTF-448, is divided into two parts to address the SPS TS format. Specifically, the Background, Applicable Safety Analyses, Limiting Conditions for Operation, Applicability, Actions and References sections are included with the TS 3.21 Bases (with portions applicable to the movement of irradiated fuel and to the TS requirements for an inoperable MCR/ESGR envelope duplicated in Surry TS 3.10, *Refueling*, and TS 3.19, *Main Control Room Bottled Air System*, respectively), and the Surveillance Requirements and References (as applicable) are included in the TS 4.18 Bases. The sections have been modified where necessary to reflect the design of the Surry MCR/ESGR EVS (e.g., Surry has four redundant EVS trains). The TS 3.21 Bases also note that the MCR/ESGR EVS together with the MCR Bottled Air System make up the

Attachment A

	4.18	Emergency Habitability System (EHS) and that both systems are used to pressurize the MCR/ESGR envelope. • The word MODE(S) is changed to the term REACTOR OPERATION condition(s) since Surry TS do not use the MODE convention to describe reactor operation parameters or include it as a defined TS term. Surry TS use specific definitions for each operating condition (MODE) instead, e.g., POWER OPERATION, HOT SHUTDOWN, INTERMEDIATE SHUTDOWN, REACTOR CRITICAL, COLD SHUTDOWN and REFUELING OPERATION. • The terms Completion Time and Required Action are changed to Allowed Outage Time and Action Statement for consistency with Surry TS terminology.
	TS 4.20	Surry TS 4.20, *Control Room Air Filtration System*, has been revised to delete: 1) SR 4.20.A.10, which requires monthly testing of each EVS filter train circuit and manual initiation from the control room, and SR 4.20.B.6, which requires a minimum period of filter train air flow of 15 minutes per month. These SRs are now included in new SR 4.18.A and its associated Basis section. A sentence in the TS 4.20 Basis associated with the 15 minute run time was also deleted since the 15 minute run requirement is now included in TS 4.18.
TS 5.5.18	**TS 6.4.R**	STS program 5.5.18, *Control Room Envelope Habitability Program*, as included in TSTF-448, is incorporated into the Surry TS as TS 6.4.R, *Main Control Room/Emergency Switchgear Room (MCR/ESGR) Envelope Habitability Program.* Two changes have been made to the TSTF-448 wording as follows: 1) Surry specific text has been added to the first paragraph to note that MCR/ESGR envelope habitability is maintained at Surry by the Emergency Habitability System, which consists of the MCR/ESGR EVS [Surry TS 3.21] and the MCR Bottled Air System [Surry TS 3.19], and 2) The phrase "18 month" has been deleted before the word "assessment" in TS 6.4.R.4 [ITS 5.5.18.d] to avoid confusion with the MCR/ESGR habitability 3-year assessment frequency discussed in TS 6.4.R.3(b) [ITS 5.5.18.c(ii)].

ATTACHMENT 2

PROPOSED TECHNICAL SPECIFICATIONS PAGES (MARK-UP)

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

(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 licensee's 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.

Q. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage times to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No. 07-0109).

INSERT 1

4. This renewed license is effective as of the date of issuance, and shall expire at midnight on May 25, 2032.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Attachment: Appendix A, Technical Specifications

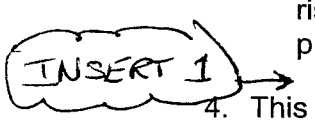
Date of Issuance: March 20, 2003

P. 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, 2002, October 1, 2002, November 4, 2002, 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 January 29, 2013, 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, 2002, October 1, 2002, November 4, 2002, 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.

Q. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage times to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No. 07-0109).



4. This renewed license is effective as of the date of issuance, and shall expire at midnight on January 29, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Attachment: Appendix A, Technical Specifications

Date of Issuance: March 20, 2003

INSERT 1 (New License Condition 3.R)

R. 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 4.18 in accordance with TS 6.4.R.3.a, the assessment of MCR/ESGR envelope habitability as required by Specification 6.4.R.3.b, and the measurement of MCR/ESGR envelope pressure as required by Specification 6.4.R.4, shall be considered met. Following implementation:

1. The first performance of SR 4.18, in accordance with Specification 6.4.R.3.a, shall be within the specified frequency of 6 years plus the 18-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.

2. The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 6.4.R.3.b, shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

3. The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 6.4.R.4, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from January 19, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

TECHNICAL SPECIFICATION
TABLE OF CONTENTS

TECHNICAL SPECIFICATION
TABLE OF CONTENTS

3.10 REFUELING

Applicability

Applies to operating limitations during REFUELING OPERATIONS or recently irradiated fuel movement in the Fuel Building.

Objective

To assure that no accident could occur during REFUELING OPERATIONS or recently irradiated fuel movement in the Fuel Building that would affect public health and safety.

Specification

A. During REFUELING OPERATIONS the following conditions are satisfied:

1. The equipment access hatch and at least one door in the personnel airlock shall be capable of being closed. For those penetrations which provide a direct path from containment atmosphere to the outside atmosphere, the containment isolation valves shall be OPERABLE or the penetration shall be closed by a valve, blind flange, or equivalent or the penetration shall be capable of being closed.

10. A spent fuel cask or heavy loads exceeding 110 percent of the weight of a fuel assembly (not including fuel handling tool) shall not be moved over spent fuel, and only one spent fuel assembly will be handled at one time over the reactor or the spent fuel pit.

    This restriction does not apply to the movement of the transfer canal door.

INSERT 2

11. Two trains of the control and relay room emergency ventilation system shall be OPERABLE. With one train inoperable for any reason, demonstrate the other train is OPERABLE by performing the test in Specification 4.20.A.1. With both trains inoperable, comply with Specification 3.10.C.

12. Two trains of the control room bottled air system shall be OPERABLE. With one train inoperable for any reason, restore the inoperable train to OPERABLE status within 7 days or comply with Specification 3.10.C. With two trains inoperable, comply with Specification 3.10.C.

13. Three chillers shall be OPERABLE in accordance with the power supply requirements of Specification 3.23.C. With one of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, return the inoperable chiller to OPERABLE status within 7 days or comply with Specification 3.10.C. With two of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, comply with Specification 3.10.C.

14. Eight air handling units (AHUs) shall be OPERABLE in accordance with the operability requirements of Specification 3.23.C. With two AHUs inoperable on the shutdown unit, ensure that one AHU is OPERABLE in each unit's main control room and emergency switchgear room, and restore an inoperable AHU to OPERABLE status within 7 days, or comply with Specification 3.10.C. With more than two AHUs inoperable, comply with Specification 3.10.C.

B. During irradiated fuel movement in the Fuel Building the following conditions are satisfied: recently

1. The fuel pit bridge area monitor and the ventilation vent stack 2 particulate and gas monitors shall be OPERABLE and continuously monitored to identify the occurrence of a fuel handling accident.

2. A spent fuel cask or heavy loads exceeding 110 percent of the weight of a fuel assembly (not including fuel handling tool) shall not be moved over spent fuel, and only one spent fuel assembly will be handled at one time over the reactor or the spent fuel pit.

   This restriction does not apply to the movement of the transfer canal door.

INSERT 2 (TS 3.10.A)

11. Two Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) trains shall be OPERABLE.

    a. With one required train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

    b. If two required trains are inoperable or one or more required trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

12. Two Main Control Room Bottled Air System trains shall be OPERABLE.

    a. With one train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

    b. If two trains are inoperable or one or more trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

3. A spent fuel cask shall not be moved into the Fuel Building unless the Cask Impact Pads are in place on the bottom of the spent fuel pool.

INSERT 3

4. Two trains of the control and relay room emergency ventilation system shall be OPERABLE. With one train inoperable for any reason, demonstrate the other train is OPERABLE by performing the test in Specification 4.20.A.1. With both trains inoperable, comply with Specification 3.10.C.

5. Two trains of the control room bottled air system shall be OPERABLE. With one train inoperable for any reason, restore the inoperable train to OPERABLE status within 7 days or comply with Specification 3.10.C. With two trains inoperable, comply with Specification 3.10.C.

6. Three chillers shall be OPERABLE in accordance with the power supply requirements of Specification 3.23.C. With one of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, return the inoperable chiller to OPERABLE status within 7 days or comply with Specification 3.10.C. With two of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, comply with Specification 3.10.C.

7. Eight air handling units (AHUs) shall be OPERABLE in accordance with the operability requirements of Specification 3.23.C. With two AHUs inoperable on either unit, ensure that one AHU is OPERABLE in each unit's main control room and emergency switchgear room, and restore an inoperable AHU to OPERABLE status within 7 days, or comply with Specification 3.10.C. With more than two AHUs inoperable on a unit, comply with Specification 3.10.C.

recently

C. If any one of the specified limiting conditions for refueling is not met, REFUELING OPERATIONS or irradiated fuel movement in the Fuel Building shall cease and irradiated fuel shall be placed in a safe position, work shall be initiated to correct the conditions so that the specified limit is met, and no operations which increase the reactivity of the core shall be made.

D. After initial fuel loading and after each core refueling operation and prior to reactor operation at greater than 75% of rated power, the movable incore detector system shall be utilized to verify proper power distribution.

