



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

May 6, 2014

Mr. Joseph H. Plona
Senior Vice President and
Chief Nuclear Officer
DTE Electric Company
Fermi 2 - 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI NUCLEAR PLANT, UNIT 2 - 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. MF0124)

Dear Mr. Plona:

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 26, 2012, DTE Electric Company (DTE) submitted its Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter for the Fermi Nuclear Plant, Unit 2. By letter dated November 18, 2013, DTE provided a response to the NRC request for additional information for the staff to complete its assessment.

The NRC staff acknowledges that a supplemental letter will be provided 90 days following the completion of refueling outage 16 (first quarter of 2014), and will address the walkdown results of the remaining inaccessible items, consistent with the regulatory commitment. 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.

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If you have any questions, please contact me at 301-415-4037 or by e-mail at Thomas.Wengert@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas J. Wengert". The signature is fluid and cursive, with the first name "Thomas" being the most prominent.

Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-341

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
DTE ELECTRIC COMPANY
FERMI NUCLEAR PLANT, UNIT 2
DOCKET NO. 50-341

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.

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

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

² ADAMS Accession No. ML12056A049

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 26, 2012,⁵ DTE Electric Company (the licensee) provided a response to Enclosure 3 of the 50.54(f) letter Required Response Item 2, for Fermi Nuclear Power Plant, Unit 2 (Fermi-2). The NRC staff reviewed the walkdown report and determined that additional supplemental information would assist the staff in completing its review. By letter dated November 1, 2013⁶, 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 18, 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 (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, 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.

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 ADAMS Package Accession No. ML121640872

⁴ ADAMS Accession No. ML12145A529

⁵ ADAMS Package Accession No. ML123420005

⁶ ADAMS Accession No. ML13304B418

⁷ ADAMS Accession No. ML13324A477

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 Fermi-2 in Section 2 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 NRC staff reviewed Section 2 of the walkdown report, focusing on the summary of the SSE and the design codes used in the design of Fermi-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 6, 2012,⁸ the licensee confirmed that it would use the walkdown guidance in the performance of the seismic walkdowns at Fermi-2.

The walkdown report dated November 26, 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 3, 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 involvement for the following personnel involved in the seismic walkdown activities: equipment

⁸ ADAMS Accession No. ML121910536

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 does not identify any individuals as the licensing basis reviewers involved in the walkdown activities. The licensee stated in Section 5.2.2 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 reviewers for the walkdown activities 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 Fermi-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 list, SWEL 1 and SWEL 2, Appendix B of the walkdown report, and discussed these lists in Section 4.2 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 Appendix B of the walkdown report, Fermi-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
- 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 being screened out during the screening process as 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 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 4.2.2 of the walkdown report, the licensee

stated that there are no components that could, upon failure, result in rapid drain-down of the spent fuel pool water level to below 3 m (10 ft) above the top of the fuel. After reviewing the information provided in this section, the NRC staff concludes that the licensee provided adequate justification for not including rapid drain-down items as part of the SWEL.

The licensee stated that, after the SWEL 1 list was completed, some replacements were made because the field-installed configuration of some of the SSCs did not allow the required access to view all of the anchors. The licensee stated that the replacement SSCs were adequately accessible and met the same requirements for selection specified in the walkdown guidance. Regarding SWEL 2, the licensee stated that two items were eliminated from the original list because visual inspection was not possible due to the items being under water. The licensee explained that these items are not located in an area of vulnerability since they are located more than 10 feet above the top of the fuel. Table B.5 of Appendix B lists the aforementioned SWEL items with a detailed explanation for their substitution or exclusion. The NRC staff concludes that the substitutions and exclusions maintained the diversity of the equipment classes represented in 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 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 over the course of three months from August 2012 to 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. The licensee stated that none of the issues identified during the walkdowns were ultimately judged to be PASCs. The licensee stated that all conditions identified in the field were addressed through the Fermi-2 CAP program as Condition Assessment Resolution Documents (CARDs). Tables 5-2

and 5-3 of the walkdown report list the conditions identified 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. 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 this table. By letter dated November 1, 2013, the NRC staff issued 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 further explain 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 stated that, during walkdowns, the SWEs used engineering judgment to assess conditions identified in the field and conditions that could not be resolved in the field were promptly entered into the plant's CAP as a CARD. Furthermore, the licensee confirmed that all PASCs identified during the walkdowns were addressed and included in the walkdown report.

