Liquid Oxygen Cylinder Explosion

- Improper methods used to render scrap cylinder unserviceable
- Unsafe modifications to cylinder design

The incident described in the following presentation did not involve an Airgas company.
Accident Profile

• Two individuals (ages 42 and 60) found a liquid oxygen cylinder that had been removed from service and left at a scrap metal dealer

• The individuals were self-employed in scrap metal cutting operations and intended to use the cylinder in their work
Accident Profile

- The individuals had access to a liquid oxygen supplier where cylinder ownership would not be questioned.
- Jury-rigging fill connections, the first attempt to fill the cylinder resulted in rapid venting through the Pressure Relief Device (PRD).
Accident Profile

- The PRDs were removed and plugged
- The cylinder was filled while onboard a pickup truck
- The cylinder, which had no vacuum, was now unable to vent excess pressure
Accident Profile

• While being transported down a busy highway, the pickup truck experienced a flat tire

• Shortly thereafter, the cylinder exploded with the results shown in the following slides
Pickup truck on which the cylinder was being transported
Pickup truck on which the cylinder was being transported
Pickup and cylinder remains
Cylinder top
Cylinder outer shell, bottom
Cylinder bottom shell
PRD location was plugged using a threaded cap
Plug/Cap

Hole in vacuum port
Both inner and outer shells separated at bottom welds
Cylinder exploded at 12:40 PM while transport vehicle was parked on busy Interstate highway.
The blast blew one individual across 5 lanes of traffic. The other was blown approximately 40 feet. Both survived.
Cylinder flew approximately ¼ mile before plunging through the roof of an apartment, severing a main natural gas line and coming to rest in the living space.

Plywood applied over hole in roof
Despite heavy damage, no injuries to apartment tenants were reported
Apartment interior
Note that the media reported the event as a Butane cylinder explosion.