February 27, 2004

MEMORANDUM TO: File

FROM: Jack N. Donohew, Senior Project Manager, Section 2 **/RA/**
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: CALLAWAY PLANT, UNIT 1 - CLARIFICATION OF LICENSEE'S APPLICATION AND RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MB9664)

By letter dated December 19, 2003 (ULNRC-04909), Union Electric Company (the licensee) submitted its responses to the NRC request for additional information (RAI) dated September 25, 2003. The RAI was for the licensee's license amendment request (LAR) on Technical Specifications 3.8.1 and 3.8.4 submitted by application dated June 6, 2003 (ULNRC-04837).

The NRC staff had the following questions to clarify the information provided by the licensee in its application and RAI response:

1. The emergency diesel generator (EDG) protection in the case of loss-of-offsite power (LOOP) is discussed in the LAR application. State what is (1) the EDG protection for the EDG during EDG testing in Modes 1 and 2, when the EDG is connected to the offsite power supply (i.e., what ensures that the EDG is not damaged by the offsite power supply during this testing), and (2) the surveillance of this EDG protection, including how often the protective relay features are calibrated. The details on the EDG protection are in the LAR application.

2. For the four restrictions given below, on testing the EDG in Modes 1 and 2 connected to the offsite power supply, state if the testing restrictions discussed in the LAR application and the supplemental RAI response letter encompass the four restrictions:

   - Weather conditions will be evaluated prior to testing the EDG in Modes 1 and 2 connected to the offsite power supply and the testing would not be conducted for severe weather watches or warnings.

   - The condition of the offsite power supply will be evaluated prior to testing the EDG in Modes 1 and 2 connected to the offsite power supply and the testing would not be conducted if the offsite power supply is being challenged.

   - No discretionary switchyard maintenance, including the main, auxiliary, or startup transformers, will be allowed during testing of the EDG in Modes 1 and 2 connected to the offsite power supply.

- No maintenance or testing that affects the reliability of the train associated with the EDG [not] being tested will be conducted during testing of the EDG in Modes 1 and 2 connected to the offsite power supply. If any testing or maintenance of the train must be performed at this time, then a 10 CFR 50.65(a)(4) evaluation will be performed prior to the EDG testing connected to the offsite power supply.

Enclosed is the licensee's e-mail providing the answers to the above questions.

The above questions were discussed with the licensee in the conference call on February 12, 2004. In that call, I stated that the reference to "the train associated with the EDG being tested" in the fourth bullet above was in fact a reference to "the train associated with the EDG not being tested."

Docket No. 50-483

Attachment: E-Mail dated February 24, 2004

- No maintenance or testing that affects the reliability of the train associated with the EDG [not] being tested will be conducted during testing of the EDG in Modes 1 and 2 connected to the offsite power supply. If any testing or maintenance of the train must be performed at this time, then a 10 CFR 50.65(a)(4) evaluation will be performed prior to the EDG testing connected to the offsite power supply.

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Docket No. 50-483

Attachment: E-Mail dated February 24, 2004

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E-MAIL DATED FEBRUARY 24, 2004

From: "Shafer, David E" <DShafer@ameren.com>
To: <jnd@nrc.gov>
Date: 2/24/04 4:21PM
Subject: FW: Response for Callaway to the Two NRC Questions E-mailed to AmerenUE in Early February Regarding Proposed Changes to TS 3.8.1 and 3.8.4

Jack, you are the intended recipient of the attached information. You may docket this information in order to support our amendment request dated 6/6/03 (ULNRC-04837)(TAC No. MB9664).

Dave Shafer

Phone 314-554-3104
Fax 314-554-3558
Email dshafer@ameren.com

-----Original Message-----
From: Elwood, Tom
Sent: Tuesday, February 24, 2004 11:34 AM
To: 'Jack Donohew'
Cc: Shafer, David E; Hooper, Terry L.
Subject: Response for Callaway to the Two NRC Questions E-mailed to AmerenUE in Early February Regarding Proposed Changes to TS 3.8.1 and 3.8.4

Jack -

Attached is our response (for Callaway) to the two questions that were E-mailed to us in early February regarding our proposed license amendment for removing or modifying the MODE restrictions currently imposed on certain diesel generator Surveillance Requirements under Technical Specification 3.8.1.

- Tom Elwood

RESPONSE FROM CALLAWAY

Below are the responses for Callaway to the two questions that were provided via E-mail to each of the STARS licensees that have submitted (and are awaiting approval of) license amendment applications for revising Surveillance Requirements under Technical Specifications 3.8.1 and 3.8.4. The questions are related to the testing of the emergency diesel generator (EDG) in Modes 1 and 2 with the EDG connected to the offsite power supply. (Note: The second question is a four-part question, and each part is addressed separately under that question.)

