September 21, 1998

Dr. Robert Van Hook, Jr.
[ ]
Lockheed Martin Energy Systems, Inc.
P.O. Box 2009
Oak Ridge, TN 37831-8001

EA 98-07

Subject: Preliminary Notice of Violation
NTS-ORO--LMES-LMESGEN-1997-0001

Dear Dr. Van Hook:

This letter refers to the Department of Energy's (DOE) evaluation of the facts and circumstances associated with deficiencies in the administration of the MK-Ferguson of Oak Ridge Company (MK-F) bioassay program, during the time period between 1996-1997 when it was a subcontractor to Lockheed Martin Energy Systems (LMES), the integrating contractor at the Oak Ridge site. The deficiencies in the bioassay program resulted in the failure, on multiple occasions over a period of close to two years, to identify significant intakes of radioactive material by two workers. The exposures occurred in 1995 when MK-F was the prime contractor for construction and construction management operations for the DOE Oak Ridge Operations Office (DOE-ORO). One worker exposure was determined to be [a specified exposure] committed dose equivalent (CDE) ([a specified exposure] committed effective dose equivalent (CEDE)) to bone surfaces while the other worker exposure was determined to be [a specified exposure] CDE ([a specified exposure] CEDE) to bone surfaces.

Based on our evaluation of these matters, DOE has concluded that violations of DOE's nuclear safety requirements involving 10 CFR 835 (Occupational Radiation Protection) likely occurred. An enforcement conference was held on July 9, 1998, with both LMES and MK-F, to discuss the circumstances surrounding these matters, their safety significance and the status of corrective actions. An Enforcement Conference Summary Report is enclosed.

These violations, which are described in the enclosed Preliminary Notice of Violation (PNOV), involve, among other things, the failure to implement an internal dose evaluation program to ensure that all occupational radiation exposure received by workers was considered when determining compliance with DOE's annual exposure limits. The elements of the internal dosimetry program had been identified as necessary and appropriate by MK-F with the concurrence of LMES. These violations are of particular concern to DOE because, for a period of almost two years, numerous

opportunities existed to identify that significant intakes to the workers had occurred. Further, after identifying problems with the bioassay program in October 1996, i.e., that approximately 100 positive bioassay results had been identified as positive that had previously been considered negative, results for these two workers were administratively invalidated without further evidence that uptakes had not occurred. These repeated failures resulted in additional 10 CFR 835 deficiencies in the areas of record keeping and issuance of accurate worker annual exposure reports. Other deficiencies identified during the investigation included (1) missed bioassay sampling, (2) failure to initiate special follow-up bioassay monitoring as required, (3) failures to notify workers of their exposures in a timely manner, and (4) failures to implement work restrictions in accordance with written procedures.

The violations described in the enclosed PNOV would normally be classified as Severity Level II violations for which civil penalties could be assessed. However, DOE has considered the comprehensive contractor response to resolve deficiencies in the site bioassay program initiated by LMES and MK-F once the problem was identified. DOE notes that all corrective actions were already completed at the time of the enforcement conference. Therefore, DOE has concluded it is appropriate to reduce these violations to Severity Level III with no civil penalty.

DOE has concluded that, in the factual circumstances of this case, it is appropriate to hold accountable both the prime contractor and the subcontractor. In particular, it was highly relevant that the subcontractor was the immediate past prime contractor and therefore had direct responsibility for the proper transitioning of the program to its successor.

Pursuant to 10 CFR 820.24 (Preliminary Notice of Violation), you are required to respond to this letter and Notice and should follow the instructions set forth in the enclosed Notice when preparing your response. Unless the violations are denied within 30 days after release of the Notice, it shall become a Final Notice of Violation.

