Revised 11/24/75

FAR EAST TRIP

Saturday, November 29th

8:00 am — Depart Andrews AFB
(Flying Time: 7 hours, 30 minutes)
(Time Change: -5 hours)

10:30 am — Arrive Eielson AFB (Fairbanks, Alaska)
Arrival program in hangar

Carry on
boots
for jacket
slacks

WEATHER: Partly cloudy and very cold. Minimum temperatures -7 to -17. Maximum temperatures -2 to 8. Wind northerly, 5 to 10 knots.

CLOTHING: Recommend warm pants suit. You will be exposed to the cold during the arrival program.

11:00 am — Depart for quarters

(PERSONAL TIME: 2 hours, 30 minutes)

2:00 pm — Depart Eielson AFB, Alaska

3:00 pm — Arrive Anchorage, Alaska

WEATHER: Party cloudy and cold. Minimum temperatures 6 to 12. Maximum temperatures 15 to 24. Wind northerly, 5 to 10 knots.

(PERSONAL TIME: 4 hours)

LIU LI CHANG -
antique St.

7:30 pm Birthday party for Senator Ted Stevens in hotel (stand-up cocktail party with informal mingling for thirty minutes).

CLOTHING: Room will be decorated with Bicentennial motif on a basic red color scheme. While the dress is business suit and long dress, informality is the order of the day.

8:15 pm Arrive suite

OVERNIGHT

Sunday, November 30th

8:00 am Depart Anchorage, Alaska

Monday, December 1st

10:30 am Arrive Tokyo, Japan

(See next page on stopover in Tokyo)

WEATHER: Variable cloudiness with a chance of showers. Minimum temperature 43 to 47. Maximum temperature 56 to 60. Wind south, 5 to 10 knots.

WELCOME TO ANCHORAGE

AND THE

ANCHORAGE WESTWARD HOTEL

STAFF OFFICE

The Staff and Advance Office is located at 1565-66. The Staff Lounge is in Room 2063.

DINING FACILITIES

GENERAL STORE: located on main floor of hotel and is open 24 hours a day. Features normal coffee shop menu. Attire: Casual.

TOP OF THE WORLD: located on 15th floor of hotel via elevators to the right as you face the main desk. Dinner, 5:30 pm--10:30 pm. Attire: Casual.

COCKTAILS

SIGNATURE ROOM: located on main floor of hotel open Saturday 6:00 pm--1:00 am. Attire Casual. Entertainment: Monday--Saturday 9:00 pm--1:00 am.

TOP OF THE WORLD: located on 15th floor of hotel via elevators to the right as you face the main desk. Open 7 days a week, 11:30 am--12:30 am. Attire: Casual.

BARBER SHOP

Barber shop facilities are available from 9:00 am--6:00 pm on the main floor.

BAGGAGE CALL

Please place all bags outside your room by 5:30 am. This luggage will be taken directly to your airplane.

GIFT SHOP, NEWSSTAND AND DRUGSTORE

All are located on the main floor of hotel off the main lobby.

MAIN GIFT SHOP: features gift items, drugs, newspapers, etc.

Hours 7:00 am-- 10:00 pm.

JEWELRY STORE: features Alaskan jewelry and gift items.

Hours 9:00 am--9:00 p.m.

LIQUOR STORE: features liquor and condiments. Hours 10:00am--

12:00 midnight.

ROOM LIST

ANCHORAGE WESTWARD HOTEL
ANCHORAGE TOWER
ANCHORAGE, ALASKA

Adams, A.	2164
Armstrong, O.	1668
Barnes, T.	1962
Barrett, Major	2268
Bautista, A.	2260
Berger, K.	2068
Biery, M.	1970
Cavaney, R.	2070
Cheney, D.	2267
Chirdon, N.	2068
Collins, M.	1968
Covey, J.	1667
Cuff, B.	1969
Domina, Capt.	2268
Fisher, Mary	1662
Friedman, M.	2064
Gilbertson, L.	1869
Gleysteen, W.	1860
Gunnels, T.	266
Habib, P.	2163
Hartmann, R.	2066
Hill, J.	1961
Jackson, R.	1870

ROOM LIST

ANCHORAGE WESTWARD HOTEL
ANCHORAGE TOWER
ANCHORAGE, ALASKA

Johnstone, L.	1861
Keiser, R.	268
Kelly, J.	1869
Kennerly, D	1967
Kissinger, Secretary	2165
Lamb, R.	1963
Lidums, A.	1567
Long, B.	1663
Lord, W.	2169
Lukash, Dr.	2269
Lynn, Mr. and Mrs. J.	1867
Meinking, N.	1970
Merson, J.	2069
Nessen, R.	1965
Newell, G.	1562
O'Donnell, T.	2060
Oldenburg, H.	1968
Quinlan, J.	2062
Ramos, B.	1868
Riley, Col.	1863
Rodman, P.	1964
San Victores, S.	2260
Schumacher, K.	1864
Scowcroft, General	2167
Serrano, E.	1868

ROOM LIST

ANCHORAGE WESTWARD HOTEL
ANCHORAGE TOWER
ANCHORAGE, ALASKA

Shiels, M.	1862
Silins, I.	1660
Sisco, J.	2168
Smith, D.	1563
Solomon, R.	1960
Stahl, N.	1969
Stern, A.	1570
Ursomarso, F.	1561
Weidenfeld, S.	2067
Yates, N.	2062

NSC Office	2161
Radio Room	1267
Comm Center	1268
Sec. State Office	2160
Senior Staff Office, State Dept.	1664
Staff Office	1566
Staff Lounge	2063
State Dept. Office	1665
Switchboard Room	1266
WHCA Office	1269

June 10, 1975

ALASKA BASKET TO MRS. FORD

A gift from the Alaska State Council on the Arts as a token of their appreciation of Mrs. Ford's support of and interest in indigenous American crafts.

Mrs. Lois Boochever of Juneau, Chairman of the Alaska State Arts Council, requested Nancy Hanks to present this beautiful example of traditional Eskimo basketry to the First Lady.

The gift to Mrs. Ford was displayed at the Governors' Arts Awards dinner climaxing a three day statewide meeting in Anchorage, March 8, 1975, of over 200 artists, arts professionals, and volunteers for arts organizations throughout the state.

