Entergy

Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249
Tel 914 734 6700

J.E. Pollock
Site Vice President
Indian Point Energy Center

September 18, 2008

Re: Indian Point Units 2 and 3
Docket Nos. 50-247 and 50-286

NL-08-137

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

SUBJECT: Reply to Request for Additional Information Regarding Amendment Application on Control Room Envelope Habitability (TAC MD7523 and MD7524)

REFERENCES:

1. NRC letter dated July 28, 2008 "Request for Additional Information Regarding Amendment Application on Control Room Envelope Habitability (TAC MD7523 and MD7524)
2. Entergy Letter to NRC (NL-07-101), "License Amendment Request to Adopt TSTF-448, Revision 3 Regarding Control Room Envelope Habitability" dated December 18, 2007

Dear Sir or Madam:

Entergy Nuclear Operations, Inc (Entergy) is providing the additional information requested in Reference 1 regarding the proposed technical specification changes (Reference 2) for Control Room Habitability. During a conference call the week of August 18, 2008, Entergy requested and was granted an extension to reply to these questions as discussed.

The responses to questions are provided in Attachment 1. Attachment 2 contains a markup of the revised Unit 3 Technical Specification as discussed in reference 1. The conclusions of the No Significant Hazards Evaluation documented in Reference 2 are not changed by the additional information provided in this response

A102
NRR

There are no new commitments identified in this submittal. If you have any questions or require additional information, please contact Mr. R. Walpole, Manager, Licensing at (914) 734-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 9-18-2008.

Sincerely,

J. E. Pollock
Site Vice President
Indian Point Energy Center

Attachments:
1. Reply to NRC Request for Additional Information Regarding Amendment Application on Control Room Envelope Habitability
2. Markup of Unit 3 Technical Specification Changes and Bases Changes Regarding Control Room Envelope Habitability

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR
Mr. Samuel J. Collins, Regional Administrator, NRC Region I
NRC Senior Resident Inspectors
Mr. Robert Callender, Vice President, NYSERDA
Mr. Paul Eddy, New York State Dept. of Public Service

ATTACHMENT 1 TO NL-08-137

REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING AMENDMENT APPLICATION ON REGARDING CONTROL ROOM ENVELOPE HABITABILITY

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3
DOCKET NOS. 50-247 AND 50-286

In a letter dated December 18, 2007, Entergy Nuclear Operations, Inc. (Entergy) submitted an application for a proposed amendment to the Technical Specifications (TS) and license which would revise control room habitability consistent with TSTF 448. The NRC requested additional information in a letter dated July 28, 2008. The Nuclear Regulatory Commission staff questions and the Entergy responses are all related to Unit 3 and there are no changes to the Unit 2 submittal of proposed changes. The questions and responses are as follows:

Question 1

Explain how not adopting the license commitment associated with NRC approved TSTF-51, Rev. 2, ensures that the lowest functional capability or performance levels of the Control Room Ventilation System required for safe operation of the facility is met per 10 CFR 50.36(d)(2)(i).

Background:

10 CFR 50.36(d)(2)(i) states Technical Specifications (TS) will include Limiting Conditions for operations (LCO) which "are the lowest functional capability or performance levels of equipment required for safe operation of the facility." LCO 3.7.11, "Control Room Ventilation System (CRVS)," is retained in the TS in order to ensure that 10 CFR 50.36(d)(2)(i) is met. The proposed Applicability for LCO 3.7.11 adds the phrase "During movement of recently irradiated fuel assemblies." This phrase was approved by the NRC for individual licensee adoption under TSTF-51, Rev. 2, "Revise containment requirements during handling irradiated fuel and core alterations." However, licensees adding the term "recently" under TSTF-51, Rev.2, must make the following commitment which is consistent with draft NUMARC 93-01, Revision 3, Section 11.2.6 "Safety Assessment for Removal of Equipment from Service During Shutdown Conditions", subheading "Containment – Primary (PWR)/Secondary(BWR)."

"The following guidelines are included in the assessment of systems removed from service during movement of irradiated fuel:

- During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from the fuel. Following shutdown, radioactivity in the fuel decays away fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay.

- A single normal or contingency method to promptly close primary or secondary containment penetrations should be developed. Such prompt methods need not completely block the penetration or be capable of resisting pressure.

