DCD/DMB

Docket No. 50-483

Union Electric Company
ATTN: Mr. Donald F. Schnell
Senior Vice President - Nuclear
Post Office Box 149 - Mail Code 400
St. Louis, MO 63166

Dear Mr. Schnell:

This refers to the routine safety inspection conducted by Mr. B. L. Bartlett, and Ms. D. R. Calhoun of this office from March 13, 1994 through May 14, 1994, of activities at Callaway Plant, Unit 1, authorized by NRC Operating License NPF-30, and to the discussion of our findings with Mr. J. D. Blosser and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection period the inspectors identified that the conduct of control room operations had deteriorated. Non-work related conversations and delays in reviewing night orders were indicative of an informal atmosphere in the control room. We are aware that you recognized the need for a high level of control room professionalism and we encourage your continued efforts in this area.

No violations of NRC requirements were identified during the course of this inspection.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosures will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Martin J. Farber, Chief,
Reactor Projects Section 3A

Enclosure: Inspection Report
No. 50-483/94005(DRP)

IE-01
1/1

See Attached Distribution

RIII	RIII	RIII	RIII	RIII
Farber	DCreed	McCormick-Barger	Olteanu	Greger
5/26		5/26/94	5/26/94	

010086

Distribution

cc w/enclosure:
G. L. Randolph, Vice President,
Nuclear Operations
J. V. Laux, Manager Quality
Assurance
T. P. Sharkey, Supervising,
Engineer, Site Licensing
OC/LFDCB
Resident Inspector, RIII
Region IV
Resident Inspector, Wolf Creek
K. Drey
C. John Renken, Engineer
Policy & Federal Dept.
Gerald Charnoff, Esq.
R. A. Kucera, Deputy Director,
Department of Natural Resources
Chairman, Illinois Commerce
Commission
S. Stein, SRS

bcc: PUBLIC (IE 01)

DETAILS

1. Management Interview (71707)

The inspectors met with licensee representatives, denoted in paragraph 8, on May 13, 1994, to discuss the scope and findings of the inspection. In addition, the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection was also discussed. The licensee did not identify any such documents or processes as proprietary.

Highlights of the exit interview are discussed below:

a. Strengths noted:

(1) An on-shift reactor operator's questioning of a scheduled work activity prevented an entry into a Technical Specification action statement that would have forced the licensee into an unscheduled power reduction (paragraph 3.I.a).

(2) An example of a good questioning attitude by a system engineer that resulted in the identification of an improperly set breaker (paragraph 3.I.b).

(3) Quality Assurance coverage of the moisture carryover test was detailed with important issues pursued to their resolution (paragraph 4c).

(4) HP coverage of the steam generator moisture carryover test was well thought out and resulted in a significant dose reduction from the previous performance of the test (paragraph 5b).

(5) During a surveillance test, an operator demonstrated a good questioning attitude when he followed up on indications he thought were not normal (paragraph 5d).

b. Weaknesses noted:

(1) Control room decorum was in need of improvement (paragraph 2a).

(2) There were two examples of poorly scheduled work activities (paragraphs 3.I.a and 3.II).

(3) The use of mechanical agitation might have caused damage to a bleeder trip valve (paragraph 3.I.c).

(4) A system engineer failed to demonstrate a questioning attitude when an inspector informed him of an abnormal condition with his assigned system (paragraph 4b).

(5) I&C technicians failed to discuss important information about their test with the control room operators (paragraph 3.II).

(6) A high radiation area door was found unsecured on several occasions (paragraph 5a).

c. A discussion concerning improvement opportunities for control room decorum was held. The issues identified to this point were not likely to have impacted safety and the licensee clearly recognized the need to improve control room decorum (paragraph 2a).

d. The plant manager briefly held the opinion that the day shift, Shift Technical Advisors (STAs) were not members of the on shift operating crew as defined in the Technical Specifications. However, after further clarifying information was supplied by the inspectors he recognized the need to keep the STAs cognizant of operations' night orders (paragraph 2b).

e. The inspectors noted during the follow up to the licensee's review of Information Notices (INs) that initially it appeared that the licensee had poor documentation of their responses. It was only after several weeks of spending part time following the INs that the licensee informed the inspectors that they were reviewing INs that were documented under an old system. The inspectors' reviews of IN documentation completed under the new system revealed much more thorough and complete documentation (paragraph 8).

2. Plant Operations (71707)

The objectives of this inspection were to ensure that the facility was being operated safely, in conformance with license and regulatory requirements, and that the licensee's management control systems were effectively discharging the licensee's responsibilities for continued safe operation. The methods used to perform this inspection included direct observation of activities and equipment, tours of the facility, interviews and discussions with licensee personnel, independent verification of safety system status and limiting conditions for operation (LCOs), corrective actions, and review of facility records.

Areas reviewed during this inspection included, but were not limited to, control room activities, routine surveillances, engineered safety feature operability, radiation protection controls, fire protection, security, plant cleanliness, instrumentation and alarms, deficiency reports, and corrective actions.

a. Control Room Decorum

The inspectors made several observations during this report period that indicated that control room decorum had slipped and was in need of improvement.

- During the morning between 6:00 a.m. and 7:30 a.m. the control room has the potential to become quite busy. ROs perform their turnover to the next shift, SROs perform their turnovers, planning and scheduling personnel come in to get a daily status, and other personnel coming in and out of the control room make this among the busiest times of the day. On multiple occasions the inspectors observed non-shift personnel discussing non-work related topics with the reactor operators.

- In addition to the identification of inconsistent requirements for on-shift crew members (discussed in paragraph b below), the inspectors noted other discrepancies with the night orders (NOs).

  During a routine control room tour the inspectors noted that the on-shift reactor operators had not read newly issued NOs more than four hours into their shift. Licensee management expectations were that the operators were to review NOs soon after relieving the watch. When this issue was discussed with on-shift management, the inspectors' impression was that no corrective action was taken, in that the ROs were not immediately instructed by on-shift management to read the NOs.