The artist is Teresa Anthony from the village of Nightmute on Nelson Island on the southwest coast of Alaska. The basket is made from the common beach grass indigenous to the southwest coast. It is a fine example of traditional Eskimo basketry and depicts a man on a seal hunt.

b & w 12 nsprs color
color 3 ~~15~~ 6
15 - bw

Ray Helms
Alaska SC
360 "K" St
Suite 240
Anchorage, Alaska
99501

Status Report:

NOVEMBER, 1975

End of the Second Summer

Summary

Project Description Of The Trans Alaska Pipeline System

September 1975

Alyeska pipeline
SERVICE COMPANY

Trans Alaska Pipeline Route

The Alyeska Pipeline Service Company is involved in one of the most significant and challenging engineering efforts of modern time: Construction of an 800-mile oil pipeline across the rugged and beautiful state of Alaska.

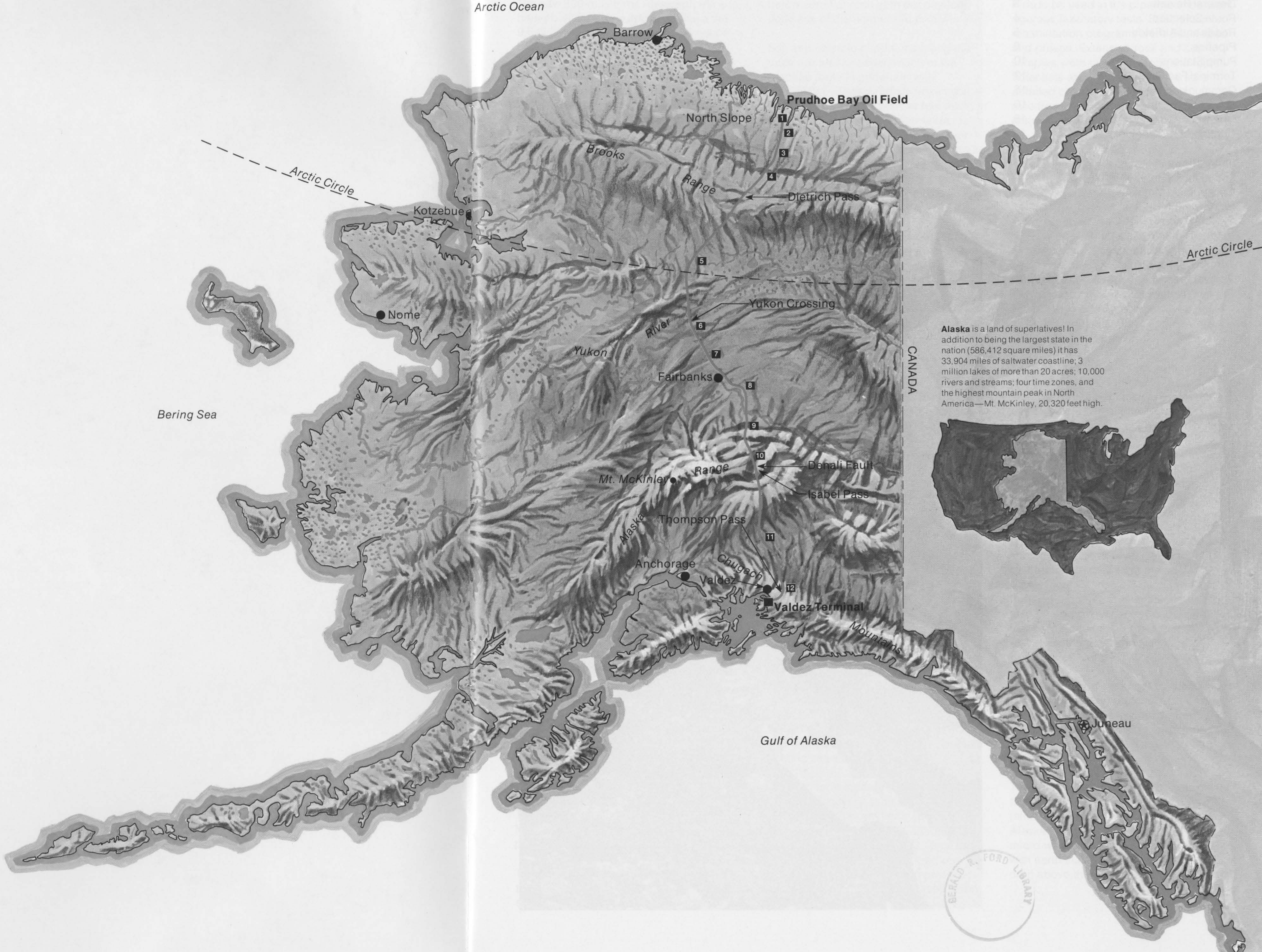
This great Alaskan project poses not only difficult physical problems but tremendous environmental challenges. Alaska is both a land of vast resources and a land of delicate beauty. And it is Alyeska's purpose to help Alaska develop the one without destroying the other.

To achieve these ends, Alyeska is devoting itself totally to building a pipeline which will disturb the Alaska countryside as little as possible during construction, and which can be operated without threat to the environment throughout its entire life.

This description of the project spells out in detail how Alyeska plans to reach those goals — how the growing oil needs of a nation can be met through development of the great resources of Alaska while still protecting the environment.

E. L. Patton

President
Alyeska Pipeline
Service Company



Legend
Pipeline
Pump Stations
Cities

Alyeska pipeline SERVICE COMPANY 1835 SOUTH BRAGAW STREET (99504), P. O. BOX 4-Z (99509), ANCHORAGE, ALASKA, TELEPHONE (907) 278-1611, TELEX 090-26-460 **news**

November 1975

Chronology of Major Events Relating to the Trans Alaska Pipeline

July 1968	Atlantic Richfield Company and Humble Oil & Refining Company (now Exxon Company, U.S.A.) confirm discovery of oil at Prudhoe Bay. Trans Alaska pipeline feasibility study announced.
Feb. 1969	Plans announced for trans Alaska pipeline.
April 1969	Pipe ordered at a cost of $100 million (delivery completed in October, 1971.)
June 1969	Application for pipeline right-of-way submitted.
August 1969	Department of Interior holds public hearings on project in Fairbanks.
Sept. 1969	Department of Interior issues draft stipulations (requirements to minimize environmental damage) for pipeline.
Dec. 1969	National Environmental Policy Act enacted by Congress December 31. Effective date: January 1, 1970.
April 1970	Suits filed by environmental groups and others to halt pipeline construction, thus starting series of events leading from U.S. District Court to U.S. Circuit Court of Appeals, U.S. Congress and, finally, the desk of the President and the signing of the Trans Alaska Pipeline Authorization Act on November 16, 1973.
Jan. 1974	Alyeska begins mobilization of equipment, supplies, personnel.
April 29, 1974	Construction begins.
Sept. 29, 1974	Five months after construction start, contractors complete the initial overlay on the 360-mile Yukon River-Prudhoe Bay road.
Feb. 1975	First vertical support for above ground portion of pipeline installed.
March 27, 1975	First mainline pipe installed at Tonsina River.
April 1975	First elevated pipe installed near Tonsina.

