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An Exelon Company

10CFR50.90

5928-08-20201

November 6, 2008

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

Three Mile Island Nuclear Station, Unit 1
Facility Operating License No. DPR-50
NRC Docket No. 50-289

Subject: License Amendment Request No. 326 to Adopt TSTF-490-A, Revision 0, "Deletion of E Bar Definition and Revision to Reactor Coolant System Specific Activity Technical Specification Using the Consolidated Line Item Improvement Process"

References:
1. TSTF-490, Revision 0, Deletion of E Bar Definition and Revision to Reactor Coolant System Specific Activity Technical Specification Using the Consolidated Line Item Improvement Process, dated March 15, 2007
2. Federal Register Notice of Availability published on March 15, 2007 (72FR12217)

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," AmerGen Energy Company, LLC (AmerGen) requests an amendment to the Technical Specifications (TS) for Three Mile Island Nuclear Station, Unit 1 (TMI Unit 1) consistent with NRC-approved Industry Technical Specification Task Force Standard Technical Specification Change Traveler, TSTF-490-A, Revision 0, "Deletion of E Bar Definition and Revision to Reactor Coolant System Specific Activity Technical Specification Using the Consolidated Line Item Improvement Process" (Reference 1). The availability of this TS improvement was announced in the Federal Register on March 15, 2007 (Reference 2) as part of the Consolidated Line Item Improvement Process (CLIIP). AmerGen has reviewed the proposed no significant hazards consideration determination published in the Federal Register on March 15, 2007 (Reference 2) as part of the CLIIP and has determined that it is applicable to TMI Unit 1.

The proposed changes would replace the current TMI Unit 1 TS 3.1.4 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 definition that would replace the current E Bar average disintegration energy definition. In addition, the current dose equivalent I-131 definition would be revised to allow the use of additional thyroid dose conversion factors.

The proposed changes have been reviewed by the Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the AmerGen Quality Assurance Program.

Attachment 1 provides a description and assessment of the proposed changes, as well as confirmation of applicability. Attachment 2 provides the existing TS pages and TS Bases marked-up to show the proposed changes.

AmerGen requests approval of the proposed amendment by November 6, 2009. Once approved, the amendment shall be implemented within 60 days.

There are no new commitments contained in this letter.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), AmerGen is notifying the Commonwealth of Pennsylvania of this application for license amendment.

Should you have any questions concerning this letter, please contact Ms. Wendy Croft at (610) 765-5726.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 6th day of November, 2008.

Respectfully,

Pamela B. Cowan
Director – Licensing and Regulatory Affairs

Attachments:

1. Evaluation of Proposed Changes
2. Mark Up of Technical Specification Pages and TS Bases Pages

cc: S. J. Collins, Administrator, Region I, USNRC
D. M. Kern, USNRC Senior Resident Inspector, TMI Unit 1
P. J. Bamford, USNRC Project Manager, TMI Unit 1
D. Allard, Director, Bureau of Radiation Protection – PA Department of Environmental Resources
Chairman, Board of County Commissioners of Dauphin County
Chairman, Board of Supervisors of Londonderry Township
File No. 08050

ATTACHMENT 1

Evaluation of Proposed Changes

Three Mile Island Unit 1
Facility Operating License No. DPR-50

Subject: Deletion of E Bar Definition and Revision to Reactor Coolant System Specific Activity Technical Specification Using the Consolidated Line Item Improvement Process

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Operating License No. DPR-50 for Three Mile Island Nuclear Station, Unit 1 (TMI, Unit 1).

The proposed changes would revise the Operating License to 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 staff via Safety Evaluation (SE) dated September 27, 2006 (ADAMS ML062700612) (Reference 1). Technical Specification (TS) Task Force (TSTF) change traveler TSTF-490-A, Revision 0, "Deletion of E Bar Definition and Revision to Reactor Coolant System Specific Activity Technical Specification Using the Consolidated Line Item Improvement Process" was announced for availability in the Federal Register on March 15, 2007 as part of the Consolidated Line Item Improvement Process (CLIIP).