  Discrepancies were also identified with the issued NOs. Two NOs had signature blocks marked as not applicable. One of these NOs had the preparer block marked as not applicable. The other NO had the approver block marked as not applicable. These items were also discussed with the Superintendent of Operations.

  The expectation of the Superintendent of Operations was that NOs should be reviewed in a timely manner after taking the watch. To ensure this expectation was met, a procedure revision was issued to have the on-coming crew review the NOs within one hour after taking the watch. Guidance was also issued giving additional instructions for the issuance of NOs. This guidance stated that since the approver block was in place to ensure that an operations representative provided oversight of NOs before they were placed in the NO book, that it was not necessary to sign both the NO preparer and approver blocks if the NO was initiated by operations. Since a licensed senior reactor operator had been the preparer for one NO and the approver for the other one, the necessary oversight had been provided.

The inspectors informed the licensee of their opinion that control room decorum had deteriorated. The operations superintendent sent an E-Mail message to the operators informing them of this issue and directed that control room decorum be improved.

Quality Assurance was scheduled to perform an audit of the operations department shortly after the inspectors identified the control room decorum improvement opportunities. The audit team leader interviewed the inspectors to determine the precise nature of the concerns and directed the audit personnel to observe control room decorum. The audit team found similar examples to the inspectors' findings and documented the examples in their audit report.

b. Inconsistent Night Order Reviews By On-Shift Crew Members

As part of their follow up to the NO concerns the inspectors reviewed ODP-ZZ-00008, "Night Order Book," Revision 2. This departmental procedure governed the responsibility of operations personnel for documenting their review of NOs and Standing Orders (SOs). The inspectors observed that a discrepancy existed regarding the various on-shift crew members' responsibilities.

Procedure ODP-ZZ-00008 stated that "Night Orders, when issued, are read and initialed by the on-coming shift crew." During the inspectors' review of issued NOs and SOs, it was noted that several of the independent safety engineering group (ISEG) engineers, who periodically fill the position of the on-shift technical advisor (STA), had not documented their review of the NOs. The shift supervisor (SS) and the control room supervisor (CRS) were questioned concerning this issue. Both stated that STAs were not operations' personnel therefore, the procedure was not applicable to the STAs. The inspectors stated that the STA was a part of the minimum staffing crew, as required by Technical Specifications (TSs). The SS responded that the STA was merely an extra manning body.

The inspectors interviewed ISEG engineers to determine their understanding of management expectations or procedural requirements for NO review and documentation. The ISEG engineers stated that they reviewed significant NOs, even though they may not have initialed the NOs. The inspectors reviewed ISEG department procedures and determined that there were no procedural requirements to document reviews of NOs or SOs.

The inspectors later discussed this concern with the supervisor of ISEG as well as the superintendent of operations; discussions indicated that management's expectation were that all on-shift crew members (including STAs) were to document their review of all NOs. The on-shift personnel were informed of this expectation.

c. Sump Inspection Covers

During a routine tour of the auxiliary building the inspectors identified a missing inspection cover to the "B" Residual Heat Removal (RHR) sump. The Final Safety Analysis Report (FSAR) stated that sumps which potentially could contain contaminated

fluid were at a negative air pressure. This design ensured that air flowed down the floor drains and into the sumps which helped prevent contaminated particles migrating from the floor drains into non-contaminated areas. With the sump inspection cover off, the ventilation system would have drawn a reduced vacuum on the sumps thus increasing the possibility that contamination would be spread from the floor drains.

The licensee was informed and the sump cover was reinstalled. The licensee determined that the cover had been removed during an operations' activity to drain equipment for maintenance. A night order was issued informing operators that covers should be reinstalled following draining activities. In addition, another night order was issued to inform the non-licensed operators to check that all sump covers were installed during their shift rounds. The operations department's procedure covering operator rounds was also revised to add this requirement.

d. Stator Cooling Water Leak

On March 26, 1994, the licensee had a brief maintenance outage to repair a stator cooling water leak. The leak could only be repaired by removing the main generator from service. The reactor was kept critical during the maintenance outage.

On March 11, 1994, a stator cooling water leak was identified by a member of the licensee's staff. The leakage was monitored and the generator vendor was contacted. The leakage was determined to be originating from the "A" phase neutral bushing. There was no evidence of leakage within the main generator or within the high voltage side of the iso-phase ductwork. After consultation with the generator vendor, bushing vendor, and plant management, it was decided to drill a hole into the low point of the ducting to allow the water to drain. This action gave assurance that water would not back up to the high voltage bus work. The leak rate was monitored and was found to be slowly trending up. The licensee decided to take the turbine generator off line and repair the leak.

After allowing sufficient time to plan the unscheduled outage, the unit was removed from service on March 26, 1994. The outage lasted for about one day. This duration allowed sufficient time to repair the stator cooling water leak and perform some other minor maintenance activities. The inspectors monitored the shutdown of the unit and determined that the evolution was well planned, well executed, and performed in a timely manner. The licensee determined that the leak was a small pinhole leak and was probably due to poor porosity of a brazed joint.

e. Inoperable Safety Injection Accumulators

On April 27, 1994, at 7:25 p.m. (CDT) the "B" safety injection (SI) accumulator high pressure alarm energized. Approximately one minute later the "C" SI accumulator high pressure alarm energized. With two SI accumulators inoperable, TS 3.0.3 was entered.

Within two minutes, both accumulators were depressurized and restored to an operable status.

The licensee informed the NRC, as required, and will submit a Licensee Event Report (LER) within 30 days of the event. This LER will be reviewed in a later inspection report.

No violations or deviations were identified.

