



U. S. Chemical Safety and Hazard Investigation Board RECOMMENDATION STATUS CHANGE SUMMARY

Report:	DuPont Corporation Toxic Chemical Releases
Recommendation Number:	2010-6-I-WV-R1
Date Issued:	September 20, 2011
Recipient:	Occupational Safety and Health Administration (OSHA)
New Status:	Closed – Reconsidered/Superseded
Date of Status Change:	June 27, 2019

Recommendation Text:

Revise OSHA 29 CFR 1910.101, General Industry Standard for Compressed Gases, to require facilities that handle toxic and highly toxic materials in compressed gas cylinders to incorporate provisions that are at least as effective as the 2010 edition of Section 7.9, Toxic and Highly Toxic Gases, in National Fire Protection Association (NFPA) 55, Compressed Gases and Cryogenic Fluids Code, including enclosures, ventilation and treatment systems, interlocked fail-safe shutdown valves, gas detection and alarm systems, piping system components, and similarly relevant layers of protection.

Board Status Change Decision:

A. Rationale for Recommendation

On January 22 and 23, 2010, three chemical incidents occurred over a 33-hour period at the DuPont Corporation's Belle, West Virginia (DuPont Belle), chemical manufacturing plant. The series of incidents began when an alarm sounded, leading operators to discover that 2,000 pounds of methyl chloride, a toxic and extremely flammable gas, had been leaking unnoticed into the atmosphere for five days. The next morning, workers discovered a leak in a pipe carrying oleum, which produced a fuming cloud of sulfur trioxide. Later that same day a hose attached to a one-ton cylinder containing highly toxic phosgene gas catastrophically failed and released, exposing a worker who died the following day.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation found multiple deficiencies in DuPont Belle's safety management system, including maintenance and inspections, alarm recognition and management, accident investigation, emergency response and communications, and hazard recognition. In addition, the CSB found that the hose that catastrophically failed was not the approved hose for that purpose, susceptible to leakage and corrosion from phosgene, and not changed out according to the maintenance schedule.

As a part of its investigation, the CSB also examined safety regulations promulgated by the Occupational Safety and Health Administration (OSHA) for the safe handling of highly toxic gases, such as phosgene. The OSHA Standard for Compressed Gases (29 CFR 1910.101) applies to employers that handle, store, and use compressed gases in cylinders, portable tanks, or tank cars. The standard includes requirements for cylinder inspections, safety relief devices, and

storage and handling of compressed gas cylinders, and requires employers to handle and store cylinders in accordance with the Compressed Gas Association (CGA) pamphlet P-1 1965, "Safe Handling of Compressed Gases in Containers." CSB noted that CGA pamphlet has undergone six revisions since OSHA incorporated the 1965 edition into its compressed gases standard in the early 1970's and that while the 1965 P-1 pamphlet contains the same general information as the current edition (2008), it lacks detailed guidance for enclosures, ventilation, piping, shutdown valves, alarms and gas detection equipment for handling toxic gases in compressed gas cylinders. Consequently, the CSB Board issued a recommendation to OSHA to upgrade its compressed gases standard.

The CSB issued two recommendations to OSHA from its DuPont Corporation Toxic Chemical Releases investigation, this status change summary addresses only CSB Recommendation No. 2010-6-I-WV-R1 (R1).

B. Response to the Recommendation

In its 2012 response to CSB, OSHA alleged that the CSB report did not "present a nexus between the causal factors of the incident and the corrective actions the CSB recommends" meaning that there is no causal link between the incident and the recommendation. Additionally, there were protections in place that DuPont Belle violated that would have prevented the chemical incident as well as the consequences related to the death of the worker from exposure to phosgene. They used a hose constructed of material that was unapproved and unsuitable for its service and was not replaced according to the maintenance schedule, both of which were violations of DuPont Belle policy. DuPont Belle did not remove the liquid phosgene from the piping as required by the standard operating procedures (SOP) for transferring cylinders. Had they followed the SOP, the worker would not have been exposed to phosgene. As such, OSHA believes that existing OSHA standards including, but not limited to, 29 CFR 1910.119 *Process Safety Management of Highly Hazardous Chemicals* would have been protective had it been followed. CSB Recommendation No. 2010-6-I-WV-R1 does not address these issues and, in this case, recognized and generally accepted good engineering practices (RAGAGEP) were also available that would close the potential regulatory gap that the recommendation intended to address. Consequently, OSHA declined to pursue the rulemaking that CSB recommended to update its compressed gases standard.

C. Board Analysis and Decision

The Board had no difficulty in concurring with OSHA's assessment that the recommendation does not prevent the hose from catastrophically failing. However, it is also clear to the Board that the recommendation could have prevented the consequence of the worker's exposure to phosgene and eventual death. Unfortunately, though the report does, without question, establish that updating the associated NFPA and CGA standards as addressed by the recommendation would drive positive safety change, it does not state that these changes would have prevented the worker from being exposed to phosgene. Without definitive information in the report that establishes that the recommendation would either prevent the chemical incident or prevent or mitigate the incident's consequences as required in Board Order 22: *CSB Recommendations Program*, the Board must, therefore, concur with OSHA's assessment that the report did not establish link or "nexus" between the incident (or its consequences) and the recommendation.

Based upon the totality of these factors, the other information above, and the requirements of Board Order 22: *CSB Recommendations Program*, the Board voted to change the status of **CSB Recommendation No. 2010-6-I-WV-R1** to: “**Closed – Reconsidered/Superseded.**”