



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

April 15, 2014

Mr. Dennis L. Koehl
President and CEO/CNO
STP Nuclear Operating Company
South Texas Project
P.O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNITS 1 AND 2 - STAFF ASSESSMENT OF THE SEISMIC WALKDOWN REPORTS SUPPORTING IMPLEMENTATION OF NEAR-TERM TASK FORCE RECOMMENDATION 2.3 RELATED TO THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT (TAC NOS. MF0178 AND MF0179)

Dear Mr. Koehl:

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 letters dated December 2, 2013, and February 27, 2014, STP Nuclear Operating Company (STPNOC, the licensee) submitted its Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter for the South Texas Project (STP), Units 1 and 2.

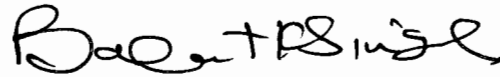
The NRC staff reviewed the information provided and, as documented in the enclosed staff assessments, Enclosure 1 for Unit 1 and Enclosure 2 for Unit 2, determined that sufficient information was provided to be responsive to Enclosure 3 of the 50.54(f) letter. This concludes the NRC's efforts associated with TAC Nos. MF0178 and MF0179.

D. Koehl

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If you have any questions, please contact me at 301-415-3016 or by e-mail at Balwant.Singal@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Balwant K. Singal'.

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosures:

1. Staff Assessment of Seismic Walkdown Report for STP, Unit 1
2. Staff Assessment of Seismic Walkdown Report for STP, Unit 2

cc w/encls: 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
STP NUCLEAR OPERATING COMPANY
SOUTH TEXAS PROJECT, UNIT 1
DOCKET NO. 50-498

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.

Enclosure 3 of the 50.54(f) letter requested licensees to provide the following:

- a. Information on 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 IPEEE [Individual Plant Examination of External Events] 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 walkdown process. By letter dated May 29, 2012,³ the Nuclear Energy Institute (NEI) staff submitted Electric Power Research Institute (EPRI) document 1025286, "Seismic Walkdown

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

² ADAMS Accession No. ML12056A049.

³ ADAMS Package Accession No. ML121640872.

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 STP Nuclear Operating Company (STPNOC, the licensee) provided a seismic walkdown report in response to Enclosure 3 of the 50.54(f) letter Required Response Item 2, for South Texas Project (STP), Unit 1.

The NRC staff reviewed the walkdown report and determined that additional information was needed for completing its review. In letter dated November 1, 2013,⁶ 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’s request for additional information (RAI) by letter dated December 2, 2013.⁷

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 for Nuclear Power Plants,” Criterion 2 (GDC 2), “Design bases for protection against natural phenomena,” and Appendix A to 10 CFR Part 100, “Reactor Site Criteria.” Criterion 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, tsunami, 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.

GDC 2 states that the design bases for the SSCs shall reflect appropriate consideration of the most severe natural phenomena that have been historically reported for the site and surrounding area with sufficient margin 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 license.

⁴ ADAMS Accession No. ML12145A529.

⁵ ADAMS Accession No. ML13003A275.

⁶ ADAMS Accession No. ML13304B418.

⁷ ADAMS Accession No. ML13346A264.

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 STP, Unit 1, in Section 1 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 1 of the walkdown report, focusing on the summary of the SSE and the design codes used in the design of STP, Unit 1.

Based on its review, the NRC 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 July 9, 2012,⁸ the licensee confirmed that it would utilize the walkdown guidance in the performance of the seismic walkdowns at STP, Unit 1.

The walkdown report dated November 27, 2012, 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

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 2 and Appendix A 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

⁸ ADAMS Accession No. ML12200A030.

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.

The NRC staff noted that the walkdown report did not clearly describe the role of the operations staff or plant personnel. By letter dated December 2, 2013, in response to the NRC staff's RAI No. 1 (described below), the licensee clarified that SWEs interfaced with plant personnel in pre-walkdown activities, mainly in document retrieval to assist the walkdown activities. In addition, the licensee stated that plant personnel assisted the SWEs during the walkdown activities and, when the case permitted, assisted to quickly resolve issues identified during the walkdowns.

The NRC staff also noted that the walkdown report does not identify names for licensing basis reviewers involved in the walkdown activities. The licensee stated in Section 5 of the walkdown report that the plant's CAP system was used to document the evaluation of potentially adverse seismic conditions (PASCs); therefore, no licensing basis evaluations or reviewers were needed.

