Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion

March 25, 2008

U.S Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Serial No	08-0135
NSSL/MLC	R0
Docket Nos.	50-336
	50-423
License Nos.	DPR-65
	NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 2 AND 3
APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT TO ADOPT TSTF-490, REVISION 0, "DELETION OF E BAR DEFINITION AND REVISION TO RCS SPECIFIC ACTIVITY TECH SPEC"

In accordance with the provisions of 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC) is submitting a request for an amendment to the technical specifications (TS) for Millstone Power Station Units 2 and 3 (MPS2 and MPS3). The proposed changes would replace the current TS 3.4.8 limit on reactor coolant system (RCS) gross specific activity with a new limit on RCS noble gas specific activity. The noble gas specific activity limit would be based on a new dose equivalent Xe-133 (DEX) definition that would replace the current E Bar average disintegration energy definition.

The changes are consistent with NRC-approved Industry Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-490, Revision 0, "Deletion of E Bar Definition and Revision to RCS Specific Activity Tech. Spec." The availability of this TS improvement was announced in the *Federal Register* on March 19, 2007 (72 FR 12838) as part of the consolidated line item improvement process (CLIIP). Because neither MPS2 nor MPS3 has adopted the Standard Technical Specifications (STS), DNC is proposing minor variations and/or deviations from the TS changes described in TSTF-490, Revision 0, to provide consistent terminology and format with the MPS2 and MPS3 TS. The minor variations and/or deviations from the specific wording/format provided in TSTF-490, Revision 0, do not change the meaning, intent, or applicability of the CLIIP.

Attachments 1 and 4 provide a description and assessment of the proposed changes, as well as confirmation of applicability for MPS2 and MPS3, respectively. Attachments 2 and 5 provide the MPS2 and MPS3 marked-up TS pages, respectively. Likewise, Attachments 3 and 6 provide the marked-up TS Bases pages for MPS2 and MPS3, respectively. The marked-up TS bases

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NRR

pages are provided for information only. The changes to the affected TS bases pages will be incorporated in accordance with the TS Bases Control Program when this amendment request is approved.

The proposed amendment does not involve a Significant Hazards Consideration pursuant to the provisions of 10 CFR 50.92. The Facility Safety Review Committee has reviewed and concurred with the determinations herein.

Issuance of this amendment is requested no later than September 30, 2008, with the amendment to be implemented within 120 days of issuance to permit adequate time to install and test the required counting equipment.

In accordance with 10 CFR 50.91(b), a copy of this license amendment request is being provided to the State of Connecticut.

Should you have any questions in regard to this submittal, please contact Mr. E. Thomas Shaub at (804) 273-2763.

Sincerely,

Leslie N. Hartz
Vice President – Nuclear Support Services

COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Leslie N. Hartz, who is Vice President – Nuclear Support Services of Dominion Nuclear Connecticut, Inc. She has affirmed before me that she is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of her knowledge and belief.

Acknowledged before me this 25th day of March, 2008.

My Commission Expires: August 31, 2008

Margaret B. Bennett
Notary Public

MARGARET B. BENNETT
Notary Public 354302
Commonwealth of Virginia
My Commission Expires Aug 31, 2008

Attachments:

1. Evaluation of Proposed License Amendment, MPS2
2. Marked Up Technical Specification Pages, MPS2
3. Marked Up Tech Spec Bases Pages, MPS2
4. Evaluation of Proposed License Amendment, MPS3
5. Marked Up Technical Specification Pages, MPS3
6. Marked Up Tech Spec Bases Pages, MPS3

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
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ATTACHMENT 1

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR

EVALUATION OF PROPOSED LICENSE AMENDMENT

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR EVALUATION OF PROPOSED LICENSE AMENDMENT

1.0 INTRODUCTION

In accordance with the provisions of 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC) is submitting a request for an amendment to the technical specifications (TS) for Millstone Power Station Unit 2 (MPS2). The proposed changes would replace the current limits on primary coolant gross specific activity with limits on primary coolant noble gas activity. The noble gas activity would be based on DOSE EQUIVALENT XE-133 and would take into account only the noble gas activity in the primary coolant. The changes were approved by the NRC's Safety Evaluation (SE) dated September 27, 2006 (ADAMS ML062700612) (Reference 1). Technical Specification Task Force (TSTF) change traveler TSTF-490, Revision 0, "Deletion of E Bar Definition and Revision to RCS Specific Activity Tech Spec" was announced for availability in the Federal Register on March 19, 2007 as part of the consolidated line item improvement process (CLIIP).

2.0 PROPOSED CHANGES

Consistent with NRC-approved TSTF-490, Revision 0, the proposed TS changes include:

- Revise the definition of DOSE EQUIVALENT I-131 in MPS2 TS 1.19.
- Replace MPS2 TS 1.20, "E Bar, AVERAGE DISINTEGRATION ENERGY" with new MPS2 TS 1.20, "DOSE EQUIVALENT XE-133."
- Revise LCO 3.4.8 to replace the gross specific activity limit with a DOSE EQUIVALENT XE-133 limit.
- Revise LCO 3.4.8 "Applicability" to specify the LCO is applicable in MODES 1, 2, 3, and 4.
- Delete Figure 3.4-1, "DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 1.0 μCi/gram DOSE EQUIVALENT I-131," and Table 4.4-2, "PRIMARY COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM."
- Modify the LCO 3.4.8 ACTIONS as follows:
    A. Renumber ACTION (d) as ACTION (a), consistent with format of TSTF-490, and delete the references to a gross specific activity limit and Table 4.4-2.
    B. Modify ACTION (b), formerly ACTION (a), to delete the reference to Figure 3.4-1, and define an upper limit for DOSE EQUIVALENT I-131 that is applicable at all power levels.
    C. Modify ACTION (c), formerly ACTION (b), to delete the reference to Figure 3.4-1, and revise the required actions (Mode 3 within 6 hours, and Mode 5 within 36 hours) to agree with TSTF-490.

D. Add a new ACTION (d) to provide a condition and required action (48 hour restoration time) for DOSE EQUIVALENT XE-133.

E. Modify former ACTION (c), now ACTION (e), to replace reference to gross specific activity limit with DOSE EQUIVALENT XE-133 limit, and provide contingency actions (Mode 3 within 6 hours, and Mode 5 within 36 hours) in the event the 48-hour restoration time of new ACTION (d) is not met, consistent with TSTF-490.

