

**U.S. NUCLEAR REGULATORY COMMISSION
REGION I**

Report Nos. **50-317/90-19 and 50-318/90-18**

Docket Nos. **50-317 and 50-318**

License Nos. **DPR-53 and DPR-69**

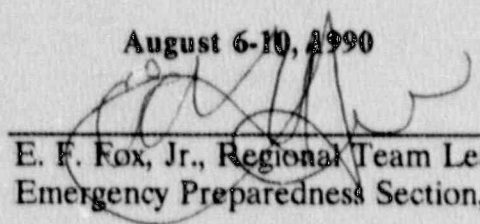
Licensee: **Baltimore Gas and Electric
MD Rts 2 & 4, P.O. Box 1535
Lusby, Maryland 20657**

Facility Name: **Calvert Cliffs Nuclear Power Plant**

Inspection at: **Lusby, Maryland**

Dates: **August 6-10, 1990**

Inspectors:



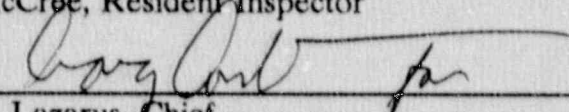
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9/20/90

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Division of Radiation Safety and Safeguards

9/20/90

date

Inspection Summary: Inspection on August 6-10, 1990 (Combined Inspection Report Nos. 50-317/90-19 and 50-318/90-18)

Areas Inspected: Routine, announced, emergency preparedness inspection of the licensee's emergency preparedness program and the annual, partial-participation emergency exercise conducted on August 8, 1990. The inspection was performed by a team of five NRC Region I and headquarters personnel.

Results: No violations were identified. Although exercise weaknesses were identified, Baltimore Gas and Electric's emergency response actions were adequate to provide protective measures for the health and safety of the public. In addition, the licensee's emergency preparedness program was in a state of operational readiness.

DETAILS

1.0 PERSONS CONTACTED:

The following Baltimore Gas and Electric personnel were contacted:

- ** A. Andje, Supervisor, Quality Assurance Unit
- * M. Bowan, General Supervisor, Planning and Support
- * G. Creel, Vice President - Nuclear Energy
- ** J. Carlson, Supervisor, Technical Training Unit
- ** S. Cowne, Senior Engineer, Quality Assurance
- J. Dempsey, Contractor, Advance Technology Nuclear Engineering Svc., Inc.
- ** G. Detter, Nuclear Regulatory Matters
- *** T. Forgette, Supervisor, Emergency Planning Unit
- * D. Frazier, Emergency Planning Analyst
- P. Hall, Training Support Unit
- *** R. Heigel, Manager, Quality Assurance Support Service Division
- *** F. Kramme, Emergency Planning Analyst
- ** L. Larragoite, Compliance Engineer
- * J. Lemons, Manager, Outage and Project Management Department
- ** M. Milbrandt, Compliance Engineer
- ** N. Millis, General Supervisor Radiation Safety
- ** K. Neitman, General Supervisor Nuclear Training
- * G. Phair, Asst. General Supervisor, Radiation Controls and Support
- *** C. Poindexter, Vice Chairman
- *** G. Rudiger, Emergency Planning Analyst
- * L. Russell, Manager, Nuclear Safety and Training
- J. Roller, Emergency Response Training Coordinator
- * L. Smilalek, Senior Plant Health Physist
- C. Zandarski, Air Conditioning Mechanic

* Indicates those present for the exit interview, August 9, 1990.

** Indicates those present for the exit interview, August 10, 1990.

*** Indicates those present for both exit interviews, August 9 & 10, 1990.

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

Nuclear Regulatory Commission:

L. Nicholson, Senior Resident Inspector

2.0 EMERGENCY EXERCISE

The Calvert Cliffs Nuclear Power Station announced, partial-participation exercise was conducted on August 8, 1990, 7:30 A.M. to 1:30 P.M.

