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

RE Florida Power & Light Company
Turkey Point Unit 4
Docket No. 50-251

Subject: Turkey Point Unit 4: Nine-Month Supplemental (Post-Outage) Response to NRC 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." January 11, 2008.
 2. Extension Request Regarding the Three-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." Letter No. L-2008-076. April 9, 2008 (ML081050251).
 3. Three-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." Letter No. L-2008-105. May 9, 2008 (ML081430648).
 4. Turkey Point, Units 3 & 4, 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. MD7890 and MD7891). September 19, 2008 (ML082540437).
 5. Nine-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." Letter No. L-2008-218. October 14, 2008.
 6. Turkey Point Unit 3: Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01. Letter No. L-2009-178. August 6, 2009 (ML092300113).

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 Action Program (CAP) action requests (ARs) for the Emergency Core Cooling System, Decay Heat Removal System, and Containment Spray System to ensure that gas accumulation is maintained less than the void volume that challenges operability of these systems, and that appropriate action is taken when conditions adverse to quality are identified.

By letter dated May 9, 2008 (Reference 3), FPL submitted the requested three-month response to GL 2008-01 for the Turkey Point nuclear units. The NRC Staff's assessment of the response for the Turkey Point nuclear units is documented in Reference 4.

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In Reference 3, commitments were made to provide supplemental letters to the nine-month response letter (Reference 5) for both Turkey Point units. The Unit 3 letter was provided in Reference 6. This supplemental response for Unit 4 is being submitted within 90 days of startup from the Unit 4 fall 2009 outage in which the deferred actions were completed. This is consistent with the commitment.

In summary, FPL has concluded that the subject systems and functions at Turkey Point Unit 4 are operable, and that Turkey Point Unit 4 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.

There are no new commitments contained in this letter.

If you have any questions regarding this matter, please contact Mr. Robert Tomonto, Licensing Manager, at (305) 246-7327.

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

Executed on March 2, 2010.

Sincerely yours, *Paul W. Rubin*



Michael W. Kiley
Site Vice President
Turkey Point Nuclear Plant

Enclosure

cc: NRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
Senior Resident Inspector, USNRC, Turkey Point Nuclear Plant

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

As committed to the Nuclear Regulatory Commission (NRC) in Reference 5, this enclosure provides the nine-month supplemental response (post-outage) for Turkey Point Unit 4 to NRC Generic Letter 2008-01 for actions that were deferred until the Unit 4 fall 2009 refueling outage.

The following information is provided in this enclosure:

- a) A description of the results of evaluations performed pursuant to Generic Letter 2008-01 on the previously incomplete activities such as system piping walk downs and ultrasonic testing (UT) at Turkey Point Unit 4 (see Section A of this enclosure).
- b) A description of any additional commitments and 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).

A. TURKEY POINT UNIT 4 EVALUATION RESULTS

1. Design Basis Documents

Changes to the Turkey Point Unit 4 design basis documentation were required as part of the modification process to incorporate four vent valves that were installed during the fall 2009 refueling outage. The locations of these valves are discussed below in Section A.3.

Calculations and analyses were performed to identify unvented locations at high points that could potentially harbor voids and to establish acceptance criteria for gas accumulation in the suction and discharge piping of the Unit 4 Emergency Core Cooling System (referred to at the Turkey Point nuclear units as Safety Injection or SI), Decay Heat Removal System (referred to at the Turkey Point nuclear units as Residual Heat Removal or RHR), and the Containment Spray System (CS). Discussions have been added to the design basis documents for these systems describing the long term gas accumulation monitoring program that has been implemented at the Turkey Point nuclear units.

Results of the analyses described above are discussed in Section A.2, below.

2. Confirmatory Walk Downs

a. Overview

Prior to the Unit 4 fall 2009 refueling outage, system isometric drawings were reviewed to determine potential high points in the systems where gas accumulation may occur. During the outage prior to placing RHR in service, eighteen possible piping high points in the RHR System inside containment were UTed to verify that the system was water-solid. At the time of the initial UT inspections performed prior to placing RHR in service, slope laser scanning

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

which would have confirmed the actual piping high points had not been completed. Therefore, all suspected high points were UTed, and later in the outage, the results were compared to actual high points as determined by laser scanning. The results of these UT inspections confirmed that all high points were water-solid except for a section of RHR suction piping between MOV-4-750 and MOV-4-751 (high points P-213 through P-217). This section of pipe was found to contain a void that was approximately 22.8 ft³. Although an operability assessment was already in place that evaluated potential voiding in RHR suction piping, actions were performed in accordance with procedures that required opening MOV-4-750 prior to opening MOV-4-751 to collapse and/or displace the void into the RCS System. Subsequent UTs performed prior to placing RHR in service confirmed that this section of pipe was water-solid. In addition to the RHR System, thirteen possible high points in SI piping were also UTed prior to placing RHR in service. No voiding was found in the SI piping.

