

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-483/89013

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 Plant

Inspection At: Callaway Site, Steedman, Missouri

Inspection Conducted: October 10-12, 1989

Inspector: *J. Patterson*  
J. Patterson  
Team Leader

*Nov. 7, 1989*  
Date

Accompanying

Inspectors: B. Little  
C. Brown  
G. Stoetzel  
R. Serbu  
R. Marabito

Approved By: *James E. Foster for*  
William Snell, Chief  
Radiological Controls and  
Emergency Preparedness Section

*11/7/89*  
Date

Inspection Summary

Inspection on October 10-12, 1989 (Report No. 50-483/89013(DRSS))

Areas Inspected: Routine, announced inspection of the annual emergency preparedness exercise (IP 82301) involving observations by six NRC representatives of certain key functions and locations activated for this exercise, which involved State and County participation.

Results: The licensee demonstrated a good response to a simulated accident scenario involving a large release of radioactivity. No violations, deficiencies or exercise weaknesses were identified. One Open Item relating to the Operational Support Center was identified as described in Section 4.c.

## DETAILS

### 1. Persons Contacted

#### a. NRC Observers and Areas Observed

- J. Patterson, Control Room (CR), Technical Support Center (TSC) and Emergency Operations Facility (EOF)
- B. Little, CR and TSC
- G. Stoetzel, EOF
- \*C. Brown, CR
- R. Serbu, Operational Support Center (OSC)
- \*R. Marabito, Joint Public Information Center (JPIC)

#### b. Licensee Personnel

- J. Blosser, Manager, Callaway Plant
- C. Naslund, Manager, Operations Support
- W. Campbell, Manager, Nuclear Engineering
- M. Stiller, Manager, Nuclear Safety and Emergency Preparedness (NSEP)
- A. White, Supervisor, Emergency Preparedness (NSEP)
- J. Laux, Manager, Quality Assurance (QA)
- W. Robinson, Assistant Manager, Operations and Maintenance
- G. Hughes, Supervisor Engineering, NS&EP
- F. Eggers, Supervisory Engineer, QA
- D. Widmer, Engineer, QA
- J. Dampf, Emergency Response Coordinator, Emergency Preparedness, NS&EP
- S. Crawford, Administrator, Nuclear Affairs, NS&EP
- M. Faulkner, Administrator, Nuclear Affairs, NS&EP
- P. Sudnak, Administrator, Nuclear Affairs, NS&EP
- M. Cleary, Supervisor, Nuclear Information
- J. McGraw, Superintendent, Design Control
- K. Gross, Engineer, Emergency Preparedness, NS&EP
- R. McAileenan, Manager, Public Relations (Corporate)

All names listed above, except the two identified by an (\*) asterisk, attended the exit interview on October 12, 1989.

### 2. General

The annual emergency exercise of the Callaway Nuclear Power Plant's Radiological Emergency Response Plan (RERP) was conducted on October 11, 1989, testing the licensee's response to a hypothetical accident scenario resulting in a simulated release of radioactive material to the environment. This was a full scale exercise for the State of Missouri and the counties of Callaway, Gasconade, Montgomery and Osage. The attachments to this report include the licensee's exercise objectives, a narrative summary and a sequence of events.

### 3. General Observations

#### a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the Callaway RERP 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 six NRC observers.

#### d. Critiques

The licensee held critiques immediately following the exercise as well as a summary critique on October 12, 1989. The NRC critique was also held on October 12, 1989. A public meeting/critique was held in the afternoon of October 12 in Fulton, Missouri. At that time, NRC and FEMA evaluators summarized their preliminary findings regarding the licensee's and the offsite support agencies' exercise performances, respectively.

### 4. Specific Observations (82301)

#### a. Control Room - Simulator (CRS)

The CR Shift Supervisor (SS) and the Operating Supervisor (OS) demonstrated effective supervision and control of CR activities which included the proper use of emergency procedures, directing "feed-back" verification of system and component status during response to events, and the effective use of available engineering and support personnel. The CRS supervisors held frequent staff briefings conveying updated plant status and reactor parameter trends.

