

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/84-41(DRS)

Docket No. 50-483

Licensee: The Union Electric Company
Post Office Box 149
St. Louis, MO 63166

Facility Name: Callaway, Unit 1

Inspection At: Callaway Site, Callaway County, MO

Inspection Conducted: August 6-8 and September 5, 1984

Inspector: *J. M. Ulie*
J. M. Ulie

9/7/84
Date

Approved By: *W. G. Guldmond*
W. G. Guldmond, Chief
Operational Program Section

9/7/84
Date

Inspection Summary

Inspection on August 6-8 and September 5, 1984 (Report No. 50-483/84-41(DRS))

Areas Inspected: Routine, announced inspection of the licensee's completion of nine fire protection license conditions and other related open fire protection issues. The inspection involved 23 on-site and in-office inspector-hours by one NRC inspector, including 5 inspector-hours during off-shifts.

Results: No items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

- *P. T. Appleby, Assistant Manager, Site Support
- *B. P. Bredeman, Operations Supervisor
- *R. E. Carlson, Quality Assurance Engineer
- S. E. Chomos, Fire Protection Engineer
- L. R. Creel, Rad Chem Foreman
- *J. W. Cruickshank, Rad Chem Foreman
- *J. E. Davis, Superintendent of Compliance
- P. S. Hobbs, Operating Supervisor
- *L. H. Kanuckel, Quality Assurance Engineer
- *A. P. Neuhalfen, Assistant Manager, Operations and Maintenance
- *B. Norton, Quality Assurance Engineer
- E. Oddo, Fire and Safety Engineer
- *G. A. Patrissi, Fire and Safety Engineer
- *J. Patterson, Assistant Superintendent Operations
- *J. A. Ridgel, Supervisor, Radwaste
- G. C. Ponchetto, Quality Assurance Engineer
- *J. R. Veatch, Supervising Engineer

*Denotes those attending the exit meeting of August 8, 1984.

2. Action on Previous Inspection Findings

(Closed) Noncompliance (483/84-11-21(DRS)): The records storage vault containing radiographs, photographs, microfilm and certain other Quality Assurance records was found to have several piping penetrations which were not sealed to provide the minimum fire rating. The inspector performed a visual inspection of the interior and exterior areas of the records storage vault and found no unsealed openings during this inspection.

(Open) Open Item (483/84-15-05(DRS)): The licensee's installed emergency lighting system inadequacies included the following:

- a. Emergency lighting outside the control room in paths to stairwells, in stairwells, and in areas where the control room operators have to perform manual actions or repairs was either not provided or was inadequate with respect to location, obstructions and improper aiming of beams,
- b. At the remote shutdown panels, fire area A-28, Room 1413, installed emergency lighting units are obstructed by the remote shutdown panels so that sufficient lighting cannot be obtained by positioning of the unit lamps. The lighting units are installed in positions behind and on the side of the remote shutdown panels such that the controls and instrumentation on the panels receive the least amount of illumination provided by the units, and

- c. In Room 1512, fire area A-21, operator actions are required to open breakers on motor control center NG-03C. Emergency lighting in access routes to auxiliary building general area (Rooms 1504, 1506, and 1513) from the control building through adjacent fire area A-22 is inadequate in that the units are not provided, or where provided, they are not installed in a manner so that sufficient illumination exists for safe access or egress. At MCC NG-03C for the control room air conditioning filtration units in room 1512, the lighting unit is installed in a position where it is not possible to adjust the lamps to provide illumination at the MCC. Similar conditions exist at MCC's NB-02, NG-02 and NG-04 in the south ESF switchgear room 3302; at MCC NG-04C in control room air conditioning filtration unit room 1501; at MCC NG-02B in the south electrical penetration room 1401, and at MCC NG-01B. Measures to assure proper aiming of lamps on properly installed emergency lighting units were not in place at the time of the inspection.

At the time of this inspection, work had not been completed on the additional emergency lighting units in safe shutdown areas nor were procedures in place to ensure proper aiming of the lighting unit lamps. However, the inspector was provided with Construction Modification Package No. 84-0228A dated August 7, 1984 which identifies on drawings the location of four areas where additional emergency lighting units are to be installed in the auxiliary building near the following motor control centers; NG-01B, NG-02A, NG-02B, and NG-04C. These four areas were identified by a joint walkdown and evaluation by the Nuclear Operations, Operations Engineering and Safety Departments. In addition, the inspector was provided with Purchase Order No. 44755 dated July 30, 1984 which indicated five Exide (two lamp style) Self-Contained Emergency Lighting Units (Model No. F-100-2H-V-MBF) have been ordered to satisfy Item G.1 of Attachment 1 to the Callaway Operating License which requires that emergency lighting units needed in safe shutdown areas must be installed and operable prior to exceeding 5% power.

