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October 13, 2008

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

Subject: Duke Energy Carolinas, LLC (Duke)
Oconee Nuclear Station, Units 1, 2 & 3, Docket Nos. 50-269, 50-270, 50-287
McGuire Nuclear Station, Units 1 & 2, Docket Nos. 50-369, 50-370
Catawba Nuclear Station, Units 1 & 2, Docket Nos. 50-413, 50-414
Generic Letter 2008-01, 9-Month Response

On January 11, 2008, the Nuclear Regulatory Commission (NRC) issued Generic Letter 2008-01, Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems. A written response consistent with the requested actions and information was requested within nine months of the date of the Generic Letter. If the requested response date could not be met, a 3-month response was requested to provide the proposed alternative course of action.

In an April 8, 2008 phone call Duke requested a 30-day extension for the 3-month response related to Generic Letter 2008-01 for Oconee, McGuire and Catawba Nuclear Stations. This extension was granted verbally and a follow-up letter to the phone call was submitted by Duke on April 9, 2008. Subsequently, the 30 day response was submitted on May 8, 2008.

On September 25, 2008 the NRC issued a letter stating that the proposed course of action for Oconee, McGuire and Catawba described in the 3-month response was acceptable, provided that the licensee describes how it plans to track long term actions described in the Generic Letter that will not be complete at the time of the response. Duke has specifically addressed how it will track both industry efforts regarding gas accumulation as well as potential changes to the Technical Specifications that may be issued as a Technical Specifications Task Force Traveler as part of this submittal.

As requested by GL 2008-01, the following information is provided in each of the four areas of concern (Licensing Basis, Design, Testing and Corrective Actions) for each Duke station:

- A description of the results of evaluations that were performed pursuant to the requested actions,
- A description of the corrective actions determined necessary to ensure compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50 and the licensing basis and operating license with respect to the subject systems, and
- A statement regarding which corrective actions have been completed, the schedule for the corrective actions not yet complete, and the basis for that schedule.

This letter constitutes Duke's 9-month response to Generic Letter 2008-01. Attachments 1-3 contain the Oconee, McGuire and Catawba responses, respectively. Attachments 4-6 contain the station-specific commitments associated with the responses.

If you have any questions, please contact Lee Hentz at (704) 875-4187.

Very truly yours,



Thomas P. Harrall

Attachments

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xc:

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Thomas P. Harrall affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

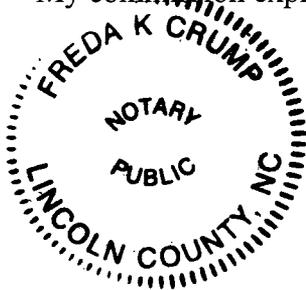
Thomas P. Harrall

Thomas P. Harrall, Vice President, Plant Support

Subscribed and sworn to me: 10/13/08
Date

Freda K. Crump, Notary Public

My commission expires: August 17, 2011
Date



SEAL

Attachment 1
Oconee Nuclear Station
Generic Letter 2008-01
9-Month Response

This attachment contains Oconee Nuclear Station's nine-month response to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008. Oconee has used an industry recommended template to develop this response.

The following information is provided in each of the four areas of concern (Licensing Basis, Design, Testing and Corrective Actions) identified by the NRC in the Generic Letter:

- A description of the results of evaluations that were performed pursuant to the requested actions,
- A description of the corrective actions determined necessary to ensure compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50 and the licensing basis and operating license with respect to the subject systems, and
- A statement regarding which corrective actions have been completed, the schedule for the corrective actions not yet complete, and the basis for that schedule.

The following systems were determined to be in the scope of GL 2008-01 for Oconee:

- Low Pressure Injection (LPI, including Core Flood)
- High Pressure Injection, (HPI) and
- Building Spray (BS)

Licensing Basis Evaluation

The Oconee licensing basis was reviewed with respect to management of gas accumulation in the Low Pressure Injection (performs decay heat removal function), High Pressure Injection, and Building Spray Systems. This review included:

- Technical Specifications (TS)
- Technical Specification Bases (TSB)
- Updated Final Safety Analysis Report (UFSAR) including the Selected Licensee Commitments (SLCs, Analogous to Technical Requirements Manual)
- Responses to NRC Generic Communications

These documents were reviewed to identify regulatory requirements and commitments related to management of gas accumulation in the subject systems and ensure that requirements are being met. Where weaknesses or deficiencies were identified, they were captured in the Corrective Action Program (PIP). Results of Oconee's licensing basis review are discussed below.

1. Technical Specifications and TS Bases

The Oconee Technical Specifications are based on and in accordance with NRC approved Standard Technical Specifications and NUREG-1430 for B&W plants. The Oconee Technical Specifications (TS) and Bases applicable to this Generic Letter are:

- TS 3.5.2 High Pressure Injection (HPI)
- TS 3.5.3 Low Pressure Injection (LPI)
- TS 3.6.5 Reactor Building Spray and Cooling Systems

These Technical Specifications and Bases were reviewed with respect to gas venting and accumulation and the following issues were identified:

- Oconee has Technical Specification venting surveillance requirements for the LPI and HPI pumps.
- There is no venting surveillance requirement for the BS system.

Oconee is managing gas in these systems currently by a combination of engineering evaluation, periodic venting, and system monitoring.

While the Oconee TS are consistent with standardized Babcock and Wilcox (B&W) Technical Specifications, Oconee believes that enhancements to the TS to improve the scope of surveillances with respect to gas accumulation are warranted. TS improvements are being addressed by the Technical Specification Task Force (TSTF) to provide an approved TSTF traveler for making changes to individual licensee's TS related to the potential for unacceptable gas accumulation. The development of the TSTF traveler relies on the results of the evaluations of a large number of licensees to address the various plant designs. Oconee is continuing to support the industry and the Nuclear Energy Institute (NEI) Gas Accumulation Management Team activities regarding the resolution of generic TS issues. Oconee will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

Corrective Action 1: Monitor the status of the TSTF effort to provide revisions to NUREG 1430 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. Oconee will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

2. Updated Final Safety Analysis Report

The Oconee Updated Final Safety Analysis Report (UFSAR) was reviewed with respect to gas venting, gas accumulation, and their potentially harmful effects. The Oconee UFSAR does not discuss requirements for gas management in the subject systems. Oconee will update the UFSAR to make appropriate changes.

Corrective Action 2: Revise Oconee UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.

3. NRC Generic Communications

A review was performed of the Generic Letters and Information Notices relevant to ECCS gas accumulation provided in GL 2008-01. In response to NRC Generic Letter 88-17, "Loss of Decay Heat Removal", Oconee committed on January 3, 1989 to have one permanent Reactor Coolant System (RCS) level instrument and evaluate the use of a temporary level instrument for the upcoming outage. Oconee also committed to monitor and record RCS level on a 2-hour frequency when at mid-loop if continuous monitoring and alarming was not in use. In addition, Oconee agreed to implement procedural and administrative guidance prohibiting evolutions which pose a substantial threat to decay heat removal (DHR) capability during reduced inventory operations. By letter of February 2, 1989, Oconee committed to install ultrasonic level instrumentation to provide redundancy. Oconee also stated that continuous visible and audible indicators of RCS level were being evaluated as a feature of the ultrasonic device. Requirements of GL 88-17 were subsequently written into the licensing basis (in 1991) as Selected Licensee Commitment (SLC) 16.5.2 (subsequently re-numbered to 16.5.3, as it exists today).

No commitments or corrective actions were identified by Oconee's review of Information Notice (IN) 88-23 or its supplements. That review concluded that Oconee was not susceptible to the failure mechanisms of concern due to safety injection systems configuration differences between B&W plants and Westinghouse plants. Therefore, no commitments were made in response to this IN. The evaluations performed for GL 2008-01 are far more comprehensive and rigorous than those performed for IN 88-23, and will be fully effective in detecting and correcting any weaknesses in Oconee's gas management practices.

Design Evaluation

The design evaluation consists of the following areas of review:

1. Design Basis Documents Review
2. Gas Volume Acceptance Criteria
3. Validation of Drawings
4. Review of Procedures
5. Review of Maintenance Activities That May Introduce Gas
6. Potential Gas Sources
7. Ongoing Industry Programs

1. Design Basis Documents Review

The Oconee design basis was reviewed with respect to gas accumulation in the HPI, LPI, and BS systems. The results have been documented in engineering technical evaluations. This review included design basis specifications, calculations, and engineering evaluations. Oconee's review of the design basis for these systems identified no deficiencies associated with implementation of existing design basis requirements.

The Design Basis Specifications for these systems do not explicitly address gas accumulation within the system boundaries. Vortexing analyses have been performed for HPI pumps aligned to take suction from the Letdown Storage Tank (LDST), for LPI pumps aligned to take suction from the reactor vessel at reduced inventory conditions, for both LPI and BS systems taking suction from the Reactor Building Emergency Sump (RBES), and for all three systems taking suction from the Borated Water Storage Tank (BWST). Vortexing analyses performed for Oconee have demonstrated that vortexing would not occur or that resultant air entrainment would not exceed the limits established for the pumps. No other established criteria were found in the design basis documents.

New design basis information pertaining to gas management has been developed in response to GL 2008-01 and documented in an Oconee calculation. Oconee plans to revise the Design Basis Specifications for HPI, LPI, and BS systems to document gas management requirements and establish limits on air entrainment which can be used in future evaluations. This is not a commitment for purposes of the GL response.