- Revise Surveillance Requirement (SR) 4.4.8 to replace Table 4.4-2 with two new requirements. SR 4.4.8.1 will verify DOSE EQUIVALENT XE-133 is within limits once per 7 days, and SR 4.4.8.2 will verify DOSE EQUIVALENT I-131 is within limits once per 14 days, and between 2 and 6 hours after a thermal power change of ≥15% within a 1-hour period. A Note is added to both SRs, consistent with TSTF-490, to allow entry into MODES 2, 3, and 4 prior to performance of the respective SRs.

3.0 BACKGROUND

The background for this application is as stated in the model SE in NRC's Notice of Availability published on March 19, 2007 (72 FR 12838), the NRC Notice for Comment published on November 20, 2006 (71 FR 67170), and TSTF-490, Revision 0.

4.0 TECHNICAL ANALYSIS

DNC has reviewed References 1, 2 and 3, and the model SE published on November 20, 2006 (71 FR 67170) as part of the CLIIP Notice for Comment. DNC has applied the methodology in Reference 1 to develop the proposed TS changes. DNC has also concluded that the justifications presented in TSTF-490, Revision 0 and the model SE prepared by the NRC staff are applicable to MPS2 and support incorporation of this amendment into the MPS2 TS.

5.0 REGULATORY ANALYSIS

A description of this proposed change and its relationship to applicable regulatory requirements and guidance was provided in the NRC Notice of Availability published on March 19, 2007 (72 FR 12838), the NRC Notice for Comment published on November 20, 2006 (71 FR 67170), and TSTF-490, Revision 0.

6.0 NO SIGNIFICANT HAZARDS CONSIDERATION

DNC has reviewed the proposed No Significant Hazards Consideration determination published in the *Federal Register* on March 19, 2007 (72 FR 12838) as part of the CLIIP. DNC has concluded that the proposed determination presented in the notice is applicable to MPS2 and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

7.0 ENVIRONMENTAL EVALUATION

DNC has reviewed the environmental consideration included in the model SE published in the *Federal Register* on March 19, 2007 (72 FR 12838) as part of the CLIIP. DNC has concluded that the staff's findings presented therein are applicable to MPS2 and the determination is hereby incorporated by reference for this application.

8.0 REFERENCES

1. NRC Safety Evaluation (SE) approving TSTF-490, Revision 0 dated September 27, 2006
2. Federal Notice for Comment published on November 20, 2006 (71 FR 67170)
3. Federal Notice of Availability published on March 19, 2007 (72 FR 12838)

ATTACHMENT 2

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR

MARKED-UP TECHNICAL SPECIFICATION PAGES

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

AZIMUTHAL POWER TILT - T_q

1.18 AZIMUTHAL POWER TILT shall be the difference between the maximum power generated in any core quadrant (upper or lower) and the average power of all quadrants in that half (upper or lower) of the core divided by the average power of all quadrants in that half (upper or lower) of the core.

$$\text{AZIMUTHALPOWERTILT} = \left[\frac{\text{Maximum power in any core quadrant (upper or lower)}}{\text{Average power of all quadrants (upper or lower)}}\right] - 1$$

DOSE EQUIVALENT I-131

when inhaled as the combined activities of iodine isotopes

1.19 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (micro-curie/gram) that ~~which~~ alone would produce the same ~~CEDE thyroid~~ 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 under inhalation in~~ Federal Guidance Report No. 11 ~~(FGR11)~~, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion and Ingestion."

~~$\bar{E}$-AVERAGE DISINTEGRATION ENERGY~~

~~1.20 $\bar{E}$ shall be the average sum of the beta and gamma energies per disintegration (in MEV) for isotopes, other than iodines, with half lives greater than 15 minutes, making up at least 95% of the total nonIodine activity in the coolant.~~

DELETE

STAGGERED TEST BASIS

1.21 A STAGGERED TEST BASIS shall consist of:

INSERT 1.20

a. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subinterval, and

b. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval.

FREQUENCY NOTATION

1.22 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2.

determination of DOSE EQUIVALENT I-131 shall be performed using Committed Dose Equivalent (CDE) or Committed Effective Dose Equivalent (CEDE) dose conversion factors from Table 2.1 of EPA

Attachment 2
MPS2 Marked-Up Technical Specification Pages

INSERT 1.20

DOSE EQUIVALENT XE-133

1.20 DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (micro-curie/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."

SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the primary coolant shall be limited to:

a. ~~≤ 1.0 μCi/gram~~ DOSE EQUIVALENT I-131, and

b. ≤ ~~100/Ē~~ 1100 μCi/gram ~~of gross specific activity~~ DOSE EQUIVALENT XE-133

APPLICABILITY: MODES 1, 2, 3, 4 ~~and 5~~.

ACTION:

DELETE

MODES 1, 2, and 3*:

a. With the specific activity of the primary coolant > 1.0 μCi/gram DOSE EQUIVALENT I-131 but within the allowable limit (below and to the left of the line) shown on Figure 3.4-1, operation may continue for up to 48 hours. Specification 3.0.4 is not applicable.

b. With the specific activity of the primary coolant > 1.0 μCi/gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in HOT STANDBY with T_{avg} < 515°F within 4 hours.

c. With the specific activity of the primary coolant > 100/Ē μCi/gram of gross specific activity, be in HOT STANDBY with T_{avg} < 515°F within 4 hours.

MODES 1, 2, 3, 4 and 5:

d. With the specific activity of the primary coolant > 1.0 μCi/gram DOSE EQUIVALENT I-131 or > 100/Ē μCi/gram of gross specific activity, perform the sampling and analysis requirements of item 4 a) of Table 4.4-2 until the specific activity of the primary coolant is restored to within its limits.

