U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-317/78-22
50-318/78-16

Docket No. 50-317
50-318

License No. DPR-53
DPR-69

Priority --

Category C
C

Licensee: Baltimore Gas and Electric Company

P. O. Box 1475

Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Units 1 & 2

Inspection at: Lusby, Maryland

Inspection conducted: August 8-11, 1978

Inspectors: J. R. White, Radiation Specialist — 9/8/78 date signed

J. A. Serabian, Radiation Specialist (Intern) — 9/8/78 date signed

date signed

Approved by: P. J. Knapp, Chief, Radiation Support Section — 9-12-78 date signed

Inspection Summary:

Inspection on August 8-11, 1978 (Report No. 50-317/78-22; 50-318/78-16)
Areas Inpsected: Routine, unannounced inspection by regional based inspectors of the radiation protection program during normal operations including: exposure control; training; qualifications; radiological protection procedures; posting and control; instruments and equipment; respiratory protection program; neutron monitoring; and inspector followup on IE Bulletin No. 78-07. On August 8, 1978, the inspection commenced during non-regular hours (7:15 p.m. to 9:30 p.m.) and involved a review of controlled areas of the plant to determine whether the radiological protection program was being effectively implemented. The inspection involved 54 inspector-hours onsite by two regional based inspectors.

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Region I Form 12
(Rev. April 77)

Results: Of the nine areas inspected, three apparent items of noncompliance were found in Units 1 and 2, in the following areas (infraction - failure to follow procedures in accord with the requirements of Technical Specification 6.11 - Paragraph 6; Units 1 and 2 infraction - failure to adhere to the requirements of Technical Specification 6.4 - Paragraph 3; infraction - failure to adhere to the requirements of 10 CFR 20.103 regarding respiratory protection - Paragraph 8).

DETAILS

1. Persons Contacted

*A. Kaupa, Radiation Safety and Chemistry Engineer
*E. Reimer, Medical Assistant
J. Speciale, Foreman, Radiation Safety and Chemistry
T. Logsdon, Training Specialist

* denotes those individuals attending the exit interview.

Additionally, the following person also attended the exit interview:

R. Douglass, Chief Engineer

The inspectors interviewed several other licensee employees, including members of the Radiation Safety and Chemistry staff, auxiliary operators, and other plant staff.

2. Qualification of Personnel

The inspectors examined the qualifications of radiation protection personnel pursuant to Technical Specification 6.3, "Facility Staff Qualification," which endorses ANSI standard N18.1-1971, "Standards for Selection and Training of Personnel for Nuclear Power Plants," for comparable positions. The records of all non-supervisory radiation protection personnel were reviewed.

No items of noncompliance were identified.

3. Training

On August 9, 1978, the inspectors reviewed the Rad-Chem technician training against Procedure CCI-607B, "Radiation Safety and Chemistry Personnel Training," and CCI-610A, "Personnel Training Records," developed pursuant to Technical Specification 6.4, "Training". Technical Specification 6.4 states that the retraining and replacement training shall be maintained and meet or exceed the requirements and recommendations of Section 5.5 of ANSI N18.1-1971, "Standards for Selection and Training of Personnel for Nuclear Power Plants". This sectio states, "A retraining program shall be established which maintains the proficiency of the operating organization through periodic

training exercises, instruction periods, and review covering those items and equipment which relate to safe operation of the facility and through special training sessions for replacement personnel. Means should be provided in the training programs for appropriate evaluation of its effectiveness." In the course of reviewing Procedure CCI-610A, the inspector noted that provisions of Section C.2 specify a process for achieving the appropriate evaluation of training effectiveness. Section C.2., "On-The-Job Training", requires that completed qualification cards and check-off sheets identifying the exact on-the-job training requirements be incorporated and maintained as part of the training record.

The inspector examined the training records of all non-supervisory radiation protection personnel against this requirement. It was observed that none of the records of training given for qualifying Radiation and Chemistry (Rad-Chem) technicians, identified the exact on-the-job training requirements used for the technicians' qualification; and thus did not provide the means necessary to demonstrate appropriate evaluation of the effectiveness of the training given.

The inspector noted that the on-the-job training qualification technique utilized by the licensee relied solely on the judgment and discretion of the Rad-Chem Foremen; without specific guidance or direction on which to base their evaluation, beyond the foremen's experience.