The Shift Technical Advisor (STA) was actively involved in the monitoring/trending of safety parameters and participated in the staff discussions and briefings. The CRS/TSC liaison provided overall assessment and coordination of information between the CRS and the TSC. He also maintained the sequence of event details for post event development of the CR logs.

The CRS crew responded promptly to the steam generator/chemistry problem associated with the overheating of the on-line demineralizer. This response included discussions with system engineers and chemistry personnel and review of procedure Technical Specifications and drawings. These discussions resulted in a recommendation to commence plant shutdown in accordance with procedures at approximately 0720. The crew was attentive to indications and problems associated with an earthquake greater than Operating Base Earthquake (OBE) levels. The CR supervisors and the STA promptly assessed the conditions, and the SS correctly classified the event at 0740 as an Alert and made the required notifications within the required times.

Good communication discipline was observed throughout the exercise with only isolated exceptions. These exceptions were with the in-plant teams communicating by radio with the CRS for the emergency diesel generator fire and for the injured man in that area. The messages in both instances were not preceded by "this is a drill." These errors required repeat messages and minor delays. The CRS status board initially contained plant status information; but the status board was not updated to reflect subsequent loss of safety systems or components.

The CRS staff's overall performance demonstrated good communications and procedures discipline, good coordination and teamwork, and good individual training and reactor systems knowledge. All displayed a positive exercise attitude. The staff provided timely and appropriate actions in response to varying plant conditions and problems.

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

b. Technical Support Center (TSC)

The Emergency Duty Officer (EDO) arrived at the TSC at approximately 0813. He was previously in the CRS keeping up to date on the events. Upon arrival in the TSC, he was briefed and updated by this support staff who were already there. At 0823, the former EDO, now Emergency Coordinator, (EC) declared the TSC to be fully operational and took over command and control from the SS in the CRS. The transition was thorough and not made until each understood the current plant conditions and his respective emergency role from that time on in the emergency. The EC demonstrated good command and control early by announcing that he would be conducting status briefings every 45 minutes starting at 0900. He stated that he expected input from his support managers at that time.

The Safety Parameter Display System (SPDS) was used throughout the exercise; being operable with scenario data as originated from the CRS. At 0907, there was a loss of all onsite AC power. This was preceded by a plane crash at the Montgomery, Missouri switchyard which resulted in a loss of all offsite power. For those onsite this meant a loss of Gaitronics and all alarm systems powered by

electricity. Telephones were still functional, since their power was supplied by a separate security diesel generator. This loss of all power proved a real challenge to the emergency responders, especially for assembly/accountability with simulated evacuation, which was required following the Site Area Emergency (SAE) declaration at 0915.

The EC requested the Security Coordinator to initiate assembly/accountability and a simulated evacuation plan. Final results of assembly/accountability were as follows:

Total accounted for:	541
Number unaccounted for in 30 minutes:	25
Number unaccounted for in 45 minutes:	9
Number unaccounted for in 62 minutes:	0

Based on the total personnel accounted for, 541, and the extraordinary means used by Security personnel including walk-throughs, surveillances and use of a portable "bull-horn" due to the loss of all onsite power, this was a successful effort.

The Dose Assessment Status Board was being maintained from approximately 0815. However, no stability class was listed until 0849. For the remainder of the exercise, this board was well maintained as were the two plant status boards. Following the SAE, an announcement was made at 0918 that until further notice no smoking, eating, or drinking was allowed in the TSC. Notification of the SAE was made to the State, counties and the NRC within prescribed times. The State Bureau of Radiation Health (SBRH) made recommendations to place animals on stored feed along with other contingencies based on the SAE declaration, even though no offsite release was identified. At 0953, communications and dose assessment responsibilities were transferred to the EOF.

Status briefings by the EC were held frequently and contained meaningful information regarding plant conditions and other relevant information.

In addition, at other times when events were changing in a more drastic manner, the EC held caucus-type meetings with his key support managers. At these meetings, held in a separate conference room, current events were segregated and summarized for the benefit of all present. A good exchange of views on various segments of the contributory causes of the emergency were discussed. The caucuses were worthwhile and gave each person their chance to express their views on the status of the areas for which they had responsibility.

In conclusion, the TSC operations demonstrated a good team effort. Support groups all made a contribution. The Dose Assessment Group could only project values and keep up with current meteorology beyond 1030, since there was no evidence of a release, internal or external up to then.

