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# Wrong Material + Wrong Tank = Trouble

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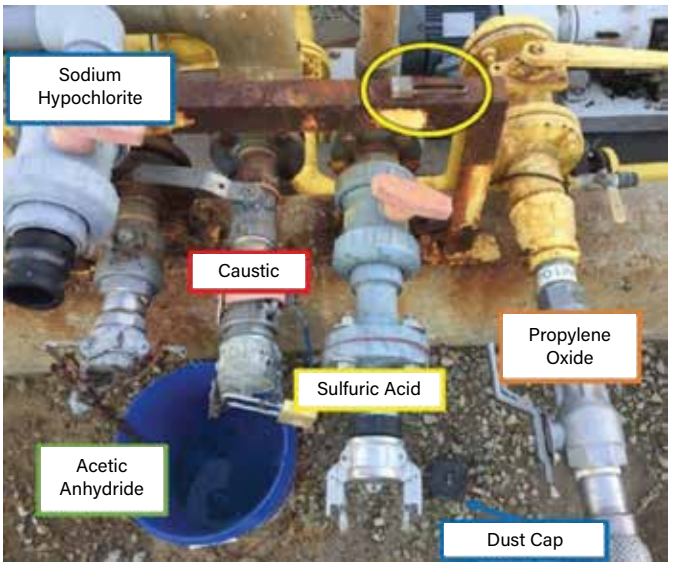


▲ **Figure 1.** Connections at the MGPI facility were found in this condition after a loading incident. The sulfuric acid fill line padlock was on the metal frame (yellow circle) and the sodium hypochlorite dust cap was on the ground. Read the U.S. Chemical Safety and Hazard Investigation Board (CSB) Report No. 2017-01-I-KS for more detail.

On Oct. 21, 2016, two incompatible chemicals were accidentally mixed at the MGPI Processing facility in Atchison, KS. The incident occurred during a routine chemical delivery of sulfuric acid from the acid supplier to the MGPI facility tank farm. The truck driver incorrectly attached the delivery hose to a connection for a tank of sodium hypochlorite (bleach). These two materials are not compatible, and mixing sulfuric acid with sodium hypochlorite produced a cloud containing chlorine and other compounds.

The cloud impacted workers onsite and the surrounding community. Over 140 people required medical attention, including members of the public, MGPI employees, and the truck driver. One MGPI employee and five members of the public required hospitalization as a result of exposure to the cloud.

Several factors led to this incident: poor labeling of the connection points for different chemicals (the connection points were not labeled as in Figure 1), a weak system to communicate the correct connection point between the company and the vendor's driver, failure of the operator to verify the correct connection before allowing transfer of the acid, errors and inconsistencies in the unloading procedure, and poor understanding of that procedure by the operators.

## Did You Know?

- Every day, millions of pounds of hazardous materials are transferred from transportation vessels (*e.g.,* trucks, railcars, cylinders, barges, and ships) to the users' sites. Most of these transfer operations are performed manually.
- Where delivery drivers are directly involved in unloading chemicals, the chemical distribution company and facility management must share the responsibility to ensure chemicals are unloaded safely.
- Highly manual activities such as chemical loading and unloading require detailed procedures and well-marked piping and connection points.
- Some companies install unique fittings on load and unload piping so that only the correct material hose can be connected.
- Procedures should establish a requirement that facility personnel are physically present during deliveries. Both facility personnel and drivers should verify the correct connection before discharging chemicals using written checklists, piping diagrams, and/or equipment walk-downs.
- Operators and drivers should wear the correct personal protective equipment (PPE) for the material being handled and be trained on how to wear it properly.

## What Can You Do?

- When making rounds, take notice of the pipe labeling. Missing or damaged labels should be replaced promptly.
- Where loading or unloading stations have multiple connection points, ensure the connections are correct and well-marked.
- Read and follow the procedure for unloading. If some steps are not clear or incorrect, inform your supervisor and have them corrected.
- During loading/unloading hazard analyses, ask what happens if the transfer hose is connected to the wrong tank. The process hazard analysis (PHA) team should use a chemical compatibility tool such as CRW4 (https://www.aiche.org/ccps/resources/crw-overview).

**Manual chemical transfers require accurate procedures that are consistently followed!**