Progress Energy

Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.90

July 12, 2007
3F0707-03

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process

Gentlemen:

Pursuant to 10 CFR 50.90, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., hereby requests an amendment to the Improved Technical Specifications (ITS) for Crystal River Unit 3 (CR-3). The proposed amendment would modify ITS 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 Operating License and ITS pages marked up with strikeout and shadowed text to show the proposed changes. Attachment 3 provides the revised Operating License and ITS pages with revision lines. Attachment 4 provides a summary of the regulatory commitments made in this submittal. Attachment 5 provides the existing ITS Bases pages marked up with strikeout and shadowed text to show the proposed changes (for information only). Attachment 6 provides the revised ITS Bases pages with revision lines.

FPC requests approval of the proposed License Amendment by July 31, 2008, with the amendment being implemented within 180 days of issuance.

The CR-3 Plant Nuclear Safety Committee has reviewed this request and recommended it for approval.

**Progress Energy Florida, Inc.**
Crystal River Nuclear Plant
15760 W. Powerline Street
Crystal River, FL 34428

A102
NRR

If you should have any questions regarding this submittal, please contact Mr. Paul Infanger, Supervisor, Licensing & Regulatory Programs, at (352) 563-4796.

Sincerely,

Dale E. Young
Vice President
Crystal River Nuclear Plant

Attachments:
1. Description and Assessment
2. Proposed Operating License and Improved Technical Specification Pages – Strikeout/Shadowed Format
3. Proposed Operating License and Improved Technical Specification Pages – Revision Bar Format
4. Regulatory Commitments
5. Proposed Improved Technical Specification Bases Pages – Strikeout/Shadowed Format
6. Proposed Improved Technical Specification Bases Pages – Revision Bar Format

xc: NRC Project Manager
NRC Regional Office
NRC Resident Inspector

**STATE OF FLORIDA**

**COUNTY OF CITRUS**

Dale E. Young states that he is the Vice President, Crystal River Nuclear Plant for Florida Power Corporation, doing business as Progress Energy Florida, Inc.; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

Dale E. Young
Vice President
Crystal River Nuclear Plant

The foregoing document was acknowledged before me this 12th day of July, 2007, by Dale E. Young.

Signature of Notary Public
State of Florida

LISA A. MORRIS
Notary Public - State of Florida
My Commission Expires Oct 25, 2007
Commission # DD249159
Bonded By National Notary Assn.

Lisa A. Morris
(Print, type, or stamp Commissioned
Name of Notary Public)

Personally Known X -OR- Produced Identification _____

**PROGRESS ENERGY FLORIDA, INC.**

**CRYSTAL RIVER - UNIT 3**

**DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72**

# License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process

## ATTACHMENT 1

## Description and Assessment

# DESCRIPTION AND ASSESSMENT

## 1.0 DESCRIPTION

The proposed amendment would modify Improved Technical Specifications (ITS) requirements related to control room envelope habitability in ITS Section 3.7.12, "Control Room Emergency Ventilation System (CREVS)" and ITS Section 5.6.2.21, "Control Complex Habitability Envelope Integrity Program."

The changes are consistent with Nuclear Regulatory Commission (NRC) approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification (STS) change TSTF-448, Revision 3. The availability of this ITS 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

Florida Power Corporation, (FPC) 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. FPC has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to Crystal River Unit 3 (CR-3) and justify this amendment for the incorporation of the changes to the CR-3 ITS.

### 2.2 Optional Changes and Variations

FPC is not proposing any significant variations or deviations from the ITS changes described in TSTF-448, Revision 3, or the applicable parts of the NRC staff's model safety evaluation dated January 17, 2007. The variations as described below reflect plant specific design, current licensing basis and plant specific variations from NUREG-1430, Standard Technical Specifications for Babcock and Wilcox Plants.

The term "Control Room Envelope (CRE)" in TSTF-448 has been modified in the FPC proposal to read "Control Complex Habitability Envelope (CCHE)." The CCHE is the equivalent of the Standard Technical Specification (STS) reference to CRE. The CCHE is the space within the Control Complex served by CREVS. Together the CCHE and CREVS provide an enclosed environment from which the plant can be operated following an uncontrolled release of radioactivity. This is considered an editorial change.

The CR-3 CCHE is unique in its design. It consists of the top five floors of the Control Complex and at a volume of 365,000 $ft^3$, it provides habitability via zone isolation with filtered recirculation. The CR-3 CCHE is not pressurized to limit inleakage, and makeup air is not utilized in recirculation mode. Leak tightness and filtration capability provide the necessary level of protection for control room operators to ensure exposure limits associated with Design Basis Accidents (DBAs) are not exceeded. The top floor contains

the control complex ventilation equipment room. The Control Room is one floor below. The CCHE also houses Emergency Safeguards (ES) Actuation System switchgear, ES batteries and the cable spreading room.

Unfiltered air inleakage tests have been performed on the CR-3 CCHE in 1997, 1999 and most recently in May 2007. The three tests have had similar results of less than 590 cfm inleakage adjusted for the worst case differential pressure. In comparison, the results of control room dose calculations indicate that CCHE inleakage can be as high as 1000 cfm under all conditions without exceeding control room dose limits.

