NEXTera® ENERGY SEABROOK

June 24, 2014

SBK-L-14024
10 CFR 50.90
Docket No. 50-443
Facility Operating License No. NPF-86

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

Seabrook Station

License Amendment Request (LAR) – 14-01, Application to Revise Technical Specifications to Adopt Technical Specifications Task Force (TSTF) Traveler -523, "Generic Letter 2008-01, Managing Gas Accumulation," Using the Consolidated Line Item Improvement Process

References

1. Letter (SBK-L-08179) from G. St. Pierre (FPL Energy Seabrook, LLC) to Document Control Desk (NRC), "Nine Month Response to NRC Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," October 14, 2008 (ADAMS Accession No. ML082910040)

Pursuant to 10 CFR 50.90, NextEra Energy Seabrook, LLC (NextEra) is submitting a request for amendment to the Technical Specifications (TS) for Seabrook Station (Seabrook), Unit 1.

The proposed amendment would modify TS requirements to address NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," as described in TSTF-523, Revision 2 "Generic Letter 2008-01, Managing Gas Accumulation." NextEra committed to submit this proposed change in Reference 1.

Attachment 1 provides a description and assessment of the proposed change. Attachment 2 provides the existing TS pages marked up to show the proposed change. Attachment 3 provides existing TS Bases pages marked to show the proposed change. Changes to the existing TS Bases, consistent with the technical and regulatory analyses, will be implemented under the Technical Specification Bases Control Program. They are provided in Attachment 3 for information only. New TS pages with the proposed change incorporated will be provided when requested by the NRC Project Manager.

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Approval of the proposed amendment is requested by June 30, 2015. Once approved the amendment will be implemented within 60 days.

The Station Operation Review Committee has reviewed this LAR. A copy of this LAR has been forwarded to the New Hampshire State Liaison Officer pursuant to 10 CFR 50.91(b).

This letter satisfies NextEra's commitment made in Reference 1 and makes no new commitments or changes to any other existing commitments.

If you have any questions or require additional information, please contact Michael Ossing at 603-773-7512.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 24, 2014.

Sincerely,

NextEra Energy Seabrook, LLC

Dean Curtland

Dean Curtland
Site Vice President

Attachments:
1. Description and Assessment
2. Proposed TS Changes (marked-up pages)
3. Proposed TS Bases Changes (marked-ups pages) – For information only

cc: USNRC Regional Administrator, Region I
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**License Amendment Request for
Adoption of Technical Specifications Task Force Traveler
(TSTF)-523, Revision 2,
Generic Letter 2008-01, Managing Gas Accumulation**

**Attachment 1
Seabrook Station
Description and Assessment**

ATTACHMENT 1
DESCRIPTION AND ASSESSMENT

1.0 DESCRIPTION

The proposed change revises or adds Surveillance Requirements to verify that the system locations susceptible to gas accumulation are sufficiently filled with water and to provide allowances which permit performance of the verification. The changes are being made to address the concerns discussed in NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," [Reference 2].

The proposed amendment is consistent with Technical Specifications Task Force Traveler (TSTF)-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation" [Reference 3].

2.0 ASSESSMENT

2.1 Applicability of Published Safety Evaluation

NextEra Energy Seabrook, LLC (NextEra) has reviewed the model safety evaluation published January 15, 2014 as part of the Federal Register Notice of Availability "TSTF-523, Generic Letter 2008-01 Managing Gas Accumulation Using the Consolidated Line Item Improvement Process" (79 FR 2700) [Reference 4]. This review included a review of the NRC staff's evaluation, as well as the information provided in TSTF-523. As described in the subsequent paragraphs, NextEra has concluded that the justifications presented in the TSTF-523 proposal and the model safety evaluation prepared by the NRC staff are applicable to Seabrook Station (Seabrook) and justify this amendment for incorporation of the changes to the Seabrook Technical Specifications (TS).

2.2 Optional Changes and Variations

NextEra is proposing the following variations from the TS changes described in the TSTF-523, Revision 2 [Reference 3], or the applicable parts of the NRC staff's model safety evaluation.

The Seabrook TS utilize different numbering, format, and titles than NUREG-1431, "Standard Technical Specifications for Westinghouse Plants" [Reference 5] on which TSTF-523 was based. Specifically, the differences in numbering and titles are provided in the table below.

