



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

October 7, 2015

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

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: UPGRADE TO  
EMERGENCY ACTION LEVEL SCHEME (CAC NO. MF4945)

Dear Mr. Diya:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 212 to Renewed Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the emergency action level (EAL) scheme in response to your application dated October 2, 2014, as supplemented by letters dated July 6, July 16, and August 31, 2015.

The amendment revises your current EAL scheme to a scheme based on Nuclear Energy Institute (NEI) 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "L. John Klos".

L. John Klos, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures:

1. Amendment No. 212 to NPF-30
2. Safety Evaluation

cc: Listserv



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

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 212  
License No. NPF-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Union Electric Company (UE, the licensee), dated October 2, 2014, as supplemented by letters dated July 6, July 16, and August 31, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, by Amendment No. 212 Renewed Facility Operating License No. NPF-30 is hereby amended to authorize revision to the Emergency Action Level Technical Bases Document as set forth in UE's application dated October 2, 2014, as supplemented by letters dated July 6, July 16, and August 31, 2015, and evaluated in the NRC staff's safety evaluation enclosed with this amendment.
3. This amendment is effective as of its date of issuance, and shall be implemented within 90 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

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William M. Dean, Director  
Office of Nuclear Reactor Regulation

Date of Issuance: October 17, 2015



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 212 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-30

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT 1

DOCKET NO. 50-483

1.0 INTRODUCTION

By application dated October 2, 2014 (Reference 1), as supplemented by letters dated July 6, July 16, and August 31, 2015 (References 2, 3, and 4, respectively), Union Electric Company (dba Ameren Missouri, the licensee), requested changes to Renewed Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1 (Callaway). The licensee is proposing to change the Emergency Action Levels (EALs) from a scheme based upon Nuclear Energy Institute (NEI) 99-01, Revision 5, "Development of Emergency Action Levels," dated February 2008 (Reference 5), to a scheme based on NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012 (Reference 6).

The supplemental letters dated July 6, July 16, and August 31, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 3, 2015 (80 FR 5813).

2.0 REGULATORY EVALUATION

The applicable regulations and guidance for the emergency plans are as follows:

2.1 Regulations

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.47, "Emergency plans," sets forth emergency plan requirements for nuclear power plant facilities. The regulations in 10 CFR 50.47(a)(1)(i) state, in part, 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.

Section 50.47(b) 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 adequate protective measures can and will be taken in the event of a radiological emergency.

Planning Standard (4) of this Section requires that onsite and offsite emergency response plans contain:

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Section 50.47(b)(4) to 10 CFR emphasizes use of a standard emergency classification and action level scheme, assuring that implementation methods are relatively consistent throughout the industry for a given reactor and containment design while simultaneously providing an opportunity for a licensee to modify its EAL scheme as necessary to address plant-specific design considerations or preferences.

Section IV.B of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states, in part:

The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.

The proposed changes were submitted to the NRC for a technical and regulatory review prior to implementation by the licensee. This review is based upon a Revision to the site-specific EAL scheme provided in the licensee's application letter and supplemented by the licensee's responses to the NRC staff's request for additional information (RAI) dated May 22, 2015 (Reference 7). The site-specific enclosures and attachments of the licensee's letter dated August 31, 2015 (Reference 4), contains the final version of the proposed EAL scheme and is the final version reviewed by the NRC staff for acceptability.

## 2.2 Guidance

EAL development guidance was initially established via Generic Letter (GL) 79-50, "Emergency Plans Submittal Dates," dated October 10, 1979 (Reference 8), and was subsequently established in NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," January 1992 (Reference 9), which was endorsed as an approach for the development of an EAL scheme via NRC Regulatory Guide (RG) 1.101, Revision 2, "Emergency Planning and Preparedness for Nuclear Power Reactors," October 1981 (Reference 10).

