



Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

October 26, 2007

TVA-SQN-TS-07-02

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Gentlemen:

In the Matter of) Docket Nos. 50-327
Tennessee Valley Authority) 50-328

SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - TECHNICAL SPECIFICATIONS (TS) CHANGE 07-02 "APPLICATION TO REVISE TECHNICAL SPECIFICATIONS (TSS) REGARDING CONTROL ROOM ENVELOPE HABITABILITY IN ACCORDANCE WITH TECHNICAL SPECIFICATION TASK FORCE (TSTF)-448, REVISION 3, USING THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS"

Pursuant to 10 CFR 50.90, Tennessee Valley Authority (TVA) is submitting a request for a TS change (TS-07-02) to Licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed amendment would modify TS requirements related to control room envelope habitability in accordance with TSTF-448, Revision 3.

Attachment 1 provides a description of the proposed changes, the requested confirmation of applicability, and plant-specific verifications. Attachment 2 provides the existing TS pages marked up to show the proposed changes. Attachment 3 provides existing TS Bases pages marked up to show the proposed changes.

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In accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Department of Public Health.

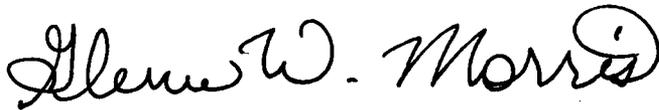
TVA requests routine processing of this TS change by NRC and that the implementation of the revised TS be within 60 days of NRC approval.

This letter satisfies the commitment TVA made in response to Generic Letter 2003-01 dated August 4, 2004. There are no new commitments contained in this submittal.

If you have any questions about this change, please contact me at 843-7170.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 26th day of October, 2007.

Sincerely,



Glenn W. Morris
Manager, Site Licensing and
Industry Affairs

Enclosures:
Evaluation of the Proposed Changes

cc: See page 3

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Enclosures

cc (Enclosures):

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY (TVA) SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

TVA EVALUATION OF THE PROPOSED CHANGES

1.0 DESCRIPTION

This letter is a request to amend Operating Licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed amendment would modify technical specification (TS) requirements related to control room envelope habitability in TS 3.7.7, "Control Room Emergency Ventilation System (CREVS)" and TS Section 6, "Administrative Controls."

The changes are consistent with Nuclear Regulatory Commission (NRC) approved Industry/Technical Specification Task Force (TSTF) standard TS change TSTF-448 Revision 3. The availability of this TS improvement was published in the *Federal Register* on January 17, 2007, as part of the consolidated line item improvement process (CLIIP).

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

TVA 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. TVA has concluded that the justifications presented in the TSTF proposal, and the safety evaluation prepared by the NRC staff, are applicable to SQN Units 1 and 2 and justify this amendment for the incorporation of the changes to the SQN TSs.

2.2 Optional Changes and Variations

TVA is proposing the following variations or deviations from the TS changes described in the TSTF-448, Revision 3, or the applicable parts of the NRC staff's model safety evaluation dated January 17, 2007:

1. The current title to Limiting Condition for Operation (LCO) 3.7.7 for SQN is "Control Room Emergency Ventilation System (CREVS)." This term is used in the amendment request in lieu of the term "Control Room Envelope Emergency Ventilation System (CREEVS)" used in the model safety evaluation.

2. NRC's letter to the TSTF dated May 12, 2006, (Adams accession number ML061310293) documented the basis for several suggested changes to TSTF-448. The fifth suggested change clarified that quantitative limits on exposure to smoke do not exist and outlined how smoke will be addressed in the Control Envelope Habitability Program (CREHP) in the administrative section of the TSs. Consistent with this, SQN proposes to modify the wording to action b. of LCO 3.7.7 to that shown below from what was provided in the CLIIP:

"With one or more CREVS trains inoperable due to inoperable control room envelope (CRE) boundary, immediately initiate action to implement mitigating actions, and within 24 hours verify mitigating actions ensure CRE occupant exposures to radiological and chemical hazards will not exceed limits and CRE occupants are protected from smoke hazards, and restore CRE boundary to OPERABLE status within 90 days. Otherwise, be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

Additionally, Section 3.3 of the model safety evaluation (SE) contains variations based on the plant-specific design and existing TS requirements. The proposed change for SQN utilizes Evaluations 2, 4, and 6 of Section 3.3 of the model SE.

