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asphyxiation of the first two men was the inhalation of natural gas released into the vault in which they were working, when an attempt was made to change a valve in the vault without first stopping the flow of gas. Four other workmen also died of asphyxiation while they were attempting to rescue the first two. Contributing to the accident were the lack of: (1) use by any of the workmen of respirators, air blowers or vapor detectors; (2) any written procedures for accomplishing the regulator station revamping; and (3) proper personnel training.

VI. RECOMMENDATIONS

The National Transportation Safety Board recommends that:

1. The Office of Pipeline Safety of the Department of Transportation clarify the language of 49 CFR 192.199(g) to state 25 clearly that the intent of the regulation is to separate pressure-limiting devices and overpressure-protection devices by distance, barrier, or separate housing.
2. The American Society of Mechanical Engineers Gas Piping Standards Committee:
   (a) Include in its "Guide for Gas Transmission and Distribution Piping Systems" procedures for testing the 26 atmosphere of underground structures prior to entering and while working in these structures. The practices of the American Telephone and Telegraph Company should be considered during the establishment of these guidelines.
   (b) Develop guidelines that pipeline operators can use in their training programs 27 which will help employees understand the characteristics of natural gas, its effects on the human body, and how to act properly while in its presence.
3. The Equitable Gas Company:
   (a) Distribute its "Standard Safety 28 Practices" manual to all employees affected by its contents.
   (b) Include programs in its training that will insure that all employees are 29 familiar with the contents of its "Standard Safety Practices" manual.
   (c) Include in its training programs a course on understanding the characteristics of natural gas, its effects on the 30 human body, and the correct procedures to be used in its presence.
   (d) Prepare written procedures for each planned shutdown of a portion of its pipeline system, or the installation or 31 replacement of portions of the system which require stopping, or initiating the flow of gas.
   (e) Conduct a field inspection of existing facilities it plans to upgrade, replace, 32 revamp, relocate, or change, prior to commencing the redesign.
   (f) Develop standards for the design of typical regulator station installations 33 for various types of service.

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