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NUCLEAR REGULATORY COMMISSION  
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May 30, 2014

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SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - 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. MF0116)

Dear Mr. Lieb:

On March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information letter per Paragraph 50.54(f) to Title 10 of the *Code of Federal Regulations*, (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 (ADAMS Accession No. ML12056A049), FirstEnergy Nuclear Operating Company (FENOC) submitted its Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter. By letter dated November 26, 2013 (ADAMS Accession No. ML13340A277), FENOC provided a response to the NRC request for additional information (RAI) dated November 1, 2013 (ADAMS Accession No. ML13304B418), needed for the staff to complete its assessments. By this same letter, the licensee updated their seismic walkdown report to incorporate the response to the RAI and to address similar issues identified at Beaver Valley Power Station by a self-assessment and NRC site audit.

The NRC staff acknowledges that a supplemental letter will be provided within 120 days following completion of the spring 2014 refueling outage addressing 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.

R. Lieb

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If you have any questions, please feel free to contact me at 301-415-2315.

Sincerely,

*/RA/*

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Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-346

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  
FIRST ENERGY NUCLEAR OPERATING COMPANY (FENOC)  
DAVIS-BESSE NUCLEAR POWER STATION (DBNPS)  
DOCKET NO. 50-346

1.0 INTRODUCTION

On March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information per Title 10 of the *Code of Federal Regulations*, Paragraph 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" (ADAMS Accession No. ML12056A049) 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 walkdown process. By letter dated May 29, 2012 (ADAMS Accession No. ML121640872), the Nuclear Energy Institute submitted Electric Power Research Institute document 1025286, "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force

Enclosure

Recommendation 2.3: Seismic,” (walkdown guidance) to the NRC staff to consider for endorsement. By letter dated May 31, 2012 (ADAMS Accession No. ML12145A529), the NRC staff endorsed the walkdown guidance.

By letter dated November 27, 2012 (ADAMS Accession No. ML13008A029), First Energy Nuclear Operating Company (FENOC, or the licensee) provided a response to Enclosure 3 of the 50.54(f) letter Required Response Item 2, for Davis Besse Nuclear Power Station (DBNPS). The NRC staff reviewed the walkdown report and determined that additional supplemental information would assist the staff in completing its review. In a letter dated November 1, 2013 (ADAMS Accession No. ML13304B418), the NRC staff requested additional information concerning the processes and procedures used by the licensee in conducting the walkdowns and walk-bys. The licensee responded in a letter dated November 26, 2013 (ADAMS Accession No. ML13340A277). By this same letter, the licensee updated their seismic walkdown report to incorporate the responses to the staff’s request and to address similar issues identified at Beaver Valley Power Station (BVPS) by a self-assessment and NRC site audit. BVPS is part of FENOC’s fleet and seismic walkdowns were performed by the same group of contractor and plant personnel. BVPS was audited by the NRC staff on July 2013.

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.

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 DBNPS in Section 2 of the walkdown report. Consistent with the walkdown guidance, the staff noted that the report includes a summary of the safe-shutdown earthquake 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.

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, are consistent with Section 8, Submittal Report, of the walkdown guidance.

#### 3.2 Seismic Walkdown Methodology Implementation

Sections 2 and 5 of the walkdown guidance provided information to licensees regarding the implementation of an appropriate seismic walkdown methodology. By letter dated July 10, 2012 (ADAMS Accession No. ML12192A615), the licensee confirmed that it would utilize the walkdown guidance in the performance of seismic walkdowns at DBNPS.

The walkdown report dated November 27, 2012, and updated on November 26, 2013, did not identify deviations from the walkdown guidance.

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

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

##### 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 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 DBNPS 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 Tables 4-2 and 4-5 of the updated walkdown report, DBNPS 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 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.

