

**Advanced Passive 1000 (AP1000)  
Generic Technical Specification Traveler (GTST)**

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**Title: Changes Related to LCO 3.7.6, Main Control Room Emergency Habitability System (VES)**

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**I. Technical Specifications Task Force (TSTF) Travelers, Approved Since Revision 2 of STS NUREG-1431, and Used to Develop this GTST**

**TSTF Number and Title:**

TSTF-448-A, Rev 3, Control Room Habitability

**STS NUREGs Affected:**

TSTF-448-A, Rev 3: NUREGs 1430, 1431, 1432, 1433, and 1434

**NRC Approval Date:**

TSTF-448-A, Rev 3: 17-Jan-07

**TSTF Classification:**

TSTF-448-A, Rev 3: Technical Change

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**II. Reference Combined License (RCOL) Standard Departures (Std. Dep.), RCOL COL Items, and RCOL Plant-Specific Technical Specifications (PTS) Changes Used to Develop this GTST**

**RCOL Std. Dep. Number and Title:**

There are no Vogtle departures applicable to Specification 3.7.6.

**RCOL COL Item Number and Title:**

There are no Vogtle COL items applicable to Specification 3.7.6.

**RCOL PTS Change Number and Title:**

- VEGP LAR DOC A038: Numerous TS surveillances are revised by deletion of word “that” from the surveillance  
VEGP LAR DOC A099: TS 3.7.6 Required Action D.1 and SR 3.7.6.2 revision  
VEGP LAR DOC D10: TS 3.7.6 Condition D revision  
VEGP LAR DOC D11: SR 3.7.6.6 revision  
VEGP LAR DOC L05: TS LCO 3.0.8 is eliminated
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**III. Comments on Relations Among TSTFs, RCOL Std. Dep., RCOL COL Items, and RCOL PTS Changes**

This section discusses changes: (1) that were applicable to previous designs, but are not to the current design; (2) that are already incorporated in the GTS; and (3) that are superseded by another change.

TSTF-448-A, Rev. 3 has been applied to AP1000 GTS 3.7.6, Rev 19 by Westinghouse. TSTF-448-A will not be discussed further as a part of this GTST. The Federal Register Notice (FRN) of Availability reference for TSTF-448-A is Volume 72, No. 10, Wednesday, January 17, 2007.

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**IV. Additional Changes Proposed as Part of this GTST (modifications proposed by NRC staff and/or clear editorial changes or deviations identified by preparer of GTST)**

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Minor corrections were made to correct grammatical errors in the bases.

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## V. Applicability

### **Affected Generic Technical Specifications and Bases:**

Section 3.7.6 Main Control Room Emergency Habitability System (VES)

### **Changes to the Generic Technical Specifications and Bases:**

The Action Note is revised to eliminate reference to LCO 3.0.8. (DOC L05)

The Phrase “8 banks” is removed from GTS 3.7.6 Condition D statement because the information is not necessary. (DOC D10)

The GTS 3.7.6 Required Action D.1 phrase “greater than” is replaced by the symbol “>.” This is consistent with TS Writers Guide (Reference 4). (DOC A099)

Editorial changes are made to GTS 3.7.6 Conditions E and F. (DOC A099)

The word “that” is deleted from GTS SRs 3.7.6.2, 3.7.6.3, 3.7.6.5, 3.7.6.6, 3.7.6.7, 3.7.6.8, 3.7.6.9, and 3.7.6.10. This is consistent with TS Writers Guide (Reference 4). (DOC A038)

The GTS SR 3.7.6.2 phrase “greater than” is replaced by the symbol “>.” This is consistent with TS Writers Guide (Reference 4). (DOC A099)

The GTS SR 3.7.6.6 description statement is revised to eliminate the specific ASHRAE Standard. This information is not necessary. (DOC D11)

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## **VI. Traveler Information**

### **Description of TSTF changes:**

Not Applicable

### **Rationale for TSTF changes:**

Not Applicable

### **Description of changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:**

VEGP LAR DOC A038 revises GTS SRs 3.7.6.2, 3.7.6.3, 3.7.6.5, 3.7.6.7, 3.7.6.8, 3.7.6.9, and 3.7.6.10 by deleting “that” from the surveillance description.

In GTS 3.7.6 Required Action D.1 and SR 3.7.6.2, VEGP LAR DOC A099 replaces the term “greater than” with the symbol, “>” in both locations. Additionally, Condition E (two locations) and Condition F (two locations) includes the phrase “Conditions A, B, C, or D.” The word “Conditions” is grammatically corrected to “Condition” in all of these locations.

VEGP LAR DOC D10 revises GTS 3.7.6 Condition D statement to “One bank of VES air tanks inoperable.”

VEGP LAR DOC D11 notes that GTS SR 3.7.6.6 states “Verify that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62.” GTS SR 3.7.6.6 is changed to STS SR 3.7.6.6, “Verify the air quality of the air storage tanks is within limits.”

VEGP LAR DOC L05 removes reference to LCO 3.0.8, which is eliminated.

A more detailed description of each DOC can be found in Reference 2, VEGP TSU LAR Enclosure 1, and the NRC staff safety evaluation can be found in Reference 3, VEGP LAR SER. The VEGP TSU LAR was modified in response to NRC staff RAIs in Reference 5 and the Southern Nuclear Operating Company RAI Response in Reference 6.

### **Rationale for changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:**

Editorial changes per VEGP LAR DOC A099 and DOC A038 are consistent with the guidance provided in the TS Writer's Guide (Reference 4).

VEGP LAR DOC D10 removes the term that describes how many tanks constitute a single bank from GTS 3.7.6 because this type of information is not necessary to be included in the TS in order to provide adequate protection of public health and safety. STS 3.7.6 Condition D retains the requirement that a single bank of tanks is inoperable. Also, the descriptive detail is adequately controlled in the TS Bases.

VEGP LAR DOC D11 removes the reference to the requirements of Appendix C, Table C-1 of ASHRAE Standard 62 in GTS SR 3.7.6.6 because this type of information is not necessary to be included in the TS in order to provide adequate protection of public health and safety. STS

SR 3.7.6.6 retains the requirement that the air quality of the tanks is within the required limits. Also, the procedural reference details are adequately controlled in the TS Bases.

VEGP LAR DOC L05 notes that current considerations of LCO 3.0.8 are adequately addressed within individual LCO referencing LCO 3.0.8 or by TS 5.4.1.b to Monitor Safety System Shutdown Monitoring Trees parameters. AP1000 GTS LCO 3.0.8 is eliminated.

**Description of additional changes proposed by NRC staff/preparer of GTST:**

Dashes were added to time descriptors such as “the 72-hour completion time is acceptable...” in the Actions section of the bases.

**Rationale for additional changes proposed by NRC staff/preparer of GTST:**

These changes are to correct grammatical errors in the bases.

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## VII. GTST Safety Evaluation

### Technical Analysis:

VEGP LAR DOC D10 revises GTS 3.7.6 Condition D statement to “One bank of VES air tanks inoperable.” The removal of the term that describes how many tanks constitute a single bank (i.e., 8 tanks) from the GTS is acceptable because this type of information is not necessary to be included in the TS in order to provide adequate protection of public health and safety. The STS 3.7.6 Condition D retains the requirement that a single bank of tanks is inoperable. Also, this change is acceptable because this descriptive detail is adequately controlled in the STS Bases consistent with the Final Safety Analysis Report (FSAR). The STS 3.7.6 Required Action D.1, D.2, and D.3 Bases state that one bank of VES air tanks is equivalent to “8 tanks out of 32 total.”

The GTS SR 3.7.6.6 action to “Verify that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62.” is changed by VEGP LAR DOC D11 to “Verify the air quality of the air storage tanks is within limits.” The removal of the required limit, Appendix C, Table C-1 of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62, from the GTS is acceptable because this type of information is not necessary to be included in the GTS in order to provide adequate protection of public health and safety. STS SR 3.7.6.6 retains the requirement that the air quality of the tanks is within the required limits. Also, this change is acceptable because these types of procedural details are adequately controlled in the STS Bases. The STS SR 3.7.6.6 Bases state that the verification of the air quality of the air storage tanks must meet the requirements of Appendix C, Table C-1 of ASHRAE Standard 62.