b. Acceptance Criteria

The as-found UT examinations were satisfactory. General acceptance criteria for gas accumulation in RHR, CS and SI suction piping are based on limiting gas entrainment after a pump start. A Pressurized Water Reactor Owners Group (PWROG) program has established interim pump gas ingestion limits for suction piping and void size for discharge piping. For suction piping, the acceptance criteria for a void fraction entering a single CS, SI or RHR pump is taken as 2% or less of the volume (continuous) and 5% or less of the volume (transient). For the discharge piping, the acceptance criteria were based on limiting the void size such that peak pressure pulsations did not exceed the design pressure capacity for the associated piping class, exceed relief valve set points on the particular piping system, or cause large transient loadings on piping and piping supports. These limits have been used as guidance to establish acceptance criteria for the SI, RHR and CS suction and discharge piping at Turkey Point Units 3 and 4.

A plant-specific evaluation was performed for use in operability determinations to define acceptance criteria for gas voids in piping of the GL 2008-01 systems based upon the PWROG gas ingestion limits. These criteria apply to the entire system and, as such, are conservative. Results are provided in Table 1.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

Table 1: Acceptance Criteria Used During the System Confirmation Walk Downs

System	Location	Acceptable Void Size
RHR	RHR suction piping (located $\geq 18'$ above the pump inlet elevation)	0.300 ft ³
RHR	RHR pump suction from the Containment Sump and RWST (located $< 18'$ above the pump inlet elevation)	0.150 ft ³
RHR	RHR Suction (RCS Cooling)	0.885 ft ³
CS/SI	All CS / SI pump suction piping excluding piggyback piping	0.030 ft ³
CS/SI	Piggyback piping from RHR discharge	0.105 ft ³
RHR/CS/SI	All discharge piping OD $\geq 4''$	0.250 ft ³
SI	Discharge piping OD = 3"	0.150 ft ³
SI	Discharge piping OD = 2"	0.015 ft ³

The above limits are consistent with what was reported previously in References 5 and 11. In addition to the above limits, the average void fraction was also limited to 40% in any segment of pipe and a peak void fraction was limited to 80%. These limits are consistent with the maximum conditions present in industry tests (documented in Reference 8).

No further evaluation for system impact is necessary on a generic basis for voids within the acceptance criteria presented in Table 1. Discovered voids that have a volume less than or equal to these values will always be acceptable. However, exceeding these values will not necessarily be unacceptable. Increased allowable void size at both Turkey Point units has been determined for a few specific locations on a case-by-case basis using a more detailed transient gas transport analysis. For example, High Point P-208 is on an eight inch RHR discharge pipe in Unit 4. Based on the information in Table 1, the acceptable criterion for this location stipulates that voids less than 0.25 ft³ would not compromise operability. However, detailed gas transport analysis has been done that justifies an increase of this value to as much as 4.0 ft³ at 58 psia (Reference 9). (The amount is considered an acceptable value for the sum of voids at High Point locations P-207 through P-212.) That means a void found in High Point P-208 that is larger than 0.250 ft³ would still be acceptable provided the sum of all Primary path RHR voids was less than 4.0 ft³.

Evaluations have concluded that containment spray discharge piping downstream of the pump discharge isolation valve can be completely voided. All piping upstream of this valve is required to meet established acceptance criteria.

In addition to the individual void limits specified above, the cumulative volume of all gas transported to the RCS must be less than the values shown in Table 2 and Table 3, below. These values are taken from Reference 7 which documents an assessment performed by

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

Westinghouse on the potential effects of noncondensable gas voids in SI piping. At UT test conditions of approximately 45 psia and 100°F, the cumulative limit is 17 ft³.

Table 2: Maximum Acceptable Gas Void in High Pressure SI Piping Evaluated for Cold Leg Injection under Transient Conditions

Pressure (psia)	Temperature (°F)	Volume (ft ³)
1800	621	2.3
1000	545	3.8
400*	350*	7.7
14.7	212	173.2

* Corresponds to approximate residual heat removal / shutdown cooling system in-service conditions

Table 3: Maximum Acceptable Gas Void in Low Pressure SI Piping (RHR) Evaluated for Cold Leg Injection under Transient Conditions

Pressure (psia)	Temperature (°F)	Volume (ft ³)
400*	350*	1.9
200	380	4.0
100	328	7.5
14.7	212	43.3

* Corresponds to approximate residual heat removal / shutdown cooling system in-service conditions

c. Results of Walk Downs and UT Examinations

As noted in Section A.2.a, a gas void was detected in RHR suction piping between MOV-4-750 and MOV-4-751. Although an operability assessment was already in place that evaluated potential voiding in RHR suction piping, actions were performed in accordance with procedures that required opening MOV-4-750 prior to opening MOV-4-751 to collapse and/or displace the void into the RCS System. Subsequent UTs performed prior to placing RHR in service confirmed that this section of pipe was water-solid. In addition to the RHR System, thirteen possible high points in SI piping were also UTed prior to placing RHR in service. No voiding was found in the SI piping.