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 STP, Unit 1, base list, SWEL 1 (sample list of designated safety functions equipment), and SWEL 2 (sample list of spent fuel pool-related equipment). The licensee provided the base lists, SWEL 1 and SWEL 2 in Appendix B of the walkdown report and discussed these lists in Section 3.2 of the walkdown report.

The overall equipment selection process followed the screening process shown in Figures 1-1 and 1-2 of the walkdown guidance. Based on the walkdown report, STP, Unit 1, 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

It is possible that some classes of equipment will not be represented on the SWEL due to individual plant configurations and the walkdown guidance screening process followed to select the final SWEL equipment. The walkdown guidance recognizes this is due to the equipment not being present in the plant (e.g., some plants generate direct current 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). 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 a rapid drain-down list was not included as part of the SWEL 2, as described in Section 3 of the guidance. In Section 3.2.2 of the walkdown report, the licensee stated there are no components that could, upon failure, result in rapid drain-down of the spent fuel pool water level to below 3 meters (10 feet) above the top of the fuel. After reviewing the information provided in this section, the staff concludes that the licensee provided adequate justification for not including rapid drain-down items as part of the SWEL 2.

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 4 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 two-person teams of trained 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 during the months of September and October 2012.

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. Appendices C and D of the walkdown report provide the completed SWCs and AWCs, documenting the results for each item of equipment on the SWELs and each area containing SWEL equipment. The licensee used the checklists provided in Appendix C of the walkdown guidance report without modification.

The licensee documented cases of PASCs in the checklists for further evaluation. Table 4-1 of the walkdown report lists the conditions identified, including PASCs, during the seismic walkdowns and the area walk-bys. The tables describe how each condition was addressed (e.g., placement in the CAP), its resolution and current status. The licensee stated that a low

threshold was used to identify and document PASCs in the field. Based on the review of the checklists, the NRC 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 NRC staff requested additional information regarding the process followed by the licensee when evaluating conditions identified in the field during the walkdowns and walk-bys. Specifically, in RAI No. 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 its December 2, 2013, response to RAI No. 1, the licensee confirmed that all conditions identified during the walkdowns and walk-bys were documented as condition reports (CRs) in the STP, Unit 1, CAP. The licensee referred to Table 4-1 of the walkdown report, which includes all PASCs identified during the walkdowns and area walk-bys for STP, Unit 1, as well as other potentially adverse conditions. The licensee stated that in addition to addressing the PASCs through the CAP, other non-seismic potentially adverse conditions, such as housekeeping and material conditions items, were identified by SWEs and addressed through the CAP. The licensee included in the response to the RAI, Table 4-1A-U1 which supplements Table 4-1 of the walkdown report and provides additional information about PASCs identified, including: condition disposition, CR issue date, and current status. Furthermore, the licensee confirmed that all of the conditions observed in the field, after evaluation either by engineering judgment or Condition Report Engineering Evaluation (CREE), lead to the conclusion that STP, Unit 1, were within its current licensing basis.

After evaluating the licensee's response and reviewing Table 4-1 of the walkdown report and Table 4-1A-U1 of the letter dated December 2, 2013, the NRC staff concludes that the licensee identified and documented conditions properly, including PASCs, and that the summary tables are 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 NRC staff notes that in Section 4 of the walkdown report, the licensee states that all electrical cabinets in the SWEL were accessible, opened, and inspected to ensure that visibly accessible internal component mountings are adequate. Based on a review of the licensee's general walkdown methodology as described in Section 4 and the SWCs and AWCs in Appendices C and D of the walkdown report, the staff confirmed that cabinets were opened, where applicable, by the seismic walkdown team.

