UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4005

November 28, 2003

Garry L. Randolph, Senior Vice
President and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000483/2003-007

Dear Mr. Randolph:

On October 21, 2003, the Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. This included onsite inspection from September 22 through October 2, 2003, as well as, in-office review from October 6-21, 2003. The enclosed report documents the inspection findings, which were discussed on October 21, 2003, with Mr. R. Affolter and other members of your staff.

This triennial fire protection inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has identified two findings that were evaluated under the risk significance determination process. One finding was determined to have very low safety significance (Green). The other finding is at least Green, but requires additional evaluation to determine the safety significance. The latter finding does not present an immediate safety concern because the procedure was corrected during the inspection. The NRC has also determined that violations are associated with each of these findings. One violation is being treated as a noncited violation, consistent with Section VI.A of the Enforcement Policy. The other violation will be dispositioned once a significance determination has been completed. These violations are described in the subject inspection report. If you contest the violation or significance of these noncited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Callaway Plant facility.

During the inspection, several examples of an apparent violation of 10 CFR Part 50, Appendix R, Section III.G.2 were identified. These circuit vulnerabilities could, under certain postulated fire scenarios, adversely affect the ability to achieve and maintain a safe shutdown of the facility. It is the NRC's understanding that you do not consider these vulnerabilities to be violations of NRC requirements. In order to allow the industry to develop an acceptable approach to resolving this issue that the NRC can endorse, the NRC will defer any enforcement action relative to these matters while the staff evaluates NEI's proposed resolution methodology and you have time to implement the resolution methodology, once approved, provided you take adequate compensatory measures for the identified vulnerabilities.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/ RPM for

Charles S. Marschall, Chief
Engineering and Maintenance Branch
Division of Reactor Safety

Docket: 50-483
License: NPF-30

Enclosure:
NRC Inspection Report
05000483/2003-007

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	50-483
License:	NPF-30
Report No.:	50-483/2003-007
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, Missouri
Dates:	September 22 - October 21, 2003
Inspectors:	N. O'Keefe, Senior Reactor Inspector, Engineering and Maintenance Branch R. Nease, Team Leader, Engineering and Maintenance Branch T. McConnell, Reactor Inspector, Engineering and Maintenance Branch
Contractor:	R. Deem, Brookhaven National Laboratory
Approved By:	Charles S. Marschall, Chief Engineering and Maintenance Branch

SUMMARY OF FINDINGS

IR 05000483-007; 09/22/2003 - 10/21/2003; Callaway Plant. Triennial Fire Protection Inspection

The inspection was conducted by three region-based engineering and maintenance inspectors and one contractor. One Green noncited violation and one violation with a potential safety significance greater than Green were identified. The significance of findings is indicated by their color (green, white, yellow, red) using Inspection Manual Chapter 0609, “Significance Determination Process." The NRC’s program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, “Reactor Oversight Process,” Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The licensee did not recognize that the halon system protecting both engineered safety feature switchgear rooms was rendered inoperable and, therefore, failed to take the required compensatory action when the control room emergency ventilation and isolation system was in operation. Two ventilation dampers in parallel through the common fire wall between these rooms open when this system starts. The team identified that these dampers do not automatically shut when the halon system actuates. The halon system would not be capable of reaching the required concentration to suppress a fire because halon would be allowed to escape under these conditions. License Condition 2.C.(5)(c) requires that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the Standardized Nuclear Unit Power Plant System Final Safety Analysis Report. Updated Final Safety Analysis Report, Table 9.5.1-2, "Halon Systems," requires that when this halon system is inoperable, the licensee shall establish a continuous fire watch with backup fire suppression capability in the affected area. Contrary to this, on numerous occasions throughout the operating life of the plant, the team found that the licensee had failed to post a continuous fire watch whenever the vital switchgear room halon system was rendered inoperable due to testing of the control room ventilation system. This violation of License Condition 2.C.(5)(c) will be treated as a noncited violation, consistent with Section VI.A of the Enforcement Policy. This issue was in the licensee’s corrective action program under Callaway Action Request 200307189.

  This finding was greater than minor because it involved the potential degradation of a fire protection feature protecting the electrical distribution equipment powering both trains of mitigating systems. This finding is of very low safety significance because the fire ignition frequency in the rooms affected is low, the remaining fire detection and suppression capability are unaffected, and sufficient accident mitigation equipment was available. (Section 1R05.9)

- TBD. The alarm response procedure for responding to smoke in the control room outside supply duct was inadequate because it did not direct operators to isolate outside air makeup upon receipt of the alarm. This alarm does not cause an automatic isolation of the control room, so operators must recognize the condition and take manual action to prevent losing control room habitability. Failure to have a procedure, required by Technical Specification 5.4.1.a and Regulatory Guide 1.33, that provided appropriate response actions for abnormal or alarm conditions was a violation. This issue was entered into the licensee's corrective action program under Callaway Action Request 200306977.