In Section 4.2 of the walkdown report, the licensee described the approach used to identify items that can lead to a rapid drain-down of the spent fuel pool (SFP). Based on the discussions provided in this section, the licensee determined that no rapid drain-down items were added to the SWEL 2. After reviewing this information, the NRC staff concludes that the licensee provided sufficient information to justify that there are no items that could lead to a rapid drain-down of the DBNPS SFP.

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 Sections 5 and 6 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 a two-person team of trained SWEs conducted the seismic walkdowns and area walk-bys together during the period of July 11 to July 14, 2012. The SWEs were assisted by plant operation personnel during the walkdown activities. The SWEs were also assisted by a senior structural engineer who served as a structural mentor and provided overall support to the walkdown team. 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 B and C of the walkdown report provide the completed seismic walkdown checklists (SWCs) and area walk-by checklists (AWCs) documenting the results for each item of equipment on the SWEL (SWEL 1 and SWEL 2) and each area containing SWEL equipment. The licensee used the checklists provided in Appendix C of the walkdown guidance report without modification.

The NRC staff reviewed these checklists and noted that SWCs and AWCs were all signed on July 25, 2012. The updated report provides additional details on the internal process followed by the SWEs which included team discussions and further evaluations at the daily meeting immediately after the walkdown. Observations identified during the walkdowns were evaluated with respect to their seismic licensing basis. If these observations could not be readily shown to meet its seismic licensing basis, the condition was immediately documented in a condition report (CR) to be further evaluated under the plant's CAP. The results of these assessments were then documented in their respective SWC or AWC. The SWCs and AWCs were not signed until all of the documentation, which included reviewer comments, was incorporated into the checklists. For this reason, according to the licensee, the SWCs and AWCs were signed when the final report was prepared and not when the in-field walkdowns were completed.

The licensee documented cases of potentially adverse seismic conditions (PASCs) in the checklists for further evaluation. Table 6-5 of the updated walkdown report lists each PASC identified during the initial area walk-bys. The licensee stated that no PASC was identified during the seismic walkdowns, and that findings identified during the seismic walkdowns were resolved and judged not to be present credible and/or significant concerns based on engineering judgment and precedent design documentation. Field notes and finding resolution were presented in their respective SWCs included in Appendix B. Table 6-5 describes the PASCs and how the condition has been addressed (e.g., placement in the CAP). Based on the review of the initial checklists, the NRC staff was unable to confirm that all the PASCs identified during the walkdowns and area walk-bys were included in this summary table. 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 a letter dated November 26, 2013, the licensee stated that the walkdown report has been updated to address the staff's concerns and included insights from observations and discussions

from the BVPS seismic walkdown audit. The licensee confirmed that any PASCs identified in the seismic walkdowns or area walk-bys was evaluated with respect to the seismic licensing basis at the end of each day. Some conditions were resolved by additional calculations or by plant documents that substantiated the as-built condition. Reference to these calculations and plant documentation was provided in the SWCs and AWCs. If the PASC could not be readily shown to meet the licensing basis, the condition was immediately documented in a CR to be further evaluated using the plant's CAP. Furthermore, the licensee stated that each CR entered into the CAP has either had corrective actions closed or has been closed to another action tracking process, such as a notification in the work order process. After evaluating the licensee's response, reviewing Table 6-5 and additional clarification provided in the updated report, the NRC staff concludes that the PASCs were properly identified and documented and summary Table 6-5 is considered complete.

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

The walkdown report does not clearly state whether the licensee opened cabinets as part of the walkdowns. The NRC staff reviewed the SWCs provided in the walkdown report and confirmed that accessible cabinets were opened to determine if any adverse conditions existed of internal equipment. Table 6-3a of the updated report includes a list of inaccessible cabinets and panels that will have their walkdowns completed by opening the cabinet doors and inspecting the internals by the plant's next refueling outage.

