Entergy

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J. E. Pollock
Site Vice President

December 20, 2007

Re: Indian Point Units 2 and 3
Dockets 50-247 and 286

NL-07-154

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

SUBJECT: **Proposed Changes to Indian Point 2 and 3 Technical Specifications: Adoption of TSTF 490 Regarding Deletion of E Bar Definition and Revision to RCS Specific Activity Technical Specification**

References:
1. Improved Standard Technical Specifications Change Traveler, TSTF-490.
2. Federal Register Notice 72 FR 12217 dated March 15, 2007.

Dear Sir:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc, (Entergy) hereby requests an amendment to the Technical Specifications for Indian Point Nuclear Generating Unit 2 (IP2) and Unit 3 (IP3). The proposed amendment will adopt TSTF 490 (Reference 1) following the Consolidated Line Item Improvement Process (CLIIP). The Notice of Availability for adoption of TSTF 490 under the CLIIP program was published in Reference 2.

The Technical Specification changes addressed by TSTF 490 include:

- Delete the term "E BAR"
- Revise the definition of "Dose Equivalent I-131"
- Add a definition for the new term "Dose Equivalent Xe-133"
- Revise LCO 3.4.16, "RCS Specific Activity"

Attachment One provides a description and assessment of the proposed changes including Entergy's confirmation of applicability of TSTF-490 to IP2 and IP3. The marked-up pages showing the proposed changes are provided in Attachment Two and the proposed final Technical Specification pages are provided in Attachment Three. The proposed changes to the Technical Specification Bases are provided in Attachment Four, for information. A copy of this application and the associated attachments are being submitted to the designated New York State official in accordance with 10 CFR 50.91.

A001
NRR

Entergy requests approval of the proposed amendment by July 2008, with the amendment being implemented within 60 days. There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Licensing at (914) 734-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 20th.

Sincerely,

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

Attachments:

One: Analysis of Proposed Technical Specification Changes Regarding Adoption of TSTF 490

Two: Markup of Technical Specification Pages for Proposed Changes Regarding Adoption of TSTF 490

Three: Proposed Final Technical Specification Pages for Proposed Changes Regarding Adoption of TSTF 490

Four: Markup of Technical Specification Bases Pages for Proposed Changes Regarding Adoption of TSTF 490

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DORL
Mr. Samuel J. Collins, Regional Administrator, NRC Region 1
NRC Resident Inspector, IP2
NRC Resident Inspector, IP3
Mr. Paul D. Tonko, President, NYSERDA
Mr. Paul Eddy, New York State Dept. of Public Service

ATTACHMENT ONE TO NL-07-154

## ANALYSIS OF PROPOSED TECHNICAL SPECIFICATION CHANGES

## REGARDING ADOPTION OF TSTF 490

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNITS NO. 2 AND 3
DOCKETS NO. 50-247 AND 50-286

## 1.0 DESCRIPTION

Entergy Nuclear Operations, Inc (Entergy) is requesting an amendment to Operating License DPR-26, Docket No. 50-247 for Indian Point Nuclear Generating Unit No. 2 (IP2) and Operating License DPR-64, Docket No. 50-286 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed change will adopt TSTF 490 (Reference 1) using the Consolidated Line Item Improvement Process. The Notice of Availability for adoption of TSTF 490 under the CLIIP program was published in 72 FR 12217 (Reference 2).

The changes addressed by TSTF 490 include:

- Delete the term "E BAR"
- Revise the definition of "Dose Equivalent I-131"
- Add a definition for the new term "Dose Equivalent Xe-133"
- Revise LCO 3.4.16, "RCS Specific Activity"

The specific proposed changes are listed in the following section.

## 2.0 PROPOSED CHANGES

The proposed changes are as described in TSTF 490 and the Technical Specification markup pages for the adoption of these changes at IP2 and IP3 are provided in Attachment Two. Specific changes are summarized below:

Section 1.1 Definitions:

- Delete existing term and definition for 'E – Average Disintegration Energy'

- Revise existing definition for 'Dose Equivalent I-131' to be:

  DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries per gram) that alone would produce the same dose when inhaled as the combined activities of iodine isotopes I-131, I-132, I-133, I-134, and I-135 actually present. If a specific isotope is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT I-131 shall be performed using Committed Effective Dose Equivalent (CEDE) dose conversion factors from Table 2.1 of EPA Federal Guidance Report No. 11, 1988.

- Add new term and definition for 'Dose Equivalent XE-133':

  DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (microcuries per gram) that alone would produce the same acute dose to the whole body as the combined activities of noble gas nuclides Kr-85m, Kr-85, Kr-87, Kr-88, Xe-131m, Xe-133m, Xe-133, Xe-135m, Xe-135, and Xe-138 actually present. If a specific noble gas nuclide is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT XE-133 shall be performed using effective dose conversion factors for air submersion listed in Table III.1 of EPA Federal Guidance Report No. 12, 1993, "External Exposure to Radionuclides in Air, Water, and Soil".

