

February 29, 2008

LICENSEE: Union Electric Company

FACILITY: Callaway Plant, Unit 1

SUBJECT: MEETING WITH REPRESENTATIVES OF UNION ELECTRIC COMPANY FOR THE CALLAWAY PLANT, UNIT 1 (TAC NOS. MD6792 AND MD7252)

A meeting was held on Wednesday, January 23, 2008, between the Nuclear Regulatory Commission (NRC) staff and the licensee for the Callaway Plant, Unit 1 (Callaway). The meeting was held at the request of the licensee to address the licensee's relief request (RR) to use plastic pipe in the safety-related essential service water (ESW) system. The buried ESW steel piping would be replaced by high density polyethylene (HDPE) piping in the upcoming fall 2008 outage, and the licensee submitted its RR I3R-10 with respect to paragraph IWA-4221(b) in Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) in its letter dated August 30, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072550488). The notice for the meeting was issued on January 8, 2008 (ADAMS Accession No. ML080040023).

The licensee also submitted a license amendment request (LAR) to extend the completion time (CT) for an inoperable ESW train and diesel generator (DG), in Technical Specification (TS) 3.7.8, "Essential Service Water System (ESW)," and TS 3.8.1, "AC [Alternating Current] Sources," to allow for the time needed to replace portions of the ESW system underground piping with the HDPE piping. This replacement of piping would be done one ESW train at a time for the two trains of ESW.

In its application, the licensee stated that the replacement of the current ESW steel piping with HDPE piping is an overall benefit to plant safety since the polyethylene (PE) piping is more resistant to fouling and microbiologically-induced corrosion (MIC). There has been a history of significant fouling and MIC in the ESW piping at Callaway. This replacement with PE piping would ensure improved long-term reliability of the ESW system and reduced fouling and MIC. At this time, the licensee intends to replace the ESW steel piping with piping made of HDPE.

The purpose of the meeting was to ensure that the NRC staff understands the RR and the licensee understands what additional information may be needed for the NRC staff to complete its review of the licensee's application. Enclosure 1 is the list of attendees. Enclosure 2 is the NRC staff handout with five questions on RR I3R-10. Enclosure 3 is the handout from the licensee. The agenda for the meeting, which is Slide 2 of Enclosure 3, was the following:

- Introductions
- Overview of ESW piping replacement
- Licensee's relief request
- Scope of work and schedule in fall 2008 outage

- One-time extension of CT in TS 3.7.8 and TS 3.8.1
- Comments, Questions, and Discussion

To meet its obligation under the Commission's policy statement on "Enhancing Public Participation in NRC meetings," in *Federal Register* notice 67 FR 36920, dated May 28, 2002, the public was allowed to ask questions of the NRC staff at the close of the meeting.

Through the slides in Enclosure 3, the licensee presented an overview of the proposed ESW piping replacement and the importance of the NRC staff timely review of (1) RR I3R-10 and (2) the one-time extension of the CT for an inoperable ESW train and the associated emergency DG. This work would be done in the upcoming fall 2008 refueling outage where one ESW train at a time would be taken out-of-service for the pipe replacement. The work on both ESW trains would be completed in the fall outage.

The background for why the licensee is proposing to replace the buried ESW steel piping with plastic piping is on Slides 4 and 5 of Enclosure 3. Pictures of the existing buried piping are on Slide 5. An overview of the piping replacement plan is on Slide 7. The basis for the choice of the HDPE piping is on Slides 9 and 10. The licensee explained its RR I3R-10 on Slides 11 through 14.

The licensee explained that the ESW pipe replacement involved work while the ESW system would be in-service and work when each ESW train would be separately taken out-of-service. The details are in Slide 15 of Enclosure 3. Not all of the work is during the fall 2008 outage. The schedule to do the work is on Slide 16.

Slides 17 through 19 addressed the licensee's request to extend the completion time in the TS for an inoperable ESW train, the train taken out-of-service to do the pipe replacement. There was no NRC staff involved in the review of the licensee's application for the extended CT dated October 31, 2007 (ADAMS Accession No. ML073100488). Prior to the meeting, questions from the PRA licensing branch (APLA) were forwarded to the licensee in an email dated January 16, 2008. These questions, although not discussed in this meeting, are given in Enclosure 2.

