

October 3, 2008

Mr. Adam C. Heflin  
Senior Vice President  
and Chief Nuclear Officer  
Union Electric Company  
P.O. Box 620  
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1, EVALUATION OF THE PROPOSED  
EMERGENCY ACTION LEVELS (TAC NO. MD5771)

Dear Mr. Heflin:

In an application dated March 27, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML070940468), and supplemented by letters dated June 4, 2007; March 7, 2008; and May 29, 2008 (ADAMS Accession Nos. ML071630403, ML080780239, and ML081580257, respectively), Union Electric Company (the licensee) requested prior U.S. Nuclear Regulatory Commission (NRC) approval for proposed changes to the emergency action levels (EALs) for Callaway Plant, Unit 1. All of these letters are classified as sensitive unclassified and are not publicly available.

The requested changes to the licensee's EALs support a conversion from the current EAL scheme to a scheme based on guidance in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, issued February 2008. For Callaway Plant, Unit 1, the licensee currently uses an EAL scheme based on the Nuclear Management and Resources Council (NUMARC) and National Environmental Studies Project (NESP) guidance document NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," Revision 2, issued January 1992.

After performing a review of the proposed changes to the Callaway Plant, Unit 1, EALs, the NRC staff determined that the licensee's incorporation of the proposed changes meets the standards in Title 10, Section 50.47(b), of the *Code of Federal Regulations* (10 CFR 50.47(b)) and the requirements of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Therefore, the NRC staff concludes that the licensee's proposed changes to the EALs for Callaway Plant, Unit 1, as outlined in its application dated March 27, 2007, and supplemented by letters dated June 4, 2007; March 7, 2008; and May 29, 2008, are acceptable.

The licensee must implement the EALs as approved by the NRC (i.e., as provided in Attachment 3 of the licensee's letter dated May 29, 2008, which includes the implementation of the EAL design-basis document). If the licensee changes the EALs in accordance with 10 CFR 50.54(q) before they are implemented, the licensee shall ensure that it provides the changes to the NRC during the next emergency preparedness baseline inspection.

A. Heflin

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If you have any questions, please contact the Callaway Plant project manager, Mohan Thadani, at (301) 415-1476.

Sincerely,

/RA/

Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure:  
As stated

cc with enclosure: See next page.

A. Heflin

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If you have any questions, please contact the Callaway Plant project manager, Mohan Thadani, at (301) 415-1476.

Sincerely,

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\* SE input memo

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED REVISIONS TO EMERGENCY ACTION LEVELS

CALLAWAY PLANT, UNIT 1

UNION ELECTRIC COMPANY

DOCKET NO. 50-483

1.0 INTRODUCTION

In an application dated March 27, 2007 (Reference 1), and supplemented by letters dated June 4, 2007; March 7, 2008; and May 29, 2008 (References 2, 3, and 4, respectively), Union Electric Company (the licensee) requested prior U.S. Nuclear Regulatory Commission (NRC) approval for proposed changes to the emergency action levels (EALs) for Callaway Plant, Unit 1.

The requested changes to the current EALs for Callaway Plant, Unit 1, will support a conversion from the current EAL scheme to a scheme based on guidance in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, issued February 2008 (Reference 5). The licensee currently uses an EAL scheme based on Nuclear Management and Resources Council (NUMARC) and National Environmental Studies Project (NESP) guidance document NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," Revision 2, issued January 1992.

2.0 REGULATORY EVALUATION

The NRC staff reviewed the proposed revision against the regulations and guidance described below.

2.1 Regulations

In Title 10, Section 50.47, "Emergency Plans," of the *Code of Federal Regulations* (10 CFR 50.47), the NRC describes the emergency plan requirements for nuclear power plant facilities. In 10 CFR 50.47(a)(1)(i), the NRC requires that "...no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." In 10 CFR 50.47(b), the NRC establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that licensees can and will take adequate protective measures in the event of a radiological emergency. One of these standards (10 CFR 50.47(b)(4)) stipulates that emergency plans include a standard emergency classification and action level scheme.