~~*With T_{avg} ≥ 515°F.~~

INSERT 3.4.8 ACTION

Attachment 2
MPS2 Marked-Up Technical Specification Pages

INSERT 3.4.8 ACTION

a. With the specific activity of the primary coolant > 1.0 μCi/gram DOSE EQUIVALENT I-131, verify DOSE EQUIVALENT I-131 ≤ 60 μCi/gram once per 4 hours.

b. With the specific activity of the primary coolant > 1.0 μCi/gram DOSE EQUIVALENT I-131 but ≤ 60 μCi/gram, operation may continue for up to 48 hours while efforts are made to restore DOSE EQUIVALENT I-131 to within the 1.0 μCi/gram limit. Specification 3.0.4 is not applicable.

c. With the specific activity of the primary coolant > 1.0 μCi/gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval, or > 60 μCi/gram DOSE EQUIVALENT I-131, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within 36 hours.

d. With the specific activity of the primary coolant > 1100 μCi/gram DOSE EQUIVALENT XE-133, operation may continue for up to 48 hours while efforts are made to restore DOSE EQUIVALENT XE-133 to within the 1100 μCi/gram limit. Specification 3.0.4 is not applicable.

e. With the specific activity of the primary coolant > 1100 μCi/gram DOSE EQUIVALENT XE-133 for more than 48 hours during one continuous time interval, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within 36 hours.

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS

~~4.4.8 The specific activity of the primary coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-2.~~

REPLACE WITH:

4.4.8.1 Verify the specific activity of the primary coolant ≤ 1100 μCi/gram DOSE EQUIVALENT XE-133 once per 7 days.*

4.4.8.2 Verify the specific activity of the primary coolant ≤ 1.0 μCi/gram DOSE EQUIVALENT I-131 once per 14 days,* and between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RATED THERMAL POWER within a one hour period.

* Surveillance only required to be performed for Mode 1 operation, consistent with the provisions of Specification 4.0.1.

TABLE 4.4-2

PRIMARY COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM

TYPE OF MEASUREMENT AND ANALYSIS	SAMPLE AND ANALYSIS FREQUENCY
1. Gross Activity Determination	3 times per 7 days with a maximum time of 72 hours between samples
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days
3. Radiochemical Analysis for $\bar{E}$ Determination	1 per 6 months*
4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135.	a) Once per 4 hours, whenever the specific activity exceeds 1.0 μCi/gram, DOSE EQUIVALENT I-131, or 100/$\bar{E}$ μCi/gram of gross specific activity, and b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period.

DELETE THIS MATERIAL.

* Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer. The provisions of Specification 4.0.4 are not applicable.

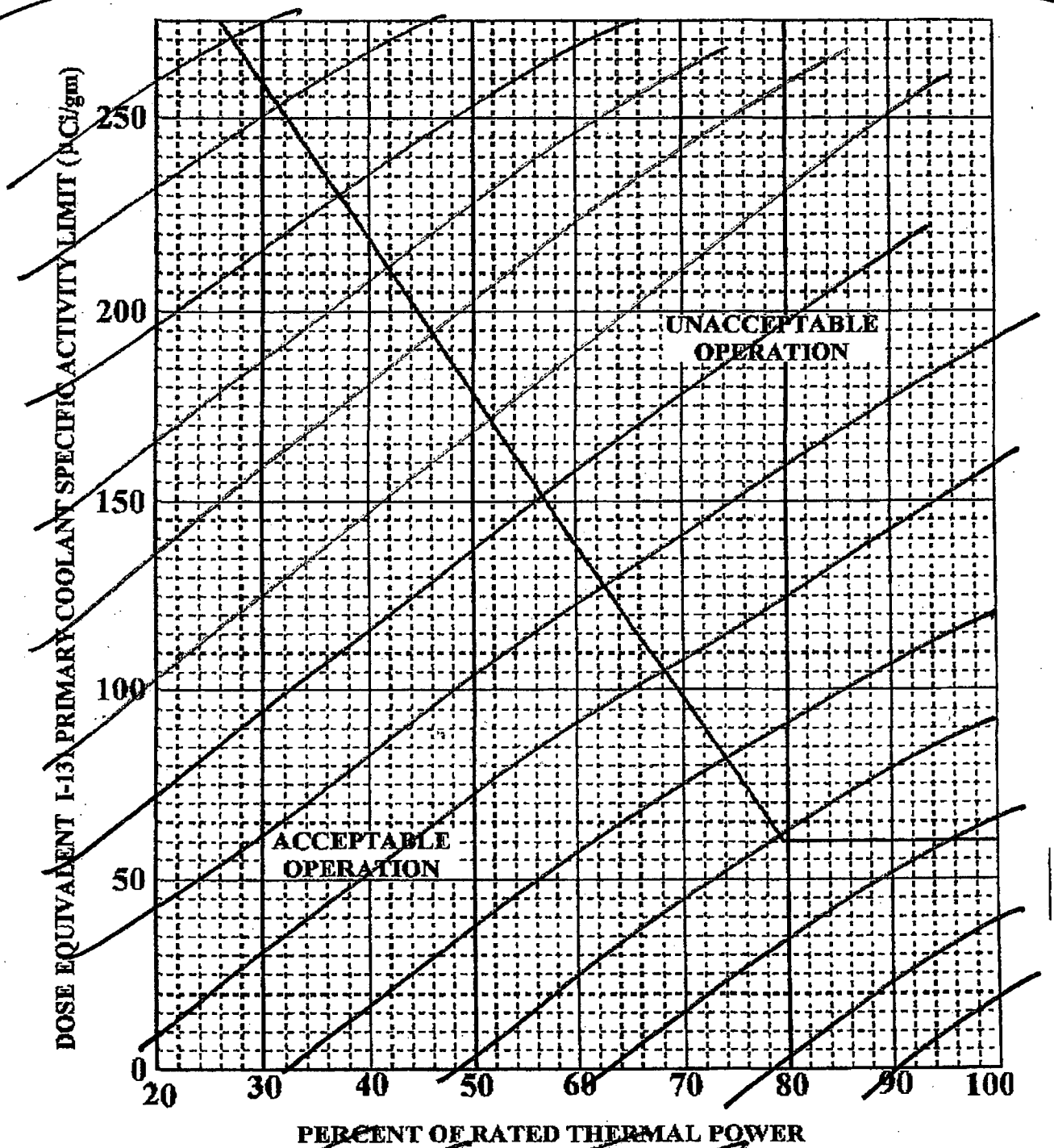

FIGURE 3.4-1

DOSE EQUIVALENT I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER with the Primary Coolant Specific Activity > 1.0 µ Ci/gram DOSE EQUIVALENT I-131

DELETE THIS MATERIAL.