SQN has not converted the TSs to the standard format contained in NUREG-1431, Revision 3, but has fashioned the proposed revisions to make the appropriate changes to the SQN requirements to achieve the same intent and application as the changes proposed in TSTF-448, Revision 3.

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

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

Upon implementation of the amendment adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air inleakage as required by Surveillance Requirement (SR) 4.7.7.h, in accordance with TS 6.17.c.(i), the assessment of CRE habitability as required by Specification 6.17.c.(ii), and the measurement of CRE pressure as required by Specification 6.17.d, shall be considered met. Following implementation:

- (a) The first performance of SR 4.7.7.h, in accordance with Specification 6.17.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 4.0.2, as measured from May 3, 2004; the date of the most recent successful tracer gas test, as stated in the August 4, 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 CRE habitability, Specification 6.17.c.(ii), shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from May 3, 2004; the date of the most recent successful tracer gas test, as stated in the August 4, 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 CRE pressure, Specification 6.17.d, shall be within 18 months, plus the 138 days allowed by SR 4.0.2, as measured from May 30, 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

TVA has reviewed the proposed no significant hazards consideration determination (NSHCD) published in the *Federal Register* as part of the CLIIP. TVA has concluded that the proposed NSHCD presented in the *Federal Register* notice is applicable to SQN and is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

4.0 ENVIRONMENTAL EVALUATION

TVA has reviewed the environmental evaluation included in the model safety evaluation dated January 17, 2007, as part of the CLIIP. TVA has concluded that the staff's findings presented in that evaluation are applicable to SQN and the evaluation is hereby incorporated by reference for this application.

ENCLOSURE 2

**TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2**

Proposed Technical Specification Changes (mark-up)

I. AFFECTED PAGE LIST

Unit 1

3/4 7-17
3/4 7-18
6-18

Unit 2

3/4 7-17
3/4 7-18
6-19

II. MARKED PAGES

See attached.

Insert 1

With one or more CREVS trains inoperable due to inoperable control room envelope (CRE) boundary, immediately initiate action to implement mitigating actions, and within 24 hours verify mitigating actions ensure CRE occupant exposures to radiological and chemical hazards will not exceed limits, CRE occupants are protected from smoke hazards, and restore CRE boundary to OPERABLE status within 90 days. Otherwise, be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Insert 2

Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program

Insert 3

6.17 Control Room Envelope Habitability Program

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Emergency Ventilation System (CREVS), CRE 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 CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem whole body or its equivalent to any part of the body for the duration of the accident. The program shall include the following elements:

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

- d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CREVS, operating at the flow rate of 4000 cubic feet per minute plus or minus 10 percent, at a Frequency of 36 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 18 month assessment of the CRE boundary.
- e. The quantitative limits on unfiltered air leakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air leakage measured by the testing described in paragraph c. The unfiltered air leakage limit for radiological challenges is the leakage flow rate assumed in the licensing-basis analyses of DBA consequences. Unfiltered air leakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.
- f. The provisions of SR 4.0.2 are applicable to the frequencies for assessing CRE habitability, determining CRE unfiltered leakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

PLANT SYSTEMS

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.7 Two independent control room emergency ventilation systems (CREVS) shall be OPERABLE. *

APPLICABILITY: ALL MODES and during movement of irradiated fuel assemblies

ACTION:

MODES 1, 2, 3 and 4

for reasons other than Action b

- a. With one CREVS inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. **Insert 1**
- c.
- b. With both CREVS inoperable due to actions taken as a result of a tornado warning, restore at least one train to operable status within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- d.
- e. With both CREVS inoperable for other than Action b., be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours

reasons

or Action c.