Enclosure

In Section IV.B of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," the NRC requires that emergency plans include EALs, which are to be used as criteria for determining the need for the notification and participation of State and local agencies, the Commission, and other Federal agencies and for determining when and what type of protective measures should be considered, both on site and off site, to protect public health and safety. EALs shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. In Section IV.B of Appendix E to 10 CFR Part 50, the NRC requires licensees to review the EALs with the State and local governmental authorities on an annual basis. This regulation also states that the NRC must approve a revision to the EALs before it is implemented if one of the following events occurs:

- The licensee changes from one EAL scheme to another (e.g., a change from an EAL scheme based on NUREG-0654/[Federal Emergency Management Agency (FEMA)] FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," issued November 1980 (Reference 6), to a scheme based on NUMARC/NESP-007 or on NEI 99-01, "Methodology for development of Emergency Action Levels [EALs]."
- The licensee proposes an alternate method for complying with the regulations.
- The EAL revision decreases the effectiveness of the emergency plan.

## 2.2 Guidance

The NRC staff has accepted the methods in the following references for developing EALs that meet the requirements in Section IV.B of Appendix E to 10 CFR Part 50 and in 10 CFR 50.47(b)(4):

- Appendix 1, "U.S. Nuclear Regulatory Commission Emergency Action Level Guidelines for Nuclear Power Plants," to NUREG-0654/FEMA-REP-1
- NUMARC/NESP-007
- NEI 99-01, Revision 4, dated January 2003.

Regulatory Issue Summary (RIS) 2003-18, "Use of NEI 99-01[, Revision 4], 'Methodology for Development of Emergency Action Levels,'" dated October 8, 2003, with Supplement 1, dated July 13, 2004; and Supplement 2, dated December 12, 2005 (Reference 7) provide guidance for developing or changing a standard emergency classification and action level scheme. In addition, this RIS provides recommendations to assist licensees, consistent with Section IV.B of Appendix E to 10 CFR Part 50, in determining whether to seek prior NRC approval of deviations from the guidance.

In a letter dated February 22, 2008, from Christopher Miller to Alan Nelson (Reference 8), the NRC staff concluded that the guidance contained in NEI 99-01, Revision 5, dated February 2008 is also an acceptable alternative method that licensees may use to develop EAL schemes that meet the requirements in Section IV.B of Appendix E to 10 CFR Part 50 and in

10 CFR 50.47(b)(4). The licensee decided to use the guidance contained in NEI 99-01, Revision 5, which henceforth will be referred to as NEI 99-01.

### 3.0 TECHNICAL EVALUATION

The licensee submitted the proposed changes to the NRC for a technical and regulatory review before implementing them, as required under Section IV.B of Appendix E to 10 CFR Part 50.

This evaluation is based on a revision to EALs provided in the licensee's application letter and supplemented by the licensee's responses to the NRC's requests for additional information.

Callaway Plant, Unit 1, currently uses an EAL scheme based on NUMARC/NESP-007. The licensee is converting to an EAL scheme based on NEI 99-01.

In its application and supplemental letters, the licensee submitted the proposed EALs for Callaway Plant, Unit 1; their technical basis; a comparison matrix; the EAL numbering scheme; and an explanation for any difference or deviation from NEI 99-01. The comparison matrix provided a cross-reference relating the proposed EAL scheme to the EALs in NEI 99-01. The NRC staff has reviewed the technical basis for the proposed EALs, the differences or deviations from NEI 99-01, and the licensee's justifications.

Therefore, the NRC staff reviewed the proposed EALs against the guidance in NEI 99-01 to determine if the EALs for Callaway Plant, Unit 1, as provided in the application and supplemental letters, meet the guidelines in that document. The NRC staff considered the following NEI 99-01 guidelines in its review:

- consistency (i.e., the EALs would lead to similar decisions under similar circumstances at different plants);
- human engineering and user friendliness;
- the potential for a classification upgrade only when there is an increasing threat to public health and safety;
- ease of upgrading and downgrading;
- thoroughness in addressing and disposing of the issues of completeness and accuracy that were raised regarding Appendix 1 to NUREG-0654/FEMA-REP-1;
- technical completeness for each classification level;
- logical progression in classification for multiple events;
- objective and observable values.

