

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

Title: Changes Related to LCO 3.4.16, Reactor Vessel Head Vent (RVHV)

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:

None

STS NUREGs Affected:

Not Applicable

NRC Approval Date:

Not Applicable

TSTF Classification:

Not Applicable

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:

There are no Vogtle departures applicable to Specification 3.4.16.

RCOL COL Item Number and Title:

There are no Vogtle COL items applicable to Specification 3.4.16.

RCOL PTS Change Number and Title:

VEGP LAR DOC A003: References to various Chapters and Sections of the Final Safety Analysis Report (FSAR) are revised to include FSAR.
VEGP LAR DOC A027 SR Clarification and Consistency with TS Writers Guide
VEGP LAR DOC A038: Numerous TS surveillances are revised by deletion of word "that" from the surveillance.
VEGP LAR DOC A063: TS 3.4.16 Actions are revised

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(1) applicable to operating reactor designs, but not to the AP1000 design; (2) already incorporated in the GTS; or (3) superseded by another change.

None

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)

Provide the complete Action C.2 requirement in the Bases discussion of the Actions. Delete the word “fully” in the bases description of SR 3.4.16.1 for consistency. Grammatical errors are corrected in several locations in the bases.

Revise the second paragraph of the “Applicability” section of the Bases to provide improved clarity, consistency, and operator usability (NRC Staff Comment):

In MODE 4, with the RCS being cooled by the RNS, and in MODES 5 and 6, operation of the CMTs or CVS will not result in a pressurizer overfill event.

APOG Recommended Changes to Improve the Bases

Revise the first paragraph of the “Applicability” section of the Bases to provide improved clarity, consistency, and operator usability:

In MODES 1, 2, **and 3**, and **MODE 4** with the RCS not being cooled by the RNS, the RVHV must be OPERABLE to mitigate the potential consequences of any event which causes an increase in the pressurizer water level that could otherwise result in overfilling of the pressurizer.

Revise the first sentence of the first paragraph under the heading “C.1 and C.2” in the “Actions” section of the Bases to provide consistency with the TS requirement(s) being discussed in the TS Bases. Supplying additional information, deleting statements inconsistent with the TS, or correcting obvious misstatements reduces potential for misunderstanding and misapplication:

...the plant must be brought to MODE 4 **with the RCS cooling provided by the RNS** where the probability and consequences of an event are minimized.

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

V. Applicability

Affected Generic Technical Specifications and Bases:

Section 3.4.16, Reactor Vessel Head Vent (RVHV)

Changes to the Generic Technical Specifications and Bases:

Action C is revised to remove an extraneous statement. (DOC A063)

The first and second paragraphs of the “Applicability” section of the Bases are revised to provide improved clarity, consistency, and operator usability. (APOG Comment and NRC Staff Edit)

The first sentence of the first paragraph under the heading “C.1 and C.2” in the “Actions” section of the Bases is revised to provide consistency with the TS requirement(s) being discussed. (APOG Comment)

The SR 3.4.16.1 description is revised to provide clarity by deleting the word “that” from the Surveillance. (DOC A038)

The SR 3.4.16.1 description is further revised to conform to the TS Writer's Guide (Reference 4). (DOC A027)

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

VI. Traveler Information**Description of TSTF changes:**

Not Applicable

Rationale for TSTF changes:

Not Applicable

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

VEGP LAR DOC A027 revises SR 3.4.16.1 from "... is OPERABLE by stroking the valve" to "... strokes."

VEGP LAR DOC A038 revises SR 3.4.16.1 by deleting "that" from the surveillance description.

VEGP LAR DOC A063 deletes the second Condition C entry condition stating "Requirements of LCO not met for reasons other than Conditions A or B."

A more detailed description of each DOC can be found in Reference 2, VEGP TSU LAR Enclosure 1, and the NRC staff safety evaluation can be found in Reference 3, VEGP LAR SER. The VEGP TSU LAR was modified in response to NRC staff RAIs in Reference 5 and the Southern Nuclear Operating Company RAI Response in Reference 6.

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

VEGP LAR DOC A027 provides clarity and is consistent with the TS Writer's Guide (Reference 4).

Deletion of "that" from Surveillances per VEGP LAR DOC A038 is consistent with the guidance provided in the TS Writer's Guide (Reference 4), that states: "Avoid the use of 'that' in the Specifications if the statement is clear without it." Deleting "that" from GTS SR 3.4.16.1 does not reduce the clarity of the SR.