MODES 5, 6, and during movement of irradiated fuel assemblies

- a. With one CREVS inoperable, restore the inoperable system to OPERABLE status within 7 days or initiate and maintain operation of the operable CREVS in the recirculation mode.
or
suspend movement of irradiated fuel assemblies.
- b. With both CREVS inoperable, suspend all operations involving movement of irradiated fuel assemblies.

or one or more CREVS trains inoperable due to an inoperable CRE boundary

SURVEILLANCE REQUIREMENTS

4.7.7 Each CREVS shall be demonstrated OPERABLE:

- a. DELETED
- b. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.
- c. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:

*** The CRE boundary may be opened intermittently under administrative control.**

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm \pm 10%.
 2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86° F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 4000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.
- d. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86° F) and a relative humidity of 70%.
- e. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the system at a flow rate of 4000 cfm \pm 10%.
 2. Verifying that on a safety injection signal or a high radiation signal from the air intake stream, the system automatically diverts its inlet flow through the HEPA filters and charcoal adsorber banks.
 3. Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch Water Gauge relative to the outside atmosphere at a system flow rate of 4000 cfm \pm 10% (\geq 3000 cfm recirculation and \leq 1000 cfm fresh air).
- f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.
- g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.

h. Insert 2

ADMINISTRATIVE CONTROLS

6.16 DIESEL FUEL OIL TESTING PROGRAM

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil prior to addition to storage tanks by determining that the fuel oil has:
 1. An API gravity or an absolute specific gravity within limits,
 2. A flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and
 3. A clear and bright appearance with proper color;
- b. Other properties for ASTM 2D fuel oil are within limits within 31 days following sampling and addition to storage tanks; and
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A.

Insert 3

PLANT SYSTEMS

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.7 Two independent control room emergency ventilation systems (CREVS) shall be OPERABLE. *

APPLICABILITY: ALL MODES and during movement of irradiated fuel assemblies

ACTION:

MODES 1, 2, 3 and 4

- a. With one CREVS inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. **Insert 1**
- c.
- b-. With both CREVS system inoperable due to actions taken as a result of a tornado warning, restore at least one train to operable status within 8 hours or be in a least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- d.
- e-. With both CREVS inoperable for other than Action b., be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours

for reasons other than Action b

reasons

or Action c.

MODES 5, 6, and during movement of irradiated fuel assemblies

- a. With one CREVS inoperable, restore the inoperable system to OPERABLE status within 7 days or initiate and maintain operation of the operable CREVS in the recirculation mode.
or
suspend movement of irradiated fuel assemblies.
- b. With both CREVS inoperable, suspend all operations involving movement of irradiated fuel assemblies.

or one or more CREVS trains inoperable due to an inoperable CRE boundary

SURVEILLANCE REQUIREMENTS

4.7.7 Each CREVS shall be demonstrated OPERABLE:

- a. DELETED
- b. At least once per 31 days on a STAGGERED TEST BASIS by initiating, from the control room, flow through the HEPA filters and charcoal adsorbers and verifying that the system operates for at least 15 minutes.
- c. At least once per 18 months or (1) after any structural maintenance on the HEPA filter or charcoal adsorber housings, or (2) following painting, fire or chemical release in any ventilation zone communicating with the system by:

* The CRE boundary may be opened intermittently under administrative control.