3. Maintenance/Surveillance (62703) (61726)

Selected portions of the plant surveillance, test, and maintenance activities on safety related systems and components were observed or reviewed to ascertain that the activities were performed in accordance with approved procedures, regulatory guides, industry codes and standards, and the Technical Specifications. The following items were considered during these inspections: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibration was performed prior to returning the components or systems to service; parts and materials that were used were properly certified; and appropriate fire prevention, radiological, and housekeeping conditions were maintained.

I. Maintenance

The reviewed maintenance activities included:

Work Request No.	Activity
W551489	Replacement and troubleshooting of power supply to "B" emergency diesel generator annunciator panel.
G547416	Generic electrical work request to troubleshoot the apparent short stroke problems with valves AB HV-0048 and AB HV-0049.
W160983	Investigate T_{ref}/T_{auct} annunciator window 65D failure to alarm.

P547875	Replace filters to component cooling water train "A" room cooler.
G541184	Inspect fuses of valve EJ HCV-0606
W550159	Replacement of the 42T relay coil and the fast start coil for the "B" train ultimate heat sink cooling tower fans.
P535852	Clean and inspect the feeder breaker to the "A" residual heat removal pump.
P525658	Install new charcoal trays and test canisters in the "A" train control room filter absorber unit.
W163976	Correct steam leak on bleeder trip valve AF BTV-0012B.
P496247	Test circuit breaker of valve EF HV-0048

a. Improperly Scheduled Work Activity

Work was improperly scheduled on the "A" train safety injection system outlet isolation valve for the boron injection tank (EM HV-8801A). This valve also served as a containment isolation valve. A preventive maintenance (PM) item was scheduled along with work on the valve that included limit switch adjustments; this adjustment activity required a partial Motor Operated Valve Actuator Testing System (MOVATS) as a post maintenance test (PMT). However, the time required to complete all of the scheduled work and subsequent PMT would have exceeded the TS 3.6.3 Limiting Condition For Operation Action Statement of four hours.

The valve had two functions; it was required to open on a safety injection signal and it may be closed by an operator's remote manual action if it becomes necessary to isolate the penetration. The scheduled work activities were reviewed by the planning department, the scheduling department and a number of licensed senior reactor operators. All overlooked the containment isolation function of the valve during the work package preparation process. In addition, workman's protection assurance (WPA) was also written to isolate the valve for maintenance. The WPA was written and approved by two different reactor operators both of whom also failed to recognize that the work could not be accomplished within the required TS action statement time limit.

The potential problem of being forced to commence a plant shutdown in accordance with TS was not identified until the PM work had commenced on the valve. The on-shift reactor operator raised a concern about not being able to meet the TS allowed outage time of the TS action statement due to the planned work request activity

(limit switch adjustment) and its associated PMT requirement (MOVATS testing). These work activities were pulled from the schedule. The remaining PM work and its associated PMT were satisfactorily completed within the TS time requirements. The licensee subsequently held an event review team (ERT) meeting to investigate the incident, identify root causes and determine corrective actions.

Discussions at the meeting centered: around the testing requirements for containment isolation type A, B, and C valves; philosophy discussions concerning action statements and LCO entry; whether if a valve had two safety functions, could the valve be operable for one function but inoperable for the other function; and the guidance available to the planners when preparing work packages (high and low security notes).

The ERT members determined that the PM was appropriately scheduled, with the plant on line, since this work can be performed within the TS time limit. However, due to the extensive set-up time of the MOVATS equipment, and the potential for equipment failure and testing problems, the work request which directed adjusting the limit switches could not have been completed and tested within the time constraints. This type of work should be scheduled during outages due to the significant amount of time required to complete the work. The licensee determined the root cause of the event to be a lack of information in the Callaway Equipment List (CEL) concerning mode restrictions. This type of information would have aided the planners in the proper scheduling of this work.

Some of the licensee's corrective actions included:

- Updating the Valve Retest Manual to required testing while only in Modes 5 and 6.
- Addition of mode applicability for TS 3.6.3. valves to high security planning and scheduling notes.
- Generation of TS applicability section on work request packages after being added as high security note.
- Pursuing a TS change to allow up to eight hours for MOVATS testing activities.
- The licensee will continue to implement corrective action for a previous similar occurrence. This corrective action consisted of a computer enhancement to assist key personnel in obtaining all pertinent information for safely accomplishing work activities.

b. Improper Resetting of A Safety Related Breaker

On March 8, 1994, maintenance/surveillance test P496247 was performed on breaker NG02BGR3. The breaker is the feed supply to essential service water from containment cooler bypass isolation valve, EF HV-0048.

The test required that the breaker be tested against values in the Motor Control Center Summary E-21NG20. The electricians noted a discrepancy between the actual breaker setpoint of 12 amperes and the setpoint value listed in the MCC Summary E-21NG20 of seven amperes. A decision was made, by a maintenance engineer, to reset the breaker to the value in the MCC Summary. As directed by the maintenance engineer, the breaker was tested at its as-found setting and was found within the required range. The setpoint was then reset to seven amperes, tested to ensure it fell within the required testing limits, and left.

The maintenance personnel documented the discrepancy between the as-found setting and the required setting in an SOS. During a routine review of recently issued SOSs, a system engineer questioned the discrepancy. The as-found setting of 12 amperes was determined to be correct by system engineering and corrective action was initiated. The review of available documentation concerning plant systems and the follow up to questionable information on those systems revealed a good questioning attitude on the part of the system engineer.

An operability evaluation was performed by engineering which determined the valve was capable of performing its intended safety function with the incorrect breaker setpoint of seven amperes.

The root cause analysis revealed that Callaway Modification Package (CMP) 91-1004 replaced the valve's existing motor size of 0.13 HP with a larger size motor of .33 HP. Due to the increase in motor horsepower, the instantaneous and overload settings were also changed. These plant changes were completed on October 28, 1993; however, the MCC Summary E-21NG20 had not been updated to reflect the design change. This oversight was attributed to personnel error.

