

RS-08-131

10 CFR 50.54(f)

October 14, 2008

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
11555 Rockville Pike  
Rockville, MD 20852

Braidwood Station, Units 1 and 2  
Facility Operating License Nos. NPF-72 and NPF-77  
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2  
Facility Operating License Nos. NPF-37 and NPF-66  
NRC Docket Nos. STN 50-454 and STN 50-455

Clinton Power Station, Unit 1  
Facility Operating License No. NPF-62  
NRC Docket No. 50-461

Dresden Nuclear Power Station, Units 2 and 3  
Renewed Facility Operating License Nos. DPR-19 and DPR-25  
NRC Docket Nos. 50-237 and 50-249

LaSalle County Station, Units 1 and 2  
Facility Operating License Nos. NPF-11 and NPF-18  
NRC Docket Nos. 50-373 and 50-374

Limerick Generating Station, Units 1 and 2  
Facility Operating License Nos. NPF-39 and NPF-85  
NRC Docket Nos. 50-352 and 50-353

Oyster Creek Nuclear Generating Station  
Facility Operating License No. DPR-16  
NRC Docket No. 50-219

Peach Bottom Atomic Power Station, Units 2 and 3  
Renewed Facility Operating License Nos. DPR-44 and DPR-56  
NRC Docket Nos. 50-277 and 50-278

Quad Cities Nuclear Power Station, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-29 and DPR-30  
NRC Docket Nos. 50-254 and 50-265

Three Mile Island Nuclear Station, Unit 1  
Facility Operating License No. DPR-50  
NRC Docket No. 50-289

Subject: Nine-Month Response to Generic Letter 2008-01

- References:
1. NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008
  2. Letter from K. R. Jury (Exelon Generation Company, LLC/AmerGen Energy Company, LLC) to U. S. NRC, "Three Month Response to Generic Letter 2008-01," dated April 11, 2008
  3. Letter from J. Wiebe (U. S. NRC) to C. G. Pardee (Exelon Generation Company, LLC/AmerGen Energy Company, LLC), "Braidwood Station, Units 1 and 2; Byron Station, Unit Nos. 1 and 2; Dresden Nuclear Power Station, Units 2 and 3; LaSalle County Station, Units 1 and 2; Limerick Generating Station, Units 1 and 2; Oyster Creek Nuclear Generating Station; Peach Bottom Atomic Power Station, Units 2 and 3; Quad Cities Nuclear Power Station, Units 1 and 2; and Three Mile Island Nuclear Station, Unit 1 – RE: Generic Letter 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems,' Proposed Alternative Course of Action (TAC NOS. MD7797, MD7798, MD7804, MD7805, MD7822, MD7823, MD7839, MD7840, MD7841, MD7842, MD7855, MD7860, MD7861, MD7868, MD7869, MD7888)," dated September 18, 2008

The NRC issued Generic Letter (GL) 2008-01 (i.e., Reference 1) to request that each licensee evaluate the licensing basis, design, testing, and corrective action programs for the Emergency Core Cooling, Decay Heat Removal, and Containment Spray systems, to ensure that gas accumulation is maintained less than the amount that challenges operability of these systems, and that appropriate action is taken when conditions adverse to quality are identified.

The NRC requested each licensee to submit a written response in accordance with 10 CFR 50.54(f) within nine months of the date of the GL to provide the following (summarized) information:

- (a) a description of the results of evaluations that were performed pursuant to the requested actions;

- (b) a description of all corrective actions that were determined necessary; and
- (c) the schedule for completion of the corrective actions, and the basis for that schedule.

Attachments 1 through 10 to this letter contain the Exelon Generation Company, LLC (EGC), and AmerGen Energy Company, LLC (AmerGen), nine-month response to NRC GL 2008-01. In summary, EGC/AmerGen has concluded, based on reviews and changes discussed in Attachments 1 through 10, that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

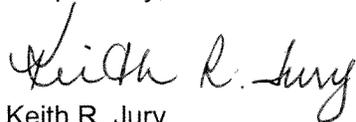
In Reference 2, EGC/AmerGen submitted the three-month response to NRC GL 2008-01 to describe an alternative course of action since the GL 2008-01 requested evaluations would not be fully complete in accordance with the timeframe required by the GL for several of the EGC/AmerGen units. As committed in Reference 2, assessments of inaccessible portions of these systems/functions will be completed during upcoming refueling outages for the affected units, and supplemental responses will be submitted to the NRC documenting completion of walkdowns of inaccessible piping sections. Based on evaluations performed to date, EGC/AmerGen continues to have a reasonable expectation that the GL 2008-01 subject systems are capable of performing their specified safety functions for the reasons discussed in Reference 2.

The NRC assessment of the three-month response was provided in Reference 3. The NRC assessment stated that the EGC/AmerGen Reference 2 submittal did not mention other potential long-term actions that are identified in the GL, such as various industry programs and potential Technical Specification changes that may be necessary to reflect the improved understanding achieved during response to the GL. These items are also addressed within Attachments 1 through 10 of the EGC/AmerGen nine-month response.

Regulatory commitments are contained in Attachments 11 through 20 of this letter. Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 14th day of October 2008.

Respectfully,



Keith R. Jury  
Vice President – Licensing and Regulatory Affairs  
Exelon Generation Company, LLC  
AmerGen Energy Company, LLC

Attachments:

1. Generic Letter 2008-01 Nine-Month Response for Braidwood Station
2. Generic Letter 2008-01 Nine-Month Response for Byron Station
3. Generic Letter 2008-01 Nine-Month Response for Clinton Power Station
4. Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station
5. Generic Letter 2008-01 Nine-Month Response for LaSalle County Station
6. Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station
7. Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station
8. Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station
9. Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station
10. Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station
11. Regulatory Commitments for Braidwood Station
12. Regulatory Commitments for Byron Station
13. Regulatory Commitments for Clinton Power Station
14. Regulatory Commitments for Dresden Nuclear Power Station
15. Regulatory Commitments for LaSalle County Station
16. Regulatory Commitments for Limerick Generating Station
17. Regulatory Commitments for Oyster Creek Nuclear Generating Station
18. Regulatory Commitments for Peach Bottom Atomic Power Station
19. Regulatory Commitments for Quad Cities Nuclear Power Station
20. Regulatory Commitments for Three Mile Island Nuclear Station

cc: NRC Regional Administrator – Region I  
NRC Regional Administrator – Region III  
Senior Resident Inspector – Braidwood Station  
Senior Resident Inspector – Byron Station  
Senior Resident Inspector – Clinton Power Station  
Senior Resident Inspector – Dresden Nuclear Power Station  
Senior Resident Inspector – LaSalle County Station  
Senior Resident Inspector – Limerick Generating Station  
Senior Resident Inspector – Oyster Creek Nuclear Generating Station  
Senior Resident Inspector – Peach Bottom Atomic Power Station  
Senior Resident Inspector – Quad Cities Nuclear Power Station  
Senior Resident Inspector – Three Mile Island Nuclear Station

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

This attachment contains the Braidwood Station 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- Safety Injection (SI),
- Chemical Volume and Control (CV),
- Residual Heat (RH), and
- Containment Spray (CS).

**A. LICENSING BASIS EVALUATION**

The Braidwood Station current licensing basis (CLB) was reviewed with respect to gas accumulation in the SI, CV, RH, and CS systems. An industry-recommended template was followed to perform this review, and results have been documented. 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.

Exelon Generation Company, LLC's (EGC's) review of the CLB for the SI, CV, RH, and CS systems identified no errors associated with implementation of existing licensing basis requirements and commitments. Braidwood TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., SI, CV, and RH) is full of water every 31 days. The TS Bases state that the system will perform properly, injecting its full capacity into the Reactor Coolant System (RCS) upon demand, by maintaining the piping from the ECCS pumps to the RCS full of water. The 31 day frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation. The subject systems and their procedures are in compliance with the Braidwood Station CLB.

There are no TS Surveillance Requirements (SRs) that require periodic venting of CS system piping. However, existing station procedures provide controls for CS system filling and venting activities following maintenance that may have voided portions of the system.

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to Braidwood Station licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

**B. DESIGN EVALUATION**

The Braidwood Station design basis was reviewed with respect to gas accumulation in the SI, CV, RH, and CS systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC'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 the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump operation, water hammer pressure transients, relief valve lifting, check valve closure, potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. No changes to design basis documents were identified as being needed.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of system piping susceptible to gas accumulation on Unit 2, as well as accessible piping sections susceptible to gas accumulation on Unit 1. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Detailed walkdowns of inaccessible piping sections on Unit 1 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for Braidwood Station.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that UT results from one train would be representative of results from a similar train, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

No new vent locations were deemed necessary to address vulnerabilities as a result of the evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective action related to the design basis for the systems within the scope of GL 2008-01 for Braidwood Station. The schedule for completing this action was discussed in EGC's three-month response to GL 2008-01 for Braidwood Station.

- Detailed walkdowns of inaccessible piping sections on Unit 1 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for Braidwood Station.

