



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 21, 2014

Mr. Mano Nazar
Executive Vice President and
Chief Nuclear Officer
Florida Power & Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: TURKEY POINT NUCLEAR GENERATING UNIT NO. 4 - STAFF ASSESSMENT
OF THE SEISMIC WALKDOWN REPORT SUPPORTING IMPLEMENTATION
OF NEAR-TERM TASK FORCE RECOMMENDATION 2.3 RELATED TO THE
FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT
(TAC NO. MF0187)

Dear Mr. Nazar:

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued a request for information letter per Title 10 of the *Code of Federal Regulations*, Subpart 50.54(f) (the 50.54(f) letter). The 50.54(f) letter was issued to power reactor licensees and holders of construction permits requesting addressees to provide further information to support the NRC staff's evaluation of regulatory actions to be taken in response to lessons learned from Japan's March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami. The request addressed the methods and procedures for nuclear power plant licensees to conduct seismic and flooding hazard walkdowns to identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program, and to verify the adequacy of the monitoring and maintenance procedures.

By letter dated November 27, 2012, Florida Power & Light Company (FPL, the licensee) submitted its Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter for the Turkey Point Nuclear Generating Unit No. 4. By letter dated July 13, 2013, FPL provided an update, designated as Revision 2, to the November 27, 2012, submittal identified as Revision 1, to include the results of the deferred walkdowns of the inaccessible items during the initial walkdown. By letter dated November 22, 2013, FPL provided a response to the NRC request for additional information for the staff to complete its assessments.

The NRC staff reviewed the information provided and, as documented in the enclosed staff assessment, determined that the licensee provided sufficient information to be responsive to Enclosure 3 of the 50.54(f) letter.

M. Nazar

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If you have any questions, please contact me at 301-415-0489 or by e-mail at audrey.klett@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to be 'AK', with a long horizontal stroke extending to the right.

Audrey L. Klett, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-251

Enclosure:
Staff Assessment of Seismic Walkdown Report

cc w/encl: Distribution via Listserv

STAFF ASSESSMENT OF SEISMIC WALKDOWN REPORT
NEAR-TERM TASK FORCE RECOMMENDATION 2.3 RELATED TO
THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT
FLORIDA POWER & LIGHT COMPANY
TURKEY POINT NUCLEAR GENERATING UNIT NO. 4
DOCKET NO. 50-251

1.0 INTRODUCTION

On March 12, 2012,¹ the U.S. Nuclear Regulatory Commission (NRC) issued a request for information per Title 10 of the *Code of Federal Regulations* (10 CFR), Subpart 50.54(f) (the 50.54(f) letter) to all power reactor licensees and holders of construction permits in active or deferred status. The request was part of the implementation of lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 3, "Recommendation 2.3: Seismic,"² to the 50.54(f) letter requested licensees to conduct seismic walkdowns to identify and address degraded, nonconforming, or unanalyzed conditions using the corrective action program (CAP), verify the adequacy of monitoring and maintenance procedures, and report the results to the NRC.

The 50.54(f) letter requested licensees to provide the following:

- a. Information concerning the plant-specific hazard licensing bases and a description of the protection and mitigation features considered in the licensing basis evaluation.
- b. Information related to the implementation of the walkdown process.
- c. A list of plant-specific vulnerabilities identified by the Individual Plant Examination of External Events (IPEEE) program and a description of the actions taken to eliminate or reduce them.
- d. Results of the walkdown including key findings and identified degraded, nonconforming, or unanalyzed conditions.
- e. Any planned or newly installed protection and mitigation features.
- f. Results and any subsequent actions taken in response to the peer review.

In accordance with the 50.54(f) letter, Enclosure 3, Required Response Item 2, licensees were required to submit a response within 180 days of the NRC's endorsement of the seismic

¹Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340

²ADAMS Accession No. ML12056A049

walkdown process. By letter dated May 29, 2012,³ the Nuclear Energy Institute staff submitted Electric Power Research Institute document EPRI 1025286, "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic," (walkdown guidance) to the NRC staff to consider for endorsement. By letter dated May 31, 2012,⁴ the NRC staff endorsed the walkdown guidance.

By letter dated November 27, 2012,⁵ Florida Power & Light Company (FPL, the licensee) provided a response to Enclosure 3 of the 50.54(f) letter Required Response Item 2, for Turkey Point Nuclear Generating Unit No. 4 (TPNG-4). By letter dated July 13, 2013,⁶ the licensee provided an update, designated as Revision 2, to the November 27, 2012, submittal identified as Revision 1, to include the results of deferred walkdowns conducted in February 2013 and May 2013 for items that were inaccessible during the initial walkdowns performed in September 2012.

