

ENCLOSURE

FINAL DIRECTOR'S DECISION UNDER TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, SECTION 2.206, "REQUESTS FOR ACTION UNDER THIS SUBPART"

Agencywide Documents Access and Management System Accession No. ML15237A181

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

William M. Dean, Director

In the Matter of	)	Docket Nos. 50-250 and 50-251
	)	
Florida Power & Light Company	)	License Nos. DPR-31 and DPR-41
	)	
Turkey Point Nuclear Generating	)	
Unit Nos. 3 and 4	)	

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**I. Introduction**

By electronic mail (e-mail) dated July 18, 2014, as supplemented by e-mail and the transcripts from a teleconference on September 3, 2014 (Agencywide Documents Access and Management System (ADAMS) package Accession No. ML14202A521), Mr. Thomas Saporito (the petitioner) of SaproDani Associates filed a petition under Title 10 of the *Code of Federal Regulations* (10 CFR), Section 2.206, "Requests for Action under This Subpart." The petitioner requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) take enforcement action against Florida Power & Light Company (FPL, the licensee) related to the Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point).

In his e-mail dated July 18, 2014 (ADAMS Accession No. ML14202A520), the petitioner requested that the NRC suspend or revoke the license for Turkey Point, issue a violation with a civil penalty of \$1 million, and issue a confirmatory order that the plant stays in a cold shutdown

mode until the licensee completes an independent assessment (via a contractor) to assess, fully understand, and correct the root cause of the rise in ultimate heat sink (UHS) temperature; a comprehensive evaluation of all nuclear safety-related equipment and components that may have been affected; and an independent evaluation of all nuclear safety-related equipment and components that may have been affected. As the basis for his request, the petitioner stated that operation at an UHS temperature in excess of 100 degrees Fahrenheit (°F) would result in a loss of control of the reactors and an accident at the plant.

On September 3, 2014, the petitioner spoke with the NRC's Petition Review Board through a public and recorded telephone conference and provided additional information concerning his request. The transcripts for the telephone conference are located in ADAMS under Accession No. ML14266A123.

By letter dated January 30, 2015 (ADAMS Accession No. ML14349A597), the NRC notified the petitioner that it acknowledged receiving his petition and accepted a portion of the petition for review in the 10 CFR 2.206 process and explained why the NRC did not accept the remaining portions of the petition for review under the 10 CFR 2.206 process. The portion of the petition that the NRC accepted for review under the 10 CFR 2.206 process was the petitioner's request that the NRC take enforcement action until the licensee completes an independent root cause assessment for the rise in UHS temperature. The letter also states that the NRC staff would determine the resolution of the petition after the NRC regional staff completes its inspection of the licensee's root cause assessment and associated corrective actions.

By letters to the petitioner and licensee dated July 27, 2015 (ADAMS Accession Nos. ML15162B048 and ML15162B050), the NRC issued the proposed director's decision (ADAMS Accession No. ML15162B053) for comment. The petitioner provided comments by e-mail dated August 5, and August 12, 2015 (ADAMS Accession Nos. ML15237A170 and

ML15229B009, respectively). The NRC's evaluation of the petitioner's comments is provided in the attachment to this final director's decision.

## **II. Discussion**

As documented in Section 4OA3.2 of the NRC's Integrated Inspection Report No. 05000250(251)/2014004, dated October 23, 2014 (ADAMS Accession No. ML14296A129), the NRC staff opened an "unresolved item" that discusses the staff's plans to inspect the licensee's root cause of the UHS conditions and associated corrective actions. In March 2015, NRC staff finished its inspection activities for this unresolved item, and documented the results in Section 4OA3 of NRC's Integrated Inspection Report No. 05000250(251)/2015001, dated April 30, 2015 (ADAMS Accession No. ML15121A674).