E. The requirements of 3.0.1 are not applicable.

INSERT 3 (TS 3.10.B)

4. Two MCR/ESGR EVS trains shall be OPERABLE.

   a. With one required train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

   b. If two required trains are inoperable or one or more required trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

5. Two Main Control Room Bottled Air System trains shall be OPERABLE.

   a. With one train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

   b. If two trains are inoperable or one or more trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

Basis

Detailed instructions, the above specified precautions, and the design of the fuel handling equipment, which incorporates built-in interlocks and safety features, provide assurance that an accident, which would result in a hazard to public health and safety, will not occur during unit REFUELING OPERATIONS of irradiated fuel movement in the Fuel Building. When no change is being made in core geometry, one neutron detector is sufficient to monitor the core and permits maintenance of the out-of-function instrumentation. Continuous monitoring of radiation levels and neutron flux provides immediate indication of an unsafe condition.

Potential escape paths for fission product radioactivity within containment are required to be closed or capable of closure to prevent the release to the environment. However, since there is no potential for significant containment pressurization during refueling, the Appendix J leakage criteria and tests are not applicable.

The containment equipment access hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of the containment. During REFUELING OPERATIONS, the equipment hatch must be capable of being closed.

The containment airlocks, which are also part of the containment pressure boundary, provide a means for personnel access during periods when CONTAINMENT INTEGRITY is required. Each airlock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening. During periods of unit shutdown when containment closure is not required, the door interlock mechanism may be disabled, allowing both doors to remain open for extended periods when frequent containment entry is necessary. During REFUELING OPERATIONS, containment closure does not have to be maintained, but airlock doors may need to be closed to establish containment closure. Therefore, the door interlock mechanism may remain disabled, but one airlock door must be capable of being closed.

Containment penetrations that terminate in the Auxiliary Building or Safeguards and provide direct access from containment atmosphere to outside atmosphere must be isolated or capable of being closed by at least one barrier during REFUELING OPERATIONS. The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated by at least one barrier during REFUELING OPERATIONS. Isolation may be achieved by an OPERABLE isolation valve, a closed valve, a blind flange, or by an equivalent isolation method. Equivalent isolation methods must be evaluated and may include use of a material that can provide a temporary, atmospheric pressure ventilation barrier.

For the personnel airlock, equipment access hatch, and other penetrations, 'capable of being closed' means the openings are able to be closed; they do not have to be sealed or meet the leakage criteria of TS 4.4. Station procedures exist that ensure in the event of a fuel handling accident, that the open personnel airlock and other penetrations can and will be closed. Closure of the equipment hatch will be accomplished in accordance with station procedures and as allowed by dose rates in containment. The radiological analysis of the fuel handling accident does not take credit for closure of the personnel airlock, equipment access hatch or other penetrations.

The fuel building ventilation exhaust and containment ventilation purge exhaust may be diverted through charcoal filters whenever refueling is in progress. However, there is no requirement for filtration since the Fuel Handling Accident analysis takes no credit for these filters. At least one flow path is required for cooling and mixing the coolant contained in the reactor vessel so as to maintain a uniform boron concentration and to remove residual heat. The requirements in this specification for the ~~control and relay room~~ emergency ventilation system, control room bottled air system, and the ~~main control room~~ and ~~emergency switchgear room~~ air conditioning system (chillers and air handling units) apply to the shutdown unit. If any of the specified limiting conditions is not met, the requirements appropriately suspend activities that could result in a release of radioactivity that might require isolation of the ~~control room~~ envelope and place irradiated fuel in a safe position without delay and in a controlled manner. The requirements applicable to the operating unit are contained in Specifications 3.19 and 3.23.

Main Control Room / Emergency Switchgear Room (MCR/ESGR)

(MCR)

(Main MCR)

(ESGR)

(EVS)

3.21

recently

MCR/ESGR

INSERT 4

INSERT 4 (TS 3.10 Bases)

During REFUELING OPERATIONS and during the movement of recently irradiated fuel assemblies, the MCR/ESGR EVS and the MCR Bottled Air System must be operable to ensure that the MCR/ESGR envelope will remain habitable during and following a Design Basis Accident.

Specifically, during REFUELING OPERATIONS and during movement of recently irradiated fuel assemblies, the MCR/ESGR EVS and the MCR Bottled Air System must be OPERABLE to respond to the release from a fuel handling accident involving recently irradiated fuel. The MCR/ESGR EVS and the MCR Bottled Air System are 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 a time frame established by analysis), due to radioactive decay. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time.

3.10.A.7 and 8

During refueling, the reactor refueling water cavity is filled with approximately 220,000 gal of water borated to at least 2,300 ppm boron. The boron concentration of this water, established by Specification 3.10.A.7, is sufficient to maintain the reactor subcritical by at least 5% Δk/k in the COLD SHUTDOWN condition with all control rod assemblies inserted. This includes a 1% Δk/k and a 50 ppm boron concentration allowance for uncertainty. This concentration is also sufficient to maintain the core subcritical with no control rod assemblies inserted into the reactor. Checks are performed during the reload design and safety analysis process to ensure the K-effective is equal to or less than 0.95 for each core. Periodic checks of refueling water boron concentration assure the proper shutdown margin. Specification 3.10.A.8 allows the Control Room Operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

INSERT 5 →

In addition to the above safeguards, interlocks are used during refueling to assure safe handling of the fuel assemblies. An excess weight interlock is provided on the lifting hoist to prevent movement of more than one fuel assembly at a time. The spent fuel transfer mechanism can accommodate only one fuel assembly at a time.

INSERT 5 (TS 3.10 Bases)

3.10.A.11 and 12 and 3.10.B.4 and 5

When one MCR/ESGR EVS or MCR 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 EVS or MCR Bottled Air System train is adequate to perform the MCR/ESGR envelope occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE MCR/ESGR EVS or MCR Bottled Air System train could result in loss of MCR/ESGR EVS or MCR Bottled Air System function. The 7 day Allowed Outage Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

During REFUELING OPERATIONS or during movement of recently irradiated fuel assemblies, if the required inoperable MCR/ESGR EVS or MCR Bottled Air System train cannot be restored to OPERABLE status within the required Allowed Outage Time, or two required MCR/ESGR EVS or MCR Bottled Air System trains are inoperable or with one or more required MCR/ESGR EVS or MCR Bottled Air System trains inoperable due to an inoperable MCR/ESGR envelope boundary, action must be taken to 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 the accident risk. This does not preclude the movement of fuel to a safe position.

Upon each completion of core loading and installation of the reactor vessel head, specific mechanical and electrical tests will be performed prior to initial criticality.

The fuel handling accident has been analyzed based on the methodology outlined in Regulatory Guide 1.183. The analysis assumes 100% release of the gap activity from the assembly with maximum gap activity after a 100-hour decay period following operation at 2605 MWt.

Detailed procedures and checks insure that fuel assemblies are loaded in the proper locations in the core. As an additional check, the movable incore detector system will be used to verify proper power distribution. This system is capable of revealing any assembly enrichment error or loading error which could cause power shapes to be peaked in excess of design value.

References

UFSAR Section 5.2	Containment Isolation
UFSAR Section 6.3	Consequence Limiting Safeguards
UFSAR Section 9.12	Fuel Handling System
UFSAR Section 11.3	Radiation Protection
UFSAR Section 13.3	Table 13.3-1
UFSAR Section 14.4.1	Fuel Handling Accidents
FSAR Supplement:	Volume I: Question 3.2

UFSAR 9.13 Auxiliary Ventilation Systems

3.19 MAIN CONTROL ROOM BOTTLED AIR SYSTEM

Applicability

~~Applies to the ability to maintain a positive differential pressure in the main control room.~~
The following Specifications are applicable whenever either unit is above COLD SHUTDOWN.

Objective

To specify functional requirements for the main control room bottled air system.

Specification

A. Requirements

Two trains of bottled air shall be OPERABLE and ~~each~~ shall be capable of pressurizing the ~~main control room~~ (Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope) to a positive differential pressure with respect to adjoining areas of the auxiliary, turbine, and service buildings for one hour. A minimum positive differential pressure of 0.05 inches of water must be maintained when the ~~control room~~ (MCR/ESGR envelope) is isolated under accident conditions. This capability shall be demonstrated by the testing requirements delineated in Technical Specification 4.1.

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

B. Remedial Action

1. With one train of the bottled air system inoperable, restore the inoperable train to OPERABLE status within 7 days or both units shall be placed in HOT SHUTDOWN within the next 8 hours.

For reasons other than Specification 3.19.B.3

2. With both trains of the bottled air system inoperable, restore one train to OPERABLE status within 8 hours or both units shall be placed in HOT SHUTDOWN within the same 8 hours.

at least

~~3. With an inoperable control room pressure boundary, restore the boundary to OPERABLE status within 8 hours or both units shall be placed in HOT SHUTDOWN within the same 8 hours. The control room pressure boundary may be intermittently opened under administrative control.~~

Insert 6

INSERT 6 (TS 3.19, replaces existing TS 3.19.B.3)

3. If one or more trains of the bottled air system are inoperable due to an inoperable MCR/ESGR envelope boundary, then perform the following:

   a. Immediately initiate action to implement mitigating actions;

   b. Within 24 hours, verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits; and

   c. Within 90 days, restore MCR/ESGR envelope boundary to OPERABLE status.