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, EGC plans to implement the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes are scheduled to be complete by December 31, 2008. In the interim, administrative controls have been implemented to require development of a fill and vent plan that includes the use of confirmatory UT, if appropriate, following system draining or maintenance activities that could introduce gas into the system.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, procedure revisions will be implemented to include requirements to verify affected instrument lines have been properly filled.

EGC's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for Braidwood Station. The schedule for completing this action, and the basis for the schedule, are also provided below. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include requirements to verify affected instrument lines have been properly filled. These changes are scheduled to be complete by December 31, 2008. In the interim, administrative controls have been implemented to require development of a fill and vent plan following system draining or maintenance activities that could introduce gas into the system.

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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.

Ongoing Industry Programs

Ongoing industry programs are planned in the following areas which may impact the conclusions reached during the design evaluation of Braidwood Station relative to gas accumulation, or may result in additional changes to the Braidwood Station design to provide additional margin.

- Gas Transport in Pump Suction Piping

The Pressurized Water Reactor Owners' Group 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.

C. TESTING EVALUATION

Braidwood Station test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

The CS system is not periodically vented since the design of the system precludes gas accumulation that can affect CS pump operation or result in a water hammer. The CS piping is designed to be empty downstream of the CS pump header isolation valves. This piping is open ended inside containment and is designed for the dynamic loads created when it fills with water. Likewise, the minimum flow recirculation line for the CS

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

recirculation piping downstream of the CS pump discharge test line isolation to Refueling Water Storage Tank (RWST) valves (i.e., SI001A/B) is open ended inside the RWST. In addition, the CS pump suction sources are designed to preclude air intrusion by ensuring an adequate RWST level or by initiating a timely pump suction swap to the recirculation sump, and both features are periodically tested.

Periodic venting of the SI, CV, and RH systems is currently performed in accordance with TS SR 3.5.2.3. Braidwood Station test procedures that govern the performance of 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, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedure requires vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing, with the exception of selected portions of SI system piping as described in the Braidwood Station TS Bases. However, since performance of UT examinations provide a consistent process to confirm the presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the SI, CV, and RH systems.

- EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems.

**D. CORRECTIVE ACTIONS EVALUATION**

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**ATTACHMENT 1**  
**Generic Letter 2008-01 Nine-Month Response for Braidwood Station**

E. CONCLUSION

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

This attachment contains the Byron Station 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- Safety Injection (SI),
- Chemical Volume and Control (CV),
- Residual Heat (RH), and
- Containment Spray (CS).

**A. LICENSING BASIS EVALUATION**

The Byron Station current licensing basis (CLB) was reviewed with respect to gas accumulation in the SI, CV, RH, and CS systems. An industry-recommended template was followed to perform this review, and results have been documented. 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.

Exelon Generation Company, LLC's (EGC's) review of the CLB for the SI, CV, RH, and CS systems identified no errors associated with implementation of existing licensing basis requirements and commitments. Byron TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., SI, CV, and RH) is full of water every 31 days. The TS Bases state that the system will perform properly, injecting its full capacity into the Reactor Coolant System (RCS) upon demand, by maintaining the piping from the ECCS pumps to the RCS full of water. The 31 day frequency takes into consideration the gradual nature of gas accumulation in the ECCS piping and the procedural controls governing system operation. The subject systems and their procedures are in compliance with the Byron Station CLB.

There are no TS Surveillance Requirements (SRs) that require periodic venting of CS system piping. However, existing station procedures provide controls for CS system filling and venting activities following maintenance that may have voided portions of the system.

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to Byron Station licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

**B. DESIGN EVALUATION**

The Byron Station design basis was reviewed with respect to gas accumulation in the SI, CV, RH, and CS systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC'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 the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and confirmation that the systems are appropriately vented (e.g., a solid stream of water observed while venting). This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump operation, water hammer pressure transients, relief valve lifting, check valve closure,

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. No changes to design basis documents were identified as being needed.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of system piping susceptible to gas accumulation on Unit 1, as well as accessible piping sections susceptible to gas accumulation on Unit 2. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Detailed walkdowns of inaccessible piping sections on Unit 2 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for Byron Station.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that UT results from one train would be representative of results from a similar train, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

No new vent locations were deemed necessary to address vulnerabilities as a result of the evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective action related to the design basis for the systems within the scope of GL 2008-01 for Byron Station. The schedule for completing this action was discussed in EGC's three-month response to GL 2008-01 for Byron Station.

- Detailed walkdowns of inaccessible piping sections on Unit 2 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for Byron Station.

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, EGC plans to implement the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes are scheduled to be complete by December 31, 2008. In the interim, administrative controls have been implemented to require development of a fill and vent plan that includes the use of confirmatory UT, if appropriate, following system draining or maintenance activities that could introduce gas into the system.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, procedure revisions will be implemented to include requirements to verify affected instrument lines have been properly filled.

EGC's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for Byron Station. The schedule for completing this action, and the basis for the schedule, are also provided below. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include requirements to verify affected instrument lines have been properly filled. These changes are scheduled to be complete by December 31, 2008. In the interim, administrative controls have been implemented to require development of a fill and vent plan following system draining or maintenance activities that could introduce gas into the system.

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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.

Ongoing Industry Programs

Ongoing industry programs are planned in the following areas which may impact the conclusions reached during the design evaluation of Byron Station relative to gas accumulation, or may result in additional changes to the Byron Station design to provide additional margin.

- Gas Transport in Pump Suction Piping

The Pressurized Water Reactor Owners' Group 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.

C. TESTING EVALUATION

Byron Station test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

The CS system is not periodically vented since the design of the system precludes gas accumulation that can affect CS pump operation or result in a water hammer. The CS piping is designed to be empty downstream of the CS pump header isolation valves. This piping is open ended inside containment and is designed for the dynamic loads created when it fills with water. Likewise, the minimum flow recirculation line for the CS

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

recirculation piping downstream of the CS pump discharge test line isolation to Refueling Water Storage Tank (RWST) valves (i.e., SI001A/B) is open ended inside the RWST. In addition, the CS pump suction sources are designed to preclude air intrusion by ensuring an adequate RWST level or by initiating a timely pump suction swap to the recirculation sump, and both features are periodically tested.

Periodic venting of the SI, CV, and RH systems is currently performed in accordance with TS SR 3.5.2.3. Byron Station test procedures that govern the performance of 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, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedure requires vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing, with the exception of selected portions of SI system piping as described in the Byron Station TS Bases. However, since performance of UT examinations provide a consistent process to confirm the presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the SI, CV, and RH systems.

- EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems.

**D. CORRECTIVE ACTIONS EVALUATION**

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**ATTACHMENT 2**  
**Generic Letter 2008-01 Nine-Month Response for Byron Station**

E. CONCLUSION

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 3**  
**Generic Letter 2008-01 Nine-Month Response for Clinton Power Station**

This attachment contains the Clinton Power Station (CPS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- High Pressure Core Spray (HPCS),
- Low Pressure Core Spray (LPCS),
- Residual Heat Removal (RHR) (i.e., Low Pressure Coolant Injection (LPCI), Shutdown Cooling, and Containment Spray modes of RHR).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

**A. LICENSING BASIS EVALUATION**

The CPS current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCS, LPCS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Safety Analysis Report (USAR), Operational Requirements Manual (ORM), responses to NRC generic communications, regulatory commitments, and license conditions.

AmerGen Energy Company, LLC's (AmerGen's) review of the CLB for the HPCS, LPCS, and RHR systems identified no errors associated with implementation of existing licensing basis requirements and commitments. CPS TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., HPCS, LPCS, and LPCI) is full of water from the pump discharge valve to the injection valve every 31 days. The TS Bases state that maintaining the pump discharge lines of the HPCS system, LPCS system, and LPCI subsystems full of water ensures that the systems will perform properly, injecting their full capacity into the Reactor Coolant System upon demand. The 31 day frequency is based on operating experience, on the procedural controls

**ATTACHMENT 3**  
**Generic Letter 2008-01 Nine-Month Response for Clinton Power Station**

governing system operation, and on the gradual nature of void buildup in the ECCS piping. The subject systems and their procedures are in compliance with the CPS CLB.

AmerGen's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. AmerGen is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. AmerGen will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to CPS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

**B. DESIGN EVALUATION**

The CPS design basis was reviewed with respect to gas accumulation in the HPCS, LPCS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. AmerGen'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 the TS and AmerGen's commitments to the applicable design criteria as described in the USAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump

**ATTACHMENT 3**  
**Generic Letter 2008-01 Nine-Month Response for Clinton Power Station**

operation, water hammer pressure transients, relief valve lifting, check valve closure, potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. However, as discussed below, new vent locations are planned for installation, and appropriate changes to design basis documents (e.g., drawing revisions) will be made in accordance with the configuration control process.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, AmerGen identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, AmerGen then performed detailed walkdowns of system piping susceptible to gas accumulation. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that UT results from one train would be representative of results from a similar train, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

Proper locations for new vents were determined after evaluation of walkdown and UT examination results. AmerGen's review identified the need to implement the following corrective actions related to the design basis for the systems within the scope of GL 2008-01 for CPS. The schedule for completing these actions, and the basis for the schedule, are also provided below.

1. For the HPCS system, one new vent will be installed prior to startup from the next refueling outage. This schedule is reasonable based on the HPCS system being currently operable and plans to implement the modification in order to minimize system unavailability.

**ATTACHMENT 3**  
**Generic Letter 2008-01 Nine-Month Response for Clinton Power Station**

2. For the RHR system, a modification to add vent and drain holes to an orifice will be installed prior to startup from the next refueling outage. This schedule is reasonable based on the RHR system being currently operable and plans to implement the modification in order to minimize system unavailability.

Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, AmerGen plans to implement the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- AmerGen will revise procedures CPS 3309.01, "High Pressure Core Spray (HPCS)," CPS 3312.01, "Residual Heat Removal (RHR)," and CPS 3313.01, "Low Pressure Core Spray (LPCS)," to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes will be completed by January 9, 2009. Administrative controls have been implemented to require the use of confirmatory UT, if appropriate, following system draining or maintenance activities that could introduce gas into the system.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. AmerGen determined that the sequence of steps was effective; however, procedure revisions will be implemented to include requirements to verify affected instrument lines have been properly filled.

AmerGen's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for CPS. The schedule for completing this action, and the basis for the schedule, are also provided below. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- AmerGen will revise procedures CPS 3309.01, CPS 3312.01, and CPS 3313.01 to include requirements to verify affected instrument lines have been properly filled as part of system restoration activities. These changes will be completed by January 9,

**ATTACHMENT 3**  
**Generic Letter 2008-01 Nine-Month Response for Clinton Power Station**

2009. Administrative controls have been implemented to provide guidance to fill and vent following system draining or maintenance activities that could introduce gas into the system.

Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, AmerGen'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.

Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of CPS relative to gas accumulation, or may result in additional changes to the CPS design to provide additional margin.

**C. TESTING EVALUATION**

CPS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

Periodic venting of the HPCS, LPCS, and RHR systems is currently performed in accordance with TS Surveillance Requirement (SR) 3.5.1.1. CPS test procedures that govern the performance of SR 3.5.1.1 were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedures require vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with AmerGen's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the

**ATTACHMENT 3**  
**Generic Letter 2008-01 Nine-Month Response for Clinton Power Station**

presence of voids, AmerGen plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, AmerGen's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the HPCS, LPCS, and RHR systems.

- AmerGen will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems.

**D. CORRECTIVE ACTIONS EVALUATION**

AmerGen's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of AmerGen's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, AmerGen's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**E. CONCLUSION**

Based upon the reviews and changes discussed above, AmerGen has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 4**  
**Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station**

This attachment contains the Dresden Nuclear Power Station (DNPS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- High Pressure Coolant Injection (HPCI),
- Low Pressure Coolant Injection (LPCI), including Containment Spray,
- Core Spray and ECCS Keepfill (CS), and
- Shutdown Cooling (SDC).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

**A. LICENSING BASIS EVALUATION**

The DNPS current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCI, LPCI, CS, and SDC systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), Technical Requirements Manual (TRM) and TRM Bases, responses to NRC generic communications, regulatory commitments, and license conditions.

The SDC system at DNPS is designed to cool and maintain the reactor water temperature following a normal reactor cooldown using the main condenser. It is not required for mitigation of any event or accident evaluated in the UFSAR, and is not an Emergency Core Cooling System (ECCS). The SDC system is procedurally filled and vented prior to being put into service. The SDC system is only required to be free of gas accumulation prior to being put into service. Therefore, the system is currently vented prior to use, and there are no CLB requirements for periodic venting of the system. Exelon Generation Company, LLC's (EGC's) review concluded that no changes to the CLB for the SDC system are needed to address the potential for gas accumulation.

## ATTACHMENT 4

### Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station

EGC's review of the CLB for the HPCI, LPCI, and SDC systems identified no errors associated with implementation of existing licensing basis requirements and commitments. However, EGC's design review identified that for the CS system, vent connections on the north injection line in each unit near the drywell penetrations were installed such that the vents come off the side of the pipe, rather than the top of the pipe. These vents have been modified to correct the design issue. No other vulnerabilities were identified with implementation of existing licensing basis requirements for the CS system.

DNPS TS require verification that ECCS piping (i.e., HPCI, LPCI, and CS) is filled with water from the pump discharge valve to the injection valve every 31 days. The TS Bases state that maintaining the pump discharge lines of the HPCI system, CS system, and LPCI subsystems full of water ensures that the ECCS will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. The 31 day frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls governing system operation, and operating experience. The subject systems and their procedures are in compliance with the DNPS CLB.

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to DNPS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

#### B. DESIGN EVALUATION

The DNPS design basis was reviewed with respect to gas accumulation in the HPCI, LPCI, CS, and SDC systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC's review of the design basis for these systems identified no deficiencies associated with implementation of existing design basis requirements, with the exception of the vents on the CS system that were installed on the side of the pipe, rather than the top of the pipe, as discussed above. Modifications have been installed to correct this

**ATTACHMENT 4**  
**Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station**

vulnerability, and as a result, the systems are designed, tested, and operated in accordance with the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump operation, water hammer pressure transients, relief valve lifting, check valve closure, potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

EGC's design review identified that for the CS system, vent connections on the north injection line in each unit near the drywell penetrations were installed such that the vents come off the side of the pipe, rather than the top of the pipe. These vents have been modified to correct the design issue, and appropriate changes to design basis documents (e.g., drawing revisions) were made in accordance with the configuration control process.

No other vulnerabilities were identified during the design basis document review, and no other changes to design basis documents were identified as being needed.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of accessible system piping susceptible to gas accumulation on both DNPS units. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe

**ATTACHMENT 4**  
**Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station**

elevations and slope) to identify areas vulnerable to gas accumulation. Detailed walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage for each DNPS unit, as discussed in the three-month response to GL 2008-01 for DNPS.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

Proper locations for new vents were determined after evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective actions related to the design basis for the systems within the scope of GL 2008-01 for DNPS. The schedule for completing the walkdowns of inaccessible piping was discussed in EGC's three-month response to GL 2008-01 for DNPS.

1. Detailed walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage for each DNPS unit, as discussed in the three-month response to GL 2008-01 for DNPS.
2. For the CS system, EGC has modified the vent connections on the north injection line in each unit near the drywell penetrations such that the vent valves come off the top of the pipe rather than the side of the pipe.
3. New vents were added to the 2A and 3B CS systems.

Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, EGC plans to implement the

## ATTACHMENT 4

### Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station

following action to address enhancements to the procedures that govern fill and vent of the HPCI, LPCI, and CS systems.

- EGC will revise procedures associated with fill and vent of the HPCI, LPCI, and CS systems to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes are scheduled to be complete by October 31, 2008. This schedule is reasonable since no activities are scheduled prior to that time that would require use of the associated procedures.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, for the LPCI system, a procedure revision will be implemented to include requirements to verify affected instrument lines have been properly filled.

EGC's review identified the need to implement the following corrective actions related to the fill and vent procedures for the systems within the scope of GL 2008-01 for DNPS. The schedule for completing these actions, and the basis for the schedule, are also provided below. These actions are necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- EGC's review of procedures that govern venting of the SDC system identified there are several vents installed on the system that are not currently used during venting activities. These procedures will be revised to incorporate use of additional vents to enhance venting practices. These changes are scheduled to be complete by October 31, 2008. This schedule is reasonable since no activities are scheduled prior to that time that would require use of the associated procedures.
- EGC will revise the procedure associated with fill and vent of the LPCI system to include requirements to verify affected instrument lines have been properly filled. This change is scheduled to be complete by October 31, 2008. This schedule is reasonable since no activities are scheduled prior to that time that would require use of the procedure.

#### Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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

**ATTACHMENT 4**  
**Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station**

restoration procedures (i.e., system venting procedures), system design, interfaces with other systems, potential external sources of gas, and operating practices.

Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of DNPS relative to gas accumulation, or may result in additional changes to the DNPS design to provide additional margin.

C. TESTING EVALUATION

DNPS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

The SDC system at DNPS is designed to cool and maintain the reactor water temperature following a normal reactor cooldown using the main condenser. It is not required for mitigation of any event or accident evaluated in the UFSAR, and is not an ECCS system. The SDC system is procedurally filled and vented prior to being put into service. The SDC system is only required to be sufficiently full prior to being placed in service. Therefore, the system is currently vented prior to use, and there is no need for periodic venting of the system.

Periodic venting of the HPCI, LPCI, and CS systems is currently performed in accordance with TS Surveillance Requirement (SR) 3.5.1.1. DNPS test procedures that govern the performance of SR 3.5.1.1 were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedure requires vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the HPCI, LPCI, and CS systems.

- EGC will revise periodic venting surveillances for the HPCI, LPCI, and CS systems to include enhanced acceptance criteria and requirements to perform UTs on a graded

**ATTACHMENT 4**  
**Generic Letter 2008-01 Nine-Month Response for Dresden Nuclear Power Station**

approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems, except for the CS vents mounted on the sides of the piping as discussed above.