The breaker was properly reset, retested, and returned to service. The MCC Summary, E-21NG20, was revised and the maintenance engineers were instructed that they should obtain concurrence from Nuclear Engineering prior to returning equipment to service when the as-found/as-left condition of the equipment was not consistent with plant drawings.

Document control performed an audit of MCC summary sheets and other discrepancies were noted. It was determined that while MCC summary sheets are controlled documents that are not considered as class 1E documents. Corrective actions included additional

administrative controls within the document control department and the upgrading of MCC summary documents to full class 1E controlled status.

c. Failure of Bleeder/Trip Valve to Close

On March 26, 1994, maintenance activities were conducted on check valve AF BTV-0012B, "Feedwater High Pressure Heater 6A 5th Stage Extraction Bleeder Trip Valve". During a surveillance test conducted on April 2, 1994, the valve was found stuck in the open position. The valve was repaired and returned to service.

Valve AF BTV-0012B is a spring to close and air assisted to open check valve located between high pressure feedwater heater 6A and the high pressure turbine. In the event of a turbine trip the valve would close to prevent energy contained within the extraction lines from the high pressure feedwater heater from expanding through the turbine. This action would help ensure that a turbine overspeed condition would not occur.

The work involved installing new gaskets, belleville washers and hinge pin cover as directed by work request W163976. The planner who generated the work request only specified a leak test on the valve as the retest since in the planner's opinion, the repair would not affect the operability of the valve. When the valve was stroked during the next weekly surveillance test following the repair, it failed to completely close. Based on the on-shift crew's understanding of the valve's function, which was to prevent a turbine overspeed following a turbine trip, the licensee entered TS 3.3.4, turbine overspeed protection system Limiting Condition for Operation Action statement, due to the valve's inability to close.

Upon investigation of the valve's failure, weld buildup was discovered on the inside of the cover, which caused interference with shaft rotation. A review of the work history on the valve showed no documentation that authorized the weld buildup. The licensee contacted the vendor to determine if the valve had been installed originally with this configuration, without having the drawings reflect this condition. The vendor's response was that this issue had been identified at other facilities and that the valve sub-contractor had apparently performed the cover plate modification.

There were nine other check valves which may have the buildup. The licensee decided not to inspect the valves due to the weekly surveillance tests on these valves having been successful. The licensee later performed ultrasonic testing on the valves and identified that six of the nine valve covers had weld buildup. These valves have all passed the surveillance which checked for movement of the arm in the closed direction and appear to be fully operable.

The licensee instituted an event review team (ERT) to determine the root causes and necessary corrective actions for the valve failure. The licensee's corrective actions to this event included: repairing the valve; adding information about this specific event in the planner's low security notes; and adding information to the maintenance procedures to ensure proper clearance between the hinge pin and the cover plate.

Operability Evaluation Of The Turbine Overspeed Protection System

The turbine overspeed protection system, as maintained and tested by the Turbine Overspeed Protection Reliability Program (TOPRP), is designed with multiple redundancies to prevent turbine rotor speed from exceeding 120% of rated speed. The bleeder-trip valves as well as the other valves specified in the TOPRP are governed by implementing procedures of the TOPRP. Procedure OSP AC-00007, "Extraction Non-Return Valve Test," verified the operability of the bleeder-trip valves and requires entry into TS 3.3.4 if a valve was determined to be inoperable.

As a result of this event, engineering performed an evaluation (request for resolution (RFR) 14929A) to determine if the turbine overspeed protective system was operable with valve AF BTV-0012B inoperable. The system engineer determined that the valve was operable in its initial as-found condition, based on engineering judgment and would have closed on a turbine trip as required. This determination was based upon engineering's belief that the valve was made inoperable on April 2, 1994, during the surveillance activity and subsequent troubleshooting, and was operable following the maintenance during the stator cooling water outage. During the troubleshooting activity personnel mechanically agitated the valve (hit it with a sledge hammer) in an attempt to move the valve. Since the valve would not close as long as extraction steam was flowing, the valve was damaged during the massaging activity.

The evaluation determined that the resultant increase in turbine speed, with the bleeder-trip valve failed on a turbine trip, would be zero. The energy in the 6A heater and extraction piping would flow to the high pressure turbine and then to the moisture separator re-heaters (MSR). The energy would be contained and not allowed to flow through the low pressure turbine as the MSR would be isolated from the low pressure turbine by the combined intercept valves (CIVs). It would take two single failures of the CIVs to cause steam from the MSR to overspeed the turbine.

Based on plant shutdown and startup evolutions, the overspeed trip protective function were tested and determined to be operable. Therefore, entry into TS 3.3.4 was not required with the bleeder-trip valve inoperable as the required overspeed protective systems were operable.

d. Air Handling Unit Filter Replacement

Under the preventive maintenance program the filters to the air handling units were being changed out. During the changeout the system engineer took infrared photos of the heat exchanger tubes to look for possible blockage. No apparent blockage was identified.

During the observation of the work activities one of the mechanics mentioned that he had submitted a Suggestion Occurrence Solution (SOS 93-0851) to reduce the costs of the filter changeout by replacing only a portion of the filters. The mechanic stated that he had received no feedback concerning his suggestion. The inspectors determined that the SOS had been written on August 3, 1993, and closed on November 9, 1993. The suggestion was not implemented due to the lack of cost savings. The inspector gave the mechanic a copy of his suggestion and then discussed the issue with plant management. Plant management stated that the maintenance workers would be reminded that they have the ability to check on the status of their SOSs and that no separate mechanism exists to inform workers when their SOSs are complete.

II. Surveillance

The reviewed surveillances included:

Procedure No.	Activity
OSP-EF-P001A	ESW train "A" operability.
OTS-UB-00001	Security diesel monthly five minute no load test.
ETP-BB-03131	Steam Generator moisture carryover test.
ITL-AE-0F510	Steam generator "A" feedwater flow control loop flow.