As industry and regulatory experience was gained with the implementation and use of EAL schemes, the industry issued revised EAL scheme development guidance to reflect lessons learned. To date, NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," January 1992 (Reference 11), NEI 99-01, Revision 4 (Reference 12), and NEI 99-01, Revisions 5 and 6, were provided to the NRC for review and endorsement as generic (non-plant-specific) EAL development guidance. Revisions 3 and 4 of RG 1.101, dated August 1992 and July 2003, respectively (Reference 10), endorsed NUMARC/NESP-007 and NEI 99-01, Revision 4, as acceptable alternatives for licensees to consider in the development of their plant-specific EAL schemes. By letter dated February 22, 2008 (Reference 13), the NRC staff endorsed NEI 99-01, Revision 5 as generic (non-plant-specific) EAL scheme development guidance. NEI 99-01, Revision 6, was endorsed by the NRC in a letter dated March 28, 2013 (Reference 14), as generic (non-plant-specific) EAL scheme development guidance.

The EAL development guidance contained in GL 79-50, NUREG-0654/FEMA-REP-1, NUMARC/NESP-007, and NEI 99-01, Revisions 4, 5, and 6, are all considered generic EAL scheme development guidance, as they are not plant-specific and may not be entirely applicable for some reactor designs. However, the guidance contained in these documents bounds the most typical accident/event scenarios for which emergency response is necessary, in a format that allows for industry standardization and consistent regulatory oversight. Most licensees choose to develop their plant-specific EAL schemes using the latest endorsed EAL development guidance with appropriate plant-specific alterations as applicable. Pursuant to 10 CFR Part 50, Appendix E, Section IV.B (2), a Revision to an EAL must be approved by the NRC before implementation, if the licensee is changing from one EAL scheme to another EAL scheme.

In summary, the NRC staff considers the following methods acceptable for use in developing plant-specific EALs that meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), with the understanding that licensees may want to develop EALs that differ from the applicable guidance document as allowed in RG 1.101 and in the applicable endorsement letters:

- Appendix 1, "Emergency Action Level Guidelines for Nuclear Power Plants," to 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;

- NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels," January 1992;
- NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," January 2003;
- NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," February 2008; and
- NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012.

NRC Regulatory Issue Summary (RIS) 2003-18, "Use of NEI 99-01, 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 15), also provides guidance for developing or changing a standard EAL scheme. In addition, this RIS and its supplements provide recommendations to assist licensees, consistent with Section IV.B of Appendix E to Part 50, in determining whether to seek prior NRC approval of deviations from the guidance.

Regardless of the generic EAL scheme development guidance document used by a licensee to develop its EAL scheme, or if a licensee chose to develop its EAL scheme using an alternative approach not endorsed by the NRC, or a combination of the two (most typical), the NRC staff reviews the EAL scheme to assure it meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4).

### 3.0 TECHNICAL EVALUATION

In its application, the licensee proposes to revise its current EAL scheme based on NEI 99-01, Revision 5, to one based on NEI 99-01, Revision 6. In its application and supplemental letters, the licensee submitted the proposed EAL scheme, the technical basis, a comparison matrix, the EAL numbering scheme, and an explanation for any difference or deviation from NEI 99-01, Revision 6. The comparison matrix provided a cross-Reference relating the proposed EAL scheme to the EAL scheme in NEI 99-01, Revision 6. The NRC staff's review is based on the proposed site-specific EAL schemes provided with the licensee's letter dated October 2, 2014, as supplemented by letters dated July 6, July 16, and August 31, 2015.

The application states that the licensee used the terms "difference" and "deviation," as defined in RIS 2003-18, as supplemented, when comparing its proposed plant-specific EALs to the generic EALs in NEI 99-01, Revision 6. The NRC staff notes that both the current and proposed EALs have modifications from the guidance due to specific plant designs and licensee preference.

Although the EALs must be plant-specific, the NRC staff reviewed the proposed EALs for the following key characteristics of an effective EAL scheme to ensure consistency and regulatory stability:

- Consistency (i.e., the EALs would lead to similar decisions under similar circumstances at different plants), up to and including standardization in intent, if not in actual wording;
- Human factors engineering and user friendliness;
- Potential for 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 raised regarding Appendix 1 to NUREG-0654 (i.e., the EAL scheme is functional and complete as a whole);
- Technical completeness for each classification level;
- Logical progression in classification for multiple events; and
- Objective and observable values.

