## [4910-60-M]

## DEPARTMENT OF TRANSPORTATION

Materials Transportation Bureau

` [49 CFR Part 195]

## [Docket No. PS 55; Notice 1] TRANSPORTATION OF LIQUIDS BY PIPELINE

# Testing Highly Volatile Liquid Pipelines

AGENCY: Materials Transportation Bureau, DOT.

ACTION: Notice of proposed rulemaking.

SUMMARY: With certain exceptions, part 195 does not require liquid pipelines constructed before January 8, 1971, to be qualified for use by hydrostatic testing. Liquid pipelines have experienced accidents caused by latent material and construction defects which could have been prevented had such defects been discovered and removed through hydrostatic testing. This notice proposes to reduce the potential for severe liquid pipeline accidents by requiring a hydrostatic test in accordance with Subpart E on all onshore pipelines carrying highly volatile liquids (HVL) which have not been previously tested to at least 1.25 times their maximum operating pressure for at least 24 hours.

DATE: Comments must be received by February 15, 1979. Late filed comments will be considered as far as practicable.

ADDRESS: Comments should identify the docket and notice numbers and be submitted in triplicate to the Docket Branch, Materials Transportation Bureau, 2100 Second Street SW., Washington, D.C. 20590. Comments are available at docket room 6500.

FOR FURTHER INFORMATION CONTACT:

Frank Robinson 202-426-2549.

SUPPLEMENTARY INFORMATION: Need for this proposal:

Accident reports on file with the Materials Transportation Bureau (MTB) covering the past 9 years show that highly volatile liquid (HVL) pipelines have caused a substantially higher percentage of deaths, injuries, and property damage than liquid pipelines carrying less volatile commodities. The record of liquid pipeline accidents reported on form DOT-7000-1 from 1968 through 1977 shows that although HVL pipeline accidents comprise only 10 percent of the total number of accidents involving liquid pipelines, the HVL accidents caused 66 percent of the deaths, 50 percent of the injuries and 30 percent of the property damage. These statistics clearly illustrate that an HVL spill presents a much higher risk to safety than spills

of other liquids. This higher potential for damage is due to the fact that when HVL is released to the atmosphere it forms a gas cloud which is a markedly different and more insidious hazard than that presented by spills of less volatile liquids.

Inside the pipeline HVL will remain a liquid as long as the pressure is higher than the vapor pressure of the liquid. If a pipeline rupture occurs and the pressure is reduced to atmospheric, some of the liquid will immediately flash to gas. The remainder will turn to gas as it picks up heat from its surroundings. The gas forms a cloud that will move downhill or downwind depending on the terrain, type of liquid involved, and atmospheric conditions. Because it is generally heavier than air, the rapidly expanding gas cloud will tend to hug the ground as it continues to move. If a source of ignition is encountered a petroleum gas cloud will burn or explode. In the case of anhydrous ammonia, the greatest danger is that of toxicity or asphyxiation. For either commodity, the hazards are severe.

A definition of "highly volatile liquid" has been proposed for adoption under part 195 in notice 1 of docket No. PS-51 (43 FR 35513, August 10, 1978) but is repeated here for clarity: A "highly volatile liquid" or "HVL" means a liquid which has an absolute vapor pressure of 100 kPa (14.5 psi) or more at 37.8° C (100° F).

Analysis of the liquid pipeline accidents reported on Form DOT-7000-1 shows that one-tenth of the accidents during the years 1968 through 1977 were caused by defective pipe seams, defective girth welds, and defective pipe materials. These types of defects should have been found during an original hydrostatic test. However, some pipelines in HVL service under part 195 either have not been hydrostatically tested or have not been hydrostatically tested adequately.

A review by MTB of 2,883 liquid pipeline carrier accident reports (DOT form 7000-1) selected from submissions between 1968 and the first quarter of 1977'showed that 1,364 (47 percent) of the pipelines involved had not been hydrostatically tested. Of those that had been tested, 476 (31 percent) had a test period of 4 hours or less. While not all the reports examined involved HVL pipelines, MTB finds it reasonable to conclude that a substantial number of HVL pipelines have not been either hydrostatically tested or subjected to a sufficiently rigorous hydrostatic test.

The value of an adequate hydrostatic test is well stated in the study "Transportation of Highly Volatile, Toxic, or Corrosive Liquids by Pipeline" (DOT/OPSO/75/06) by Battelle

Columbus Laboratories. On page 52 this study states:

"Field Hydrostatic Test. The ultimate test for basic structural integrity of a pipeline is the field hydrostatic tests\* \* \* within thousands of miles of pipelines tested to stress levels of 90 percent of SMYS, or more, and subsequently operated at a stress level of 72 percent of SMYS there have been no ruptures resulting from original manufacturing or construction defects. This operating experience strongly suggests that of all the steps an operator can take to insure that his pipeline is initially free of harmful defects, highpressure hydrostatic testing in the field (to 90 percent of SMYS or more). is the only one that has demonstrated a successful track record. The benefits of such testing are accrued in rehabilition testing existing lines, as well as in new pipelines."