April 11, 2005

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

1. Verifying that the cleanup system satisfies the in-place testing acceptance criteria and uses the test procedures of Regulatory Positions C.5.a, C.5.c and C.5.d of Regulatory Guide 1.52, Revision 2, March 1978 (except for the provisions of ANSI N510 Sections 8 and 9), and the system flow rate is 4000 cfm \pm 10%.
 2. Verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86° F) and a relative humidity of 70%.
 3. Verifying a system flow rate of 4000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.
- d. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal, that a laboratory analysis of representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows the methyl iodide penetration less than 2.5% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86° F) and a relative humidity of 70%.
- e. At least once per 18 months by:
1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 3 inches Water Gauge while operating the system at a flow rate of 4000 cfm \pm 10%.
 2. Verifying that on a safety injection signal or a high radiation signal from the air intake stream, the system automatically diverts its inlet flow through the HEPA filters and charcoal adsorber banks.
 3. ~~Verifying that the system maintains the control room at a positive pressure of greater than or equal to 1/8 inch Water Gauge relative to the outside atmosphere at a system flow rate of 4000 cfm \pm 10% (\geq 3000 cfm recirculation and \leq 1000 cfm fresh air).~~
- f. After each complete or partial replacement of a HEPA filter bank by verifying that the HEPA filter banks remove greater than or equal to 99.95% of the DOP when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.
- g. After each complete or partial replacement of a charcoal adsorber bank by verifying that the charcoal adsorbers remove greater than or equal to 99.95% of a halogenated hydrocarbon refrigerant test gas when they are tested in-place in accordance with ANSI N510-1975 while operating the system at a flow rate of 4000 cfm \pm 10%.

h. Insert 2

ADMINISTRATIVE CONTROLS

6.16 DIESEL FUEL OIL TESTING PROGRAM

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil prior to addition to storage tanks by determining that the fuel oil has:
 1. An API gravity or an absolute specific gravity within limits,
 2. A flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and
 3. A clear and bright appearance with proper color;
- b. Other properties for ASTM 2D fuel oil are within limits within 31 days following sampling and addition to storage tanks; and
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A.

Insert 3

ENCLOSURE 3

**TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2**

Changes to Technical Specifications Bases Pages

I. AFFECTED PAGE LIST

Unit 1

B 3/4 7-4

B 3/4 7-4a

Unit 2

B 3/4 7-4

B 3/4 7-4a

II. MARKED PAGES

See attached.

Insert 4

BACKGROUND

The CREVS provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke.

The CREVS consists of two independent, redundant trains that recirculate and filter the air in the control room envelope (CRE) and a CRE boundary that limits the inleakage of unfiltered air. Each CREVS train consists of a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or dampers, doors, barriers, and instrumentation also form part of the system.

The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

The CREVS is an emergency system, parts of which may also operate during normal unit operations in the standby mode of operation. Actuation of the CREVS places the system in the emergency radiation state mode of operation. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the air within the CRE through the redundant trains of HEPA and the charcoal filters. The emergency radiation state also initiates pressurization and filtered ventilation of the air supply to the CRE.

Outside air is filtered and added to the air being recirculated from the CRE. Pressurization of the CRE minimizes infiltration of unfiltered air through the CRE boundary from all the surrounding areas adjacent to the CRE boundary. The air entering the CRE is

continuously monitored by radiation detectors. One detector output above the setpoint will cause actuation of the emergency radiation state.

A single CREVS train operating at a flow rate of 4000 cfm plus or minus 10 percent will pressurize the main control room to 0.125 inch water gauge relative to outside atmosphere. The CRE will be maintained at a slightly positive pressure relative to external areas adjacent to the CRE boundary. The CREVS operation in maintaining the CRE habitable is discussed in the Updated Final Safety Analysis Report (UFSAR), Sections 6.4 and 9.4 (Ref. 1 and 2).

Redundant supply and recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally open 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 CREVS is designed in accordance with Seismic Category I requirements.

The CREVS is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a DBA without exceeding a 5 rem whole body dose or its equivalent to any part of the body.