ATTACHMENT 3

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR

MARKED-UP BASES PAGES (INFORMATION ONLY)

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.2 REACTOR COOLANT SYSTEM OPERATIONAL OPERATIONAL LEAKAGE

REFERENCES

1 10 CFR 50, Appendix A, GDC 30.

2 Regulatory Guide 1.45, May 1973.

3 FSAR, Section 14

4 NEI 97-06, "Steam Generator Program Guidelines."

5 EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."

3/4.4.7 DELETE

3/4.4.8 SPECIFIC ACTIVITY

~~The limitations on the specific activity of the primary coolant ensure that the resulting 2 hour doses at the SITE BOUNDARY will not exceed an appropriately small fraction of Part 100 limits following a steam generator tube rupture accident.~~

~~The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity > 1.0 μ Ci/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.~~

REPLACE WITH 3/4.4.8 BASES

Attachment 3
MPS2 Marked-Up Bases Pages (Information Only)

INSERT 3/4.4.8 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 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 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 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 150 gpd 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 3.7.1.4, "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 to the accident. In both cases, the noble gas specific activity is assumed to be 1100 μCi/gm DOSE EQUIVALENT XE-133.

The SGTR analysis assumes a rise in pressure in the ruptured SG causes radioactively contaminated steam to discharge to the atmosphere through the atmospheric dump valves or the main steam safety valves. The atmospheric discharge stops when the turbine bypass to the condenser removes the excess energy to rapidly reduce the RCS pressure and close the valves. The unaffected SG removes core decay heat by venting steam until the cooldown ends and the Shutdown Cooling (SDC) 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. The affected SG blows down completely and steam is vented directly to the atmosphere. The unaffected SG removes core decay heat by venting steam to the atmosphere until the cooldown ends and the SDC system is placed in service.

Operation with iodine specific activity levels greater than 1μCi/gm but less than or equal to 60.0 μCi/gm is permissible for up to 48 hours while efforts are made to restore DOSE EQUIVALENT I-131 to within the 1 μCi/gm LCO limit. Operation with iodine specific activity levels greater than 60 μCi/gm is not permissible.

The RCS specific activity limits 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 1100 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).

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

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. and b.

With the DOSE EQUIVALENT I-131 greater than the LCO limit, samples at intervals of four hours must be taken to demonstrate that the specific activity is ≤ 60 μCi/gm. Four hours is required to obtain and analyze a sample. Sampling is continued every four 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 statement in ACTION b. indicates the provisions of LCO 3.0.4 are not applicable. This exception to LCO 3.0.4 permits entry into the applicable MODE(S), relying on ACTIONS a. and b. while the DOSE EQUIVALENT I-131 LCO is not met. This exception is acceptable due to the significant conservatism incorporated into the RCS 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.

If the required action and completion time of ACTION b. is not met, or if the DOSE EQUIVALENT I-131 is > 60 μCi/gm, the reactor must be brought to HOT STANDBY (MODE 3) within 6 hours and COLD SHUTDOWN (MODE 5) within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

d.

With the RCS 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.

A statement in ACTION d. indicates the provisions of LCO 3.0.4 are not applicable. This exception to LCO 3.0.4 permits entry into the applicable MODE(S), relying on ACTION d. while the DOSE EQUIVALENT XE-133 LCO is not met. This exception is acceptable due to the significant conservatism incorporated into the RCS 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.

e.

If the required action and completion time of ACTION d. is not met, the reactor must be brought to HOT STANDBY (MODE 3) within 6 hours and COLD SHUTDOWN (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

4.4.8.1

Surveillance Requirement 4.4.8.1 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 Requirement provides an indication of any increase in the noble gas specific activity.

Trending the results of this Surveillance Requirement allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The surveillance 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 Surveillance Requirement 4.4.8.1 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 Surveillance Requirement to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the Surveillance Requirement. This allows the Surveillance Requirement to be performed in those MODES, prior to entering MODE 1.

4.4.8.2

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

REFERENCES

1. 10 CFR 50.67.

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

3. FSAR, Section 14.1.5.

4. FSAR, Section 14.6.3.

~~Reducing T_{avg} to < 515°F prevents the release of activity should a steam generator tube rupture since the saturation pressure of the primary coolant is below the lift pressure of the atmospheric steam relief valves. The surveillance requirements provide adequate assurance that excessive specific activity levels in the primary coolant will be detected in sufficient time to take corrective action. Information obtained on iodine spiking will be used to assess the parameters associated with iodine spiking phenomena. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.~~

DELETE

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

All components in the Reactor Coolant System are designed to withstand the effects of cyclic loads due to system temperature and pressure changes. These cyclic loads are introduced by normal load transients, reactor trips, and startup and shutdown operations. The various categories of load cycles used for design purposes are provided in Section 4.0 of the FSAR. During startup and shutdown, the rates of temperature and pressure changes are limited so that the maximum specified heatup and cooldown rates are consistent with the design assumptions and satisfy the stress limits for cyclic operation. In addition, during heatup and cooldown evolutions, the RCS ferritic materials transition between ductile and brittle (non-ductile) behavior. To provide adequate protection, the pressure/temperature limits were developed in accordance with the 10CFR50 Appendix G requirements to ensure the margins of safety against non-ductile failure are maintained during all normal and anticipated operational occurrences. These pressure/temperature limits are provided in Figures 3.4-2a and 3.4-2b and the heatup and cooldown rates are contained in Table 3.4-2.

During heatup, the thermal gradients in the reactor vessel wall produce thermal stresses which vary from compressive at the inner wall to tensile at the outer wall. These thermally induced compressive stresses at the inside wall tend to alleviate the tensile stresses induced by the internal pressure. Therefore, a pressure- temperature curve based on steady state conditions (i.e., no thermal stresses) represents a lower bound of all similar curves for finite heatup rates when the inner wall of the vessel is treated as the governing location.

The heatup analysis also covers the determination of pressure-temperature limitations for the case in which the outer wall of the vessel becomes the controlling location. The thermal gradients established during heatup produce tensile stresses at the outer wall of the vessel. These stresses are additive to the pressure induced tensile stresses which are already present. The thermally induced stresses at the outer wall of the vessel are tensile and are dependent on both the rate of heatup and the time along the heatup ramp; therefore, a lower bound curve similar to that described for the heatup of the inner wall cannot be defined. Subsequently, for the cases in which the outer wall of the vessel becomes the stress controlling location, each heatup rate of interest must be analyzed on an individual basis.