4. If the requirements of Specification 3.19.B.1 or 3.19.B.2, ~~or 3.19.B.3~~ are not met within 48 hours after achieving HOT SHUTDOWN, both units shall be placed in COLD SHUTDOWN within the next 30 hours.

INSERT 7

Basis

Following a design basis accident, the containment will be depressurized to 0.5 psig (Unit 1), 1.0 psig (Unit 2) in less than 1 hour and to subatmospheric pressure within 4 hours. The radiological consequences analysis demonstrates acceptable results provided the containment pressure does not exceed 0.5 psig (Unit 1), 1.0 psig (Unit 2) for the interval from 1 to 4 hours following the Design Basis Accident. Beyond 4 hours, containment pressure is assumed to be less than 0.0 psig, terminating leakage from containment. The main control room is maintained at a positive differential pressure using bottled air during the first hour, when the containment leakrate is greatest.

INSERT 8

The main control room is contained in the control room pressure boundary or envelope, which is defined in the Technical Specification 3.23 Basis.

The control room pressure boundary is permitted to be opened intermittently under administrative control without declaring the boundary inoperable. The administrative control must provide the capability to re-establish the control room pressure boundary. For normal ingress into and egress from the pressure boundary, the individual entering or exiting the area has control of the door.

INSERT 7 (TS 3.19, new TS 3.19.B.5)

5. If the requirements of Specification 3.19.B.3 are not met, both units shall be placed in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 hours.

INSERT 8 (TS 3.19 Basis)

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

Following a Design Basis Accident (DBA), the containment will be depressurized to 0.5 psig (Unit 1), 1.0 psig (Unit 2) in less than 1 hour and to subatmospheric pressure within 4 hours. The radiological consequences analysis demonstrates acceptable results provided the containment pressure does not exceed 0.5 psig (Unit 1) and 1.0 psig (Unit 2) for the interval from 1 to 4 hours following the DBA. Beyond 4 hours, containment pressure is assumed to be less than 0.0 psig, terminating leakage from containment. The MCR/ESGR envelope is maintained at a positive differential pressure using bottled air during the first hour, when the containment leakrate is greatest.

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 common Main Control Room and the Emergency Switchgear Rooms, 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 (TS 6.4.R).

Upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, and airflow from the MCR Bottled Air System maintains a positive pressure in the MCR/ESGR envelope. Two dampers in series in both the MCR/ESGR envelope supply and exhaust ducts close to isolate the MCR/ESGR envelope. Approximately 60 minutes after the actuation of the MCR

Bottled Air System, the MCR/ESGR EVS is manually actuated. Each MCR/ESGR EVS train provides filtered air from the Turbine Building to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers. Prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope limits infiltration of unfiltered air from the surrounding areas adjacent to the MCR/ESGR envelope.

A single train of the MCR Bottled Air System will pressurize the MCR/ESGR envelope to $\geq$0.05 inches water gauge for at least 60 minutes. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 9.13 (Ref. 3).

The MCR/ESGR EHS is designed to maintain a habitable environment in the MCR/ESGR envelope for 30 days of continuous occupancy after a DBA without exceeding a 5 rem total effective dose equivalent (TEDE).

The MCR/ESGR envelope boundary may be opened intermittently under administrative control. This provision 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 MCR/ESGR envelope. This individual will have a method to rapidly close the opening and to restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR envelope isolation is indicated.

TS 3.19.B.3 and 5

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 TEDE), 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 Allowed Outage 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 Allowed Outage 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 Allowed Outage Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCR/ESGR envelope boundary.

REFERENCES

1. UFSAR, Section 2.1 — Geography, Demography And Potential External Hazards
2. UFSAR, Section 9.10 — Fire Protection
3. UFSAR, Section 9.13 — Auxiliary Ventilation Systems
4. UFSAR, Chapter 14 — Safety Analysis
5. Letters from B. R. Sylvia (VEPCO) to Harold R. Denton (NRC) dated January 19 and June 30, 1981, Response to Item III.D.3.4, Control Room Habitability Requirements of NUREG-0737 for Surry Power Station.
6. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors"
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)

INSERT 9 (New TS Section 3.21)

3.21 MAIN CONTROL ROOM/EMERGENCY SWITCHGEAR ROOM (MCR/ESGR) EMERGENCY VENTILATION SYSTEM (EVS)

Applicability

The following specifications are applicable whenever either unit is above COLD SHUTDOWN.

Objective

To specify the functional requirements for the MCR/ESGR EVS.

Specifications

A. Two MCR/ESGR EVS trains shall be OPERABLE whenever the unit is above COLD SHUTDOWN.

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

B. If one required MCR/ESGR EVS train is inoperable for reasons other than Specification 3.21.C, restore the MCR/ESGR EVS train to OPERABLE status within 7 days.

C. If one or more required MCR/ESGR EVS trains are inoperable due to an inoperable MCR/ESGR envelope boundary, then perform the following:

   1. Immediately initiate action to implement mitigating actions.

   2. Within 24 hours, verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.

   3. Within 90 days, restore MCR/ESGR envelope boundary to OPERABLE status.

D. If the requirements of Specifications 3.21.B or 3.21.C are not met, the unit shall be placed in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

E. If two required MCR/ESGR EVS trains are inoperable for reasons other than TS 3.21.C, the unit shall be placed in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

BASES

BACKGROUND - The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The MCR/ESGR EHS consists of the Main Control Room Bottled Air System (TS 3.19) and the MCR/ESGR EVS.

The MCR/ESGR EVS consists of four full capacity trains that supply filtered air to the MCR/ESGR envelope and a MCR/ESGR envelope boundary that limits the inleakage of unfiltered air. Each MCR/ESGR EVS train consists of a prefilter, 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 providing outside filtered air for pressurization. Two independently powered EVS trains 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 common Main Control Room and the Emergency Switchgear Rooms, 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 (TS 6.4.R).

Upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, and airflow from the MCR Bottled Air System maintains a positive pressure in the MCR/ESGR envelope. Two dampers in series in both the MCR/ESGR envelope supply and exhaust ducts close to isolate the MCR/ESGR envelope. Approximately 60 minutes after the isolation of the MCR/ESGR envelope and actuation of the MCR Bottled Air System, the MCR/ESGR EVS is manually actuated. Each MCR/ESGR EVS train provides filtered air from the Turbine Building to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers. Prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope limits infiltration of unfiltered air from the surrounding areas adjacent to the MCR/ESGR envelope.

A single train of the MCR/ESGR EVS will pressurize the MCR/ESGR envelope to about 0.05 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 9.13 (Ref. 3).

Redundant MCR/ESGR EVS supply trains provide the required pressurization and filtration should one train fail to start or should an excessive pressure drop develop across the operating filter train. Isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The MCR/ESGR EVS 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 for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem total effective dose equivalent (TEDE).

APPLICABLE SAFETY ANALYSES - The MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The MCR/ESGR EHS provides airborne radiological protection for the MCR/ESGR envelope occupants, as demonstrated by the MCR/ESGR envelope occupant dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 14 (Ref. 4).

The MCR/ESGR EHS provides protection from smoke and hazardous chemicals to the MCR/ESGR envelope occupants. An evaluation of hazardous chemical releases demonstrates that the toxicity limits for chemicals are not exceeded in the MCR/ESGR envelope following a hazardous chemical release (Refs. 1 and 5) or that ample time is available for MCR/ESGR envelope occupants to isolate the MCR/ESGR envelope. The evaluation of a smoke challenge demonstrates that it will not result in the inability of the MCR/ESGR envelope occupants to control the reactor either from the MCR or from the remote shutdown panel (Ref. 2).

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 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LIMITING CONDITIONS FOR OPERATION (LCO) - Two independent and redundant MCR/ESGR EVS trains are required to be OPERABLE to ensure that at least one is available to pressurize and to provide filtered air to the MCR/ESGR envelope assuming a single active failure disables one of the two required trains. Due to electrical power considerations, one train must be from the other unit. Total system failure, such as from a loss of both ventilation trains or from an inoperable MCR/ESGR envelope boundary, could result in exceeding a dose of 5 rem TEDE to the MCR/ESGR envelope occupants in the event of a large radioactive release.

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

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air flow can be maintained.

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

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 MCR/ESGR envelope. This individual will have a method to rapidly close the opening and to restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR envelope isolation is indicated.

APPLICABILITY - In REACTOR OPERATION conditions above COLD SHUTDOWN, the MCR/ESGR EVS must be OPERABLE to ensure that the MCR/ESGR envelope will remain habitable during and following a DBA.

ACTIONS

3.21.B

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 failure in the OPERABLE MCR/ESGR EVS train could result in loss of MCR/ESGR EVS function. The 7 day Allowed Outage Time is based on the low probability of a DBA occurring

during this time period, and ability of the remaining train to provide the required capability.

3.21.C

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 TEDE), 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 Allowed Outage 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 Allowed Outage 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 Allowed Outage Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCR/ESGR envelope boundary.

