

April 7, 1994

Docket No. 50-483

Mr. Donald F. Schnell  
Senior Vice President - Nuclear  
Union Electric Company  
Post Office Box 149  
St. Louis, Missouri 63166

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Dear Mr. Schnell:

SUBJECT: CALLAWAY - REQUEST FOR ADDITIONAL INFORMATION ON EMERGENCY ACTION LEVELS PROCEDURE, REVISION 15 (TAC M88479)

By letter dated December 17, 1993, you submitted for NRC review the Callaway Emergency Action Level procedure EIP-ZZ-00101, Classification of Emergencies, Revision 15. The staff has completed its initial review of the proposed revision. When compared to the endorsed guidance provided in NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," the staff identified EALs that deviated from the guidance.

We have discussed these deviations, with members of your staff, by telephone on March 25, 1994, and April 4, 1994. We request you provide additional information on those EALs that deviated from the endorsed guidance. The enclosure summarizes the specific areas for which additional information is needed to complete our review.

This request for information affects fewer than 10 respondents; therefore, OMB clearance is not required under Public Law 96-511.

If you have any questions, please feel free to contact me on (301) 504-1396.

Sincerely,

ORIGINAL SIGNED BY

L. Raynard Wharton, Project Manager  
Project Directorate III-3  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

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Enclosure:  
Emergency Action Level Review

cc w/enclosure:  
See next page

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

April 7, 1994

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Senior Vice President - Nuclear  
Union Electric Company  
Post Office Box 149  
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If you have any questions, please feel free to contact me on (301) 504-1396.

Sincerely,

A handwritten signature in cursive script that reads "L. Raynard Wharton".

L. Raynard Wharton, Project Manager  
Project Directorate III-3  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation

Enclosure:  
Emergency Action Level Review

cc w/enclosure:  
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Mr. D. F. Schnell  
Union Electric Company

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REQUEST FOR ADDITIONAL INFORMATION  
REGARDING CALLAWAY PLANT  
EAL REVISION TO NUMARC/NESP-007 METHODOLOGY

The NRC has completed its initial review of the proposed emergency action levels (EALs) in Revision 15 to the Callaway Plant Emergency Action Level procedure, EIP-ZZ-00101. The proposed EALs were reviewed against the guidance in NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," (Revision 2). NUMARC/NESP-007 has been endorsed by the NRC in Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," (Revision 3), as an alternative means by which licensees can meet the requirements in 10 CFR 50.47(b)(4) and Appendix E to 10 CFR Part 50.

Since the staff has previously endorsed the guidance in NUMARC/NESP-007, the review focused on those EALs that deviated from the guidance and those EALs that required the development of site-specific thresholds. As a result of the initial review, a number of EALs were identified which required additional information in order to determine whether the EALs conform with NUMARC/NESP-007. Please provide this additional information as discussed below.

1. General - No Emergency Coordinator Judgement EAL

The Callaway EAL scheme did not include EALs corresponding to the NUMARC/NESP-007 EALs for classification of events upon the Emergency Coordinator's judgement. The Callaway emergency classification procedure does contain a step which allows the Emergency Coordinator to classify an event based upon his/her judgement. However specific EALs containing guidance as to threshold for the plant conditions and the potential for radiological releases, upon which this judgement would be based, were not specified.

Provide justification for this deviation from the NUMARC/NESP-007 guidance.

2. EAL 1A Any Unplanned Release of Radioactivity to the Environment that Exceeds 2 Times the Radiological Effluent Control Limits in the ODCM (APA-ZZ-01003) for > 60 minutes

The following two NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme.

- AUI-3 Valid reading on perimeter radiation monitoring system greater than 0.10 mR/hr above normal background for 60 minutes [for sites having telemetered perimeter monitors].
- AUI-4 Valid indication on automatic real-time dose assessment capability greater than (site-specific value) for 60 minutes or longer [for sites having such capability].

Provide justification for this deviation. If these EALs were not included because these specific indications are not available at Callaway, consider whether other indications are available to determine whether the initiating condition (IC) should be entered.

3. EAL 1B Any Unplanned Release of Radioactivity to the Environment that Exceeds 200 Times the Radiological Effluent Control Limits in the ODCM (APA-ZZ-01003) for > 15 minutes

The following two NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme.

AA1-3 Valid reading on perimeter radiation monitoring system greater than 10 mR/hr above normal background for 15 minutes [for sites having telemetered perimeter monitors].

