



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

Report:	Kleen Energy Natural Gas Explosion
Recommendation Number(s):	2010-07-01-UR1
Date Issued:	June 28, 2010
Recipient:	Occupational Safety and Health Administration
New Status:	Closed - Unacceptable Action/No Response Received
Date of Status Change:	July 28, 2021

Recommendation Text:

Promulgate regulations that address fuel gas safety for both construction and general industry. At a minimum:

- a. Prohibit the release of flammable gas to the atmosphere for the purpose of cleaning fuel gas piping.*
- b. Prohibit flammable gas venting or purging indoors. Prohibit venting or purging outdoors where fuel gas may form a flammable atmosphere in the vicinity of workers and/or ignition sources.*
- c. Prohibit any work activity in areas where the concentration of flammable gas exceeds a fixed low percentage of the lower explosive limit (LEL)*
- d. Require that companies develop flammable gas safety procedures and training that involves contractors, workers, and their representatives in decision-making.*

Board Status Change Decision:

A. Rationale for Recommendation

Combined-cycle natural gas power plants generate electricity with combustion turbines fired by natural gas. When new fuel gas piping is installed, it must be cleaned of debris that may have been introduced into the piping during construction. On February 7, 2010, an explosion occurred during the planned cleaning of new piping at Kleen Energy, a combined-cycle natural gas fueled power plant that was under construction in Middletown, Connecticut. Immediately prior to the explosion, workers were conducting a "gas blow," whereby natural gas is forced through the piping at a high volume and pressure to remove debris. The natural gas and debris were subsequently vented into a congested outdoor area where the natural gas accumulated and found an ignition source resulting, in an explosion. The explosion resulted in six fatalities and injured at least 50 other personnel.

The U.S. Chemical Safety and Hazard Investigation Board's (CSB) investigation concluded that the venting of natural gas in this manner is inherently unsafe because of the intrinsic fire and explosion hazards. The CSB also concluded that alternative pipe-cleaning methods, such as pigging or blowing with air or nitrogen, are readily available, feasible, and affordable to accomplish the same cleaning function.

Less than eight months earlier, on June 9, 2009, another natural gas explosion occurred at the ConAgra Slim Jim factory in Garner, North Carolina. In this incident, a technician was attempting to purge air from natural gas piping as a part of the installation and commissioning of a new industrial water heater. The released gas accumulated inside the building, ignited, and exploded, causing the walls and roof of the facility to collapse. Four individuals were fatally injured, and 67 others were injured, some severely. Damage to the plant's ammonia-based refrigeration system caused the release of approximately 18,000 pounds of anhydrous ammonia gas.

Although the specific circumstances of these two incidents were different, both resulted from planned work activities that created large and entirely avoidable releases of flammable natural gas in the presence of workers and ignition sources. These two investigations make it clear that releasing flammable gases in the vicinity of workers and/or ignition sources is inherently unsafe.

Despite the hazards of fuel gases and their widespread usage in both construction and general industry, the federal Occupational Safety and Health Administration (OSHA) has no fuel gas safety regulation. Yet, the consumption of natural gas as a fuel in the US far exceeds that of liquefied petroleum gases such as propane and butane, for which OSHA has specific standards in general industry and construction (*Storage and Handling of Liquefied Petroleum Gases*, §1910.110 and §1926.153). OSHA also has standards for far less commonly used flammable gases such as hydrogen (§1910.103) and acetylene (§1910.102). Moreover, 80 percent of natural gas used in the U.S. is used in sectors covered by OSHA. As a result of these findings, the CSB issued a recommendation to OSHA to promulgate regulations that address fuel gas safety.

B. Response to the Recommendation

OSHA responded to the CSB on this recommendation several times, the most recent being on April 6, 2021. In that communication it was stated again that OSHA did not intend to initiate rulemaking to address gas-blowing, and instead would be relying on National Fire Protection Association (NFPA) 56 and its Hazard Alert letter entitled *Cleaning Piping Systems with natural Gas* as the basis for employer knowledge and feasible means of abatement to support general duty clause citations.

In addition, the Fall 2020 Unified Agenda of Regulatory and Deregulatory Actions lays out the regulatory priorities of over 60 federal agencies, departments, and commissions for the next 12 months. Consistent with their response, it does not mention OSHA initiating rulemaking on a fuel gas standard.¹

¹ See

https://www.reginfo.gov/public/do/eAgendaMain?operation=OPERATION_GET_AGENCY_RULE_LIST¤tPub=true&agencyCode=&showStage=active&agencyCd=1200&csrf_token=65D5AF7E6C89B1D67110B8EC0E00

Per CSB policy as communicated to OSHA, Urgent Recommendations address issues identified during the course of an investigation that are considered to be an imminent hazard and have the potential to cause serious harm unless rectified in a short timeframe. To date, OSHA has not initiated any rulemaking to address this Urgent Recommendation since it was issued over 10 years ago.

C. Board Analysis and Decision

Based upon the information above, the Board concluded that OSHA does not intend to implement the CSB's Urgent Recommendation which was issued over 10 years ago. As such, the Board voted to designate CSB Recommendation No. 2010-07-I-CT-UR1 as: "**Closed - Unacceptable Action/No Response Received.**"

[E03031079CC5FF767FE4DAC1CC85A0404666CC1C754CE0CFF5FDA54E2B8E0D5CD833A2E6](https://www.csb.gov/record/2010-07-I-CT-UR1) (accessed April 19, 2021).