



U.S. Chemical Safety and
Hazard Investigation Board

NEWS RELEASE

U.S. CHEMICAL SAFETY BOARD

Thursday, November 15, 2007

One Year after Massive Blast in Danvers, Massachusetts, CSB Analysis Confirms Solvent Vapor Explosion, Examination of State's Fire Safety Oversight Continues

Washington, DC, November 15, 2007 – The U.S. Chemical Safety Board (CSB) today announced that laboratory testing of chemicals involved in the November 22, 2006, explosion at a Danvers, Massachusetts, printing ink manufacturing company is complete, and confirms that vapor from the mixture in the tank was sufficiently volatile to cause the explosion.

The CSB tested the exact solvent blend in use on the night of the explosion at the CAI/Arnel facility in Danvers. The testing revealed that the blend was significantly more volatile than its individual components, due to the formation of what chemists refer to as an azeotropic mixture.

“The mixing tank could have easily overheated due a single steam valve inadvertently left open or leaking. Our testing and calculations confirm that overheating the tank in this way would cause the building to fill with a large quantity of explosive solvent vapor,” said CSB Supervisory Investigator John Vorderbrueggen, P.E. “As we pointed out earlier this year, the CAI/Arnel facility did not follow state and federal fire safety regulations when they turned the ventilation system off.” The facility also lacked safety interlocks to prevent accidental overheating of the mixing tank. Fire codes do not currently require such interlocks.

Mr. Vorderbrueggen noted, “The CAI/Arnel site was originally licensed under state law for just 250 gallons of ‘lacquer’ back in 1944, to a company that long since sold the property. During the 62 years that followed, the amount permitted by the license was increased to some 11,500 gallons of flammable and combustible substances. State law does not require any safety review or public impact review when a licensee obtains increases in the registered quantity.”

Each year when the occupying business went to pay its license renewal fee, it was simply asked how much flammable material was stored at the site so fees could be properly collected, Mr. Vorderbrueggen said. The CSB is currently reviewing the state’s licensing and land-use rules and oversight of facilities that handle flammable substances to determine if recommendations are appropriate.

The explosion that occurred one year ago next week at the CAI/Arnel manufacturing facility damaged or destroyed approximately 100 homes and businesses in

the surrounding residential neighborhood. The facility was not staffed during the overnight hours, and there were no eyewitnesses to what occurred inside the building.

“This was a devastating blast,” said William E. Wright, CSB board member and interim executive. “Had the explosion occurred during waking hours, there would have been far more injuries and potential fatalities among members of the public. The purpose of our investigation is to understand exactly what happened and why and to prevent something like this from happening again in Danvers or elsewhere.”

At a public meeting in Danvers in May 2007, CSB investigators presented evidence that on the night of the explosion, a mixing tank containing highly flammable heptane and alcohol solvents overheated, releasing vapor that filled the building and then ignited at about 2:45 a.m. on the morning of November 22. Investigators found that the building’s ventilation system was routinely turned off at night to reduce noise in the community, allowing the accumulation of the flammable vapor.

The CSB’s final report is planned for release at a public meeting in Danvers in April 2008.

CSB investigators also have been working with the Danvers community organization known as Safe Area for Everyone (SAFE) in an effort to track down the source of gas odors sometimes reported in the neighborhood around the CAI/Arnel facility. Investigators conducted a number of follow-up interviews with residents and employees of Eastern Propane, a propane supplier across the street from the CAI/Arnel facility, after the May 2007 public meeting where some neighbors raised concerns about gas.

Mr. Vorderbrueggen said, “We spent an extensive amount of time duly considering the possibility that the explosion was due to natural gas, propane, or some other flammable gas source. However, our thorough analysis and completed laboratory testing clearly point to flammable vapor as the sole source of explosive material in this accident. We have therefore ruled out natural gas or propane as a fuel.”

The CSB is an independent federal agency charged with investigating industrial chemical accidents. The agency's board members are appointed by the President and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in safety regulations, codes, standards, management systems, training, and industry practices.

The Board does not issue citations or fines but does make safety recommendations to plants, industry organizations, labor groups, and regulatory agencies such as OSHA and EPA. For more information, please visit our website, www.csb.gov.

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