Progress Energy

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62
Nine-month Response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems"

References:
1. Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008 (ADAMS Accession Number ML072910759)
2. Letter from Benjamin C. Waldrep to the U.S. Nuclear Regulatory Commission (Serial: BSEP 08-0060), "Three-month Response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" dated May 9, 2008 (ADAMS Accession Number ML081420026)

Ladies and Gentlemen:

On January 11, 2008, the NRC issued Generic Letter (GL) 2008-01 requesting that each licensee evaluate the licensing basis, design, testing, and corrective action programs for the Emergency Core Cooling Systems (ECCS), Decay Heat Removal (RHR) system, and Containment Spray system, to ensure that gas accumulation is maintained less than the amount that challenges operability of these systems, and that appropriate action will be taken when conditions adverse to quality are identified.

The enclosure to this submittal provides Carolina Power & Light Company's (CP&L), now doing business as Progress Energy Carolinas, Inc., nine-month response to GL 2008-01 for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2.

CP&L has concluded that the subject systems/functions at the BSEP, Units 1 and 2 are in compliance with the TS definition of Operability (i.e., capable of performing their intended safety function) and that BSEP Units 1 and 2 are currently in compliance with 10 CFR 50, Appendix B, Sections III, V, XI, XVI and XVII, with respect to the concerns outlined in GL 2008-01 regarding gas accumulation in the accessible portions of these

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systems/functions. As committed in Reference 2, CP&L will complete its assessments of those inaccessible portions of these systems/functions during the next scheduled refuel outage for each unit and provide a supplement to this report with those results within 90 days following the completion of that outage.

Regulatory commitments associated with this submittal are documented in the enclosure. Please refer any questions regarding this submittal to Mr. Gene Atkinson, Supervisor - Licensing/Regulatory Programs, at (910) 457-2056.

I declare, under penalty of perjury, that the foregoing is true and correct. Executed on October 10, 2008.

Sincerely,

Benjamin C. Waldrep

MAT/mat

Enclosure:

Nine-month Response to Generic Letter 2008-01

cc (with enclosure):

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Nine-month Response to Generic Letter 2008-01

Background

On January 11, 2008, the NRC issued Generic Letter (GL) 2008-01 requesting that each licensee evaluate the licensing basis, design, testing, and corrective action programs for the Emergency Core Cooling Systems (ECCS), Decay Heat Removal (RHR) system, and Containment Spray system, to ensure that gas accumulation is maintained less than the amount that challenges operability of these systems, and that appropriate action will be taken when conditions adverse to quality are identified.

The following provides Carolina Power & Light Company's (CP&L), now doing business as Progress Energy Carolinas, Inc., nine-month response to GL 2008-01 for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. As requested by GL 2008-01, the following information is included:

a) A description of the results of evaluations that were performed pursuant to the requested actions,

b) A description of the corrective actions determined necessary to assure 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

c) A statement regarding which corrective actions have been completed, the schedule for the corrective actions not yet complete, and the basis for that schedule.

Systems determined to be within the scope of GL 2008-01 for BSEP are:

High Pressure ECCS	High Pressure Coolant Injection (HPCI) - water side.
Low Pressure ECCS	Core Spray (CS) and Residual Heat Removal (RHR) - Low Pressure Coolant Injection (LPCI) mode.
Decay Heat Removal	RHR - Shutdown Cooling mode, LPCI mode, and Suppression Pool Cooling mode. These three modes use the RHR heat exchangers for decay heat removal. The latter two would be used during a Loss-of-Coolant Accident (LOCA) where decay heat has been transferred from the reactor to the suppression pool, while Shutdown Cooling mode is the normal means for removing decay heat from the core during planned shutdowns and abnormal operating occurrences that result in a plant scram.

Containment Spray	RHR - Drywell Spray mode and RHR - Suppression Pool Spray mode.

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (e.g., GSI-193). Consistent with discussions in SECY 2008-108, resolution of these related issues would be addressed independent of the Generic Letter and will not be addressed herein.

A. Evaluation

Licensing Basis Evaluation

The BSEP current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCI, RHR, and CS systems. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), Technical Requirements Manual (TRM), responses to NRC generic communications, regulatory commitments, and license conditions.

1. Licensing Basis Review Results

The CLB review identified no errors associated with implementation of existing licensing basis requirements and commitments. BSEP TS require verification that ECCS injection/spray piping from the pump discharge valve to the injection valve, is filled with water every 31 days. The 31 day frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation.