  This finding is unresolved pending completion of a significance determination. This issue was more than minor because failure to isolate the control room ventilation could lead to unnecessary evacuation, which would result in a plant transient and disabling much of the mitigation equipment that would otherwise be available. This issue is being treated as an unresolved item pending completion of a significance determination. (Section 1R05.9)

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

Report Details

1. REACTOR SAFETY

1R05 Fire Protection

The purpose of this inspection was to review the Callaway Plant fire protection program for selected risk-significant fire areas. Emphasis was placed on verification of the licensee's post-fire safe shutdown capability. The inspection was performed in accordance with the NRC regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team leader and a Region IV senior reactor analyst used the Callaway Individual Plant Examination for External Events to choose several risk-significant areas for detailed inspection and review. Inspection Procedure 71111.05 requires selecting three to five fire areas for review. The three fire areas reviewed during this inspection were:

- C-9, Train A engineered safety feature switchgear room
- A-18, north electrical penetration room
- A-21, north control room ventilation equipment room

For each of these fire areas, the inspection was focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of license commitments, and changes to the fire protection program.

Documents reviewed by the team are listed in the attachment.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

The team reviewed the functional requirements identified by the licensee as necessary for achieving and maintaining hot shutdown conditions to ensure that at least one post-fire safe shutdown success path was available in the event of a fire in each of the selected areas. The team reviewed piping and instrumentation diagrams of systems credited in accomplishing safe shutdown functions to independently verify whether the licensee's shutdown methodology had properly identified the required components. The team focused on the following functions that must be available to achieve and maintain post-fire safe shutdown conditions:

- Reactivity control capable of achieving and maintaining cold shutdown reactivity conditions,

- Reactor coolant makeup capable of maintaining the reactor coolant inventory,

- Reactor heat removal capable of achieving and maintaining decay heat removal, and

- Supporting systems capable of providing all other services necessary to permit extended operation of equipment necessary to achieve and maintain hot shutdown conditions.

A review was also conducted to ensure that all required electrical components in the selected systems were included in the licensee's safe shutdown analysis. The team identified the systems required for each of the primary safety functions necessary to shut down the reactor. These systems were then evaluated to identify the systems that interfaced with the fire areas inspected and were the most risk significant systems required for reaching both hot and cold shutdown conditions. The systems selected for review were the chemical and volume control, reactor coolant, and the safety injection.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability and Post-fire Safe Shutdown Circuit Analysis

a. Inspection Scope

The team reviewed licensee documentation to verify that at least one post-fire safe shutdown success path was free of fire damage in the event of a fire in the selected fire areas. Specifically, the team examined the separation of safe shutdown cables, equipment, and components within the same fire areas. The team reviewed, on a sample basis, the analysis of electrical protective devices (e.g., circuit breakers, fuses, relays), coordination, and adequacy of electrical protection provided for nonessential cables, which share a common enclosure (e.g., cable trays) with cables of equipment required to achieve and maintain safe shutdown conditions. Additionally, the team reviewed the protection of diagnostic instrumentation required for safe shutdown for fires in the selected areas. The team reviewed the licensee's methodology for meeting the requirements of 10 CFR 50.48, and the bases for the NRC's acceptance of this methodology as documented in NRC safety evaluation reports. In addition, the team reviewed license documentation, such as, the Updated Final Safety Evaluation Report, submittals made to the NRC by the licensee in support of the NRC's review of their fire protection program, and deviations from NRC regulations to verify that the licensee met license commitments.

b. Findings

Introduction. The scope of Inspection Procedure 71111.05 has been temporarily reduced to stop requiring inspectors to address fire-induced circuit failure of associated circuits as a direct line of inquiry, nor to require developing associated circuit inspection findings. This was being done in order to allow the industry to develop an approach acceptable to the NRC for resolving this issue. However, during the course of this inspection, a number of associated circuit vulnerabilities were incidentally identified. These circuit vulnerabilities could, under certain postulated fire scenarios, adversely affect the ability to achieve and maintain safe shutdown of the facility.

Description. Appendix R, Section III.G.1 of 10 CFR Part 50, requires that one train of systems needed to achieve and maintain hot shutdown conditions must be free of fire damage. Section III.G.2 states that cables or equipment, including associated non-safety-related circuits that could prevent operation or cause mal-operation due to fire damage of redundant trains of systems necessary to achieve and maintain hot shutdown conditions, must be protected. The Callaway Updated Final Safety Analysis Report allows either "free of fire damage, or a diverse means will be provided." The team identified some associated circuit issues that are neither protected from fire damage nor provided with a diverse means of providing the function. Specific examples of equipment or associated cables located within the fire areas reviewed by the team that could affect the safe shutdown process included:

> Fire Area A-21 - possible loss-of-seal water injection capability to any one of the four reactor coolant pumps, which could lead to seal failure; and inability to isolate any one of the four main steam isolation valves or main feedwater isolation valves, which cool lead to overcooling of the reactor coolant system.
>
> Fire Area A-18 - loss of thermal barrier cooling to any one of four reactor coolant pumps, which could lead to seal failure; spurious opening of a pressurizer spray valve or the pressurizer auxiliary spray valve, which could lead to uncontrolled depressurization and overfilling the reactor coolant system; spurious opening of a containment emergency recirculation sump isolation valve that could divert water from the refueling water storage tank to the containment sump and make it unavailable for coolant inventory control; spurious opening of a reactor head vent flow path, causing a loss-of-coolant and uncontrolled depressurization; and spurious closing of either steam admission valves to the turbine driven auxiliary feedwater pump, making it unavailable for decay heat removal.
>
> Fire Area C-9 - spurious closure of a volume control tank outlet valve, causing a loss of charging, affecting reactor coolant inventory control and reactor coolant pump seal cooling.

Analysis. This finding is unresolved pending additional action by the NRC. See below.

Enforcement. Failure to either protect these associated circuits from spurious operation or otherwise prevent them from affecting safe shutdown is an apparent violation of Appendix R, Section III.G.2. In accordance with the NRC Enforcement Manual, Section 8.1.7.1.a, this apparent violation will be treated as an unresolved item pending development of an industry method to resolve these types of issues; Unresolved Item 05000483/2003007-01, Failure to Protect Associated Circuits. The determination of the safety significance and disposition of this apparent violation will be performed after the NRC develops additional guidance for addressing associated circuit issues. This issue is in the licensee's corrective action program under Callaway Action Request 200307232. This Callaway action request included an action to evaluate whether any specific compensatory actions were needed.

.3 Alternative Safe Shutdown Capability

a. Inspection Scope

The team reviewed the licensee's alternative shutdown methodology to determine if the licensee properly identified the components and systems necessary to achieve and maintain safe shutdown conditions from the remote shutdown panel and alternative shutdown locations for a fire in the unit's control room. The team focused on the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions. The team verified that hot and cold shutdown from outside the control room can be achieved and maintained with off-site power available or not available. The team verified that the transfer of control from the control room to the alternative locations has been demonstrated and not affected by fire-induced circuit faults by reviewing the provision of separate fuses for alternative shutdown control circuits.

b. Findings

Findings from this review are discussed in Section 1R05.4. No additional findings of significance were identified.

.4 Operational Implementation of Alternate Shutdown Capability

a. Inspection Scope

The team performed walkdowns of the actions defined in Procedure OTO-ZZ-00001, "Control Room Inaccesibility," Revision 19, with licensed and non-licensed operators. Procedure OTO-ZZ-00001 provided instructions for performing an alternative shutdown from the remote shutdown panel and for manipulating equipment locally in the plant. The team verified that the number of available operators could reasonably be expected to perform the procedure actions within the applicable plant shutdown time requirements, and that equipment labeling was consistent with the procedure. Also, the team verified that the licensee had adequate tools and equipment to successfully perform the procedure as intended. The team also reviewed records for training conducted on this procedure.

b. Findings

Introduction. An unresolved item was identified to assess the safety significance of the licensee not completing some manual actions for shutting down the plant from outside the control room within the times required in the Callaway Safety Evaulation Report during a timed walk-through.

Discussion. The team conducted a walk-through of Procedure OTO-ZZ-00001 with qualified licensed and non-licensed operators. Each operator performed the actions of a specific watchstation to which the individuals were typically assigned. Procedure steps were simulated, and completion times were noted. The team noted that the operators were familiar with the procedure and the actions assigned, and were able to perform the

required actions smoothly. However, some of the required actions intended to assure a safe shutdown condition was achieved took longer than the time required in the safety evaluation report.

The team attempted to determine whether the performance goals of 10 CFR Part 50, Appendix R, III.L.2, for a fire safe shutdown were being met based on the actual performance times. However, the licensee was unable to provide documentation, which demonstrated that the alternate shutdown actions and required times satisfied these performance goals. Therefore, the team requested information on several important thermal hydraulic parameters. This information was used to construct a rough thermal hydraulic time line to evaluate performance criteria in the shutdown procedures. There were six instances where one or both criteria were exceeded, as shown below:

Required Action	Safety Evaluation Report Time Required	Calculation Minimum Time	Measured Completion Time
Establish auxiliary feedwater flow	5 min	17 min	9:06 min
Open two steam generator power operated relief valves	5 min		9:30 min
Isolate letdown	5 min	61 min	8:05 min
Isolate pressurizer power operated relief valves	5 min	7 min	8:05 and 9:00 min
Isolate auxiliary pressurizer spray		20 min	not in procedure

As an example, the safety evaluation report required that operators establish auxiliary feedwater flow to two steam generators and begin bleeding steam through two steam generator power-operated relief valves within 5 minutes of initiating a control room evacuation in order to establish a method of core decay heat removal. During the walk-through conducted by the team, these actions took over 9 minutes to complete. However, preliminary calculations performed at the team's request indicated that as many as 17 minutes were available before the steam generators would boil dry. The technical basis for the time requirements listed could not be determined during the inspection. Therefore, additional information is required to establish the significance of the actual time needed to complete the above actions. The other actions above either establish similar required states or prevent conditions that could cause the licensee to fail to meet the required performance goals.