VEGP LAR DOC L05 eliminates GTS LCO 3.0.8. In conjunction with the change to eliminate LCO 3.0.8, all Notes and references are no longer necessary and are administratively eliminated. The elimination of GTS LCO 3.0.8 is discussed in detail in GTS O01-LCO 3.0.

The remaining changes are editorial, clarifying, grammatical, or otherwise considered administrative. These changes do not affect the technical content, but improve the readability, implementation, and understanding of the requirements, and are therefore acceptable.

### References to Previous NRC Safety Evaluation Reports (SERs):

VEGP LAR SER (Reference 3)

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## **VIII. Review Information**

### **Evaluator Comments:**

None

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### **Review Information:**

Availability for public review and comment on Revision 0 of this traveler approved by NRC staff on Monday, May 19, 2014.

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### **NRC Final Approval Date:**

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### **NRC Contact:**

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**IX. Evaluator Comments for Consideration in Finalizing Technical Specifications and Bases**

The database does not yet recognize non-breaking hyphens or spaces. For Rev. 0 of this GTST, it was necessary to manually insert (1) non-breaking hyphens as necessary to interlock designations such as P-10 to avoid breaking across the end of a line; and (2) non-breaking spaces as necessary to (a) keep symbols such as “≥” with the subsequent value; and (b) avoid stranding a number value on a subsequent line, such as MODE 5.

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**X. References Used in GTST**

1. AP1000 DCD, Revision 19, Section 16, "Technical Specifications," June 2011 (ML11171A500).
2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Technical Specifications Upgrade License Amendment Request, February 24, 2011 (ML12065A057).
3. NRC Safety Evaluation (SE) for Amendment No. 13 to Combined License (COL) No. NPF-91 for Vogtle Electric Generating Plant (VEGP) Unit 3, and Amendment No. 13 to COL No. NPF-92 for VEGP Unit 4, September 9, 2013, ADAMS Package Accession No. ML13238A337, which contains:  

ML13238A355	Cover Letter - Issuance of License Amendment No. 13 for Vogtle Units 3 and 4 (LAR 12-002).
ML13238A359	Enclosure 1 - Amendment No. 13 to COL No. NPF-91
ML13239A256	Enclosure 2 - Amendment No. 13 to COL No. NPF-92
ML13239A284	Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13)
ML13239A287	Enclosure 4 - Safety Evaluation (SE), and Attachment 1 - Acronyms
ML13239A288	SE Attachment 2 - Table A - Administrative Changes
ML13239A319	SE Attachment 3 - Table M - More Restrictive Changes
ML13239A333	SE Attachment 4 - Table R - Relocated Specifications
ML13239A331	SE Attachment 5 - Table D - Detail Removed Changes
ML13239A316	SE Attachment 6 - Table L - Less Restrictive Changes

The following documents were subsequently issued to correct an administrative error in Enclosure 3:

- |             |                                                                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ML13277A616 | Letter - Correction To The Attachment (Replacement Pages) - Vogtle Electric Generating Plant Units 3 and 4-Issuance of Amendment Re: Technical Specifications Upgrade (LAR 12-002) (TAC No. RP9402) |
| ML13277A637 | Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13) (corrected)                                                                                                          |
4. TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications," June 2005.
  5. RAI Letter No. 01 Related to License Amendment Request (LAR) 12-002 for the Vogtle Electric Generating Plant Units 3 and 4 Combined Licenses, September 7, 2012 (ML12251A355).
  6. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Response to Request for Additional Information Letter No. 01 Related to License Amendment Request LAR-12-002, ND-12-2015, October 04, 2012 (ML12286A363 and ML12286A360)
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## XI. **MARKUP of the Applicable GTS Section for Preparation of the STS NUREG**

The entire section of the Specifications and the Bases associated with this GTST is presented next.

Changes to the Specifications and Bases are denoted as follows: Deleted portions are marked in strikethrough red font, and inserted portions in bold blue font.

## 3.7 PLANT SYSTEMS

## 3.7.6 Main Control Room Emergency Habitability System (VES)

LCO 3.7.6      The VES shall be OPERABLE.

## -----NOTE-----

The main control room envelope (MCRE) boundary may be opened intermittently under administrative control.

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

## ACTIONS

## NOTE

~~LCO 3.0.8 is not applicable.~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One valve or damper inoperable.	A.1      Restore valve or damper to OPERABLE status.	7 days
B. MCRC air temperature not within limit.	B.1      Restore MCRC air temperature to within limit.	24 hours
C. VES inoperable due to inoperable MCRC boundary in MODE 1, 2, 3, or 4.	C.1      Initiate action to implement mitigating actions. <u>AND</u>	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	<p>C.2 Verify mitigating actions ensure MCRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.</p> <p><u>AND</u></p> <p>C.3 Restore MCRE boundary to OPERABLE status.</p>	<p>24 hours</p> <p>90 days</p>
D. One bank of VES air tanks ( <del>8 tanks</del> ) inoperable.	<p>D.1 Verify that the OPERABLE tanks contain &gt; <del>greater than</del> 245,680 scf of compressed air.</p> <p><u>AND</u></p> <p>D.2 Verify VBS MCRE ancillary fans and supporting equipment are available.</p> <p><u>AND</u></p> <p>D.3 Restore VES to OPERABLE status.</p>	<p>2 hours</p> <p>AND</p> <p>Once per 12 hours thereafter</p> <p>24 hours</p> <p>7 days</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Conditions A, B, C, or D not met in MODE 1, 2, 3, or 4.  <u>OR</u>  VES inoperable for reasons other than Conditions A, B, C, or D in MODE 1, 2, 3, or 4.	E.1 Be in MODE 3.  <u>AND</u>  E.2 Be in MODE 5.	6 hours  36 hours
F. Required Action and associated Completion Time of Conditions A, B, C, or D not met during movement of irradiated fuel.  <u>OR</u>  VES inoperable for reasons other than Conditions A, B, C, or D during movement of irradiated fuel.  <u>OR</u>  VES inoperable due to inoperable MCRC boundary during movement of irradiated fuel.	F.1 Suspend movement of irradiated fuel assemblies.	Immediately

**SURVEILLANCE REQUIREMENTS**

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify MCREE air temperature is $\leq$ 75°F.	24 hours
SR 3.7.6.2	Verify <del>that</del> the compressed air storage tanks contain <del>&gt; greater than</del> 327,574 scf of compressed air.	24 hours
SR 3.7.6.3	Verify <del>that</del> each VES air delivery isolation valve is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.4	Operate VES for $\geq$ 15 minutes.	31 days
SR 3.7.6.5	Verify <del>that</del> each VES air header manual isolation valve is in an open position.	31 days
SR 3.7.6.6	Verify <del>that</del> the air quality of the air storage tanks <del>is within limits</del> <del>meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62.</del>	92 days
SR 3.7.6.7	Verify <del>that</del> all MCREE isolation valves are OPERABLE and will close upon receipt of an actual or simulated actuation signal.	24 months
SR 3.7.6.8	Verify <del>that</del> each VES pressure relief isolation valve within the MCREE pressure boundary is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.9	Verify <del>that</del> each VES pressure relief damper is OPERABLE.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.6.10	Verify <del>that</del> the self-contained pressure regulating valve in each VES air delivery flow path is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.11	Perform required MCRE unfiltered air inleakage testing in accordance with the Main Control Room Envelope Habitability Program.	In accordance with the Main Control Room Envelope Habitability Program
SR 3.7.6.12	Perform required VES Passive Filtration system filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

## B 3.7 PLANT SYSTEMS

### B 3.7.6 Main Control Room Emergency Habitability System (VES)

#### BASES

##### BACKGROUND

The Main Control Room Emergency Habitability System (VES) provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The system is designed to operate following a Design Basis Accident (DBA) which requires protection from the release of radioactivity. In these events, the Nuclear Island Non Radioactive Ventilation System (VBS) would continue to function if AC power is available. If AC power is lost or a High-2 Main Control Room Envelope (MCRE) radiation signal is received, the VES is actuated. The major functions of the VES are: 1) to provide forced ventilation to deliver an adequate supply of breathable air (Ref. 4) for the MCRE occupants; 2) to provide forced ventilation to maintain the MCRE at a 1/8 inch water gauge positive pressure with respect to the surrounding areas; 3) provide passive filtration to filter contaminated air in the MCRE; and 4) to limit the temperature increase of the MCRE equipment and facilities that must remain functional during an accident, via the heat absorption of passive heat sinks.