The purpose of the "prompt methods" mentioned above are to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored."

For licensee consideration, TSTF-51, Rev. 2, was not approved under the CLIIP process.

As a result, technical branch review is required for adoption of the term "recently." Therefore approval of this LAR associated with Indian Point, Unit 3, will need to be done outside of the CLIIP process if the licensee wishes to adopt the term "recently."

Response:

A telecom was held with the NRC regarding this and the other questions associated with the request for additional information. The addition of the terminology "During movement of recently irradiated fuel assemblies" to the Applicability section of the TS by Entergy was intended to allow the provisions of TSTF-448 related to fuel handling movements to be included. As noted by the question, the opposite effect was true since it represented a change made in TSTF-51. The discussion identified that two approaches were acceptable. Remove the Applicability statement, "During movement of recently irradiated fuel assemblies," and the associated Condition E or keep the Applicability Statement and add Conditions E and F that are the same as Unit 2. Entergy decided to select the second option in order to keep the TS more consistent with the Standard TS and with Unit 2.

Attachment 2 contains the marked up TS for Unit 3. The markup adds Conditions E and F that are the same as Conditions D and E in the marked up TS in TSTF-448 so they represent TS conditions previously approved by the NRC. The revised TS 3.7.11 now matches the Unit 2 TS as marked up for TSTF-448. Question 4 discusses why the NRC found the Unit 3 TS to be non-conservative without these conditions when the Applicability includes "During movement of recently irradiated fuel assemblies." Question 2 discusses why prior amendments provide the bases, previously approved, for adding "During movement of recently irradiated fuel assemblies" to the Applicability.

The markup in Attachment 2 revises TS 3.7.11 as follows:

> Add a new Condition E that reads "One CRVS train inoperable during movement of recently irradiated fuel assemblies." The associated Required Action reads "E.1 Place OPERABLE CRVS train in pressurization mode. <u>OR</u> E.2 Suspend movement of recently irradiated fuel assemblies." The Completion Time for each required action is immediately.
>
> Revise the proposed Condition E by renumbering it as Condition F. Revise the new Condition F by adding "Two CRVS trains inoperable during movement of recently irradiated fuel assemblies. OR" in front of the currently proposed Condition that reads "One or more CRVS trains inoperable due to an inoperable CRE boundary during movement of recently irradiated fuel assemblies." The Required Action and the Completion Time remain unchanged except for the numbering.

The TS Bases are being revised to reflect this change adopting the wording from the Unit 2 Bases for the same Conditions.

This is regarded as an administrative change due to the incorporation of TSTF 448 so that no change to the significant hazards analysis is required. The TSTF 448 has a condition that says "One or more CRVS trains inoperable due to an inoperable CRE boundary during movement of recently irradiated fuel assemblies." In order to add this provision it is necessary to add the applicability statement "During movement of recently irradiated fuel assemblies" to the TS.

When the applicability statement is added, the Conditions A and C become non-conservative unless the provisions discussed in Conditions E and F, discussed above, are added. The technical bases for these changes have been previously approved by the NRC. Question 2 discusses the technical bases approved for the change to the applicability statement (TSTF 51) and TSTF-448 reflects the Conditions E and F being added.

Question 2

Provide confirmation that the analysis approved by the NRC for Amendment 224 supports adoption of TSTF-51, Rev. 2, thereby ensuring that the lowest functional capability or performance levels of the Control Room Ventilation System required for safe operation of the facility is met per 10 CFR 50.36(d)(2)(i).

Background:

10 CFR 50.36(d)(2)(i) states Technical Specifications (TS) will include Limiting Conditions for Operations (LCO) which "are the lowest functional capability or performance levels of equipment required for safe operation of the facility." LCO 3.7.11, "Control Room Ventilation System (CRVS)," is retained in the TS in order to ensure that 10 CFR 50.36(d)(2)(i) is met.

The proposed Applicability for LCO 3.7.11 adds the phrase "During movement of recently irradiated fuel assemblies." This phrase was approved by the NRC for individual licensee adoption under TSTF-51, Rev. 2, "Revise containment requirements during handling irradiated fuel and core alterations." The addition of the term "recently" associated with handling irradiated fuel is only applicable to those licensees who have demonstrated by analysis that after sufficient radioactive decay has occurred, off-site doses resulting from a fuel handling accident remain below the Standard Review Plan limits (well within 10CFR100). This analysis appears to have been approved by the NRC for Indian Point, Unit 3, Amendment 224 (ML050750431). However, the licensee needs to provide confirmation that the analysis approved by the NRC for Amendment 224 supports adoption of the term "recently."