2. Gas Volume Acceptance Criteria Review

Acceptance criteria in the Oconee venting procedures required only that a solid water stream flows from the vent line at the conclusion of the venting activity. For purposes of inspections performed as part of the GL evaluations, however, Oconee adopted a zero tolerance for gas in all inspection locations. Where gas was found, it was promptly removed or evaluated for operability. More conservative acceptance criteria are being implemented in Oconee's periodic venting procedures as noted in the Procedure Review portion of this evaluation.

Based on pump vendor letters, Oconee has established a transient limit of 2% for the HPI, LPI, and BS pumps for use in evaluating suction-side gas. An interim limit of 1/3 cubic feet has been established for a discreet void in the HPI, LPI, and BS pump discharge piping sections and may be used to evaluate gas detected by surveillances.

As discussed in the "Ongoing Industry Programs" section, Oconee will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits for pumps and piping. Oconee will then evaluate those results to determine if additional changes to the applicable acceptance criteria are required.

3. Validation of Drawings

A review of the Oconee piping isometrics was performed. High points and other potential gas accumulation locations on the system piping were identified, provision for venting at these locations was evaluated for adequacy, and potential gas sources were evaluated. Dimensional details were confirmed in selected locations by comparison of piping drawings to piping isometrics.

Field walkdowns were performed on accessible piping to verify the as-built configuration matched the drawings. Piping that was considered inaccessible on all three Oconee units is described in the May 8, 2008 three-month response. The piping walkdown scope also included observation for evidence of water hammer damage.

Field surveys were performed on accessible horizontal pipe runs to check for adverse sloping which could introduce the potential for gas accumulation. Adverse sloping of horizontal pipe runs was evaluated for vent valve addition or relocation. Much of the piping in these systems is insulated at Oconee. Insulation was not removed from piping when performing field surveys. Instead, a probe type device was used to establish contact with the top or bottom surface of the pipe, serving as a fixed reference distance from the pipe surface. In some cases physical access to desired survey locations was not possible due to obstructions. In each of these cases, there was sufficient overall survey data available to evaluate slope conditions for the piping segments. All survey high points greater than 0.5 inch were considered areas of concern regardless of the span length or pipe diameter. High points were evaluated for gas accumulation mechanisms and venting capability (either static or dynamic) as well as potential threats to operability.

Corrective actions were identified based upon these evaluations. Locations evaluated to have operability significance were inspected by Ultrasonic Test (UT) to identify the presence of gas. Where gas was found, operability evaluations were performed promptly or the gas was removed.

Field walkdowns and surveys are complete on accessible piping at Oconee.

The walkdown of the systems identified one minor discrepancy between the as-built field piping configuration and the piping isometrics; however, the piping drawings accurately reflected the as-built field conditions. The walkdown found no evidence of water hammer damage.

Review of piping configuration drawings, system walkdowns, and field surveys identified 128 locations where gas could potentially accumulate and a credible mechanism for gas intrusion existed. These locations were evaluated for risk of gas and 116 were selected for prompt UT inspection. Evidence of gas was found in seven locations. In all cases, the gas was immediately vented or evaluated to ensure operability and the corrective action program was entered to ensure that operability and reportability evaluations were performed and documented. One location is still under evaluation for reportability of gas found in the HPI suction piping. To ensure that these locations do not affect continued operability, they were dispositioned in one of three ways: 1) they were added to the monthly surveillance program, 2) the gas intrusion root cause was resolved, or 3) the consequences of the gas were evaluated to be acceptable.

The drawing validation work also identified a need for additional venting capability in some locations. Approximately 20 new vent valves will be needed on each unit. Vent additions are not commitments for this GL response.

4. Review of Procedures

An extensive review of procedures was performed for the HPI, LPI, and BS systems. The procedures evaluated in this section include routine outage fill and vent, normal operating, surveillance test procedures (e. g. valve stroke timing, pump testing, check valve testing, Emergency Safeguards Features (ESF) testing procedures, periodic flush procedures which could transport/liberate gas, and emergency/abnormal procedures (EPs/APs).

Procedures were generally reviewed to ensure:

- Routine venting is performed at locations where gas could migrate or accumulate,
- Venting steps are performed in a logical sequence,
- Additional venting is performed after system cooldown and depressurization,
- Venting performed after valve and pump testing if gas generation is suspected,

- Effective transport velocities when dynamic venting is credited (Froude number of > 0.55 for horizontal piping runs and > 1.0 for vertical piping runs),
- Venting of captive high points following dynamic venting,
- Adequate venting of pump suctions and casings,
- The corrective action program is entered if the vented volume exceeds a predetermined threshold,
- Venting surveillance procedure results/findings are routed to Engineering for trending.

For static venting procedures, counter-flow conditions, long horizontal sections and the potential for trapped gas were considered.

Several operating procedures were found to need enhancement with regard to proper gas management practices. Enhancements fall into the following categories:

- Improved venting sequence,
- Use of more effective vent locations,
- Improved timing of venting evolutions,
- Improved use of dynamic venting,
- Use of additional venting locations (static or dynamic),
- Addition of quantitative acceptance criteria.

These issues do not challenge system operability, as susceptible gas accumulation locations have been inspected by UT and verified to be sufficiently full of water, and interim monitoring, venting, or engineering evaluation will ensure effective gas management. In addition, procedure changes have been made, will be made prior to procedure use, or procedures have been placed on hold to improve Oconee's gas management practices.

The following corrective actions were identified through the procedure review as needed to ensure conformance with the GL guidance:

Corrective Action 3: Revise BS system operating procedure to control migration of air from the BS suction piping into the LPI suction header. Also add a requirement for flushing the suction and discharge piping after system fill before declaring the system operable.

Corrective Action 4: Revise BS system valve stroke test procedure to require placing the A BS pump in recirculation after stroking BS-1 and before returning the train to service. Also, add enhancements to venting (or UT, engineering evaluation, etc) following stroke testing of BS-2.

Corrective Action 5: Revise or create HPI, LPI, and BS system periodic venting surveillance procedures to include additional venting locations identified in procedure review documentation. Procedures shall include acceptance criteria with direction to initiate a PIP when acceptance criteria are not met.

Corrective Action 6: Revise the HPI system full flow test procedures to add a minimum time requirement for dynamic venting (with flow through crossover piping) to be effective.

Corrective Action 7: Revise HPI Pump Maintenance and Testing procedures to ensure adequate fill of the affected piping.

Corrective Action 8: Revise monthly HPI and LPI pump venting procedures to add acceptance criteria for monthly venting of pump casings with direction to initiate a PIP when acceptance criteria are not met.

Corrective Action 9: Revise LPI system fill and startup procedures to make changes identified in procedure review documentation to ensure procedural controls are in place to flush the suction and discharge piping after system fill, before declaring the system operable.

Corrective Action 10: Revise LPI system operating procedures as described in procedure review documentation to ensure adequate fill of system piping.

Corrective Action 11: Revise unit startup procedures to require sufficient venting of the LPI system after it has been placed in Engineered Safeguards (ES) alignment.

Corrective Action 12: Revise Unit 1 startup procedure to prohibit stroking of 1LP-105.

5. Review of Maintenance Activities That May Introduce Gas

Process controls for system fill and vent activities associated with maintenance were also reviewed. The objective was to ensure that systems are adequately filled and vented to remove gas following maintenance.

Adequate venting following maintenance activities are addressed by the Oconee Operations Group System and Component Removal and Restoration (R&R) process. Inadequate fill and vent after online maintenance is a known gas intrusion risk. Generic guidance is provided within Duke's Standard Operations Management Procedure (SOMP), "Safety Tagging and Configuration Control" as follows:

“IF ECCS system piping which includes the suction source, pump, and/or discharge piping is drained, and an approved procedure for fill and vent does NOT exist, System Engineering shall be consulted to determine all necessary vent valves that are to be used to ensure the piping is fully vented when the system is restored to service.”

This SOMP guidance was determined to be sufficient to support adequate fill and vent evolutions following maintenance activities for the ECCS systems. The BS system and DHR portions of LPI system are not addressed in the SOMP.

The following corrective action is planned as determined by the review of Maintenance Activities:

Corrective Action 13: Revise SOMP, “Safety Tagging and Configuration Control,” to include the Building Spray system and DHR portions of LPI.

6. Potential Gas Sources

The following potential gas sources were identified for the HPI, LPI, and BS systems:

- Improper system fill and vent practices
- Inadequate venting during post-maintenance restoration activities
- Outgassing due to leakage at high/low pressure interfaces (e.g., isolation valves)
- Outgassing due to fluid temperature changes
- Vortexing at fluid free surfaces

These potential gas intrusion sources were considered during the extensive reviews of configuration, procedures, and testing. Corrective actions associated with potential gas sources were identified in those sections of the submittal.

Core Flood Tank (CFT) leakage, Reactor Coolant system check valve leakage and inadequate system fill/vent are considered credible sources for gas intrusion and accumulation for the LPI system. Provisions exist to detect and mitigate credible gas accumulation. CFT water make-ups and make-up rates (non-outage) are trended on a periodic basis as part of Oconee’s Engineering Support Program (ESP). Should make-up frequency or volume exceed expectations, the work request and corrective action programs are used to ensure that appropriate actions are taken. For example, though not an NRC commitment for this GL response, confirmatory UT inspections at strategic locations would be considered if CFT leakage trending determines that leakage is occurring and the lost volume cannot be accounted for external to the system.

