U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483

Docket No. 50-483 License No. NPF-30

Licensee: Union Electric Company
Post Office Box 149 - Mail Code 400
St. Louis, MO 63166

Facility Name: Callaway Nuclear Power Plant

Inspection At: Callaway Plant, Reform, Missouri

Inspection Conducted: June 6-7, 1988

Inspectors: T. Ploski W. Snell for
Team Leader 6/16/88
Date

J. Patterson W. Snell for 6/16/88
Date

Approved By: W. Snell
William Snell, Chief
Emergency Preparedness
Section 6/16/88
Date

Inspection Summary

Inspection on June 6-7, 1988 (Report No. 50-483/88010(DRSS)
Areas Inspected: Routine, announced inspection (IP 82301) of the Callaway Nuclear Power Plant's emergency preparedness exercise. Three NRC inspectors observed key functions at some of the locations that were activated during the exercise.
Results: No violations, deficiencies, deviations or exercise weaknesses were identified. Adequate corrective actions were demonstrated on the weakness identified during the 1987 exercise.

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DETAILS

1. Persons Contacted

a. NRC Observers and Areas Observed

*T. Ploski, Onsite Medical Drill, Technical Support Center (TSC), Emergency Operations Facility (EOF)
*J. Patterson, Control Room Simulator, (TSC)
B. Little, Control Room Simulator

b. Licensee Representatives

*G. Randolph, General Manager, Nuclear Operations
*J. Peevy Assistant Manager, Technical Services
*M. Stiller, Manager, Nuclear Safety and Emergency Preparedness (NS&EP)
*A. Neuhalfen, Manager, Quality Assurance
*A. White, Supervisor, Emergency Preparedness - NS&EP
*G. Hughes, Supervisor, Engineering, NS&EP
*R. McAllenan, Manager, Public Relations - Corporate
*G. Nevels, Supervisor, Nuclear Information
*J. Gearhart, Superintendent, Quality Assurance
*T. Stotlar, Supervising Engineer, Quality Assurance
*M. Cleary, Supervisor, Nuclear Information
*M. Schreiber, Emergency Planning Specialist
*W. Hinchie, Emergency Planner
*P. Sudmak, Nuclear Affairs Staff
*M. Faulkner, Nuclear Affairs Staff
*S. Crawford, Nuclear Affairs Staff
*E. Thornton, Emergency Evaluator
*J. Dampf, Lead Control Room Controller - NS&EP
*E. Andes, Quality Assurance Engineer
*L. Roper, Co-op Employee
L. Smith, Site Nurse

*Indicates those who attended the June 7, 1988 exit interview.

2. Licensee Actions on Previously Identified Items (92701)

(Closed) Open Item No. 50-483/87017-01: During the 1987 exercise, the onsite portion of the medical drill was inadequate with respect to various contamination control practices and other aspects of Emergency Implementing Procedure (EIP) EIP-ZZ-00224. As indicated in Section 5b of this report, the licensee's performance during the onsite medical drill portion of the 1988 exercise was very good, and responsive to the concerns identified during the 1987 exercise.

The inspector also reviewed records relevant to the upgraded training given to the licensee's Medical Emergency Response Team (MERT) personnel during 1988, and discussed medical program upgrades with cognizant licensee representatives. Since the summer of 1987, a Site Nurse has

been available onsite during day shifts on weekdays. The nurse's current contract is up for renewal this summer. Records indicated that the nurse held monthly meetings with MERT team leaders to discuss relevant topics and to conduct additional training on providing medical care, including taking blood pressure readings and administer oxygen. More frequent informal meetings have been held with available MERT team members. Since January 1988, eleven onsite medical drills have been conducted and critiqued in addition to the demonstration during the annual exercise. Approximately 90% of all personnel who are designated MERT team leaders or members have participated in at least one of these drills. Drills were adequately documented, and included participants lists, objectives, scenarios, critique comments, and references to the licensee's action item tracking system.

The licensee also indicated that first aid kits and contamination control kits used by the MERT have been upgraded since mid-1987. The licensee indicated that these kits were being inventoried quarterly and after each use. Inventory records were not reviewed during this inspection. The licensee has scheduled a plant tour for about 25 hospital and ambulance service staff later in June 1988. An agreement was being negotiated with the University of Missouri at Columbia to make available a "Staff for Life" helicopter service to provide improved capability to quickly transport onsite personnel to a regional hospital.

This item is closed.

