

Date: Wed, 27 Sep 2000 17:25:59 -0600
From: Meredith Brown <racer@lanl.gov>
Subject: Yellow Alert: Chain Break Results in Fallen Cylinder

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TITLE: Yellow Alert- Chain Break Results in Fallen Cylinder

IDENTIFIER: Y-2000-OR-BJCETTP-0902 DATE: September 15, 2000

LESSON LEARNED STATEMENT: Rusty chains and clasps used to secure gas cylinders to carts have the potential to fail during gas cylinder transport.

DISCUSSION OF ACTIVITIES: Corrosion of chains, clasps, clips and other restraints racks may lead to failure of the restraint under load. The clasp on a chain restraining a K-sized gas cylinder broke during fork truck transport of a fully loaded cylinder rack. As the fork truck moved over the threshold to enter the storage building, a gas cylinder fell from the rack as the result of the failure of the clasp/chain restraint. The cylinder hit the pavement and rolled about one meter where it came to rest half a meter from the feet of a nearby employee. Neither the employees nor the cylinder were damaged. Fortunately, the valve cover had been tightened securely and the gas cylinder was not breached in the fall. The fork truck operator responded quickly by stopping the motion of the fork truck. He notified his supervisor, then placed a ratchet strap around the remaining eleven cylinders to ensure they were held securely on the cart. The cylinder that had fallen from the cart was returned to the supplier for inspection. Visual inspection of the swivel end of the spring loaded clasp (clip) following the failure revealed that internal corrosion had developed along a crack in the pot metal. The swivel appeared to be good from the outside. The only clue to a potential failure was the presence of rust on the chain to which the swivel was attached. The twelve-cylinder cart was estimated to be more than fifteen years old and all of the chains used to secure the gas cylinders exhibited some degree of corrosion. The subcontractor could have elected to replace the chains and clasps with new ones, but chose to order new cylinder carts with bar-type positive restraints. Similar gas cylinder carts have been observed with rusty chains and clasps. Inspection prior to use may not reveal internal corrosion. Use of ratchet straps or other supplemental tie-down is recommended until the gas cylinder cart chains or the entire cart can be replaced.

ANALYSIS: Visual inspection of compressed gas cylinder chains and clasps may not reveal internal corrosion.

RECOMMENDED ACTIONS: Chains and clasps that appear corroded - even slightly - should be replaced. The entire cart may be replaced with new equipment. If there is any doubt about the security of the restraints, supplemental restraints should be used during transport of compressed gas cylinders.

PRIORITY DESCRIPTOR: Yellow/Caution
FUNCTIONAL CATEGORY (S) (DOE): Safety
BJC TREND CODE (S) (USER-DEFINED): Transportation Safety
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NAME OF REVIEWING OFFICIAL: D. D. Holt
KEYWORDS: chains, clasps, clips; corrosion; cylinder carts
REFERENCES: None
HAZARDS: Other
WORK ACTIVITY: Material/Material Handling; Facility Equipment
ISMS CODE: Analyze Hazards

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 (865) 483-0554, e-mail at schuttj@pwtor.com of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.