

The Massachusetts Propane Investigation



Department Of Fire Services

The Incident

- **July 30, 2010 at 1220 hrs.**
- **Multiple calls for a reported explosion**
- **Resulted in 7 injuries and 1 fatality.**
- **5 alarm rescue/fire mission; took over an hour to extricate victims.**
- **21 communities in MA responded along with DFS Support Units**



Department Of Fire Services

The Cause/Origin Investigation

- Cause/Origin investigation was initiated by State Fire Marshal, as well as Norfolk FD/PD.
- Questions were raised as to whether LP-Gas was smelled prior to explosion.
- Liquid samples taken from tanks confirmed virtually no Ethyl Mercaptan (odorant) present.



The LP-Gas Investigation



- **NFD issues order to conduct liquid tests for remaining LP tanks to check for odorant level**
- **August 30 - Norfolk FD/Energy USA stain tube tested the remaining tanks at complex, which showed under-odorized LP Gas. Closed those tanks and brought in Temporary tanks.**
- **The temporary tanks were tested and also found to be odorant deficient, as was the delivery truck that filled the tanks.**

Department Of Fire Services

The LP-Gas Investigation (cont'd)

EnergyUSA Propane®

- **Testing was then conducted at the Energy USA bulk facility in Taunton, which also showed under-odorized LP Gas.**
- **Based upon the testing and lack of odorant, State Fire Marshal Coan ordered a comprehensive investigation and contacted the Attorney General's Office for assistance.**

The LP-Gas Investigation (cont'd)

- **DFS worked with Energy USA to determine their source of LP-Gas**
 - **DCP Midstream in Westfield, MA (as of 8/30)**
- **DFS immediately dispatched CCEU personnel to Westfield**
- **DFS issues cease and desist order at facility in Westfield on August 31, 2010**

EnergyUSA Propane®

dcp
Midstream.

Department Of Fire Services

The LP-Gas Investigation (cont'd)

- **The FRA, CSB and CPSC provided technical assistance and contacts.**
- **Based upon the information provided and reviews conducted by those states, both Connecticut and New Hampshire identified similar LP-Gas issues, resulting in facility closures.**
- **On September 8, correspondence was received from Aux Sable in East Morris, IL indicating that under-odorized propane may have been shipped from their facility to MA and 9 other states.**

The LP-Gas Investigation (cont'd)

- In order to facilitate a systemic review, the MA Attorney General's Office and DFS entered into an agreement with DCP on September 14, leading to the hiring of an Independent Examiner.
- The Independent Examiner was charged with investigating DCP from May 6 forward regarding: all deliveries, all sales of propane (whether odorized or not), and who was sold propane and in what amounts.

The LP-Gas Investigation (cont'd)

- **The parties determined 2 test methodologies would be used: vapor testing based on ASTM D5303-97 and liquid testing based on ASTM D1265-05.**
- **The parties also agreed on the following levels of Ethyl Mercaptan based on federal standards injection rate and national standards of 1lb/10,000 gallons:**
 - **Vapor Test – 5 ppm Ethyl Mercaptan**
 - **“Flash Test” – 17 ppm Ethyl Mercaptan**
 - **Liquid Test – 17 ppm Ethyl Mercaptan**

The LP-Gas Investigation (cont'd)

- **September 17 – voluntary reporting by Enterprise/Heritage of lack of odorant.**
- **Independent Examiner - determined that there was a probability that under-odorized propane entered the system but could not clearly link it to the DCP facility (since DCP did not open and begin shipping LP-Gas until May 6, 2010).**
- **Final reports of the DFS Division of Fire Safety and Fire Investigation Unit were released January 4, 2011. Transmitted to federal and national groups for further action.**

What we learned along the way

- **Federal Regulations**
 - LP Gas lacks regulations
 - Lacks odorant requirements
 - Lacks odor fade standards
- **Natural Gas is regulated heavily compared to LP Gas.**
- **DFS to propose increased standards to BFPR for the MA regulations.**



Federal Railroad Administration
Office of Safety Analysis



United States
Consumer Product Safety Commission

Department Of Fire Services

What we learned along the way

- **Odorant Fade**
 - Common occurrence in new tanks
 - Been known for many years
 - Reaction of moisture in tank and ethyl mercaptan
 - Chemical reaction with odorant to create sulfides
 - Resolves itself with fill-ups
- Is there a connection between these LP issues and natural gas?



Is there a common thread?

- **Yes**
 - **Odorant fade and;**
 - **Mercaptin**
 - **Ethyl (LP) versus Methyl (NG)**
 - **Both have odorant Fade Issues**
 - **NG Explosion related to odorant fade is Con Agra Plant in NC**



Explosion seriously damages three floors of a Hilton Hotel under construction in San Diego in May 2008, injuring 14.

Department Of Fire Services



U.S. Chemical Safety and Hazard Investigation Board

September 2009

Dangers of Purging Gas Piping into Buildings

No. 2009-12-I-NC

When new fuel gas piping is put into service – or when existing piping is returned to service after interruptions – it is typically necessary to purge the lines of air¹ U.S. fuel gas safety codes require that new piping installations be pressure-tested with air or an inert gas prior to initial operation, and this activity requires purging during the introduction of natural gas.² Purging is commonly done by

one of two methods: (a) fuel gas is used to directly displace the air, or (b) inert gas is used to displace the air and then fuel gas is used to displace the inert gas. With this Safety Bulletin, the U.S. Chemical Safety Board (CSB) draws attention to serious dangers that can arise during fuel gas purging operations and highlights five key lessons the agency recommends for improving safety in the workplace.



Who's at Risk...

Key - Chemical Safety Board Recommendations

- (c) Combustible gas detectors are used to continuously monitor the gas concentration at appropriate locations in the vicinity where purged gases are released
- (d) Personnel are trained about the problems of odor fade and odor fatigue and warned against relying on odor alone for detecting releases of fuel gases

Summary

- **Reviewed the LP Gas Incident**
- **Appears to be an odorant fade issue**
- **Common thread to natural gas installations**
- **Work toward a common goal of public safety**

Thank you!

Stephen D. Coan, State Fire Marshal
Timothee Rodrique, Director – Division of
Fire Safety

Contact:
Department of Fire Services
978-567-3100

