

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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Forwarded to:

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SAFETY RECOMMENDATION(S)

P-83-11

On October 29, 1982, Washington Gas Light Company dispatched a three-person crew, consisting of a crew leader, a crew mechanic, and a helper mechanic, to make three service line extensions in a new housing development at Burke, Virginia. The extensions were to be made without shutting off the flow of gas in the main.

About 10:30 a.m., the crew arrived at the work site and connected the service line for residence No. 10027 (see figure 1) to an existing service line stub. After making this connection, the crew was to install a branch service line to residence No. 10023 from the service line connected to the house next door, No. 10025. Using hand tools, a hole 30 inches deep was excavated to expose the plastic service line. The service line was cut, and the end of the service line segment which contained gas under pressure was sealed with a cap. The installation required that a branch tee connection be installed in the service line to No. 10025 to allow No. 10023 to be served from the same service line. A check of the service truck disclosed that the appropriate compression tee was not available at the job site; by radio, the crew leader called the foreman and advised him that a branch tee was needed. While waiting for the requested fitting, the crew began work at residence No. 10002.

When the foreman arrived with the branch tee, the crew mechanic volunteered to install the tee on the service line to No. 10025. Neither the foreman nor the crew leader advised against this action, and the crew leader and helper mechanic continued working at residence No. 10002. After a few minutes, the crew leader looked up and did not see the crew mechanic. He walked to No. 10025 and found the crew mechanic face down inside the excavation with gas escaping at 18 psig from the service line. He pulled the crew mechanic from the excavation and tried to revive him by calling his name and slapping his face. When this action did not revive the crew mechanic, the crew leader ran to his truck and called the gas company dispatcher. Meanwhile, the helper mechanic arrived at the excavation site. Both the crew leader and the helper mechanic had attended company cardiopulmonary resuscitation (CPR) training, but neither attempted to use this means to revive the crew mechanic. About 4 to 5 minutes later, a rescue squad arrived and, after attempting to revive the crew mechanic, transported him to the hospital, where he was declared dead.

After removing the crew mechanic from the excavation, the crew leader and helper mechanic noticed that the compression tee was partially installed. One downstream connection was completed; the other downstream connection had been made, but the retaining nut was only hand-tight. The upstream connection had not been made, and the cap had been removed from the portion of the service line under pressure. Company

procedures allow work to be performed on lines containing gas under pressure, and for the installation being undertaken, a pressure up to 55 psig was permissible. Company procedures also require that (1) as a means to reduce the time an employee works in a hazardous environment, the nonpressurized connections be completed before the cap on the line under pressure is removed for making the final connection, and (2) when performing work on lines containing gas under pressure, at least two employees be present, with one observing the work and available to rescue the employee performing the work if necessary.

Company records reflect that each crewmember had received a combination of on-the-job and classroom training sufficient to qualify him to perform his assigned duties in accordance with company procedures. The company evaluates the effectiveness of the classroom training through an employee testing program.

Employee actions in this accident demonstrate that these crewmembers did not follow company procedures and did not apply training received -- (1) the crew leader and the crew mechanic both failed to comply with the requirement that two employees be present when working on lines containing gas under pressure; (2) the crew mechanic did not follow explicitly the installation procedures for installing the compression tee; and (3) neither the crew leader nor the helper mechanic attempted to revive the crew mechanic by employing CPR techniques. This death could have been prevented had a second employee been present while the compression tee was being installed, and the accident may have been prevented had the compression tee installation procedures been followed explicitly.

In a 1981 Special Study, 1/ the Safety Board characterized many conditions under which the installation of excess flow valves 2/ appear to have safety potential, and recommended that the Gas Research Institute (GRI):

Determine the conditions and locations (other than those for which the Safety Board is recommending immediate regulatory action--i.e., high pressure, single-family residential services) for which excess flow valves can be effective in preventing or minimizing the potential for various types of accidents resulting from leaks on high and low pressure service lines. Among the conditions which should be evaluated are gas demand variations, minimum operating pressure, service line size, length, and configuration, major leaks on house piping, cleanliness of gas, and effect of peak shaving operations. (P-81-36)

In response to this recommendation, the GRI has instituted a research project, which, as one of its 1983 objectives, will identify situations in which excess flow valves are cost-effective. Recognizing that the cause of this accident was unsafe work practices, the Safety Board believes that this accident might have been prevented if an excess flow valve had been installed in the service lines. The Safety Board also believes that the previously unidentified potential for excess flow valves to prevent accidents when work is being performed on gas pipelines should be included as a part of the GRI's project for assessing the cost-effectiveness of excess flow valves.

1/ Pipeline Special Study: "Pipeline Excess Flow Valves" National Transportation Safety Board, September 9, 1981, (NTSB-PSS-81-1).

