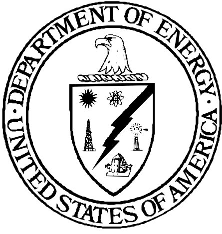

Department of Energy
Washington, DC 20585

August 14, 2001

Hermann Grunder, Ph.D.
[ ]
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439

EA-2001-05

Subject: Preliminary Notice of Violation

Dear Dr. Grunder:

This letter refers to the Department of Energy's (DOE) evaluation of the facts and circumstances concerning an uncontrolled release of [radioactive material] due to Laboratory management failures affecting nuclear safety at the Department's Argonne National Laboratory-East (ANL-E) site. The release occurred during decontamination and decommissioning work at Building 211, a former cyclotron facility, and resulted from the opening of two vials containing what was believed to be a total of 500 millicuries of [radioactive material]. This release of [radioactive material] resulted in measurable uptakes of radioactive material by seven workers. While the radiation doses are well within regulatory limits, the DOE is concerned about any nuclear activity that subjects a worker to an unexpected radiological exposure. Thus, the DOE Office of Price-Anderson Enforcement, in coordination with the DOE Argonne Area Office (AAO), conducted an onsite investigation of this event during May 8-9, 2001. The results of this investigation were provided to you on June 20, 2001; and an enforcement conference was held with members of your staff on July 16, 2001, to discuss these findings. The conference's summary report is enclosed.

Based on the DOE's investigation and information your staff provided during the enforcement conference, DOE has concluded that violations of 10 CFR 830, "Nuclear Safety Management," and 10 CFR 835, "Occupational Radiation Protection," likely occurred. I am therefore issuing the enclosed Preliminary Notice of Violation (PNOV) that describes the violations in detail.

Section I of the PNOV describes violations associated with the failure to properly identify the radiological hazards involved with opening vials containing [radioactive material] solutions. Specifically, ANL-E management's use of off-site radiation safety personnel who were inexperienced in working with [radioactive material]; failure to adequately develop and maintain Building 211's Authorization Basis; and not utilizing

available information regarding a previous [radioactive material] contamination event that could have prevented the worker contaminations.

Section II describes violations associated with work controls for stabilizing [radioactive material] solutions at Building 211. These include ANL-E management's failure to maintain several workers' respiratory protection qualifications, and failure to prepare an acceptable work plan for stabilizing [radioactive material] solutions in accordance with site requirements.

Section III of the PNOV describes violations in administrative controls to maintain radiation exposures as low as reasonably achievable. These are associated with Laboratory management failing to determine the limitations of off-site radiation safety personnel before they became involved in the planning of and carrying out the [radioactive material] solution stabilization, and by allowing a deficient work plan to be used that contributed to the [radioactive material] release.

The DOE is concerned that the hazards that created the event were not previously identified and incorporated into the work plan despite multiple opportunities to do so. Moreover, the radiation doses were low due to fortuitous circumstances in that the actual amount of [radioactive material] to be stabilized was actually about 100 times less than the quantity presumed. Therefore, the safety significance of each violation warranted a Severity Level II rating. No mitigation for self-identification or corrective actions was appropriate due to (1) the self-disclosing nature of the event, (2) the ineffectiveness of previous corrective actions resulting from the November 1999 enforcement action concerning work processes and quality improvement, (3) the University of Chicago's (University) failure to resolve chronic communication and cooperation issues affecting health physics support for nuclear work, and (4) to ensure that required management assessments of its nuclear activities were performed with regard to Building 211 activities. Furthermore, were it not for the University's statutory exemption from civil penalties, the DOE would have included a proposed Imposition of Civil Penalty in the amount of $165,000 ($55,000 for each Severity Level II violation) for this event.

The Department, however, recognizes the efforts of the Laboratory's Office of Environment, Safety and Health/Quality Assurance Oversight (EQO). This organization's function is viewed as an important part of the University's process to respond to or mitigate any future nuclear safety deficiencies. In this instance, the timeliness in developing corrective actions, and the thoroughness of the corrective actions addressing work planning processes, the reviewing of proposed work documents, and worker training and qualification issues, highlight the potential effectiveness of this organization. What was noticeably absent, though, was the same degree of attention to management oversight deficiencies within the line organizations directly responsible for the event. The Department also recognizes the Laboratory's senior management support of this organization and encourages continued, long-term support at this level in order for the University to better develop an institutionalized program for addressing nuclear safety issues.