AA1-4 Valid indication on automatic real-time dose assessment capability greater than (site-specific value) for 15 minutes or longer [for sites having such capability].

Provide justification for this deviation. If these EALs were not included because these specific indications are not available at Callaway, consider whether other indications are available to determine whether the IC should be entered.

4. EAL 1C EAB Dose Resulting From an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mrem Whole Body or 500 mrem Thyroid for the Actual or Projected Duration of the Release

- A. It is not clear whether the setpoints for the effluent radiation monitors were calculated in accordance with the NUMARC/NESP-007 guidance.

NUMARC/NESP-007 specifies that the setpoint for the effluent radiation monitors should be calculated using the FSAR source term applicable to each monitored pathway in conjunction with annual average meteorology. The basis for the Callaway EAL 1C indicates that a most limiting case regarding the direction of the release was used to calculate the setpoint.

Provide additional information describing the relationship between the method used to calculate the radiation monitor setpoint for the Callaway EAL and the NUMARC/NESP-007 method. Provide justification for any deviation between these methods.

- B. The Callaway EAL scheme did not include the NUMARC/NESP-007 condition to perform a dose assessment if the effluent levels exceed the radiation monitoring setpoints.

The corresponding NUMARC/NESP-007 EAL provides guidance to initiate a dose assessment using actual source term and meteorological conditions upon exceeding the radiation monitor setpoint so that the classification will be based upon the best estimate of dose consequences. An event should be

classified based upon the effluent radiation monitor setpoints (which were calculated using default values) only if a dose assessment cannot be performed within 15 minutes.

Provide justification for this deviation from the NUMARC/NESP-007 guidance.

- C. The following two NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme.

AS1-3 A valid reading sustained for 15 minutes or longer on perimeter radiation monitoring system greater than 100 mR/hr [for sites having telemetered perimeter monitors].

AS1-4 Field survey results indicate site boundary dose rates exceeding 100 mR/hr expected to continue for more than one hour; or analyses of field survey samples indicate child thyroid dose commitment of 500 mR for one hour of inhalation.

Provide justification for this deviation. If these EALs were not included because these specific indications are not available at Callaway, consider whether other indications are available to determine whether the IC should be entered.

5. EAL 1D EAB Dose Resulting From an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mrem Whole Body or 5000 mrem thyroid for the Actual or Projected Duration of the Release

- A. It not clear whether the setpoints for the effluent radiation monitors were calculated in accordance with the NUMARC/NESP-007 guidance.

NUMARC/NESP-007 specifies that the setpoint for the effluent radiation monitors should be calculated using the FSAR source term applicable to each monitored pathway in conjunction with annual average meteorology. The basis for the Callaway EAL 1C indicates that a most limiting case regarding the direction of the release was used to calculate the setpoint.

Provide additional information describing the relationship between the method used to calculate the radiation monitor setpoint for the Callaway EAL and the NUMARC/NESP-007 method. Provide justification for any deviation between these methods.

- B. The Callaway EAL scheme did not include the NUMARC/NESP-007 condition to perform a dose assessment if the effluent levels exceed the radiation monitoring setpoints.

The corresponding NUMARC/NESP-007 EAL provides guidance to initiate a dose assessment using actual source term and meteorological conditions upon exceeding the radiation monitor setpoint so that the classification will be based upon the best estimate of dose consequences. An event should be classified based upon the effluent radiation monitor setpoints (which were calculated using default values) only if a dose assessment cannot be performed within 15 minutes.

Provide justification for this deviation from the NUMARC/NESP-007 guidance.

- C. The following two NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme.

AG1-3 A valid reading sustained for 15 minutes or longer on perimeter radiation monitoring system greater than 1000 mR/hr [for sites having telemetered perimeter monitors].

AG1-4 Field survey results indicate site boundary dose rates exceeding 1000 mR/hr expected to continue for more than one hour; or analyses of field survey samples indicate child thyroid dose commitment of 5000 mR for one hour of inhalation.

Provide justification for this deviation. If these EALs were not included because these specific indications are not available at Callaway, consider whether other indications are available to determine whether the IC should be entered.

6. EAL 1E Unexpected Increase in Plant Radiation

The Callaway site specific EAL 1E, "Spent Fuel Pool level is decreasing on EC-LI-0039A with all available installed makeup sources being added, and all irradiated fuel assemblies remain covered" deviates from the corresponding NUMARC/NESP-007 EAL (AU2-1) by including the condition, "with all available installed makeup sources being added," in place of the NUMARC/NESP-007 EAL condition of "uncontrolled water level decrease."

