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SOUTHERN COMPANY
Energy to Serve Your World

July 31, 2009

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

Joseph M. Farley Nuclear Plant
Unit 1 Nine-Month Supplemental (Post-Outage) Response to
Nuclear Regulatory Commission 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. Request for Extension of the Three-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated April 8, 2008.
3. Three-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated May 30, 2008.
4. NRC Letter to Nuclear Energy Institute, dated July 8, 2008 (ML081830557).
5. Nine-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated October 10, 2008.
6. Unit 2 Nine-Month Supplemental (Post-Outage) Response to Nuclear Regulatory Commission Generic Letter 2008-01, dated February 19, 2009.

Ladies and Gentlemen:

The Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2008-01 (Reference 1) to request that each licensee evaluate the licensing basis, design, testing, and corrective actions 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.

As stated in Reference 5, please find attached (Enclosure 1) the Southern Nuclear Operating Company (SNC) supplemental response to the nine-month response letter. This supplemental response is being submitted within ninety days following the completion of the Joseph M. Farley Nuclear Plant (FNP) Unit 1 refueling outage (1R22). Also included are updates to Unit 2 information (Reference 6) which was submitted ninety-days following the recent Unit 2 refueling outage.

In summary, SNC has concluded that the subject systems at FNP are operable and that FNP is currently in compliance with the licensing basis documentation and applicable regulations, including 10 CFR 50 Appendix B, Criteria III, V, XI, XVI, and XVII, with respect to the concerns outlined in GL 2008-01 regarding managing gas accumulation in these systems/functions.

This letter contains an NRC commitment, described in Enclosure 2, to revise procedure(s) to incorporate the results of Unit 1 and Unit 2 laser scanning.

This submittal completes all FNP Unit 1 and Unit 2 required NRC responses associated with GL 2008-01.

Mr. M. J. Ajluni states he is Nuclear Licensing Manager of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

If you have any questions, please advise.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

Mark J Ajluni

M. J. Ajluni
Manager, Nuclear Licensing

Sworn to and subscribed before me this 31st *day of* July, *2009.*

Charlotte A. Graham
Notary Public

My commission expires: 6/9/12

MJA/JLS/phr

Enclosures: 1 - Unit 1 Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01
2 - Commitment Table

cc: Southern Nuclear Operating Company
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U. S. Nuclear Regulatory Commission
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Joseph M. Farley Nuclear Plant
Supplemental Response to Nuclear Regulatory Commission
Generic Letter 2008-01

Enclosure 1

Unit 1 Nine-Month Supplemental (Post-Outage)
Response to NRC Generic Letter 2008-01

Enclosure 1

Unit 1 Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01

This enclosure provides the Nine-Month Supplemental (Post-Outage) Response to Generic Letter (GL) 2008-01, as requested by the Nuclear Regulatory Commission (NRC) in a letter to Nuclear Energy Institute, dated July 8, 2008 (ML081830557), for actions that were deferred until the next refueling outage.

The following information is provided in this enclosure:

- A description of the results of evaluations that were performed pursuant to GL 2008-01 on the previously incomplete activities, such as system piping walkdowns, at Joseph M. Farley Nuclear Plant (FNP) (see Section A of this enclosure).

- A description of any additional corrective actions determined necessary to assure system operability and compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50 and the licensing basis and operating license with respect to the subject systems, including a schedule and a basis for that schedule (see Section B.1 of this enclosure), and summary of any changes or updates to previous corrective actions, including any schedule change and the basis for the change. (See Section B.2 of this enclosure).

- Updates to Unit 2 information which was submitted in SNC letter "Unit 2 Nine-Month Supplemental (Post-Outage) Response to Nuclear Regulatory Commission Generic Letter 2008-01," dated February 19, 2009.

The original conclusions documented in the nine-month response have not changed, that the licensing basis, design, testing, and corrective action evaluations, and the corrective actions resulting from these evaluations performed in response to GL 2008-01 provide reasonable assurance that the FNP Emergency Core Cooling (ECCS), Containment Spray (CS), and Residual Heat Removal (RHR) systems will continue to perform their required safety functions.

