June 4, 1998

Mr. W. John Denson
[ ]
Lockheed Martin Idaho Technologies Company
P.O. Box 1625, MS 3989
Idaho Falls, ID 83415-3898

EA 98-04

Subject: Preliminary Notice of Violation and Proposed Imposition of Civil Penalty - $125,000 (NTS-ID--LITC-TRA-1997-0003)

Dear Mr. Denson:

This letter refers to the Department of Energy's (DOE) investigation of the facts and circumstances concerning the release of radioactive material at the Idaho National Engineering and Environmental Laboratory (INEEL). Specifically, on September 17, 1997, radioactive [material] was uncontrollably released to Test Reactor Area [building] from [radioactive material] processing activities taking place in [a Hot Cell]. The result of this release was contamination of the entire interior of [the building] and the contamination of six workers inside [the building]. Two companies were involved in this event: Lockheed Martin Idaho Technologies Company (LMITCO) and MAC Isotopes, L.L.C. (MAC) (now International Isotopes Idaho, Inc.). LMITCO is the site prime contractor to DOE while MAC functions as a subcontractor to LMITCO but performs radioisotope production for commercial distribution in a privatized capacity. While the isotope production work was performed by MAC, LMITCO was responsible for ensuring implementation and adherence to all applicable radiological and quality assurance procedures.

The DOE's Office of Enforcement and Investigation initiated an investigation of this event in October 1997. Based on a review of relevant facility documentation, and discussions with involved personnel at the TRA and DOE's Idaho Operations Office personnel during January 13-14, 1998, DOE has concluded that violations of 10 CFR 830, "Nuclear Safety Management," and 10 CFR 835, "Occupational Radiation Protection," occurred; these violations are described in the enclosed Preliminary Notice of Violation (PNOV).

The enclosed PNOV describes deficient radiological work control processes, including work document preparation and review, as well as As Low As Reasonably Achievable planning and review. The execution of these tasks for the September 17, 1997, work on Hot Cell Manipulator [ ] failed to ensure that the scope of the maintenance work

was defined, and the associated radiological hazards were identified and communicated to involved workers and management of LMITCO and MAC. Additionally, the [radioactive material] release was caused by multiple failures to follow written INEEL procedures by LMITCO and MAC personnel, and deficiencies in radiological control training including the lack of knowledge by the radiological control staff of the characteristics of the radioactive material involved [ ].

Although the consequences of the [radioactive material] release resulted in low doses to the workers in [the building], the recovery of [the building] from the contamination event required approximately three weeks. DOE is concerned about these violations because they are not isolated instances, and reflect multiple failures across several organizations and organizational levels through a continuing trend of failure to adhere to regulatory and INEEL requirements for radiological work control. DOE is particularly concerned that similar issues had been identified to LMITCO as a result of earlier radiological and work control deficiencies associated with decommissioning activities at the Waste Calcining Facility in July 1996 as described in Docket Number EA-97-01 and in a number of other events including a January 13, 1997, incident resulting in unplanned radiation exposures to two workers in a filter cell at the New Waste Calcining Facility. Furthermore, the ensuing corrective actions developed by LMITCO in response to the events at the waste calcining facilities, if fully implemented as committed, should have prevented the work control deficiencies that led to the release and personnel contaminations exhibited at [the building] on September 17, 1997.

Therefore, in accordance with 10 CFR 820, "Procedural Rules for DOE Nuclear Activities," Appendix A, the violations associated with the September 17, 1997, contamination incident have been classified as Severity Level II violations.

To emphasize the need for assuring the proper control of work-related activities, and to ensure that effective actions are taken to preclude a recurrence with potentially more serious consequences, I am issuing the enclosed Preliminary Notice of Violation and Proposed Imposition of Civil Penalty in the amount of $125,000. In accordance with the Enforcement Policy in effect at the time of this event, the base civil penalty for each of the five Severity Level II violations at a facility such as TRA-632 is $25,000. The escalation and mitigation factors set forth in the Enforcement Policy were considered and no adjustment was considered appropriate. Specifically, the violations were identified only as a result of an event that caused multiple personnel contaminations and shutdown of the facility rather than through proactive efforts to identify and correct work planning and control problems occurring during the course of work. DOE considered escalating the civil penalty because of the failure to fully implement corrective actions from previous events with similar underlying causes that, if effectively implemented, would likely have precluded this problem from occurring. For example, corrective actions proposed for a previous case that resulted in a civil penalty (EA-97-01) for failures to implement adequate radiological work controls included, among other things, training of all radiological control technicians (RCTs) and RCT foremen on the importance of being aware of the full scope of the job and the

monitoring throughout the job to ensure changing conditions were promptly identified. However, since DOE considered this issue in assignment of the five Severity Level II violations, further escalation on this factor was considered inappropriate.