On July 20, 2014, the Turkey Point UHS temperature exceeded the Technical Specifications (TSs) limit for the UHS temperature (100 °F at that time). The Turkey Point TSs require that when the UHS temperature exceeds the limit, both units be in at least the hot standby mode of operation within 12 hours and in the cold shutdown mode of operation within the following 30 hours. The UHS temperature did not exceed 100 degrees for more than 12 hours at a time; therefore, the plant was not required to be in hot standby. The plant was not in a condition prohibited by TSs. The licensee requested that the NRC exercise discretion not to enforce compliance with the required actions of the TSs. The licensee stated that compliance with the TS requirements would result in the unnecessary shutdown of both units without a corresponding health and safety benefit and operation of the units was essential for maintaining electrical grid voltage stability. The NRC granted verbal approval of the enforcement discretion on July 20, 2014 (ADAMS Accession Nos. ML14204A652 and ML14213A069). The enforcement discretion period ended when the NRC subsequently issued license amendments under exigent circumstances for Turkey Point on August 8, 2014 (ADAMS Accession No. ML14199A107). The amendments raised the TS temperature limit for the UHS from 100 °F

to 104 °F. On September 18, 2014, the licensee submitted Licensee Event Report (LER) 050002502014-004-00 (ADAMS Accession No. ML14280A484) for the UHS temperature exceeding the TS limit of 100 °F.

The licensee entered this event into its corrective action program and performed a root cause evaluation. NRC's inspectors reviewed the licensee's evaluation and the associated corrective actions taken and planned. The inspectors also reviewed licensee performance attributes associated with supplying the NRC with complete and accurate information of the problem, reporting requirements, the root or any contributing causes, and planning or completion of identified corrective actions. The inspectors interviewed plant personnel and evaluated the licensee's administration of this issue in accordance with its corrective action program as specified in licensee procedures.

The inspectors also reviewed information associated with the licensee's request for enforcement discretion to determine the accuracy and consistency of the licensee's assertions, including the potential for low grid voltage that could have resulted from the shutdown of the two units. Factors other than generation load that could affect the cooling canal temperature (i.e., elevated algae levels and abnormally low rainfall) were also evaluated. During its review of the licensee's request for enforcement discretion, the NRC staff independently verified the licensee's information on grid reliability with the North American Electric Reliability Corporation (NERC) and the Florida Reliability Coordinating Council (FRCC). NERC and FRCC confirmed the licensee's information about the electrical grid conditions. The inspectors also verified the licensee's implementation of the commitments and compensatory measures during the period of enforcement discretion, which included maintaining a third component cooling water (CCW) heat exchanger in service; increasing the frequency of the CCW heat exchanger performance testing and cleaning; increasing CCW and UHS temperature monitoring, management

oversight, and just-in-time operator training; and minimizing the performance of coincident risk-significant maintenance activities.

The NRC inspectors determined that the event was not reasonably within the licensee's ability to foresee and prevent. The licensee determined that high concentrations of algae combined with high summer temperatures and low rainfall conditions created unexpectedly high solar heating effects on the cooling canal system and determined these conditions to be a natural event. A root cause is the basic reason (e.g., hardware, process, or human performance) for a problem, which if corrected, will prevent recurrence of that problem.

Although the low rainfall and algae presence were not within the licensee's ability to foresee and prevent, the licensee determined that the lack of monitoring the overall health of the cooling canal system and its impact on the UHS TS temperature limit was within its ability to correct and hence was the root cause. The inspectors found that the licensee had identified and measured increased algae levels and water temperatures in the canal system dating back to the summer of 2013. The inspectors determined that the licensee was aware of the canal system changes in 2013 and, at that time, the licensee concluded the conditions would not affect the UHS temperature limit in the future. However, in the spring of 2014, the licensee found that the algae and salinity concentrations in the canal system were increasing.

The licensee determined that the increased salinity concentration enhanced algae growth in the canal. The licensee performed a prompt operability evaluation focusing on CCW heat exchanger performance and concluded that the heat exchangers were operable with the elevated canal algae conditions. In June 2014, the licensee initiated a chemical treatment project of the canal system in an attempt to reduce the algae concentration to reduce the solar heating effect on the UHS temperature before the late summer months. The project decreased algae concentrations slightly but was unsuccessful in limiting the solar heating effects. As a result, the cooling canal system experienced increased temperatures in July, and the licensee

requested enforcement discretion. The inspectors did not identify any trends not already identified by the licensee. The inspectors did not identify any new issues during the review of the unresolved item and LER and closed these items in the inspection report.