2.1 Pre-exercise Activities

The exercise objectives submitted to NRC Region I on May 10, 1990, were reviewed and, following revision, determined to be adequate to test the licensee's Emergency Plan. On June 7, 1990, the licensee submitted the complete scenario package for NRC review and evaluation. Region I representatives had telephone conversations with the licensee's emergency preparedness staff to discuss the scope and content of the scenario. As a result, minor revisions were made to the scenario which allowed adequate testing of the major portions of the Calvert Cliffs Emergency Plan and Implementing Procedures and also provided the opportunity for the licensee to demonstrate those areas previously identified by the NRC as in need of corrective action. NRC observers attended a licensee briefing on August 7, 1990. Changes to the scenario made by the licensee were discussed during the briefing. The licensee stated that certain emergency response activities would be simulated and that controllers would intercede in exercise activities to prevent disruption of normal plant activities.

2.2 Exercise Scenario

This was the licensee's first exercise using the simulator. A living scenario was used wherein the actions taken by plant personnel influenced the data and outcome of events. It provided success oriented paths which allowed for the mitigation of the accident and for the observation and evaluation of the licensee's response capabilities. The exercise scenario included the following major events:

1. Loss of Feedwater Pumps;
2. Alert declared based on auxiliary feedwater not available and a reactor trip;
3. Effort to re-energize Motor Control Center (MCC) 104 in order to restore Power Operated Relief Valves (PORV) operability;
4. Loss of Core Cooling capability;
5. Site Area Emergency declared based on a total loss of feedwater and decay heat removal capability;
6. Accountability of on-site personnel;
7. Discussion of declaration of General Emergency and probable Protective Action Recommendations;
8. MCC 104 returned to service;

9. Auxillary Feedwater Pump repaired; and
10. Recovery Planning.

2.3 Activities Observed

During the conduct of the licensee's exercise, NRC Team members made detailed observations of the activation and augmentation of the Emergency Response Facilities (ERF's) and the Emergency Response Activation (ERO) staff and actions of ERO staff during operation of the ERFs. The following activities were observed:

1. Detection, classification, and assessment of scenario events;
2. Augmentation of the emergency organization and response facility operations;
3. Direction and coordination of emergency response;
4. Notification of licensee personnel and off-site agencies of pertinent plant status information;
5. Communications/information flow, and record keeping;
6. Assessment of plant conditions;
7. Assessment and projection of off-site radiological dose and consideration of protective actions; and,
8. Engineering analysis of accident mitigation strategies.

2.4 Classification of Exercise Findings

Emergency Preparedness exercise findings are classified as follows.

Exercise Strengths

Exercise strength are areas of the licensee's response that provide strong positive indication of their ability to cope with abnormal plant condition and implement the Emergency Plan.

Exercise Weaknesses

Exercise weaknesses are areas of the licensees' response in which the performance was such that it could have precluded effective implementation of the emergency Plan in the event of an actual emergency in the area being observed. Existence of an

exercise weakness does not itself indicate that overall response was inadequate to protect the health and safety of the public.

Areas for Improvement

An area for improvement is an area which did not have a significant negative impact on the ability to implement the Emergency Plan and response was adequate. However, it should be evaluated by the licensee to determine if corrective action could improve performance.

2.5 Licensee Critique

The NRC team attended the licensee's exercise critique on August 9, 1990 during which the licensee's lead controller discussed observations of the exercise. The licensee's critique was critical, thorough, and identified areas which the NRC team had also noted. The licensee indicated that these observations would be evaluated and appropriate corrective actions taken.

2.6 Exercise Observations

The inspectors observed licensee response actions in the emergency response facilities. The use of these facilities was generally consistent with the licensee's Emergency Plan and Implementing Procedures. Although the licensee followed its Emergency Plan and Implementing Procedures, classification of scenario events did not appear to follow the guidance of NUREG 0654 and is an example of the concern expressed in section 3.0 (UNR 50-317/90-04-02 and 50-318/90-04-02). The following strengths, weaknesses, and areas for improvement were identified.

Control Room (CR)

The following exercise strengths were identified:

1. Excellent response, evaluation, and assessment of accident conditions was demonstrated.
2. Very good command and control was exhibited.
3. Prompt notification of on-site and off-site personnel and accurate information provided on emergency conditions was noted.
4. Communications among control room personnel were formal, succinct and appropriate.

The following exercise weakness was identified.

