Advanced Passive 1000 (AP1000)
Generic Technical Specification Traveler (GTST)

Title: Changes Related to LCO 3.6.1, Containment

I. Technical Specifications Task Force (TSTF) Travelers, Approved Since Revision 2 of STS NUREG-1431, and Used to Develop this GTST

TSTF Number and Title:

TSTF-52-A, Rev. 3,	Implement 10 CFR 50, Appendix J, Option B
TSTF-343-A, Rev. 1,	Containment Structural Integrity
TSTF-425, Rev. 3,	Relocate Surveillance Frequencies to Licensee Control - RITSTF Initiative 5b

STS NUREGs Affected:

TSTF-52-A, Rev. 3:	NUREG-1430, 1431, 1432, 1433, 1434
TSTF-343-A, Rev. 1:	NUREG-1430, 1431, 1432, 1433, 1434
TSTF-425, Rev. 3:	NUREG-1430, 1431, 1432, 1433, 1434

NRC Approval Date:

TSTF-52-A, Rev. 3:	14-Apr-00
TSTF-343-A, Rev. 1:	06-Dec-05
TSTF-425, Rev. 3:	06-Jul-09

TSTF Classification:

TSTF-52-A, Rev. 3:	Plant Variation
TSTF-343-A, Rev. 1:	Technical Change
TSTF-425, Rev. 3:	Technical Change

II. Reference Combined License (RCOL) Standard Departures (Std. Dep.), RCOL COL Items, and RCOL Plant-Specific Technical Specifications (PTS) Changes Used to Develop this GTST

RCOL Std. Dep. Number and Title:

None

RCOL COL Item Number and Title:

None

RCOL PTS Change Number and Title:

None

III. Comments on Relations Among TSTFs, RCOL Std. Dep., RCOL COL Items, and RCOL PTS Changes

This section discusses the considered changes that are: (1) applicable to operating reactor designs, but not to the AP1000 design; (2) already incorporated in the GTS; or (3) superseded by another change.

TSTF-343-A, Rev. 1 is to allow exceptions to RG 1.163 regulatory position C.3 on frequency of inspections of outside and inside surfaces of the primary containment. Since the AP1000 design does not have the pre-stressed concrete structure and Technical Specification 5.5.8, “Containment Leakage Rate Testing Program” does not list any exception to RG 1.163 requirements, TSTF-343-A, Rev. 1 is not applicable. Therefore, these changes are not incorporated into the AP1000 Technical Specification 3.6.1.

TSTF-52-A was partially incorporated into the AP1000 Specification 3.6.1. Other changes that were not previously incorporated and are applicable to the AP1000 Specification 3.6.1, are incorporated as discussed in Section VI.

TSTF-425 is deferred for future consideration.

IV. Additional Changes Proposed as Part of this GTST (modifications proposed by NRC staff and/or clear editorial changes or deviations identified by preparer of GTST)

In the “Applicability” section of the bases, the reference to “LCO 3.6.8” is changed to “LCO 3.6.7” as a result of VEGP LAR DOC M13.

In the “References” section of the Bases, the title for FSAR Chapter 15 is corrected from “Accident Analysis” to “Accident Analyses.”

APOG Recommended Changes to Improve the Bases

Throughout the Bases, references to Sections and Chapters of the FSAR do not include the “FSAR” modifier. Since these Section and Chapter references are to an external document, it is appropriate to include the acronym “FSAR” to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003)

Revise the “Background” section of the Bases, fourth paragraph. The change improves consistency with STS NUREG-1431, Rev. 4 by changing “conform” to “comply”.

Revise the “Background” section of the Bases, under item “a”. The first words for item 1 and 2 are capitalized.

Revise the “Applicability” section of the Bases, the period of the last sentence is moved inside of the close- quote.

Revise the “References” section of the Bases, the title of the first reference is revised to include the Option B title.

V. Applicability

Affected Generic Technical Specifications and Bases:

Section 3.6.1, Containment

Changes to the Generic Technical Specifications and Bases:

“Background” section, “Applicable Safety Analyses” section, “References” section, and Surveillance Requirement (SR) 3.6.1.1 of Bases 3.6.1 are revised to incorporate applicable changes from TSTF-52-A to implement 10 CFR 50 Appendix J, Option B.