Variations from the NRC-approved TSTF-490-A, Revision 0, and the proposed TS changes are delineated in Sections 2.0 and 3.0 below.

2.0 DETAILED DESCRIPTION

The background for this application is stated in the model SE in NRC's Notice of Availability published on March 15, 2007 (72FR12217), the NRC Notice for Comment, published on November 20, 2006 (71FR67170), and TSTF-490-A, Revision 0.

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

- Revise the definition of DOSE EQUIVALENT I-131.
- Add a new TS definition for DOSE EQUIVALENT Xe-133.
- Revise LCO 3.1.4.1, "Reactor Coolant System Activity" to delete references to gross specific activity; add limit for DOSE EQUIVALENT Xe-133;
- Delete Figure 3.1-2a, "Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity Limit versus Percent of RATED THERMAL POWER."
- Revise LCO 3.1.4.2 "Applicability" to specify the LCO is applicable in all modes with the exception of REFUELING and COLD SHUTDOWN.
- Modify ACTIONS 3.1.4.3 as follows:
  A. Condition A is modified to delete the reference to Figure 3.1-2a, and define an upper limit that is applicable at all power levels.
  B. NUREG-1430 and NUREG-1432 are reordered, moving Condition C to Condition B to be consistent with the Writer's Guide.
  C. Condition B (was Condition C in NUREG-1430 and NUREG -1432) is modified to provide a Condition and Required Action for DOSE EQUIVALENT Xe-133 instead of gross specific activity. The Completion Time is changed from 6 hours to 48 hours.
  D. Condition C (was Condition B in NUREG-1430 and NUREG-1432) is included in revised Conditions A and B to reflect the change in the LCO applicability.
- Revise Surveillance Requirement (SR) Table 4.1-3, Item 1.a, to verify the limit for DOSE EQUIVALENT Xe-133. Wording is also deleted, consistent with SR Table 4.1-3, Item 1.b, to allow entry into STARTUP, HOT STANDBY and HOT SHUTDOWN prior to performance of the SR.
- Delete SR Table 4.1-3, Item 1.c.

3.0 TECHNICAL EVALUATION

AmerGen Energy LLC, (AmerGen) has reviewed References 1, 2 and 3, and the model SE published on November 20, 2006 (71FR67170) as part of the CLIIP Notice for Comment. AmerGen has applied the methodology in Reference 1 to develop the proposed TS changes. AmerGen has also concluded that the justifications presented in TSTF-490-A, Revision 0, and the model SE prepared by the NRC staff are applicable to TMI Unit 1 and justify this amendment for incorporation of the changes to the TMI Unit 1 TS.

Additional reviews have determined that the proposed changes do not require any exemption or relief from regulatory requirements, other than the Technical Specifications, and do not affect conformance to any General Design Criteria differently than described in the UFSAR.

TMI Unit 1 is a custom technical specification PWR plant and, therefore, the applicable TSs and associated bases section numbers and wording are different from the BWOG STSs. Minor variations, grammatical and administrative in nature, have been made that do not change the technical intent of the changes proposed. A list is provided below of the variations to the approved TSTF-490-A, Revision 0:

- The deletion of Figure 3.1-2a, "Reactor Coolant DOSE EQUIVALENT I-131 Specific Activity Limit versus Percent of RATED THERMAL POWER" in the TS requires deletion of the figure title in the "List of Figures" on TS page vii, and the insertion of the word "DELETED" to note the change. This change meets the original intent of TSTF 490-A, Revision 0.

- Corresponding ACTIONS Table 3.1.4.3 in BWOG STS are formatted differently than the non-tabular custom TMI Unit 1 TS. Due to this difference, there is no Condition C, and the proposed actions contained therein have been included in Conditions A and B appropriately. This change meets the original intent of TSTF 490-A, Revision 0.