7. Ongoing Industry Programs

Ongoing industry programs are planned in the following areas which may impact the conclusions reached during the Design evaluation of Oconee relative to gas accumulation. The activities will be monitored to determine if additional changes to the Oconee design basis may be required.

- Gas Transport in Pump Suction Piping

The Pressurized Water Reactor Owner's Group (PWROG) has initiated testing to provide additional knowledge relative to gas transport in large diameter piping. One program performed testing of gas transport in 6-inch and 8-inch piping. Another program will perform additional testing of gas transport in 4-inch and 12-inch low temperature systems and 4-inch high temperature systems. This program will also integrate the results of the 4-inch, 6-inch, 8-inch, and 12-inch testing.

- Pump Acceptance Criteria

Long-term industry tasks were identified that will provide additional tools to address GL 2008-01 with respect to pump gas void ingestion tolerance limits. Oconee will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits for pumps and piping. When program results are available, Oconee will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Corrective Action 14: Oconee will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. When program results are available, Oconee will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Testing Evaluation

Periodic venting is currently being performed on a monthly basis for the ECCS systems that include the HPI and LPI systems in accordance with Technical Specifications. The testing evaluation consisted of a review and assessment of Oconee's periodic venting surveillance procedures. Procedures were reviewed to ensure that pump suction and discharges are vented periodically, procedures have acceptance criteria, when acceptance criteria are not met the results are entered into the corrective action program and data is recorded for trending purposes. The procedures were also reviewed to ensure that venting is performed at all appropriate locations based on the validation of drawings that is described above.

Oconee has procedures for periodically venting in the following locations:

- LPI pump casings
- HPI pump casings
- LPI/BS suction piping

These venting procedures have the following deficiencies:

- Additional vent locations are needed for more effective venting
- Procedures lack quantitative measurement of gas for trending and documentation of “as found” conditions
- Procedures lack quantitative acceptance criteria
- Procedures lack guidance to enter corrective action program if acceptance criteria are not met.

Corrective actions listed in the Procedure Review section above provide sufficient enhancements to ensure effective gas management. No additional corrective actions are needed to improve Oconee’s testing program/procedures for gas management.

As an enhancement to the venting program, Oconee plans to utilize ultrasonic testing (UT) as a means for verifying piping is sufficiently full of water. UT provides a consistent process to identify and quantify gas accumulation. UT may be utilized during the monthly surveillance tests as well as following system fill and vent activities. This is considered an enhancement to the venting program and is not a commitment for this GL response.

Corrective Actions

The fourth principal area of concern noted in the GL is Corrective Actions. This concern focuses on the treatment of gas accumulation by some licensees as an expected condition rather than a nonconforming condition. The NRC’s expectation is that gas accumulation be recognized as a nonconforming condition and that licensees document and evaluate the condition in their corrective action programs.

In order to assess the degree to which Oconee Nuclear Station has recognized gas accumulation as a nonconforming condition, a search of the corrective action database was performed. Periodic venting procedures were also reviewed to check for steps requiring entry into the corrective action program upon discovery of gas accumulation in the subject systems.

Based upon the findings of this review, Oconee concluded that prior to the issuance of this GL it has not consistently treated the presence of gas in the HPI, LPI, and BS systems as a nonconforming condition.

Several PIPs have been written to document the presence of gas in these systems since the issuance of the GL. For the most part, these PIPs document the findings of UT examinations performed as part of the design review portion of the GL response. Based upon these recent PIP records, Oconee has demonstrated a heightened awareness that the presence of gas in the subject systems is a nonconforming condition, and it is being addressed accordingly.

The corrective actions noted in the Procedure Review section of this response include revision to Oconee's test procedures to require entry into the corrective action program when acceptance criteria are not met. This will provide appropriate assurance that the presence of gas in these systems is recognized as a nonconforming condition and treated appropriately.

Summary of Committed Corrective Actions:

Corrective Action 1: Monitor the status of the TSTF effort to provide revisions to NUREG 1430 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. Oconee will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

Status: Incomplete.

Schedule: 180 days following NRC approval of the TSTF

Basis: Allows time for processing TS change. No safety risk, as interim gas management measures are in place.

Corrective Action 2: Revise Oconee UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.

Status: Incomplete.

Schedule: 6/30/2009

Basis: Schedule allows time for completing task without undue burden on available resources. There is no safety risk with regard to completion schedule, as effective gas management is not dependent upon the UFSAR.

Corrective Action 3: Revise BS system operating procedures to control migration of air from the BS suction piping into the LPI suction header during system fill. Also add a requirement for flushing the suction and discharge piping after system fill before declaring the system operable.

Status: Incomplete.

Schedule: Complete for Unit 1 prior to Mode 3 on startup from refueling outage 1EOC25 in the fall of 2009.
Complete for Unit 2 prior to Mode 3 on startup from refueling outage 2EOC23 in the fall of 2008.
Complete for Unit 3 prior to Mode 3 on startup from refueling outage 3EOC24 in the spring of 2009.

Basis: The schedule is tied to the first refueling outages following the submittal date. The schedule allows time for completion of this work without undue burden on resources or disruption of planning processes. Procedure changes are not required to ensure current operability until the units reach Mode 3 on startup after the system is filled during the next outage. Since procedure changes will be in place prior to that time, there is no safety significance.

Corrective Action 4: Revise BS system valve stroke test procedure to require placing the A BS pump in recirculation after stroking BS-1 and before returning the train to service. Also, add enhancements to venting (or UT, engineering evaluation, etc) following stroke testing of BS-2.

Status: Incomplete. Procedures are on hold.

Schedule: Complete for Units 1 and 3 prior to next procedure use.
Complete for Unit 2 prior to the end of Unit 2 refueling outage 2EOC23 in the fall of 2008.

Basis: The schedule is tied to the first outage following the submittal date for Unit 2. For Units 1 and 3, the schedule allows time for completion of this work without undue burden on resources or disruption of planning processes. Procedures for all units have been placed on hold to prevent use until changes are made. Therefore, there is no safety risk associated with the committed schedule.

Corrective Action 5: Revise or create HPI, LPI, and BS system periodic venting surveillance procedures to include additional venting locations identified in procedure review documentation. Procedures shall include acceptance criteria with direction to initiate a PIP when acceptance criteria are not met.

Status: Incomplete. Procedures are on hold.

Schedule: Procedures will be complete prior to next use or next scheduled surveillance.

Basis: Since procedure changes will be made prior to next use, there is no safety significance.

Corrective Action 6: Revise the HPI system full flow test procedures to add a minimum time requirement for dynamic venting (with flow through crossover piping) to be effective.

Status: Incomplete. Procedures have been placed on hold.

Schedule: Prior to next use of procedures.

Basis: Since procedures are on hold, there is no safety significance.

Corrective Action 7: Revise HPI Pump Maintenance and Testing procedures to ensure adequate fill of the affected piping.

Status: Incomplete. Procedures have been placed on hold.

Schedule: Prior to next use of procedures.

Basis: Since procedures are on hold, there is no safety significance.

Corrective Action 8: Revise monthly HPI and LPI pump venting procedures to add acceptance criteria for monthly venting of pump casings with direction to initiate a PIP when acceptance criteria are not met.

Status: Incomplete. Procedures are on hold.

Schedule: Prior to next use of procedure.

Basis: Since procedures will be changed prior to next use, there is no safety significance.

Corrective Action 9: Revise LPI system fill and startup procedures to make changes identified in procedures review documentation to ensure procedural controls are in place to flush the suction and discharge piping after system fill, before declaring the system operable.

Status: Incomplete. Procedures are on hold.

Schedule: Corrective actions will be complete for all units prior to startup from next forced or scheduled outage (for each unit) in which LPI system is placed in service.

Basis: Since procedures are on hold, there is no safety significance.

Corrective Action 10: Revise LPI system operating procedures as described in procedure review documentation to ensure adequate fill of system piping.

Status: Complete.

Corrective Action 11: Revise unit startup procedures to require sufficient venting of the LPI system after it has been placed in Engineered Safeguards (ES) alignment.

Status: Incomplete.

Schedule: Corrective actions will be complete for all units prior to startup from next forced or scheduled outage (for each unit) in which LPI system is placed in service.

Basis: The schedule is tied to the first outage in which the procedures would be used. Therefore, there is no safety significance.

Corrective Action 12: Revise Unit 1 startup procedure to prohibit stroking of 1LP-105.

Status: Incomplete. Procedure is on hold.

Schedule: Complete prior to startup from refueling outage 1EOC25 in the fall of 2009 or forced shutdown requiring procedure use.

Basis: The schedule is tied to the first outage following the submittal date. The schedule allows time for completion of this work without undue burden on resources or disruption of planning processes. Since procedure changes will be complete prior to next use, there is no safety significance.

Corrective Action 13: Revise SOMP, "Safety Tagging and Configuration Control," to include the Building Spray system and DHR portions of LPI.

Status: In progress.

Schedule: January 31, 2009

Basis: Schedule allows sufficient time to complete revision in a timely manner following completion of the GL 2008-01 response. Completion of this corrective action is not a requirement of operability.

Corrective Action 14: Oconee will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. When program results are available, Oconee will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Status: In progress.

Schedule: To be determined by industry.

