



National Transportation Safety Board

Washington, D. C. 20594

Safety Recommendation

Log P-291D

Date: November 21, 1988

In reply refer to: P-88-14

Mr. G. H. Lawrence
President
American Gas Association
1515 Wilson Boulevard
Arlington, Virginia 22209

On January 18, 1988, a natural gas explosion destroyed the building housing the K&W Cafeteria and the lobby of the Sheraton Motor Inn at 380 Knollwood Street, Winston-Salem, North Carolina. Two adjoining motel wings suffered structural damage. Of the four persons in the lobby/cafe building at the time of the explosion, three sustained minor injuries. The fourth person sustained a fractured ankle. One motel guest also sustained minor cuts but refused treatment.¹

If the gas meter had not been located in a pit that also opened directly into the boiler room, the accident likely would not have occurred. When the meter installation was designed in 1964, the Piedmont Natural Gas Company (Piedmont) recognized some danger of placing the meter in the pit by using a security valve rather than a pressure relief valve to protect against overpressurization and possible rupture of customer piping. The security valve stops the flow of gas to the customer whereas the pressure relief valve vents gas to the atmosphere. In the case of a catastrophic failure upstream of the security valve, gas would be released directly into the pit until a valve on the distribution line was closed.

Current Federal regulations, 49 CFR 192.353(b), published in 1970, require that inside meters be located in a well-ventilated place and not less than 3 feet from any source of ignition. The direct openings in the basement wall into the pit effectively placed the gas meter within the boiler room. Other than the squirrel cage fan, the gas meter and piping likely were not within 3 feet of any potential ignition source. Section 192.355(b) requires that a customer's service regulator and relief valve be located where gas from the vent can escape freely into the atmosphere and away from any opening into the building. Section 192.357(d) also requires that each regulator that might release gas in its operation be vented to the outside atmosphere.

¹For more detailed information, read Pipeline Accident Report--Piedmont Natural Gas Company, *Natural Gas Explosion and Fire, Winston-Salem, North Carolina, January 18, 1988* (NTSB/PAR-88/01)

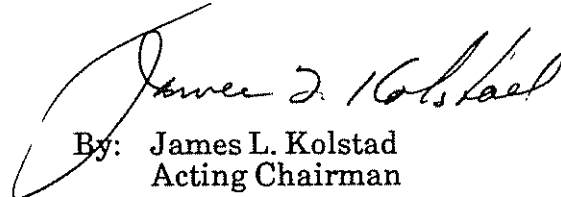
The Safety Board recognizes that the pit and meter arrangement at the Sheraton likely satisfied both provisions. The top of the pit, being covered by a metal grate, was open to the atmosphere. Natural gas, being less dense than air, normally rises and would be expected to vent through the top of the pit, away from the ventilation openings into the boiler room. Since the squirrel cage fan was drawing air into the boiler room from the pit, sufficient dispersion of leaking gas into the atmosphere is questionable at best. Consequently, the Safety Board believes that the placement of the gas meter set in a pit with openings directly to the boiler room was a poor engineering design and was inherently dangerous. The Safety Board believes that Piedmont should have recognized at the time the gas meter was installed the dangers such an arrangement presented and, therefore, should have installed the meter in a safer location.

Therefore, the National Transportation Safety Board recommends that the American Gas Association:

Notify member companies of the circumstances of the natural gas explosion in Winston-Salem, North Carolina, on January 18, 1988, and recommend that each company survey existing gas meter installations and relocate those that are in pits adjacent to building openings. (Class II, Priority Action) (P-88-14)

Also, as a result of its investigation, the Safety Board issued Safety Recommendations P-88-4 through -9 to the Piedmont Natural Gas Company; P-88-10 to the city of Winston-Salem, North Carolina; P-88-11 and -12 to the North Carolina Utilities Commission; P-88-13 to the Research and Special Programs Administration of the U.S. Department of Transportation; and P-88-14 to the American Gas Association.

KOLSTAD, Acting Chairman, and BURNETT, LAUBER, NALL, and DICKINSON, Members, concurred in this recommendation.


By: James L. Kolstad
Acting Chairman