To aid in understanding the nomenclature used in this safety evaluation, for each category of EALs reviewed, the following naming/numbering convention is used: the first letter signifies the category; the second letter signifies the classification level (G = General Emergency (GE), S = Site Area Emergency (SAE), A = Alert, and U = Notification of Unusual Event (UE)); and the number is the applicable number from the plant-specific EAL scheme.

For ease of use, this safety evaluation will use the numbering system from the plant-specific EAL scheme; however, the numbering system from the generic EAL scheme development guidance is also annotated in [brackets] to aid in cross-referencing the site-specific EAL numbering convention with that of the guidance when the numbering is different.

### 3.1 Category 'R' – Abnormal Radiological Release/Radiological Effluent

#### 3.1.1 EAL Set RG1/RS1/RA1/RU1 [AG1/AS1/AA1/AU1]

This EAL set is based upon plant-specific indications of a release of radioactivity (gaseous and/or liquid). The NRC staff has determined that the progression from UE to GE is appropriate and consistent with EAL scheme development guidance.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL set are consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

Furthermore, the licensee used an updated dose modeling software program and chose to utilize a different set of input parameters consistent with the guidance in NEI 99-01, Revision 6 for developing EALs RG 1.1 [AG1], RS1.1 [AS1], and RU1.1 [AU1] than what was originally approved for its current EAL scheme. This resulted in a slight difference of EAL threshold values between its currently approved scheme and the scheme included in this amendment. The NRC staff concludes that the technical basis provided by the licensee for the input parameters and the resulting EAL threshold values provide for a progression from UE to GE, which is appropriate and consistent with EAL scheme development guidance.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.1.2 EAL Set RG2/RS2/RA2/RU2 [AG2/AS2/AA2/AU2]

This EAL set is based upon plant-specific indications of fuel uncover, including spent fuel in the refueling pathway or stored in the spent fuel pool. The NRC staff has determined that the progression from UE to GE is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are also bounded by indications available in the fission product barrier matrix, as well as in EALs RS1 and RG1.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL set are consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme, meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.1.3 EAL RA3 [AA3]

This EAL is not part of an EAL set within the overall EAL scheme. This EAL is based upon radiation levels in the plant that limit normal access. This Alert EAL is primarily intended to ensure that the plant emergency response organization is activated to support the control room

in removing the impediment to normal access. Indications of increasing radiation levels in the plant are bounded by indication of fission product barrier loss or potential loss, as well as in RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.2 Category 'C' – Cold Shutdown/Refueling System Malfunction

#### 3.2.1 EAL Set CG1/CS1/CA1/CU1

This EAL set is based upon a loss of reactor pressure vessel inventory and/or reactor coolant system (RCS) leakage. The NRC staff has determined that the progression from UE to GE is appropriate and consistent with EAL scheme development guidance.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

#### 3.2.2 EAL CA2/CU2

This EAL set is based upon a loss of available alternating current (AC) power to emergency power electrical busses. The NRC staff has determined that the progression from UE to Alert is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are bounded by indications available in EALs RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development

guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.2.3 EAL Set CA3/CU3

This EAL set is based upon an inability to maintain control of decay heat removal. The NRC staff has determined that the progression from UE to Alert is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are bounded by indications available in EALs RS1 and RG1.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.2.4 EAL CU4

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to ensure that an EAL is declared when a loss of direct current (DC) power event occurs, as this condition compromises the ability of the licensee to monitor and control the removal of decay heat during cold shutdown or refueling modes of operation. The Alert, SAE, and GE classification levels for this specific accident progression are bounded by indications available in EALs RA1, RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development

guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.2.5 EAL CU5

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to highlight the importance of emergency communications by ensuring that an EAL is declared if normal communication methods for onsite and offsite personnel, or for offsite response organizations including the NRC, are lost. The NRC staff has determined that no escalation path is necessary for this EAL.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The communication methods derived for this EAL are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.2.6 EAL CA6

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to ensure that an EAL is declared when hazardous events lead to potential damage to safety systems. The SAE and GE classification levels for this accident progression are bounded by indications available in EALs RS1 and RG1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.3 Category 'E' – Independent Spent Fuel Storage Installation