The formation of the void between valves MOV-4-750 and MOV-4-751 is not a unique event. During the spring 2009 Unit 3 refueling outage, a void found between the same two valves, MOV-3-750 and MOV-3-751, was documented in Condition Report CR-2009-7682. Corrective actions included a procedure change to sequentially open MOV-N-750 and MOV-N-751 (where N is the Turkey Point unit) such that any voiding would be collapsed. Similarly, Condition Report CR-00-1164 evaluated INPO OE 11134, which also discussed

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

the formation of voids between these valves. The apparent cause for the void found between these valves during the recent Unit 3 refueling outage (documented in Reference 11) was attributed to the thermal contraction of the water captured between MOV-3-750 and MOV-3-751.

A summary of the results for the void found between MOV-4-750 and MOV-4-751 is provided in Table 4.

Table 4: Gas Void Detected during Walk Down UT Examinations

System	Location	Description	Acceptance Criteria	Measured Void Size
RHR	P-213, P-214, P-215, P-216, P-217	Suction piping, 14" pipe between valves MOV-4-750 and MOV-4-751 at elevation 19'	Procedures require valves to be sequentially operated to collapse and flush all voids in this volume before RHR is put in service	22.8 ft ³ (pressure unknown)

d. Post-Maintenance and Post-Modification UT Examinations

Maintenance and plant modification activities performed during the fall 2009 refueling outage that required draining and refilling of the SI, RHR and CS systems were reviewed to identify vulnerable locations where voids could have been introduced. Before the end of the outage, all vulnerable locations but one was verified to be water-solid. The one location that was not vented or UTed at outage completion was High Point P-225. This location is in the hot leg injection of SI near vent valve 4-941B, downstream of MOV-4-869 and upstream of MOV-4-866A/B

Typically, locations that are inside containment like P-225 are inaccessible, and therefore, cannot be monitored on a routine basis during normal operation. Instead, these locations are monitored during refueling outages when they become accessible. For trending purposes, a UT is performed on these locations at the beginning of outages to document the accumulation of any gases. Each location is again UTed or vented at the end of the outage (as required by procedure) to verify a water-solid condition for base-line comparisons between outages. At the end of the fall 2009 outage for Unit 4, the locations inside containment were vented to verify the water-solid condition. However during a post-outage-review, location P-225 could not be verified to have been UTed or vented at the time. It was later UTed to verify it was a water-solid condition during a forced outage in January 2010. Note that the as-found condition prior to the fall 2009 outage was also water-solid.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

3. Vent Valves

Inaccessible Locations

The walk downs and UTs performed on *inaccessible* locations during the 2009 Turkey Point Unit 4 refueling outage identified a void at one location (the discovery of this was discussed in Section A.2.c and in Table 4). This location was evaluated to determine required actions to prevent gas accumulation. An analysis determined that a vent valve for this location was unnecessary. Rather, the collapsing and/or flushing of any accumulated void at this location by the controlled manipulation of valves is controlled by procedure. Remaining locations that might require venting were determined to be acceptable as-is and do not require the installation of vent valves based on the presence of existing vent valves that could be used to vent any accumulated gas.

Table 5: Inaccessible Locations at Turkey Point Unit 4 Considered for Vent Valve Installation

Location	Description	Comment
P-204	RHR, 8" pipe upstream of check valve 4-876E at elevation 21'-5"	Vent valve 4-490X is already available for venting.
P-205	RHR, 8" pipe upstream of check valve 4-876D at elevation 24'-4 7/16"	Vent valve 4-490J is already available for venting.
P-208	RHR, 8" pipe downstream of vent valve 4-876E at elevation 23'-6"	Vent valve 4-4922 is already available for venting.
P-209	RHR, 8" pipe upstream of valve 4-490H at elevation 21'-5"	Vent valve 4-490H is already available for venting.
P-211 P-212	RHR, 8" pipe upstream of check valve 4-876C at elevation 21'-6"	Vent valve 4-490L is already available for venting.
P-213	RHR, 14" pipe between valves MOV-4-750 and MOV-4-751 at elevation 19'	Vent valve 4-490L is already available for venting.
P-225	SI, 2" pipe upstream of valve 4-866B at elevation 26'-10"	Vent valve 4-941B is already available for venting.

Procedure changes have been implemented to specify use of the vent valves during normal system filling and venting. The revised procedures are discussed in Section A.4 below.

Accessible Locations

Reference 5 states that all *accessible* locations at Turkey Point Unit 4 were dispositioned in October 2008 as not requiring the installation, modification, or utilization of a new vent valve. However, on-going reviews sparked by evolving industry activities related to the GL and pipe scanning of field conditions to verify any slope identified four accessible locations with a piping configuration that may be susceptible to gas accumulation where no venting capability exists. As

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

a proactive enhancement, new vent valves were installed at each of these four locations during the fall 2009 refueling outage. The addition of these valves will allow for future venting, if it becomes necessary at these locations.