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

c. Operational Support Center (OSC)

The OSC facility was set up and made operational according to procedures in a timely manner in approximately 17 minutes. Command and control was adequate; however, there were periods of high noise level and extraneous conversations that detracted from the Coordinator's effectiveness. Essential repair efforts were quickly identified and repair teams were assigned specific tasks. The dispatching and debriefing of teams was found to be timely and according to procedures. Some team members as well as coordinators appeared at times to be confused as to who was on which team. Team numbers changed with assignments; and individuals identified initially as on one team were switched to another for a different assignment. The main OSC coordinated with the Radiological Controls Coordinator (RCC) at Health Physics Access Control (HPAC) prior to dispatching teams. However, a well-integrated review of proposed tasks in specified areas which considered degrading plant conditions was not performed until a release was recognized. An RCC/briefer could have advised the O&M Coordinator at the OSC location; or a briefing could have been held in both locations at the same time to assure a proper understanding of radiological conditions for all concerned.

The exterior roll-up door to the maintenance shop area was open for the major part of the exercise. This door should be closed according to Procedure EIP-ZZ-00241, Section 4.1.5.4. This procedure includes all the conditions required for operation of the OSC. The Team Leader learned from the licensee after the exit interview that this door was opened because welding operations were being conducted in that area, and the open roll-up door was needed for adequate ventilation for the workers. This real time use excuses that condition for the time in question. It was observed that during a release, repair or maintenance teams may have to cross a contaminated area to get from the OSC to the turbine building or the auxiliary building. When they get there, no anti-contamination clothing is available. This anti-contamination clothing should be made available at the HPAC area portion of the OSC.

Status boards and checklists were completed according to procedures. A site status board, however, did not include meteorology information such as wind direction until the release actually occurred at approximately 1130. The OSC Coordinator properly periodically directed that plant/radiological status be relayed to OSC personnel. The reasons for the declaration of General Emergency were not posted or provided in a briefing within the OSC for OSC personnel information.

Radiological habitability was not well monitored in the OSC. A Security Guard was stationed at the OSC entrance to monitor use of the frisker and alert someone if the instruments noise rate increased above normal. This appeared to be the only example of habitability control. Routine radiation survey, contamination controls including taking smear samples, or air samples were not taken for almost the complete exercise time. Even though an unmonitored release had occurred (1130), no such surveys as

indicated above were conducted by a Health Physics Technician until approximately 1240. This was not initiated until two requests for such services were made by the OSC Coordinator.

A total of six in-plant repair teams were dispatched during the exercise. The Fire Brigade demonstrated good competence in responding to the fire in the "B" diesel generator room. They donned proper equipment, performed required Self-Contained Breathing Apparatus checks, and made an entry into the diesel room to fight the fire. Activities were carried out safely and were well supported by the security force. On at least two occasions, the OSC Coordinator received erroneous or incomplete information and forwarded it to OCS personnel, before being assured of its accuracy. These two occasions identified related to the extent of the diesel generator damage and the time estimated for repair of the generator. Teams were encouraged to think through and discuss their assigned tasks as part of their briefings. Recommendations for travel routes to and from the OSC and into the plant were provided and well followed by the teams.

Radiation doses for in-plant team members were not recorded in the OSC. The NRC evaluator did not observe any individual dose recording, either before or after team assignments, during any of the three team briefings he observed. Doses should be tracked from the initial OSC operations, whether or not an actual radioactive release has been confirmed or not. This will be an Open Item No. 50-483/89013-01. It should be noted that doses were being recorded for any teams entering or leaving from the HPAC; however, teams could choose another route depending on radiation levels and bypass the HPAC.

With the exception of the above listed Open Item, this portion of the licensee's program was acceptable. However, the following item should be considered for improvement.