(Open) Open Item (483/84-15-06(DRS)): The licensee's communication system inadequacies included the following:

- a. The plug-in handsets for operator use at the remote shutdown panel were not installed,
- b. The Gaitronics (PA) System is such that messages cannot be clearly understood in all areas of the plant,
- c. An analysis has not been performed to determine what portions of the Gaitronics System would be lost given a fire in specific plant areas. Reliance is placed on the Gaitronics Systems as a means of communicating to accomplish safe shutdown in the event of a fire, and
- d. Reliance is also placed on portable radio communications to accomplish safe shutdown; however, portable radio communications are unreliable due to the number of dead spots where portable radio communications cannot be transmitted or heard, including inside the remote shutdown panel rooms.

At the time of this inspection, work had not been completed on the Gaitronics or portable radio communication systems. This item remains open until the four inadequacies listed above have been addressed. However, the inspector was provided with Construction Modification Package No. 84-03-27A dated July 3, 1984 and Work Request No. 026996 dated July 4, 1984 that indicate a Gaitronics handset with speakers and a telephone have been approved to be installed in the Auxiliary Shutdown Panel Room. To satisfy item G.2 of Attachment 1 to the Callaway Operating License the Gaitronics handset with speakers and the telephone need to be installed in the Auxiliary Shutdown Panel Room and an analysis to show that adequate communications are in place to support plant shutdown from outside the control room must be completed and available on-site for review prior to exceeding 5% power.

(Closed) Open Item (483/84-15-07(DRS)): Failure to include procedural steps to isolate spurious signals that may have caused the opening of the Pressurizer Power Operated Relief (PORV) block valves during a control room fire: The licensee has incorporated steps in Procedure No. OTO-ZZ-00001, Attachment No. 1, Steps 3.1 and 3.2 to provide for local closing of the PORV block valves in the event of spurious PORV actuation during a control room fire.

(Open) Open Item (483/84-15-08(DRS)): Lack of administrative procedures to specify an adequate number of on-shift personnel to support concurrent remote shutdown and fire brigade activities. The inspector reviewed Procedure No. APA-22-00032, Revision 3, that included requirements for two Rad Chem Helpers on each shift be qualified fire brigade members. To verify this procedure's adequacy, on August 5, 1984 the inspector accompanied by a Quality Assurance Engineer, toured the control room and observed that the Crew Assignment Sheet identifying those rad chem helpers assigned to the fire brigade was not filled in until the inspector's arrival in the control room. However, the shift supervisor did provide the inspector with the names of two rad chem helpers he believed were assigned to the brigade for that shift. The inspector then toured the rad chem control room and interviewed a rad chem foreman who provided the inspector with the names of two different rad chem helpers assigned to the fire brigade than were provided by the shift supervisor in the control room. The inspector requested the list used to assign rad chem helpers to the fire brigade. The list the inspector was shown was the shift list of twenty-one (21) rad chem helpers. The list of rad chem helpers qualified to be fire brigade members obtained earlier consisted of eighteen (18) names. The rad chem foreman was unaware of which three brigade members were not qualified. A second rad chem foreman interviewed provided the inspector with the rad chem control room memo book which contained an up-to-date copy of rad chem helpers qualified to be fire brigade members. The inspector also interviewed the four rad chem helpers individually whose names were obtained from the shift supervisor and rad chem foreman of which three were uncertain as to their fire brigade assignment for that particular shift.

Discussions with the second rad chem foreman indicated that past practice has been that he would telephone the control room during the weekdays with the names of rad chem helpers assigned to the fire brigade and on weekends this

responsibility was performed by the other rad chem control room foremen. However, there was no formalized procedure which incorporated this practice or described in the absence of the foremen the responsibility of notifying the control room. This item is still considered open pending the licensee's revision of Administrative Procedure No APA-22-00032, as discussed at the exit interview, incorporating steps to ensure the control room is notified of the two rad chem helpers assigned to the fire brigade and to verify those individuals assigned are qualified fire brigade members.