The VES consists of compressed air storage tanks, two air delivery flow paths, an eductor, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), associated valves or dampers, piping, and instrumentation. The tanks contain enough breathable air to supply the required air flow to the MCRE for at least 72 hours. The VES system is designed to maintain CO<sub>2</sub> concentration less than 0.5% for up to 11 MCRE occupants.

The MCRE is the area within the confines of the MCRE boundary that contains the spaces that control room operators inhabit to control the unit during normal and accident conditions. This area encompasses the main control area, operations work area, operational break room, shift supervisor's office, kitchen, and toilet facilities (Ref. 1). The MCRE is protected during normal operation, natural events, and accident conditions. The MCRE boundary is the combination of walls, floor, roof, electrical and mechanical penetrations, and access doors. The OPERABILITY of the MCRE boundary must be maintained to ensure that the inleakage of unfiltered air into the MCRE will not exceed the

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**BASES****BACKGROUND (continued)**

inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to MCRE occupants. The MCRE and its boundary are defined in the Main Control Room Envelope Habitability Program.

Sufficient thermal mass exists in the surrounding concrete structure (including walls, ceiling and floors) to absorb the heat generated inside the MCRE, which is initially at or below 75°F. Heat sources inside the MCRE include operator workstations, emergency lighting and occupants. Sufficient insulation is provided surrounding the MCRE pressure boundary to preserve the minimum required thermal capacity of the heat sink. The insulation also limits the heat gain from the adjoining areas following the loss of VBS cooling.

In the unlikely event that power to the VBS is unavailable for more than 72 hours, MCRE habitability is maintained by operating one of the two MCRE ancillary fans to supply outside air to the MCRE.

The compressed air storage tanks are initially filled to contain greater than 327,574 scf of compressed air. The compressed air storage tanks, the tank pressure, and the room temperature are monitored to confirm that the required volume of breathable air is stored. During operation of the VES, a self contained pressure regulating valve maintains a constant downstream pressure regardless of the upstream pressure. An orifice downstream of the regulating valve is used to control the air flow rate into the MCRE. The MCRE is maintained at a 1/8 inch water gauge positive pressure to minimize the infiltration of airborne contaminants from the surrounding areas. The VES operation in maintaining the MCRE habitable is discussed in Reference 1.

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**APPLICABLE  
SAFETY  
ANALYSES**

The compressed air storage tanks are sized such that the set of tanks has a combined capacity that provides at least 72 hours of VES operation.

Operation of the VES is automatically initiated by the following safety related signal: high-2 particulate or iodine radioactivity.

In the event of a loss of all AC power, the VES functions to provide ventilation, pressurization, and cooling of the MCRE pressure boundary.

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**BASES****APPLICABLE SAFETY ANALYSES (continued)**

In the event of a high level of gaseous radioactivity outside of the MCRE, the VBS continues to operate to provide pressurization and filtration functions. The MCRE air supply downstream of the filtration units is monitored by a safety related radiation detector. Upon high-2 particulate or iodine radioactivity setpoint, a safety related signal is generated to isolate the MCRE and to initiate air flow from the VES storage tanks. Isolation of the MCRE consists of closing safety related valves in the lines that penetrate the MCRE pressure boundary. Valves in the VBS supply and exhaust ducts, and the Sanitary Drainage System (SDS) vent lines are automatically isolated. VES air flow is initiated by a safety related signal which opens the isolation valves in the VES supply lines.

The VES provides protection from smoke and hazardous chemicals to the MCRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the MCRE following a hazardous chemical release (Ref. 1). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the MCRE occupants to control the reactor either from the control room or from the remote shutdown room (Ref. 2).

The VES functions to mitigate a DBA or transient that either assumes the failure of or challenges the integrity of the fission product barrier.

The VES satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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**LCO**

The VES limits the MCRE temperature rise and maintains the MCRE at a positive pressure relative to the surrounding environment.

Two air delivery flow paths are required to be OPERABLE to ensure that at least one is available, assuming a single failure.

The VES is considered OPERABLE when the individual components necessary to deliver a supply of breathable air to the MCRE are OPERABLE. This includes components listed in SR 3.7.6.3 through 3.7.6.10. In addition, the MCRE pressure boundary must be maintained, including the integrity of the walls, floors, ceilings, electrical and mechanical penetrations, and access doors. The MCRE pressure boundary includes the Potable Water System (PWS) and SDS running

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**BASES****LCO (continued)**

(piping drain) traps, which retain a fluid level sufficient to maintain a seal preventing gas flow through the piping. The MCRE pressure boundary also includes the Waste Water System (WWS) drain line, which is isolated by a normally closed isolation valve.

In order for the VES to be considered OPERABLE, the MCRE boundary must be maintained such that the MCRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analysis for DBAs, and that MCRE occupants are protected from hazardous chemicals and smoke.

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

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**APPLICABILITY**

In MODES 1, 2, 3, and 4 and during movement of irradiated fuel assemblies, the VES must be OPERABLE to ensure that the MCRE will remain habitable during and following a DBA.

The VES is not required to be OPERABLE in MODES 5 and 6 when irradiated fuel is not being moved because accidents resulting in fission product release are not postulated.

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**BASES**

**ACTIONS** ~~LCO 3.0.8 is applicable while in MODE 5 or 6. Since irradiated fuel assembly movement can occur in MODE 5 or 6, the ACTIONS have been modified by a Note stating that LCO 3.0.8 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, the fuel movement is independent of shutdown reactor operations. Entering LCO 3.0.8 while in MODE 5 or 6 would require the optimization of plant safety, unnecessarily.~~

**A.1**

When a VES valve, a VES damper, or a main control room boundary isolation valve is inoperable, action is required to restore the component to OPERABLE status. A Completion Time of 7 days is permitted to restore the valve or damper to OPERABLE status before action must be taken to reduce power. The Completion Time of 7 days is based on engineering judgment, considering the low probability of an accident that would result in a significant radiation release from the fuel, the low probability of not containing the radiation, and that the remaining components can provide the required capability.

**B.1**

When the MCRC air temperature is outside the acceptable range during VBS operation, action is required to restore it to an acceptable range. A Completion Time of 24 hours is permitted based upon the availability of temperature indication in the MCRC. It is judged to be a sufficient amount of time allotted to correct the deficiency in the nonsafety ventilation system before shutting down.

**C.1, C.2, and C.3**

If the unfiltered inleakage of potentially contaminated air past the MCRC boundary and into the MCRC can result in MCRC 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 MCRC occupants from hazardous chemicals or smoke, the MCRC boundary is inoperable. Actions must be taken to restore an OPERABLE MCRC boundary within 90 days.

During the period that the MCRC boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on MCRC occupants from the potential hazards of a radiological or

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**BASES****ACTIONS (continued)**

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 MCRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that MCRE occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable MCRE boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24-hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of MCRE occupants within analyzed limits while limiting the probability that MCRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90-day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCRE boundary.

**D.1, D.2, and D.3**

If one bank of VES air tanks (8 tanks out of 32 total) is inoperable, then the VES is able to supply air to the MCRE for 54 hours (75% of the required 72 hours). If the VES is actuated, the operator must take actions to maintain habitability of the MCRE once the air in the tanks has been exhausted. The VBS supplemental filtration mode or MCRE ancillary fans are both capable of maintaining the habitability of the MCRE after 54 hours.