Sincerely,

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

PRELIMINARY NOTICE OF VIOLATION

Lockheed Martin Energy Systems
Oak Ridge Facilities

EA 98-07

As a result of a Department of Energy (DOE) evaluation of activities associated with the implementation of the MK-Ferguson of Oak Ridge Company (MK-F), a subcontractor to Lockheed Martin Energy Systems (LMES) Internal Dosimetry Program, violations of DOE requirements were identified. The Internal Dosimetry Program deficiencies defined by these violations occurred between January 1, 1996, and October 1, 1997, and involved two workers designated Worker No.1 and Worker No. 5. These violations are described below in accordance with 10 CFR 820, Appendix A, AGeneral Statement of Enforcement Policy.@

I. 10 CFR 835.402(d) requires that internal dose evaluation programs shall be adequate to demonstrate compliance with 10 CFR 835.202, the DOE annual exposure limits.

10 CFR 835.702(a) requires that records shall 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 normal conditions, are likely to receive 100 mrem or more CEDE from all occupational radionuclides intakes in a year.

10 CFR 835.702(c)(1) states that individual monitoring records required by 10 CFR 835.702 shall be sufficient to evaluate compliance with 10 CFR 835.202, i.e., DOE annual exposure limits.

10 CFR 835.702(c)(2) states that individual monitoring records required by 10 CFR 835.702 shall be sufficient to provide dose information necessary to complete reports required by 10 CFR 835, Subpart I, *Reports to Individuals.*

10 CFR 835.801(c) requires that each DOE-contractor-operated site or facility shall, on an annual basis, provide a radiation dose report to each individual monitored during the year at that site or facility in accordance with 10 CFR 835.402, i.e., radiological workers who, under typical conditions, are likely to receive 100 mrem or more CEDE.

Contrary to the above, the internal dose evaluation programs of MK-F were not adequate to demonstrate compliance with the annual DOE exposure limits and record keeping requirements in that

A. Although multiple, positive urinalysis results were obtained throughout the calendar year 1996, indicating that Workers No. 1 and No. 5 had experienced intakes of [radioactive material], MK-F failed to recognize that internal intakes by the two workers had occurred. As a consequence, the internal dose evaluation program as implemented, was not adequate to ensure that personnel intakes of radioactive material were identified and evaluated in a manner to be able to ensure that all dose control requirements and annual dose limits specified by 10 CFR 835 were met.

B. For 1996, adequate records of worker dose were not maintained nor were accurate, annual reports of radiation exposures to workers provided in that positive bioassay results for Workers No. 1 and No. 5 were treated as zero until December 1996. As a consequence, internal MK-F records, as well as accounts of worker radiation exposures to DOE and to individual workers in March 1996 and March 1997, failed to report doses received from internal intakes of [radioactive material] for these two workers.

This is a Severity Level III violation.

II. 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, adequate administrative controls and procedural requirements to maintain personnel radiation exposures ALARA for employees of MK-F were not developed or not implemented in that

A. *MK-Ferguson Technical Basis for Internal Dosimetry* (TBD) dated September 4, 1995:

1. Part I: *Special Bioassay Program,* p. 2, states that Aa special bioassay program will be established for radiation workers when an intake through the skin, a wound, or ingestion capable of delivering a dose of 100 mrem CEDE may have occurred or when bioassay measurement results are significantly different than expected.@ However, positive, routine bioassay sample results obtained for two workers on February 29, 1996, and May 29, 1996, had results significantly different than expected in that the bioassay results indicated that internal intakes of [radioactive material] in excess of 100 mrem CEDE had occurred. Yet a special bioassay program was not established.

2. Part III: *Bioassay Frequency and Type*, p. 28, states that the MK-F bioassay program focuses primarily on urinalysis. AThe urinalysis program uses two 24-hour urine samples each quarter.@ However, one worker with previous multiple positive urinalysis results, including a February 29, 1996, sample, failed to submit a bioassay sample for the second quarter 1996, while a second worker with a prior positive bioassay result failed to submit a bioassay sample for the first quarter 1996.

3. Part III: *Annual Report to Workers*, p. 29, states that Aon an annual basis and in accordance with 10 CFR 835, MK-F issues a report to each radiation worker containing that individual=s radiation exposure for the year.@ However, radiation exposure reports issued for Workers No. 1 and No. 5 in 1996 for the1995 calendar year were incomplete in that doses resulting from internal intakes of radioactive material [ ] were not reported.