(Closed) Open Item (483/84-15-09(DRS)): Failure of Off Normal Procedure OTO-ZZ-00001 to consider the loss of the diesel generator load sequencer given a control room fire requiring the diesel generators to be manually loaded. The licensee has incorporated steps in Procedure No. OTO-ZZ-00001, Revision 3, Attachment 3, Step 1.3 which specifies how to manually load the diesel generators if necessary during a control room fire.

(Closed) Open Item (483/84-15-10(DRS)): Failure to procedurally require the operator to verify diesel generator day tank level and diesel generator fuel oil transfer pump running status during or following a control room fire. The licensee has incorporated Steps 5.1 and 5.2 in Procedure No. OTO-ZZ-00001, Attachment 3, which specify monitoring diesel generator day tanks levels and manually starting the transfer pumps from the motor control center breakers if required during a control room fire.

(Open) Open Item (483/84-15-01(DRS)): Successful testing of the control room Halon system and resolution of the applicant's 10 CFR 50.55(e) Report No. U-78 identifying the installation of defective Chemtron check valves.

- (a) Regarding the successful testing of the control room Halon system, Union Electric informed the NRC that the preoperational test (concentration test) of the control room Halon system had been performed and met NFPA No. 12A-1973 standards with the exception of a small section at the top of the vertical cable chase extending about 5 feet below the floor of the upper cable spreading room. A conference call was held on July 18, 1984 between Union Electric, NRC-Region III, and NRC-NRR, in which additional information was requested regarding the control room Halon system.

On August 7, 1984, during this inspection, the inspector held another conference call between Union Electric Technical and Licensing personnel, NRC-Region III and, NRC-NRR to clarify item G.7 of Attachment 1 to the Callaway Operating License regarding the control room Halon system. During this conference call it was agreed that the concentration test previously conducted showed that the control room Halon system met the design criteria of NFPA 12A-1973 with the exception of the upper five feet of the vertical cable chase and that no additional concentration tests would be required.

To provide additional fire suppression assurance for the upper five feet of vertical cable chase and to satisfy item G.7 of Attachment 1 to the Callaway Operating License, Union Electric committed to modify

the Halon system to include automatic-timed initiation of a reserve bank of Halon cylinders immediately following the discharge of the main bank of cylinders. By performing this modification the Halon soak time at the upper five feet of vertical chase will be extended from three and half minutes to seven minutes at a concentration in excess of 5%. In addition, upon installation of this modification, it is the inspectors' understanding that successful testing of the reworked wiring on the main and reserve solenoids will be performed.

- b. Regarding the resolution of the applicant's 10 CFR 50.55(e) report, a conference call was held on August 9, 1984 between Union Electric (U.E.), Underwriters Laboratories (U.L.), and NRC-Region III regarding U.L. acceptance of the reworked two inch Chemtron check valves. It was the inspector's position that documentation on the check valve qualification provided by the licensee at the time of the inspection referred to the original listing of the check valves and not to the reworked check valves. It was agreed that U.E. needed to contact Chemtron Fire Systems, manufacturer of the check valves installed in the Halon systems, and also to provide U.L. with data regarding the reworked check valves.

To resolve open item No. 483/84-15-01 the inspector requested the licensee to provide documentation from U.L. which indicated that they have reviewed the data for the reworked check valves and U.L. will retain the listing of the reworked check valves.

(Open) Open Item (483/84-15-03(DRS)): Failure to provide the inspectors with acceptable documentation or other objective evidence to verify auxiliary building electrical penetrations Numbers 307, 312, 604 and other electrical penetration openings in fire barriers were sealed. The licensee was nearing completion of installation of the auxiliary building electrical penetrations; however, completion of the seals and final verification was not performed prior to the end of this inspection. To satisfy Item 2.C(7)(a) (passive fire protection portion) to the Callaway Operating License the licensee must complete fire seal installation and have the required compensatory measures in effect for areas containing any unsealed penetrations in the auxiliary building.

(Closed) Open Item (483/84-15-04(DRS)): Incomplete testing of the Protecto-wire line type fire detection system installed inside containment. The licensee indicated a portion of the line type fire detection system was damaged and this prevented completion of the preoperational test on this portion of the system. The inspector was provided with Work Request No. 16998 which indicated the damaged Protecto-wire had been replaced and retested acceptably on June 1, 1984. This also closes Item 2.c(7)(a) (thermal detectors inside containment portion) to the Callaway Operating License.