Analysis. This finding is unresolved pending review of additional information to be provided by the licensee. See below.

Enforcement. Failure to meet the required action times from the safety evaluation report was an apparent violation of License Condition 2.C. Failure to meet the other (calculated) times needs to be further evaluated for possible failure to meet the acceptance criteria of Appendix R, Section III.L.2. The licensee stated that they would

perform a formal timing and validation of the procedure in accordance with station procedures, using several operations' crews, to precisely determine how long it takes to complete each critical action. This issue was not an immediate safety concern because the times to complete the actions were reasonable compared to the reference times discussed above. In the case of isolation the auxiliary pressurizer spray, indications were available to allow diagnosis of a problem and corrective actions.

The significance of not meeting the times required in the safety evaluation report could not be determined based on the information available. Additional analysis by the licensee was needed to evaluate the significance, as well as, to verify the calculated times, in order to place this issue into context for safety significance and enforcement. Additionally, the inspectors will consider the licensee's timing and validation methodology, and compare the results with the results of the team's walkthrough. This finding is identified as Unresolved Item 05000483/2003007-02, Failure to Perform Alternative Shutdown Manual Actions Within Required Times, pending this additional information from the licensee. This issue was being tracked in the licensee's corrective action program under Callaway Action Request 200307160.

.5 Communications

a. Inspection Scope

The team reviewed the communications required to implement the alternative shutdown Procedure OTO-ZZ-00001, "Control Room Inaccessibility," Revision 19. The plant radio system was to be used by operations personnel to perform an alternative shutdown outside of the control room. The team reviewed the design of the radio system to (1) ensure the radio system was sufficient to support alternative shutdown operator actions, and (2) ensure that damage from a control room fire will not impact the performance of the rest of the system.

b. Findings

No findings of significance were identified.

.6 Emergency Lighting

a. Inspection Scope

The team reviewed the adequacy of emergency lighting for performing actions required in Procedure OTO-ZZ-00001, "Control Room Inaccessibility," Revision 19, which included access and egress routes. The team reviewed test procedures and test data to verify that the individual battery operated units were able to supply light for the required 8-hour period. The following specific documents were reviewed:

Callaway Plant Procedure OTS-QD-00001,"Emergency Light Tests," Revision 11

Callaway Preventive Maintenance Procedure PM-17,"Annual Service of Fire Protection Emergency Lighting," dated 7/22/03

Union Electric Company, Callaway Plant Fire Protection Emergency Battery Lights White Paper dated 04/30/96

b. Findings

No findings of significance were identified.

.7 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed equipment operations and capability to determine if any repairs were required in order to achieve cold shutdown. The team noted that the licensee did not require the repair of equipment to reach cold shutdown based on the safe shutdown methodology implemented.

b. Findings

No findings of significance were identified.

.8 Compensatory Measures

a. Inspection Scope

The team verified, by sampling, that adequate compensatory measures were put in place by the licensee for out-of-service, degraded, or inoperable fire protection features and post-fire safe shutdown equipment, and systems.

b. Findings

Introduction. A Green noncited violation was identified for failure to take required compensatory actions when operation of the control room emergency ventilation and isolation system (CREVIS) rendered the engineered safety features switchgear room halon inoperable.

Description. The team identified that the licensee failed to recognize that the halon system protecting both engineered safety feature switchgear rooms was rendered inoperable when the CREVIS was in operation. Two ventilation dampers in parallel through the common fire wall separating these rooms open when CREVIS starts. The team identified that these dampers do not automatically shut when the halon system actuates. The halon system would not be capable of reaching the required concentration to suppress a fire in either switchgear room under these conditions because halon would be allowed to escape. The team determined that CREVIS was required by a technical specification surveillance to be run for 10 hours on a monthly periodicity.

Updated Final Safety Analysis Report, Table 9.5.1-2, "Halon Systems," requires that when this halon system was inoperable, the licensee shall establish a continuous fire watch with backup fire suppression capability in the affected area within 1 hour. This requirement should have been implemented during each monthly CREVIS surveillance, as well as any other time the system was run for longer than 1 hour. However, the licensee stated that, since this issue was not recognized, it was not their practice to implement this compensatory measure during CREVIS operation. This issue was in the licensee's corrective action program under Callaway Action Request 200307189.