“Applicability” section of Bases 3.6.1 is revised to replace the phrase “LCO 3.6.8” with “LCO 3.6.7”. (NRC staff proposed change)

The acronym “FSAR” is added to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

In the “Background” section of the Bases, fourth paragraph, the word “conform” is changed to “comply”. (APOG Comment)

In the “Background” section of the Bases, under item “a”, second-tier list items 1 and 2, the first words are capitalized. (APOG Comment)

In the “Applicability” section of the Bases, the last sentence is revised by moving the period inside the close- quote. (APOG Comment)

In the “References” section of the Bases, the title of the first reference is revised to include “…, Performance-Based Requirements.” (APOG Comment)

In the “References” section of the Bases, the title for FSAR Chapter 15 is corrected from “Accident Analysis” to “Accident Analyses.” (NRC staff proposed change)

VI. Traveler Information

Description of TSTF changes:

TSTF-52-A changes to the Bases are to implement 10 CFR 50, Appendix J, Option B. The Design Basis Accident is changed to design basis loss of coolant accident. References to 10 CFR, Appendix J are specified as Option B. For Surveillance Requirement (SR) 3.6.1.1 the required overall Type A leakage is changed from "< 0.75 L_a" to "≤ 0.75 L_a". In the "References" section, the change is implemented as "Option B".

Rationale for TSTF changes:

TSTF-52-A: Implementation of 10 CFR 50, Appendix J, Option B is already included in Specification 5.5.8, "Primary Containment Leakage Rate Testing Program" of the AP1000 Technical Specification. Specifying that the Design Basis Accident is the design basis Loss of Coolant Accident (LOCA) provides clarification. Changing "<" to "≤" is consistent with the Option B required overall Type A leakage.

Description of changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:

None

Rationale for changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:

Not applicable

Description of additional changes proposed by NRC staff/preparer of GTST:

In the "Applicability" section of the bases, the reference to "LCO 3.6.8" is replaced with "LCO 3.6.7".

The acronym "FSAR" is added to modify "Section" and "Chapter" in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

The word "conform" is changed to "comply" in the "Background" section of the Bases, fourth paragraph. (APOG Comment)

The first words are capitalized in items 1 and 2 in the "Background" section of the Bases, under item "a". (APOG Comment)

The last sentence is revised by moving the period inside the close- quote in the "Applicability" section of the Bases. (APOG Comment)

The title of 10 CFR 50, Appendix J, Option B in the "References" section of the Bases is revised to include "…, Performance-Based Requirements." (APOG Comment)

In the "References" section of the Bases, the title for FSAR Chapter 15 is corrected from "Accident Analysis" to "Accident Analyses."

Rationale for additional changes proposed by NRC staff/preparer of GTST:

This change is similar to a change to TS 3.6.3 as a result of VEGP LAR DOC M13.

Since Bases references to FSAR Sections and Chapters are to an external document, it is appropriate to include the "FSAR" modifier.

Changing the word "conform" to "comply" improves consistency with STS NUREG-1431, Rev. 4.

Capitalizing the first words in the list in the "Background" section of the Bases provides improved clarity, consistency, and operator usability.

Moving the period inside of the close- quote is an editorial correction that provides improved clarity, consistency, and operator usability.

Revising the title of the 10 CFR 50, Appendix J, Option B reference is an editorial clarification.

Correcting the title for FSAR Chapter 15 from "Accident Analysis" to "Accident Analyses" is an editorial change.

VII. GTST Safety Evaluation

Technical Analysis:

TSTF-52-A: The NRC added Option B, "Performance-Based Requirements," to allow licensees to voluntarily replace the prescriptive testing requirements of 10 CFR Part 50, Appendix J, with testing requirements based on both overall performance and the performance of individual components. An NRC Review [ML010930230] found that the TS changes proposed by the licensee are in compliance with the requirements of Option B and are consistent with the guidance of RG 1.163 and TSTF-52, Revision 3.

The remaining changes are editorial, clarifying, grammatical, or otherwise considered administrative. These changes do not affect the technical content, but improve the readability, implementation, and understanding of the requirements, and are therefore acceptable.

Having found that this GTST's proposed changes to the GTS and Bases are acceptable, the NRC staff concludes that AP1000 STS Subsection 3.6.1 is an acceptable model Specification for the AP1000 standard reactor design.

References to Previous NRC Safety Evaluation Reports (SERs):

Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 194 to Facility Operating License No. DPR-20 Consumer Energy Company Palisades Plant Docket No. 50-255 (ML010930230).