In the discussion on RR I3R-10, the NRC staff stated that its review would focus on the soundness of the proposed HDPE material for the replacement piping, the procedure for forming the complete piping from the individual HDPE pipe sections, and the testing and surveillance on the HDPE piping. The testing would be related to the decision of whether the formed plastic pipe is sufficiently sound for service and the surveillance is on future checks of the piping that it remains sound. The NRC concern is that, while steel piping would leak before a break in the piping, the plastic pipe may not do this so that there would be no indication of degradation of the plastic pipe before it fails in a safety-related system. After the NRC staff and the licensee completed the discussion on RR I3R-10, the meeting was ended. The NRC staff stated that it expected to complete the Piping and NDE Branch's questions within a month. The Mechanical and Civil Engineering Branch's questions are in Enclosure 2.

One member of the public was in attendance. The person was given the opportunity to ask questions of the NRC staff, but the person had no questions. During the meeting, a Public Meeting Feedback form was given to the person. Any comments received in the future on this

meeting will be forwarded to the NRR Senior Communications Analyst, who will forward then to the Office of the Executive Director for Operations.

Direct any inquiries about this meeting to me at 301-415-1307, or by electronic mail to jnd@nrc.gov.

/RA/

Jack Donohew, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosures: 1. List of Attendees at Meeting
 2. NRC Staff's Handout
 3. Licensee's Handout

cc w/encls: See next page

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ADAMS Accession Nos.: Pkg ML080380681 (Orig. Meeting Notice ML080040023, Summary/Encl 1/Encl 2 ML080380647, Encl 3 ML080250405) NRC-001

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DATE	2/14/08	2/14/08	2/26/08	2/29/08

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Callaway Plant, Unit 1

(11/26/2007)

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WITH UNION ELECTRIC COMPANY (AMEREN UE)

	<u>NAME</u>	<u>AFFILIATION</u>
NRC:	J. Donohew	NRC/NRR/LPLIV
	T. Chan	NRC/NRR/CPNB
	D. Naujock	NRC/NRR/CPNB
	C. Basavaraju	NRC/NRR/EMCB
	T. Sullivan	NRC/NRR/DCI
	M. Thadani	NRC/NRR/LPLIV
	C. Ng	NRC/NRO/DE
Licensee:	S. Maglio	Ameren UE (UEC)
	B. Yates	Ameren UE (UEC)
	L. Graessle	Ameren UE (UEC)
	S. Abel	Ameren UE (UEC)
	M. Brandes	Ameren UE (UEC)
Licensee: (contractors)	F. Schaaf	SRC - Callaway
	J. McLean	Sargent & Lundy
	T. Musto	Sargent & Lundy
	K. Connelly	Scientech
Public:	M. Golliet	WEC

Where:

- CPNB = Piping and NDE [non-destructive examination] Branch
- DCI = Division of Component Integrity
- DE = Division of Engineering
- EMCB = Mechanical and Civil Engineering Branch
- EPRI = Electric Power Research Institute
- LPLXX = Plant Licensing Branch XX
- NRC = Nuclear Regulatory Commission
- NRO = Office of New Reactors
- NRR = Office of Nuclear Reactor Regulation
- UEC = Union Electric Company (or Ameren UE, a trade name)
- WEC = Westinghouse Electric Company

NRC STAFF'S HANDOUT FOR JANUARY 23, 2008, MEETING

The following request for additional information was handed to the licensee as part of the January 23, 2008, meeting. These questions on Relief Request I3R-10 are from the Mechanical and Civil Engineering Branch (EMCB).

REQUEST FOR ADDITIONAL INFORMATION (RAI) REGARDING
CALLAWAY PLANT UNIT 1 RELIEF REQUEST
FOR REPLACEMENT OF CLASS 3 BURIED STEEL PIPING
IN ESW SYSTEM WITH POLYETHYLENE PIPING

In its application dated August 30, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072550488), Union Electric Company (Ameren UE) submitted Relief Request (RR) I3R-10 for the replacement of Class 3 buried steel piping in the safety-related essential service water system (ESW) system with polyethylene (PE) piping at the Callaway Plant (Callaway). Ameren UE stated that the construction code of record for buried ASME class 3 piping is American Society of Mechanical Engineers Boiler and Pressure Vessel Code (i.e., ASME Code), Section III, Division 1, subsection ND, 1974 edition through summer 1975 addenda. As the construction code and later editions and addenda do not provide rules for the design, fabrication, installation, examination, and testing of piping constructed using PE [polyethylene] material, RR I3R-10 must be approved for the use of PE piping in a safety-related system. In RR I3R-10, Ameren UE proposed to use the provisions of ASME Code Case N-755 for the ESW piping replacement effort.