The equipment and areas that were inaccessible during the 180-day period are listed in Tables 6-3 and 6-3a of the updated walkdown report. The list of inaccessible items also includes the condition which caused the delay of the walkdown. A limited number of SWEL components (total of 15) were inaccessible or were not walkdowned at the time of the initial walkdowns. The licensee stated that the internally mounted items on seven cabinets and panels will be inspected during the next refueling outage. However, the external anchorage conditions for these components were assessed during the initial walkdowns. The other eight SWEL components located in the containment building were inaccessible during the plant's normal operations. The walkdowns for all of these items were committed to be completed by the end of the next scheduled refueling outage (spring 2014). In the November 27, 2012, submittal, the licensee committed to provide a supplemental submittal with the results of these walkdown items within 120 days following the completion of the spring 2014 refueling outage.

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 7.0 of the 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. Based on the information provided in the walkdown report, any PASC identified in the seismic walkdowns or area walk-bys was evaluated with respect to the seismic licensing basis at the end of each day. Some conditions were resolved by additional calculations or by plant documents that substantiated the as-built condition. Reference to these calculations and plant documentation was provided in the SWCs and AWCs. If the PASC could not be readily shown to meet the licensing basis, the condition was immediately documented in a CR to be further evaluated using the plant's CAP. Table 6-5 in the walkdown report list each PASC identified during the initial area walk-bys, respectively. This table describes how each condition has been addressed (e.g., placement in the CAP).

The NRC staff reviewed the CAP entries and the description of the actions taken or planned to address deficiencies. The staff concludes that the licensee appropriately identified 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 of the walkdown report, which describes the conduct of the peer review. In addition, the staff reviewed the response to RAI 2. In RAI 2, the staff requested the licensee to provide additional information on the overall peer review process that was followed as part of the walkdown activities. Specifically, the staff requested the licensee to confirm that the activities identified in page 6-1 of the walkdown guidance were assessed and documented in the report. The licensee was also requested to confirm that any individual involved in performing any given walkdown activity was not a peer reviewer for that same activity. The licensee updated the walkdown report to address the staff's requests and included insights from observations and discussions of the BVPS seismic walkdown

audit. 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. In addition, the licensee provided additional information in the updated report to better document the level of involvement of the peer review team and its leader in order to further demonstrate the independence of the peer review process.

The 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 Generic Letter 88-20, licensees had previously performed a systematic examination to identify any plant-specific vulnerabilities to severe accidents.

The NRC staff reviewed Section 8.0 of the walkdown report which makes reference to Table 4-3 and Appendix G of the updated report. Table 4-3 provides a list of equipment enhanced due to vulnerabilities identified during the A-46 (Seismic Qualification of Equipment in Operating Plants)/IPEEE programs. Appendix G provides dates and modification numbers that document the closure of the vulnerabilities.

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

### 3.5 Planned Upgrades

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

### 3.6 NRC Oversight

#### 3.6.1 Independent Verification by Resident Inspectors

On July 6, 2012 (ADAMS Accession No. ML12156A052), 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 DBNPS 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 January 25, 2013 (ADAMS Accession No. ML13025A126), 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 Tables 6-3 and 6-3a of the updated walkdown report. The list of inaccessible items also includes the condition which caused the delay of the walkdown. As discussed above, a limited number of SWEL components (total of 15) 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 (spring 2014). The licensee committed in the November 27, 2012, submittal, to provide a supplemental submittal with the results of these walkdown items within 120 days following the completion of the spring 2014 refueling 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 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. 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 acknowledges that a supplemental letter will be provided within 120 days following completion of the spring 2014 refueling outage addressing the remaining inaccessible items consistent with the regulatory commitment.

R. Lieb

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If you have any questions, please feel free to contact me at 301-415-2315.

Sincerely,

*/RA/*

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Plant Licensing III-2 and  
Planning and Analysis Branch  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:  
Staff Assessment of Seismic Walkdown Report

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**ADAMS Accession Number: ML14134A517**

\* concurrence by e-mail

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