#### 3.3.1 EAL EU1 [E-HU1]

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is limited to radiological events at the independent spent fuel storage installation (ISFSI). The NRC staff has determined that, while security-related events at the ISFSI are also of concern, they are bounded by the licensee's EAL HA1.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. However, the NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme, meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.4 Category 'F' – Fission Product Barrier Matrix

This category is unique in the overall EAL scheme, as the thresholds are not intended to be stand-alone indicators of a particular event occurring at the plant. Rather, they are to be used as triggers within the particular logic configuration needed to reflect a loss or potential loss of a fission product barrier. Nuclear power plants in the United States have three fission product barriers: fuel cladding, RCS, and primary containment. Licensees are to develop thresholds that provide EAL decision-makers input into making an event declaration based upon degradation of one or more of these fission product barriers.

There are numerous triggers used as logic inputs to decide on the appropriate classification based upon the number of loss and/or potential loss indicators that are triggered for each barrier. By design, these indicators are redundant with other similar indicators in the Category 'R' and Category 'S' EAL sets, due to the importance for licensees to be able to recognize reactor and/or fission product barrier events as timely as possible using the best available indicators from several different perspectives.

The NRC staff verified that the logic used to determine the appropriate emergency classification is consistent with the generic EAL scheme development guidance.

The instrumentation and set points derived for this EAL category are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The licensee chose to modify this EAL category by using a plant-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL category is in alignment with the key characteristics of an effective EAL scheme, and while different than that provided in the generic EAL development guidance, continues to meet the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.5 Category 'H' – Hazards

#### 3.5.1 EAL Set HG1/HS1/HA1/HU1

This EAL set is based upon security-related events originally developed in accordance with the guidance from NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (Reference 16), or RIS 2006-12, "Endorsement of Nuclear Energy Institute Guidance 'Enhancements to Emergency Preparedness Programs for Hostile Action,'" dated July 19, 2006 (Reference 17), for licensees to implement regardless of the specific version of the generic EAL scheme development guidance used, or if the particular licensee developed its EAL scheme using an alternative approach. Based upon lessons learned from the implementation and use of this EAL set, particularly the insights gained from combined security and emergency preparedness drills, the NRC staff and the industry worked to enhance the language of these EALs so as to eliminate any confusion without changing the intent of the EAL set as set forth in NRC Bulletin 2005-02 and RIS 2006-12.

The licensee chose to modify this EAL set by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff has also determined that this EAL set is consistent with the guidance provided in NRC Bulletin 2005-02 and RIS 2006-12, as further enhanced by the lessons learned from implementation and drills, which were incorporated in NEI 99-01, Revision 6.

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.5.2 EAL HU2

This EAL is not part of an EAL set within the overall EAL scheme. This EAL is based upon the effect that a seismic event may have on the facility. The Alert, SAE and GE classification levels for this specific accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RA1, RS1, RG1, CA6, and SA9.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.5.3 EAL HU3

This EAL is not part of an EAL set within the overall EAL scheme. This EAL is based upon the effect that natural and destructive hazards may have on the facility. The Alert, SAE, and GE classification levels for this specific accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RA1, RS1, RG1, CA6, and SA9.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.5.4 EAL HU4

This EAL is not part of an EAL set within the overall EAL scheme. This EAL is based upon the effect that fires may have on the facility. The Alert, SAE and GE classification levels for this specific accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RA1, RS1, RG1, CA6, and SA9.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme

development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and therefore, it is acceptable.

### 3.5.5 EAL HA5

This EAL is not part of an EAL set within the overall EAL scheme. This EAL is based upon the effect that toxic, corrosive, asphyxiant, or flammable gases may have on the facility. The SAE and GE classification levels for this specific accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RS1 and RG1.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.5.6 EAL Set HS5/HA5

This EAL set is based upon control room evacuation with the inability to control critical plant systems remotely. The NRC staff has determined that the progression from Alert to SAE is appropriate and consistent with EAL scheme development guidance. The GE classification level for this specific accident progression is bounded by indications available in the fission product barrier matrix, as well as in EAL RG1.

The licensee chose to modify this EAL set by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.5.7 EAL Set HG6/HS6/HA6/HU6

This EAL set is based upon providing the decision-makers with EALs to consider when, in their judgment, an emergency classification is warranted.

