

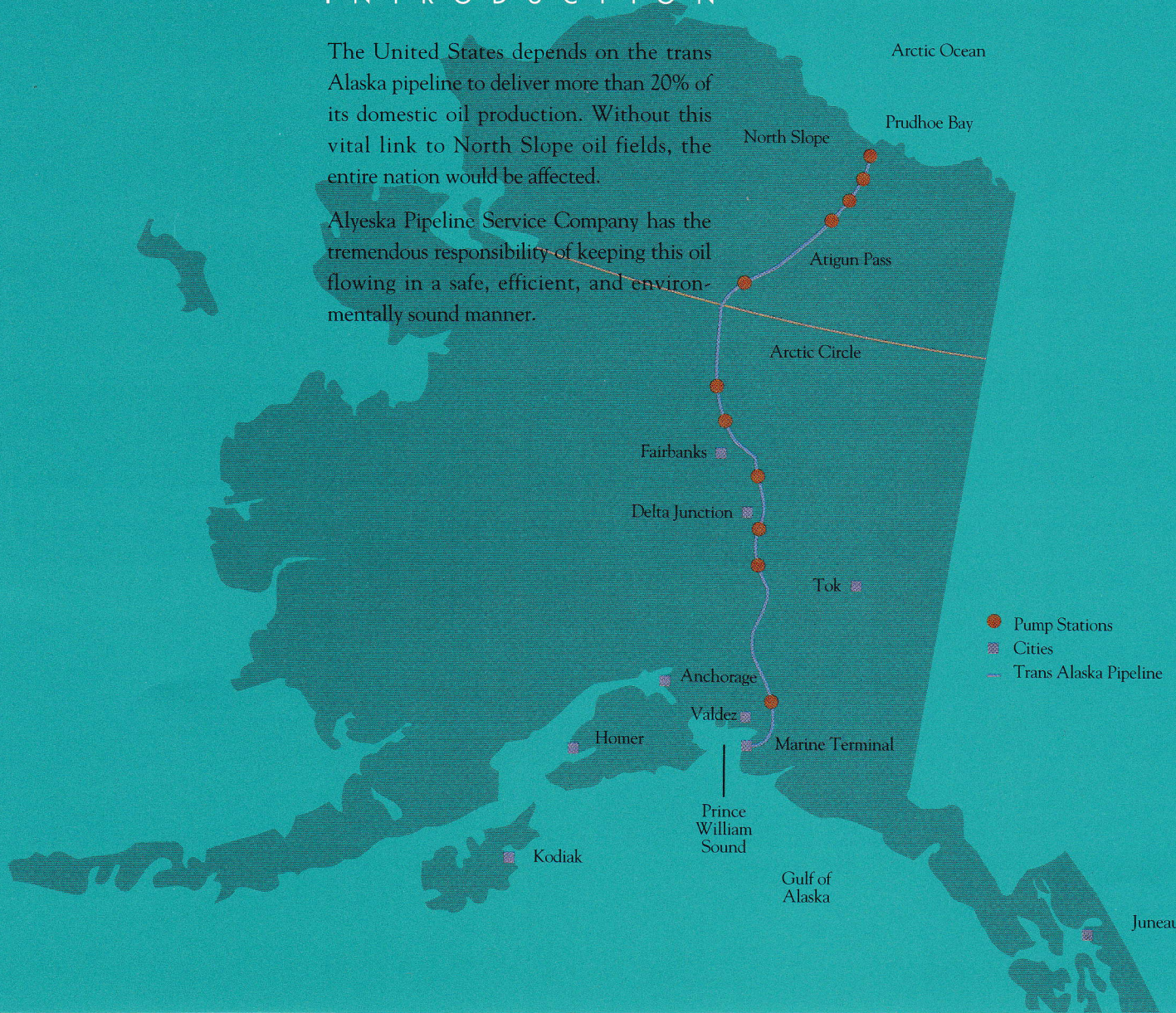
THE
TRANS
ALASKA
PIPELINE



INTRODUCTION

The United States depends on the trans Alaska pipeline to deliver more than 20% of its domestic oil production. Without this vital link to North Slope oil fields, the entire nation would be affected.

