

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-317/84-13  
50-318/84-13

Docket No. 50-317  
50-318

License No. DPR-53  
DPR-69 Priority - Category C

Licensee: Baltimore Gas and Electric Company  
P.O. Box 1475  
Baltimore, MD 21203

Facility Name: Calvert Cliffs Nuclear Power Plant

Inspection At: Lusby, Maryland

Inspection Conducted: May 21-25, 1984

Inspectors: for M. J. Cioffi 6-14-84  
H. J. Bicehouse, Radiation Specialist date

M. J. Cioffi 6-14-84  
M. J. Cioffi, Radiation Specialist date

Approved by: M. Shanbaky 6/14/84  
M. M. Shanbaky, Ph.D., Chief date  
Facilities Radiation Protection Section

Inspection Summary: Inspection conducted on May 21-25, 1984 (Combined Inspection Report Nos. 50-317/84-13 and 50-318/84-13)

Areas Inspected: Routine, unannounced safety inspection of the radiation protection program including: inplant radiation protection program implementation; radiation worker, technician and respiratory protection training and qualification; external and internal exposure control; respiratory protection program during the outage; ALARA; actions relative to fuel leakage; and follow-up on previous open items. The inspection involved 80 hours onsite by two regionally based inspectors.

Results: In the areas inspected, no violations were noted. However, the presence of leaking fuel pins may lead to an increased alpha activity and changes in the beta emitter components. Monitoring of alpha activity in the plant was discussed (details, paragraph 8).

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## DETAILS

### 1. Persons Contacted

During this routine inspection, the following personnel were contacted or interviewed.

#### 1.1 Licensee Personnel

- \*Mr. L. B. Russell, Plant Superintendent
- \*Mr. N. L. Millis, General Supervisor - Radiation Safety
- \*Mr. L. J. Smialek, Senior Plant Health Physicist
- \*Mr. J. T. Carlson, Supervisor - Radiation Control Unit
- \*Mr. R. L. Wenderlich, Supervisor - Operations QA Auditing Unit
- Mr. P. Crinigan, Supervisor - Chemistry
- Mr. J. Lenhart, Supervisor - Radioactive Waste Unit
- Mr. T. E. Goff, Supervisor - Dosimetry Unit
- Mr. S. Hutson, Supervisor - Radiological Support Unit
- Mr. D. Harshberger, Physician's Assistant

Other licensee or contractor personnel were also interviewed or contacted.

#### 1.2 NRC Personnel

- \*Mr. D. C. Trimble, Resident Inspector

- \*Attended the exit interview of May 25, 1984.

### 2. Purpose

The purpose of this routine safety inspection was to review the performance of the licensee's radiation protection program during the 1984 refueling outage with respect to the following elements:

- Previously identified items;
- Audits of radiological controls by the Quality Assurance organization;
- Training and qualification of personnel;
- External exposure control;
- Internal exposure control and respiratory protection;
- Implementation of the inplant radiation protection program; and
- ALARA review of outage activities.

In addition, the licensee's radiological controls in response to the discovery of leaking fuel pins were reviewed.

### 3. Status of Previously Identified Items

(Closed) Violation (83-29-01) Licensee failed to authorize overtime for technicians in accordance with Calvert Cliffs Instruction (CCI) 140C. The actions described in the licensee's response dated January 19, 1984 to this violation were reviewed and found to be complete. In addition, overtime authorizations for thirty instances of overtime in excess of thirty two hours in one working week were reviewed and found to be in accordance with existing licensee's procedures.

(Closed) Inspector Followup Item (83-29-02) Verify that licensee was using new or di-sec, octyl phthalate (DOP) tested filters for respirators. The licensee recertifies high efficiency particulate activity (HEPA) filters used on respirators with DOP testing.

### 4. Quality Assurance (QA) Audits

The licensee's program for internal audits of radiation protection, radioactive waste disposal and training activities was reviewed against criteria provided in Technical Specification 6.5, "Review and Audit". The licensee's performance relative to these criteria was determined by:

- interviews with Quality Assurance Auditing Unit staff members;
- review of scheduled audits by the QA Auditing Unit; and
- examination of Audit Number 8-9-84, "Audit of Quality Assurance Procedure 8, Radiation Safety (Dosimetry and Respiratory Protection)."

Within the scope of this review, no violations were noted.