- The definition of "E Bar," AVERAGE DISINTEGRATION ENERGY is not in the TMI Unit TS, and therefore does not require deletion. This change meets the original intent of TSTF 490-A, Revision 0.

- TMI Unit 1's custom TS do not refer to modes of operation by number (1, 2, 3, etc.) as in the BWOG STS. To meet the intent of revising LCO 3.1.4.2 to indicate the "LCO is applicable in MODES 1, 2, 3, and 4," the LCO has been changed to state "LCO is applicable in all modes with the exception of REFUELING and COLD SHUTDOWN." This change corresponds to operating only in the intended modes of operation (BWOG STS modes 1, 2, 3 and 4). This change meets the original intent of TSTF 490-A, Revision 0.

- The equivalent notes in the BWOG STS SR Table 4.1-3 Items 1.a and b state that the testing shall be conducted only during "POWER OPERATION." Therefore, wording was deleted from TMI Unit 1 TS SR Table 4.1-3 Items 1.a and b to state that the testing shall be conducted only during "POWER OPERATION."

- The TMI Unit 1 SR Table 4.1-3 Item 1.b.iii references E Bar Determination and the TSTF updated SR Table 4.1-3 Item 1.a in the statement, "or 100/E μCi/gram during all modes but refueling." This statement has been deleted to align with the TSTF changes to delete Radiochemical E Bar determination. This change meets the original intent of TSTF 490-A, Revision 0.

- The deletion of SR Table 4.1-3 Item 1.c requires the insertion of the word "Deleted" to note the change. This change meets the original intent of TSTF 490-A, Revision 0.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements

A description of these proposed changes and their relationship to applicable regulatory requirements and guidance was provided in the NRC Notice of Availability published on March 15, 2007 (72FR12217), the NRC Notice for Comment published on November 20, 2006 (71FR67170), and TSTF-490-A, Revision 0.

4.2 Precedent

This application is being made in accordance with the CLIIP. AmerGen is not proposing significant variations or deviations from the TS changes described in TSTF 490 or in the content of the NRC staff's model safety evaluation published on November 20, 2006 (71FR67170). The NRC has previously approved similar amendment requests to the TS for Point Beach Nuclear Plant, Units 1 and 2, Indian Point Nuclear Generating Station, Units 2 and 3, Diablo Canyon Power Plant, Units 1 and 2, Callaway Plant, Unit 1, Wolf Creek Generating Station, and Comanche Peak Steam Electric Station, Units 1 and 2. The subject License Amendment Request proposes to adopt surveillance testing requirements similar to those discussed in the previously approved amendments.

4.3 No Significant Hazards Consideration (NSHC)

AmerGen has reviewed the proposed no significant hazards consideration determination published in the *Federal Register* on March 15, 2007 (72FR12217) as part of the CLIIP. AmerGen has concluded that the proposed determination presented in the notice is applicable to TMI Unit 1 and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

Based on the above, AmerGen concludes that the proposed changes do not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of no significant hazards consideration is justified.

4.4 Conclusion

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

AmerGen has reviewed the environmental consideration included in the model SE published in the Federal Register on March 15, 2007 (72FR12217) as part of the CLIIP. AmerGen has concluded that the staff's findings presented therein are applicable to TMI Unit 1 and the determination is hereby incorporated by reference for this application.

