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From: Meredith Brown <racer@lanl.gov>
Subject: Blue: Internal Valve Failure

TITLE: **Failed Bypass Valve Causes Gasoline Spill that Resulted in Building Evacuations**

IDENTIFIER: 1998-LA-LANL-ESH7-0007
DATE: August 6, 1998

LESSONS LEARNED STATEMENT: Equipment that utilizes valves to control system pressure should be designed to ensure that the valves can be accessed for routine maintenance and testing.

ANALYSIS: Approximately 12 gallons of gasoline spilled onto an asphalt loading dock at the Los Alamos Plutonium Handling and Processing Facility when a bypass valve failed on a tanker truck as an employee was fueling a motor-powered cart. The fueling hose blew off the tanker pipe connection when the employee activated the fueling pump. The employee immediately activated the tanker's emergency shutoff switch. The gasoline was quickly contained with spill dykes and absorbent material.

Fumes from the gasoline spill entered several nearby buildings, which were subsequently evacuated.

Investigators determined that a bypass valve inside the pump failed, allowing excessive pressure to build up inside the fueling hose, which caused the hose to blow off the tanker connection. The valve normally allows fuel to be pumped from the discharge end of the pump to the suction end until the nozzle on the fuel hose is opened. The bypass valve, which is intended to prevent pressure from building up in the piping and hose, failed closed.

No routine preventative maintenance or testing was performed on the valve because the pump would have had to have been torn down to allow access to the internal component. The manufacture (Roper) was contacted and a representative indicated that the valves could fail on pumps that have been in service for more than five years. The manufacture representative recommended replacing pumps with internal valves with newer pumps that had been designed with external bypass valves to permit routine maintenance and testing. Both the older internal valve design and the newer external valve design pumps are listed as Roper Model 3600 Series Type III pumps. Laboratory personnel were unaware of the potential for the valves to fail after five years or the new pump design that had been developed by Roper.

To prevent a recurrence, all tanker trucks at the Laboratory have been upgraded with the new pump design. A maintenance procedure was also written specifying that the bypass valves will be cleaned, inspected, and tested annually by the Laboratory services support subcontractor. The valves will also be inspected and tested when the tankers undergo annual cleaning and pressure testing.

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DOE FUNCTIONAL CATEGORY: MAINTENANCE
KEYWORDS: gasoline spill, tanker, bypass valve, pump
REFERENCES: Occurrence report ALO-LA-LANL-TA55-1998-0020

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.