GENERAL WRITTEN SOP -- Compressed Gases

The OSHA Laboratory Standard explicitly requires "standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals." If the general SOP in this section do not fulfill this requirement, you must amend and append in some manner so as to comply.

Special Precautions for Working with Compressed Gases: *Special systems are needed for handling materials under pressure. Toxic and corrosive gases present special problems in designing engineering controls. The physical and health hazards of any material are typically compounded by the pressure hazard. Carefully observe special precautions.*

1. Always use the smallest size cylinder required to perform the work.
2. Cylinders of compressed gases must be handled as high energy sources.
3. Cylinders on wheeled carts must be capped and secured by an approved cylinder support strap or chain. The cart must be an approved cylinder cart. Do not attempt to take a loaded cylinder cart up or down a stairway.
4. In the event the cylinder must be moved between floors, an elevator is an acceptable means to do so. Personnel should **NEVER** occupy the same elevator as a compressed gas cylinder.
5. All uncapped cylinders must be secured independently (not ganged behind a single chain) to a solid element of the lab structure. Carts are not acceptable for supporting uncapped or in-use cylinders.
6. Never bleed a cylinder completely empty. Leave a slight pressure to keep contaminants out.
7. Oil or grease on the high pressure side of an oxygen cylinder can cause an explosion. Do not lubricate an oxygen regulator or use a fuel gas regulator on an oxygen cylinder.
8. Always wear goggles or safety glasses with side shields when handling compressed gases.
9. Always use appropriate gauges, fittings, and materials compatible with the particular gas being handled. Regulators must be compatible with gas cylinders (do not use adapters).
10. When work with toxic, corrosive, or reactive gases is planned, the Laboratory Safety Manager and EHS should be contacted for information concerning specific handling requirements for the gas involved. Generally, these gases will need to be used and stored with local exhaust ventilation such as a lab chemical fume hood or a gas cabinet designed for that purpose.

Liquid Nitrogen

Because liquid nitrogen containers are at low pressure and have protective rings mounted around the regulator, they are not required to be affixed to a permanent fixture such as a wall. However, additional protection considerations should be addressed when storing liquid nitrogen in a laboratory. The primary risk to laboratory personnel from liquid nitrogen is skin or eye thermal damage caused by contact with the material. In addition, nitrogen expands 696:1 when changing from a cryogenic liquid to a room temperature gas. The gases usually are not toxic, but if too much oxygen is displaced, asphyxiation is a possibility. Always use appropriate thermally insulated gloves when handling liquid nitrogen. Face shields may be needed in cases where splashing can occur.