6.0 REFERENCES

1. NRC Safety Evaluation (SE) approving TSTF-490-A, Revision 0, dated September 27, 2006.
2. Federal Register Notice of Opportunity to Comment published on November 20, 2006 (71FR67170)
3. Federal Register Notice of Availability published on March 15, 2007 (72FR12217)

ATTACHMENT 2

Markup of Technical Specifications Pages
and TS BASES Pages

Three Mile Island Unit 1
Facility Operating License No. DPR-50

REVISED TECHNICAL SPECIFICATIONS PAGES

vii
1-6
1-8
3-8
3-9
3-9b
4-9

LIST OF FIGURES

Amendment Nos. ~~11, 17, 29, 39, 45, 50, 59, 72, 106, 109, 120, 126, 134, 142, 150, 164, 167, 168, 184, 211, 227, 234~~ e

1.9 DELETED

1.10 DELETED

1.11 DELETED

1.12 DOSE EQUIVALENT I-131

Insert 1

~~The DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcurie/gram) which alone would produce the same 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 in Table III of TID 14844, "Calculation of Distance Factors for Power and Test Reactor Sites". [Or in Table E-7 of NRC Regulatory Guide 1.109, Revision 1, October 1977.]~~

1.13 SOURCE CHECK

A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

1.14 DELETED

1.15 OFFSITE DOSE CALCULATION MANUAL (ODCM)

The OFFSITE DOSE CALCULATION MANUAL (ODCM) shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluent, in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and in the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain (1) the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Section 6.8.4 and (2) descriptions of the information that should be included in the Annual Radiological Environmental Operating and Annual Radioactive Effluent Release Reports required by Specifications 6.9.3 and 6.9.4.

1.16 PROCESS CONTROL PROGRAM (PCP)

The PROCESS CONTROL PROGRAM (PCP) shall contain the current formulas, sampling, analyses, test, and determinations to be made to ensure that processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Parts 20, 61, and 71, State regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

1.17 GASEOUS RADWASTE TREATMENT

The GASEOUS RADWASTE TREATMENT SYSTEM is the system designed and installed to reduce radioactive gaseous effluent by collecting primary coolant system off gases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

Insert 1:

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. The determination of DOSE EQUIVALENT I-131 shall be performed using thyroid dose conversion factors from:

a. Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites," or

b. Table E-7 of Regulatory Guide 1.109, Rev. 1, NRC, 1977, or

c. ICRP-30, 1979, Supplement to Part 1, pages 192-212, Table titled, "Committed Dose Equivalent in Target Organs" or "Tissues per Intake of Unit Activity," or

d. Table 2.1 of EPA Federal Guidance Report No. 11, 1988, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion."

1.24 CORE OPERATING LIMITS REPORT

The CORE OPERATING LIMITS REPORT is a TMI-1 specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.9.5. Plant operation within these operating limits is addressed in individual specifications.

1.25 FREQUENCY NOTATION

The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.2. All Surveillance Requirements shall be performed within the specified time interval with a maximum allowable extension not to exceed 25% of the surveillance interval. The 25% extension applies to all frequency intervals with the exception of "F." No extension is allowed for intervals designated "F."

TABLE 1.2

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	Shiftly (once per 12 hours)
D	Daily (once per 24 hours)
W	Weekly (once per 7 days)
M	Monthly (once per 31 days)
Q	Quarterly (once per 92 days)
S/A	Semi-Annually (once per 184 days)
R	Refueling Interval (once per 24 months)
P S/U	Prior to each reactor startup, if not done during the previous 7 days
P S/A	**Within six (6) months prior to each reactor startup**
P	Completed prior to each release
N/A (NA)	Not applicable
E	Once per 18 months
F	Not to exceed 24 months

Insert 2 →

Insert 2:

1.26 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, or the average gamma disintegration energies as provided in ICRP Publication 38, "Radionuclide Transformations" or similar source.

(RCS)

3.1.4 REACTOR COOLANT SYSTEM ACTIVITY

3.1.4.1 LIMITING CONDITION FOR OPERATION

Insert 3

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

~~a. Less than or equal to 0.35 microcurie/gram DOSE EQUIVALENT I-131, and~~

~~b. Less than or equal to 100/$\bar{E}$ microcuries/gram*~~

3.1.4.2 ~~APPLICABILITY: at all times except refueling~~ ← Insert 4

3.1.4.3 ACTION:

~~MODES: Power Operation, Start-Up, Hot Standby~~ ← Insert5

~~a. With the specific activity of the primary coolant greater than 0.35 microcurie/gram DOSE EQUIVALENT I-131 for more than 48 hours** during one continuous time interval or exceeding the limit line shown on Figure 3.1-2a, be in at least HOT SHUTDOWN within 6 hours. Power operation may continue when DOSE EQUIVALENT I-131 is below 0.35 microcurie/gram.~~