-MORE-

April 29, 1975	Start of second year of construction; work underway on all phases of project: tanker terminal, pump stations, pipeline.
May 5, 1975	First extensive ditch excavation for conventional pipeline burial, on North Slope.
May 12, 1975	First annular rings of steel for storage tanks installed at Valdez terminal.
June 2, 1975	Assembly begun on first of three storage tanks at origin pump station.
Aug. 19, 1975	First 100 miles of pipeline in place.
Aug. 27, 1975	First mainline pumps installed, at Pump Stations 1 and 10.
Sept. 2, 1975	Last double-joint welded at Valdez pipe yard.
Sept. 1975	Turbines installed to drive pumps at Stations 1 and 10.
Nov. 1, 1975	Total project more than 35 per cent complete; pipeline portion more than 50 per cent complete; pump stations and terminal more than 20 per cent complete; communications sites 64 per cent complete.
	--Scheduled--
1976	Pipeline construction to be completed. Terminal and pump station construction to continue.
3rd Qtr. 1977	Pipeline to begin operation. The first tanker to leave Valdez with oil bound for delivery to West Coast ports.
Nov. 1977	System to reach initial operating capacity of 1.2 million barrels a day.

Alyeska pipeline SERVICE COMPANY

1835 SOUTH BRAGAW STREET (99504), P.O. BOX 4-Z (99503), ANCHORAGE, ALASKA, TELEPHONE (907) 277-1661, TELEX 090-26-460

news

PIPELINE FACTS

Pipeline designer, builder, operator: Alyeska Pipeline Service Company--a consortium of eight major oil companies whose holdings are:

Sohio Pipe Line Company	33.34%	Mobil Alaska Pipeline Company	5.00%
BP Pipelines Inc.	15.84%	Union Alaska Pipeline Company	1.66%
ARCO Pipe Line Company	21.00%	Phillips Petroleum Company	1.66%
Exxon Pipeline Company	20.00%	Amerada Hess Corporation	1.50%

Pipeline length: 800 miles, about half buried, the remainder on above ground supports.

Expected cost: $6.375 billion, all in private funds.

Capacity: 1.2 million barrels a day initial capacity, can be increased with addition of pumping stations and terminal facilites to 2 million barrels a day.

Estimated North Slope crude oil recoverable reserves: 9.6 billion barrels.

Pipeline construction workpad: 54 feet wide, with a minimum thickness of two feet of gravel.

Pipe size: 48-inch diameter, in lengths of 40 and 60 feet and thicknesses of .462 and .562 inch.

Schedule dates: Construction started--April, 1974
Installation of first pipe--March 27, 1975
First shipment of oil--Mid-1977

Total miles of pipe installed as of November 9--339.5

Completion percentages as of November 16--pipeline 54.2%, pump stations 22.7%, terminal 23.8%. Total project 39.2%.

Total number of project workers September, 21,600; and November 9, 19,600.

News Bureaus
Alyeska Pipeline Service Company

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November, 1975

Alyeska pipeline SERVICE COMPANY 1835 SOUTH BRAGAW STREET (99504), P. O. BOX 4-Z (99509), ANCHORAGE, ALASKA, TELEPHONE (907) 278-1611, TELEX 090-26-460

FEWER JOBS THAN EVER

Pipeline jobs for unskilled workers have been a scarce commodity since the beginning of construction of the trans Alaska pipeline. Now they are even more scarce, due to normal winter work force reductions.

The peak work force at the height of the construction effort last September has 21,600 persons. That number is being reduced to between 8,100 and 9,900 during the winter season, when Alaska's severe climatic conditions make some construction activities impossible and reduce efficiency of workers and equipment engaged in others.

Officials of Alyeska Pipeline Service Company warned that employment possibilities on the project will be almost non-existent during the winter.

The work force in the 1976 construction season, expected to reach a peak in June or July, will be only about 19,400 persons for the final full year of construction.

Thus, job opportunities will continue to be extremely limited for unskilled workers who are not residents of Alaska.

The few jobs available even in the summer construction season are filled through union hiring halls, where members seeking employment already number several thousand.

(more)

Furthermore, pipeline construction contractors, under terms of the pipeline construction permit and Alaska law, must provide job opportunities to Alaska Natives, and give hiring priority to persons who have been Alaska residents for one year or longer.

Persons coming to Alaska to find work discover that several thousand unemployed are competing for a few available pipeline jobs, living costs are extremely high and housing is expensive or impossible to obtain.

Further information about pipeline construction jobs may be obtained by writing to:

JOBS
Alyeska Pipeline Service Company
1835 South Bragaw Street
Anchorage, Alaska 99504

Contents

General Review

The new 800-mile trans Alaska pipeline is being built for one purpose: to make the 9.6 billion barrel oil reserves at Prudhoe Bay, Alaska, available to U.S. industry and consumers.

Initially, 1.2 million barrels of oil a day will be transported through the line from Prudhoe Bay to Valdez, Alaska, for shipment by tanker to West Coast ports. At capacity, the total will reach 2 million barrels a day.

This project, the largest privately funded construction effort in history, is being built by the Alyeska Pipeline Service Company, formed by eight companies — The Amerada Hess Corporation, ARCO Pipe Line Company, SOHIO Pipe Line Company, Exxon Pipeline Company, Mobil Alaska Pipeline Company, Phillips Petroleum Company, Union Alaska Pipeline Company and BP Pipelines, Inc.

