

October 21, 1997

Mr. Philip Ayers
[]
EG&G Incorporated
45 William Street
Wellesley, MA 02181

EA 97-10

Subject: Preliminary Notice of Violation and Proposed Imposition of Civil
Penalty - \$112,500 (NTS-OH-MB-EGGM-EGGMATO4-1997-0001)
(NTS-OH-MB-EGGM-EGGMAT04-1997-0002)

This letter refers to the Department of Energy's (DOE) evaluation of the facts and circumstances surrounding a number of potential programmatic deficiencies involving the administration of the Mound Plant's bioassay program and methodologies used for determining and assigning internal radiation doses to workers. The DOE Office of Enforcement and Investigation conducted an on-site review of these matters between June 17, 1997, and July 22, 1997, and issued an Investigation Summary Report. This report was provided to you on August 29, 1997.

Based upon our evaluation of these issues, DOE has concluded that violations of DOE's Occupational Radiation Protection Rule (10 CFR 835) and Quality Assurance Rule (10 CFR 830.120) likely occurred. An enforcement conference was held with you and members of your staff on September 24, 1997. This conference included a discussion of the facts, circumstances and current status of the Mound Bioassay program, as well as potential violations, their safety significance and the status of corrective actions. A Conference Summary Report is enclosed.

Section I of the enclosed Preliminary Notice of Violation (PNOV) and Proposed Civil Penalty describes violations associated with the failure to adequately assure that the Mound Plant's Bioassay Program for workers was implemented in accordance with your own established program requirements. Specifically, for 1997 alone, it was determined that approximately 108 workers performing radiological work activities under the auspices of at least 20 different Radiation Work Permits had failed to submit samples for bioassay as required.

Under your established procedures, supervisors were required to identify workers who, based on the work to be performed under a Radiation Work Permit, would require bioassay and to initiate Bioassay Information Forms (Forms) to ensure that

the samples were obtained and submitted by workers for analysis. The investigation established that supervisors routinely failed to ensure that the Forms were initiated or that workers adhered to Radiation Work Permit requirements to submit bioassay samples for analysis. EG&G initially identified this problem in February 1996, through its self-assessment process. However, these violations are of particular concern to DOE because the corrective actions that would have resolved the problem involving the failure to obtain samples were deferred multiple times and then subsequently cancelled. Moreover, bioassay sampling is your primary basis for assigning workers' internal dose, and missed samples can result in a worker's internal radiation dose not being fully assigned and documented. The bioassay sampling program takes on added importance since, as you acknowledged at the enforcement conference, the balance of your worker radiation protection program had not yet been fully implemented at the facility level subsequent to the effective date of 10 CFR 835 (January 1, 1996).

Section II of the enclosed PNOV describes violations associated with the failure to ensure that all occupational exposure received by individual workers during the year would be included and controlled to prevent workers from exceeding the annual radiation dose limits. These violations occurred because the most current, accurate laboratory data were not used to evaluate worker bioassay sample results. In fact, the Minimum Detectable Activity (MDA) values for some radionuclides, [], had not been updated since 1992 even though the detection capability of the bioassay laboratory had steadily improved. As a result of these practices, a situation occurred where positive dose for workers would not have been identified, evaluated and recorded. For example, you identified that for [a radionuclide], the most current, accurate laboratory data provided a detection capability that was six times lower than the historical MDA that was in use for dose assessment. By failing to use current, accurate data for calculating worker exposure to [a radionuclide], individual workers could have received internal doses up to [specified value] which would have been recorded as a zero dose in the workers records. DOE is concerned in that as early as 1995, laboratory and internal dosimetry personnel were aware of the need to update the data that were being used to evaluate and assess worker bioassay results and make dose assignment. While laboratory data for some radionuclides were updated in 1995, other radionuclide data were not revised. As well as [one radionuclide], other radionuclide data that were not updated included [specified radionuclides].

