

U. S. ARMY  
CORPS OF ENGINEERS  
ALASKA DISTRICT

PRODUCTS PIPELINE  
HAINES TO FAIRBANKS  
ALASKA

OPERATING MANUAL

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(3) That electrical connections to pipeline are sound. (Visual inspection.)

(4) That conductor insulation is still intact and taped joints are well insulated. (Visual inspection.)

(5) That terrain has not been appreciably changed by stream course changes which would require added cathodic protection for the line.

The pipeline in protected areas should hold a voltage relative to the soil of at least PLUS 230 millivolts. In patrolling the pipeline, the line walkers should locate the cathodically protected sections and inspect the pipe when possible for pitting and corrosion. These men should also be present to observe pipe which is dug up and replaced because of corrosion in order to train them for spotting the conditions which cause the corrosion.

#### 96. Maintenance Considerations

Since the pipeline section from Station #2 to Station #2A is practically all exposed, the line patrol personnel have opportunity for visual inspection of the steel pipe. In walking the line these observers should be alert to erosion caused by flash floods and they should note the condition and location of valves and valve boxes, mileage markers, warning signs and the general degree of regrowth of trees and vegetation along the cleared right-of-way. Commercial pipelines have found it an advantage to ask residents near their lines to report unusual conditions and indications of leaks to their dispatching offices with a resulting saving of products in case of line breaks. This measure may or may not be workable in the case of the Haines-Fairbanks Products Pipeline. The line patrol personnel should also note activities related to new building construction along the pipeline since the construction equipment used sometimes causes accidental damage to the line in one way or another. All of this type of data forms the basis for preventive maintenance measures which reduce outage time of the pipeline.

When the line develops a leak or when a pipeline break occurs the situation is likely to be noticed first on the pressure instruments at the station which is nearest the defect. A plugged line causes an immediate rise in pressure and the leaking or ruptured line causes a drop in pressure. The first move should be to get the line block valves upstream and downstream from the defect closed to save the products. Also the dispatcher should be notified of the situation immediately so that the line pumps and the pipeline can be shut down. If the break is in a buried line, the defect can usually be seen from the saturated earth above the line. In any line break, there is always the chance that the spilled product can be ignited by careless smoking, passing traffic or other sources of fire and sparks. This kind of situation demands utmost caution and strict observance of fire and safety rules.

In the case of a buried line, a bell hole is dug around the defect large enough for working space for two workmen. During the digging process and during welding operations a gas analyzer should be used near the break

for detecting a hazardous vapor mixture. If the pipeline is badly damaged a section can be cut out using a mechanical pipe cutter. For this operation, it may be necessary to raise the pipeline above grade using truck mounted A-frames and jacks. A bonding cable should always be used across sections of pipeline which are to be cut. If the leak is small and the nearby pipe is not severely corroded, the repair can be made by welding or by using patented leak clamps which are available on the market. When welding is necessary in repairing a broken line, the product vapors must be removed or eliminated from the work area. This can be done by plugging the severed line sections with compression type mechanical plugs. If the pipe rupture is of short length, the defect is cut out with a mechanical pipe cutter, the pipe ends are beveled and fitted with weld-on flanges. Frequently, in the case of short line defects (in the order of several inches) the flange bolts can be used to draw up and mate the flanges. If the section removed from the line is too long for drawing the flanges together in this manner, a pipe spool of proper length can be made to fit between the flanges previously welded on the pipeline. The mechanical plugs are removed from the pipeline after the welding operations on the pipe flanges are completed.

When a pipeline break is repaired, the repair operation causes a varying amount of air to enter the line. This is not a desirable result; however, the situation has not been known to cause trouble. When the line is repressured, it must be done gradually. The air which has been trapped in the line undergoes compression and usually heats the pipeline slightly. After this, it becomes contained in the pipeline stream in the form of small air bubbles.

From the above description, it is seen that the line gangs require the use of suitably equipped trucks which can negotiate the highways and cleared line areas. Also the station warehouses must stock various pipe and pipe fittings, valve repair parts, line repair tools and an array of items too numerous to mention in this type of manual. For additional reading on line repair and maintenance the reader is referred to the following publications:

- (1) Oil Pipe Line Construction & Maintenance.
- (2) A Primer of Oil Pipe Line Operation.

These publications are available from Petroleum Extension Service, The University of Texas, Division of Extension, Box 8024 University Station, Austin 12, Texas.

#### Brush and Weed Control

Prior to construction of the pipeline, the right-of-way through the countryside was cleared of vegetation, brush and trees mostly by mechanical means. This cleared strip is usually about 30 feet wide. In order to maintain the pipeline, this right-of-way must be kept sufficiently clear to permit patrolling operations and passage of maintenance trucks and equipment as might be necessary. Without suitable control measures, the cleared area

will be subject to regrowth which, in a period of one to two years, will hinder maintenance operations. In maintaining rights of way in the case of public utility power lines, it has been found that the most economical method of control is one which utilizes chemical spraying of the regrowing vegetation. The selection of the proper herbicides and application method for spray control of the Haines-Fairbanks Products Pipeline right-of-way vegetation should be determined by consultation with one of the manufacturers of these chemicals. Following this, suitable equipment can be made available at the required maintenance locations along the pipeline. In general, the chemicals selected should not be injurious to personnel, to the steel pipeline or to fish and wildlife in the territory.

37. Index to Equipment Manuals

<u>Item</u>	<u>Equipment Manual</u>
	<u>Reference Section</u>
Valves, Swing check	600 lb. ASA I-05
Gate	600 lb. ASA I-05