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FPL

JAN 2 7 2006

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

L-2006-028
10 CFR 50.54(f)

Re: Florida Power and Light Company
Turkey Point Unit 4
Docket No. 50-251

FPL Energy Seabrook, LLC
Seabrook Station
Docket No. 50-443

Supplement to Response to NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors"

By letter L-2005-181 dated September 1, 2005, Florida Power and Light Company (FPL), the licensee for St. Lucie Units 1 and 2 and Turkey Point Units 3 and 4 and FPL Energy Seabrook, LLC (FPL Energy Seabrook), the licensee for Seabrook Station submitted the second of two responses requested by Generic Letter 2004-02. The St. Lucie Units 1 and 2, Turkey Point Units 3 and 4 and Seabrook Station responses to requested information items 2(a) and 2(b) indicated that corrective actions would be implemented to ensure that the emergency core cooling system and containment building spray recirculation functions under debris loading conditions would be in compliance with the Applicable Regulatory Requirements section of the Generic Letter when all modifications are completed by December 31, 2007.

FPL and FPL Energy Seabrook are fully committed to resolve the containment sump issue. Contracts have been awarded for the design, testing, fabrication, and installation of sump strainers (each design involving a unique solution) at all five of our nuclear units. In addition, the assessment of downstream effects on components (e.g., pumps) and fuel as well as chemical effects assessments are ongoing for each unit. The completion of the corrective actions committed to in our September 1, 2005 letter for St. Lucie Units 1 and 2 and Turkey Point Unit 3 are on track for December 31, 2007 as required by Generic Letter 2004-02. However, Turkey Point Unit 4 and Seabrook, both currently scheduled to have new strainers installed during their respective fall 2006 refueling outages, are facing challenges to the current implementation schedule. As such, a short extension to the completion schedule is respectfully requested to extend the completion of the corrective actions required by Generic Letter 2004-02 for both Turkey Point Unit 4 and Seabrook Station until the spring 2008 outages at those units.

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In the interim, FPL and FPL Energy Seabrook will implement a number of significant compensatory hardware modifications in their respective fall 2006 refueling outages. Specifically, at Turkey Point Unit 4, FPL will remove the calcium silicate insulation from the pressurizer relief tank (PRT), increase the available sump screen area by 400 ft^2 (770 percent), install debris interceptors at the entrances of the biological shield wall to reduce the quantity of debris that can potentially reach the sump, and modify existing penetrations in the biological shield wall to prevent debris from passing through the biological shield wall. Additionally, FPL will evaluate moving the start of the Turkey Point Unit 4 refueling outage forward up to one month from the current start date of April 27, 2008. At Seabrook Station, FPL Energy Seabrook will install debris interceptors which will trap debris and allow the remaining debris more time to settle prior to reaching the sump.

The conceptual design for the replacement strainers at Turkey Point Unit 4 specifies a passive strainer design. Recent design work and at-power containment walkdowns indicate that a passive strainer may not be practical at Turkey Point because of the large number of strainer modules required, limited floor space available, module interference with outage activities and numerous installation interferences. These issues have required a significant change to our approach to resolve the issue by assessing the use of active strainers. Technical challenges such as downstream effects, cable routing, emergency diesel loading, control board modifications, and the development of a license amendment request that are unique to an active strainer design must also be assessed. In addition, Turkey Point was intending to use trisodium phosphate instead of sodium tetraborate (borax) as a pH buffer as part of the alternate source term implementation to gain additional dose margin with respect to control room habitability. Because of chemical effects issues, this buffer change will not be implemented. Additional time is required to develop an integrated solution to address both the containment sump and control room habitability issues.

FPL and FPL Energy Seabrook are in the process of planning and implementing a significant number of regulatory driven, safety and equipment reliability projects across the division. Major projects scheduled for the fall 2006 refueling outage at Seabrook include a first-time reactor vessel head volumetric inspection, control rod guide tube support (split) pin replacement, one-hundred percent steam generator eddy current testing, main generator rewind, installation of a new excitation system on the main generator, and the installation of an upgrade to the feedwater ultrasonic flowmeter instrumentation. Seabrook's passive strainer design still has a number of open industry and plant specific design issues to resolve. The Seabrook strainer head loss and chemical effects testing by the vendor is scheduled for completion in April 2006. The resolution of industry and plant specific analyses and testing issues after April 2006 may require additional design changes. The late resolution of these issues may not provide adequate time to finalize the design and fabrication of the strainers.