APPLICABLE
SAFETY
ANALYSES

The CREVS components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the CRE ensures an adequate supply of filtered air to all areas requiring access. The CREVS provides airborne radiological protection for the CRE occupants, as demonstrated by the CRE occupant dose analyses for the most limiting DBA fission product release presented in the UFSAR, Chapter 15 (Ref. 3).

The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Ref. 4 and 5). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CRE occupants to control the reactor either from the control room or from the remote shutdown panels (Ref. 2 and 4).

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

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

LCO

Two independent and redundant CREVS trains are required to be OPERABLE to ensure that at least one is available if a single active failure disables the other train. Total system failure, such as from a loss of both ventilation trains or from an inoperable CRE boundary, could result in exceeding a dose of 5 rem whole body or its equivalent to any part of the body to the CRE occupants in the event of a large radioactive release.

Each CREVS train is considered OPERABLE when the individual components necessary to limit CRE occupant exposure are OPERABLE. A CREVS 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 circulation can be maintained.

In order for the CREVS trains to be considered OPERABLE, the CRE boundary must be maintained such that the CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs.

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

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CREVS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.

During movement of irradiated fuel assemblies, the CREVS must be OPERABLE to cope with the release from a fuel handling accident.

ACTIONS

a. (MODES 1, 2, 3, and 4)

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

In MODE 1, 2, 3, or 4, if the inoperable CREVS train cannot be restored to OPERABLE status within the required completion time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least HOT STANDBY 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.

b. (MODES 1, 2, 3, and 4)

If the unfiltered inleakage of potentially contaminated air past the CRE boundary and into the CRE can result in CRE occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem whole body or its equivalent to any part of the body), the CRE boundary is inoperable. Actions must be taken to restore an OPERABLE CRE boundary within 90 days.

During the period that the CRE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CRE 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 CRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that CRE occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CRE 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 CRE occupants within

analyzed limits while limiting the probability that CRE 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 CRE boundary.

In MODE 1, 2, 3, or 4, if the inoperable CRE boundary cannot be restored to OPERABLE status within the required completion time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least HOT STANDBY 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.

c. (MODES 1, 2, 3, and 4)

When both CREVS train are inoperable, for actions taken as a result of a tornado warning, action must be taken to restore at least one train of CREVS to OPERABLE status within 8 hours. In this condition, the shutdown of the operating unit would not be reasonable in consideration that the actions that created the inoperable condition was for the protection of the operating unit and would not be expected to last for a significant duration. The 8 hour completion time is reasonable based on the low probability of a DBA occurring during this time period, and high probability that the CREVS trains can be returned to OPERABLE status within 8 hours following the tornado warning.

In MODE 1, 2, 3, or 4, if at least one inoperable CREVS train cannot be restored to OPERABLE status within the required completion time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least HOT STANDBY 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.

d. (MODES 1, 2, 3, and 4)

If both CREVS trains are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable CRE boundary or tornado (i.e., Action b. or c.), the CREVS 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 a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least HOT STANDBY 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.

a. (MODES 5 and 6, and during movement of irradiated fuel assemblies)

In MODE 5 or 6, or during movement of irradiated fuel assemblies, if the inoperable CREVS train cannot be restored to OPERABLE status within the required completion time, action must be taken to immediately place the OPERABLE CREVS train in the recirculation mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.

An alternative to placing the operable CREVS train in service is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

b. (MODES 5 and 6, and during movement of irradiated fuel assemblies)

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CREVS trains inoperable or with one or more CREVS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE
REQUIREMENTS

SR 4.7.7.b.

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 on a STAGGERED TEST BASIS is based on the reliability of the equipment and the two train redundancy.

SR 4.7.7.c., d., e.1., f., and g.

These SRs verify that the required CREVS filter testing is performed. These SRs include 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 conditions that require testing are included in each SR to ensure the functionality of the filters on a periodic basis and in response to plant conditions that may have affected the filtration capability.

SR 4.7.7.e.2.

This SR verifies that each CREVS train starts and operates on an actual or simulated actuation signal. The frequency of 18 months is based on industry operating experience and is consistent with the typical refueling cycle.