The licensee chose to modify this EAL set by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6 Category 'S' – System Malfunction

#### 3.6.1 EAL Set SG1/SS1/SA1/SU1 [licensee's SG1 includes SG8 from approved guidance]

This EAL set is based upon a loss of available alternating current (AC) power sources to the emergency busses, as well as a concurrent loss of site AC and DC power sources. The EAL's intent is to ensure that an EAL is declared when a loss of AC or DC power event occurs, as this condition compromises the ability of the licensee to monitor and control the removal of decay heat. The NRC staff has determined that the progression from UE to GE is appropriate and consistent with EAL scheme development guidance.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance, as well as renaming EAL SG8 to SG1. The NRC staff has determined that the numbering, sequencing, and format of this EAL set are consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation, values, and listing of applicable power sources derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.2 EAL SS2 [SS8]

This EAL is based upon a loss of site DC power sources. The EAL's intent is to ensure that an EAL is declared when a loss of DC power event occurs, as this condition compromises the ability of the licensee to monitor and control the removal of decay heat.

The licensee chose to modify this EAL by using a site-specific implementation method that uses a modified numbering format and EAL sequence other than that provided in the generic EAL scheme development guidance, as well as renaming EAL SG8 to SG1. The NRC staff has determined that the numbering, sequencing, and format of this EAL is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.3 EAL Set SA3/SU3 [SA2/SU2]

This EAL set is based upon the effect that a loss of available indicators in the control room has on the facility. The NRC staff has determined that the progression from UE to Alert is appropriate and consistent with EAL scheme development guidance. The SAE and GE classification levels for this specific accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RS1 and RG1.

The licensee chose to modify this EAL set by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.4 EAL SU4 [SU3]

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to ensure that an EAL is declared when RCS activity is greater than Technical Specification allowable limits. The Alert, SAE and GE classification levels for this specific accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RA1, RS1, and RG1.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.5 EAL SU5 [SU4]

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to ensure that an EAL is declared when the plant has indications of RCS leakage. By design, this EAL is redundant with corresponding indicators from a loss or potential loss of fission product barriers, as well as radiation monitoring, to ensure reactor and/or fission product barrier events are recognized regardless of the particular EAL table a licensee may be referring to. EAL escalation is bounded by indications available in the fission product barrier matrix, as well as in EALs RA1, RS1, and RG1.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.6 EAL Set SS6/SA6/SU6 [SS5/SA5/SU5]

This EAL set is based upon the effect that a failure of the reactor protection system may have on the plant. The NRC staff has determined that the progression from UE to SAE is appropriate and consistent with EAL scheme development guidance. The GE classification level for this event is bounded by indications available in the fission product barrier matrix, as well as in EAL RG1.

The licensee chose to modify this EAL set by using a site-specific implementation method that uses a modified numbering format. The NRC staff has determined that the numbering and

format of this EAL set is consistent with the overall EAL scheme development guidance and with the site-specific implementation strategies provided.

The instrumentation and set points derived for this EAL set are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.7 EAL SU7 [SU6]

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to highlight the importance of emergency communications by ensuring that an EAL is declared if normal communication methods for onsite and offsite personnel, or for offsite response organizations including the NRC, are lost. The NRC staff has determined that no escalation path is necessary.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The communication methods derived for this EAL are consistent with the overall EAL scheme development guidance, address the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL set is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.8 EAL SU8 [SU7]

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to ensure an EAL is declared when the plant has indications containment barrier degradation. By design, this EAL is redundant with corresponding indicators from a loss or potential loss of fission product barriers, as well as radiation monitoring, to ensure reactor and/or fission product barrier events are recognized regardless of the particular EAL table a licensee may be referring to. EAL escalation is bounded by fission product barrier indicators or EALs RA1, RS1, and RG1.

The NRC staff has determined that the numbering, sequencing, and format of this EAL are consistent with the overall EAL scheme development guidance, are consistent with the plant-specific implementation strategies provided, and are consistent with a standard EAL scheme, as required by 10 CFR 50.47(b)(4).

