Process Safety Beacon
Messages for Manufacturing Personnel
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Toxic Gases

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Figure 1. Chlorine release from a dropped cylinder

Source: https://www.voanews.com/a/jordan-negligence-responsible-for-aqaba-chlorine-tank-explosion-/6644453.html

What Happened?

On June 27, 2022, a 25-ton isotainer of liquefied chlorine gas was being loaded onto a ship by a crane in Aqaba, Jordan. A lifting cable snapped, and the tank crashed onto the ship's deck and ruptured. A huge cloud of toxic yellow chlorine gas formed and workers evacuated the area. Thirteen people were killed and about 300 others were hospitalized.

Officials stated the tank's weight was "three times more than the cable load capacity," and the required safety measures for dealing with such hazardous material were not in place. No qualified person was on the deck at the time to check the lifting equipment and procedures.

Experts said the incident could have become a catastrophe had dozens of workers ending a shift not left the site shortly before the leak. Fortunately, winds also blew the toxic gas away from populated areas in the port city to the outlying desert.

Precautions should be taken during chemical unloading operations in case of leaks, whether the materials are solids, liquids or gases. In this case, there were a number of people close to the loading area who did not need to be there at the time of the incident.

Did You Know?

- Toxic gases can cause poisonous effects at relatively low concentrations when in contact with the human body.
- Toxic gases are normally grouped as irritants like chlorine and ammonia, asphyxiants like nitrogen and carbon monoxide, anesthetics like nitrous oxide, and special toxicants like hydrogen sulfide and hydrogen cyanide.
- Inhalation of toxic gases can be swiftly fatal as the lungs provide a direct route to the blood stream. Some materials can also be absorbed through the skin and eyes.
- Toxic gases are especially dangerous because they are commonly stored and transported under pressure. They rapidly expand and move through the air when released. Many, like hydrogen sulfide and carbon monoxide, are invisible and have unreliable or no odor warning properties.
- Lifting operations are dangerous work. In some companies and countries, a formal lift plan is required. Essential elements of such plans and safety practices for heavy lifts in areas where highly hazardous materials are present will be covered in a future Beacon.

What Can You Do?

- Preparation for materials handling operations involving toxic gases should always include what to do if a release occurs:
  - ✓ Always be aware of the materials being handled, equipment in use, people and surroundings in the areas where you work.
  - ✓ Read and heed the warnings on labels, placards and signs where toxic gases are stored and used.
  - ✓ Stay well away of lifting operations and warn other personnel who are too close to move away.
  - ✓ Know where to go and what procedures to follow if there is a release.
  - ✓ Be gone, not drawn to toxic gas releases unless you are trained and equipped as an emergency responder. Move cross-wind and away from the path of the gas release to approved safe havens and shelter-in-place locations.
  - ✓ Don, test-for-fit and use respirators, other personal protective equipment and portable gas detectors where authorized, available and suitable for the release at hand.

Toxic gas exposures can be fatal. Take the correct actions to protect yourself and others.