

# **Callaway Plant Unit 2**

## **Combined License Application**

### **Part 5: Enclosure A Callaway Plant Unit 2 Summary Explanation of Emergency Action Levels**

This Part is completely site specific.

Revision 1  
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## 1.0 INTRODUCTION

On October 8, 2003, the Nuclear Regulatory Commission (NRC) issued Regulatory Issue Summary (RIS) 2003-18, "Use of NEI 99-01, Methodology for Development of Emergency Action Levels" as guidance in developing or changing a standard emergency or action level scheme. NEI 99-01, "Methodology for Development of Emergency Action Levels" (Revision 5, February 2008), represents the latest Emergency Action Level (EAL) methodology approved for use by the NRC. This revision included the resolution of numerous frequently asked questions (FAQs), incorporation of NRC Bulletin 2005-02, changes from industry experience and good practices, and cleanup of editorial typographical errors.

RIS 2003-18 and its two supplements provide guidance on information to be included for EAL submittals to the NRC. The following information is contained in this submittal package:

- ◆ Enclosure A: Summary Explanation
- ◆ Enclosure B: Detailed Justification
  - ◆ Attachment 1, Description of Changes and Technical Basis
  - ◆ Attachment 2, EAL Comparison Table
- ◆ Enclosure C: New EALs and Bases Manual
- ◆ State/Local Government Commitment Documentation is contained in Part 5

An enclosure providing a list of supporting technical information as recommended by the RIS is not provided separately with this EAL submittal package. The information applicable to this enclosure is referenced as part of the COL application.

This enclosure (Enclosure A) provides a general explanation of the considerations applicable to the Callaway Plant Unit 2 EALs and an outline of the contents in this submittal package.

## 2.0 DISCUSSION

An initial set of Emergency Action Levels (EALs) for the Callaway Plant Unit 2, a U.S. Evolutionary Power Reactor (U.S. EPR) has been developed. This initial set of EALs is based on NEI 99-01 Rev 5, with appropriate changes added to include plant design characteristics unique to the U.S. EPR. The intent of this initial set of Callaway Plant Unit 2 EALs is to provide consistent emergency classifications internally and between the U.S. EPR plants to the greatest extent possible, limited only by plant specific design or location.

### 2.1 EAL CROSS REFERENCES

As discussed above, the Callaway Plant Unit 2 EALs are primarily based on NEI 99-01 Rev 5. However, the addition and deletion of Initiating Conditions (ICs) and EALs since endorsement of the original guidance document has led to an inconsistent sequencing of the identification codes. To correct this for human factors consideration, the Callaway Plant Unit 2 IC and EAL sequence has been set up to provide a consistent code progression associated with each recognition category sub- group. Attachment 1 of Enclosure B provides cross-reference tables for simple association of the NEI and Callaway Plant Unit 2 IC identification codes.

## 2.2 DIFFERENCES AND DEVIATIONS

RIS 2003-18, Supplement 1, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels," was issued by the NRC on July 13, 2004. The RIS included definitions of what is considered an EAL difference and deviation.

*A difference is where the site specific EAL, as compared to the basis scheme guidance, differs in wording but agrees in meaning and intent such that classification of the event would be the same.*

*A deviation is where the site specific EAL, as compared to the basis scheme guidance, differs in wording and is altered in meaning or intent such that classification of the event could be different.*

An EAL comparison table is given in Attachment 1 of Enclosure B to provide simple method for contrasting and assessing the differences and deviations between the Callaway Plant Unit 2 and NEI EAL set.

Any Callaway Plant Unit 2 EAL (or IC, Fuel Product Barrier (FPB) threshold value or bases statement) that has been evaluated as not meeting the meaning and intent of the NEI 99-01 Rev 5 guidelines are identified as deviations and are listed as such in Attachment 1 of Enclosure B. The basis for each deviation has been documented in the technical evaluation section to describe the rational for not adopting the specific NEI guidance wording. Deviations in this evaluation have been separated to include comparisons with the approved for use NEI 99-01 Rev 5 version. The deviations identified and presented in this submittal provide justification that the proposed EAL revisions in aggregate do not constitute a decrease in effectiveness and alternative methods, where appropriate, are in place to ensure the intent of the NEI 99-01 EAL is maintained. The proposed EALs will continue to satisfy the criteria of Appendix E to 10 CFR Part 50 as well as 10 CFR 50.47(b).

An EAL comparison table, Attachment 2 of Enclosure B, is provided in the format given below to allow easy comparison between the wording for NEI 99-01 Rev 5 against the Callaway Plant Unit 2 EALs:

| NEI 99-01, Rev 5      | Callaway Plant Unit 2 EALs | Difference/Deviation |
|-----------------------|----------------------------|----------------------|
| EAL Identifier:       | EAL Identifier:            | Differences:         |
| Initiating Condition: | Initiating Condition:      | Deviations:          |
| Mode Applicability:   | Mode Applicability:        |                      |
| EAL(s):               | EAL(s):                    |                      |

RIS 2003-18, Supplement 2, "Use of Nuclear Energy Institute (NEI) 99-01, Methodology for Development of Emergency Action Levels," was issued by the NRC on December 12, 2005. This RIS included expanded clarification on differences and deviations, as well as administrative changes that are neither differences nor deviations. Examples of global differences and administrative changes utilized in the Callaway Plant Unit 2 EALs include the following:

- ◆ Use of a different numbering scheme than the NEI 99-01 scheme without changing the intent of the overall EAL scheme.
- ◆ Transfer of information from the basis section into the actual EAL that does not change the intent of the EAL.

