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Callaway Plant

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U.S. Nuclear Regulatory Commission  
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ALNRC 00024



**Subject:** AmerenUE, Callaway Plant Unit 2 (NRC Docket No. 52-037)  
Response to RAI No. 9 (e-RAI 2484), Revision 0,  
Section 09.05.02 – Communications Systems

**Reference:** Surinder Arora (NRC) to David E. Shafer (AmerenUE), "Final RAI  
No. 9 (e-RAI No. 2484) - Public" email dated April 22, 2009.

The purpose of this letter is to respond to the Request for Additional Information (RAI) identified in the NRC e-mail correspondence to AmerenUE, dated 4/22/09 (reference). This RAI addresses the Communications Systems as discussed in Section 9.5.2 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Callaway Plant Unit 2 Combined License Application (COLA), Revision 1.

Enclosure 1 provides our response to RAI No. 9 (e-RAI No. 2484), Revision 0.

Enclosure 2 provides a change to FSAR Section 14.2.14 as a result of the response to Question 09.05.02-1. This change will be incorporated in the next formal revision of the Callaway Plant Unit 2 COLA.

This response does not include any new regulatory commitments or contain proprietary information.

If there are any questions regarding this transmittal, please contact Scott Bond at (573) 676-8519, SBond2@ameren.com or Dave Shafer at (573) 676-4722, DShafer@ameren.com.

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I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 20, 2009

A handwritten signature in black ink, appearing to read 'TEH', with a long horizontal flourish extending to the right.

T. E. Herrmann  
Vice President, Engineering

TEH/AML/slk

Enclosures:

1. Response to RAI No. 9 (e-RAI No. 2484), Revision 0
2. Proposed COLA Changes Associated with RAI No. 9 (e-RAI 2484), Revision 0.

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Enclosure 1

**Enclosure 1**

**Response to RAI No. 9 (e-RAI No. 2484), Revision 0**

**Question 09.05.02-1**

Demonstrate that the portable wireless communication system used in the ESWEMS Pumphouse is not susceptible to excess noise level, electromagnetic interference (EMI), and radio frequency interference (RFI).

Section 9.5.2.3 of the Callaway COL FSAR states that communications equipment is provided in ESWEMS Pumphouse to support effective communication between plant personnel during normal operation, as well as during accident conditions. These locations will contain equipment to allow use of the plant digital telephone system, PA, and alarm system, and sound powered system. A portable wireless communication system will also be provided for use by fire brigade and other operations personnel required to achieve safe plant shutdown. 10 CFR 52.47(a)(9) requires, in part, that for applications for light-water cooled nuclear power plants, an evaluation of the standard plant design against the SRP revision in effect 6 months before the docket date of the application. The evaluation required by this section shall include an identification and description of all differences in design features, analytical techniques, and procedural measures proposed for a facility and those corresponding features, techniques, and measures given in the SRP acceptance criteria. Where such a difference exists, the evaluation shall discuss the manner in which the alternative proposed provides an acceptable method of complying with those rules or regulations of the Commission, or portions thereof that underlie the corresponding SRP acceptance criteria. Section 9.5.2.III.1 of the Standard Review Plan provides acceptance criteria for plant communications systems. This includes demonstrating that communication systems are not impeded by transmission through barriers, high-noise areas, personnel use of protective equipment, inadequate number of communication channels, interference between channels or subsystems, or interference from other electronic or electrical equipment. Describe the design by which the portable wireless communication system used in the ESWEMS Pumphouse withstands excess noise level, EMI, RFI, and other interferences within this location.

**Response**

The portable wireless communications system provided in the Essential Service Water System Emergency Makeup System (ESWEMS) Pumphouse is a part of the portable wireless communications system described in Callaway Plant Unit 2 FSAR Section 9.5.2.3. The design for the communications system is site specific.

The devices used for the communications system are conventional and have a history of reliable operation. Most of these devices are in routine use at Callaway

Plant Unit 1. The routine use demonstrates the availability of the devices. Furthermore, the communications system equipment will be factory tested to verify compliance with the emission limits specified in EPRI TR-102323-R3, Guidelines for Electromagnetic Interference Testing of Power Plant Equipment.

The communications equipment will also be tested in accordance with the procedures recommended by the equipment supplier to verify communications system operation under the potential maximum anticipated noise levels in the ESWEMS Pumphouse.

### **COLA Impact**

During the next formal revision of the Callaway Plant Unit 2 FSAR, Section 14.2.14 will be revised to add a new site specific test description for the ESWEMS communications system as shown in Enclosure 2, Proposed COLA Changes Associated with RAI No. 9 (e-RAI 2484), Revision 0.