You are required to respond to this letter and you should follow the instructions specified in the enclosed PNOV when preparing your response. Your response should document any additional specific actions taken to date and any additional actions planned to prevent recurrence. After reviewing your response to this Notice, DOE will determine whether further action is necessary to ensure compliance with applicable nuclear safety requirements.

Sincerely,

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

CERTIFIED MAIL
RECEIPT REQUESTED

Enclosures:
Preliminary Notice of Violation and
Proposed Imposition of Civil Penalty
Enforcement Conference Summary
Enforcement Conference Attendance List

cc: M. Zacchero, EH-1
K. Christopher, EH-10
S. Zobel, EH-10
B. Revsin-Watson, EH-10
G. Podonsky, EH-2
O. Pearson, EH-3
J. Fitzgerald, EH-5
L. Miller, NE-40
J. Wilcynski, DOE-ID
W. Bergholz, DOE-ID
S. Sommers, DOE-ID
K. Whitham, DOE-ID
S. Forcey, LMITCO PAAA Coordinator
J. Lieberman, NRC
D. Thompson, DNFSB
Docket Clerk, EH-10

PRELIMINARY NOTICE OF VIOLATION
and
PROPOSED IMPOSITION OF CIVIL PENALTY
NTS-ID--LITC-TRA-1997-0003

Lockheed Martin Idaho Technologies Company
Idaho National Engineering and Environmental Laboratory
Test Reactor Area

EA 98-04

As a result of a Department of Energy (DOE) evaluation of activities associated with the uncontrolled release of radioactive [material] to the Test Reactor Area [building] that occurred on September 17, 1997, violations of DOE nuclear safety requirements were identified. In accordance with 10 CFR 820, Appendix A, "General Statement of Enforcement Policy," DOE proposes to impose civil penalties 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 penalties are set forth below.

I. 10 CFR 830.120(c)(2)(i) requires that work shall be performed to established administrative controls using approved instructions and procedures.

Contrary to the above, work was not performed to established administrative controls using approved instructions and procedures in that

A. Procedure MCP-2798, "Maintenance Work Control," Revision 3, dated July 1, 1997:

1. Section 4.2.1.2 stated that "where a written work order is required, enter or verify that the appropriate information has been entered into the Computerized Maintenance Management System fields (see Appendix B)." Appendix B, "Work Package Checklist," identifies the Work Plan Detail Section as "the procedure to be used for performing the work." However, Work Order BI031, that described work to be performed on [a Manipulator] on September 17, 1997, contained no provision for partial withdrawal and *in situ* repair of [the Manipulator]. Furthermore,

Work Orders BI025 and BI031 for July 16, September 15, and September 17, 1997, were inadequate for maintenance on Manipulators [ ] in that the work orders did not contain instructions for removal of radioactively contaminated manipulator sleeves.

2. Section 4.2.2., Note 1, states that in developing work packages, "If general intent compliance is required, identify this requirement before the first action step. If not identified as a general intent Work Order, it is assumed that the work will be conducted as a step-by-step procedural compliance without deviation." However, on September 15, 1997, the removal and repair of [the Manipulator] was initiated using a partially completed and initialed work order (BI025) that had already been used on July 16, 1997. Therefore, step-by-step compliance could not be assured.

3. Section 4.3.1.2 states "Job Supervisor, Foreman, Technical Lead: Review maintenance work to ensure that all necessary documentation and required reviews and approvals are included, and the job can be performed as planned." However, on September 17, 1997, maintenance work was initiated to partially withdraw [a Manipulator] to effect cable repairs, although management and radiological control for the job knew that Work Order BI031 did not contain steps for partial manipulator withdrawal and *in situ* repair of [a Manipulator].