VIII. Review Information

Evaluator Comments:

None

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Review Information:

Availability for public review and comment on Revision 0 of this traveler approved by NRC staff on 5/23/2014.

APOG Comments (Ref. 8) and Resolutions:

1. (Internal #3) Throughout the Bases, references to Sections and Chapters of the FSAR do not include the “FSAR” modifier. Since these Section and Chapter references are to an external document, it is appropriate (DOC A003) to include the “FSAR” modifier. This is resolved by adding the FSAR modifier to every FSAR reference in the Bases.

2. (Internal #13) The NRC approval of TSTF-425, and model safety evaluation provided in the CLIIP for TSTF-425, are generically applicable to any design’s Technical Specifications. As such, the replacement of certain Frequencies with a Surveillance Frequency Control Program should be included in the GTST for AP1000 STS NUREG.

   However, implementation in the AP1000 STS should not reflect optional (i.e., bracketed) material showing retention of fixed Surveillance Frequencies where relocation to a Surveillance Frequency Control Program is acceptable. Since each represented AP1000 Utility is committed to maintaining standardization, there is no rationale for an AP1000 STS that includes bracketed options.

   Consistent with TSTF-425 criteria, replace applicable Surveillance Frequencies with “In accordance with the Surveillance Frequency control Program” and add that Program as new AP1000 STS Specification 5.5.15.

   NRC Staff disagreed with implementing TSTF-425 in the initial version of the STS. Although the APOG thinks the analysis supporting this traveler is general enough to be applicable to AP1000, staff thinks an AP1000-specific proposal from APOG is needed to identify any GTS SRs that should be excluded. Also, with the adoption of a Surveillance Frequency Control Program (SFCP) in the AP1000 STS, bracketed Frequencies, which provide a choice between the GTS Frequency and the SFCP Frequency, are needed because the NRC will use the AP1000 STS as a reference, and to be consistent with NUREG-1431, Rev. 4. APOG was requested to consider proposing an AP1000 version of TSTF-425 for a subsequent revision of the STS.

3. (Internal #335) Revise TS 3.6.1 Bases Background to change from “conform with 10 CFR 50” to “comply with 10 CFR 50” for consistency with NUREG-1431 and editorial

clarification. This is resolved by making the APOG recommended change to the "Background" section Bases, last sentence of the fourth paragraph.

4. (Internal #336) Editorial change is recommended to the ordered list under item "a" in the "Background" section of the Bases by capitalizing the first words for second-tier items 1 and 2 . These non-technical changes provide improved clarity, consistency, and operator usability. These changes are presentation preferences that deviate from TSTF-GG-05-01, Rev.1. This is resolved by making the APOG recommended changes.

5. (Internal #337) Editorial change is recommended to the last sentence in the "Applicability" section of the Bases by moving the period inside the close- quote. This non-technical change provides improved clarity, consistency, and operator usability. This is resolved by making the APOG recommended change.

6. (Internal #338) Revise various TS Bases from "Appendix J," to "Appendix J, Option B" for consistency with NUREG-1431 and editorial clarification. The changes from "Appendix J," to "Appendix J, Option B" are part of the TSTF-52-A changes. The APOG recommended change to the "References" section of the Bases, first reference is resolved by making the following change:

    "10 CFR 50, Appendix J, Option B, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors**, Performance-Based Requirements**."

NRC Final Approval Date: 12/15/2015

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IX. Evaluator Comments for Consideration in Finalizing Technical Specifications and Bases

None

X. References Used in GTST

1. Regulatory Guide 1.163, “Performance-Based Containment Leak-Test Program”, September 1995, (ML003740058).

2. AP1000 DCD, Revision 19, Section 16, “Technical Specifications,” June 2011 (ML11171A500).

3. TSTF-GG-05-01, “Writer's Guide for Plant-Specific Improved Technical Specifications,” June 2005 (ML070660229).

4. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Technical Specifications Upgrade License Amendment Request, February 24, 2011 (ML12065A057).