Basis: The completion of industry testing and analytical programs is not a condition of operability. The applicable systems were demonstrated to be operable based upon evaluations performed for this GL response.

Conclusion

Oconee has evaluated the accessible portions of the HPI, LPI, and BS systems that perform the functions described in the Generic Letter. Oconee has concluded that these systems are operable, as defined in the Oconee Technical Specifications and are in conformance with our commitments to the applicable General Design Criteria as stated in the Oconee UFSAR.

The corrective actions cited above are considered to be enhancements to the existing programs/processes/procedures for assuring continued operability of the subject systems.

As committed in the Oconee GL 2008-01 Three-Month Response dated May 8, 2008, Oconee will submit its evaluation of the inaccessible portions of these systems within 90 days of the end of the fall 2008 refueling outage for Unit 2, the spring 2009 refueling outage for Unit 3, and the fall 2009 refueling outage for Unit 1.

Attachment 2
McGuire Nuclear Station
Generic Letter 2008-01
9-Month Response

This attachment contains the nine-month response to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008. McGuire used an industry recommended template to develop this response.

The following information is provided in each of the four areas of concern (Licensing Basis, Design, Testing and Corrective Actions) identified by the NRC in the Generic Letter:

- A description of the results of evaluations that were performed pursuant to the requested actions,
- A description of the corrective actions determined necessary to ensure compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50 and the licensing basis and operating license with respect to the subject systems, and
- A statement regarding which corrective actions have been completed, the schedule for the corrective actions not yet complete, and the basis for that schedule.

The following systems (or portions of systems) were determined to be in the scope of GL 2008-01 for McGuire:

- Chemical and Volume Control
- Safety Injection
- Residual Heat Removal
- Containment Spray
- Refueling Water

Licensing Basis Evaluation

The McGuire licensing basis was reviewed with respect to management of gas accumulation in the ECCS portions of Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water Systems. This review included:

- Technical Specifications,
- Technical Specification Bases,
- Updated Final Safety Analysis Report including the Selected Licensee Commitments (analogous to Technical Requirements Manual),
- Responses to NRC Generic Communications.

These documents were reviewed to identify regulatory requirements and commitments related to management of gas accumulation in the subject systems to ensure that requirements are being met. Where deficiencies were identified, they were captured in the Corrective Action Program (PIP). The results of the McGuire licensing basis evaluation are presented below.

1. Technical Specifications and Bases

The McGuire Technical Specifications are based on and in accordance with NRC approved Standard Technical Specifications and NUREG-1431 for Westinghouse plants. The McGuire Technical Specifications (TS) and Bases applicable to this Generic Letter are:

- TS 3.4.6, 3.4.7 and 3.4.8, RCS Loops
- TS 3.5.2 and 3.5.3, Emergency Core Cooling Systems
- TS 3.6.6, Containment Spray System
- TS 3.9.5 and 3.9.6, RHR and Coolant Circulation

These Technical Specifications and Bases were reviewed with respect to gas venting and accumulation. The following potential issues were identified:

- TS Surveillance Requirement (SR) 3.5.2.3 requires verification that ECCS piping is full of water every 31 days in Modes 1, 2 and 3. This Surveillance is also applied by TS SR 3.5.3.1 for ECCS in Mode 4. It may not be necessary for the ECCS piping to be completely full of water to ensure operability.
- The Bases for TS SR 3.5.2.3 state that maintaining piping from the ECCS pumps to the RCS full of water ensures that the system will perform properly. This Basis implies that only the ECCS pump discharge piping needs to be full of water. McGuire currently vents both suction and discharge piping.
- There is no TS Surveillance for verification that Containment Spray piping remains full of water or is verified periodically.

Additional venting of the Containment Spray System will be procedurally controlled on an interim basis (Corrective Action 4). Procedure reviews verified that adequate venting of the Residual Heat Removal system is procedurally controlled.

McGuire's evaluations have concluded that enhancements to the TS to clarify the wording with respect to gas accumulation and to evaluate additional requirements may be warranted. TS improvements are being addressed by the Technical Specification Task Force (TSTF) to provide an approved TSTF traveler for making changes to individual licensee's TS related to the potential for unacceptable gas accumulation. The development of the TSTF traveler relies on the results of the

evaluations of a large number of licensees to address the various plant designs. McGuire is continuing to support the industry and the NEI Gas Accumulation Management Team activities regarding the resolution of generic TS issues. McGuire will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

Corrective Action 1: Monitor the status of the TSTF effort to provide revisions to NUREG-1431 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. McGuire will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

2. Updated Final Safety Analysis Report

The McGuire Updated Final Safety Analysis Report (UFSAR) was reviewed with respect to gas venting, gas accumulation, and their potential harmful effects. The level of detail was found to be insufficient in that the ECCS and Containment Spray piping sections make very little mention of venting or gas accumulation, or any design controls to avoid unventable high points, water hammer or remaining water solid. The Test and Inspection sections make no mention of periodically looking for gas accumulation.

Corrective Action 2: Revise the UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.

The McGuire Selected Licensee Commitment (SLC) manual was reviewed with respect to gas venting, gas accumulation, and their potential harmful effects. SLC 16.5.2, "Power Systems and Decay Heat Removal during Reduced Inventory Operation," requires two Residual Heat Removal pumps available and one in operation. Periodic venting is procedurally controlled, however, this SLC has no surveillance requirements for Residual Heat Removal loop initial or periodic venting. McGuire does not plan to add a venting surveillance to this SLC at this time. Any Residual Heat Removal system venting surveillance is expected to be addressed by the TSTF process discussed above.

3. NRC Generic Communications

A review was performed of the Generic Letters and Information Notices relevant to ECCS gas accumulation provided in this GL 2008-01.

In response to NRC Generic Letter (GL) 88-17, "Loss of Decay Heat Removal," TS 3.9.5 and 3.9.6, "Refueling Operations - RHR and Coolant Circulation," were revised to specify lower allowable RHR pump flow rates based on vortexing concerns. Additional venting was also incorporated into surveillance procedures.

McGuire's evaluation of NRC Information Notice (IN) 88-23, "Potential for Gas Binding High Pressure Safety Injection Pumps during a LOCA," also resulted in the addition of numerous vent locations being added to the ECCS TS SR 3.5.2.3 surveillance procedure.

No new corrective actions or outstanding commitments were identified with respect to applicable NRC Generic Communications.

Design Evaluation

The Design evaluation consists of the following:

1. Design Basis Documents Review
2. Gas Volume Acceptance Criteria
3. Validation of Drawings
4. Review of Procedures
5. Review of Maintenance Activities that may Introduce Gas
6. Potential Gas Sources
7. Ongoing Industry Programs

1. Design Basis Documents Review

The McGuire design basis was reviewed with respect to gas accumulation in the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water Systems. The results have been documented in Engineering technical evaluations. This review included design basis documents, calculations and engineering evaluations. McGuire's review of the design basis for these systems identified no deficiencies associated with implementation of existing design basis requirements. Each system specific Design Basis Document will be updated as appropriate to reflect enhancements associated with Generic Letter 2008-01. This is considered an enhancement to the Design Basis Documents and is not a commitment for this GL response.

2. Gas Volume Acceptance Criteria

The current acceptance criteria in the McGuire venting surveillance procedures are that the piping is full of water at the conclusion of the venting activity. The surveillance procedures have a low threshold for as found gas. A low threshold is defined as an insignificant void fraction that would not challenge system operability. If gas is found above the low threshold, Engineering is notified and the condition is evaluated.

As discussed in the "Ongoing Industry Programs" section, McGuire will monitor the results of the industry testing and analytical programs associated with allowable gas

volume limits for pumps and piping. McGuire will then evaluate those results to determine if additional changes to the applicable acceptance criteria are required.

3. Validation of Drawings

An extensive review of the McGuire Unit 1 and 2 Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water system piping drawings (isometrics and piping layout) was performed. The drawing review identified several locations where gas could potentially accumulate, and/or could not readily be vented. Additional susceptible locations were identified during the field surveys. The suspect locations were determined to be sufficiently full of water by Ultrasonic Testing (UT) of the piping or by verification of adequate dynamic venting through procedure reviews.

Extensive system piping walk downs were also performed to verify drawings were accurate and that there were no indications of system or component (supports, restraints, insulation, etc.) damage indicative of past water hammer events. The walk downs were limited to areas outside containment for this Nine Month Response. Similar walk downs and surveys will be performed inside the McGuire Unit 1 and 2 Containments to support the GL 2008-01 Three Month Response commitments dated May 8, 2008.

The as-built field piping revealed discrepancies with the piping shown on some drawings. In many cases, vent valves are not shown on the piping layout drawings. These valves are shown on system flow diagrams, and where appropriate, are used in venting procedures. Drawing discrepancies were entered into the corrective action program. These drawing revisions are not commitments for this GL response.

Extensive field surveys were also performed to verify acceptable slope of horizontal piping sections. In all cases, piping insulation was either completely removed or the pipe center was validated by boring through insulation at three equally spaced points. The results of the surveys were evaluated to determine if adverse pipe slope created the potential for gas accumulation.

UTs of the piping were conducted on potentially susceptible gas accumulation locations identified during the field surveys. Each UT verified that the piping of concern was sufficiently full of water and showed no gas voids. Other susceptible locations were evaluated by verification of adequate dynamic venting through procedure reviews.