The NRC staff reviewed the proposed EALs and has determined that they are consistent with EALs implemented at other plants with a Westinghouse pressurized-water reactor design, use objective and observable values, and are consistent with the intent of NEI 99-01.

The NRC staff reviewed the proposed EALs to determine whether they are worded in a manner that addresses human engineering and user-friendliness concerns. The proposed EALs use procedural language, including specific tag numbers for instrument readings and alarms; flow charts; critical safety function status trees; check lists; and combinations of the above. Based on this review, the staff has determined that the proposed EALs meet the guidelines in NEI 99-01 in this area.

The NRC staff reviewed the proposed EAL sets<sup>1</sup> and has determined that classification upgrades are based upon an increasing threat to public health and safety, can effectively support upgrading and downgrading, and follow a logical progression for multiple events. Based on this review, the NRC staff concludes that the EALs are in accordance with the intent of NEI 99-01 in these areas.

The NRC staff also reviewed the proposed EALs for technical completeness and accuracy for each classification level. The proposed EALs are based on a risk assessment used to set the boundaries of the emergency classification levels and to ensure that all EALs that trigger that emergency classification are in the same range of relative risk. Precursor conditions of more serious emergencies also represent a potential risk to the public and are appropriately classified. The staff has determined that the proposed EALs are consistent with NEI 99-01, which it has determined is an acceptable alternative to EALs based on Appendix 1 to NUREG-0654/FEMA-REP-1.

Based on its review of the proposed EALs, the NRC staff concludes that these EALs meet the guidelines in NEI 99-01 for all of the areas listed above in this section. Therefore, based on this, the staff further concludes that the proposed EALs meet NEI 99-01, which is an acceptable alternative to the regulatory requirements listed in Section 2.0 of this safety evaluation.

#### 4.0 CONCLUSION

The NRC staff performed a technical and regulatory review of the proposed changes to the Callaway Plant, Unit 1, EALs. The staff has determined that the proposed changes meet the guidelines in NEI 99-01, which is an acceptable alternative for development of an EAL scheme that meets the regulatory requirements. Based on this, the staff concludes that the proposed EALs meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50 and provide reasonable assurance that the licensee will take adequate protective measures in a radiological emergency. Therefore, based on this conclusion, the NRC staff determines that the proposed EAL changes are acceptable.

#### 5.0 REFERENCES

1. Letter from Union Electric Company to the NRC, "Upgrade Submittal Adopting NRC Endorsed NEI 99-01, Revision 4," March 27, 2007 (ADAMS Accession No. ML070940468).

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<sup>1</sup> An EAL set is a group of EALs within a category that is related to a common concern (e.g., an EAL set might include an unusual event, an alert, a site area emergency, and a general emergency related to the failure of an automatic scram to shut down the plant).



2. Letter from Union Electric Company to the NRC, "Submittal of Information Needed for Proposed Revision of Emergency Action Levels," June 4, 2007 (ADAMS Accession No. ML071630403).
3. Letter from Union Electric Company to the NRC, "Response to NRC Request for Additional Information (RAI) Regarding Proposed Revision of Emergency Action Levels," March 7, 2008 (ADAMS Accession No. ML080780239).
4. Letter from Union Electric Company to the NRC, "Response to NRC Request for Additional Information (RAI) Regarding Proposed Revision of Emergency Action Levels," May 29, 2008 (ADAMS Accession No. ML081580257).
5. NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, February 2008 (ADAMS Accession No. ML080450149).
6. NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980 (ADAMS Accession No. ML040420012).
7. RIS 2003-18, with Supplements 1 and 2, "Use of NEI 99-01, 'Methodology for Development of Emergency Action Levels,'" January 2003 (ADAMS Accession Nos. ML032580518, ML041550395, and ML051450482, respectively).
8. Letter from Christopher Miller (NRC) to Alan Nelson (NEI), "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision 5, Dated February 2008," February 22, 2008 (ADAMS Accession No. ML080430535).

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Date: October 3, 2008