This enclosure only discusses the results of design evaluation reviews conducted for the recent Unit 1 and Unit 2 refueling outages, associated with previously uncompleted walkdown activities.

Enclosure 1

Unit 1 Nine-Month Supplemental (Post-Outage)
Response to NRC Generic Letter 2008-01

A. EVALUATION RESULTS

1. Design Basis Documents

There have been no changes to the design basis documents, and thus is no additional information to report, since the Southern Nuclear Operating Company (SNC) Nine-Month Response, dated October 10, 2008, to NRC GL 2008-01.

2. Confirmatory Walkdowns

a. Walkdowns and the technical evaluation of the laser scanning results have been completed for Unit 1 and Unit 2. The following is a summary of the results of that evaluation:

The confirmatory walkdown and the laser scanning of inaccessible areas were completed at FNP Unit 1 during the Spring, 2009 1R22 refueling outage, and for Unit 2 during the Fall 2008 2R19 refueling outage. For both Unit 1 and Unit 2, no additional configuration issues were identified during the walkdown activities. During technical evaluation of the laser scanning results, piping high spots were identified that could contain potentially unventable voids. For Unit 2, these locations have been reviewed against void size acceptance criteria and monitoring frequencies and the recently received Unit 1 results are currently being reviewed. By September 30, 2009 procedures will be modified, as appropriate, for the Unit 1 and Unit 2 locations.

b. The following is a summary of the results of Unit 1 venting utilized to ensure that voids in the identified high points were confirmed acceptable:

A gas void was found prior to the 1R22 refueling outage at one location. The location was in a vertical run of pipe from the liquid waste system that ties into the Charging Pump miniflow line before it goes back to the Charging Pump suction. A vent valve was installed at this location during the 1R22 outage and this gas void was vented. This void was then verified to be removed.

During the performance of gas void monitoring in containment while at power (prior to 1R22), a gas void was found in the A train RHR loop suction line used for normal reactor coolant system cooldown alignment. It was determined that this void formed after venting because the line segment is isolated during plant heatup and subsequently cools to ambient temperature. The void has been evaluated as acceptable since the gas void is smaller than the acceptable limit for that location.

3. Vent Valves

Vent valves were installed at five locations on FNP Unit 1. Three of these vent valves were installed on the Charging Pump miniflow piping at high points that did not have vent capability, one on the liquid waste discharge to the Charging Pump suction where a gas void was previously found, and one on the A Train RHR loop suction piping.

There were no modifications to vent valves or utilization of vent valves that were previously considered to be in inaccessible areas, since the SNC Nine-Month Response. As the need arises, and based on the results of monitoring, installation of additional vent valves will be evaluated.

4. Procedures

Since the SNC Nine-Month Response letter dated October 10, 2008, the following Unit 1 and 2 related procedure was revised to incorporate information such as pump discharge criteria and additional monitoring locations:

FNP-0-ETP-4574, "Gas Accumulation Monitoring and Trending"

B. DESCRIPTION OF NECESSARY ADDITIONAL CORRECTIVE ACTIONS

1. Additional Corrective Actions

Since the SNC Nine-Month Response, dated October 10, 2008, to NRC GL 2008-01, the following additional corrective action was identified:

Revise procedure FNP-0-ETP-4574, "Gas Accumulation Monitoring and Trending" to incorporate information such as pump discharge criteria, additional monitoring locations, updated gas volume acceptance criteria for discharge piping, and for total non-condensable gas in the Low-Head Safety Injection (LHSI) and High-Head Safety Injection (HHSI) systems.

The procedure was revised on April 21, 2009 to incorporate Unit 2 information, and revised on July 20, 2009 to incorporate Unit 1 information. This corrective action for FNP Unit 1 and Unit 2 is complete.

2. Corrective Action Updates

The following is a summary of changes and updates to previous corrective actions, including and schedule changes and the basis for the change. The following corrective actions, described in our October 10, 2008 response, are repeated below for clarity, followed by the status as of the completion of the FNP Unit 1 1R22 refueling outage:

a. A Corrective Action for procedure development/revision has been initiated to include requirements for periodic monitoring and trending of ECCS piping and CS System piping to ensure this piping is maintained sufficiently full of water such that the ECCS and CS Systems remain capable of performing their intended safety functions. This action will be complete by November 21, 2008.