Vent valves added to Unit 4 *accessible* areas are identified below:

Table 6: Vent Valves added to Turkey Point Unit 4 Accessible Areas

Location	Description	Valve Number
P-27	SI, 2" pipe off penetration 58 at elevation 28' 6"	4-1493
P-28	SI, 2" pipe off penetration 60 at elevation 28' 6"	4-1494
P-29	SI, 2" pipe off penetration 59 at elevation 31'	4-1492
P-53	RHR, 12" pipe downstream of FE-4-605	4-1501

4. Procedures

Nine procedures have been revised or created to fully implement the Gas Accumulation Management Program at Turkey Point Unit 4. Changes to incorporate the addition of four new vent valves on Unit 4 (all four in accessible locations as discussed in Section A.3, above) were reflected in these procedure changes. Similarly, changes were made to require venting, prior to returning the unit to service.

Table 7: Procedure Changes for New Vent Valves

Procedure	Procedure Title
0-AMD-547	"Gas Accumulation Management Program"
0-OSP-202.3	"Safety Injection Pump and Piping Venting"
0-OSP-205	"Verification of Administratively Controlled Valves, Locks and Switches"
4-NOP-062	"Safety Injection"
4-NOP-068	"Containment Spray System"
4-OP-041.8	"Filling and Venting of the Reactor Coolant System"
4-OP-050	"Residual Heat Removal System"
4-OSP-051.12	"Refueling Containment Penetration Alignment"
4-OSP-202.2	"RHR Pump and Piping Venting"

Implementation of the Gas Accumulation Management Program and these procedures is intended to be an ongoing process that will continue to evolve with industry, site and corporate experience as well as reflect evolving NRC concerns. As such, this list of procedures may not be all inclusive and may be expanded to address additional program enhancements.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

5. Training

Currently, site training has been provided to Turkey Point personnel involved with executing field UTs. Additionally, generic training on entrained gas management is being developed. This training is being designed with targeted audiences of Engineering, Maintenance, Operations, and Chemistry. The mission is to ensure the target population has the appropriate knowledge to prevent conditions that might create voids or encumber the ability to manage them once they exist, to identify symptoms of gas intrusion, and to promote effective corrective actions. Like the Gas Accumulation Management Program, training on this issue will evolve with industry experience. Future training needs beyond this will be identified by the Turkey Point Training Review Committee(s).

B. DESCRIPTION OF NECESSARY ADDITIONAL COMMITMENTS AND CORRECTIVE ACTIONS

1. Additional Commitments and Corrective Actions

a. Additional Commitments

No additional regulatory commitments are being addressed in this response.

b. Additional Corrective Actions

Corrective actions for Turkey Point Unit 4 that had not been previously identified in Reference 5 such as procedure revisions and the installation of specific vent valves have already been discussed earlier in this document. Beyond these, there is no additional corrective action for Unit 4.

2. Commitment and Corrective Action Updates

a. Commitment Updates

Four regulatory commitments were identified in the nine-month response letter (Reference 5). They are reiterated below with an update as appropriate.

- i. (Excerpt from Reference 5) From Reference [3], FPL will provide a complete GL 2008-01 submittal 90 days after the end of the Unit 3 spring 2009 refueling outage. This submittal will complete the design evaluation review based on the completed walk downs of inaccessible area piping, completed evaluation results, and schedule for any additional corrective actions based on the completed evaluations for Unit 3.

Update: This letter has been provided by the required date (Reference 11). Therefore, this commitment is satisfied.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

- ii. (Excerpt from Reference 5) From Reference [3], FPL will provide a complete GL 2008-01 submittal 90 days after the end of the Unit 4 fall 2009 refueling outage. This submittal will complete the design evaluation review based on the completed walk downs of inaccessible area piping, completed evaluation results, and schedule for any additional corrective actions based on the completed evaluations for Unit 4.

Update: The fall 2009 outage ended on December 4, 2009. Ninety days after this date is March 4, 2010. This letter is being provided by this date and completes the design evaluation review for Turkey Point Unit 4. Therefore, this commitment is satisfied.

- iii. (Excerpt from Reference 5) FPL commits to submit to the NRC proposed changes to the Turkey Point Units 3 and 4 Technical Specifications based upon the final, approved version of Technical Specification Task Force (TSTF) traveler for unacceptable gas accumulation in SI, adjusted, as needed, to account for plant-specific Turkey Point Units 3 and 4 design and licensing basis, within 180 days following NRC publication of the Notice of Approval of the TSTF traveler in the Federal Register and the Consolidated Line Item Improvement Process Notice of Availability.

Update: Industry efforts to prepare the subject TSTF continue. However, a Notice of Approval of the TSTF traveler or a Consolidated Line Item Improvement Process Notice of Availability has not yet been published. Consequently, this commitment remains unchanged and unscheduled.