The inspector identified failure to establish and use specific statements of on-the-job training requirements in the training system for non-supervisory radiation protection personnel as noncompliance with the requirement for a system of evaluating training effectiveness incorporated into Technical Specification 6.4. (317/78-22-01; 318/78-16-01)

4. Radiological Protection Procedures

The inspector reviewed procedures relating to exposure control, instruments and calibration, and Rad-Chem Technician and Radiation Monitoring Personnel training. Procedures were reviewed against the requirements set forth in Technical Specification 6.8, "Procedures", Regulatory Guide 1.33-1972, "Quality Assurance Program Requirements", Technical Specification 6.11, "Radiation Protection Program" and the applicable regulatory requirements of 10 CFR 20.

In reviewing procedure RCP-2-413, Rev. 0, "Calibration and Maintenance of the Eberline PIC-6A Survey Meter," the inspector noted that the calibration technique described therein necessitated performing adjustments to the instrument while it is located in a 15 R/hr radiation field. The inspector verified by actual measurements that extremity exposure while making the instrument adjustment could be as high as 10 R/hr to the hands.

However, the licensee representative stated that calibration adjustments are performed using a different technique (involving removing the instrument from the field to adjust) which does not involve extremity exposure. The inspector discussed this as a matter of interest with the licensee representative. The licensee representative stated that action would be initiated to revise the calibration procedure to ensure that the technique specified in the procedure for calibration adjustment does not involve extremity exposure to the individual.

The inspector noted that this item would be reviewed in a subsequent inspection. (317/78-22-02; 318/78-16-02)

5. Instruments and Equipment

The inspector examined the licensee's calibration documents for adequacy. Calibration procedures were examined against procedural requirements for calibration frequency and accuracy. Calibration stickers on 20 instruments were checked to determine whether the calibration frequency was being maintained as required by procedure RCP-2-402, Rev. 1, "Calibration and Maintenance Records." The inspector noted that procedure RCP-2-402, Rev. 1, states that instruments must be calibrated within the three day period ending with the due date shown on the "Annual Instrument Calibration Record," form, RCP-2-402-4. Instruments found to be out of calibration are to be tagged with a rejection sticker and segregated from other instruments. On August 10, 1978, the inspector observed instruments for which the calibration due date had been passed and which were not tagged with a rejection sticker and which were not segregated from other instruments available for use. These instruments are identified in the following table.

Instrument	Serial No.	Calibration Date	Instrument Status Board Notation
PIC-6A	1348	8/4/78	In Service
PIC-6A	1342	8/4/78	In Service
Teletector (6112)	2	8/1/78	In Service

The licensee representative, upon being notified by the inspector of the three instruments found to be beyond calibration, immediately removed those instruments from their accessible locations to the instrument work bench.

The inspector noted that Technical Specification 6.11 "Radiation Protection Program" requires that procedures be prepared consistent with the requirements of 10 CFR, and be approved, maintained and adhered to for all operations involving personnel radiation exposure.

It was noted by the inspector that failure to adhere to the requirements specified in procedure RCP-2-402, constituted noncompliance with Technical Specification 6.11. (317/78-22-03; 318/78-16-03)

6. Respiratory Protection Program; Internal Exposure Control

a. The inspector established through questioning licensee representatives and reviewing records that the licensee makes allowance for the use of respiratory protective equipment in limiting the inhalation of airborne radioactive material. The inspector reviewed the licensee's respiratory protection program against the following:

-- 10 CFR 20.103, "Exposure of individuals to concentrations of radioactive materials in air in restricted areas."

-- Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection.

Regulatory Guide 8.15, which augments the regulatory requirements of 10 CFR 20.103, states in Section C.8.a, "Respirable air of approved quality and quantity is to be provided and oxygen deficiency is to be avoided (NUREG-0041, Sections ... 9.8)."

NUREG-0041, Section 9.8, "Maintenance of Air for Oxygen Supplies," requires that procedures for the maintenance of a supply of respirable air or oxygen are included as part of the respiratory protection equipment program; and that compressed gas cylinder supplies are to be maintained and used in accord with appropriate standards and recommendations.