3.21.D

In REACTOR OPERATION conditions above COLD SHUTDOWN, if the inoperable MCR/ESGR EVS train or the MCR/ESGR envelope boundary cannot be restored to OPERABLE status within the Allowed Outage Time, the unit must be placed in a REACTOR OPERATION condition that minimizes accident risk. To achieve this status, the unit must be placed in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 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.

3.21.E

If both MCR/ESGR EVS trains are inoperable in REACTOR OPERATION conditions above COLD SHUTDOWN for reasons other than an inoperable MCR/ESGR envelope boundary (i.e., TS 3.21.C), 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, the unit must be placed in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 hours.

REFERENCES

1. UFSAR, Section 2.1 — Geography, Demography and Potential External Hazards
2. UFSAR, Section 9.10 — Fire Protection
3. UFSAR, Section 9.13 — Auxiliary Ventilation Systems
4. UFSAR, Chapter 14 — Safety Analysis
5. Letters from B. R. Sylvia (VEPCO) to Harold R. Denton (NRC) dated January 19 and June 30, 1981, Response to Item III.D.3.4, Control Room Habitability Requirements of NUREG-0737 for Surry Power Station
6. Regulatory Guide 1.196, “Control Room Habitability at Light-Water Nuclear Power Reactors”
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)

3.23 MAIN CONTROL ROOM AND EMERGENCY SWITCHGEAR ROOM ~~VENTILATION AND~~ AIR CONDITIONING SYSTEMS

Applicability

Applies to the Main Control Room (MCR) and Emergency Switchgear Room (ESGR) Air Conditioning System ~~and Emergency Ventilation System.~~

Objective

To specify requirements to ensure the proper function of the Main Control Room and Emergency Switchgear Room Air Conditioning System ~~and Emergency Ventilation System.~~

Specification

A. Both trains of the Main Control Room and Emergency Switchgear Room Emergency Ventilation System shall be OPERABLE whenever either unit is above COLD SHUTDOWN.

B. With one train of the Main Control Room and Emergency Switchgear Room Emergency Ventilation System inoperable for any reason, return the inoperable train to an OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 48 hours.

C. The Main Control Room and Emergency Switchgear Room Air Conditioning System shall be OPERABLE as delineated in the following:

1. Chiller Refrigeration Units

   a. Three main control room and emergency switchgear room chillers must be OPERABLE whenever either unit is above COLD SHUTDOWN.

   b. The three OPERABLE chillers are required to be powered from three of the four emergency buses with one of those chillers capable of being powered from the fourth emergency bus.

   c. If one of the OPERABLE chillers becomes inoperable or is not powered as required by Specification 3.23.C.1.b, return an inoperable chiller to OPERABLE status within seven (7) days or bring both units to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

   d. If two of the OPERABLE chillers become inoperable or are not powered as required by Specification 3.23.C.1.b, return an inoperable chiller to OPERABLE status within one (1) hour or bring both units to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

2. If two Unit 2 AHUs on different chilled water loops and in different air conditioning zones (2-VS-AC-7 and 2-VS-AC-8 or 2-VS-AC-6 and 2-VS-AC-9) become inoperable, restore operability of the two inoperable AHUs within seven (7) days or bring Unit 2 to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

3. If two Unit 2 AHUs in the same air conditioning zone (2-VS-AC-8 and 2-VS-AC-9 or 2-VS-AC-6 and 2-VS-AC-7) become inoperable, restore operability of at least one Unit 2 AHU in each air conditioning zone (2-VS-AC-8 or 2-VS-AC-9 and 2-VS-AC-6 or 2-VS-AC-7) within one (1) hour or bring Unit 2 to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

4. If more than two Unit 2 AHUs become inoperable, restore operability of at least one Unit 2 AHU in each air conditioning zone (2-VS-AC-8 or 2-VS-AC-9 and 2-VS-AC-6 or 2-VS-AC-7) within one (1) hour or bring Unit 2 to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

c. Both Unit 1 AHUs or both Unit 2 AHUs powered from the respective H buses (1-VS-AC-1 and 1-VS-AC-7 or 2-VS-AC-6 and 2-VS-AC-8) must be OPERABLE whenever both units are above COLD SHUTDOWN.

1. If one or two AHUs on each unit powered from an H bus is inoperable, restore operability of the inoperable AHU(s) on one unit within one (1) hour or bring both units to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the next 30 hours.

Basis

When the supply of compressed bottled air is depleted, the Main Control Room (MCR) and Emergency Switchgear Room (ESGR) Emergency Ventilation System is manually started to continue to maintain the control room pressure at the design positive pressure so that leakage is outleakage. One train of the main control room emergency ventilation consists of one fan powered from an independent emergency power source.

The MCR and ESGR Emergency Ventilation System is designed to filter the intake air to the control room pressure envelope during a loss of coolant accident. The control room pressure envelope consists of the control room complex (including the control room, control room annex area, Units 1 and 2 air conditioning equipment rooms, and Units 1 and 2 computer rooms), Units 1 and 2 emergency switchgear rooms, Unit 1 relay room, and Unit 2 relay room (including Mechanical Equipment Room 3 (MER-3)).

High efficiency particulate air (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radio-iodine to the control room.

If the system is found to be inoperable, there is no immediate threat to the control room, and reactor operation may continue for a limited period of time while repairs are being made. If the system cannot be repaired within the specified time, procedures are initiated to establish conditions for which the filter system is not required.

The MCR and ESGR Air Conditioning System (ACS) cools the ~~control room pressure~~ envelope. From an ACS perspective, the envelope consists of four zones: 1) the Unit 1 side of the control room (including the Unit 1 air conditioning equipment and computer rooms), 2) the Unit 2 side of the control room (including the annex area, the Unit 2 air conditioning equipment and computer rooms), 3) the Unit 1 ESGR and relay room (referred to as the Unit 1 ESGR), and 4) the Unit 2 ESGR and relay room (including MER-3), referred to as the Unit 2 ESGR. The design basis of the MCR and ESGR ACS is to maintain the ~~control room pressure~~ envelope temperature within the equipment design limits for 30 days of continuous occupancy after a design basis accident (DBA). The ACS includes five chillers (1-VS-E-4A, 4B, 4C, 4D, and 4E). Chillers 4A, 4B, and 4C are located in MER-3, in the Unit 2 ESGR. Chillers 4D and 4E are located in MER-5, in the Unit 2 Turbine Building. The chillers supply chilled water to eight air handling units (AHUs), arranged in two independent and redundant chilled water loops. Each chilled water loop provides redundant 100% heat removal capacity per unit. Each loop contains four AHUs (one AHU in each unit's air conditioning zones), the necessary power supplies, the associated valves, piping (from the supply header to return header), instrumentation, and controls. Each AHU has 100% capacity for cooling its zone.

The combination of five chillers and two chilled water loops affords considerable flexibility in meeting the cooling requirements. Two chillers are powered from single emergency buses (1-VS-E-4C from 2H, 1-VS-E-4E from 1H). The remaining three chillers can be powered from either of two emergency buses (1-VS-E-4A from 1J or 2J, 1-VS-E-4B from 1J or 2H, and 1-VS-E-4D from 1H or 2J). The AHUs are powered from the four emergency buses in pairs. For example, the Unit 1 MCR and ESGR AHUs 1-VS-AC-1 and 1-VS-AC-7 are powered from the 1H bus; the redundant Unit 1 MCR and ESGR AHUs 1-VS-AC-2 and 1-VS-AC-6 are powered from the 1J bus. Control of the ACS is by manual action.

The chillers are procedurally aligned by power supply to meet TS 3.23.C.1.b, and the AHU pairs are normally aligned to match the power supplies of the OPERABLE chillers. For example, chiller 1-VS-E-4E and AHUs 1-VS-AC-1 and 1-VS-AC-7 are powered from the 1H emergency bus. However, due to the number of emergency diesel generators (EDGs) and the chiller/AHU piping layout, only one chiller and AHU pair can be powered from each emergency bus at a time. Also, if chilled water is needed in both chilled water loops, two chillers must be operated. Only one chiller can be operated on each chilled water loop at a time, and the 4D and 4E chillers cannot be operated simultaneously. The combinations of OPERABLE chillers/AHUs allowed by procedure ensure that sufficient cooling capacity is available during a DBA with a coincident loss of offsite power (LOOP) and single failure of an EDG, a chiller, or an AHU.

INSERT 10 (New TS Section 4.18)

4.18 MAIN CONTROL ROOM/EMERGENCY SWITCHGEAR ROOM (MCR/ESGR) EMERGENCY VENTILATION SYSTEM (EVS) TESTING

A. Operate each MCR/ESGR EVS train for ≥15 minutes once every 31 days.

B. Perform required Control Room Air Filtration System Testing in accordance with TS 4.20.

C. Perform required MCR/ESGR envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.

BASES

SURVEILLANCE REQUIREMENTS (SR)

SR 4.18.A

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. Systems without heaters need only be operated for ≥15 minutes to demonstrate the function of the system. The 31 day frequency is based on the reliability of the equipment and the two train redundancy. Operation of the MCR/ESGR EVS trains shall be initiated manually from the MCR.

SR 4.18.B

This SR verifies that the required Control Room Air Filtration System testing is performed in accordance with Specification 4.20. Specification 4.20 includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in TS 4.20.