The NRC staff reviewed the walkdown report and determined that additional supplemental information would assist the staff in completing its review. In letter dated November 1, 2013,⁷ the NRC staff requested additional information to gain a better understanding of the processes and procedures used by the licensee in conducting the walkdowns and walk-bys. The licensee responded to the NRC staff request by letter dated November 22, 2013.⁸

The NRC staff evaluated the licensee's submittals to determine if the information provided in the walkdown report met the intent of the walkdown guidance and if the licensee responded appropriately to Enclosure 3 of the 50.54(f) letter.

2.0 REGULATORY EVALUATION

The structures, systems, and components (SSCs) important to safety in operating nuclear power plants are designed either in accordance with, or meet the intent of Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 2: "Design Bases for Protection Against Natural Phenomena"; and Appendix A to 10 CFR Part 100, "Reactor Site Criteria." GDC 2 states that SSCs important to safety at nuclear power plants shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions.

For initial licensing, each licensee was required to develop and maintain design bases that, as defined by 10 CFR 50.2, identify the specific functions each SSC of a facility must perform, and the specific values or ranges of values chosen for controlling parameters as reference bounds for the design.

The design bases for the SSCs reflect appropriate consideration of the most severe natural phenomena that have been historically reported for the site and surrounding area. The design

³ADAMS Package Accession No. ML121640872

⁴ADAMS Accession No. ML12145A529

⁵ADAMS Accession No. ML12349A162

⁶ADAMS Package Accession No. ML13213A193

⁷ADAMS Accession No. ML13304B418

⁸ADAMS Accession No. ML13338A581

bases also reflect sufficient margin to account for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

The current licensing basis is the set of NRC requirements applicable to a specific plant, including the licensee's docketed commitments for ensuring compliance with, and operation within, applicable NRC requirements and the plant-specific design basis, including all modifications and additions to such commitments over the life of the facility operating license.

3.0 TECHNICAL EVALUATION

3.1 Seismic Licensing Basis Information

The licensee provided information on the plant-specific licensing basis for the Seismic Category I SSCs for TPNG-4 in Section 2 of the walkdown report. Consistent with the walkdown guidance, the staff noted that the report includes a summary of the Safe Shutdown Earthquake (SSE) and a description of the codes, standards, and methods that were used in the design of the Seismic Category I SSCs for meeting the plant-specific seismic licensing basis requirements. The NRC staff reviewed Section 2.0 of the walkdown report, focusing on the summary of the SSE and the design codes used in the design.

Based on the NRC staff's review, the staff concludes that the licensee has provided information on the plant-specific seismic licensing basis and a description of the protection and mitigation features considered in the licensing bases evaluation consistent with Section 8, Submittal Report, of the walkdown guidance.

3.2 Seismic Walkdown Methodology Implementation

Section 2, Personnel Qualifications; Section 3, Selection of SSCs; Section 4, Seismic Walkdowns and Area Walk-Bys; and Section 5, Seismic Licensing Basis Evaluations, of the walkdown guidance provide information to licensees regarding the implementation of an appropriate seismic walkdown methodology. By letter dated June 12, 2012,⁹ the licensee confirmed that it would utilize the walkdown guidance in the performance of the seismic walkdowns at TPNG-4.

Revision 1 of walkdown report dated November 27, 2012 and updated Revision 2 of the walkdown report dated July 13, 2013 did not identify deviations from the walkdown guidance.

The NRC staff reviewed the following sections of the walkdown methodology implementation provided in the walkdown report:

- Personnel Qualifications
- Development of the Seismic Walkdown Equipment Lists (SWELs)
- Implementation of the Walkdown Process
- Licensing Basis Evaluations and Results

⁹ADAMS Accession No. ML12198A003

3.2.1 Personnel Qualifications

Section 2, Personnel Qualifications, of the walkdown guidance provides licensees with qualification information for personnel involved in the conduct of the seismic walkdowns and area walk-bys.

The NRC staff reviewed the information provided in Section 3, Appendix A and Appendix F of the walkdown report, which includes information on the walkdown personnel and their qualifications. Specifically, the staff reviewed the summary of the background, experience, and level of involvement for the following personnel involved in the seismic walkdown activities: equipment selection personnel, seismic walkdown engineers (SWEs), licensing basis reviewers, IPEEE reviewers, peer review team, and operations staff.

