

DPC Enterprises Festus Chlorine Release

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<http://www.csb.gov/little-general-store-propane-explosion/>

Activity

The DPC Enterprises plant in Festus, MO handles the transfer of chlorine gas. This facility repackages bulk dry liquid chlorine from rail cars into containers for industrial and municipal use in the St. Louis area. The plant unloads shipments of chlorine from a rail car. They must connect a transfer hose in order to perform this process. If the liquid chlorine is spilled, it vaporizes quickly and forms a toxic and corrosive gas. On August 14, 2002, a chlorine transfer was happening at the plant.

Hazards

The Safety Data Sheet for chlorine gas notes hazards of this material including:

- May cause or intensify fire; oxidizer
- Contains gas under pressure; may explode if heated
- Causes severe skin burns and eye damage
- Fatal if inhaled
- Very toxic to aquatic life
- Corrosive to the respiratory tract

Preventative Actions and Safeguards

Inspect and test loading hoses to ensure they are in good condition and appropriate materials of construction.

Contingency Action/ Mitigating Actions

Ensure chlorine detectors and emergency shutdown valves are tested and in good working order.

Initiating Event

The chlorine hose connected to a railroad tanker burst. The transfer hose was composed of a braided stainless steel, a material not recommended for chlorine transfer. The documentation of the hose claims the hose was made from a chlorine-resistant alloy. These two kinds of braiding are visually indistinguishable. This mistake ended up causing failure because the flow of the chlorine gas degraded the material causing leakage. The emergency shut-off valves at the site also failed to operate correctly.

Incident

With this failure of the shutdown system, the chlorine gas leaked unnoticed for around three-hours. There was a release of about 48,000 pounds of toxic chlorine gas. Sixty-three people, consisting of workers and nearby residents, ended up having to be treated at a local hospital for respiratory problems. Three ended up having to be admitted overnight.

Lessons Learned

Verify proper materials of construction of their chlorine transfer hoses. They should be contrasted with the correct structural braiding layer either being PVDF monofilament or Hastelloy C-276. Plants should perform better equipment maintenance and quality assurance programs. Also a big learning experience is the emergency response to an incident and how this needs improvement.