### OBJECTIVE

Pipelines constructed before January 8, 1971, the effective date of subpart E of part 195, are currently not required to be qualified for use by hydrostatic testing. Although qualification testing was proposed in notice 68-4 (33 FR 10213), the proposal was withdrawn when part 195 was adopted (34 FR 15473), primarily on cost-benefit grounds. In view of the HVL accident record. MTB now believes, however, that hydrostatically testing existing onshore HVL pipelines which have never been tested to the level provided by part 195 for new pipelines or existing pipelines which are changed would be justified by the benefits achieved. By preventing failures due to latent material and construction defects and other defects that would appear during hydrostatic testing, the potential for HVL accidents can be significantly reduced. Therefore, this notice proposes to amend subpart E to require that carriers perform a hydrostatic test in accordance with subpart E on each onshore steel pipeline carrying a highly volatile liquid which has not been previously tested to at least 1.25 times its maximum operating pressure for at least 24 hours. The proposed rulemaking is applicable only to onshore pipelines in the belief that an accidental release of HVL from offshore pipelines would not pose the same hazard as a spill onshore.

#### Issues

To comply with this proposed rulemaking the affected pipelines would have to be taken out of service temporarily. However, MTB believes that the relatively high potential for destructive consequences of future HVL pipeline accidents due to latent defects justifies the costs involved.

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MTB recognizes that compliance with this proposal might not be equitable for all carriers. Carriers who transport HVL on an occasional basis would be required to hydrostatically test the same as those carriers who transport HVL continuously. Comment on this issue is specifically requested.

There is also the issue of these inadequately tested HVL pipelines which have not yet experienced leaks due to material or construction defects. Should they be subjected to the same testing requirements as similarly constructed HVL pipelines that have had leaks? MTB believes they should be so tested because of the time it takes for a latent defect to surface. Comment is requested.

MTB recognizes that a substantial amount of work would have to be done by those carriers affected by this proposed rulemaking to meet the proposed hydrostatic testing requirement. Consequently, MTB requests comments regarding what an appropriate time period for compliance should be.

Under the text of the proposed amendment set forth hereafter, a carrier would have to test an existing HVL pipeline in accordance with subpart E unless the carrier can demonstrate by "appropriate records" that the pipeline previously was tested to at least 1.25 times its maximum operating pressure for at least 24 hours. Since testing records for pipeline constructed before January 8, 1971, may vary from carrier to carrier, to insure uniform application of the proposed testing requirement, MTB is considering making the proposed proof of adequate prior testing more definitive in the final rule. Thus, comments are requested regarding the types of records that are available that would suffice as appropriate evidence of prior testing. Also, commenters should consider whether any form of proof other than records would satisfactorily show adequate prior testing of a pipeline. It is important to note that under this proposal, carriers who do not have "appropriate records" of prior testing, or proof as it may be further defined in the final rule, would have to retest the HVL pipelines involved in accordance with subpart E.

#### ALTERNATIVE

The use of electronic detection equipment to detect latent defects was considered in lieu of hydrostatic testing. MTB believes that hydrostatic testing provides better proof of the structural integrity of a pipeline system. Comment on the use of electronic detection equipment as a substitute for or an adjunct to hydrostatic testing is specifically requested.

NOTE.—MTB has determined that this document does not contain a major proposal requiring preparation of a regulatory analysis under DOT procedures.

#### CHANGES TO REGULATIONS

In consideration of the foregoing, MTB proposes to amend part 195 of title 49 of the Code of Federal Regulations as follows:

1. By revising § 195.300 to read as follows:

#### §195.300 Scope.

This subpart prescribes minimum requirements for hydrostatic testing of existing onshore steel pipeline systems transporting highly volatile liquids, newly constructed steel pipeline systems, and for hydrostatic testing of existing steel pipeline systems that are relocated, replaced, or otherwise changed. However, this subpart does not apply to movement of pipe covered by § 195.424.

2. By redesignating the present § 195.302(b) as § 195.302(c) and adding a new § 195.302(b) to read as follows:

#### § 195.302 General Requirements.

. . . .

(b) An onshore pipeline constructed before January 8, 1971, transporting a highly volatile liquid must be hydro<statically tested in accordance with this subpart without leakage unless the carrier demonstrates by appropriate records that the pipeline has been hydrostatically tested to at least 1.25 times its maximum operating pressure for at least 24 hours.

#### . . . .

(18 U.S.C. 831-835, 49 U.S.C. 1655, 49 CFR 1.53(b), appendix A of part 1 and paragraph(b)(1) of appendix A to part 106.)

Issued in Washington, D.C., on November 7, 1978.

LUCIAN M. FURROW, Acting Associate Director for Pipeline Safety Regulation. (FR Doc. 78-31759 Filed 11-9-78; 8:45 am)