SR 4.18.C

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 (TS 6.4.R).

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, Specification 3.21.C must be entered. Specification 3.21.C.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. 1) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 2). These compensatory measures may also be used as mitigating actions as required by Specification 3.21.C.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 3). 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.

REFERENCES

1. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors"

2. NEI 99-03, "Control Room Habitability Assessment," June 2001

3. 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)

8. The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in Specification 4.20.B.4.

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

   a. Initially;

   b. Once per 18 months; and

   c. After each complete or partial replacement of filters or adsorbers.

~~10. Each filter train circuit shall be operated every month. Filter Train Operation shall be initiated manually from the control room.~~

B. Acceptance Criteria

1. Fan flow tube test shall show a flow rate through any single filter train of 1000 ± 10 percent cfm.

2. In-place cold DOP tests on HEPA filters shall show greater than or equal to 99.5 percent DOP removal. Leaking sources shall be identified, repaired and retested. Any HEPA filter found defective shall be replaced.

3. In-place halogenated hydrocarbon leakage tests on charcoal adsorber banks shall show greater than or equal to 99 percent halogenated hydrocarbon removal. Leakage sources shall be identified, repaired and retested.

4. Laboratory analysis on new charcoal adsorbent shall show the methyl iodide penetration less than or equal to 14 percent, when tested in accordance with ASTM D3803-1989 (with the exception of face velocity which is to be at 24.4 M/min), with the relative humidity equal to 95 percent, and the temperature equal to 30°C (86°F).

5. The pressure drop across filter cells and adsorbers shall not exceed 5.0 inches W.G. at design flow rate. If this condition cannot be met, new filter cells shall be installed.

~~6. The minimum period of air flow through the filter shall be 15 minutes per month.~~

Basis

Ventilation system filter components are not subject to rapid deterioration, having lifetimes of many years. The tests outlined above provide assurance of filter reliability and will ensure timely detection of conditions which could cause filter degradation.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than 5 inches of water will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. ~~Operation of the filtration system for a minimum of 15 minutes a month prevents moisture buildup in the filters and adsorbers.~~

c. The operational LEAKAGE performance criterion is specified in TS 3.1.C and 4.13, "RCS Operational LEAKAGE."

3. Provisions for SG tube repair criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

4. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube repair criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of 4.a, 4.b, and 4.c below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. An assessment of degradation shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

   a. Inspect 100% of the tubes in each SG during the first refueling outage following SG replacement.

   b. Inspect 100% of the tubes at sequential periods of 120, 90, and, thereafter, 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. In addition, inspect 50% of the tubes by the refueling outage nearest the midpoint of the period and the remaining 50% by the refueling outage nearest the end of the period. No SG shall operate for more than 48 effective full power months or two refueling outages (whichever is less) without being inspected.

   c. If crack indications are found in any SG tube, then the next inspection for each SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever is less). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

5. Provisions for monitoring operational primary to secondary LEAKAGE.

INSERT 11

INSERT 11 (New TS Program 6.4.R)

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

A Main Control Room/Emergency Switchgear Room (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., the MCR/ESGR Emergency Ventilation System (EVS) and the Main Control Room 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 (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident. The program shall include the following elements:

1. The definition of the MCR/ESGR envelope and the MCR/ESGR envelope boundary.

2. Requirements for maintaining the MCR/ESGR envelope boundary in its design condition including configuration control and preventive maintenance.

3. Requirements for (a) determining the unfiltered air inleakage past the MCR/ESGR envelope boundary into the MCR/ESGR envelope in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (b) 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 Sections C.1 and 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 (RGs) 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.

4. 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 TS 4.20, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the assessment of the MCR/ESGR envelope boundary.

5. 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 3. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA 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.

6. The provisions of SR 4.0.2 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 3 and 4, respectively.

ATTACHMENT 3

PROPOSED TECHNICAL SPECIFICATIONS PAGES (TYPED)

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

(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 licensee's 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.

Q. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage times to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No. 07-0109).

R. 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 4.18 in accordance with TS 6.4.R.3.a, the assessment of MCR/ESGR envelope habitability as required by Specification 6.4.R.3.b, and the measurement of MCR/ESGR envelope pressure as required by Specification 6.4.R.4, shall be considered met. Following implementation:

(1) The first performance of SR 4.18, in accordance with Specification 6.4.R.3.a, shall be within the specified frequency of 6 years plus the 18-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.

(2) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 6.4.R.3.b, shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

(3) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 6.4.R.4, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from January 19, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

4. This renewed license is effective as of the date of issuance, and shall expire at midnight on May 25, 2032.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Attachment: Appendix A, Technical Specifications

Date of Issuance: March 20, 2003

P. 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, 2002, October 1, 2002, November 4, 2002, 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 January 29, 2013, 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, 2002, October 1, 2002, November 4, 2002, 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.

Q. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage times to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No. 07-0109).

R. 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 4.18 in accordance with TS 6.4.R.3.a, the assessment of MCR/ESGR envelope habitability as required by Specification 6.4.R.3.b, and the measurement of MCR/ESGR envelope pressure as required by Specification 6.4.R.4, shall be considered met. Following implementation:

(1) The first performance of SR 4.18, in accordance with Specification 6.4.R.3.a, shall be within the specified frequency of 6 years plus the 18-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.

(2) The first performance of the periodic assessment of MCR/ESGR envelope habitability, Specification 6.4.R.3.b, shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from January 18, 2004, the date of the most recent successful tracer gas test, as stated in the April 22, 2004 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

(3) The first performance of the periodic measurement of MCR/ESGR envelope pressure, Specification 6.4.R.4, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from January 19, 2007, the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

4. This renewed license is effective as of the date of issuance, and shall expire at midnight on January 29, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

Attachment: Appendix A, Technical Specifications

Date of Issuance: March 20, 2003

TECHNICAL SPECIFICATION
TABLE OF CONTENTS

TECHNICAL SPECIFICATION
TABLE OF CONTENTS

3.10 REFUELING

Applicability

Applies to operating limitations during REFUELING OPERATIONS or recently irradiated fuel movement in the Fuel Building.

Objective

To assure that no accident could occur during REFUELING OPERATIONS or recently irradiated fuel movement in the Fuel Building that would affect public health and safety.

Specification

A. During REFUELING OPERATIONS the following conditions are satisfied:

1. The equipment access hatch and at least one door in the personnel airlock shall be capable of being closed. For those penetrations which provide a direct path from containment atmosphere to the outside atmosphere, the containment isolation valves shall be OPERABLE or the penetration shall be closed by a valve, blind flange, or equivalent or the penetration shall be capable of being closed.

10. A spent fuel cask or heavy loads exceeding 110 percent of the weight of a fuel assembly (not including fuel handling tool) shall not be moved over spent fuel, and only one spent fuel assembly will be handled at one time over the reactor or the spent fuel pit.

    This restriction does not apply to the movement of the transfer canal door.

11. Two Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS) trains shall be OPERABLE.

    a. With one required train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

    b. If two required trains are inoperable or one or more required trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

12. Two Main Control Room Bottled Air System trains shall be OPERABLE.

    a. With one train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

    b. If two trains are inoperable or one or more trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

13. Three chillers shall be OPERABLE in accordance with the power supply requirements of Specification 3.23.C. With one of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, return the inoperable chiller to OPERABLE status within 7 days or comply with Specification 3.10.C. With two of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, comply with Specification 3.10.C.

14. Eight air handling units (AHUs) shall be OPERABLE in accordance with the operability requirements of Specification 3.23.C. With two AHUs inoperable on the shutdown unit, ensure that one AHU is OPERABLE in each unit's main control room and emergency switchgear room, and restore an inoperable AHU to OPERABLE status within 7 days, or comply with Specification 3.10.C. With more than two AHUs inoperable, comply with Specification 3.10.C.

B. During recently irradiated fuel movement in the Fuel Building the following conditions are satisfied:

1. The fuel pit bridge area monitor and the ventilation vent stack 2 particulate and gas monitors shall be OPERABLE and continuously monitored to identify the occurrence of a fuel handling accident.

2. A spent fuel cask or heavy loads exceeding 110 percent of the weight of a fuel assembly (not including fuel handling tool) shall not be moved over spent fuel, and only one spent fuel assembly will be handled at one time over the reactor or the spent fuel pit.

   This restriction does not apply to the movement of the transfer canal door.

3. A spent fuel cask shall not be moved into the Fuel Building unless the Cask Impact Pads are in place on the bottom of the spent fuel pool.

4. Two MCR/ESGR EVS trains shall be OPERABLE.

   a. With one required train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

   b. If two required trains are inoperable or one or more required trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

5. Two Main Control Room Bottled Air System trains shall be OPERABLE.

   a. With one train inoperable for reasons other than an inoperable MCR/ESGR envelope boundary, restore the inoperable train to OPERABLE status within 7 days. If the inoperable train is not returned to OPERABLE status within 7 days, comply with Specification 3.10.C.

   b. If two trains are inoperable or one or more trains are inoperable due to an inoperable MCR/ESGR envelope boundary, comply with Specification 3.10.C.