4. Section 4.3.2 Note stated that "If a maintenance task cannot be executed in accordance with written work instructions, then stop the maintenance activity and notify the foreman." Work on [a Manipulator] on July 16, 1997, could not be executed in accordance with written instructions. However, procedure MCP-2798 was inadequate in that guidance as to the final disposition of an incomplete work order package was not specified. As a result, the same copy of Work Order BI025 was reused on September 15, 1997. It was not possible, then, for the maintenance crew to comply with written check-offs that were required by the first 17 steps of Work Order BI025.

B. Procedure MCP-3003, "Performing Pre-Job Briefings and Post-Job Reviews," Revision 0, dated June 2, 1997, Section 4.1.4.2.1 required that when a formal pre-job briefing was performed, document the briefing and attach Form 434.15#, "Pre-Job Attendance Record," to the work documentation records. Section 4.1.5 stated "Employee: Attend pre-job briefing." However, for the September 17, 1997, pre-job briefing for Work Order BI031, attendance lists

were not maintained as required on Form 434.15#. In addition, one radiological control technician, who provided support to the job-coverage radiological control technician, did not attend the pre-job briefing.

These violations constitute a Severity Level II problem.
Civil Penalty - $25,000

II. 10 CFR 835.903 requires the training program for radiological control technicians to include procedures specific to the site or facility where a technician is assigned. The level of training required shall be commensurate with the technician's assignment.

Contrary to the above, the level of training required was not commensurate with the technician's assignment in that:

A. The radiological control technician assigned to work at [the building] on September 17, 1997, to support Work Order BI031 had not received training specific to the [ ] hot cell facility. The technician had not received any on-the-job training regarding manipulator repair, had not participated in or observed a manipulator removal, and had not been informed of the behavior and physical and radiological characteristics of the [radioactive material] source term within [a Hot Cell].

B. The "Qualification Standard, TRA Radiological Control Technician," dated January 5, 1995, that was used as a check list for radiological control technician training in the [building] area, did not address hot cell manipulator withdrawal, repair, or insertion, and did not emphasize the need for familiarity with the radiological and special physical properties of the radionuclides of interest.

These violations constitute a Severity Level II problem.
Civil Penalty - $25,000

III. 10 CFR 835.1001(b) requires that for specific activities 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, procedures were not followed or were inadequate to maintain personnel exposures ALARA in that:

A. Procedure MCP-91, "ALARA Program and Implementation," Revision 5, dated June 25, 1997, Section 4.5.4 requires that the facility ALARA Committee

perform a review of Work Order BI031. Furthermore, Section 4.5.4.C states "Request a Facility ALARA Committee review for specific jobs when radiological work activity is infrequent or a first-time operation as stated in Section 4.2.7.2 - 4.2.7.4." Section 4.2.7.2 requires an ALARA Committee review of work activities with a high potential for unknown radiological consequences that included conditions of probable high levels of contamination where dose rates and contamination levels could increase rapidly; and Section 4.2.7.3 addresses radiological work activities that were infrequent or are first time activities where dose rates and contamination were not easy to characterize. However, Work Order BI031 for September 17, 1997, was not submitted to the ALARA Committee for evaluation of the radiological hazards and consequences of the activity.

B. Radiological Work Permit No. 978046, Revision 0, identified the limiting conditions that voided the permit; however, a contingency plan for what to do should a limiting condition of the permit be reached was not identified on the permit nor discussed in the pre-job briefing. Instead, on September 17, 1997, when it became known that a limiting condition of the permit had been exceeded, i.e., the dose rate measured [a specified amount], rather than stop work, personnel immediately began to reinsert the manipulator arm back into the hot cell. Subsequent activities resulted in the uncontrolled release of radioactive [material to the building].

C. Procedure MCP-7, Sections 4.6.2 and 4.7.1, requires those areas where various radiological conditions may be located be identified on the radiological work permit. Radiological Work Permit No. 978046, Revision 0, stated for radiation location, "see current survey;" but the radiological work permit did not provide the identity (i.e., identification number) of the survey that should have been consulted nor does procedure MCP-7 stipulate alternate methods to be utilized for relating locations of the radiological hazards to the worker.

D. Procedure MCP-354, "Placement of Air Samplers and Monitors," Revision 0, dated November 30, 1995, provides the following:

1. Section 4.1.1 states "Radiological Support Engineer/Radiological Control Technician: Determine CAM/Air Sampler Requirements. Obtain the data from the airborne hazard evaluation of the area," i.e., the airborne hazard index. However, prior to the [radioactive material] release on September 17, 1997, an airborne hazard index had not been determined for the [radioactive material] processing activities being conducted in the [ ] hot cells.