The oil pipeline system is being developed in two phases. The first phase, scheduled for completion in mid-1977, includes completion of a new all-weather highway from the Yukon River to Prudhoe Bay, construction of a 48-inch steel pipeline from Prudhoe Bay to Valdez, building of eight pump stations along the route and development of oil storage and tanker loading facilities at Valdez.

Four additional pipeline pump stations along the route and more oil storage and tanker docking facilities at Valdez are planned in the final phase.

The new pipeline will bring oil across some of the most rugged terrain in North America, but it will have an impact on very little Alaska land. On completion, the line will occupy only 12 square miles of the state's 586,000 square miles. Construction will have a temporary impact on an additional 50 to 60 square miles.

Starting in the Arctic plains of Prudhoe Bay with its annual rainfall of only 6 inches, the pipeline climbs 4,800 feet over Dietrich Pass in the Brooks Range, crosses the Yukon River, climbs 3,300 feet over the Alaska Range and then over Thompson Pass in the Chugach Mountains before reaching the ice-free port of Valdez.

Temperatures along the route range from the 90s in the summer, when the Alaska sun remains up all day, to 80 degrees below zero Fahrenheit in the day-long darkness of the northern Alaska winter.

Soil and seismic conditions along the route are also unusual. Much of the pipeline route is underlain with permafrost — permanently frozen soil — in some places hundreds of feet thick. In the coldest regions, the permafrost is covered with a fragile mat of delicate vegetation called tundra, easily damaged when in a melted state in summer. Special construction designs and techniques were developed to protect all such sensitive areas.

Earthquakes also pose special pipeline design and construction problems. The Alaska earthquake of 1964, which reached the highest magnitude ever recorded, 8.5 on the Richter scale, was centered in Prince William Sound. The ground motion produced by a quake approaching that magnitude could create unusual bending, tension and compression stresses on the pipeline, as well as tend to damage pump station and terminal facilities. An additional threat to the terminal could come from seismic sea waves caused by possible landslides along Valdez Arm.

To withstand these forces, every aspect of the pipeline system — pipe, pump stations and terminal — has been designed to withstand a contingency level earthquake at any particular point along the line. Seismologists deem the occurrence of such an earthquake in the vicinity of the pipeline as very unlikely during the life of the line, and deem this event ever being exceeded as even less likely. The advanced design of the pipeline control system will provide the capability to maintain control of the pipeline and facilities during and after a contingency level earthquake. The line and facilities have been designed to operate without interruption during a quake of one-half contingency level. Terminal facilities at Valdez are being built largely on bedrock and well above the level of any potential seismic sea wave.

Planning for the pipeline began in 1968 after the discovery of oil at Prudhoe Bay. While legislative, environmental and court hearings were being conducted in Alaska and Washington, D.C., pipeline engineers and scientists carried out detailed and extensive environmental and design studies on all phases of the system.

Pipe to be used in the pipeline underwent rigorous laboratory tests. Special soil rehabilitation programs were developed and proven. Extensive rock and soil samples were taken all along the route. Scientists and engineers prepared a detailed comparative analysis of resource values and possible risks for the entire system.

In addition, scientific specialists conducted specific studies along the route in biology, botany, agronomy, zoology, geology, seismology, archeology, marine biology and oceanography.

Construction of the pipeline system began with work on the pipeline road, north of the Yukon River, in April 1974. President Nixon had signed measures authorizing construction in November 1973. Federal and state permits were issued shortly thereafter.

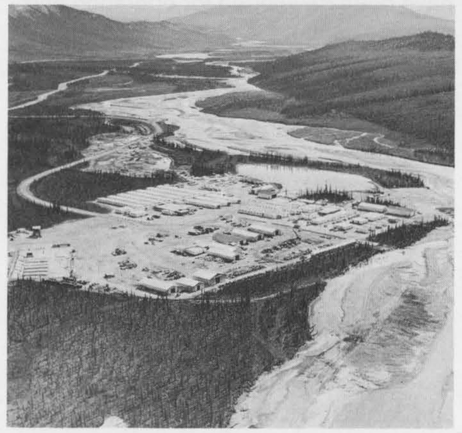
Work on the road and preparation of pump station and terminal sites began first. Construction plans called for the actual pipeline, stations, terminal facilities and permanent communications systems to follow.

All the construction work has been subjected to a higher level of inspection than ever used on any oil pipeline project before. In addition to undergoing inspections by federal and state agencies, pipeline work also has been subjected to a two-level inspection procedure adapted from the nuclear power industry. In this system, work of the traditional quality control inspector is also reviewed by an independent quality assurance auditor charged with seeing that all inspections and work are performed properly.

Operational and contingency plans also have been developed for operation and management of the system. In-depth, pre-planned programs for responding to any contingencies have already been prepared.

The operating communication network for the system will be built around a new micro-wave network, the first to cross Alaska from north to south. The micro-wave system will be backed up with earth station links to a satellite in orbit above the equator.

Route Selection



The final pipeline route and sites for pump stations and terminal were selected after detailed studies of eight possible routes and four possible terminal locations.

The start of the line at Prudhoe Bay was fixed by the location of the North Slope oil fields. But the choice of sites for the southern terminal was based on a variety of factors. They included approaches to the port, weather and water conditions, water depths, availability of land for a tank farm, access from the tank farm to docks, and the relative merits of the location in terms of pipeline length and construction conditions.

Evaluated in choosing the final site were south central Alaska ports at Whittier, Seward, the shores of Cook Inlet and Valdez.

Whittier was rejected principally because of the restricted maneuvering room available for large tankers there. Lack of adequate land for a tank farm and construction difficulties along a pipeline route to Whittier were also factors.

Seward was ruled out because a pipeline route to that city would be substantially longer and involve more difficult construction than to most of the other areas. Also, at Seward, sea conditions tend to be more severe during spring and summer when prevailing winds blow directly into the port. It also appeared that construction of a suitable line from a tank farm to docks would be difficult.

The Cook Inlet location was deemed less desirable because it would require construction of a longer pipeline and because extensive ice floe activity in winter could cause shipping complications.

Valdez finally was selected because it offered both an excellent port and permitted construction of the shortest pipeline.

The port is ice-free throughout the year. It is well protected from the open ocean and is both wide and deep. Wave heights and tidal currents are low and fog does not persist for long periods of time. A further major advantage is the fact that sufficient land is available for construction of a tank farm on bed rock. The elevation of the tank farm at Valdez will permit loading of ships by gravity flow.

