U. S. Nuclear Regulatory Commission
Region I

Docket/Report: **50-317/50-318:92-20** License: **DPR-28**

Licensee: **Baltimore Gas and Electric Company**
P.O. Box 1535
Lusby, Maryland 20657

Facility Name: **Calvert Cliffs Nuclear Power Plant, Units 1 and 2**

Inspection: **August 17 - 19, 1992**

Inspection At: **Lusby and Prince Frederick, Maryland**

Inspectors: John H. Lusher 09/01/92
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Areas Inspected

The licensee's annual, partial-participation emergency preparedness exercise.

Results

Exercise performance showed the ability to protect public health and safety. Strengths included recognition of potential degraded plant and emergency response facility conditions due to the simulated earthquake, staff interactions in diagnosing and mitigating accident conditions, and maintenance team deployment. No violations or exercise weaknesses were identified. Areas for improvement included exercise and scenario control, plant announcements over the public address system, and maintenance of status boards in the Technical Support Center (TSC).

DETAILS

1.0 Persons Contacted

The following individuals were contacted during the inspection.

C. Andrews, Supervisor, Procedure Development and Modification Acceptance Unit
D. Dean, Security Training Specialist
T. Forgette, Supervisor, Emergency Planning Unit
R. Franke, Engineer/Nuclear Regulatory Matters
C. Hart, Sr., Supervisor, Security Planning and Programs
D. Holm, Assistant General Manager, Operations Training
J. Kane, Telecommunications Engineer
F. Kramme, Emergency Preparedness Analyst
W. Lippold, General Supervisor, Technical Services Engineering
T. Pritchett, General Supervisor Support Services
E. Roach, Emergency Preparedness Analyst
G. Rudigier, Emergency Preparedness Analyst
L. Russell, Manager, Nuclear Safety and Planning Department
R. Thompson, Emergency Preparedness Analyst

The inspectors also interviewed and/or observed the actions of other licensee personnel.

2.0 Emergency Exercise

A partial-participation emergency exercise was conducted at the Calvert Cliffs Nuclear Power Plant on August 18, 1992 from 0800 to 1400.

2.1 Scenario Planning

Exercise objectives were submitted to NRC Region I on May 19, 1992. The completed scenario package was submitted to the NRC on June 17, 1992. Region I reviewers discussed scenario improvements with the licensee's emergency preparedness staff on July 16, 1992. These improvements were similar to those identified in the licensee's 1991 scenario submittal (50-317/91-26-01 and 50-318/91-26-01). NRC review also noted that licensee scenario planning does not appear to assure that scenarios will test responses across the range of possible initiating events. This consideration will be further evaluated during future scenario reviews and this item is updated as IFI 50-317/92-20-01 and 50-318/92-20-01.

The licensee subsequently revised the exercise scenario to reduce similarities to the dress rehearsal scenario. These changes, as submitted on July 28, 1992, provided adequate testing of the major portions of the Emergency Plan and Implementing Procedures, and also provided for demonstration of areas previously identified by the NRC as in need of corrective action.

On August 17, 1992, NRC observers attended a licensee briefing on the revised scenario. The licensee stated that certain emergency response activities would be simulated and that controllers would intercede in exercise activities to prevent disrupting plant activities.

2.2 Exercise Scenario

The submitted scenario included the following simulated events:

- Initial conditions: Unit 1 in Mode 5, Unit 2 at 100% power. Unit 1 in the shutdown cooling mode with operators preparing to draw a bubble in the pressurizer. Various components out of service for maintenance on both units. The discharge valve for Containment Spray Pump 12 is broken shut, High Pressure Safety Injection Pumps 11 and 12 are out of service. Spent Fuel Pool Cross Tie Valve 0-SFP-154 is broken shut.

- A Seismic Event causes SEISMIC ACCELERATION RECORDER 0-YR-001 (Control Room) Yellow Event Alarm illumination; the event indicator is white. (EAL: Alert, WEATHER, Earthquake ≥0.08g horizontal or 0.053g vertical.)

- An aftershock, more severe than the first earthquake, occurs. (EAL: Site Area Emergency, WEATHER, Earthquake ≥0.15g horizontal or 0.10g vertical.)