~~b. With the specific activity of the primary coolant greater than 100/$\bar{E}$ microcuries/gram be in at least HOT SHUTDOWN within 6 hours. Power operation may continue when primary coolant activity is less than 100/$\bar{E}$ microcuries/gram.~~

~~MODES: At all times except refueling.~~

~~c. With the specific activity of the primary coolant greater than 0.35 microcurie/gram DOSE EQUIVALENT I-131 or greater than 100/$\bar{E}$ microcuries/gram perform the sampling and analysis requirements of Table 4.1-3 until the specific activity of the primary coolant is restored to within its limits.~~

Bases

INSERT 6

~~The limitations on the specific activity of the primary coolant ensure that the resulting 2 hour doses at the site boundary will be well within the Part 100 limit following a steam generator tube rupture accident or steam line break accident with postulated accident induced steam generator tube leakage in conjunction with an assumed steady state primary-to-secondary steam generator leakage rate of 1.0 GPM. The values for the limits on specific activity represent limits based on a parametric evaluation by the NRC of typical site locations. These values are conservative, in that the specific site parameters of TMI-1, such as site boundary, location and meteorological conditions, were not considered in this evaluation.~~

~~* $\bar{E}$ 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 greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.~~

~~** The time period begins from the time the sample is taken.~~

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity greater than 0.35 microcurie/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.1-2a, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.

Proceeding to HOT SHUTDOWN 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 spiking phenomena. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.

The NRC staff has performed a generic analysis of airborne radiation released via the Reactor Building Purge Isolation Valves. The dose contribution due to the radiation contained in the air and steam released through the purge isolation valves prior to closure was found to be acceptable provided that the requirements of Specifications 3.1.4.1, 3.1.4.2 and 3.1.4.3 are met.

Insert 3:

RCS DOSE EQUIVALENT I-131 and DOSE EQUIVALENT Xe-133 specific activity shall be limited to:

a. Less than or equal to 0.35 microcuries/gram DOSE EQUIVALENT I-131, and

b. Less than or equal to 797 microcuries/gram DOSE EQUIVALENT Xe-133.

Insert 4:

APPLICABILITY: At all times except REFUELING and COLD SHUTDOWN.

Insert 5:

MODES: At all times except REFUELING and COLD SHUTDOWN

a.1 With DOSE EQUIVALENT I-131 not within limit, perform the sampling and analysis requirements of Table 4.1.3 until the RCS DOSE EQUIVALENT I-131 is restored to within limit, AND

a.2 Verify that DOSE EQUIVALENT I-131 is less than or equal to 60 microcuries/gram, AND

a.3 Restore DOSE EQUIVALENT I-131 to within limit within 48 hours.

a.4 If the requirements of a.1, a.2 or a.3 cannot be met, be in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within 36 hours.

b.1 With DOSE EQUIVALENT Xe-133 not within limit, restore DOSE EQUIVALENT Xe-133 to within limit within 48 hours.

b.2 If the requirements of b.1 cannot be met, be in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within 36 hours.

Insert 6:

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 (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).

The LCO limits on the specific activity of the reactor coolant ensure that the resulting offsite and control room doses meet the appropriate 10CFR100.11 (Ref. 1) and 10CFR50 Appendix A GDC19 (Ref. 5) 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 3.13, "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 to the accident. In both cases, the noble gas specific activity is assumed to be 797 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 Decay Heat Removal (DHR) system is placed in service.

