UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

April 17, 2006

EA-06-027

Florida Power and Light Company
ATTN: Mr. J. A. Stall, Senior Vice President
Nuclear and Chief Nuclear Officer
P. O. Box 14000
Juno Beach, FL 33408-0420

SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING AND NOTICE OF VIOLATION (Turkey Point Nuclear Plant - NRC Inspection Report No. 05000250,251/200610)

Dear Mr. Stall:

The purpose of this letter is to provide you with the Nuclear Regulatory Commission's (NRC) final significance determination for a finding involving the B auxiliary feedwater (AFW) pump that was determined to be inoperable due to an incorrectly installed bearing. The finding was documented in NRC Inspection Report No. 05000250,251/2005005 dated January 27, 2006, and was assessed under the significance determination process as a preliminary White issue (i.e., an issue of low to moderate safety significance which may require additional NRC inspection). The cover letter to the inspection report informed Florida Power and Light Company (FPL) of the NRC's preliminary conclusion, provided FPL an opportunity to request a regulatory conference on this matter, and forwarded the details of the NRC's preliminary estimate of the change in core damage frequency for this finding.

In lieu of a regulatory conference, FPL provided a written response dated March 13, 2006. FPL's assessment identified several plant-specific factors beyond those used in the NRC's preliminary estimate and concluded that the finding was of very low risk significance (Green). In summary, the plant-specific factors included the time dependent degradation of the B AFW pump, more recent industry generic failure data, and additional and diverse plant specific features for secondary side heat removal.

After considering the information developed during the inspection and the information FPL provided in its written response, the NRC has concluded that the final inspection finding is appropriately characterized as White in the mitigating systems cornerstone. In summary, the NRC's risk assessment concluded that the factors identified in FPL's written response of March 13, 2006, were insufficient to warrant a significant change in our preliminary risk estimate. Additional information on the NRC's risk estimate, including the disposition of those factors identified in FPL's written response, are included as Enclosure 2 to this letter.

You have 10 business days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in NRC Inspection Manual Chapter 0609, Supplement 3.

The NRC has also determined that the finding represents a violation of Technical Specification 3.7.1.2 and 10 CFR Part 50, Appendix B, Criterion XVI. In this case, the B AFW

pump was inoperable from approximately September 10, 2003, until November 7, 2005, due to an incorrectly installed bearing. In addition, FPL failed to identify and correct the condition of the pump during this time period as required by 10 CFR Part 50, Appendix B, Criterion XVI, despite several indicators that the pump was degraded. The violation is cited in the attached Notice of Violation (Notice), and the circumstances surrounding it are described in detail in NRC Inspection Report No. 05000250,251/2005005. In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding.

Because plant performance for this issue has been determined to be in the regulatory response band, we will use the NRC Action Matrix to determine the most appropriate NRC response for this event. We will notify you, by separate correspondence, of that determination.

You are not required to respond to this letter unless the description herein does not accurately reflect your position, or if you choose to provide additional information. For administrative purposes, this letter is issued as a separate NRC Inspection Report (Nos. 05000250,251/2006010) and the above violation is identified as VIO 05000250,251/2006010-01, White Finding - AFW Pump B out of Service Greater than TS Allowed Due to Incorrect Bearing Installation. Accordingly, Apparent Violation (AV) 05000250,251/2005005-02 is closed.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (should you choose to provide one) will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS) which is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, any response should not include any personal privacy, proprietary, classified, or safeguards information so that it can be made available to the Public without redaction. The NRC also includes significant enforcement actions on its Web site at www.nrc.gov; select **What We Do**, **Enforcement**, then **Significant Enforcement Actions**.

Should you have any questions regarding this letter, please contact Mr. Charles A. Casto, Director, Division of Reactor Projects, at (404)562-4500.