The multiple examples of the violations identified in Section I of the enclosed PNOV could be cited and assessed individually for civil penalties. However, in accordance with the criteria set forth in 10 CFR 820, Appendix A, (Enforcement Policy) the violations described in Section I of the enclosed PNOV have been classified in the aggregate as a Severity Level I problem to focus on the programmatic nature and significance of the problem. In classifying these violations at Severity Level I, DOE

escalated the severity level based on factors to be considered by DOE as stated in the Enforcement Policy. Specifically, DOE considered the past performance of the contractor in the administration of the bioassay program. The failure to ensure that the bioassay sampling program was properly implemented was demonstrated by multiple examples involving numerous workers. DOE also considered the fact that these violations continued to occur over an extended period of time even though the documentary evidence established that supervisory personnel were aware of the ongoing nature of the problem but repeatedly deferred the corrective actions necessary to correct the problem. The violations described in Section II of the PNOV have been classified as a Severity Level II problem.

To emphasize the need for timely identification, evaluation, and correction of nuclear safety deficiencies to assure the proper control of radiological work-related activities, I am issuing the enclosed Preliminary Notice of Violation and Proposed Imposition of Civil Penalties in the amount of \$112,500.

The base civil penalty for a Severity Level I problem is \$75,000. The adjustment factors set forth in the Enforcement Policy were considered and no adjustments were considered appropriate. Specifically, while the problem was initially identified by your self-assessment activities, the immediate actions to restore compliance were not taken. DOE considered whether the civil penalty should be escalated with respect to the failure to implement the corrective actions to resolve the problem; however, since this consideration formed part of the basis of the decision to classify the violations at Severity Level I, further escalation on this factor was considered inappropriate.

The base civil penalty for the violations described in Section II of the Notice is \$37,500. No adjustments to the base civil penalty for the violations in Section II of the Notice were considered appropriate in that the violations were not identified and reported to DOE. Further, while the corrective actions, when implemented, may be adequate to resolve this problem in the future, they were not implemented in a timely manner from when your personnel first became aware of the problem in 1995, and thus do not warrant mitigation.

You are required to respond to this letter and you should follow the instructions specified in the enclosed Notice when preparing your response to the Preliminary Notice of Violation. After reviewing your response to this Notice and the status of your corrective action plan, DOE will determine whether further action is necessary to ensure compliance with the applicable nuclear safety requirements.

Sincerely,



Peter N. Brush
Acting Assistant Secretary
Environment, Safety and Health

**PRELIMINARY NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTY**

EG&G Mound Applied Technologies
Mound Site
EA 97-10

As a result of a Department of Energy (DOE) evaluation of activities associated with the implementation of the Mound Internal Dosimetry Program, violations of DOE requirements were identified. In accordance with the "General Statement of Enforcement Policy," 10 CFR 820, Appendix A, DOE proposes to impose a civil penalty pursuant to Section 234A of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2282a., and 10 CFR 820. The particular violations and associated civil penalty are set forth below.

I. INADEQUATE BIOASSAY PROGRAM PARTICIPATION

- A. 10 CFR 830.120(c)(2)(i) requires that work be performed to established administrative controls using approved procedures.

10 CFR 835.1001(b) requires that where use of physical design features are demonstrated to be impractical, administrative controls and procedural requirements shall be used to maintain radiation exposures as low as reasonably achievable (ALARA).

Contrary to the above, work was not performed in accordance with established administrative controls using approved procedures, and administrative controls and procedural requirements to maintain personnel radiation ALARA were not implemented or adhered to in that:

1. Section 5.1.1 of Operation 302, Internal Dosimetry Operations, Issues 3 and 4 from MD-10432, *Mound Radiological Monitoring Program*, required that supervisors initiate a Bioassay Information Form for the workers that would be working under a radiological work permit (RWP) that required bioassay sampling.

Section 4.5, Issue 4 and Section 4.4, Issue 3 of Operation 302 further required that site management, supervision, and sponsors be responsible for initiation of Bioassay Information Forms and ensuring that they and the

personnel under them follow the instructions provided in Operation 302.

Section 6.4.10 of Operation 100, Radiological Work Permits, Issues 3 and 4 from Technical Manual MD-80043, *Radiological Work Requirements*, required that the job sponsor/leader ensure that all personnel expected to use the RWP have a Bioassay Information Form (BIF) completed and submitted to the Internal Dosimetry Coordinator.

Section 6.9.7 of Operation 90018, Radiological Work Permit Preparation, Issue 1 from Technical Manual MD-80036, *Radiological Operations Procedures*, required that the job sponsor/leader complete the BIF for individuals entering on a RWP that required bioassay and submit the completed forms to the Internal Dosimetry Coordinator.