With one bank of VES air tanks inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the stored amount of compressed air in the remaining OPERABLE VES air tanks must be verified within 2 hours and every 12 hours thereafter to be **> at least** 245,680 scf. The 245,680 scf value is 75 percent of the minimum amount of stored compressed air that must be available in the compressed air storage tanks. The standard volume is determined using the compressed air storage tank room temperature (VAS-TE-080A/B), compressed air storage tanks pressure (VES-PT-001A/B), and Figure B 3.7.6-2, Compressed Air Storage Tanks Minimum Volume - One Bank of

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**BASES****ACTIONS (continued)**

VES Air Tanks (8 Tanks) Inoperable. Values above the 245,680 scf line in the figure meet the Required Action criteria. Verification that the minimum volume of compressed air is contained in the OPERABLE compressed air storage tanks ensures a 54 hour air supply will be available if needed. Additionally, within 24 hours, the VBS ancillary fans are verified to be OPERABLE so that, if needed, can be put into use once the OPERABLE compressed air storage tanks have been exhausted. The Completion Times associated with these actions and the 7-day Completion Time to restore VES to OPERABLE are based on engineering judgment, considering the low probability of an accident that would result in a significant radiation release from the reactor core, the low probability of radioactivity release, and that the remaining components and compensatory systems can provide the required capability. The 54 hours of air in the remaining OPERABLE compressed air storage tanks, along with compensatory operator actions, are adequate to protect the main control room envelope habitability. Dose calculations verify that the MCRE dose limits will remain within the requirements of GDC 19 with the compensatory actions taken at 54 hours.

**E.1 and E.2**

In MODE 1, 2, 3, or 4 if the Required Actions and Completion Times of Conditions A, B, C, or D are not met, or the VES is inoperable for reasons other than Conditions A, B, C, or D, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

**F.1**

During movement of irradiated fuel assemblies, if the Required Actions and Completion Times of Conditions A, B, C, or D are not met, or the VES is inoperable for reasons other than Conditions A, B, C, or D, or the VES is inoperable due to an inoperable MCRE boundary, action must be taken immediately to suspend the movement of fuel. This does not preclude the movement of fuel to a safe position.

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**BASES****SURVEILLANCE  
REQUIREMENTS****SR 3.7.6.1**

The MCRe air temperature is checked at a frequency of 24 hours to verify that the VBS is performing as required to maintain the initial condition temperature assumed in the safety analysis, and to ensure that the MCRe temperature will not exceed the required conditions after loss of VBS cooling. The surveillance limit of 75°F is the initial heat sink temperature assumed in the VES thermal analysis. The 24-hour Frequency is acceptable based on the availability of temperature indication in the MCRe.

**SR 3.7.6.2**

Verification every 24 hours that compressed air storage tanks contain > ~~greater than~~ 327,574 scf of breathable air.

The standard volume is determined using the compressed air storage tank room temperature (VAS-TE-080A/B), compressed air storage tanks pressure (VES PT 001A/B), and Figure B 3.7.6-1, Compressed Air Storage Tanks Minimum Volume. Values above the 327,574 scf line in the figure meet the surveillance criteria. Verification that the minimum volume of compressed air is contained in the compressed air storage tanks ensures that there will be an adequate supply of breathable air to maintain MCRe habitability for a period of 72 hours. The Frequency of 24 hours is based on the availability of pressure indication in the MCRe.

**SR 3.7.6.3**

VES air delivery isolation valves are required to be verified as OPERABLE. The Frequency required is in accordance with the Inservice Testing Program.

**SR 3.7.6.4**

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 VES once every month provides an adequate check of the system. The 31-day Frequency is based on the reliability of the equipment and the availability of system redundancy.

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**BASES****SURVEILLANCE REQUIREMENTS (continued)****SR 3.7.6.5**

VES air header isolation valves are required to be verified open at 31-day intervals. This SR is designed to ensure that the pathways for supplying breathable air to the MCRE are available should loss of VBS occur. These valves should be closed only during required testing or maintenance of downstream components, or to preclude complete depressurization of the system should the VES isolation valves in the air delivery line open inadvertently or begin to leak.

**SR 3.7.6.6**

Verification that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62 ([Ref. 4](#)) is required every 92 days. If air has not been added to the air storage tanks since the previous verification, verification may be accomplished by confirmation of the acceptability of the previous surveillance results along with examination of the documented record of air makeup. The purpose of ASHRAE Standard 62 states: "This standard specifies minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects." Verification of the initial air quality (in combination with the other surveillances) ensures that breathable air is available for 11 MCRE occupants for at least 72 hours.

**SR 3.7.6.7**

Verification that the VBS isolation valves and the Sanitary Drainage System (SDS) isolation valves are OPERABLE and will actuate upon demand is required every 24 months to ensure that the MCRE can be isolated upon loss of VBS operation.

**SR 3.7.6.8**

Verification that each VES pressure relief isolation valve within the MCRE pressure boundary is OPERABLE is required in accordance with the Inservice Testing Program. The SR is used in combination with SR 3.7.6.9 to ensure that adequate vent area is available to mitigate MCRE overpressurization.

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**BASES****SURVEILLANCE REQUIREMENTS (continued)****SR 3.7.6.9**

Verification that the VES pressure relief damper is OPERABLE is required at 24-month intervals. The SR is used in combination with SR 3.7.6.8 to ensure that adequate vent area is available to mitigate MCRE overpressurization.

**SR 3.7.6.10**

Verification of the OPERABILITY of the self contained pressure regulating valve in each VES air delivery flow path is required in accordance with the Inservice Testing Program. This is done to ensure that a sufficient supply of air is provided as required, and that uncontrolled air flow into the MCRE will not occur.

**SR 3.7.6.11**

This SR verifies the OPERABILITY of the MCRE boundary by testing for unfiltered air inleakage past the MCRE boundary and into the MCRE. The details of the testing are specified in the Main Control Room Envelope Habitability Program.

The MCRE is considered habitable when the radiological dose to MCRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the MCRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the MCRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition C must be entered. Required Action C.3 allows time to restore the MCRE boundary to OPERABLE status provided mitigating actions can ensure that the MCRE 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. 3) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 5). These compensatory measures may also be used as mitigating actions as required by Required Action C.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 6). Options for restoring the MCRE boundary to OPERABLE status include changing the licensing basis DBA

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**BASES****SURVEILLANCE REQUIREMENTS (continued)**

consequence analysis, repairing the MCRAE 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 MCRAE boundary has been restored to OPERABLE status.

**SR 3.7.6.12**

This SR verifies that the required VES testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VES filter tests are in accordance with Regulatory Guide 1.52 (Ref. 7). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in the VFTP.