On September 17, 2001, CR-3 was issued ITS Amendment No. 199 regarding alternative source term (AST) and the control room ventilation system. The amendment adopted full implementation of the alternative source term and conformed to the intent of TSTF Traveler 287. With Amendment No. 199, ITS 3.7.12 was revised to remove applicability of the ITS during movement of irradiated fuel assemblies. This revision included limiting the applicability of ITS 3.7.12 to Modes 1, 2, 3 and 4, deleting ITS 3.7.12 Conditions D and F and deleting references to Modes 1, 2, 3 and 4 in conditions C and E. The NRC found this acceptable based on the following: FPC did not credit control room isolation or the use of the CREVS recirculation filters in the performance of the fuel handling accident analyses. FPC showed the control room dose criterion of 10 CFR 50.67(b)(2)(iii) and that of GDC-19 will still be met without this credit. As a result of Amendment No. 199, CR-3 is not proposing to adopt the changes denoted in Condition D or E of TSTF 448, nor the associated Bases changes.

CR-3 ITS Section 3.7.12 REQUIRED ACTION B.2 has been revised to read "Verify mitigating actions ensure CCHE occupant exposures to radiological hazards will not exceed limits." This wording differs from TSTF-448 in that it has removed the words "chemical and smoke hazards." CR-3 has evaluated control room habitability in accordance with 10 CFR 50 Appendix A, General Design Criteria 19, as revised in 1999 to incorporate the Alternative Source Term. The CR-3 design basis evaluation for the CCHE does not include quantitative limits for chemical or smoke hazards. Without quantitative limits for chemicals or smoke, upon entering into Condition B, "One or more CREVS trains inoperable due to inoperable CCHE boundary," an operator would not be able to complete the proposed Action B.2. and "Verify mitigating actions ensure CCHE occupant exposures to chemical and smoke hazards will not exceed limits."

Changes that correspond with the removal of "chemical and smoke hazards" from REQUIRED ACTION B.2 have been made throughout the ITS Bases Section B 3.7.12 and ITS Section 5.6.2.21, Control Complex Habitability Envelope Integrity Program.

When addressing chemical hazards, analysis has shown CREVS can remain in normal alignment and still provide CCHE occupants two minutes after initial nasal detection to take appropriate action, including use of Self Contained Breathing Apparatus (SCBA) and isolation of CREVS with manual actions. Therefore, maintaining a low leakage boundary in accordance with the radiological criterion, combined with the availability of respiratory protection for the control room operators, ensures the capability of continued control room habitability following a toxic gas release.

For a smoke event, maintaining a low leakage boundary in accordance with the radiological criterion, combined with the availability of respiratory protection for the control room operators, and the ability to place the control complex in the smoke purge mode ensures the capability of continued control room habitability following a smoke release.

The CR-3 CCHE is not pressurized to limit inleakage. Leak tightness and filtration capability provide the necessary level of protection for the control room occupants to ensure that exposure limits associated with design basis accidents are not exceeded. Therefore, there are several sections of TSTF-448 that are not applicable to the CR-3 CCHE. TSTF-448, SR 3.7.10.5 requires a verification of system makeup flow rate supplying the control room with outside air. The CR-3 CREVS does not utilize makeup flow because of its CCHE pressure neutrality. The air within the CCHE is recirculated and does not require outside air to supplement that which is within the CCHE boundary. Additionally, TSTF-448, Control Room Envelope Habitability Program 5.5.18.d. requires a measurement of CCHE pressure relative to all external areas during the pressurization mode. Since CR-3 CREVS does not operate in a pressurization mode, this section is not included.

Section 3.3 of the NRC model safety evaluation provides several different evaluations that would be applicable to different sites due to site-specific physical configurations or licensing bases. Evaluation 1 of the Model Safety Evaluation Section 3.0 is applicable to CR-3.

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

FPC proposes the following as a license condition to support implementation of the proposed ITS changes:

> Upon implementation of Amendment No. xxx adopting TSTF-448, Revision 3, the determination of control complex habitability envelope (CCHE) unfiltered air inleakage as required by Surveillance Requirement (SR) 3.7.12.4, in accordance with ITS 5.6.2.21.3(i) and the assessment of CCHE habitability as required by ITS 5.6.2.21.3(ii), shall be considered met. Following implementation:
>
> a) The first performance of SR 3.7.12.4, in accordance with Specification 5.6.2.21.3(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from May 18, 2007, the date of the most recent successful tracer gas test.
>
> b) The first performance of the periodic assessment of CCHE habitability, ITS 5.6.2.21.3(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from May 18, 2007, the date of the most recent successful tracer gas test.

## 3.0 REGULATORY ANALYSIS

### 3.1 No Significant Hazards Consideration Determination

Florida Power Corporation (FPC) has reviewed the proposed no significant hazards consideration determination (NSHCD) published in the *Federal Register* as part of the CLIIP. FPC has concluded that the proposed NSHCD presented in the *Federal Register* notice is applicable to Crystal River Unit 3 and is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

### 3.2 Verification and Commitments

There are no new regulatory commitments contained in this submittal.

## 4.0 ENVIRONMENTAL EVALUATION

Florida Power Corporation (FPC) has reviewed the environmental evaluation included in the model safety evaluation dated January 17, 2007 as part of the CLIIP. FPC has concluded that the staff's findings presented in that evaluation are applicable to Crystal River Unit 3 and the evaluation is hereby incorporated by reference for this application.