Although not required to maintain operability, approximately 10 new vent valves will be added by design change. In addition, several existing vent valves will be added to procedures to add flexibility for maintaining these systems sufficiently full of water. These venting additions are not commitments for this GL response.

4. Review of Procedures

An extensive review of procedures was performed that impact the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water systems. This included Surveillance, Operating, Abnormal and Emergency procedures. Approximately 100 procedures were reviewed. In general, the review was designed to ensure:

- Routine venting is performed at locations where gas could migrate or accumulate,
- Venting steps are performed in a logical sequence,
- Additional venting is performed after system cool down and depressurization,
- Venting performed after valve and pump testing if gas generation is suspected,
- Effective transport velocities when dynamic venting is credited (Froude number of >0.55 for horizontal piping runs and >1.0 for vertical piping runs).
- Venting of captive high points following dynamic venting,
- Adequate venting of pump suctions and casings,
- The Corrective Action Program is entered if the vented volume exceeds a predetermined threshold,
- Procedure results/findings are routed to Engineering for trending.

The Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water system procedures were reviewed and found to be adequate with respect to gas accumulation. Enhancements were recommended that fall into the following categories:

- Additional venting using existing vent valve locations,
- Addition of vent valves to procedures to provide additional operational flexibility,
- Changes in the sequencing of venting to enhance effectiveness,
- Changes to enhance dynamic venting.

The above changes are considered enhancements to the procedures and are not commitments for this GL response.

The following specific procedure changes were identified as corrective actions to ensure conformance with the Generic Letter guidance:

Corrective Action 3: The quarterly surveillance procedures that operate the Residual Heat Removal pumps in a recirculation alignment throttle the manual discharge isolation valves to avoid any fluid momentum effect. Consistent with the recommendations of the Generic Letter, this practice will be discontinued to alleviate any preconditioning concerns.

Corrective Action 4: Additional venting downstream of the Containment Spray heat exchanger is recommended after quarterly pump testing since gas could be transported downstream of the heat exchanger during the pump test. The procedure revision shall also include criteria to ensure entry into the Corrective Action Program and engineering notification, if gas is found above the low threshold specified in the procedures.

Corrective Action 5: The ECCS monthly venting surveillance procedures will be revised to require entry into the Corrective Action Program (PIP) anytime gas is found above the low threshold specified in the procedures.

5. Review of Maintenance Activities That May Introduce Gas

Process controls for system fill and vent activities associated with maintenance were also reviewed. The intent was to ensure that systems post maintenance are adequately filled and vented.

Adequate venting following maintenance activities are addressed by the McGuire Operations Group System and Component Removal and Restoration (R&R) process. Inadequate fill and vent after online maintenance is a known gas intrusion risk. Generic guidance is provided within Duke's Standard Operations Management Procedure (SOMP) for Safety Tagging and Configuration Control as follows:

“IF ECCS system piping which includes the suction source, pump, and/or discharge piping is drained, and an approved procedure for fill and vent does NOT exist, System Engineering shall be consulted to determine all necessary vent valves that are to be used to ensure the piping is fully vented when the system is restored to service.”

This SOMP guidance was determined to be sufficient to support adequate fill and vent evolutions for the ECCS systems following maintenance activities. As a programmatic 3-site (Duke) enhancement, the SOMP will be expanded to include the Containment Spray and Residual Heat Removal systems.

Corrective Action 6: Revise the SOMP for Safety Tagging and Configuration Control to include the Containment Spray and Residual Heat Removal systems.

6. Potential Gas Sources

Potential gas sources were identified for the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water Systems.

Generically, the following gas sources apply to the ECCS and Containment Spray systems:

- Gas dissolution due to changes in process temperature/pressure or mechanical agitation,
- Leakage through valves,
- Inadequate fill and venting following outages or after on-line maintenance,
- Inadequate venting following pump flow or valve stroke testing,
- Air entrainment due to vortexing.

These potential gas intrusion sources were considered during the extensive procedure and testing reviews. No changes were deemed necessary as a result of this review.

At least one Chemical and Volume Control Pump is continuously in service during normal operation. Thus, introduction of gas into the discharge piping once filled and vented is not a concern. No gases will come out of solution due to normal system pressures being much greater than the Volume Control Tank head pressure.

Cold Leg Accumulator (CLA) leakage, Reactor Coolant System check valve leakage and inadequate system fill and vent are the most credible sources for gas intrusion and accumulation for the Safety Injection and Residual Heat Removal Systems. Several provisions exist to detect and mitigate credible gas accumulation sources. CLA nitrogen make-ups and water make-ups (non-outage) are trended on a periodic basis using the Engineering Support Program (ESP). Should nitrogen or water make-ups exceed expectations, the Work Request and Corrective Action Programs are utilized to ensure that appropriate actions are taken. Another indicator of a gas intrusion event is increased pump discharge pressures for the Safety Injection Pumps and the Residual Heat Removal Pumps while in a standby condition. Operations Surveillance procedures include a check of the pump discharge pressures. Any abnormal condition will be entered into the Corrective Action Program and engineering is notified.

Gas can be introduced into the Refueling Water, Chemical and Volume Control, Safety Injection, Residual Heat Removal, and Containment Spray systems during an accident condition if the Refueling Water Storage Tank level (FWST) indications are incorrect. FWST level setpoints and emergency procedures ensure that the ECCS and Containment Spray pumps are realigned from the FWST to the ECCS sump prior to the onset of vortexing or loss of adequate net positive suction head. Sufficient margin exists to the level setpoints to ensure that gas is not introduced to the pump suction by FWST vortexing. Additional conservatism and margin are included in the analysis for instrument uncertainty and operator action times.

ECCS realignments during design basis events have been evaluated to be acceptable for system operability with a system that is kept sufficiently full of water. Containment sump strainer performance, including debris laden suction geometry and vortexing has been evaluated and was provided to the NRC under separate correspondence as a

supplemental response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors."

Design features and water level set points are controlled by design documents and operating procedures to prevent vortex effects that can potentially ingest gas into the systems during design basis events. Additional restrictions on maximum flow rates also prevent vortex effects during shutdown cooling operations at reduced RCS inventory.

7. Ongoing Industry Programs

Ongoing industry programs are planned in the following areas which may impact the conclusions reached during the Design Evaluation of McGuire relative to gas accumulation. The activities will be monitored to determine if additional changes to the McGuire design may be required or desired to provide additional margin.

- Gas Transport in Pump Suction Piping

The Pressurized Water Reactor Owners Group (PWROG) has initiated testing to provide additional knowledge relative to gas transport in large diameter piping. One program performed testing of gas transport in 6-inch and 8-inch piping. Another program will perform additional testing of gas transport in 4-inch and 12-inch low temperature systems and 4-inch high temperature systems. This program will also integrate the results of the 4-inch, 6-inch, 8-inch and 12-inch testing.

- Pump Acceptance Criteria

Long-term industry tasks were identified that will provide additional tools to address GL 2008-01 with respect to pump gas void ingestion tolerance limits. Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Corrective Action 7: Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Testing Evaluation

Procedures that perform tests and surveillances were also reviewed using the procedure review guidelines.

Periodic venting is currently being performed on a monthly basis for the ECCS systems that include Chemical and Volume Control, Safety Injection, Residual Heat Removal and

Refueling Water systems in accordance with Technical Specifications. The procedure review concluded that the venting locations currently specified in the monthly TS Surveillance procedure are effective for identifying potential gas accumulation. Procedure revisions are being developed to ensure that there is appropriate acceptance criteria associated with venting, and that procedures specify entry into the Corrective Action Program when gas accumulation is identified (see Corrective Action 5).

Periodic venting is not currently performed for the Containment Spray system, as there is currently no formal Technical Specification surveillance requirement. Based on past operating history and the design review, there is minimal risk of a gas intrusion event from other than inadequate fill and vent after online maintenance. One of the recommendations of the procedure review was to implement routine venting of the Containment Spray heat exchanger discharge header high points, following quarterly Containment Spray pump testing. This has been entered into the Corrective Action Program (see Corrective Action 4).

As an enhancement to the venting program, McGuire plans to utilize ultrasonic testing (UT) as a means for verifying piping is sufficiently full of water. UT provides a consistent process to identify and quantify gas accumulation. UT may be utilized during the monthly surveillance tests as well as following system fill and vent activities. This is considered an enhancement to the venting program and is not a commitment for this GL response.

Corrective Actions

The fourth principal area of concern noted in the GL is Corrective Actions. This concern focuses on the treatment of gas accumulation by some licensees as an expected condition rather than a nonconforming condition. McGuire's expectation is that gas accumulation be recognized as an unexpected, nonconforming condition.

McGuire's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of the McGuire Corrective Action Program, gas accumulation is evaluated for potential impact on Operability and Reportability. Therefore, McGuire's review concluded that issues involving gas intrusion/accumulation are properly prioritized and evaluated under the Corrective Action Program.

Summary of Committed Corrective Actions

Corrective Action 1: Monitor the status of the TSTF effort to provide revisions to NUREG-1431 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. McGuire will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

Status: Following the TSTF effort.

Schedule: To be determined by TSTF approval process.

Basis: The completed and proposed procedure revisions will maintain the ECCS, Residual Heat Removal and Containment Spray systems operable in the interim.

Corrective Action 2: Revise the UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.

Status: In progress.

Schedule: Approve UFSAR change packages by March 31, 2009.