Once Valdez was selected as the southern terminal for the line, the general route was further defined by the selection of major mountain and river crossings. A Dietrich Pass crossing was chosen in place of Anaktuvuk Pass in the Brooks Range largely because of soil conditions and route length, even though Dietrich Pass is higher than Anaktuvuk, 60 miles to the west.

The pipeline route at the Yukon River crossing was determined by the existence of a suitable bridge site.

Specific alignment of the pipeline and location of pump station sites were made after a detailed analysis of soil and environmental conditions along the entire pipeline corridor. To find the most secure route and station locations scientists drilled about 3,400 bore holes and took more than 15,000 soil samples. In addition, they also checked the route for environmental features, identifying animal movement zones, mineral licks, dens and nesting areas, archeological sites and fish spawning streams.

This is a continuing process, and as late as early 1975 some major changes were made to reflect concern for the environment. An example of this ongoing effort was the decision to move Pump Station 2 after it was discovered that certain rare raptors nested in the vicinity.

In addition to weighing environmental factors, efforts were also made to: minimize the length of the line, maximize buried construction in stable soils, minimize construction in ice-rich permafrost, avoid conditions which presented construction difficulties, reduce extensive grading and side-hill construction, and bypass population centers.

Roads and Airfields

Construction of the pipeline required construction of the first all-season, all-weather highway to be built across the Arctic Circle in the United States.

Although existing roads in the State of Alaska provided relatively easy access to pipeline and pump station construction sites south of the Yukon, there were no permanent roads north of the river in the vicinity of the route.

The State of Alaska obtained a right-of-way permit from the U.S. Department of Interior allowing Alyeska to build a 361-mile road roughly parallel to the pipeline from the Yukon River to Prudhoe Bay. Construction of the road was the first major undertaking of the pipeline project. Work on the road was begun April 29, 1974, and five months, 3 million man hours and 25 million cubic yards of gravel later, the road was finished. At present the road is open only to pipeline project vehicles, but upon completion of the project, the road will become part of the state's secondary highway system.

In addition to the main road, temporary and permanent access roads were built to material sites, camps and pump stations along the route. Three permanent and eight temporary airfields have been built to support pipeline construction and maintenance activities.

Also, the state is constructing the first permanent bridge across the Yukon River. Alyeska and the state are sharing the construction costs of the bridge, nearly $25 million.

Yukon to Prudhoe Bay Road

The new 28-foot-wide gravel-surfaced road was laid out so as to disturb terrain features as little as possible. On stable subgrade soil the road has a three foot gravel base. On less stable soil, the base is from five to six feet thick.

Timber-decked vehicle bridges with steel pilings have been constructed at 20 major creek and river crossings. The bridges have a maximum length of 420 feet, and a clear roadway width of 24 feet. They are built in 30-foot and 60-foot span lengths and the steel piles on which they rest have a minimum bearing capacity of 30 tons.

Openings beneath the bridges were designed to provide a four-foot minimum clearance above the level of a so-called 50-year flood, the highest water expected in that period of time. Spur dikes are used to protect the bridges and approach embankments against water erosion and ice.

Access Roads

Fifteen permanent access roads link the main road with pump station sites and permanent airfields. One unmanned communication site will be linked by a permanent road to the highway, while the balance will be serviced by helicopter. Access roads to pump stations total six miles and vary in length from 120 feet to two miles. All access roads to pump stations have a minimum three-foot gravel base and a two-lane roadway, 28 feet wide.

Temporary roads provide access to the pipeline right-of-way and material sites. Temporary roads south of the Yukon are located in 2 to 12 mile intervals along the route. These roads vary from 150 feet to 6 miles in length, totaling about 120 miles.

When the line is completed, some strategically located access roads will be maintained as permanent inspection and maintenance roads. Others will be closed and left in a condition which complies with governmental stipulations for the pipeline.

Airfields

Three permanent airfields were constructed near camps at Prospect Creek, Dietrich and Galbraith Lake for support not only of construction but for operation and maintenance of the pipeline system and road. The fields are designed to handle aircraft as large as the Hercules L-382. The runway at Prospect is 5,000 feet long. Runways at Dietrich and Galbraith are 5,200 feet long. A screened-gravel surface was applied atop four to five feet of coarse gravel base.

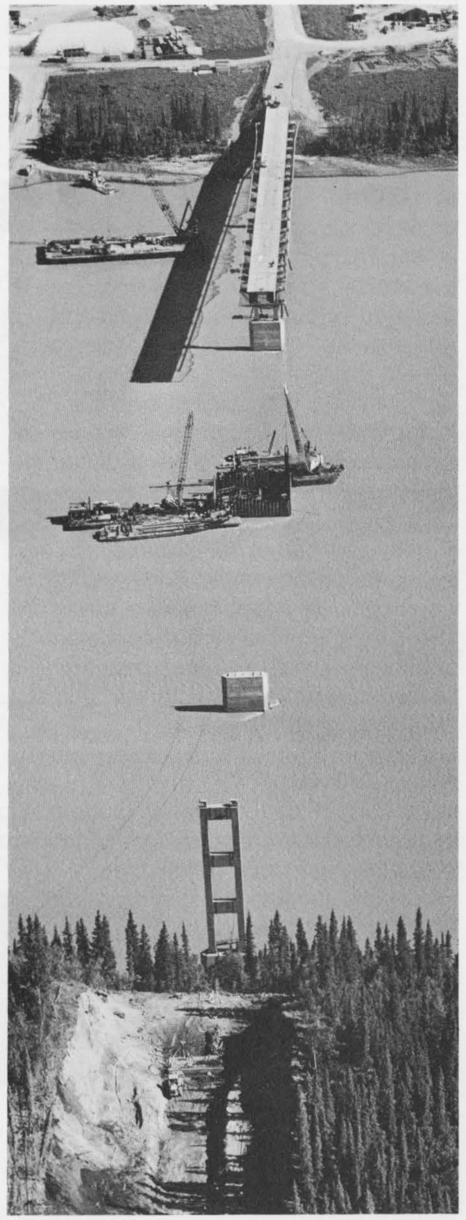
Eight temporary airfields also support road and pipeline construction. Four of these strips have 3,000-foot runways. Four others have 5,000-foot runways.

Yukon Bridge

The pipeline is being supported on the side of the two-lane, 2,300-foot bridge being built by the state across the Yukon River.