NUREG-1431 Standard Technical Specifications Westinghouse Plants	Seabrook Technical Specifications
3.4.6, RCS LOOPS – Mode 4	3/4.4.1.3, Reactor Coolant Loops and Coolant Circulation – Hot Shutdown
3.4.7, RCS LOOPS – Mode 5 Loops Filled	3/4.4.1.4.1, Reactor Coolant Loops and Coolant Circulation – Cold Shutdown – Loops Filled
3.4.8, RCS LOOPS – Mode 5 Loops Not Filled	3/4.4.1.4.2, Reactor Coolant Loops and Coolant Circulation – Cold Shutdown – Loops Not Filled
3.5.2, ECCS – Operating	3/4.5.2, ECCS Subsystems - T_{avg} Greater than or Equal to 350°F
3.6.6, Containment Spray and Cooling Systems	3/4.6.2.1, Containment Systems - Depressurization and Cooling Systems
3.9.5, RHR and Coolant Circulation – High Water Level	3/4.9.8.1, Residual Heat Removal and Coolant Circulation - High Water Level
3.9.6, RHR and Coolant Circulation - Low Water Level	3/4.9.8.2, Residual Heat Removal and Coolant Circulation - Low Water Level

These differences are administrative and do not affect the applicability of TSTF-523 to Seabrook.

3.0 REGULATORY SAFETY ANALYSIS

3.1 No Significant Hazards Consideration Determination

NextEra requests adoption of Technical Specification Task Force Traveler (TSTF)-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation," which is an approved change to the standard technical specifications (STS), into the Seabrook Station Technical Specifications (TS). The proposed change revises or adds Surveillance Requirements (SRs) to verify that the system locations susceptible to gas accumulation are sufficiently filled with water and to provide allowances which permit performance of the verification.

NextEra has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1: Does the Proposed Change Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated?

Response: No

The proposed change revises or adds SRs that require verification that the Emergency Core Cooling Systems (ECCS), Residual Heat Removal (RHR) System, and Containment Spray (CS) System are not rendered inoperable due to accumulated gas and to provide allowances which permit performance of the revised verification. Gas accumulation in the subject systems is not an initiator of any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The proposed SRs ensure that the subject systems continue to be capable to perform their assumed safety function and are not rendered inoperable due to gas accumulation. Thus, the consequences of any accident previously evaluated are not significantly increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the Proposed Change Create the Possibility of a New or Different Kind of Accident from any Accident Previously Evaluated?

Response: No

The proposed change revises or adds SRs that require verification that the ECCS, RHR System, and CS System are not rendered inoperable due to accumulated gas and to provide allowances which permit performance of the revised verification. The proposed change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the proposed change does not impose any new or different requirements that could initiate an accident. The proposed change does not alter assumptions made in the safety analysis and is consistent with the safety analysis assumptions

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the Proposed Change Involve a Significant Reduction in a Margin of Safety?

Response: No

The proposed change revises or adds SRs that require verification that the ECCS, RHR System, and CS System are not rendered inoperable due to accumulated gas and to provide allowances which permit performance of the revised verification. The proposed change adds new requirements to manage gas accumulation in order to ensure that the subject systems are capable of performing their assumed safety functions. The proposed SRs are more comprehensive than the current SRs and will ensure that the assumptions of the safety analysis are protected. The proposed change does not adversely affect any current plant safety margins or the reliability of the equipment assumed in the safety analysis. Therefore, there are no changes being made to any safety analysis assumptions, safety limits, or limiting safety system settings that would adversely affect plant safety as a result of the proposed change.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

3.2 Applicable Regulatory Requirements/Criteria

Based on the above, NextEra concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.0 ENVIRONMENTAL EVALUATION

The proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

5.0 REFERENCES

1. Letter (SBK-L-08179) from G. St. Pierre (FPL Energy Seabrook, LLC) to Document Control Desk (NRC), "Nine Month Response to NRC Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," October 14, 2008 (ADAMS Accession No. ML082910040)

2. Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," January 11, 2008, (ADAMS Accession No. ML072910759)

3. Technical Specifications Task Force Traveler (TSTF)-523, Revision 2, "Generic Letter 2008-01, Managing Gas Accumulation," February 23, 2013, (ADAMS Accession No. ML13053A075)

4. Federal Register Notice of Availability, "TSTF-523, Generic Letter 2008-01 Managing Gas Accumulation Using the Consolidated Line Item Improvement Process" published January 15, 2014 (79 FR 2700).

5. NUREG-1431, Revision 4, "Standard Technical Specifications –Westinghouse Plants," April 2012 (ADAMS Accession No. ML12100A222)

**License Amendment Request for
Adoption of Technical Specifications Task Force Traveler
(TSTF)-523, Revision 2,
Generic Letter 2008-01, Managing Gas Accumulation**

**Attachment 2
Seabrook Station
Technical Specifications Changes
Marked Up Pages**

This coversheet plus 8 pages

SURVEILLANCE REQUIREMENTS

4.4.1.3.1 The required reactor coolant pump(s), if not in operation, shall be determined OPERABLE once per 7 days by verifying correct breaker alignments and indicated power availability.

4.4.1.3.2 The required steam generator(s) shall be determined OPERABLE by verifying secondary-side water level to be greater than or equal to 14% at least once per 12 hours.

4.4.1.3.3 At least one reactor coolant or RHR loop shall be verified in operation and circulating reactor coolant at least once per 12 hours.