* * * * * * * * * * * *

References

1) AmerenUE Letter ULNRC-04837, "License Amendment Request OL-1228 – Revision to Technical Specification Surveillance Requirements 3.8.1 and 3.8.4," from D. Shafer (AmerenUE) to USNRC, dated June 6, 2003

2) USNRC Letter, "Request for Additional Information re: Technical Specifications 3.8.1 and 3.8.4 for Callaway, Diablo Canyon, Palo Verde, and Wolf Creek Plants," from J. Donahew (USNRC) to G. Randolph, AmerenUE; G. Rueger, Pacific Gas and Electric; G. Overbeck, Arizona Public Service Company, and R. Muench, Wolf Creek Nuclear Operating Corporation; dated September 25, 2003

3) AmerenUE Letter ULNRC-04909, "Response to Request for Additional Information Regarding License Amendment Request OL-1228 (Revision to Technical Specification Surveillance Requirements 3.8.1 and 3.8.4)," from K. Young (AmerenUE) to USNRC, dated December 19, 2003

1. The EDG protection in the case of loss-of-offsite power (LOOP) is discussed in the LAR application. State what is (1) the EDG protection for the EDG during EDG testing in Modes 1 and 2, when the EDG is connected to the offsite power supply (i.e., what ensures that the EDG is not damaged by the offsite power supply during this testing) and (2) the surveillance of this EDG protection, including how often the protective relay features are calibrated. The details on the EDG protection are in the LAR application.

RESPONSE:

Automatic protection for each of the two Callaway EDGs was described in Section 3.1 of Reference 1 (i.e., in Attachment 1 of the submittal). Specifically, automatic protection for the following conditions was identified:

- Start failure
- Engine overspeed
- High jacket coolant temperature
- Low lube oil pressure
- High crankcase pressure
- Generator differential

It was noted that these protective functions (to shut down the diesel or trip the DG breaker) are retained during receipt of an SIS. The instrumentation associated with the above critical DG protective functions (which is safety-related) is calibrated such that one train (associated with one DG) is calibrated each refueling cycle. Thus, for the two trains, each train is calibrated every three years.

In addition to the above functions, it was noted (in the same section of Reference 1) that DG protection is also provided for the following conditions:

- Reverse power
- Loss of field
- Generator over-excitation (Volts/Hertz)
- Generator overcurrent
- Generator voltage-restrained overcurrent
- Generator ground overcurrent
- Underfrequency

It was noted that these protection functions are only in effect during tests when the diesel generator is operating in parallel with the preferred (offsite) power system, and that they are automatically bypassed upon receipt of an SIS or loss of power. This is based on the design consideration that DG availability to mitigate a DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG. Further, as described in Section 4.1.2 of Reference 1, these protective functions are tested to verify that they are bypassed on a loss-of-voltage signal concurrent with an ESF actuation test signal, pursuant to Technical Specification (TS) Surveillance Requirement (SR) 3.8.1.13 (which is one of the SRs for which Callaway is proposing to delete the current Mode restrictions).

The above “non-critical” (but safety-related) protective functions are calibrated such that one train (associated with one DG) is calibrated each refueling cycle. Therefore, each train is calibrated every 36 months.

In addition to merely identifying the above protection functions in Reference 1, AmerenUE provided discussion on how the EDG automatic protection could be expected to respond to a Loss of Offsite Power (LOOP), a loss-of-coolant accident (LOCA) [i.e., a safety injection signal (SIS)], or a LOOP concurrent with a LOCA, while a DG is paralleled to the offsite source for testing. This was discussed in Section 4.1.4 of Reference 1. In Reference 3, particularly in the response to Question 2.b of Reference 2, a more detailed discussion was provided on what protective functions are capable of being actuated by an offsite source condition while an EDG is paralleled to offsite power, and which of the protective functions would likely trip first in response to such a condition. The protective functions discussed were the underfrequency, degraded voltage, loss-of-voltage, time overcurrent and voltage-restrained overcurrent relays. It was noted which of these could be expected to respond to certain conditions (depending on the cause of the loss of offsite power), given the redundancy or back-up capability afforded by these diverse protective functions.

In addition to the above, there is protective relaying associated with the 4.16-kV buses themselves (such as the degraded voltage relays), the ESF transformers, the startup transformer, the safeguards transformers in the switchyard as well as the two 345-kV buses in the switchyard, and

then out on the grid. Some of this relaying is non-safety grade, yet, depending on the cause of the loss-of-power event (such as due to a local fault) the relays at these locations can realistically be expected to respond first [to trip open associated breaker(s)] in response to certain events. The non-safety relays are maintained to protect plant equipment (and AmerenUE's investment therein) and may therefore be regarded as reliable.

The above-noted, safety-related and non-safety related relays – from the 4.16 kV buses in the plant out to the 345-kV buses in the switchyard - are all calibrated at a frequency of once per 36 months. This includes tripping sequence testing as well. The typical manner in which testing is done is to complete the calibrations and testing for each bus or train on alternate basis such that one train or bus is done every refueling cycle.