ATTACHMENT 4

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR

EVALUATION OF PROPOSED LICENSE AMENDMENT

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR EVALUATION OF PROPOSED LICENSE AMENDMENT

1.0 INTRODUCTION

In accordance with the provisions of 10 CFR 50.90, Dominion Nuclear Connecticut, Inc. (DNC) is submitting a request for an amendment to the technical specifications (TS) for Millstone Power Station Unit 3 (MPS3). The proposed changes would replace the current limits on primary coolant gross specific activity with limits on primary coolant noble gas activity. The noble gas activity would be based on DOSE EQUIVALENT XE-133 and would take into account only the noble gas activity in the primary coolant. The changes were approved by the NRC's Safety Evaluation (SE) dated September 27, 2006 (ADAMS ML062700612) (Reference 1). Technical Specification Task Force (TSTF) change traveler TSTF-490, Revision 0, "Deletion of E Bar Definition and Revision to RCS Specific Activity Tech Spec" was announced for availability in the Federal Register on March 19, 2007 as part of the consolidated line item improvement process (CLIIP).

2.0 PROPOSED CHANGES

Consistent with NRC-approved TSTF-490, Revision 0, the proposed TS changes include:

- Revise the definition of DOSE EQUIVALENT I-131 in MPS3 TS 1.10.
- Replace MPS3 TS 1.11, "E Bar, AVERAGE DISINTEGRATION ENERGY" with new MPS3 TS 1.11, "DOSE EQUIVALENT XE-133."
- Revise LCO 3.4.8 to replace the gross radioactivity limit with a DOSE EQUIVALENT XE-133 limit.
- Revise LCO 3.4.8 "Applicability" to specify the LCO is applicable in MODES 1, 2, 3, and 4.
- Delete Figure 3.4-1, "DOSE EQUIVALENT I-131 REACTOR COOLANT SPECIFIC ACTIVITY LIMIT VERSUS PERCENT OF RATED THERMAL POWER WITH THE REACTOR COOLANT SPECIFIC ACTIVITY >1 μCi/gram DOSE EQUIVALENT I-131," and Table 4.4-4, "REACTOR COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM."
- Replace the existing LCO 3.4.8 ACTIONS with the following:
    A. An ACTION to verify DOSE EQUIVALENT I-131 less than an absolute upper limit of 60 μCi/gram for all power levels once per 4 hours when DOSE EQUIVALENT I-131 is >1 μCi/gram.
    B. An ACTION permitting continued operation for up to 48 hours if DOSE EQUIVALENT I-131 is >1 μCi/gram, but less than the specified upper limit, while efforts are made to restore DOSE EQUIVALENT I-131 to within the 1 μCi/gram limit.

C. An ACTION to place the plant in Mode 3 within 6 hours, and Mode 5 within 36 hours, if DOSE EQUIVALENT I-131 is >1 μCi/gram for more than 48 continuous hours, or exceeds the absolute upper limit of 60 μCi/gram.

D. An ACTION permitting continued operation for up to 48 hours if the new DOSE EQUIVALENT XE-133 limit is exceeded while efforts are made to restore DOSE EQUIVALENT XE-133 to within the new LCO limit.

E. An ACTION to place the plant in Mode 3 within 6 hours, and Mode 5 within 36 hours, if DOSE EQUIVALENT XE-133 exceeds the LCO limit for more than 48 continuous hours.

- Revise Surveillance Requirement (SR) 4.4.8 to replace Table 4.4-4 with two new requirements. SR 4.4.8.1 will verify DOSE EQUIVALENT XE-133 is within limits once per 7 days, and SR 4.4.8.2 will verify DOSE EQUIVALENT I-131 is within limits once per 14 days, and between 2 and 6 hours after a thermal power change of ≥15% within a 1-hour period. A Note is added to both SRs, consistent with TSTF-490, to allow entry into MODES 2, 3, and 4 prior to performance of the respective SRs.

3.0 BACKGROUND

The background for this application is as stated in the model SE in NRC's Notice of Availability published on March 19, 2007 (72 FR 12838), the NRC Notice for Comment published on November 20, 2006 (71 FR 67170), and TSTF-490, Revision 0.

4.0 TECHNICAL ANALYSIS

DNC has reviewed References 1, 2 and 3, and the model SE published on November 20, 2006 (71 FR 67170) as part of the CLIIP Notice for Comment. DNC has applied the methodology in Reference 1 to develop the proposed TS changes. DNC has also concluded that the justifications presented in TSTF-490, Revision 0 and the model SE prepared by the NRC staff are applicable to MPS3 and support incorporation of this amendment into the MPS3 TS.

The proposed DOSE EQUIVALENT XE-133 limit is based on the revised reactor coolant radionuclide concentrations used in the Stretch Power Uprate (SPU) analyses submitted in DNC letter 07-0450 dated July 13, 2007. The reactor coolant radionuclide concentrations associated with the current specific activity limit of 100/E-bar correspond to greater than 1% failed fuel. However, the reactor coolant radioiodine concentrations associated with the specific activity limit of 1 μCi/gram DOSE EQUIVALENT I-131 correspond to 0.29% failed fuel. For the SPU analyses, the more limiting condition of 0.29% failed fuel was used to define the reactor coolant radionuclide concentrations for both activity limits (100/E Bar and 1 μCi/gram DOSE EQUIVALENT I-131). By comparison, if the current (non-SPU) licensing basis reactor coolant radionuclide concentrations were used to specify the new DOSE EQUIVALENT XE-133 limit, the limit would be 985 μCi/gram, vice the proposed 81.2 μCi/gram.

5.0 REGULATORY ANALYSIS

A description of this proposed change and its relationship to applicable regulatory requirements and guidance was provided in the NRC Notice of Availability published on March 19, 2007 (72 FR 12838), the NRC Notice for Comment published on November 20, 2006 (71 FR 67170), and TSTF-490, Revision 0.