- iv. (Excerpt from Reference 5) FPL commits to developing a long term gas monitoring program for Turkey Point to manage gas accumulation in SI, RHR, and CS Systems. FPL will develop the program and associated procedures in parallel with the industry activities and implement the program by June 30, 2009.

Update: A site-specific Gas Accumulation Management Program (0-ADM-547) has been developed and implemented at the Turkey Point nuclear units. This involved the creation of new program documents and the assignment of a program owner. This is a "living" program, meaning it will evolve to incorporate on-going industry, site and corporate experience as well as reflect evolving NRC concerns. Implementation of this program and the supporting procedures was completed by June 30, 2009, as documented in Reference 11. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well. As such, this commitment has been satisfied.

b. Corrective Action Updates

Corrective actions were previously identified in the nine-month response (Reference 5) in sections requesting a detailed list of items that had not been completed, a schedule for their completion, and the basis for that schedule. An update of these items is provided below:

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

i. Reference 5: Section A. EVALUATION RESULTS / Licensing Basis Evaluation / Section 3 (page 4 of 24)

- a) (Excerpt from Reference 5) FPL plans to evaluate the TSTF traveler and submit a TS change request, as needed. However, no current schedule exists for the availability of the TSTF traveler for use in revising the Turkey Point TSs. As such, FPL plans to perform these actions within 180 days following NRC publication of the Notice of Approval of the TSTF traveler in the Federal Register and the Consolidated Line Item Improvement Process (CLIIP) Notice of Availability. This will allow an appropriate amount of time for its evaluation and necessary actions taken that result from that evaluation that might lead to a TS change submittal.

Once the Notice of Approval of the TSTF traveler is published in the Federal Register, its review and evaluation will be tracked in the Corrective Action Program. The proposed changes will be submitted, as needed, 180 days after the Notice of Approval has been published in the Federal Register.

Update: Industrial efforts to prepare the subject TSTF continue. However, a Notice of Approval of the TSTF traveler or a CLIIP has not yet been published. Consequently, the response to this item remains unchanged and unscheduled.

- b) (Excerpt from Reference 5) Any changes to licensing basis documents resulting from industry testing and analytical programs related to gas accumulation are dependent upon the completion of these industry efforts. A defined schedule does not currently exist for their completion, and it is not clear what the outcome will be. As such, there is no clear basis at this time on what to estimate a completion date for this item. As these changes become more clearly defined, they will be captured and tracked in the Corrective Action Program.

Update: Turkey Point has implemented a Gas Accumulation Management Program. This program will evolve to incorporate on-going industry experience. Operating [industry] experience will be routinely reviewed and if appropriate, be incorporated into the program in a controlled manner employing the Corrective Action Program. This may include the identification and implementation of future changes to procedures and licensing basis documents resulting from industry testing and analytical programs. Currently, the UFSAR and design basis documents have been revised to incorporate a discussion on the management of accumulated gas in the RHR, SI and CS Systems in accordance with the site program.

- c) (Excerpt from Reference 5) Changes to the UFSAR will be completed by June 30, 2009. This will provide sufficient resources to perform an engineering review and

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

evaluation of the proposed UFSAR changes along with the associated procedure changes and incorporate the information related to the long term gas monitoring program.

This revision to the UFSAR and revisions to the implementing procedures will be tracked in the Corrective Action Program.

Update: The Turkey Point UFSAR has been revised to describe the methodology by which the accumulation of gas is monitored in the RHR, SI and CS Systems. This has been done in accordance with the identified schedule. Therefore, this corrective action is complete.

- d) (Excerpt from Reference 5) FPL will provide a complete GL 2008-01 submittal for Unit 3, 90 days after the end of the Unit 3 Spring 2009 refueling outage. This submittal will complete the design evaluation review based on the completed walk downs of inaccessible area piping, completed evaluation results, and schedule for any additional corrective actions based on the completed evaluations for Turkey Point Unit 3.

Update: This letter has been provided by the required date (Reference 11). Therefore, this corrective action is satisfied.

- e) (Excerpt from Reference 5) FPL will provide a complete GL 2008-01 submittal for Unit 4, 90 days after the end of the Unit 4 Fall 2009 refueling outage. This submittal will complete the design evaluation review based on the completed walk downs of inaccessible area piping, completed evaluation results, and schedule for any additional corrective actions based on the completed evaluations for Turkey Point Unit 4.

Update: The fall 2009 outage ended on December 4, 2009. Ninety days after this date is March 4, 2010. This letter is being provided by this date and completes the design evaluation review for Turkey Point Unit 4. Therefore, this corrective action is satisfied.

ii. Reference 5: Section A. EVALUATION RESULTS / Design Basis Evaluation / Section 12 (page 16 of 24)

- a) (Excerpt from Reference 5) There is no existing long term void management program for Turkey Point. Such a program will provide specific acceptance criteria and establish practices consistent with industry standards. New procedures and other necessary documentation are needed to implement this. Implementation of such a

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

program will be complete by June 30, 2009, to allow time for industry advancements and for coordination with the FPL Fleet.