After evaluating the licensee's response and reviewing the summary tables, Tables 5-2 and 5-3 of the walkdown report, the NRC staff concludes that the licensee responded appropriately to RAI 1. In addition, the staff concludes that conditions, including any PASCs, were properly identified and documented, and the summary tables provided 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.

Section 5.2 of the walkdown report states that accessible cabinets were opened to verify their internal components. The NRC staff reviewed the seismic walkdown checklists and confirmed that cabinets and panels were opened to determine if any adverse conditions existed among internal equipment.

Table E-1 lists equipment and areas that were inaccessible during the 180-day period. Table E-1 lists 13 SWEL components that were inaccessible at the time of the initial walkdowns due to required accessibility during an outage or the energized nature of the component. The licensee committed to complete the deferred walkdowns for the inaccessible items during the next refueling outage, RF16, and to provide the results in a final walkdown report within 90 days of completion of the outage. The NRC staff concludes that the inaccessible equipment list was developed consistent with the walkdown guidance. The schedule for completion is consistent with the timing of the next scheduled refueling and system outages.

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 Fermi-2 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 all conditions identified during the walkdowns and walk-bys were addressed through the plant's CAP. The licensee added that, since all conditions were determined not to be PASCs, formal licensing basis evaluations were not necessary nor performed. The licensee further added that in all cases the identified condition would not prevent the equipment or component from performing its safety-related function. 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 current status of each of the items the licensee 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 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 7 of the Fermi-2 walkdown report, which describes the conduct of the peer review. In addition, the staff reviewed the response to RAI 2. In RAI 2, the NRC 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 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 stated 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 Section 8 and the full peer review report in Appendix F of the walkdown report. In addition, the licensee stated that the peer reviewers did not review 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 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 meet 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 88-20, "Individual Plant Examination of External Events for Severe Accident Vulnerabilities," 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 and referenced several submittals to the NRC. The licensee lists, in Tables 7-1, 7-2 and 7-3 of the walkdown report, previously identified outliers, their tracking numbers and resolution status. The licensee stated that a sample of twenty components was selected from the outlier populations identified by the IPEEE and included in the walkdown packages in order to verify completion of the associated corrective actions. The licensee stated that no PASCs were identified on these components.

Based on the NRC staff's review of Section 7 of the walkdown report, the staff concludes that the licensee's summary of the IPEEE is consistent with, and 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, 2012,⁹ 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 Fermi-2 implemented the seismic walkdowns in

⁹ ADAMS Accession No. ML12156A052

accordance with the walkdown guidance. Additionally, the inspectors independently performed walkdowns of a sample of seismic protection features. The inspection report dated January 28, 2013,¹⁰ documents the results of this inspection and states that no findings were identified.

4.0 INACCESSIBLE ITEMS

The equipment and areas that were inaccessible during the 180-day period are listed in Table E-1 of the walkdown report. The list of inaccessible items also includes the condition that caused the delay of the walkdown. As discussed above, a limited number of SWEL components (total of 13) were inaccessible at the time of the initial walkdowns. The walkdowns for all of the remaining inaccessible items were committed to be completed by the end of the next scheduled refueling outage (first quarter of 2014) and a final walkdown report containing the results will be provided within 90 days of completion of the outage.

5.0 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 NRC staff notes that no immediate safety concerns were identified. The staff acknowledges that the licensee will submit a supplemental letter that will address the walkdown results for the remaining inaccessible items, consistent with the regulatory commitment, within 90 days of completion of the RF16 outage, which was scheduled to be completed in the first quarter of 2014. The NRC 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. ML13028A454

If you have any questions, please contact me at 301-415-4037 or by e-mail at Thomas.Wengert@nrc.gov.

Sincerely,

/RA/

Thomas J. Wengert, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosure:
Staff Assessment of Seismic Walkdown Report

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