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Catastrophic Failure Of An
Oxygen Cylinder Fitting In A Refuge Alternative**

On Sunday, January 9, 2011, a catastrophic failure occurred in an oxygen cylinder fitting connected to the breathable air system in a refuge alternative located in an underground coal mine. The refuge alternative was an inflatable tent design manufactured by the A.L. Lee Corporation, model number 4042-35 manufactured on March 21, 2008. This refuge alternative is equipped with 12 high pressure oxygen cylinders, each pressurized at 4,500 psi. The manufacturer of the failed high pressure fitting is unknown at this time. Once the fitting manufacturer is identified, this alert will be updated with this information.

On the day of the incident, the refuge alternative had been examined during the required pre-shift examination, and no defects were identified. Approximately two and one-half hours later, a scoop operator discovered debris scattered on the mine floor near the refuge alternative.

The refuge alternative manufacturer, state inspectors, and MSHA examined the refuge alternative to determine the cause of the incident. The preliminary findings indicate there was a catastrophic failure of a brass high pressure fitting connected to an oxygen cylinder valve. Photograph 1 (below) shows the separation of the top face of the nut from the nut body.

This catastrophic failure allowed a rapid release of oxygen, which pressurized the interior of the steel structure. The initial determination is that the pressure build-up inside the container forced open both the tent deployment door and the air-lock access door, ejecting a supply container and three 5-gallon water containers from the access door area onto a nearby rib.

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