- Communications between the CR and Technical Support Center staff during Functional Recovery was inadequate (i.e. failure to acquire TSC's recommendation on using once through core cooling after restoration of MCC 104). (50-317/90-19-01; 50-318/90-18-01)

No areas for improvement were identified.

Operational Support Center (OSC)

The following strengths were identified.

1. The center was promptly staffed and activated and fully functional in a timely manner.
2. Good telecommunications was demonstrated between the OSC, TSC and Control Room staffs.
3. OSC staff was extremely knowledgeable of duties and responsibilities.
4. Congestion and noise level were maintained at minimum levels.
5. Very good team briefings were conducted and the teams were dispatched in a timely manner.

The following exercise weakness was identified.

- Although telecommunications were good, there was poor human interface between the OSC and TSC in communicating essential event information. (50-317/90-19-02; 50-318/90-18-02)

No areas for improvement were identified.

Technical Support Center (TSC)

The following strength was identified.

- Excellent performance by the Manager of Calvert Cliffs Nuclear Power Plant and the Director of the TSC. Both demonstrated the ability to assess conditions and project future problems.

The following exercise weakness was identified.

1. TSC staff did not refer to TSC procedures or predesignated computational aids to assess plant conditions. (50-317/90-19-03; 50-318/90-18-03)

The following area for improvement was identified.

1. Although Plant Status Boards were updated, the TSC Reactor Vessel Level Instrumentation System (RVLIS) board was not used and displayed information which remained from a previous drill/exercise; the board was never erased nor updated when RVLIS indicated a bubble in the reactor vessel.

Emergency Operations Facility (EOF)

The following strengths were identified.

1. Good command and control was demonstrated.
2. Good team work was exemplified by the Recovery Officer, Site Emergency Coordinator(SEC), and alternate SEC.
3. EOF staff was very pro-active regarding accident analysis.
4. Timely and frequent off-site notifications and updates were made.
5. The Recovery Phase was well thought out and presented.

No exercise weaknesses were identified.

No areas for improvement were identified.

Exercise Control

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

Other Exercise Activities

The following exercise strengths were identified.

1. Excellent use of the simulator for success oriented scenario and contingency planning in case the simulator failed.
2. Very good living scenario.

3. Excellent drillsmanship exhibited by all exercise participants.

3.0 LICENSEE ACTION ON PREVIOUSLY IDENTIFIED ITEMS

The following items were identified during previous inspections. Based upon observations made by the NRC team during this exercise, review of the Emergency Plan and Implementing Procedures, and interviews with the Calvert Cliffs staff, the status of those items is as follows.

3.1 (CLOSED) (50-317/89-16-01 and 50-318/89-17-01) Notice Of Violation: The Control Room does not have the capability to perform Dose Assessment based upon a Steam Generator Tube Rupture. The licensee has approved and implemented Emergency Response Plan Implementing Procedure (ERPIP) 3.0 which includes this capability and performed the required training prior to implementing the change.

3.2 (CLOSED) (50-317/89-20-01 and 50-318/89-22-01) Exercise Weakness: Upon declaration of the Site Area Emergency it was not clear who was responsible for transmitting notification messages to off-site authorities. The licensee has revised ERPIP 4.1.22.2 to indicate who has responsibility for making such notifications and notifications were properly made during the August 8, 1990 exercise.

3.3 (CLOSED) (50-317/89-20-02 and 50-318/89-22-02) UNR: During activation, the Emergency Operations Facility experienced an actual temporary loss of primary and back-up power. This was not repeated during the August 8, 1990 exercise. Additionally, a successful test of the capability of the back-up power for the EOF was witnessed on August 10, 1990. Surveillance procedures are in place as well as a contract which requires preventative maintenance and a replacement generator should the EOF generator fail to start.

3.4 (CLOSED) (50-317/89-23-05 and 50-318/89-23-05) UNR: Availability and adequacy of emergency generator power to the EOF. See above.