- ◆ Use of synonymous wording.
- ◆ EAL format written to conform to site-specific writers guides.
- ◆ Use of the phrase “Unusual Event” versus “Notification of Unusual Event” to sustain common terminology.

## 2.3 OPERATIONAL MODES

The Callaway Plant Unit 2 operational modes are contained in the Callaway Plant Unit 2 EAL Technical Bases Manual provided in Enclosure C. Operational mode values are as follows:

| Mode               | Reactivity Condition, $K_{eff}$                                                                                 | % Rated Thermal Power* | Average Reactor Coolant Temperature                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------|
| 1) Power Operation | $\geq 0.99$                                                                                                     | $> 5\%$                | N/A                                                   |
| 2) Startup         | $\geq 0.99$                                                                                                     | $\leq 5\%$             | N/A                                                   |
| 3) Hot Standby     | $< 0.99$                                                                                                        | N/A                    | $\geq 350^{\circ}\text{F}$                            |
| 4) Hot Shutdown    | $< 0.99$                                                                                                        | N/A                    | $350^{\circ}\text{F} > T_{AVG} > 200^{\circ}\text{F}$ |
| 5) Cold Shutdown   | $< 0.99$                                                                                                        | N/A                    | $\leq 200^{\circ}\text{F}$                            |
| 6) Refueling       | One or more vessel head closure bolts less than fully tensioned.                                                |                        |                                                       |
| D) Defueled        | All reactor fuel removed from reactor pressure vessel (full core off load during refueling or extended outage). |                        |                                                       |

\*Excluding decay heat.

## 2.4 CALLAWAY PLANT UNIT 2 EALS AND TECHNICAL BASES

The Callaway Plant Unit 2 EAL Technical Bases Manual is provided in Enclosure C. Its sections provide the following content:

- ◆ Emergency Classification Level (ECL) discussion
- ◆ Initiating Condition (IC) discussion
- ◆ Emergency Action Level (EAL) and Fission Product Barrier (FPB) discussion
- ◆ Operating Mode Applicability
- ◆ Definitions for terms having specific meaning to the EALs.
- ◆ EAL Matrix Table designed as an evaluation tool used by qualified ERO members to determine, classify and declare emergency events.
- ◆ Technical Bases documentation for each EAL and FPB.

## 2.5 STATE/LOCAL GOVERNMENT AGREEMENT DOCUMENTATION

Per 10 CFR Part 50, Appendix E, Section IV.B, initial EALs developed by licensees must be agreed on by offsite emergency response authorities and approved by the NRC prior to implementation.

The applicant worked with the state and local government agencies in accordance with the regulatory requirements and guidance. Since a standard EAL scheme for the U.S. EPR has yet to be endorsed by the NRC, state and local agencies have agreed with the scheme used in the development of the EALs. Copies of these commitments are provided in Part 5.

### 3.0 APPLICABLE REGULATIONS AND GUIDANCE

The applicable regulations and guidance that must be met for the Emergency Plans, and changes to EALs, are described below:

#### 3.1 REGULATIONS

Paragraph (a)(1) to Section 10 CFR 50.47, “Emergency Plans,” states that no 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. §50.47 establishes standards that onsite and offsite emergency response plans must meet for the 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. One of these standards, 10 CFR 50.47(b)(4), stipulates that Emergency Plans include a standard emergency classification and action level scheme.

Section IV.B to 10 CFR 50 Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities,” provides that Emergency Plans include EALs, which are to be used as criteria for determining the need for notification and participation of local and State agencies, and for determining when and what type of protective measures should be considered to protect the health and safety of individuals both onsite and offsite. EALs are to be based on plant conditions and instrumentation, as well as onsite and offsite radiological monitoring. Appendix E Section IV.B provides that initial EALs shall be discussed and agreed on by the applicant and State and local authorities, be approved by the NRC, and reviewed annually thereafter with State and local authorities.

#### 3.2 GUIDANCE

NRC letter from Christopher G. Miller, Deputy Director for Emergency Preparedness, Division of Preparedness and Response, Office of Nuclear Security and Incident Response, to Alan Nelson, NEI, dated 02/22/08, approved for use the guidance contained in NEI 99-01, Revision 5, and is acceptable to the NRC staff as an alternative method to that described in the following guidance for developing EALs required in Section IV.B to Appendix E of 10 CFR Part 50 and 10 CFR 50.47(b)(4):

- ◆ Appendix 1 to NUREG-0654/FEMA-REP-I, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants” (November 1980)
- ◆ Nuclear Utilities Management Council (NUMARC) document, entitled NESP-007, “Methodology for Development of Emergency Action Levels” (Revision 2, January 1992).
- ◆ Revision 4 to Regulatory Guide 1.101, Emergency Response Planning and Preparedness for Nuclear Power Reactors.

Regulatory Issue Summary (RIS) 2003-18, "Use of NEI 99-01, Methodology for Development of Emergency Action Levels," dated October 8, 2003, provides guidance for developing or changing a standard emergency classification and action level scheme. In addition, RIS 2003-18 provides recommendations to assist licensees, consistent with Section IV.B to Appendix E of Part 50, in determining whether to seek prior NRC approval of deviations from the new guidance. Supplement 1 to RIS 2003-18, dated July 13, 2004, and Supplement 2 to RIS 2003-18, dated December 12, 2005, were issued to clarify various technical positions regarding EAL revisions.