6. Three chillers shall be OPERABLE in accordance with the power supply requirements of Specification 3.23.C. With one of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, return the inoperable chiller to OPERABLE status within 7 days or comply with Specification 3.10.C. With two of the required OPERABLE chillers inoperable or not powered as required by Specification 3.23.C.1, comply with Specification 3.10.C.

7. Eight air handling units (AHUs) shall be OPERABLE in accordance with the operability requirements of Specification 3.23.C. With two AHUs inoperable on either unit, ensure that one AHU is OPERABLE in each unit's main control room and emergency switchgear room, and restore an inoperable AHU to OPERABLE status within 7 days, or comply with Specification 3.10.C. With more than two AHUs inoperable on a unit, comply with Specification 3.10.C.

C. If any one of the specified limiting conditions for refueling is not met, REFUELING OPERATIONS or recently irradiated fuel movement in the Fuel Building shall cease and recently irradiated fuel shall be placed in a safe position, work shall be initiated to correct the conditions so that the specified limit is met, and no operations which increase the reactivity of the core shall be made.

D. After initial fuel loading and after each core refueling operation and prior to reactor operation at greater than 75% of rated power, the movable incore detector system shall be utilized to verify proper power distribution.

E. The requirements of 3.0.1 are not applicable.

Basis

Detailed instructions, the above specified precautions, and the design of the fuel handling equipment, which incorporates built-in interlocks and safety features, provide assurance that an accident, which would result in a hazard to public health and safety, will not occur during unit REFUELING OPERATIONS or recently irradiated fuel movement in the Fuel Building. When no change is being made in core geometry, one neutron detector is sufficient to monitor the core and permits maintenance of the out-of-function instrumentation. Continuous monitoring of radiation levels and neutron flux provides immediate indication of an unsafe condition.

Potential escape paths for fission product radioactivity within containment are required to be closed or capable of closure to prevent the release to the environment. However, since there is no potential for significant containment pressurization during refueling, the Appendix J leakage criteria and tests are not applicable.

The containment equipment access hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of the containment. During REFUELING OPERATIONS, the equipment hatch must be capable of being closed.

The containment airlocks, which are also part of the containment pressure boundary, provide a means for personnel access during periods when CONTAINMENT INTEGRITY is required. Each airlock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening. During periods of unit shutdown when containment closure is not required, the door interlock mechanism may be disabled, allowing both doors to remain open for extended periods when frequent containment entry is necessary. During REFUELING OPERATIONS, containment closure does not have to be maintained, but airlock doors may need to be closed to establish containment closure. Therefore, the door interlock mechanism may remain disabled, but one airlock door must be capable of being closed.

Containment penetrations that terminate in the Auxiliary Building or Safeguards and provide direct access from containment atmosphere to outside atmosphere must be isolated or capable of being closed by at least one barrier during REFUELING OPERATIONS. The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated by at least one barrier during REFUELING OPERATIONS. Isolation may be achieved by an OPERABLE isolation valve, a closed valve, a blind flange, or by an equivalent isolation method. Equivalent isolation methods must be evaluated and may include use of a material that can provide a temporary, atmospheric pressure ventilation barrier.

For the personnel airlock, equipment access hatch, and other penetrations, 'capable of being closed' means the openings are able to be closed; they do not have to be sealed or meet the leakage criteria of TS 4.4. Station procedures exist that ensure in the event of a fuel handling accident, that the open personnel airlock and other penetrations can and will be closed. Closure of the equipment hatch will be accomplished in accordance with station procedures and as allowed by dose rates in containment. The radiological analysis of the fuel handling accident does not take credit for closure of the personnel airlock, equipment access hatch or other penetrations.

The fuel building ventilation exhaust and containment ventilation purge exhaust may be diverted through charcoal filters whenever refueling is in progress. However, there is no requirement for filtration since the Fuel Handling Accident analysis takes no credit for these filters. At least one flow path is required for cooling and mixing the coolant contained in the reactor vessel so as to maintain a uniform boron concentration and to remove residual heat.

The requirements in this specification for the Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS), Main Control Room (MCR) Bottled Air System, and the MCR and ESGR Air Conditioning System (chillers and air handling units) apply to the shutdown unit. If any of the specified limiting conditions is not met, the requirements appropriately suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope and place recently irradiated fuel in a safe position without delay and in a controlled manner. The requirements applicable to the operating unit are contained in Specifications 3.19, 3.21, and 3.23.

During REFUELING OPERATIONS and during the movement of recently irradiated fuel assemblies, the MCR/ESGR EVS and the MCR Bottled Air System must be operable to ensure that the MCR/ESGR envelope will remain habitable during and following a Design Basis Accident.

Specifically, during REFUELING OPERATIONS and during movement of recently irradiated fuel assemblies, the MCR/ESGR EVS and the MCR Bottled Air System must be OPERABLE to respond to the release from a fuel handling accident involving recently irradiated fuel. The MCR/ESGR EVS and the MCR Bottled Air System are 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 a time frame established by analysis), due to radioactive decay. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time.

3.10.A.7 and 8

During refueling, the reactor refueling water cavity is filled with approximately 220,000 gal of water borated to at least 2,300 ppm boron. The boron concentration of this water, established by Specification 3.10.A.7, is sufficient to maintain the reactor subcritical by at least 5% $\Delta k/k$ in the COLD SHUTDOWN condition with all control rod assemblies inserted. This includes a 1% $\Delta k/k$ and a 50 ppm boron concentration allowance for uncertainty. This concentration is also sufficient to maintain the core subcritical with no control rod assemblies inserted into the reactor. Checks are performed during the reload design and safety analysis process to ensure the K-effective is equal to or less than 0.95 for each core. Periodic checks of refueling water boron concentration assure the proper shutdown margin. Specification 3.10.A.8 allows the Control Room Operator to inform the manipulator operator of any impending unsafe condition detected from the main control board indicators during fuel movement.

3.10.A.11 and 12 and 3.10.B.4 and 5

When one MCR/ESGR EVS or MCR 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 EVS or MCR Bottled Air System train is adequate to perform the MCR/ESGR envelope occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE MCR/ESGR EVS or MCR Bottled Air System train could result in loss of MCR/ESGR EVS or MCR Bottled Air System function. The 7 day Allowed Outage Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

During REFUELING OPERATIONS or during movement of recently irradiated fuel assemblies, if the required inoperable MCR/ESGR EVS or MCR Bottled Air System train cannot be restored to OPERABLE status within the required Allowed Outage Time, or two required MCR/ESGR EVS or MCR Bottled Air System trains are inoperable or with one or more required MCR/ESGR EVS or MCR Bottled Air System trains inoperable due to an inoperable MCR/ESGR envelope boundary, action must be taken to 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 the accident risk. This does not preclude the movement of fuel to a safe position.

In addition to the above safeguards, interlocks are used during refueling to assure safe handling of the fuel assemblies. An excess weight interlock is provided on the lifting hoist to prevent movement of more than one fuel assembly at a time. The spent fuel transfer mechanism can accommodate only one fuel assembly at a time.

Upon each completion of core loading and installation of the reactor vessel head, specific mechanical and electrical tests will be performed prior to initial criticality.

The fuel handling accident has been analyzed based on the methodology outlined in Regulatory Guide 1.183. The analysis assumes 100% release of the gap activity from the assembly with maximum gap activity after a 100-hour decay period following operation at 2605 MWt.

Detailed procedures and checks insure that fuel assemblies are loaded in the proper locations in the core. As an additional check, the movable incore detector system will be used to verify proper power distribution. This system is capable of revealing any assembly enrichment error or loading error which could cause power shapes to be peaked in excess of design value.

References

UFSAR Section 5.2	Containment Isolation
UFSAR Section 6.3	Consequence Limiting Safeguards
UFSAR Section 9.12	Fuel Handling System
UFSAR Section 9.13	Auxiliary Ventilation Systems
UFSAR Section 11.3	Radiation Protection
UFSAR Section 13.3	Table 13.3-1
UFSAR Section 14.4.1	Fuel Handling Accidents
FSAR Supplement:	Volume I: Question 3.2

3.19 MAIN CONTROL ROOM BOTTLED AIR SYSTEM

Applicability

The following Specifications are applicable whenever either unit is above COLD SHUTDOWN.

Objective

To specify functional requirements for the main control room bottled air system.

Specification

A. Requirements

Two trains of bottled air shall be OPERABLE and each shall be capable of pressurizing the Main Control Room/Emergency Switchgear Room (MCR/ESGR) envelope to a positive differential pressure with respect to adjoining areas of the auxiliary, turbine, and service buildings for one hour. A minimum positive differential pressure of 0.05 inches of water must be maintained when the MCR/ESGR envelope is isolated under accident conditions. This capability shall be demonstrated by the testing requirements delineated in Technical Specification 4.1.

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

B. Remedial Action

1. With one train of the bottled air system inoperable for reasons other than Specification 3.19.B.3, restore the inoperable train to OPERABLE status within 7 days or both units shall be placed in at least HOT SHUTDOWN within the next 8 hours.
2. With both trains of the bottled air system inoperable for reasons other than Specification 3.19.B.3, restore one train to OPERABLE status within 8 hours or both units shall be placed in at least HOT SHUTDOWN within the same 8 hours.
3. If one or more trains of the bottled air system are inoperable due to an inoperable MCR/ESGR envelope boundary, then perform the following:
   a. Immediately initiate action to implement mitigating actions;
   b. Within 24 hours, verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits; and
   c. Within 90 days, restore MCR/ESGR envelope boundary to OPERABLE status.