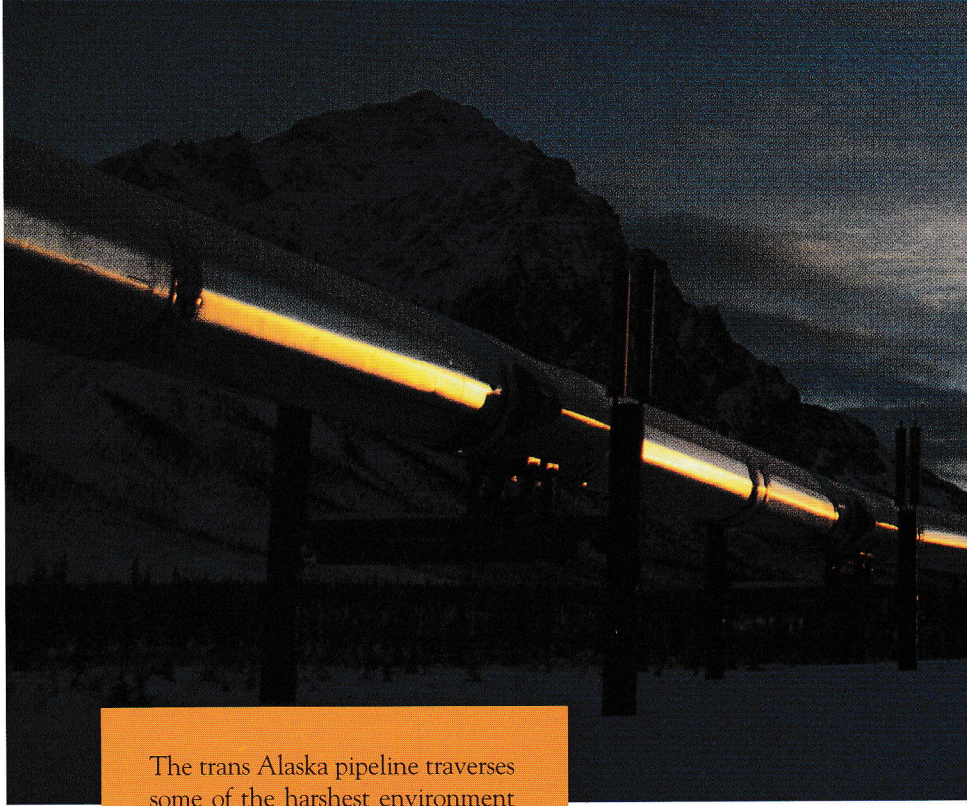
Alyeska Pipeline Service Company has the tremendous responsibility of keeping this oil flowing in a safe, efficient, and environmentally sound manner.



T H E P I P E L I N E

The trans Alaska pipeline is one of the largest pipeline systems in the world. Its design and construction is considered to be one of the most difficult engineering feats of our time. The pipeline carries crude oil from Prudhoe Bay and other reservoirs on the North Slope, over 800 miles of rugged Alaskan mountains, rivers and harsh terrain to Valdez—the northernmost ice-free port in North America.

Building a pipeline from the Arctic had never before been achieved, and operating it in such an isolated region is a continuing challenge.



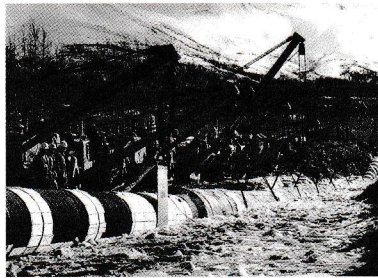
The trans Alaska pipeline traverses some of the harshest environment on earth – including the frigid arctic region, where wind chill factors cause temperatures to drop below -100°F, and over the Brooks mountain range, where 40 feet of snow can accumulate in winter.





ROUTE

- Length: 800.34 miles.
- Beginning: Prudhoe Bay.
- Mountain Ranges Crossed: 3 (Brooks, Alaska, Chugach.)
- Highest elevation: Atigun Pass, 4,739 ft.
- Terminus: Valdez Marine Terminal.

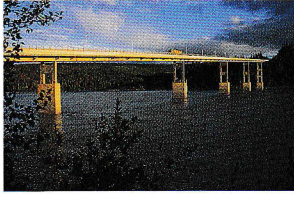


HISTORY

- Discovery of oil at Prudhoe Bay announced: 1968.
- First Pipe Laid: March 27, 1975 at the Tonsina River. (left)
- Final Weld: May 31, 1977 (Near Pump Station 3.)
- First Oil Flowed: June 20, 1977.