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme, meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.6.9 EAL SA9

This EAL is not part of an EAL set within the overall EAL scheme. The EAL's intent is to ensure that an EAL is declared when hazardous events lead to potential damage to safety systems. The SAE and GE classification levels for this accident progression are bounded by indications available in the fission product barrier matrix, as well as in EALs RS1 and RG1.

The licensee chose to modify this EAL by using a plant-specific implementation method that uses a modified numbering format other than that provided in the generic EAL scheme development guidance. The NRC staff has determined that the numbering, sequencing, and format of this EAL category are consistent with the overall EAL scheme development guidance and with the plant-specific implementation strategies provided.

The NRC staff concludes that the plant-specific implementation method for this EAL is in alignment with the key characteristics of an effective EAL scheme and meets the requirements of Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4), and is, therefore, acceptable.

### 3.7 Summary

The NRC staff has reviewed the technical bases for the proposed EAL scheme, the modifications from NEI 99-01, Revision 6, and the licensee's evaluation of the proposed changes. The licensee chose to modify its proposed EAL scheme from the generic EAL scheme development guidance provided in NEI 99-01, Revision 6, in order to adopt a format that is better aligned with how it currently implements its EALs, as well as with plant-specific writer's guides and preferences. The NRC staff determined that these modifications do not alter the intent of any specific EAL within an EAL set, EAL category, or within the entire EAL scheme as stated in NEI 99-01, Revision 6.

Based on its review, the NRC staff has determined that the proposed EAL scheme uses objective and observable values; is worded in a manner that addresses human factors engineering and user friendliness concerns; follows logical progressions for escalating events; and allows for event downgrading and upgrading based upon the potential risk to the public health and safety. Risk assessments were appropriately used to set the boundaries of the emergency classification levels and ensure that all EALs that trigger an emergency classification are in the same range of relative risk. In addition, the NRC staff has determined that the proposed EAL scheme is technically complete and consistent with EAL schemes implemented at similarly designed plants.

### 3.8 Conclusion

Based on the above, the NRC staff has determined that the proposed changes meet the requirements in Appendix E to 10 CFR Part 50 and the planning standards of 10 CFR 50.47(b). Therefore, the NRC staff concludes that the licensee's proposed EAL scheme is acceptable and provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency. Specifically, the staff concludes that the licensee's site-specific EAL basis document, provided by supplemental letter dated August 31, 2015, is acceptable.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Missouri State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding published in *Federal Register* on February 3, 2015 (80 FR 5813). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

### 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

### 7.0 REFERENCES

1. Maglio, S. A., Ameren Missouri, letter to U.S. Nuclear Regulatory Commission, "License Amendment Request for Emergency Action Level (EAL) Upgrade Adopting NRC-Endorsed NEI 99-01, Revision 6," dated October 2, 2014 (Agencywide Documents Access and Management System (ADAMS) package Accession No. ML14275A435).
2. Maglio, S. A., Ameren Missouri, letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information (RAI) Relating to License Amendment