Response

Entergy initially submitted a TS amendment request for the partial adoption of the Alternate Source Term (AST) on June 2, 2002 (NL-02-044, "Proposed Changes to Technical Specifications: Selective Adoption of Alternate Source Term and Incorporation of Generic Changes; TSTF-51, TSTF-68, and TSTF-312"). The dose analysis took no credit for automatic isolation of the Control Room (CR) HVAC system and allows an interval of twenty minutes for operator action to manually establish HVAC emergency mode after the radiation alarm sounds. The amendment request did make the following commitment:

IPN-02-044-1	ENO will establish administrative controls to ensure prompt closure of containment openings in the event of a fuel handling accident in the containment building.

The submittal described the provisions for Containment isolation as follows:

"a. Equipment hatch opening capable of being closed

Technical Specification 3.9.3.a currently requires the equipment hatch or an equipment hatch closure plate to be installed. The proposed change will allow the equipment hatch opening to be open if it is capable of being closed. This allowance will provide additional flexibility in scheduling and performing outage activities with less impact on the critical path duration. Activities that depend on service lines (e.g., electricity, water, air) fed from outside containment and the transport of materials into and out of containment can proceed safely in parallel with fuel movement.

The analysis of the fuel handing accident using the AST methodology demonstrates that regulatory dose limits are satisfied with no credit for protection provided by the containment building. Therefore, allowing the equipment hatch opening to be open is consistent with safety analysis assumptions. Technical specification requirements regarding the equipment hatch opening will be retained and administrative controls will be established to ensure closure of the equipment hatch opening in the event of a FHA to minimize potential migration of fission product activity to the outside atmosphere. The equipment hatch opening can be closed by the normal Equipment Hatch that is used when the plant is at power operation, or it can be closed with the use of the Outage Equipment Hatch (OEH) that has been designed and evaluated for use with the plant in Mode 6, Refueling. The OEH also has a personnel access door and penetrations for service lines such as power cords and air / water hoses. The proposed new specification will allow the Equipment Hatch, the OEH, or the access doors / penetrations in these hatches to be open and capable of being closed during movement of irradiated fuel. Although the safety analysis does not credit any time limit for closure, good practice dictates that this should be accomplished with minimal effort and under the authority of an individual designated to direct the response to a FHA. The administrative controls proposed by ENO to satisfy the 'capable of being closed' requirement will ensure that the equipment hatch opening can be closed within 30 minutes from the time that the designated individual directs that this action be taken. Administrative controls require that any obstructions (e.g., hoses) placed in the opening(s) can be readily removed and that specified individuals are identified and available on site to close these opening(s) when directed. This application for amendment includes a commitment from ENO to establish the administrative controls. Implementation of administrative controls is reflected in the proposed changes to the Bases. In addition, the Bases for the surveillance requirement associated with this LCO are expanded to include verification that if the openings are not closed, that they are capable of being closed.

b. Air lock doors capable of being closed

Technical Specification 3.9.3.b currently requires one door in each airlock to be closed. The proposed change adopts TSTF-68, Rev 2, which has been approved by the NRC and is incorporated into Revision 2 of NUREG-1431. This change provides the option to allow both doors in any containment personnel airlock to remain open during the movement of irradiated fuel assemblies. As

stated in the 'Reviewers Note' established by this TSTF, adopting this allowance is based on dose calculations that indicate acceptable radiological consequences and commitments from the licensee to implement administrative controls regarding prompt closure of a door in each airlock in the event of a FHA. The consequences of a FHA have been evaluated using the alternate source term methodology and acceptable radiological consequences have been demonstrated by analysis. The analysis assumptions bound the condition of having the airlock doors open, by taking no credit for holdup of fission products by the containment building. This request for amendment to the Indian Point 3 Technical Specifications includes a commitment by Entergy Nuclear Operations, Inc to implement the required administrative controls. Implementation of administrative controls is reflected in the proposed changes to the Bases.

a. Penetrations open under administrative control

Technical Specification 3.9.3.c currently requires containment penetrations to be closed, except that an operable containment purge system isolation valve can be open. The proposed change adopts TSTF-312, Rev 1, which has been approved by the NRC and is incorporated into Revision 2 of NUREG-1431. This change adds a Note to the LCO allowing penetration flow paths to be unisolated under administrative control. The adoption of this allowance is contingent on meeting the terms of a 'Reviewers Note' as discussed in item b. The revised dose analysis for the FHA bounds the condition of having containment penetrations unisolated by taking no credit for holdup of fission products by the containment building. As stated in item b, ENO is committing to administrative controls as implemented by proposed changes to the Bases."