- Habitability monitoring should be performed more thoroughly and consistently than demonstrated in this exercise. Routine radiation monitoring, contamination surveys including taking of surface swipes, and continuous air sampling should be conducted in the OSC. These precautionary surveys should commence once the OSC is fully operational, regardless of whether a release has occurred or not. These changes may require a procedural revision to existing EIPs.

d. Emergency Operations Facility (EOF)

The EOF activation was performed in a timely manner by the Offsite Liaison Coordinator (OLC). The EOF checklist sheet (Attachment 1 of EIP-ZZ-C0010) was followed step-by-step. All equipment was found to be in operating order. The OLC arrived at the EOF at 0749, approximately 6 minutes after the Alert declaration. Security personnel arrived at the EOF at 0756 and immediately established access control and accountability of personnel entering and exiting the EOF. A frisker was set up at the entrance to the EOF for radiation detection.

The field teams performed source checks on all portable survey instruments prior to being dispatched. An operability check was made on the Ludlum analyzer used for counting particulate filters and radioiodine cartridges in the field. HP technicians followed Procedure HIP-ZZ-04113 when performing these checks. The initial vehicles assigned to the first two field teams had to return to the plant, one to obtain a generator to power the air sampler and analyzer, the other to replace a faulty generator. This shortage of operable generators delayed the dispatch of these two teams for approximately 30 minutes. This faulty or missing generator problem should have been discovered during the briefing of the teams at the OSC. This briefing form had a listing of all vehicles with generators. Backup portable generators were not available in the EOF.

The environmental samples taken at various location in the EPZ were brought to the EOF for analysis. The inspector observed that several of these samples collected by the field teams were not individually labeled with information such as sample location, sampling time, and date. One group of samples collected at a common location were placed in one plastic bag which was labeled on the outside with sample location and time only. The individual samples within the bag were not labeled. This could result in a tracking problem when the samples were removed for counting on the detector. The emergency kits have pre-printed sample labels which should be completed and placed on each individual sample.

During the time period of the power failure, the dose assessment staff in the EOF made a dose projection based on a portable survey instrument of 0.6 mR/hour on contact with the outside of the Containment dome. Procedure EIP-ZZ-01211, Back-Up Method for Initial Dose Assessment was used; and results indicated a thyroid dose on the order of  $10^5$  to  $10^6$  Rem at the Site Boundary for an 8 hour release period. This value appeared unrealistically high, suggesting that the basis for this procedure should be reviewed by the licensee.

At approximately 1202, the dose assessment staff was aware of an approximate five orders of magnitude increase in the unit vent reading. The Recovery Manager (RM) was not immediately made aware of this significant information. At approximately 1215, while the RM was visiting the dose assessment area for another purpose; he was told of this increase. The Radiological Assessment Coordinator (RAC) should have informed the RM immediately of this large increase in the radiation level.

The Field Team Coordinator (FTC) in the EOF did a good job of controlling the field teams and recording data received from the teams. Separate data sheets were completed for each location where readings and samples were collected. There appeared to be a good interface with the State Bureau of Radiation Health (SBRH) Field Team Coordinator. The State Emergency Management Agency (SEMA) representative had numerous, lengthy discussions on appropriate protective action recommendations (PARs). A final decision for PARs

by the licensee's RM with the RAC could have been made sooner if less BRH personnel were involved in the discussions with the RM and the RAC. A single SBRH representative should have been identified as the contact person for input into the PAR decisions. The initial PAR issued was for evacuation in a two mile radius and sheltering five miles downwind in Sectors H, J and K. The second updated PAR from the licensee to the counties was to evacuate out to 2 miles and 5 miles downwind in Sectors H, J and K. This was agreed upon by the SBRH. Later at 1301, the State wanted to use field team data as a basis for PARs, rather than dose assessment values, but this approach did not prevail with the licensee.

The Engineering Support Group and the Communicators did a very good job. The Engineering Group worked well together, were seeking ways to mitigate the events as well as trending key reactor and containment parameters. Communicators were diligent, attentive and kept up their assignments in a timely manner throughout the exercise.

The RM provided frequent briefings to the EOF staff over the facility Public Address System. Current information on plant status, emergency classifications and offsite releases were provided. Status boards were well maintained including Dose Assessment boards, Field Team data board and the Plant Parameter board.