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**REFERENCES**

1. Section 6.4, "Main Control Room Habitability Systems."
  2. Section 9.5.1, "Fire Protection System."
  3. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors."
  4. ASHRAE Standard 62-1989, "Ventilation for Acceptable Indoor Air Quality."
  5. NEI 99-03, "Control Room Habitability Assessment," June 2001.
  6. 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).
  7. Regulatory Guide 1.52, "Design, Inspection, and Testing Criteria for Airfiltration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," Revision 3.
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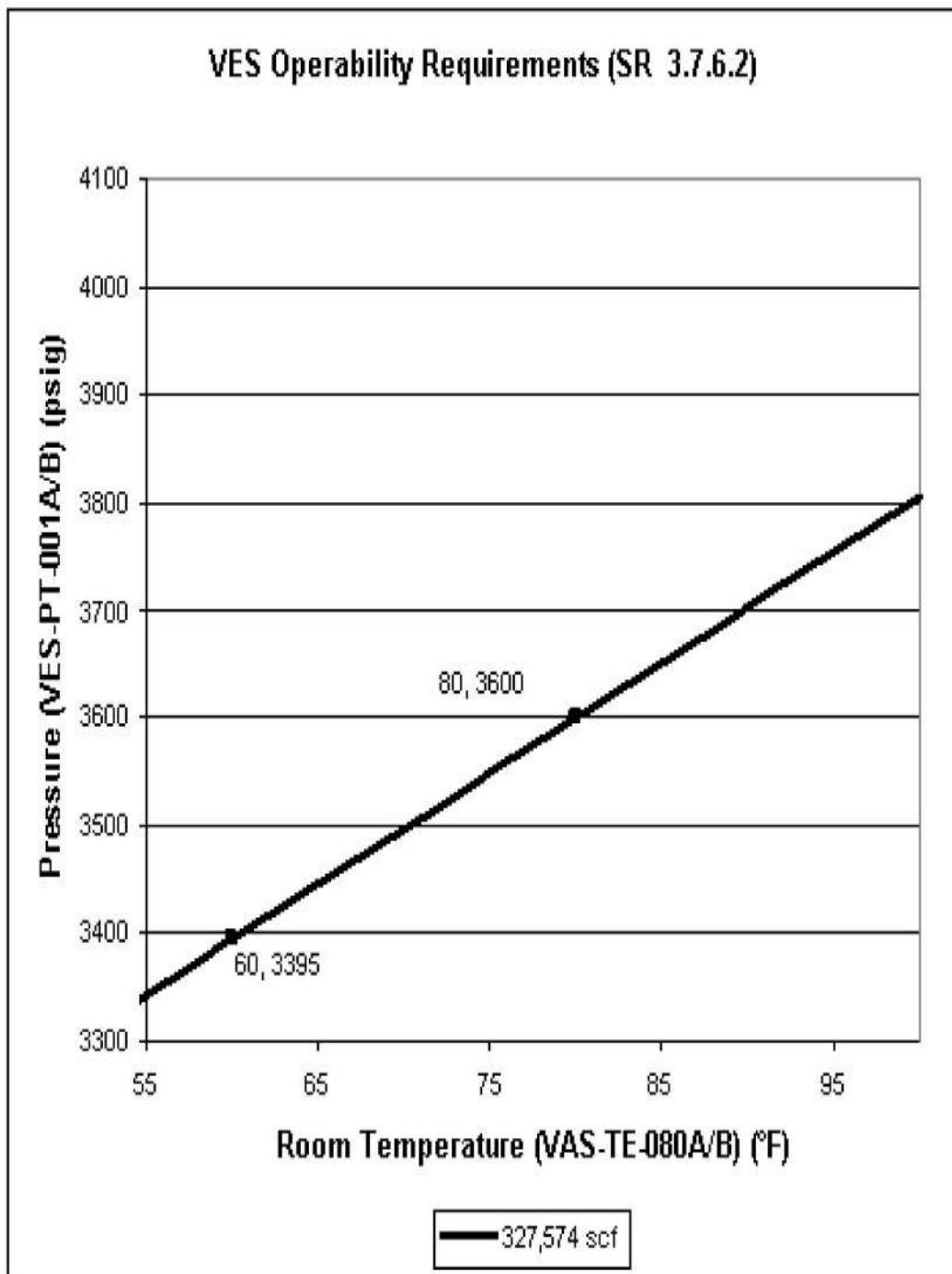


Figure B 3.7.6-1  
Compressed Air Storage Tanks Minimum Volume

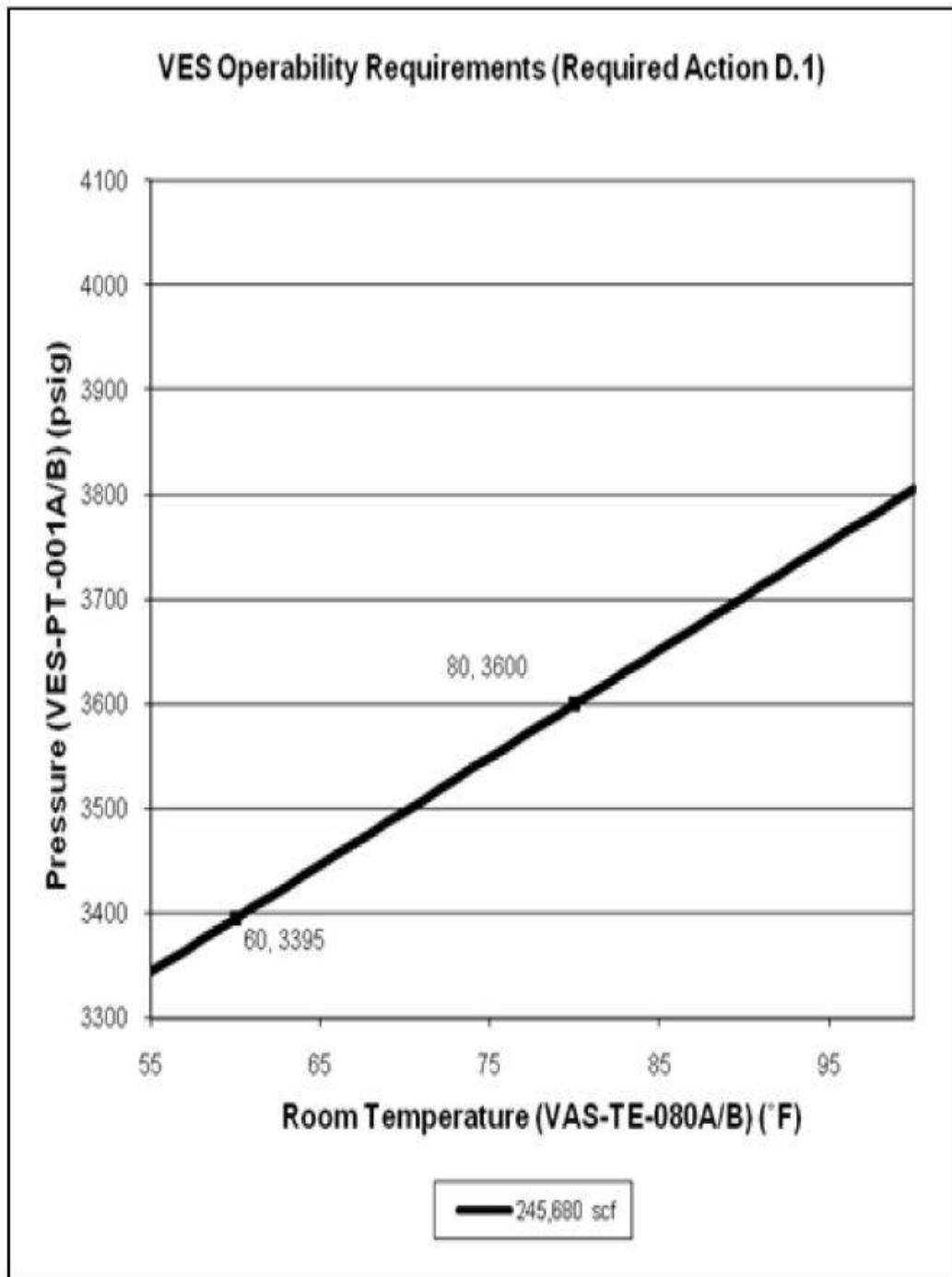


Figure B 3.7.6-2  
Compressed Air Storage Tanks Minimum Volume - One Bank of VES Air Tanks (8 Tanks)  
Inoperable

**XII. Applicable STS Subsection After Incorporation of this GTST's Modifications**

The entire subsection of the Specifications and the Bases associated with this GTST, following incorporation of the modifications, is presented next.

## 3.7 PLANT SYSTEMS

## 3.7.6 Main Control Room Emergency Habitability System (VES)

LCO 3.7.6      The VES shall be OPERABLE.

NOTE

The main control room envelope (MCRE) boundary may be opened intermittently under administrative control.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One valve or damper inoperable.	A.1 Restore valve or damper to OPERABLE status.	7 days
B. MCRC air temperature not within limit.	B.1 Restore MCRC air temperature to within limit.	24 hours
C. VES inoperable due to inoperable MCRC boundary in MODE 1, 2, 3, or 4.	C.1 Initiate action to implement mitigating actions. <u>AND</u> C.2 Verify mitigating actions ensure MCRC occupant exposures to radiological, chemical, and smoke hazards will not exceed limits. <u>AND</u>	Immediately 24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.3 Restore MCRE boundary to OPERABLE status.	90 days
D. One bank of VES air tanks inoperable.	D.1 Verify that the OPERABLE tanks contain > 245,680 scf of compressed air.  <u>AND</u>  D.2 Verify VBS MCRE ancillary fans and supporting equipment are available.  <u>AND</u>  D.3 Restore VES to OPERABLE status.	2 hours  AND  Once per 12 hours thereafter  24 hours  7 days
E. Required Action and associated Completion Time of Condition A, B, C, or D not met in MODE 1, 2, 3, or 4.  <u>OR</u>  VES inoperable for reasons other than Condition A, B, C, or D in MODE 1, 2, 3, or 4.	E.1 Be in MODE 3.  <u>AND</u>  E.2 Be in MODE 5.	6 hours  36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, or D not met during movement of irradiated fuel.  <u>OR</u> VES inoperable for reasons other than Condition A, B, C, or D during movement of irradiated fuel.  <u>OR</u> VES inoperable due to inoperable MCRC boundary during movement of irradiated fuel.	F.1 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify MCRC air temperature is $\leq 75^{\circ}\text{F}$ .	24 hours
SR 3.7.6.2	Verify the compressed air storage tanks contain $> 327,574 \text{ scf}$ of compressed air.	24 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.7.6.3 Verify each VES air delivery isolation valve is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.4 Operate VES for $\geq$ 15 minutes.	31 days
SR 3.7.6.5 Verify each VES air header manual isolation valve is in an open position.	31 days
SR 3.7.6.6 Verify the air quality of the air storage tanks is within limits.	92 days
SR 3.7.6.7 Verify all MCRC isolation valves are OPERABLE and will close upon receipt of an actual or simulated actuation signal.	24 months
SR 3.7.6.8 Verify each VES pressure relief isolation valve within the MCRC pressure boundary is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.6.9 Verify each VES pressure relief damper is OPERABLE.	24 months
SR 3.7.6.10 Verify the self-contained pressure regulating valve in each VES air delivery flow path is OPERABLE.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.7.6.11	Perform required MCRC unfiltered air inleakage testing in accordance with the Main Control Room Envelope Habitability Program.	In accordance with the Main Control Room Envelope Habitability Program
SR 3.7.6.12	Perform required VES Passive Filtration system filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP

## B 3.7 PLANT SYSTEMS

### B 3.7.6 Main Control Room Emergency Habitability System (VES)

#### BASES

##### BACKGROUND

The Main Control Room Emergency Habitability System (VES) provides a protected environment from which operators can control the plant following an uncontrolled release of radioactivity, hazardous chemicals, or smoke. The system is designed to operate following a Design Basis Accident (DBA) which requires protection from the release of radioactivity. In these events, the Nuclear Island Non Radioactive Ventilation System (VBS) would continue to function if AC power is available. If AC power is lost or a High-2 Main Control Room Envelope (MCRE) radiation signal is received, the VES is actuated. The major functions of the VES are: 1) to provide forced ventilation to deliver an adequate supply of breathable air (Ref. 4) for the MCRE occupants; 2) to provide forced ventilation to maintain the MCRE at a 1/8 inch water gauge positive pressure with respect to the surrounding areas; 3) provide passive filtration to filter contaminated air in the MCRE; and 4) to limit the temperature increase of the MCRE equipment and facilities that must remain functional during an accident, via the heat absorption of passive heat sinks.

The VES consists of compressed air storage tanks, two air delivery flow paths, an eductor, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), associated valves or dampers, piping, and instrumentation. The tanks contain enough breathable air to supply the required air flow to the MCRE for at least 72 hours. The VES system is designed to maintain CO<sub>2</sub> concentration less than 0.5% for up to 11 MCRE occupants.

The MCRE is the area within the confines of the MCRE boundary that contains the spaces that control room operators inhabit to control the unit during normal and accident conditions. This area encompasses the main control area, operations work area, operational break room, shift supervisor's office, kitchen, and toilet facilities (Ref. 1). The MCRE is protected during normal operation, natural events, and accident conditions. The MCRE boundary is the combination of walls, floor, roof, electrical and mechanical penetrations, and access doors. The OPERABILITY of the MCRE boundary must be maintained to ensure that the inleakage of unfiltered air into the MCRE will not exceed the

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**BASES****BACKGROUND (continued)**

inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to MCRE occupants. The MCRE and its boundary are defined in the Main Control Room Envelope Habitability Program.

Sufficient thermal mass exists in the surrounding concrete structure (including walls, ceiling and floors) to absorb the heat generated inside the MCRE, which is initially at or below 75°F. Heat sources inside the MCRE include operator workstations, emergency lighting and occupants. Sufficient insulation is provided surrounding the MCRE pressure boundary to preserve the minimum required thermal capacity of the heat sink. The insulation also limits the heat gain from the adjoining areas following the loss of VBS cooling.

In the unlikely event that power to the VBS is unavailable for more than 72 hours, MCRE habitability is maintained by operating one of the two MCRE ancillary fans to supply outside air to the MCRE.

The compressed air storage tanks are initially filled to contain greater than 327,574 scf of compressed air. The compressed air storage tanks, the tank pressure, and the room temperature are monitored to confirm that the required volume of breathable air is stored. During operation of the VES, a self contained pressure regulating valve maintains a constant downstream pressure regardless of the upstream pressure. An orifice downstream of the regulating valve is used to control the air flow rate into the MCRE. The MCRE is maintained at a 1/8 inch water gauge positive pressure to minimize the infiltration of airborne contaminants from the surrounding areas. The VES operation in maintaining the MCRE habitable is discussed in Reference 1.

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**APPLICABLE  
SAFETY  
ANALYSES**

The compressed air storage tanks are sized such that the set of tanks has a combined capacity that provides at least 72 hours of VES operation.

Operation of the VES is automatically initiated by the following safety related signal: high-2 particulate or iodine radioactivity.

In the event of a loss of all AC power, the VES functions to provide ventilation, pressurization, and cooling of the MCRE pressure boundary.

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**BASES****APPLICABLE SAFETY ANALYSES (continued)**

In the event of a high level of gaseous radioactivity outside of the MCRE, the VBS continues to operate to provide pressurization and filtration functions. The MCRE air supply downstream of the filtration units is monitored by a safety related radiation detector. Upon high-2 particulate or iodine radioactivity setpoint, a safety related signal is generated to isolate the MCRE and to initiate air flow from the VES storage tanks. Isolation of the MCRE consists of closing safety related valves in the lines that penetrate the MCRE pressure boundary. Valves in the VBS supply and exhaust ducts, and the Sanitary Drainage System (SDS) vent lines are automatically isolated. VES air flow is initiated by a safety related signal which opens the isolation valves in the VES supply lines.

The VES provides protection from smoke and hazardous chemicals to the MCRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the MCRE following a hazardous chemical release (Ref. 1). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the MCRE occupants to control the reactor either from the control room or from the remote shutdown room (Ref. 2).

The VES functions to mitigate a DBA or transient that either assumes the failure of or challenges the integrity of the fission product barrier.

The VES satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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**LCO**

The VES limits the MCRE temperature rise and maintains the MCRE at a positive pressure relative to the surrounding environment.

Two air delivery flow paths are required to be OPERABLE to ensure that at least one is available, assuming a single failure.

The VES is considered OPERABLE when the individual components necessary to deliver a supply of breathable air to the MCRE are OPERABLE. This includes components listed in SR 3.7.6.3 through 3.7.6.10. In addition, the MCRE pressure boundary must be maintained, including the integrity of the walls, floors, ceilings, electrical and mechanical penetrations, and access doors. The MCRE pressure boundary includes the Potable Water System (PWS) and SDS running

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**BASES****LCO (continued)**

(piping drain) traps, which retain a fluid level sufficient to maintain a seal preventing gas flow through the piping. The MCRE pressure boundary also includes the Waste Water System (WWS) drain line, which is isolated by a normally closed isolation valve.

In order for the VES to be considered OPERABLE, the MCRE boundary must be maintained such that the MCRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analysis for DBAs, and that MCRE occupants are protected from hazardous chemicals and smoke.

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

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**APPLICABILITY**

In MODES 1, 2, 3, and 4 and during movement of irradiated fuel assemblies, the VES must be OPERABLE to ensure that the MCRE will remain habitable during and following a DBA.

The VES is not required to be OPERABLE in MODES 5 and 6 when irradiated fuel is not being moved because accidents resulting in fission product release are not postulated.

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**BASES****ACTIONS**A.1

When a VES valve, a VES damper, or a main control room boundary isolation valve is inoperable, action is required to restore the component to OPERABLE status. A Completion Time of 7 days is permitted to restore the valve or damper to OPERABLE status before action must be taken to reduce power. The Completion Time of 7 days is based on engineering judgment, considering the low probability of an accident that would result in a significant radiation release from the fuel, the low probability of not containing the radiation, and that the remaining components can provide the required capability.

B.1

When the MCRE air temperature is outside the acceptable range during VBS operation, action is required to restore it to an acceptable range. A Completion Time of 24 hours is permitted based upon the availability of temperature indication in the MCRE. It is judged to be a sufficient amount of time allotted to correct the deficiency in the nonsafety ventilation system before shutting down.