6.0 NO SIGNIFICANT HAZARDS CONSIDERATION

DNC has reviewed the proposed No Significant Hazards Consideration determination published in the *Federal Register* on March 19, 2007 (72 FR 12838) as part of the CLIIP. DNC has concluded that the proposed determination presented in the notice is applicable to MPS3 and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

7.0 ENVIRONMENTAL EVALUATION

DNC has reviewed the environmental consideration included in the model SE published in the *Federal Register* on March 19, 2007 (72 FR 12838) as part of the CLIIP. DNC has concluded that the staff's findings presented therein are applicable to MPS3 and the determination is hereby incorporated by reference for this application.

8.0 REFERENCES

1. NRC Safety Evaluation (SE) approving TSTF-490, Revision 0 dated September 27, 2006
2. Federal Notice for Comment published on November 20, 2006 (71 FR 67170)
3. Federal Notice of Availability published on March 19, 2007 (72 FR 12838)

ATTACHMENT 5

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR

MARKED-UP TECHNICAL SPECIFICATION PAGES

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

CONTAINMENT INTEGRITY

1.7 CONTAINMENT INTEGRITY shall exist when:

a. All penetrations required to be closed during accident conditions are either:

1) Capable of being closed by an OPERABLE containment automatic isolation valve system*, or

2) Closed by manual valves, blind flanges, or deactivated automatic valves secured in their closed positions, except for valves that are opened under administrative control as permitted by Specification 3.6.3.

b. All equipment hatches are closed and sealed,

c. Each air lock is in compliance with the requirements of Specification 3.6.1.3,

d. The containment leakage rates are within the limits of the Containment Leakage Rate Testing Program, and

e. The sealing mechanism associated with each penetration (e.g., welds, bellows, or O-rings) is OPERABLE.

1.8 DELETED

CORE ALTERATIONS

1.9 CORE ALTERATIONS shall be the movement of any fuel, sources, reactivity control components, or other components affecting reactivity 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.

DOSE EQUIVALENT I-131

when inhaled

Combined activities of iodine isotopes

1.10 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microCurie/gram) ~~which~~ that alone would produce the same ~~CDE thyroid~~ 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 under "Inhalation" in~~ Federal Guidance Report No. 11 (FGR 11), "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion and Ingestion."

determination of DOSE EQUIVALENT I-131 shall be performed using Committed Dose Equivalent (CDE) or Committed Effective Dose Equivalent (CEDE) dose conversion factors from Table 2.1 of EPA

* In MODE 4, the requirement for an OPERABLE containment isolation valve system is satisfied by use of the containment isolation actuation pushbuttons.

~~$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY~~

~~1.11 $\bar{E}$ shall be the average (weighted in proportion to the concentration of each radionuclide in the sample) of the sum of the average beta and gamma energies per disintegration (MeV/d) for the radionuclides in the sample.~~

DELETE

1.12 DELETED

ENGINEERED SAFETY FEATURES RESPONSE TIME

1.13 The ENGINEERED SAFETY FEATURES (ESF) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF Actuation Setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

1.14 DELETED

FREQUENCY NOTATION

1.15 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.1.

LEAKAGE

1.16 LEAKAGE shall be:

1.16.1 CONTROLLED LEAKAGE

CONTROLLED LEAKAGE shall be that seal water flow supplied to the reactor coolant pump seals, and

1.16.2 IDENTIFIED LEAKAGE

IDENTIFIED LEAKAGE shall be:

a. Leakage (except CONTROLLED LEAKAGE) into closed systems, such as pump seal or valve packing leaks that are captured and conducted to a sump or collecting tank, or

b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of Leakage Detection Systems or not to be PRESSURE BOUNDARY LEAKAGE, or

Attachment 5
MPS3 Marked-Up Technical Specification Pages

INSERT 1.11

DOSE EQUIVALENT XE-133

1.11 DOSE EQUIVALENT XE-133 shall be that concentration of Xe-133 (micro-Curie/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."

3/4.4.8 SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the reactor coolant shall be limited to:

a. Less than or equal to 1 microCurie per gram DOSE EQUIVALENT I-131, and

b. Less than or equal to ~~100/$\bar{E}$~~ 81.2 microCuries per gram ~~of gross radioactivity~~ DOSE EQUIVALENT XE-133.

APPLICABILITY: MODES 1, 2, 3, 4, ~~and 5~~

DELETE.

ACTION:

MODES 1, 2 and 3*:

a. With the specific activity of the reactor coolant greater than 1 microCurie per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval, or exceeding the limit line shown on Figure 3.4-1, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours; and

b. With the specific activity of the reactor coolant greater than 100/$\bar{E}$ microCuries per gram, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours.

MODES 1, 2, 3, 4, and 5:

With the specific activity of the reactor coolant greater than 1 microCurie per gram DOSE EQUIVALENT I-131 or greater than 100/$\bar{E}$ microCuries per gram, perform the sampling and analysis requirements of Item 4.a) of Table 4.4-4 until the specific activity of the reactor coolant is restored to within its limits.

INSERT 3.4.8 ACTION

~~*With T_{avg} greater than or equal to 500°F.~~

Attachment 5
MPS3 Marked-Up Technical Specification Pages

INSERT 3.4.8 ACTION

a. With the specific activity of the reactor coolant > 1.0 microCurie per gram DOSE EQUIVALENT I-131, verify DOSE EQUIVALENT I-131 ≤ 60 microCuries per gram once per 4 hours.

b. With the specific activity of the reactor coolant > 1.0 microCurie per gram DOSE EQUIVALENT I-131 but ≤ 60 microCuries per gram, operation may continue for up to 48 hours while efforts are made to restore DOSE EQUIVALENT I-131 to within the 1.0 microCurie per gram limit. Specification 3.0.4 is not applicable.

c. With the specific activity of the reactor coolant > 1.0 microCurie per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval, or > 60 microCuries per gram DOSE EQUIVALENT I-131, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within 36 hours.

d. With the specific activity of the reactor coolant > 81.2 microCuries per gram DOSE EQUIVALENT XE-133, operation may continue for up to 48 hours while efforts are made to restore DOSE EQUIVALENT XE-133 to within the 81.2 microCuries per gram limit. Specification 3.0.4 is not applicable.

e. With the specific activity of the reactor coolant > 81.2 microCuries per gram DOSE EQUIVALENT XE-133 for more than 48 hours during one continuous time interval, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within 36 hours.