NUREG-0041, Chapter 3, Elements of an Acceptable Program, and Chapter 5, Classification, Description, and Limitations of Respirators, recommends the following standards regarding air supplies in compressed gas cylinders:

-- ANSI Z48.1-1954, "Method of Marking Portable Compressed Gas Containers to Identify the Material Contained."

-- Federal Specification BB-A-1034.a, "Air Compressed for Breathing Purposes."

-- Interim Federal Specification GG-B-00675.b, "Breathing Apparatus, Self Contained."

-- Compressed Gas Association Commodity Specification G-7.1-1966, "Commodity Specification for Air" (ANSI Z86.1-1972)

-- Compressed Gas Association Specification G-7, "Compressed Air for Human Respiration."

-- ANSI Z88.2-1969, "Standard Practices for Respiratory Protection."

NUREG-0041 also recommends that compressed air for breathing purposes meet Grade "E" specifications; that as recommended in ANSI Z88.2-1969, Grade "D" air should be regarded as the limit for air of deteriorating quality.

The inspector noted on August 11, 1978, that although the licensee utilized cylinders of compressed air for breathing purposes, and provides for the charging of such cylinders in-house, there were neither procedures for the maintenance of breathing air supplies in compressed gas cylinders, nor was there any form of quality assurance implemented to verify that the quality of air supplied was in accord with the appropriate standards and recommendations, such as those endorsed by NUREG-0041. The licensee could not demonstrate that the quality of the breathing air met at least Grade "D" specifications.

The inspector identified making allowance for the use of respiratory protective equipment in the absence of procedures for maintaining a respirable air supply and for verifying that breathing air quality meets appropriate standards, as noncompliance with 10 CFR 20.103c. (317/78-22-04; 318/78-16-04)

b. The inspector reviewed the personnel exposure records of 30 individuals against the regulatory requirements of 10 CFR 20.103 pertaining to internal deposition of airborne radioactivity.

No items of noncompliance were identified.

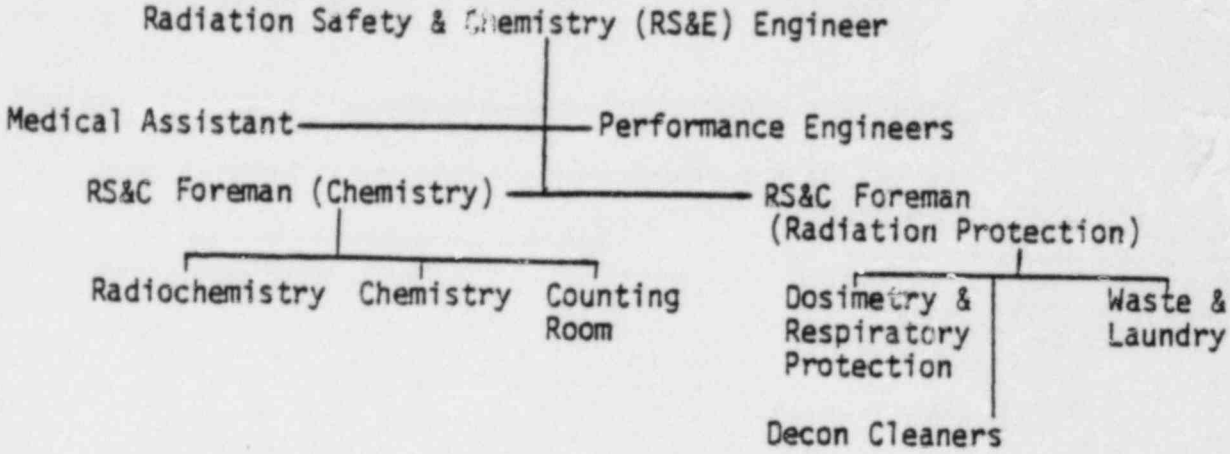
7. Posting and Control

On August 8 and 10, 1978, a tour through various areas of the plant was performed to review the posting and control of radiological areas and radioactive material against the requirements of 10 CFR 20.105, "Permissible Levels of Radiation in Unrestricted Areas" and 10 CFR 20.203, "Caution Signs, Labels, Signals, and Controls."

No items of noncompliance were identified.