2. Section 4.1.2 states "Radiological Support Engineer/Radiological Control Technician: Make recommendations [for air sampling] based on the likely

release concentration from the evaluation." The methodology to be used in determining the airborne hazard index is provided in Step 4.2 of MCP-354. Appendix B of MCP-354 provided release fraction parameters to be used for calculating the air hazard index. However, the release fraction parameter needed to compute the airborne hazard index for dispersible [radioactive material] was not provided.

E. Procedure MCP-357, "Job-Specific Air Sampling/Monitoring," Revision 2, dated August 19, 1996, Section 4.2.1.B requires job-specific air sampling be performed for work in areas with contamination levels greater than 100,000 disintegrations per minute. Section 4.2.1.D requires job-specific air sampling be performed when opening a potentially contaminated system with unknown or suspected high contamination levels that has the potential to create airborne radioactivity. However, job-specific air sampling was not performed on September 17, 1997, even though Radiological Work Permit No. 978046 states the actual contamination levels equal [a specified amount].

F. The ALARA review performed on September 16, 1997, in accordance with criteria set forth in ALARA Review Form 441.10#, Revision 2, dated April 1997 was inadequate in that (1) the review validated that the work to be performed was in accordance with the requirements set forth in Work Order BI031, (2) that Work Order BI031 contained the required contingency plan, and (3) that a dry run or a walk-down had been performed prior to the beginning of the work. However, the work order did not describe the partial removal and *in situ* repair, the work order did not provide a contingency plan, and no walk-down or dry run had been performed prior to the beginning of the work.

G. ALARA Review Form 441.10# requires completion of Form # 441.47#, "Radiological Control - Pre-Job 'Planning' Checklist," as a prerequisite for initiation of the ALARA review form. However, Form # 441.47# was not completed in conjunction with the September 16, 1997, ALARA Review Form 441.10# that was completed for the September 17, 1997, work order.

These violations constitute a Severity Level II problem.
Civil Penalty - $25,000

IV. 10 CFR 835.404(a) requires that techniques used for radioactive contamination control be adequate to ensure compliance with 10 CFR 835.404(c)(2).

10 CFR 835.404(c)(2) requires that any area in which contamination values exceed removable beta/gamma contamination of 1,000 disintegrations per minute be controlled in a manner commensurate with the physical characteristics of the contaminant.

Contrary to the above, radioactive contamination control techniques were not adequate in that on September 17, 1997, after insertion of [the Manipulator] into [the Hot Cell], contamination control techniques implemented by Radiological Control did not encompass known data regarding the physical characteristics of the radioactive [material], i.e., the [material] being readily dispersible. As a result, [the radioactive material] was released into the entire [ ] Facility when the plastic containment containing the [material], in a quantity sufficient to generate a radiation field of [specified amount], was removed from [the Manipulator].

This violation constitutes a Severity Level II problem.
Civil Penalty - $25,000

V. 10 CFR 835.401(a)(3) requires that monitoring of areas shall be performed to detect changes in radiological conditions in the work place.

Contrary to the above, surveys to characterize the radiological status of the partially reinserted arm were not performed prior to the sleeve's removal. The plastic sleeve surrounding [the manipulator] contained radioactive contamination measuring [a specified amount].

This violation constitutes a Severity Level II problem.
Civil Penalty - $25,000

Pursuant to the provisions of 10 CFR Part 820, LMITCO is hereby required within 30 days of the date of this Notice to submit a written statement or explanation to the Director, Office of Enforcement and Investigation, Attention: Office of the Docketing Clerk, EH-10, P.O. Box 2225, Germantown, MD 20875-2225, with copies to the Manager, DOE, Idaho Operations Office, and to the Cognizant DOE Secretarial Office 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 for each violation: (1) admission or denial of the alleged violation; (2) the steps that will be taken to address the corrective action issues identified in DOE's Investigation Summary Report for this incident; and (3) the date when full compliance will be achieved and corrective actions completed.

eter N. Brush
Acting Assistant Secretary

Environment, Safety and Health

Dated at Washington, DC,
this 4th day of June 1998