There was a good discussion of recovery actions which were planned after the emergency conditions were more under control. These discussions were held in a separate conference room in the EOF. These discussions included the RM and his support manager and the EC from the TSC with his support managers using a speaker phone. Areas that were discussed included the need for obtaining environmental monitoring and HP assistance from the Wolf Creek Plant and INPO, the need for a walk-down of the plant to determine if the earthquake had damaged any additional systems, the need to identify the exact location of the containment leak, a thorough review of Technical Specifications to determine which can be met and which cannot, assignment of a full time ALARA Coordinator, and means to determine the extent of the core damage problem. All present were asked for their suggestions on recovery activities and most responded with items for consideration. However, no specific priorities or estimated completion times for assigned tasks were established at this meeting.

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

- All equipment including portable generator for the field teams should be checked for operability before dispatching the vehicle from the plant. At least one replaceable backup generator should be available from the EOF.

- More emphasis in training should be placed on proper labeling of environmental samples for positive identification before and after analyses. Pre-printed labels could also be used.

5. Scenario (82301, 82302)

The scenario content and general flow of activities was considered good. The earthquake event had a certain realism to it because of an actual recorded earthquake felt in the Callaway County area about three years ago. The loss of first offsite power and then all onsite power was a real challenge to the participants on how to respond and keep functioning efficiently. This scenario was reviewed by NRC prior to the exercise and only two questions were identified in the reactor-related data; one minor inconsistency in the meteorological data was identified; and it was suggested that more medical information on the scenario victim be generated such as pulse rate and blood pressure. Additionally, the offsite release values had to be increased to include plume coverage for Callaway County and Montgomery County, which had to demonstrate their emergency response capabilities, since this was a full scale exercise. Radiation-related data was reviewed and found to be consistent with the plant radiation monitoring equipment. All the above items were satisfactorily resolved by the licensee, with data modified where necessary, prior to the exercise.

This entire loss of power made the assembly/accountability and simulated evacuation of non-essential personnel a real challenge to the participants. Through a coordinated effort by the licensee's Security Forces (as described in Section 4.b), this task was successfully completed. Many segments of the licensee's emergency response capability were tested in this exercise, including the Medical Emergency Response Team (MERT) and the plant's Fire Brigade.

The Controllers performed well and kept the information flowing and related it in the proper perspective. No examples of Controller prompting were identified by any of the NRC evaluation team. With the first indication of a release from containment not occurring until approximately 1200, the dose assessment group had to be diligent and persevere until that time, developing dose projection values and monitoring meteorological conditions and in-plant radiation indicators continually. This aspect of the scenario was a good test for the RAC's and their perspective groups in the TSC and in the EOF.

After completion of the exercise, the NRC evaluation team concluded the licensee's performance demonstrated that all exercise objectives approved in earlier submittals to the NRC were met.

6. Joint Public Information Center (JPIC)

The information flow from the EOF to the JPIC was not always timely. One example cited was when it was determined there was a high radiation level in the reactor building. This information was released at the JPIC approximately 30-40 minutes later. The specific notification was

"buried" in the press release with no details. At 1030, the State issued a press release which included the declaration of a General Emergency which was made at the EOF at 1015. It was not until 1049 that the licensee issued a similar press release. The technical briefer did not utilize any visual aids until approximately 1130. These should have been part of the initial presentation. Name placards should have been provided at the speaker's table to identify the licensee representatives.

The current practice of having the State representative be a spokesperson for all four counties did not seem to work efficiently. Several times the State representative demonstrated that she could not answer specific questions on county conditions or their reasons for following PARs different than those recommended by the licensee and/or the State. One example was the option Callaway County took in evacuating everyone within a 5 mile radius at 1225. Osage County chose later to shelter those people (approximately 200) in the 10 mile EPZ range, when the plume was near this area.

No media representatives were present; however, three journalism students from the University of Missouri were there. The students refused to ask any questions of the media presenters, even when prodded. For the next participation of the JPIC in an emergency exercise, the NRC evaluator recommended that licensee representatives be used as "plants" to ask meaningful, thought provoking questions of the JPIC participants. This should be done only if no news media representatives are present.

The briefings held were timely and the print handouts were good. The status board was not posted timely for either the Site Area Emergency or the General Emergency. The television coverage by the licensee should be useful as a training tool to improve the JPIC's performance. The main JPIC room appeared somewhat smaller than desired but adequate for this emergency exercise.