Sincerely,

/RA/

William D. Travers
Regional Administrator

Docket Nos. 50-250, 50-251
License Nos. DPR-31, DPR-41

Enclosures:
1. Notice of Violation
2. NRC Evaluation of Risk Significant Factors

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* See previous concurrences

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DATE	04/03/06	04/03/06	04/03/06	04/12/06	04/06/06		
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: E:\Filenet\ML061090107.wpd

NOTICE OF VIOLATION

Florida Power and Light Company, Inc.
Turkey Point Nuclear Plant
Units 3 and 4

Docket No. 50-250, 50-251
License No. DPR-31, DPR-41
EA-06-027

During an NRC inspection completed on December 31, 2005, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Technical Specification 3.7.1.2 requires two independent auxiliary feedwater trains including three pumps during plant operation. Action statement 3 states, in part, that with a single auxiliary feedwater pump inoperable, within 4 hours, verify operability of two independent auxiliary feedwater trains and restore the inoperable pump to operable status within 30 days or place the affected units in at least Hot Standby within the next 6 hours.
>
> 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, states, in part, that measures shall be established to assure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.
>
> Contrary to the above, the licensee failed to restore the B auxiliary feedwater pump to operable status within 30 days and did not place the unit in at least Hot Standby during this time. In this case, the B auxiliary feedwater pump was placed in service on September 10, 2003, in an inoperable condition due to a misaligned radial bearing, and the inoperable condition was not identified until November 7, 2005. In addition, the licensee failed to identify and correct the condition adverse to quality during this time frame even though pump bearing vibration levels and oil samples provided indication of the adverse condition.
>
> This violation is associated with a White significance determination process finding for Units 3 and 4 in the mitigating systems cornerstone.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence, and the date when full compliance was achieved is already adequately addressed on the docket in the information provided by Florida Power and Light Company's written response of March 13, 2006, and in NRC Inspection Report No. 05000250,251/2005005. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation - EA-06-027," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS),

to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within 2 working days.

Dated this 17th day of April 2006

NRC EVALUATION OF RISK SIGNIFICANT FACTORS

In lieu of a regulatory conference, Florida Power and Light Company (FPL) provided a written response (dated March 13, 2006) to support its determination of the risk significance of a finding involving an inoperable auxiliary feedwater (AFW) pump. Based on a review of this information, the following is provided as the basis for the NRC's final risk significance determination:

1. Licensee Input - There was a time dependent degradation of AFW pump B. Therefore, up until October 30, 2005, it can be assumed that the pump would have performed its intended function for at least 1 hour. This was based upon the completion of a 2.1-hour surveillance run on October 10, 2005.

   NRC Disposition - The historical information provided about AFW pump B supported the continuation of selecting the fail-to-run basic event surrogate for the performance deficiency. However, the information provided did not support that the surveillance test of October 10, 2005, indicated that the pump would operate for at least 1 hour up until October 30, 2005. From the completion the 2003 bearing mis-installation the pump's vibration was twice what it had been before bearing replacement and progressively worsened to five times its original value over the ensuing time period. Periodic oil samples taken since 2003 were also problematic, and on occasion, the bearing indicated high temperature. Upon disassembly there was grease caking, uneven tooth wear at the coupling, and flaking of the sleeve bearing babbit. The as-found condition clearly indicated the potential for imminent failure. How much earlier in the exposure period the pump would have failed cannot be exactly selected. Therefore, consistent with NRC Manual Chapter 0609, a t/2 correlation was used. All of these factors collectively indicated that pump failure could have happened anytime during the mission time. Recognizing that surveillance performance does not represent actual demand conditions (longer duration, higher pressure, and flow increasing shaft loading), no correlation for bearing performance between test operation and that which would be applicable for an actual demand was provided. Given the bearing's condition/possible pump failure mechanism, insufficient information was provided to support that bearing failure was a function of cumulative pump operation. However, for analysis purposes, the post-reactor trip performance of AFW pump B on March 22, 2005, was evaluated as the break point between failure in less than 1 hour or at greater than 1 hour. This is because the information provided indicated that the pump operated in a post-trip condition for greater than 1 hour. To simplify the analysis, only this exposure period of 63% of a year was quantified. Therefore, the input was partially included in the NRC's final significance determination.

