

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

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**Title: Changes Related to LCO 3.7.7, Startup Feedwater Isolation and Control Valves**

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**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

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**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 3.7.7.

**RCOL COL Item Number and Title:**

There are no Vogtle COL items applicable to Specification 3.7.7.

**RCOL PTS Change Number and Title:**

VEGP LAR DOC A100: TS 3.7.7 Specification revision  
VEGP LAR DOC A101: Editorial revision to TS 3.7.7 Required Actions A.1 and A.2  
VEGP LAR DOC A102: Deletion of TS 3.7.7 Required Action C.3  
VEGP LAR DOC M11: Containment valve isolation revisions to TS 3.7.7  
VEGP LAR DOC M15: Applicability revision to TS 3.7.7  
VEGP LAR DOC L01: TS Definition for Actuation Device Test is deleted

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

This section discusses changes: (1) that were applicable to previous designs, but are not to the current design; (2) that are already incorporated in the GTS; and (3) that are superseded by another change.

None

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**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)**

None

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**V. Applicability**

**Affected Generic Technical Specifications and Bases:**

Section 3.7.7 Startup Feedwater Isolation and Control Valves

**Changes to the Generic Technical Specifications and Bases:**

The GTS 3.7.7 LCO Specification is revised to provide clarification of LCO coverage. (DOC A100)

The GTS 3.7.7 Applicability statement is revised to remove an exception. (DOC M11 and DOC M15)

GTS 3.7.7 Required Actions A.1 and A.2 are revised to remove "(s)." This is consistent with TS writer's guide (Reference 4). (DOC A101)

GTS 3.7.7 Required Action C.3 is deleted and replaced with STS 3.7.7 Required Action C.3 "Be in MODE 5." This eliminates a redundant phrase; is consistent with TS 3.6.3; and provides an exit path from the LCO condition. (DOC A102, DOC M11, and DOC M15)

The GTS SR 3.7.7.1 description is revised. Editorial changes are provided for clarification. (DOC A100)

STS SR 3.7.7.2 is added. This provides administrative support of SRs added by VEGP LAR DOC L01 and is consistent with GTS 3.6.3. (DOC M11 and DOC L01)

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**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 A100 revises the GTS 3.7.7 LCO statement to "Each Startup Feedwater Isolation Valve and Control Valve shall be OPERABLE." In addition, GTS SR 3.7.7.1 is revised from "Verify both startup feedwater isolation and control valves are OPERABLE," to "Verify each startup feedwater isolation and control valve is OPERABLE."

VEGP LAR DOC A101 revises GTS 3.7.7 Required Action A.1 and Required Action A.2 to delete the "(s)" in the word path.

VEGP LAR DOC A102 deletes GTS 3.7.7 Required Action C.3.

VEGP LAR DOC M11 revises the GTS 3.7.7 Applicability from "MODES 1, 2, 3, and 4 except when the startup feedwater flow paths are isolated," to STS 3.7.7 Applicability, "MODES 1, 2, 3, and 4. GTS 3.7.7 Required Action C.3 is revised from "Isolate the affected flow path(s)," to STS 3.7.7 Required Action C.3, "Be in MODE 5." A new SR 3.7.7.2 is added.

VEGP LAR DOC M15 complements the Applicability change noted by DOC M11. A new Required Action C.3 is added stating: "Be in MODE 5" in 36 hours.

VEGP LAR DOC L01 adds STS SR 3.7.7.2.

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:**

Editorial changes per VEGP LAR DOC A100 and DOC A101 are consistent with the guidance provided in the Writer's Guide (reference 4).

VEGP LAR DOC A102 notes that GTS 3.7.7 Required Action C.3 is redundant to GTS 3.7.7 Required Actions A.1 and B.1.

VEGP LAR DOC M11 provides closed system containment isolation valve requirements that are either consistent with or more restrictive than those in GTS 3.6.3.

VEGP LAR DOC M15 removes the exception statement from the LCO Applicability. When the unit is in MODE 1, 2, 3, or 4, GTS 3.7.7 currently does not apply to the valves whose flow path is isolated by a closed and deactivated valve. Thus, when a startup feedwater control valve is inoperable in Mode 1, 2, 3, or 4, once the affected flow path is isolated as required by GTS 3.7.7 Required Action A.1 or B.1, GTS 3.7.7 would not apply and the periodic verification of Required Actions A.2 would not be required.