Improperly Scheduled Work Activity

On March 25, 1994, the unit was downpowered to perform repairs to the "A" phase generator bushing. During the inspectors' observation of control room activities, unexpected control room annunciators came in (steam generator level deviation and lo steam generator level alarms). The on-shift crew immediately questioned the instrumentation and control (I&C) personnel who were performing W549739. The I&C activities were temporarily suspended until a determination could be made of the cause of the annunciators.

The on-shift crew's review of I&C procedure ITL-AE-0F510, "Steam Generator "A" Feedwater Flow Control Loop Flow," Revision 10,

indicated that the present plant conditions did not allow the performance of the work request. The work request directed the performance of section 7.5 of the procedure. The procedure recommended that no main feedwater pumps be operating. However, due to the reactor not being completely shutdown, one main feedwater pump was in operation. The I&C technicians who performed the surveillance failed to observe the precaution and started the surveillance after receiving permission from the operating supervisor.

This work request was to troubleshoot oscillations with the "A" feedwater regulating valve (FRV). Normally, this procedure would be performed during a refueling outage, due to the large number of plant parameters affected. Prior to the technicians beginning the surveillance, the affected channel was deselected as the controlling input into the chart recorder and the FRV (due to the low power level the unit was being operated on bypass feedwater regulating valves). When the I&C technicians removed cards, RP043-0423 and 0424 as directed by the procedure, annunciators energized, and the "A" bypass FRV opened further. The balance-of-plant (BOP) operator took manual control of the valve. The need to take manual control was an unexpected response since the BOP operator understood that the newly selected controlling channel, AE FS-0511, would not be affected by this work request.

As a result of removing the cards, all indications on the chart recorder defaulted to zero indicating all inputs had failed. This recorder provided information on 1) feed flow, 2) steam flow, and 3) steam generator level. The BOP operator had selected away from the previous controlling channel (AE FS-0510), based on surveillance activities affecting that channel, and had selected channel, AE FS-0511. This channel was also lost when the cards were pulled, because it is an input on card RP043-0424. Personnel were not aware that all inputs feeding the chart recorder would be lost while performing this activity.

The safety significance of this event was minimal as the operators had other indications of the lost parameters, a plant transient did not occur, and the BOP operator was able to manually control the valve.

The shift supervisor instructed the I&C technicians to restore the equipment and cancelled the work request. An SOS was written to document this event. Although the safety significance of this event is minimal, this is another example of an activity that was improperly scheduled. Again, in-line barriers, I&C personnel, planners and operations personnel, failed to identify these issues.

No violations or deviations were identified.

4. Onsite Engineering (37551)

Selected engineering problems or events were evaluated to determine root causes. The effectiveness of the licensee's controls for the identification, resolution, and prevention of problems was reviewed. The inspection included the review of areas such as corrective action systems, root cause analysis, safety committees, and self assessment in the area of engineering.

a. Unexpected Response During Fuse Inspection

During an NRC inspection of the licensee's electrical distribution system it was identified that there was weak control over fuses. In response to that finding the licensee committed to inspect fuses and to institute a fuse control program. This program is controlled by engineering. Inspections by licensee personnel have identified multiple examples of wrong fuses being installed. All wrong fuses were evaluated and equipment was found to be fully operable. The fuse inspection activities have not been completed yet and wrong fuses continue to be evaluated as they are identified.

During the inspectors' observations of fuse inspection activities, an unexpected annunciator response occurred. The fuse inspection was conducted by an electrician, a quality control inspector, the field operations supervisor (FOS), and the system engineer. The FOS informed the control room crew that the ESFAS annunciator for valve EJ HV-0606 would be received upon the electricians removing control power fuse, EJFURP333FU47. The FOS was contacted by the control room and informed that this was not the response received. The actual annunciation received had been the ESFAS annunciator for valve EJ HV-0607. The system engineer checked the Callaway Equipment List (CEL) to determine the components supplied by the fuse. The review discovered that the CEL incorrectly listed the fuse supply to both the EJ HV-0606 and EJ HV-0607 valves; the information was swapped for the two valves. An SOS was written to document the occurrence and to correct the CEL for these components.

These valves were the mini-flow return valves to the residual heat removal pumps. Both valves were air-operated flow control valves which fail closed on loss of air supply; the valves would be in the safeguards position for an accident. Therefore, the safety significance of this incident was minimal.

b. Sump Inspection Covers

During inspector followup to the missing sump covers discussed in paragraph 2.c above, the inspectors questioned the system engineer assigned to floor and equipment drains. The system engineer was unsure as to the purpose of the sump covers and did not have a

concern with the covers being missing. The inspectors determined the purpose of the covers and then informed the system engineer.

The inspectors informed engineering management that system engineers should question any condition that is not normal for their assigned system. The system engineer should assume that any abnormal lineup of their assigned systems should be pursued until closure. Even though this was an insignificant finding, if the system engineer had performed minor followup to the inspectors' question the potential health physics aspects of the missing cover would have been identified.

Licensee management agreed with the importance of a good questioning attitude to the identification and resolution of issues. Engineering management discussed the importance of a good questioning attitude with the engineering staff.

c. Steam Generator Moisture Carryover (MCO) Test

Due to damage found on the high pressure turbine blades during the outage, the licensee inferred that the moisture content of the steam may be too high. The MCO results from 1984 indicated that there was 0.01 percent carryover. The licensee became concerned that the carryover of moisture had increased.

On March 24, 1994, the licensee conducted a test to determine the current amount of moisture in the steam exiting the steam generators. The steam generator moisture carryover measurement test was performed in accordance with engineering technical procedure, ETP-BB-03131, Revision 0, which utilized the radioactive tracer method. The average moisture carryover calculated had to be less than or equal to 0.25% to meet the test acceptance criteria (AC). If the AC was not met, the procedure allowed for re-performing the test with the steam generators reduced to 48% programmed level to get back within design limits.

The inspectors attended meetings held by the licensee to prepare for and to perform the test. Procedure ETP-BB-03131 was discussed in detail with key personnel and various other departmental representatives during the first meeting to identify any overlooked problems, assure everyone understood the evolution, and assure activities proceeded in a controlled manner. The licensee also conducted a walk through exercise of the evolution to capture any additional useful information to aid in the execution of the planned test. No significant enhancement items or deficiencies were noted by the licensee during this exercise.

A second meeting was held, the morning of the test, with representatives from various departments in attendance, as well as two vendor engineers who were to perform the MCO calculations. Due to concerns with potential contamination of the vial, health physics (HP) personnel were instructed to be extremely cautious

and thorough in conducting associated activities. The inspectors observed the HP technician, who had donned the proper dosimetry, survey the shipping cask upon its arrival. The sides and the bottom of the cask, on contact, had readings of 50 mrem/hr and 80 mrem/hr, respectively.

To facilitate mixing, the vial containing the radioactive source was emptied into a temporary tank containing 20 gallons of demineralized water. The outlet of the tank was located upstream of the feedwater chemical addition point which allowed migration into the secondary water system. After a two hour mixing period, three grab samples, taken 15 minutes apart, were to be obtained; each sample consisted of four steam generator upper shell samples, four steam generator steam samples, and one common point feedwater sample.

Results from the first set of samples indicated that the feedwater sample and one main steam sample were below the minimum detectable limit (MDL) after counting each sample for 15 minutes. The samples were then recounted for 30 additional minutes rendering the same results. At that point, a decision was made to count the samples for approximately two hours to ensure exceeding the MDL. Subsequent results from all three samples indicated a MCO of 0.05%. Acceptability of the samples at 50% programmed steam generator level nullified the need to reduce steam generator level to 48% programmed level.

The inspectors reviewed the safety evaluation for the moisture carryover test and determined that the engineer properly performed the evaluation by considering the impact of the test and the temporary modifications on accident analysis. The release of any radioactivity during this test would be bounded by previously analyzed accidents. Significant management presence was observed for the performance of the MCO test which resulted in proper control and satisfactory performance of the test.

Quality Assurance (QA) Surveillance Findings For The MCO

QA performed a surveillance of the MCO. In general, the QA findings agreed with the inspectors' findings; however, QA had a few additional comments.

QA noted that due to the previously known situation of Na "hideout" that the levels of Na in the returning feedwater were low. This condition had not been taken into account and resulted in the Na_{24} levels being below the MDL. The MDL value was chosen by default for the resulting MCO calculation. This action resulted in a conservative MCO value of 0.052%. This decision also meant that the value of MCO was no more than 0.052% but that it could have been lower.

The MCO value is utilized by reactor engineering in the calorimetric calculations of reactor power. The calculation involves the use of enthalpy values for the feedwater and steam. The quality of steam is an important parameter for calculating enthalpy. Utilizing a conservatively high MCO value would result in a lower quality of steam value; as such reactor power was lower than expected. This decision meant that the use of a conservative MCO value could result in a non-conservative calculation of reactor power.

Reactor engineering committed to QA to use the original MCO value calculated following the 1984 test. This value was lower than the 1994 test value and would result in a conservative reactor power calculation.

No violations or deviations were identified.

5. Plant Support Activities (71750)

Selected activities in radiological controls, radiological effluents, waste treatment, environmental monitoring, physical security, emergency preparedness and fire protection were reviewed to ensure conformance with facility compliance with regulatory requirements.

a. Unlocked High Radiation Area Door

On March 30, 1994, and again on April 30, 1994, a door to a high radiation area was found open by the licensee. The relevant procedure stated that the door should be locked therefore the condition was a failure to meet a management expectation and not a procedural violation. The door provides access control to the "A" floor drain tank room (room number 7129). The unlocked door was identified during a routine housekeeping tour on both dates.

The floor drain tank room is connected to an ante-room (room number 7128) that contains valves, and pumps. Room 7128 did not have a high radiation condition. However, the only entrance to 7129 is through 7128 and the only door which could be locked was on the entrance to room 7128. At all times, room 7129 was posted and barricaded as a high radiation area.

The licensee believes that during work in room 7128 that the door was accidentally left unsecured.

Corrective actions by the licensee included:

- The initiation of SOSs for each occurrence and the performance of a root cause analysis.

- Verification that the unsecured door was not a violation of TS, of 10 CFR Part 20, or of plant procedures.

- Increasing the priority to a plant modification that would give room 7129 its own lockable door, enabling the door to room 7128 to be left unsecured.

- Cautioning the HP technicians and the rad waste technicians to ensure that doors were left secured, and

- Placing an article in the employee newsletter informing all plant personnel of the need to ensure doors are left secured.

b. Health Physics Aspects Of The Moisture Carryover Test

The test directed a radioactive isotope injection of one curie of sodium 24; however, only 0.922 curies were used due to rehydrating activities, at the source supply facility, which caused the isotope to boil over. The half-life of the isotope was 15 hours. Prior to the radioactive source injection, steam generator blowdown was isolated and the condensate polishers were bypassed. In addition, four radiation monitors, SJ RT-0002, BM RT-0025, BM RT-0052, and GE RT-0092 had their blowdown and sample isolation signals blocked to prevent interference, by valve closure, while sampling the steam generator's upper shells. This temporary modification, as well as the contingent steam generator level reduction, and the sodium mixing tank, were controlled by the test procedure.

A reading of 12,000 millirem/hr., on contact with the tank, was obtained after mixing the radioactive sodium. The work area had been properly posted and boundaries appropriately established. The inspectors verified that all designated posting were in-place prior to the injection. A maximum reading of four millirem was read at the southwest boundary, located approximately 75 feet away from the tank when the vial was retrieved from the shipping cask. A reading of three millirem was read at the same boundary point after the radioactive isotope had been inserted into the feedwater line. Health physics personnel surveyed the feedwater chemical addition lines to verify that radiation levels reflected the radioactive material that was injected. The tank and the chemical addition lines were subsequently flushed with demineralized water to ensure all residual source material had been removed.

Due to the presence of decaying Na-24, several of the radiation monitors which had temporary modifications against them were in high alarm. A decision was made to keep the temporary modifications in-place until the radiation levels decreased below the radiation monitors' alarm setpoint. After the monitors trended down and came out of alarm, instrumentation and control personnel were contacted to remove the temporary modifications.

During the 1984 performance of the MCO test the licensee had a total dose of about 120 mrem; good ALARA practices during the 1994 test resulted in a total dose of about 40 mrem.

c. The inspectors observed the licensee's pre-exercise drill conducted on May 11, 1994. This drill evaluated, for the first time, the implementation of newly revised emergency action levels and the new location of the Operations Support Center (OSC). Overall, the drill was adequately performed; however, the inspectors did identify the following improvement opportunities.

The licensee recently moved the OSC from the maintenance area to the TSC. In the past, the OSC operations were conducted at two separate locations. The maintenance OSC is where emergency response team members (ERTMs) were dispatched and the health physics access OSC is where radiological support was provided. Now, the OSC operations are conducted from the Technical Support Center (TSC) which uses a Support Area Center (SAC) to assemble the members of the emergency repair and field monitoring teams.

Based on this configuration, the licensee may need to store pocket ion chambers (PICs) of various ranges at the TSC. This action would prevent ERTMs from entering the radiologically controlled area without having the appropriate dosimetry. At the TSC, ERTMs read and sign the radiological work permit, don minimum dosimetry requirements, and log into the RCA. The potential exists for ERTMs not to obtain additional required dosimetry which is only available at the health physics access point. There is no barrier to prevent this problem, as most of the HP functions were performed at the TSC. The licensee agreed to evaluate the supply of dosimetry at the TSC.

The radiological control coordinator (RCC) and maintenance foreman (MF) did not demonstrate an adequate level of concern for the safety of the ERTMs. Emergency response team members, who were to be dispatched to area five to gage a valve, raised the question as to whether the only emergency exit from that area was locked. The RCC and MF stated that to their knowledge the emergency exit was always locked from the non-vital side; therefore, the only exit was the door used to enter the area. The ERTMs pursued the issue further and were able to ensure having the emergency hatch available. The inspector's follow up evaluation determined that the emergency hatch was at all times fully operable and would have allowed emergency access from the room. The licensee agreed to inform their personnel of the operability of the emergency hatch.

Appropriate alarming and frisking stations were required to be set-up at the SAC to ensure habitability and prevent the spread of contamination. Habitability, per procedure, was to be maintained by the RCC who would be notified by SAC personnel when the monitor alarmed. The procedure could be strengthened by designating an individual to report the abnormal condition. By assigning

accountability to ensure RCC notification, habitability concerns are minimized. In addition, it is questionable as to whether the alarming monitor was ever set-up. The inspectors observed activities at the SAC several times and only noted two friskir stations. The lack of the monitor would have prevented the proper monitoring of radiological conditions and brought the habitability of the area into question.

The items were discussed with the licensee.

d. Monthly Test Of The Security Diesel

During the performance of operations surveillance test OTS-UB-00001 no significant problems were encountered. However, the equipment operator did identify an opportunity to improve the surveillance procedure.

This surveillance started and ran the security diesel for five minutes under no load conditions. After the diesel was stopped the overspeed alarm energized. The surveillance test directed the operator to reset any alarms and he manually reset the overspeed. The operator discussed this alarm with on-shift management to determine if this was an expected alarm as he did not recall seeing the alarm during previous surveillances. On-shift management informed the operator that this alarm energized every time the diesel was stopped and was a normal alarm. The operator recorded the alarm in the surveillance procedure and signed it off as completed satisfactorily.

The operator demonstrated a good questioning attitude when he encountered a condition he did not remember as normal.

e. Vital Tank Security Barrier

On March 24, 1994, the inspectors were informed by the resident inspectors of a similar facility of questions raised concerning the security barrier to an important tank.

The inspectors informed licensee management and then toured the tank with licensee management. The same physical configuration as existed at the other facility was confirmed to exist at Callaway.

During the tour of the tank a member of the licensee's security management was observed also touring the tank. He had been informed by members of the similar facility's security personnel of the potential problem and was performing his own inspection.

It was determined that the licensee's commitments regarding the portion of the tank in question were different than that of the similar facility, that no security violation existed, and that the value added by the security barrier was questionable.

No violations or deviations were identified.

6. Follow Up - Plant Operations (92901)

(Closed) LER 483/92004, "Auxiliary Feedwater Actuation Signal"

During shutdown activities for refueling outage five, an auxiliary feedwater actuation signal (AFAS) was generated. At the time of the actuation, the operator was directed to trip the turbine generator after high vibration readings were received on the number 4 bearing. In an effort to reduce bearing vibration, which had increased to 14.8 mils, the operator followed plant procedures and broke condenser vacuum. During this time, only the "B" main feedwater pump was operating, so when the "B" main feedwater pump (MFP) was manually tripped in accordance with procedures the AFAS logic was satisfied.

Licensee's Evaluation of Root Cause and Corrective Action

The AFAS occurred due to the ESFAS logic being met following the trip of the second main feedwater pump. Several other contributing causes were that the procedure failed to limit the time the unit operated at low generator load and the breaking of condenser vacuum in accordance with a conservative procedure. The licensee conducted an event review team (ERT) meeting to investigate the event. The licensee revised several procedures to improved the performance of the shutdown evolution. The turbine-generator bearings were inspected and did not reveal any damage which indicated they did not cause this event. The licensee also performed a turbine inspection during the refueling outage and no damage was noted.

