

July 30, 1999

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

Subject: Enforcement Letter

Dear Dr. Van Hook:

This letter refers to the Department of Energy's (DOE) evaluation of the facts and circumstances concerning the unexpected uptakes of a radioactive material, [ ], by employees at the Y-12 Plant subsequent to the June 8, 1998, restart of [ ] operations [ ]. These uptakes occurred at Y-12 Buildings 9212 and 9215 and involved 55 workers over a period of approximately five months. Radiation doses received by these workers ranged from 115 to 1124 millirem committed effective dose equivalent. During April 6-7, 1999, DOE conducted an investigation of these uptakes to determine what, if any, noncompliances with nuclear safety regulations may have occurred. A copy of the investigation summary report is enclosed.

Based on a review of relevant documentation and discussions with Y-12 Radiological Control (RadCon) personnel, it was determined the unexpected worker exposures occurred due to weaknesses in Y-12's air sampling and internal dosimetry programs that led to the failure to maintain the radiological exposures of plant workers as low as reasonably achievable. For example, while workers' breathing zone (BZ) air samples contained elevated amounts of radioactive material, timely responses were not taken to identify the source(s) and extent of the airborne [radioactive material]. This occurred because the elevated worker BZ air samples' significance was not fully appreciated since more traditional methods of air monitoring had not indicated a problem existed. Consequently, approximately 70 days elapsed before special bioassay sampling was initiated to confirm whether or not a worker believed to have the highest potential for inhalation of airborne [radioactive material] had actually been exposed. A subsequent increased scope of special bioassay sampling ultimately determined that 55 workers received unplanned exposures to airborne [radioactive material], albeit with resulting doses below regulatory limits.

In addition to the BZ air sampling issue, the Y-12 RadCon organization had previously developed a mathematical model for estimating worker dose due to [radioactive material] uptake. This model incorporated several nonconservative assumptions that, in retrospect, significantly underestimated the radiological dose workers actually received during June through August 1998. At the time of DOE's investigation, Y-12 had not yet determined the path that would be taken to review and revise historical doses to

personnel as a result of deficiencies identified by the use of its nonconservative dose assessment model. This issue, however, remains an area of interest and concern to DOE.

Upon identification of uptakes of [radioactive material] by [Y-12] workers, corrective action taken by Y-12 management led to the identification of the higher dose type of [radioactive material] in Buildings 9212 and 9215 processes. Extensive special bioassay sampling of radiation workers led to the identification of 55 out of 125 workers who received inadvertent doses from insoluble [radioactive material]. Other comprehensive corrective actions were initiated to limit further intakes of insoluble [radioactive material] through respirator and BZ air sampler usage until the extent of the hazard was determined. In addition, access to the operating areas of the buildings was limited; extensive building decontamination was performed; and a bioassay program was implemented for insoluble [radioactive material] for those activities that posed a higher risk of personnel exposure. DOE has decided, based on the nature of these corrective actions, to defer enforcement action with regard to determination of Lockheed-Martin Energy System's compliance with 10 CFR 835, "Occupational Radiation Protection," requirements at this time.

Please contact Mr. Steven Zobel of my staff at (301) 903-0100 should you want to discuss this matter further.

Sincerely,



R. Keith Christopher  
Director  
Office of Enforcement and Investigation

Enclosure:  
Investigation Summary Report

cc: D. Michaels, EH-1  
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