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

- JPIC participants should improve the timeliness of issuance of information from the EOF for news briefings and press releases. JPIC Status board entries should be made on a more timely basis.

## 7. Exit Interview

On October 12, 1989, the inspection team met with those licensee representatives identified in Section 1 to present their preliminary inspection findings. The team leader discussed the scope and preliminary results of the emergency exercise. In general, the exercise was well conducted and the participants demonstrated a good level of competence in performing their emergency response functions. There were no exercise weaknesses identified. However, the OSC performance could be improved by more thorough habitability monitoring, and a recording of doses for the ir-plant repair teams from the OSC, before and after their plant assignments.

The latter item was identified as an Open Item. Also, the JPIC's performance did not always include timeliness in issuing news releases or in posting the current level of emergency classification on the status board.

The licensee indicated that none of the information discussed during this meeting was proprietary.

Attachments:

1. Exercise Objectives and  
Narrative Summary
2. Sequence of Events

CALLAWAY PLANT  
ANNUAL EXERCISE OCTOBER 11, 1989

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:

ONSITE (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 perform environmental assessment to predict off-site doses for the protection of the health and safety of 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.

CALLAWAY PLANT  
ANNUAL EXERCISE OCTOBER 11, 1989

OBJECTIVES

- 15) The ability to implement in-plant radiological controls.
- 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 monitor protective action EBS messages from the counties in the Plume Exposure Pathway EPZ.
- 22) The ability to recommend protective actions for the general public to the counties in the Plume Exposure Pathway EPZ.
- 23) The use of protective equipment and supplies to minimize radiological exposure, contamination, or fire fighting hazards.
- 24) The ability to control contamination on-site.
- 25) The ability to control radiation exposure.
- 26) The ability to provide first aid to injured/ill on-site personnel.
- 27) The availability of emergency equipment in the TSC.
- 28) The availability of emergency equipment in the OSC - Maintenance Area.
- 29) The availability of emergency equipment in the OSC - HPAC.
- 30) The availability of emergency equipment in the EOF.
- 31) The availability of emergency equipment in the JPIC.
- 32) The analysis capabilities of the PASS.
- 33) The ability to plan for short-term recovery objectives.
- 34) The ability to conduct a post-drill/exercise critique.

ANNUAL EXERCISE  
NARRATIVE SUMMARY

The plant is operating at 100% power. The plant has been on-line for 140 days. Total Core IV EFPD is 128. At about 0330, the on-line CVCS letdown demineralizer severely overheated and didn't automatically isolate from the RCS. As a result, Chemistry has been trending increasing RCS activity and chlorides.

At 0720, Chemistry reports that chlorides in the RCS have exceeded the Action 3 limit and the operating crew should commence a plant shutdown.

At 0735, an 'OBE' earthquake occurs causing a loss of the Cal-Bland transmission line, several plant equipment failures and varying damage to off-site areas in the EPZ. The Shift Supervisor should declare an ALERT and activate the On-site Emergency Organization.

The transmission line surveillance airplane crashes into the Montgomery Switchyard causing both Montgomery/Callaway lines to trip resulting in a loss of off-site AC power and a reactor/turbine trip. After automatic start, the only available emergency diesel generator trips off and catches fire. The loss of the diesel results in a total loss of AC power. RCS leakage increases through the reactor coolant pump seals due to the loss of seal injection. The MERT is dispatched to provide care to an equipment operator overcome by smoke at the diesel fire. A SITE EMERGENCY is declared based on Loss of all AC power for more than 15 minutes and all Emergency Organizations are activated.

The turbine-driven auxiliary feed pump trips and causes a loss of all steam generator feedwater. After S/G levels fall to less than 24% WR, a GENERAL EMERGENCY is declared and a Protective Action Recommendation of shelter 2 mile radius and 5 miles downwind is made to the public.

Increasing radiation levels in the Auxiliary Building and Unit Vent indicate the release of radioactive material to the environment. Investigation reveals the leakage from containment through a damaged piping penetration.

Following clearance of the fault on the Cal-Bland line or repair of DG NE01, the operating crew restores power to one vital AC bus and begins restoring the plant to a stable condition. When an emergency repair team successfully repairs the damaged penetration, the release is stopped.

