

## Pyrophoric Event in a LANL Plutonium Facility Lab (A Housekeeping Day Event)

**Lesson ID:** LANL-2017-428 (Source: User Submitted)

**Originating Organization or Contracting Company:** Los Alamos National Laboratory (LANL)

**Date:** 8/22/2017

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**Statement:** On the day of the event the Los Alamos National Lab (LANL) Plutonium Facility paused operations to support a Housekeeping Day. One of the Tenant Groups engaged in what they believed to be low hazard work. Under the Housekeeping effort they decided to discard unneeded equipment from one of their laboratories. All of the equipment/components being discarded were assumed to be chemically inert. The event was initiated when the team decided to empty the contents of several tube shaped metal vessels thought to have contained activated charcoal. The vessels actually contained an active metal/metal-hydride powder. When exposed to air it triggered a pyrophoric reaction, resulting in a metal fire and a burn to one of the worker's hands. The fire was extinguished by the Worker with a Class D Fire Extinguisher.

Multiple factors contributed to the onset of the incident, the most prominent of which are discussed below:

**Labeling and Hazard Identification:** The metal hydride beds were legacy material and had not been used for over ten years. The vessels were not clearly marked. The vessels were once components of a larger legacy system, once separated from the parent system, proper identification of the internal hazard could possibly have prevented the incident from occurring.

**Questioning Attitude:** This incident exemplifies the importance of a questioning attitude. Multiple opportunities were present where a questioning attitude could have prevented this incident. These opportunities existed in the management of the organization, and in the work planning, work authorization, and work execution phases of the task.

**Identification of Error Precursors:** The team of workers and their First Line Manager (FLM) did not have a predefined scope of work for their part in the Housekeeping day. They decided to clean up their lab (housekeep it) by discarding items and equipment they no longer needed. They assumed the vessel contents were non-hazardous, based on their process knowledge and beliefs. Multiple error precursors were present leading up to the incident (departure from normal routine, unexpected equipment condition, assumptions, etc.). Timely identification and discussion of these error precursors by either the workers on the floor or line management, could have prevented the incident.

**Latent Organizational Weaknesses:** Management had allowed the vessels to be stored in the lab for over ten years, without the proper permanent labelling to communicate the hazards associated with the material contained within. A management team with a healthy questioning attitude and solid "what if" mindset could have seen these items as needing to be properly labeled, and/or properly discarded, back when the contents were well known.

**Discussion:** On Wednesday, April 19, 2017 at approximately 09:38, at Technical Area 55, there was a small pyrophoric event (heat and a small amount of smoke) caused by a chemical reaction involving materials in a small container that was opened for disposal. One employee sustained burns to four fingers (blistering). The reaction was extinguished with a Met-L-X fire extinguisher and the employee was transported for medical treatment.

### Analysis:

#### Recommended Actions:

1. Provide operations specific Incident Command training to Operations Center Supervisors
2. Develop a Recovery Plan for post Hazardous Material Response Scene and execute
3. Work with Lessons Learned Coordinator to develop a Lessons Learned on this Pyrophoric event with regard to:
  - \* Labeling hazardous material container and process sub-system
  - \* Management expectations with regard to handling/repackaging material without full understanding of what material is
  - \* Management expectations ensuring containers are properly labeled and controlled
4. Perform an Extent of Condition walk down to identify and label all containers and sub-systems containing hazardous material
5. Develop Housekeeping Guidelines

**Savings:** N/A

**Keywords:** HOUSEKEEPING, PYROPHORIC, hazardous materials, fire

**Hazard(s):** Fire / Smoke / NFPA, Personal Injury / Exposure - Other

**ISM Code(s):** Analyze Hazards, Define Work, Develop / Implement Controls

**Work Function(s):** Conduct of Operations - Work Planning, Material - Material Storage, Occupational Safety & Health - General, Packaging & Transportation

**References:** \* PFITS 2017-871 \* ORPS NA-LASO-LANL-TA55-2017-0015

**Priority Descriptor:** Yellow / Caution