**D. CORRECTIVE ACTIONS EVALUATION**

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**E. CONCLUSION**

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

This attachment contains the LaSalle County Station (LSCS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- High Pressure Core Spray (HPCS),
- Low Pressure Core Spray (LPCS), and
- Residual Heat Removal (RHR) (i.e., Suppression Pool Cooling, Low Pressure Coolant Injection (LPCI), Shutdown Cooling, Drywell Spray, and Suppression Pool Spray modes of RHR).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

**A. LICENSING BASIS EVALUATION**

The LSCS current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCS, LPCS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), Technical Requirements Manual (TRM) and TRM Bases, responses to NRC generic communications, regulatory commitments, and license conditions.

Exelon Generation Company, LLC's (EGC's) review of the CLB for the HPCS, LPCS, and RHR systems identified no errors associated with implementation of existing licensing basis requirements and commitments. LSCS TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., HPCS, LPCS, and LPCI) is filled with water from the pump discharge valve to the injection valve every 31 days. The TS Bases state that maintaining the pump discharge lines of the HPCS system, LPCS system, and LPCI subsystems full of water ensures that the systems will perform properly, injecting their full capacity into the Reactor Coolant System (RCS) upon

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

demand. The 31 day frequency is based on operating experience, on the procedural controls governing system operation, and on the gradual nature of void buildup in the ECCS piping. The subject systems and their procedures are in compliance with the LSCS CLB.

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to LSCS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

**B. DESIGN EVALUATION**

The LSCS design basis was reviewed with respect to gas accumulation in the HPCS, LPCS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC'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 the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump operation, water hammer pressure transients, relief valve lifting, check valve closure, potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

1. The HPCS system is connected to the RCS through the injection line, which includes a normally closed injection valve and injection check valve. RCS leakage past both these valves would result in actuation of a pressure switch, actuation of a control room annunciator, and entry into the associated alarm response procedure. This procedure was revised to provide direction for identifying a temperature increase that could lead to saturated conditions within the piping, which could result in void formation.
2. The LPCS system is connected to the RCS through the injection line, which includes a normally closed injection valve and injection check valve. RCS leakage past both these valves would result in actuation of a pressure switch, actuation of a control room annunciator, and entry into the associated alarm response procedure. This procedure was revised to provide direction for identifying a temperature increase that could lead to saturated conditions within the piping, which could result in void formation.
3. The RHR system is connected to the RCS through several different lines, each containing valves that are normally closed. RCS leakage past these valves could potentially lead to saturated conditions within the piping, which could result in void formation. This would result in actuation of pressure switches and annunciation in the control room. Annunciator response procedures were revised to provide direction for identifying a temperature increase that could lead to saturated conditions within the piping, which could result in void formation.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of accessible system piping susceptible to gas accumulation on both LSCS units. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Detailed

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage for each LSCS unit, as discussed in the three-month response to GL 2008-01 for LSCS.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

No new vent locations were deemed necessary to address vulnerabilities as a result of the evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective action related to the design basis for the systems within the scope of GL 2008-01 for LSCS. The schedule for completing this action was discussed in EGC's three-month response to GL 2008-01 for LSCS.

- Detailed walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage for each LSCS unit, as discussed in the three-month response to GL 2008-01 for LSCS.

Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, EGC has implemented the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- EGC has revised procedures associated with fill and vent of the GL 2008-01 subject systems to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required.

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, a procedure revision for the HPCS system was implemented to include requirements to verify affected instrument lines have been properly filled. EGC's evaluation determined that procedures for the LPCS and RHR systems provide appropriate guidance for instrument lines.

EGC's review identified the need to implement the following corrective actions related to the fill and vent procedures for the systems within the scope of GL 2008-01 for LSCS. These actions are necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

1. EGC has revised the procedure associated with fill and vent of the HPCS system to include requirements to verify affected instrument lines have been properly filled.
2. EGC has revised the procedure associated with fill and vent of the LPCS system to add a requirement to use valves 1(2)E21-F027/F323 and 1(2)E21-F029/F324 during system venting.
3. EGC has revised the procedure associated with fill and vent of the HPCS system to add a requirement to use valves 1(2)E22-F026, 1(2)E22-F012, and 1(2)E22-F023 during system venting.
4. EGC has revised the procedure associated with fill and vent of the RHR system to add a requirement to use vent valves that were previously not used.

Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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.

Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of LSCS relative to gas accumulation, or may result in additional changes to the LSCS design to provide additional margin.

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

C. TESTING EVALUATION

LSCS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

Periodic venting of the HPCS, LPCS, and RHR systems is currently performed in accordance with TS Surveillance Requirements (SRs) 3.5.1.1 and 3.5.2.3. LSCS test procedures that govern the performance of SRs 3.5.1.1 and 3.5.2.3 were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedure requires vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the HPCS, LPCS, and RHR systems.

- EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of acceptable high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems.

D. CORRECTIVE ACTIONS EVALUATION

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**ATTACHMENT 5**  
**Generic Letter 2008-01 Nine-Month Response for LaSalle County Station**

E. CONCLUSION

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 6**  
**Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station**

This attachment contains the Limerick Generation Station (LGS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- High Pressure Coolant Injection (HPCI),
- Core Spray (CS), and
- Residual Heat Removal (RHR) (i.e., Suppression Pool Cooling, Shutdown Cooling, Alternate Decay Heat Removal, Low Pressure Coolant Injection (LPCI), and Containment Spray modes of RHR).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

**A. LICENSING BASIS EVALUATION**

The LGS current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCI, CS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), Technical Requirements Manual (TRM) and TRM Bases, responses to NRC generic communications, regulatory commitments, and license conditions.

Exelon Generation Company, LLC's (EGC's) review of the CLB for the HPCI, CS, and RHR systems identified no errors associated with implementation of existing licensing basis requirements and commitments. LGS TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., HPCI, CS, and LPCI) is full from the pump discharge valve to the system isolation valve (i.e., injection valve) in accordance with the Surveillance Frequency Control Program. The TS Bases state that the pump discharge piping is maintained full to prevent water hammer damage and to provide cooling at the

**ATTACHMENT 6**  
**Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station**

earliest moment. The subject systems and their procedures are in compliance with the LGS CLB.

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to LGS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

**B. DESIGN EVALUATION**

The LGS design basis was reviewed with respect to gas accumulation in the HPCI, CS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC'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 the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump

**ATTACHMENT 6**  
**Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station**

operation, water hammer pressure transients, relief valve lifting, check valve closure, potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. However, as discussed below, new vent locations are planned for installation, and appropriate changes to design basis documents (e.g., drawing revisions) will be made in accordance with the configuration control process.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of system piping susceptible to gas accumulation on Unit 1, as well as accessible piping sections susceptible to gas accumulation on Unit 2. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Detailed walkdowns of inaccessible piping sections on Unit 2 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for LGS.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that UT results from one train would be representative of results from a similar train, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

Proper locations for new vents were determined after evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective actions related to the design basis for the systems within the scope of GL 2008-01 for LGS. The schedule for completing the remaining corrective actions, and the basis for the schedule, are also provided below.

## ATTACHMENT 6

### Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station

1. Detailed walkdowns of inaccessible piping sections on Unit 2 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for LGS. The schedule for completing this action was discussed in EGC's three-month response to GL 2008-01 for LGS.
2. For the HPCI system, three new vents were installed on each LGS unit. In addition, three additional new vents will be installed on each LGS unit prior to startup from the next scheduled refueling outage for each unit. Voids that were discovered in the HPCI system have been evaluated and determined to not adversely impact the ability of the HPCI system to perform its specified safety functions.
3. For the CS system, six new vents will be installed on each LGS unit prior to startup from the next scheduled refueling outage for each unit. Voids that were discovered in the CS system have been evaluated and determined to not adversely impact the ability of the CS system to perform its specified safety functions.
4. For the RHR system, one new vent will be installed on Unit 1, and two new vents will be installed on Unit 2, prior to startup from the next scheduled refueling outage for each unit. Voids that were discovered in the RHR system have been evaluated and determined to not adversely impact the ability of the RHR system to perform its specified safety functions.

#### Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, LGS procedures for the GL 2008-01 subject systems include requirements for the use of post fill and vent confirmatory UT verifications during system restoration activities as required.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, a procedure revision for the CS system

## ATTACHMENT 6

### Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station

was implemented to include requirements to verify affected instrument lines have been properly filled.

EGC's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for LGS. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- EGC has revised procedure S52.1.A, "Core Spray Setup for Service Operation," to include requirements to verify affected instrument lines have been properly filled.

#### Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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.

#### Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of LGS relative to gas accumulation, or may result in additional changes to the LGS design to provide additional margin.

### C. TESTING EVALUATION

LGS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

Periodic venting of the HPCI, CS, and RHR systems is currently performed in accordance with TS Surveillance Requirement (SR) 4.5.1.a.1.a. LGS test procedures that govern the performance of SR 4.5.1.a.1.a were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedure requires vent valves to be opened, and a solid stream of water must be observed while venting. This is

**ATTACHMENT 6**  
**Generic Letter 2008-01 Nine-Month Response for Limerick Generating Station**

consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the HPCI, RHR, and CS systems.

- EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems. In addition, surge chambers for the systems will alarm in the Main Control Room on low system water level. These surge chambers are located at the high points of the systems and are physically higher than the main system piping, ensuring gas that accumulates at the high points is detected in a timely manner.

**D. CORRECTIVE ACTIONS EVALUATION**

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**E. CONCLUSION**

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

## ATTACHMENT 7

### Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station

This attachment contains the Oyster Creek Nuclear Generating Station (OCNGS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- Core Spray (CS),
- Isolation Condenser System (ICS),
- Containment Spray, and
- Shutdown Cooling (SDC).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

#### A. LICENSING BASIS EVALUATION

The OCNGS current licensing basis (CLB) was reviewed with respect to gas accumulation in the CS, ICS, Containment Spray, and SDC systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), responses to NRC generic communications, regulatory commitments, and license conditions.

The CS system includes a Core Spray Filling System to keep the CS system piping filled with water. A water leg is maintained in the piping to preclude water hammer when the system goes into operation. Fill pumps take suction from the torus and discharge torus water to the main piping, which overflows through the pump minimum flow recirculation piping back to the torus. This assures that the main piping remains full since the recirculation lines are located at a higher elevation than the main piping. The CS discharge piping is kept full by use of a continuously operating keep-fill pump. Fill pump operation is verified daily by operator rounds and an alarm for low discharge line pressure is provided in the control room.

## ATTACHMENT 7

### Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station

The ICS is one of three Emergency Core Cooling Systems (ECCS) at OCNGS. The ICS is a standby, high-pressure system for removal of fission product decay heat when the reactor vessel is isolated from the main condenser. The system prevents overheating of the reactor fuel, controls the reactor pressure rise, and limits the loss of reactor coolant through the relief valves. The ICS operates by natural circulation without the need for driving power other than the electrical system used to place the ICS in operation. During ICS operation, steam from the reactor vessel condenses at the tube bundles as heat is transferred through the tubes into the shell side of the ICS. Condensate flows by natural circulation back into recirculation loops A and E through the condensate return lines. The valves in the steam inlet lines are normally open so that the tube bundles are at reactor pressure. Only the DC motor-operated condensate isolation valves are normally closed. The high points in the steam supply lines to each loop are vented continuously to the main turbine steam header downstream of the main steam isolation valves when the plant is operating and the ICS is in standby. This is done to remove noncondensable gases from the reactor steam, which would otherwise collect at these high points in the system. Therefore, the ICS is not vulnerable to gas accumulation related transients due to the system's design.

The Containment Spray system consists of two redundant loops, which deliver water from the suppression pool to the spray headers in the drywell and torus. Both loops share a common suction header from the suppression pool and a common spray header in the torus air space. A recirculation line, which returns to the torus, permits operation of the system for controlling the temperature of the suppression pool during normal and abnormal plant operation. During standby, the Containment Spray system piping drains back to the torus after securing pumps, down to a level equal to the torus water level. Since the piping system is open ended to the drywell atmosphere or torus, there is no potential for significant pressure transients due to gas accumulation. The pump discharge piping is, by design, voided. There have been no water hammer events during the plant operating history, which includes spurious system initiations and quarterly testing.

The SDC system at OCNGS is designed to remove fission product decay heat during shutdown, and to provide a means of cooling the reactor pressure vessel to allow for refueling or maintenance following a period of operation. It is not required for mitigation of any event or accident evaluated in the UFSAR, and is not a safety related system. The SDC system is procedurally filled and vented prior to being put into service. The SDC system is only required to be free of gas accumulation prior to alignment. Therefore, the system is currently vented prior to use, and there are no CLB requirements for periodic venting of the system. AmerGen Energy Company, LLC's (AmerGen's) review concluded that no changes to the CLB for the SDC system are needed to address the potential for gas accumulation.

AmerGen's review of the CLB for the CS, ICS, and Containment Spray systems identified no errors associated with implementation of existing licensing basis requirements and commitments. The CLB does not require periodic venting of the GL 2008-01 subject systems.

## ATTACHMENT 7

### Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station

AmerGen's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. AmerGen is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. AmerGen will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to OCNCS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

#### B. DESIGN EVALUATION

The OCNCS design basis was reviewed with respect to gas accumulation in the CS, ICS, Containment Spray, and SDC systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. AmerGen'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 the TS and AmerGen's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

##### Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump operation, water hammer pressure transients, relief valve lifting, check valve closure,

**ATTACHMENT 7**  
**Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station**

potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. No changes to design basis documents were identified as being needed.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, AmerGen identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, AmerGen then performed detailed walkdowns of accessible system piping susceptible to gas accumulation. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for OCNGS.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that UT results from one train would be representative of results from a similar train).

No new vent locations were deemed necessary to address vulnerabilities as a result of the evaluation of walkdown and UT examination results. AmerGen's review identified the need to implement the following corrective actions related to the design basis for the systems within the scope of GL 2008-01 for OCNGS. The schedule for completing the remaining corrective actions, and the basis for the schedule, are also provided below.

1. Walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for OCNGS. The schedule for completing this action was discussed in AmerGen's three-month response to GL 2008-01 for OCNGS.

## ATTACHMENT 7

### Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station

- AmerGen's review of the procedure that governs venting of the SDC system identified that there are vents installed on the system that are not currently used during venting activities. This procedure was revised to incorporate use of these vents during SDC system venting activities.

#### Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, AmerGen plans to implement the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- AmerGen will revise procedures associated with fill and vent of the CS and Containment Spray systems to include requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes are scheduled to be complete by October 24, 2008. This date ensures implementation prior to the start of the refueling outage and when the affected systems will be drained.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. AmerGen determined that the sequence of steps was effective; however, procedure revisions will be implemented to include requirements to verify affected instrument lines have been properly filled.

AmerGen's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for OCNCS. The schedule for completing this action, and the basis for the schedule, are also provided below. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- AmerGen will revise procedures associated with fill and vent of the CS and Containment Spray systems to include requirements to verify affected instrument lines have been properly filled. These changes are scheduled to be complete by

## ATTACHMENT 7

### Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station

October 24, 2008. This date ensures implementation prior to the start of the refueling outage and when the affected systems will be drained.

#### Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

- Poor refill and vent after draining,
- Steam intrusion,
- Gas coming out of solution over time, and
- Gas intrusion from an inter-connected system.

In conjunction with the actions discussed within this attachment, AmerGen'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.

#### Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of OCNGS relative to gas accumulation, or may result in additional changes to the OCNGS design to provide additional margin.

#### C. TESTING EVALUATION

OCNGS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

There are no periodic venting requirements for the ICS, Containment Spray, and SDC systems due to the design of the systems as discussed in the Licensing Basis Evaluation section above. Periodic venting of the CS system is currently performed on a weekly basis in accordance with station procedures. These procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedure requires vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with AmerGen's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the

## ATTACHMENT 7

### Generic Letter 2008-01 Nine-Month Response for Oyster Creek Nuclear Generating Station

presence of voids, AmerGen plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, AmerGen's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the CS, Containment Spray, and SDC systems.

- AmerGen will revise the periodic venting procedure for the CS system to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems.

#### D. CORRECTIVE ACTIONS EVALUATION

AmerGen's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of AmerGen's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, AmerGen's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

#### E. CONCLUSION

Based upon the reviews and changes discussed above, AmerGen has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

## ATTACHMENT 8

### Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station

This attachment contains the Peach Bottom Atomic Power Station (PBAPS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- High Pressure Coolant Injection (HPCI),
- Core Spray (CS), and
- Residual Heat Removal (RHR) (i.e., Low Pressure Coolant Injection (LPCI), Containment Cooling, and Shutdown Cooling modes of RHR).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

#### A. LICENSING BASIS EVALUATION

The PBAPS current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCI, CS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), Technical Requirements Manual (TRM) and TRM Bases, responses to NRC generic communications, regulatory commitments, and license conditions.

Exelon Generation Company, LLC's (EGC's) review of the CLB for the HPCI, CS and RHR systems identified no errors associated with implementation of existing licensing basis requirements and commitments. PBAPS TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., HPCI, CS, and LPCI) is filled with water from the pump discharge valve to the injection valve every 31 days. The TS Bases state that maintaining the pump discharge lines of the HPCI system, CS system, and LPCI subsystems full of water ensures that the ECCS will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. The 31 day frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls

## ATTACHMENT 8

### Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station

governing system operation, and operating experience. The subject systems and their procedures are in compliance with the PBAPS CLB.

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to PBAPS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

#### B. DESIGN EVALUATION

The PBAPS design basis was reviewed with respect to gas accumulation in the HPCI, CS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC'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 the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

##### Applicable Gas Volume Acceptance Criteria

Historically, station procedures associated with filling and venting the GL 2008-01 subject systems have not specified location-specific gas volume acceptance criteria. Rather, the procedures require vent valves to be opened, and a solid stream of water observed while venting. This practice ensures that the amount of air in systems is appropriately minimized to the extent practical, and ensures that systems are maintained in a condition of being sufficiently full following performance of venting surveillances such that the systems can perform their specified safety functions.

The impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation. The evaluation process includes consideration of the impact that the void could have on pump

**ATTACHMENT 8**  
**Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station**

operation, water hammer pressure transients, relief valve lifting, check valve closure, potential unbalanced loads, and accident and transient analyses. Industry guidance developed specifically in response to GL 2008-01 is also used.

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. No changes to design basis documents were identified as being needed.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of accessible system piping susceptible to gas accumulation on both PBAPS units. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Detailed walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage for each PBAPS unit, as discussed in the three-month response to GL 2008-01 for PBAPS.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

No new vent locations were deemed necessary to address vulnerabilities as a result of the evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective action related to the design basis for the systems within the scope of GL 2008-01 for PBAPS. The schedule for completing this action was discussed in EGC's three-month response to GL 2008-01 for PBAPS.

- Detailed walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage for each PBAPS unit, as discussed in the three-month response to GL 2008-01 for PBAPS.

**ATTACHMENT 8**  
**Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station**

Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, EGC plans to implement the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes are scheduled to be complete by February 27, 2009. This date is reasonable because PBAPS Unit 2 is currently in a refueling outage, and EGC has implemented administrative controls, via manual activities in work orders, to perform confirmatory UT examination as part of system restoration activities. In addition, a review of online maintenance activities has been performed, and use of these procedures is not currently planned prior to the scheduled date for revision.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, procedure revisions will be implemented to include requirements to verify affected instrument lines have been properly filled.

EGC's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for PBAPS. The schedule for completing this action, and the basis for the schedule, are also provided below. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include requirements to verify affected instrument lines have been properly filled. These changes are scheduled to be complete by February 27, 2009. This date is reasonable because PBAPS Unit 2 is currently in a refueling outage, and EGC has implemented administrative controls, via manual activities in work orders, to perform confirmatory UT examination as part of system restoration activities. In

**ATTACHMENT 8**  
**Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station**

addition, a review of online maintenance activities has been performed, and use of these procedures is not currently planned prior to the scheduled date for revision.

Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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.

Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of PBAPS relative to gas accumulation, or may result in additional changes to the PBAPS design to provide additional margin.

**C. TESTING EVALUATION**

PBAPS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

Periodic venting of the HPCI, CS, and RHR systems is currently performed in accordance with TS Surveillance Requirement (SR) 3.5.1.1. PBAPS test procedures that govern the performance of SR 3.5.1.1 were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. These procedures do not specify gas volume acceptance criteria that must be met to satisfy the surveillance. Rather, the procedures require vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

**ATTACHMENT 8**  
**Generic Letter 2008-01 Nine-Month Response for Peach Bottom Atomic Power Station**

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the HPCI, CS, and RHR systems.

- EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is reasonable based on the fact that the evaluations and UT examinations performed to date on the GL 2008-01 subject systems have not identified vulnerabilities that challenge the operability of these systems.

**D. CORRECTIVE ACTIONS EVALUATION**

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

**E. CONCLUSION**

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

## ATTACHMENT 9

### Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station

This attachment contains the Quad Cities Nuclear Power Station (QCNPS) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- High Pressure Coolant Injection (HPCI),
- Core Spray (CS),
- Residual Heat Removal (RHR) (i.e., Low Pressure Coolant Injection (LPCI), Shutdown Cooling, and Containment Cooling modes of RHR).

There are related issues that the nuclear industry is currently considering with respect to the overall performance of these systems (i.e., Generic Safety Issue 193, "BWR ECCS Suction Concerns"). Consistent with discussions in SECY 2008-108, "Summary of Activities Related to Generic Issues Program," resolution of these related issues would be addressed independent of GL 2008-01 and will not be addressed herein.

#### A. LICENSING BASIS EVALUATION

The QCNPS current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPCI, CS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), Technical Requirements Manual (TRM) and TRM Bases, responses to NRC generic communications, regulatory commitments, and license conditions.

Exelon Generation Company, LLC's (EGC's) review of the CLB for the HPCI, CS, and RHR systems identified no errors associated with implementation of existing licensing basis requirements and commitments. QCNPS TS require verification that Emergency Core Cooling System (ECCS) piping (i.e., HPCI, CS, and LPCI) is full of water from the pump discharge valve to the injection valve every 31 days. The TS Bases state that maintaining the pump discharge lines of the HPCI system, CS system, and LPCI subsystems full of water ensures that the ECCS will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. The 31 day frequency is based on operating experience, on the procedural controls governing system operation, and on

## ATTACHMENT 9

### Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station

the gradual nature of void buildup in the ECCS piping. The subject systems and their procedures are in compliance with the QCNPS CLB.

EGC's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to QCNPS licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

#### B. DESIGN EVALUATION

The QCNPS design basis was reviewed with respect to gas accumulation in the HPCI, CS, and RHR systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. EGC'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 the TS and EGC's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

##### Applicable Gas Volume Acceptance Criteria

QCNPS venting procedures require a solid stream of water be observed for a specified duration as a requirement for considering the system full. The monthly vent verifications already included acceptance criteria for the amount of air that is measured in the system. These criteria are used to determine the impact on system operability when venting activities identify a system is not completely full. Station procedures require an Issue Report to be initiated if the acceptance criteria are exceeded.

No additional vent verification testing corrective actions were identified to ensure that gas accumulation is maintained less than the amount that challenges operability.

**ATTACHMENT 9**  
**Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station**

Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. No changes to design basis documents were identified as being needed.

Drawing Reviews and System Walkdowns

Piping & instrumentation 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. As a result of the drawing reviews, EGC identified high points that may be susceptible to gas accumulation. These areas were further evaluated as discussed below.

Using the results of the drawing review described above, EGC then performed detailed walkdowns of system piping susceptible to gas accumulation on Unit 2, as well as accessible piping sections susceptible to gas accumulation on Unit 1. The walkdowns were performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation. Detailed walkdowns of inaccessible piping sections on Unit 1 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for QCNPS.

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 functions. These piping locations were further evaluated, and ultrasonic testing (UT) examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function, a determination was made that UT results from one train would be representative of results from a similar train, a determination was made that system flow rates during periodic testing would be adequate to remove voids).

No new vent locations were deemed necessary to address vulnerabilities as a result of the evaluation of walkdown and UT examination results. EGC's review identified the need to implement the following corrective action related to the design basis for the systems within the scope of GL 2008-01 for QCNPS. The schedule for completing this action was discussed in EGC's three-month response to GL 2008-01 for QCNPS.

- Detailed walkdowns of inaccessible piping sections on Unit 1 will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for QCNPS.

## ATTACHMENT 9

### Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station

#### Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, EGC plans to implement the following action to address enhancements to the procedures that govern fill and vent of the GL 2008-01 subject systems.

- EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include additional requirements associated with the use of confirmatory UT examinations as part of system restoration activities as required. These changes are scheduled to be complete by March 31, 2009. This schedule is acceptable because there are no planned refueling outages in this timeframe. Furthermore, periodic venting procedures ensure systems are sufficiently full and include acceptance criteria for identifying unacceptable void conditions.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. EGC determined that the sequence of steps was effective; however, procedure revisions will be implemented as necessary to include requirements to verify affected instrument lines have been properly filled.

EGC's review identified the need to implement the following corrective action related to the fill and vent procedures for the systems within the scope of GL 2008-01 for QCNPS. This action is necessary to address gaps that were identified to more accurately reflect the systems' susceptibility to adverse gas accumulation.

- EGC will revise fill and vent procedures to include requirements to verify as necessary affected instrument lines have been properly filled. These changes are scheduled to be complete by March 31, 2009. This schedule is acceptable because there are no planned refueling outages in this timeframe. Furthermore, general work practices ensure sensing lines are filled and vented following instrument maintenance that could potentially drain these lines.

**ATTACHMENT 9**  
**Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station**

Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

In conjunction with the actions discussed within this attachment, EGC'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. No corrective actions were identified to ensure that gas accumulation is maintained less than the amount that challenges operability.

Ongoing Industry Programs

Ongoing industry programs are planned which may impact the conclusions reached during the design evaluation of QCNPS relative to gas accumulation, or may result in additional changes to the QCNPS design to provide additional margin.

**C. TESTING EVALUATION**

QCNPS test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

Periodic venting of the HPCI, CS, and RHR systems is currently performed in accordance with TS Surveillance Requirement (SR) 3.5.1.1. QCNPS test procedures that govern the performance of SR 3.5.1.1 were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records.

There were no vulnerabilities identified during the system testing reviews. The procedures require vent valves to be opened, and a solid stream of water must be observed while venting. This is consistent with EGC's goal of returning systems to a condition of being sufficiently full following performance of venting surveillances, such that the systems can perform their specified safety functions. If the system piping is found not full, the monthly vent verification procedures already included acceptance criteria for the amount of air that is measured in the system.

UT examinations are not currently performed during periodic system testing. However, since performance of UT examinations provide a consistent process to confirm the

## ATTACHMENT 9

### Generic Letter 2008-01 Nine-Month Response for Quad Cities Nuclear Power Station

presence of voids, EGC plans to implement a graded approach for performing periodic UT examinations of susceptible piping locations.

