



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

April 1, 2014

Vice President, Operations
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 3 - 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. MF0134)

Dear Sir or Madam:

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) (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.

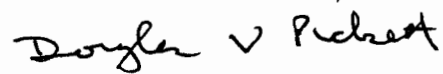
By letter dated November 27, 2012, as supplemented by letter dated June 12, 2013, Entergy Nuclear Operations, Inc. (Entergy) submitted its Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter for Indian Point Nuclear Generating Unit No. 3 (IP3). By letter dated December 2, 2013, Entergy 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 sufficient information was provided to be responsive to Enclosure 3 of the 50.54(f) letter.

- 2 -

If you have any questions, please contact me at 301-415-1364 or by e-mail at Douglas.Pickett@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Douglas V. Pickett". The signature is written in a cursive style with a checkmark-like flourish above the 'V'.

Douglas V. Pickett, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-286

Enclosure:
Staff Assessment of Seismic Walkdown Report

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STAFF ASSESSMENT OF SEISMIC WALKDOWN REPORT
NEAR-TERM TASK FORCE RECOMMENDATION 2.3 RELATED TO
THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT
ENERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

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*, Subpart 50.54(f) (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.

¹ ADAMS Accession No. ML12053A340.

² ADAMS Accession No. ML12056A049

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 walkdown process. By letter dated May 29, 2012,³ the Nuclear Energy Institute (NEI) staff submitted Electric Power Research Institute document 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 Entergy Nuclear Operations, Inc (the licensee) provided a response to Enclosure 3 of the 50.54(f) letter Required Response Item 2, for Indian Point Nuclear Generation Unit No. 3 (IP3). In addition to the aforementioned letter, the licensee, by letter dated June 12, 2013⁶, provided an update to the IP3 seismic walkdown report. The updated report provides the results for the supplemental seismic walkdowns of components that were inaccessible during the initial walkdowns.

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, 2013⁷, the 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 staff request by letter dated December 2, 2013⁸.

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 Criteria (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 that an SSC of a facility must perform, and the specific values or ranges of values chosen for controlling parameters as reference bounds for the design.

³ ADAMS Package Accession No. ML121640872.

⁴ ADAMS Accession No. ML12145A529

⁵ ADAMS Package Accession No.. ML123530535

⁶ ADAMS Package Accession No. ML131760043

⁷ ADAMS Accession No. ML13304B418

⁸ ADAMS Accession No. ML13343A145

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 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 IP3 in Section 2.0 of the walkdown report. Consistent with the walkdown guidance, the NRC 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 staff reviewed Section 2.0 of the walkdown report, focusing on the summary of the SSE, methodology 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 previously referenced NEI 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 NEI seismic walkdown guidance provide information to licensees regarding the implementation of an appropriate seismic walkdown methodology. By letter dated July 10, 2012,⁹ the licensee confirmed that it would utilize the walkdown guidance as the basis for conducting and documenting seismic walkdowns at IP3.

The walkdown report dated November 27, 2012, and supplemented on June 12, 2013, did not identify any deviations from the walkdown guidance. However, the licensee prepared "Fukushima Near-Term Task Force Recommendations 2.3: Seismic Walk-down Procedure EN-DC-168" to govern the performance of the seismic walkdowns and preparation of the seismic report. The licensee indicated that the objective of this report is to document the results of the seismic walkdowns undertaken in accordance with the walkdown guidance and under the guidance of Entergy procedure EN-DC-168 and provide the information necessary for responding to Enclosure 3 of the 50.54 (f) letter.

⁹ ADAMS Accession No. ML12202A009

The NRC staff reviewed the following areas 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

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 4.0 and Attachment I 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 IP3 base 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 Attachment B, Table 2 and 5, of the walkdown report, IP3 SWEL 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

Due to 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 due to 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 is 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 licensee discussed the approach to identifying all items that can lead to rapid drain-down in Section 6.2 of the walkdown report. The licensee reviewed the SFP documentation to identify penetrations below about 10 ft above the top of the fuel assemblies and assessed hydraulic lines and connected equipment of each such penetration for potentially seismic induced failure modes that could lead to rapid drain-down. Attachment B, Table-4 of the walkdown report identifies two SSCs related to the fuel transfer tube and fuel transfer canal that could have a possible rapid drain-down capability. The licensee evaluated and determined to exclude the SSCs in the rapid drain-down list from the SWEL-2. The NRC staff reviewed Attachment B, Table-4 and noted that sufficient information was provided to explain the reasons for exclusion of these items in the SWEL-2. After reviewing the information provided in this section, the staff concludes that the licensee provided sufficient information to justify that there are no items which could lead to rapid drain-down of the IP3 spent fuel pool.

In Section 6.3.1 of the supplemental walkdown report, the licensee stated that a SWEL component substitution was made due to plant protected train restrictions during the refueling outage. The NRC staff reviewed the licensee's justification provided for the equipment substitution, reviewed the description and equipment location, and agrees that the substituted item is comparable to the previous one and was located in similar environmental conditions. The licensee provided a full description of the substitution in their updated report and documented the supplemental inspection in the seismic walkdown checklists (SWCs) in Attachment J of the updated seismic walkdown report. The staff concludes that the SWEL diversity has been maintained and the overall SWEL with the substitutions continues to have representation from every equipment class as the original SWEL.

