Date: Wed, 31 Oct 2001 15:42:07 -0800
From: PHMC_Lessons_Learned@rl.gov
Subject: Green Alert- Aerosol Can Explodes

This lessons learned alert was developed by Bechtel Nevada (BN) for distribution to other DOE sites and facilities for utilization. Information in this report is accurate to the best of our knowledge. Please contact Dr. Dawn Starrett to provide feedback for any action taken within your area in response to this alert, or of any technical inaccuracies you have found. Your feedback is appreciated.

Title: Green Alert- Aerosol Can Explodes in Flammables Cabinet
Date: September 6, 2001
Identifier: 2001-NV-NLVBN-036

Lessons Learned Statement: Controlling potential hazards can reduce risk of injury that occurs as a result of unexpected failures.

Discussion: An employee noticed an apparent solvent odor upon returning to work after a three-day weekend, no source of the odor was found during a cursory search of the room that afternoon. The next morning, the smell was still in evidence, and a more thorough search located the source in a test cell. A small flammables cabinet inside the test cell was coated with a dark gray substance, dry for the most part, but with a powdery residual that would transfer to anything that contacted it. The remnants of an aerosol can were located on the lower shelf, split into two pieces. A manager and two workers retrieved several pieces of the label from the cabinet in order to identify the contents of the can. The manager determined that the can had contained a colloidal graphite spray (Aerodag G distributed by Acheson Industries). He reviewed the Material Safety Data Sheet (MSDS) for the product and contacted safety and industrial hygiene professionals to determine if any required personal protective equipment (PPE) or special precautions were needed for cleanup personnel. The recommended course of action was to clean the other chemical containers in the cabinet and transfer them to another flammables cabinet. After emptying the affected cabinet, the door was left open to further dissipate the fumes before cleaning the cabinet. With adequate ventilation, the cabinet was then cleaned without the need for respiratory PPE. Rubber gloves were used. Waste disposal personnel were contacted and they determined that the cleanup residuals did not have to be treated as hazardous waste, assuming that the cleanup could be accomplished without the use of chlorinated solvents.

Analysis: The test cell had been inactive for several weeks, and no personnel had worked in the area since the last operation. Personnel from the interior of the building occasionally enter the area to retrieve stored equipment and electronic parts, but it is not unusual for a full day to go by with no one entering the area. The cabinet was inspected on Thursday morning during an Industrial Hygiene assessment, and the can was intact at that time. The explosion had to occur some time between Thursday morning and Tuesday morning when the odor was detected. The cause of the can explosion is not known. The aerosol can was properly contained in a flammables cabinet and had not been subjected to temperature extremes. The manager reviewed the MSDS for potential hazards and consulted with appropriate personnel to determine the

course of action for cleanup and disposal. The risk of injury and exposure from the exploding can was reduced because controls were put into place and followed. An investigation determined that the Aerodag G aerosol can had been brought to the facility by personnel who were working in the test cell during system buildup more than a year earlier. Although no other instances of can explosions were noted, personnel who were queried mentioned that the can may have been several years old. There may have been corrosion on the interior surfaces of the can over a period of years that eventually led to the rupture of the can. The nearly perfect circumferential break line on the upper portion of the can supports this theory.

Recommended Actions: Inspect aerosol cans (especially those from Aerodag G) for signs of corrosion. Discard those that show signs of corrosion or excessive age according to local procedures. This incident should be used as a positive example of effective use of Integrated Safety Management principles and included in safety meeting briefings.

Priority Descriptor: Green
Work Function: Occupational Safety and Health- General
Hazard: Personal Injury/Exposure - Toxic Material
ISM Core Function: Develop and Implement Controls
Originator: Michael Carlisle; (702) 295-3065
Contact: Dr. Dawn Starrett; (702) 295-4297; Fax: 295-0674; e-mail: starred@nv.doe.gov
DC: Jeff Gordon
UCNI Reviewing Official: Jeff Gordon
Key Words: aerosol can, exploding, flammable cabinet, cleanup
References: N/A

FOLLOW-UP ACTIONS: Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please contact the originator of significant actions taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.