4.4.1.3.4 Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water at least once per 31 days.*

* Not required to be performed until 12 hours after entering MODE 4.

COLD SHUTDOWN - LOOPS FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.1 At least one residual heat removal (RHR) loop shall be OPERABLE and in operation*, and either:

a. One additional RHR loop shall be OPERABLE**, or

b. The secondary-side water level of at least two steam generators shall be greater than 14%.

APPLICABILITY: MODE 5 with reactor coolant loops filled***.

ACTION:

a. With one of the RHR loops inoperable and with less than the required steam generator water level, immediately initiate corrective action to return the inoperable RHR loop to OPERABLE status or restore the required steam generator water level as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE REQUIREMENTS

4.4.1.4.1.1 The secondary side water level of at least two steam generators when required shall be determined to be within limits at least once per 12 hours.

4.4.1.4.1.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

4.4.1.4.1.3 Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water at least once per 31 days.

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*The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

**One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

***A reactor coolant pump shall not be started unless the secondary water temperature of each steam generator is less than 50°F above each of the Reactor Coolant System cold-leg temperatures.

COLD SHUTDOWN - LOOPS NOT FILLED

LIMITING CONDITION FOR OPERATION

3.4.1.4.2 Two residual heat removal (RHR) loops shall be OPERABLE* and at least one RHR loop shall be in operation.**

APPLICABILITY: MODE 5 with reactor coolant loops not filled.

ACTION:

a. With less than the above required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation.

SURVEILLANCE RQUIREMENTS

4.4.1.4.2 At least one RHR loop shall be determined to be in operation and circulating reactor coolant at least once per 12 hours.

4.4.1.4.2.1 Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water at least once per 31 days.

*One RHR loop may be inoperable for up to 2 hours for surveillance testing provided the other RHR loop is OPERABLE and in operation.

**The RHR pump may be deenergized for up to 1 hour provided: (1) no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

a. At least once per 24 hours by verifying that the following valves are in the indicated positions with power to the valve operators removed:

Valve Number	Valve Function	Valve Position
SI-V-3	Accumulator Isolation	Open*
SI-V-17	Accumulator Isolation	Open*
SI-V-32	Accumulator Isolation	Open*
SI-V-47	Accumulator Isolation	Open*
SI-V-114	SI Pump to Cold-Leg Isolation	Open
RH-V-14	RHR Pump to Cold-Leg Isolation	Open
RH-V-26	RHR Pump to Cold-Leg Isolation	Open
RH-V-32	RHR to Hot-Leg Isolation	Closed
RH-V-70	RHR to Hot-Leg Isolation	Closed
SI-V-77	SI to Hot-Leg Isolation	Closed
SI-V-102	SI to Hot-Leg Isolation	Closed

b. At least once per 31 days by:

Verifying ECCS locations susceptible to gas accumulation are sufficiently filled with water.

1) ~~Verifying that the ECCS piping is full of water~~, and

2) Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position. **

c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. This visual inspection shall be performed:

1) For all accessible areas of the containment prior to establishing primary CONTAINMENT INTEGRITY, and

2) At least once daily of the areas affected within containment by *containment entry and during the final entry when primary* CONTAINMENT INTEGRITY is established.

*Pressurizer pressure above 1000 psig.

** Not required to be met for system vent flow paths opened under administrative control.

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent Containment Spray Systems shall be OPERABLE with each Spray System capable of taking suction from the RWST* and automatically transferring suction to the containment sump.

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

ACTION:

With one Containment Spray System inoperable, restore the inoperable Spray System to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable Spray System to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each Containment Spray System shall be demonstrated OPERABLE:

INSERT 1 Next Page

a. ~~At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position;~~

b. By verifying OPERABILITY of each pump when tested pursuant to Specification 4.0.5;

c. At least once per 18 months during shutdown, by:

1) Verifying that each automatic valve in the flow path actuates to its correct position on a Containment Pressure-Hi-3 test signal, and

2) Verifying that each spray pump starts automatically on a Containment Pressure-Hi-3 test signal.

INSERT 2 Next Page

d. By verifying each spray nozzle is unobstructed following activities that could result in nozzle blockage.

*In MODE 4, when the Residual Heat Removal System is in operation, an OPERABLE flow path is one that is capable of taking suction from the refueling water storage tank upon being manually realigned.

INSERT 1

a. At least once per 31 days by:

1. Verifying that each valve (manual, power operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position is in its correct position**, and

2. Verifying Containment Spray locations susceptible to gas accumulation are sufficiently filled with water.

INSERT 2

** Not required to be met for system vent flow paths opened under administrative control.

3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

HIGH WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one residual heat removal (RHR) loop shall be OPERABLE and in operation.*

APPLICABILITY: MODE 6, when the water level above the top of the reactor vessel flange is greater than or equal to 23 feet.