With one flow path inoperable, the Actions of Condition A are required to be entered. With both flow paths inoperable, the Actions of Condition B are required to be entered. The second entry condition of Condition C is entered if the requirements of the GTS LCO are not met for reasons other than Condition A or B. Because the entry conditions for Condition A and Condition B would apply for any inoperable condition related to the RVHV (one or both flow paths not Operable), the second entry condition of GTS Condition C does not address equipment inoperability that would not be adequately addressed by Condition A or Condition B and per VEGP LAR DOC A063 is, therefore, extraneous.

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

Provide the complete Action C.2 requirement in the Bases discussion of the Actions. Delete the word “fully” in the bases description of SR 3.4.16.1 for consistency. Grammatical errors are corrected in several places in the Bases.

The first and second paragraphs of the “Applicability” section of the Bases are revised to provide improved clarity, consistency, and operator usability (APOG and NRC Staff Comment):

In MODES 1, 2, **and 3**, and **MODE 4** with the RCS not being cooled by the RNS, the RVHV must be OPERABLE to mitigate the potential consequences of any event which causes an increase in the pressurizer water level that could otherwise result in overfilling of the pressurizer.

In MODE 4, with the RCS being cooled by the RNS, and in MODES 5 and 6, operation of the CMTs or CVS will not result in a pressurizer overfill event.

The first sentence of the first paragraph under the heading “C.1 and C.2” in the “Actions” section of the Bases is revised (APOG Comment):

...the plant must be brought to MODE 4 **with the RCS cooling provided by the RNS** where the probability and consequences of an event are minimized.

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

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

Corrected grammar is provided in the Bases.

The non-technical changes to the first and second paragraphs of the “Applicability” section of the Bases provide improved clarity, consistency, and operator usability.

The non-technical changes to the “Actions” section of the Bases under the heading “Action C.1 and C.2” provides clarity and consistency between the Specification and the Bases description.

The revision to the “Actions” section of the Bases provides consistency with the TS requirement(s) being discussed in the TS Bases. Supplying additional information, deleting statements inconsistent with the TS, or correcting obvious misstatements reduces potential for misunderstanding and misapplication.

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

VII. GTST Safety Evaluation

Technical Analysis:

The 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 3.4.16 is an acceptable model Specification for the AP1000 standard reactor design.

References to Previous NRC Safety Evaluation Reports (SERs):

None

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 5/16/2014.

APOG Comments (Ref. 7) and Resolutions:

1. (Internal #3) Throughout the Bases, references to Sections and Chapters of the FSAR do not include the "FSAR" clarifier. 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 as appropriate.
2. (Internal # 6) The GTST sections often repeat VEGP LAR DOCs, which reference "existing" and "current" requirements. The inclusion in the GTST of references to "existing" and "current," are not always valid in the context of the GTS. Each occurrence of "existing" and "current" should be revised to be clear and specific to GTS, MTS, or VEGP COL TS (or other), as appropriate. Noted ambiguities are corrected in the GTST body.
3. (Internal #7) Section VII, GTST Safety Evaluation, inconsistently completes the subsection "References to Previous NRC Safety Evaluation Reports (SERs)" by citing the associated SE for VEGP 3&4 COL Amendment 13. It is not clear whether there is a substantive intended difference when omitting the SE citation. This is resolved by removing the SE citation in Section VII of the GTST and ensuring that appropriate references to the consistent citation of this reference in Section X of the GTST are made.
4. (Internal # 287) An editorial change is recommended to the "Applicability" section of the Bases. Revise the first paragraph, as indicated:

In MODES 1, 2, **and** 3, and **MODE** 4 with the RCS not being cooled by the RNS, the RVHV ...

This non-technical change provides improved clarity, consistency, and operator usability. This is resolved by making the recommended change with additional edits:

In MODES 1, 2, **and** 3, and **MODE** 4 with the RCS not being cooled by the RNS, the RVHV must be OPERABLE to mitigate the potential consequences of any event which causes an increase in the pressurizer water level that could otherwise result in overfilling of the pressurizer.

In MODE 4, with the RCS being cooled by the RNS, and in MODES 5 and 6, operation of the CMTs or CVS will not result in a pressurizer overfill event.

5. (Internal # 288) An editorial change is recommended to provide consistency with the TS requirement(s) being discussed in the TS Bases. Supplying additional information, deleting statements inconsistent with the TS, or correcting obvious misstatements reduces potential for misunderstanding and misapplication. In the "Actions" section of the Bases, revise the first sentence of the first paragraph under the heading "C.1 and C.2" as indicated:

...the plant must be brought to MODE 4 **with the RCS cooling provided by the RNS** where the probability and consequences of an event are minimized.

This is resolved by making the recommended change.

