

Con Agra Explosion Prompts NC Fuel Gas Code Amendment

At a public meeting in Raleigh on February 4th, the Chemical Safety Board presented preliminary findings in its investigation of the devastating gas explosion that occurred at the Con Agra plant in Garner, North Carolina, on June 9th last year.

Four people lost their lives, and sixty-seven were injured, some of whom still face a long recovery. Damage to the building was much more extensive than it appeared in news pictures; about 60% of the interior space was rendered unusable and/or unsafe. Five months later, the plant was far from fully operational and more than 300 of the company's 750 employees at the site were laid off.

The Board investigation report included mention of about half a dozen similar incidents of varying seriousness nationwide, including one at a Cary, NC fitness center in 1997. As a result of their findings so far, the Board had drafted amendments to the Fuel Gas Code section on gas line purging, and, at the meeting, voted 2-1 to approve these 'Urgent Recommendations' to the National Fire Protection Association (NFPA); the American Gas Association (AGA); the International Code Committee (ICC); and the Chair of the NFPA 542/ANSI Z 223.1 Committee.

The Urgent Recommendations comprise a series of precautions to be taken during purging of fuel gas piping at industrial, commercial, and public facilities. (Full text available at: www.csb.gov).

In order to become part of the relevant Codes, these recommendations would have to be adopted officially by the NFPA, AGA, and ICC.

In October 2009, the North Carolina Building Code Council, (www.ncbuildingcodes.com), made an emergency amendment to North Carolina State Building Code, Volume: Fuel Gas, Section 406.7 which now requires:

"406.7 Purging. Purging of piping shall comply with Sections 406.7.1 through 406.7.4

406.7.1 Removal from Service. Where gas piping is to be opened for servicing, addition, or modification, the section to be worked on shall be turned off from the gas supply at the nearest convenient point, and the line pressure vented to the outdoors. The remaining gas in this section of pipe shall be displaced with an inert gas as required by Table 406.7.1

Exception: If the line pressure cannot be vented to the outdoors: the building and all affected spaces shall be evacuated of personnel not purging the gas lines; quantities of flammable gas shall not exceed 25% of the lower explosive limit as measured by a combustible gas detector; eliminate all ignition sources and provide adequate ventilation to prevent accumulation of flammable gases. (*Table 406.7.1; Section 406.7.2 Placing in Operation; and Table 406.7.2 are unchanged by the amendment*).

406.7.3 Discharge of Purged Gases. The open end of piping systems being purged shall not discharge into confined spaces or areas where quantities of flammable gas can exceed 25% of the lower explosive limit as measured by a combustible gas detector. All potential sources of

ignition shall be identified and eliminated or controlled. Precautions shall be taken to maintain the concentration of the flammable gas below 25% of the lower explosive limit, such as adequate ventilation, control of the purging rate and other measures, as appropriate”.

The cost implications of the use of combustible gas detectors were discussed briefly; it was stated that the devices were not prohibitively expensive, but did require a certain amount of operator training for effective and reliable use.

The Chemical Safety Board investigation report did not include information about the training and/or experience of the personnel engaged in purging the gas line at the plant that day, but it is important to note the requirements of NC Fuel Gas Code, **Section 406.7.5 Personnel Training**: “Personnel performing purging operations shall be trained to the hazards associated with purging and shall not rely on odor when monitoring the concentration of combustible gas.”

There appears to be a real need for increased diligence in flammable gas purging operations; there was yet another serious explosion on February 7th in Middletown, Conn., at the site of a power plant under construction. It was reported that five people were killed and twelve or more injured during a test of natural gas lines. The plant, said to be 95% complete, was very badly damaged.

Although the Con Agra explosion has been identified as having originated in the plant’s Vacuum Pump Room, the precise sequence of events leading up to it has not; a further report is expected when the CSB investigation is complete.

The Chemical Safety Board is an independent federal agency charged with investigating industrial chemical accidents. Board members are appointed by the president and approved by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems.