

Attachment 2 to ULNRC-06488

Evaluation of Proposed Emergency Action Levels

(9 pages)

1.0 DESCRIPTION

In accordance with the provisions of Part 50, Appendix E, section IV, item B, paragraph 2 and 50.90 of Title 10 of the Code of Federal Regulations (10 CFR), Union Electric Company (Ameren Missouri), is proposing changes to the emergency action levels (EALs) and their technical bases, as used at Callaway Plant.

Ameren Missouri proposes to modify EALs CA6.1, "Cold Shutdown / Refueling System Malfunction – Hazardous event affecting a SAFETY SYSTEM needed for the current operating MODE: Alert," and SA9.1, "System Malfunction – Hazardous event affecting a SAFETY SYSTEM needed for the current operating MODE: Alert," and eliminate initiating condition (IC) HG1 and associated EAL HG1.1, "Hazard – HOSTILE ACTION resulting in loss of physical control of the facility: General Emergency." Consistent with those changes, Ameren Missouri also proposes to re-define the term VISIBLE DAMAGE. Such changes to the EAL scheme require NRC approval prior to implementation. With these changes incorporated, the Emergency Plan for Callaway Plant would continue to meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR 50.

2.0 PROPOSED CHANGE

A brief description of the proposed EAL changes is provided below along with a discussion of the justification for each change.

1. Change the verbiage in the EAL matrix and technical bases for EAL CA6.1 which reads:

The occurrence of **any** Table C-6 hazardous event.

AND EITHER:

- Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating MODE.
- The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating MODE.

to read:

The occurrence of **any** Table C-6 hazardous event

AND

Event damage has caused indications of degraded performance on one train of a SAFETY SYSTEM needed for the current operating MODE

AND EITHER:

- Event damage has caused indications of degraded performance in a second train of a SAFETY SYSTEM needed for the current operating MODE.
- Event damage has resulted in VISIBLE DAMAGE to a second train of a SAFETY SYSTEM needed for the current operating MODE.

2. Add Note 11 and Note 12 to the EAL Matrix (in the Notes text box and in the CA6.1 EAL description text) per Emergency Preparedness Frequently Asked Question (EPFAQ) 2016-002, "Clarification of Equipment Damage as a Result of a Hazardous Event":

Note 11: If the affected SAFETY SYSTEM train was already inoperable or out of service before the hazardous event occurred, then this emergency classification is not warranted.

Note 12: If the hazardous event only results in VISIBLE DAMAGE, with no indication of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.

3. Change the verbiage in the EAL matrix and technical bases for EAL SA9.1 which reads:

The occurrence of **any** Table S-5 hazardous event.

AND EITHER:

- Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating MODE.
- The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating MODE.

to read:

The occurrence of **any** Table S-5 hazardous event

AND

Event damage has caused indications of degraded performance on one train of a SAFETY SYSTEM needed for the current operating MODE

AND EITHER:

- Event damage has caused indications of degraded performance in a second train of a SAFETY SYSTEM needed for the current operating MODE.
- Event damage has resulted in VISIBLE DAMAGE to a second train of a SAFETY SYSTEM needed for the current operating MODE.

4. Add Note 11 and Note 12 to the EAL Matrix (in the Notes text box and in the SA9.1 EAL description text) per Emergency Preparedness Frequently Asked Question (EPFAQ) 2016-002, "Clarification of Equipment Damage as a Result of a Hazardous Event":

Note 11: If the affected SAFETY SYSTEM train was already inoperable or out of service before the hazardous event occurred, then this emergency classification is not warranted.

Note 12: If the hazardous event only results in VISIBLE DAMAGE, with no indication of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted.

5. Change the verbiage in the EAL technical bases document definition of VISIBLE DAMAGE, which reads:

Damage to a component or structure that is readily observable without measurements, testing or analysis. The visual impact of the damage is sufficient to cause concern regarding the operability or reliability of the affected component or structure.

to read:

Damage to a SAFETY SYSTEM train that is readily observable without measurements, testing or analysis. The visual impact of the damage is sufficient to cause concern regarding the operability or reliability of the affected SAFETY SYSTEM train.

6. Remove EAL HG1.1 and its associated IC HG1 from the EAL Matrix per EPFAQ 2015-0013, "Hostile Action resulting in a loss of control of the facility declarations when fuel damage is likely within 4-hours or results in a loss of physical control of spent fuel" (and shade the resulting empty space in with gray shading to match the other gray shading on the wallcharts). Also remove EAL HG1.1 and IC HG1 from the EAL Technical Bases Document, and eliminate references to EAL HG1.1 and IC HG1 from the technical bases for other EALs.
7. Add the following verbiage to EAL technical bases document regarding the Bases for EALs CA6.1 and SA9.1, consistent with the guidance that is provided in EPFAQ 2018-004, "EPFAQ 2018-04 Clarification of Hazardous Events and Safety Systems Concurrence Package for Public Comment Release":

An event affecting equipment common to two or more safety systems or safety system trains (i.e., there are indications of degraded performance and/or **VISIBLE DAMAGE** affecting the common equipment) should be classified as an Alert. By affecting the operability or reliability of multiple system trains, the loss of the common equipment effectively meets the two-train impact criteria that underlie the EALs and Bases. For example, this guidance would apply to a unit with a tank that is the water source for multiple safety injection systems or trains, such as a Refueling Water Storage Tank.

An event that affects two trains of a safety system (e.g., one train has indications of degraded performance and the other **VISIBLE DAMAGE**) that also has one or more additional trains should be classified as an Alert. This approach maintains consistency with the two-train impact criteria that underlie the EALs and Bases, and is warranted because the event was severe enough to affect the operability or reliability of two trains of a safety system despite plant design criteria associated with system and system train separation and protection. Such an event may have caused other plant impacts that are not immediately apparent. For example, this guidance would apply to a unit that has an Auxiliary/Emergency Feedwater System with three trains.

Regarding the changes listed as 1, 2, 3, and 4 above, the wording of EALs CA6.1 and SA9.1 is being revised (and Notes 11 and 12 are being added) in order to preclude an unnecessary Alert declaration when the hazardous event has not caused indication of degraded performance or visible damage on a second train of the same safety system.

Regarding the change listed as 5 above, the definition of **VISIBLE DAMAGE** is being changed to work more seamlessly with modified EALs CA6.1 and SA9.1 (including added Note 12) described above.

Regarding the change listed as 6 above, EAL HG1.1 (with its associated IC HG1) is redundant to other EALs, (i.e., RA2.1, RA2.2, RA2.3, RS2.1, RG2.1, RS1.1, RS1.2, RS1.3, RG1.1, RG1.2, RG1.3, HS1.1, HS6.1, HS7.1, and HG7.1), which would encompass any escalation from a Hostile Action.

Regarding the change listed as 7 above, the additional paragraphs are being added to the Bases for EALs CA6.1 and SA9.1 in order to provide clarification on how to apply the EAL criteria to cases where the event affects equipment common to two or more safety systems or safety system trains, or where the event affects two trains of a safety system having more than two trains.

Mark-ups of affected pages and a clean copy of the revised EAL Technical Bases Document are provided as Attachments 3 and 4 to the license amendment request.

3.0 BACKGROUND

EALs are the plant-specific indications, conditions or instrument readings that are utilized to classify emergency conditions defined in the Callaway Plant Radiological Emergency Response Plan (RERP). In 2015, the NRC approved use of an EAL scheme for Callaway Plant that was developed in accordance with NEI 99-01 Revision 6, "Methodology for the Development of Emergency Action Levels for Non-Passive Reactors."

Regarding the NEI 99-01, Revision 6 EALs, the NRC staff position documented in EPFAQ 2016-002 states in part that:

An Alert should be declared only when actual or potential performance issues with SAFETY SYSTEMS have occurred as a result of a hazardous event. The occurrence of a hazardous event will result in a Notification of Unusual Event (NOUE) classification at a minimum. In order to warrant escalation to the Alert classification, the hazardous event should cause indications of degraded performance to one train of a SAFETY SYSTEM with either indications of degraded performance on the second SAFETY SYSTEM train or VISIBLE DAMAGE to the second SAFETY SYSTEM train, such that the operability or reliability of the second train is a concern. In addition, escalation to the Alert classification should not occur if the damage from the hazardous event is limited to a SAFETY SYSTEM that was inoperable, or out of service, prior to the event occurring. As such, the proposed guidance will reduce the potential of declaring an Alert when events are in progress that do not involve an actual or potential substantial degradation of the level of safety of the plant, i.e., does not cause significant concern with shutting down or cooling down the plant.

It should be noted that the verbiage of the proposed new Notes 11 and 12 per the changes listed as 2 and 4 above is taken directly from EPFAQ 2016-002.

Regarding the change listed as 6 above, Ameren Missouri originally developed IC HG1 and EAL HG1.1 in accordance with NEI 99-01, Revision 6. Since implementation, many questions have arisen that could not be clearly answered due to the wording of the IC and EAL. Furthermore, it has been noted that if a Hostile Action were to occur and major safety functions were lost (or damage to the fuel pool occurred), any accident that could cause a concern for the health and safety of the public would

be identified by one or more of the other existing EALs. In regards to this issue, the NRC staff position documented in EPFAQ 2015-013 states in part that:

Consideration can be given to not include EAL HG1 in a site-specific EAL scheme. However, EALs AA2, AS2, AG2, AS1, AG1, HS1, HS6, HS7, and HG7 shall be as provided in NEI 99-01, Revision 6.

Consistent with this guidance, Ameren Missouri has developed and implemented NEI 99-01 Revision 6 ICs AA2, AS2, AG2, AS1, AG1, HS1, HS6, HS7, and HG7, as endorsed by the NRC. In the Callaway RERP, the equivalent ICs are RA2, RS2, RG2, RS1, RG1, HS1, HS6, HS7, and HG7, respectively. EAL HG1.1 (and its associated IC HG1), which is proposed to be removed from the Callaway RERP, is redundant to EALs RA2.1, RA2.2, RA2.3, RS2.1, RG2.1, RS1.1, RS1.2, RS1.3, RG1.1, RG1.2, RG1.3, HS1.1, HS6.1, HS7.1, and HG7.1, as these EALs would encompass any escalation from a Hostile Action.

Regarding the change listed as 7 above, in EPFAQ 2018-004, the NRC staff concluded that the verbiage in the first paragraph described an acceptable resolution of a case where the event affects equipment common to two or more safety systems or safety system trains. The NRC staff further concluded that the verbiage in the second paragraph described an acceptable resolution of a case where the event affects two trains of a safety system having more than two trains. Since the approved Callaway Plant EAL scheme uses the EAL identifiers CA6.1 and SA9.1 in place of the NEI 99-01 Rev. 6 EAL identifiers CA6 and SA9, respectively, the clause "under CA6 or SA9, as appropriate to the plant mode," has been omitted from the first sentence of each paragraph. This deviation from the EPFAQ 2018-004 does not affect the intent of either paragraph, as EAL CA6.1 would continue to apply only to system malfunctions during cold shutdown / refueling, while EAL SA9.1 would continue to apply only to system malfunctions during other operating modes. The sentence added at the end of each paragraph describes an example of equipment or a system (taken from the questions that are cited in EPFAQ 2018-004) to which the guidance in the paragraph may be applied. It should be noted that the EPFAQ 2018-004 guidance regarding an event that affects a safety system that has only one train does not apply to Callaway Plant, and therefore, Ameren Missouri does not propose to add this guidance to the EAL CA6.1 or SA9.1 Bases.

4.0 TECHNICAL ANALYSIS

The proposed changes affect the Callaway Plant Radiological Emergency Response Plan (RERP) and otherwise do not alter requirements of the Operating License or the Technical Specifications. These changes do not alter any of the assumptions used in the safety analyses, nor do they cause any safety system parameters to exceed their acceptance limits. Therefore, the proposed changes have no adverse effect on plant safety.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements / Criteria

Per 10 CFR 50.54(q)(2):

A holder of a license under this part, or a combined license under part 52 of this chapter after the Commission makes the finding under § 52.103(g) of this chapter, shall follow and maintain the effectiveness of an emergency plan that meets the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).

10 CFR 50.47(b)(4) requires the emergency response plan to meet the following standard:

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.

10 CFR 50.54(q)(4) states:

The changes to a licensee's emergency plan that reduce the effectiveness of the plan as defined in paragraph (q)(1)(iv) of this section may not be implemented without prior approval by the NRC. A licensee desiring to make such a change after February 21, 2012 shall submit an application for an amendment to its license. In addition to the filing requirements of §§ 50.90 and 50.91, the request must include all emergency plan pages affected by that change and must be accompanied by a forwarding letter identifying the change, the reason for the change, and the basis for concluding that the licensee's emergency plan, as revised, will continue to meet the requirements in appendix E to this part and, for nuclear power reactor licensees, the planning standards of § 50.47(b).

As defined in 10 CFR 50.54(q)(1)(iv):

Reduction in effectiveness means a change in an emergency plan that results in reducing the licensee's capability to perform an emergency planning function in the event of a radiological emergency.

The proposed changes listed as 1, 2, 3, 4, and 5 above are consistent with the NRC staff position documented in EPFAQ 2016-002, and Ameren Missouri has therefore concluded that the Emergency Plan for Callaway Plant would continue to meet the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR 50. However, an emergency event classification based on NRC-endorsed industry guidance in NEI 99-01, Revisions 4, 5, and 6, as well as in NUMARC/NESP-007, could be different from a classification based on the revised EALs. Therefore, this proposed change is considered a "deviation" in accordance with Regulatory Issue Summary (RIS) 2003-18, Supplement 2, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels," Revision 4. Deviations are considered to be a reduction in effectiveness, and thus, prior NRC approval is required.