- Pressurizer low level alarms and decreasing level indicating loss of coolant.

- Low Pressure Safety Injection (LPSI) Pump 12 leaking at the suction spool piece.

- LPSI Pump 12 trips after a short period of cavitation.

- Radiation Monitor for Emergency Core Cooling System (ECCS) room and ECCS Pump 12 room vent monitor increase.

- A bus fault causes the loss of 4KV Bus 11; some Radiation Monitoring System (RMS) indications lose power.

- Recovery discussion.

- Exercise termination.

2.3 Activities Observed

The NRC inspection team observed the activation and augmentation of the Emergency Response Facilities and the actions of the Emergency Response Organization staff. The following activities were observed:

1. Selection and use of control room procedures.
2. Detection, classification, and assessment of scenario events.
3. Direction and coordination of emergency response.
4. Notification of licensee personnel and off-site agencies.
5. Communications/information flow, and record keeping.
6. Assessment and projection of off-site radiological dose, and consideration of protective actions.
7. Provisions for in-plant radiation protection.
8. Provisions for communicating information to the public.
9. Accident analysis and mitigation.
10. Accountability of personnel.
11. Post-exercise critique by the licensee.

2.4 Exercise Finding Classifications

Inspection findings were classified, where appropriate, as follows:

Exercise Strength: a strong positive indicator of the licensee's ability to cope with abnormal plant conditions and implement the emergency plan.

Exercise Weakness: less than effective Emergency Plan implementation which did not, alone, constitute overall response inadequacy.

Area for Improvement: an aspect which did not significantly detract from the licensee's response, but which merits licensee evaluation for corrective action.

2.5 Exercise Observations

Activation and utilization of the Emergency Response Organization (ERO) and Emergency Response Facilities (ERFs) were generally consistent with the Emergency Plan and Emergency Response Plan Implementing Procedures (ERPIPs). The following observations were made in the ERFs.

Overall ERF Observations

- Shift of command and control went smoothly, with recognition of the potentially degraded condition of off-site facilities.

- There was excellent assessment and aggressive analysis of plant problems.

No exercise weaknesses were observed.

The following area for improvement was noted:

- Overall scenario control needs to be improved as indicated by the following:

  * There were several areas of inconsistent data, (e.g. Unit 2 shut-down information, Core Exit Thermocouple temperatures, Refueling Water Tank levels).

  * When scenario actions were completed, that was not relayed to the simulator controllers so that the faults could be removed, and so that the operators would not think the problem(s) still existed or that another problem was causing the associated fault(s).

Simulator Control Room (SCR)

Control room operators anticipated potential problems based on plant conditions and prepared responses to mitigate and control them. The EALs were recognized and events were declared in a timely manner. Crew members communicated well with each other in analyzing plant conditions and responding to plant events.

The following exercise strength was observed:

- The crew maintained a sound safety perspective throughout the scenario as demonstrated by the following:

  * Walk-downs of containment to investigate the consequence of earthquakes were held up due to proper evaluation of the high potential for a Loss of Coolant Accident (LOCA).

  * A decision was made, after the initial seismic event, to draw a bubble in the pressurizer by making changes to Operating Procedure 1 (OP-1) in accordance with Calvert Cliffs Instruction-300, to provide more control during possible pressure transients.

No exercise weaknesses were observed.

The following area for improvement was noted.

- Public Address (PA) announcements could have been made more frequently regarding EAL and plant status.

Technical Support Center (TSC)

The TSC was activated in a timely manner and the engineering staff performed as required in assessing plant conditions.

The following exercise strengths were observed:

- TSC Engineers and analysts were quick to recognize inconsistencies in reported data and make required investigations (e.g. core thermocouples remained at the same temperature for a long time, and a large drop in Refueling Water Storage Tank level indicated a tank rupture which had not been reported.

- The health physics technician performing habitability checks was quick to recognize that a radiation monitoring instrument was not working properly and requested a replacement.

No exercise weaknesses were observed.

The following areas for improvement were noted:

- There were lapses in the professionalism of TSC personnel. Unprofessional remarks were made about the earthquake simulation. Also, some recommendations and reports were made based on memory rather than upon careful research of applicable prints or documents.