Inspector's Review

The inspectors verified the appropriate procedural changes had been implemented. Discussions were held with the turbine generator system engineer to determine the results of the turbine inspections. In addition, the inspectors reviewed the ERT meeting minutes and the SOS on the event. The inspectors also verified that the additional followup actions specified in the SOS were performed.

This LER is closed.

7. Follow Up - Plant Support (92904)

(Closed) Unresolved Item (483/87018-03) "Fire Hose Station Pressure"

During an inspection conducted on June 1 through 5 and on June 29, 1987, the licensee was unable to provide the NRC inspector with documentation concerning the setpoint of the pressure reducing devices (PRDs) on the fire hose stations. Pending further evaluation by the licensee and review of that evaluation by the NRC in determining fire brigade readiness to properly control fire hose station pressure this unresolved item was issued.

The licensee committed to:

- Train the fire brigade members in the safe handling of high pressure fire hoses and in the use of multiple personnel when handling high pressure fire hoses.

- Label fire hose stations warning personnel of the potential that the hose station pressure could be up to 150 psig.

The inspectors verified through plant walkdowns that the warning signs were in place. Through interviews with random selected members of the plant fire brigade, the inspectors determined that the brigade members were aware of the hazards associated with high pressure fire hoses and had been trained how to handle those hazards.

This unresolved item is closed.

(Closed) Violation (483/90017) "Emergency Lights Not Maintained"

During an inspection conducted on October 22 through 26, and November 5 through 9, 1990, an NRC inspector identified that emergency lights were not being maintained or tested to ensure they would function as designed.

The licensee performed the following corrective actions:

- The lights identified by the inspectors were repaired.

- The annual PM was left unchanged but an additional PM was written to check the electrolyte level three times a year. Combined with the original PM the lights would be checked quarterly. In addition, the as-found condition of the lights would be recorded and the PM frequency adjusted as necessary to ensure continued operability.

The inspectors verified that the PM was added at the frequency specified in the licensees response to the Notice of Violation. In addition, during routine plant tours the inspectors observed the operability status of emergency lights and have identified no additional concerns.

This violation is closed.

8. Regional Request For Followup (90700)

On December 3, 1993, the NRC issued Information Notice (IN) 89-77, Supplement 1, "DEBRIS IN CONTAINMENT EMERGENCY SUMPS AND INCORRECT SCREEN CONFIGURATIONS". The supplement to IN 89-77 was issued to alert addressees to additional potential problems that may not have been previously considered. INs do not contain requirements; therefore, no specific action or written response was required.

The information notice concerned debris in or near the containment emergency sumps, and configuration difficulties with the design and construction of the sumps.

The inspectors reviewed the licensee's internal assessment and closure of the IN and had the following comments:

- The licensee appeared to properly address the concerns with debris but appeared to have failed to address the concerns with configuration control.

- In response to the issues that were discussed in the IN, the licensee inspected the containment emergency sumps for improper screen configurations. However, this inspection was not referenced in the closeout of this IN.

- The licensee's response to the original IN 89-77 only referenced a TS requirement. It did not specify how the TS requirement was being met or if it was being met.

In summary, at all times the licensee had met TS requirements for ensuring debris did not interfere with the proper functioning of the emergency sumps. In addition, the sumps' screen configuration was confirmed, by direct inspection, to be adequate. However, the response to the IN was poorly documented and the incorrect screen configuration issue was not understood by those responsible for ensuring the IN was properly closed out.

In response to this weakness, the licensee requested Quality Assurance to perform an audit of the IN program to ensure that important issues were addressed.

Additional IN Followup

During this inspection period a representative of the Office of Nuclear Reactor Regulation spent several days on site reviewing the licensee's IN response system. The representative had reviewed several plants and was familiar with the IN response systems of several other licensees. The representative selected several INs to determine if the licensee had preformed adequate follow up. The representative determined that in each case the licensee had performed an adequate followup, but the documentation was poor. Through interviews, reviews of procedures, and other unrelated documentation the representative was able to verify that the technical issues in the selected INs were properly evaluated and reviewed. However, the documentation in the IN file was inadequate for the representative to confirm that the issues had been properly addressed. The representative informed the licensee that the documentation of IN followup was among the weakest he had seen.

The inspectors discussed the apparent weaknesses with licensee management. The licensee stated that the apparent weaknesses no longer existed and that the evaluation of INs was now tracked with a computer

system. The Callaway Action Tracking System (CATS) was used to track and document the assessments of INs. This system included documentation of the results of the review.

The inspectors selected a sample of 1994 INs to review. All selected INs were addressed in a timely manner and were well documented. The new system of using CATS to follow up INs appeared to be working effectively.

No violations or deviations were identified.

9. Persons Contacted

D. F. Schnell, Senior Vice President, Nuclear
*G. L. Randolph, Vice President, Nuclear Operations
*J. D. Blosser, Manager, Callaway Plant
*C. D. Naslund, Manager, Nuclear Engineering
*J. V. Laux, Manager, Quality Assurance
*M. E. Taylor, Assistant Manager, Work Control
D. E. Young, Superintendent, Operations
*M. S. Evans, Superintendent, Health Physics
*A. H. Daume, Shift Supervisor
*J. R. Peevy, Manager, Operations Support
*C. S. Petzel, Senior Quality Assurance Engineer
*T. P. Sharkey, Supervising Engineering, Site Licensing
*K. R. Evans, Superintendent, Instrumentation and Controls
*R. D. Affolter, Manager, Operations Support (Designate)

*Denotes those present at one or more exit interviews.

In addition, a number of equipment operators, reactor operators, senior reactor operators, and other members of the quality control, operations, maintenance, health physics, and engineering staffs were contacted.