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From: Meredith Brown <racer@lanl.gov>
Subject: Yellow Alert: **De-mister Canister Overpressurization**

The following Bechtel Jacobs Company, LLC Lesson Learned Yellow Alert is being distributed to communicate lessons learned from a recent incident at the East Tennessee Technology Park (ETTP). If you have any questions, please contact Joanne Schutt at (423)574-1258, e-mail = s6u@ornl.gov.

Cynthia M. Eubanks
Performance/Quality Assurance Org.
Bechtel Jacobs Company, LLC
Phone: (423)576-7763; Pager = 873-6968
Fax: (423)574-5398

TITLE: De-mister Canister Overpressurization

IDENTIFIER: Y-1998-OR-BJCETTP-0601
DATE: June 4, 1998

LESSONS LEARNED STATEMENT: A configuration control process should be implemented by operations organizations to ensure changes are properly identified, developed, reviewed, approved, scheduled, implemented, and documented and that all procedures, drawings, designs, training, etc., affected by the change are updated accordingly.

DISCUSSION: During a pumping operation that required pumping of non-hazardous, low-level waste from a 55-gallon drum to a vacuum tanker, the de-mister device attached to the vacuum tanker was inadvertently overpressurized. The de-mister device is a canister that contains a filter designed to remove organic vapors or mist produced when pulling a vacuum on the receiving tanker. This overpressurization caused the de-mister filter, end cap, and filter-retaining devices to be propelled from the de-mister housing. Parts discharged from the de-mister filter housing were estimated to have traveled between 25 and 40 feet from the housing. There were no injuries as a result of this incident. However, the potential for someone being struck by the propelled components made the event a near-miss incident.

ANALYSIS: The direct cause of this incident was that the vacuum tanker pump exhaust end caps, used to keep rainwater and dirt out of the vacuum tanker de-mister, were not removed prior to operating the tanker's vacuum pump.

The East Tennessee Technology Park (ETTP) Waste Transportation and Storage Operations Organization (WTSO) was preparing to bulk liquid non-hazardous low-level waste from 55-gallon drums to a vacuum loading tanker trailer. The tanker is equipped with a vacuum pump used to keep the air pressure in the tank lower than the air pressure on the surface of the liquid to be transferred inside the tanker. When the tanker loading valve is opened and the attached transfer hose is submerged into a liquid, the air pressure on the surface of the liquid forces the liquid through the hose and into the tanker. When this event occurred, the vacuum pump was

being used to remove air from the tanker to lower the pressure. The transfer hose had not been placed into a liquid waste. The operator had started the vacuum pump and had engaged the clutch to begin removing air from the tanker, when he noticed the pump motor bog down. Immediately upon noticing the pump motor bogging down the operator disengaged the clutch. The de-mister filter and associated retaining devices were discharged from the de-mister filter housing while the pump motor clutch was engaged. The pump was shut down and an inspection revealed that end caps (cam-lock fittings with end caps) placed on the pumps exhaust system to keep rain and moisture from the system had not been removed. These caps obstructed the openings where pump exhaust normally vents from the system. When the pump was activated pressure built in the exhaust system, causing the de-mister filter, end cap, and retaining parts to be discharged from the de-mister filter housing.

The root cause of the incident was no configuration control process (administrative control) in place when the de-mister was added to the vacuum tanker. After the vacuum tanker had been in use, a de-mister was placed on the exhaust side of the vacuum tanker pump to remove moisture and minimize unpleasant odors emitted from the tank. The pump discharge opening was moved to an elevation above worker's heads. No configuration change control process was in place to ensure that changes (modifications) to the vacuum tanker were identified, developed, technically reviewed, approved, scheduled, implemented, validated, and documented and that all command media elements (procedures, drawings, reports, designs, training, etc.) affected by the change were identified and updated according to an approved change control process. Vacuum tanker truck operators are trained per Module 15678, "Vacuum Tanker Pre-Operations" and Module 15679, "Vacuum Tank Operations." Operator Aid 97-WTSO-08, "Vacuum Truck Operational Information and Guidelines" a "step by step" checklist for operating the vacuum tanker is posted at the control area for the tanker's pump. Neither the training material nor the operator aid listed removal of exhaust system end caps as a pre-operational work step.

RESOLUTION/RECOMMENDED ACTIONS: The training module and operator aid for operating the vacuum tanker were revised to include the pre-operational step "remove cover from pump exhaust pipe." These changes were communicated to appropriate personnel. The operator aid was also changed to a non-record reference checklist to be used by personnel operating the tanker (as steps are completed they are checked off by the operator). When the de-mister was added to the vacuum tanker truck, WTSO had not implemented a configuration control process. A "Configuration Change Control" procedure has been implemented by WTSO, listing vacuum tanker trucks as a configuration control item. Had the de-mister been added to the vacuum tanker while the configuration control process was in effect, it is likely that work controls would have included a pre-operational step to verify exhaust end cap removal prior to operating the vacuum tanker pump.

ORIGINATOR: Bechtel Jacobs Company, LLC; E. J. Lavender, (423)576-4620, Performance/Quality Assurance
VALIDATOR: S. A. Guy, (423)576-6414
CONTACT: Joanne E. Schutt, (423)574-1248
NAME OF AUTHORIZED DERIVATIVE CLASSIFIER: Gerald B Boroughs
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KEYWORDS: vacuum, pressure, end caps, cam-lock, de-mister, filter, near-miss, pump
DOE FUNCTIONAL CATEGORY: Configuration Management, Occupational Safety and Health
BJC FUNCTIONAL CATEGORY: CM - Configuration Management, SH - Safety and Health
HAZARD CATEGORY: Pressurized Systems
WORK ACTIVITY: Material/Material Handling, Facility Equipment
REFERENCES: Occurrence Report: ORO--LMES-K25GENLAN-1998-0006, Critique
Summary: CR-98-015 "Inadvertent Pressurization of Vacuum Tanker Pump Exhaust System"

FOLLOW-UP ACTION: Information in this report is accurate to the best of our knowledge. As means of measuring the effectiveness of this report please notify Joanne E. Schutt at (423)574-1248, e-mail at s6u@ornl.gov of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.

Meredith Brown
ESH Lessons Learned Program Manager
505 667 0604