2. Licensee Input - For the exposure time prior to October 30, 2005, with AFW pump B operating for 1 hour prior to failure, the decay heat within the reactor would be lower, allowing a longer time for operators to perform any actions. This would change the performance shaping factors for any human reliability failure probabilities from what was originally developed in the probabilistic risk assessments (PRA).

   NRC Disposition - It is true that the decay heat would be less with a subsequent lengthening of the time to core damage given a longer operation of AFW pump B. However, this does not automatically cause a shift in the human error probability (particularly an order of magnitude shift). Each basic event involving operator error must

be evaluated since the performance shaping factor for time may already be a minor input or part of a dependency calculation that is insensitive to time. In addition, the attempted human action may have been a function of a particular setpoint or set of conditions which is not directly affected by the decay heat load. Finally, the quantified analysis was only for the time frame of less than 1 hour. Therefore, an alteration of the human error probabilities did not need to be considered in the quantification analysis.

3. Licensee Input - Due to the time dependent nature of AWF pump B's failure, additional offsite power recovery actions should be added to the PRA.

   NRC Disposition - There was no basis provided by the licensee to support this statement. Consequently, the specific actions could neither be identified nor considered in any quantification of the safety significance. In addition, the dominant accident sequences were not initiated by a loss of offsite power. Therefore, this input was not included in the final significance determination.

4. Licensee Input - Using a 24-hour mission time for the three AFW pumps and two standby steam generator pumps overestimates the probability of failure.

   NRC Disposition - This statement is true for all sequences that exclusively include "failure to run" basic events for any pumps including the pumps mentioned above. However, this is the standard methodology used in PRAs. To perform such an involved calculation would be very time consuming and of marginal value. The licensee did not provide any quantification as to the real effects of using this methodology on the PRA results. Therefore, this input was not included in the final significance determination.

5. Licensee Input - For that exposure time prior to November 30, 2005, with the lower decay heat level, the success criteria for feed and bleed can be modified from 2 of 3 reactor coolant system power operated relief valves to 1 of 3. The results of thermal-hydraulic computer simulations were provided to support this statement.

   NRC Disposition - Given the way in which the final significance determination was accomplished, the risk contribution in which the AFW pump B was postulated to operate for greater than 1 hour was not critical. Consequently, an extensive evaluation into possibly changing the success criteria was not conducted. The NRC recognizes that making changes in PRAs like this on time dependent failures is not atypical. However, the substantial information necessary to support such a change in success criteria was not provided. Therefore, this input was not included in the final significance determination.

6. Licensee Input - The Turkey Point probabilistic safety analysis (PSA) used generic data for basic events. When the new "generic" data from the draft mitigating systems performance indicator (MSPI) program was inserted into the PSA, comparable results with the simplified plant analysis risk (SPAR) were achieved.

   NRC Disposition - The input was included in the final significance determination.

7. Licensee Input - Turkey Point has additional and diverse plant specific secondary side heat removal features. Qualitatively, the risk impact of failing one AFW pump is minimal. Even with the failure of an AFW pump, Turkey Point still has the same degree of

defense-in-depth and margin of safety as a majority of pressurized water reactors. The number and diversity of secondary side heat removal systems provides a strong basis that the loss of one AFW pump is not risk significant.

NRC Disposition - All evaluations performed under Phase 2 and Phase 3 of the significance determination process (SDP) have recognized and included these diverse means in the analysis. The Phase 2 SDP worksheets and the computer models used incorporated the strengths and weaknesses associated with all the features mentioned in FPL's letter of March 13, 2006. Due to the nature of the initiating event or dependency involved with the failure of a particular basic event, all of these features are not available to provide secondary side heat removal. Without an informed understanding of these conditions, one cannot draw an accurate qualitative conclusion regarding how the failure of one AFW pump affects the risk significance. Risk insights gained from reviewing any PRA associated with Turkey Point clearly indicate (depending upon the nature of the failure, exposure time, and possibility for recovery) that such a failure can be of at least low to moderate safety significance.