CP&L has concluded that clarifications or other changes to the TS and TS Bases might be warranted relative to gas accumulation issues for the GL 2008-01 subject systems. For example, TS Bases Section 3.5.1 recognizes that gas accumulation is expected to occur over time; however, Surveillance Requirement (SR) 3.5.1.1 and SR 3.5.2.3 are not written to require verification that piping is "sufficiently full of water. Also, system suction piping is not specifically addressed in the TS or TS Bases. As a result, the following corrective action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

2. Licensing Basis Changes

TS improvements are being addressed by the Technical Specifications 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. CP&L is continuing to support the industry and Nuclear

Energy Institute (NEI) Gas Accumulation Management Team activities regarding the resolution of generic TS changes via the TSTF Traveler process. After NRC approval of the Traveler, CP&L will evaluate its applicability to BSEP Units 1 and 2, and evaluate adopting the Traveler to either supplement or replace the current TS requirements.

Summary of Planned Actions

Commitment:	CP&L will submit a license amendment request based on the approved TSTF, if deemed necessary.
Schedule:	Within nine months following NRC approval of the TSTF.
Basis:	Nine months provides sufficient time for processing of a TS amendment request.

No other changes to the BSEP licensing basis documents are planned as a result of evaluations performed in response to GL 2008-01.

Design Evaluation

The BSEP design basis was reviewed with respect to gas accumulation in the HPCI, RHR, and CS systems. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals.

1. *Design Basis Review Results*

   As stated in the NRC's "Safety Evaluation of the Brunswick Steam Electric Station Units 1 and 2," dated November 1973, BSEP meets the intent of the General Design Criteria (GDC), published in the Federal Register on May 21, 1971, as Appendix A to 10 CFR Part 50. CP&L's review of the design basis for these systems identified no deficiencies associated with implementation of existing design basis requirements. The systems are designed, tested, and operated in accordance with CP&L's commitments to 10 CFR 50, Appendix A; the UFSAR; and TS.

2. *Applicable Gas Void Acceptance Criteria*

   General void acceptance criteria have not been established. As an alternative, identified gas voids were entered into the corrective action program (CAP) where they were evaluated for impact of system operability. Location-specific acceptance criteria have been established for the locations where these gas voids have been identified. It is expected that additional acceptance criteria will be developed for locations potentially susceptible to gas accumulation to preclude the need for entering the CAP. Until such acceptance criteria are developed, the CAP will be used. Recently published industry guidance will be considered when either evaluating operability or establishing acceptance

criteria. This guidance, which is summarized below, will be supplemented as necessary when evaluating locations/conditions not covered by the industry guidance.

a. Suction Piping

The interim allowable gas accumulation in the pump suction piping is based on limiting the gas entrainment to the pump after a pump start. A Boiling Water Reactor Owners Group (BWROG) program established interim pump gas ingestion limits to be employed by the member utilities. Pump suction gas void acceptance criteria were determined to be a bounding 2 percent void fraction for continuous voiding and 10 percent void fraction for up to 5 seconds for transient voiding. However, the study also recommends that pumps which operate above 120 percent Best Efficiency Point should be limited to a 1percent allowable continuous void fraction.

These conservative criteria will be applied in support of system operability determinations and development of interim acceptance criteria until further data either substantiate the values or support a change. These criteria, used in conjunction with other factors such as net positive suction head requirements ($NPSH_R$), duration of gas flow, and accidents for which the system is credited, provide a basis for system operability.

Gas accumulation in the RHR shutdown cooling (SDC) suction flow path is satisfactorily addressed by procedures which fill the system prior to placing SDC in service. Since the non-safety shutdown cooling mode of RHR is manually initiated at a low reactor pressure, sufficient time is available to ensure fill and warm-up of the flow path have been performed prior to RHR pump start to avoid any unacceptable pressure transients on the system.

b. Discharge Piping

A joint Owners' Group program evaluated pump discharge piping gas accumulation. Gas accumulation in the piping downstream of the pump to the first closed isolation valve will result in amplified pressure pulsations after a pump start. BSEP will use plant specific information to determine the acceptability of gas voids such that relief valve lifting does not occur and pipe loading is within acceptable limits. This methodology, coupled with empirical data, will be applied in support of system operability determinations.