- Command and control among the TSC, the Operational Support Center (OSC) and the Control Room were blurred at times. On one occasion the Plant General Manager, acting as the Site Emergency Coordinator (SEC), gave the OSC a priority listing of assigned tasks. A short while later, the SEC discovered that the Superintendent - Nuclear Operations had given the OSC Director a different priority listing. The problem of controlling OSC task priorities also was compounded by the lack of a status board for tracking OSC tasks and priorities.

- After the initial conditions were listed, the equipment status portion of the TSC plant status board was not updated. Significant component casualties such as the suction leak on LPSI Pump 12 and the ground on 4KV Electrical Bus 11 were not noted on the status board.

Operational Support Center (OSC)

Overall, the OSC functioned well. It was fully staffed and activated within 15 minutes of announcement of the Alert. Good teamwork and coordination were noted by the inspectors. The OSC Director maintained excellent control of the repair organization. He made periodic announcements in the OSC on plant status, OSC priorities, and the status of success paths in order to keep team members informed and focused. Log books were well kept and ERPIP-310 brief/debrief forms for the Emergency Response Teams (ERTs) were utilized. OSC members periodically referred to their position procedures to ensure that all required actions were completed.

The following exercise strengths were observed:

- ERT members were knowledgeable and profersional in completing the tasks the scenario imposed. Teams were able to quickly assess equipment problems and determine viable courses of action to restore equipment to service. Team members were given good briefings that included detailed instructions on what to inspect, communication requirements, expected radiological conditions, and preferred routes. Debriefs were timely and detailed. ERTs maintained good communications with the OSC from the repair sites, keeping the maintenance team leaders well informed on equipment conditions and status of repairs.

- The Radiation Protection Director maintained good control of his monitoring teams. He had a good understanding of radiological conditions and kept the OSC Director and ERTs well informed.

- Adequate consideration was given to the ramifications of the seismic event. Structural integrity of buildings, off-site electrical power sources, and vital underground piping was confirmed.

No exercise weaknesse[s] or areas for improvement were observed.

Emergency Operations Facility (EOF)

The EOF was activated about one hour after the Alert declaration. The Site Emergency Coordinator (SEC) remained cognizant of plant status via frequent briefings and discussions with the TSC. He then provided frequent (about every 30 minutes or as changes occurred) updates on plant status to the state and local governments.

The following exercise strengths were observed:

- Effective interfaces and coordination between the SEC and the state and local governments regarding all activities, especially earthquake effects off-site and release of non-essential personnel from the site.

- High quality briefings of both the EOF staff and off-site officials.

- Very good pre-activation recognition and assessment of potential EOF damage as a result of the simulated earthquake.

Media Center

The media center was activated and several news briefings were conducted. The Media Spokesperson was knowledgeable of the plant and its operation and fielded the simulated news media questions well.

No exercise strengths, weaknesses, or areas for improvement were identified.

3.0 Licensee action on previously identified items

Based upon discussions with the licensee representatives, examination of procedures, and records, and NRC observations during the exercise, the status of open items is as follows:

- (Closed) 50-317, 50-318/91-26-02: Simulator Control Room and Operational Support Center interface concerning the communication of essential event information.

All areas for improvement identified in the previous annual exercise were acceptably demonstrated and not repeated.

4.0 Licensee critique

On August 19, 1992 the NRC team attended the licensee's exercise critique. The Supervisor, Emergency Planning Unit, and lead facility controllers summarized the licensee's observations. No critique inadequacies were identified. It was nonetheless observed that licensee items were not prioritized or categorized as to importance, and that credit was not taken for completion of success paths.

5.0 Exit Meeting

On August 19, 1992 The team met with the licensee personnel denoted in Detail 1 of this report. Team observations were summarized.

The licensee was informed of the following:

- That adequate protection of public health and safety had been demonstrated.
- That no violations were found.
- That previous concerns had been adequately addressed and were resolved.
- The areas for improvement identified during this exercise.

Licensee management acknowledged the findings and indicated that they would evaluate and take appropriate action on the identified items.