Section 3.4.16 RCS Specific Activity:

- Revise existing LCO statement; 'The specific activity of the reactor coolant shall be within limits' to read; 'RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.'
- Revise existing Applicability; 'MODES 1 and 2, MODE 3 with RCS [IP3: loop] average temperature ($T_{avg}$) > 500$^{O}$F' to read; 'MODES 1,2,3, and 4'
- Revise existing Condition A; DOSE EQUIVALENT I-131 > 1.0 µCi/gm.' to read; 'DOSE EQUIVALENT I-131 not within limit
- Revise existing IP3 Condition A Required Action; 'Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1.' to read 'Verify DOSE EQUIVALENT I-131 $\leq$ 60.0 µCi/gm.'
- Delete existing IP3 Figure 3.4.16-1.
- Revise existing Condition B; 'Gross specific activity of the reactor coolant not with limit. [IP3:of SR 3.4.16.1]' to read; 'DOSE EQUIVALENT XE-133 not within limit.'
- Revise existing Condition B Required Action; 'Be in MODE 3 with $T_{avg}$ < 500$^{O}$F' to read; 'Restore DOSE EQUIVALENT XE-133 to within limit.'
- Add 'NOTE LCO 3.0.4.c is applicable' to Condition B Required Action.
- Revise existing Condition B completion time; '6 hours' to read '48 hours'.
- Revise existing first condition of Condition C; 'Required Action and associated Completion Time of Condition A not met.' to read 'Required Action and associated Completion Time of Condition A or B not met.'
- Revise IP3 existing second condition of Condition C; 'DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.' to read 'DOSE EQUIVALENT I-131 > 60.0 µCi/gm.'
- Add new Condition C.2 and associated Completion Time; 'Be in MODE 5 36 hours'
- Revise existing IP2 SR 3.4.16.1; 'Verify reactor coolant gross specific activity (excluding tritium) $\leq$ 60/E(bar) µCi/gm.' and existing IP3 SR 3.4.16.1; 'Verify reactor

coolant gross specific activity ≤ 100/E(bar) μCi/gm.' To read; 'DOSE EQUIVALENT XE-133 specific activity ≤ [IP2:632 IP3: 652] μCi/gm.'

- Add 'NOTE Only required to be performed in MODE 1.' to Surveillance 3.4.16.1.
- Delete existing SR 3.4.16.3.

In addition to the above proposed Technical Specification changes, the proposed changes to the Technical Specification Bases are provided, for information, in Attachment Four.

## 3.0 BACKGROUND

The background for this application is as stated in TSTF 490 (Reference 1), the model Safety Evaluation provided in NRC's Notice of Availability (Reference 2), and the NRC Notice for Comment (Reference 3).

## 4.0 TECHNICAL ANALYSIS

Entergy has reviewed References 1, 2, and 3, including the model Safety Evaluation published as part of the Federal Register Notice of Availability for adoption of TSTF 490 under the CLIIP program. Entergy has applied the methodology in Reference 1 to develop the proposed Technical Specification changes. The current licensing basis, as previously reviewed and approved by NRC for IP2 and IP3, apply the alternate source term methodology as reflected in References 4 and 5. The site specific parameters applicable for the IP2 and IP3 Technical Specifications and Bases are derived from the Steam Generator Tube Rupture and Main Steam Line Break dose consequence accident analyses referred to References 4 and 5.

Entergy has also concluded that the justifications presented in TSTF 490 and the NRC Model Safety Evaluation are applicable to IP2 and IP3 and support this amendment request for the incorporation of the changes into the IP2 and IP3 Technical Specifications.

Entergy is proposing a site-specific wording preference for the definition of Dose Equivalent I-131. The definition for Dose Equivalent Xe-133, as stated in the TSTF and as proposed for adoption at IP2 and IP3, includes a statement regarding the use of 'minimum detectable activity' (MDA). Entergy proposes to also include this statement in the definition of Dose Equivalent I-131. There is no technical reason for the two terms to be treated differently in this regard. Therefore to be consistent, the definitions for both terms should contain the clarification regarding MDA.

## 5.0 REGULATORY ANALYSIS

A description of the proposed change and its relationship to applicable regulatory requirements and guidance was provided in References 1, 2, and 3.

### 5.1 No Significant Hazards Consideration

Entergy has reviewed the proposed no significant hazards consideration (NSHC) determination provided in TSTF 490 and as published in Reference 2. Entergy has concluded that the proposed NSHC is applicable to IP2 and IP3 and the determination is hereby incorporated by reference into the License Amendment Request to satisfy the requirements of 10 CFR 50.91(a).

5.2 Environmental Evaluation

Entergy has reviewed the environmental consideration included in the model Safety Evaluation included in Reference 2 and Entergy has concluded that the staff's findings presented therein are applicable to IP2 and IP3 and the determination is hereby incorporated by reference for this application.

## 6.0 REFERENCES

1. Improved Standard Technical Specification Change Traveler, TSTF 490, Rev 0.

2. Federal Register Notice 72 FR 12217, regarding Notice of Availability for CLIIP adoption of TSTF-490, dated March 15, 2007.

3. Federal Register Notice 71 FR 67170, regarding Notice for Comment of proposed CLIIP adoption of TSTF-490, dated November 20, 2006.

4. NRC letter to Entergy, Issuance of Indian Point 2 License Amendment 241 for Stretch Power Uprate, dated October 27, 2004.

5. NRC letter to Entergy, Issuance of Indian Point 3 License Amendment 224 for Adoption of Alternate Source Term, dated March 22, 2005.

# ATTACHMENT TWO TO NL-07-154

**MARKUP OF TECHNICAL SPECIFICATION PAGES FOR PROPOSED CHANGES**

**REGARDING ADOPTION OF TSTF 490**

**Affected Pages**

| IP2 Pages | IP3 Pages |
|---|---|
| 1.1-2, Amend 250 | 1.1-3, Amend 224 |
| 3.4.16-1, Amend 238 | 3.4.16-1, Amend 'Revised by letter dated December 20, 2005' |
| 3.4.16-2, Amend 238 | 3.4.16-2, Amend 205 |
| | 3.4.16-3, Amend 205 |
| | 3.4.16-4, Amend 205 (Deleted) |

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNITS NO. 2 AND 3
DOCKETS NO. 50-247 AND 50-286