Evaluations have been performed for various void sizes and locations in the system discharge piping. These evaluations will be used as interim acceptance criteria. Voids which exceed the interim criteria will be entered in the CAP and be analyzed on a case-by-case basis.

c. ECCS Piping Downstream of Injection/Spray Isolation Valves

An analysis of ECCS piping downstream of the injection valves has been completed and a determination made that with the exception of HPCI, which will be inspected during the next scheduled refueling outage for each unit, the existence of air voids will have no adverse consequences related to accident conditions for the following reasons.

- If voids existed downstream of the injection valves in LPCI or CS, the pressure transient created by collapsing the existing gas voids would be negligible compared to the resulting transient of fluid in the line flashing during a postulated LOCA and the subsequent injection into a steam environment. The piping is designed to withstand the loads created by this more limiting scenario.
- Containment Spray and Suppression Pool Spray sections of piping downstream of the injection valves communicate directly with nitrogen or air filled containment space, and thus are voided by design. Therefore, no further actions in regards to piping inspection or venting are needed or required.

Regarding piping downstream of the HPCI injection isolation valve, a review of internal operating experience on HPCI injections provides high confidence that any existing voids in the HPCI system will not adversely impact system operability.

d. Reactor Coolant System Gas Ingestion

A conservative "worst case" scenario evaluation for the entire United States Boiling Water Reactor fleet provides a limiting LOCA peak clad temperature (PCT) heat-up rate of 12 degrees F/second. Using this heat-up rate, 48 degrees F of PCT impact is assessed with a maximum of 4-second delay in the ECCS actuation. This bounding analysis is applicable for the fuel types currently in use at BSEP.

A BWROG report justified that gas voids, injected into the reactor vessel by CS, HPCI, and LPCI, do not pose an additional safety concern for the following reasons:

- For CS, air injected into the system via the core spray would not find its way into the core since the air-coolant mixture would be delivered into the upper plenum and only the water would flow down into the channels and the bypass region. Air would separate from the air-coolant mixture and would be swept upward together with the steam.
- In the case of HPCI, the vessel would contain a large amount of coolant during the injection into the FW line. The air would most likely partition in the downcomer and mix with the steam in the dome and upper parts of the voided vessel. If any amount of air can get into the core region, it would be extremely

small, and its effects would be insignificant because the BWR geometry allows air and steam to pass through the core.

- In the case of LPCI delivered to the recirculation line, some air can be carried downward through the jet pumps into the lower plenum. Some of this air will be passing through the core: some in bypass region and some in the fuel channels. At the time of LPCI initiation, the reactor would be at relatively low pressure, because most of the liquid in the lower plenum region had already flashed. The cladding would be exposed to significant voiding as high quality two-phase flow condition is present in the core. During this time, convective heat transfer is dominated by steam cooling and radiation heat transfer for the higher PCTs becomes a significant part of the overall heat removal. In these conditions, addition of a small amount of air passing through the core would have insignificant impact on the progression of the accident, since it would not alter the heat transfer by any significant amount.

Assessments of the Loss of Feedwater (LOFW) and Anticipated Transient Without Scram (ATWS) events concluded that a delay of 5 seconds in ECCS flow would affect the analysis results insignificantly and have no impact on meeting the acceptance criteria. The evaluation of station blackout (SBO) events indicates that a delay of 10 seconds would not impact the ability of the water makeup system to maintain the vessel water level above the top of active fuel. Similarly, it is concluded that a delay of 10 seconds would have an insignificant impact on meeting the acceptance criteria in Appendix R fire safe shutdown analysis.

3. *Changes to Design Basis Documents*

No vulnerabilities were identified during the HPCI, RHR, and CS systems design basis document review. The HPCI, RHR, and CS systems are designed, tested, and operated in accordance with CP&L's commitments to 10 CFR 50, Appendix A; the UFSAR; and the Technical Specifications. No changes to existing design basis documents are planned.

Currently there is no design documentation that addresses void size acceptability for the systems identified in GL 2008-01. An enhancement from this review is the establishment of a calculation to document acceptance criteria.

Summary of Planned Actions

Enhancement:	CP&L will develop a calculation that provides an analytical basis for void acceptance criteria for systems within the scope of GL 2008-01.
Schedule:	This calculation will be developed by the completion of the B219R1 refueling outage, currently scheduled to begin on February 28, 2009.