3. General

An off hours exercise of the Callaway Nuclear Power Plant Emergency Plan was conducted on June 6, 1988, testing the licensee's response to a hypothetical accident scenario resulting in a simulated release of radioactive material to the environment. The attachments to this report consist of a narrative summary and approximate timeline of the scenario, and a listing of the licensee's exercise objectives. This was a full scale exercise for the State of Missouri and a full scale exercise for Callaway, Gasconade, Montgomery, and Osage Counties.

4. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the Callaway Plant Emergency Plan and related Emergency Implementing Procedures.

b. Coordination

The licensee's response was generally coordinated, orderly, and timely. If scenario events had been real, actions taken by the licensee's emergency organization would have been sufficient to allow State and local officials to take appropriate actions to protect public health and safety.

c. Observers

Licensee observers monitored and evaluated the exercise along with the NRC observers.

d. Critiques

The licensee held critiques immediately following the exercise and a summary critique was also conducted on June 7, 1988. A public critique was held that evening in Fulton, Missouri, at which time NRC and FEMA evaluators summarized their preliminary findings regarding the licensee's and offsite support agencies' exercise performances, respectively.

5. Specific Observations (822301)

a. Control Room Simulator

The Control Room crew demonstrated good teamwork and responsiveness to changing abnormal plant conditions. Communications among the crew were done in a professional manner. The Senior Reactor Operator (SRO) kept the Shift Supervisor (SS) well informed of changing conditions. The Shift Technical Advisor (STA) was effectively utilized in trending key parameters, monitoring safety systems' status, and was actively involved in various decisionmaking discussions. Plant drawings were well utilized during problem evaluations. Emergency operating and emergency plan implementing procedures were correctly followed with one minor exception. At about 7:25 p.m., an automatic main steam line isolation actuation signal was received. This could have been avoided had the crew observed a procedure caution note on blocking the signal. The actuation resulted in a simulated, brief loss of secondary coolant through the steam generator relief valves. The crew promptly and correctly responded to the actuation signal.

The SS adequately briefed the Superintendent of Operations and the Emergency Duty Officer (EDO) upon their arrival in the Simulator. These individuals became involved in various discussions, but properly did not assume control of response activities from the SS. The EDO later became the Emergency Coordinator (EC) in the Technical Support Center (TSC), and assumed command and control of onsite emergency response activities from that facility.

The SS promptly and correctly classified the Alert and Site Area Emergency. Initial notifications to State, county, and NRC officials were accurately completed within the regulatory time limits. The SS approved the initial message forms prior to their transmittal by communicators.

Based on the above findings, this portion of the licensee's program was acceptable.

b. Onsite Medical Drill

The scenario began with a simulated medical emergency within the Radwaste Building. An employee had fallen off a ladder and broken his right leg. The worker's wound and protective clothing had become contaminated by the time that he had been removed from a pump room to a nearby area where medical assistance was requested by a co-worker.

The Medical Emergency Response Team (MERT) arrived at the victim's location approximately five minutes after the accident had been reported to the Control Room Simulator. The MERT leader demonstrated good, decisive leadership until the victim was transferred to an ambulance for transport to the local hospital. The MERT exhibited good teamwork, and good understandings of their medical treatment and contamination control responsibilities.

The MERT arrived at the victim's location equipped with first aid and contamination control kits. The team donned shoe covers and gloves upon seeing the victim. While the MERT leader and one assistant began their initial evaluation of the victim's condition, other team members adequately defined and posted the borders of the contaminated zone around the victim. The contaminated zone's boundary was reduced following more thorough surveys. A continuous air sample was taken near the victim, but not so close as to inhibit care being administered to him.

One technician and a security guard remained outside the contaminated zone. During the demonstration, the guard provided valuable assistance by communicating frequent updates on the victim's medical and contamination status to the Central Alarm Station (CAS), which forwarded the MERT's reports to the Control Room Simulator. The guard also kept the MERT well advised of incoming messages regarding the whereabouts of the ambulance and six stretcher bearers which the MERT leader had requested. The stretcher bearers ultimately arrived, an unacceptable 30 minutes after they had been requested. Post-exercise investigation of this delay revealed that it was largely due to the artificiality of the exercise. At times, CAS staff initially telephoned the MERT's reports to controllers in the Control Room Simulator rather than placing the calls to the Shift Supervisor's telephone in the Simulator. Had scenario events been real, procedures allow anyone at an accident scene to communicate directly with the real Control Room.