**PROGRESS ENERGY FLORIDA, INC.**

**CRYSTAL RIVER - UNIT 3**

**DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72**

# License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process

## ATTACHMENT 2

## PROPOSED REVISED OPERATING LICENSE AND IMPROVED TECHNICAL SPECIFICATION PAGES

## STRIKEOUT/SHADOWED FORMAT

~~Strikeout Text~~ Indicates Deleted Text
Shadowed Text Indicates Added Text

Fire Zone AB-95-3U
The portion of the fire zone that can be locked will be locked and the keys will be administratively controlled. Entries will be limited to only operationally necessary activities and require inspection for transient combustible materials upon exit. The portion of the zone that cannot be locked will be observed by the roving fire watch. No hot or spark producing work will be conducted.

2.C.(14) Upon implementation of Amendment xxx adopting TSTF-448, Revision 3, the determination of control complex habitability envelope (CCHE) unfiltered air inleakage as required by Surveillance Requirement (SR) 3.7.12.4, in accordance with ITS 5.6.2.21.3(i), and the assessment of CCHE habitability as required by ITS 5.6.2.21.3(ii), shall be considered met. Following implementation:

a) The first performance of SR 3.7.12.4, in accordance with Specification 5.6.2.21.3(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from May 18, 2007, the date of the most recent successful tracer gas test.

b) The first performance of the periodic assessment of CCHE habitability, ITS 5.6.2.21.3(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from May 18, 2007, the date of the most recent successful tracer gas test and assessment.

2.D The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21 is entitled: "Crystal River Nuclear Power Plant Security, Training and Qualification, and Safeguards Contingency Plan, Revision 0" submitted by letter dated September 30, 2004, as supplemented by letter dated October 20, 2004.

2.D.(3) "Crystal River Nuclear Plant Unit 3 Security Training and Qualification Plan", Revision 3, dated December 30, 1981, submitted by letter dated March 19, 1982, and consisting of all previous revisions. This plan shall be followed in accordance with 10 CFR 73.55(b)(4), 60 days after approval by the Commission. All security personnel, as required in the above plans, shall be qualified within two years of this approval. The licensee may make changes to this plan without prior Commission approval if the changes do not decrease the safeguards effectiveness of the plan. The licensee shall maintain records of and submit reports concerning such changes in the same manner as required for changes made to the Security Plan and Safeguards Contingency Plan pursuant to 10 CFR 50.54(p).

3.7 PLANT SYSTEMS

3.7.12 Control Room Emergency Ventilation System (CREVS)

LCO 3.7.12 Two CREVS trains shall be OPERABLE.

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**NOTE**

The control complex habitability envelope (CCHE) boundary may be opened intermittently under administrative control.

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

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One CREVS train inoperable for reasons other than Condition B. | A.1 Restore CREVS train to OPERABLE status. | 7 days |
| B. ~~Two~~ One or more CREVS trains inoperable due to inoperable CCHE boundary. | B.1 ~~Restore CCHE boundary to OPERABLE status.~~ Initiate action to implement mitigating actions.<br>AND<br>B.2 Verify mitigating actions ensure CCHE occupant exposures to radiological hazards will not exceed limits.<br>AND<br>B.3 Restore CCHE boundary to OPERABLE status. | ~~24 hours~~ Immediately<br><br>24 hours<br><br>90 days |

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.12.1 | Operate each CREVS train for ≥ 15 minutes. | 31 days |
| SR 3.7.12.2 | Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program. | In accordance with the Ventilation Filter Testing Program |
| SR 3.7.12.3 | Verify each CREVS train actuates to the emergency recirculation mode on an actual or simulated actuation signal. | 24 months |
| SR 3.7.12.4 | ~~Verify control complex habitability envelope integrity in accordance with ITS 5.6.2.21.~~ Perform required CCHE unfiltered air inleakage testing in accordance with the Control Complex Habitability Envelope Integrity Program. | In accordance with the Control Complex Habitability Envelope Integrity Program |

## 5.6 Procedures, Programs and Manuals

### 5.6.2.21 Control Complex Habitability Envelope Integrity Program

~~A program shall be established to maintain the integrity of the control complex habitability envelope to ensure the dose limits of 10 CFR 50 Appendix A General Design Criteria 19 are not exceeded. The program shall establish acceptable leakage limits, ensure maintenance activities are monitored and provide a preventive maintenance program for the control complex habitability envelope.~~

~~The Control Complex Habitability Envelope Integrity Program shall ensure that:~~

~~1. Breaches in the habitability envelope are managed to ensure that in-leakage remains below design basis analysis limits.~~

~~2. The preventive maintenance program includes doors, wall/roof/floor penetrations, dampers and floor drains that are part of the control complex habitability envelope.~~

~~3. Periodic evaluations of the systems, components and key analysis assumptions are performed.~~

~~4. Configuration control of the CCHE is maintained.~~

A Control Complex Habitability Envelope Integrity Program shall be established and implemented to ensure that CCHE habitability is maintained such that, with an OPERABLE Control Room Emergency Ventilation System (CREVS), CCHE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CCHE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident. The program shall include the following elements.

1. The definition of the CCHE and the CCHE boundary.

2. Requirements for maintaining the CCHE boundary in its design condition including configuration control and preventive maintenance.

(continued)

## 5.6 Procedures, Programs and Manuals

5.6.2.21 Control Complex Habitability Envelope Integrity Program (continued)

3. Requirements for (i) determining the unfiltered air inleakage past the CCHE boundary into the CCHE 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 CCHE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

4. The quantitative limits on unfiltered air inleakage into the CCHE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph 3. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences.

5. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CCHE habitability, determining CCHE unfiltered inleakage as required by paragraph 3.

# PROGRESS ENERGY FLORIDA, INC.

# CRYSTAL RIVER - UNIT 3

# DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

## License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process

## ATTACHMENT 3

## PROPOSED REVISED OPERATING LICENSE AND IMPROVED TECHNICAL SPECIFICATION PAGES

## REVISION BAR FORMAT

Fire Zone AB-95-3U
The portion of the fire zone that can be locked will be locked and the keys will be administratively controlled. Entries will be limited to only operationally necessary activities and require inspection for transient combustible materials upon exit. The portion of the zone that cannot be locked will be observed by the roving fire watch. No hot or spark producing work will be conducted.

2.C.(14) Upon implementation of Amendment xxx adopting TSTF-448, Revision 3, the determination of control complex habitability envelope (CCHE) unfiltered air inleakage as required by Surveillance Requirement (SR) 3.7.12.4, in accordance with ITS 5.6.2.21.3(i), and the assessment of CCHE habitability as required by ITS 5.6.2.21.3(ii), shall be considered met. Following implementation:

a) The first performance of SR 3.7.12.4, in accordance with Specification 5.6.2.21.3(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from May 18, 2007, the date of the most recent successful tracer gas test.

b) The first performance of the periodic assessment of CCHE habitability, ITS 5.6.2.21.3(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from May 18, 2007, the date of the most recent successful tracer gas test.

2.D The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21 is entitled: "Crystal River Nuclear Power Plant Security, Training and Qualification, and Safeguards Contingency Plan, Revision 0" submitted by letter dated September 30, 2004, as supplemented by letter dated October 20, 2004.

2.D.(3) "Crystal River Nuclear Plant Unit 3 Security Training and Qualification Plan", Revision 3, dated December 30, 1981, submitted by letter dated March 19, 1982, and consisting of all previous revisions. This plan shall be followed in accordance with 10 CFR 73.55(b)(4), 60 days after approval by the Commission. All security personnel, as required in the above plans, shall be qualified within two years of this approval. The licensee may make changes to this plan without prior Commission approval if the changes do not decrease the safeguards effectiveness of the plan. The licensee shall maintain records of and submit reports concerning such changes in the same manner as required for changes made to the Security Plan and Safeguards Contingency Plan pursuant to 10 CFR 50.54(p).

3.7 PLANT SYSTEMS

3.7.12 Control Room Emergency Ventilation System (CREVS)

LCO 3.7.12 Two CREVS trains shall be OPERABLE.

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**NOTE**

The control complex habitability envelope (CCHE) boundary may be opened intermittently under administrative control.

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

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One CREVS train inoperable for reasons other than Condition B. | A.1 Restore CREVS train to OPERABLE status. | 7 days |
| B. One or more CREVS trains inoperable due to inoperable CCHE boundary. | B.1 Initiate action to implement mitigating actions.<br><br>AND<br><br>B.2 Verify mitigating actions ensure CCHE occupant exposures to radiological hazards will not exceed limits.<br><br>AND<br><br>B.3 Restore CCHE boundary to OPERABLE status. | Immediately<br><br><br><br>24 hours<br><br><br><br><br><br>90 days |

(continued)

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.12.1 | Operate each CREVS train for $\geq$ 15 minutes. | 31 days |
| SR 3.7.12.2 | Perform required CREVS filter testing in accordance with the Ventilation Filter Testing Program. | In accordance with the Ventilation Filter Testing Program |
| SR 3.7.12.3 | Verify each CREVS train actuates to the emergency recirculation mode on an actual or simulated actuation signal. | 24 months |
| SR 3.7.12.4 | Perform required CCHE unfiltered air inleakage testing in accordance with Control Complex Habitability Envelope Integrity Program. | In accordance with the Control Complex Habitability Envelope Integrity Program |

## 5.6 Procedures, Programs and Manuals

### 5.6.2.21 Control Complex Habitability Envelope Integrity Program

A Control Complex Habitability Envelope Integrity Program shall be established and implemented to ensure that CCHE habitability is maintained such that, with an OPERABLE Control Room Emergency Ventilation System (CREVS), CCHE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CCHE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident. The program shall include the following elements.

1. The definition of the CCHE and the CCHE boundary.

2. Requirements for maintaining the CCHE boundary in its design condition including configuration control and preventive maintenance.

3. Requirements for (i) determining the unfiltered air inleakage past the CCHE boundary into the CCHE 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 CCHE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

4. The quantitative limits on unfiltered air inleakage into the CCHE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph 3. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences.

5. The provisions of SR 3.0.2 are applicable to the frequencies for assessing CCHE habitability, determining CCHE unfiltered inleakage as required by paragraph 3.