ANNUAL EXERCISE  
SEQUENCE OF EVENTS

SCENARIO TIME	ACTUAL TIME	MESSAGE NUMBER	INITIATED FROM	EVENT
0700		1	SIM	Initial conditions are established. Exercise commences with watch turnover to the shift crew.
0720		2	CHEMISTRY	Chemistry reports that chlorides in the RCS exceed 1500 ppb. (APA-ZZ-01020, Action 3 limit)
(0721)		OBS	SIM	The shift crew should commence a plant shutdown in accordance with OTG-ZZ-00004.
0735		3SIM	SIM	Three main control board annunciators indicating an OBE earthquake are in alarm.
(0735)		4SIM & Mini-Scenario #1	SIM	The Cal-Bland line trips on fault.
(0735)		5SIM	SIM	MCB annunciator 79F, Loose Parts Monitor, alarms. (Note: Alarm will not occur if control rod motion is demanded)
(0735)		6SIM	SIM	The operating intake pump trips off.
(0735)		7SIM	SIM	MCB annunciator 70B, RCP 'Alert' Vib, alarms.
(0736)		8	SIM	The computer indicates that RCPs A & C alarmed reading approximately 4 mils. The readings are not increasing.
(0736)		9	SIM	The Loose Parts Monitor alarm was on Channel 3. The alarm does not recur when reset.
(0736)		OBS	SIM	The operating crew should respond to the earthquake in accordance with procedure OTO-SG-00001, Earthquake.

(TIME) = Approximate Time  
 C = Contingency Message  
 P = Prompting Message  
 OBS = Observed - No Message  
 SIM = Simulator Message  
 s = Supplementary Message

ANNUAL EXERCISE  
SEQUENCE OF EVENTS

SCENARIO TIME	ACTUAL TIME	MESSAGE NUMBER	INITIATED FROM	EVENT
(0737)		10	SIM	The SS/OS should contact the U.S. Geological Survey and the St. Louis Geophysical Observatory to confirm seismic activity. (Calls will be made to alternate phone numbers.)
(0737)		11	EXERCISE COMMUNICATION CENTER	Both the U.S. Geological Survey and the St. Louis Geophysical Observatory confirm severe seismic activity.
(0750)		12C	SIM	The Shift Supervisor should declare an 'ALERT' based on EAL Group 8-B, Earthquake greater than Operating Basis Earthquake (OBE) Levels and implement the appropriate actions of EIP-2Z-00102.
(0755)		OBS	TSC/OSC	Emergency Response personnel should commence activation of the TSC and OSC.
(0805)		OBS	SIM	Notification of State and Local agencies should be completed.
0810		13SIM	SIM	Alarm 61A (Process Rad High-High) is received on the Main Control Board.
(0811)		14	SIM	Panel RM-11 indicates that the CVCS letdown monitor SJ-RE-01 is in alarm reading 5.2 uc/gm.
(0812)		OBS	SIM	The crew should respond to the RCS high activity in accordance with OTO-BB-00005.
0900		15SIM & Mini-Scenario #2	SIM	Both Montgomery 7 and 8 lines are lost due to a plane crash at the Montgomery switchyard. This results in a complete loss of off-site AC power.
(0900)		16SIM	SIM	A reactor and turbine trip occur due to loss of off-site power.

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ANNUAL EXERCISE  
SEQUENCE OF EVENTS

SCENARIO TIME	ACTUAL TIME	MESSAGE NUMBER	INITIATED FROM	EVENT
(0900)		17SIM & Mini-Scenario #3	SIM	DG NE01 fails to auto start after the loss of AC power.
(0901)		OBS	SIM	The Shift Supervisor should dispatch an EO to troubleshoot DG NE01.
0905		18SIM & Mini-Scenario #4	SIM	Emergency diesel generator NE02 catches fire after auto starting and trips off resulting in a complete loss of on-site AC power.
(0905)		OBS	SIM	The operating crew should respond to the plant trip and loss of all AC power in accordance with Emergency procedures E-0 and ECA-0.0.
(0905)		19	All Facilities	The plant gaitronics and plant alarms are inoperable due to the loss of AC power.
(0906)		20	CAS	DG NE02 room intrusion alarm.
0910		21SIM	SIM	RCS leakage from RCP seals begins increasing above normal values (reaches approximately 300 gpm in 20 minutes).
(0915)		22 & Mini-Scenario #4	DG NE02	Security discovers an unconscious operator outside the DG NE02 room.
(0916)		OBS		The Emergency Coordinator should dispatch the MERT and Fire Brigade. (Calls to the ambulance and hospital will be simulated, if necessary.)
0920		OBS	SIM	Conditions have been reached for a Site Emergency declaration.