5. NRC Safety Evaluation (SE) for Amendment No. 13 to Combined License (COL) No. NPF-91 for Vogtle Electric Generating Plant (VEGP) Unit 3, and Amendment No. 13 to COL No. NPF-92 for VEGP Unit 4, September 9, 2013, ADAMS Package Accession No. ML13238A337, which contains:

ML13238A355	Cover Letter - Issuance of License Amendment No. 13 for Vogtle Units 3 and 4 (LAR 12-002).
ML13238A359	Enclosure 1 - Amendment No. 13 to COL No. NPF-91
ML13239A256	Enclosure 2 - Amendment No. 13 to COL No. NPF-92
ML13239A284	Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13)
ML13239A287	Enclosure 4 - Safety Evaluation (SE), and Attachment 1 - Acronyms
ML13239A288	SE Attachment 2 - Table A - Administrative Changes
ML13239A319	SE Attachment 3 - Table M - More Restrictive Changes
ML13239A333	SE Attachment 4 - Table R - Relocated Specifications
ML13239A331	SE Attachment 5 - Table D - Detail Removed Changes
ML13239A316	SE Attachment 6 - Table L - Less Restrictive Changes

The following documents were subsequently issued to correct an administrative error in Enclosure 3:

ML13277A616	Letter - Correction To The Attachment (Replacement Pages) - Vogtle Electric Generating Plant Units 3 and 4-Issuance of Amendment Re: Technical Specifications Upgrade (LAR 12-002) (TAC No. RP9402)
ML13277A637	Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13) (corrected)

6. RAI Letter No. 01 Related to License Amendment Request (LAR) 12-002 for the Vogtle Electric Generating Plant Units 3 and 4 Combined Licenses, September 7, 2012 (ML12251A355).

7. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Response to Request for Additional Information Letter No. 01 Related to License Amendment Request LAR-12-002, ND-12-2015, October 04, 2012 (ML12286A363 and ML12286A360).

8. APOG-2014-008, APOG (AP1000 Utilities) Comments on AP1000 Standardized Technical Specifications (STS) Generic Technical Specification Travelers (GTSTs), Docket ID NRC-2014-0147, September 22, 2014 (ML 14265A493).

XI. MARKUP of the Applicable GTS Subsection for Preparation of the STS NUREG

The entire section of the Specifications and the Bases associated with this GTST is presented next.

Changes to the Specifications and Bases are denoted as follows: Deleted portions are marked in strikethrough red font, and inserted portions in bold blue font.

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment inoperable.	A.1 Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and leakage-rate testing except for containment air-lock testing, in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1 Containment

BASES

BACKGROUND

The containment is a free standing steel pressure vessel surrounded by a reinforced concrete shield building. The containment vessel, including all its penetrations, is a low-leakage steel vessel designed to contain radioactive material that may be released from the reactor core following a ~~Design Basis Accident (DBA)~~**design basis loss of coolant accident (LOCA)** such that offsite radiation exposures are maintained within limits. The containment and shield building provide shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment vessel is a vertical cylindrical steel pressure vessel with elliptical upper and lower heads, completely enclosed by a seismic Category I reinforced concrete shield building. A 4.5 foot wide annular space exists between the walls and domes of the steel containment vessel and the concrete shield building to permit inservice inspection and air flow over the steel dome for containment cooling. The containment utilizes the outer concrete building for shielding and a missile barrier, and the inner steel containment for leak tightness and passive containment cooling.

Containment piping penetration assemblies provide for the passage of process, service and sampling pipelines into the containment vessel while maintaining containment integrity. The shield building provides biological shielding and environmental missile protection for the containment vessel and the Nuclear Steam Supply System.

The inner steel containment and its penetrations establish the leakage limiting boundary of the containment. Maintaining the containment OPERABLE limits the leakage of fission product radioactivity from the containment to the environment. SR 3.6.1.1 leakage rate Surveillance Requirements ~~conform~~**comply** with 10 CFR 50, Appendix J**, Option B** (Ref. 1), as modified by approved exemptions.

BASES

BACKGROUND (continued)

The isolation devices for the penetrations in the containment boundary are a part of the containment leak tight barrier. To maintain this leak tight barrier:

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

   1. ~~c~~**C**apable of being closed by an OPERABLE automatic containment isolation system, or

   2. ~~c~~**C**losed by manual valves, blind flanges, or de-activated automatic valves secured in their closed positions, except as provided in LCO 3.6.3, “Containment Isolation Valves”;

b. Each air lock is OPERABLE, except as provided in LCO 3.6.2, “Containment Air Locks”; and

c. All equipment hatches are closed.

APPLICABLE SAFETY ANALYSES

The safety design basis for the containment is that the containment must withstand the pressures and temperatures of the limiting **Design Basis Accident (**DBA**)** without exceeding the design leakage rates.