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 5 of the STP, Unit 1, Walkdown Report, which discusses the process used by the licensee to identify and resolve PASCs identified during the walkdowns. The licensee stated that SWE teams performing the walkdowns used a very low threshold to identify and document conditions in the field, including housekeeping seismic issues and PASCs. The licensee stated that conditions were dispositioned in the plant's CAP and, therefore, no licensing basis evaluations were needed. The licensee added that in some cases, immediate operability determinations were performed by the senior reactor operators on shift and in all occasions the equipment was determined to be operable and no further evaluation was needed. Table 4-1 of the walkdown report and supplement Table 4-1A-U1 of the December 2, 2013, letter lists the key licensee findings, and provides 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 current status of each condition entered into the CAP

The NRC staff reviewed the CAP entries and the description of the actions taken or planned to address potential 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 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 7 of the STP, Unit 1, Walkdown Report which describes the conduct of the peer review. In addition, the staff reviewed the response to RAI No. 2. In RAI No. 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 on page 6-1 of the walkdown guidance were assessed and documented in the report. The NRC staff also requested the licensee to confirm that any individual involved in performing any given walkdown activity was not a peer reviewer for that same activity. In its letter dated December 2, 2013, 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 Section 7 of the STP, Unit 1, walkdown report. In addition, the licensee confirmed that "there were no cases where a peer reviewer reviewed their own work."

The NRC staff reviewed the licensee's summary of each of these activities, which included a discussion of the peer review team members' qualifications and 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 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 Generic Letter (GL) 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities – 10 CFR 50.54(f)," dated November 23, 1988,⁹ licensees previously had performed a systematic examination to identify any plant-specific vulnerabilities to severe accidents.

The licensee provided background information regarding its IPEEE program. In those submittals, the licensee stated that there were no vulnerabilities identified during its IPEEE program. The licensee stated that since seismic hazard is extremely low at STP, Unit 1, a limited scope, conservative and bounding analysis was performed in the STP IPEEE.

Based on the NRC staff's review of Section 6 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.

⁹ ADAMS Accession No. ML031150465.

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 STP, Unit 1, 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 5, 2013,¹¹ documents the results of this inspection. No inspection findings were reported.

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 the licensee, through the implementation of the walkdown guidance activities and, in accordance with plant processes and procedures, 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 concludes that the licensee responded appropriately to Enclosure 3 of the 50.54(f) letter, dated March 12, 2012.

¹⁰ ADAMS Accession No. ML12156A052.

¹¹ ADAMS Accession No. ML13037A195.

STAFF ASSESSMENT OF SEISMIC WALKDOWN REPORT
NEAR-TERM TASK FORCE RECOMMENDATION 2.3 RELATED TO
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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.

Enclosure 3 of the 50.54(f) letter requested licensees to provide the following:

- a. Information on 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.
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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, 2012³, the Nuclear Energy Institute (NEI) staff submitted Electric Power Research Institute (EPRI) document 1025286, "Seismic Walkdown

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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, 2012⁵, STP Nuclear Operating Company (STPNOC, the licensee) provided a seismic walkdown report in response to Enclosure 3 of the 50.54(f) letter Required Response Item 2, for South Texas Project (STP), Unit 2. This report contained a small number of inaccessible items that the licensee committed to complete at a later date. The licensee, by letter dated June 19, 2013,⁶ revised the due date for the commitment, as established in the initial walkdown report, to provide final walkdown results for all items from July 2013 to February 2014. Therefore, by letter dated February 27, 2014,⁷ the licensee provided an updated revision to the initial STP, Unit 2, seismic walkdown report. The purpose of the latter walkdown report was to update, supplement, and provide information on the remaining inaccessible components not completed in the initial walkdown report.

The NRC staff reviewed the initial walkdown report and determined that additional information is needed for completing its review. By letter dated November 1, 2013,⁸ 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’s request for additional information (RAI) by letter dated December 2, 2013.⁹

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 for Nuclear Power Plants,” Criterion 2 (GDC 2), “Design bases for protection against natural phenomena,” and Appendix A to 10 CFR Part 100, “Reactor Site Criteria.” Criterion 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.

⁴ ADAMS Accession No. ML12145A529.

⁵ ADAMS Accession No. ML13003A275.

⁶ ADAMS Accession No. ML13191A910.

⁷ ADAMS Accession No. ML14077A279.

⁸ ADAMS Accession No. ML13304B418.

⁹ ADAMS Accession No. ML13346A264.

GDC 2 states that the design bases for the SSCs shall reflect appropriate consideration of the most severe natural phenomena that have been historically reported for the site and surrounding area with sufficient margin 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 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 STP, Unit 2, in Section 1 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 1 of the updated walkdown report, focusing on the summary of the SSE and the design codes used in the design of STP, Unit 2.