ACTION:

With no RHR loop OPERABLE and in operation, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to OPERABLE and operating status as soon as possible. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.1 At least one RHR loop shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 2750 gpm at least once per 12 hours.

4.9.8.1.1 Verify required RHR loop locations susceptible to gas accumulation are sufficiently filled with water at least once per 31 days.

* The RHR loop may be removed from operation for up to 1 hour per 8-hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor vessel hot legs.

RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

LOW WATER LEVEL

LIMITING CONDITION FOR OPERATION

3.9.8.2 Two independent residual heat removal (RHR) loops shall be OPERABLE, and at least one RHR loop shall be in operation.*

APPLICABILITY: MODE 6, when the water level above the top of the reactor vessel flange is less than 23 feet.

ACTION:

a. With less than the required RHR loops OPERABLE, immediately initiate corrective action to return the required RHR loops to OPERABLE status, or to establish greater than or equal to 23 feet of water above the reactor vessel flange, as soon as possible.

b. With no RHR loop in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required RHR loop to operation. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

SURVEILLANCE REQUIREMENTS

4.9.8.2 At least one RHR loop shall be verified in operation and circulating reactor coolant at a flow rate of greater than or equal to 2750 gpm at least once per 12 hours.

4.9.8.2.1 Verify RHR loop locations susceptible to gas accumulation are sufficiently filled with water at least once per 31 days.

* Prior to initial criticality, the RHR loop may be removed from operation for up to 1 hour per 8-hour period during the performance of CORE ALTERATIONS in the vicinity of the reactor vessel hot legs.

License Amendment Request for Adoption of Technical Specifications Task Force Traveler (TSTF)-523, Revision 2, Generic Letter 2008-01, Managing Gas Accumulation

Attachment 3
Seabrook Station
Technical Specifications Bases Changes
Marked Up Pages
For Information Only

This coversheet plus 13 pages

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

An OPERABLE reactor coolant system loop consists of an OPERABLE reactor coolant pump and an OPERABLE steam generator.

The plant is designed to operate with all reactor coolant loops in operation and maintain DNBR above 1.30 during all normal operations and anticipated transients. In MODES 1 and 2 with one reactor coolant loop not in operation, this specification requires that the plant be in at least HOT STANDBY within 6 hours.

In MODE 3, two reactor coolant loops provide sufficient heat removal capability for removing core decay heat even in the event of a bank withdrawal accident; however, a single reactor coolant loop provides sufficient heat removal capacity if a bank withdrawal accident can be prevented, i.e., by placing the Control Rod Drive System in a condition incapable of rod withdrawal. Single failure considerations require that two loops be OPERABLE at all times.

In MODE 4, and in MODE 5 with reactor coolant loops filled, a single reactor coolant loop or RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops (either RHR or RCS) be OPERABLE.

In MODE 5 with reactor coolant loops not filled, a single RHR loop provides sufficient heat removal capability for removing decay heat; but single failure considerations, and the unavailability of the steam generators as a heat removing component, require that at least two RHR loops be OPERABLE.

Managing of gas voids is important to RHR System OPERABILITY.

A Reactor Coolant "loops filled" condition is defined as follows: (1) Having pressurizer level greater than or equal to 55% if the pressurizer does not have a bubble, and greater than or equal to 17% when there is a bubble in the pressurizer. (2) Having the air and non-condensables evacuated from the Reactor Coolant System by either operating each reactor coolant pump for a short duration to sweep air from the Steam Generator U-tubes into the upper head area of the reactor vessel, or removing the air from the Reactor Coolant System via an RCS evacuation skid, and (3) Having vented the upper head area of the reactor vessel if the pressurizer does not have a bubble. (4) Having the Reactor Coolant System not vented, or if vented capable of isolating the vent paths within the time to boil.

Draining the RCS to a level that is lower than the stated limits (55% with no bubble or 17% with a bubble) and subsequently re-establishing the required levels does not preclude establishing the "loops filled" condition as long as the level is not dropped to the point at which additional air can be introduced into the steam generator tubes. If no additional air is introduced into the steam generator tubes, the refill of the RCS re-establishes the conditions that existed prior to the draining. Engineering Evaluation EE-08-012 demonstrates that, with the maximum amount of air/gas available from reactor coolant system sources in Mode 5 present in the steam generator tubes, any two steam generators provide adequate decay heat removal via natural circulation approximately 12 hours after shutdown.

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION (Continued)

If the RCS is drained to the point where additional air is available to enter the steam generators, i.e., to a reduced inventory condition [El.(-)36"], then the air/gas must be removed from the steam generator tubes prior to the steam generators being available as a heat sink. This will require either the removal of the air from the Reactor Coolant System via the RCS evacuation skid or operating each reactor coolant pump for a short duration to sweep air from the Steam Generator U-tubes (only required for those generators to be credited for decay heat removal). Operating the reactor coolant pumps to sweep the loops re-establishes the conditions that existed prior to draining the RCS. Using the evacuation skid results in a larger volume of air/gas contained in the steam generator u-tubes than exists under the initial shutdown conditions, however Engineering Evaluations EE-08-012 demonstrates the natural circulation conditions will be established for this circumstance.