Analysis. This finding is of very low safety significance because the fire ignition frequency in the rooms affected was low, the remaining fire detection and suppression capability were unaffected, and sufficient accident mitigation equipment remained available. This finding affected only the fixed fire suppression equipment, and did not impact the manual firefighting capability. Despite the open dampers in the 3-hour fire barrier, the team concluded that the integrity of the fire barrier would be maintained because the separate fire dampers in these ducts remained unaffected by this findings, and should function normally. Therefore, the redundant train of engineered safety feature switchgear would remain available. This finding was more than minor because it involved the potential degradation of a fire protection feature protecting the electrical distribution equipment powering both trains of mitigating systems, affecting the Mitigating System Cornerstone.

Enforcement. The team found that testing of the control room ventilation system rendered the halon system in both of the vital switchgear rooms inoperable. Union Electric Company, Docket No. Stn 50-483, Callaway Plant, Unit 1, Facility Operating License, Condition 2.C.(5)(c), states, "The licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in the Standardized Nuclear Unit Power Plant System (SNUPPS) Final Safety Analysis Report for the facility through Revision 15, the Callaway Plant site addendum through Revision 8, and as approved in the Safety Evaluation Report through Supplement 4, subject to provision "d" below." Final Safety Analysis Report, Table 9.5.1-2, (Sheet 4), System 4, "Halon Systems," required that when in Condition "a" where one or more halon systems was inoperable in areas containing redundant systems or components, the licensee was required by Action "a" to "Establish a continuous fire watch with backup fire suppression capability in the affected area." Contrary to this requirement, on numerous occasions throughout the operating life of the plant, the team found that licensee had failed to post a continuous fire watch whenever the vital switchgear rooms halon system was rendered inoperable due to testing of the control room ventilation system. This is a violation of License Condition 2.C.(5)(c); Noncited Violation 50-483/0307-03, Failure to Take Required Compensatory Actions.

.9 Fire Protection Systems, Features and Equipment

a. Inspection Scope

For the selected fire areas, the team evaluated the adequacy of fire protection features (e.g., detection and suppression systems, or passive fire barrier features), such as, fire suppression and detection systems, fire area barriers, penetration seals, and fire doors.

The team observed the material condition and configuration of the installed fire detection and suppression systems, fire barriers, and construction details and supporting fire tests for the installed fire barriers. In addition, the team reviewed license documentation, such as, NRC safety evaluation reports and deviations from NRC regulations and the National Fire Protection Association codes to verify that fire protection features met license commitments.

The team walked down the areas to verify that the detection and suppression system location drawings agreed with the as-installed configurations. The team reviewed the original suppression systems specifications, the hydraulic calculations for the pre-action water systems, and the carbon dioxide system design calculations. The team reviewed the periodic testing performed on the automatic halon total flooding system including the interfacing fire detection systems and ventilation system dampers. The team also reviewed the original testing performed to confirm that the design concentration of halon was sufficient.

b. Findings

Introduction. An apparent violation was identified for an inadequate smoke alarm response procedure. This issue was being tracked as an unresolved item pending significance determination.

Description. The alarm response procedure for responding to smoke in the control room outside supply duct was inadequate because it did not direct isolating outside air makeup upon receipt of the alarm. The team determined that this alarm does not cause an automatic isolation of the control room, so operators must recognize the condition and take manual action to prevent losing control room habitability. However, the alarm response procedure directed that operators search the control building for a source of the fire, which would be misleading if the smoke were coming from outside the building. This misdirected search for the source of the smoke could allow smoke to build up to the point where control room habitability would be jeopardized. This issue was entered into the licensee's corrective action program under Callaway Action Request 200306977.

Analysis. Loss of control room habitability could cause operators to evacuate the control room. This action would necessitate manually tripping the plant, establishing control of the plant at the alternate shutdown panel, and manually operating the plant with limited control and indication equipment. This represented an inappropriate response to a fire outside the plant. A Phase 1 significance determination process required that a Phase 3 significance determination process be performed by senior reactor analysts. However, this analysis was not complete at the time of this report. This issue is unresolved pending completion of a significance determination process. This issue was more than minor because failure to isolate the control room ventilation could lead to unnecessary evacuation, which would result in a plant transient and disabling much of the mitigation equipment that would otherwise be available, affecting the Initiating Events and Mitigating Systems Cornerstones.

Enforcement. Alarm Response Procedure OTA-KC-00008, window 119/157, “Auxiliary Building Control Building Supply Air Supply Alarm,” Revision 9, a procedure required by Technical Specification 5.4.1.a and Regulatory Guide 1.33, was determined to be inadequate because it did not contain steps to secure outside makeup to ensure control room habitability when smoke was detected in this duct. This violation existed since the plant began operation. This apparent violation will be treated as Unresolved Item 5000483/2003007-04, Inadequate Smoke Alarm Response Procedure for Control Room Supply, pending determination by the NRC of the significance of the finding. This finding did not present an immediate safety concern because the licensee corrected the procedure promptly during the inspection.