When NL-02-044 was submitted there was no need to revise TS 3.7.11 to adopt TSTF-51 because credit had been taken for the filtration of the CR HVAC system during the fuel handling accident. The amendment requested by NL-02-044 and a supplement was approved as amendment 215 by NRC letter dated March 17, 2003 (TAC MB5382).

Subsequently, Entergy submitted a TS amendment request to adopt the full scope of the AST by letter dated June 2, 2004 (NL-04-068, "Proposed Change to Technical Specifications Regarding Full Scope Adoption of Alternate Source Term"). A supplement dated March 14, 2005 (NL-05-036, "Additional Information Regarding Indian Point 3 License Amendment Request Alternate Source Term (TAC MC3551)") noted that the most recent dose analysis that had been submitted (NL-05-026 dated February 22, 2005, "Additional Information Regarding Indian Point 3 License Amendment Request Alternate Source Term (TAC MC3551)") included a scenario with no credit for operator action for switching the CRVS mode of operation. NL-05-036 requested approval of that scenario. Tracer gas testing had been completed and the assumptions used for unfiltered inleakage bounded the test results. The NRC approved the full scope adoption of the alternate source term by letter dated March 22, 2005 (TAC MC3351). When NL-04-068 and its supplements were submitted, there was no need to revise TS 3.7.11 to adopt TSTF-51 because the TS did not have the words "During movement of irradiated fuel assemblies" in the TS applicability section.

Entergy concludes that the analysis approved by the NRC for Amendment 224 and the commitments made to support Amendment 215 supports adoption of TSTF-51, Rev. 2, thereby

ensuring that the lowest functional capability or performance levels of the Control Room Ventilation System required for safe operation of the facility is met per 10 CFR 50.36(d)(2)(i).

Question 3

Explain how Criterion 3 of 10 CFR 50.36(d)(2)(ii) would be satisfied if there is an allowance in LCO 3.7.11 to move fuel prior to 84 hours after shutdown, when the FSAR does not support such movements.

Background:

In Section 14.2.1, "Fuel Handling Accidents" of the Indian Point Unit 3 FSAR, an assumption is stated as "No movement of irradiated fuel in the reactor is made until the reactor has been subcritical for at least 84 hours." The proposed Bases for LCO 3.7.11, "Control Room Ventilation System (CRVS)," state that the applicability of the LCO is "during the movement of recently irradiated fuel (i.e. fuel that has occupied part of a critical reactor core within the previous 84 hours)." As a result, the statement in the Bases could be used as an allowance to allow fuel movements prior to 84 hours after shutdown, if the CRVS was operable. This is contrary to the analysis in the FSAR.

Criterion 3 of 10 CFR 50.36(d)(2)(ii) states a technical specification limiting condition for operation of a nuclear reactor must be established for "a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier." It is unclear how Criterion 3 of 10 CFR 50.36(d)(2)(ii) would be met if fuel movements prior to 84 hours after shutdown were allowed when the FSAR does not support such movements. As an example for reference, the Indian Point Unit 2 FSAR has a similar analysis, and the Indian Point Unit 2 Bases have a statement of the "Technical Requirements Manual (TRM) 3.9.A, 'Decay Time – Refueling,' (Ref. 5) prevents any movement of recently irradiated fuel by prohibiting movement of any fuel in the reactor until 84 hours after reactor shutdown.

Response

The Applicability in the Bases for LCO 3.7.11 will be revised by deleting the first two paragraphs that could be used to allow the movement of fuel prior to 84 hours after shutdown and adding two paragraphs so that they will read the same as the Unit 2 LCO Bases. The Unit 2 Bases do not provide this allowance. The two paragraphs read as follows:

> "In MODES 1, 2, 3 and 4, CRVS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.
>
> During movement of recently irradiated fuel assemblies, the CRVS must be OPERABLE to cope with the release from a fuel handling accident involving recently irradiated fuel. The CRVS is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 84 hours), due to radioactive decay."