Provide justification for this deviation.

7. EAL 2 Containment Barrier Potential Loss Indications

- A. The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

Containment Pressure (site-specific) PSIG and increasing

Provide justification for this deviation.

- B. Provide additional documentation regarding the derivation of the setpoint for the RCS Barrier loss indicator, "3. Containment Radiation Monitoring: GT-RE-59/60...reading >15 E+3 R/hr."

- C. Provide all of the critical safety function status procedures which are referenced in the fission product barrier EALs.

8. EAL 2 RCS Barrier Loss Indicators

- A. The Callaway RCS Barrier loss indicator EAL, "1. RCS Leak Rate: Safety Injection initiated with a loss of subcooling..." deviates from the corresponding NUMARC/NESP-007 EAL, "RCS Leak Rate: Greater than available makeup capacity as indicated by a loss of RCS subcooling."

The Callaway EAL contains the condition that Safety Injection has initiated whereas the NUMARC/NESP-007 EAL does not include this condition.

Provide justification for this deviation.

- B. The Callaway RCS Barrier loss indicator EAL, "2. SG Tube Rupture: a) Any of the following...and b) SG pressure decreasing in an uncontrolled manner" deviates from the corresponding NUMARC/NESP-007 EAL, "(site-specific indication that a SG is ruptured and has a non-isolable secondary line break or (site-specific) indication that a SG has ruptured and a prolonged release of contaminated secondary coolant is occurring from the affected SG to the environment." The Callaway EAL condition that SG pressure is decreasing in an uncontrolled manner does not appear to have a one-to-one correspondence to the NUMARC/NESP-007 EAL condition of a non-isolable secondary line break or a prolonged release of contaminated coolant.

Provide justification for this deviation.

- C. Provide additional documentation regarding the derivation of the setpoint for the RCS Barrier loss indicator, "3. Containment Radiation Monitoring: GT-RE-59/60...reading >1 E+3 R/hr."

9. EAL 2 Fuel Clad Barrier Loss Indicators

- A. The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

Core Exit Thermocouple Readings - Greater than (site-specific) degree °F (Table 4)

Although the Critical Safety Function Status - Core Cooling Red may use the same indicator as the NUMARC/NESP-007 EAL, e.g. core exit thermocouple > 1200 °F, all available indications should be used. Provide justification for this deviation.

- B. Provide additional documentation regarding the derivation of the setpoint for the Fuel Clad Barrier loss indicator, "3. Containment Radiation Monitoring: GT-RE-59/60...reading >3 E+3 R/hr."

10. EAL 2 Fuel Clad Barrier Potential Loss Indicators

- A. The following NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme.

Core Exit Thermocouple Readings - Greater than (site-specific) degree °F

Reactor Vessel Water Level - less than (site-specific) value



Although the Critical Safety Function Status - Core Cooling Orange may use the same indicators as these NUMARC/NESP-007 EALs, e.g. core exit thermocouple > 700 °F and vessel level below..., all available indications should be used. Provide justification for this deviation.

11. EAL 3A Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant

The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

HU4-2 Other security events as determined from (site-specific) Safeguards Contingency Plan

Provide justification for this deviation.

12. EAL 3B Security Event in the Plant Protected Area

The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

HA4-2 Other security events as determined from (site-specific) Safeguards Contingency Plan

Provide justification for this deviation.

13. EAL 3C Security Event in a Safe Shutdown Area

The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

HS1-2 Other security events as determined from (site-specific) safeguards Contingency Plan

Provide justification for this deviation.

14. EAL 3F Fire Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown

The Callaway EAL for this IC, "Fire in any of the following areas:...and there is visible damage to permanent structures or equipment, affecting the operability of redundant trains of safety related equipment" deviates from the corresponding NUMARC/NESP-007 EAL (HA2), "Fire or explosion in any of the following areas...and affected system parameter indications show degraded performance or plant personnel report visible damage to permanent structures or equipment within the specified area," in that the Callaway scheme includes the condition that redundant trains are affected.

A fire does not need to affect redundant trains of safety related equipment to meet the threshold specified in the NUMARC/NESP-007 guidance for this EAL.

Provide justification for this deviation.