# PROGRESS ENERGY FLORIDA, INC.

# CRYSTAL RIVER - UNIT 3

# DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

## License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process

## ATTACHMENT 4

## REGULATORY COMMITMENTS

## Regulatory Commitments

The following table identifies those actions committed to by Florida Power Corporation (FPC) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Paul Infanger, Supervisor, Licensing & Regulatory Programs at (352) 563-4796.

| Regulatory Commitments | Due date/event |
|---|---|
| There are no new regulatory commitments contained in this submittal. | |

**PROGRESS ENERGY FLORIDA, INC.**

**CRYSTAL RIVER - UNIT 3**

**DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72**

# License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process

## ATTACHMENT 5

## PROPOSED IMPROVED TECHNICAL SPECIFICATION BASES PAGES

~~Strikeout Text~~ Indicates Deleted Text
Shadowed Text Indicates Added Text

B 3.7 PLANT SYSTEMS

B 3.7.12 Control Room Emergency Ventilation System (CREVS)

BASES

BACKGROUND

The principal function of the Control Room Emergency Ventilation System (CREVS) is to provide an enclosed environment from which the plant can be operated following an uncontrolled release of radioactivity, ~~or toxic gas~~ hazardous chemicals or smoke.

The CREVS consists of two trains that recirculate and filter the air in the control complex habitability envelope (CCHE) and a CCHE boundary that limits the inleakage of unfiltered air. ~~with~~ mMuch of the non-safety related equipment is common to both trains ~~and~~ with two independent, redundant components supplied for major items of safety related equipment (Ref. 1). The major equipment consists of the normal duty filter banks, the emergency filters, air handling heat exchangers, the normal duty and emergency duty supply fans, and the return fans. The normal duty filters consist of one bank of glass fiber roughing filters. The emergency filters consist of a roughing filter similar to the normal filters, high efficiency particulate air (HEPA) filters, and activated charcoal adsorbers for removal of gaseous activity (principally iodine). The rest of the system, consisting of supply and return ductwork, dampers, and instrumentation, is not designed with redundant components. However, redundant dampers are provided for isolation of the ventilation system from the surrounding environment.

The ~~Control Complex Habitability Envelope (CCHE)~~ is the space within the Control Complex served by CREVS. This includes Control Complex floor elevations from 108 through 180 feet and the stair enclosure from elevation 95 to 198 feet~~.~~, including the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CCHE is protected during normal operation, natural events, and accident conditions. The elements which compromise the CCHE are walls, doors, a roof, floors, floor drains, penetration seals, and ventilation isolation dampers. Together the CCHE and CREVS provide an enclosed environment from which the plant can be operated following an uncontrolled release of radioactivity, ~~or toxic gas~~ hazardous chemicals or smoke.

(continued)

BASES

BACKGROUND (continued)

The OPERABILITY of the CCHE boundary must be maintained to ensure that the inleakage of unfiltered air into the CCHE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CCHE occupants. The CCHE and its boundary are defined in the Control Complex Habitability Envelope Integrity Program.

CREVS has a normal operation mode and two recirculation modes. During normal operation, the system provides filtered, conditioned air to the control complex, including the controlled access area (CA) on the 95 foot elevation. When switched to the recirculation mode, isolation dampers close isolating the discharge to the controlled access area and isolating the outside air intake. In this mode the system recirculates filtered air through the CCHE.

The control complex normal duty ventilation system is operated from the control room and runs continuously. During normal operation, the outside air intake damper is partially open, the atmospheric relief discharge damper is closed, the discharge to the CA is open, and the system return damper is throttled. This configuration allows a controlled amount of outside air to be admitted to the control complex. The design temperature maintained by the system is 75°F at a relative humidity of 50%.

Two signals will cause the system to automatically switch to the recirculation modes of operation.

1. Engineered Safeguards Actuation System (ESAS) signal (high reactor building pressure).

2. High radiation signal from the return duct radiation monitor RM-A5.

The recirculation modes isolate the CCHE from outside air to ensure a habitable environment for the safe shutdown of the plant. In these modes of operation, the controlled access area is isolated from the CCHE.

Upon detection of ESAS, the system switches to the normal recirculation mode. In this mode, dampers for the outside air intake and the exhaust to the CA will automatically close, isolating the CCHE from outside air exchange, and the system return damper will open thus allowing air in the CCHE to be recirculated. Additionally, the CA fume hood exhaust fan, CA fume hood auxiliary supply fan, and CA

(continued)

BASES

BACKGROUND (continued)

exhaust fans are de-energized and their corresponding isolation dampers close. The return fan, normal filters, normal fan, and the cooling (or heating) coils remain in operation in a recirculating mode.

Upon detection of high radiation by RM-A5 the system switches to the emergency recirculation mode. In this mode, the dampers that isolate the CCHE from the surroundings will automatically close. The CA fume hood exhaust fan, CA fume hood auxiliary supply fan, CA exhaust fan, normal supply fan, and return fan are tripped and their corresponding isolation dampers close. Manual action is required to restart the return fan and place the emergency fans and filters in operation. The cooling (or heating) coils remain in operation.

The CREVS is designed to maintain a habitable environment in the CCHE for 30 days of continuous occupancy after a DBA, without exceeding a 5 rem total effective dose equivalent (TEDE).

APPLICABLE SAFETY ANALYSIS

During emergency operations the design basis of the CREVS and the CCHE is to provide radiation protection to the control room occupants. The limiting accident which may threaten the habitability of the control room (i.e., accidents resulting in release of airborne radioactivity) is the postulated Control Rod Ejection accident. The consequences of this event result in the limiting radiological source term for the control room habitability evaluation (Ref. 2). The CREVS and the CCHE ensures that the control room will remain habitable following all postulated design basis events, maintaining exposures to control room occupants within the limits of GDC 19 of 10 CFR 50 Appendix A (Ref. 3).