## 1.1 Definitions

| | |
|---|---|
| CHANNEL OPERATIONAL TEST (COT) | A COT shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY of all devices in the channel required for channel OPERABILITY. The COT shall include adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. The COT may be performed by means of any series of sequential, overlapping, or total channel steps. |
| CORE ALTERATION | CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position. |
| CORE OPERATING LIMITS REPORT (COLR) | The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications. |
| DOSE EQUIVALENT I-131<br>INSERT DE I-131<br>INSERT DE XE-133 | DOSE EQUIVALENT I-131 shall be that amount of I-131 (Curies) that alone would produce the same committed effective dose equivalent (CEDE) dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table 2.1 of EPA Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1988. |
| $\overline{E}$ - AVERAGE DISINTEGRATION ENERGY | $\overline{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 30 minutes, making up at least 95% of the total noniodine activity in the coolant. |

## INSERTS FOR IP2 AND IP3 TECHNICAL SPECIFICATIONS:

- Insert DE I-131:

DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries per gram) that alone would produce the same dose when inhaled as the combined activities of iodine isotopes I-131, I-132, I-133, I-134, and I-135 actually present. If a specific isotope is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT I-131 shall be performed using Committed Effective Dose Equivalent (CEDE) dose conversion factors from Table 2.1 of EPA Federal Guidance Report No. 11, 1988.

- Insert DE XE-133:

DOSE EQUIVALENT XE-133 — DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (microcuries per gram) that alone would produce the same acute dose to the whole body as the combined activities of noble gas nuclides Kr-85m, Kr-85, Kr-87, Kr-88, Xe-131m, Xe-133m, Xe-133, Xe-135m, Xe-135, and Xe-138 actually present. If a specific noble gas nuclide is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT XE-133 shall be performed using effective dose conversion factors for air submersion listed in Table III.1 of EPA Federal Guidance Report No. 12, 1993, "External Exposure to Radionuclides in Air, Water, and Soil".

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature ($T_{avg}$) ≥ 500°F.

1, 2, 3, and 4

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. DOSE EQUIVALENT I-131 > 1.0 µCi/gm. not within limit. | - NOTE - LCO 3.0.4.c is applicable. | |
| | A.1 Verify DOSE EQUIVALENT I-131 is ≤ 60.0 µCi/gm. | Once per 4 hours |
| | AND | repeat Note |
| DOSE EQUIVALENT XE-133 not within limit. | A.2 Restore DOSE EQUIVALENT I-131 to within limit. | 48 hours |
| B. Gross specific activity of the reactor coolant not within limit. | B.1 Be in MODE 3 with $T_{avg}$ < 500°F. Restore DOSE EQUIVALENT XE-133 to within limit. | ~~6~~ hours 48 |
| C. Required Action and associated Completion Time of Condition A or B not met. | C.1 Be in MODE 3 with $T_{avg}$ < 500°F. | 6 hours |
| OR | AND | |
| DOSE EQUIVALENT I-131 > 60.0 µCi/gm. | C.2 Be in MODE 5 | 36 hours |

DOSE EQUIVALENT XE-133 specific activity ≤ 632 μCi/gm.



SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.4.16.1 | Verify reactor coolant gross specific activity (excluding tritium) ≤ 60/$\bar{E}$ $\mu$Ci/gm. | 7 days |
| SR 3.4.16.2 | - NOTE - <br> Only required to be performed in MODE 1. <br><br> Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 $\mu$Ci/gm. | repeat Note <br><br> 14 days <br><br> <u>AND</u> <br><br> Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period |
| SR 3.4.16.3 | - NOTE - <br> Not required to be performed until 31 days after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. <br><br> Determine $\bar{E}$ from a sample taken in MODE 1 after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. | 184 days |

1.1 Definitions (continued)

INSERT DE I-131

INSERT XE-133

DOSE EQUIVALENT I-131

DOSE EQUIVALENT I-131 shall be that amount of I-131 (curies) that alone would produce the same committed effective dose equivalent (CEDE) dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The CEDE dose conversion factors used for this calculation shall be those listed in Table 2.1 of EPA Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion," 1988.

$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY

$\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration (in MeV) for isotopes, other than iodines, with half lives > 10 minutes, making up at least 95% of the total noniodine activity in the coolant.

$L_a$

The maximum allowable primary containment leakage rate, $L_a$, shall be 0.1% of primary containment air weight per day at the calculated peak containment pressure ($P_a$).

LEAKAGE

LEAKAGE shall be:

a. <u>Identified LEAKAGE</u>

1. LEAKAGE, such as that from pump seals or valve packing (except for leakage into closed systems and reactor coolant pump (RCP) seal water injection or leakoff), that is captured and conducted to collection systems or a sump or collecting tank;

(Leakage into closed systems is leakage that can be accounted for and contained by a

(continued)

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS loop average temperature ($T_{avg}$) ≥ 500°F.

1, 2, 3, and 4

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. DOSE EQUIVALENT I-131 > 1.0 μCi/gm. not within limit. | ---------- NOTE ---------<br>LCO 3.0.4.c is applicable<br>-------------------------- | |
| | A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1. ≤ 60.0 μCi/gm. | Once per 4 hours repeat Note |
| | AND | |
| | A.2 Restore DOSE EQUIVALENT I-131 to within limit. | 48 hours |
| B. Gross specific activity of the reactor coolant not within limit of SR 3.4.16.1. DOSE EQUIVALENT XE-133 not within limit. | B.1 Be in MODE 3 with $T_{avg}$ < 500°F. Restore DOSE EQUIVALENT XE-133 to within limit. | ~~6~~ hours 48 |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| C. Required Action and associated Completion Time of Condition A or B not met.<br><br>OR<br><br>DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1. > 60.0 μCi/gm | C.1 | Be in MODE 3 with $T_{avg}$ < 500°F. | 6 hours |
| | AND | | |
| | C.2 | Be in MODE 5 | 36 hours |