Based on the review of the licensee's submittals, the NRC staff concludes that those involved in the seismic walkdown activities have the appropriate seismic background, knowledge and experience, as specified in Section 2 of the walkdown guidance.

3.2.2 Development of the SWELs

Section 3, Selection of SSCs, of the walkdown guidance provides information to licensees for selecting the SSCs that should be placed on the SWELs, so that they can be walked down by qualified personnel.

The NRC staff reviewed the overall process used by the licensee to develop the TPNG-4 Master Component List, SWEL 1 (sample list of designated safety functions equipment), and SWEL 2 (sample list of spent fuel pool related equipment). The overall equipment selection process followed the screening process shown in Figures 1-1 and 1-2 of the walkdown guidance. Based on Appendix B of the walkdown report, TPNG-4 SWELs 1 and 2 meet the inclusion requirements of the walkdown guidance. Specifically, the following attributes were considered in the sample selection:

- A variety of systems, equipment and environments
- IPEEE equipment
- Major new or replacement equipment
- Risk considerations

Because of individual plant configurations and the walkdown guidance screening process followed to select the final SWEL equipment, it is possible that some classes of equipment will not be represented on the SWEL. The walkdown guidance recognizes this is because of the equipment not being present in the plant (e.g., some plants generate DC power using inverters and therefore do not have motor generators) or the equipment being screened out during the screening process (the screening process is described in Section 3 of the walkdown guidance). Based on the information provided, the NRC staff noted that a detailed explanation was provided justifying cases where specific classes of equipment were not included as part of the SWEL, and concludes that these exclusions are acceptable.

The NRC staff also noted that Appendix B of the walkdown report states an evaluation of the spent fuel pool (SFP) identified two penetrations that could lead to rapid drain down. The basis

for determining which SSCs could or could not cause rapid drain-down is described in Appendix B of the walkdown report. The licensee states that other components were included in this screening based on their importance in maintaining SFP inventory and cooling. After reviewing the information provided in Appendix B of the walkdown report, the staff concludes that the licensee provided sufficient information on the approach to identify the rapid drain-down items that should be included as part of the SWEL 2 for TPNG-4.

After reviewing SWELs 1 and 2, the NRC staff concludes that the sample of SSCs represents a diversity of component types and assures inclusion of components from critical systems and functions, thereby meeting the intent of the walkdown guidance. In addition, the NRC staff notes that the equipment selection personnel were appropriately supported by plant operations staff as described in the walkdown guidance.

3.2.3 Implementation of the Walkdown Process

Section 4, Seismic Walkdowns and Area Walk-Bys, of the walkdown guidance provides information to licensees regarding the conduct of the seismic walkdowns and area walk-bys for each site.

The NRC staff reviewed Section 5 of the walkdown report, which summarizes the results of the seismic walkdowns and area walk-bys, including an overview of the number of items walked down and the number of areas walked-by. The walkdown report states that teams, which consisted of at least two qualified SWEs, conducted the seismic walkdowns and area walk-bys. According to the signed seismic walkdown checklists (SWCs) and area walk-by checklists (AWCs), these activities were conducted in September 2012 for initial seismic walkdowns, in February 2013 for components in the containment building that were inaccessible at the time of the initial seismic walkdowns, and in May 2013 for electrical cabinets with restricted access. Appendices C and D of the walkdown report provide the completed SWCs and AWCs, documenting the results for each item of equipment on SWEL 1 and 2 and each area containing SWEL equipment. The licensee used the checklists provided in Appendix C of the walkdown guidance report without modification.

The staff noted that the walkdown report does not specifically state that during these evaluations, the SWEs actively discussed their observations and judgments with each other. However, Appendix C in both Revision 1 and Revision 2 of the walkdown report states that detailed signed records of the checklists are available at the site. Additionally, as discussed below, the licensee described the walkdown process in the response to request for additional information (RAI) 1. The staff concludes that this approach meets the intent of the walkdown guidance.