Basis: Development of this calculation is an enhancement item and not required to support system operability. Evaluations have been performed for various void sizes and locations in the system discharge piping. These evaluations will be used as interim acceptance criteria until a bounding analysis can be developed. Voids which exceed the interim criteria will be entered in the CAP and be analyzed on a case-by-case basis.

4. *Drawing Review and System Walkdowns*

Piping and instrument diagrams (P&IDs) and isometric drawings were reviewed for the systems within the scope of GL 2008-01 to identify vents and high points. System high points include areas where gas can accumulate in the system, including isolated branch lines, valve bodies, heat exchangers, improperly sloped piping, or locations upstream of components in horizontal lines.

CP&L has also performed detailed walkdowns of accessible system piping on Units 1 and 2. The walkdowns were performed to confirm the location and orientation of system vents, and to identify any additional areas vulnerable to gas accumulation. The walkdowns were performed using a Zip Level to obtain elevation measurements at approximately 8-foot intervals and on each end of the piping segments. For a given section of piping, the Zip Level measuring module was placed on the top dead center or bottom dead center (i.e., depending upon accessibility) of the pipe along the entire length. At each location along the pipe, elevations were recorded at corresponding locations on their respective isometric drawings. Using these elevation measurements, slope direction and local high points in individual lines were identified. The walkdowns also verified that the isometric drawings for main process lines (i.e., any primary flow path required for the modes of operation covered by GL 2008-01) were consistent with as-built plant configuration.

Results of the drawing reviews and system walkdowns were collectively evaluated to identify areas susceptible to gas accumulation that could potentially impact the systems' ability to perform their specified safety or decay heat removal functions; 127 locations were identified. These piping locations were further evaluated and ultrasonic testing (UT) examinations were performed to confirm whether voids were present. Although some voids were discovered, they were not of sufficient size to challenge the operability of the systems.

For normally inaccessible locations (i.e., drywell, torus, main steam isolation valve (MSIV) pit, penetration room, etc.), UT examinations and/or walkdowns will not be performed where an assessment resulted in the determination that the worst-case gas accumulation is acceptable or, as with the SDC suction path, is adequately filled and purged prior to placing the system in service.

Locations for new vents were determined after completion and analyses of walkdown and UT examination results. CP&L's review identified the need to implement the following corrective actions for the systems within the scope of GL 2008-01 for BSEP.

5. *New Vent Locations*

New vents will be installed at the following locations:

Unit 1 HPCI:

- HPCI injection line, downstream of valve 1-E41-V159,
- HPCI injection line, downstream of valve 1-E41-F007,
- Torus suction line,
- HPCI main pump seal purge lines,
- HPCI booster pump seal purge lines.

Unit 1 RHR:

- Shutdown cooling common suction line,
- Torus suction lines (i.e., Loops A and B).

Unit 1 Core Spray:

- Core Spray A injection line, downstream of flow orifice 1-E21-FO-D002A,
- Core Spray B injection line, downstream of flow orifice 1-E21-FO-D002B,
- Torus suction lines (i.e., Loops A and B).

Unit 2 HPCI:

- HPCI injection line, downstream of valve 2-E41-V159,
- HPCI injection line, downstream of valve 2-E41-F007,
- Torus suction line,
- HPCI main pump seal purge lines,
- HPCI booster pump seal purge lines.

Unit 2 RHR:

- Shutdown cooling common suction line,
- Torus suction lines (i.e., Loops A and B).

Unit 2 Core Spray:

- Core Spray A injection line, downstream of flow orifice 2-E21-FO-D002A,

- Core Spray B injection line, downstream of flow orifice 2-E21-FO-D002B,
- Torus suction lines (i.e., Loops A and B).

Summary of Planned Actions

Commitment: CP&L will install new vent valves in the Unit 1 and Unit 2 HPCI, RHR, and CS systems in locations which were determined based on analyses of walkdown and UT examination results completed to date.

Schedule: Installation of the new Unit 1 vent valves will be completed prior to startup from the B118R1 refueling outage, currently scheduled to begin on February 27, 2010.

Installation of the new Unit 2 vents valves will be completed prior to startup from the B219R1 refueling outage, currently scheduled to begin on February 28, 2009.

Basis: Installation of some of the new vent valves constitutes an outage-related activity. This schedule is acceptable based on the fact that the voided locations discovered in ECCS piping during initial UT inspections have not challenged the operability of these systems and trending of voids has determined that void growth is not occurring. Therefore, it is acceptable to install the vents prior to startup from the next scheduled unit's refueling outage.