4. OTHER ACTIVITIES (OA)

4OA5 Other

(Closed) Unresolved Item 05000483/2001007-01: Control Room Halon Bank Operability Questions

An unresolved item was identified in NRC Inspection Report 50-483/2001-07, dated May 1, 2002, for further evaluation of the licensing basis of the control room halon system. Specifically, inspectors questioned the acceptance criteria for determining the operability of the control room halon system in Administrative Procedure APA-ZZ-00703 (95 percent of the full charge weight of 110 pounds).

The team reviewed NRC Inspection Reports 50-483/84-41 (dated September 7, 1984) and 50-483/84-49 (dated October 16, 1984). In Inspection Report 50-483/84-41, the NRC documented that the licensee's halon pre-operational test in the control room resulted in a halon concentration in the upper 5 feet that did not meet National Fire Protection Association Code 12A-1975. A fully charged 110 pound halon bottle was discharged during this test. At that time, the NRC agreed that the licensee would add a second bottle of halon which would discharge immediately following the first bottle, and that no further halon testing was necessary. This open item was closed in NRC Inspection Report 50-483/84-49, with no further discussion of the control room halon system.

In October 18, 1984, the NRC issued the Callaway Facility Operating License NPF-30 together with the Callaway Technical Specifications (Revision 1 of NUREG-1058, "Technical Specifications, Callaway Plant, Unit 1, Appendix 'A' to License No. NFP-30"). The technical specifications included operability requirements for the control room halon system. Technical Specification Surveillance Requirement 4.7.10.3, stated that halon systems shall be demonstrated operable every 6 months by verifying the halon tanks to be at least 95 percent of full charge weight. In 1989, the NRC, at the licensee's request, removed this specification from the technical specifications, and placed this requirement (95 percent of full charge weight) in Administrative Procedure APA-ZZ-00703.

The team concluded that the NRC was aware that the concentration of halon in the upper 5 feet of the control room halon trench did not meet the National Fire Protection Association Code 12A. In addition, in issuing the technical specifications, the NRC

approved the acceptance criteria for operability of the control room halon system as 95 percent of the full charge weight of 110 pounds. Therefore Unresolved Item 50-483/0107-01 is closed.

4OA6 Exit Meeting

On October 21, 2003, the team presented the inspection results to Mr. R. Affolter and other members of his staff, who acknowledged the findings. The team confirmed that proprietary information was not provided or examined during the inspection.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements, which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an noncited violation.

- Union Electric Company, Docket No. Stn 50-483, Callaway Plant, Unit 1, Facility Operating License, Condition 2.C.(5)(c), requires that the licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in the SNUPPS Final Safety Analysis Report, the Callaway Plant site addendum, and as approved in the Safety Evaluation Report. Callaway Plant Final Safety Analysis Report, Site Addendum, Appendix 9.5A, Section C.8, requires that non-conformances, which affect fire protection are controlled by the Operating Quality Assurance Manual. The Operating Quality Assurance Manual, Section 16.1, states, "Measures shall be established to assure that conditions adverse to quality are promptly identified, reported, and corrected." Contrary to this, in 1994, the licensee failed to correct a condition adverse to quality. Specifically, the licensee failed to revise the fire hazards analysis and the fire pre-plans to address the potential failure of the condensate storage tank level transmitters because of fire damage, potentially preventing automatic swap-over of auxiliary feedwater pump suction from the condensate storage tank to emergency service water. This is a violation of License Condition 2.C.(5)(c). The licensee identified this failure to correct a condition adverse to quality in SA01-NE-008, "Self-Assessment Report, Post-Fire Safe Shutdown, Electrical Fire Hazards Analysis," and in Callaway Action Requests 200107132 and 20017174. This finding is of very low safety significance because alarms in the control room would alert the operators to the low condensate storage tank level in time to manually switch auxiliary feedwater pump suction from the condensate storage tank to emergency service water.

ATTACHMENT

KEY POINTS OF CONTACT

Licensee

R. Affolter, Vice President, Nuclear
K. Barbour, System Engineer
K. Bruckerhoff, Fire Marschall/Emergency Preparedness Supervisor
L. Eitel, Fire Protection Engineer
M. Evans, Manager, Nuclear Engineering
E. Goss, System Engineer
L. Kanuckel, Superintendent, Quality Assurrance
J. Little, Safety Analysis Engineer
R. McCann, System Engineer
G. Olmstead, Assistant Operations Superintendent
S. Petzel, Regional Regulatory Affairs Engineer
R, Pohlman, System Engineer
M. Reidmeyer, Regional Regulatory Affairs Supervisor
K. Young, Manager, Regulatory Affairs

NRC

D. Loveless, Senior Reactor Analyst
P. Qualls, Office Nuclear Reactor Regulation
M. Salley, Office Nuclear Reactor Regulation