Attachments 1 and 2 to this letter provide the bases for our conclusions that it is acceptable to extend the completion of the corrective actions required by Generic Letter 2004-02 for both Turkey Point Unit 4 and Seabrook until spring 2008 outages. Additionally, these attachments outline the mitigating actions that will be taken in the 2006 refueling outages to improve existing margins until the final design can be implemented. It is requested that the NRC respond to this request by March 1, 2006 to allow proper planning for the fall outages.

The attached information is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

Please contact Rajiv S. Kundalkar at (561) 694-4848 if you have any questions regarding these responses.

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

Executed on JANUARY 27, 2006

Sincerely yours,

Rajiv S. Kundalkar
for J. A. Stall
Senior Vice President, Nuclear and
Chief Nuclear Officer

Attachments: Attachment 1, Basis for Acceptability for Extension Request for Completion Date of the Turkey Point Unit 4 Containment Sump Modification

Attachment 2, Basis for Acceptability for Extension Request for Completion Date of the Seabrook Station Containment Sump Modification

cc: Regional Administrator, Region I
Regional Administrator, Region II
USNRC Project Manager, Turkey Point
Senior Resident Inspector, USNRC, Turkey Point
USNRC Project Manager, Seabrook Station
Senior Resident Inspector, USNRC, Seabrook Station

ATTACHMENT 1

Basis for Acceptability for Extension Request for Completion Date of the Turkey Point Unit 4 Containment Sump Modification

In Generic Letter (GL) 2004-02, the NRC staff summarized their reasoning and assessment to conclude that existing pressurized-water reactors (PWRs) may continue to operate through December 31, 2007 while responding to the GL and implementing the required corrective actions. The following discussions are a description of how Turkey Point Unit 4 has established that safety is maintained until all corrective actions are completed. This discussion supports Florida Power and Light's request for an extension of the completion date for the Turkey Point Unit 4 corrective action from December 31, 2007 (as required by GL 2004-02) to the completion of the spring 2008 refueling outage currently scheduled to begin on April 27, 2008. The short extension of the GSI-191 implementation schedule from December 31, 2007 to the spring of 2008 refueling outage does not impact the NRC staff's original conclusions summarized in GL 2004-02. The staff concluded that it is acceptable to operate until the corrective actions are completed because the additional risk is inconsequential as demonstrated in Item 1 below.

1. Risk Estimate

Included in the Generic Letter 2004-02 are risk reducing facts that remain valid if the commitments are extended until spring 2008. The probability of a large break remains extremely low as is the probability of a small break which may not require recirculation. The containment is compartmentalized making transport to the sump screens more difficult. The switchover to recirculation 20 to 30 minutes after the event allows debris settling.

A probabilistic safety assessment (PSA) was performed by FPL that specifically assessed the impact of extending the time for implementing the sump strainer modification at Turkey Point Unit 4 until spring 2008 (approximately four-month delay assumed). This assessment conservatively assumed that the sumps are failed for all initiators that result in actuation of containment building spray, but did take some credit for the actions taken in response to NRC Bulletin 2003-01 that could mitigate sump blockage. A modeling approach similar to that described in WCAP-16362, *PRA Modeling Template for Sump Blockage* (April 2005) (Reference 1) is used in the assessment. This assessment demonstrated that the risk of extending the modification schedule by four (4) months is <1E-6.