Detailed walkdowns of normally inaccessible piping sections which are required to be filled with water and are potentially susceptible to gas accumulation will be completed during the next scheduled refueling outages, as previously committed to in the three-month response to GL 2008-01 for BSEP. Based on completed design reviews and site operating experience, there is reasonable assurance that the inaccessible portions of these systems are operable, and these walkdowns are confirmatory in nature.

6. *Procedure Reviews Associated With Fill and Vent Activities*

The process for filling and venting the GL 2008-01 subject systems is controlled through BSEP system operating procedures (OPs). Each operating procedure contains a section that provides instructions for filling and venting the system after the system has been drained.

The HPCI, RHR, and CS fill and vent procedures, as well as the post maintenance test procedure, were reviewed. Several procedure enhancements have been identified and are provided below.

7. *Procedure Revisions*

HPCI Procedures

1/2OP-19, "High Pressure Coolant Injection System Operating Procedure" (i.e., Unit 1 / Unit 2)

- Add steps to fill and vent instrument lines as required.
- Add step(s) to perform UT examinations after fill and vent activities as needed. These UTs will be performed at engineering discretion and will provide additional confidence that the procedural guidance is adequate to remove gas from the system.

RHR Procedures

1/2OP-17, "Residual Heat Removal System Operating Procedure" (i.e., Unit 1 / Unit 2)

- Add steps to vent, in the proper sequence, from selected vent valves that are currently not used when filling following system drain down.
- Add steps to fill and vent instrument lines as required.
- Add step(s) to perform UT examinations after fill and vent activities as needed. These UTs will be performed at engineering discretion and will provide additional confidence that the procedural guidance is adequate to remove gas from the system.

CS Procedures

1/2OP-18, "Core Spray System Operating Procedure" (i.e., Unit 1 / Unit 2)

- Add steps to fill and vent instrument lines as required.
- Add step(s) to perform UT examinations after fill and vent activities as needed. These UTs will be performed at engineering discretion and will provide additional confidence that the procedural guidance is adequate to remove gas from the system.

Post-Maintenance Test Procedure

0PLP-20, "Post-Maintenance Testing Program"

- CP&L will revise 0PLP-20 to indicate that intrusive maintenance on an ECCS/Containment Spray system can result in gas intrusion if the system is not properly filled and vented. This revision will provide an administrative barrier to ensure that the affected system is properly filled and vented following maintenance. The revision will also include planning of contingency activities for Quality Control (QC) to perform UT inspections at engineering discretion.

Summary of Planned Actions

Commitment:	CP&L will revise existing fill and vent procedures for the HPCI, RHR, and CS systems to: (1) incorporate use of additional existing vents as required, in the proper sequence, and (2) fill and vent instrument lines, as required.
Schedule:	These revisions will be completed by April 11, 2009, for Unit 1. These revisions will be completed prior to the system being restored to service during the B219R1 refueling outage for Unit 2, currently scheduled to begin on February 28, 2009.
Basis:	This schedule is acceptable based on the fact that the voided locations discovered in ECCS piping during initial UT inspections have not challenged the operability of these systems and trending of voids has determined that void growth is not occurring. The planned improvements provide additional assurance of this effectiveness and are not required to confirm operability of the systems within the scope of GL 2008-01.
Commitment:	CP&L will revise existing fill and vent procedures for the HPCI, RHR, and CS systems to incorporate the addition of new vents valves.
Schedule:	Unit 1 procedure revisions will be completed prior to the end of the B118R1 refueling outage, currently scheduled to begin on February 27, 2010. Unit 2 procedure revisions will be completed prior to the end of the B219R1 refueling outage, currently scheduled to begin on February 28, 2009.
Basis:	These procedure changes coincide with the installation schedule for the new vent valves and will be controlled by the engineering change process associated with adding the valves.
Enhancement:	CP&L will revise existing fill and vent procedures for the HPCI, RHR, and CS systems to include performance of UT examinations, at engineering discretion, after fill and vent activities.
Schedule:	These revisions will be completed by April 11, 2009, for Unit 1. These revisions will be completed prior to the system being restored to service during the B219R1 refueling outage for Unit 2, currently scheduled to begin on February 28, 2009.
Basis:	Performance of UT examinations is an enhancement and not required to confirm operability of the systems within the scope of GL 2008-01. As

stated, these UTs will be performed at engineering discretion and will provide additional confidence that the procedural guidance is adequate to remove gas from the system.