DOSE EQUIVALENT XE-133 specific activity ≤ 652 μCi/gm.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.16.1 | Verify reactor coolant gross specific activity ≤ 100/E(bar) μCi/gm. | 7 days |
| SR 3.4.16.2 | --------------------NOTE-------------------- Only required to be performed in MODE 1. ------------------------------------------- repeat Note<br><br>Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm. | 14 days<br><br>AND<br><br>Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period |
| SR 3.4.16.3 | --------------------NOTE-------------------- Not required to be performed until 31 days after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. -------------------------------------------<br><br>Determine E(bar) from a sample taken in MODE 1 after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. | 184 days |

DELETE FIGURE



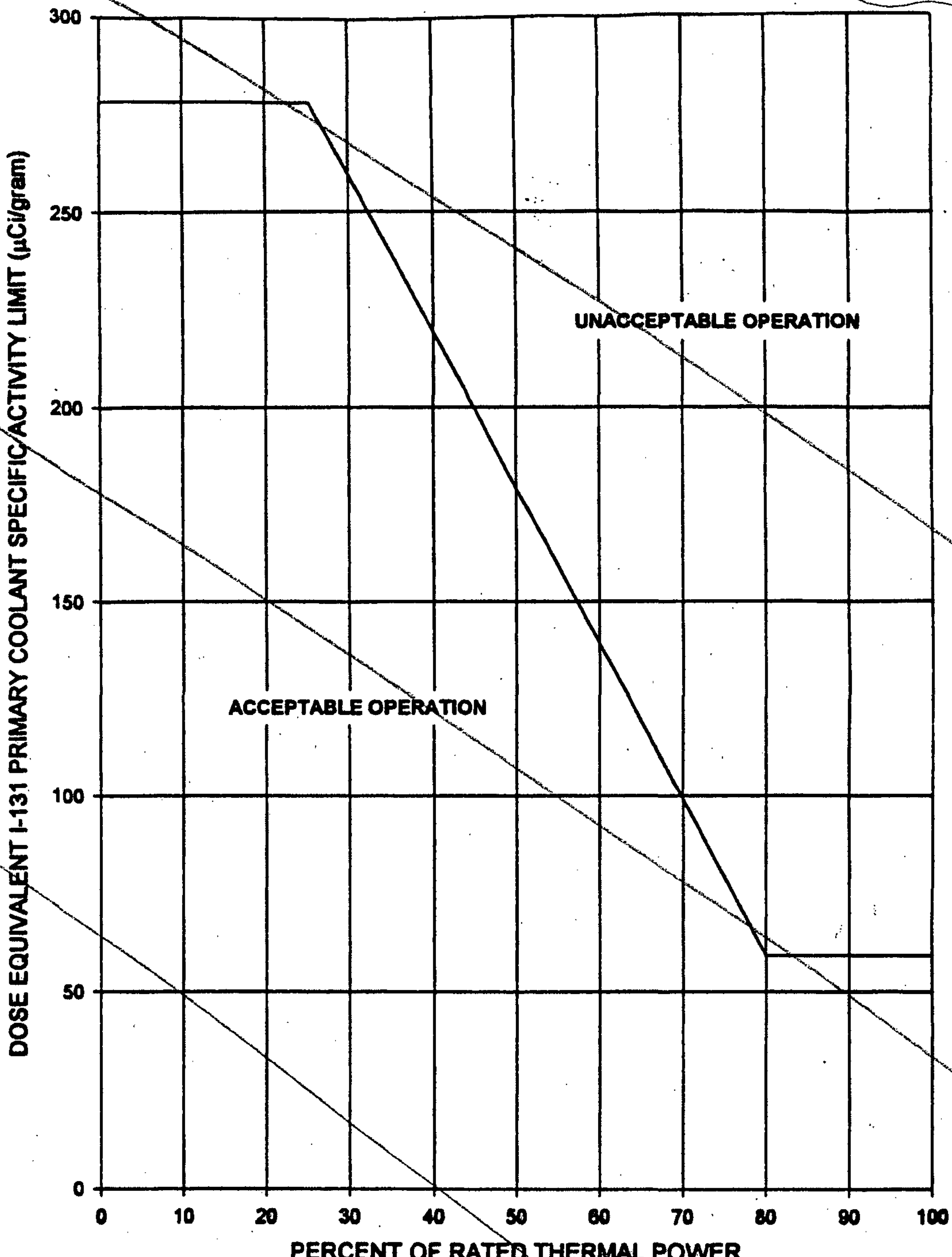


Figure 3.4.16-1 (page 1 of 1)
Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity
Limit Versus Percent of RATED THERMAL POWER
(Primary Coolant Specific Activity is greater than
1.0 µCi/gram DOSE EQUIVALENT I-131)

# ATTACHMENT THREE TO NL-07-154

**PROPOSED FINAL TECHNICAL SPECIFICATION PAGES FOR PROPOSED CHANGES**

**REGARDING ADOPTION OF TSTF 490**

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNITS NO. 2 AND 3
DOCKETS NO. 50-247 AND 50-286