GTS SR 3.3.2.7 (“Perform ACTUATION DEVICE TEST”) and SR 3.3.2.8 (“Perform ACTUATION DEVICE TEST for squib valves”) are deleted from GTS 3.3.2 and Table 3.3.2-1, Function 26.a, ESF Actuation Subsystem per VEGP LAR DOC L01. The equivalent requirement (using phrasing generally consistent with NUREG-1431) must be included in individual Specifications for the actuated devices with the same 24 month Frequency as the deleted SRs. Therefore, device-specific SRs such as STS SR 3.7.7.2 must be added.

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

Not Applicable

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

Not Applicable

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## VII. GTST Safety Evaluation

### Technical Analysis:

VEGP LAR DOC A102 deletes GTS 3.7.7 Required Action C.3. GTS 3.7.7 Required Action C.3 is redundant to GTS 3.7.7 Required Actions A.1 and B.1. Under circumstances where GTS 3.7.7 Condition C applies, GTS 3.7.7 Conditions A and/or B continue to apply, and their respective Required Actions continue to be required. Since GTS 3.7.7 Required Actions A.1 and B.1 require the affected flow path to be isolated, there is no need to repeat this Required Action in GTS 3.7.7 Required Action C.3. Once the flow path is isolated as required by GTS 3.7.7 Required Actions A.1 and/or B.1, Condition C would no longer apply and can be exited. Therefore, the GTS 3.7.7 Required Action C.3 can be deleted with no resultant technical change.

VEGP LAR DOC M11 and DOC M15 revise the GTS 3.7.7 Applicability from “MODES 1, 2, 3, and 4 except when the MFIVs or associated MFCV are closed and deactivated,” to STS 3.7.7 Applicability, “MODES 1, 2, 3, and 4.” This change is necessary because GTS 3.7.7 would not apply to startup feedwater valves whose flow path is isolated when the unit is in Mode 1, 2, 3, or 4. As a result, when a startup feedwater control valve is inoperable in Mode 1, 2, 3, or 4, once the affected flow path is isolated, as required by GTS 3.7.7 Required Action A.1 or B.1, GTS 3.7.7 would no longer apply and the periodic verification of GTS 3.7.7 Required Action A.2 would not be required. This is not the desired intent of LCO 3.7.7.

Similar to the Applicability of GTS 3.6.3, the GTS 3.7.7 Applicability is changed to eliminate this exception once the affected flow path is isolated. The startup feedwater control valves will remain required to be Operable in Modes 1, 2, 3, and 4, even when the affected flow path is isolated. This change will ensure that the periodic verification of GTS Required Action A.2 is performed as long as a valve in the affected flow path remains inoperable. This change is acceptable since it ensures the flow path is periodically verified to be in the post accident state (i.e., isolated) anytime when in Modes 1, 2, 3, and 4 with an associated startup feedwater control valve inoperable.

GTS 3.6.3 provides the requirement for the containment isolation valve function. Some of the valves that are containment isolation valves are also required to be operable to meet other safety related functions and these requirements are provided in separate LCOs. Thus, for certain containment isolation valves on closed systems, the same valve has two separate TS that cover its requirements. GTS 3.7.1 provides requirements for MSSVs, GTS 3.7.2 provides requirements for the MSIVs, GTS 3.7.3 provides requirements for the MFIVs, GTS 3.7.7 provides requirements for the startup feedwater isolation valves, and GTS 3.7.10 provides requirements for the power operated relief valve (PORV) block valves and SG blowdown isolation valves.

In lieu of including these valves in both GTS 3.6.3 and their individual Specification, GTS 3.6.3 is revised to exclude all closed system containment isolation valves. All of the moved containment isolation valves are associated with a closed system and they are the only closed system containment isolation valves. The individual Specifications where these valves are moved to include the same or more restrictive requirements as currently in GTS 3.6.3, or have been revised to include the requirements from GTS 3.6.3.