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SCENARIO TIME	ACTUAL TIME	MESSAGE NUMBER	INITIATED FROM	EVENT
(0935)		23C	TSC	The Emergency Coordinator should declare a "SITE EMERGENCY" based on EAL 4-C, Loss of all AC Power for more than 15 minutes and implement the appropriate steps in EIP-ZZ-00102.
(0935)		OBS	EOF	Emergency response personnel should commence activation of the EOF.
(0940)		24C	TSC	The Emergency Coordinator should announce assembly for accountability. (Evacuation of non-essential personnel will be simulated).
0945		25SIM & Mini-Scenario #5	SIM	MCB Annunciator 128D, TDAFWP BRNG Oil Pressure Low alarms and the TDAFWP trips due to a failure of the shaft driven oil pump.
(0950)		OBS	TSC	Notification to State and local agencies should be complete.
1030		26SIM	SIM	All four SG wide range levels fall below 24%.
(1045)		27C	TSC	The Emergency Coordinator should declare a "GENERAL EMERGENCY" based on EAL 4D, Failure of AC Power and a total loss of auxiliary feed-water, and implement the appropriate steps of EIP-ZZ-00102. (Note: The General Emergency declaration could be based on Group 1G or 2G.)
(1100)		OBS		Notifications of the General Emergency and an initial Protective Action Recommendation (PAR) of shelter 2 mile radius and 5 miles downwind to the State and Counties should be complete.
(1100)		28SIM	SIM	Containment pressure exceeds 3.5 psig.

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SCENARIO TIME	ACTUAL TIME	MESSAGE NUMBER	INITIATED FROM	EVENT
(1107)		29SIM	SIM	Core water level has dropped to less than 40% as indicated by RVLIS.
1115		30C	HP	Containment radiation levels exceed 85,000 REM based on portable instrument readings or Ctmt activity exceeds 2000 uci/gm by grab sample.
(1115)		OBS	SEMA	An FBS message should be broadcast and warning sirens sounded.
(1130)		31C	EOF	A PAR of evacuate 5 mile radius and 10 miles downwind should be made to SEMA/Counties.
1145		Mini-Scenario #6	SIM	A release of radioactive material from Ctmt occurs due to a cracked spare piping penetration.
1145		32	LOAD DISPATCH	Load dispatch informs the plant that the Cal-Bland line breakers can be closed to provide power to the plant. (Note: DG NEO1 repairs may be complete by this time enabling the crew to restart the diesel to supply power.)
(1150)		OBS	SIM	The crew should re-energize the switchyard or start the diesel to supply AC power to one vital bus.
(1200)		OBS	SIM	The crew should begin restoring the plant to a stable condition by performing the applicable steps in Emergency procedure ECA-0.2.
1215		Mini-Scenario #7	OFF-SITE	An auto accident on Route CC northwest of the plant results in an injury and potential contamination concerns. The Callaway Ambulance Service should respond.

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ANNUAL EXERCISE  
SEQUENCE OF EVENTS

SCENARIO TIME	ACTUAL TIME	MESSAGE NUMBER	INITIATED FROM	EVENT
(1235)		OBS	OFF-SITE	The Callaway EOC or hospital may request that the Callaway Plant send a Health Physics Tech to the hospital to assist with the contaminated victim.
1300		33P	RAD ASSESSMENT COORDINATOR	Soil and vegetation samples should be obtained.
1315		34	ALL FACILITIES	The lead facility controller announces a 10 minute hold while conditions are established following a 24 hour time jump.
(1315)		35	TSC, EOF, JPIC, EOCs	24 hour time jump conditions.
1325		36	TSC, EOF, JPIC, EOCs	Exercise recommences.
1325		37	SIM, OSC, HPAC	Facility critique should commence.

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