



National Association of State Fire Marshals
Advisory Bulletin based on December 13, 2005
Bergenfield, New Jersey
Natural Gas Pipeline Leak and
Apartment Building Explosion

Safety Advisory:

The National Transportation Safety Board (NTSB) has issued a report on the natural gas explosion that occurred on December 13, 2005 in Bergenfield, New Jersey. The National Association of State Fire Marshals (NASFM) is issuing the following advisory bulletin based upon the findings in the NTSB report:

- **All emergency responders, career and volunteer firefighters, should receive initial training or recurrent training on natural gas safety and incident response. NASFM and the US Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) have developed and are providing free *Pipeline Emergencies* training materials that can satisfy the needs for this training. More information on the Pipeline Emergencies training program is provided at the end of this advisory bulletin and can be found at www.pipelineemergencies.com**
- **Emergency response agencies should establish and implement written operating procedures for responding to natural gas emergencies. This should include flammable gas measurement procedures, incident management and coordination with utility companies.**
- **Fire service and other emergency responders should establish and implement procedures for emergency responders to rapidly assess situations involving natural gas leaks and to determine whether prompt evacuations are warranted.**

Background:

The National Association of State Fire Marshals (NASFM) is involved in a cooperative effort with federal regulators and pipeline operators in the interest of improving pipeline safety. An additional goal of the NASFM program is to provide training to those who may

respond in the event of a pipeline emergency. As part of this process NASFM becomes aware, from time to time, of specific situations that arise during incidents that we believe should be shared with emergency responders to better prepare them in preplanning and emergency management. This and subsequent bulletins will provide information of importance to fire marshals, potential incident commanders, fire service instructors, fire chiefs and other emergency response personnel.

The Incident:

On December 13, 2005, at 9:26 a.m., an apartment building exploded in Bergenfield, New Jersey, after natural gas migrated into the building from a damaged pipeline. Investigators found a break in an underground 1 1/4-inch steel natural gas distribution service line that was operating at 11 1/2 pounds per square inch, gauge. The break occurred at an underground threaded tee connection downstream from where excavators were removing an oil tank that was buried under the asphalt parking lot adjacent to the building. The break occurred, under the parking lot, about 7 feet 4 inches from the building's wall. Three residents of the apartment building were killed. Four residents and a tank removal worker were injured and transported to hospitals. The property damage consisted of the apartment building, which was a complete loss. According to Bergen County tax records, the assessed value of the apartment building was \$863,300.

The Cause:

The National Transportation Safety Board determines that the probable cause of the natural gas explosion and fire was the failure of the American Tank Service Company to adequately protect the natural gas service line from shifting soil during excavation, which resulted in damage to the service line and the release and migration of natural gas into the apartment building. Contributing to the accident was the failure of the Public Service Electric and Gas Company (PSE&G) to conduct effective oversight of the excavation activities adjacent to the gas service line and to be prepared to promptly shut off the flow of natural gas after the service line was damaged. Contributing to the casualties in the accident was the failure of the Bergenfield Fire Department to evacuate the apartment building despite the strong evidence of a natural gas leak and the potential for gas to migrate into the building.

Emergency Response:

Prior to the explosion, the tank removal company had been on the scene since 8:30 am the day before the event where they had been excavating the tank. On the day of the accident the crew returned at 8:30 am to continue work on the excavation. A local business owner observed the operation of the tank crew and noticed water flowing down the road; he approached the excavation and smelled natural gas. At 8:49 am, he called 911 and reported a gas leak to the Bergenfield Police Department. His call was the only call the Bergenfield Police Department received.

According to the Bergenfield Police Department dispatch logs, at 8:52 a.m., the Bergenfield Fire Department's chief, a fire official (career fire employee who conducts site inspections and fire investigations), and an engine company responded to an initial notification of a gas leak. Two Bergenfield Police Department crews were also dispatched.

After arriving on scene about 8:54 a.m., the fire chief asked the police dispatchers to notify the PSE&G. At 8:58 a.m., police dispatchers notified the PSE&G of the incident. The fire chief told Safety Board investigators that he had not observed any signs of a leak at the trench (that is, smelling gas, hearing a "hissing" sound, or seeing bubbling of water in the trench). No one from the Bergenfield Fire Department checked the apartment building for the presence of natural gas. The fire department did not attempt to evacuate the building before the explosion.

About 9:22 a.m., a PSE&G service technician arrived on scene. The technician attempted to close the curb valve to shut off the gas, but he was unable to apply enough force to close it. The service technician, using a portable gas detector, detected a positive gas reading just inside the boiler room doorway of the apartment building. He started moving away from the building as it exploded at 9:26 a.m.

The police and fire departments, American Tank, and the PSE&G started rescue actions. The fire department started firefighting operations. About 10:00 a.m., a PSE&G street crew was able to shut off the gas to the service line by closing the curb valve.

According to the fire chief, the Bergenfield Fire department did not have written procedures for natural gas. The fire department relied heavily on the assistance of the utility company (PSE&G) in deciding whether to evacuate a structure.

As a result of this emergency, PSE&G has obtained permission from the NJ Board of Public to distribute a PSE&G produced video for firefighters and first responders in the State of New Jersey.

NASFM Advisory:

To: Emergency responders and potential incident commanders

Subject: Response to a natural gas pipeline rupture near occupied structures

As a result of this event the NTSB identified several safety recommendations that could have mitigated the consequences of the explosion. All recommendations are in the NTSB report cited at the end of this document. NASFM has identified the safety issues as a result of the specific NTSB recommendations identified for the emergency response in Bergenfield NJ. NASFM believes these issues are imperative for emergency responder safety. The *Pipeline Emergencies* training program provides guidance for many of the safety issues identified by NTSB. The *Pipeline Emergencies* program is available at no charge to any first responder. For more information on the training, please visit: www.pipelineemergencies.com. NASFM is providing this advisory bulletin as a summary of the events and lessons learned from the Bergenfield, NJ event.

Safety Advisory

- 1) All emergency responders, career and volunteer firefighters should receive recurrent training on natural gas safety and incident response.
- 2) Emergency response agencies should establish and implement written operating procedures for responding to natural gas emergencies.

3) National fire service organizations, including International Association of Fire Chiefs, NASFM, notify their members of the circumstances surrounding the December 13, 2005 accident in Bergenfield, New Jersey and urge them to establish and implement procedures for emergency responders to rapidly assess situations involving natural gas leaks and to determine whether prompt evacuations are warranted.

Pipeline Emergencies

NASFM and PHMSA collaborated with the emergency response community and industry experts to develop the *Pipeline Emergencies* training program.

The *Pipeline Emergencies* training program offers a comprehensive, integrated emergency response training program designed to teach emergency responders how to safely respond and effectively manage pipeline incidents for both natural gas and liquids. The program includes a textbook, DVD and facilitator's guide with interactive pipeline training scenarios. The training materials are free to the emergency response community and can be obtained by contacting the NASFM at www.pipelineemergencies.com.

Specific areas that address all aspects of the recommendations from the NTSB can be found in:

Chapter 3 provides an operational overview of the pipeline transmission & distribution systems, pipeline construction, and methods of identifying pipelines.

Chapter 5 is dedicated to natural gas pipelines, the chemical and physical properties, other hazards, transmission and distribution systems, service equipment and controls.

Chapter 6 discusses emergency response procedures, action plans, emergency scene strategies, tactics and the eight steps for managing a natural gas emergency.

Chapter 7 is Tactical Response Guidelines for Pipeline Emergencies. It begins with a discussion of hazard and risk assessment. It discusses safety issues and provides 10

tactical scenarios designed to discuss strategic and tactical operations at pipeline emergencies.

Scenario 1 and 2 identify many of the tactical recommendations identified as training and procedural elements by the NTSB report.

Scenario 1 - Odor of gas in a residential area

It is a response by police and fire to an unknown source of a natural gas in the neighborhood. Identifying the location, tactical considerations like Securing the area isolating the area and denying entry, evacuation of effected area and developing an action plan

Scenario 2 - Release as a result of a punctured 2-inch distribution line in a commercial area.

In this scenario the fire department responds and established the following tactical operations, evacuation, isolate and deny entry to the area, prevent ignition and notify the gas company. The first engine followed the standard operating procedures

- Establishing command in a safe area;
- Control access to the area;
- Establish hazard control zones by using combustible gas indicators;
- Controlling ignition sources;
- Evacuation; and
- interfacing with the utility company upon their arrival.

For More Information:

The entire NTSB report can be accessed at:

http://www.nts.gov/Publictn/P_Acc.htm

U.S. DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) has issued an Advisory Bulletin to pipeline operators addressing emergency planning.

The Advisory Bulletin is available at:

http://primis.phmsa.dot.gov/comm/PHMSA_Advisory_Bulletin_2005-05-23.pdf

For more information on NASFM's Pipeline Emergencies programs please visit:

Pipeline Training

<http://www.pipelineemergencies.com>

Or call 877-627-3605

High Consequence Areas and Liquefied Natural Gas:

<http://www.safepipelines.org>