For the startup feedwater isolation valves the Applicability of GTS 3.7.7, which is Modes 1, 2, 3, and 4 except when the startup feedwater flow paths are isolated is revised to delete the exception for conditions where the startup feedwater flow paths are isolated to be consistent

with the Applicability of GTS 3.6.3, which is Modes 1, 2, 3, and 4. Thus, the proposed Applicability is consistent with the GTS 3.6.3 Applicability for the startup feedwater control valves.

For the startup feedwater isolation valves GTS 3.7.7 Required Actions do not include the restrictions of GTS 3.6.3 Required Action C.1 that require deactivating the startup feedwater isolation valves in the closed position if it were used to meet the action to isolate the flow path. Conversely, GTS 3.6.3 Required Action C.2 periodic verification of "Once per 31 days" is less restrictive than the periodic verification of GTS 3.7.7 Required Action A.2 of "Once per 7 days." The GTS 3.7.7 more frequent verification adequately compensates for not imposing a requirement to deactivate the startup feedwater isolation valves in the closed position. Additionally, GTS 3.7.7 Actions do not contain the flexibility found in GTS 3.6.3 Required Action C.2 Notes allowing administrative means to verify flow path isolation. The flexibility of GTS 3.6.3 Actions Note 1 ("Penetration flow path(s) may be unisolated intermittently under administrative controls") and Actions Note 2 ("Separate Condition entry is allowed for each penetration flow path") are consistent with GTS 3.7.7 Actions Notes 1 and 2; therefore GTS 3.7.7 imposes consistent or more restrictive Actions. GTS 3.6.3 Actions Notes 3 and 4 do not apply to startup feedwater isolation valves and are not included in STS 3.7.7.

The overall impact on safety from moving the Action requirement for startup feedwater isolation valves out of GTS 3.6.3 is minimal. The more restrictive Actions of GTS 3.7.7 to affect isolation result in achieving the appropriate compensatory measure and protection of public health and safety sooner and the more frequent verification adequately compensates for not requiring that the startup feedwater isolation valves be deenergized.

In addition, due to the Applicability change, VEGP LAR DOC M11 and DOC M15 add STS Required Action C.3 to be in Mode 5 within 36 hours. This ensures that when conditions warrant, the Applicability of the LCO is exited.

In the event that the flow path associated with startup feedwater isolation valves is not isolated, the default actions of GTS 3.6.3 current Action D require being in Mode 3 within 6 hours and being in Mode 5 within 36 hours, which is consistent with GTS 3.7.7 Required Actions C.1 and STS 3.7.7 Required Action C.3. GTS 3.7.7 Required Action C.2 imposes a more restrictive requirement to be in Mode 4 with the Reactor Coolant System (RCS) cooling provided by the Normal Residual Heat Removal System (RNS). These actions provide consistent or more restrictive actions for the startup feedwater isolation valves as moved from GTS 3.6.3 into STS 3.7.7. STS 3.7.7 Required Action C.3 requires Mode 5 to be ultimately entered when the flow path is not isolated as required by Actions A and B. Under similar conditions (i.e., flow path not isolated as required by GTS 3.6.3 Action C), GTS 3.6.3 Condition D.2 requires Mode 5 to be entered.

Finally, VEGP LAR DOC M11 STS SR 3.7.7.2 is added for the startup feedwater isolation valves, which requires verification that each startup feedwater isolation valve actuates to the isolation position on an actual or simulated actuation signal at a Frequency of 24 months. STS SR 3.7.7.2 is consistent with GTS SR 3.6.3.5. GTS 3.6.3 SRs 3.6.3.1, 3.6.3.2, and 3.6.3.3 are not applicable to startup feedwater isolation valves. The GTS SR 3.6.3.4 surveillance to verify isolation time in accordance with the Inservice Testing Program is equivalent to GTS SR 3.7.7.1 to verify operability in accordance with the Inservice Testing Program. Therefore, the STS 3.7.7 LCO requirement, Actions, and SRs, as they relate to the startup feedwater isolation valves, are either consistent with or more restrictive than those in GTS 3.6.3.