The licensee documented cases of potentially adverse seismic conditions (PASCs) in the checklists for further evaluation. Tables 5-2 and 5-3 of the walkdown report list the PASCs identified during the seismic walkdowns and the area walk-bys. The table describes how each condition was addressed (e.g., placement in the CAP), its resolution, and its status. Based on the initial review of the checklists, the staff was unable to confirm that all the PASCs identified during the walkdowns were included in this table. By letter dated November 1, 2013, the staff issued two questions in an RAI in order to obtain additional clarification regarding the process followed by the licensee when evaluating conditions identified in the field during the walkdowns and walk-bys. Specifically, in RAI 1 the staff requested the licensee to provide further explanation

regarding how a field observation was determined to be PASC, and to ensure that the basis for determination was addressed using normal plant processes and documented in the walkdown report. In response to RAI 1, the licensee states that if an observation could not be resolved with a simplistic engineering evaluation based on the walkdown guidance training, or on an existing drawing, or on a calculation that provided the basis for a satisfactory determination, then these observation items were considered as PASCs by the SWEs and entered into the SWCs or AWCs. The licensee's response further states that all PASCs have been entered in the CAP, with the exception of three equipment anchors due to physical obstructions of visibility. Based on a simplistic evaluation documented on Table 5-2 of the walkdown report, the SWEs determined that all three items were found acceptable and therefore, not entered in the CAP.

After evaluating the licensee's response and reviewing Tables 5-2 and 5-3, the staff concludes that the licensee responded appropriately to RAI 1, PASCs were properly identified and documented, and summary Tables 5-2 and 5-3 is considered complete.

In addition to the information provided above, the NRC staff notes that anchorage configurations were verified to be consistent with existing plant documentation for at least 50 percent of the SWEL items, in accordance with Section 4 of the walkdown guidance.

The equipment and areas that were inaccessible during the 180-day period are listed in Attachment E, Tables E-1, E-2, and E-3 of the walkdown report. The lists of inaccessible items also include the condition that caused the delay of the walkdown. A limited number of SWEL components (total of 18) were inaccessible at the time of the initial walkdowns. Revision 2 of the walkdown report provided the results of additional walkdowns performed during the February and May 2013 periods. The NRC staff reviewed the checklists of Attachment C (SWCs) and Attachment D (AWCs) from Revision 2 of the walkdown report and noted that a total of 17 components were walked down during the February and May 2013 time periods, and one item was removed from the SWEL. In Revision 2 of the walkdown report, the licensee stated that this item, which was originally included in the SWEL in Revision 1 of the walkdown report, was removed from the SWEL because of deficiencies in the room access doors that require an extended period to repair. The licensee further stated that this item is only one out of 13 components of the same class (tanks and/or heat exchangers) included in SWEL 1 and SWEL 2. The staff concludes that the SWEL diversity has been maintained and the overall SWEL continues to have representation from every equipment class as the original SWEL.

Based on the information provided in the licensee's submittals, the NRC staff concludes that the licensee's implementation of the walkdown process meets the intent of the walkdown guidance.

3.2.4 Licensing Basis Evaluations and Results

Section 5, Seismic Licensing Basis Evaluations, of the walkdown guidance provides information to licensees regarding the conduct of licensing basis evaluations for items identified during the seismic walkdowns as degraded, nonconforming, or unanalyzed that might have potential seismic significance.

The NRC staff reviewed Section 6 of the TPNG-4 Walkdown Report, which discusses the process for conducting the seismic licensing basis evaluations of the PASCs identified during the seismic walkdowns and area walk-bys. The licensee stated that it performed its licensing basis

evaluations and resolved PASCs using the CAP. Tables 5-2 and 5-3 of the walkdown report list the key licensee findings, and provide a complete list of the potentially degraded, nonconforming, or unanalyzed conditions. These tables also describe the actions taken or planned to address these conditions, including the status of each of the items the licensee entered into the CAP.

The staff reviewed the CAP entries and the description of the actions taken or planned to address deficiencies. The staff concludes that the licensee appropriately identified potentially degraded, nonconforming, or unanalyzed conditions and entered them into the CAP, which meets the intent of the walkdown guidance.

3.2.5 Conclusion

Based on the aforementioned discussion, the NRC staff concludes that the licensee's implementation of seismic walkdown methodology meets the intent of the walkdown guidance for personnel qualifications, development of SWELs, implementation of the walkdown process, and seismic licensing basis evaluations.

3.3 Peer Review

Section 6, Peer Review, of the walkdown guidance provides licensees with information regarding the conduct of peer reviews for the activities performed during the seismic walkdowns.