(Open) Open Item (483/84-15-02(DRS)): Failure to include the boric acid transfer pump flow rate, the RWST boron concentration, and tank level indication in the Technical Specification requirements. The licensee indicated that the boric acid transfer pumps would not be used to achieve the required boron concentration during post fire safe shutdown. Subsequent to this inspection, this matter was discussed in a call on August 29, 1984

between the inspector and members of the licensee's Quality Assurance (QA) staff. It was agreed that the QA staff needed to discuss further with the operations staff the acceptability of revising the applicable off-normal procedure(s) to include verification of the RWST tank level and boron concentration in order to achieve post fire safe shutdown. Pending revision of this procedure and/or any additional discussions between U.E. and Region III on resolution of this issue this item remains open.

(Closed) License Condition 2.c(7)(a)(DRS) (Halon system portion): Prior to exceeding five percent of rated power, U.E. shall have operable the Halon systems in the South Electrical Penetration Room (Fire Area A-17). The licensee has completed the design change of the South Electrical Penetration Room from a Halon system to a sprinkler system as identified in Revision 15 to the FSAR dated June, 1984, and Section 3.7.10.2 of the plant technical specifications for both the North and South Electrical Penetration Rooms (EL. 2026).

3. List of Documents Reviewed

a. Procedures

<u>Date</u>	<u>Number</u>	<u>Title</u>
May 30, 1984	OTO-ZZ-00001, Revision 1	Control Room Inaccessibility
July 12, 1984	APA-ZZ-00032, Revision 3	Conduct of Operations-Operations
June 14, 1984	APA-ZZ-00743, Revision 5	Fire Team Organization and Duties
July 13, 1984	APA-ZZ-00010, Revision 4	Conduct of Operation-Operations

b. Drawings

<u>Date</u>	<u>Number</u>	<u>Title</u>
December 17, 1982	E-OL3302, Revision 7	Lighting, Grounding, and Communications - Plan EL 2000' and 2016'
September 22, 1982	E-OL1404, Revision 8	Lighting, Grounding, and Communications - Plan EL 2026'
March 29, 1983	E-OL1505, Revision 8	Lighting, Grounding, and Communications - Plan EL 2047'6"
September 16, 1977	E-OL1101, Revision 5	Lighting, Grounding, and Communications - Plan EL 1974
December 9, 1983	E-2L3101, Revision 1	Lighting, Grounding, and Communications - Plan EL 1974' and 1984'

c. Work Request

<u>Number</u>	<u>Title</u>
016998	Protecto-wire Installation

d. Modification Package

<u>Number</u>	<u>Title</u>
CMP 84-0228A	Installation of Plant Emergency Lighting
CMP 84-03-27A	Gaitronics Communication System
CMP 84-02-28B	Halon Discharge for the Control Room Trench and Chase

e. FSAR/Technical Specification Changes

<u>Number</u>	<u>Title</u>
A.17.1, Rev. 15	Electrical Penetration Room (South) Room 1409
A.18.1, Rev. 15	Electrical Penetration Room (North) Room 1410
3.7.10.2.a, Rev.15	Spray and/or Sprinkler Systems

f. List of Qualified Fire Brigade Members

<u>Number</u>	<u>Title</u>
UOSCS 84-47	Qualified Fire Brigade Members dated June 29, 1984

g. Audit Report

<u>Number</u>	<u>Title</u>
8406B	Fire Protection Audit

h. Training Documentation

<u>Number</u>	<u>Title</u>
66.06.09A	Training Documentation Form dated February 6, 1984
66.06.09A	Training Documentation Form dated February 20, 1984

4. Control Room Inaccessability Procedure Walkdown

At the request of the inspector a procedural walkdown was performed on August 7, 1984 of Off-Normal Operating Procedure No. OTO-ZZ-00001 titled, "Control Room Inaccessability to assess its adequacy.

During the walkdown of Steps 6.2.3.15 through 6.2.3.18, difficulty occurred in attempting to make access to the South Electrical Penetration Room (1409) and North Electrical Penetration Room (1410) using the set of master keys assigned for the walkdown. A telephone call was necessary to have an equipment operator obtain the correct keys to these areas. This resulted in a delay in obtaining access to these rooms. This matter was discussed in a call on September 5, 1984, between the inspector and a member of the licensee's Quality Assurance staff.

Licensee action is required to verify that the master set of keys in place in the control room does in fact open all doors they are required to open. This will be tracked as an open item (483/84-41-01(DRS)).

No items of noncompliance or deviations were identified.