VEGP LAR DOC L01 deletes the Actuation Device Test and adds STS SR 3.7.7.2 that states: "Verify each startup feedwater isolation and control valve actuates to the isolation position on an actual or simulated actuation signal." In accordance with the defined term, an actuation device

test is a test of the actuated equipment. And as discussed in the TS Bases, performance of an actuation device test demonstrates that the actuated device responds to a simulated actuation signal. As such, Surveillances associated with the testing of the actuated equipment should be addressed in the actuated equipment Specifications, where failures of the surveillance would lead to entering the Actions for the inoperable actuated equipment.

Currently, the only Surveillances that utilize this defined term are in GTS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation;" as GTS SRs 3.3.2.7, 3.3.2.8, and 3.3.2.9. GTS SRs 3.3.2.7 and 3.3.2.8 provide the actuation device test for Engineered Safety Features (ESF) that are actuated by Table 3.3.2-1, Function 26. As such, failures of GTS SRs 3.3.2.7 and 3.3.2.8 (i.e., failures in the actuated equipment) would inappropriately result in applying the Actions of GTS 3.3.2 for Function 26. This is inconsistent with the intent of applying Actions specific to the equipment inoperability. Therefore GTS SRs 3.3.2.7 and 3.3.2.8 are deleted from GTS 3.3.2 and Table 3.3.2-1, Function 26, ESF Actuation. In conjunction with this deletion, each Specification for ESF actuated equipment is provided with Surveillance(s) that appropriately address the testing of the actuated devices consistent with these SRs and the definition being removed. In certain actuated device Specifications, there is currently an appropriate actuated device test and no new SR is added. Where an actuated device test is not specified in the existing actuated equipment Specification, a new SR is added.

The effect of moving the requirement for the actuated device test from GTS 3.3.2 to the individual equipment Specifications is for less restrictive actions when the device is inoperable. As an SR associated with GTS 3.3.2, Table 3.3.2-1, Function 26 for Modes 1, 2, 3, and 4, would impose a 6 hour restoration (Action D) prior to a required plant shutdown (Action O). GTS 3.7.7 with SRs added to address actuation device testing has a 7-day restoration allowance. These less restrictive actions are currently approved in STS as appropriate for the inoperable devices. The current more restrictive actions imposed by GTS 3.3.2 are therefore excessively restrictive. The change maintains the same level of safety provided by the existing separate TS Actions for inoperability of the specific actuated devices.

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.

### **References to Previous NRC Safety Evaluation Reports (SERs):**

VEGP LAR SER (Reference 3)

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**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 Monday, May 19, 2014.

**NRC Final Approval Date:**

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

None

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**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)
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**XI. MARKUP of the Applicable GTS Section 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.

Startup Feedwater Isolation and Control Valves  
3.7.7

3.7 PLANT SYSTEMS

3.7.7 Startup Feedwater Isolation and Control Valves

LCO 3.7.7      **Each** ~~Both~~ Startup Feedwater Isolation Valves and Control Valves shall be OPERABLE.

APPLICABILITY:      MODES 1, 2, 3, and 4 ~~except when the startup feedwater flow paths are isolated.~~

ACTIONS

-----NOTES-----

1. Flow paths may be unisolated intermittently under administrative controls.
  2. Separate Condition entry is allowed for each flow path.
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CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with one inoperable valve.	A.1 Isolate the affected flow path(s).	72 hours
	<u>AND</u> A.2 Verify affected flow path(s) is isolated.	Once per 7 days
B. One flow path with two inoperable valves.	B.1 Isolate the affected flow path.	8 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <u>AND</u>	6 hours

Startup Feedwater Isolation and Control Valves  
3.7.7

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2 Be in MODE 4 with the Reactor Coolant System (RCS) cooling provided by the Normal Residual Heat Removal System (RNS).	24 hours
	<u>AND</u> C.3 <b>Be in MODE 5</b> <del>Isolate the affected flow path(s).</del>	36 hours

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.7.1 Verify <b>each</b> <del>both</del> -startup feedwater isolation and control valves <del>is are</del> -OPERABLE.	In accordance with the Inservice Testing Program
<b>SR 3.7.7.2</b> <b>Verify each startup feedwater isolation and control valve actuates to the isolation position on an actual or simulated actuation signal.</b>	<b>24 months</b>

## B 3.7 PLANT SYSTEMS

## B 3.7.7 Startup Feedwater Isolation and Control Valves

BASES

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**BACKGROUND** The startup feedwater system supplies feedwater to the steam generators during plant startup, hot standby and cooldown, and in the event of main feedwater unavailability.