4. If the requirements of Specification 3.19.B.1 or 3.19.B.2 are not met within 48 hours after achieving HOT SHUTDOWN, both units shall be placed in COLD SHUTDOWN within the next 30 hours.
5. If the requirements of Specification 3.19.B.3 are not met, both units shall be placed in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 hours.

Basis

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

Following a Design Basis Accident (DBA), the containment will be depressurized to 0.5 psig (Unit 1), 1.0 psig (Unit 2) in less than 1 hour and to subatmospheric pressure within 4 hours. The radiological consequences analysis demonstrates acceptable results provided the containment pressure does not exceed 0.5 psig (Unit 1) and 1.0 psig (Unit 2) for the interval from 1 to 4 hours following the DBA. Beyond 4 hours, containment pressure is assumed to be less than 0.0 psig, terminating leakage from containment. The MCR/ESGR envelope is maintained at a positive differential pressure using bottled air during the first hour, when the containment leakrate is greatest.

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 common Main Control Room and the Emergency Switchgear Rooms, 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 (TS 6.4.R).

Upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, and airflow from the MCR Bottled Air System maintains a positive pressure in the MCR/ESGR envelope. Two dampers in series in both the MCR/ESGR envelope supply and exhaust ducts close to isolate the MCR/ESGR envelope. Approximately 60 minutes after the actuation of the MCR Bottled Air System, the MCR/ESGR EVS is manually actuated. Each MCR/ESGR EVS train provides filtered air from the Turbine Building to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers. Prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope limits infiltration of unfiltered air from the surrounding areas adjacent to the MCR/ESGR envelope.

A single train of the MCR Bottled Air System will pressurize the MCR/ESGR envelope to ≥ 0.05 inches water gauge for at least 60 minutes. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 9.13 (Ref. 3).

The MCR/ESGR EHS is designed to maintain a habitable environment in the MCR/ESGR envelope for 30 days of continuous occupancy after a DBA without exceeding a 5 rem total effective dose equivalent (TEDE).

The MCR/ESGR envelope boundary may be opened intermittently under administrative control. This provision 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 MCR/ESGR envelope. This individual will have a method to rapidly close the opening and to restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR envelope isolation is indicated.

TS 3.19.B.3 and 5

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 TEDE), 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 Allowed Outage 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 Allowed Outage 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 Allowed Outage Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCR/ESGR envelope boundary.

REFERENCES

1. UFSAR, Section 2.1, Geography, Demography And Potential External Hazards
2. UFSAR, Section 9.10, Fire Protection
3. UFSAR, Section 9.13, Auxiliary Ventilation Systems
4. UFSAR, Chapter 14, Safety Analysis
5. Letters from B. R. Sylvia (VEPCO) to Harold R. Denton (NRC) dated January 19 and June 30, 1981, Response to Item III.D.3.4, Control Room Habitability Requirements of NUREG-0737 for Surry Power Station.
6. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors"
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)

3.21 MAIN CONTROL ROOM/EMERGENCY SWITCHGEAR ROOM (MCR/ESGR) EMERGENCY VENTILATION SYSTEM (EVS)

Applicability

The following specifications are applicable whenever either unit is above COLD SHUTDOWN.

Objective

To specify the functional requirements for the MCR/ESGR EVS.

Specifications

A. Two MCR/ESGR EVS trains shall be OPERABLE whenever the unit is above COLD SHUTDOWN.

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

B. If one required MCR/ESGR EVS train is inoperable for reasons other than Specification 3.21.C, restore the MCR/ESGR EVS train to OPERABLE status within 7 days.

C. If one or more required MCR/ESGR EVS trains are inoperable due to an inoperable MCR/ESGR envelope boundary, then perform the following:

   1. Immediately initiate action to implement mitigating actions.

   2. Within 24 hours, verify mitigating actions ensure MCR/ESGR envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.

   3. Within 90 days, restore MCR/ESGR envelope boundary to OPERABLE status.

D. If the requirements of Specifications 3.21.B or 3.21.C are not met, the unit shall be placed in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

E. If two required MCR/ESGR EVS trains are inoperable for reasons other than TS 3.21.C, the unit shall be placed in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

BASES

BACKGROUND - The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The MCR/ESGR EHS consists of the Main Control Room Bottled Air System (TS 3.19) and the MCR/ESGR EVS.

The MCR/ESGR EVS consists of four full capacity trains that supply filtered air to the MCR/ESGR envelope and a MCR/ESGR envelope boundary that limits the inleakage of unfiltered air. Each MCR/ESGR EVS train consists of a prefilter, 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 providing outside filtered air for pressurization. Two independently powered EVS trains 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 common Main Control Room and the Emergency Switchgear Rooms, 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 (TS 6.4.R).

Upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, and airflow from the MCR Bottled Air System maintains a positive pressure in the MCR/ESGR envelope. Two dampers in series in both the MCR/ESGR envelope supply and exhaust ducts close to isolate the MCR/ESGR envelope. Approximately 60 minutes after the isolation of the MCR/ESGR envelope and actuation of the MCR Bottled Air System, the MCR/ESGR EVS is manually actuated. Each MCR/ESGR EVS train provides filtered air from the Turbine Building to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers. Prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope limits infiltration of unfiltered air from the surrounding areas adjacent to the MCR/ESGR envelope.

A single train of the MCR/ESGR EVS will pressurize the MCR/ESGR envelope to about 0.05 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 9.13 (Ref. 3).

Redundant MCR/ESGR EVS supply trains provide the required pressurization and filtration should one train fail to start or should an excessive pressure drop develop across the operating filter train. Isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The MCR/ESGR EVS 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 for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem total effective dose equivalent (TEDE).

APPLICABLE SAFETY ANALYSES - The MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The MCR/ESGR EHS provides airborne radiological protection for the MCR/ESGR envelope occupants, as demonstrated by the MCR/ESGR envelope occupant dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 14 (Ref. 4).

The MCR/ESGR EHS provides protection from smoke and hazardous chemicals to the MCR/ESGR envelope occupants. An evaluation of hazardous chemical releases demonstrates that the toxicity limits for chemicals are not exceeded in the MCR/ESGR envelope following a hazardous chemical release (Refs. 1 and 5) or that ample time is available for MCR/ESGR envelope occupants to isolate the MCR/ESGR envelope. The evaluation of a smoke challenge demonstrates that it will not result in the inability of the MCR/ESGR envelope occupants to control the reactor either from the MCR or from the remote shutdown panel (Ref. 2).

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 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LIMITING CONDITIONS FOR OPERATION (LCO) - Two independent and redundant MCR/ESGR EVS trains are required to be OPERABLE to ensure that at least one is available to pressurize and to provide filtered air to the MCR/ESGR envelope assuming a single active failure disables one of the two required trains. Due to electrical power considerations, one train must be from the other unit. Total system failure, such as from a loss of both ventilation trains or from an inoperable MCR/ESGR envelope boundary, could result in exceeding a dose of 5 rem TEDE to the MCR/ESGR envelope occupants in the event of a large radioactive release.

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

a. Fan is OPERABLE;

b. HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air flow can be maintained.

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

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 MCR/ESGR envelope. This individual will have a method to rapidly close the opening and to restore the MCR/ESGR envelope boundary to a condition equivalent to the design condition when a need for MCR/ESGR envelope isolation is indicated.

APPLICABILITY - In REACTOR OPERATION conditions above COLD SHUTDOWN, the MCR/ESGR EVS must be OPERABLE to ensure that the MCR/ESGR envelope will remain habitable during and following a DBA.

ACTIONS

3.21.B

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 failure in the OPERABLE MCR/ESGR EVS train could result in loss of MCR/ESGR EVS function. The 7 day Allowed Outage Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

3.21.C

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 TEDE), 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 Allowed Outage 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 Allowed Outage 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 Allowed Outage Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCR/ESGR envelope boundary.

3.21.D

In REACTOR OPERATION conditions above COLD SHUTDOWN, if the inoperable MCR/ESGR EVS train or the MCR/ESGR envelope boundary cannot be restored to OPERABLE status within the Allowed Outage Time, the unit must be placed in a REACTOR OPERATION condition that minimizes accident risk. To achieve this status, the unit must be placed in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 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.

3.21.E

If both MCR/ESGR EVS trains are inoperable in REACTOR OPERATION conditions above COLD SHUTDOWN for reasons other than an inoperable MCR/ESGR envelope boundary (i.e., TS 3.21.C), 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, the unit must be placed in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the following 30 hours.