SURVEILLANCE REQUIREMENTS

~~4.4.8 The specific activity of the reactor coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.~~

REPLACE WITH:

4.4.8.1 Verify the specific activity of the reactor coolant ≤ 81.2 microCuries per gram DOSE EQUIVALENT XE-133 once per 7 days.*

4.4.8.2 Verify the specific activity of the reactor coolant ≤ 1.0 microCuries per gram DOSE EQUIVALENT I-131 once per 14 days,* and between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RATED THERMAL POWER within a one hour period.

* Surveillance only required to be performed for Mode 1 operation, consistent with the provisions of Specification 4.0.1.

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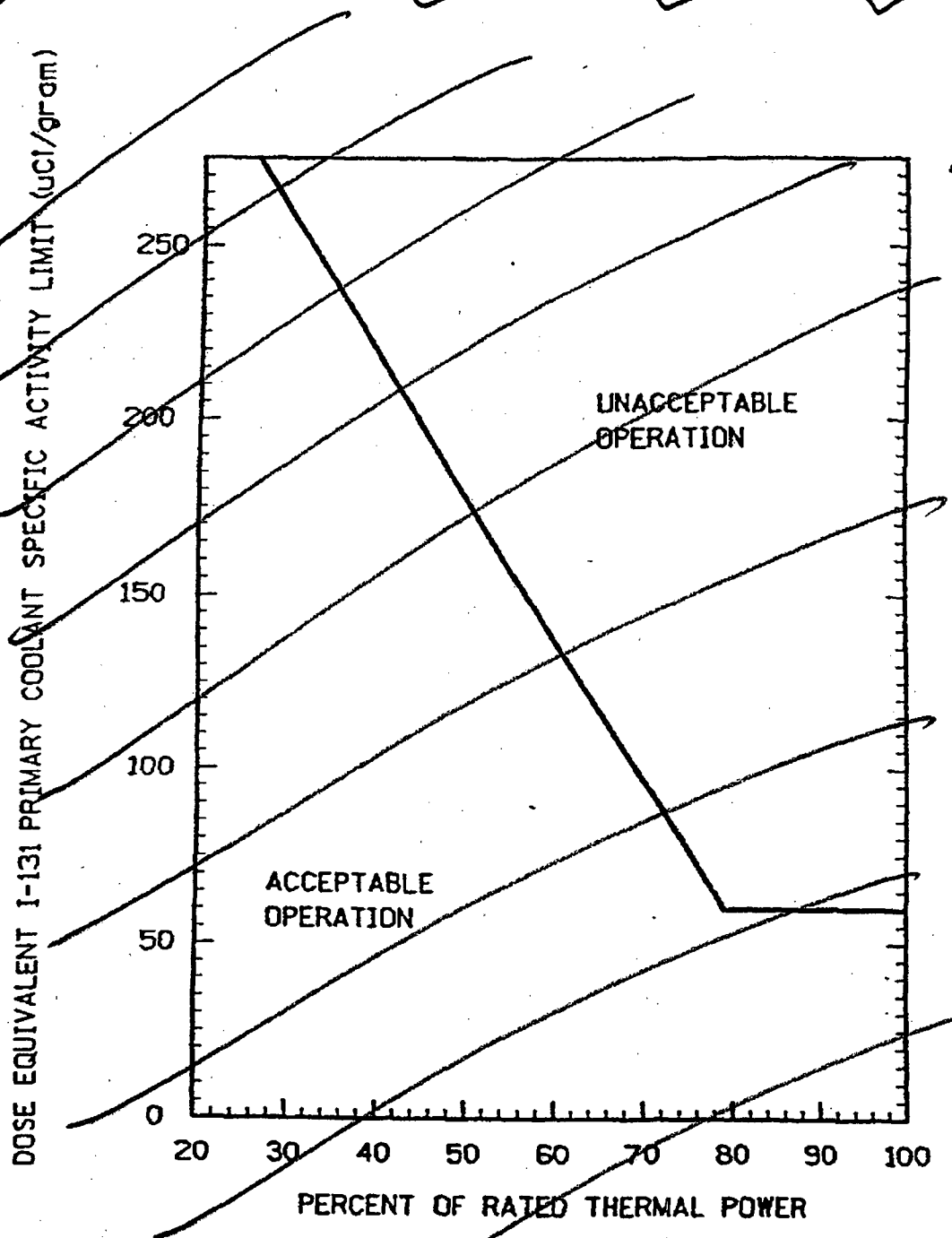

FIGURE 3.4-1

DOSE EQUIVALENT I-131 REACTOR COOLANT SPECIFIC ACTIVITY LIMIT VERSUS PERCENT OF RATED THERMAL POWER WITH THE REACTOR COOLANT SPECIFIC ACTIVIY >1 uCi/gram DOSE EQUIVALENT I-131

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TABLE 4.4-4

REACTOR COOLANT SPECIFIC ACTIVITY SAMPLE AND ANALYSIS PROGRAM

TYPE OF MEASUREMENT AND ANALYSIS	SAMPLE AND ANALYSIS FREQUENCY	MODES IN WHICH SAMPLE AND ANALYSIS REQUIRED
1. Gross Radioactivity Determination	At least once per 72 hours.	1, 2, 3, 4
2. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1 per 14 days.	1
3. Radiochemical for $\bar{E}$ Determination*	1 per 6 months**	1
4. Isotopic Analysis for Iodine Including I-131, I-133, and I-135	a) Once per 4 hours, whenever the specific activity exceeds 1 μCi/gram DOSE EQUIVALENT I-131 or 100/$\bar{E}$ μCi/gram of gross radioactivity, and	1#, 2#, 3#, 4#, 5#
	b) One sample between 2 and 6 hours following a THERMAL POWER change exceeding 15% of the RATED THERMAL POWER within a 1-hour period.	1, 2, 3

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~~TABLE 4.4-4 (Continued)~~

~~TABLE NOTATIONS~~

~~*A radiochemical analysis for $\bar{E}$ shall consist of the quantitative measurement of the specific activity for each radionuclide, except for radionuclides with half-lives less than 10 minutes and all radioiodines, which is identified in the reactor coolant. The specific activities for these individual radionuclides shall be used in the determination of $\bar{E}$ for the reactor coolant sample. Determination of the contributors to $\bar{E}$ shall be based upon those energy peaks identifiable with a 95% confidence level.~~

