Contributing to the amount of NGL released were (1) the long distance between remotely controlled main-line valves and (2) the volatility of NGL, which permitted the escape of most of the NGL in the isolated section of pipeline.

VI. RECOMMENDATIONS

The National Transportation Safety Board recommends that:

1. The Office of Pipeline Safety of the Department of Transportation:

(a) Expedite rulemaking currently under study to provide for more complete and effective controls over the transportation by pipeline of liquefied petroleum gases, which would include natural gas liquids. These regulations should contain minimum standards for the design, construction, testing, operation, and maintenance of both new and existing pipelines. (Recommendation No. P-73-47)

(b) Undertake rulemaking concerning methods of handling, containing, and disposing of liquefied petroleum gases involved in pipeline failures. This rulemaking should take into account such external factors as weather conditions, leak site topography, and population density. (Recommendation No. P-73-48)

(c) Amend 49 CFR 195 to establish an educational program to enable customers and the general public to recognize and report liquefied petroleum gas leaks to appropriate officials. These regulations should be similar to those which appear in 49 CFR 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards." (Recommendation No. P-73-49)

(d) Undertake a study of the effects of pipe stress concentration caused by improper weld positioning and improper welding techniques. Based on the results of this study, incorporated into 49 CFR 195 specifications for pipeline repair-welding procedures designed to avoid stress concentrations. (Recommendation No. P-73-50)

2. The Phillips Pipe Line Company:

(a) Examine its pipeline system and excavate the line on a random-sample basis in areas where full-wrap reinforcement sleeves have been installed, and inspect those repaired sections for possible areas of stress concentration. (Recommendation No. P-73-51)

(b) Amend its Maintenance Operating Manual to include a section on stress concentration as a result of improper repair welding. (Recommendation No. P-73-52)

PAR 73-4

(c) Instruct its pipeline maintenance crews on the importance and necessity of proper positioning of welded reinforcement sleeves to minimize the chance of stress concentration on the carrier pipe. (Recommendation No. P-73-53)

(d) Make comprehensive soil tests along this entire pipeline right-of-way particularly in areas where pipeline failures have occurred. As a result of these tests, Phillips should check the pipe in areas of severe soil swell potential and should replace, anchor, or provide additional slack for pipe through the area. (Recommendation No. P-73-54)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOHN H. REED
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ LOUIS M. THAYER
Member

/s/ ISABEL A. BURGESS
Member

/s/ WILLIAM R. HALEY
Member

November 7, 1973