The operation of one reactor coolant pump (RCP) or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting an RCP in MODES 4 and 5 are provided to prevent RCS pressure transients, caused by energy additions from the Secondary Coolant System, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold-leg temperatures.

INSERT 1 next page

INSERT 1

RHR System piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the RHR loops and may also prevent water hammer, pump cavitation, and pumping of non-condensible gas into the reactor vessel.

Selection of RHR System locations susceptible to gas accumulation is based on a review of system design information, including piping and instrument drawings, isometric drawings, plan and elevation drawings, and calculations. The design review is supplemented by system walkdowns to validate the system high points and to confirm the location and orientation of important components that can become sources of gas or could otherwise cause gas to be trapped or difficult to remove during system maintenance or restoration. Susceptible locations depend on plant and system configuration, such as standby versus operating conditions.

The RHR System is OPERABLE when it is sufficiently filled with water. Acceptance criteria are established for the volume of accumulated gas at susceptible locations. If accumulated gas is discovered that exceeds the acceptance criteria for the susceptible location (or the volume of accumulated gas at one or more susceptible locations exceeds an acceptance criteria for gas volume at the suction or discharge of a pump), the Surveillance is not met. If it is determined by subsequent evaluation that the RHR System is not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met. Accumulated gas should be eliminated or brought within the acceptance criteria limits.

RHR System locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative subset of susceptible locations. Monitoring may not be practical for locations that are inaccessible due to radiological or environmental conditions, plant configuration, or personnel safety. For these locations, alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

SR 4.4.1.3.4 is modified by a Note that states the SR is not required to be performed until 12 hours after entering MODE 4. In a rapid shutdown, there may be insufficient time to verify all susceptible locations prior to entering MODE 4.

The 31 day frequency for ensuring locations are sufficiently filled with water takes into consideration the gradual nature of gas accumulation in the RHR System piping and the procedural controls governing system operation.

3/4.5.1 ACCUMULATORS

The OPERABILITY of each Reactor Coolant System (RCS) accumulator ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration, and pressure ensure that the assumptions used for accumulator injection in the safety analysis are met.

In MODES 1 and 2, the accumulator power-operated isolation valves are considered to be "operating bypasses" in the context of IEEE Std. 279-1971, which requires that bypasses of a protective function be removed automatically whenever permissive conditions are not met. In MODES 1, 2, 3, and in MODE 4 within 12 hours of entry into MODE 3 from 4, the accumulator isolation valves are open with their power removed whenever pressurizer pressure is greater than 1000 psig. In addition, as these accumulator isolation valves fail to meet single-failure criteria, removal of power to the valves is required.

The limits for operation with an accumulator inoperable for any reason except an isolation valve closed minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures. If a closed isolation valve cannot be immediately opened, the full capability of one accumulator is not available and prompt action is required to place the reactor in a mode where this capability is not required.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single-failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold-leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period. Managing of gas voids is important to ECCS OPERABILITY.

Operability of the ECCS flow paths is contingent on the ability of the encapsulations surrounding the containment sump isolation valves (CBS-V8 and CBS-V14) to perform their design functions. During the recirculation phase of an accident, any postulated leakage resulting from the failure of the valves or piping will be contained within the encapsulations, preserving the water inventory needed to support ECCS operation during recirculation. Consequently, maintaining the encapsulations intact with leakage within allowable limits is necessary to ensure operability of the ECCS flow paths. Although designed to withstand containment pressure, the encapsulations do not function as a containment boundary, but rather prevent the release of radioactive fluid and gasses to the environment.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

An automatic valve may be aligned in other than its accident position provided (1) the valve receives an automatic signal to re-position to its required position in the event of an accident, and (2) the valve is otherwise operable (stroke time within limits, motive force available to re-position the valve, control circuitry energized, and mechanically capable of re-positioning).

With the exception of the operating centrifugal charging pump, the ECCS pumps are normally in a standby, non-operating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases. Maintaining the piping from the refueling water storage tank (RWST) and from the ECCS recirculation sump to the RCS full of water (by verifying at the accessible ECCS piping high points and pump casings, excluding the operating centrifugal charging pump) ensures that the system will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent water hammer, pump cavitation, and pumping of non-condensable gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following a safety injection (SI) signal or during shutdown cooling. The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.

It should be noted that Surveillance Requirement 4.5.2b.1 Bases also

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ECCS piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the ECCS and may also prevent a water hammer, pump cavitation, and pumping of noncondensible gas into the reactor vessel.

