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Subject: Blue Alert: Inadequate Procedure Leads to Excess Nuclide Inventory

Title: Inadequate Procedure Leads to Nuclide Inventory In Excess of DOE-STD-1027-92 Guidelines at a Non-Permitted Storage Area

Identifier: Formal Lessons Learned Report, 1999-KO-SNL-0004

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Lessons Learned Statement: The procedure and controls were in place to make sure that the workers were protected from dose rate exposure. However, even when a procedure is followed, if there is a failure to integrate all requirements (an authorization basis requirement, in this case), risk assessment is a valuable tool for identifying problems that may be present when compliance alone is inadequate. For that reason, it is essential that "Lessons Learned" be disseminated in a meaningful way.

Discussion of Activities: In the third week of July 1997, the manager of a nuclear facility was reviewing estimates of radioactive materials inventory in waste drums that were in a storage building several hundred feet away from his nuclear facility. The "characterization" of those drums had recently been completed and compiled in a short report. The facility manager became suspicious that the estimated levels may have been conservatively high, but if accurate, then, those drums, by virtue of their actinide contents, should not be stored outside a nuclear facility. He suspected that controls on radioactive inventory at the storage building were not adequate to monitor total inventory at that storage location in accordance with DOE Guidelines. However, the method for estimating the contents was very conservative and there was uncertainty about whether the guidelines in the standard had, in fact, been exceeded. Immediate actions were taken to alleviate the situation, namely: a) three "suspect" drums from the storage building were moved back into the nuclear facility and b) the manager initiated an investigation to determine how to evaluate the radioactive material "roll up" conditions.

Analysis: The suspect drums were those whose estimated inventory could "collectively" have exceeded DOE Standard 1027-92 Hazard Category 3 threshold limits at the storage building, primarily due to small quantities of actinides. The storage building is not a nuclear facility and is not authorized for Hazard Category 3 levels of radioactive materials. The investigation concluded two months later that the guidelines had, indeed, been exceeded. It was determined that there was a failure to integrate authorization basis requirements of DOE Standard STD 1027-92 into the implementation of Technical Work Documents. The requirements were identified throughout the process, however, they were not integrated at the level of the work performed. Facility owners, managers, and workers were not cognizant of the need to identify the authorization basis compliance hazards as well as radiological hazards associated with the movement and storage of radioactive material/waste for a non-nuclear facility. Facility owners/managers did not receive inventory data in a timely manner. This prevented the facility manager from evaluating the effect(s) of relocating waste in Building 6596 with regard to specific limits identified in DOE STD-1027-92 for a non-nuclear facility and the potential for violating the

authorization basis. While there was a Preliminary Hazard Assessment (PHA) in place at the time of the event, the hazard associated with regulatory non-compliance was not identified. This in turn resulted in the failure to identify appropriate hazard controls. The radiation protection safety review was insufficient to address this hazard. No process or awareness training was in place to make the workers moving the radioactive material aware that the receiving facility had specific radionuclide threshold limits.

Recommended Actions: Establish a formal Work Planning Process to integrate Technical Work Documents, standards, and requirements. Utilize the Work Planning Process to identify and assess hazards associated with the storage of radionuclides and develop a Standard Operating Procedure (SOP) to monitor the roll-up inventory of radionuclides for Department-controlled locations, which the manager has approved for storage of radionuclides. The purpose of the SOP will be to ensure that the roll-up of the radionuclide inventory at those department-controlled storage locations does not exceed the authorization basis, as defined in DOE STD 1027-92 (or subsequent revision of this standard). [Additionally, as an interim control, the manager immediately prohibited the addition of new packages containing actinides to the inventory at the Bldg. 6596 Chapel storage location and ordered the removal of packages known to have large hazard Category 3 ratios as a result of the characterization effort, which is still in progress. No individual package with a Hazard Category 3 ratio > 0.3 will be allowed in the Chapel and the sum of the all Hazard Category 3 ratios in the Chapel will be maintained at less than 1.0. These interim controls shall remain in place until a complete inventory and baseline is established for the Chapel using the RadTrack software, see item 04 below.] Establish awareness training that links the hazard classification to posting, labeling, storing, and moving packages that contain radioactive material/waste. Utilize the RadTrack software to create real-time inventories at facilities. Provide "Lessons Learned" reports to groups and organizations with similar hazards. Perform a Primary Hazard Screen (PHS) and Hazards Analysis (HA) for the chapel. The HA, unlike the previous PHA, addresses the requirements of std 1027 and requires administrative controls such as an SOP to ensure total inventory stays below the Category 3 levels.

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References: Occurrence Report ALO-KO-SNL-9000-1997-0009

Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of the SNL Lessons Learned Program, please inform Chris Tolendino at (505) 844-5996 of any action taken within your area, as a response to this report, or of any technical inaccuracies you have found. Your feedback is important and appreciated.