The proposed change listed as 6 above is consistent with the NRC staff position documented in EPFAQ 2015-013, and Ameren Missouri has therefore concluded that the Emergency Plan for Callaway Plant would continue to meet the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR 50. However, this proposed change is also considered a

"deviation" in accordance with Regulatory RIS 2003-18, Supplement 2, and thus, prior NRC approval is required.

The proposed change listed as 7 above is consistent with the NRC staff position documented in EPFAQ 2018-004 that applies to plants that have implemented the guidance of EPFAQ 2016-002. Ameren Missouri has therefore concluded that the Emergency Plan for Callaway Plant would continue to meet the planning standards of 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR 50. This proposed change is considered a "difference" in accordance with Regulatory RIS 2003-18, Supplement 2, and thus, prior NRC approval would not be required. However, its application is contingent upon NRC approval of the proposed changes listed as 1, 2, 3, 4, and 5 above.

5.2 No Significant Hazards Consideration

Ameren Missouri has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No. The proposed changes to the Callaway Plant emergency action levels do not impact the physical function of plant structures, systems, or components (SSC) or the manner in which SSCs perform their design function. The proposed changes have no effect on accident initiators or precursors, nor do they alter design assumptions. The proposed changes do not alter or prevent the ability of SSCs to perform their intended function to mitigate the consequences of an initiating event within assumed acceptance limits. No operating procedures or administrative controls that function to prevent or mitigate postulated accidents as described in the FSAR are affected by the proposed changes. Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No. The proposed changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed, and no equipment will be removed), nor do the proposed changes involve a change in the method of plant operation. The proposed changes will not introduce failure modes that could result in a new accident, nor do the changes alter assumptions made in the safety analysis. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No. There is no change being made to safety analysis assumptions, safety limits, or limiting safety system settings that would adversely affect plant safety as a result of the proposed changes. There are no changes to setpoints or environmental conditions of any SSC or the manner in which any SSC is operated. Margins of safety are unaffected by the proposed changes. The

applicable requirements of 10 CFR 50.47 and 10 CFR 50, Appendix E will continue to be met. Therefore, the proposed changes do not involve any reduction in a margin of safety.

Based on the above, Ameren Missouri concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92, and accordingly, a finding of "no significant hazards consideration" is justified.

6.0 ENVIRONMENTAL CONSIDERATIONS

The proposed changes to the emergency action levels maintain the environmental bounds of the current environmental assessment associated with the Callaway Plant Unit 1. The proposed changes will not affect plant safety and will not have an adverse effect on the probability of an accident occurring. The proposed changes do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Therefore, no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 PRECEDENTS

The proposed changes listed as 1, 2, 3, 4, and 5 above are similar in nature to changes that were included in a license amendment request (LAR) for changes to Monticello Nuclear Generating Plant EALs that was submitted by Northern States Power Company (Xcel Energy) on September 27, 2017 (ADAMS Accession No. ML17269A076).

The proposed changes listed as 6 above are similar in nature to changes that were included in a LAR for changes to the Beaver Valley Power Station EALs that was submitted by First Energy Nuclear Operating Company on August 10, 2017 (ADAMS Accession No. ML17222A219).

Ameren Missouri is not aware of any similar LARs that have yet been approved by the NRC.

8.0 REFERENCES

1. EPFAQ 2016-002, "Clarification of Equipment Damage as a Result of a Hazardous Event" (ADAMS Accession No. ML17195A299)
2. EPFAQ 2015-013, "Hostile Action resulting in a loss of control of the facility declarations when fuel damage is likely within 4-hours or results in a loss of physical control of spent fuel" (ADAMS Accession No. ML16166A366)
3. EPFAQ 2018-004, "EPFAQ 2018-04 Clarification of Hazardous Events and Safety Systems Concurrence Package for Public Comment Release" (ADAMS Accession No. ML18268A168)
4. NRC Regulatory Issue Summary 2005-02, Revision 1, "Clarifying the Process for Making Emergency Plan Changes" (ADAMS Accession No. ML100340545)
5. NEI 99-01, Revision 6, "Methodology for the Development of Emergency Action Levels for Non-Passive Reactors" (ADAMS Accession No. ML12326A805)

6. Regulatory Issue Summary 2003-18, Supplement 2, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels," Revision 4 (ADAMS Accession No. ML051450482)
7. NUMARC/NESP-007, Rev. 2, "Methodology for Development of Emergency Action Levels" (ADAMS Accession No. ML041120174)