Project Hanford Lessons Learned

Title: Incorrect Assumption Leads to Criticality Nonconformance

Date: October 5, 2005

Identifier: 2005-RL-HNF-0035

Lessons Learned Summary:
Assumptions should never be made when requirements are not clearly understood. When unfamiliar situations or uncertainty arise work should be stopped and the appropriate individuals should be contacted for guidance or resolution. Workers must communicate to supervision when procedural steps are missed or misinterpreted, and must request that work be stopped when the conditions warrant.

Facilities changing from processing operations to decontamination and decommissioning activities need to ensure workers who are carried over from previous operations are proficient in carrying out new assignments.

Discussion of Activities:
On the evening of July 13, 2005, at the Plutonium Reclamation Facility (PRF), eleven Isolated Transport Containers (ITCs) were loaded with potential plutonium bearing glove box debris. Prior to performing the work the Person in Charge (PIC) evaluated the debris for classification and noticed that some of the debris had a sheen over the surface of the material. The PIC believed the sheen was a fixative used to fix contamination during decommissioning and decontamination (D&D) activities. The fixative contains water and glycerin. While the water evaporates, the glycerin remains. Discussion regarding classification of the debris occurred between the PIC and other workers but not with management or the Criticality Safety Representative (CSR). Following the discussion with the other workers the PIC classified the wastes as Type 2A and directed the containers be labeled with a Fissile Material Label showing an H/X of >20 and a plutonium mass of 150 grams. The ITCs were then placed in storage according to the Type 2A classification requirements.

On July 18, 2005, during a surveillance of the PRF, it was observed that all 11 ITCs located in Room 42 were labeled the same, showing a plutonium mass value of 150-grams. This did not appear normal to the surveillant, who then discussed the storage array with the PIC and the CSR. This discussion led to the discovery of a Criticality Safety Nonconformance.

Analysis:
The PFP had been performing Plutonium processing operations for many years. Over the past few years the facility has undergone a transition from limited processing operations to more Decontamination and Decommissioning (D&D) work. Even with limited operations, many of the waste streams and materials were consistent with earlier processing activities. Additionally, many of the supervisors involved with processing operations have carried over in the facility to manage the D&D work activities.

As a result, some of the waste streams from D&D activities may not be as obvious to those with past history as to their classification. The wording in the Criticality Prevention Specification still referred to "wet processing" activities. While it was clear to the CSR that wet processing included any processing activity (e.g., D&D) that would create wet waste, it was not as apparent to an individual experienced in previous processing evolutions.

Although believing the debris did not fit into either of the classifications, the PIC proceeded to classify the wastes as Type 2A. Both types (Type 1A or Type 2A) refer to wastes from "wet processing" and the PIC thought "wet processing" referred only to plutonium processing and not D&D activities. Based upon the observed sheen the PIC decided that the waste was from D&D activities and not from "wet processing," i.e., plutonium processing. The PIC determined the wastes were from "dry processes" and were uncounted, so classified the waste as moderated Type 2A wastes. In an attempt to be conservative and alert others of the "wet wastes," the PIC directed the containers to be labeled with a Fissile Material Label showing an H/X of >20 and a plutonium mass of 150 grams without the benefit of an NDA assay. Workers installed the labels as directed, even though they felt this was not consistent with the fissile material labeling procedure.

All of the glovebox debris loaded in the containers was classified as moderated Type 2A waste, when in actuality 3 of the 11 containers should have been classified as Type 1A waste. Additionally, all containers were improperly labeled with a Fissile Material Label showing an H/X of >20 and a Plutonium mass of 150 grams without the benefit of an NDA assay. The three improperly categorized ITC's were spaced at less than the 36 inch spacing requirement. While type 2A waste containers have no spacing requirement, containers with Type 1A waste have a spacing requirement of 36 inches. This event resulted in loss of the spacing control representing the loss of double contingency against a criticality event. A Potential Criticality Nonconformance Response Checklist was completed and it was determined that the loss of spacing controls could only be asserted as single contingency.

The assigned PIC was experienced with plutonium processing but had not worked with glovebox activities for several months. Unfamiliarity with D&D debris led to questions regarding whether the apparent dampness on the debris was due to plutonium processing or D&D activities. These issues were not discussed in the pre-job meeting nor were they discussed with the CSR prior to the work process.

Recommended Actions:
Facilities that transition from processing operations to decontamination and decommissioning work should review worker proficiency in dealing with new and/or unfamiliar processing requirements.

Criticality safety training should incorporate Conduct of Operations topics (e.g., technical inquisitiveness, conservative decision making, proper communications, stopping when signs are indicated) to maintain continued focus.

Estimated Savings/Cost Avoidance: Not evaluated

Priority Descriptor: BLUE/Information

Work / Functions: Criticality, CONOPS-Procedure Adherence, Material Handling and Storage

Hanford Functional Categories: Causal Factors - A3B2C02 - Human Performance LTA; A5B1C05 - Communications LTA; A6B2C01 - Training Deficiency - Practice or "hands-on" experience LTA.

Hazard: Personal Injury/Exposure-Radiation/Contamination

ISM Core Function: Develop and Implement Controls, Perform Work Within Controls

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