5. Effects Of A Fire In The Control Room

During a July 30, 1984 safe shutdown inspection of the Wolf Creek facility in Region IV, the NRC inspection team raised concerns regarding the effects of a fire of unknown size and severity in the control room which caused instantaneous fire damage to redundant safe shutdown circuits.

The same concern was identified and discussed in Section 5.c.(50) of Region III Inspection Report No. 483/84-15 for the Callaway facility. The concern was presumably resolved at Callaway with Union Electric's (U.E.) revision of Off-Normal Operating Procedure OTO-ZZ-00001 to instruct operators to immediately evacuate the control room in the event of a control room fire and achieve and maintain hot standby conditions using Remote Shutdown Panel No. RP-118B. Section G. of Attachment No. 2 to the Callaway Facility Operating License No. NPF-25 contains six specific license conditions which were meant to provide plant operators with the capability of achieving and maintaining hot standby conditions independent of the control room in the event that a control room fire of any magnitude caused instantaneous fire damage to redundant safe shutdown circuits.

For both SNUPPS plants (Callaway and Wolf Creek) and for all nuclear plants, the NRC's position is, and has been since Appendix R was promulgated, that nuclear plant designs must be capable of withstanding the effects of instantaneous fire damage to safe shutdown trains due to a single fire so that hot standby or hot shutdown conditions can be achieved and maintained independent of the area involved in fire. One train of systems and equipment needed for safe shutdown must remain free of fire damage.

Contrary to the NRC's position, the inspection team at Wolf Creek found that the SNUPPS design for both Callaway and Wolf Creek did not contain true isolation circuits. During the July 30, 1984 inspection at Wolf Creek, the inspection team performed an associated circuit analysis of the transfer switch which transfers control from the control room to remote shutdown panel RP-118B. The circuits at Callaway are identical.

Given a control room fire, the SNUPPS design assumes no fire damage to redundant safe shutdown circuits for a period of 4 to 5 minutes. The rationale and basis for this assumption was the SNUPPS staff belief that a credible fire causing fire induced damage to redundant safe shutdown circuits would not occur within that period of time. Therefore, plant operators would have time to reach the location of the switch and transfer control from the control room to remote shutdown panel RP-118B prior to fire damage in the circuits. If no fire damage occurred the transfer could be accomplished.

A fire of any magnitude in the control room which caused instantaneous fire damage to this circuit (hot short) would cause a loss of power, and control to needed safe shutdown equipment. This hot short would blow a fuse in the circuit which would make it impossible to transfer control to the remote shutdown panel. If the short was sustained, replacement fuses would blow. The flash field for the emergency diesels would be lost resulting in the inability to locally start the diesels. With a simultaneous loss of offsite power, plant operators would be unable to locally start centrifugal charging pumps, auxiliary feedwater pumps, essential service water pumps, component cooling water pumps and associated support systems needed for achieving and maintaining safe shutdown.

Based on the inspection team's associated circuit review at Wolf Creek, it is apparent that the Callaway Facility cannot currently comply with the license conditions contained in Attachment No. 2 of Operating License No. NPF-25, prior to exceeding 5% power.

By letter dated August 10, 1984, Union Electric (U.E.) took the position that the instantaneous effects of a control room fire represented a significant change from the previous regulatory position regarding fires in the SNUPPS plants. As a result, U.E. and Kansas Gas and Electric (KG&E) requested an appeal meeting between the SNUPPS utilities and the NRC staff. This meeting was held on August 14, 1984 at which time the SNUPPS utilities agreed to reevaluate their plant designs for compliance with the NRC's position stated above.

By letter dated August 23, 1984, UE and KG&E provided the results of their evaluation and a summary of their response plan necessary to ensure achieving and maintaining hot standby considering the effects of instantaneous fire damage. This resulted in UE and KG&E committing to installation of five new isolation switches and modifying four existing isolation switches to achieve isolation of equipment needed for achieving and maintaining safe shutdown. The proposed schedule for installation of these modifications at each plant is during the first extended scheduled outage (greater than two weeks) after February 15, 1985. In the interim, UE believes the safe shutdown functions can be performed by manual actions at local panels at Callaway. New procedures are being developed to accomplish those actions. This is considered an open item (483/84-41-02(DRS)) pending NRC review of UE's acceptable resolution of all of the issues identified.

6. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 4 and 5.

7. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) on August 8, 1984. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the findings. In addition, a telephone conference call was held between the licensee and Region III staff on September 5, 1984, to further discuss additional findings identified during the inspector's in-office review of the information obtained during the inspection.