ITEMS OPENED AND CLOSED

Opened

05000483/2003007-01	URI	Failure to protect associated circuits from fire damage or provide diverse means to achieve safe shutdown (Section 1R05.2)
05000483/2003007-02	URI	Failure to perform alternate shutdown manual actions within the required times (Section 1R05.4)
05000483/2003007-04	URI	Alarm response procedure for smoke in control room outside makeup duct was an inadequate procedure (Section 1R05.9)

Opened and Closed

05000483/2003007-03	NCV	Failure to take required compensatory actions when CREVIS operation rendered the engineered safety feature switchgear halon system inoperable (Section 1R05.8)

Closed

05000483/2001007-01 URI Inoperable Control Room Halon Bank

DOCUMENTS REVIEWED

The following documents were selected and reviewed by the team to accomplish the objectives and scope of the inspection and to support any findings:

Corrective Action Documents

Callaway Action Request 200107132, "SA01-NE-008 Finding - Fire Hazards Analysis Inconsistency," dated 11/16/2001

Callaway Action Request 200107134, "SA01-NE-008 Finding - Fire Hazards Analysis on AFP Pressure Transmitters," dated 11/16/2001

Callaway Action Request 200201889, “Control Room Halon Bank Has Depressurized," dated 3/20/02

Union Electric Company Request for Resolution 16516, "Material Equivalency for Teledyne Big Beam Module Emergency Light,” Revision A, dated 08/09/99

Union Electric Company Request for Resolution 16731, “Teledyne Emergency Battery Lights with Three Lamps,” Revision A, dated 06/03/96

Union Electric Company Request for Resolution 19214, “Approve Use of Chairman Battery in EBLs,” Revision A, dated 11/02/98

Union Electric Company Request for Resolution 19638, "Change to Charging on Hot Area Emergency Lights,” Revision A, dated 03/15/99

Union Electric Company Request for Resolution 20817, “Evaluate Fire Detector Spacing Requirements," Revision A, dated 12/20/00

Union Electric Company Request for Resolution 21138, “Evaluate Fire Rating of TCAFP Blowout Panel," Revision A, dated 04/08/02

Union Electric Company Request for Resolution 22678, “Design Basis of Control Room Cable Trench Halon," Revision A, dated 09/23/03

Procedures

8.1.4.3, Callaway Design Criteria, Regulatory Guides and IEEE Standards, 05/03 OL-13

APA-ZZ-00701, Callaway Plant Nuclear Engineering, "Control of Fire Protection Impairments," 06/12/02, Revision 9

APA-ZZ-00703, Callaway Plant Administrative Procedure “Fire Protection Operability Criteria and Surveillance Requirements,” 08/21/01, Revision 13

APA-ZZ-00050, “Halon Discharge Test for North Electrical Penetration Room Supplemental Record to Pre-op Test Package CS-04KC02,” 2/7/85

CS-04KC02, Union Electric Company Preoperational Test Procedure “Fire Protection System (Halon) Preoperational Test,” 08/02/03, Revision 0

EE-002 “Electrical Separation Criteria,” 11/8/00, Revision 2

MSM-ZZ-FG002, Callaway Plant Maintenance Surveillance Procedure
“Fire Damper Inspection and Drop Test,” 08/15/03, Revision 3

MSM-KC-FW009, Callaway Plant Mechanical Surveillance Procedure, "Fire Hose Station Inspection Outside RCA," 1/13/00, Revision 3

OSP-GK-0001A, Callaway Plant Operations Surveillance Procedure “A Train Control Room Filtration and Pressurization System Monthly Operability Verification,” 02/26/03, Revision 3

OTN-GK-00001, Callaway Plant Normal Operating Procedure “Control Building HVAC System,” 02/19/03, Revision 11

OTS-QD-00001, Callaway Plant Procedure “Emergency Light Tests,” Revision 11

PM-17, Callaway Preventive Maintenance Procedure “Annual Service of Fire Protection Emergency Lighting,” 07/22/03

SDP-KC-00001, "Requirements for and Duties of Compensatory Fire Watches," Revision 5

Calculations and Analyses

800 MHz Mobile Propagation Survey Log for Callaway Plant Power Block 4/18/96

Union Electric Company Callaway Plant Fire Protection Emergency Battery Lights White Paper dated 04/30/96

CMP 91-1060, “Formal Safety Evaluation - Permanent Removal of Halon Systems in Six Switchgear Rooms in Control Building,” Revision B

Callaway License Condition Letter to NRR, “North Electrical Penetration Room Halon System,” dated 02/21/85

Plant Drawings

A-2803, Bechtel Standardized Nuclear Unit Power Plant System (SNUPPS) Architectural Drawing “Fire Delineation Floor Plan, El 2026',” Revision 7

