



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: June 8, 2006

In reply refer to: P-06-1

Mr. Wendell F. Holland
Chairman
Pennsylvania Public Utility Commission
400 North Street
P.O. Box 3265
Harrisburg, Pennsylvania 17105-3265

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 Pennsylvania Public Utility Commission's (PUC's) oversight duties pertaining to the integrity of butt-fusion joints in National Fuel Gas Distribution Corporation's (National Fuel's) gas distribution system. This recommendation is derived from the Safety Board's investigation of the August 21, 2004, leak, explosion, and fire in DuBois, Pennsylvania, 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 five safety recommendations, one of which is addressed to the Pennsylvania PUC. 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 August 21, 2004, about 8:54 a.m., a natural gas explosion destroyed a residence located at 48 Woodland Lane in DuBois, Pennsylvania. Two residents were killed in this accident. The Safety Board determined that the probable cause of the leak, explosion, and fire in DuBois, Pennsylvania, on August 21, 2004, was the fracture of a defective butt-fusion joint and the failure of National Fuel to have an adequate program to inspect butt-fusion joints and replace those joints not meeting its inspection criteria.

¹ For additional information, see National Transportation Safety Board, *Natural Gas Pipeline Leak, Explosion, and Fire, DuBois, Pennsylvania, August 21, 2004*, Pipeline Accident Brief NTSB/PAB-06/01 (Washington, DC: NTSB, 2006).

The May 2005 National Fuel fusion procedure addresses drag force.² However, instead of determining the drag force on a case-by-case basis in the field, the National Fuel procedure adds a predetermined fixed drag force for some fusion machines. Drag force is dependent on the friction forces of the ground over which the pipe has to be moved in order to join the sections. Therefore, it is a variable that should be determined on a case-by-case basis and accounted for before the joining force is applied.

National Fuel employees who produce plastic fusions and fitting installations are required to take an initial qualification course and are then requalified annually. This process requires the trainee to make test joints that may or may not be made from coiled pipe. However, butt fusion of coiled pipe is considered more difficult than fusion of straight pipe because the residual curvature makes it difficult to obtain an optimal alignment and reduce mitering. Proper procedures, equipment, and extra care are necessary if high-quality joints are to be consistently produced. It is important to conduct fusion qualification and requalification using coiled pipe if coiled pipe will be butt fused in the field.

Federal regulations (49 *Code of Federal Regulations* 192.613 and 192.617) require that gas pipeline system operators have procedures in place for monitoring the performance of their gas systems. These procedures must cover surveillance of gas system failures and leakage history, analysis of failures, submission of failed samples for laboratory examination (to determine the causes of failure), and minimizing the possibility of future recurrences. National Fuel has reported that it is revising its surveillance and analysis program to address the integrity of butt-fusion joints.

The Safety Board notes that the butt-fusion joint linked to the accident was defective and did not meet National Fuel's visual inspection criteria. The Board's investigation also revealed that additional butt-fusion joints did not meet the inspection criteria, and two of the joints had an area that separated in the joint during tensile testing. To date, National Fuel has not recognized many of these results. Further, National Fuel's fusion procedure has not adequately addressed drag force, nor has it required fusers³ to make qualifying test joints using coiled pipe. The results of the Board's investigation raise questions about the integrity of butt-fusion joints constructed and maintained by National Fuel.

The National Transportation Safety Board therefore makes the following safety recommendation to the Pennsylvania Public Utility Commission:

² The fusion of a long or heavy segment of pipe is different from the fusion of two small segments of plastic pipe. *Drag force* is the force required to move the pipe to be joined. If this drag force is not added before applying the joining force, the proper joining force may not be applied.

³ A *fuser* is a person who makes fusion joints.

Require an analysis of the integrity of butt-fusion joints in National Fuel Gas Distribution Corporation's gas distribution system and replacement of those joints that are determined to have unacceptable characteristics. (P-06-1)

The Safety Board also issued safety recommendations to National Fuel Gas Distribution Corporation, USPoly Company, and the Plastics Pipe Institute. In your response to the recommendation in this letter, please refer to Safety Recommendation P-06-1. If you need additional information, you may call (202) 314-6177.

Acting Chairman ROSENKER and Members ENGLEMAN CONNERS, HERSMAN, and HIGGINS concurred in this recommendation.

[Original Signed]

By: Mark V. Rosenker
Acting Chairman