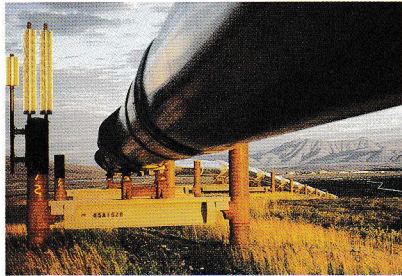


- Total Workforce (1969-1977): 70,000.
- Number of Permits Required: Federal, 515; State, 832.
- Total Project Cost: Approximately \$8 billion.



BRIDGES

- Number of Bridges: 13.
- Largest Bridge: 2,295 ft. Orthotropic box girder bridge (over Yukon River.) Officially named E.L. Patton Yukon River Bridge.



VERTICAL SUPPORT MEMBERS (VSMs)

- Number: 78,000.
- Frequency: Every 60 ft.
- Depth Embedded: 15 to 60 ft. (Frozen in place through passive refrigeration.)
- Pipe Movement Allowance: Horizontal, 12 ft.; Vertical, 2 ft. (For pipe expansion and contraction and possible seismic disturbances.)



PROVISIONS FOR THE ENVIRONMENT

- Minimum Pipeline Elevation: 5 ft., allowing uninhibited caribou migration.
- Special Animal Crossings: 554 (At least 10 ft. high.)
- Buried Pipeline: 380 mi. (4 mi. refrigerated.)
- Maximum Earthquake Strength: Designed to withstand earthquakes from 5.5 to 8.5 on the Richter Scale.



IN HARMONY WITH NATURE

The pipeline was designed both to endure and to protect the Alaskan environment. Permafrost, or permanently frozen soil, posed a construction challenge. If heat from the buried pipeline were to melt the permafrost, the soil in some areas would become unstable.

Where these “thaw unstable” conditions occurred, the pipeline was insulated, jacketed, and installed above ground, supported by Vertical Support Members (VSMs).

The wildlife that live along the pipeline route include moose, caribou, grizzly bear, Dall sheep, fox, ptarmigan, wolf, polar bear, parka squirrel, wolverines, marmots, and musk oxen.

Numerous wildlife studies were conducted to evaluate their populations, migratory patterns, and special needs. The pipeline was designed and constructed with these needs in mind.



INSIDE THE PIPELINE

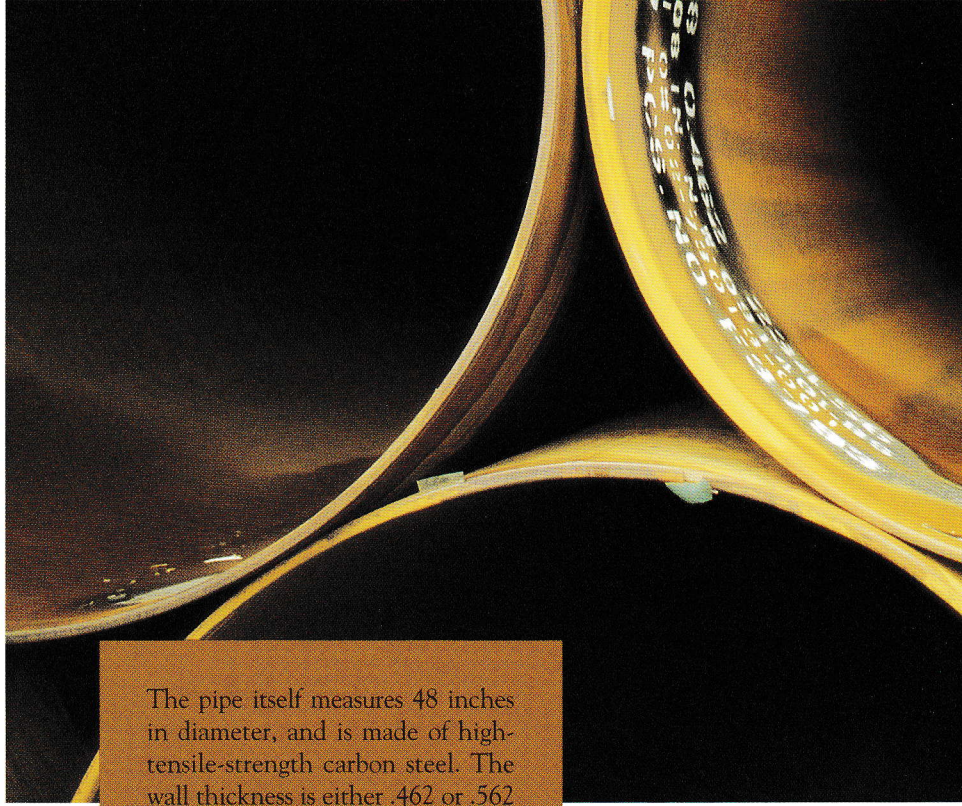
Keeping up to 1.7 million barrels of oil moving through the pipeline every day requires constant monitoring, maintenance, and technical support.