The NRC inspectors did not identify any inspection findings in accordance with the NRC's Reactor Oversight Process. Therefore, the NRC did not have a basis for expanding its current level of regulatory oversight or for taking the petitioner's requested enforcement actions against the licensee.

### **III. Conclusion**

The NRC does not have a technical or legal basis for taking the petitioner's requested enforcement actions against the licensee. The NRC did not find that the continued operation of the plants would adversely affect the health and safety of the public. Therefore, the NRC denies the petitioner's requested enforcement actions against the licensee.

As provided in 10 CFR 2.206(c), the NRC will file a copy of this director's decision with the Secretary of the Commission for the Commission to review. As provided for by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision unless the Commission, on its own motion, institutes a review of the decision within that time.

Dated at Rockville, Maryland, this 23<sup>rd</sup> day of September 2015.

FOR THE NUCLEAR REGULATORY COMMISSION

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William M. Dean, Director,  
Officer of Nuclear Reactor Regulation.

COMMENTS RECEIVED FROM THE PETITIONER  
ON THE PROPOSED DIRECTOR'S DECISION DATED JULY 27, 2015

By letter dated July 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15162B048), the U.S. Nuclear Regulatory Commission (NRC) sent a copy of the proposed director's decision (ADAMS Accession No. ML15162B053) to Mr. Thomas Saporito (the petitioner) for comment. By electronic mail dated August 5, and August 12, 2015 (ADAMS Accession Nos. ML15237A170 and ML15229B009, respectively), the petitioner responded with comments. The NRC's responses to the petitioner's comments follow.

Comment 1 (summarized)

The petitioner commented that the root cause for the algae growth cited in the NRC inspection report and referenced in the proposed director's decision was incorrect. The petitioner commented that he provided the NRC with documents showing a significant increase in the ultimate heat sink (UHS) water temperature following the extended power uprate at Turkey Point Units 3 and 4. The petitioner commented that the temperature increase was directly related to the extended power uprate and that the additional heat to the UHS from the extended power uprate was the likely cause of increased algae growth in the UHS.

Response

The NRC staff acknowledges that power generation produces a thermal load (i.e., a heat discharge) to the UHS (i.e., the cooling canal system) and that since the extended power

Attachment

uprate, Turkey Point Units 3 and 4 have a higher heat discharge to the UHS. However, based on the NRC staff's inspection of the root cause evaluation for the cooling canal system conditions and review of the amount of heat discharge to the cooling canal system, the staff did not find information that supported the petitioner's assertion that the UHS conditions (i.e., algae growth and increased temperatures) were caused by the heat discharge from the extended power uprate of Turkey Point Units 3 and 4.

Turkey Point Units 3 and 4 share the site complex with two oil/natural gas fired generating units (Units 1 and 2) and a combined cycle gas-fired unit (Unit 5). Units 3 and 4 share the cooling canal system with Units 1 and 2. Prior to the extended power uprate, Units 3 and 4 produced an electrical power output of 775 megawatts electric (MWe) per unit. The extended power uprate increased this to 888 MWe per unit. Units 1 and 2 produce an electrical output of about 400 MWe per unit. However, since December 2010, the licensee has operated Unit 2 in synchronous condenser mode and, therefore, this unit is producing significantly less heat discharge to the UHS than it did when operating as a power generator.

The licensee calculated the heat discharge from the four units to the cooling canal system before and after the extended power uprate. The heat discharge to the cooling canal system from Units 1, 3, and 4 at post-extended power uprate operation was slightly less than the heat discharge to the cooling canal system from all four units prior to the extended power uprate because of the transition of Unit 2 to a synchronous condenser unit.