1.1 Definitions

| | |
|---|---|
| CHANNEL OPERATIONAL TEST (COT) | A COT shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify OPERABILITY of all devices in the channel required for channel OPERABILITY. The COT shall include adjustments, as necessary, of the required alarm, interlock, and trip setpoints required for channel OPERABILITY such that the setpoints are within the necessary range and accuracy. The COT may be performed by means of any series of sequential, overlapping, or total channel steps. |
| CORE ALTERATION | CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position. |
| CORE OPERATING LIMITS REPORT (COLR) | The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific parameter limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications. |
| DOSE EQUIVALENT I-131 | DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries per gram) that alone would produce the same dose when inhaled as the combined activities of iodine isotopes I-131, I-132, I-133, I-134, and I-135 actually present. If a specific isotope is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT I-131 shall be performed using Committed Effective Dose Equivalent (CEDE) dose conversion factors from Table 2.1 of EPA Federal Guidance Report No. 11, 1988. |
| DOSE EQUIVALENT XE-133 | DOSE EQUIVALENT XE-133 shall be that concentration of XE-133 (microcuries per gram) that alone would produce the same acute dose to the whole body as the combined activities of noble gas nuclides Kr-85m, Kr-85, Kr-87, Kr-88, Xe-131m, Xe-133m, Xe-133, Xe-135m, Xe-135, and Xe-138 actually present. If a specific noble gas nuclide is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT XE-133 shall be performed using effective dose conversion factors for air submersion listed in Table III.1 of EPA Federal Guidance Report No. 12, 1993, "External Exposure to Radionuclides in Air, Water, and Soil." |

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.16 RCS Specific Activity

LCO 3.4.16 RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. DOSE EQUIVALENT I-131 not within limit. | | **- NOTE -** LCO 3.0.4.c is applicable. | |
| | A.1 | Verify DOSE EQUIVALENT I-131 ≤ 60.0 μCi/gm. | Once per 4 hours |
| | <u>AND</u> | | |
| | A.2 | Restore DOSE EQUIVALENT I-131 to within limit. | 48 hours |
| B. DOSE EQUIVALENT XE-133 not within limit. | | **- NOTE -** LCO 3.0.4.c is applicable. | |
| | B.1 | Restore DOSE EQUIVALENT XE-133 to within limit. | 48 hours |
| C. Required Action and associated Completion Time of Condition A or B not met.<br><br><u>OR</u><br><br>DOSE EQUIVALENT I-131 > 60.0 μCi/gm. | C.1 | Be in MODE 3 with $T_{avg}$ < 500°F. | 6 hours |
| | <u>AND</u> | | |
| | C.2 | Be in MODE 5 | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.16.1 | - NOTE -<br>Only required to be performed in MODE 1.<br><br>Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 632 μCi/gm. | 7 days |
| SR 3.4.16.2 | - NOTE -<br>Only required to be performed in MODE 1.<br><br>Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm. | 14 days<br><br><u>AND</u><br><br>Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period |

1.1 Definitions (continued)

DOSE EQUIVALENT I-131

DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries per gram) that alone would produce the same dose when inhaled as the combined activities of iodine isotopes I-131, I-132, I-133, I-134, and I-135 actually present. If a specific isotope is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT I-131 shall be performed using Committed Effective Dose Equivalent (CEDE) dose conversion factors from Table 2.1 of EPA Federal Guidance Report No. 11, 1988.

DOSE EQUIVALENT XE-133

DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (microcuries per gram) that alone would produce the same acute dose to the whole body as the combined activities of noble gas nuclides Kr-85m, Kr-85, Kr-87, Kr-88, Xe-131m, XE-133m, Xe-133, Xe-133, Xe-135m, Xe-135, and Xe-138 actually present. If a specific noble gas nuclide is not detected, it should be assumed to be present at the minimum detectable activity. The determination of DOSE EQUIVALENT XE-133 shall be performed using effective dose conversion factors for air submersion listed in Table III.1 of EPA Federal Guidance Report No. 12, 1993, "External Exposure to Radionuclides in Air, Water, and Soil".

$L_a$

The maximum allowable primary containment leakage rate, $L_a$, shall be 0.1% of primary containment air weight per day at the calculated peak containment pressure ($P_a$).

LEAKAGE

LEAKAGE shall be:

a. Identified LEAKAGE

1. LEAKAGE, such as that from pump seals or valve packing (except for leakage into closed systems and reactor coolant pump (RCP) seal water injection or leakoff), that is captured and conducted to collection systems or a sump or collecting tank;

(Leakage into closed systems is leakage that can be accounted for and contained by a

(continued)

## 3.4 REACTOR COOLANT SYSTEM (RCS)

### 3.4.16 RCS Specific Activity

LCO 3.4.16 RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 specific activity shall be within limits.

APPLICABILITY: MODES 1, 2, 3, and 4

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. DOSE EQUIVALENT I-131 not within limit. | ---------- NOTE -------- LCO 3.0.4.c is applicable ------------------------ | |
| | A.1 Verify DOSE EQUIVALENT I-131 $\leq$ 60.0 μCi/gm. | Once per 4 hours |
| | AND | |
| | A.2 Restore DOSE EQUIVALENT I-131 to within limit. | 48 hours |
| B. DOSE EQUIVALENT XE-133 not within limit. | ---------- NOTE -------- LCO 3.0.4.c is applicable ------------------------ | 48 hours |
| | B.1 Restore DOSE EQUIVALENT XE-133 within limit. | |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time of Condition A or B not met.<br><br><u>OR</u><br><br>DOSE EQUIVALENT I-131 > 60.0 μCi/gm. | C.1 Be in MODE 3 with $T_{avg}$ < 500°F.<br><br><u>AND</u><br><br>C.2 Be in MODE 5 | 6 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.4.16.1 | -------------------NOTE----------------<br>Only required to be performed in MODE 1.<br>---------------------------------------<br><br>Verify reactor coolant DOSE EQUIVALENT XE-133 specific activity ≤ 652 μCi/gm. | 7 days |
| SR 3.4.16.2 | -------------------NOTE----------------<br>Only required to be performed in MODE 1.<br>---------------------------------------<br><br>Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm. | 14 days<br><br><u>AND</u><br><br>Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period |