REFERENCES

1. UFSAR, Section 2.1, Geography, Demography and Potential External Hazards
2. UFSAR, Section 9.10, Fire Protection
3. UFSAR, Section 9.13, Auxiliary Ventilation Systems
4. UFSAR, Chapter 14, Safety Analysis
5. Letters from B. R. Sylvia (VEPCO) to Harold R. Denton (NRC) dated January 19 and June 30, 1981, Response to Item III.D.3.4, Control Room Habitability Requirements of NUREG-0737 for Surry Power Station
6. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors"
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)

3.23 MAIN CONTROL ROOM AND EMERGENCY SWITCHGEAR ROOM AIR CONDITIONING SYSTEM

Applicability

Applies to the Main Control Room (MCR) and Emergency Switchgear Room (ESGR) Air Conditioning System.

Objective

To specify requirements to ensure the proper function of the Main Control Room and Emergency Switchgear Room Air Conditioning System.

Specification

A. The Main Control Room and Emergency Switchgear Room Air Conditioning System shall be OPERABLE as delineated in the following:

1. Chiller Refrigeration Units

a. Three main control room and emergency switchgear room chillers must be OPERABLE whenever either unit is above COLD SHUTDOWN.

b. The three OPERABLE chillers are required to be powered from three of the four emergency buses with one of those chillers capable of being powered from the fourth emergency bus.

c. If one of the OPERABLE chillers becomes inoperable or is not powered as required by Specification 3.23.A.1.b, return an inoperable chiller to OPERABLE status within seven (7) days or bring both units to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

d. If two of the OPERABLE chillers become inoperable or are not powered as required by Specification 3.23.A.1.b, return an inoperable chiller to OPERABLE status within one (1) hour or bring both units to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

2. If two Unit 2 AHUs on different chilled water loops and in different air conditioning zones (2-VS-AC-7 and 2-VS-AC-8 or 2-VS-AC-6 and 2-VS-AC-9) become inoperable, restore operability of the two inoperable AHUs within seven (7) days or bring Unit 2 to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

3. If two Unit 2 AHUs in the same air conditioning zone (2-VS-AC-8 and 2-VS-AC-9 or 2-VS-AC-6 and 2-VS-AC-7) become inoperable, restore operability of at least one Unit 2 AHU in each air conditioning zone (2-VS-AC-8 or 2-VS-AC-9 and 2-VS-AC-6 or 2-VS-AC-7) within one (1) hour or bring Unit 2 to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

4. If more than two Unit 2 AHUs become inoperable, restore operability of at least one Unit 2 AHU in each air conditioning zone (2-VS-AC-8 or 2-VS-AC-9 and 2-VS-AC-6 or 2-VS-AC-7) within one (1) hour or bring Unit 2 to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the following 30 hours.

c. Both Unit 1 AHUs or both Unit 2 AHUs powered from the respective H buses (1-VS-AC-1 and 1-VS-AC-7 or 2-VS-AC-6 and 2-VS-AC-8) must be OPERABLE whenever both units are above COLD SHUTDOWN.

1. If one or two AHUs on each unit powered from an H bus is inoperable, restore operability of the inoperable AHU(s) on one unit within one (1) hour or bring both units to HOT SHUTDOWN within the next six (6) hours and be in COLD SHUTDOWN within the next 30 hours.

Basis

The MCR and ESGR Air Conditioning System (ACS) cools the MCR/ESGR envelope. From an ACS perspective, the envelope consists of four zones: 1) the Unit 1 side of the control room (including the Unit 1 air conditioning equipment and computer rooms), 2) the Unit 2 side of the control room (including the annex area, the Unit 2 air conditioning equipment and computer rooms), 3) the Unit 1 ESGR and relay room (referred to as the Unit 1 ESGR), and 4) the Unit 2 ESGR and relay room (including MER-3), referred to as the Unit 2 ESGR. The design basis of the MCR and ESGR ACS is to maintain the MCR/ESGR envelope temperature within the equipment design limits for 30 days of continuous occupancy after a design basis accident (DBA). The ACS includes five chillers (1-VS-E-4A, 4B, 4C, 4D, and 4E). Chillers 4A, 4B, and 4C are located in MER-3, in the Unit 2 ESGR. Chillers 4D and 4E are located in MER-5, in the Unit 2 Turbine Building. The chillers supply chilled water to eight air handling units (AHUs), arranged in two independent and redundant chilled water loops. Each chilled water loop provides redundant 100% heat removal capacity per unit. Each loop contains four AHUs (one AHU in each unit's air conditioning zones), the necessary power supplies, the associated valves, piping (from the supply header to return header), instrumentation, and controls. Each AHU has 100% capacity for cooling its zone.

The combination of five chillers and two chilled water loops affords considerable flexibility in meeting the cooling requirements. Two chillers are powered from single emergency buses (1-VS-E-4C from 2H, 1-VS-E-4E from 1H). The remaining three chillers can be powered from either of two emergency buses (1-VS-E-4A from 1J or 2J, 1-VS-E-4B from 1J or 2H, and 1-VS-E-4D from 1H or 2J). The AHUs are powered from the four emergency buses in pairs. For example, the Unit 1 MCR and ESGR AHUs 1-VS-AC-1 and 1-VS-AC-7 are powered from the 1H bus; the redundant Unit 1 MCR and ESGR AHUs 1-VS-AC-2 and 1-VS-AC-6 are powered from the 1J bus. Control of the ACS is by manual action.

The chillers are procedurally aligned by power supply to meet TS 3.23.A.1.b, and the AHU pairs are normally aligned to match the power supplies of the OPERABLE chillers. For example, chiller 1-VS-E-4E and AHUs 1-VS-AC-1 and 1-VS-AC-7 are powered from the 1H emergency bus. However, due to the number of emergency diesel generators (EDGs) and the chiller/AHU piping layout, only one chiller and AHU pair can be powered from each emergency bus at a time. Also, if chilled water is needed in both chilled water loops, two chillers must be operated. Only one chiller can be operated on each chilled water loop at a time, and the 4D and 4E chillers cannot be operated simultaneously. The combinations of OPERABLE chillers/AHUs allowed by procedure ensure that sufficient cooling capacity is available during a DBA with a coincident loss of offsite power (LOOP) and single failure of an EDG, a chiller, or an AHU.

4.18 MAIN CONTROL ROOM/EMERGENCY SWITCHGEAR ROOM (MCR/ESGR) EMERGENCY VENTILATION SYSTEM (EVS) TESTING

A. Operate each MCR/ESGR EVS train for ≥ 15 minutes once every 31 days.

B. Perform required Control Room Air Filtration System Testing in accordance with TS 4.20.

C. Perform required MCR/ESGR envelope unfiltered air inleakage testing in accordance with the MCR/ESGR Envelope Habitability Program.

BASES

SURVEILLANCE REQUIREMENTS (SR)

SR 4.18.A

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day frequency is based on the reliability of the equipment and the two train redundancy. Operation of the MCR/ESGR EVS trains shall be initiated manually from the MCR.

SR 4.18.B

This SR verifies that the required Control Room Air Filtration System testing is performed in accordance with Specification 4.20. Specification 4.20 includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in TS 4.20.

SR 4.18.C

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 (TS 6.4.R).

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, Specification 3.21.C must be entered. Specification 3.21.C.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. 1) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 2). These compensatory measures may also be used as mitigating actions as required by Specification 3.21.C.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 3). 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.

REFERENCES

1. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors"

2. NEI 99-03, "Control Room Habitability Assessment," June 2001

3. 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)

8. The procedure for iodine removal efficiency tests shall follow ASTM D3803. The test conditions shall be in accordance with those listed in Specification 4.20.B.4.

9. The pressure drop across the HEPA filter and adsorber banks shall be checked:

   a. Initially;

   b. Once per 18 months; and

   c. After each complete or partial replacement of filters or adsorbers.

B. Acceptance Criteria

1. Fan flow tube test shall show a flow rate through any single filter train of 1000 ± 10 percent cfm.

2. In-place cold DOP tests on HEPA filters shall show greater than or equal to 99.5 percent DOP removal. Leaking sources shall be identified, repaired and retested. Any HEPA filter found defective shall be replaced.

3. In-place halogenated hydrocarbon leakage tests on charcoal adsorber banks shall show greater than or equal to 99 percent halogenated hydrocarbon removal. Leakage sources shall be identified, repaired and retested.

4. Laboratory analysis on new charcoal adsorbent shall show the methyl iodide penetration less than or equal to 14 percent, when tested in accordance with ASTM D3803-1989 (with the exception of face velocity which is to be at 24.4 M/min), with the relative humidity equal to 95 percent, and the temperature equal to 30°C (86°F).

5. The pressure drop across filter cells and adsorbers shall not exceed 5.0 inches W.G. at design flow rate. If this condition cannot be met, new filter cells shall be installed.

Basis

Ventilation system filter components are not subject to rapid deterioration, having lifetimes of many years. The tests outlined above provide assurance of filter reliability and will ensure timely detection of conditions which could cause filter degradation.

A pressure drop across the combined HEPA filters and charcoal adsorbers of less than 5 inches of water will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter.

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

A Main Control Room/Emergency Switchgear Room (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., the MCR/ESGR Emergency Ventilation System (EVS) and the Main Control Room 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 (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident. The program shall include the following elements:

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

4. 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 TS 4.20, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the assessment of the MCR/ESGR envelope boundary.
5. 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 3. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA 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.
6. The provisions of SR 4.0.2 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 3 and 4, respectively.