However, from January 1, 1997, to May 15, 1997, supervisors/job sponsors did not submit required BIFs for at least 76 radiological workers entering work areas on RWPs that required bioassay, and thus bioassay samples were not obtained as required. Further, site management did not ensure that the radiological workers under them followed the instructions regarding bioassay program requirements.

2. Section 5.1.1 of Operation 302, Internal Dosimetry Operations, Issues 3 and 4 of MD-10432, *Mound Radiological Monitoring Program*, required Radiological Operations to specify Bioassay Sampling and isotopes(s) on RWPs for entry into areas listed in Table 1.

Section 5.1 of Operation 302, Issues 3 and 4, specified that the supervisor and worker each shared the responsibility of meeting the bioassay program requirements defined on the RWP.

Section 6.11.11 of Operation 100, Radiological Work Permits, Issues 3 and 4 of MD-80043, *Radiological Work Requirements*, required that the RWP user sign in on the RWP Personnel Roster, signifying that the RWP has been read, understood and will be complied with.

The following RWPs specified bioassay sampling and isotopes as part of the radiological protection requirements for work activities: (1) SW-008-97; (2) SW-010-97; (3) SW-012-97; (4) SW-013-97; (5) SW-021-97; (6) SW-023-97; (7) 38-016-97; (8) 38-029-97; (9) 38-034-97; (10) 38-089-96; (11) 38-094-96; (12) WD 13-97; (13) T-009-97; (14) T-011-97; (15) 88-004-97; (16) 88-006-97; (17) 88-007-97; (18) 88-010-97; and (19) 88-015-97.

However, from January 1, 1997, to May 15, 1997, at least 76 radiological

workers, who had signed in on a RWP Personnel Roster associated with at least one of the RWPs listed above indicating that the associated RWP requirements would be complied with, did not submit the bioassay samples as required by the RWPs.

- B. 10 CFR 830.120(c)(1)(iii), *Quality Improvement*, requires that items, services and processes that do not meet established requirements shall be identified, controlled, and corrected according to the importance of the problem and the work affected. Correction shall include identifying the causes of problems, and working to prevent recurrence.

Contrary to the above, following a self-assessment conducted by Mound in February 1996 that identified numerous instances in which workers were not submitting bioassay samples for internal exposure evaluation as required by the applicable Radiological Work Permit (RWP), comprehensive and effective corrective actions were not instituted in that:

1. In March 1996 in response to the February 1996 finding, a corrective action was adopted that required that work be stopped if bioassay requirements were not met. Implementation of stop work corrective action was repeatedly deferred.
2. In August 1996 another instance was identified in which personnel failed to submit bioassay samples as required. Although this finding demonstrated that worker bioassay program participation continued to be a problem, Mound made no changes to the corrective actions that were adopted in response to the February 1996 finding.
3. In December 1996 the stop work corrective action of March 1996 was canceled to be replaced with the alternative corrective action of reducing the number of instances where bioassay was required. This corrective action did not address the root problem of workers failing to participate in the bioassay program.
4. For the time period February through April 1997 a self-assessment performed by Mound showed that worker participation in the bioassay program, as evidenced by the failure to submit required bioassay samples, continued to be an issue, and that corrective actions taken by Mound were not adequate to prevent recurrence of the problem. Failures to submit bioassay samples involving approximately 20 RWPs affecting 108 workers were identified.

- C. 10 CFR 835.402(d) requires that internal dose evaluation programs shall be

adequate to demonstrate compliance with 10 CFR 835.202.

10 CFR 835.202(a) requires that the occupational exposure to general employees resulting from DOE activities shall be controlled so that annual occupational exposure limits are not exceeded.

10 CFR 835.202(b) states that all occupational exposure received during the current year shall be included when demonstrating compliance with 10 CFR 835.202(a).

Contrary to the above, the internal dose evaluation programs at the Mound Plant were not adequate to demonstrate compliance with 10 CFR 835.202 in that between January 1, 1997, and May 15, 1997, the internal dose evaluation programs did not consider occupational exposures for at least 76 radiological workers working under control of the RWP program because the workers failed to submit bioassay samples for analysis and dose evaluation as required by the RWP. The results from worker bioassay samples are used by Mound to evaluate and assign worker internal dose.