3.5 (OPEN) (50-317/90-04-01 and 50-318/90-04-01) UNR: Several areas identified in the 1988 Quality Assurance Audit were also identified in the 1989 Quality Assurance Audit. Although the areas had been addressed by the licensee for corrective action, the actions appear to be ineffective as the problems had reoccurred. This indicates a lack of effective root cause analysis and/or ineffective corrective actions. Emergency Preparedness Staff have taken a Root Cause Analysis Course and others are scheduled for 1991 and 1992. At the time of this inspection, the licensee was beginning to apply root cause analysis to QA Audit findings, NRC violations and significant concerns, exercise deficiencies, INPO discrepancies, and, at the discretion of the EP Supervisor, any other items that would benefit from this analysis. By November 1, 1990, root cause analysis will be done on findings identified in the 1989 audit of the Emergency Response Plan. By December 31, 1991, root cause analysis will be done on the

balance of QA audit findings from 1989 to 1984.

3.6 (OPEN) (50-317/90-04-02 and 50-318/90-04-02) UNR: Emergency Action Level (EAL) inadequacies. The licensee agreed to evaluate and upgrade their EALs to conform to NUREG 0654. During this inspection, the licensee provided a revision to their EALs and the technical basis for either including the example conditions from NUREG 0654 or not. The licensee's response is being evaluated.

4.0 EMERGENCY PREPAREDNESS PROGRAM

4.1 Emergency Plan and Implementing Procedures

Except for the Emergency Action Level issue as discussed in section 3.0 above, there have been no significant changes to the licensee's emergency program since the last inspection. Program changes which have taken place have been minor and have not had an adverse effect on the licensee's overall state of emergency preparedness. All changes to the Emergency Plan and Implementing Procedures are reviewed and approved in accordance with procedures and NRC requirements.

The inspectors reviewed the licensee's internal process for the review of Proposed Emergency Plan and Implementing Procedure changes for compliance with the requirements of 10 CFR 50.54 (q). The existing process assures that appropriate reviews are performed and that the effect of the proposed change on Emergency Plan effectiveness is adequately addressed. The licensee is cognizant of the need to submit a proposed change to NRC in accordance with 10 CFR 50.4 when internal licensee review results in a decision that NRC approval is necessary prior to the implementation of the change.

Based upon the above review, this portion of the licensee's Emergency Preparedness Program is acceptable.

4.2 Emergency Facilities, Equipment, Instrumentation and Supplies

The inspectors were able to verify key facilities and equipment are adequately maintained by observing the activation and use of most of the Emergency Response Facilities (ERFs) during the exercise. However, because the simulator was used for the exercise, the Control Room was also inspected and it was determined that equipment, the Emergency Plan and Implementing Procedures, communications and dose assessment capability in it were being maintained in a state of operational readiness. The inspectors observed during the course of the exercise, that the non-dedicated office space to be used as ERF's was rapidly reconfigured, where appropriate, to ERF configuration. Plans, procedures, drawings, maps, and forms were readily available. Implementing procedures were current. Communications systems functioned well.

The inspectors reviewed the results of recent performances of post-drill, monthly and quarterly equipment checks (ERPIP 8.1, Rev. 15) of the Calvert Cliffs ERFs. The procedure provides for a comprehensive verification of the operational readiness of ERF equipment including communications systems. The equipment checks have been performed as required with appropriate discrepancy and correction sheets available for review. Discrepancies are promptly assessed and remedied.

Based upon the above review, this portion of the licensee's Emergency Preparedness Program is acceptable.

4.3 Organization Management and Controls

The inspectors interviewed licensee personnel to determine the effect of any changes which may have been made to the emergency organization and/or management control systems since the last inspection, and to verify that the changes had been properly incorporated into the emergency plan and implementing procedures.

Since the last inspection, the on site emergency preparedness staff now consists of nine persons reflecting an increase of five persons one of whom, although employed by BG&E, works within the Maryland Department of Environment. This provides direct liaison to the State of Maryland and facilitates the resolution of issues that occur relating to off-site emergency preparedness. There is an organizational change scheduled for October 1, 1990, wherein the Emergency Planning Unit (EPU) Supervisor will report to the Nuclear Safety and Planning Manager who in turn will report to the Vice President, Nuclear Energy. Currently, the EPU Supervisor reports to the General Manager, Radiation Safety who reports to the Superintendent of Technical Support who reports to the Plant General Manager. This should provide a more direct route to report Emergency Preparedness matters to senior licensee management.