In summary, EGC's review of periodic testing activities identified the need to implement the following corrective action to address improvements to the procedures that govern periodic venting of the HPCI, CS, and RHR systems.

- EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points. These changes are scheduled to be complete by April 30, 2009. This schedule is acceptable because periodic venting procedures require a solid stream of water be observed for a specified duration as a requirement for considering the system full. Acceptance criteria are provided for identifying unacceptable void conditions.

#### D. CORRECTIVE ACTIONS EVALUATION

EGC's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of EGC's Corrective Action Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, EGC's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

#### E. CONCLUSION

Based upon the reviews and changes discussed above, EGC has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 10**  
**Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station**

This attachment contains the Three Mile Island Nuclear Station (TMI) 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. The following information is provided in this response:

- (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 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," 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.

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

- Makeup and Purification (MU) – portion that performs or affects High Pressure Injection (HPI) function,
- Decay Heat Removal (DH) – including Low Pressure Injection (LPI) function,
- Core Flooding (CF), and
- Building Spray (BS).

**A. LICENSING BASIS EVALUATION**

The TMI current licensing basis (CLB) was reviewed with respect to gas accumulation in the HPI, DH, CF, and BS systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included the Technical Specifications (TS), TS Bases, Updated Final Safety Analysis Report (UFSAR), responses to NRC generic communications, regulatory commitments, and license conditions.

AmerGen Energy Company, LLC's (AmerGen's) review of the CLB for the HPI, DH, CF, and BS systems identified no errors associated with implementation of existing licensing basis requirements and commitments. TMI TS for the HPI and DH systems require venting during each refueling interval and following maintenance or modification that affects system flow characteristics. There are no periodic venting or void verification check requirements in the CLB for the HPI, DH, and BS. Although not required by TS, TMI is currently performing initial fill ultrasonic testing (UT) checks, post-maintenance fill UT checks, and periodic UT checks for the HPI, DH, and BS systems.

The CF system is a self-contained, self-actuating passive system. Two tanks are two-thirds full of borated water, with the upper one-third filled with nitrogen. When Reactor Coolant System pressure drops to 600 psig, two in-series check valves open from each tank to allow water to directly flow to the reactor vessel. There are no pumps in the system, and the pipes slope upwards to the tanks to ensure no void formation. Since

## ATTACHMENT 10

### Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station

the CF system is not susceptible to gas accumulation, there are no CLB requirements for venting any portion of the system.

AmerGen's evaluation concluded that clarifications or other changes to the TS and TS Bases might be warranted to enhance wording relative to gas accumulation issues for the GL 2008-01 subject systems. As a result, the following action is planned to ensure that the TS and TS Bases accurately reflect the technical considerations discussed in GL 2008-01.

- Potential TS improvements are being developed by the Technical Specifications Task Force (TSTF) with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. AmerGen is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. AmerGen will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.

No other changes to TMI licensing basis documents were identified as a result of evaluations performed in response to GL 2008-01.

#### B. DESIGN EVALUATION

The TMI design basis was reviewed with respect to gas accumulation in the HPI, DH, CF, and BS systems. An industry-recommended template was followed to perform this review, and results have been documented. This review included design basis documents, calculations, engineering evaluations, and vendor technical manuals. AmerGen'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 the TS and AmerGen's commitments to the applicable design criteria as described in the UFSAR. The design bases and operating procedures appropriately minimize and monitor for gas accumulation.

As a result of issues with gas accumulation prior to the issuance of GL 2008-01, extensive evaluations were performed in the 2006-2007 timeframe. These evaluations included detailed walkdowns of systems and UT examinations of piping sections susceptible to gas accumulation. In addition, 16 new vent locations were installed on the BS, DH, and HPI systems. These modifications are complete.

#### Applicable Gas Volume Acceptance Criteria

Void volume acceptance criteria have been established at TMI. The acceptance criteria are used for periodic UT checks as well as post-maintenance fill and vent UT checks. The criteria allow less than five percent voids in discrete high point locations on the suction side of the LPI pumps and two percent voids in discrete high point locations on the suction and discharge side of the HPI pumps. The acceptance criteria are supported

## ATTACHMENT 10

### Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station

by technical evaluation and GOTHIC computer modeling that ensures proper pump performance. Previous venting methods swept system voids from the piping during refueling full flow or quarterly inservice testing, and no water hammer events occurred. This operational experience and engineering judgment is used to support the current acceptance criteria. Small ribbons of air at discrete locations are considered inconsequential. No ribbons or voids have been found after two years of periodic UT examinations. Identified voids are documented in the Corrective Action Program by initiating an Issue Report. Detailed evaluation for the particular void size and location would follow.

#### Changes Resulting from Design Basis Review

No vulnerabilities were identified during the design basis document review. No changes to design basis documents were identified as being needed.

#### Drawing Reviews and System Walkdowns

Piping & instrumentation 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. Walkdowns were also performed to confirm pertinent design details (e.g., the location and orientation of system vents) and as-built configurations (e.g., pipe elevations and slope) to identify areas vulnerable to gas accumulation.

In 2006 and 2007, HPI, DH, and BS system piping outside the Reactor Building was walked down. For the DH system, multiple locations were identified with high points that were not vented, and 12 new vent locations were installed. Three new vent locations were also installed on the BS system in 2006 and 2007 as a result of the drawing reviews and system walkdowns. In addition, one new vent location was installed on the HPI system.

HPI, DH, and BS DH system piping inside the Reactor Building was not walked down in 2006 and 2007; however, system drawings, photos, and system knowledge was used to evaluate the potential for voids in the system. The BS system piping inside the Reactor Building was not measured, since the piping is drained per design until initiation. The CF system is not susceptible to gas accumulation; therefore, no system walkdowns are required for the CF system. Confirmatory detailed walkdowns of inaccessible piping sections on the HPI and DH systems will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for TMI.

In 2006 and 2007, 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 functions. These piping locations were further evaluated, and UT examinations were performed, where appropriate, to confirm whether voids were present. UT examinations were not performed on areas where an assessment concluded they were not necessary (e.g., a

## ATTACHMENT 10

### Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station

determination was made that voiding in the piping location would not impact the system's ability to perform its specified safety function).

AmerGen's review identified the need to implement the following corrective action related to the design basis for the systems within the scope of GL 2008-01 for TMI. The schedule for completing this action was discussed in AmerGen's three-month response to GL 2008-01 for TMI.

- Detailed walkdowns of inaccessible piping sections will be completed during the next scheduled refueling outage, as discussed in the three-month response to GL 2008-01 for TMI.

#### Procedure Reviews Associated With Fill and Vent Activities

The process for filling and venting the GL 2008-01 subject systems is controlled through station procedures. The procedures have been used multiple times with acceptable results achieved during system restoration. The procedures are adequately segmented to permit appropriate flexibility in restoration of system piping segments based on the maintenance performed. These procedures, coupled with surveillance test procedures, provide the means to fill and vent the subject systems as well as purge air and other non-condensable gases from associated piping and components.

Procedure OP-AA-108-106, "Equipment Return to Service," provides controls to assure the correct performance of activities related to the return to service of plant equipment. The guidance in the procedure is not system-specific; rather, the procedure provides general requirements associated with returning plant equipment to service and clearance restoration. The procedure was revised as a result of the technical considerations identified in GL 2008-01 to require consideration of UT examinations to ensure proper fill and vent has been achieved. In addition, TMI procedures for the GL 2008-01 subject systems also include steps associated with the use of UT examinations during system restoration activities as required.

The fill and vent procedures were evaluated to determine if the sequence of steps was effective and whether venting of instrument lines was included. AmerGen determined that the sequence of steps was effective, and appropriately include considerations for instrument lines.

In summary, no corrective actions related to fill and vent procedures were identified as being necessary to address gas accumulation issues.

#### Potential Gas Intrusion Mechanisms

Examples of mechanisms that can result in unacceptable gas intrusion include:

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

## ATTACHMENT 10

### Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station

In conjunction with the actions discussed within this attachment, AmerGen'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.

#### Ongoing Industry Programs

Ongoing industry programs are planned in the following areas which may impact the conclusions reached during the design evaluation of TMI relative to gas accumulation, or may result in additional changes to the TMI design to provide additional margin.

- Gas Transport in Pump Suction Piping

The Pressurized Water Reactor Owners' Group 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.

#### C. TESTING EVALUATION

TMI test procedures were reviewed to determine whether the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, and whether the procedures require documentation of appropriate records. An industry-recommended template was followed to perform this review, and results have been documented.

There are no CLB requirements to periodically vent the GL 2008-01 subject systems. However, periodic monitoring of the HPI, DH, and BS systems is currently being performed in accordance with station procedures. AmerGen's review of the TMI test procedures concluded the procedures incorporate the requirements and acceptance limits contained in applicable design and licensing documents, the procedures require documentation of appropriate records, the procedures require identified gas voids to be entered into the Corrective Action Program for evaluation and disposition, and the procedures require periodic UT verifications. No corrective actions related to the TMI test procedures are required to address the potential for gas accumulation.