The startup feedwater system serves no safety related function and has no safety related design basis, except to isolate feedwater in the event of a feedwater, steam line break, a steam generator tube rupture or other secondary side event.

The startup feedwater system consists of a flow path to each of the steam generators. Each flow path consists of two series startup feedwater valves to provide feedwater control for low feedwater demand conditions. Feedwater can be supplied to the startup feedwater line via either the main or startup feedwater pumps. The feedwater is delivered directly to the **steam generator (SG)** independent of the main feedwater line. Each startup feedwater line contains one control valve and one isolation valve (Ref. 1).

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**APPLICABLE SAFETY ANALYSES** The basis for the requirement to isolate the startup feedwater system is established by the analysis for large Steam Line Break (SLB) inside containment. It is also based on the analysis for a large Feedline Break (FLB) and a steam generator tube rupture.

Failure to isolate the startup feedwater system following a SLB or FLB can lead to additional mass and energy being delivered to the steam generators, resulting in excessive cooldown and additional mass and energy release in containment. Failure to isolate the startup feedwater following a steam generator tube rupture may result in overfilling the steam generator.

Low  $T_{cold}$  or high steam generator level signals close the startup feedwater control and isolation valves and trips the startup feedwater pumps.

**In addition, the startup feedwater isolation and control valves are containment isolation valves and support the assumptions related**

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**BASES**

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**APPLICABLE SAFETY ANALYSES (continued)**

**to minimizing the loss of inventory and establishing the containment boundary during major accidents. Therefore, the safety analysis of any event requiring isolation of containment is applicable to these valves.**

The startup feedwater isolation and control valves are components which actuate to mitigate a Design Basis Accident, and as such meet Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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**LCO**

This LCO ensures that the startup feedwater isolation and control valves will actuate on command, following a SLB, FLB or SGTR, and isolate startup feedwater flow to the steam generators.

The startup feedwater isolation and control valves are considered OPERABLE when they automatically close on an isolation actuation signal, and their isolation times are within the required limits.

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**APPLICABILITY**

The startup feedwater isolation and control valves must be OPERABLE whenever there is significant mass and energy in the Reactor Coolant System and the steam generators. In MODES 1, 2, 3 and 4, the startup feedwater isolation and control valves are required to be OPERABLE in order to limit the amount of mass and energy that could be added to containment in the event of a SLB or FLB and prevent steam generator overfill in the event of an SGTR **and where a DBA could cause a release of radioactive material to containment.** ~~When the valves are closed, they are already performing their safety function.~~

In MODES 5 and 6, the energy in the steam generators is low, and isolation of the startup feedwater system is not required.

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**BASES**

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**ACTIONS**

The ACTIONS are modified by a Note allowing flow paths to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the flow paths can be rapidly isolated.

The second Note allows separate Condition entry for each flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable flow path.

A.1 and A.2

With only one isolation or control valve OPERABLE in one or more flow paths, there is no redundant capability to isolate the flow paths. In this case, both an isolation and a control valve in each flow path must be restored to OPERABLE status with 72 hours, or the flow path must be isolated. A Completion Time of 72 hours is acceptable since, with one valve in a flow path inoperable, there is a second valve available in the flow path to isolate the line.

If the inoperable valve in the flow path can not be restored to OPERABLE status, then the flow path must be isolated within a Completion Time of 72 hours. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure.

For flow paths isolated in accordance with Required Action A.2.1, the affected flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that flow paths required to be isolated following an accident will be in the isolation position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that the isolation devices are in the correct position. The Completion Time of "once per 7 days" is appropriate considering the fact that the devices are operated under administrative controls, valve status indications in the main control room and the probability of their misalignment is low.