In its root cause evaluation, the licensee considered the thermal load to the CCS, canal level, algae, and salinity. From February 26, 2012, through September 5, 2012, Unit 3 was in a prolonged refueling outage for the extended power uprate installation. Unit 4 was in a prolonged refueling outage for the extended power uprate installation from November 5, 2012, through April 17, 2013. The licensee's root cause evaluation contains a graph that shows the cooling canal system temperature from November 2007 through November 2014. The graph

also shows the cooling canal system temperatures during the prolonged outages for the extended power uprate installations and after Unit 2 ceased power generation. The graph shows that despite the reduced cooling burden of the Unit 2 synchronous generator mode of operation and the prolonged outages of Units 3 and 4, the cooling canal system temperatures did not have the expected corresponding decrease in temperature during the prolonged outages. The licensee noted that instead, the cooling canal system temperature kept rising while one of the nuclear units was at 50 percent power and the fossil units were not generating power.

The licensee's root cause evaluation noted that an algal bloom occurred in August 2012, which was when Unit 3 was in an extended outage (i.e., during a period of less heat discharge than at full-power operation) and prior to operation of either unit at extended power uprate power levels. In addition, in the summer of 2012, the cooling canal system temperatures appeared to have reached a peak value similar to the peak values in the summers of 2008, 2009, 2010, and 2011, despite Unit 3 being in a prolonged outage. This information does not support the petitioner's assertion that the algae bloom was caused by the heat discharge at extended power uprate operation.

In its root cause evaluation, the licensee concluded that while the thermal outputs of the plants contribute to the cooling canal system temperature, they are not the main cause of the cooling canal system conditions. The licensee determined that high concentrations of algae combined with high summer temperatures and low rainfall conditions created unexpectedly high solar heating effects on the cooling canal system. Though thermal output may not be a main driver, the licensee concluded in its root cause evaluation that monitoring of thermal output to UHS temperature could have been used as a trigger to investigate why the correlation was different from the expected temperatures, especially during the winter months when UHS temperatures were above normal. Based on the information it reviewed and the presence of

other factors (e.g., the lower rainfall and its impact on salinity and algae) at the time of the cooling canal system temperature increase, the NRC staff did not find evidence that confirmed the petitioner's assertion that the heat discharge from the extended power uprate was the root cause of the algae growth.

A root cause is the basic reason (e.g., hardware, process, or human performance) for a problem, which if corrected, will prevent recurrence of that problem. The NRC did not identify any findings associated with the licensee's determination that the root cause of the event was due to not having a program in place to monitor the overall health of the cooling canal system and its impact on the Technical Specifications UHS temperature limit. The NRC staff continues to monitor the licensee's corrective actions for addressing the root cause.

#### Comment 2 (summarized)

The petitioner provided a hyperlink (<http://www.bloomberg.com/news/articles/2015-08-11/who-s-behind-the-96-million-shade-balls-they-just-rolled-into-l-a-s-reservoirs->) to an article that discussed a method for blocking sunlight and reducing evaporation in a reservoir. The petitioner commented that the article may be of help to the licensee for addressing the algae bloom in its UHS.

#### Response

The NRC continues to monitor the licensee's progress in implementing its corrective actions for the UHS conditions and appreciates the petitioner's interest in addressing the conditions of the UHS. As a matter of compliance with a particular license condition or rule, NRC staff can refer to a regulatory guide that describes an acceptable (but not necessarily the only) method of achieving compliance. However, in other areas for which the NRC has not established an acceptable position on a matter, there may be a number of ways to correct

issues. It is the licensee's responsibility to decide how best to achieve compliance or correct any other issues relating to safe operation.

The NRC staff has determined that the comments provided by the petitioner did not provide any relevant additional information and support for the petition that had not already been considered. Thus, the comments did not change the conclusion of the proposed director's decision. The final director's decision denies the petitioner's request for enforcement action. The NRC appreciates the petitioner's comments and thanks the petitioner for raising the concerns in the interest of protection of the health and safety of the public.