Enhancement: CP&L will revise existing 0PLP-20, "Post-Maintenance Testing Program," to include an administrative barrier to ensure that the affected system is properly filled and vented following maintenance and planning of contingency activities to perform UT inspections at engineering discretion.

Schedule: This revision will be completed prior the end of the B219R1 refueling outage, currently scheduled to begin on February 28, 2009.

Basis: Addition of an administrative barrier and performance of UT examinations are enhancements and not required to confirm operability of the systems within the scope of GL 2008-01. As stated, these UTs will be performed at engineering discretion and will provide additional confidence that the procedural guidance is adequate to remove gas from the system.

8. *Gas Intrusion Mechanisms*

The following mechanisms can result in unacceptable gas intrusion:

- Inadequate refill and vent after a return-to-service,
- Gas coming out of solution over time, and
- Gas intrusion from an inter-connected system.

CP&L's review of system design and operating practices concluded that the systems are adequately monitored and tested for these potential gas intrusion mechanisms. This review included restoration procedures (i.e., system venting procedures), system design, interfaces with other systems, potential external sources of gas, and operating practices. While gas voids were identified in systems within the scope of GL 2008-01 during UT inspections, they were evaluated and determined to not adversely affect system function.

Based on review of the subject systems and applicable internal and external operating experience, BSEP's main concern with gas intrusion is inadequate fill and vent when systems are returned to service following system drain down for maintenance or extended layup (i.e., RHR shutdown cooling). As stated previously, improvements are being made to fill and vent procedures.

9. Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of BSEP relative to gas accumulation. These activities will be monitored to determine if additional changes to the BSEP design may be required or desired to provide additional margin. BSEP actions will be refined as CP&L and the nuclear industry identify processes and lessons-learned that can reduce the vulnerability to gas intrusion.

Testing Evaluation

BSEP test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents.

1. TS Surveillance Procedure Review

Periodic venting of the HPCI, RHR, and CS systems is currently performed in accordance with TS SR 3.5.1.1, when in Modes 1, 2, and 3. Periodic venting of the RHR and CS systems is currently performed in accordance with TS SR 3.5.2.3, when in Modes 4 and 5. BSEP test procedures that govern the performance of SR 3.5.1.1 and SR 3.5.2.3 were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents. These procedures currently do not specify gas void acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water must be observed while venting. Currently, the procedures require initiation of a work request if air is observed while venting. This is consistent with CP&L's goal of maintaining systems sufficiently full such that the systems can perform their specified safety functions.

The most likely method of air intrusion is inadequate venting following maintenance. Aside from this, with the ECCS systems in normal alignment and the keep fill system in service, the only credible higher pressure source of gas intrusion is from the reactor vessel coolant. As an interim measure, BSEP plans to supplement the 31-day TS surveillance procedures with UT inspections at select locations to provide additional monitoring to address this intrusion mechanism. UT data will be used for trending purposes. BSEP will evaluate the recommendations of the TSTF and will base long term surveillance requirements on this review. If trending of UT results determines that verification of "sufficiently full" is satisfactorily monitored by 31-day manipulation of high point vents and complies with the TSTF recommendations, UT examinations may be reduced in frequency or discontinued, as appropriate.

Summary of Planned Actions

Enhancement:	CP&L will supplement the 31-day TS venting surveillance procedures for the HPCI, RHR, and CS systems with UT inspections at select locations.
Schedule:	The supplemental UT inspections will be implemented by December 31, 2008.
Basis:	Performance of UT examinations is an enhancement and not required to confirm operability of the systems within the scope of GL 2008-01. This is considered reasonable based on the fact that the voided locations discovered in ECCS injection/spray piping discovered during initial UT inspections have not challenged the operability of these systems and trending of voids has determined that void growth is not occurring. Trending of the UT results will be used to confirm that these surveillances are adequate to ensure that the discharge piping is maintained "sufficiently full" by 31-day manipulation of high point vents.

BSEP procedures will also be revised to include more robust venting criteria and to require unacceptable gas voids to be entered into the CAP for evaluation and disposition. This ensures that the voids are properly documented, evaluated for impact to system operability, and trended.