C.1, C.2, and C.3

If the unfiltered inleakage of potentially contaminated air past the MCRE boundary and into the MCRE can result in MCRE 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 MCRE occupants from hazardous chemicals or smoke, the MCRE boundary is inoperable. Actions must be taken to restore an OPERABLE MCRE boundary within 90 days.

During the period that the MCRE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on MCRE 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 MCRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that MCRE occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable MCRE boundary) should be preplanned for implementation upon entry into the condition, regardless of whether

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**BASES****ACTIONS (continued)**

entry is intentional or unintentional. The 24-hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90-day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of MCRE occupants within analyzed limits while limiting the probability that MCRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90-day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the MCRE boundary.

**D.1, D.2, and D.3**

If one bank of VES air tanks (8 tanks out of 32 total) is inoperable, then the VES is able to supply air to the MCRE for 54 hours (75% of the required 72 hours). If the VES is actuated, the operator must take actions to maintain habitability of the MCRE once the air in the tanks has been exhausted. The VBS supplemental filtration mode or MCRE ancillary fans are both capable of maintaining the habitability of the MCRE after 54 hours.

With one bank of VES air tanks inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the stored amount of compressed air in the remaining OPERABLE VES air tanks must be verified within 2 hours and every 12 hours thereafter to be > 245,680 scf. The 245,680 scf value is 75 percent of the minimum amount of stored compressed air that must be available in the compressed air storage tanks. The standard volume is determined using the compressed air storage tank room temperature (VAS-TE-080A/B), compressed air storage tanks pressure (VES-PT-001A/B), and Figure B 3.7.6-2, Compressed Air Storage Tanks Minimum Volume - One Bank of VES Air Tanks (8 Tanks) Inoperable. Values above the 245,680 scf line in the figure meet the Required Action criteria. Verification that the minimum volume of compressed air is contained in the OPERABLE compressed air storage tanks ensures a 54 hour air supply will be available if needed. Additionally, within 24 hours, the VBS ancillary fans are verified to be OPERABLE so that, if needed, can be put into use once the OPERABLE compressed air storage tanks have been exhausted. The Completion Times associated with these actions and the

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**BASES****ACTIONS (continued)**

7-day Completion Time to restore VES to OPERABLE are based on engineering judgment, considering the low probability of an accident that would result in a significant radiation release from the reactor core, the low probability of radioactivity release, and that the remaining components and compensatory systems can provide the required capability. The 54 hours of air in the remaining OPERABLE compressed air storage tanks, along with compensatory operator actions, are adequate to protect the main control room envelope habitability. Dose calculations verify that the MCRC dose limits will remain within the requirements of GDC 19 with the compensatory actions taken at 54 hours.

**E.1 and E.2**

In MODE 1, 2, 3, or 4 if the Required Actions and Completion Times of Condition A, B, C, or D are not met, or the VES is inoperable for reasons other than Condition A, B, C, or D, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

**F.1**

During movement of irradiated fuel assemblies, if the Required Actions and Completion Times of Condition A, B, C, or D are not met, or the VES is inoperable for reasons other than Condition A, B, C, or D, or the VES is inoperable due to an inoperable MCRC boundary, action must be taken immediately to suspend the movement of fuel. This does not preclude the movement of fuel to a safe position.

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**SURVEILLANCE REQUIREMENTS****SR 3.7.6.1**

The MCRC air temperature is checked at a frequency of 24 hours to verify that the VBS is performing as required to maintain the initial condition temperature assumed in the safety analysis, and to ensure that the MCRC temperature will not exceed the required conditions after loss of VBS cooling. The surveillance limit of 75°F is the initial heat sink temperature assumed in the VES thermal analysis. The 24-hour Frequency is acceptable based on the availability of temperature indication in the MCRC.

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**BASES****SURVEILLANCE REQUIREMENTS (continued)****SR 3.7.6.2**

Verification every 24 hours that compressed air storage tanks contain > 327,574 scf of breathable air.

The standard volume is determined using the compressed air storage tank room temperature (VAS-TE-080A/B), compressed air storage tanks pressure (VES PT 001A/B), and Figure B 3.7.6-1, Compressed Air Storage Tanks Minimum Volume. Values above the 327,574 scf line in the figure meet the surveillance criteria. Verification that the minimum volume of compressed air is contained in the compressed air storage tanks ensures that there will be an adequate supply of breathable air to maintain MCRC habitability for a period of 72 hours. The Frequency of 24 hours is based on the availability of pressure indication in the MCRC.

**SR 3.7.6.3**

VES air delivery isolation valves are required to be verified as OPERABLE. The Frequency required is in accordance with the Inservice Testing Program.

**SR 3.7.6.4**

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 VES once every month provides an adequate check of the system. The 31-day Frequency is based on the reliability of the equipment and the availability of system redundancy.

**SR 3.7.6.5**

VES air header isolation valves are required to be verified open at 31-day intervals. This SR is designed to ensure that the pathways for supplying breathable air to the MCRC are available should loss of VBS occur. These valves should be closed only during required testing or maintenance of downstream components, or to preclude complete depressurization of the system should the VES isolation valves in the air delivery line open inadvertently or begin to leak.

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**BASES****SURVEILLANCE REQUIREMENTS (continued)****SR 3.7.6.6**

Verification that the air quality of the air storage tanks meets the requirements of Appendix C, Table C-1 of ASHRAE Standard 62 (Ref. 4) is required every 92 days. If air has not been added to the air storage tanks since the previous verification, verification may be accomplished by confirmation of the acceptability of the previous surveillance results along with examination of the documented record of air makeup. The purpose of ASHRAE Standard 62 states: "This standard specifies minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects." Verification of the initial air quality (in combination with the other surveillances) ensures that breathable air is available for 11 MCRE occupants for at least 72 hours.

**SR 3.7.6.7**

Verification that the VBS isolation valves and the Sanitary Drainage System (SDS) isolation valves are OPERABLE and will actuate upon demand is required every 24 months to ensure that the MCRE can be isolated upon loss of VBS operation.

**SR 3.7.6.8**

Verification that each VES pressure relief isolation valve within the MCRE pressure boundary is OPERABLE is required in accordance with the Inservice Testing Program. The SR is used in combination with SR 3.7.6.9 to ensure that adequate vent area is available to mitigate MCRE overpressurization.

**SR 3.7.6.9**

Verification that the VES pressure relief damper is OPERABLE is required at 24-month intervals. The SR is used in combination with SR 3.7.6.8 to ensure that adequate vent area is available to mitigate MCRE overpressurization.

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**BASES****SURVEILLANCE REQUIREMENTS (continued)****SR 3.7.6.10**

Verification of the OPERABILITY of the self-contained pressure regulating valve in each VES air delivery flow path is required in accordance with the Inservice Testing Program. This is done to ensure that a sufficient supply of air is provided as required, and that uncontrolled air flow into the MCRE will not occur.

**SR 3.7.6.11**

This SR verifies the OPERABILITY of the MCRE boundary by testing for unfiltered air inleakage past the MCRE boundary and into the MCRE. The details of the testing are specified in the Main Control Room Envelope Habitability Program.

The MCRE is considered habitable when the radiological dose to MCRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the MCRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the MCRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition C must be entered. Required Action C.3 allows time to restore the MCRE boundary to OPERABLE status provided mitigating actions can ensure that the MCRE 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. 3) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 5). These compensatory measures may also be used as mitigating actions as required by Required Action C.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 6). Options for restoring the MCRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the MCRE 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 MCRE boundary has been restored to OPERABLE status.

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**BASES****SURVEILLANCE REQUIREMENTS (continued)****SR 3.7.6.12**

This SR verifies that the required VES testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VES filter tests are in accordance with Regulatory Guide 1.52 (Ref. 7). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in the VFTP.