Basis: Schedule allows sufficient time to complete the change packages in a timely manner following completion of the GL 2008-01 response. Completion of this corrective action is not a requirement of operability.

Corrective Action 3: Revise the Residual Heat Removal pump quarterly surveillance procedures to eliminate the steps that throttle the pump discharge isolation valve prior to pump start.

Status: Complete.

Corrective Action 4: Add steps to the Containment Spray pump quarterly surveillance procedures to vent downstream of the Heat Exchangers after quarterly pump runs. The procedure revision shall include criteria to ensure entry into the Corrective Action Program and engineering notification, if gas is found above the low threshold specified in the procedures.

Status: Complete.

Corrective Action 5: Revise the ECCS monthly venting surveillance procedures to require entry into the Corrective Action Program (PIP) anytime gas is found above the low threshold specified in the procedures.

Status: Complete.

Corrective Action 6: Revise SOMP for Safety Tagging and Configuration Control to include the Containment Spray and Residual Heat Removal systems.

Status: In progress.

Schedule: Revise and approve revision by January 31, 2009.

Basis: Schedule allows sufficient time to complete the revision in a timely manner following completion of the GL 2008-01 response. Completion of this corrective action is not a requirement of operability.

Corrective Action 7: Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Status: In progress.

Schedule: To be determined by industry.

Basis: The completion of the industry testing and analytical programs is not a condition of operability. The applicable systems were demonstrated to be operable based on evaluations performed for this Generic Letter response.

Conclusion

McGuire has evaluated the accessible portions of the Chemical and Volume Control, Safety Injection, Residual Heat Removal, Containment Spray, and Refueling Water systems that perform the functions described in the Generic Letter and has concluded that these systems are operable, as defined in the McGuire Technical Specifications and are in conformance to our commitments to the applicable General Design Criteria as stated in the McGuire UFSAR.

The corrective actions cited above are considered to be enhancements to the existing programs/processes/procedures for assuring continued operability of these subject systems.

As committed in the McGuire GL 2008-01 Three Month Response dated May 8, 2008, McGuire will submit its evaluation of the inaccessible portions of these systems within 90 days of the end of the Fall 2008 refueling outage for Unit 1 and the Fall 2009 refueling outage for Unit 2.

Attachment 3
Catawba Nuclear Station
Generic Letter 2008-01
9 - Month Response

This attachment contains the nine-month response to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008. Catawba used an industry recommended template to develop this response.

The following information is provided in each of the four areas of concern (Licensing Basis, Design, Testing and Corrective Actions) identified by the NRC in the Generic Letter:

- A description of the results of evaluations that were performed pursuant to the requested actions,
- A description of the corrective actions determined necessary to ensure compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50 and the licensing basis and operating license with respect to the subject systems, and
- A statement regarding which corrective actions have been completed, the schedule for the corrective actions not yet complete, and the basis for that schedule.

The following systems (or portions of systems) were determined to be in the scope of GL 2008-01 for Catawba:

- Chemical and Volume Control
- Safety Injection
- Residual Heat Removal
- Containment Spray
- Refueling Water

Licensing Basis Evaluation

The Catawba licensing basis was reviewed with respect to gas accumulation in the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water Systems. This review included:

- Technical Specifications,
- Technical Specification Bases,
- Updated Final Safety Analysis Report including Selected Licensee Commitments (Analogous to Technical Requirements Manual),
- Responses to NRC Generic Communications

These documents were reviewed to identify regulatory requirements and commitments related to management of gas accumulation in the subject systems and to ensure that requirements are being met. Where deficiencies were identified, they were captured in the Corrective Action Program (PIP). The results of the Catawba licensing basis evaluation are presented below.

1. Technical Specifications and Bases

The Catawba Technical Specifications are based on and in accordance with NRC approved Standard Technical Specifications and NUREG-1431 for Westinghouse plants. The Catawba Technical Specifications (TS) and Bases applicable to this Generic Letter are:

- TS 3.4.6, 3.4.7 and 3.4.8, RCS Loops
- TS 3.5.2 and 3.5.3, Emergency Core Cooling Systems
- TS 3.6.6, Containment Spray System
- TS 3.9.4 and 3.9.5, RHR and Coolant Circulation

These Technical Specifications and Bases were reviewed with respect to gas venting and accumulation. The following potential issues were identified:

- TS Surveillance Requirement (SR) 3.5.2.3 requires verification that ECCS piping is full of water every 31 days in Modes 1, 2 and 3. This Surveillance is also applied by TS SR 3.5.3.1 for ECCS in Mode 4. It may not be necessary for the ECCS piping to be completely full of water to ensure operability.
- The Bases for TS SR 3.5.2.3 state that maintaining piping from the ECCS pumps to the RCS full of water ensures that the system will perform properly. This Basis implies that only the ECCS pump discharge piping needs to be full of water. Catawba currently vents both suction and discharge piping.
- There is no TS Surveillance for verification that Containment Spray piping remains full of water or is verified periodically.

Additional venting of the Containment Spray System will be procedurally controlled on an interim basis (Corrective Action 4). Procedure reviews verified that adequate venting of Residual Heat Removal is procedurally controlled.

Catawba's evaluations have concluded that enhancements to the TS to clarify the wording with respect to gas accumulation and to evaluate additional requirements may be warranted. TS improvements are being addressed by the Technical Specification Task Force (TSTF) to provide an approved TSTF traveler for making changes to individual licensee's TS related to the potential for unacceptable gas accumulation. The development of the TSTF traveler relies on the results of the

evaluations of a large number of licensees to address the various plant designs. Catawba is continuing to support the industry and the NEI Gas Accumulation Management Team activities regarding the resolution of generic TS issues. Catawba will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

Corrective Action 1: Monitor the status of the TSTF effort to provide revisions to NUREG-1431 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. Catawba will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

2. Updated Final Safety Analysis Report

The Catawba Updated Final Safety Analysis Report (UFSAR) was reviewed with respect to gas venting, gas accumulation, and their potential harmful effects. The ECCS section of the UFSAR does contain descriptions of steps taken to avoid water hammer, vents being provided to allow proper venting of ECCS lines and the Technical Specification SR 3.5.2 monthly venting requirement. However, the UFSAR may not address all aspects of the Generic Letter. The level of detail was found to be insufficient for the Containment Spray piping.

Corrective Action 2: Revise the UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.

3. NRC Generic Communications

In response to NRC Generic Letter (GL) 88-17, "Loss of Decay Heat Removal," TS 3.9.4 and 3.9.5, "Refueling Operations - RHR and Coolant Circulation," were revised to specify lower allowable RHR pump flow rates based on vortexing concerns.

Catawba's evaluation of NRC Information Notice (IN) 88-23, "Potential for Gas Binding High Pressure Safety Injection Pumps during a LOCA," also resulted in the addition of numerous vent locations being added to the ECCS TS SR 3.5.2.3 surveillance procedure.

No new corrective actions or outstanding commitments were identified with respect to applicable NRC Generic Communications.

Design Evaluation

The Design evaluation consists of the following:

1. Design Basis Documents Review
2. Gas Volume Acceptance Criteria
3. Validation of Drawings
4. Review of Procedures
5. Review of Maintenance Activities that may Introduce Gas
6. Potential Gas Sources
7. Ongoing Industry Programs

1. Design Basis Documents Review

The Catawba design basis was reviewed with respect to gas accumulation in the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water systems. The results have been documented in engineering technical evaluations. This review included design basis documents, calculations, and engineering evaluations. Catawba's review of the design basis for these systems identified no deficiencies associated with implementation of existing design basis requirements. Each system specific Design Basis Document will be updated as appropriate to reflect enhancements associated with Generic Letter 2008-01. This is considered an enhancement to the Design Basis Documents and is not a commitment for this GL response.

2. Gas Volume Acceptance Criteria

The current acceptance criteria in the Catawba venting procedures are that the piping is full of water at the conclusion of the venting activity. Surveillance procedures have a low threshold for as found gas. A low threshold is defined as an insignificant void fraction that would not challenge system operability. If gas is found above the low threshold, then engineering is notified and the condition is evaluated.

At Catawba there is one vent valve on each unit where a small amount of gas is expected during the monthly venting surveillance. This vent valve is located in a section of piping located above the Volume Control Tank water level and therefore some degassing is expected to occur. Evaluations performed due to a 2004 gas intrusion event show that this small amount of gas is well below the volume that would adversely affect system operability.

As discussed in the "Ongoing Industry Programs" section, Catawba will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits for pumps and piping. Catawba will then evaluate those results to determine if additional changes to the applicable acceptance criteria are required.

3. Validation of Drawings

An extensive review of the Catawba Unit 1 and 2 Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water system piping drawings (isometrics and piping layout) was performed. The drawing review identified several locations where gas could potentially accumulate, and/or could not readily be vented. The suspect locations were individually evaluated by Ultrasonic Testing (UT) of the piping or verification of adequate dynamic venting through procedure reviews.

Extensive system piping walk downs were also performed to verify drawings were accurate and that there were no unevaluated indications of system or component (supports, restraints, insulation, etc.) damage indicative of past water hammer events. For the walk-downs that have been completed, no discrepancies with the piping shown on the isometric and piping drawings were identified.

Extensive field surveys were also performed to verify acceptable slope of horizontal piping sections. In all cases, piping insulation was either completely removed or the pipe slope was validated by boring through insulation. The results of the surveys were evaluated to determine if adverse pipe slope created the potential for gas accumulation.