The bridge, which towers 17 stories over the south side of the river, is supported by five river piers, some more than 150 feet high.

The structure is designed to withstand ice forces during spring breakup of the river, winds up to 80 miles an hour, temperatures ranging from minus 60 degrees to 100 degrees Fahrenheit, earthquake stresses slightly more than five times higher than accepted engineering levels for that location, and the effects of any 50-year-level flood.



Pipeline

The pipeline, which will extend in a continuous line from Prudhoe Bay to Valdez, is being built in three modes, depending on environmental, terrain and soil conditions.

The oil will come from the ground at Prudhoe Bay at a temperature of up to 180 degrees Fahrenheit and will enter the line at about 135 degrees, depending on production rates and handling procedures between the wells and the pipeline.

Because of heat generated by pumping and because of friction within the pipe, the oil will travel through the pipeline at temperatures between 130 and 140 degrees at the design rate of 2 million barrels per day. The temperature of the oil in the pipe will be slightly less at lower pumping rates.

Potential effect of the oil heat on soils along the route determines the mode of installing the pipe.

Conventional Burial

In stable soils, the pipe will be buried in a conventional manner, much as it is in other parts of the nation. Conventional burial is being used in areas where soil is either bedrock, thaw-stable sand and gravel or thawed soil; or where the results of field exploration and analysis demonstrated that soil settlement or instability, resulting from thawing, would not cause unacceptable disruption of the terrain or damage to the pipeline.

Slightly over half of the pipeline is being installed conventionally. Burial depths will range from 3 feet minimum cover above the top of the pipe to occasional depths greater than 12 feet, depending on the pipe configuration, terrain, and soil properties at each location.

Above Ground

In sections of the route where melting of the permafrost by heat from the pipeline might create difficult soil stability conditions, the line is being installed above ground.

In the above-ground mode, the pipe will be covered with four inches of resin-impregnated fibrous glass insulation, jacketed with galvanized steel. The pipe in this mode will be mounted on support platforms, 60 feet apart.

The oil pipe will be supported on a cross beam installed between two vertical support members (VSMs) embedded in the ground. To prevent thawing around the VSMs, special thermal devices will be installed inside them where required. These devices consist of metal tubes filled with a refrigerant which evaporates and condenses, thereby chilling the ground whenever the ground temperature exceeds the temperature of the air. The devices are non-mechanical and self-operating.

In this mode the frozen soil between the supports will also be overlain with gravel pads, and in some sections, an additional layer of plastic foam insulation.

Insulation of the above-ground pipe will keep the oil in a warm pumpable state for an ample period in which to complete any unexpected maintenance, should oil movement stop for any reason.

Expansion

To compensate for expansion of above-ground pipe caused by the warm oil, the line is being built in a flexible zigzag configuration which converts expansion of the pipe into sideways movement.

In these sections, the pipe is being secured in a shoe-and-saddle assembly which will allow the pipe to slide on the crossbeam as the line expands. As it contracts, the pipe will be free to slide back to its original position.

To provide partial restraint of the pipe, anchors are positioned on special platforms in each zigzag configuration (every 800 to 1,800 feet). (See illustration).

Where the potential horizontal movement from a severe earthquake may be large, certain of the supports will be fitted with bumpers. Bumper beams installed on the pipe at these points will serve to absorb dynamic energy and limit the movement of the pipe.

At the Denali fault, special long-width support beams are being installed to permit still more movement. The pipeline there is being built to withstand a fault displacement of up to 20 feet horizontally and 5 feet vertically.

Special Burial

Three short sections of line, all in the southern portion of the pipeline, will be specially buried, with the soils supporting the buried pipeline being maintained frozen by refrigeration. The total length of these specially buried sections is just over four miles. Two pump stations north of the Yukon River will connect to the pipeline by way of very short sections, about 200 feet, of specially buried pipe.

In this configuration, the pipe, insulated with three inches of polyurethane foam covered with a resin-reinforced fiber glass jacket, will be buried in permafrost and the permafrost will be maintained in a frozen condition. Refrigerated brine will be pumped through pipes buried beneath the pipeline to keep the ground frozen. The refrigeration units are to be powered by electric motors.

The Pipe

The pipe was specially engineered and fabricated for the Alaska pipeline.

Even though it will not generally be subjected to unusual forces and deformations, the pipeline was designed to sustain all expected hydraulic pressures, thermal forces, and stresses induced by settlement, compaction, earthquakes, and weight between supports of the elevated line, including snow and wind loads. Particular emphasis was placed on providing a high degree of assurance that the line will not leak oil even though deformed well beyond the limit at which it can successfully transport oil.

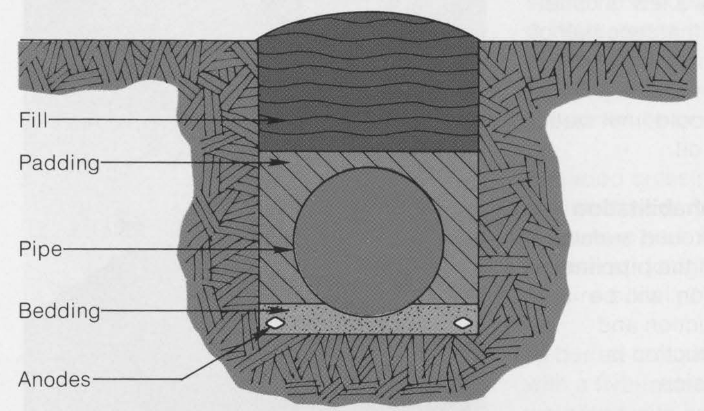
The pipe, manufactured in three grades and two wall thicknesses (.462 inches and .562 inches), was alloyed slightly with vanadium and manufactured in a carefully controlled rolling process.

The pipe has specified minimum yield strengths of 60,000, 65,000 and 70,000 pounds per square inch.