~~**Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer. The provisions of Specification 4.0.4 are not applicable.~~

~~#Until the specific activity of the Reactor Coolant System is restored within its limits.~~

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ATTACHMENT 6

APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT REGARDING DELETION OF E BAR

MARKED-UP BASES PAGES (INFORMATION ONLY)

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

3/4.4.7 DELETED

3/4.4.8 SPECIFIC ACTIVITY

~~The limitations on the specific activity of the reactor coolant ensure that the resulting EAB, LPZ and control room doses will not exceed 10 CFR 50.67 and Regulatory Guide 1.183 dose criteria following a steam generator tube rupture accident in conjunction with an assumed steady-state reactor-to-secondary steam generator leakage rate of 1 gpm. The values~~

REPLACE WITH 3/4.4.8 BASES

Attachment 6
MPS3 Marked-Up Bases Pages (Information Only)

INSERT 3/4.4.8 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 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 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 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 3.7.1.4, "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 to the accident. In both cases, the noble gas specific activity is assumed to be 81.2 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/or 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 put in service.

The SLB radiological analysis assumes 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 1μCi/gm but less than or equal to 60.0 μCi/gm is permissible for up to 48 hours while efforts are made to restore DOSE EQUIVALENT I-131 to within the 1 μCi/gm LCO limit. Operation with iodine specific activity levels greater than 60 μCi/gm is not permissible.

The RCS specific activity limits 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 81.2 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).

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

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. and b.

With the DOSE EQUIVALENT I-131 greater than the LCO limit, samples at intervals of four hours must be taken to demonstrate that the specific activity is ≤ 60 μCi/gm. Four hours is required to obtain and analyze a sample. Sampling is continued every four 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 statement in ACTION b. indicates the provisions of LCO 3.0.4 are not applicable. This exception to LCO 3.0.4 permits entry into the applicable MODE(S), relying on ACTIONS a. and b. while the DOSE EQUIVALENT I-131 LCO is not met. This exception is acceptable due to the significant conservatism incorporated into the RCS 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.

If the required action and completion time of ACTION b. is not met, or if the DOSE EQUIVALENT I-131 is > 60 μCi/gm, the reactor must be brought to HOT STANDBY (MODE 3) within 6 hours and COLD SHUTDOWN (MODE 5) within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

d.

With the RCS 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.

A statement in ACTION d. indicates the provisions of LCO 3.0.4 are not applicable. This exception to LCO 3.0.4 permits entry into the applicable MODE(S), relying on ACTION d. while the DOSE EQUIVALENT XE-133 LCO is not met. This exception is acceptable due to the significant conservatism incorporated into the RCS 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.

e.

If the required action and completion time of ACTION d. is not met, the reactor must be brought to HOT STANDBY (MODE 3) within 6 hours and COLD SHUTDOWN (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

4.4.8.1

Surveillance Requirement 4.4.8.1 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 Requirement provides an indication of any increase in the noble gas specific activity.

Trending the results of this Surveillance Requirement allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The surveillance 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 Surveillance Requirement 4.4.8.1 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 Surveillance Requirement to allow entry into and operation in MODE 4, MODE 3, and MODE 2 prior to performing the Surveillance Requirement. This allows the Surveillance Requirement to be performed in those MODES, prior to entering MODE 1.

4.4.8.2

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

REFERENCES

1. 10 CFR 50.67.

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

3. FSAR, Section 15.1.5.

4. FSAR, Section 15.6.3.

SPECIFIC ACTIVITY (Continued)

for the limits on specific activity represent limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters of the Millstone site, such as SITE BOUNDARY location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the reactor coolant's specific activity greater than 1 microCurie/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.

The sample analysis for determining the gross specific activity and E can exclude the radioiodines because of the low reactor coolant limit of 1 microCurie/gram DOSE EQUIVALENT I-131, and because, if the limit is exceeded, the radioiodine level is to be determined every 4 hours. If the gross specific activity level and radioiodine level in the reactor coolant were at their limits, the radioiodine contribution would be approximately 1%. In a release of reactor coolant with a typical mixture of radioactivity, the actual radioiodine contribution would probably be about 20%. The exclusion of radionuclides with half-lives less than 10 minutes from these determinations has been made for several reasons. The first consideration is the difficulty to identify short-lived radionuclides in a sample that requires a significant time to collect, transport, and analyze. The second consideration is the predictable delay time between the postulated release of radioactivity from the reactor coolant to its release to the environment and transport to the SITE BOUNDARY, which is relatable to at least 30 minutes decay time. The choice of 10 minutes for the half-life cutoff was made because of the nuclear characteristics of the typical reactor coolant radioactivity. The radionuclides in the typical reactor coolant have half-lives of less than 4 minutes or half-lives of greater than 14 minutes, which allows a distinction between the radionuclides above and below a half-life of 10 minutes. For these reasons the radionuclides that are excluded from consideration are expected to decay to very low levels before they could be transported from the reactor coolant to the SITE BOUNDARY under any accident condition.

DELETE

SPECIFIC ACTIVITY (Continued)

~~Reducing T_{avg} to less than 500°F prevents the release of activity should a steam generator tube rupture since the saturation pressure of the reactor coolant is below the lift pressure of the atmospheric steam relief valves. The Surveillance Requirements provide adequate assurance that excessive specific activity levels in the reactor coolant will be detected in sufficient time to take corrective action. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.~~

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM (EXCEPT THE PRESSURIZER)

BACKGROUND

DELETE

All components of the RCS are designed to withstand effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients, and reactor trips. This LCO limits the pressure and temperature changes during RCS heatup and cooldown, within the design assumptions and the stress limits for cyclic operation.

Figures 3.4-2 and 3.4-3 contain P/T limit curves for heatup, cooldown, inservice leak and hydrostatic (ISLH) testing, and data for the maximum rate of change of reactor coolant temperature.

Each P/T limit curve defines an acceptable region for normal operation. The usual use of the curves is operational requirements during heatup or cooldown maneuvering, when pressure and temperature indications are monitored and compared to the applicable curve to determine that operation is within the allowable region. A heatup or cooldown is defined as a temperature increase or decrease of greater than or equal to 10°F in any one hour period. This definition of heatup and cooldown is based upon the ASME definition of isothermal conditions described in ASME, Section XI, Appendix E.