### 5. Selection, Qualification and Training of Outage Personnel

#### 5.1 General Employee Training

The licensee's general employee training program for outage personnel was reviewed against criteria provided in 10 CFR 19.12. The licensee's performance in this area was determined by examination of training records for forty radiation workers.

Within the scope of this review, no violations were noted.

#### 5.2 Respirator Training/Qualification

The licensee's respirator user training for outage personnel was reviewed against criteria provided in 10 CFR 20.103 and Technical Specification 6.11, "Radiation Protection Program." The licensee's

performance relative to these criteria was determined by review of training and fit test records for thirty-two respirator users.

Within the scope of this review, no violations were noted.

### 5.3 Radiation Safety Section

The selection, qualification and training of selected members of the licensee's Radiation Safety Section were reviewed against criteria contained in the following:

- Technical Specification 6.3, "Facility Staff Qualifications",
- Technical Specification 6.4, "Training",
- ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel" and
- Licensee's "Radiation Safety Section Training and Qualifications Manual", Revision 1.

The licensee's performance in this area was determined by:

- interviews of the four Unit Supervisors within the Radiation Safety Section;
- discussion with technicians, clerks and other personnel in the various units;
- examination of the training and qualification procedures used in the four units; and
- review of training records, resumes' and other documents for selected personnel in each unit

Within the scope of this review, the following items were identified:

- Qualification standards for personnel in the Dosimetry Unit were not provided in the "Radiation Safety Section Training and Qualifications Manual". Discussions with cognizant personnel indicated that qualification standards have been under development for nearly a year but remained incomplete. Interviews with selected technicians and clerks showed the incumbents to be qualified to competently complete their assigned tasks. At the Exit Interview, the licensee's representative stated that qualification standards for the Dosimetry Unit will be in place by October 1, 1984. This item will be reviewed during a subsequent inspection (50-317/50-318/84-13-01).

- Twelve Senior and five Junior Contractor technicians in the Radiation Control Unit were performing procedures, (e.g., radiation and contamination surveys) for which no record of training was available.

Interviews of selected Senior and Junior Contractor Technicians showed them to be familiar with the procedures involved and competent to complete the procedures. The licensee conducted interviews of the technicians and certified each of them in the procedures. This action was completed during the inspection. Qualification verification and documentation of contractor Radiation Control Unit Technicians will be reviewed in a subsequent inspection (50-317/50-318-84-02).

## 6. External Exposure Control

### 6.1 External Dosimetry Program

The implementation of the licensee's external dosimetry program was reviewed against criteria provided in:

- 10 CFR 20.101, 20.102, 20.104, 20.105, 20.202 and 20.401; and
- Technical Specification 6.11, "Radiation Protection Program"

The licensee's performance relative to these criteria was determined by:

- Interviews of the Supervisor-Dosimetry and certain members of his staff;
- Examination of selected personnel dosimetry records; and
- Review of several radiation safety procedures related to external dosimetry.

Within the scope of this review, no violations were noted.

### 6.2 Exposure Control Program,

The licensee's program for controlling external exposures during the 1984 Refueling Outage was reviewed against criteria contained in:

- 10 CFR 20.201, 20.203 and 20.401;
- Technical Specification 6.11, "Radiation Protection Program";
- Technical Specification 6.12, "High Radiation Area", and
- Licensee's Procedure No. RSP 1-106, "Special Work Permits"

The licensee's performance relative to these criteria was determined by:

- Interviews of the Supervisor-Radiation Control and certain members of his staff;
- Examination of forty special work permits associated with the outage;
- Review of surveys supporting the special work permits; and
- Direct observation during the plant tours.

Within the scope of this review, no violations were noted.

## 7. Internal Exposure Control

### 7.1 Internal Dosimetry Program

The licensee's internal dosimetry program was reviewed against criteria provided in:

- 10 CFR 20.103 and 20.401;
- Technical Specification 6.11, "Radiation Protection Program", and
- ANSI N343-1978, "American National Standard for Internal Dosimetry for Mixed Fission and Activation Products"

The licensee's performance relative to these criteria was determined by interviews of the Supervisor-Dosimetry and members of his staff and selective examinations of internal dosimetry records.

Within the scope of this review, no violations were noted.

