

## Do Not Mix Incompatible Materials in Storage Tanks

The incompatible chemicals sulfuric acid and sodium hypochlorite (bleach) were inadvertently mixed during a routine raw material delivery to a plant in Atchison, KS, on Oct. 21, 2016. The chemicals reacted, releasing a cloud of chlorine gas into the surrounding community. Approximately 100 people required medical treatment, several schools were evacuated, and about 11,000 residents were advised to shelter indoors for two hours.

Similar releases of chlorine gas have happened before:

- May 2013, Portland, OR, U.S. — A supplier truck driver pumped a mixture of nitric and phosphoric acids into a tank containing sodium hypochlorite at a dairy.
- October 2007, Frankfurt, Germany — Hydrochloric acid was accidentally transferred into a sodium hypochlorite tank. Approximately 200 kg of chlorine was released and more than 60 people were injured. The operator who terminated the transfer died from exposure to chlorine.
- August 2001, Coatbridge, U.K. — A tanker driver transferred sodium hypochlorite solution and hydrochloric acid into the same tank at a swimming pool. Thirty people required medical treatment for exposure to chlorine.
- August 1993, Stockholm, Sweden — A truck driver pumped phosphoric acid into a storage tank containing sodium hypochlorite at a swimming pool.
- March 1985, Westmalle, Belgium — Hydrochloric acid was pumped into a tank containing residual sodium hypochlorite.
- November 1984, Slaithwaite, U.K. — A plant expecting a delivery of sodium hypochlorite instead received ferric chloride solution (an acidic solution) that was unloaded into the sodium hypochlorite tank.
- September 1984, Hinckley, U.K. — Hydrochloric acid solution was unloaded into a tank containing sodium hypochlorite.

▶ The chlorine gas cloud released in Kansas affected members of the surrounding community — some required medical treatment while others were forced to seek shelter.



## What can you do?

- Understand the materials used at your plant, including any potential hazardous interactions. The July 2016 Beacon describes the CCPS Chemical Reactivity Worksheet — a tool that can help you determine hazardous chemical interactions.
- Check (and double-check) all of the documentation and labeling on incoming shipments of raw materials to confirm that the material is correct.
- Follow your plant's procedures for identification and unloading of raw material shipments.
- Ensure that all piping and equipment in your raw material unloading areas are clearly labeled. Tanks containing incompat-

ible materials should not have any connections between them.

- If the area where raw materials are unloaded has confusing piping, or if incompatible materials are unloaded in locations near each other, inform management so that improvements can be made to the layout or procedures.
- Make sure supplier truck drivers who are responsible for unloading material into storage tanks at your plant are familiar with your unloading facilities and procedures.
- Read the March 2009 and April 2012 Beacons for more examples of incidents involving the unloading of incompatible materials into tanks.

**Put the right stuff in the right place!**

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