The statement in the Unit 3 FSAR "No movement of irradiated fuel in the reactor is made until the reactor has been subcritical for at least 84 hours" has the same effect as the TRM on Unit 2 (they are both licensing basis documents with modifications controlled per 10 CFR 50.59) to prevent the movement of fuel prior to 84 hours of decay.

Criterion 3 of 10 CFR 50.36(d)(2)(ii) is satisfied since there is no longer an allowance in LCO 3.7.11 to move fuel prior to 84 hours after shutdown and this is stated in the FSAR.

Question 4

The licensee's proposed Conditions A and C are inconsistent with, and less conservative than, the approved TSTF-448, Rev. 3. Explain the basis for not requiring actions for these two Conditions in accordance with TSTF-448, Rev. 3.

Background:

For Indian Point, Unit 3, proposed Condition A is applicable during movement of recently irradiated fuel assemblies when one CRVS train is inoperable for reasons other than Condition B. No follow up actions are provided during fuel movements if the Required Actions of Condition A can not be completed within the required Completion Time of 7 days. For comparison purposes TSTF-448, Rev. 3, has a Condition D that contains follow up actions during fuel movements if the Required Actions of Condition A can not be completed within the required Completion Time of 7 days.

In addition, proposed Condition C is applicable during movement of recently irradiated fuel assemblies when two CRVS train are inoperable for reasons other than Condition B. The proposed Required Action for Condition C during movement of recently irradiated fuel assemblies is to restore one CRVS train to operable status within 72 hours. The proposed Required Actions for Condition C during movement of recently irradiated fuel assemblies is not in accordance with TSTF-448, Rev. 3, and is less conservative. TSTF-448, Rev. 3, has a Condition E that is applicable when two CRVS trains are inoperable during movement of recently irradiated fuel assemblies (regardless of whether the inoperability is due to an inoperable CRE boundary or not). The Required Actions of Condition E are to immediately suspend movement of recently irradiated fuel assemblies.

10 CFR 50.36(d)(2)(i) states "limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met." It is unclear why proposed Condition A and proposed Condition C should be permitted, as allowed by 10 CFR 50.36(d)(2)(i), given that the Conditions are not in accordance with and less conservative than the Conditions previously approved by the NRC under TSTF-448, Rev. 3.

Response

The addition of the terminology "During movement of recently irradiated fuel assemblies" was added to the applicability of proposed TS 3.7.11 in order to allow addition of the proposed condition E. When this change is made, Entergy agrees that the effect on Condition A and C is to make them non conservative. The changes proposed in response to Questions 1 propose to

leave "During movement of recently irradiated fuel assemblies" in the TS and revise Conditions E and F to address this concern.

ATTACHMENT 2 TO NL-08-137

MARKUP OF UNIT 3 TECHNICAL SPECIFICATION CHANGES AND BASES CHANGES REGARDING CONTROL ROOM ENVELOPE HABITABILITY

Bold, italics for added text ~~Strikeout~~ for deleted text

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3
DOCKET NOS. 50-247 AND 50-286

3.7 PLANT SYSTEMS

3.7.11 Control Room Ventilation System (CRVS)

LCO 3.7.11 Two CRVS trains shall be OPERABLE.

- NOTE -
The control room envelope (CRE) boundary may be opened intermittently under administrative control.