UTs of the piping were conducted on potentially susceptible gas accumulation locations identified during the field surveys. Each UT verified that the piping of concern was sufficiently full of water. There was one UT point that detected a small gas void. This condition was immediately entered into the corrective action program and the operability determination process was entered. The small gas void was subsequently shown to have no adverse effect on system operability. Other susceptible locations were evaluated by verification of adequate dynamic venting through procedure reviews.

The field work for Catawba Unit 1 is complete. As described in Catawba's 3-month response dated May 8, 2008, the field verifications for Unit 2 were limited to accessible areas, and will be complete in the spring 2009 refueling outage.

Although not required to maintain operability, approximately 13 new vent valves will be added by design change. In addition, several existing vent valves will be added to procedures to add flexibility for maintaining these systems sufficiently full of water. These venting additions are not commitments for this GL response.

4. Review of Procedures

An extensive review of procedures was performed that impact the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water systems. This included Surveillance, Operating, Abnormal and Emergency

procedures. Approximately 100 procedures were reviewed. In general, the review was designed to ensure:

- Routine venting is performed at locations where gas could migrate or accumulate
- Venting steps are performed in a logical sequence
- Additional venting is performed after system cool down and depressurization
- Venting is performed after valve and pump testing if gas generation is suspected
- Effective transport velocities when dynamic venting is credited (Froude number of > 0.55 for horizontal piping runs and > 1.0 for vertical piping runs)
- Venting of captive high points following dynamic venting
- Adequate venting of pump suctions and casings
- The Corrective Action Program is entered if the vented volume exceeds a predetermined threshold

The Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water system procedures were reviewed and found to be adequate with respect to gas accumulation. Enhancements were recommended that fall into the following categories:

- Additional venting using existing vent valve locations
- Addition of vent valves to procedures to provide additional operational flexibility
- Changes in the sequencing of venting to enhance effectiveness
- Changes to enhance dynamic venting

The above changes are considered enhancements to the procedures and are not commitments for this GL response.

The following specific procedure changes were identified as corrective actions to ensure conformance with the Generic Letter guidance:

Corrective Action 3: The quarterly surveillance procedures that operate the Residual Heat Removal pumps in a recirculation alignment require the heat exchanger outlet valves to be closed to avoid any fluid momentum effect. Consistent with the recommendations of the Generic Letter, this practice will be discontinued to alleviate any preconditioning concerns.

Corrective Action 4: Additional venting downstream of the Containment Spray heat exchanger is recommended after pump testing since gas could be transported downstream of the heat exchanger during the pump test. The procedure revision shall also include criteria to ensure entry into the Corrective Action Program (PIP) and engineering notification, if gas is found above the low threshold specified in the procedure.

Corrective Action 5: The ECCS monthly venting surveillance procedures will be revised to require entry into the Corrective Action Program (PIP) anytime gas is found above the low threshold specified in the procedures.

5. Review of Maintenance Activities That May Introduce Gas.

Process controls for system fill and vent activities associated with maintenance were also reviewed. The intent was to ensure that systems post maintenance are adequately filled and vented.

Adequate venting following maintenance activities are addressed by the Catawba Operations Group System and Component Removal and Restoration (R&R) process. As a part of this process, operating procedures provide prescriptive guidance for fill and vent of ECCS piping and components. Inadequate fill and vent after online maintenance is a known gas intrusion risk. Generic guidance is provided within Duke's Standard Operations Management Procedure (SOMP) for Safety Tagging and Configuration Control as follows:

“IF ECCS system piping which includes the suction source, pump, and/or discharge piping is drained, and an approved procedure for fill and vent does NOT exist, System Engineering shall be consulted to determine all necessary vent valves that are to be used to ensure the piping is fully vented when the system is restored to service.”

This SOMP guidance was determined to be sufficient to support adequate fill and vent evolutions for the ECCS systems following maintenance activities. As a programmatic 3-site (Duke) enhancement, the SOMP will be expanded to include the Containment Spray and Residual Heat Removal systems.

Corrective Action 6: Revise SOMP for Safety Tagging and Configuration Control to include the Containment Spray and Residual Heat Removal systems.

6. Potential Gas Sources

Potential gas sources were identified for the Chemical and Volume Control, Safety Injection, Containment Spray, Residual Heat Removal and Refueling Water Systems. Generically, the following gas sources apply to the ECCS and Containment Spray systems:

- Gas dissolution due to changes in process temperature/pressure or mechanical agitation
- Leakage through valves
- Inadequate fill and venting following outages or after on-line maintenance
- Inadequate venting following pump flow or valve stroke testing
- Air entrainment due to vortexing

These potential gas intrusion sources were considered during the comprehensive procedure and testing reviews.

At least one Chemical and Volume Control Pump is continuously in service during normal operation. Thus, introduction of gas into the discharge piping once filled and vented is not a concern. No gases will come out of solution due to normal system pressures being much greater than Volume Control Tank head pressure.

Another well known mechanism for gas intrusion into the Chemical and Volume Control system is gas stripping across the minimum flow orifices. There are currently some Catawba procedures that still allow the Chemical and Volume Control system pump minimum flow to be aligned back to the pump suction. These procedures will be revised to remove this allowance and keep the minimum flow aligned to the Volume Control Tank. Procedures used for outage related activities only, will allow the minimum flow alignment to the pump suction for short periods of time.

Corrective Action 7: Revise applicable procedures to keep the Chemical and Volume Control system pumps minimum flow aligned to the Volume Control Tank at all times.

Cold Leg Accumulator (CLA) leakage, Reactor Coolant System check valve leakage and inadequate system fill and vent are the most credible sources for gas intrusion and accumulation for the Safety Injection and Residual Heat Removal Systems. Several provisions exist to detect and mitigate credible gas accumulation sources. CLA water make-ups and water makeup rates (non-outage) are trended on a periodic basis using the Engineering Support Program (ESP). Should water make-ups exceed expectations and become a concern, the Work Request and Corrective Action Programs are utilized to ensure that appropriate actions are taken. Another indicator of a gas intrusion event is increased pump discharge pressures for the Safety Injection Pumps and the Residual Heat Removal Pumps. There is currently no formal process for monitoring these parameters; therefore the Operations Surveillance procedures will be revised to include a check of the pump discharge pressures. Any abnormal condition will be entered into the Corrective Action Program and engineering notified.

Corrective Action 8: Revise applicable Operations Surveillance procedures to require verification of normal pump discharge pressures for the Safety Injection and Residual Heat Removal pumps.

Gas can be introduced into the Refueling Water, Chemical and Volume Control, Safety Injection, Residual Heat Removal, and Containment Spray systems during an accident condition if the Refueling Water Storage Tank level (FWST) indications are incorrect. FWST level setpoints and emergency procedures ensure that the ECCS and Containment Spray pumps are realigned from the FWST to the ECCS sump prior to the onset of vortexing or loss of adequate net positive suction head (NPSH). Sufficient margin exists

to the level setpoints to ensure that gas is not introduced to the pump suction by FWST vortexing. Additional conservatism and margin are included in the analysis for instrument uncertainty and operator action times.

ECCS realignments during design basis events have been evaluated to be acceptable for system operability with a system that is kept sufficiently full. Containment sump strainer performance, including debris laden suction geometry and vortexing has been evaluated and was provided to the NRC under separate correspondence as a supplemental response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors."

Design features and water level set points are controlled by design documents and operating procedures to prevent vortex effects that can potentially ingest gas into the systems during design basis events. Additional restrictions on maximum flow rates also prevent vortex effects during shutdown cooling operations at reduced RCS inventory.

7. Ongoing Industry Programs

Ongoing industry programs are planned in the following areas which may impact the conclusions reached during the Design Evaluation of Catawba relative to gas accumulation. The activities will be monitored to determine if additional changes to the Catawba design may be required or desired to provide additional margin.

- Gas Transport in Pump Suction Piping

The Pressurized Water Reactor Owners Group PWROG has initiated testing to provide additional knowledge relative to gas transport in large diameter piping. One program performed testing of gas transport in 6-inch and 8-inch piping. Another program will perform additional testing of gas transport in 4-inch and 12-inch low temperature systems and 4-inch high temperature systems. This program will also integrate the results of the 4-inch, 6-inch, 8-inch and 12-inch testing.

- Pump Acceptance Criteria

Long-term industry tasks were identified that will provide additional tools to address GL 2008-01 with respect to pump gas void ingestion tolerance limits. Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Corrective Action 9: Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Testing Evaluation

Procedures that perform tests and surveillances were also reviewed using the procedure review guidelines.

Periodic venting is currently being performed on a monthly basis for the ECCS systems that include Chemical and Volume Control, Safety Injection, Residual Heat Removal and Refueling Water systems in accordance with Technical Specifications. The procedure review concluded that the venting locations currently specified in the monthly TS Surveillance procedure are effective for identifying potential gas accumulation outside containment. Piping inside containment is not vented during operation unless precursors (CLA levels decreasing, pump discharge pressures increasing, etc) indicate that gas accumulation may be occurring.

Procedure revisions are being developed to ensure that there is appropriate guidance associated with venting, and that procedures specify entry into the Corrective Action Program when gas accumulation is identified (see Corrective Action 5).