While caring for the victim, the MERT leader and several aides demonstrated good contamination control techniques. Gloves were changed at appropriate times to avoid spreading contamination on the victim or on medical equipment, which was surveyed between use. The medical kit and supplies removed from it were placed on a clean plastic blanket to further avoid it becoming contaminated. The victim was checked for other injuries and was never left alone. The MERT bandaged the wound, applied a leg splint and a neck brace, and

administered oxygen. He was carefully placed and secured onto a collapsible backboard, which had first been kept on a clean plastic blanket to avoid contaminating its underside.

The MERT was preparing to carry the victim up three flights of stairs when the stretcher bearers and two medical technicians from the ambulance arrived at the victim's location. The medical technician's wore personal dosimetry. They received an adequate briefing from the MERT leader on the victim's medical and contamination status. The medical technicians and stretcher bearers remained on the clean side of the contaminated area boundary. The victim on the backboard was carefully transferred across the boundary, and additional surveys of the backboard were performed to better ensure that its underside was not contaminated. The stretcher bearers carried the victim up the staircase and outside the Radwaste Building where the victim and the backboard were secured on a gurney and loaded into the ambulance. Due to the contamination control activities that occurred inplant, it was not necessary to lay plastic within the ambulance.

Both the hospital and the ambulance had been informed by exercise participants in the Simulator that the victim was contaminated. The licensee's procedures do not require that an Unusual Event be declared until an ambulance leaves the Protected Area with a contaminated, injured person. By the time that occurred in this scenario, an Alert had already been declared for a simulated reactor coolant pump failure. Although an Unusual Event had not been declared for the onsite medical emergency, State and county officials were informed of that situation soon after the ambulance had left the plant.

Based on the above findings, this portion of the licensee's program was acceptable.

c. Technical Support Center (TSC)

The TSC achieved fully operational status about 75 minutes after the Alert declaration. Assembly and accountability of all onsite personnel was promptly initiated by the Emergency Coordinator (EC) after the Site Area Emergency declaration, and was completed within the 30 minute goal.

The EC and his TSC staff maintained a good awareness of changing plant conditions, the activities of inplant repair teams and current and forecast meteorological conditions. The EC and his principal aides held several meaningful discussions to set priorities and to share information on their efforts. Offsite dose assessment responsibility was transferred to Emergency Operations Facility (EOF) staff prior to the simulated release. However, TSC dose assessment staff worked in parallel with their EOF counterparts until the release had been terminated.

Beginning at about 7:45 p.m., exercise controllers made the Emergency Response Facility Information System (ERFIS) unavailable to TSC and EOF exercise participants. This computer system is used to provide current plant parameter information and to trend certain types of plant data. The unavailability of ERFIS caused the EC to dispatch a Health Physics technician to the Control Room Simulator to obtain relevant area radiation monitor date. These data were then periodically reported to TSC staff over the telephone. Other TSC staff also had to rely on more frequent conversations with Control Room staff to obtain updated information on such key plant parameters as containment pressure and radiation level. TSC staff then used telephone lines to relay updated plant parameter data to their EOF counterparts.

TSC and EOF staff used pre-formatted status boards to display relevant plant parameter data. With the unavailability of ERFIS computer terminals, flip charts or graph paper were primarily used to trend critical containment parameters. The pre-formatted status boards were also used in both facilities to display parameter trends by using color-coding to indicate the valid times of several sets of data, or by using arrows to indicate trends. However, the display of trended data was more readily visible in the EOF than in the TSC. Also, the methods utilized to display trended data on pre-formatted status boards varied over time in both facilities, but were somewhat more consistent in the EOF.

Habitability monitoring was adequately demonstrated in the TSC. The EC was kept informed of Operational Support Center habitability. Administrative support and security were very good in the TSC.

Based on the above findings, this portion of the licensee's program was acceptable; however, the following item should be considered for improvement:

- To avoid confusion, a more consistent methodology should be developed for prominently displaying several hours of trended plant data on TSC and EOF status boards.

d. Emergency Operations Facilitiy (EOF)

The EOF became fully operational, with the Recovery Manager (RM) in charge of the licensee's response efforts, approximately one hour after the Site Area Emergency declaration. A General Emergency was correctly classified within another five minutes. Initial offsite notifications were completed in a timely manner by EOF communicators using a dedicated telephone line to the State's and counties' Emergency Operations Centers (EOCs). The RM reviewed approved all initial and periodic followup message forms prior to message transmittal to offsite officials. On at least three occasions during the exercise, the RM personally spoke to offsite officials using the dedicated telephone line to explain the rationale behind the current Protective Action Recommendation (PAR) and to elaborate

on current plant conditions, onsite repair activities, and his prognoses for major changes. Periodic staff meetings and facility Public Address (PA) announcements were effectively used within the EOF to share information on changing scenario conditions and response efforts. Representatives of offsite agencies, located in a room adjacent to the Recovery Center Room, could listen to these PA announcements and could also interface with the EOF's Offsite Liaison Coordinator.