NRC Final Approval Date: 5/27/2015

NRC Contact:

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

None

X. References Used in GTST

1. AP1000 DCD, Revision 19, Section 16, "Technical Specifications," June 2011 (ML11171A500).
2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Technical Specifications Upgrade License Amendment Request, February 24, 2011 (ML12065A057).
3. 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)
4. TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications," June 2005.
 5. 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).
 6. 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)

7. 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 (ML14265A493).
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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.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 Reactor Vessel Head Vent (RVHV)

LCO 3.4.16 The Reactor Vessel Head Vent shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with the RCS not being cooled by the Normal Residual Heat
Removal System (RNS).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One flow path inoperable.	A.1 Restore flow path to OPERABLE status.	72 hours
B. Two flow paths inoperable.	B.1 Restore at least one flow path to OPERABLE status.	6 hours
C. Required Action and associated Completion Time not met. OR Requirements of LCO not met for reasons other than Conditions A or B.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 4, with the RCS cooling provided by the RNS.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.16.1 Verify that each RVHV valve is OPERABLE by stroking it strokes open.	In accordance with the Inservice Testing Program

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.16 Reactor Vessel Head Vent (RVHV)

BASES

BACKGROUND

The reactor vessel head vent (RVHV) is designed to assure that long term operation of the Core Makeup Tanks (CMTs) does not result in overfilling of the pressurizer during Condition II Design Basis Accidents (DBAs). The RVHV can be manually actuated by the operators in the main control room to reduce the pressurizer water level during long-term operation of the CMTs.

The RVHV consists of two parallel flow paths each containing two RVHV isolation valves in series. The RVHV valves are connected to the reactor vessel head via a common line. The outlets of the RVHV flow paths combine into one common discharge line which connects to a single ADS discharge header that discharges to spargers located in the in containment refueling water storage tank (IRWST). The RVHV valves are 1 inch valves with DC solenoid operators.

The RVHV valves are designed to open when actuated by the operator, and to reclose when actuated by the operator from the main control room.

The number and capacity of the RVHV flow paths are selected so that letdown flow from the RCS is sufficient to prevent pressurizer overfill for events where extended operation of the CMTs causes the pressurizer water level to increase. Although realistic evaluations of the Condition II non-LOCA events does not result in pressurizer overfill, conservative analyses of some of these events can result in pressurizer overfill if no operator actions are assumed.

**APPLICABLE
SAFETY
ANALYSES**

For Condition II non-LOCA events, such as inadvertent passive core cooling system operation and chemical and volume control system malfunction, the use of the RVHV may be required to prevent long-term pressurizer overfill (Ref. 1).

For LOCA events, the RVHV is not required.

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

BASES

LCO The requirement that all four RVHV valves be OPERABLE ensures that upon actuation, the RVHV can reduce the pressurizer water level as assumed in the DBA safety analyses.

For the RVHV to be considered OPERABLE, all four valves must be closed and OPERABLE (capable of opening from the main control room).

APPLICABILITY In MODES 1, 2, **and** 3, and **MODE** 4 with the RCS not being cooled by the RNS, the RVHV must be OPERABLE to mitigate the potential consequences of any event which causes an increase in the pressurizer water level that could otherwise result in overfilling ~~of~~ the pressurizer.

In ~~MODE 4,~~ with the RCS being cooled by the RNS, and in MODES 5 and 6, operation of the CMTs or CVS will not result in a pressurizer overfill event.

ACTIONS

A.1

If one or two RVHV valves in a single flow path are determined to be inoperable, the flow path is inoperable. The remaining OPERABLE RVHV flow path is adequate to perform the required safety function. A Completion Time of 72 hours is acceptable since the OPERABLE RVHV paths can mitigate DBAs without a single failure.

B.1

If both flow paths are determined to be inoperable, the RVHV is degraded such that the system is not available for some DBA non-LOCA analyses for which it may be required. A Completion Time of 6 hours is permitted to restore at least one flow path. This Completion Time is acceptable considering that the realistic analysis of these non-LOCA events do not result in pressurizer overfill.

C.1 and C.2

If the Required Actions and associated Completion Times are not met ~~of the requirements of LCO 3.4.16 are not met for reasons other than Conditions A or B,~~ the plant must be brought to MODE 4 **with the RCS cooling provided by the RNS** where the probability and consequences of an event are minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 **with the RCS cooling provided by the RNS** within 12 hours. The allowed Completion

BASES

ACTIONS (continued)

Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner, without challenging plant systems.

**SURVEILLANCE
REQUIREMENTS**SR 3.4.16.1

The dedicated component level remote manual valve switches in the main control room shall be used to stroke each RVHV valve to demonstrate OPERABILITY of the controls.