#### D. CORRECTIVE ACTIONS EVALUATION

AmerGen's Corrective Action Program is used to document gas intrusion/accumulation issues as potential nonconforming conditions. As part of AmerGen's Corrective Action

## **ATTACHMENT 10**

### **Generic Letter 2008-01 Nine-Month Response for Three Mile Island Nuclear Station**

Program, Issue Reports related to plant equipment are evaluated for potential impact on operability and reportability. Therefore, AmerGen's review concluded that issues involving gas intrusion/accumulation are properly entered, prioritized, and evaluated under the Corrective Action Program.

#### **E. CONCLUSION**

Based upon the reviews and changes discussed above, AmerGen has concluded that the GL 2008-01 subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance.

**ATTACHMENT 11  
Regulatory Commitments for Braidwood Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for Braidwood Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include requirements to verify affected instrument lines have been properly filled.	December 31, 2008	No	Yes

**ATTACHMENT 11**  
**Regulatory Commitments for Braidwood Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 12  
Regulatory Commitments for Byron Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for Byron Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include requirements to verify affected instrument lines have been properly filled.	December 31, 2008	No	Yes

**ATTACHMENT 12  
Regulatory Commitments for Byron Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 13  
Regulatory Commitments for Clinton Power Station**

The following list identifies those actions committed to by AmerGen Energy Company, LLC (AmerGen) for Clinton Power Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by AmerGen, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. AmerGen is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. AmerGen will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
For the HPCS system, one new vent will be installed prior to startup from the next refueling outage.	Prior to startup from the next refueling outage	Yes	No
For the RHR system, a modification will be installed to add vent and drain holes to an orifice.	Prior to startup from the next refueling outage	Yes	No

**ATTACHMENT 13  
Regulatory Commitments for Clinton Power Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
AmerGen will revise procedures CPS 3309.01, CPS 3312.01, and CPS 3313.01 to include requirements to verify affected instrument lines have been properly filled as part of system restoration activities.	January 9, 2009	No	Yes
AmerGen will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 14  
Regulatory Commitments for Dresden Nuclear Power Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for Dresden Nuclear Power Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
EGC's review of procedures that govern venting of the SDC system identified there are several vents installed on the system that are not currently used during venting activities. These procedures will be revised to incorporate use of additional vents to enhance venting practices.	October 31, 2008	No	Yes

**ATTACHMENT 14**  
**Regulatory Commitments for Dresden Nuclear Power Station**

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM- MATIC (YES/NO)
EGC will revise the procedure associated with fill and vent of the LPCI system to include requirements to verify affected instrument lines have been properly filled.	October 31, 2008	No	Yes
EGC will revise periodic venting surveillances for the HPCI, LPCI, and CS systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 15  
Regulatory Commitments for LaSalle County Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for LaSalle County Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No

**ATTACHMENT 15  
Regulatory Commitments for LaSalle County Station**

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
The HPCS system is connected to the Reactor Coolant System (RCS) through the injection line, which includes a normally closed injection valve and injection check valve. RCS leakage past both these valves would result in actuation of a pressure switch, actuation of a control room annunciator, and entry into the associated alarm response procedure. This procedure was revised to provide direction for identifying a temperature increase that could lead to saturated conditions within the piping, which could result in void formation.	Complete	No	Yes
The LPCS system is connected to the RCS through the injection line, which includes a normally closed injection valve and injection check valve. RCS leakage past both these valves would result in actuation of a pressure switch, actuation of a control room annunciator, and entry into the associated alarm response procedure. This procedure was revised to provide direction for identifying a temperature increase that could lead to saturated conditions within the piping, which could result in void formation.	Complete	No	Yes

**ATTACHMENT 15**  
**Regulatory Commitments for LaSalle County Station**

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM- MATIC (YES/NO)
The RHR system is connected to the RCS through several different lines, each containing valves that are normally closed. RCS leakage past these valves could potentially lead to saturated conditions within the piping, which could result in void formation. This would result in actuation of pressure switches and annunciation in the control room. Annunciator response procedures were revised to provide direction for identifying a temperature increase that could lead to saturated conditions within the piping, which could result in void formation.	Complete	No	Yes
EGC has revised the procedure associated with fill and vent of the HPCS system to include requirements to verify affected instrument lines have been properly filled.	Complete	No	Yes
EGC has revised the procedure associated with fill and vent of the LPCS system to add a requirement to use valves 1(2)E21-F027/F323 and 1(2)E21-F029/F324 during system venting.	Complete	No	Yes
EGC has revised the procedure associated with fill and vent of the HPCS system to add a requirement to use valves 1(2)E22-F026, 1(2)E22-F012, and 1(2)E22-F023 during system venting.	Complete	No	Yes

**ATTACHMENT 15**  
**Regulatory Commitments for LaSalle County Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
EGC has revised the procedure associated with fill and vent of the RHR system to add a requirement to use vent valves that were previously not used.	Complete	No	Yes
EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 16**  
**Regulatory Commitments for Limerick Generating Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for Limerick Generating Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
For the HPCI system, three new vents will be installed on each LGS unit prior to startup from the next scheduled refueling outage for each unit.	Prior to startup from the next refueling outage for each LGS unit	Yes	No

**ATTACHMENT 16**  
**Regulatory Commitments for Limerick Generating Station**

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
For the CS system, six new vents will be installed on each LGS unit prior to startup from the next scheduled refueling outage for each unit.	Prior to startup from the next refueling outage for each LGS unit	Yes	No
For the RHR system, one new vent will be installed on Unit 1, and two new vents will be installed on Unit 2, prior to startup from the next scheduled refueling outage for each unit.	Prior to startup from the next refueling outage for each LGS unit	Yes	No
EGC has revised procedure S52.1.A, "Core Spray Setup for Service Operation," to include requirements to verify affected instrument lines have been properly filled.	Complete	No	Yes
EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 17**  
**Regulatory Commitments for Oyster Creek Nuclear Generating Station**

The following list identifies those actions committed to by AmerGen Energy Company, LLC (AmerGen) for Oyster Creek Nuclear Generating Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by AmerGen, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. AmerGen is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. AmerGen will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
AmerGen's review of the procedure that governs venting of the SDC system identified there are vents installed on the system that are not currently used during venting activities. This procedure was revised to incorporate use of these vents during SDC system venting activities.	Complete	No	Yes

**ATTACHMENT 17**  
**Regulatory Commitments for Oyster Creek Nuclear Generating Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
AmerGen will revise procedures associated with fill and vent of the CS and Containment Spray systems to include requirements to verify affected instrument lines have been properly filled.	October 24, 2008	No	Yes
AmerGen will revise the periodic venting procedure for the CS system to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 18**  
**Regulatory Commitments for Peach Bottom Atomic Power Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for Peach Bottom Atomic Power Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
EGC will revise procedures associated with fill and vent of the GL 2008-01 subject systems to include requirements to verify affected instrument lines have been properly filled.	February 27, 2009	No	Yes

**ATTACHMENT 18**  
**Regulatory Commitments for Peach Bottom Atomic Power Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 19**  
**Regulatory Commitments for Quad Cities Nuclear Power Station**

The following list identifies those actions committed to by Exelon Generation Company, LLC, (EGC) for Quad Cities Nuclear Power Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by EGC, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. EGC is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. EGC will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No
EGC will revise fill and vent procedures as necessary to include requirements to verify affected instrument lines have been properly filled.	March 31, 2009	No	Yes

**ATTACHMENT 19  
Regulatory Commitments for Quad Cities Nuclear Power Station**

<b>COMMITMENT</b>	<b>COMMITTED DATE OR "OUTAGE"</b>	<b>COMMITMENT TYPE</b>	
		<b>ONE-TIME ACTION (YES/NO)</b>	<b>PROGRAM- MATIC (YES/NO)</b>
EGC will revise periodic venting procedures for the GL 2008-01 subject systems to include enhanced acceptance criteria and requirements to perform UTs on a graded approach as part of venting verifications of accessible high points.	April 30, 2009	No	Yes

**ATTACHMENT 20  
Regulatory Commitments for Three Mile Island Nuclear Station**

The following list identifies those actions committed to by AmerGen Energy Company, LLC (AmerGen) for Three Mile Island Nuclear Station in this submittal. Any other actions discussed in the submittal represent intended or planned actions by AmerGen, are described only for information, and are not regulatory commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAM-MATIC (YES/NO)
Potential TS improvements are being developed by the TSTF with the goal of an NRC-approved TSTF Traveler for making changes to individual licensee's TS related to the potential for adverse gas accumulation. The development of such a traveler hinges on the results of the evaluations of a large number of licensees to address the various plant designs. AmerGen is actively supporting the industry TSTF and NEI Gas Accumulation Management Team activities regarding resolution of generic TS issues. AmerGen will evaluate resolution of TS issues with respect to the elements contained in the TSTF, and submit a license amendment request, if deemed necessary based on this evaluation, within 180 days following NRC approval of the TSTF.	180 days after NRC approval of the TSTF Traveler	Yes	No