2. Interim Compensatory Measures Planned to be Completed During the Fall 2006 Refueling Outage

   a. The calcium silicate insulation is scheduled to be removed from the pressurizer relief tank (PRT). This removes 38 percent of the calcium silicate insulation debris that is transported to the sump.

   b. As an interim measure, the available screen area will be increased by 400 ft^2 (770 percent). The final design solution will determine whether the interim strainers will become a portion of the final design or will be removed and replaced by the final strainer design.

   c. Debris interceptors will be installed at the entrances to the biological shield walls on the 14-ft elevation of the containment to reduce the quantity of debris that could potentially reach the sumps.

d. The Turkey Point Unit 4 biological shield wall contains 32 scuppers (8-inch half-drain pipes) on the 14-ft elevation of the containment. The scuppers allow draining through the biological shield wall. The scupper openings that are not already sealed, will have screens placed on them to prevent debris from passing through the biological shield wall.

e. Additionally, FPL will evaluate moving the start of the Turkey Point Unit 4 refueling outage forward from the current start date of April 27, 2008.

3. Safety Features and Margins in Current Configuration/Design Basis

In addition to the interim compensatory measures described in Section 2 above, there are a number of design features/analyses that would mitigate this issue. These are summarized below:

a. There is a connection between the suction sides of the residual heat removal (RHR) pumps that allows the pump from either train to take water from either sump.

b. Turkey Point safety high head Injection pumps are shared between units and can be cross tied to the opposite unit's refueling water storage tank (RWST) for additional water.

c. The emergency containment coolers can supplement containment heat removal capability if spray flow is degraded.

d. Testing is currently underway to confirm that the qualified coating zone of influence (ZOI) is less than 10 times the diameter of the pipe break (10D), which is the value that was used in the debris generation calculation. The expected result is that the tests will confirm that the ZOI is 4D. A ZOI less than 10D would significantly reduce the quantity of particulates in the debris load at the sump screen because the quantity of coating debris is a function of the square of the diameter (D^2).

e. Turkey Point Unit 4 has NRC approval (Safety Evaluation Report attached to NRC letter dated June 23, 1995) (Reference 2) to invoke the leak-before-break methodology to eliminate the dynamic effects (pipe whip and jet impingement) of postulated reactor coolant piping (hot leg, cold leg, and cross-over piping) ruptures from the design basis of the plant. The approval was based on the conclusion that the probability of a pipe failure before noticeable leakage could be detected and the plant brought to a safe-shutdown condition is negligibly small. While leak-before-break is not being used to establish the design basis load on the sump strainer, it does provide a basis for safe continued operation until the completion of the spring 2008 outage.

4. Containment Cleanliness

FPL has implemented a number of actions to enhance containment cleanliness as documented in the response to Bulletin 2003-01. Detailed containment cleanliness procedures exist for unit restart readiness and for containment entry at power. These procedures incorporate the

industry guidance of Nuclear Energy Institute (NEI) 02-01, Revision 1 (Reference 6) to minimize miscellaneous debris sources within the containment. Specifically, the procedures require that no loose debris (rags, trash, clothing, etc) is present in the containment which could be transported to the containment recirculation sumps. In addition, the Site Vice President and Plant General Manager are required to personally walk down the containment prior to the restart from an outage. Detailed containment sump inspections are performed at the end of each outage. These visual inspections of the containment sump screens ensure that the suction inlets are not restricted by debris.

5. Procedural Guidance, Training, and Actions

As discussed in our responses to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," Turkey Point has implemented a number of interim corrective actions to assure core cooling and containment integrity (References 3 and 4). In the NRC letter of August 15, 2005 (Reference 5), the staff concluded that FPL was responsive to and met the intent of Bulletin 2003-01 for Turkey Point Units 3 and 4.

Operators are trained and have guidance for continuously monitoring emergency core cooling system (ECCS) and containment spray system (CSS) pump parameters, including loss of net-positive suction head (NPSH) as indicated by erratic pump current or discharge flow. Training briefs presented during operator requalification training have increased operations personnel awareness of the potential for the containment recirculation sump to become clogged during operation of the ECCS and CSS pumps in the recirculation cooling mode. Procedural actions were developed to provide additional injection sources by aligning the opposite units RWST and high head safety injection (HHSI) pumps to the accident unit, or aligning the accident unit's charging pump to drain the remaining inventory from the RWST.