III. Document 3A- ES&H Procedure No.4.123, *Internal Dosimetry*, Revision 0, dated May 12,1994. This document was in effect when the intakes of radioactive material occurred in 1995 and during the first nine months of 1996 when positive bioassay samples for the two workers continued to be detected by the laboratory.

A. Section 5.1.4 states that AMK-F employees, including subcontractors= workers, who participate in the bioassay program submit their urinalysis samples on a quarterly basis.@ However, during 1996, Worker No. 1 failed to submit a bioassay sample for the second quarter of 1996, and Worker No. 5 failed to submit a bioassay sample for the first quarter of 1996.

B. Section 5.1.5 states that Apersonnel shall participate in follow-up bioassay monitoring when their routine bioassay results indicate an intake in the current year with a CEDE of 100 mrem or more.@ However, Workers No. 1 and No. 5 had multiple positive bioassay results in 1996 and follow-up bioassay monitoring was not initiated. Further, when potential intakes of [radioactive material] in excess of 100 mrem CEDE were identified in October of 1996, more than one year after the intakes occurred, follow-up bioassay sampling was still not initiated for these individuals until additional routine bioassays samples also provided positive results.

C. Section 5.1.6 states that Apersonnel shall be notified promptly of positive bioassay results and the results of dose assessments and subsequent refinements.@ During 1996 Workers No. 1 and No. 5 had positive bioassay results on February 29, 1996, and May 29, 1996, and were not promptly notified of these results in that notifications were not provided until 1998.

D. Section 5.2.5 states that Abioassay monitoring of MK-F employees and those of MK-F subcontractors who enter radiological areas where an employee is likely to receive intakes, during the calendar year, resulting in a CEDE greater than 100 mrem is performed on a quarterly basis....@ Section 5.2.9 states that Aeach employee who leaves the site without turning in his/her urine sample will be restricted from all future access to radiological areas and the access bar code on his/her identification card will be voided until written authorization from the MK-F Health Physics Manager is obtained.@ However, bioassay samples were not obtained from Worker No. 1 during the second quarter of 1996, and bioassay samples were not obtained from Worker No. 5 during the first quarter of 1996. Yet these workers were not restricted from entering radiological areas.

E. Section 5.2.13 states that a Apreliminary assessment of any intakes detected shall be conducted prior to permitting an employee to return to radiological work.@ However, during 1996, positive intakes of [radioactive material] were detected during conduct of the routine bioassay program on February 29, 1996, and May 29, 1996, without preliminary assessment of the intakes being performed prior to permitting the employees to return to radiological work.

F. Section 5.5.2.2 states that Aany employee or individual [at X-10] whose internal monitoring results correspond to a detected CEDE of 100 mrem shall be required to submit additional urine samples for testing.@ However, bioassay results detected on February 29, 1996, and May 29, 1996, from Workers No. 1 and No. 5 were indicative of intakes in excess of 100 mrem,

but additional urine samples were not required from these workers for testing.

This is a Severity Level III violation.
Pursuant to 10 CFR 820.24, (Preliminary Notice of Violation) Lockheed Martin Energy Systems is required within 30 days of the date of this Notice to submit a reply to the Director, Office of Enforcement and Investigation, P.O. Box 2225, Germantown, MD 20874-2225, Attention: Office of the Docketing Clerk, with copies to the Manager, DOE Oak Ridge Operations Office, and to the congnizant DOE Secretarial Office for the facilities and activities that are the subject of this Notice. Based on the information presented at the Enforcement Conference on July 9, 1998, which included (1) the admission of the alleged violations, (2) enumeration of the corrective actions that are being taken, and (3) the fact that all proposed corrective actions had been implemented as of July 9, 1998, a confirmation of the oral admission and agreements, as set forth in 10 CFR 820.24(d) will be sufficient to meet this requirement.

Unless the violations are denied within 30 days after the issuance of this Preliminary Notice of Violation in accordance with the requirements set forth in 10 CFR 820.24(c), this Notice shall become a Final Notice of Violation.

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

Dated at Washington, D. C.
this 21st day of September 1998