Collectively, these violations constitute a Severity Level I Violation.
Civil Penalty - \$75,000

II. INADEQUATE DOSE EVALUATION

10 CFR 835.402(d) requires that internal dose evaluation programs shall be adequate to demonstrate compliance with 10 CFR 835.202.

10 CFR 835.202(a) requires that the occupational exposure to general employees resulting from DOE activities shall be controlled so that annual occupational exposure limits are not exceeded.

10 CFR 835.202(b) requires that all occupational exposure received during the current year shall be included when demonstrating compliance with 10 CFR 835.202(a).

10 CFR 835.203(a) requires that the total effective dose equivalent during a year shall be determined by summing the effective dose equivalent from external exposures and the committed effective dose equivalent (CEDE) from intakes during the year.

10 CFR 835.702(a) requires that records be maintained to document doses received by all individuals for whom monitoring was required by 10 CFR 835.402, i.e., radiological workers who, under typical conditions, are likely to receive 100

mrem or more Committed Effective Dose Equivalent (CEDE) from all occupational radionuclide intakes in a year.

10 CFR 835.702(c)(1) and 835.702(c)(2) require that the records required by 10 CFR 835.702 shall be sufficient to evaluate compliance with 10 CFR 835.202 and be sufficient to provide dose information necessary to complete reports required by 10 CFR 835, Subpart I, *Reports to Individuals*.

Contrary to the above, the internal dose evaluation programs at the Mound Plant were not adequate to demonstrate compliance with the annual DOE exposure limits in that:

1. For 1996, all occupational exposures received from internal intakes of [a radionuclide] at the Mound Plant could not be included for purposes of evaluating compliance with DOE's annual exposure limits for workers in that [radionuclide] exposures up to [a specified value] would have been recorded as zero.
2. For 1996, the total effective dose equivalent for the year could not be determined by summing the effective dose equivalent from external exposures and the total CEDE from intakes during the year in that bioassay results up to [a specified value] would not have been assigned and thus not available for summing.
3. For 1996, adequate records of worker dose could not be maintained in that worker exposures to [a radionuclide] up to [a specified value] CEDE would not have been recorded as positive dose. For these workers with positive doses that would not have been recorded, records sufficient to evaluate compliance with 10 CFR 835.202 and records sufficient to provide dose information in annual reports to individuals could not be adequately maintained.

This is a Severity Level II Violation.
Civil Penalty - \$37,500

Pursuant to 10 CFR 820.24, EG&G Mound Applied Technologies is hereby required within 30 days of the date of this Notice and Proposed Imposition of Civil Penalty, to submit a written statement or explanation to the Director, Office of Enforcement and Investigation, Office of the Assistant Secretary for Environment, Safety and Health, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874-12903 Attention: Office of the Docketing Clerk, CXXI, Suite 305, with copies to the Manager,

DOE Ohio Field Office, to the Manager, Miamisburg Area Office, and to the cognizant DOE Secretarial Office for the facilities that are the subject of this Notice. This reply should be clearly marked as a "Reply to a Preliminary Notice of Violation and Proposed Civil Penalty" and should include for each violation: (1) admission or denial of the alleged violations and (2) the facts set forth above which are not correct and the reasons for the violations if admitted, and if denied, the reasons they are not correct.

Any request for remission or mitigation of civil penalties must be accompanied by a substantive justification demonstrating extenuating circumstances or other reasons why the assessed penalties should not be imposed in full. Unless the violations are denied, or remission or mitigation is requested within the 30 days after the issuance of the Preliminary Notice of Violation and Civil Penalty, EG&G shall pay the civil penalties totaling \$112,500 (imposed under Section 234a of the Act) by check, draft or money order payable to the Treasurer of the United States (Account Number 891099) mailed to the Director, Office of Enforcement and Investigation, U.S. Department of Energy. Should the contractor fail to answer within the time specified, an order imposing the civil penalty will be issued. If requesting mitigation of the proposed penalty, EG&G should address the adjustment factors described in Section VIII of 10 CFR 820, Appendix A.



Peter N. Brush
Acting Assistant Secretary
Environment, Safety and Health

Dated at Washington, D.C.
this 21st day of October 1997