- Request for Emergency Action Level (EAL) Upgrade Adopting NRC-Endorsed NEI 99-01, Revision 6," dated July 6, 2015 (ADAMS Accession No. ML15187A379).
3. Maglio, S. A., Ameren Missouri, letter to U.S. Nuclear Regulatory Commission, "Supplement to Response to Request for Additional Information (RAI) Relating to License Amendment Request for Emergency Action Level (EAL) Upgrade Adopting NRC-Endorsed NEI 99-01, Revision 6," dated July 16, 2015 (ADAMS Accession No. ML15197A251).
  4. Maglio, S. A., Ameren Missouri, letter to U.S. Nuclear Regulatory Commission, "Response to Supplemental Request for Additional Information (RAI) Relating to License Amendment Request for Emergency Action Level (EAL) Upgrade Adopting NRC-Endorsed NEI 99-01, Revision 6," dated August 31, 2015 (ADAMS Accession No. ML15244B274).
  5. Nuclear Energy Institute, NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," February 2008 (ADAMS Accession No. ML080450149).
  6. Nuclear Energy Institute, NEI 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," November 2012 (ADAMS Accession No. ML12326A805).
  7. Klos, L. J., U.S. Nuclear Regulatory Commission, e-mail to Thomas Elwood, Ameren Missouri, "Requests for Additional Information: Callaway License Amendment Upgrade Emergency Action Level Scheme, Adopt NRC-endorsed NEI 99-01, Revision 6," dated May 22, 2015 (ADAMS Accession No. ML15142A396).
  8. U.S. Nuclear Regulatory Commission, Generic Letter 79-50, "Emergency Plans Submittal Dates," dated October 10, 1979 (ADAMS Accession No. ML031320278).
  9. U.S. Nuclear Regulatory Commission and Federal Emergency Management Agency, NUREG-0654/FEMA-REP-1, Revision 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).
  10. U.S. Nuclear Regulatory Commission, Regulatory Guide (RG) 1.101, Revision 2, "Emergency Planning and Preparedness for Nuclear Power Reactors," October 1981 (ADAMS Accession No. ML090440294); RG 1.101, Revision 3, August 1992 (ADAMS Accession No. ML003740302); and RG 1.101, Revision 4, July 2003 (ADAMS Accession No. ML032020276).
  11. Nuclear Management and Resources Council/National Environmental Studies Project (NUMARC/NESP)-007, Revision 2, "Methodology for Development of Emergency Action Levels," January 1992 (ADAMS Accession No. ML041120174).
  12. Nuclear Energy Institute, NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," January 2003 (ADAMS Accession No. ML041470143).

13. Miller, C. G., U.S. Nuclear Regulatory Commission, Letter to Alan Nelson, Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI-99-01, Revision 5, dated February 22, 2008," dated February 22, 2008 (ADAMS Accession No. ML080430535).
14. Thaggard, M., U.S. Nuclear Regulatory Commission, letter to Ms. Perkins-Grew, Nuclear Energy Institute, "U.S. Nuclear Regulatory Commission Review and Endorsement of NEI-99-01, Revision 6," dated March 28, 2013 (ADAMS Accession No. ML12346A463).
15. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary 2003-18, with Supplements 1 and 2, "Use of NEI-99-01, 'Methodology for Development of Emergency Action Levels,' Revision 4, dated January 22, 2003," dated October 8, 2003, July 13, 2004, and December 12, 2005 (ADAMS Accession Nos. ML032580518, ML041550395, and ML051450482).
16. U.S. Nuclear Regulatory Commission, NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (ADAMS Accession No. ML051740058).
17. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary 2006-12, "Endorsement of Nuclear Energy Institute Guidance 'Enhancements to Emergency Preparedness Programs for Hostile Action,'" dated July 19, 2006 (ADAMS Accession No. ML072670421).

Principal Contributor: R. Hoffman, NSIR

Date: October 7, 2015

October 7, 2015

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

SUBJECT: CALLAWAY PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: UPGRADE TO  
EMERGENCY ACTION LEVEL SCHEME (CAC NO. MF4945)

Dear Mr. Diya:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 212 to Renewed Facility Operating License No. NPF-30 for the Callaway Plant, Unit 1. The amendment consists of changes to the emergency action level (EAL) scheme in response to your application dated October 2, 2014, as supplemented by letters dated July 6, July 16, and August 31, 2015.

The amendment revises your current EAL scheme to a scheme based on Nuclear Energy Institute (NEI) 99-01, Revision 6, "Development of Emergency Action Levels for Non-Passive Reactors," dated November 2012.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,  
*/RA/*

L. John Klos, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures:

- 1. Amendment No. 212 to NPF-30
- 2. Safety Evaluation

cc: Listserv

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RHoffman, NSIR/DPR

ADAMS Accession No. ML15251A493

\*SE memorandum dated

OFFICE	NRR/DORL/LPL4-1/PM	NRR/DORL/LPL4-1/LA	NSIR/DPR/ORLOB/BC*	OGC
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DATE	9/8/2015	9/10/15	9/3/15	9/21/15
OFFICE	NRR/DORL/LPL4-1/BC	NRR/DORL/D	NRR/D	NRR/DORL/LPL4-1/PM
NAME	MMarkley	ABoland	WDean	JKlos
DATE	9/23/15	9/28/15	10/6/15	10/7/15

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