This item will be tracked in the Corrective Action Program.

Update: A site-specific a Gas Accumulation Management Program (0-ADM-547) has been developed and implemented at the Turkey Point nuclear units. This involved the creation of new program documents and the assignment of a program owner. This will be a "living" program, meaning it will evolve to incorporate on-going industry, site and corporate experience. This program and its supporting procedures were implemented by June 30, 2009, as documented in Referenced 11. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well. As such, this commitment has been satisfied.

- b) (Excerpt from Reference 5) A discussion of long term void management will be inserted in the design basis documents for SI, CS and RHR Systems. This is scheduled for June 30, 2009, to coincide with the implementation of the void management program.

This item will be tracked in the Corrective Action Program.

Update: The design basis documents for the RHR, SI and CS Systems have been revised in accordance with the identified schedule to include a discussion on the methodology used to monitor the accumulation. Therefore, this corrective action is complete.

- c) (Excerpt from Reference 5) Currently, there is no existing procedure requirement to perform UT checks to confirm systems are full following valve manipulations, system realignments, and maintenance. New procedures and/or procedure revisions are needed to address this. These procedures will identify the location, acceptance criteria, the required frequency for monitoring and actions to quantify the gas void when discovered. Trending of void identification will be included. These procedures will be implemented on or before June 30, 2009, to coincide with implementation of the void management program.

This item will be tracked in the Corrective Action Program.

Update: Since the issuance of Reference 5, a Gas Accumulation Management Program (0-ADM-547) has been implemented at the Turkey Point nuclear units. Procedure requirements have been implemented that make it necessary to verify the RHR, SI or CS System to be full of water to satisfy its safety function after any kind of activity that may introduce gas in the piping. The locations, acceptance criteria,

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

monitoring frequency and actions for trending purposes are identified in the program and/or supporting procedures.

(Note: the referenced text above mentions that when a gas void has been identified, its size will be quantified and trended, but it does not stipulate under what circumstances this is to be done. Trending and the determination of the size of a void are not necessarily meaningful in all scenarios. If found after a period of operation, knowing the volume of a gas void and trending its growth can be valuable information in assessing a system for its past, current and future health. However, if a bubble is found following maintenance when the system had been emptied, its size would be meaningless for trending or assessing the system's health. Therefore, the program only requires quantification and trending of voids when that information is meaningful.)

The program and its supporting procedures were implemented by June 30, 2009. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well. This will be a "living" program, meaning it will evolve to incorporate on-going industry, site and corporate experiences.

- d) (Excerpt from Reference 5) FPL will determine if and when additional vent locations are required in currently inaccessible areas. If new vents are required, a modification will be generated and entered into FPL's Corrective Action Program. These corrective actions will be completed in a time commensurate with the safety significance of the vent location, but no later than the next refueling outage for the particular Turkey Point unit beginning after October 11, 2008.

Update: Walk downs of the Turkey Point Unit 4 inaccessible areas occurred at the beginning of the fall 2009 outage. Based on the results of these walk downs and analyses, no new vent valves were installed in inaccessible locations, but four accessible locations were identified during the fall 2009 outage to have new vent valves installed as an enhancement. Further discussion of these vent valves was previously provided in Section A.3.

iii. Reference 5: Section A. EVALUATION RESULTS / Testing Evaluation / Section 6 (page 20 of 24)

- a) (Excerpt from Reference 5) A new procedure or revision will be implemented to include language assuring that the CS System (discharge and suction piping up to the first closed discharge line isolation valve) is "sufficiently" full of liquid to reliably perform the intended safety function. This will be consistent with GL 2008-01 and will consider acceptance criteria for gas voiding in the CS piping. This will be

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

complete by June 30, 2009, to be implemented coincident with the long term void management program.

This item will be entered and tracked in the Corrective Action Program.

Update: Most of the CS System piping is designed to be full of air at atmospheric conditions when not operating. However, for the CS System to be considered operable, the pump discharge and suction piping up to the first closed discharge line isolation valve must be filled with water. The Gas Accumulation Management Program (0-ADM-547) implemented at the Turkey Point nuclear units ensures that this portion of the Unit 4 CS System is operable. Locations where gases could potentially accumulate in the CS System, pump discharge and suction piping up to the discharge isolation valve, are periodically monitored using UT and/or vented to verify the system is filled. Revised program procedures reflect this.

The Gas Accumulation Management Program and its supporting procedures were implemented by June 30, 2009, as documented in Reference 11. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well. This will be a "living" program, meaning it will evolve to incorporate on-going industry, site and corporate experiences.