During the enforcement conference, Laboratory senior staff described the implementation of a new Integrated Safety Management System assessment process. This was presented as a system of self-assessments performed by each Laboratory division and independent assessments of each division performed by the EQO group. In addition, a structured program of management assessments is being implemented and is to be completed by each Associate Laboratory Director by October 31, 2001. You are, therefore, further required to provide to the AAO a summary briefing on and copies of the EQO and management assessments of the Technology Development Division no later than November 30, 2001.

You are required to respond to this letter and follow the instructions specified in the enclosed PNOV when preparing your response. Your response should document any additional specific actions taken to date. Corrective actions should also be tracked in the DOE Noncompliance Tracking System (NTS). You should enter into the NTS (1) any actions that have been or will be taken to prevent recurrence and (2) the target and completion dates of such actions. After reviewing your response to the PNOV, including any corrective actions entered into the NTS as well as the results of any other assessment or inspection, DOE will determine whether further enforcement action is necessary to ensure compliance with DOE nuclear safety requirements.

Sincerely,

R. Keith Christopher
Director
Office of Price-Anderson Enforcement

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Enclosures:
Preliminary Notice of Violation
Enforcement Conference Summary
List of Attendees

cc: S. Cary, EH-1
M. Zacchero, EH-1
R. Day, OE
S. Zobel, OE
D. Stadler, EH-2
F. Russo, EH-3
R. Jones, EH-5
J. Roberson, EM-1
H. Himpler, EM-5, DOE PAAA Coordinator
J. Decker, SC-1
R. Schwartz, SC-83, DOE PAAA Coordinator
M. Gunn, DOE-CH
J. Drago, DOE-CH PAAA Coordinator
R. Wunderlich, DOE-AAO
C. Zook, AAO-DOE PAAA Coordinator
A. Cohen, ANL-E PAAA Coordinator
R. Azzaro, DNFSB
Docket Clerk, OE

Preliminary Notice of Violation

University of Chicago
Argonne National Laboratory-East

EA-2001-05

During a Department of Energy (DOE) investigation conducted on May 8-9, 2001, violations of DOE nuclear safety requirements were identified. In accordance with the "General Statement of Enforcement Policy," 10 CFR 820, Appendix A, DOE is issuing this Preliminary Notice of Violation. The particular violations are set forth below.

I. Hazard Identification

A. 10 CFR 830.120(c)(1)(ii) states, in part, that "[p]ersonnel shall be…qualified to ensure they are capable of performing their assigned work."

Contrary to the above, personnel were not qualified to ensure they were capable of performing their assigned work in that, at the time of the October 26, 2000, event, assigned health physics (HP) personnel responsible for controlling worker radiation exposure did not know the well-documented hazards and characteristics associated with [radioactive material] and, therefore, were unable to safely plan and conduct work, thus causing the event.

B. 10 CFR 830.120(c)(1)(iii) states, in part, that "[i]tem characteristics, process implementation, and other quality-related information shall be reviewed…to identify…services and processes needing improvement."

Contrary to the above, item characteristics, process implementation, and other quality-related information were not reviewed to identify services and processes needing improvement in that, between February 1997 and October 2000, the [radioactive material] hazard associated with [radioactive material] was not identified as follows–

1. The executive summary of the March 1998 "Building 211 Cyclotron Characterization Survey Report" states "[t]he Senior Cave contains a variety of radioactive sources which must be removed from the facility, most notably a shielded 0.5 Ci [radioactive material] source." However, though the Characterization Report did not specifically identify a [radioactive material]

hazard, this quantity of [radioactive material] did

not cause Technology Development Division (TD) and affiliated personnel to assess any [radioactive material]-related hazards.

2. The Auditable Safety Analysis (ASA) and the Health and Safety Plan (HASP) comprise Building 211's Authorization Basis.

   a. The ASA identifies the [radioactive material] sources in the Senior Cave, identifies as Task 3 the removal of these sources, and specifically addresses the chemical hazard associated with stabilizing the [radioactive material] solutions. However, [radioactive material] hazards were not addressed and this document was not kept current to reflect new activities or unidentified and unanalyzed hazards.

   b. The HASP lists 12 Task Descriptions to complete the Building 211 decontamination and decommissioning (D&D) effort and the associated hazards and control methodologies for each task. However, none of these tasks addressed the treatment, packaging, or removal of legacy waste contained in the Senior Cave, nor was this document kept current to reflect new activities or unidentified and unanalyzed hazards.