8. Radiation Protection Organization

During the course of the inspection, the inspector learned that the Radiation Protection Organization had changed since it was last reported in inspection 50-317/77-17; 50-318/77-15. The current Radiation Protection Organization Chart is as follows:



9. Personnel Monitoring, Neutron

The inspector reviewed the licensee's neutron monitoring program against the requirements of 10 CFR 20.202, "Personnel Monitoring", and Regulatory Guide 8.14, "Personnel Neutron Dosimeters."

10 CFR 20.202 requires the licensee to supply appropriate personnel monitoring equipment (i.e., film badges, pocket chambers, pocket dosimeters, film rings, etc) and to require the use of such equipment by each individual who enters a restricted area under such circumstances that the individual receives or is likely to receive a dose in a calendar quarter in excess of 25 percent of the applicable value specified in 10 CFR 20.101.

Regarding personnel neutron monitoring equipment, the standard (ANSI N319-1976, "Standard for Personnel Neutron Dosimeters - Neutron energies less than 20 MeV) requires in paragraph 4.1, that such dosimetry be capable of detecting a minimum quarterly neutron dose equivalent of 300 mrem (i.e., the lower limit of detection for the dosimetry system shall be no greater than 300 mrem divided by the number of dosimetry periods per quarter).

Regulatory Guide 8.14, which indicates that the ANSI N319-1976 is generally acceptable, supplements the requirements of the standard by stating, "Neutron dosimeters should be worn whenever the neutron dose equivalent is likely to exceed 300 mrem in a quarter (the minimum sensitivity required of a neutron dosimeter in paragraph 4.1 of the standard)." In this manner, Regulatory Guide 8.14 is

consistent with the regulatory requirement of 10 CFR 20.202, in that 300 mrem per quarter is approximately 25% of the applicable whole body value (1.250 rem) specified in 10 CFR 20.101(a).

The inspector noted that, in lieu of the usual types of devices normally employed for personnel monitoring, the licensee's procedure (RCP-3-307, "Determination of Neutron Exposure") provided for the use of a portable neutron survey instrument (PNR-4) in determining the neutron dose equivalent to which personnel were exposed. A measurement of the maximum neutron dose rate to which the individual can be exposed is combined with the individual's occupancy time in the neutron radiation area to determine the individual's exposure. (e.g., a maximum neutron measurement of 200 mrem per hour in an area occupied by an individual for 30 minutes yields a personnel neutron exposure of 100 mrem).

The licensee indicated to the inspector that in order to assure the intent of 10 CFR 20.202 was fully met, procedure RCP-3-307 would be amended to require the Radiation Safety and Chemistry Engineer to personnally review and authorize personnel exposure to neutrons when such exposure is (or is expected to be) greater than 300 mrem per quarter.

The licensee also indicated it was expected that the use of a personnel neutron monitoring device would be implemented by the station in approximately six months. The inspector indicated that this item would be reviewed in a subsequent inspection. (317/78-22-05; 318/78-16-05)

No items of noncompliance were identified.

10. Licensee Action on Bulletins

The inspector reviewed the licensee's response to IE Bulletin No. 78-07, "Protection Afforded by Air-Line Respirators and Supplied Air Hoods", as provided in the licensee's letter of July 21, 1978.

Regarding the licensee's use of air supplied hoods, the inspector noted that the licensee's program does not provide for the use of calibrated air flow measuring equipment as recommended by the bulletin. The inspector noted that this item would remain open pending the performance of independent measurements on the supplied air system in a subsequent inspection. (78-BU-07)

11. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection of August 10, 1978, and summarized the scope and findings of the inspection. The licensee representative made the following comments concerning items discussed by the inspector.

-- Procedure CCI 607B will be amended to indicate that Part A (Fundamental Training Courses) is prerequisite to the Part B (On-the-job-training) in order to assure that only fully capable personnel are qualified as Rad-Chem Technicians.

-- Waivers from the Fundamental Training Courses (Part A of CCI 607B) will be granted if deemed appropriate to the Radiation Safety & Chemistry Engineer, provided the basis for such waiver demonstrates that the person has the required knowledge without benefit of the Fundamental Training Courses.

-- The Radiation Safety and Chemistry Engineer will provide a review and authorization for entry into neutron radiation areas in the case of individuals expected to receive greater than 300 mrem (neutron) per calendar quarter.