



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

PDR

September 2, 1998

EA 98-280

Mr. Charles H. Cruse
Vice President - Nuclear Energy
Baltimore Gas and Electric Company (BGE)
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL
PENALTY - \$55,000
(NRC Inspection Report Nos. 50-317/98-05 and 50-318/98-05)

Dear Mr. Cruse:

This letter refers to the NRC inspection conducted at the Calvert Cliffs Nuclear Power Plant during the period April 20-24, May 11-14, and May 19-20, 1998, the findings of which were provided to you during exit meetings on April 24, May 14, and May 20, 1998. The inspection report was sent to you on June 2, 1998. During the inspection, several apparent violations were identified related to the failure to properly implement your radiological control procedures for activities in the reactor annulus on April 9, 1998. On June 18, 1998, a Predecisional Enforcement Conference was conducted with you and members of your staff, to discuss the violations, their causes, and your corrective actions.

Based on the information developed during the inspection, and the information provided during the enforcement conference, three violations of NRC requirements are being cited and are described in the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice). The violations, which involved multiple failures to adhere to your radiological control procedures during replacement of nuclear instrumentation (NI) detectors in the reactor annulus, included: (1) the failure of workers to wear alarming dosimetry when entering the reactor annulus; (2) the failure of radiation protection personnel to stop work when unexpected alarms and radiological conditions were encountered; and (3) the failure to properly determine worker stay times for work in a high radiation area.

The violations are associated with two instances, both of which occurred on April 9, 1998, wherein personnel failed to follow radiological control procedures for personnel monitoring. In the first instance, in the early morning hours of April 9, 1998, six workers entered the reactor vessel cavity to prepare for removal of insulation and replacement of the NI detectors. Four of these workers then entered the reactor annulus, a high radiation area (HRA) with accessible radiation dose rates that ranged from 2000 mR/hr to 6000 mR/hr. However, the individuals were not wearing alarming dosimetry as required by the special work permit (SWP). Although radiation safety personnel were required to physically verify that the workers were wearing the required dosimetry prior to entering the HRA, these checks were not adequately

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performed. The alarming dosimeters were apparently prepared for use by the lead radiation safety technician (RST); however, the dosimeters were not provided to the workers and use of the dosimeters was not discussed at the pre-job briefing.

In the second instance, later that morning, an instrumentation and controls (I&C) technician entered the reactor annulus to attempt to relatch a detector well. Although the I&C technician was provided with alarming teledosimetry as required by the SWP, the dose and dose rate alarms for three of the five detectors were not set properly in accordance with applicable procedures. The three incorrectly set detectors alarmed almost immediately when the worker entered the annulus area and continued to alarm until the worker left the area approximately nine minutes later. However, the RST assigned to monitor the teledosimetry data did not react to the alarms nor stop the work, as required, when unexpected alarms occurred as he was apparently focused on the observation of only one of the correctly set detectors. Furthermore, although one of the detectors encountered dose rates in excess of the SWP limit, the RST, who was in voice contact with the I&C technician, did not instruct the I&C technician to exit the area, as required, when unexpected radiological conditions are encountered. As a result, the I&C technician received an unplanned exposure of approximately 760 mR to the left thigh which was in excess of the SWP dose limit of 600 mR. In addition to the failures to wear the proper dosimetry and to properly monitor personnel exposure, the stay times for both HRA entries were calculated incorrectly, resulting in non-conservative estimates of the time available for the workers to remain in the HRA.

The failure to adhere to radiological control procedures for monitoring and controlling personnel exposure resulted in one worker receiving an unplanned exposure in excess of the SWP limit, and also created the potential for additional workers to receive unplanned exposures. Multiple barriers for control of personnel exposure failed or were ineffective, including procedural controls, training, and management oversight. These failures represent a significant lack of attention toward control of radiological activities, in particular the control of personnel exposure. Therefore, the violations in this Notice are of significant concern and are classified in the aggregate as a Severity Level III problem in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600.