2. *TS Surveillance Procedure Revisions*

CP&L's review of periodic testing activities identified the following corrective actions to implement improvements in the procedures that govern periodic venting of the HPCI, RHR, and CS systems.

HPCI Procedures

0PT-09.2, "HPCI System Operability Test"

- Add a requirement to ensure that monthly surveillance testing performance occurs prior to or as part of the quarterly surveillance to ensure that pre-conditioning of potential voids does not occur. This is currently being performed by administrative controls.

0PT-09.3a, "HPCI System Component Test"

- Require entry into the CAP when excessive gas accumulation is identified to address operability considerations.
- Revise solid stream acceptance criterion to "solid stream for at least 2 minutes."

RHR Procedures

0PT-08.2.2c, "LPCI/RHR System Operability Test - Loop A"
0PT-08.2.2b, "LPCI/RHR System Operability Test - Loop B"

- Add a requirement to ensure that monthly surveillance testing performance occurs prior to or as part of the quarterly surveillance to ensure that pre-conditioning of potential voids does not occur. This is currently being performed by administrative controls.

0PT-08.1.3a, "LPCI/RHR System Component Test - Loop A"
0PT-08.1.3b, "LPCI/RHR System Component Test - Loop B"

- Require entry into the CAP when excessive gas accumulation is identified to address operability concerns.
- Revise solid stream acceptance criterion to "solid stream for at least 2 minutes."

CS Procedures

0PT-07.2.4a, "Core Spray System Operability Test - Loop A"
0PT-07.2.4b, "Core Spray System Operability Test - Loop B"

- Add a requirement to ensure that monthly surveillance testing performance occurs prior to or as part of the quarterly surveillance to ensure that pre-conditioning of potential voids does not occur. This is currently being performed by administrative controls.

0PT-07.1.8, "Core Spray System Component Test"

- Require entry into the CAP when excessive gas accumulation is identified to address operability concerns.
- Revise solid stream acceptance criterion to "solid stream for at least 2 minutes."

Summary of Planned Actions

Commitment:	CP&L will revise the BSEP TS monthly surveillance testing procedures for the GL 2008-01 subject systems to: (1) require entry into the CAP when excessive gas accumulation is found to address operability considerations and (2) revise solid stream acceptance criterion to "solid stream for at least 2 minutes."
Schedule:	These procedures will be revised by completion of the B219R1 outage, currently scheduled to begin on February 28, 2009.
Basis:	Based on the GL 2008-01 evaluations and the UT results to date, current procedures and processes are considered adequate to ensure that ECCS/Containment Spray piping is "sufficiently full." The planned

improvements provide additional assurance of this effectiveness and are not required to confirm operability of the systems within the scope of GL 2008-01.

Commitment: CP&L will revise the BSEP TS quarterly surveillance testing procedures for the GL 2008-01 subject systems to ensure that monthly surveillance testing performance occurs prior to or as part of the quarterly surveillance.

Schedule: These procedures will be revised by completion of the B219R1 outage, currently scheduled to begin on February 28, 2009.

Basis: The planned improvement ensures that pre-conditioning of potential voids does not occur and is not required to confirm operability of the systems within the scope of GL 2008-01. This is currently being performed by administrative controls.

Corrective Action Program

CP&L's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. Existing procedures for the HPCI, RHR, and CS systems will be revised to require a Nuclear Condition Report (NCR) be initiated if excessive gas accumulation is identified. As part of the CAP, NCRs are evaluated for potential impact on operability and reportability.

Evaluation Summary

Based upon the above, CP&L has concluded that BSEP, Units 1 and 2 are in conformance with 10 CFR 50, Appendix B, Sections III, V, XI, XVI, and XVII, with respect to gas accumulation concerns addressed in GL 2008-01.

The evaluations described above identified no significant adverse conditions for the GL 2008-01 subject systems at BSEP, Units. 1 and 2. However, a number of design, testing, and procedural enhancements were identified. During system walkdowns and drawing reviews, no discrepancies were identified in regard to pipe configuration and vent locations. The design review identified opportunities for improvement by the installation of new vent locations. The surveillance testing review identified procedural enhancements that will require longer venting times, as well as ensure excessive gas accumulation is documented in the CAP. Operating Procedure reviews identified enhancements that will incorporate the venting of required instrument lines, establish more effective venting sequences, and perform confirmatory UT inspections as needed following maintenance. Additionally, the post-maintenance test procedure will be revised to include administrative barriers to ensure that the affected system is properly filled and vented following maintenance.