The following additional information is requested as it was not included in RR I3R-10, as submitted in the application:

1. Ameren UE indicated that PE material with a cell classification of 445574C will be utilized. This PE material has a higher tensile strength than 445474C PE material specified in the code case. Provide the mechanical properties of the 445574C PE material.
2. Ameren UE indicated that mitered elbows of less than 90 degrees (i.e., 45 and 22.5 degree) and less than 3 [three] joints may be utilized, while the code case specifies three or five-joint mitered elbows. Address if any test data is available and what stress intensification factor values will be used for mitered joints with less than three joints.
3. The relief request did not include the piping diameter (D_o), wall thickness (t), and dimension ratio (DR) values. Provide this information for the PE pipe sizes proposed for use at Callaway.

ENCLOSURE 2

4. Provide a complete stress analysis calculation package of one buried ESW piping system containing detailed evaluations showing structural integrity, stress margins, and factors of safety.
5. Ameren UE stated that the PE piping will be subjected to pressures and temperatures as high as 165 psig [pounds per square inch gauge], and 180 °F [degrees Fahrenheit], which exceed the limitations provided in ASME Code Case N-755. The material properties will be determined by material testing.
 - a. Provide the material test data for the 445574C PE material for temperatures up to 180 °F.
 - b. Provide structural integrity evaluations performed for the high pressure, high temperature applications of the PE piping showing stress margins, and factors of safety.

Note: There are several editorial changes between what was handed out to the licensee at the meeting and what is stated above.

Below are RAI questions from the PRA licensing branch (APLA) that were forwarded to Ameren UE in an email dated January 16, 2008, as part of the NRC staff's preparation for this meeting. These questions were based on APLA's review of the licensee's application dated October 31, 2007 (ADAMS Accession No. ML073100488). Although the following set of RAI questions were not discussed during the meeting, these questions were sent to the licensee in preparation for the meeting in the case that the APLA reviewer may need to explain these questions to the licensee. This was not needed in the meeting, and the following questions were not handed out for discussion:

REQUEST FOR ADDITIONAL INFORMATION RELATED TO AN AMENDMENT TO REVISE
TECHNICAL SPECIFICATIONS FOR ESSENTIAL SERVICE WATER
CALLAWAY PLANT
DOCKET NO. 50-483
TAC NO. MD7252

The questions given below are based on the NRC staff's review of the license amendment request (LAR) submitted on October 31, 2007 (ULNRC-05445), by the Union Electric Company (the licensee) for the Callaway Plant. This LAR proposes changes to the Callaway Technical Specifications (TSs).

1. The licensee identified that five open significant (level A or B facts and observations (F&Os)) from its industry peer review are not yet resolved and incorporated into the Callaway probabilistic risk assessment (PRA) model used to support this application, and similarly that none of the gap items identified by

the Scientech peer review are yet resolved. The licensee stated that none of the open F&Os would have a direct impact on the PRA insights developed for this application, and further that it did not believe that the gap analysis findings invalidate the PRA insights developed to support this license amendment request. The licensee is requested to provide additional details and justify its technical basis that these open, unresolved issues have an insignificant impact on the risk analyses supporting this amendment request.