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CRVS train inoperable ***for reasons other than Condition B.***	A.1	Restore CRVS train to OPERABLE status.	7 days
B. ***One or more CRVS trains inoperable due to inoperable CRE boundary in MODE 1, 2, 3, or 4.***	***B.1***	***Initiate action to implement mitigating actions.***	***Immediately***
	AND		
	B.2	***Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.***	***24 hours***
	AND		
	B.3	***Restore CRE boundary to OPERABLE status.***	***90 days***
C~~B~~. Two CRVS trains inoperable ***for reasons other than Condition B***	***C***~~B~~.1	Restore one CRVS train to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D~~C~~. Required Action and associated Completion Time of Condition A, ~~or~~ B ***or C*** not met ***in Mode 1, 2, 3, or 4.***	~~C~~***D***.1 Be in MODE 3. AND ~~C~~***D***.2 Be in MODE 5.	6 hours 36 hours
E. One CRVS train inoperable during movement of recently irradiated fuel assemblies.	***E.1 Place OPERABLE CRVS train in pressurization mode.*** ***OR*** ***E.2 Suspend movement of recently irradiated fuel assemblies.***	***Immediately*** ***Immediately***
F. Two CRVS trains inoperable during movement of recently irradiated fuel assemblies. ***OR*** ***One or more CRVS trains inoperable due to an inoperable CRE boundary during movement of recently irradiated fuel assemblies.***	***F.1 Suspend movement of recently irradiated fuel assemblies.***	***Immediately***

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Operate each CRVS train for ≥ 15 minutes.	31 days
SR 3.7.11.2	Perform required CRVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with ***the*** VFTP
SR 3.7.11.3	Verify each CRVS train actuates on an actual or simulated actuation signal.	24 months

SURVEILLANCE		FREQUENCY
SR 3.7.11.4	***Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.*** ~~Verify one CRVS train can maintain a slight positive pressure relative to the adjacent enclosed area during the CRVS Mode 3 operation at a makeup flow rate of ≥ 1500 cfm.~~	***In accordance with the Control Room Envelope Habitability Program*** ~~24 months on a STAGGERED TEST BASIS~~

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Ventilation System (CRVS)

BASES

BACKGROUND

The CRVS provides a protected environment from which ~~operators~~ ***occupants*** can control the unit following an uncontrolled release of radioactivity, ***hazardous*** chemicals, or ***smoke*** ~~toxic gas~~.

The Control Room Ventilation System consists of the following equipment: a single filter unit consisting of two roughing filters, two high efficiency particulate air (HEPA) filters; two activated charcoal adsorbers for removal of gaseous activity (principally iodines); two 100% capacity filter booster fans; and, a single duct system including dampers, controls and associated accessories to provide for three different air flow configurations. The air-conditioning units associated with the CRVS are governed by LCO 3.7.12, "Control Room Air Conditioning System (CRACS)."

The CRVS is divided into two trains with each train consisting of a filter booster fan with its associated inlet damper, an air conditioning unit fan powered from the same safeguards power train with its associated inlet damper, and the following components which are common to both trains: the control room filter unit, Damper A (filter unit bypass for outside air makeup to the Control Room ***Envelope (CRE)***), Damper B (filter unit inlet for outside air makeup to the ***CRE*** ~~Control Room~~), and the toilet and locker room exhaust fan. The two filter booster fans (F 31 and F 32) are powered from safeguards power trains 5A (EDG 33) and 6A (EDG 32), respectively. The automatic dampers that are common to both trains are positioned in the fail-safe position (open or closed) by either of the redundant actuation channels.

The control room envelope (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

(continued)

BASES

BACKGROUND (continued)

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 Habitability Program.

The CRVS is an emergency system, parts of which operate during normal unit operations.

The three different CRVS air flow configurations are as follows:

a) CRVS Mode 2 Normal operation - Ventilation is provided to the CC~~R~~***E*** via outside air drawn through Damper A driven by the operation of the CRACS fan(s) and the toilet/locker room exhaust fan;

b) CRVS Mode 3 Incident mode with outside air makeup (known as the 10% incident mode) - Ventilation and pressurization are provided for the CC~~R~~***E*** via altered outside air drawn through Damper B, driven by the operation of the CRACS fan(s) and its associated filter booster fan;

c) CRVS Mode 4 Incident mode with no outside air makeup (i.e. 100% recirculation mode) - In this mode there is no ventilation provided to the CC~~R~~***E***. Both A and B Dampers are closed and the only associated CRVS components operating are the CRACS fan(s).

CRVS Mode 3 (10% Incident Mode) is the required method of operation during any radiological event because it provides outside air for pressurization of the ***CRE*** ~~Control Room~~. It has been demonstrated via industry experience with tracer gas testing that increased pressurization helps attenuate unfiltered inleakage.