Periodic venting is not currently performed for the Containment Spray system, as there is currently no formal Technical Specification surveillance requirement. Based on past operating history and the design review, there is minimal risk of a gas intrusion event from other than inadequate fill and vent. One of the recommendations of the procedure review was to implement routine venting of the Containment Spray heat exchanger discharge header high points, following quarterly Containment Spray pump testing. This has been entered into the Corrective Action Program (see Corrective Action 4).

As an enhancement to the venting program, Catawba plans to utilize ultrasonic testing as a means for verifying piping is sufficiently full of water. UT provides a consistent process to identify and quantify gas accumulation. UT may be utilized during the monthly surveillance tests as well as following fill and vent activities. This is considered an enhancement to the program and is not a commitment for this Generic Letter response.

Corrective Actions

The fourth principal area of concern noted in the GL is Corrective Actions. This concern focuses on the treatment of gas accumulation by some licensees as an expected condition rather than a nonconforming condition. Catawba's expectation is that gas accumulation be recognized as an unexpected and non-conforming condition.

Catawba's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of the Catawba Corrective Action Program, gas accumulation is evaluated for potential impact on Operability and Reportability. Therefore, Catawba's review concluded that issues involving gas intrusion/accumulation are properly prioritized and evaluated under the Corrective Action Program.

Summary of Committed Corrective Actions

Corrective Action 1: Monitor the status of the TSTF effort to provide revisions to NUREG-1431 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. Catawba will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.

Status: Waiting on TSTF approval process.

Schedule: To be determined by TSTF approval process.

Basis: The completed and proposed procedure revisions will maintain the ECCS and Containment Spray systems operable in the interim.

Corrective Action 2: Revise the UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.

Status: Incomplete.

Schedule: Approve UFSAR change packages by January 31, 2009.

Basis: Schedule allows sufficient time to complete the change packages in a timely manner following completion of the GL 2008-01 response. Completion of this corrective action is not a requirement of operability.

Corrective Action 3: The quarterly surveillance procedures that operate the Residual Heat Removal pumps in a recirculation alignment require the heat exchanger outlet valves to be closed to avoid any fluid momentum effect. Consistent with the recommendations of the Generic Letter, this practice will be discontinued to alleviate any preconditioning concerns.

Status: Complete

Corrective Action 4: Additional venting downstream of the Containment Spray heat exchanger is recommended after pump testing since gas could be transported downstream of the heat exchanger during the pump test. The procedure revision shall also include criteria to ensure entry into the Corrective Action Program (PIP) and engineering notification, if gas is found above the low threshold specified in the procedure.

Status: Complete

Corrective Action 5: The ECCS monthly venting surveillance procedures will be revised to require entry into the Corrective Action Program (PIP) anytime gas is found above the low threshold specified in the procedures.

Status: Complete.

Corrective Action 6: Revise SOMP for Safety Tagging and Configuration Control to include the Containment Spray and Residual Heat Removal systems.

Status: In progress.

Schedule: Revise and approve revision by January 31, 2009.

Basis: Schedule allows sufficient time to complete the revision in a timely manner following completion of the GL 2008-01 response. Completion of this corrective action is not a requirement of operability.

Corrective Action 7: Revise applicable procedures to keep the Chemical and Volume Control system pumps minimum flow aligned to the Volume Control Tank at all times.

Status: Incomplete

Schedule: Prior to next performance of the surveillance.

Basis: Procedure placed on Technical Hold. Outage related procedure to be revised prior to next use.

Corrective Action 8: Revise applicable Operations Surveillance procedures to require verification of normal pump discharge pressures for the Safety Injection and Residual Heat Removal pumps.

Status: Complete

Corrective Action 9: Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.

Status: In progress

Schedule: To be determined by industry

Basis: The completion of the industry testing and analytical programs is not a condition of operability. The applicable systems were demonstrated to be operable based on evaluations performed for this Generic Letter response.

Conclusion

Catawba has evaluated the accessible portions of the Chemical and Volume Control, Safety Injection, Residual Heat Removal, Containment Spray, and Refueling Water systems that perform the functions described in the Generic Letter and has concluded that these systems are operable, as defined in the Catawba TS and are in conformance to our commitments to the applicable General Design Criteria as stated in the Catawba UFSAR.

The corrective actions cited above are considered to be enhancements to the existing programs/processes/procedures for assuring continued operability of these subject systems.

As committed in the Catawba 3-Month Response, dated May 8, 2008, Catawba will complete its evaluation of the inaccessible portions of these systems by startup from the Spring 2009 refueling outage and will provide a supplement to this response within 90 days thereafter.

Attachment 4
Oconee Nuclear Station
Generic Letter 2008-01 9-Month Response
List of Commitments

Commitment	Commitment Date or Outage
<p>Monitor the status of the TSTF effort to provide revisions to NUREG 1430 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. Oconee will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation.</p>	<p>Within 180 days following NRC approval of the TSTF</p>
<p>Revise Oconee UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.</p>	<p>June 30, 2009</p>
<p>Revise BS system operating procedures to control migration of air from the BS suction piping into the LPI suction header during system fill. Also add a requirement for flushing the suction and discharge piping after system fill before declaring the system operable.</p>	<p>For Unit 1, prior to Mode 3 on startup from refueling outage 1EOC25 in fall 2009. For Unit 2, prior to Mode 3 on startup from refueling outage 2EOC23 in fall 2008. For Unit 3, prior to Mode 3 on startup from refueling outage 3EOC24 in spring 2009.</p>
<p>Revise BS system valve stroke test procedure to require placing the A BS pump in recirculation after stroking BS-1 and before returning the train to service. Also, add enhancements to venting (or UT, engineering evaluation, etc) following stroke testing of BS-2.</p>	<p>For Units 1 and 3 prior to next procedure use. For Unit 2, prior to end of refueling outage 2EOC23 in fall of 2008.</p>
<p>Revise or create HPI, LPI, and BS system periodic venting surveillance procedures to include additional venting locations identified in procedure review documentation. Procedures shall include acceptance criteria with direction to initiate a PIP when acceptance criteria are not met.</p>	<p>Prior to next procedure use or next scheduled surveillance.</p>
<p>Revise the HPI system full flow test procedures to add a minimum time requirement for dynamic venting (with flow through crossover piping) to be effective.</p>	<p>Prior to next use of procedures.</p>
<p>Revise HPI Pump Maintenance and Testing procedures to ensure adequate fill of the affected piping.</p>	<p>Prior to next use of procedures.</p>

Attachment 4
Oconee Nuclear Station
Generic Letter 2008-01 9-Month Response
List of Commitments

Revise monthly HPI and LPI pump venting procedures to add acceptance criteria for monthly venting of pump casings with direction to initiate a PIP when acceptance criteria are not met.	Prior to next use of procedure.
Revise LPI system fill and startup procedures to make changes identified in procedure review documentation to ensure procedural controls are in place to flush the suction and discharge piping after system fill, before declaring the system operable.	Prior to startup from next forced or scheduled outage (for each unit) in which LPI system is placed in service.
Revise unit startup procedures to require sufficient venting of the LPI system after it has been placed in Engineered Safeguards (ES) alignment.	Prior to startup from next forced or scheduled outage (for each unit) in which LPI system is placed in service.
Revise Unit 1 startup procedure to prohibit stroking of 1LP-105.	Prior to startup from refueling outage 1EOC25 in the fall of 2009 or prior to any startup from any forced outage requiring procedure use.
Revise SOMP, "Safety Tagging and Configuration Control," to include the Building Spray system and DHR portions of LPI.	January 31, 2009
Oconee will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. When program results are available, Oconee will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.	To be determined by industry.

Attachment 5
McGuire Nuclear Station
Generic Letter 2008-01 9-Month Response
List of Commitments

Commitment	Commitment Date or Outage
<p>Monitor the status of the TSTF effort to provide revisions to NUREG-1431 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. McGuire will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.</p>	<p>180 days following industry and NRC approval of the GL 2008-01 TSTF.</p>
<p>Revise the UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.</p>	<p>March 31, 2009</p>
<p>Revise SOMP for Safety Tagging and Configuration Control to include the Containment Spray and Residual Heat Removal systems.</p>	<p>January 31, 2009.</p>
<p>Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.</p>	<p>To be determined by industry.</p>

Attachment 6
Catawba Nuclear Station
Generic Letter 2008-01 9-Month Response
List of Commitments

Commitment	Commitment Date or Outage
Monitor the status of the TSTF effort to provide revisions to NUREG-1431 Technical Specifications and their associated Bases in regard to the periodic venting surveillance. Catawba will evaluate the resolution of TS issues with respect to the changes contained in the TSTF traveler, and submit a license amendment request based on this evaluation within 180 days following NRC approval of the TSTF.	180 days after NRC approval of TSTF
Revise the UFSAR in regard to gas accumulation and venting consistent with the guidance described in GL 2008-01.	January 31, 2009
Revise SOMP for Safety Tagging and Configuration Control to include the Containment Spray and Residual Heat Removal systems.	January 31, 2009
Revise applicable procedures to keep the Chemical and Volume Control system pumps minimum flow aligned to the Volume Control Tank at all times.	To be revised prior to next outage (1EOC 18 and 2EOC16). Placed on Technical Hold.
Duke will monitor the results of the industry testing and analytical programs associated with allowable gas volume limits and gas transport for pumps and piping. Then Duke will evaluate the results to determine if additional changes to the applicable acceptance criteria are required.	To be determined by industry.