Gas Cylinder Leak- March 2017

What happened?

On March 17, 2017, a laboratory worker was attempting to weigh a liquefied carbon dioxide gas cylinder (size 200) that was connected as a back up to an Ultra-Low Temperature freezer. The worker was rolling the cylinder onto the scale (less than 1 foot away) while still connected when they lost control of the cylinder. The cylinder fell breaking the copper line connecting it to the freezer. The worker evacuated the room and notified a supervisor. The supervisor contacted University of Chicago Medicine (UCM) Security, who initiated a coordinated response between UCM EHS and Office of Research Safety.

What was the cause?

The large and heavy cylinder (tare weight of 119lbs.; fill weight of 169lbs.) was not able to be controlled by the worker. Once the cylinder started to roll, the tile floor made it nearly impossible to hold upright.

What were some of the things done well?

There was no injury and little damage as a result of the incident, however there were a lot of possibilities which a serious injury or significant damage could have resulted. One can imagine several scenarios in which the worker could have injured themselves by improper lifting of the cylinder or having the cylinder fall on them. Also with carbon dioxide being an asphyxiant, the worker could have been in an Immediately Dangerous to Life or Health (IDLH) and/or oxygen deficient atmosphere. Some of the actions of the worker and supervisor kept this close-call from become worse. Such actions include:

- Lab has wall restraints for compressed gas cylinders installed.
- The room's ventilation was working well and no measurement of carbon dioxide exceeded Occupational Health and Safety Administration's Permissible Exposure Level (OSHA PEL) of 5000ppm.
- Worker did not try to catch the cylinder once it was obvious that it was on its way down
- Immediate evacuation once the cylinder fell
- Prompt reporting to supervisor and UCM Security

What are some lessons learned from the incident?

- Gas cylinders often possess hazards beyond the pressurized gas. Any gas besides oxygen is an asphxiant
- Use a transportation cart when transporting gas cylinders even for short distances.
- Avoid working alone

References and Resources

1. University of Chicago's Chemical Hygiene Plan template https://researchsafety.uchicago.edu/page/policies-and-safety-manuals
2. National Research Council. 2011. Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Updated Version. Washington, DC: The National Academies Press. https://doi.org/10.17226/12654.
3. Air Gas Safety Booklet https://case.edu/cse/emac/leizhu/Update_2013/Airgas%20Booklet.pdf

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