Selection of ECCS locations susceptible to gas accumulation is based on a review of system design information, including piping and instrument drawings, isometric drawings, plan and elevation drawings, and calculations. The design review is supplemented by system walkdowns to validate the system high points and to confirm the location and orientation of important components that can become sources of gas or could otherwise cause gas to be trapped or difficult to remove during system maintenance or restoration. Susceptible locations depend on plant and system configuration, such as standby versus operating conditions.

The ECCS is OPERABLE when it is sufficiently filled with water. Acceptance criteria are established for the volume of accumulated gas at susceptible locations. If accumulated gas is discovered that exceeds the acceptance criteria for the susceptible location (or the volume of accumulated gas at one or more susceptible locations exceeds an acceptance criteria for gas volume at the suction or discharge of a pump), the Surveillance is not met. If it is determined by subsequent evaluation that the ECCS is not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met. Accumulated gas should be eliminated or brought within the acceptance criteria limits.

ECCS locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative subset of susceptible locations. Monitoring may not be practical for locations that are inaccessible due to radiological or environmental conditions, plant configuration, or personnel safety. For these locations, alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The 31 day frequency for SR 4.5.2.b.1) takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.

Surveillance 4.5.2.b.2) is modified by a Note which exempts system vent flow paths opened under administrative control. The administrative control should be proceduralized and include stationing a dedicated individual at the system vent path who is in continuous communication with the operators in the control room. The individual will have a method to rapidly close the system vent flow path if directed.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

conditions the Surveillance Requirement by stating that verification is to be performed at the "accessible" ECCS piping high points and pump casing, excluding the operating centrifugal charging pump. Thus, the Bases recognizes that certain "impracticalities," i.e., physical accessibility issues or the operating centrifugal charging pump (only) under dynamic conditions, may preclude verification at certain points and as such provides relief. However, such relief cannot be taken at the expense of possible system inoperability because of lack of periodic verification. Such relief can only be taken if there is reasonable assurance that the collection of gasses or void formation is of no significant concern at the points not to be verified periodically within the stipulated surveillance interval (i.e., every 31 days). Furthermore, because of regulatory requirements, even if reasonable assurance can be justified for not requiring verification at a particular high point, such verification must be performed if the high point is accessible. "Inaccessibility" cannot be used as a mere convenience.

ECCS piping high points may be considered inaccessible if any of the following criteria are met:

a) The high point is located inside the bioshield in containment while the reactor is critical (Modes 1 & 2), since this area can contain lethal radiation fields during reactor operation. During those situations when the reactor is not critical, other conditions where gaining access poses a safety or radiological hazard (e.g., high system temperature, high radiological conditions) may prohibit verification by UT/venting.

b) The high point is located in an area where gaining access poses a safety or radiological hazard, e.g.:

- Installation/removal of temporary ladders within containment or other areas where stay times (heat stress / high radiation levels) or other factors must be kept to minimums.

Note: The safety or radiological concern should be documented for further evaluation by the responsible organization(s).

c) High points within heat exchanger tubes.

The phrase "full of water" is subjective particularly since most system fluid streams do contain a certain amount of non-condensable gasses. ECCS piping may be considered "full of water" if there is reasonable assurance that the content of the non-condensable gas within the system (including the aggregate amount of non-condensable gasses in all ECCS piping) and at a particular point will not be of significance to impair the ECCS system from performing

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

properly by injecting its full capacity into the RCS upon demand. Consideration must be given to water hammer, pump cavitation or pumping of non-condensable gas into the reactor vessel following a safety injection (SI) signal or during shutdown cooling.

Other Considerations:

I. Venting causing ECCS Inoperability – opening a vent valve in an ECCS flowpath that will result in both trains of an ECCS sub-system becoming inoperable during the period in which the vent is open such that it cannot be restored during a design basis accident. However, verification can be made by other means e.g., UT.

II. No makeup water source for venting – in the situation where a high point exists between two closed valves and opening a valve to align a water source will result in ECCS inoperability, it is not possible to verify the system is full since there is no source of water to discharge from the vent. Venting at these locations may in fact induce gasses into the system via "gas stripping" as the fluid is depressurized. However, verification can be made by other means e.g., UT.

III. High-pressure fluid within system piping – a vent in a high-pressure system is inaccessible if manipulating the valve can cause personnel safety concerns. However, verification can be made by other means e.g., ultrasonic testing (UT).

IV. The TS Bases states, in part, that "With the exception of the operating centrifugal charging pump, the ECCS pumps are normally in a standby, non-operating mode. As such, flow path piping has the potential to develop voids and pockets of entrained gases." When RHR is in its shutdown cooling mode the potential for development of voids and pockets of entrained gases in flow path piping is, practically, of no concern. Observation of normal operating parameters/indications of the operating RHR train is sufficient verification that the piping in the flow path is full of water. However, these portions of piping in the RHR train that are stagnant and which are used for ECCS purposes would still require verification by other means (e.g., UT, venting) to ensure the stagnant piping is full of water.