Status:

Procedure FNP-0-ETP-4574 "Gas Accumulation Monitoring and Trending" was created, and monthly monitoring (by the use of preventive maintenance tasks)

was implemented for each unit. The procedure is the overall guiding gas voiding procedure. It contains specific acceptance criteria for monitored locations and overall acceptance criteria limits. The procedure lists locations that are monitored, using ultrasonic measurements, for gas voids and lists locations that are monitored by performance of routine venting by Operations. The procedure also includes the frequency for monitoring and guidance for ultrasonic monitoring performed by engineering personnel. The procedure was implemented on November 20, 2008 and the current version was issued on July 20, 2009. This corrective action for FNP Unit 1 and Unit 2 is complete.

b. FNP procedures will be revised to provide assurance that the volume of gas in the pump suction piping for the ECCS, RHR, and CS System is limited such that pump gas ingestion is within the PWROG program established interim criteria. Procedural guidance will be provided by November 21, 2008.

Status:

Procedure FNP-0-ETP-4574 "Gas Accumulation Monitoring and Trending" was created and monthly monitoring (by the use of preventive maintenance tasks) was implemented for each unit. The procedure is the overall guiding gas voiding procedure. It contains specific acceptance criteria for monitored locations and overall acceptance criteria limits. The procedure lists locations that are monitored, using ultrasonic monitoring, for gas voids and lists locations that are monitored by performance of routine venting by Operations. The procedure also includes the frequency for monitoring and guidance for ultrasonic monitoring performed by engineering personnel. The procedure was implemented on November 20, 2008 and the current version was issued on July 20, 2009. This corrective action for FNP Unit 1 and Unit 2 is complete.

c. SNC will implement the PWROG methodology for evaluation of pump discharge piping gas accumulation and establish the applicable limits for gas accumulation in the discharge piping of the affected systems. Air trapped in valve bonnets that could get in the piping of the subject systems will be accounted for in the pump discharge void acceptance criteria for FNP. FNP procedures will be revised to provide assurance that gas in the affected systems discharge piping is limited to within the acceptance criteria. SNC expects to receive the results of the application of this methodology by December 2008. SNC will determine if any follow up corrective actions are needed within 90 days following receipt of the evaluation. Final corrective action will be discussed in our follow-up letter.

Status:

The HHSI, LHSI, and CS pump discharge piping were evaluated for water-hammer. This includes a plant specific evaluation to assess the influence of the flow restrictions (orifices and throttle valves) in the hot leg injection flow path. The evaluations provide an assessment of the maximum pressures that could result from both pump starts due to a receipt of a safety injection signal, as well as during pump surveillance testing. This information was used to determine the maximum gas volume that can be accumulated within the piping highpoints to

prevent challenging the system relief valves and confirm the load on the piping system remains within the design of the piping restraints. The assessment of the relief valves is a function of the total gas volume in the system and therefore is system related. The evaluation for the piping loads is typically governed by the gas volume that could be accumulated in the highpoint with the largest volume. In this regard, a bounding (system related) criterion was determined. Selected highpoints will be monitored to provide reasonable assurance that the total gas volume is less than the system related criterion.

The gas that could be collected in check valves was included in the total gas system volume (discussed above). The gas volumes that are collected in the bonnets of globe and gate valves were not included since they do not actively participate in the fluid stream and act as local surge suppressors that reduce the waterhammer impulse and therefore the piping loads.

The acceptance criteria for the discharge piping were incorporated into the FNP procedure FNP-0-ETP-4574, "Gas Accumulation Monitoring and Trending." Per the corrective action statement, "SNC will determine if any follow up corrective actions are needed within 90 days following receipt of the evaluation." The evaluation for Unit 2 was received on February 17, 2009 and the acceptance criteria for the Unit 2 discharge piping was incorporated in the version of FNP-0-ETP-4574 issued on April 21, 2009. The evaluation for Unit 1 was received on April 24, 2009, and the acceptance criteria for the Unit 1 discharge piping was incorporated in the version of FNP-0-ETP-4574 issued on July 20, 2009. This corrective action for FNP Unit 1 and Unit 2 is complete.

d. The FNP Containment Spray System discharge header piping will be evaluated using the PWROG methodology. Using this methodology it will be determined if the force imbalances on the Containment Spray System discharge header piping are within the margin of the pipe hanger design. SNC expects to receive the results of the application of this methodology by December 2008. SNC will determine if any follow up corrective actions are needed within 90 days following receipt of the evaluation. Final corrective action will be discussed in our follow-up letter.