3. On two separate occasions prior to the October 26, 2000, 2R container repackaging, Laboratory HP personnel met with TD personnel to discuss the stabilization of the [radioactive material] solutions and provided TD personnel with documentation describing a February 1997 Senior Cave contamination event. This documentation stated a worker's contamination was due to [radioactive material] decay products from that same 2R container. However, this information was not taken in account in planning the [radioactive material] solution stabilization.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - $55,000 (exempted)

II. Work Control

A. 10 CFR 830.120(c)(1)(ii) states, in part, that "[p]ersonnel shall be provided continuing training to ensure that job proficiency is maintained."

   Contrary to the above, personnel were not provided continuing training to ensure that job proficiency was maintained in that, on October 26, 2000, the TD project manager's respiratory training for supervisors of respiratory protection users was expired, and the TD Project Specialist's "Respiratory Protection – Air Purifying Respirators" training, annual medical certification to use a respirator, and annual respirator fit test were lapsed. However, these were required by the site Environment, Safety and Health (ES&H) Manual, section 12.2, "Respiratory

Protection," to be current due to these individuals' work activities.

B. 10 CFR 830.120(c)(1)(iv) states, in part, that "[d]ocuments shall be prepared, reviewed, [and] approved…to prescribe processes…."

   Contrary to the above, documents were not prepared, reviewed, and approved to prescribe processes in that–

   1. The October 26, 2000, job evolution used "Packaging Plan for 2-R Containers and Paint Can Located in 55 Gallon Drum." However, this packaging plan was not subjected to a formal review and approval process as required by AP-1.1, "Document Preparation and Control Procedure," dated December 1998, and did not meet the format and content requirements stated in AP-1.1, section 5.3.2, for first-time activities.

   2. The radiological work permit (RWP) for the October 26, 2000, job evolution was prepared in accordance with a previously approved, alternate RWP procedure. However, the RWP's preparation did not adhere to the requirements of the September 25, 2000, revision to section 5.24 of the ES&H Manual. Section 5.24.3 of the revision states "[t]his section is applicable to activities by ANL employees, non-ANL employees, facility users, subcontractors and/or service contractors."

C. 10 CFR 830.120(c)(2)(i) states, in part, that "[w]ork shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means."

   Contrary to the above, work was not performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means in that–

   1. The Radiation Work Permit Request associated with the October 26, 2000, [radioactive material] solution stabilization did not require an ALARA (as low as reasonably achievable) review. However, ES&H Manual section 5.21, "ALARA Program Description," subsection 5.21.7, "Division/Department ALARA Review Triggers," requires an ALARA review for "[a]ctivities with the potential for dose and/or contamination being performed for the first time in a radiological area by division/department."

   2. The October 26, 2000,[radioactive material] solution stabilization was performed in a basement alcove of Building 211 where a ventilated plastic containment was constructed. However, this containment design was not subjected to the requirements of ES&H Manual section 5.18, "Containment Requirements for Dispersible Radioactive Material," nor was section 5.18 used to determine the most reasonable containment approach for the work to

be performed.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - $55,000 (exempted)

III. Maintaining Exposures ALARA

10 CFR 835.1001(a) states, in part, that "[m]easures shall be taken to maintain radiation exposures in controlled areas ALARA through physical design features and administrative control."

Contrary to the above, measures were not taken to maintain radiation exposures in controlled areas ALARA through physical design features and administrative control in that, between February 1997 and October 2000–

A. Technology Development D&D management failed to assess the limitations of the assigned HP staff and thereby failed to administratively control worker exposures to radiation in accordance with ALARA practices.

B. The packaging plan and associated RWP, that directed the stabilization of the [radioactive material] solutions, were not adequate to ensure radiation exposures would be ALARA as follows:

   1. The air mover used to depressurize the alcove's plastic containment, with the intention of minimizing the escape of contamination, transported [radioactive material] from the containment to the area just outside the alcove.