### **Question 09.05.02-2**

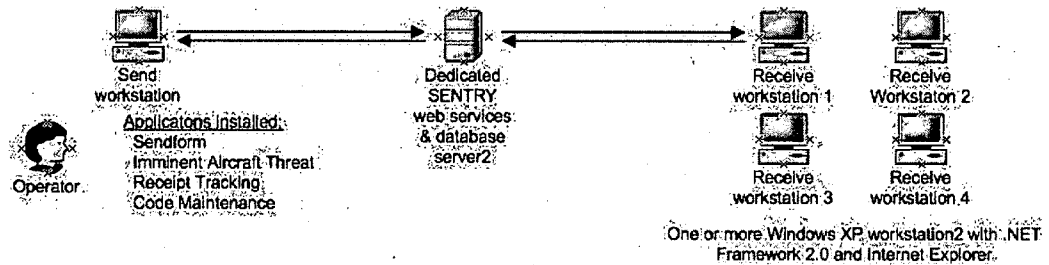
Provide the functional design of the SENTRY system used for emergency communications with state and local authorities as required by Appendix 10 CFR 50.47(b)(8).

Section F, "Emergency Communications" of the Callaway Plant unit 2 Emergency Plan describes the details of the plant's emergency response facilities and associated communications capabilities. Section F.1 of the Emergency Plan states that the SENTRY System is a dedicated communications system that has been installed for the purpose of notifying state and local authorities of declared nuclear emergencies. This system links together the station control room, the EOF, TSC and State and local authorities as appropriate. It allows a notification form to be completed on screen and transmitted to the local agencies and the State Emergency Operations Center. 10 CFR 50.47(b)(8) requires the licensee to provide equipment and facilities to support emergency response. The staff finds that additional information is necessary to evaluate the adequacy SENTRY system to notify the state and local authorities of declared nuclear emergencies. Describe the functional design of the SENTRY System (e.g. dedicated phone lines) that will be used to communicate with state and local authorities as required by 10 CFR 50.47(b)(8).

## Response

SENTRY Version 3.0, Callaway Plant Notification System, is a custom-built suite of VB .NET client server applications that execute within an isolated workspace. The suite is divided into multiple applications to provide flexibility in deployment. SENTRY is designed to comply with the requirements contained in NEI 04-04, Cyber Security Program for Power Reactors, Revision 1.

This SENTRY system is currently used for Callaway Plant Unit 1 emergency communications and has performed adequately in that application. Callaway Plant Unit 2 will use the same SENTRY system.



SENTRY version 3 runs within a Workspace to isolate it from the rest of the domain.

The preceding image is SENTRY version 3 in its simplest terms, the applications in the SENTRY suite are:

- **SendForm** – a client/server .NET application used by an operator to compose and send a plant notification to the state and surrounding counties. This application has interfaces to other plant systems that provide wind and dose information as needed for the notification.
- **Imminent Aircraft Threat** – a client/server .NET application used only by Control Room personnel to quickly notify surrounding counties of an aircraft threat to the plant.
- **Receipt Tracking** – a client/server .NET application that allows the operator to monitor receipt notification from the state and counties.
- **Code Maintenance** – a client/server .NET application used by IT and SENTRY administrators to maintain standard text and configuration data for the system.

- ReceiveForm – a client/server .NET application process that runs continually on secured workstations at designated non-plant sites in the state and counties. This application polls the SENTRY server for notifications designated for the particular workstation. When new notifications are found, the application retrieves the notification information, generates a report, displays the report on-line, plays an audio file to verbally notify state and county personnel, and automatically prints the report at a locally attached printer once receipt of the notification is acknowledged.
- Receive Box Availability – a client/server .NET application used by IT personnel to monitor availability of the ReceiveForm application in the state and county locations. This application also provides capability to extract information for monthly availability reporting. Restricted web services are used to interface with the associated SQL 2005 database.

#### **Actual Layout**

1. Send Workstations – Located in the Main Control Room (MCR), Training Simulator, Technical Support Center/Operations Support Center (TSC), and Emergency Operations Center (EOF).
  - a. The primary notification goes out from the MCR. When the EOF is activated (ALERT), notifications are moved to the EOF directly from the MCR.
  - b. The Training Simulator is used for training, drills, and exercises.
  - c. The TSC is combined with the OSC in one facility. The SENTRY in this facility is used as a backup to the MCR if it is evacuated.