V. If an ECCS high point that is normally monitored becomes inaccessible due to a change in conditions, such as elevated radiation levels, an evaluation may be used as an interim measure to provide reasonable assurance that the ECCS remains operable. When the high point becomes accessible, verification that the piping is full of water must be performed.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS (Continued)

VI. Should activities (e.g., maintenance) or events (e.g., flow interruption, depressurization, system leakage) occur that could cause gasses to come out of solution or be introduced into ECCS piping then it may be prudent to verify the ECCS piping as being full at those potentially affected high points including those high points that are not normally verified, if deemed appropriate.

VII. A void detected by UT would require further investigation to determine its size and source, and the void must either be refilled by purging/venting or evaluated to determine impact on continued ECCS OPERABILITY.

Surveillance Requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

Verifying that the RHR system suction valve interlock is OPERABLE ensures that the RCS will not pressurize the RHR system beyond its design pressure. The value specified in the surveillance requirement ensures that the valves cannot be opened unless the RCS pressure is less than 440 psig. Due to bistable reset design, and the instrument uncertainty, the valves could be open above the interlock setpoint, but below the reset pressure. To ensure that the RHR system design pressure will not be exceeded, the actual interlock setpoint takes into consideration RHR suction relief valve settings and allowable tolerance, bistable deadband, total instrument channel uncertainty associated with the interlock, and available operating margin (differential pressure operating limit) for reactor coolant pump operation to ensure shutdown cooling can be transitioned to RHR. This results in the actual setpoint and reset values being below the value specified in the surveillance requirement. The actual interlock setpoint and reset values, in addition to separate administrative controls, will ensure that the RHR suction isolation valves cannot be opened from the main control room when the RCS pressure could cause the RHR system design pressure to be exceeded.

3/4.5.4 REFUELING WATER STORAGE TANK

The OPERABILITY of the refueling water storage tank (RWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA. The limits on RWST minimum volume and boron concentration ensure that: (1) sufficient water is available within containment to permit recirculation cooling flow to the core and (2) the reactor will remain subcritical in the cold

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

Managing of gas voids is important to Containment Spray System OPERABILITY.

The OPERABILITY of the Containment Spray System ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The two independent Containment Spray Systems provide post-accident cooling of the containment atmosphere. The Containment Spray Systems also provide a mechanism for removing iodine from the containment atmosphere, and, therefore, the time requirements for restoring an inoperable Spray System to OPERABLE status have been maintained consistent with those assigned other inoperable ESF equipment.

~~The Containment Building Spray System suction and discharge piping must be maintained full of water to ensure system operability. The piping may be considered full of water, even with some gas voids present, if an evaluation concludes that the system remains capable of performing its specified safety function.~~

Verifying the correct alignment of manual, power-operated, and automatic valves provides assurance that the proper flow paths exist for operation of the Containment Spray System under accident conditions. This verification includes only those valves in the direct flow paths through safety-related equipment whose position is critical to the proper functioning of the safety-related equipment. Vents, drains, sampling connections, instrument taps, etc., that are not directly in the flow path and are not critical to proper functioning of the safety-related equipment are excluded from this surveillance requirement. This surveillance does not apply to valves that are locked, sealed, or otherwise secured in position because these valves are verified in their correct position prior to locking, sealing, or securing. Also, this requirement does not apply to valves that cannot be inadvertently misaligned, such as check valves.

An automatic valve may be aligned in other than its accident position provided (1) the valve receives an automatic signal to re-position to its required position in the event of an accident, and (2) the valve is otherwise operable (stroke time within limits, motive force available to re-position the valve, control circuitry energized, and mechanically capable of re-positioning).

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Surveillance requirement (SR) 4.6.2.1.d requires verification that each spray nozzle is unobstructed following activities that could cause nozzle blockage. An air or smoke flow test is used to ensure that each spray nozzle is unobstructed and that spray coverage of the containment during an accident is not degraded. Normal plant activities are not expected to initiate this SR. However, activities such as inadvertent spray actuation that causes fluid flow through the spray nozzles or a loss of foreign material control when working on the system may require performing the surveillance.

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Containment Spray System flow path piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the containment spray trains and may also prevent a water hammer and pump cavitation.

Selection of Containment Spray System locations susceptible to gas accumulation is based on a review of system design information, including piping and instrument drawings, isometric drawings, plan and elevation drawings, and calculations. The design review is supplemented by system walkdowns to validate the system high points and to confirm the location and orientation of important components that can become sources of gas or could otherwise cause gas to be trapped or difficult to remove during system maintenance or restoration. Susceptible locations depend on plant and system configuration, such as standby versus operating conditions.