Ten pump stations are currently operating, each with two or three turbine-driven pumps, and an average crew of 20-25 people.

Pump Station 5 is a pressure relief station.

Pump Station 4 is located near Atigun Pass at elevation 2,763 feet; Pump Station 1, by contrast, sits at 39 feet above sea level.

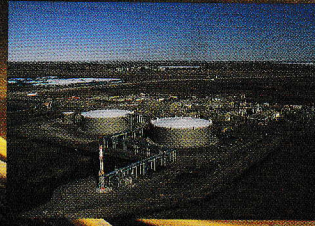
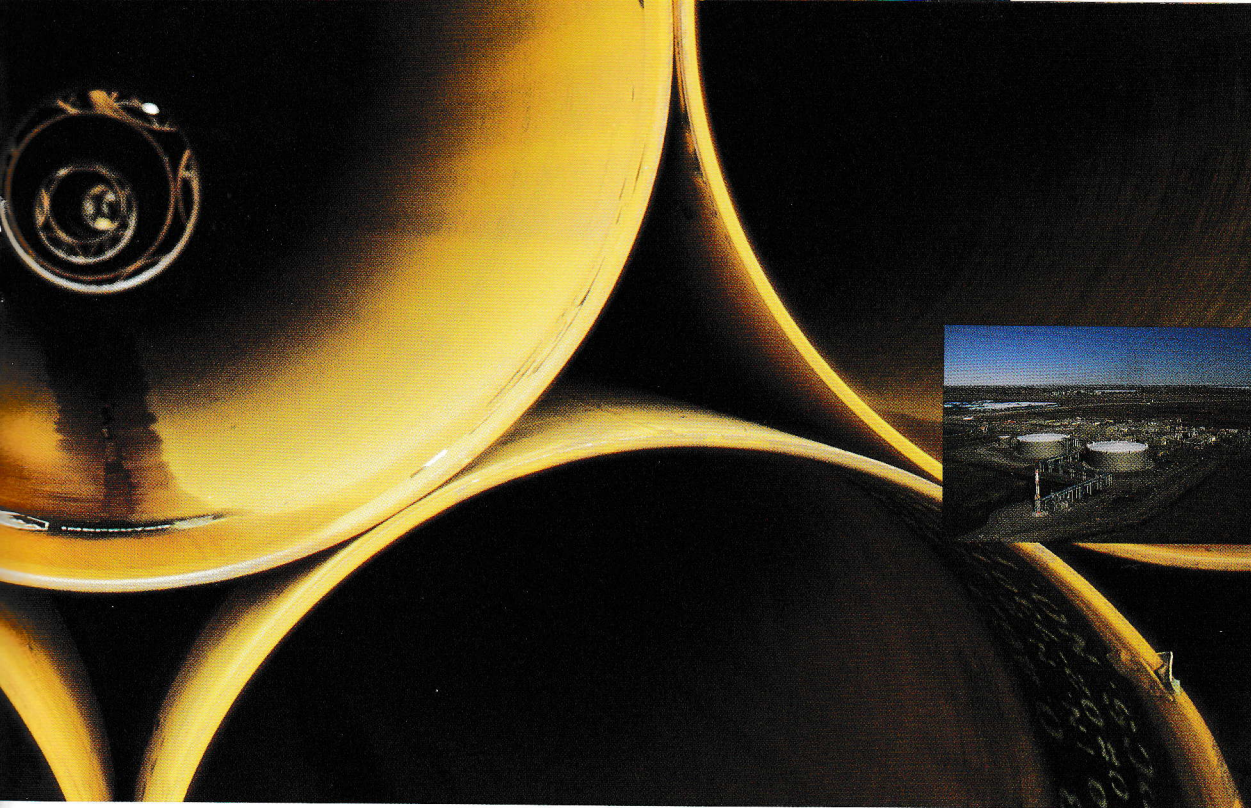
The temperature of the oil fluctuates between about 120°F at Prudhoe Bay, to 90-110°F at the Marine Terminal.



