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Subject: Yellow Alert: Chemical Reaction Starts Crate Fire

Title: Chemical Reaction Starts Crate Fire

Identifier: 1998-NVO-BN-007
Date: December 3, 1998

Lessons Learned Statements: Warranty information needs to be kept with chemical products until they are properly discarded.

Discussion of Activities: A security police officer on routine patrol spotted a small fire in a wood crate. The officer immediately called the fire department, and then he attempted to control the fire using a portable dry-chemical fire extinguisher. Fire department personnel subsequently extinguished the fire. A construction employee was contacted at home and confirmed the crate contained a versi-foam product. Management expressed a concern that application of the foam product underground could cause a similar ignition, and an independent investigation was initiated.

Analysis: Versi-foam systems, components A and B, when blended together create an exothermic reaction if more than 4 inches of product is dispensed in a given application. If the heat from the reaction does not dissipate, the product can ignite. In this incident, a combination of unmixed and mixed products almost 18 inches deep was applied continuously until all Versi-foam component cylinders were empty. The layers of the products cured unevenly and generated heat for approximately 60 hours before igniting the crate.

As Versi-foam cylinders are removed from the shipping container, the shipping containers are tossed into a dumpster as ordinary trash. The warranty date is only stamped on the shipping container, not on the cylinder. If the cylinders are not emptied on first application, the cylinders are stored for the next job with no indication as to warranty date. When the unmixed product was discharged into the crate, it should have been treated as a spill and appropriate absorbent materials such as vermiculite or sawdust should have been applied as specified in the material safety data sheet.

A job hazard analysis was not performed and a special work permit was not generated for the task of emptying the versi-foam cylinders. Although technical support from the Environmental Compliance Office (ECO) has been provided in the past for similar activity, the ECO was not appraised that a wooden crate was to be used in this work assignment.

Recommended Actions: The cylinder should always be kept with the shipping container (cradle to grave), or the warranty date needs to be transferred to the cylinder if the shipping container is discarded. This will facilitate review of the product precautions for training purposes. Adequate training should be provided and appropriate safety documentation (i.e, a job hazard analysis) for all new tasks

should be developed and reviewed. The material safety data sheet must be reviewed by personnel before they work with chemicals. The appropriate safety representative should be involved in all matters where potential hazards may exist.

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Authorized Derivative Classifier: Jeff Gordon

Reviewing Official: Jeff Gordon

Priority Descriptor: Yellow Alert

DOE Functional Category: Occupational Safety and Health

User-Defined Category: Training and Qualification

Keywords: Fire, Versi-Foam, chemical, exothermic reaction, Material Safety Data Sheets, job hazard analysis.

References: BN Incident Report BN-0018

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 action(s) taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.