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 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 7.0 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 seismic review teams of at least two SWEs conducted the seismic walkdowns and area walk-bys together during the course

of 3.5 weeks. The initial walkdowns were performed in October 2012 and a subsequent set of walkdowns were performed in February and March of 2013, to complete inspections on a number of components that were inaccessible during the initial walkdowns. By letter dated June 12, 2013, the licensee submitted a supplemental walkdown report describing the results of these subsequent seismic walkdowns. The walkdown report also states that the SWEs discussed their observations and judgments with each other during the walkdowns. Additionally, the SWEs agreed on the results of their seismic walkdowns and area walk-bys before reporting the results of their review. Attachments C, J, D and K of the updated walkdown report provides the completed SWCs and area walk-by checklists (AWCs), documenting the results for each item of equipment on SWELs 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 walkdown report provides details on the internal process followed by the SWEs which included the documentation of the results for each SWEL item in the SWCs or AWCs. The licensee documented cases of potentially adverse seismic conditions (PASCs) in the checklists for further evaluation. Attachments E and M of the updated 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 current status.

By letter dated November 1, 2013, the NRC staff issued two questions in a request for additional information (RAI) in order to obtain 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 a 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 indicated that unusual conditions were noted on the SWCs or AWCs and briefly discussed between the SWEs to agree upon whether it was a PASC or not. Conditions determined to be PASCs were addressed either with a licensing basis evaluation (LBE) to determine whether it requires entry into the CAP, or by entering it into the CAP directly. The licensee conducted an LBE or entered the condition directly into the CAP on a case-by-case basis based on the efficiency of each process for eventual resolution of each specific condition. Attachment E and L of the updated walkdown report provides a list of these conditions, describes how each condition was addressed and report its current status. The licensee stated that uncertain conditions were entered directly to the CAP for further resolution. The licensee stated that unusual conditions that were not seismically significant, such as housekeeping conditions items, were identified by SWEs and addressed through the CAP. The licensee referred to Section 8.0 of the walkdown report which includes a summary on the process used for identifying conditions, and the process for the condition resolution. The licensee confirmed that the reported information supports the conclusion that the plant meets its current licensing basis and that no new conditions were identified and all the items were addressed and properly included in the walkdown report.

After evaluating the licensee's response and Attachment E and L of the updated walkdown report, the NRC staff concludes that the licensee responded appropriately to RAI 1 and that PASCs were properly identified and documented.

The licensee stated 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.

Section 6.3 of the updated walkdown report confirms that additional walkdowns were conducted during February and March 2013 to perform inspections on inaccessible equipment and internal cabinets that were not completely inspected or were not opened during the initial walkdowns. In Section 6.3.1 of the updated walkdown report, the licensee provided a table that summarizes the completed subsequent inspections. The NRC staff reviewed the seismic walkdown checklists in Attachment J of the updated walkdown report and confirmed that cabinets were opened to determine if any adverse conditions existed of internal equipment and that all supplemental inspections for inaccessible equipment were also conducted.

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 8.0 of the IP3 updated 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 PASCs identified during the seismic walkdown and area walk-bys were included in Attachments E and L of the updated walkdown report. Each PASC was then addressed either with an LBE to determine whether it required entry into the CAP, or by entering it into the CAP directly. The licensee stated the decision to conduct an LBE or using the CAP directly was made on a case-by-case basis. Attachments F and M of the walkdown report documents the results of each of the LBEs.

The NRC staff reviewed the LBE and CAP entries and the description of the actions taken or planned to address potential deficiencies. The staff concludes that the licensee appropriately identified 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 discussion above, 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 9.0 of the IP3 updated walkdown report which describes the conduct of the peer review. In addition, the staff reviewed Attachments G and H, which contains all findings noted by the independent reviewers and the resolution. 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 the walkdown report. In addition, the licensee confirmed that an independent review was performed and provided additional information on the level of involvement of the peer review team in order to further demonstrate the independence of the peer review process.

The NRC 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 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 discussion above, 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 GL 88-20, "Individual Plant Examination of External Events for Severe Accident Vulnerabilities," licensees previously performed a systematic examination to identify any plant-specific vulnerabilities to severe accidents.

In Section 5.0 of the walkdown report the licensee provided background information regarding their IPEEE program. The licensee identified one seismic vulnerability regarding the emergency diesel generator ventilation system. Attachment A of the walkdown report includes the description, commitment and resolution of the vulnerability. The licensee indicated that the equipment enhanced as a result of the IPEEE program was included in the SWEL 1. Attachment A indicates that the resolution of the vulnerability was completed and resolved.

Based on the NRC staff's review of Section 5.0 and Attachment A 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 IP3 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 report dated February 8, 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 staff reviewed the information provided and determined that sufficient information was provided to be responsive to Enclosure 3 of the 50.54(f) letter.

¹⁰ ADAMS Accession No. ML12156A052

¹¹ ADAMS Accession No. ML13039A047

If you have any questions, please contact me at 301-415-1364 or by e-mail at Douglas.Pickett@nrc.gov.

Sincerely,

/ra/

Douglas V. Pickett, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-286

Enclosure:
Staff Assessment of Seismic Walkdown Report

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* concurrence by e-mail

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