

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Corrected copy
ISSUED: June 18, 1984

Forwarded to:

Honorable Howard Dugoff
Administrator
Research and Special Programs
Administration
U.S. Department of Transportation
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

P-84-26

About 7:25 p.m., c.s.t., on March 15, 1983, an 8-inch-diameter liquefied petroleum gas (LPG) pipeline operated by the Mid-America Pipeline System (MAPCO) was damaged by a rotating power auger being used to drill holes in rocky terrain to plant trees on Lot 8, Section 5, Block 43 of the Chaparral Estates housing development near West Odessa, Texas. The damaged pipeline ruptured and within 3 minutes, LPG, which was being transported at 1,075 psig, escaped, vaporized, and was ignited by an undetermined source. In the resultant fire, five persons were killed and five persons were seriously injured--one person died 5 days later. Two mobile homes, a small frame house, an auger truck, two cars, and a pickup truck were destroyed; 9,375 barrels of LPG were burned.

When the pipeline was installed in 1960, the area west of Odessa was undeveloped and uncultivated land. The Grant of Easement entered into in 1960 between MAPCO and the former owner of the land now known as Chaparral Estates provided permanent rights for MAPCO to clear and keep clear an area along the route of the pipeline which extended 25 feet on each side of the center of the pipeline. The easement was recorded in Vol. 369, page 1 of the deed records of Ector County. Additionally, the easement precluded the grantor of the easement from building or allowing others to build upon the easement in any way "that will interfere with the normal operation and maintenance" of the pipeline. With the growth of Odessa after 1960, surrounding acreage has been developed into unincorporated residential communities, many of which have been built over existing oil gathering, natural gas transmission, and liquefied petroleum pipelines.

In the late 1970's and early 1980's, the area known as Chaparral Estates was subdivided into residential lots. Many conventional and mobile homes have been placed on the lots. Block 43 of Section 5, the portion of Chaparral Estates in which the rupture occurred, was subdivided in 1981, and 11 of the residential lots overlay MAPCO's LPG pipeline easement. The two mobile homes destroyed in the fire were located on 2 of these

1/ For more detailed information read Pipeline Accident Report--"Mid-America Pipeline System Liquefied Petroleum Gas Pipeline Rupture, West Odessa, Texas, March 15, 1983" (NTSB/PAR-84/01).

11 lots, and the mobile home on Lot 8 encroached 15 feet into MAPCO's easement and was within 10 feet of the pipeline. Since the development of Block 43 of Chaparral Estates, roads have been graded over the pipeline, and numerous excavations have been made adjacent to the pipeline for installing buried telephone cables, septic tanks, and poles for electric power lines.

When MAPCO learned that land adjacent to its pipeline was being developed for residential lots, additional markers were installed over the pipeline. Even though MAPCO was aware that its pipeline lay only 16 inches below the surface, that roads had been graded over the pipeline, and that the high-pressure pipeline now would be exposed to additional risks which might endanger a significant number of people, no changes were made in the design or operation of the pipeline to increase protection for persons who would live close to the pipeline. No changes were required by 49 CFR Part 195 (Federal requirements for liquid pipelines).

Chaparral Estates, like many other land subdivisions, was planned without consideration of the hazards that might be posed to future residents by damage to pipelines transporting hazardous materials. Moreover, Ector County officials approved the plans for Chaparral Estates without consideration of the effect of the development upon the safety of MAPCO's pipeline and also without consideration of the possible hazard to future residents posed by the pipeline. Because neither the developer nor land planning officials recognized the location of the pipeline within the planned subdivision as a potential threat to the safety of future residents, 11 lots in Block 43 were allowed to be developed over the land occupied by MAPCO's pipeline easement. Dwellings could not be erected or placed on some of these lots without siting the dwelling over the pipeline. MAPCO's first knowledge of the development was provided by its aerial surveys when construction activity was noted.

The Safety Board recognizes that high-pressure pipelines underlie many residential lots throughout the nation and that houses have been built over them. These potentially adverse conditions will be difficult to abate easily or economically; however, there is no justification for local land use and planning agencies or land developers to continue to add to the problem. Local governments should establish land development standards which will preclude subdividers from creating lots over pipelines or lots in which construction cannot be undertaken without encroaching on pipeline easements. Such standards might even be tailored to force land developers to subdivide lands so that the high-pressure pipelines lie within an area to be used as streets or clear areas within the community. If these alternatives are not possible, the developer should be required to arrange with the owner of a pipeline for its relocation away from the residential development or to provide a necessary margin of safety by other means.

Title 49 CFR Part 192 and 49 CFR Part 195 were primarily based on industry codes (ASA B31.8 for natural gas pipelines and ASA B31.4 for liquid pipelines). The gas code took into account population densities for the construction of pipelines while the liquid code did not incorporate comparable restrictions. Consequently, the Federal liquid regulations do not take into account population densities.

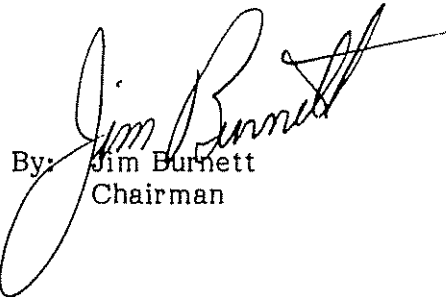
Title 49 CFR Part 192 requires operators of natural gas pipelines that are located in areas where the population has increased significantly since the pipeline's installation to reevaluate and/or retest the pipeline to confirm that its margin of safety is adequate or to reduce the maximum allowable operating pressure such that an adequate margin of safety is achieved. However, the regulations in Part 195 do not require operators of liquid pipelines to take comparable action and, consequently, many liquid pipelines continue to

operate without increasing the margin of safety even though the land adjacent to the pipeline may have become more densely populated. The margin of safety provided for liquid pipelines, especially for those that transport highly volatile liquids or liquids which possess toxic materials, should be reevaluated periodically. Provisions for reevaluating safety factors, such as the provisions contained in 49 CFR 192.611 for natural gas pipelines, should be established for liquid pipelines which transport highly volatile or toxic liquids.

Therefore, the National Transportation Safety Board recommends that the Research and Special Programs Administration:

Amend Federal regulations governing pipelines that transport highly volatile liquids to require a level of safety for the public comparable to that now required for natural gas pipelines. (Class II, Priority Action)
(P-84-26)

BURNETT, Chairman, and BURSLEY and GROSE, Members, concurred in this recommendation. GOLDMAN, Vice Chairman, did not participate.


By: Jim Burnett
Chairman