The analysis of hazardous chemical releases demonstrates operator actions can be taken to ensure that the toxicity limits are not exceeded prior to donning protective equipment in the CCHE following a hazardous chemical release. The CREVS can also be used to provide protection from smoke hazards for the CCHE occupants. The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CCHE occupants to control the reactor either from the control room or from the remote shutdown panels.

The CREVS is not in the primary success path for any accident analysis. However, the Control Room Emergency Ventilation System meets Criterion 3 of the NRC Policy Statement since long term control room habitability is essential to mitigation of accidents resulting in atmospheric fission product release.

BASES

LCO

Two trains of the control room emergency ventilation system are required to be OPERABLE to ensure that at least one is available assuming a single active failure disables the other train. Failure to meet the LCO could result in the control room becoming uninhabitable in the unlikely event of an accident. Total system failure, such as from a loss of both ventilation trains or from an inoperable CCHE boundary, could result in exceeding a dose of 5 rem TEDE to the CCHE occupants in the event of a large radioactive release.

The required CREVS trains must be independent to the extent allowed by the design which provides redundant components for the major equipment as discussed in the BACKGROUND section of this bases. OPERABILITY of the CREVS requires the following as a minimum:

a. A Control Complex Emergency Duty Supply Fan is OPERABLE;

b. A Control Complex Return Fan is OPERABLE;

c. HEPA filter and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions;

d. Ductwork and dampers are OPERABLE, and air circulation can be maintained; and

e. the CCHE is intact as discussed below.

~~The CCHE boundary including the integrity of the doors, walls, roof, floors, floor drains, penetration seals, and ventilation isolation dampers must be maintained within the assumptions of the design calculations.~~ Breaches in the CCHE must be controlled to provide assurance that the CCHE remains capable of performing its function.

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

If CCHE integrity cannot be maintained within limits, the CCHE is rendered inoperable and entry into LCO Condition B is required. If the Required Actions of ~~LCO~~ Condition B ~~is~~ are not met within the respective Completion Times, then Condition C must be entered.

(continued)

BASES

LCO (continued)

The LCO is modified by a Note allowing the CCHE boundary to be opened intermittently under administrative controls. This Note only applies to openings in the CCHE 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 person(s) entering or exiting the area. For other designed openings such as hatches, panels and access ports, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the opening and to restore the CCHE boundary to a condition equivalent to the design condition when a need for CCHE isolation is indicated.

The ability to maintain temperature in the Control Complex is addressed in Technical Specification 3.7.18.

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREVS must be OPERABLE to ensure that the CCHE will remain habitable during and following a postulated accident.

ACTIONS

A.1

With one CREVS train inoperable for reasons other than an inoperable CCHE boundary, action must be taken to restore the train to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREVS train is adequate to perform the radiation protection function for control room ~~operators~~ occupants. 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 an accident occurring during this time period, and ability of the remaining train to provide the required capability.

(continued)

BASES

ACTIONS (continued)

B.1, B.2 and B.3

~~With the CCHE inoperable, the CREVS trains cannot perform their intended functions. Actions must be taken to restore an OPERABLE CCHE boundary within 24 hours. During the time frame that the CCHE boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radiation, toxic chemicals and smoke. Restoration of the CCHE boundary is not limited to returning the boundary to its previous condition, but can also be accomplished using temporary sealing measures as described in plant procedures and/or work instructions.~~

~~Condition B will permit maintenance and modification to the habitability envelope boundary. It also will provide the opportunity to repair the boundary in a time frame consistent with the safety significance. Breaches in the envelope, that are either planned or discovered, may be evaluated in accordance with design basis documents to determine if the CCHE remains OPERABLE. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour completion time is reasonable based on the low probability of a significant release occurring during this time and the use of compensatory measures.~~

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

During the period that the CCHE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CCHE occupants from the potential hazards of a radiological event. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that CCHE occupant radiological exposure will not exceed the calculated dose of the licensing basis analysis of DBA consequences. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CCHE 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

(continued)

BASES

ACTIONS (continued)

B.1, B.2 and B.3 (continued)

reasonable based on the determination that the mitigating actions will ensure protection of CCHE occupants within analyzed limits while limiting the probability the CCHE occupants will have to complement 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 CCHE boundary.

C.1 and C.2

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

D.1

If both CREVS trains are inoperable for reasons other than an inoperable CCHE the CREVS may not be capable of performing the intended function and the plant is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month adequately checks proper function of this system. Systems such as the CR-3 design without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.

SR 3.7.12.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREVS filter tests are in accordance with Regulatory Guide 1.52, (Ref. 4) as described in the

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.2 (continued)

VFTP Program description (FSAR, Section 9.7.4). The VFTP includes testing HEPA filter performance, charcoal absorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.3

This SR verifies that each CREVS train actuates to place the control complex into the emergency recirculation mode on an actual or simulated actuation signal. The Frequency of 24 months is based on industry operating experience and is consistent with the typical fuel cycle length.

SR 3.7.12.4

~~This SR verifies that CCHE integrity is maintained. The details of the program are contained in the Control Complex Habitability Envelope Integrity Program, which is required by Technical Specification 5.6.2.21. Failure to meet individual program requirements does not necessarily make the CCHE inoperable. Each individual failure should be evaluated in accordance with design basis documents to determine if the CCHE can still perform its safety function. If the CCHE can still function as required in the design basis analysis, the system remains OPERABLE.~~

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

The CCHE is considered habitable when the radiological dose to CCHE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE. This SR verifies that the unfiltered air inleakage into the CCHE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.4 (continued)

than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CCHE boundary to OPERABLE status provided mitigating actions can ensure that the CCHE 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. 5) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 6). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 7). Options for restoring the CCHE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CCHE 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 CCHE boundary has been restored to OPERABLE status.