On a Safety Injection signal or high radiation in the ***CRE*** ~~Control Room~~ (Radiation Monitor R-1), the CRVS will actuate to the CRVS Mode 3 incident mode with outside air makeup (known as the 10% incident mode). This will cause one of the two filters booster fans to start, the locker room exhaust fan to stop, and CRVS dampers to open or close as necessary to filter all incoming outside air. In the event that the first booster fan fails to start, the second booster fan will start after a predetermined time delay.

A single train***, operating at a minimal flow rate of <2000 cfm,*** will create a slight positive pressure in the ***CRE relative to external areas adjacent to the CRE boundary***

(continued)

BASES

BACKGROUND (continued)

~~control room~~. The CRVS operation in maintaining the ***CRE*** ~~control room~~ habitable is discussed in the FSAR, Section 9.9 (Ref. 1).

The ***CRE*** ~~control room~~ is continuously monitored by radiation and toxic gas detectors.

The CRVS does not actuate automatically in response to toxic gases. Separate chlorine, ammonia and oxygen probes are provided to detect the presence of these gases in the outside air intake. Additionally, monitors in the ***CRE*** ~~Control Room~~ will detect low oxygen levels and high levels of chlorine and ammonia. The CRVS may be placed in the CRVS Mode 4 incident mode with no outside air makeup (i.e. 100% recirculation mode) to respond to these conditions. Instrumentation for toxic gas monitoring is governed by the IP3 Technical Requirements Manual (TRM) (Ref. 4). Generally, the manually initiated actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.

If for any reason it is required or desired to operate with 100%
recirculated air (e.g., toxic gas condition is identified), the CRVS can be placed in the CRVS Mode 4 incident mode with no outside air makeup (i.e. 100% recirculation mode) by remote manually operated switches. The Firestat detectors will shutdown both air conditioning units associated with the CRVS, resulting in shutting the outside air dampers. However, if any filter booster fan was running at that time, it will be tripped.

The CRVS is designed in accordance with Seismic Category I requirements.

The CRVS is designed to maintain the ***CRE*** ~~control room environment~~ for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem TEDE dose.

APPLICABLE SAFETY ANALYSES

The CRVS active components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the ***CRE*** ~~control building envelope~~ provides protection from natural phenomena events. The CRVS provides airborne radiological protection for the

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

CRE occupants ~~control room operators~~, as demonstrated by the control room accident dose analyses for the most limiting design basis accident (i.e., DBA LOCA) fission product release (Ref. 3).

Radiation monitor R-1 is not required for the Operability of the Control Room Ventilation System because control room isolation is initiated by the safety injection signal in MODES 1, 2, 3, 4, and ***CRE*** ~~control room~~ isolation is not credited for maintaining radiation exposure within General Design Criteria 19 limits following a fuel handling accident or gas-decay-tank rupture.

The CRVS provides protection from smoke and hazardous chemicals to the CRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Ref. 1). 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. 1).

The worst case active failure of a component of the CRVS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function. However, the original CRVS design was not required to meet single failure criteria and, although upgraded from the original design, CRVS does not satisfy all requirements in IEEE-279 for single failure tolerance.

Each of the automatic dampers that are common to both trains is positioned in the CRVS Mode 3 (10% incident mode) fail-safe position (open or closed) by either of the redundant actuation channels.

The CRVS satisfies Criterion 3 of 10 CFR 50.36.

LCO

Two CRVS trains are required to be OPERABLE to ensure that at least one is available. 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 TEDE to the ***CRE occupants*** ~~control room~~ operator in the event of a large radioactive release.

Each ~~The~~ CRVS ***train*** is considered OPERABLE when the individual components necessary to limit ***CRE occupant*** ~~operator~~ exposure are OPERABLE in both trains. A CRVS train is OPERABLE when the associated:

(continued)

LCO (continued)

a. Filter booster fan and an air-conditioning unit fan powered from the same safeguards power train are OPERABLE;

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

c. Valves, and dampers are OPERABLE or in the incident mode, 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 CCR access doors.~~

In order for the CRVS 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, and that CRE occupants are protected from hazardous chemicals and smoke.

Criteria has been established for leakage from primary coolant sources outside of containment which could render the CCR Filter System inoperable. For more information refer to Technical Specification

5.5.2, "Primary Coolant Sources Outside of Containment" and Procedure ENN-DC-197, "Integrity of Systems Outside PWR Containment".

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.

Instrumentation for toxic gas monitoring is governed by the IP3 Technical Requirements Manual (TRM) (Ref. 4) and is not included in the LCO.