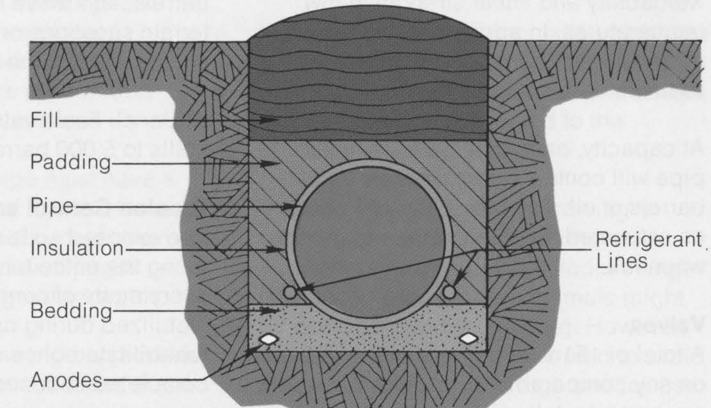
Different grades of pipe are being used in different locations, depending on the pressures and stresses expected to be encountered in each location. The pipe has been specially coated and is being given cathodic protection to prevent bacteriological, chemical and electrolytic corrosion.

Construction Modes

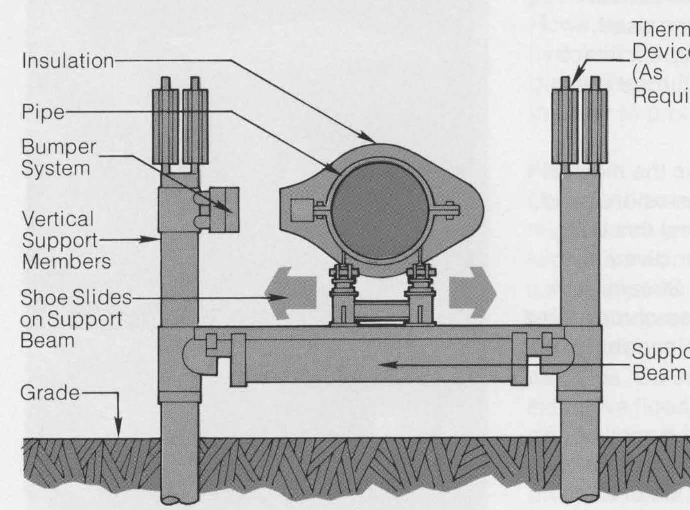
Conventional Bury



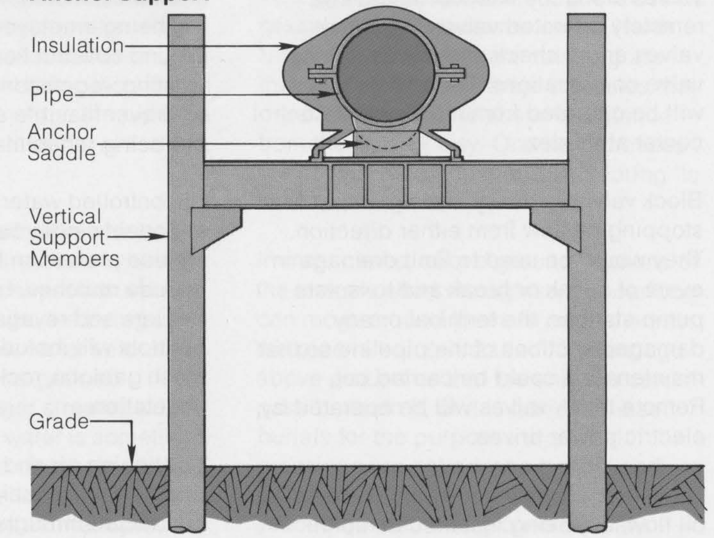
Special Bury



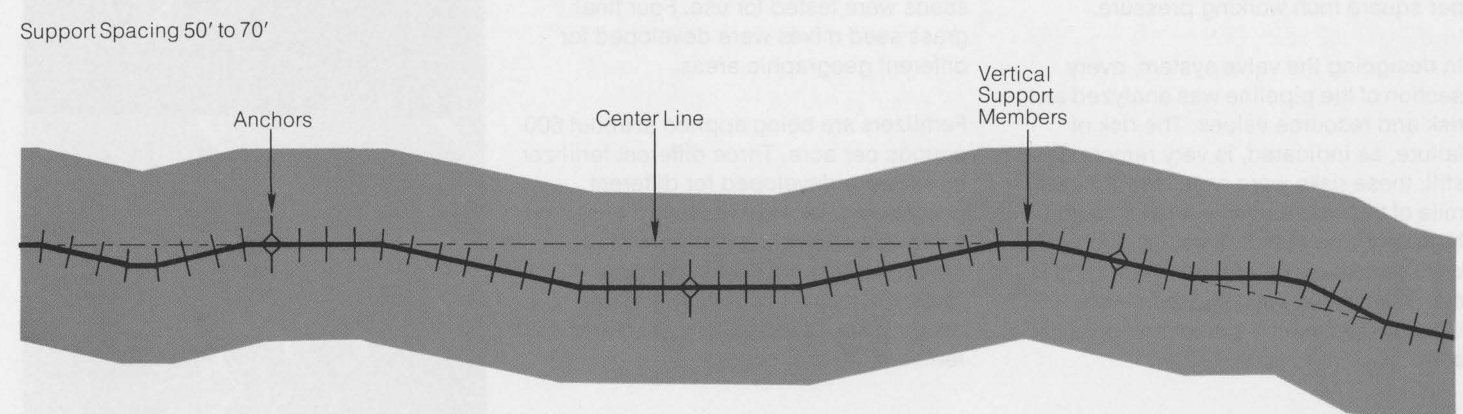
Conventional Elevated



Anchor Support



Typical Zigzag Configuration



The pipe was extensively tested at the mills and at laboratories at the University of California. Other tests assured the pipe's toughness, bendability, ductility, weldability and shear strength at low temperatures. In addition, the pipe material was analyzed chemically to assure that it met specifications.

At capacity, each mile of the installed pipe will contain approximately 11,300 barrels of oil. The entire line will contain an estimated 9 million barrels of oil when full.

Valves

A total of 151 valves, more per mile than on any comparable pipeline in the world, are being installed along the line. Additional valves are being installed at the pump stations and terminal site.

Valves along the line will include 62 remotely operated valves, 71 check valves and 9 check and manual block valve combinations. The remote valves will be operated from the pipeline control center at Valdez.

Block valves in the system are capable of stopping oil flow from either direction. They would be used to limit drainage in event of a leak or break and to isolate pump stations, the terminal or any damaged sections of the pipeline so that maintenance could be carried out. Remote block valves will be operated by electric power drives.