The pipe itself measures 48 inches in diameter, and is made of high-tensile-strength carbon steel. The wall thickness is either .462 or .562 inches. With Alyeska's comprehensive monitoring and repair program, the pipe is expected to last indefinitely.

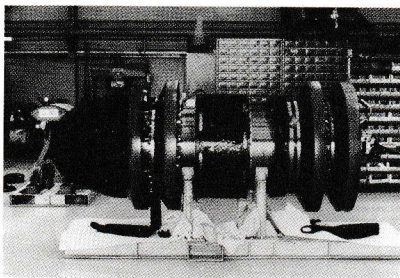
Inside the pipeline, 71 gate- and 80 check valves are critically positioned as safety devices to block the flow of oil if necessary.





THROUGHPUT

- Daily Yield: Approx. 1.7 million bbl./day (Projected 1992 average.)
- Travel Time: About 5.5 days.
- Average Speed: 6.25 mph.
- Maximum Operating Pressure: 1,180 psi.



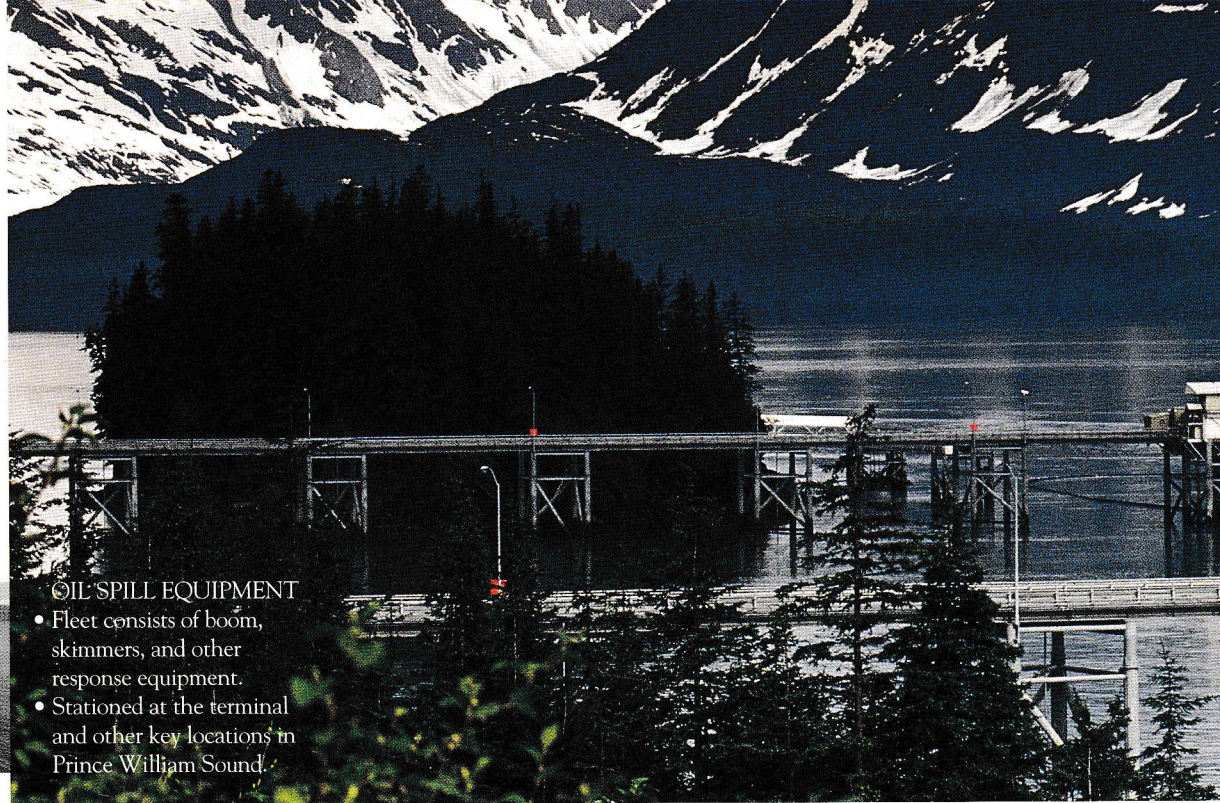
"PIGS"