Page 6-1 of the walkdown guidance identifies the following activities to be conducted during the peer review process:

- Review the selection of the SSCs included on the SWELs
- Review a sample of the checklists prepared for the seismic walkdowns and area walk-bys
- Review the licensing basis evaluations
- Review the decisions for entering the potentially adverse conditions into the CAP
- Review the walkdown report
- Summarize the results of the peer review process in the walkdown report

The NRC staff reviewed the information provided in Section 8 and Appendix F of the TPNG-4 Walkdown Report, which describes the conduct of the peer review. In addition, the staff reviewed the response to RAI 2. In RAI 2, the staff requested the licensee to provide additional information on the overall peer review process that was followed as part of the walkdown activities. Specifically, the staff requested the licensee to confirm that the activities identified in page 6-1 of the walkdown guidance were assessed and documented in the report. The licensee was also requested to confirm that any individual involved in performing any given walkdown activity was not a peer reviewer for that same activity. In response to RAI 2, the licensee confirmed that all the activities identified on page 6-1 of the walkdown guidance were included as part of the peer review process and referred to the summary of the peer review activities provided in Appendix F of the walkdown report. In addition, the licensee provided additional information on the level of involvement of the peer review team and its leader in order to further demonstrate the independence of the peer review process.

The staff reviewed the licensee's summary of each of these activities, which included the peer review team members' level of involvement, the peer review findings, and resolution of peer

review comments. After reviewing the licensee's submittals, the NRC staff concludes that the licensee sufficiently documented the results of the peer review activities and how these reviews affected the work described in the walkdown report.

Based on the aforementioned discussion, the NRC staff concludes that the licensee's results of the peer review and subsequent actions taken in response to the peer review meets the intent of Section 6 of the walkdown guidance.

3.4 IPEEE Information

Section 7, IPEEE Vulnerabilities, of the walkdown guidance provides information to licensees regarding the reporting of the evaluations conducted and actions taken in response to seismic vulnerabilities identified during the IPEEE program. Through the IPEEE program and Generic Letter (GL) 88-20, "Individual Plant Examination of External Events for Severe Accident Vulnerabilities," licensees previously had performed a systematic examination to identify any plant-specific vulnerability to severe accidents.

In lieu of a full IPEEE seismic analysis, the licensee states that it opted to perform a "scaled back" program to address Unresolved Safety Issue (USI) A-46 and GL 87-02, as allowed by the NRC in a letter dated November 4, 1998. Section 7 of the walkdown report states that the final results of the USI A-46 program were submitted to the NRC (FPL Letter L-93-155) and the components selected for this analysis were also included in the SWEL in order to verify no outlier issues persisted. The actions taken for USI A-46 outlier resolution are summarized in Table 7-1 of the walkdown report. Section 2.3 of the submittal states that FPL addressed all outlier issues identified during the USI A-46 program walkdowns.

Based on the NRC staff's review of Section 7 of the walkdown report, the staff concludes that the licensee's identification of plant-specific vulnerabilities (including anomalies, outliers, and other findings) identified by the IPEEE program, as well as actions taken to eliminate or reduce them, meets the intent of Section 7 of the walkdown guidance.

3.5 Planned Upgrades

The licensee did not identify any planned or newly installed protection and mitigation features in the walkdown report.

3.6 NRC Oversight

3.6.1 Independent Verification by Resident Inspectors

On July 6, 2012,¹⁰ the NRC issued Temporary Instruction (TI) 2515/188 "Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns." In accordance with the TI, NRC inspectors independently verified that the TPNG-4 licensee implemented the seismic walkdowns in accordance with the walkdown guidance. Additionally, the inspectors independently performed walkdowns of a sample of seismic protection features. The inspection

¹⁰ADAMS Accession No. ML12156A052

report dated January 30, 2013,¹¹ documents the results of this inspection and states that no findings were identified.

4.0 CONCLUSION

The NRC staff concludes that the licensee's implementation of seismic walkdown methodology meets the intent of the walkdown guidance. The staff concludes that, through the implementation of the walkdown guidance activities and, in accordance with plant processes and procedures, the licensee verified the plant configuration with the current seismic licensing basis; addressed degraded, nonconforming, or unanalyzed seismic conditions; and verified the adequacy of monitoring and maintenance programs for protective features. Furthermore, the staff notes that no immediate safety concerns were identified. The NRC staff reviewed the information provided and determined sufficient information was provided to be responsive to Enclosure 3 of the 50.54(f) letter.

¹¹ ADAMS Accession No. ML13030A208

M. Nazar

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If you have any questions, please contact me at 301-415-0489 or by e-mail at audrey.klett@nrc.gov.

Sincerely,

/RA/

Audrey L. Klett, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-251

Enclosure:
Staff Assessment of Seismic Walkdown Report

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