



State of West Virginia
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TO: WV Underground Mine Operators and Shelter Manufacturers

FROM: C. A. Phillips, Director *C. A. Phillips*

DATE: October 14, 2011 (Supersedes September 29, 2011 Order of same name)

SUBJECT: **Order to Refit Approved Underground Mine Shelters**

UNDERGROUND MINE SHELTER SAFETY ISSUE

On Sunday, January 9, 2011, a catastrophic failure occurred in a high pressure gas cylinder fitting connected to the breathable air system in an approved shelter located in an underground West Virginia coal mine. The West Virginia approved shelter, model number 4042-35, was manufactured by the A.L. Lee Corporation on March 21, 2008. This inflatable design shelter was equipped with 12 high pressure oxygen cylinders, each pressurized at 4,500 psi and connected to a manifold. This catastrophic failure allowed a rapid release of oxygen, which pressurized the interior of the steel structure. Following an inspection of the failed shelter, OMHS&T and MSHA initially determined that the pressure build-up inside the container forced open both the tent deployment door and the air-lock access door and ejected a supply container and 5-gallon water containers from the access door area onto a nearby rib.

ANALYSIS

Subsequent analysis of the failed shelter led to the discovery of cracks on multiple valves and fittings and identification of fittings that did not meet Compressed Gas Association dimensional specifications. Inspections of additional underground mine shelters conducted at OMSH&T's request discovered similar issues on valves and fittings of high pressure oxygen, air cylinders and associated distribution manifolds used in approved shelters produced by all manufacturers. A significant number of fittings and valves on high pressure cylinders had developed cracks after only three years of service. Specifically, in one instance, half of the valves and fittings in a refuge shelter had developed cracks that were classified by valve