- Pass through the pipeline with the oil.
- Clean interior pipe walls.
- Survey interior pipe shape.
- Detect corrosion.



THE OPERATIONS CONTROL CENTER (OCC)

- Provides instantaneous monitoring and control of all significant aspects of operation.
- Monitored 24 hours a day.
- Located at the Marine Terminal.



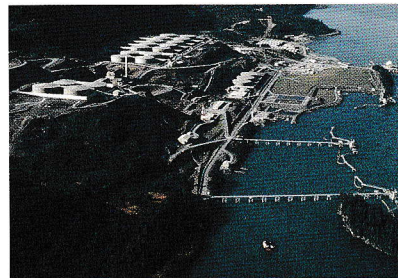
OIL SPILL EQUIPMENT

- Fleet consists of boom, skimmers, and other response equipment.
- Stationed at the terminal and other key locations in Prince William Sound.



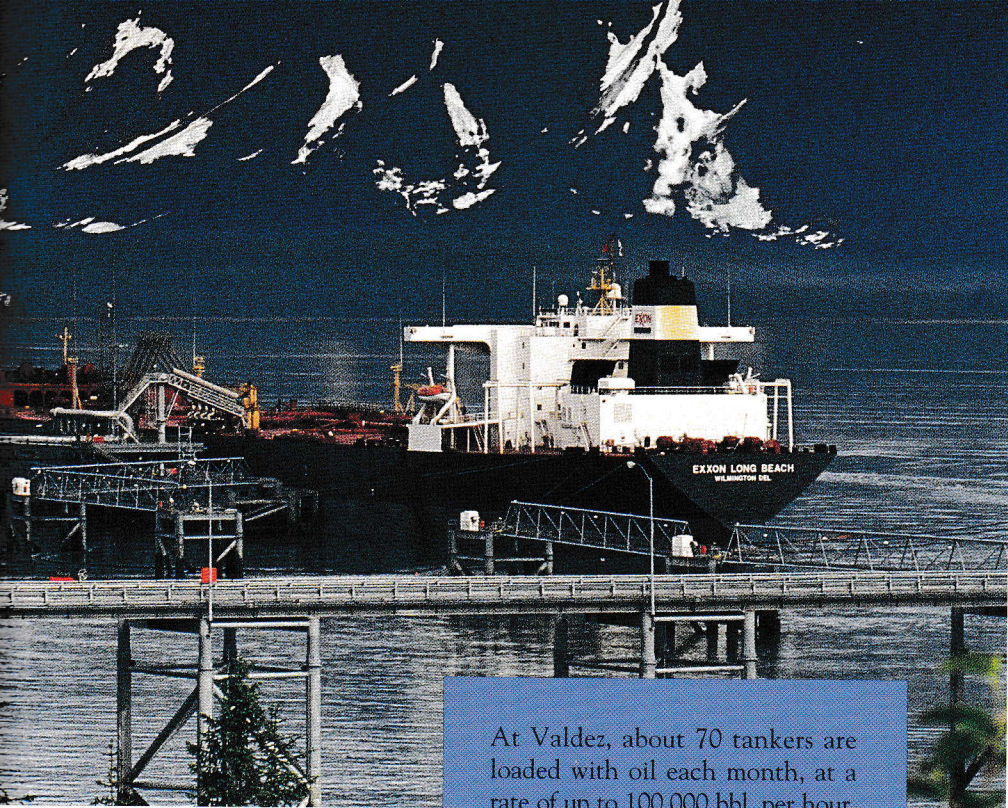
ESCORT VESSELS

- Each laden tanker is now escorted through Prince William Sound by specially equipped Escort Response Vessels (ERVs), a prevention measure to ensure safe passage.