# ATTACHMENT FOUR TO NL-07-154

**MARKUP OF TECHNICAL SPECIFICATION BASES PAGES FOR PROPOSED CHANGES**

**REGARDING ADOPTION OF TSTF 490**

**IP2: Replace existing B 3.4.16 with new section**

**IP3: Replace existing B 3.4.16 with new section**

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNITS NO. 2 AND 3
DOCKETS NO. 50-247 AND 50-286

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.16 RCS Specific Activity

BASES

BACKGROUND

The maximum dose that an individual at the exclusion area boundary can receive for 2 hours following an accident, or at the low population zone outer boundary for the radiological release duration, is specified in [10 CFR 100.11] 10 CFR 50.67 (Ref. 1). Doses to control room operators must be limited per GDC 19. The limits on specific activity ensure that the offsite and control room doses are appropriately limited during analyzed transients and accidents.

The RCS specific activity LCO limits the allowable concentration level of radionuclides in the reactor coolant. The LCO limits are established to minimize the dose consequences in the event of a steam line break (SLB) or steam generator tube rupture (SGTR) accident.

The LCO contains specific activity limits for both DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133. The allowable levels are intended to ensure that offsite and control room doses meet the appropriate acceptance criteria in the Standard Review Plan (Ref. 2).

APPLICABLE SAFETY ANALYSES

150 gallons per day per SG

0.15

The LCO limits on the specific activity of the reactor coolant ensure that the resulting offsite and control room doses meet the appropriate SRP acceptance criteria following a SLB or SGTR accident. The safety analyses (Refs. 3 and 4) assume the specific activity of the reactor coolant is at the LCO limits, and an existing reactor coolant steam generator (SG) tube leakage rate of [1 gpm] exists. The safety analyses assume the specific activity of the secondary coolant is at its limit of [0.1] μCi/gm DOSE EQUIVALENT I-131 from LCO 3.7.18, "Secondary Specific Activity."

The analyses for the SLB and SGTR accidents establish the acceptance limits for RCS specific activity. Reference to these analyses is used to assess changes to the unit that could affect RCS specific activity, as they relate to the acceptance limits.

The safety analyses consider two cases of reactor coolant iodine specific activity. One case assumes specific activity at [1.0] μCi/gm DOSE EQUIVALENT I-131 with a concurrent large iodine spike that increases the rate of release of iodine from the fuel rods containing cladding defects to the primary coolant immediately after a SLB (by a factor of 500), or SGTR (by a factor of 335), respectively. The second case assumes the initial reactor coolant iodine activity at [60.0] μCi/gm DOSE EQUIVALENT I-131 due to an iodine spike caused by a reactor or an RCS transient prior

BASES

APPLICABLE SAFETY ANALYSES (continued)

to the accident. In both cases, the noble gas specific activity is assumed to be [280] μCi/gm DOSE EQUIVALENT XE-133.

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The SGTR analysis also assumes a loss of offsite power at the same time as the reactor trip. The SGTR causes a reduction in reactor coolant inventory. The reduction initiates a reactor trip from a low pressurizer pressure signal [or an RCS overtemperature ΔT signal].

The loss of offsite power causes the steam dump valves to close to protect the condenser. The rise in pressure in the ruptured SG discharges radioactively contaminated steam to the atmosphere through the SG power operated relief valves [and the main steam safety valves]. The unaffected SGs remove core decay heat by venting steam to the atmosphere until the cooldown ends and the Residual Heat Removal (RHR) system is placed in service.

The SLB radiological analysis assumes that offsite power is lost at the same time as the pipe break occurs outside containment. Reactor trip occurs after the generation of an SI signal on low steam line pressure. The affected SG blows down completely and steam is vented directly to the atmosphere. The unaffected SGs remove core decay heat by venting steam to the atmosphere until the cooldown ends and the RHR system is placed in service.

Operation with iodine specific activity levels greater than the LCO limit is permissible, if the activity levels do not exceed [60.0] μCi/gm for more than 48 hours.

The limits on RCS specific activity are also used for establishing standardization in radiation shielding and plant personnel radiation protection practices.

RCS specific activity satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The iodine specific activity in the reactor coolant is limited to [1.0] μCi/gm DOSE EQUIVALENT I-131, and the noble gas specific activity in the reactor coolant is limited to [280] μCi/gm DOSE EQUIVALENT XE-133. The limits on specific activity ensure that offsite and control room doses will meet the appropriate SRP acceptance criteria (Ref. 2).

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The SLB and SGTR accident analyses (Refs. 3 and 4) show that the calculated doses are within acceptable limits. Violation of the LCO may result in reactor coolant radioactivity levels that could, in the event of a SLB or SGTR, lead to doses that exceed the SRP acceptance criteria (Ref. 2).

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, operation within the LCO limits for DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 is necessary to limit the potential consequences of a SLB or SGTR to within the SRP acceptance criteria (Ref. 2).

In MODES 5 and 6, the steam generators are not being used for decay heat removal, the RCS and steam generators are depressurized, and primary to secondary leakage is minimal. Therefore, the monitoring of RCS specific activity is not required.

ACTIONS

A.1 and A.2

With the DOSE EQUIVALENT I-131 greater than the LCO limit, samples at intervals of 4 hours must be taken to demonstrate that the specific activity is ≤ [60.0] μCi/gm. The Completion Time of 4 hours is required to obtain and analyze a sample. Sampling is continued every 4 hours to provide a trend.

The DOSE EQUIVALENT I-131 must be restored to within limit within 48 hours. The Completion Time of 48 hours is acceptable since it is expected that, if there were an iodine spike, the normal coolant iodine concentration would be restored within this time period. Also, there is a low probability of a SLB or SGTR occurring during this time period.