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**BASES**

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**ACTIONS (continued)**B.1

With both the isolation and control valves inoperable in one flow path, the affected flow path must be restored to OPERABLE status or isolated within a Completion Time of 8 hours. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure.

C.1, C.2, and C.3

If the isolation and control valves cannot be restored to OPERABLE status, closed, or isolated within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be placed in least MODE 3 within 6 hours, ~~and~~ in MODE 4 with RCS cooling provided by the normal residual heat removal system within 24 hours, and **in MODE 5** ~~the affected flow path isolated~~ within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

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**SURVEILLANCE  
REQUIREMENTS**SR 3.7.7.1

This surveillance requires verification in accordance with the Inservice Testing Program to assure that **each** ~~both~~ startup feedwater isolation and control valves ~~is are~~ OPERABLE. The Surveillance Frequency is provided in the Inservice Testing Program.

SR 3.7.7.2

**This SR ensures that each startup feedwater isolation valve and startup feedwater control valve will actuate to its isolation position on an actual or simulated actuation signal. The ACTUATION LOGIC TEST overlaps this Surveillance to provide complete testing of the assumed safety function.**

**The 24-month Frequency is based on the need to perform this Surveillance during periods in which the plant is shutdown for refueling to prevent any upsets of plant operation.**

Startup Feedwater Isolation and Control Valves  
B 3.7.7

BASES

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REFERENCES      1.    Section 10.4.9, "Startup Feedwater System."

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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.

Startup Feedwater Isolation and Control Valves  
3.7.7

## 3.7 PLANT SYSTEMS

## 3.7.7 Startup Feedwater Isolation and Control Valves

LCO 3.7.7            Each Startup Feedwater Isolation Valve and Control Valve shall be OPERABLE.

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

## ACTIONS

## -----NOTES-----

1.    Flow paths may be unisolated intermittently under administrative controls.
2.    Separate Condition entry is allowed for each flow path.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with one inoperable valve.	A.1    Isolate the affected flow path.	72 hours
	<u>AND</u>	
	A.2    Verify affected flow path is isolated.	Once per 7 days
B. One flow path with two inoperable valves.	B.1    Isolate the affected flow path.	8 hours
C. Required Action and associated Completion Time not met.	C.1    Be in MODE 3.	6 hours
	<u>AND</u>	

Startup Feedwater Isolation and Control Valves  
3.7.7

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2 Be in MODE 4 with the Reactor Coolant System (RCS) cooling provided by the Normal Residual Heat Removal System (RNS).	24 hours
	<u>AND</u> C.3 Be in MODE 5.	36 hours

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify each startup feedwater isolation and control valve is OPERABLE.	In accordance with the Inservice Testing Program
SR 3.7.7.2	Verify each startup feedwater isolation and control valve actuates to the isolation position on an actual or simulated actuation signal.	24 months

## B 3.7 PLANT SYSTEMS

## B 3.7.7 Startup Feedwater Isolation and Control Valves

BASES

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**BACKGROUND** The startup feedwater system supplies feedwater to the steam generators during plant startup, hot standby and cooldown, and in the event of main feedwater unavailability.

The startup feedwater system serves no safety related function and has no safety related design basis, except to isolate feedwater in the event of a feedwater, steam line break, a steam generator tube rupture or other secondary side event.

The startup feedwater system consists of a flow path to each of the steam generators. Each flow path consists of two series startup feedwater valves to provide feedwater control for low feedwater demand conditions. Feedwater can be supplied to the startup feedwater line via either the main or startup feedwater pumps. The feedwater is delivered directly to the steam generator (SG) independent of the main feedwater line. Each startup feedwater line contains one control valve and one isolation valve (Ref. 1).

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**APPLICABLE SAFETY ANALYSES** The basis for the requirement to isolate the startup feedwater system is established by the analysis for large Steam Line Break (SLB) inside containment. It is also based on the analysis for a large Feedline Break (FLB) and a steam generator tube rupture.

Failure to isolate the startup feedwater system following a SLB or FLB can lead to additional mass and energy being delivered to the steam generators, resulting in excessive cooldown and additional mass and energy release in containment. Failure to isolate the startup feedwater following a steam generator tube rupture may result in overfilling the steam generator.