E-2F3301, Bechtel SNUPPS Drawing “Fire Detection/Protection System Control Building, El-2000' and El 2016',” Revision 11

E-2F3101, Bechtel SNUPPS Drawing “Fire Detection/Protection System Control Building, El-1974' and El 1984',” Revision 4

A-2804, Bechtel SNUPPS Architectural Drawing “Fire Delineation Floor Plan, El 2047',” Revision 20

A-2801, Bechtel SNUPPS Architectural Drawing “Fire Delineation Floor Plan, El 1974',” Revision 1

A-2802, Bechtel SNUPPS Architectural Drawing “Fire Delineation Floor Plan, El 2000',” Revision 10

E-23RP13, Callaway Plant Electrical Schematic Drawing “Lock-Out Relay Contact Development Sep. Grp. 6,” Revision 2

E-2L9903, “Bechtel SNUPPS Public Address System Riser Diagram,” Revision 49

J-24001, “Bechtel SNUPPS Control Room Equipment Arrangement,” Revision 11

E-2R3321, “Bechtel SNUPPS Raceway Plan Communication Corridor EL 2000',” Revision 2

E-2R3212(Q), “Bechtel SNUPPS Exposed Conduit Control Building EL 1984',” Revision 19

E-2R3211(Q), “Bechtel SNUPPS Raceway Plan Control Building EL 1984',” Revision 4

E-21001(Q), “Callaway Plant Main Single Line Diagram Electrical,” Revision 10

E-0R3211(Q), “Bechtel SNUPPS Raceway Plan Control Building EL 1974',” Revision 8

E-23BB24, Callaway Plant Schematic Diagram “Pressurizer Heater Backup Group B,” Revision 1

E-23RP15(Q), Callaway Plant Electrical Schematic Drawing “Lock-Out Relay Control Circuits RP334/RP335,” Revision 2

E-23RP11(Q), Callaway Plant Electrical Schematic Drawing “Lock-Out Relay Contact Development Sep. Grp. 2,” Revision 1

E-23RP12(Q), Callaway Plant Electrical Schematic Drawing “Lock-Out Relay Contact Development Sep. Grp. 4,” Revision 3

Miscellaneous Documents

NUREG 0830, “Safety Evaluation Report related to the operation of Callaway Plant, Unit No. 1,” dated October 1981

NUREG 0830, Supplement No. 3, “Safety Evaluation Report related to the operation of Callaway Plant, Unit No. 1,” dated October 1983

NUREG 0830, Supplement No. 4, “Safety Evaluation Report related to the operation of Callaway Plant, Unit No. 1,” dated October 1984

NUREG-1058, "Technical Specifications, Callaway Plant, Unit No. 1, Appendix 'A' to License No. NFP-30", Revision 1

Callaway Plant Individual Plant Examination of External Events

Letter to Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation, USNRC from Nicholas A. Petrick, Executive Director, Standardized Nuclear Unit Power Plant System, dated February 1, 1984 (SLNRC 84-0013)

Letter to Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation, USNRC from Nicholas A. Petrick, Executive Director, Standardized Nuclear Unit Power Plant System, dated February 1, 1984 (SLNRC 84-0014)

Letter to Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation, USNRC from Nicholas A. Petrick, Executive Director, Standardized Nuclear Unit Power Plant System, dated February 24, 1984 (SLNRC 84-0037)

Letter to Mr. Harold R. Denton, Director, Office of Nuclear Reactor Regulation, USNRC from Nicholas A. Petrick, Executive Director, Standardized Nuclear Unit Power Plant System, dated August 23, 1984 (SLNRC 84-0109)

Letter to Mr. James G. Keppler, Regional Administrator, Region III, USNRC, from Donald R. Schnell, Vice President, Union Electric Company, "Acceptability of Test Results for Control Room Halon System (SKC07)," dated June 29, 1984 (ULNRC 857)

Letter to Mr. James G. Keppler, Regional Administrator, Region III, USNRC, from Donald R. Schnell, Vice President, Union Electric Company, dated July 31, 1984 (ULNRC 893)

Memorandum to Harold R. Denton, Director, Office of Nuclear Reactor Regulation, USNRC from James G. Keppler, Regional Administrator, Region III, USNRC, dated October 16, 1984

Minutes of August 22, 1984, Meeting with Kansas Gas and Electric and Union Electric Company, issued by the USNRC on August 31, 1984

SA01-NE-008, "Self-Assessment Report, Post-Fire Safe Shutdown, Electrical Fire Hazards Analysis," dated November 19, 2001

NRC Inspection Report No. 50-483/84-49(DRP), dated October 16, 1985

NRC Inspection Report No. 50-483/84-41(DRS), dated September 7, 1985

Callaway Plant Final Safety Analysis Report, Revision OL-13, dated May 23, 2003

Callaway Plant Final Safety Analysis Report, Site Addendum, Revision OL-13

Operating Quality Assurance Manual, Revision 23