The inspectors reviewed the drill/exercise documentation generated by the licensee since the last routine inspection. The number and types of drills conducted were appropriate and complete summary reports were generated subsequent to each exercise/drill. Items requiring corrective action were appropriately noted.

Action items which arise from drills, exercises and other evaluations of the Emergency Preparedness Program are tracked to resolution. A review of available action item documentation revealed that resolution of action items is conservative and technically appropriate and is accomplished in a timely manner.

Based upon the above review, this portion of the licensee's Emergency Preparedness Program is acceptable.

4.4 Training

The inspectors reviewed ERPIP 5.4, Rev 10, Ch 2, Training, and interviewed licensee personnel in order to verify that the licensee's key emergency response personnel have been properly trained and understand their emergency responsibilities and that if changes have been made to the licensee's emergency preparedness program since the last inspection, to determine whether respective personnel are aware of the changes, understand them, and have been adequately trained to implement them.

Emergency Response Organization (ERO) training, as identified in Attachment 1 of ERPIP 5.4, is divided between the Emergency Preparedness Unit (EPU), the Technical Training Unit (TTU), the Operations Training Unit, and the Security Training and Education Unit. The EPU maintains overall responsibility, identifies personnel requiring emergency response training, notifies line supervisors of personnel training deficiencies/attendance and assists and provides the TTU with feedback on training needs and in identification of training needs. The EPU is also responsible for planning, conducting and evaluating drills and exercises and the development of drill/exercise scenarios. It also provides instructors for Key Personnel (Managers, Directors, Coordinator) training.

The inspectors reviewed the required training, the Emergency Response Organization roster and the records of training to verify the training of persons assigned to the ERO. Persons were identified on the roster who had not been qualified and the licensee provided the required training to assure that all persons were qualified prior to the conclusion of the inspection. The unqualified persons were not in key ERO positions. The licensee also acknowledged the problem with assuring that persons assigned to the ERO are qualified and to provide this information to the EPU in such a manner to preclude the assignment of unqualified persons to emergency response positions. This is the second time this issue has been identified and the licensee stated corrective action would be taken to assure it does not reoccur. (UNR 50-318/90-19-04; 50-318/90-18-04)

With the exception of assigning unqualified persons to ERO positions and based upon the above review, this portion of the licensee's Emergency Preparedness Program is acceptable.

4.5 Independent Audits and Reviews

In order to determine compliance with NRC requirements, whether licensee commitments and corrective actions were implemented in a timely manner and to determine whether the licensee has a corrective action system for deficiencies and weaknesses identified during drills and exercises and that appropriate corrective actions have been made in a timely manner, the inspectors reviewed previous audit report, the licensee's corrective action systems, and interviewed licensee personnel.

The 1990 Quality Assurance Audit was still in process at the time of this inspection and was not complete. However, a review of the preliminary findings indicated that issues identified in the 1988 and 1989 audits had not reoccurred. Both the Quality Assurance Unit and the EPU have corrective action systems which provide for the tracking of items to their resolution. Notwithstanding the issue identified in section 3.0 of this report with respect to QA Audits corrective action, the inspectors reviewed the corrective actions taken and determined that the licensee had taken appropriate corrective actions in response to items identified in the audit.

The inspectors also determined that those persons responsible for the audit were independent from the EPU and the previous years audit results regarding the licensee, state, and local government interface were provided to the state and local governments.

Except as noted in section 3.5 of this report, this portion of the licensee's Emergency Preparedness Program is acceptable.

5.0 EXIT MEETING

Following the licensee's critique on August 9, 1990, the NRC team met with the licensee representatives indicated in section 1 to discuss findings as detailed in section 2.0 of this report.

The NRC Team Leader summarized the observations made during the exercise. The licensee was advised no violations or deviations were identified. Although exercise weaknesses and areas for improvement were identified, the NRC team determined that within the scope and limitations of the scenario, the licensee's performance demonstrated they could implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner that would adequately provide protective measures for the health and safety of the public.

During a second exit meeting on August 10, 1990 with the licensee representatives as indicated in section 1, the inspector discussed the findings as detailed in sections 3.0 and 4.0 of this report. The licensee was advised no violations or deviations were identified.