Low  $T_{\text{cold}}$  or high steam generator level signals close the startup feedwater control and isolation valves and trips the startup feedwater pumps.

In addition, the startup feedwater isolation and control valves are containment isolation valves and support the assumptions related to minimizing the loss of inventory and establishing the containment boundary during major accidents. Therefore, the safety analysis of any event requiring isolation of containment is applicable to these valves.

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**BASES**

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**APPLICABLE SAFETY ANALYSES (continued)**

The startup feedwater isolation and control valves are components which actuate to mitigate a Design Basis Accident, and as such meet Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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**LCO**

This LCO ensures that the startup feedwater isolation and control valves will actuate on command, following a SLB, FLB or SGTR, and isolate startup feedwater flow to the steam generators.

The startup feedwater isolation and control valves are considered OPERABLE when they automatically close on an isolation actuation signal, and their isolation times are within the required limits.

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**APPLICABILITY**

The startup feedwater isolation and control valves must be OPERABLE whenever there is significant mass and energy in the Reactor Coolant System and the steam generators. In MODES 1, 2, 3 and 4, the startup feedwater isolation and control valves are required to be OPERABLE in order to limit the amount of mass and energy that could be added to containment in the event of a SLB or FLB and prevent steam generator overfill in the event of an SGTR and where a DBA could cause a release of radioactive material to containment.

In MODES 5 and 6, the energy in the steam generators is low, and isolation of the startup feedwater system is not required.

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**ACTIONS**

The ACTIONS are modified by a Note allowing flow paths to be unisolated intermittently under administrative controls. These controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the flow paths can be rapidly isolated.

The second Note allows separate Condition entry for each flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable flow path.

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**BASES**

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**ACTIONS (continued)**A.1 and A.2

With only one isolation or control valve OPERABLE in one or more flow paths, there is no redundant capability to isolate the flow paths. In this case, both an isolation and a control valve in each flow path must be restored to OPERABLE status with 72 hours, or the flow path must be isolated. A Completion Time of 72 hours is acceptable since, with one valve in a flow path inoperable, there is a second valve available in the flow path to isolate the line.

If the inoperable valve in the flow path can not be restored to OPERABLE status, then the flow path must be isolated within a Completion Time of 72 hours. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure.

For flow paths isolated in accordance with Required Action A.2.1, the affected flow paths must be verified to be isolated on a periodic basis. This is necessary to ensure that flow paths required to be isolated following an accident will be in the isolation position should an event occur. This Required Action does not require any testing or device manipulation. Rather, it involves verification, through a system walkdown, that the isolation devices are in the correct position. The Completion Time of "once per 7 days" is appropriate considering the fact that the devices are operated under administrative controls, valve status indications in the main control room and the probability of their misalignment is low.

B.1

With both the isolation and control valves inoperable in one flow path, the affected flow path must be restored to OPERABLE status or isolated within a Completion Time of 8 hours. The method of isolation must include the use of at least one isolation barrier that cannot be adversely affected by a single active failure.

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**BASES**

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**ACTIONS (continued)**C.1, C.2, and C.3

If the isolation and control valves cannot be restored to OPERABLE status, closed, or isolated within the associated Completion Times, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be placed in least MODE 3 within 6 hours, in MODE 4 with RCS cooling provided by the normal residual heat removal system within 24 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

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**SURVEILLANCE  
REQUIREMENTS**SR 3.7.7.1

This surveillance requires verification in accordance with the Inservice Testing Program to assure that each startup feedwater isolation and control valve is OPERABLE. The Surveillance Frequency is provided in the Inservice Testing Program.

SR 3.7.7.2

This SR ensures that each startup feedwater isolation valve and startup feedwater control valve will actuate to its isolation position on an actual or simulated actuation signal. The ACTUATION LOGIC TEST overlaps this Surveillance to provide complete testing of the assumed safety function.

The 24-month Frequency is based on the need to perform this Surveillance during periods in which the plant is shutdown for refueling to prevent any upsets of plant operation.

Startup Feedwater Isolation and Control Valves  
B 3.7.7

BASES

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REFERENCES      1.    Section 10.4.9, "Startup Feedwater System."

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