REFERENCES

1. FSAR, Section 9.7.2.1.g.

2. FPC Calculation N-00-0006.

3. 10 CFR 50, Appendix A, GDC 19.

4. Regulatory Guide 1.52, Rev. ~~2~~3, ~~1978~~ 2001.

5. Regulatory Guide 1.196

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

7. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2005, "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).

# PROGRESS ENERGY FLORIDA, INC.

## CRYSTAL RIVER - UNIT 3

## DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

**License Amendment Request No. 299, Revision 0, Application to Revise Technical Specifications Regarding Control Room Envelope Habitability in Accordance with TSTF-448, Revision 3, Using the Consolidated Line Item Improvement Process**

## ATTACHMENT 6

## PROPOSED IMPROVED TECHNICAL SPECIFICATION BASES PAGES

## REVISION BAR FORMAT

B 3.7 PLANT SYSTEMS

B 3.7.12 Control Room Emergency Ventilation System (CREVS)

BASES

BACKGROUND

The principal function of the Control Room Emergency Ventilation System (CREVS) is to provide an enclosed environment from which the plant can be operated following an uncontrolled release of radioactivity, hazardous chemicals or smoke.

The CREVS consists of two trains that recirculate and filter the air in the control complex habitability envelope (CCHE) and a CCHE boundary that limits the inleakage of unfiltered air. Much of the non-safety related equipment is common to both trains with two independent, redundant components supplied for major items of safety related equipment (Ref. 1). The major equipment consists of the normal duty filter banks, the emergency filters, air handling heat exchangers, the normal duty and emergency duty supply fans, and the return fans. The normal duty filters consist of one bank of glass fiber roughing filters. The emergency filters consist of a roughing filter similar to the normal filters, high efficiency particulate air (HEPA) filters, and activated charcoal adsorbers for removal of gaseous activity (principally iodine). The rest of the system, consisting of supply and return ductwork, dampers, and instrumentation, is not designed with redundant components. However, redundant dampers are provided for isolation of the ventilation system from the surrounding environment.

The CCHE is the space within the Control Complex served by CREVS. This includes Control Complex floor elevations from 108 through 180 feet and the stair enclosure from elevation 95 to 198 feet, including the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CCHE is protected during normal operation, natural events, and accident conditions. The elements which compromise the CCHE are walls, doors, a roof, floors, floor drains, penetration seals, and ventilation isolation dampers. Together the CCHE and CREVS provide an enclosed environment from which the plant can be operated following an uncontrolled release of radioactivity, hazardous chemicals or smoke.

(continued)

BASES

BACKGROUND (continued)

The OPERABILITY of the CCHE boundary must be maintained to ensure that the inleakage of unfiltered air into the CCHE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CCHE occupants. The CCHE and its boundary are defined in the Control Complex Habitability Envelope Integrity Program.

CREVS has a normal operation mode and two recirculation modes. During normal operation, the system provides filtered, conditioned air to the control complex, including the controlled access area (CA) on the 95 foot elevation. When switched to the recirculation mode, isolation dampers close isolating the discharge to the controlled access area and isolating the outside air intake. In this mode the system recirculates filtered air through the CCHE.

The control complex normal duty ventilation system is operated from the control room and runs continuously. During normal operation, the outside air intake damper is partially open, the atmospheric relief discharge damper is closed, the discharge to the CA is open, and the system return damper is throttled. This configuration allows a controlled amount of outside air to be admitted to the control complex. The design temperature maintained by the system is 75°F at a relative humidity of 50%.

Two signals will cause the system to automatically switch to the recirculation modes of operation.

1. Engineered Safeguards Actuation System (ESAS) signal (high reactor building pressure).

2. High radiation signal from the return duct radiation monitor RM-A5.

The recirculation modes isolate the CCHE from outside air to ensure a habitable environment for the safe shutdown of the plant. In these modes of operation, the controlled access area is isolated from the CCHE.

Upon detection of ESAS, the system switches to the normal recirculation mode. In this mode, dampers for the outside air intake and the exhaust to the CA will automatically close, isolating the CCHE from outside air exchange, and the system return damper will open thus allowing air in the CCHE to be recirculated. Additionally, the CA fume hood exhaust fan, CA fume hood auxiliary supply fan, and CA

(continued)

BASES

BACKGROUND (continued)

exhaust fans are de-energized and their corresponding isolation dampers close. The return fan, normal filters, normal fan, and the cooling (or heating) coils remain in operation in a recirculating mode.

Upon detection of high radiation by RM-A5 the system switches to the emergency recirculation mode. In this mode, the dampers that isolate the CCHE from the surroundings will automatically close. The CA fume hood exhaust fan, CA fume hood auxiliary supply fan, CA exhaust fan, normal supply fan, and return fan are tripped and their corresponding isolation dampers close. Manual action is required to restart the return fan and place the emergency fans and filters in operation. The cooling (or heating) coils remain in operation.