A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE(S), relying on Required Actions A.1 and A.2 while the DOSE EQUIVALENT I-131 LCO limit is not met. This allowance is acceptable due to the significant conservatism incorporated into the specific activity limit, the low probability of an event which is limiting due to exceeding this limit, and the ability to restore transient-specific activity excursions while the plant remains at, or proceeds to, power operation.

B.1

With the DOSE EQUIVALENT XE-133 greater than the LCO limit, DOSE EQUIVALENT XE-133 must be restored to within limit within 48 hours. The allowed Completion Time of 48 hours is acceptable since it is expected that, if there were a noble gas spike, the normal coolant noble gas concentration would be restored within this time period. Also, there is a low probability of a SLB or SGTR occurring during this time period.

BASES

ACTIONS (continued)

A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODES(S), relying on Required Action B.1 while the DOSE EQUIVALENT XE-133 LCO limit is not met. This allowance is acceptable due to the significant conservatism incorporated into the specific activity limit, the low probability of an event which is limiting due to exceeding this limit, and the ability to restore transient-specific activity excursions while the plant remains at, or proceeds to, power operation.

C.1 and C.2

If the Required Action and associated Completion Time of Condition A or B is not met, or if the DOSE EQUIVALENT I-131 is > [60.0] μCi/gm, the reactor must be brought to MODE 3 within 6 hours and 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.

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the noble gas specific activity of the reactor coolant at least once every 7 days. This measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in the noble gas specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The 7 day Frequency considers the low probability of a gross fuel failure during this time.

Due to the inherent difficulty in detecting Kr-85 in a reactor coolant sample due to masking from radioisotopes with similar decay energies, such as F-18 and I-134, it is acceptable to include the minimum detectable activity for Kr-85 in the SR 3.4.16.1 calculation. If a specific noble gas nuclide listed in the definition of DOSE EQUIVALENT XE-133 is not detected, it should be assumed to be present at the minimum detectable activity.

A Note modifies the SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.16.2

This Surveillance is performed to ensure iodine specific activity remains within the LCO limit during normal operation and following fast power changes when iodine spiking is more apt to occur. The 14 day Frequency is adequate to trend changes in the iodine activity level, considering noble gas activity is monitored every 7 days. The Frequency, between 2 and 6 hours after a power change ≥ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following iodine spike initiation; samples at other times would provide inaccurate results.

The Note modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

REFERENCES

------------------------------ Reviewer's Note ------------------------------
The first listed References 1 and 2 are for plants that are licensed to 10 CFR 100.11. The second set of References are for plants that are licensed to 10 CFR 50.67.
-------------------------------------------------------------------------------

[ 1. 10 CFR 100.11.

2. Standard Review Plan (SRP) Section 15.1.5 Appendix A (SLB) and Section 15.6.3 (SGTR).

1. 10 CFR 50.67.

2. Standard Review Plan (SRP) Section 15.0.1 "Radiological Consequence Analyses Using Alternative Source Terms." ]

3. FSAR, Section [15.1.5]. 14.2.4 (SGTR)

4. FSAR, Section [15.6.3]. 14.2.5 (MSLB)

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.16 RCS Specific Activity

BASES

BACKGROUND

The maximum dose that an individual at the exclusion area boundary can receive for 2 hours following an accident, or at the low population zone outer boundary for the radiological release duration, is specified in [10 CFR 100.11][10 CFR 50.67] (Ref. 1). Doses to control room operators must be limited per GDC 19. The limits on specific activity ensure that the offsite and control room doses are appropriately limited during analyzed transients and accidents.

The RCS specific activity LCO limits the allowable concentration level of radionuclides in the reactor coolant. The LCO limits are established to minimize the dose consequences in the event of a steam line break (SLB) or steam generator tube rupture (SGTR) accident.

The LCO contains specific activity limits for both DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133. The allowable levels are intended to ensure that offsite and control room doses meet the appropriate acceptance criteria in the Standard Review Plan (Ref. 2).

APPLICABLE SAFETY ANALYSES

The LCO limits on the specific activity of the reactor coolant ensure that the resulting offsite and control room doses meet the appropriate SRP acceptance criteria following a SLB or SGTR accident. The safety analyses (Refs. 3 and 4) assume the specific activity of the reactor coolant is at the LCO limits, and an existing reactor coolant steam generator (SG) tube leakage rate of [1 gpm] exists. The safety analyses assume the specific activity of the secondary coolant is at its limit of [0.1] μCi/gm DOSE EQUIVALENT I-131 from LCO 3.7.18, "Secondary Specific Activity."

The analyses for the SLB and SGTR accidents establish the acceptance limits for RCS specific activity. Reference to these analyses is used to assess changes to the unit that could affect RCS specific activity, as they relate to the acceptance limits.

The safety analyses consider two cases of reactor coolant iodine specific activity. One case assumes specific activity at [1.0] μCi/gm DOSE EQUIVALENT I-131 with a concurrent large iodine spike that increases the rate of release of iodine from the fuel rods containing cladding defects to the primary coolant immediately after a SLB (by a factor of 500), or SGTR (by a factor of 335), respectively. The second case assumes the initial reactor coolant iodine activity at [60.0] μCi/gm DOSE EQUIVALENT I-131 due to an iodine spike caused by a reactor or an RCS transient prior

BASES

APPLICABLE SAFETY ANALYSES (continued)

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to the accident. In both cases, the noble gas specific activity is assumed to be [280] μCi/gm DOSE EQUIVALENT XE-133.