6. Information Notice 2005-26

On September 16, 2005, NRC issued Information Notice (IN) 2005-26, "Results of Chemical Effects Head Loss Tests in a Simulated PWR Sump Pool Environment." The IN only applies to plants that have calcium silicate (Cal-Sil) insulation and utilize trisodium phosphate (TSP) as a buffering agent in the containment sump. Turkey Point Unit 4 currently uses sodium tetraborate as a buffering agent, not TSP. Therefore, Turkey Point Unit 4 is not susceptible to the chemical effects issues delineated in the IN. In the September 1, 2005 response to GL 2004-02, future plans to change the buffering agent to TSP prior to startup from the Turkey Point fall 2006 refueling outage were discussed. Based upon the review of the IN, this buffer change will not be implemented.

Reference:

1. Westinghouse WCAP-16362, PRA Modeling Template for Sump Blockage, April 2005.

2. NRC Letter, from R. P. Croteau (NRC) to J.H. Goldberg (FPL), "Turkey Point Units 3 and 4 - Approval to Utilize Leak-Before-Break Methodology for Reactor Coolant System Piping (TAC M91494 and M91495)," dated June 23, 1995.

3. Letter from J. A. Stall (L-2003-201), "NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," August 8, 2003.

4. Letter from T. O. Jones (L-2004-255), "Response to Request for Additional Information Regarding NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," November 9, 2004.

5. Letter from B. T. Moroney to J. A. Stall, "Turkey Point Nuclear Plant Units 3 and 4 – Response to NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," (TAC Nos. MB9623 and MB9624), August 15, 2005.

6. NEI 02-01, Revision 1, "Condition Assessment Guidelines; Debris Sources Inside PWR Containments"

ATTACHMENT 2

Basis for Acceptability for Extension Request for Completion Date of the Seabrook Station Containment Sump Modification

In Generic Letter (GL) 2004-02, the NRC staff summarized their reasoning and assessment to conclude that existing pressurized-water reactors (PWRs) may continue to operate through December 31, 2007 while responding to the GL and implementing the required corrective actions. The following discussions are a description of how Seabrook has established that safety is maintained until all corrective actions are completed. This discussion supports FPL Energy Seabrook's request for an extension of the completion date for the Seabrook corrective action from December 31, 2007 (as required by GL 2004-02) to the completion of the spring 2008 refueling outage currently scheduled to begin on April 1, 2008. The short extension of the GSI-191 implementation schedule from December 31 2007 to the spring of 2008 refueling outage does not impact the NRC's original conclusions summarized in GL 2004-02. The GL concluded that it is acceptable to operate until the corrective actions are completed because the additional risk is inconsequential as demonstrated in Item 1 below.

1. Risk Estimate

Included in the Generic Letter 2004-02 are risk reducing facts that remain valid if the commitments are extended until spring 2008. The probability of a large break remains extremely low as is the probability of a small break which may not require recirculation. The containment is compartmentalized making transport to the sump screens more difficult. The switchover to recirculation 20 to 30 minutes after the event allows debris settling.

A probabilistic risk assessment (PRA) was performed by FPL Energy Seabrook that specifically assessed the impact of extending the time for implementing the sump strainer modification at Seabrook until the spring 2008 refueling outage (four-month delay assumed). This assessment conservatively assumed that the sumps are failed for all initiators that result in actuation of containment building spray, but did take some credit for the actions taken in response to NRC Bulletin 2003-01 that could mitigate sump blockage. A modeling approach similar to that described in WCAP-16362, *PRA Modeling Template for Sump Blockage* (April 2005) (Reference 1) was used in the assessment. This PRA demonstrated that the risk of extending the modification schedule by four (4) months is <1E-6.

2. Interim Compensatory Measures to be Completed During the Fall 2006 Refueling Outage

At Seabrook, FPL Energy Seabrook will install debris interceptors which will trap debris and allow the remaining debris more time to settle prior to reaching the sump.