The DBAs that result in a challenge to containment OPERABILITY from high pressures and temperatures are a ~~loss of coolant accident (~~LOCA~~)~~, a steam line break, and a rod ejection accident (REA) (Ref. 2). In addition, release of significant fission product radioactivity within containment can occur from a LOCA or REA. The DBA analyses assume that the containment is OPERABLE such that, for the DBAs involving release of fission product radioactivity, release to the environment is controlled by the rate of containment leakage. The containment is designed with an allowable leakage rate of 0.10% of containment air weight of the original content of containment air after a DBA per day (Ref. 3). This leakage rate, used in the evaluation of offsite doses resulting from accidents, is defined in 10 CFR 50, Appendix J**, Option B** (Ref. 1), as L_a: the maximum allowable containment leakage rate at the calculated peak containment internal pressure (P_a) resulting from the limiting ~~DBA~~**design basis LOCA**. The allowable leakage rate represented by L_a forms the basis for the acceptance criteria imposed on containment leakage rate testing. L_a is assumed to be 0.10% per day in the safety analysis.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Satisfactory leakage rate test results is a requirement for the establishment of containment OPERABILITY.

The containment satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Containment OPERABILITY is maintained by limiting leakage to ≤ 1.0 L_a, except prior to the first startup after performing a required Containment Leakage Rate Testing Program Leakage Test. At this time, the applicable leakage limits must be met.

Compliance with this LCO will ensure a containment configuration, including equipment hatches, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analysis.

Individual leakage rates specified for the containment air lock (LCO 3.6.2) are not specifically part of the acceptance criteria of 10 CFR 50, Appendix J, Option B. Therefore, leakage rates exceeding these individual limits only result in the containment being inoperable when the leakage results in exceeding the overall acceptance criteria of 1.0 L_a.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material into containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. The MODES 5 and 6 requirements are specified in LCO ~~3.6.8~~**3.6.7**, "Containment Penetrations**.**"~~.~~

ACTIONS

A.1

In the event containment is inoperable, containment must be restored to OPERABLE status within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining containment OPERABLE during MODES 1, 2, 3, and 4. This time period also ensures that the probability of an accident (requiring containment OPERABILITY) occurring during periods when containment is inoperable is minimal.

BASES

ACTIONS (continued)

B.1 and B.2

If containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Containment Leakage Rate Testing Program. Failure to meet air lock leakage limits specified in LCO 3.6.2 does not invalidate the acceptability of these overall leakage determinations unless their contribution to overall Type A, B, and C leakage causes that to exceed limits. As left leakage prior to the first startup after performing a required leakage test is required to be < 0.6 L_a for combined Type B and C leakage, and **≤**~~<~~ 0.75 L_a for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of ≤ 1.0 L_a. At ≤ 1.0 L_a the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by the Containment Leakage Rate Testing Program. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis.

REFERENCES

1. 10 CFR 50, Appendix J, **Option B,** “Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors**, Performance-Based Requirements**.”
2. **FSAR** Chapter 15, “Accident Analys~~i~~**e**s.”
3. **FSAR** Section 6.2, “Containment Systems.”

XII. Applicable STS Subsection After Incorporation of this GTST's Modifications

The entire subsection of the Specifications and the Bases associated with this GTST, following incorporation of the modifications, is presented next.

3.6 CONTAINMENT SYSTEMS

3.6.1 Containment

LCO 3.6.1 Containment shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment inoperable.	A.1 Restore containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.1.1	Perform required visual examinations and leakage-rate testing except for containment air-lock testing, in accordance with the Containment Leakage Rate Testing Program.	In accordance with the Containment Leakage Rate Testing Program

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1 Containment

BASES

BACKGROUND

The containment is a free standing steel pressure vessel surrounded by a reinforced concrete shield building. The containment vessel, including all its penetrations, is a low-leakage steel vessel designed to contain radioactive material that may be released from the reactor core following a design basis loss of coolant accident (LOCA) such that offsite radiation exposures are maintained within limits. The containment and shield building provide shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment vessel is a vertical cylindrical steel pressure vessel with elliptical upper and lower heads, completely enclosed by a seismic Category I reinforced concrete shield building. A 4.5 foot wide annular space exists between the walls and domes of the steel containment vessel and the concrete shield building to permit inservice inspection and air flow over the steel dome for containment cooling. The containment utilizes the outer concrete building for shielding and a missile barrier, and the inner steel containment for leak tightness and passive containment cooling.