B. Description of Commitments and Schedule

As discussed in Section A, CP&L has concluded that BSEP, Units 1 and 2 are in conformance with its commitments to 10 CFR 50, Appendix B, Sections III, V, XI, XVI, and XVII. This conclusion was based on the following completed actions.

1. Completed Actions

- CP&L has completed the GL 2008-01 requested actions involving evaluation of licensing basis, design, testing, and corrective actions for both BSEP Units 1 and 2.
- CP&L has also completed detailed physical walkdowns of the BSEP Units 1 and 2 accessible subject piping systems to confirm pertinent design details (e.g., locations of high point vents), confirm as-built configurations (e.g., pipe elevations and slope), and ultrasonic examinations at locations potentially susceptible to gas accumulation.

2. Committed Actions

In order to assure continued compliance and enhance BSEP's ability to manage gas accumulation in ECCS, decay heat removal, and containment spray systems, the following table identifies those actions committed to by CP&L in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

Commitment	Schedule
1. CP&L will submit a license amendment request based on the approved TSTF related to the potential for unacceptable gas accumulation, if deemed necessary.	Within nine months following NRC approval of the TSTF.
2. CP&L will install new vent valves in the Unit 1 and Unit 2 HPCI, RHR, and CS systems in locations which were determined based on analyses of walkdown and UT examination results completed to date. CP&L will revise the following fill and vent procedures for the HPCI, RHR, and CS systems to incorporate the addition of new vent valves. 1/2OP-19, "High Pressure Coolant Injection System Operating Procedure" 1/2OP-17, "Residual Heat Removal System Operating Procedure" 1/2OP-18, "Core Spray System Operating Procedure"	Installation of the new Unit 1 vent valves and associated procedure changes will be completed prior to startup from the B118R1 refueling outage, currently scheduled to begin on February 27, 2010. Installation of the new Unit 2 vents valves and associated procedure

Commitment	Schedule
	changes will be completed prior to startup from the B219R1 refueling outage, currently scheduled to begin on February 28, 2009.
3. CP&L will revise the following fill and vent procedures for the HPCI, RHR, and CS systems to: (1) incorporate use of additional existing vents as required, in the proper sequence, and (2) fill and vent instrument lines, as required. 1/2OP-19, "High Pressure Coolant Injection System Operating Procedure" 1/2OP-17, "Residual Heat Removal System Operating Procedure" 1/2OP-18, "Core Spray System Operating Procedure"	These revisions will be completed by April 11, 2009 for Unit 1. These revisions will be completed prior to the system being restored to service during the B219R1 refueling outage for Unit 2.
4. CP&L will revise the following BSEP TS monthly surveillance testing procedures for the GL 2008-01 subject systems to: (1) require entry into the CAP when excessive gas accumulation is found to address operability considerations and (2) revise solid stream acceptance criterion to "solid stream for at least 2 minutes." 0PT-09.3a, "HPCI System Component Test" 0PT-08.1.3a, "LPCI/RHR System Component Test - Loop A" 0PT-08.1.3b, "LPCI/RHR System Component Test - Loop B" 0PT-07.1.8, "Core Spray System Component Test"	These procedures will be revised by completion of the B219R1 outage, currently scheduled to begin on February 28, 2009.
5. CP&L will revise the following BSEP TS quarterly surveillance testing procedures for the GL 2008-01 subject systems to ensure that monthly surveillance testing performance occurs prior to or as part of the quarterly surveillance. 0PT-09.2, "HPCI System Operability Test" 0PT-08.2.2c, "LPCI/RHR System Operability Test - Loop A" 0PT-08.2.2b, "LPCI/RHR System Operability Test - Loop B" 0PT-07.2.4a, "Core Spray System Operability Test - Loop A" 0PT-07.2.4b, "Core Spray System Operability Test - Loop B"	These procedures will be revised by completion of the B219R1 outage, currently scheduled to begin on February 28, 2009.

C. Conclusion

BSEP has evaluated the HPCI, RHR, and CS systems pursuant to GL 2008-01 and has concluded that these systems are operable, as defined in the BSEP, Units 1 and 2 TS, and are in conformance to BSEP commitments to the applicable General Design Criteria (GDC), as stated in the BSEP UFSAR.

The commitments cited section B.2 are considered to be enhancements for assuring continued operability of these subject systems.