2. The licensee is requested to confirm that there are no (1) current outstanding plant changes (i.e., modifications or changes to operating procedures) or (2) planned changes which would be implemented prior to the expiration date of the temporary change, which would impact the PRA model. If such changes exist, the licensee is requested to identify such changes and provide its technical basis that the change(s) have an insignificant impact on the risk analyses supporting this amendment request.
3. The licensee is requested to identify and justify truncation levels used to generate the risk results in support of this application in accordance with NRC Regulatory Guide (RG) 1.177, Section 2.3.3.4.
4. The licensee identifies that internal flooding, internal fires, seismic events, and other external events are not in the scope of its PRA models and risk analyses. No disposition of these risk sources has been provided to address the potential risk exposure when one essential service water (ESW) header is unavailable under the proposed TS change. The licensee is requested to provide an appropriate technical basis, supported by qualitative and/or quantitative risk insights, to support a conclusion that the risk impact from these unmodeled events is insignificant, or to provide appropriate effective compensatory measures to mitigate that risk during the ESW train outage.
5. The licensee is requested to address sources of uncertainty in the PRA calculations in support of this application, specifically the following:
 - a. Whether the reported values of the risk metrics are point estimates of the mean or mean values calculated by propagating uncertainties in the data;
 - b. Important assumptions in the PRA models relevant to this application, such as ESW success criteria, loss-of-offsite power frequency and recovery, reactor coolant pump seal LOCA [loss-of-coolant accident] modeling, credit for equipment repair and recovery, and other important assumptions based on the licensee's review of the risk results and insights.
 - c. How potential parametric and/or model uncertainties have been accounted for in the calculations, and how they impact the conclusions.

6. In the tier 2 evaluation of the proposed TS change, the licensee states that credit is taken in the PRA calculations for certain tier 2 restrictions, specifically the following:

- a. No PRA-modeled equipment other than the affected ESW train will be voluntarily removed from service;
- b. No work will be performed in the Callaway switchyard; and
- c. The extended CT will not be entered if inclement weather is forecast.

The licensee is requested to more specifically identify how the PRA model and/or results were modified to quantitatively account for these commitments. The licensee should specifically address the following:

- How unplanned unavailability of PRA-modeled equipment is accounted for in the risk calculations;
- How the frequency of a loss-of-offsite power event has been adjusted;
- How the probability of recovery of offsite power after loss has been adjusted; and
- How “inclement weather” is defined and what initiating event frequencies or other PRA model probabilities have been adjusted.

7. The licensee has identified that the normal service water system will be aligned for the majority of the time of the extended CT, and that the risk analyses do not credit this alternate cooling capability. The impact on CDF [core damage frequency] and LERF [large early release frequency] had also been quantified in a sensitivity study, and would reduce the risk impact by about 40% for CDF and 70% for LERF. The NRC staff would expect that the majority of the risk impact for a loss of one ESW train would be due to loss-of-offsite power initiating events, for which the normal service water system is identified as unavailable since it is not powered from a vital bus. Therefore, this significant reduction in risk due to the normal service water system is not fully understood as follows and should be addressed.

- a. Since the risk impact is above the RG 1.777 criteria, why is no credit taken for the normal service water system?
- b. The licensee is requested to describe the dominant accident sequences which contribute to the increase in risk during the extended CT, and the mitigative effect of the availability of the normal service water system on these sequences and cutsets. A brief description of the normal service water system configuration, support systems, and operation would also

assist the NRC staff in understanding the relative importance of this tier 2 compensatory measure.

8. The licensee has included a regulatory commitment in its application to implement the proposed TS changes prior to December 31, 2008. Also, the licensee has proposed that the one-time TS change to extend the ESW CT in the TSs will expire on that same date. Since the amendment must be implemented prior to its use, the licensee must implement the amendment at least 14 days before December 31, 2008, to be able to use the full 14 days for the ESW CT. The extended CT can not be used after December 31, 2008. The licensee is requested to address this apparent inconsistency between the regulatory commitment and the proposed extended CT.

LICENSEE'S HANDOUT FOR JANUARY 23, 2008, MEETING

ADAMS* ACCESSION NO. ML080250405

The licensee's handout is 20 slides used in its presentation to the NRC staff in the meeting. This handout included two pages (i.e., pages 3 and 8 of 20) that contained schematics of the underground essential service water piping and the routing of the replacement plastic piping. Ameren UE considered the two schematics as providing sensitive information about a safety-related system important to the safe shutdown of the plant during an accident. As such, the licensee handed out the schematics for the discussion in the meeting and collected the schematics toward the end of the meeting. The two pages in the handout have the statement "withheld" below the titles on the two pages. The NRC staff had no disagreement with this.

*Agencywide Documents Access and Management System.