In summary, there is a wide range of protection at several levels between the diesel generators and the offsite source. While the protective response to an offsite power condition is dependent on the cause of the loss-of-power event, overall, a significant degree of defense in depth exists to greatly minimize the potential for an EDG to be damaged by an offsite power event while the EDG is paralleled to offsite power.

2. For the four restrictions given below, on testing the EDG in Modes 1 and 2 connected to the offsite power supply, state if the testing restrictions discussed in the LAR application and the supplemental RAI response letter encompass the four restrictions:

(1) Weather conditions will be evaluated prior to testing the EDG in Modes 1 and 2 connected to the offsite power supply and the testing would not be conducted for severe weather watches or warnings.

RESPONSE:

With regard to avoiding severe weather conditions when scheduling the performance of EDG surveillance testing that requires paralleling the EDG to the offsite source, it was stated in Sections 4.1.1 and 4.1.3 of Reference 1 that "the normal practices of work management exercised at Callaway ensure that SRs of this type are not scheduled during periods in which the potential for grid or bus disturbances exists (such as during severe weather or maintenance activities in the switchyard)." In Reference 3, conditions for EDG testing that requires the EDG to be inoperable or that is performed while the EDG is inoperable, were addressed. Specifically, in the Reference 3 response to Question 1.d of Reference 2, the guidance of Callaway procedure EDP-ZZ-00129, "Callaway Plant Risk Assessment," was discussed. It was noted that for an EDG outage (or an outage of the associated essential service water loop), this procedure requires plant personnel to "minimize the chance for concurrent loss of offsite power (i.e., no inclement weather and/or no work in the switchyard that can cause a loss of offsite power)."

(2) The condition of the offsite power supply will be evaluated prior to testing the EDG in Modes 1 and 2 connected to the offsite power supply and the testing would not be conducted if the offsite power supply is being challenged.

RESPONSE:

See the above response to restriction (1).

(3) No discretionary switchyard maintenance, including the main, auxiliary, or startup transformers, will be allowed during testing of the EDG in Modes 1 and 2 connected to the offsite power supply.

Again, see the response to restriction (1) above. In particular, the statement/commitment made in Reference 1 (Sections 4.1.1 and 4.1.3) describing how "the normal practices of work management exercised at Callaway ensure that SRs of this type are not scheduled during periods in which the potential for grid or bus disturbances exists (such as during severe weather or maintenance activities in the switchyard)" encompasses this concern. Although the main, auxiliary and startup transformers were not specifically identified therein, the control of activities that could create "the potential for grid or bus disturbances" would extend to these components as well.

(4) No maintenance or testing that affects the reliability of the train associated with the EDG [not] being tested will be conducted during testing of the EDG in Modes 1 and 2 connected to the offsite power supply. If any testing or maintenance of the train must be performed at this time, then a 10 CFR 50.65(a)(4) evaluation will be performed prior to the EDG testing connected to the offsite power supply.

RESPONSE:

As clarified with the NRC Project Manager [in the conference call] on February 12, 2004, the first sentence of this suggested restriction is actually concerned with maintenance or testing that affects the train for which the associated EDG is *not* being tested (i.e., the train that is redundant to the train whose EDG is being tested). [The not has been added to the above question.] AmerenUE addressed this concern in several places within Attachment 1 of Reference 1, and in Reference 3, specifically in the response to Question 1.d (of Reference 2). The information and/or responses provided in these documents, in fact, completely addresses this concern or restriction.

Specifically, in Sections 4.1.1 and 4.1.3 of Reference 1, it was noted that "the normal practices of risk management exercised at Callaway…require only one EDG to be tested at a time based on the established practice of 'protecting' the other train when a component (or components) of one train is being tested or declared inoperable." "Protection" of the other train requires consideration to be given to the impact of removing from service any significant component on that train (not just the EDG). This practice relates to the second sentence of the restriction, regarding 10CFR50.65(a)(4) evaluations.

With the plant at a particular risk level, a 10CFR50.65(a)(4) evaluation is considered any time a safety-significant piece of equipment is considered for removal from service for maintenance or repair. Thus, it should be noted that whether an EDG is under test or not (given that the EDG may or may not be OPERABLE during such testing), if a safety-significant piece of equipment is to be removed from service (whether it's associated with the train that has its EDG under test, or whether it's associated with the other train), a 10CFR50.65(a)(4) evaluation would be performed as necessary to evaluate the change in plant risk that would result from removing that piece of equipment from service.

Finally, as discussed in Reference 3 (response to Question 1.d), removal of additional equipment from service while a DG is under test could require entry into a short-term Required Action under

the applicable Limiting Condition for Operation (LCO) of the Technical Specifications. If the DG under test were inoperable, for example, and the other EDG was being considered for removal from service for some reason, not only would the plant risk be evaluated per 10CFR50.65(a)(4), but with two DGs inoperable, Required Action E.1 of Condition E under TS 3.8.1 would require restoring one DG to OPERABLE status in 2 hours. Entry into such a short-term Required Action would be discouraged.