### 7.2 Internal Exposure Control

The licensee's program for internal exposure control during the outage was reviewed against criteria provided in:

- 10 CFR 20.103, 20.201, and 20.203(d);
- Technical Specification 6.11, "Radiation Protection Program"; and
- Licensee's Procedure No. RSP 1-106, "Special Work Permits"

The licensee's performance relative to these criteria was determined by interviews of the Radiation Control Unit staff, examination of

twenty seven special work permits and supporting surveys and direct observation during plant tours.

Within the scope of this review, no violations were noted.

### 7.3 Respiratory Protection Program

The implementation of the licensee's respiratory protection program during the outage was reviewed against criteria contained in:

- 10 CFR 20.103;
- Technical Specification 6.11, "Radiation Protection Program"; and
- Licensee's Procedure No. RSP-2-301, "Respiratory Protection Program".

The licensee's performance during the outage relative to these criteria was determined by:

- interviews of the individuals responsible for various aspects of the program;
- examination of respirator user records, fit tests, special work permits, air sample data and airborne exposure tracking records; and
- direct observations of fit test equipment, maintenance areas, storage facilities and equipment in use during plant tours.

Within the scope of this review, no violations were noted.

### 8. Inplant Radiation Protection Program Implementation

The implementation of the inplant radiation protection program during the outage was reviewed against criteria contained in:

- 10 CFR 20.201, 20.203, 20.206 and 20.401;
- Technical Specification 6.11, "Radiation Protection Program;" and
- Technical Specification 6.12, "High Radiation Area".

The licensee's performance in this area relative to these criteria was determined by:

- interviews and discussions with members of the Radiation Control Unit staff.

- discussion of the Cerium-141/144 issues with representatives from the Radiation Safety and Plant Chemistry Sections.
- examination of special work permits and supporting surveys for twenty seven outage activities.
- review of routine outage surveillance activities conducted by the Radiation Control Section; and
- direct observations and measurements during plant tours.

Within the scope of this review, the following items were identified:

- The licensee's contamination and airborne surveys in support of Unit No. 2 Steam Generator and In Core Instrumentation work revealed the presence of Cerium 141/144. The inspector discussed with the licensee the chemical behavioral similarity between Cerium and the Transuranic elements. The inspector also noted that the licensee had reported leakage of fuel pins which may lead to release of nonvolatile fission products to the Reactor Coolant System. The licensee had taken air samples for potential alpha activity and recorded gross alpha levels at 2E-11 microcuries per cubic centimeter (uCi/cc). The inspector noted that the protection afforded by the respiratory protective equipment in use was sufficient to maintain the summation of airborne radioactivity levels of transuranic and other fission products to less than 10 CFR 20 Appendix B concentrations. However, the inspector discussed the potential movement of transuranics to other plant systems and subsystems. Surveillance for potential alpha activity in air samples for other Unit No. 2 work activities will be reviewed in a subsequent inspection (50-318/84-13-03).
- The presence of leaking fuel may alter the beta energy spectrum assumed in determining beta protection factors for any work that breaches the primary systems. The licensee stated that new beta protection factors will be established if the presence of a strontium-yttrium component is confirmed.

This item will be reviewed in a subsequent inspection (50-318/84-13-04).

- Radioactive waste transferred by the licensee under 10 CFR 20.311 must meet requirements in 10 CFR 61.55 and 61.56. The inspectors noted that waste from the Unit No. 2 primary system potentially affected by leaking fuel had not been processed for shipment. The licensee stated that the waste would be prepared and classified in accordance with 10 CFR 20.311 requirements including estimation of the transuranic contents. This item will be reviewed in a subsequent inspection (50-318/84-05).



9. ALARA

The licensee's outage ALARA program was examined relative to criteria contained in:

- Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as Low As is Reasonably Achievable",
- NUREG/CR-3254, "Licensee Programs for Maintaining Occupational Exposure to Radiation As Low As is Reasonably Achievable", and
- Calvert Cliffs Instruction 809A, "ALARA Program".

The licensee's performance relative to these criteria was determined by:

- Interviews with ALARA specialists;
- examination of outage ALARA reports and summaries; and
- review of ALARA inputs to selected special work permits.

Within the scope of this review, it was determined that the licensee has implemented an ALARA program containing the basic elements of Regulatory Guide 8.8 during this outage.

10. Exit Interview

The inspectors met with the licensee's representatives (denoted in Section 1.1) at the conclusion of the inspection on May 25, 1984. The inspector summarized the purpose and scope of the inspection and identified findings as described in this report.

At no time during the inspection was written material provided to the licensee by the inspectors.