   2. The personal protective equipment specified on the October 25, 2000, RWP required the use of full-face respirators with activated carbon filter cartridges, yet assigned HP staff who prepared the RWP did not recognize the filters would not impede [radioactive material] and its decay products.

   3. The October 25, 2000, RWP did not require the use of extremity--finger--dosimeters despite both Technology Development D&D and assigned HP personnel knowing the [radioactive material] vials would be handled without the use of tongs or other similar devices.

   4. The RWP did not provide instructions regarding emergency response nor did assigned HP personnel to know how to respond to an emergency situation to maintain radiation exposures ALARA once the [radioactive material] vials were opened.

Collectively, these violations constitute a Severity Level II problem.
Civil Penalty - $55,000 (exempted)

Pursuant to the provisions of 10 CFR 820.24, the University of Chicago (University) is hereby required within 30 days of the date of this Preliminary Notice of Violation to submit a written statement or explanation to the Director, Office of Price-Anderson Enforcement, Attention: Office of the Docketing Clerk, P.O. Box 2225, Germantown, MD 20875-2225. Copies should also be sent to the Manager, DOE Argonne Area Office, and to the Cognizant Secretarial Offices at Headquarters for the facility that is

the subject of this Notice. This reply should be clearly marked as a “Reply to a

Preliminary Notice of Violation" and should include the following for each violation: (1) admission or denial of the alleged violation, (2) any facts set forth that are not correct, and (3) the reasons for the violation if admitted, or the basis for denial if denied. Corrective actions that have been or will be taken to avoid any future violation should be delineated with target and completion dates in DOE's Noncompliance Tracking System. In the event the violations set forth in the Preliminary Notice of Violation are admitted, this Notice will constitute a Final Notice of Violation in compliance with the requirements of 10 CFR 820.25. Should the University fail to answer within the time specified, DOE will issue an Order imposing the violations.

R. Keith Christopher
Director
Office of Price-Anderson Enforcement

Dated at Washington, DC,
this 14th day of August 2001

Enforcement Conference Summary

The Department of Energy's (DOE) Office of Price-Anderson Enforcement (OE) held an Enforcement Conference with University of Chicago (UC), personnel on July 16, 2001, in Germantown, Maryland, to discuss the circumstances of the event described in the OE Investigation Summary Report in addition to the UC's proposed and implemented corrective actions pertaining to the event. Mr. Keith Christopher, OE Director, began the conference by explaining this meeting would be an opportunity for the UC to make its case for enforcement mitigation. Mr. Christopher further stated that material provided by the UC would be incorporated into the docket file.

Mr. Samuel Golden, [ ], University of Chicago, spoke briefly stating that the University's Board of Governors had reviewed the investigation summary report and took the report's findings seriously.

Dr. Beverly Hartline, [ ], Argonne National Laboratory - East, began her presentation by acknowledging and agreeing with DOE's findings in the summary report. This was followed by an overview of the event and the corrective actions that were developed to resolve the associated deficiencies. Dr. Hartline concluded the presentation by stating the [radioactive material] exposures were fortuitously low due to a record keeping error that indicated the [radioactive material] concentration was much greater than it actually was. Dr. Hartline and her staff then answered several questions concerning the corrective actions.

Mr. Christopher stated that the UC's presentation and other information would be taken into consideration for DOE's enforcement deliberations. The conference was then adjourned.

July 16, 2001

University of Chicago

Building 211 [Radioactive Material] Release

Enforcement Conference List of Attendees

Office of Price-Anderson Enforcement

R. Keith Christopher, Director
Richard Day, Enforcement Officer
Steven Zobel, Enforcement Officer

Office of Environmental Management

Henry Himpler, PAAA Coordinator
Tom Evans, EM-5
Bob Fleming, EM-34
Shirley Frush, EM-34

Office of Science

Ray Schwartz, PAAA Coordinator
Stan Staten, SC-10
Van Nguyen, SC-83
Barry Parks, SC-83

Argonne National Laboratory

Beverly Hartline, [ ]
Adam Cohen, [ ]
Yoon Chang, [ ]

University of Chicago

Samuel Golden, [ ]

Argonne Area Office

Bob Wunderlich, Manager
A. Creig Zook, PAAA Coordinator
Andrew Gabel, Environmental Projects

Chicago Operations Office

Joe Drago, PAAA Coordinator