3. Safety Features and Margins in Current Configuration/Design Basis

In addition to the interim compensatory measures described in Section 2 above, there are a number of design features/analyses that would mitigate this issue. These are summarized below:

a. Seabrook has one of the largest existing sumps in the industry with approximately 350 ft^2 of screen surface area in place.

b. The sump water approach velocity is relatively low, 0.192 ft/sec for a 50 percent blocked screen.

c. Heavy particles are prevented from reaching the sumps because the surrounding floor slopes away from the sumps. This facilitates settling of debris on the floor prior to reaching the sump area.

d. A recent revision of the current debris generation calculation has resulted in a reduction in the NUKON debris load at the sump by approximately 30 percent.

e. Testing is currently underway to confirm that the qualified coating zone of influence (ZOI) is less than 10 times the diameter of the pipe break (10D), which is the value that was used in the initial debris generation calculation. The expected result is that the tests will confirm that the ZOI is 4D. A ZOI less than 10D would significantly reduce the quantity of coating particulates in the debris load at the sump screen because the quantity of coating debris is a function of the square of the diameter (D^2).

f. Detailed fracture mechanics methodology referenced in the UFSAR and approved by the NRC allowed Seabrook to eliminate the dynamic effects (pipe whip and jet impingement) of postulated reactor coolant piping (hot leg, cold leg, and cross-over piping) ruptures from the design basis of the plant. The approval was based on the conclusion that the probability of a pipe failure before noticeable leakage could be detected and the plant brought to a safe-shutdown condition is negligibly small. This methodology is typically called leak-before-break. While leak-before-break is not being used to establish the design basis load on the sump strainer, it does provide a basis for safe continued operation until the spring 2008 outage.

4. Containment Cleanliness

Seabrook has implemented an aggressive containment cleaning and foreign material exclusion program meeting the latest industry guidance of Nuclear Energy Institute (NEI) 02-01, revision 1 (*Reference 2*) to minimize miscellaneous debris sources within the containment. Detailed containment cleanliness procedures exist for unit restart readiness and for containment entries at power. The requirement to assure that the containment is free of loose debris that could be transported to the sump is specifically addressed. The Site Vice President and Station Director are required to perform a formal walkdown prior to Mode 4 at the end of each refueling outage to ensure plant readiness.

5. Procedural Guidance, Training, and Actions

As discussed in our responses to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," Seabrook has implemented a number of interim corrective actions to assure core cooling and containment integrity (Reference 3 and 4). In the letter of September 19, 2005 (Reference 5) the NRC staff concluded that FPL Energy Seabrook was responsive to and met the intent of Bulletin 2003-01 for Seabrook.

Seabrook has provided operator guidance and training for continuously monitoring ECCS and containment building spray (CBS) pump parameters, including loss of net-positive suction head (NPSH) as indicated by erratic current, flow, discharge pressure, suction pressure (CBS pumps only), and pump bearing temperature. Because of the low suction velocity to the sump, and the available debris settling time prior to recirculation mode, the sump strainer at Seabrook is not susceptible to rapid accumulation of debris. Procedural actions were developed to provide additional/extended injection by aligning the charging pump to drain the remaining inventory from the RWST, throttling the charging pump flow, and refilling the RWST.

6. Information Notice 2005-26

On September 16, 2005, NRC issued Information Notice (IN) 2005-26, "Results of Chemical Effects Head Loss Tests in a Simulated PWR Sump Pool Environment." The IN only applies to plants that have calcium silicate (Cal-Sil) insulation and utilize trisodium phosphate (TSP) as a buffering agent in the containment sump. Seabrook uses sodium hydroxide as the sump buffering agent, not TSP. In addition, Seabrook does not utilize Cal-Sil insulation in containment. Therefore, the concerns raised in the IN are not applicable to Seabrook.

Reference:

1. Westinghouse WCAP-16362, PRA Modeling Template for Sump Blockage, April 2005.

2. NEI 02-01, Revision 1, "Condition Assessment Guidelines; Debris Sources Inside PWR Containments"

3. Letter from J. A. Stall (L-2003-201), "NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," August 8, 2003.

4. Letter from M. E. Warner, "Seabrook Station - Response to Request for Additional Information Regarding NRC Bulletin 2003-01," October 28, 2004.

5. Letter from V. Nerses to G. St. Pierre, "Seabrook Station, Unit No. 1 Response to NRC Bulletin 2003-01, Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," (TAC No. MB9612), September 19, 2005.