Send workstations consist of desktop, monitor, mouse and printer. The send workstations functions are limited to the send form, Aircraft quick notification, and tracking, which display each receiving unit and identifies when they acknowledge the notification.

2. Receive Workstations – Located adjacent to all the Send Computers listed above, and in Callaway County, Montgomery County, Osage County, and Gasconade County 911 Dispatch Centers (manned 24/7) and Emergency Operations Centers (manned only after ALERT).

Receive units are also in the State Emergency Management Agency (SEMA) Control Room (normal working hours and after an ALERT) and the Missouri Disaster Situation Room (DSR). The DSR is the state 24/7



notification point for all emergency events. These locations are in Jefferson City, Missouri.

The Receive Workstations function is to receive the notifications for tracking and information use.

### **Actual Operation**

1. The Send Workstation is functionally locked down for any functions except for three icons on the desktop as follows:
  - a. The Send Form, which activates the send form page that can be filled out, automatically downloading current weather from the Plant Computer System (PCS). The form contains an option is to use data from the Training Simulator or from the Dose Assessment Program, which provides a file up loaded from the Dose Assessment Program (MAGNEM).
  - b. The Imminent Aircraft Threat which activates a form notifying Callaway County to activate fire rescue, ambulance, and other emergency responders.
  - c. The tracking icon that activates all the receiving units and provides real time message acknowledgement.
2. When the message is sent a copy is automatically printed at the send computer.
3. The only function of the Receive Workstation is to receive the send form, which when received generates an audio message stating either "An event has been declared at the Callaway Nuclear Plant" or "This is a Drill". These messages continue until acknowledged on the receiving machine. Once the message is acknowledged it prints out a hard copy.

### **COLA Impact**

The Callaway Plant Unit 2 COLA does not require revision as a result of this response.

### **Question 09.05.02-3**

Demonstrate that Bulletin 80-15 has been addressed in the Emergency Communications System design. Specifically, provide information identifying the

backup power sources that are available for the Emergency Notification System (ENS) and its interfaces.

The staff reviewed Section 9.5.2 of the U.S. EPR DC-FSAR. The staff found that Bulletin 80-15 had not been addressed in the DC-FSAR. The staff requested that AREVA provide information to demonstrate Bulletin 80-15 had been addressed as required by 10 CFR 50.54(f). NRC Bulletin 80-15 states that licensees should address Emergency Notification System backup power availability in case of loss-of-offsite power. In response, AREVA stated that the power source for the emergency offsite communication system, including backup power, will be addressed by the COL Applicant. This COL applicant responsibility is included in the proposed new COL Item 9.5-21, which states: "a COL applicant that references the U.S. EPR design certification will provide a description of the offsite communication system that interfaces with the onsite communication system." Identify the backup power sources that are available in the Callaway Unit 2 Plant design for the Emergency Notification System and its interfaces.

### **Response**

All locations of the SENTRY Send and Receive Computers have battery uninterruptible power supplies (UPS) that power the units until emergency diesel backup power is activated. All locations, except the Training Simulator have emergency diesel backup power.

### **COLA Impact**

During the next formal revision of the Callaway Plant Unit 2 COLA, the FSAR will be revised to incorporate the new COL applicant item 9.5-21. Proposed changes to the FSAR are not being provided at this time in order to ensure consistent incorporation of this new COL applicant item by the U.S. EPR Design Centered Working Group following submittal of DCD revision 1.

### **Question 09.05.02-4**

Demonstrate the adequacy of the backup communications systems to provide communications capabilities to plant personnel in the Main Control Room (MCR), Technical Support Center (TSC), Operations Support Center (OSC), and Emergency Offsite Facility (EOF) when the primary communications system is unavailable to meet the requirements of 10 CFR 50.47(b)(8).

Section F, "Emergency Communications" of the Callaway Plant unit 2 Emergency Plan describes the details of the plant's emergency response facilities and associated communications capabilities. This section describes several communication systems that ensure reliable and timely exchange of information necessary to provide effective Command and Control over any emergency response; (1) between the site and state and local agencies within the emergency planning zones, (2) with federal emergency response organizations, (3) between the plant, the EOF, and the state and local emergency offsite centers, and (4) between Emergency Response Facilities and Monitoring Teams. 10 CFR 50.47(b)(8) requires the licensee to provide equipment and facilities to support emergency response. The staff finds that additional information is required to demonstrate the adequacy of the backup communications systems to provide communications capabilities to plant personnel in the required locations (e.g. MCR, TSC, OSC, and EOF) when the primary communications system is unavailable to meet the requirements of 10 CFR 50.47(b)(8). Specifically, demonstrate that a single event, such as a fire, cannot prevent the operation of both the primary and the backup communications systems in the required locations.