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**REFERENCES**

1. Section 6.4, "Main Control Room Habitability Systems."
  2. Section 9.5.1, "Fire Protection System."
  3. Regulatory Guide 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors."
  4. ASHRAE Standard 62-1989, "Ventilation for Acceptable Indoor Air Quality."
  5. NEI 99-03, "Control Room Habitability Assessment," June 2001.
  6. 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).
  7. Regulatory Guide 1.52, "Design, Inspection, and Testing Criteria for Airfiltration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," Revision 3.
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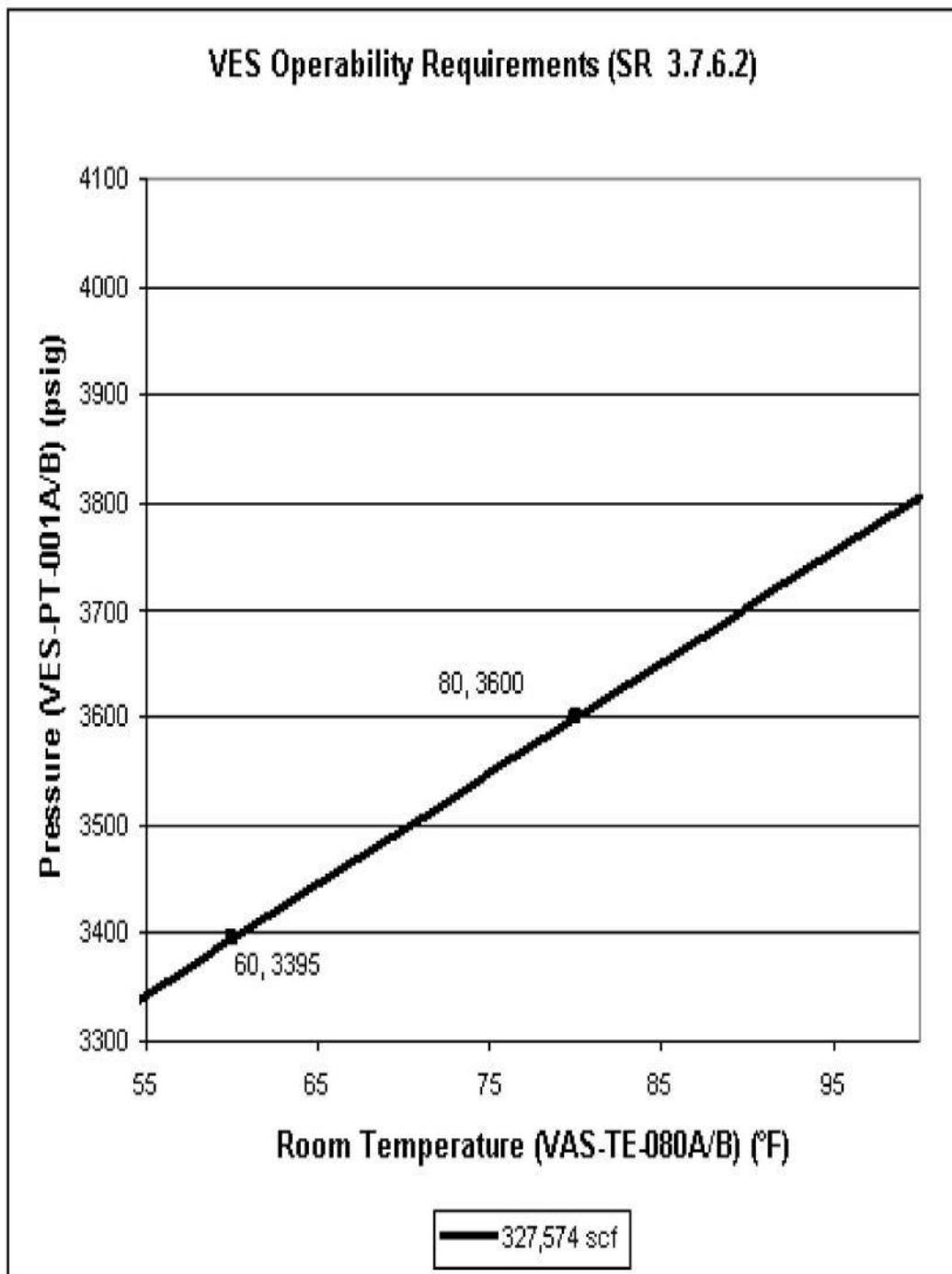


Figure B 3.7.6-1  
Compressed Air Storage Tanks Minimum Volume

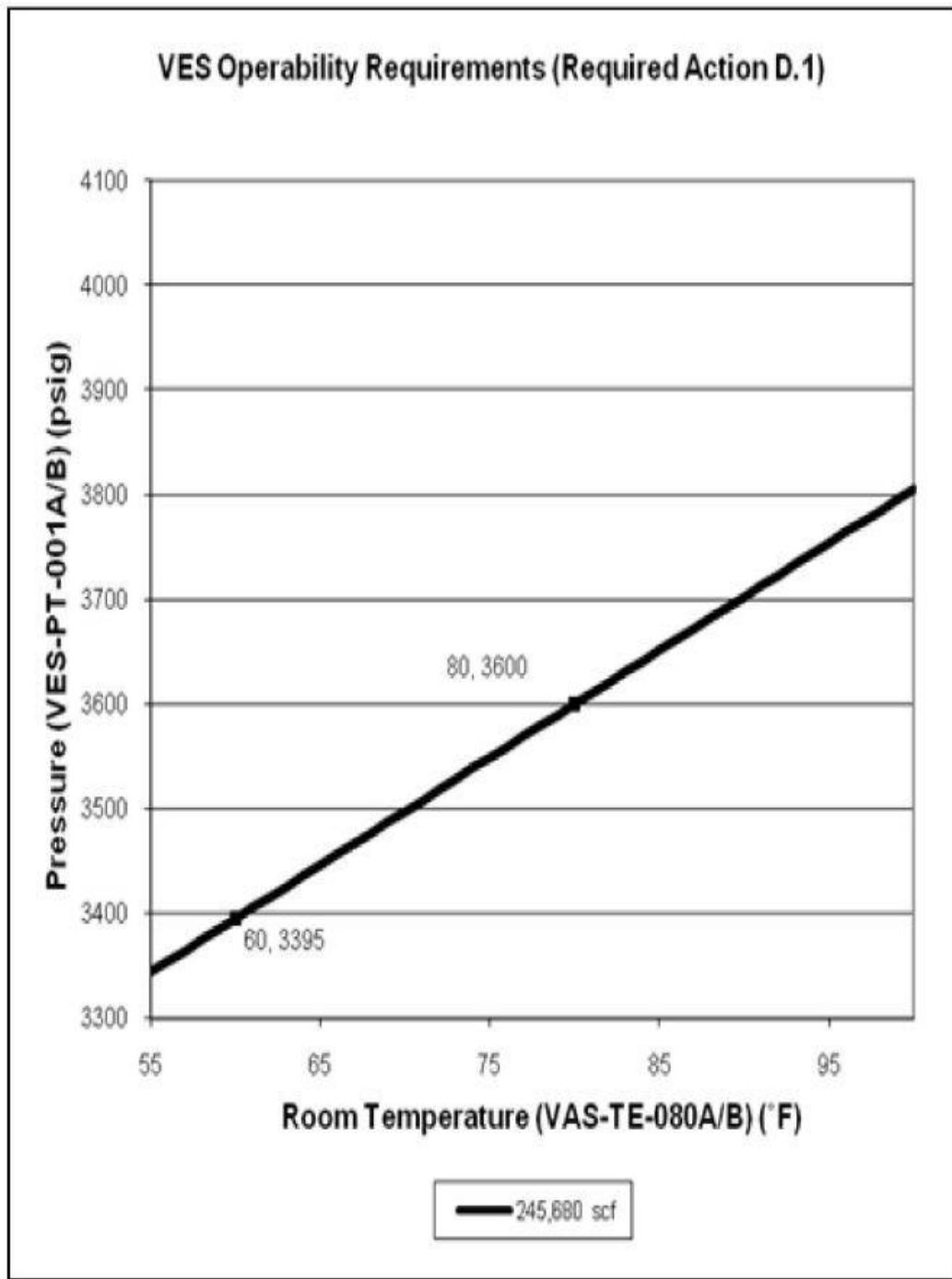


Figure B 3.7.6-2  
Compressed Air Storage Tanks Minimum Volume - One Bank of VES Air Tanks (8 Tanks)  
Inoperable