



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

Report:	Veolia ES Technical Solutions, LLC: Explosion and Fire in West Carrollton, Ohio
Recommendation Number:	2009-10-I-OH-R4
Date Issued:	July 21, 2010
Recipient:	National Fire Protection Association (NFPA)
New Status:	R4: Closed – Acceptable Action
Date of Status Change:	March 31, 2015

Recommendation Text(s):

Revise NFPA 30, Chapter 17, to include a section requiring a written engineering analysis to determine the safe separation distance for occupied buildings, control rooms, and operating areas. The analysis must be acceptable to the authority having jurisdiction.

Board Status Change Decision:

A. Rationale for Recommendation

On May 4, 2009, an explosion and fire occurred at the Veolia ES Technical Solutions LLC (Veolia) facility in West Carrollton, Ohio. The facility provided hazardous waste services for industrial and municipal customers and was a state-permitted treatment, storage and disposal facility (TSDF). On the day of the incident, tetrahydrofuran (THF), a flammable organic solvent was released from a solvent recovery process in a tank farm.

Uncontrolled venting of THF allowed flammable vapors to accumulate to explosive concentrations outside the process equipment and ignite. The initial blast injured four workers, two seriously. Multiple subsequent explosions significantly damaged the site; nearby residences and businesses also sustained considerable damage from the overblast pressure.

The CSB found that the likely source of ignition was lit boilers in a lab/operations building approximately 30 feet away. This lab/operations building housed a number of non-essential personnel¹ and also the control room. When the initial release occurred, the unit operator tried to approach the shut off valves located in the unit but could not because of the overpowering odor of the released material. Unable to shut off the process in time, ignition occurred leading to the explosion. The operator was in the control room and reported being enveloped by a "fireball."

The National Fire Protection Association (NFPA) is an international, nonprofit organization that develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other similar risks. NFPA 30, the *Flammable and Combustible Liquids Code*, applies to the storage, handling, and use of

¹ Veolia considers "non-essential personnel" to be employees and contractors whose specific work Activities do not require them to be located in buildings in close proximity to a process area. Examples include but are not limited to: maintenance, laboratory, clerical staff, and administrative support personnel

flammable and combustible liquids. Chapter 17, entitled *Process Facilities*, provides primary requirements for facilities such as Veolia, including requirements for locating process vessels with respect to buildings.

The CSB found during its investigation that Veolia, who appeared to already be following NFPA standards with regard to electrical classification of buildings, never conducted a process hazard analysis for the siting of the lab/operations building so close to the operating units. OSHA's post incident inspection cited the company for not evaluating facility siting. Yet even if Veolia had conducted a siting analysis, NFPA 30, Chapter 17 would allow for control room locations as close as 10 feet to an operating unit processing "stable combustible liquids." The control room at Veolia was approximately 25 feet from the operating unit.

Therefore, based on these findings, the CSB recommended that NFPA 30 be revised to require a written engineering analysis that would evaluate safe separation distances between operating areas, control rooms, and buildings that have either essential or non-essential personnel, to prevent a fire or explosion from occurring.

B. Response to the Recommendation

In December of 2014, the NFPA issued the 2015 edition of NFPA 30. In the 2015 edition, subsection 17.4.3 and Table 17.4.3 were amended to increase some minimum required separation distances between process vessels and adjacent important buildings, adjacent property lines, and the near and far sides of public ways. Also, new annex material has been added at A17.4.3 to explain when an engineering evaluation would be required for determining separation distances along with 14 references to aid the NFPA 30 user in conducting it properly.

C. Board Analysis and Decision

As the changes made to Chapter 17 and the Annex of the 2015 edition of NFPA 30 met the intent of CSB Recommendation No. 2009-10-I-OH-R4, the Board voted to change the status of this recommendation to: **"Closed-Acceptable Action."**