SR 4.7.7.h.

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

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem whole body or its equivalent to any part of the body and the CRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the CRE 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, Action b. (MODES 1, 2, 3, and 4) must be entered. This action allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory

Guide 1.196, Section C.2.7.3, (Ref. 6) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 7). These compensatory measures may also be used as mitigating actions as required by Action b. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 8). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE 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 CRE boundary has been restored to OPERABLE status.

REFERENCES

1. UFSAR, Section 6.4.
 2. UFSAR, Chapter 9.4.
 3. UFSAR, Section 15.
 4. UFSAR, Section 2.2.
 5. UFSAR, Section 8.3.1.2.3.
 6. Regulatory Guide 1.196.
 7. NEI 99-03, "Control Room Habitability Assessment," June 2001.
 8. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).
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PLANT SYSTEMS

This Discussion Affected by TS Change 06-03

BASES

3/4.7.5 ULTIMATE HEAT SINK (UHS)

The limitations on UHS water level and temperature ensure that sufficient cooling capacity is available to either 1) provide normal cooldown of the facility, or 2) to mitigate the effects of accident conditions within acceptable limits.

The limitations on the maximum temperature are based on providing a 30 day cooling water supply to safety related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants", March 1974.

The limitations on minimum water level are based on providing sufficient flow to the ERCW serviced heat loads after a postulated event assuming a time-dependent drawdown of reservoir level. Flow to the major transient heat loads (CCS and CS heat exchangers) is balanced assuming a reservoir level of elevation 670. The time-independent heat loads (ESF room coolers, etc.) are balanced assuming a reservoir level of elevation 639.

3/4.7.6 FLOOD PROTECTION

This specification is deleted.

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

~~The OPERABILITY of the control room ventilation system ensures that the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 19 of Appendix "A", 10 CFR 50. ANSIN510-1975 will be used as a procedural guide for surveillance testing.~~

Insert 4

PLANT SYSTEMS

BASES

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

~~_____ LCOs are based on two independent and redundant CREVS trains being required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding a dose of 5 rem to the control room operator in the event of a large radioactive release.~~

~~_____ The CREVS is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in both trains. A CREVS train is OPERABLE when the associated:~~

- ~~_____ a. _____ Fan is OPERABLE;~~
- ~~_____ b. _____ HEPA filters and charcoal adsorbent are not excessively restricting flow, and are capable of performing their filtration functions; and~~
- ~~_____ c. _____ Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.~~

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

PLANT SYSTEMS

This Discussion Affected by TS Change 06-03

BASES

3/4.7.5 ULTIMATE HEAT SINK

The limitations on the ultimate heat sink water level and temperature ensure that sufficient cooling capacity is available to either 1) provide normal cooldown of the facility, or 2) to mitigate the effects of accident conditions within acceptable limits.

The limitation on maximum temperature is based on providing a 30 day cooling water supply to safety related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants", March 1974.

The limitations on minimum water level are based on providing sufficient flow to the ERCW serviced heat loads after a postulated event assuming a time dependent drawdown of reservoir level. Flow to the major transient heat loads (CCS and CS heat exchangers) is balanced assuming a reservoir level of el. 670. The time independent heat loads (ESF room coolers, etc.) are balanced assuming a reservoir level of el. 639.

3/4.7.6 FLOOD PROTECTION

This specification is deleted.

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

~~———— The OPERABILITY of the control room ventilation system ensures that the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criteria 19 of Appendix "A", 10 CFR 50. ANSIN510-1975 will be used as a procedural guide for surveillance testing.~~

Insert 4

PLANT SYSTEMS

BASES

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

~~_____ LCOs are based on two independent and redundant CREVS trains being required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding a dose of 5 rem to the control room operator in the event of a large radioactive release.~~

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- ~~_____ 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 circulation can be maintained.~~

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