- b) (Excerpt from Reference 5) Revisions of existing surveillance procedures and/or creation of new procedures are needed to establish appropriate surveillance criteria to provide a more refined analytical basis for operability determinations. Similarly, these criteria will provide a more quantitative means for system trending to identify potential conditions adverse to quality more effectively. This will be complete by June 30, 2009, to be implemented coincident with the long term void management program.

This item will be entered and tracked in the Corrective Action Program.

Update: At the time that Reference 5 was submitted, there was no formal program at Turkey Point to monitor gas voids found in the RHR, SI and CS Systems. However, Technical Specifications required periodic (i.e. every 31 days) venting of ECCS discharge piping, but there was no official method to quantify the size of the void, assess if trends indicated conditions were deteriorating, or establish an acceptance criterion. Since that time, a Gas Accumulation Management Program (0-ADM-547) has been implemented at the Turkey Point nuclear units that defines requirements to monitor, evaluate, trend, and control gas build up in the RHR, SI and CS Systems. Under this program, gas voids will be trended. From this data, current, past and future health of these systems can be determined, and corrective actions, as

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

appropriate, can be identified and implemented. This provides a more refined and quantitative approach in the assessment of system operability.

This program and its supporting procedures were implemented by June 30, 2009, as documented in Reference 11. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well. This will be a "living" program, meaning it will evolve to incorporate on-going industry, site and corporate experiences.

- c) (Excerpt from Reference 5) Appropriate procedures will be revised or created to include requirements following valve manipulations, system realignments, and maintenance for confirmatory UT examinations, including acceptance criteria and actions to quantify gas void when discovered. Trending of void identification will be included. This will be complete by June 30, 2009, to be implemented coincident with the long term void management program.

These actions will be entered and tracked in the Corrective Actions Program.

Update: This is the same as item B.2.b.ii.c), above. Please refer to the update provided for that item.

iv. Reference 5: Section A. EVALUATION RESULTS / Corrective Actions Evaluation / Section 2 (page 21 of 24)

Corrective actions relevant to how gas accumulation has been addressed at the Turkey Point nuclear units have already been captured in earlier sections. No new items were uncovered here.

No update necessary.

v. Reference 5: Section C. CORRECTIVE ACTION SCHEDULE / Section 2 (page 22 of 24)

- a) (Excerpt from Reference 5) FPL plans to evaluate the TSTF traveler and submit a TS change request, as needed. However, no current schedule exists for the availability of the TSTF traveler for use in revising the Turkey Point TSs. As such, FPL plans to perform these actions within 180 days following NRC publication of the Notice of Approval of the TSTF traveler in the Federal Register and CLIIP issuance. This will allow an appropriate amount of time for its evaluation and necessary actions taken that result from that evaluation that might lead to a TS change submittal.

Once the Notice of Approval of the TSTF traveler is published in the Federal Register, its review and evaluation will be tracked in the Corrective Action Program.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

Update: This is the same as item B.2.b.i.a), above. Please refer to the update provided for that item.

- b) (Excerpt from Reference 5) Any changes to licensing basis documents resulting from industry testing and analytical programs related to gas accumulation are dependent upon the completion of these industry efforts. A defined schedule does not currently exist for their completion, and it is not clear what the outcome will be. As such, there is no clear basis at this time on what to estimate a completion date for this item. As these changes become more clearly defined, they will be captured and tracked in the Corrective Action Program.

Update: This is the same as item B.2.b.i.b), above. Please refer to the update provided for that item.

- c) (Excerpt from Reference 5) As stated in Section B [of Reference 5], FPL commits to developing a long term gas monitoring program by June 30, 2009. A number of actions will be required to support this program. These actions include:
- Revisions of existing surveillance procedures and/or creation of new procedures to provide a more analytical basis for operability determinations and provide a more quantitative means for system trending.
 - Revising the design basis documents and/or UFSAR for SI, CS and RHR Systems to include a discussion of long term void management.
 - Incorporating confirmatory UT requirements in the appropriate procedure following valve manipulations, system realignments, and/or maintenance, including acceptance criteria and actions to quantify gas void when discovered.

These items will be tracked in the Corrective Action Program.

Update: A long term Gas Accumulation Management Program (0-ADM-547) has been implemented at both Turkey Point units. It provides guidance on monitoring, evaluating, trending, and controlling gas build-up in these safety-related fluid systems to maintain them in an operable state. The program and procedures for the Turkey Point nuclear units were in place by June 30, 2009, as documented in Reference 11. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well.

At the time that Reference 5 was submitted, there was no formal program at Turkey Point that established controlled monitoring of gas voids found in the RHR, SI and CS Systems. However, Technical Specifications required periodic (i.e. every 31

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

days) venting of ECCS discharge piping, but there was no official method to quantify the size of the void, assess if trends indicated conditions were deteriorating, or establish an acceptance criterion. Since that time, a Gas Accumulation Monitoring Program has been implemented at both Turkey Point units that defines requirements to monitor, evaluate, trend, and control gas build up in the RHR, SI and CS Systems. Under this program, gas voids are formally quantified, assessed and trended. From this data, the current, past and future health of these systems can be determined, and corrective actions, as appropriate, can be identified and acted upon. This provides a more refined and quantitative approach in the assessment of system operability.