The NRC is particularly concerned that these failures involve recurrence of the some of the same fundamental problems in your radiological protection program that caused a serious event in April 1997, in which you failed to implement appropriate radiological controls during diving operations in the Unit 2 spent fuel pool. A \$176,000 civil penalty was previously issued to you for the related violations that were categorized at Severity Level II. A Severity Level III NOV without a civil penalty was also issued for your failure to establish adequate controls for airborne radioactivity for work in the reactor cavity in May 1997. Although a civil penalty could have been considered for the Severity Level III problem, discretion was exercised not to propose a civil penalty because the violations related to the cavity event occurred approximately one month after the diver event and appeared to be the result of the same fundamental performance deficiencies. During the April 9, 1998, entries to the annulus, deficiencies similar to those identified during the 1997 events were identified, including ineffective pre-job briefings, failure of radiation protection personnel to provide adequate monitoring of personnel exposure, and ineffective management oversight. As you explained at the conference, your corrective actions following the diver event were focused on improving the preparation and planning of radiological control activities. However, you failed to

recognize that behavioral changes were needed, and you did not follow through with the implementation of those necessary controls. Although you established and communicated your expectations for the safe conduct of work in radiologically controlled areas, it appears that the plant staff, including radiation safety personnel, had not fully embraced or internalized these standards.

In accordance with the Enforcement Policy, a base civil penalty in the amount of \$55,000 is considered for a Severity Level III problem. Since Calvert Cliffs has been the subject of escalated enforcement actions within the last 2 years¹, the NRC would normally consider whether credit was warranted for *Identification* and *Corrective Action* in accordance with the civil penalty assessment process in Section VI.B.2 of the Enforcement Policy. Although another RST technician recognized the alarms upon completion of work in the annulus area, the unplanned exposure to the I&C technician occurred due to the failure of the assigned RST to respond to the conditions that were clearly indicated by the alarms and teledosimetry data. Following the identification of the unplanned exposure, you took appropriate actions to stop work in the Unit 1 reactor annulus and perform an investigation of the event and assessment of your radiological control activities. As a result of this investigation, you identified the failure to wear alarming dosimetry in the early morning hours of April 9, 1998, and the incorrect stay time calculations. Your corrective actions which include: (1) providing increased management involvement and supervisory oversight of pre-job planning, pre-job briefing, and actual work activities; (2) plans to update the Radiation Protection Improvement Plan (RPIP) with lessons learned from these events; and (3) plans to standardize radiation protection work practices and improve procedures for work in the RCA appear to be comprehensive.

Notwithstanding these actions, your performance in the last year in the area of radiological controls has been particularly poor as evidenced by the diver event in April 1997, the failure to establish adequate controls for airborne radioactivity for work in the reactor cavity in May 1997, and the events associated with replacement of NI detectors in the reactor annulus in April 1998. These three cases each had similar root causes and demonstrate a lack of regard for the importance of radiation protection by a number of your personnel. The implementation of your corrective actions for the 1997 events, which included an assessment of all aspects of your radiation safety program and which should have precluded the 1998 violations, were ineffective. Therefore, I have decided, in light of your previous performance and your failure to preclude recurrence of these violations, to propose a civil penalty at the base amount in accordance with Section VII.A.1(c) and (d) of the Enforcement Policy.

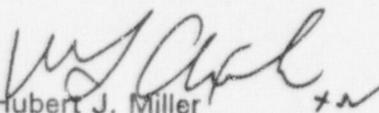
Accordingly, to emphasize the importance of appropriate management oversight and control of radiation protection activities and the need for ensuring that your corrective actions are effectively implemented, I have been authorized, after consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Regulatory Effectiveness, to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) in the amount of \$55,000 for the violations.

¹e.g., A Notice of Violation and Proposed Imposition of Civil Penalties in the amount of \$176,000 was issued on August 11, 1997 (EA 97-192) and a Notice of Violation without a civil penalty was issued on March 20, 1998 (EA 98-106). Both of these actions involved deficient radiological controls during the 1997 Unit 2 refueling outage.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. As noted above, your corrective actions do appear to be comprehensive. However, you had previously described corrective actions that were thought to be comprehensive. In light of this being your third radiation protection incident within a year, your response should address why you have confidence that your corrective actions this time will effectively preclude similar events in the future. Failure to achieve effective lasting corrective action may result in more significant enforcement action. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be placed in the NRC Public Document Room (PDR).

Sincerely,


Hubert J. Miller
Regional Administrator

Docket/License Nos: 50-317/DPR-53
50-318/DPR-69

Enclosure: Notice of Violation and Proposed Imposition of
Civil Penalty

cc w/encl:

T. Pritchett, Director, Nuclear Regulatory Matters (CCNPP)

R. McLean, Administrator, Nuclear Evaluations

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