<u>Status</u>:

The transient force imbalances on the containment spray headers have been analyzed. These spray headers have a different configuration than was considered in the generic methodology developed for the Pressurized Water Reactor Owners Group (PWROG). Specifically, the water supplies for the individual semi-circular ring headers are near one end of the header and the headers fill in essentially one direction. There are six headers for each train with five of these being semi-circular with equal gas volumes on the two ends that would be trapped as the header fills. The sixth header is oriented vertically downward in the center of the containment and would fill from the bottom to the top and is not subject to the gas-water waterhammer conditions evaluated for the other five headers.

Because of these differences in the header configuration, a similar but modified methodology was used for the evaluation. As with the PWROG methodology, the maximum pressurization rate is evaluated when the last spray nozzle has been covered and this rate is conservatively calculated by the full flow of the spray water at this time. It is also noted that no decrease in the water velocity is credited as a result of the compression wave developed by the pressurization.

With this evaluation, the maximum transient force imbalance was found to be less than the dead weight of the piping for each header. Given the small and transient nature of these loads, these would not result in a gas-water waterhammer that would challenge the operability of the containment spray system.

In conclusion, a gas-water waterhammer event would not cause a problem in the FNP spray headers and no actions are required. This corrective action for FNP Unit 1 and Unit 2 is complete.

e. Since the FNP ECCS flow path for switchover to hot leg injection has flow restrictions (orifices and throttle valves) in the hot leg injection flow path, the PWROG methodology cannot be used. As such, a detailed plant specific evaluation will be performed to assess the influence of the flow restriction(s). The FNP specific evaluation will determine allowable void sizes that will prevent significant waterhammer, in other words, none of the relief valves in the subject systems would lift and none of the piping restraints would be damaged as a result of the flow restrictions in the flow path. This evaluation will be completed by December 2008. SNC will determine if any follow-up corrective actions are needed within 90 days following receipt of the evaluation. Final corrective action will be discussed in our follow-up letter.

Status:

This plant specific evaluation was part of the evaluations performed for Section B.2.c. above, and is discussed in the status of Section B.2.c.

f. The FNP procedures will be revised, as necessary, to provide assurance that the gas accumulation in any sections of the FNP LPSI [LHSI] injection system cold leg and hot leg piping is verified to be less than 5 cubic feet of non-condensable gas at 100 psia at any location. FNP procedures will also be revised to provide assurance that the gas accumulation in any sections of the FNP HHSI cold and hot leg injection is verified to be less than 5 cubic feet of non-condensable gas at 400 psia at any location. These procedure revisions will be completed by November 21, 2008.

Status:

Procedure guidance is provided in FNP-0-ETP-4574, "Gas Accumulation Monitoring and Trending." The procedure is the overall guiding gas voiding procedure. It contains specific acceptance criteria for monitored locations and overall acceptance criteria limits. The procedure contains acceptance criteria that gas accumulation of the LHSI system cold leg and hot leg piping must be

less than 5 cubic feet of non-condensable gas at 100 psia and that gas accumulation of the HHSI system cold and hot leg injection must be less than 5 cubic feet of non-condensable gas at 400 psia. The procedure was implemented on November 20, 2008. Subsequent to the issuance of the procedure on November 20, 2008, the need for further clarification regarding acceptance criteria was noted. The revised acceptance criteria were incorporated in to the procedure on February 19, 2009. This corrective action for FNP Unit 1 and Unit 2 is complete.

g. For Unit 2, three new vent valves will be installed by the end of the Fall 2008 Unit 2 refueling outage. For Unit 1, one new vent valve will be installed by the end of the Spring 2009 Unit 1 refueling outage. SNC will complete the evaluation of the other locations to determine if vent valves need to be installed and/or if these locations should be monitored. SNC expects to receive the results of an evaluation using the PWROG methodology by December 2008. SNC will determine if any follow up corrective actions are needed within 90 days following receipt of the evaluation. Final corrective action will be discussed in our follow-up letter.