MARINE TERMINAL

- Cost To Build: \$1.4 billion.
- Area: 1,000 acres.
- Employees: Approx. 250 (Does not include contractor personnel.)
- Oil Storage Capacity: 9.18 million bbl.



DESTINATION VALDEZ

At the Valdez Marine Terminal, the crude oil is transferred from the Pipeline (or storage tanks) to tankers, and is ultimately sent to U.S. markets.

Alyeska has established a comprehensive oil spill prevention and response system, on behalf of tankers, designed to eliminate or minimize potential vessel spills at the Marine Terminal and in Prince William Sound. It includes specialized vessels, as well as tugs, barges, spill containment and recovery equipment, and a highly trained crew in service or on call 24-hours a day.

At Valdez, about 70 tankers are loaded with oil each month, at a rate of up to 100,000 bbl. per hour. Tankers spend an average of 22 hours at a berth; there are one floating and three fixed berths. Holding capacities vary from 0.2 million to 1.8 million bbl., depending on the tanker.

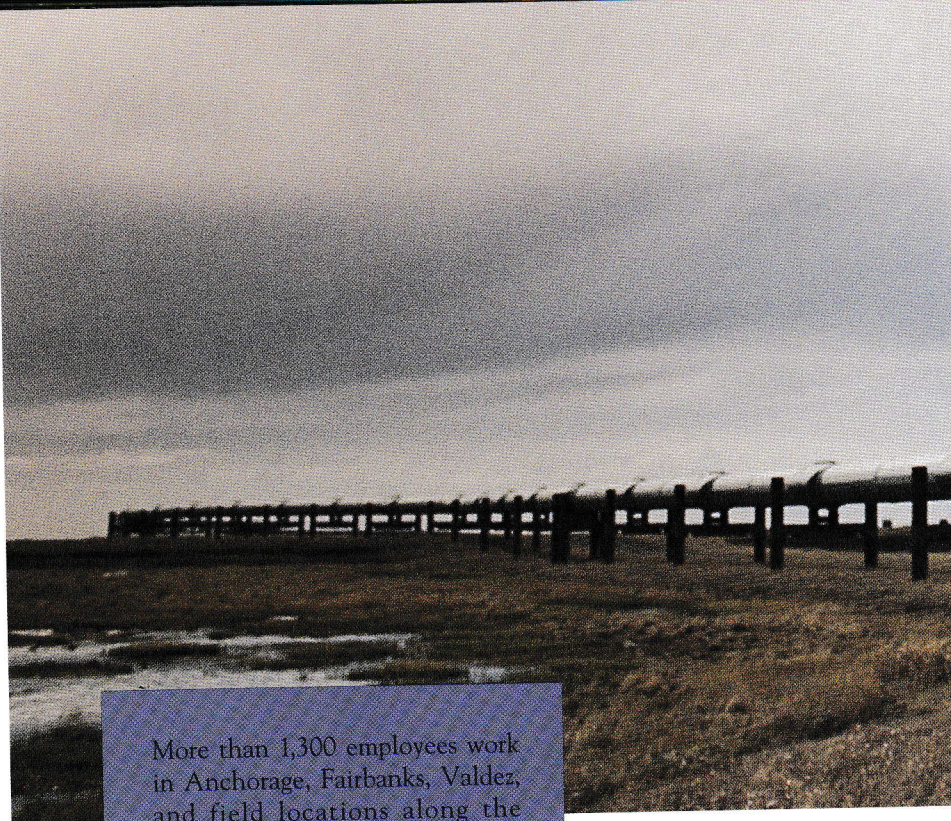
By 1992, over 12,000 tankers will have been loaded, with more than nine billion barrels of oil.



ALYESKA PIPELINE SERVICE COMPANY

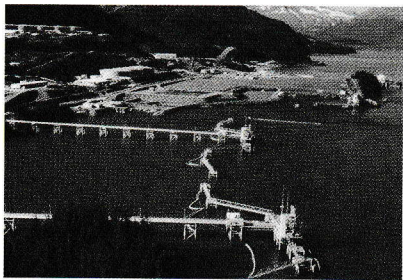
Alyeska is responsible for operation and maintenance of the pipeline.