Insert 6 Continued:

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 DHR 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 0.35 µCi/gm DOSE EQUIVALENT I-131, and the noble gas specific activity in the reactor coolant is limited to 797 µCi/gm DOSE EQUIVALENT Xe-133. The limits on specific activity ensure that offsite and control room doses will meet the appropriate 10CFR100.11 (Ref. 1) and 10CFR50 Appendix A GDC19 (Ref. 5) acceptance criteria.

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 10CFR100.11 (Ref. 1) and 10CFR50 Appendix A GDC19 (Ref. 5) acceptance criteria.

APPLICABILITY
In all MODES other than REFUELING and COLD SHUTDOWN, 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 10CFR100.11 acceptance criteria (Ref. 1) and 10CFR50 Appendix A GDC 19 acceptance criteria (Ref. 5).

In the REFUELING and COLD SHUTDOWN MODES, the steam generators are transitioning to decay heat removal and primary to secondary leakage is minimal. Therefore, the monitoring of RCS specific activity is not required.

ACTIONS
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 $\leq$ 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.

Insert 6 Continued:

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.

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.

If the Required Actions of 3.1.4.3.a and 3.1.4.3.b are not met, or if the DOSE EQUIVALENT I-131 is > 60.0 μCi/gm, the reactor must be brought to HOT SHUTDOWN within 6 hours and COLD SHUTDOWN 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
Table 4.1-3 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 Table 4.1-3 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.

The SR allows entry into and operation in HOT SHUTDOWN, HOT STANDBY, and STARTUP prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering POWER OPERATION.

The Table 4.1-3 surveillance for isotopic analysis for DOSE EQUIVALENT I-131 concentration 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.

Insert 6 Continued:

The SR allows entry into and operation in HOT SHUTDOWN, HOT STANDBY, and STARTUP prior to performing the SR. This allows the Surveillance to be performed in those MODES, prior to entering POWER OPERATION.

REFERENCES

1. 10 CFR 100.11.