Status:

Vent valves were installed at three locations on Unit 2 during the 2R19 outage. Two of these vent valves were installed on the A train Charging Pump suction lines, one on the RHR supply line at the 2A Charging Pump suction and the other on the RWST supply line to the 2A Charging Pump suction. The third vent was installed on a high point in the Charging Pump miniflow line.

Vent valves were installed at five locations on Unit 1 during the 1R22 outage. Three of these vent valves were installed on the Charging Pump miniflow piping at high points that did not have vent capability, one on the liquid waste discharge to the Charging Pump suction where a gas void was previously found, and the one on the A Train RHR loop suction piping.

An evaluation of the other locations was completed using the developed discharge piping acceptance criteria and monitoring and trending results to determine if vent valves need to be installed or these locations should be monitored. The results of this evaluation concluded that twenty-three locations in the Unit 1 discharge piping and thirteen locations in the Unit 2 discharge piping should be considered for addition to the monitoring program. These locations were evaluated by SNC for inclusion to the monitoring program and nine Unit 1 locations and thirteen Unit 2 locations were added to the program.

Per the corrective action statement, "SNC will determine if any follow up corrective actions are needed within 90 days following receipt of the evaluation." The evaluation was received on February 17, 2009 and the evaluation completed on April 23, 2009. As a result of this evaluation, the following follow-up corrective actions were identified:

Upon receipt of the evaluation that utilized PWROG methodology, the identified locations to monitor were evaluated (by ultrasonic testing) for gas

voids. The voids were verified to be less than the acceptance criteria and, as follow-up corrective actions, thirteen Unit 2 monitoring points were incorporated into the monitoring program procedure FNP-0-ETP-4574 (Version 3) and nine Unit 1 monitoring points were incorporated into the monitoring program procedure FNP-0-ETP-4574 (Version 4). These corrective actions for FNP Unit 1 and Unit 2 are complete.

h. The Unit 2 un-insulated subject system piping that is inside containment will be walked down during the Fall 2008 refueling outage. The Unit 2 subject system piping that is located outside of containment will also be walked down, where practical, during the Fall 2008 refueling outage.

   The Unit 1 un-insulated subject system piping that is inside containment will be walked down during the Spring 2009 refueling outage. The Unit 1 subject system piping that is located outside of containment will also be walked down, where practical, during the Spring 2009 refueling outage.

   Status:

   Unit 2 walkdowns were completed during outage 2R19. Unit 1 walkdowns were completed during outage 1R22. No configuration issues were identified. These corrective actions for FNP Unit 1 and Unit 2 are complete.

i. A Corrective Action for potential procedure revisions was initiated to evaluate the comments resulting from the operating procedure review. The Corrective Action will require reviewing the comments to determine the scope of the necessary procedure revisions. This Corrective Action will be complete by June 30, 2009.

   Status:

   This corrective action, to review the comments and determine the scope of the necessary procedure revisions, is complete. The comments were reviewed and the scope of procedure revisions determined. Operation and Maintenance procedures were revised as necessary. This corrective action for FNP Unit 1 and Unit 2 is complete.

Conclusion

SNC has evaluated the previously unevaluated portions of the applicable systems at FNP that perform the functions described in the GL and has concluded that these systems are operable. All FNP Unit 1 and Unit 2 required NRC responses associated with GL 2008-01 are complete.

Joseph M. Farley Nuclear Plant
Supplemental Response to Nuclear Regulatory Commission
Generic Letter 2008-01

Enclosure 2

Commitment Table

Enclosure 2

Commitment Table

Commitment	Type		Scheduled Completion Date
	One-Time Action	Continuing Compliance	
Revise procedure(s), as appropriate, to incorporate results of Unit 1 and Unit 2 laser scanning.	X		September 30, 2009