# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

**Date:** November 4, 2004

**In reply refer to:** P-04-14

Dr. Harry Armen
President
American Society of Mechanical Engineers
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The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses the adequacy of industry standards for emergency planning. The recommendation is derived from the Safety Board's investigation of the April 7, 2003, storage tank explosion and fire in Glenpool, Oklahoma, and is consistent with the evidence we found and the analysis we performed.[1] As a result of this investigation, the Safety Board has issued eight safety recommendations, one of which is addressed to the American Society of Mechanical Engineers. Information supporting this recommendation is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

On April 7, 2003, about 8:55 p.m., central daylight time, an 80,000-barrel storage tank at ConocoPhillips Company's (ConocoPhillips) Glenpool South tank farm in Glenpool, Oklahoma, exploded and burned as it was being filled with diesel. The tank had previously contained gasoline, which had been removed from the tank earlier in the day. The tank contained between 7,397 and 7,600 barrels of diesel at the time of the explosion. The resulting fire burned for about 21 hours and damaged two other storage tanks in the area. The cost of the accident, including emergency response, environmental remediation, evacuation, lost product, property damage, and claims, was $2,357,483. There were no injuries or fatalities. Nearby residents were evacuated, and schools were closed for 2 days.

The Safety Board determined that the probable cause of the storage tank explosion and fire was ignition of a flammable fuel-air mixture within the tank by a static electricity discharge due to the improper manner in which ConocoPhillips conducted tank operations. Contributing to the extent of the property damage and the magnitude of the impact on the local community was

[1] For additional information, see National Transportation Safety Board, *Storage Tank Explosion and Fire in Glenpool, Oklahoma, April 7, 2003*, Pipeline Accident Report NTSB/PAR-04/02 (Washington, D.C.: NTSB, 2004).

the failure of American Electric Power (AEP) employees to recognize the risk the tank fire posed to the nearby power lines and take effective emergency action.

AEP power poles were located east of the Glenpool South tank farm on top of the wall of the dike that surrounded the tank farm. The facilities included three conductors and two shield wires[2] supported off a single cross bar on dual wooden poles. AEP personnel became aware of the accident through broadcast news reports shortly after the explosion occurred, and although the AEP transmission system operator knew the AEP power lines were near the fire, no AEP personnel responded until several hours later when a ConocoPhillips employee contacted AEP and asked that the electric lines be inspected. An AEP representative visited the scene twice while the tank burned, and he inspected the power lines. But he did not notify the incident commander when he arrived on scene or inform him of his findings. About 6:00 a.m. on April 8, the shield wires and energized conductors on these poles fell to the ground. This started a fire in the unburned diesel that was released from the destroyed tank that was being impounded in the dike north of the destroyed tank 11.

Because of the proximity of the AEP power lines and the Glenpool South tank farm, it is obvious that damage, a failure, or an emergency at one facility had the potential to jeopardize the safety of the other. However, neither AEP personnel nor ConocoPhillips personnel had contacted one another to familiarize themselves with the affected facilities at the Glenpool South tank farm or to plan for a coordinated response to pipeline and electrical emergencies there.

The fact that the AEP representative never made contact with the incident commander limited the incident command's ability to keep AEP informed as the fire situation changed and limited AEP's knowledge of the situation. As a result, AEP's second response to the accident site was too late, and its overall response was ineffective.

Federal regulations for hazardous liquid pipelines (49 *Code of Federal Regulations* Part 195), which cover breakout tanks such as those at the Glenpool South tank farm, have requirements for emergency procedures, including emergency response planning and emergency response. For natural gas pipelines, the American National Standards Institute (ANSI) Gas Piping Technology Committee's *Guide for Gas Transmission and Distribution Piping Systems*[3] includes material intended to assist the user in complying with the Federal regulations. It states that parts of an emergency plan may need to:

> be developed and maintained in coordination with local emergency response personnel (e.g., police, fire, and other public officials) and with other entities in or near the pipeline rights-of-way (e.g., other utilities, highway authorities, and railroads) that may need to respond to a pipeline emergency.

[2] A *shield wire* is a grounded conductor installed to shield a phase conductor from a direct lightning strike.

3 ANSI GPTC Z380.1, Guide for Gas Transmission and Distribution Piping Systems, Gas Piping Technology Committee. The Gas Piping Technology Committee is an independent consensus committee comprising representatives from the pipeline industry, including manufacturers, operators, and consultants, as well as from pipeline safety regulatory agencies.

Nationally recognized industry codes are an important resource for facility operators. When written by Government and industry professionals with experience in emergency planning, implementation, and personnel training, a code can be a primary reference when an operator prepares a company-specific emergency plan.

For natural gas and hazardous liquid pipeline systems, the American Society of Mechanical Engineers codes include requirements for emergency planning. However, the codes do not list electric utilities among the parties a pipeline operator should contact when planning its response to an emergency.

Therefore, the National Transportation Safety Board makes the following safety recommendation to the American Society of Mechanical Engineers:

> Revise the emergency response planning requirements in your gas and hazardous liquid pipeline codes to include coordination with electric and other utilities that may need to respond to a pipeline emergency. (P-04-14)

The Safety Board also issued safety recommendations to the Research and Special Programs Administration in the Department of Transportation, ConocoPhillips Company, American Electric Power, and the Institute of Electrical and Electronics Engineers. In your response to the recommendation in this letter, please refer to Safety Recommendation P-04-14. If you need additional information, you may call (202) 314-6177.

Chairman ENGLEMAN CONNERS, Vice Chairman ROSENKER, and Members CARMODY, HEALING, and HERSMAN concurred in this recommendation.

*Original Signed*

By: Ellen Engleman Conners
Chairman