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

3. FSAR, Section 14.1.2.9.

4. FSAR, Section 14.1.2.10.

5. 10 CFR 50 Appendix A, General Design Criteria 19

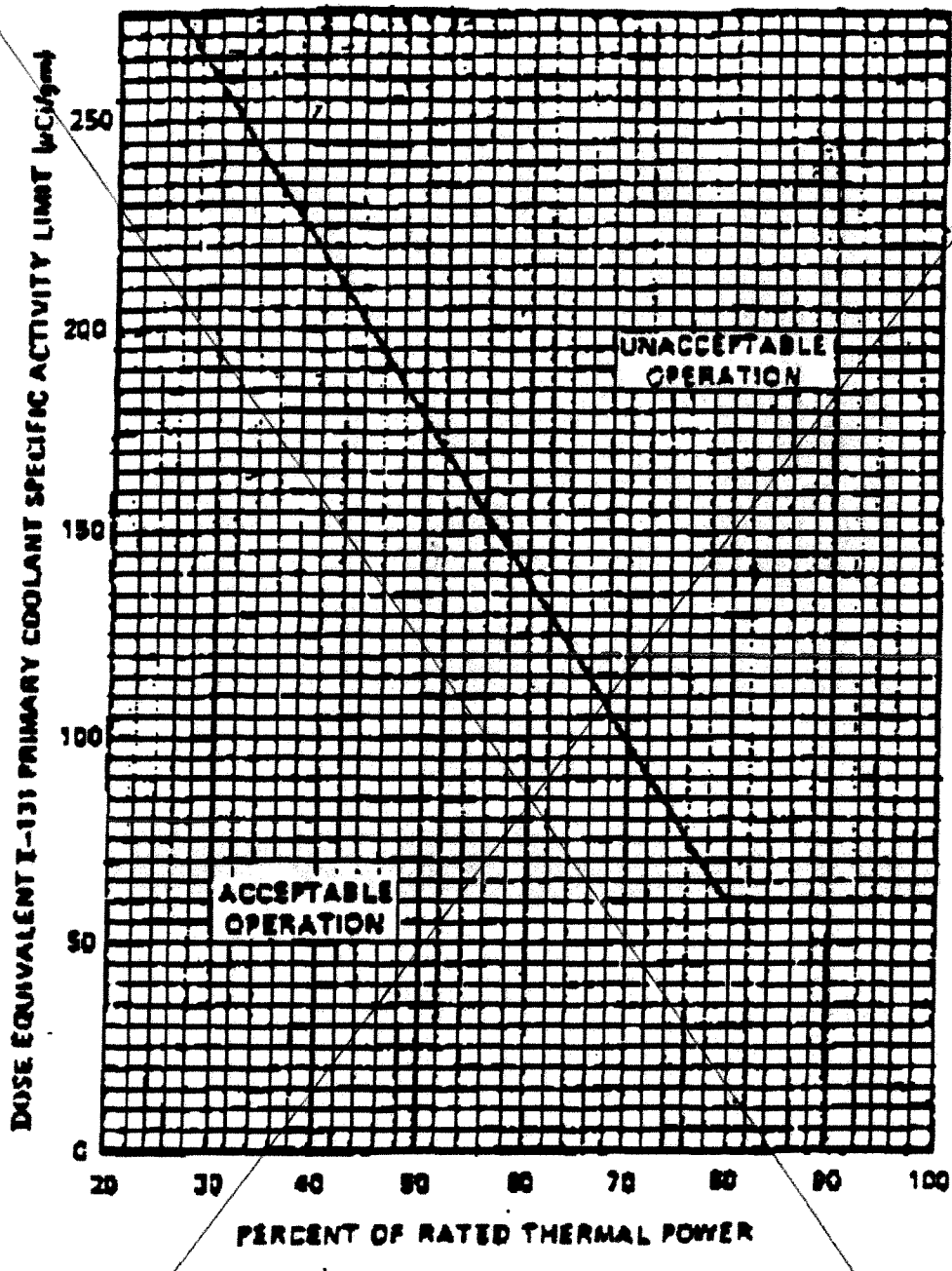

FIGURE 3.1-2a

Dose equivalent I-131 Primary Coolant Specific Activity Limit Versus Percent of RATED THERMAL POWER (with the Primary Coolant Specific Activity >0.35 μCi/gram Dose Equivalent 1-131).

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TABLE 4.1-3
MINIMUM SAMPLING FREQUENCY

Item	Check	Frequency
1. Reactor Coolant	a. ~~Specific Activity Determination to compare to the 100/Ē µCi/gm limit~~ ← Insert 7	At least once each 7 days during POWER OPERATION~~, HOT STANDBY, START-UP, and HOT SHUTDOWN.~~
	b. Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	i) 1 per 14 days during power operations.
		ii) One Sample between 2 and 6 hours following a THERMAL POWER change exceeding 15% of the RATED THERMAL POWER within a one hour period during power operation~~, start-up and hot standby.~~
		iii) # Once per 4 hours, whenever the specific activity exceeds 0.35 µCi/gram DOSE EQUIVALENT I-131 ~~or 100/Ē µCi/gram during all modes but refueling.~~
	C. Deleted ↓ ~~c. Radiochemical for Ē Determination~~	~~1 per 6 months* during power operation.~~
	d. Chemistry (Cl, F and O2)	5 times/week when Tavg IS GREATER THAN 200°F.
	e. Boron concentration	2 times/week
	f. Tritium Radioactivity	Monthly
2. Borated Water Storage Tank Water Sample	Boron concentration	Weekly and after each makeup when reactor coolant system pressure is greater than 300 psig or Tavg is greater than 200°F.
3. Core Flooding Tank Water Sample	Boron concentration	Monthly and after each makeup when RCS pressure is greater than 700 psig.

Insert 7:

Verify reactor coolant DOSE EQUIVALENT Xe-133 specific activity is less than or equal to 797 microcuries/gram.