15. EAL 3G Natural and Destructive Phenomena Affecting the Protected Area

The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

HU1-4 Vehicle crash into plant structures or systems within protected area boundary

The licensee states that although NUMARC/NESP-007 specifies that a vehicle crash into a plant safety system is an unusual event, since at Callaway safety systems are located in vital areas, this EAL is classified at the Alert level.

The basis for the NUMARC/NESP-007 EAL (HU4-1) is: "EAL4 is intended to address such items as plane or helicopter crash, or on some sites, train crash, or barge crash that may potentially damage plant structures containing functions and systems required for safe shutdown of the plant." Furthermore, the NUMARC/NESP-007 basis specifies that: "if the crash is confirmed to affect a plant vital area, the event may be escalated to Alert." In consideration of the basis for the NUMARC/NESP-007 EAL it is appropriate for the Callaway EAL scheme to include an unusual event EAL for a vehicle crash.

Add a vehicle crash EAL or provide additional justification for this deviation.

16. EAL 3H Natural and Destructive Phenomena Affecting a Safe Shutdown Area

The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme.

HA1-6 Turbine Failure generated missiles result in any visible structural damage to or penetration of any of the following plant areas..."

The licensee's basis for not including a site-specific EAL which corresponds to this NUMARC/NESP-007 EAL is that turbine generated missiles can not affect safety systems due to the configuration of the main turbine. Provide additional information to support this supposition.

17. EAL 3I Release of Toxic or Flammable Gases Deemed Detrimental to Safe Operation of the Plant

Provide additional information regarding the "limits" specified in this EAL, (i.e. "amounts in excess of limits for atmospheric contaminants per CTP-ZZ-01200").

18. EAL 3J Release of Toxic or Flammable Gases Within a Facility Structure Jeopardizes Operation...

Provide additional information regarding the "limits" specified in this EAL, (i.e. "IDLH concentration per CTP-ZZ-01200 and LEL per CTP-ZZ-01200").

19. EAL 3L Control Room Evacuation Has Been Initiated and Plant Control Cannot Be Established

The Callaway EAL scheme for EAL 3L, "Entry into OTO-ZZ-00001 Control room evacuation is required and 2. The Aux Shutdown Panel (ASP) cannot be manned within 15 minutes," deviates from the corresponding NUMARC/NESP-007 EAL, "a. Control room evacuation has been initiated and Control of the plant cannot be established per (site-specific) procedure..." in that the Callaway scheme does not specify that control of the plant is established.

The condition that the ASP is manned with 15 minutes does not correlate to the condition that plant control has been established.

Provided justification for this deviation.

20. EAL 4A Unplanned Loss of Most or All Alarms (Annunciators) for Greater than 15 Minutes

The following NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme under this IC.

SU3-1b Compensatory non-alarming indications are available, and

SU3-1c In the opinion of the Shift Supervisor, the loss of the annunciators or indicators requires increased surveillance to safely operate the unit(s)

Provide justification for this deviation.

Provide information regarding the conditions specified in the Callaway EAL scheme to indicate that the loss of most or all annunciators. In particular, describe how the Callaway EAL conditions relate to the corresponding NUMARC/NESP-007 EAL.

21. EAL 4B Unplanned Loss of Most or All Alarms (Annunciators) With Either a Transient In Progress...

The following NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme under this IC.

SA4-1.b In the opinion of the Shift Supervisor, the loss of the annunciators or indicators requires increased surveillance to safely operate the unit(s)

SA4-1.d.2 Compensatory non-alarming indications are available

Provide justification for this deviation.

22. EAL 4C Inability to Monitor a Significant Transient in Progress

The following NUMARC/NESP-007 EALs were not included in the Callaway EAL scheme under this IC.

SS6-1.b Compensatory non-alarming indications are available, and

SS6-1.c Indications needed to monitor (site-specific) safety functions are unavailable

Provide justification for this deviation.

23. EAL 4P Fuel Clad Degradation

The following NUMARC/NESP-007 EAL was not included in the Callaway EAL scheme under this IC.

SU4-1 (Site -Specific) radiation monitor readings indicating fuel clad degradation greater than Technical Specification allowable limits

The licensee states that the failed fuel monitor was not used in its EAL because it would duplicate the chemistry sample indication. However, all available indicators should be used to determine whether an IC is met. In addition, the failed fuel monitor indication may be available before the chemical sample indication.

Modify this IC to incorporate the NUMARC/NESP-007 EAL or provide additional justification for this deviation.