

5. The lack of facilities to transmit the continuously recorded line pressures from the unattended pump stations to the dispatching office resulted in the dispatchers' being unaware of trouble in the closed-in system.

6. At the time of the accident, Exxon was not in conformance with the intent of 49 CFR 195.408, Communications. This regulation, however, is vague and therefore unenforceable, and is not specific enough to guide pipeline companies to provide the correct kind and amount of communicable information for the safe operation of pipelines.

7. Unawareness on the part of the dispatchers of any line trouble from 12:30 a.m. until 6:20 a.m. resulted in the late notification of the maintenance personnel and the subsequent failure to shut off the leaking crude oil until after the explosion and fire.

8. The 4½-hour lapse between the line rupture and the explosion allowed enough crude oil to escape to fuel a fire which temporarily severed all pipeline, railroad, and telephone communications and blocked the main highway into Hearne from the south.

9. If an undetected leak of this nature had occurred in a more densely populated area, numerous fatalities, more injuries, and greater property damage would have occurred.

V. PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of the explosion and fire was the ignition of an accumulation of vapors from crude oil which had sprayed from a shutdown, closed-in pipeline that had been ruptured by excessive internal pressure.

Contributing to the excessive internal pressure were an increase in the temperature of the crude oil within the pipe, the resultant expansion of the crude oil, and the failure by the pipeline company to provide any pressure relief for the closed-in pipeline system.

Contributing to the failure of the pipe was its thin-wall condition, caused by the corrosion of the unprotected bare steel walls. The lack of any Federal regulations to require periodic, hydrostatic pressure testing was a factor in the pipeline rupture.

VI. RECOMMENDATIONS

The National Transportation Safety Board recommends that:

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

(a) Review the proposals made by the Hazardous Materials Regulations Board in Docket HM-6, and review the accident records of uncoated, unprotected, or partially protected pipelines. Based upon the results of that review, rulemaking should be undertaken to provide for either

periodic hydrostatic retesting of these pipelines or progressive reduction in their operating pressures based upon the effects of continuing corrosion, or both. (Recommendation No. P-73-29.)

(b) Amend the 49 CFR 195.408, Communications, to describe more fully the type of information required for the safe operation of pipelines and the conditions under which this information should be transmitted remotely. (Recommendation No. P-73-30.)

2. The Exxon Pipe Line Company:

(a) Install pressure relief devices on this system and similar systems, if applicable, to prevent a repetition of the failure of a closed-in system due to overpressure. (Recommendation No. P-73-31.)

(b) Install facilities capable of remotely transmitting the continuous recording pressures from the Comyn and Hearne pump stations to the central dispatching office. (Recommendation No. P-73-32.)

(c) Instruct the dispatchers to monitor carefully those lines which are closed-in and inoperative to preclude the possibility of overpressure. (Recommendation No. P-73-33.)

(d) Initiate a thorough cathodic protection survey over this system, from Hearne to Satsuma as a minimum, and at random intervals uncover and physically inspect the pipe, with particular emphasis on the known "hot spot" corrosion areas. (Recommendation No. P-73-34.)

(e) Add additional cathodic protection equipment, based upon the results of this survey, to mitigate the continuing effects of corrosion on this system. (Recommendation No. P-73-35.)

(f) Not operate or close in the Comyn to Satsuma system from Hearne to Satsuma at a pressure greater than 400 p.s.i.g., until at least this section of line has been hydrostatically tested successfully and found to be safe for higher operating pressures. (Recommendation No. P-73-36.)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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August 1, 1973