This Surveillance requires verification that each RVHV valve strokes to its ~~fully~~ open position. The Surveillance Frequency for demonstrating valve OPERABILITY references the Inservice Testing Program.

REFERENCES

1. **FSAR** Section 15.5, "Increase in Reactor Coolant System Inventory."
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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.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 Reactor Vessel Head Vent (RVHV)

LCO 3.4.16 The Reactor Vessel Head Vent shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with the RCS not being cooled by the Normal Residual Heat
Removal System (RNS).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One flow path inoperable.	A.1 Restore flow path to OPERABLE status.	72 hours
B. Two flow paths inoperable.	B.1 Restore at least one flow path to OPERABLE status.	6 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Be in MODE 4, with the RCS cooling provided by the RNS.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.16.1 Verify each RVHV valve strokes open.	In accordance with the Inservice Testing Program

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.16 Reactor Vessel Head Vent (RVHV)

BASES

BACKGROUND

The reactor vessel head vent (RVHV) is designed to assure that long term operation of the Core Makeup Tanks (CMTs) does not result in overfilling of the pressurizer during Condition II Design Basis Accidents (DBAs). The RVHV can be manually actuated by the operators in the main control room to reduce the pressurizer water level during long-term operation of the CMTs.

The RVHV consists of two parallel flow paths each containing two RVHV isolation valves in series. The RVHV valves are connected to the reactor vessel head via a common line. The outlets of the RVHV flow paths combine into one common discharge line which connects to a single ADS discharge header that discharges to spargers located in the in containment refueling water storage tank (IRWST). The RVHV valves are 1 inch valves with DC solenoid operators.

The RVHV valves are designed to open when actuated by the operator, and to reclose when actuated by the operator from the main control room.

The number and capacity of the RVHV flow paths are selected so that letdown flow from the RCS is sufficient to prevent pressurizer overfill for events where extended operation of the CMTs causes the pressurizer water level to increase. Although realistic evaluations of the Condition II non-LOCA events does not result in pressurizer overfill, conservative analyses of some of these events can result in pressurizer overfill if no operator actions are assumed.

 APPLICABLE
SAFETY
ANALYSES

For Condition II non-LOCA events, such as inadvertent passive core cooling system operation and chemical and volume control system malfunction, the use of the RVHV may be required to prevent long-term pressurizer overfill (Ref. 1).

For LOCA events, the RVHV is not required.

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

BASES

LCO The requirement that all four RVHV valves be OPERABLE ensures that upon actuation, the RVHV can reduce the pressurizer water level as assumed in the DBA safety analyses.

For the RVHV to be considered OPERABLE, all four valves must be closed and OPERABLE (capable of opening from the main control room).

APPLICABILITY In MODES 1, 2, and 3, and MODE 4 with the RCS not being cooled by the RNS, the RVHV must be OPERABLE to mitigate the potential consequences of any event which causes an increase in the pressurizer water level that could otherwise result in overflowing the pressurizer.

In MODE 4 with the RCS being cooled by the RNS, and in MODES 5 and 6, operation of the CMTs or CVS will not result in a pressurizer overflow event.

ACTIONS A.1

If one or two RVHV valves in a single flow path are determined to be inoperable, the flow path is inoperable. The remaining OPERABLE RVHV flow path is adequate to perform the required safety function. A Completion Time of 72 hours is acceptable since the OPERABLE RVHV paths can mitigate DBAs without a single failure.

B.1

If both flow paths are determined to be inoperable, the RVHV is degraded such that the system is not available for some DBA non-LOCA analyses for which it may be required. A Completion Time of 6 hours is permitted to restore at least one flow path. This Completion Time is acceptable considering that the realistic analysis of these non-LOCA events do not result in pressurizer overflow.

C.1 and C.2

If the Required Actions and associated Completion Times are not met the plant must be brought to MODE 4 with the RCS cooling provided by the RNS where the probability and consequences of an event are minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 with the RCS cooling provided by the RNS within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full

BASES

ACTIONS (continued)

power conditions in an orderly manner, without challenging plant systems.

**SURVEILLANCE
REQUIREMENTS**SR 3.4.16.1

The dedicated component level remote manual valve switches in the main control room shall be used to stroke each RVHV valve to demonstrate OPERABILITY of the controls.

This Surveillance requires verification that each RVHV valve strokes to its open position. The Surveillance Frequency for demonstrating valve OPERABILITY references the Inservice Testing Program.

REFERENCES

1. FSAR Section 15.5, "Increase in Reactor Coolant System Inventory."
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