Containment piping penetration assemblies provide for the passage of process, service and sampling pipelines into the containment vessel while maintaining containment integrity. The shield building provides biological shielding and environmental missile protection for the containment vessel and the Nuclear Steam Supply System.

The inner steel containment and its penetrations establish the leakage limiting boundary of the containment. Maintaining the containment OPERABLE limits the leakage of fission product radioactivity from the containment to the environment. SR 3.6.1.1 leakage rate Surveillance Requirements comply with 10 CFR 50, Appendix J, Option B (Ref. 1), as modified by approved exemptions.

BASES

BACKGROUND (continued)

The isolation devices for the penetrations in the containment boundary are a part of the containment leak tight barrier. To maintain this leak tight barrier:

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

   1. Capable of being closed by an OPERABLE automatic containment isolation system, or

   2. Closed by manual valves, blind flanges, or de-activated automatic valves secured in their closed positions, except as provided in LCO 3.6.3, “Containment Isolation Valves”;

b. Each air lock is OPERABLE, except as provided in LCO 3.6.2, “Containment Air Locks”; and

c. All equipment hatches are closed.

APPLICABLE SAFETY ANALYSES

The safety design basis for the containment is that the containment must withstand the pressures and temperatures of the limiting Design Basis Accident (DBA) without exceeding the design leakage rates.

The DBAs that result in a challenge to containment OPERABILITY from high pressures and temperatures are a LOCA, a steam line break, and a rod ejection accident (REA) (Ref. 2). In addition, release of significant fission product radioactivity within containment can occur from a LOCA or REA. The DBA analyses assume that the containment is OPERABLE such that, for the DBAs involving release of fission product radioactivity, release to the environment is controlled by the rate of containment leakage. The containment is designed with an allowable leakage rate of 0.10% of containment air weight of the original content of containment air after a DBA per day (Ref. 3). This leakage rate, used in the evaluation of offsite doses resulting from accidents, is defined in 10 CFR 50, Appendix J, Option B (Ref. 1), as L_a: the maximum allowable containment leakage rate at the calculated peak containment internal pressure (P_a) resulting from the limiting design basis LOCA. The allowable leakage rate represented by L_a forms the basis for the acceptance criteria imposed on containment leakage rate testing. L_a is assumed to be 0.10% per day in the safety analysis.

BASES

APPLICABLE SAFETY ANALYSES (continued)

Satisfactory leakage rate test results is a requirement for the establishment of containment OPERABILITY.

The containment satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Containment OPERABILITY is maintained by limiting leakage to ≤ 1.0 L_a, except prior to the first startup after performing a required Containment Leakage Rate Testing Program Leakage Test. At this time, the applicable leakage limits must be met.

Compliance with this LCO will ensure a containment configuration, including equipment hatches, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analysis.

Individual leakage rates specified for the containment air lock (LCO 3.6.2) are not specifically part of the acceptance criteria of 10 CFR 50, Appendix J, Option B. Therefore, leakage rates exceeding these individual limits only result in the containment being inoperable when the leakage results in exceeding the overall acceptance criteria of 1.0 L_a.

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material into containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. The MODES 5 and 6 requirements are specified in LCO 3.6.7, “Containment Penetrations.”

ACTIONS

A.1

In the event containment is inoperable, containment must be restored to OPERABLE status within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining containment OPERABLE during MODES 1, 2, 3, and 4. This time period also ensures that the probability of an accident (requiring containment OPERABILITY) occurring during periods when containment is inoperable is minimal.

BASES

ACTIONS (continued)

B.1 and B.2

If containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Containment Leakage Rate Testing Program. Failure to meet air lock leakage limits specified in LCO 3.6.2 does not invalidate the acceptability of these overall leakage determinations unless their contribution to overall Type A, B, and C leakage causes that to exceed limits. As left leakage prior to the first startup after performing a required leakage test is required to be $< 0.6\ L_a$ for combined Type B and C leakage, and $\leq 0.75\ L_a$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0\ L_a$. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. SR Frequencies are as required by the Containment Leakage Rate Testing Program. These periodic testing requirements verify that the containment leakage rate does not exceed the leakage rate assumed in the safety analysis.

REFERENCES

1. 10 CFR 50, Appendix J, Option B, “Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, Performance-Based Requirements.”

2. FSAR Chapter 15, “Accident Analyses.”

3. FSAR Section 6.2, “Containment Systems.”