### **Response**

The initial backup system for SENTRY is a Backup Radio System (BURS). This is a radio system between the send and receive locations on a dedicated frequency (party line). This radio system can be used for Coordination as well as notification. BURS is on the same power circuit as SENTRY and supplied by the same emergency diesel power.

The normal telephone land line provides a second backup communication system. Duty Emergency Response personnel at Callaway Plant are supplied with cell phones providing a third backup system. A fourth is a satellite phone available to the MCR that is programmed with the four counties 911 Center and the State SEMA contacts. The Callaway Plant Security Radio in the Central Alarm Station and Secondary Alarm Station that is continuously online with the Callaway County 911 Center acts as the fifth backup communication system.

### **COLA Impact**

The Callaway Plant Unit 2 COLA does not require revision as a result of this response.

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Enclosure 2

**Enclosure 2**

**Proposed COLA Changes Associated with  
RAI No. 9 (e-RAI 2484). Revision 0.**

- b. ESWEMS Pumphouse Ventilation System instrumentation is installed, functional and calibrated.
  - c. Support systems required for operation of the ESWEMS Pumphouse Ventilation System are installed and functional.
  - d. The ESWEMS Pumphouse is in its final configuration (doors and access points installed and wall, ceiling, and floor penetrations in their design condition).
  - e. Test instrumentation available and calibrated.
  - f. The ESWEMS Pumphouse Ventilation System flow balance has been completed.
3. TEST METHOD
- a. Verify control logic and interlock functions for each division.
  - b. Verify alarms, displays, indication and status lights both locally and in the main control room for each division as applicable.
  - c. Verify operation of dampers and damper controls per design requirements.
  - d. Verify operation of the exhaust fan units and dampers per design requirements.
  - e. Verify each division's air flow meets design specifications.
  - f. Verify that room temperatures in the pump room in each division can be maintained within the design range under design ambient (heating load and cooling load) conditions.
4. DATA REQUIRED
- a. Fan operating data.
  - b. Setpoints at which alarms and interlocks occur.
  - c. Unit heater operating data.
  - d. Powered damper operating data.
  - e. Air flow measurements in ducts.
  - f. Air flow measurements in inlets and outlets.
  - g. Temperatures of each division's pump room.
5. ACCEPTANCE CRITERIA
- a. The ESWEMS Pumphouse Ventilation System operates per design requirements and as described in Section 9.4.15.}

#### **14.2.14.6 ESWEMS Pumphouse Communications System**

##### **1. OBJECTIVES**

- a. To demonstrate the adequacy of the ESWEMS Pumphouse plant communications system to provide communications between vital plant areas.
2. PREREQUISITES
    - a. Construction activities on the plant communications system are complete.
    - b. Support systems required for operation of the plant communications system are complete and functional.
    - c. Plant equipment that contributes to the ambient noise level in the ESWEMS Pumphouse is in operation.
3. TEST METHOD
    - a. Verify the plant portable wireless communications system functions as designed in the ESWEMS Pumphouse.
    - b. Verify the plant digital telephone system functions as designed in the ESWEMS Pumphouse.
    - c. Verify the plant public address (PA) system functions as designed in the ESWEMS Pumphouse.
    - d. Verify the plant alarm system functions as designed in the ESWEMS Pumphouse.
    - e. Verify the plant sound powered telephone system functions as designed in the ESWEMS Pumphouse.
    - f. Verify the communications equipment will perform under the anticipated maximum noise levels in the ESWEMS Pumphouse.
    - g. Verify the effectiveness of the exclusion zones established for protecting the safety-related I&C equipment from mis-operation due to EMI/RFI effects from the portable wireless communications equipment or verify the adequacy of the lack of exclusion zones in the ESWEMS Pumphouse.
4. DATA REQUIRED
    - a. Record the results of communication attempts from each system and the locations of the attempts.
5. ACCEPTANCE CRITERIA
    - a. The plant communications system in the ESWEMS Pumphouse operates to the same level of performance as described in the U.S. EPR FSAR Section 9.5.2.
    - b. The communications equipment in the ESWEMS Pumphouse is capable of operating under maximum noise levels in the ESWEMS Pumphouse.
    - c. Safety-related I&C equipment performance is not adversely impacted by the operation of the communications system.