L-99 P-309 E

National Transportation Safety Board
Washington, D.C. 20594

Safety Recommendation

Date: FEB 7 1995

In Reply Refer To: P-95-14 and -15

Mr. Charles J. DiBona
President
American Petroleum Institute
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About 11:55 p.m. on March 23, 1994, a 36-inch diameter pipeline owned and operated by Texas Eastern Transmission Corporation (TETCO) ruptured catastrophically in Edison Township, New Jersey, within an asphalt plant compound. The force of the rupture and of natural gas escaping at a pressure of about 970 psig (pounds per square inch gauge) excavated the soil around the pipe and blew gas hundreds of feet into the air, propelling pipe fragments, rocks, and debris more than 800 feet. Within 1 to 2 minutes of the rupture, one of several possible sources ignited the escaping gas, sending flames upward 400 to 500 feet in the air. Heat radiating from the massive fire ignited the roofs of several building roofs in a nearby apartment complex. Occupants, alerted to the emergency by noises from escaping gas and rocks hitting the roofs, fled from the burning buildings. Approximately 1,500 apartment residents were evacuated. Miraculously, no deaths directly resulted from the rupture and resulting fire. Most injuries were minor foot burns and cuts that the apartment residents sustained from the hot pavement and glass shards as they fled the complex. Damage from the accident exceeded $25 million.[1]

Following the accident, the Safety Board interviewed the asphalt plant employees and mailed questionnaires to the apartment complex residents to determine whether they were aware of the presence of the TETCO pipeline. Only long-time plant employees who had witnessed the installation of the pipeline were aware that it crossed the plant property. All of the apartment

[1] For more detailed information, read Pipeline Accident Report–*Texas Eastern Transmission Corporation Natural Gas Pipeline Explosion and Fire, Edison, New Jersey, March 23, 1994* (NTSB/PAR-95/01).

residents responding to the Safety Board survey indicated that they had no knowledge of the pipeline.

TETCO's public awareness actions were typical of most natural gas transmission companies. The pipeline company sent annual mailings to all owners of property adjacent to the pipeline informing them about the pipeline and related safety information. TETCO also notified the general public about the pipeline by publishing notices in area newspapers.

The Edison accident raises questions as to whether TETCO's and other pipeline operators' public education programs are adequate to reach the necessary audiences. The Safety Board does not believe pipeline operators can practicably disseminate public education information to all occupants and employees of commercial and industrial properties adjacent to pipelines. Rather, it believes the notified land owners should further disseminate information about the pipeline. Apartment managers can provide pipeline safety information to tenants when they rent their units. Owners of business properties adjacent to the pipeline can post pipeline information on an employee bulletin board, conduct a briefing about the pipeline in an employee safety meeting, or disseminate the information to their employees in the manner that they determine is most effective. In the case of this accident, such information may have better prepared the apartment residents for evacuating the buildings and cautioned plant employees about excavating or storing materials in the area or the pipeline. The Safety Board believes that pipeline operators should advise land owners about the importance of further disseminating its safety information to tenants and employees who live or work on land adjacent to high-pressure pipelines.

The Safety Board determined that the major problem in this accident was TETCO's inability to shut off the gas flow to the rupture for 2 1/2 hours. The burning gas continued to radiate such great heat that firefighters could not even get close enough to the burning apartment buildings nearest the fireball to combat the blazes, let alone contain or extinguish the fires. Had TETCO had the capability to promptly shut down the flow of gas to the rupture, firefighters could have sooner extinguished the blazes after the pressure in the line diminished and likely could have controlled the spread of the fires to adjacent buildings. The damage in the rupture area likely would have been the same, but the damage to the surrounding residential area probably would have been substantially less.

The TETCO employees had no way to remotely shut down the gas flow because the company's valves were not equipped to close automatically or be controlled remotely. TETCO has no automatic-operated valves (ACVs) and few remote-operated automatic valves (RCVs) on its 10,000-mile system. Despite the limitations in TETCO's system, the company is in compliance with Federal regulations, which do not contain specific requirements for rapid detection and shutdown of failed pipe segments. TETCO's Senior Vice President stated that the company is considering using RCVs to improve its ability to rapidly shut down failed pipeline segments. He said TETCO is not considering automatic shutdown valves because it is convinced they are not sufficiently reliable.

In its background investigation for this accident, the Safety Board reviewed pipeline operator responses to a 1989 Research and Special Programs Administration (RSPA) request for

comments on the use of ACVs and RCVs (Docket PS-104). The number of valves used by each operator ranged from 4 to 600. Because RSPA did not request specific information, most responses from operators did not contain sufficient information to determine whether they were currently using ACVs and RCVs, how many valves they were using, how long they had used ACVs or RCVs, or on what length of pipeline they had installed ACVs or RCVs. However, a number of responders indicated that their experience with ACVs and RCVs had been good; several cited instances in which ACVs or RCVs sensed a pressure drop following a rupture and closed properly.

The Safety Board believes that, based on current uses of ACVs and RCVs by some gas transmission companies, the industry needs to assess the risks posed to public safety if failed pipeline segments are not promptly shut down. ACVs and RCVs should be installed where public safety risks are determined to be unreasonable.

Therefore, the National Transportation Safety Board recommends that the American Petroleum Institute:

> Encourage your Members to modify the information in the annual mailings of their public education pipeline safety program to encourage recipients to disseminate the pipeline safety precautions to their tenants and employees who reside and work on property adjacent to high-pressure pipelines. (Class II, Priority Action)(P-95-14)
>
> Encourage your members to develop programs, which include the modification of exisiting valves for remote or automatic operation, that will reduce to a minimum the time required to stop the flow of natural gas or hazardous liquids to failed pipeline segments, especially those segments in urban or environmentally sensitive locations. (Class II, Priority Action)(P-95-15)

Also, the Safety Board issued Safety Recommendations P-95-1 through -4 to the Research and Special Programs Administration, P-95-5 through -7 to the Texas Eastern Transmission Corporation, P-95-8 and -9 to the American Public Works Association, P-95-10 and -11 to the Interstate Natural Gas Association of America, P-95-12 and -13 to the Association of Oil Pipe Lines, P-95-16 and -17 to the American Gas Association, P-95-18 and -19 to the American Society of Civil Engineers, P-95-20 and -21 to the International City/County Management Association, and P-95-22 and -23 to the American Planning Association. The Safety Board is also reiterating Safety Recommendations P-87-4 and P-90-21 to the Research and Special Programs Administration. If you need additional information, you may call (202) 382-0672.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with

respect to the recommendations in this letter. Please refer to Safety Recommendations P-95-14 and -15 in your reply.

Chairman HALL and Members HAMMERSCHMIDT and FRANCIS concurred in these recommendations.

By: Jim Hall
Chairman