2/ An excess flow valve is a safety device installed on the service line near its connection with the gas main to automatically and rapidly shut off the flow of gas in the event of a service line rupture. These devices are not required by Federal safety standards.

Accordingly, the National Transportation Safety Board recommends that the Gas Research Institute:

Include within its ongoing research for assessing the cost effectiveness of excess flow valves, an assessment of the potential for such valves to prevent or minimize the effect of accidents which may occur while work is being performed on the system by gas company employees. (Class II, Priority Action) (P-83-11)

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." (P.L. 93-633). The Safety Board is vitally interested in any actions taken as a result of our safety recommendations. Therefore, we would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS, BURSLEY, and ENGEN, Members, concurred in this recommendation.


By: Jim Burnett
Chairman

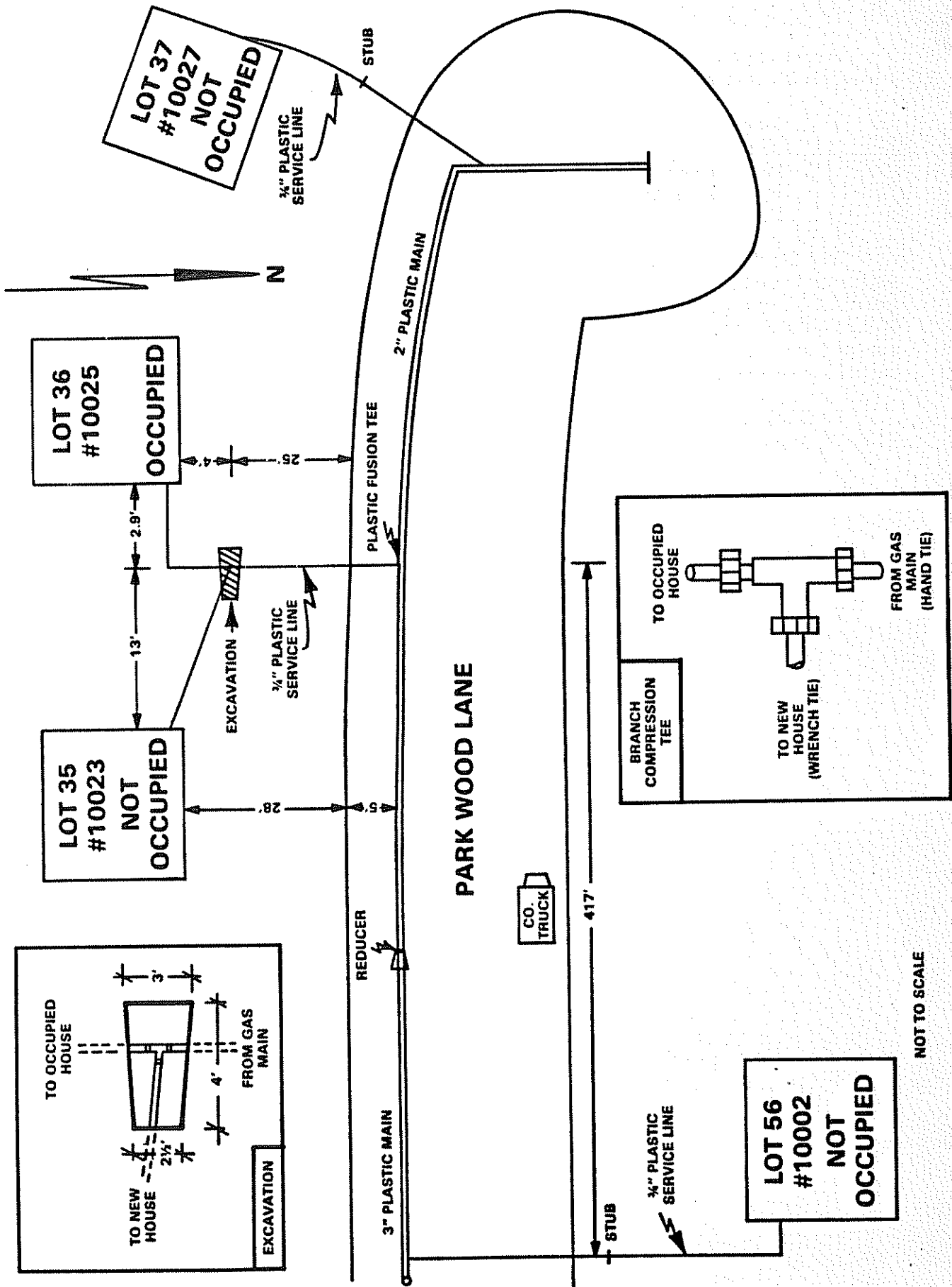


FIGURE 1: PLAN VI OF ACCIDENT SITE