It was formed in 1970 to design and build the pipeline, and acts as agent for the seven companies which own the trans Alaska pipeline: Amerada Hess Pipeline Corporation, ARCO Transportation Alaska, Inc., BP Pipelines (Alaska) Inc., Exxon Pipeline Company, Mobil Alaska Pipeline Company, Phillips Alaska Pipeline Corporation, and Unocal Pipeline Company.

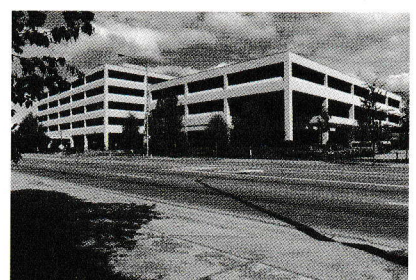
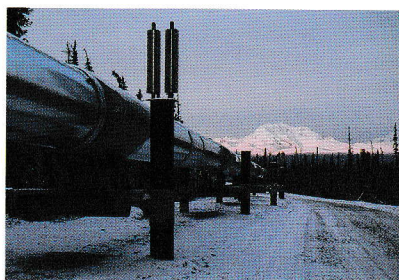


More than 1,300 employees work in Anchorage, Fairbanks, Valdez, and field locations along the pipeline. In addition, hundreds of contractors support the company during peak activities. Many Alyeska employees are seasoned professionals who helped build the pipeline. About 99% live in Alaska.





Valdez Marine Terminal



Anchorage Headquarters

GENERAL INFORMATION

PIPELINE VISITOR ACCESS

There are numerous information centers in Alaska where visitors may learn about the Pipeline. Driving the Richardson Highway, from Valdez to Fairbanks, visitors will see wildlife, panoramic scenery, and geological formations, as well as informational road signs along the way.

At the Valdez Marine Terminal entrance, there are information signs and a pipeline monument. A visitor information center which conduct tours is located at the Valdez Airport. There is also a display in the Valdez Heritage Center. Other displays can be found in the Anchorage Museum of History and Art, and the University of Alaska Fairbanks Museum.

REGULATORY AGENCIES

These agencies represent some of the governmental entities that regulate Alyeska.

Bureau of Land Management • U.S. Department of Transportation, Office of Pipeline Safety • United States Coast Guard • Army Corps of Engineers • U.S. Fish and Wildlife • Environmental Protection Agency • Alaska Department of Natural Resources • Alaska Department of Environmental Conservation • Alaska Department of Fish and Game.

GLOSSARY

ALYESKA: Alyeska Pipeline Service Company, founded in 1970. "Alyeska" and "Alaska" are two of several spellings of the original Aleut root word meaning "the mainland." Literally, according to one account, it means "where the sea breaks its back" – a reference to the Alaska Peninsula from the perspective of the people of the Aleutian Chain.

BBL.: Barrels of oil. One barrel = 42 U.S. gallons.

CRUDE OIL: Liquid petroleum as it comes out of the ground. Before the crude is shipped through the pipeline, natural gas and water are separated from the oil.

HAUL ROAD: The original name for the James Dalton Highway, which parallels the pipeline path.

PERMAFROST: Any soil that has remained below 32°F continuously for two or more years. Permafrost found at the North Slope is between 1,200 to 2,000 feet deep.

PUMP STATIONS: Control points and housing for turbine-driven pumps required to maintain oil flow. Living quarters are provided for people working there. Personnel work one of two 12-hour shifts – seven days on, seven days off.

PIGS: Devices passed through pipeline with oil flow to clean interior pipe walls of waxy residue naturally present in some crude oil, survey interior pipe shape, and detect corrosion.

TAPS: Abbreviation for the trans Alaska pipeline system.

THROUGHPUT: Rate at which oil flow through the pipeline.

VALVES: (a) Gate Valve: blocks oil flow, both directions; (b) Check Valve: held open by flow of oil, and will drop closed automatically when the oil flow is stopped or reversed.

VSMs: Vertical Support Members, to support insulated, above-ground pipeline in various soil and permafrost conditions. They are constructed to allow for both horizontal and vertical movement from pipe expansion and contraction, and possible seismic disturbances. Special thermal devices called heat pipes are installed in the pilings to maintain the permafrost in a stable condition around the VSM foundations.