The initial and upgraded PAR were formulated in accordance with procedures, and were accurately transmitted to State and county officials in a timely manner. The RM and several key aides remained adequately aware of what protective actions were being implemented by county officials. Although a prominent Recovery Center status board had provisions for listing the current PAR and the actions being implemented by offsite officials, the initial PAR was never written on this status board nor were those protective actions being taken offsite.

The release began after the revised PAR, which was based on deteriorating plant conditions, had been transmitted to offsite officials. About ten minutes later, the RM used the dedicated telephone line to informally brief offsite officials on the suspected release path. He also indicated that the revised PAR was being reevaluated in view of the release. Dose assessment staff correctly concluded that no further PAR changes were warranted. The official message stating that the release had begun was transmitted about 35 minutes after the release began.

The RM and key staff were kept adequately informed of an inplant team's progress in temporarily blocking the release path, and on other teams' progress in restoring various plant systems. Dose assessment staff utilized a default release duration value until a better engineering estimate of release duration became available.

Once the path had been temporarily blocked, the RM exhibited good conservation in not downgrading the emergency classification. He stated that he wanted to wait until a more permanent seal for the release path had been fabricated and installed, and until further investigations had been completed to ensure that no other release paths existed. He also stated that substantial core damage had been estimated and that much offsite survey work needed to be completed. For these reasons, the RM correctly saw no purpose in hastily downgrading the emergency classification.

Following a one day time jump in the scenario, the RM led his key staff in a good, initial compilation of Recovery action items. His staff provided a number of good inputs regarding: assessing plant system's status; determining onsite decontamination needs; addressing offsite radiological impact; public affairs concerns; and assessing longer-term staffing requirements. The needs to prioritize these action items and estimate task completion times were also recognized.

Based on the above findings, this portion of the licensee's program was acceptable; however, the following item should be considered for improvement:

- The current PAR and protective measures being implemented offsite should be posted on a status board for quick reference by anyone in the EOF, including any newly arrived Federal, State, county, and license representatives.

6. Scenario and Controller Actions (82301)

The licensee's scenario was submitted in accordance with the established schedule. Clarifications and several corrections to the scenario information were provided in a timely manner. Exercise controllers did a good job in keeping the exercise on scheduled without resorting to contingency messages. No examples of improper controller actions were identified by the inspectors.

Based on the above findings, this portion of the licensee's program was acceptable. However, the scenario also included activation of the Operational Support Center (OSC), inplant maintenance teams, a post-accident sampling team, offsite survey teams, and the Joint Public Information Center (JPIC). While two inspectors briefly observed OSC activities, neither concluded that sufficient time was spent in the facility to meaningfully evaluate player performance. Due to an Emergency Facility Appraisal being conducted concurrently with the exercise inspection and other factors restricting exercise inspection team size, the JPIC and aforementioned inplant and offsite teams were not evaluated during this inspection.

7. Exit Interview

On June 7, 1988, the inspectors met with those licensee representatives identified in Paragraph 1 to present their preliminary inspection findings. The licensee agreed to consider the items discussed and indicated that none were proprietary in nature.

Attachments:
1. Exercise Objectives
2. Narrative Summary
   Timeline

1988 ANNUAL EXERCISE
OBJECTIVES

The overall objective of the Annual Exercise is to demonstrate the level of emergency preparedness which exists for the Callaway Plant. The Exercise will demonstrate the adequacy of the Radiological Emergency Response Plan and appropriate Implementing Procedures for the Callaway Plant, the State of Missouri, and the counties of Callaway, Osage, Montgomery and Gasconade.

The following specific objectives will be demonstrated:

ON-SITE

Callaway Plant

1) The ability to activate the On-Shift Emergency Organization.

2) The ability to activate the On-Site Emergency Organization.

3) The ability to activate the EOF Emergency Organization.

4) The ability to activate the Emergency Public Information Organization.

5) The ability to request support from private sector organizations, and the ability to coordinate such support.

6) The ability to request support from local agencies and the ability to coordinate such support.

7) The ability to provide Technical Representatives to the local EOCs.

8) The ability to recognize and evaluate emergency conditions.

9) The ability to take actions to correct or mitigate the emergency condition.

10) The ability to properly classify and declare an emergency.

11) The ability to properly perform notifications.

12) The ability to provide continuous assessment for control of plant operations.

13) The ability to project off-site doses to the public within the Plume Exposure EPZ.