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 July 9, 2012,¹⁰ the licensee confirmed that it would utilize the walkdown guidance in the performance of the seismic walkdowns at STP, Unit 2.

The initial and updated walkdown reports dated November 27, 2012, and February 27, 2014, respectively, 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)

¹⁰ ADAMS Accession No. ML12200A030.

- 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 2 and Appendix A of the initial 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.

The NRC staff noted that the initial walkdown report did not clearly describe the role of the operations staff or plant personnel. By letter dated December 2, 2013, in response to the NRC staff's RAI No. 1 (described below), the licensee clarified that SWEs interfaced with plant personnel in pre-walkdown activities, mainly in document retrieval to assist the walkdown activities. In addition, the licensee stated that plant personnel assisted the SWEs during the walkdown activities and, when the case permitted, assisted to quickly resolve issues identified during the walkdowns.

The NRC staff also noted that the updated walkdown report does not identify names for licensing basis reviewers involved in the walkdown activities. However, the licensee stated in Section 5 of the walkdown report that the plant's CAP system was used to document the evaluation of potentially adverse seismic conditions (PASCs), therefore, no licensing basis evaluations or reviewers were needed.

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 STP, Unit 2, base list, SWEL 1 (sample list of designated safety functions equipment), and SWEL 2 (sample list of spent fuel pool-related equipment). The licensee provided the base lists, SWEL 1 and SWEL 2 in Appendix B of the initial walkdown report and discussed these lists in Section 3.2. Table B-5 of the updated walkdown report contains a revised version of the SWEL that incorporates more information on inaccessible items.

The overall equipment selection process followed the screening process shown in Figures 1-1 and 1-2 of the walkdown guidance. Based on the updated walkdown report, STP, Unit 2, 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
- IEEE equipment
- Major new or replacement equipment
- Risk considerations

It is possible that some classes of equipment will not be represented on the SWEL due to individual plant configurations and the walkdown guidance screening process followed to select the final SWEL equipment. The walkdown guidance recognizes this is due to the equipment not being present in the plant (e.g., some plants generate direct current 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 a rapid drain-down list was not included as part of the SWEL 2, as described in Section 3 of the guidance. In Section 3.2.2 of the updated walkdown report, the licensee stated there are no components that could, upon failure, result in rapid drain-down of the spent fuel pool water level to below 3 meters (10 feet) above the top of the fuel. After reviewing the information provided in this section, the staff concludes that the licensee provided adequate justification for not including rapid drain-down items as part of the SWEL 2.

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 4 of the updated 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 two-person teams of trained SWEs conducted the seismic walkdowns and area walk-bys. According to the signed seismic walkdown checklists (SWCs) and area walk-by checklists (AWCs), the initial activities were conducted during the months of September and October 2012. The

equipment that was inaccessible during the initial 180-day period is listed in Table 3-5 of the STP, Unit 2, updated walkdown report. There were 15 SSCs that could only be accessed during a plant outage. The licensee completed all of the deferred walkdowns in November of 2013 and provided the results in the updated walkdown report dated February 27, 2014.

The updated 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. Appendices C and D of the initial walkdown report provide the completed SWCs and AWCs, documenting the results for each item of equipment on the SWEL and each area containing SWEL equipment inspected during the initial walkdowns. Similarly, Appendices C and D of the updated walkdown report document the results of deferred walkdowns performed on the inaccessible items. The licensee used the checklists provided in Appendix C of the walkdown guidance report without modification.

The licensee documented cases of PASCs in the checklists for further evaluation. Table 4-1 of the updated walkdown report lists the conditions identified, including PASCs, during the seismic walkdowns and area walk-bys performed for the initial walkdown report. In a similar fashion, Table 4-2 of the updated walkdown report lists conditions, including PASCs, identified during the walkdown activities for the inaccessible items. The tables describe how each condition was addressed (e.g., placement in the CAP), its resolution and current status. The licensee stated that a low threshold was used to identify and document PASCs in the field.