The Containment Spray System is OPERABLE when it is sufficiently filled with water. Acceptance criteria are established for the volume of accumulated gas at susceptible locations. If accumulated gas is discovered that exceeds the acceptance criteria for the susceptible location (or the volume of accumulated gas at one or more susceptible locations exceeds an acceptance criteria for gas volume at the suction or discharge of a pump), the Surveillance is not met. If it is determined by subsequent evaluation that the Containment Spray System is not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met. Accumulated gas should be eliminated or brought within the acceptance criteria limits.

Containment Spray System locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative subset of susceptible locations. Monitoring may not be practical for locations that are inaccessible due to radiological or environmental conditions, plant configuration, or personnel safety. For these locations, alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The 31 day frequency for SR 4.6.2.1.a.1) takes into consideration the gradual nature of gas accumulation in the Containment Spray System piping and the procedural controls governing system operation.

Surveillance 4.6.2.1.a is modified by a Note which exempts system vent flow paths opened under administrative control. The administrative control should be proceduralized and include stationing a dedicated individual at the system vent path who is in continuous communication with the operators in the control room. The individual will have a method to rapidly close the system vent flow path if directed.

BASES

3/4.9.5 (THIS SPECIFICATION NUMBER IS NOT USED.)

3/4.9.6 (THIS SPECIFICATION NUMBER IS NOT USED.)

3/4.9.7 (THIS SPECIFICATION NUMBER IS NOT USED.)

Managing of gas voids is important to RHR System OPERABILITY.

3/4.9.8 RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION

The requirement that at least one residual heat removal (RHR) loop be in operation ensures that: (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the core to minimize the effect of a boron dilution incident and prevent boron stratification.

The requirement to have two RHR loops OPERABLE when there is less than 23 feet of water above the reactor vessel flange ensures that a single failure of the operating RHR loop will not result in a complete loss of residual heat removal capability. However, only one RHR loop is required for decay heat removal with water level at least 23 feet above the reactor vessel flange and the upper internals removed from the reactor vessel. The large volume of water above the flange provides backup decay heat removal capability.

When installed in the reactor vessel, the upper internals provide a flow restriction between the core region and the refueling cavity. Consequently, following a loss of RHR cooling, heating of the water in the core would proceed faster than heating of the refueling cavity water, and core boiling could occur in a relatively short period of time. As a result, administrative controls implement compensatory measures to reduce the risk of core boiling should a loss of RHR cooling occur. These administrative controls ensure that the second train of RHR, although not required by the TS to be operable, will be functional within approximately one-half the time to core boiling following a loss of the operable RHR train.

Closure of the Equipment Hatch containment penetration using the Containment Outage Door may satisfy the containment closure requirement of the action statements for Technical Specifications 3.9.8.1 and 3.9.8.2, when the Containment Outage Door is being used during the movement of non-recently irradiated fuel assemblies within containment in lieu of the Containment Equipment Hatch.

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RHR System piping and components have the potential to develop voids and pockets of entrained gases. Preventing and managing gas intrusion and accumulation is necessary for proper operation of the RHR loops and may also prevent water hammer, pump cavitation, and pumping of non-condensible gas into the reactor vessel.

Selection of RHR System locations susceptible to gas accumulation is based on a review of system design information, including piping and instrument drawings, isometric drawings, plan and elevation drawings, and calculations. The design review is supplemented by system walkdowns to validate the system high points and to confirm the location and orientation of important components that can become sources of gas or could otherwise cause gas to be trapped or difficult to remove during system maintenance or restoration. Susceptible locations depend on plant and system configuration, such as standby versus operating conditions.

The RHR System is OPERABLE when it is sufficiently filled with water. Acceptance criteria are established for the volume of accumulated gas at susceptible locations. If accumulated gas is discovered that exceeds the acceptance criteria for the susceptible location (or the volume of accumulated gas at one or more susceptible locations exceeds an acceptance criteria for gas volume at the suction or discharge of a pump), the Surveillance is not met. If it is determined by subsequent evaluation that the RHR System is not rendered inoperable by the accumulated gas (i.e., the system is sufficiently filled with water), the Surveillance may be declared met. Accumulated gas should be eliminated or brought within the acceptance criteria limits.

RHR System locations susceptible to gas accumulation are monitored and, if gas is found, the gas volume is compared to the acceptance criteria for the location. Susceptible locations in the same system flow path which are subject to the same gas intrusion mechanisms may be verified by monitoring a representative subset of susceptible locations. Monitoring may not be practical for locations that are inaccessible due to radiological or environmental conditions, plant configuration, or personnel safety. For these locations, alternative methods (e.g., operating parameters, remote monitoring) may be used to monitor the susceptible location. Monitoring is not required for susceptible locations where the maximum potential accumulated gas void volume has been evaluated and determined to not challenge system OPERABILITY. The accuracy of the method used for monitoring the susceptible locations and trending of the results should be sufficient to assure system OPERABILITY during the Surveillance interval.

The 31 day frequency for ensuring locations are sufficiently filled with water takes into consideration the gradual nature of gas accumulation in the RHR System piping and the procedural controls governing system operation.