This program and its supporting procedures were implemented by June 30, 2009, as documented in Reference 11. Residual procedure revisions to reflect Unit 4 outage activities have been completed, as well. This will be a "living" program, meaning it will evolve to incorporate on-going industry, site and corporate experiences.

The design basis documents and UFSAR sections for the RHR, SI and CS systems have been revised to include a discussion of long term void management. These changes were implemented by June 30, 2009.

Procedure changes have been made to require UT monitoring after actions that could result in creating a void in one of these systems. Acceptance criteria and the requirement to trend voids are also described in the program and implemented in the procedures. Further description of the procedure changes is provided in Section A.4.

- d) (Excerpt from Reference 5) FPL will determine if additional vent locations are required in currently inaccessible areas. If new vents are required, a modification will be generated and entered into FPL's Corrective Action program. These corrective actions will be completed in a time commensurate with the safety significance of the vent location, but no later than the next refueling outage for the particular Turkey Point unit beginning after October 11, 2008.

Update: This is the same as item B.2.b.ii.d), above. Please refer to the update provided for that item.

- e) (Excerpt from Reference 5) A new procedure or revision will be implemented to include language assuring that the CS System (discharge and suction piping up to the first closed discharge line isolation valve) is "sufficiently" full of liquid to reliably perform the intended safety function. This will be consistent with GL 2008-01 and will consider acceptance criteria for gas voiding in the CS piping. This will be complete by June 30, 2009, to be implemented coincident with the long term void management program.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC Generic Letter 2008-01

This item will be tracked in the Corrective Action Program.

Update: This is the same as item B.2.b.iii.a), above. Please refer to the update provided for that item.

- f) (Excerpt from Reference 5) One location (Point P-13) was identified with UT that had a void, but was evaluated to be acceptable. This location will receive periodic UT verification to monitor the size of the void.

This item will be entered and tracked in the Corrective Action Program.

Update: The location of this void was in an alternate RHR line of Turkey Point Unit 3. The details of this (and other issues pertinent to Unit 3) are discussed in Reference 11. The void was subsequently removed and the system was verified to be water-solid. There is no further relevance of this to Unit 4, so no further discussion is provided here.

Conclusion

FPL has evaluated the previously unevaluated portions of the applicable systems at Turkey Point Unit 4 that perform the functions described in the GL and has concluded that these systems are operable. A Gas Accumulation Management Program is active at both Turkey Point units.

Turkey Point Unit 4
Nine-Month Supplemental (Post Outage) Response to NRC 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." January 11, 2008.
2. "Extension Request Regarding the Three-Month Response to NRC Generic Letter 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems.'" Letter No. L-2008-076. April 9, 2008 (ML081050251).
3. "Three-Month Response to NRC Generic Letter 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems.'" Letter No. L-2008-105. May 9, 2008 (ML081430648).
4. "Turkey Point, Units 3 & 4, 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. MD7890 and MD7891)." September 19, 2008 (ML082540437).
5. "Nine-Month Response to NRC Generic Letter 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems.'" Letter No. L-2008-218. October 14, 2008.
6. "GL 2008-01 Evaluation of High Point Gas Voids inside Unit 3 Containment." Automated Engineering Services Corp. (AES) Report Number PTN-110389-002-M04, Revision 0.
7. Non-Condensable Gas Voids in SI Piping: Assessment of Potential Effects on Reactor Coolant System Transients Including Chapter 15 Events. Westinghouse Letter and Attachment. LTR-LIS-08-543. August 19, 2008.
8. "Testing and Evaluation of Gas Transport to the Suction of ECCS Pumps," Revision 0. WCAP-16631-NP.
9. "Evaluation of Gas Accumulation in Turkey Point ECCS Discharge Piping – Unit 3 and 4 Inside Containment." Numerical Applications, Inc. (NAI) Report Number NAI-1400-005, Revision 2.
10. "Evaluation of Gas Accumulation in Turkey Point Unit 3 ECCS Suction Piping." NAI Report Number NAI-1400-002 Revision 0.
11. "Turkey Point Unit 3: Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01. Letter No. L-2009-178." August 6, 2009 (ML092300113).
12. "Evaluation of Gas Accumulation in Turkey Point ECCS Unit 4 Suction Piping." NAI Report Number NAI-1400-003, Revision 0.
13. "GL 2008-01 Evaluation of High Point Gas Voids inside Unit 4 Containment." AES Report Number PTN-110389-002-M05, Revision 0.
14. "GL 2009-01 Evaluation of High Points and Maximum Potential Voids." AES Report Number PTN-110389-002-M02, Revision 2.