

# Lessons from the Recent Chinese Warehouse Explosions



On Aug. 12, 2015, a series of explosions at a warehouse in the port city of Tianjin, China killed at least 114 people—including 53 firefighters and seven police officers—and destroyed dozens of buildings. And the number of deceased could increase because 64 people are still missing, including 49 firefighters and four police officers.

Officials said it's not yet clear what triggered the blasts, which they're still investigating. But we do know a few things about this tragic incident that safety professionals across the world should consider.

First, the warehouse contained hazardous and flammable chemicals, including calcium carbide, sodium cyanide, potassium nitrate, ammonium nitrate and sodium nitrate. Of specific concern, more than 700 tonnes of sodium cyanide were being stored there—well above the 10 tonnes allowed by Chinese safety regulations.

When sodium cyanide comes into contact with water, it can form combustible substances. In fact, some speculate that the firefighters inadvertently caused additional explosions when they sprayed water on the burning structure due to the presence of sodium cyanide. This substance can also release hydrogen cyanide gas, a highly toxic chemical asphyxiant that interferes with the body's ability to use oxygen.

*Lesson:* Hazardous materials must be properly stored or the results can be catastrophic. For example, incompatible materials must be stored separately and in appropriate storage areas. And you should limit the amounts of hazardous substances stored whenever possible.

The deaths of so many firefighters has also raised questions about whether first responders had the appropriate equipment and materials to battle the fires, especially given that the exposure of certain chemicals could cause additional explosions. And it's unclear whether firefighters had the information they needed, such as the fact the fire *did* involve chemicals and the location of those hazardous substances.

*Lesson:* It's important to share critical information about your workplace and its operations with any first responders who may be called to an emergency at

your facilities. For example, you should at least give local authorities copies of your emergency response plan and any other information that could be useful in an emergency, such as the types and locations of any hazard substances or flammable materials you use or store, a diagram of the layout of the workplace and shift records indicating who's working and where at any given time. (See, 8 Emergency Preparedness and Response Tips.)

As a result of this incident and the surrounding controversy, the Chinese government ordered a nationwide review of workplace safety. The country's Ministry of Industry and Information Technology ordered government authorities to check on companies that produce or store hazardous materials to determine whether they're compliant with safety regulations. And authorities have said they'll investigate potential criminal charges relating to the incident.