8. Licensee Input - The fault exposure time does not reflect the time-dependent nature of AFW pump B's condition. The draft MSPI program eliminates fault exposure time. Based upon conservative weighting factors, 12-quarter performance data, and the Institute for Nuclear Power Operations MSPI calculator; the MSPI for AFW is Green.

   NRC Disposition - As has been discussed in numerous public forums, a correlation between MSPI results and SDP results is not appropriate because the two programs monitor two different aspects of performance. In addition, the basis that MSPI is only appropriate to deal with the time-dependent nature of this performance deficiency is not justified. The SDP is adequately suited to deal with this situation as exemplified by using the fail-to-run basic event surrogate in the SDP analyses. Therefore, this input was not included in the final safety significance determination.

9. Licensee Input - Using the Turkey Point PSA model was appropriate for Phase 2 SDP but was overly conservative for a Phase 3 SDP.

   NRC Disposition - Phase 2 SDPs are defined as the results obtained from the SDP Notebooks. When an alteration or amplification of methodologies beyond the notebook is used, it is a defacto Phase 3 analysis. Using PRA models is the normal protocol for Phase 3 analysis. In this particular case, two PRA models (SPAR and licensee full scope) were used – both of which indicated the performance deficiency was of low to moderate safety significance.

10. Licensee Input - Recovery of the AFW pump A is possible upon loss of the A direct current (DC) bus. The recovery activity is proceduralized and involves local operator actions to open valves and throttle flow. It has been quantified with a failure probability of 0.11.

    NRC Disposition - Although the actual methodology associated with acquiring this failure probability was not provided, the NRC examined this possibility and did not include it in the analysis. The procedure for responding to a loss of the A DC bus does not direct or provide a transition to the procedure that contained the instructions for operating AFW

pump A locally. In addition, the procedure for responding to a loss of the A DC bus specifically stated that AFW pump A would be lost. Given a loss of the A DC bus and no specific cue, it is highly questionable whether operators would focus on these actions for recovering secondary side heat removal from a human reliability analysis perspective.

11. Licensee Input - FPL offered that, when the AFW pump B failed within 1 hour, the deadheading of the weak pump phenomena included in the PRA model would not occur.

    NRC Disposition - An NRC review of the procedures indicated that 20 minutes was a more appropriate time for possible failure of the weak pump. For ease of analysis, only 66% of the scenario time was quantified in the final significance determination. Therefore, this input was partially included in the final safety significance determination.

12. Licensee Input - The units were shutdown for select periods of time during the exposure time.

    NRC Disposition - At the inception of the SDP, all parties recognized the excessive burden associated with re-creating the actual plant conditions during any exposure time. Consequently, Phase 3 analyses use the averaged PRA model. This input was not included in the final safety significance determination.

13. Licensee Input - When the new basic event probabilities and the time-dependent nature of the AFW pump B failure were inserted into the model, the risk result was less than 1E-6.

    NRC Disposition - For the final significance determination, Sensitivity Cases 1 and 2 of your letter of March 13, 2006, were evaluated. Cutset No. 3 was revised to exclude use of AFW pump A following a loss of DC bus A. The resulting change in core damage frequency was reduced by 63% to account for the postulated pump failure within 1 hour. The result was subsequently reduced by 66% to account for only that period of time when the weak pump could fail after 20 minutes. The quantification was 1.2E-6 (low to moderate safety significance). This quantification did not include the accident sequences that were not dependent upon the weak pump phenomena to fail AFW pump B for this 63% of the exposure time or any of the cutsets associated with the other 37% of the exposure time. Alteration of the original SPAR model by (.63)(.66) produced comparable results. Therefore, the NRC reached a different conclusion than that proposed by FPL regarding this performance deficiency.

In conclusion, after considering the information developed during the inspection and the information FPL provided in its written response, the NRC has concluded that the final inspection finding is appropriately characterized as White in the mitigating systems cornerstone. In summary, the NRC's risk assessment concluded that the factors identified in FPL's written response of March 13, 2006, were insufficient to warrant a significant change in our preliminary risk estimate.