The SGTR analysis also assumes a loss of offsite power at the same time as the reactor trip. The SGTR causes a reduction in reactor coolant inventory. The reduction initiates a reactor trip from a low pressurizer pressure signal [or an RCS overtemperature ΔT signal].

The loss of offsite power causes the steam dump valves to close to protect the condenser. The rise in pressure in the ruptured SG discharges radioactively contaminated steam to the atmosphere through the SG power operated relief valves [and the main steam safety valves]. The unaffected SGs remove core decay heat by venting steam to the atmosphere until the cooldown ends and the Residual Heat Removal (RHR) system is placed in service.

The SLB radiological analysis assumes that offsite power is lost at the same time as the pipe break occurs outside containment. Reactor trip occurs after the generation of an SI signal on low steam line pressure. The affected SG blows down completely and steam is vented directly to the atmosphere. The unaffected SGs remove core decay heat by venting steam to the atmosphere until the cooldown ends and the RHR system is placed in service.

Operation with iodine specific activity levels greater than the LCO limit is permissible, if the activity levels do not exceed [60.0] μCi/gm for more than 48 hours.

The limits on RCS specific activity are also used for establishing standardization in radiation shielding and plant personnel radiation protection practices.

RCS specific activity satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The iodine specific activity in the reactor coolant is limited to [1.0] μCi/gm DOSE EQUIVALENT I-131, and the noble gas specific activity in the reactor coolant is limited to [280] μCi/gm DOSE EQUIVALENT XE-133. The limits on specific activity ensure that offsite and control room doses will meet the appropriate SRP acceptance criteria (Ref. 2).

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The SLB and SGTR accident analyses (Refs. 3 and 4) show that the calculated doses are within acceptable limits. Violation of the LCO may result in reactor coolant radioactivity levels that could, in the event of a SLB or SGTR, lead to doses that exceed the SRP acceptance criteria (Ref. 2).

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, operation within the LCO limits for DOSE EQUIVALENT I-131 and DOSE EQUIVALENT XE-133 is necessary to limit the potential consequences of a SLB or SGTR to within the SRP acceptance criteria (Ref. 2).

In MODES 5 and 6, the steam generators are not being used for decay heat removal, the RCS and steam generators are depressurized, and primary to secondary leakage is minimal. Therefore, the monitoring of RCS specific activity is not required.

ACTIONS

A.1 and A.2

With the DOSE EQUIVALENT I-131 greater than the LCO limit, samples at intervals of 4 hours must be taken to demonstrate that the specific activity is ≤ 60.0 μCi/gm. The Completion Time of 4 hours is required to obtain and analyze a sample. Sampling is continued every 4 hours to provide a trend.

The DOSE EQUIVALENT I-131 must be restored to within limit within 48 hours. The Completion Time of 48 hours is acceptable since it is expected that, if there were an iodine spike, the normal coolant iodine concentration would be restored within this time period. Also, there is a low probability of a SLB or SGTR occurring during this time period.

A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODE(S), relying on Required Actions A.1 and A.2 while the DOSE EQUIVALENT I-131 LCO limit is not met. This allowance is acceptable due to the significant conservatism incorporated into the specific activity limit, the low probability of an event which is limiting due to exceeding this limit, and the ability to restore transient-specific activity excursions while the plant remains at, or proceeds to, power operation.

B.1

With the DOSE EQUIVALENT XE-133 greater than the LCO limit, DOSE EQUIVALENT XE-133 must be restored to within limit within 48 hours. The allowed Completion Time of 48 hours is acceptable since it is expected that, if there were a noble gas spike, the normal coolant noble gas concentration would be restored within this time period. Also, there is a low probability of a SLB or SGTR occurring during this time period.

BASES

ACTIONS (continued)

A Note permits the use of the provisions of LCO 3.0.4.c. This allowance permits entry into the applicable MODES(S), relying on Required Action B.1 while the DOSE EQUIVALENT XE-133 LCO limit is not met. This allowance is acceptable due to the significant conservatism incorporated into the specific activity limit, the low probability of an event which is limiting due to exceeding this limit, and the ability to restore transient-specific activity excursions while the plant remains at, or proceeds to, power operation.

C.1 and C.2

If the Required Action and associated Completion Time of Condition A or B is not met, or if the DOSE EQUIVALENT I-131 is > [60.0] μCi/gm, the reactor must be brought to MODE 3 within 6 hours and 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.

SURVEILLANCE REQUIREMENTS

SR 3.4.16.1

SR 3.4.16.1 requires performing a gamma isotopic analysis as a measure of the noble gas specific activity of the reactor coolant at least once every 7 days. This measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in the noble gas specific activity.

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Due to the inherent difficulty in detecting Kr-85 in a reactor coolant sample due to masking from radioisotopes with similar decay energies, such as F-18 and I-134, it is acceptable to include the minimum detectable activity for Kr-85 in the SR 3.4.16.1 calculation. If a specific noble gas nuclide listed in the definition of DOSE EQUIVALENT XE-133 is not detected, it should be assumed to be present at the minimum detectable activity.

A Note modifies the SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.16.2

This Surveillance is performed to ensure iodine specific activity remains within the LCO limit during normal operation and following fast power changes when iodine spiking is more apt to occur. The 14 day Frequency is adequate to trend changes in the iodine activity level, considering noble gas activity is monitored every 7 days. The Frequency, between 2 and 6 hours after a power change $\geq$ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following iodine spike initiation; samples at other times would provide inaccurate results.

The Note modifies this SR to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering MODE 1.

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2. Standard Review Plan (SRP) Section 15.0.1 "Radiological Consequence Analyses Using Alternative Source Terms." ]

3. FSAR, Section [15.1.5]. 14.2.4 (SGTR)

4. FSAR, Section [15.6.3]. 14.2.5 (MSLB)