(continued)

APPLICABILITY

~~In MODES 1, 2, 3, 4 CRVS must be OPERABLE to limit operator exposure during and following a DBA~~ ~~***and during the movement of recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 84 hours)***~~.~~

~~The CRVS is not required in MODE 5 or 6, or during movement of irradiated fuel assemblies and core alterations because analysis indicates that isolation of the control room is not required for maintaining radiation exposure within acceptable limits following a fuel handling accident or gas decay tank rupture.~~

In MODES 1, 2, 3 and 4, CRVS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.

During movement of recently irradiated fuel assemblies, the CRVS must be OPERABLE to cope with the release from a fuel handling accident involving recently irradiated fuel. The CRVS is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 84 hours), due to radioactive decay.

Administrative controls address the role of the CRVS in maintaining control room habitability following an event at Indian Point Unit 2.

ACTIONS

A.1

When one CRVS 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 CRVS train is adequate to perform the ***CRE occupants*** ~~control room~~ protection function. However, the overall reliability is reduced because a failure in the OPERABLE CRVS train could result in loss of CRVS 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.

B.1, B.2, and B.3 ~~B.1~~

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

(continued)

(allowed to be up to 5 rem TEDE), or inadequate protection of CRE occupants from hazardous chemicals or smoke, 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.

~~B.1~~ ***C.1***

When neither CRVS train is Operable, ***for reasons other than Condition B,*** action must be taken to restore at least one train to OPERABLE status within 72 hours. The 72 hour Completion Time is acceptable because of the low probability of a DBA occurring during this time period.

~~C.and C.2~~***D.1 and D.2***

If Required Actions ~~A.1 or B.1~~ ***of Conditions A, B or C*** are not met within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating

(continued)

BASES

ACTION (continued)

experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

E.1 and E.2

Reference 3 did not address exposure to CRE resulting from fuel handling accidents when less than 84 hours of decay time have elapsed if the CRE ventilation safety function is not met. Therefore, when only one CRVS train is OPERABLE during movement of recently irradiated fuel, action must be taken to immediately place the OPERABLE CRVS train in the pressurization 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 Required Action E.1 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.

F.1

Reference 3 did not address exposure to CRE occupants resulting from fuel handling accidents when less than 84 hours of decay time have elapsed if the CRE ventilation safety function is not met. Therefore, during movement of recently irradiated fuel when neither CRVS train is OPERABLE or with one or more CRVS 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 3.7.11.1

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

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

check of this system. Note that a CRVS train includes both the filter booster fan and an air-conditioning unit fan powered from the same safeguards power train. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy ~~availability~~.

SR 3.7.11.2

This SR verifies that the required CRVS testing is performed in

accordance with the Ventilation Filter Testing Program (VFTP). The CRVS filter tests are in accordance with the sections of Regulatory Guide 1.52 (Ref. 3) identified in the VFTP. The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies that each CRVS train starts and operates on an actual or simulated actuation signal. The Frequency of 24 months is based on operating experience which has demonstrated this Frequency provides a high degree of assurance that the booster fans will operate and dampers actuate to the correct position when required ***and is consistent with the typical refueling cycle***.

SR 3.7.11.4

~~This SR verifies the integrity of the control room enclosure, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the CRVS. During operation in the CRVS Mode 3 (i.e. 10% incident mode), the CRVS is designed to maintain the control room at a slight positive pressure with respect to adjacent areas in order to attenuate unfiltered inleakage. The acceptance criteria of ≥ 1500 cfm filtered make-up air is the value used in the Control Room dose assessment.~~

~~The SR Frequency of 24 months on a staggered test basis is acceptable because operating experience has demonstrated that the control room boundary is not normally disturbed. Staggered testing is acceptable because the SR is primarily a verification of Control Room integrity because fan operation is tested elsewhere.~~

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 analysis of DBA consequences is no more than 5 rem TEDE 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, Condition B must be entered. Required Action B.3 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. 5) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 6).

(continued)

SURVEILLANCE REQUIREMENTS (continued)

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 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. FSAR, Section 9.9.

2. FSAR, Chapter 14.

3. Safety Evaluation Report (SER) for IP3 Amendment 224.

4. IP3 Technical Requirements Manual.

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, 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).***