The CREVS is designed to maintain a habitable environment in the CCHE for 30 days of continuous occupancy after a DBA, without exceeding a 5 rem total effective dose equivalent (TEDE).

APPLICABLE SAFETY ANALYSIS

During emergency operations the design basis of the CREVS and the CCHE is to provide radiation protection to the control room occupants. The limiting accident which may threaten the habitability of the control room (i.e., accidents resulting in release of airborne radioactivity) is the postulated Control Rod Ejection accident. The consequences of this event result in the limiting radiological source term for the control room habitability evaluation (Ref. 2). The CREVS and the CCHE ensures that the control room will remain habitable following all postulated design basis events, maintaining exposures to control room occupants within the limits of GDC 19 of 10 CFR 50 Appendix A (Ref. 3).

The analysis of hazardous chemical releases demonstrates operator actions can be taken to ensure that the toxicity limits are not exceeded prior to donning protective equipment in the CCHE following a hazardous chemical release. The CREVS can also be used to provide protection from smoke hazards for the CCHE occupants. The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CCHE occupants to control the reactor either from the control room or from the remote shutdown panels.

The CREVS is not in the primary success path for any accident analysis. However, the Control Room Emergency Ventilation System meets Criterion 3 of the NRC Policy Statement since long term control room habitability is essential to mitigation of accidents resulting in atmospheric fission product release.

BASES

LCO

Two trains of the control room emergency ventilation system are required to be OPERABLE to ensure that at least one is available assuming a single active failure disables the other train. Failure to meet the LCO could result in the control room becoming uninhabitable in the unlikely event of an accident. Total system failure, such as from a loss of both ventilation trains or from an inoperable CCHE boundary, could result in exceeding a dose of 5 rem TEDE to the CCHE occupants in the event of a large radioactive release.

The required CREVS trains must be independent to the extent allowed by the design which provides redundant components for the major equipment as discussed in the BACKGROUND section of this bases. OPERABILITY of the CREVS requires the following as a minimum:

a. A Control Complex Emergency Duty Supply Fan is OPERABLE;

b. A Control Complex Return Fan is OPERABLE;

c. HEPA filter and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions;

d. Ductwork and dampers are OPERABLE, and air circulation can be maintained; and

e. the CCHE is intact as discussed below.

Breaches in the CCHE must be controlled to provide assurance that the CCHE remains capable of performing its function.

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

If CCHE integrity cannot be maintained within limits, the CCHE is rendered inoperable and entry into LCO Condition B is required. If the Required Actions of Condition B are not met within the respective Completion Times, then Condition C must be entered.

(continued)

BASES

LCO (continued)

The LCO is modified by a Note allowing the CCHE boundary to be opened intermittently under administrative controls. This Note only applies to openings in the CCHE 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 person(s) entering or exiting the area. For other designed openings such as hatches, panels and access ports, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with the operators in the control room. This individual will have a method to rapidly close the opening and to restore the CCHE boundary to a condition equivalent to the design condition when a need for CCHE isolation is indicated.

The ability to maintain temperature in the Control Complex is addressed in Technical Specification 3.7.18.

APPLICABILITY

In MODES 1, 2, 3, and 4, the CREVS must be OPERABLE to ensure that the CCHE will remain habitable during and following a postulated accident.

ACTIONS

A.1

With one CREVS train inoperable for reasons other than an inoperable CCHE boundary, action must be taken to restore the train to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREVS train is adequate to perform the radiation protection function for control room occupants. 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 an accident occurring during this time period, and ability of the remaining train to provide the required capability.

(continued)

BASES

ACTIONS (continued)

B.1, B.2 and B.3

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

During the period that the CCHE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CCHE occupants from the potential hazards of a radiological event. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that CCHE occupant radiological exposure will not exceed the calculated dose of the licensing basis analysis of DBA consequences. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CCHE 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 CCHE occupants within analyzed limits while limiting the probability the CCHE occupants will have to complement 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 CCHE boundary.

C.1 and C.2

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

(continued)

BASES

ACTIONS (continued)

D.1

If both CREVS trains are inoperable for reasons other than an inoperable CCHE the CREVS may not be capable of performing the intended function and the plant is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. Since the environment and normal operating conditions on this system are not severe, testing each train once every month adequately checks proper function of this system. Systems such as the CR-3 design without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.

SR 3.7.12.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREVS filter tests are in accordance with Regulatory Guide 1.52, (Ref. 4) as described in the VFTP Program description (FSAR, Section 9.7.4). The VFTP includes testing HEPA filter performance, charcoal absorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.12.3

This SR verifies that each CREVS train actuates to place the control complex into the emergency recirculation mode on an actual or simulated actuation signal. The Frequency of 24 months is based on industry operating experience and is consistent with the typical fuel cycle length.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.4

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

The CCHE is considered habitable when the radiological dose to CCHE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE. This SR verifies that the unfiltered air inleakage into the CCHE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CCHE boundary to OPERABLE status provided mitigating actions can ensure that the CCHE 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. 5) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 6). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 7). Options for restoring the CCHE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CCHE 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 CCHE boundary has been restored to OPERABLE status.

BASES

REFERENCES

1. FSAR, Section 9.7.2.1.g.

2. FPC Calculation N-00-0006.

3. 10 CFR 50, Appendix A, GDC 19.

4. Regulatory Guide 1.52, Rev. 3, 2001.

5. Regulatory Guide 1.196

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

7. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2005, "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).