Based on the initial review of the checklists, the NRC staff was unable to confirm that all the PASCs identified during the walkdowns were included in these tables. As such, 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 No. 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 its December 2, 2013, response to RAI No. 1, the licensee confirmed that all conditions identified during the walkdowns and walk-bys were documented as condition reports (CRs) in the STP, Unit 2, CAP. The licensee referred to Table 4-1 of the walkdown reports, which include all PASCs identified during the walkdowns and area walk-bys for STP, Unit 2, as well as other potentially adverse conditions. The licensee stated that in addition to addressing the PASCs through the CAP, other non-seismic potentially adverse conditions, such as housekeeping and material conditions items, were identified by SWEs and addressed through the CAP. The licensee included in the response to RAI No. 1, Table 4-1A-U2 which supplements Table 4-1 of the walkdown report and provides additional information about PASCs identified, including: condition disposition, CR issue date and current status. Furthermore, the licensee confirmed that all of the conditions observed in the field, after evaluation either by engineering judgment or Condition Report Engineering Evaluation (CREE), lead to the conclusion that STP, Unit 2, were within its current licensing basis.

After evaluating the licensee's response and reviewing Tables 4-1, 4-1A-U2 and 4-2, the NRC staff concludes that the licensee identified and documented conditions properly, including PASCs, and that the summary tables are 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 NRC staff notes that in Section 4 of the updated walkdown report, the licensee states that all electrical cabinets in the SWEL were accessible, opened, and inspected to ensure that visibly accessible internal component mountings are adequate. Based on a review of the licensee's general walkdown methodology as described in Section 4 and the SWCs and AWCs in Appendices C and D of the walkdown report, the staff confirmed that cabinets were opened, where applicable, by the seismic walkdown team.

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 5 of the STP, Unit 2, updated walkdown report, which discusses the process used by the licensee to identify and resolve PASCs identified during the walkdowns. The licensee stated that SWE teams performing the walkdowns used a very low threshold to identify and document conditions in the field, including housekeeping seismic issues and PASCs. The licensee stated that conditions were dispositioned in the plant's CAP and, therefore, no licensing basis evaluations were needed. The licensee added that in some cases, immediate operability determinations were performed by the senior reactor operators on shift and in all occasions the equipment was determined to be operable and no further evaluation was needed. Tables 4-1, 4-1A-U2 and 4-2 of the updated 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 current status of each condition entered into the CAP.

The NRC staff reviewed the CAP entries and the description of the actions taken or planned to address potential 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 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 7 of the STP, Unit 2, Walkdown Report which describes the conduct of the peer review. In addition, the staff reviewed the response to RAI No. 2. In RAI No. 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 on page 6-1 of the walkdown guidance were assessed and documented in the report. The NRC staff also requested the licensee to confirm that any individual involved in performing any given walkdown activity was not a peer reviewer for that same activity. In its letter dated December 2, 2013, 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 Section 7 of the STP, Unit 2, walkdown report. In addition, the licensee confirmed that "there were no cases where a peer reviewer reviewed their own work."

The staff reviewed the licensee's summary of each of these activities, which included a discussion of the peer review team members' qualifications and 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 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 Generic

Letter (GL) 88-20, "Individual Plant Examination or Severe Accident Vulnerabilities – 10 CFR 50.54(f)," dated November 23, 1988,¹¹ licensees previously had performed a systematic examination to identify any plant-specific vulnerabilities to severe accidents.

The licensee provided background information regarding its IPEEE program in Section 6 of the updated walkdown report. The licensee stated that there were no vulnerabilities identified during its IPEEE program. The licensee stated that since seismic hazard is extremely low at STP, Unit 2, a limited scope, conservative and bounding analysis was performed in the STP IPEEE.

Based on the NRC staff's review of Section 6 of the updated 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, 2012,¹² 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 STP, Unit 2, 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 5, 2013,¹³ documents the results of this inspection. No inspection findings were reported.

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 the licensee, through the implementation of the walkdown guidance activities and, in accordance with plant processes and procedures, 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 concludes that the licensee responded appropriately to Enclosure 3 of the 50.54(f) letter, dated March 12, 2012.

¹¹ ADAMS Accession No. ML031150465.

¹² ADAMS Accession No. ML12156A052.

¹³ ADAMS Accession No. ML13037A195.

D. Koehl

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If you have any questions, please contact me at 301-415-3016 or by e-mail at Balwant.Singal@nrc.gov.

Sincerely,

/RA/

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosures:

1. Staff Assessment of Seismic Walkdown Report for STP, Unit 1
2. Staff Assessment of Seismic Walkdown Report for STP, Unit 2

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ADAMS Accession No.: ML14087A078

* Memo dated 3/18/14

**via email

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