14) The ability to perform off-site field monitoring in support of dose assessment activities and protective action recommendations.

15) The ability to implement in-plant radiological controls.

ON-SITE

Callaway Plant (Cont'd.)

16) The ability to assess the status of the reactor core and determine the extent of damage.

17) The ability to implement protective actions for plant personnel.

18) The ability to alert personnel on-site.

19) The ability to perform personnel accountability.

20) The ability to control access and maintain plant security.

21) The ability to evacuate non-essential personnel from the plant.

22) The ability to monitor protective action EBS messages from the counties in the Plume Exposure Pathway EPZ.

23) The ability to recommend protective actions for the general public to the counties in the Plume Exposure Pathway EPZ.

24) The use of protective equipment and supplies to minimize radiological exposure, contamination, or fire-fighting hazards.

25) The ability to control contamination on-site.

26) The ability to control radiation exposure.

27) The ability to provide first aid to injured/ill on-site personnel, including contaminated victims.

28) The availability of emergency equipment in the TSC.

29) The availability of emergency equipment in the OSC - Maintenance Area.

30) The availability of emergency equipment in the OSC - HPAC.

31) The availability of emergency equipment in the EOF.

32) The availability of emergency equipment in the JPIC.

33) The analysis capabilities of the PASS.

34) The ability to conduct an exercise during times which are not normal business hours.

35) The ability to conduct a post-drill/exercise critique.

ANNUAL EXERCISE

NARRATIVE SUMMARY

The plant is operating at 100% power and has been on line for 12 days. Total core III EFPD is 152.

While at full load, a loose parts monitor alarm is received on the Main Control Board. Shortly afterward, RCS activity begins to increase as indicated on the CVCS letdown monitor.

An individual is injured in the Radwaste Building necessitating activation of the MERT and subsequent transportation of a contaminated injured person by the Callaway County Ambulance Service to the Callaway Community Hospital.

RCP 'B' trips on overload causing a trip of the reactor and main turbine. The Shift Supervisor should declare an Alert and activate the On-site Emergency Organization.

An RCS leak develops as indicated by increasing containment atmosphere activity. The leakage increases to approximately 300 gpm and the Emergency Coordinator should declare a Site Emergency and activate the EOF Emergency Organization. An evacuation of all non-essential personnel should occur.

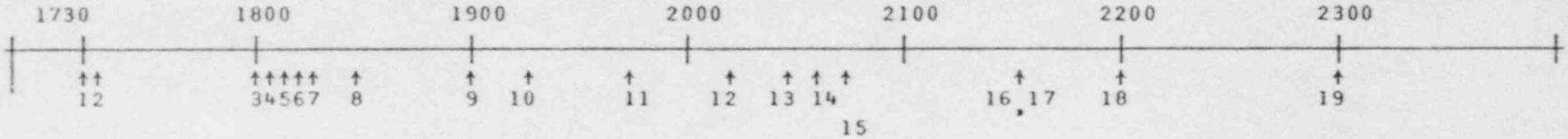
Vital bus NB01 trips due to a bus failure. This power loss results in a loss of all 'A' train ESF equipment. RCS leakage increases to approximately 1000 gpm. Increasing pressure in containment ruptures a spare piping penetration in the Aux. Building resulting in a release of radioactivity to the Aux. Building and atmosphere through the Unit Vent.

The Emergency Coordinator should declare a General Emergency. Anticipated initial Protective Action Recommendations to the public include shelter for a two mile radius and five miles downwind.

Repairs are completed to bus NB01 and containment pressure is reduced to atmospheric. The release is terminated and adequate core cooling is established.

Actions are taken to transition to a Recovery Organization.

1988 ANNUAL EXERCISE TIME LINE



1. Establish initial conditions on the simulator.
2. Commence watch relief.
3. Complete watch relief. Exercise begins.
4. Loose parts alarm/high RCS activity.
5. Radwaste personnel injured/MERT dispatched.
6. RCP 'B' trips/Reactor Trip.
7. Alert declared.
8. RCS leak commences.
9. Site Emergency declared.
10. Evacuation of non-essential personnel.
11. RCS activity >1000 μci/gm.
12. Vital bus NB01 de-energizes due to a fault.
13. General Emergency declared.
14. RCS leakage increases to 1000 gpm.
15. Radioactive release through unit vent.
16. Containment pressure dropped to 0.0 psig/release terminated.
17. Vital bus NB01 re-energized/adequate core cooling established.
18. Recovery declared.
19. Drill terminated.

Drill 88-3
03/09/88