Check valves, which prevent a reversal of oil flow, are being installed on uphill slopes to prevent downhill flow in event of a break. Flow in one direction keeps the valves open. When flow reverses, the valves close automatically.

All valves are designed for 1,200 pounds per square inch working pressure.

In designing the valve system, every section of the pipeline was analyzed as to risk and resource values. The risk of failure, as indicated, is very remote. But, still, these risks were assessed for every mile of the line. And where risks could be high or where resource values such as wildlife, fish and recreation were higher than elsewhere, valve systems were installed to limit the size of any possible spill.

Spills on the average section would be limited to 15,000 barrels after valves were closed. Maximum static spills after valves are closed would be held to 50,000 barrels, and these in only a few unusual terrain situations on less than one half of one per cent of the line.

At Denali Fault, valves would limit static spills to 5,000 barrels of oil.

Erosion Control and Rehabilitation

The exposed soils and ground surface along the entire length of the pipeline, in every mode of construction, will be stabilized during construction and rehabilitated once construction is completed to control erosion.

Where the pipeline is buried and existing vegetation is disturbed, erosion control techniques — drainage control, diversion structures, mulches and revegetation — are being employed. Where above-ground construction is being used, existing vegetation is being left intact wherever feasible and disturbed areas are being rehabilitated.

Uncontrolled water runoff is the most important single cause of erosion. Land surface protection to prevent this will include mulches, benches, diversion barriers and revegetation. Stream bank controls will include the use of rock-filled mesh gabions, rock riprap, sandbags and vegetation.

Continuing air and ground surveillance and corrective maintenance will be conducted throughout the life of the pipeline.

An erosion control program was developed for the entire project with methods and procedures spelled out for every area. More than 250 different grass seeds were tested for use. Four final grass seed mixes were developed for different geographic areas.

Fertilizers are being applied at about 600 pounds per acre. Three different fertilizer mixes were developed for different geographical areas. These are based on a soil nutrient testing program which covered the entire pipeline. Hand methods, hydro-seeding and aerial seeding are used to apply seed and fertilizer.

Rivers & Streams

The pipeline crosses more than 800 streams and roughly parallels the floodplain channels of 5 large rivers. Most stream and floodplain crossings are constructed in the conventional above-ground or buried modes. In 13 crossings, however, the pipe will be supported on bridge structures.

At buried crossings, pipe must have a minimum cover depth of five feet beneath the stream bed. At 85 such locations, bed erosion at design flood discharges require burial at even greater depths.

At buried crossings, the pipe is jacketed with a five-inch layer of concrete, or is weighted with concrete "saddles", each weighing about nine tons.

The width, depth and course of streams are being maintained as closely as possible to their original conditions. However, in a number of instances hydraulic structures are being installed to divert stream flow away from the pipeline in order to protect the integrity of the line.

Fish

Construction-caused siltation which might damage spawning beds is being kept to a minimum. Semi-permanent or temporary siltation basins are being used when necessary to slow water velocities and allow settling of fine-grained particles. On some major streams with extensive floodplains, water is sometimes diverted to abandoned channels during construction to avoid siltation. The diversion also provides uninterrupted movement of fish through the construction zone.

Wildlife

Critical wildlife habitat was identified along the entire pipeline right-of-way before construction began.

Surveys of breeding populations indicate a low density of nesting pairs of waterfowl along most of the pipeline route with high density populations limited to the Prudhoe Bay area.

The only big game animal calving or lambing concentration near the route involves several separate Brooks Range Dall sheep areas. These animals might be disturbed during lambing. However, construction is being scheduled to avoid periods of lambing and high salt lick use. Disturbances of small game and fur bearers are expected to be temporary, during construction only.

As many as 450,000 caribou are known to graze during the summer on the North Slope. Most of these animals migrate through the Brooks Range on routes that parallel the pipeline at some distance from the right of way. One herd crosses the southern portion of the line during its seasonal migration.

In most cases, above-ground sections of the line are short enough so that caribou can move around them. In critical areas, the pipe is being installed high enough above ground so that the animals can pass beneath it, or it is buried. These burials for the purposes of animal crossings are called 'sag bends' and consist of 60 to 100 foot sections of pipe placed beneath the ground so that animals may pass over it. In one instance, a special refrigerated burial will also serve as an animal crossing.

Pump Stations

The number of pumping stations along the pipeline will be increased as the capacity of the line is increased.

The system will require 8 stations to move 1.2 million barrels of oil daily. Four additional stations will be required by the time the line reaches design capacity of 2 million barrels per day. While some facilities are under construction at all 12 locations, only stations 1, 3, 4, 6, 8, 9, 10 and 12 are to be completed for initial operation. Station 5 also is being partially completed to serve as a relief or "drain down" station, with main line pumps not to be installed until the station's pumping capacity is required.

At the start, oil will move through the line at slightly more than four miles an hour taking approximately 7½ days to be pumped from Prudhoe Bay to Valdez. At capacity, the oil will travel at slightly more than seven miles an hour, completing the trip in about 4½ days.

If the pipeline were built on level ground, the pump stations could be equally spaced, approximately 65 miles apart. But the trans Alaska line crosses three mountain ranges and the pump stations must be spaced irregularly — close together on up-slopes and widely spaced on down-slopes — to meet hydraulic design requirements. Accessibility, soil characteristics, water table levels and vulnerability to flooding from nearby rivers were also factors in locating the stations.

In the first phase of construction, three of the stations (1, 3 and 4) will be built north of the Brooks Range. Four others (6, 8, 9 and 10) will be north of the Alaska Range and one (12) will be built between the Alaska and Chugach ranges. (See Alaska map).

Centrifugal pumps at each station will be powered by modified 13,500-horsepower aircraft-type gas turbines. Engines will be muffled to meet noise standards of the Federal Occupational Safety and Health Act.

In the initial phase three pumps, with one of them in standby reserve, are being installed at each station. In the final phase, a total of four pumps will be installed — three operating and one on standby.

Natural gas from the Prudhoe Bay oil field will be used to fuel the turbines at Stations 1, 2, 3 and 4. Small fuel preparation units are to be installed initially at Stations 6, 8 and 10 to produce liquid turbine fuel for use at these and other stations south of the Brooks Range.

Facilities for launching or receiving scrapers — a mechanical device for removing incrustation in the pipeline — will be installed at stations 1, 5 and 10 and at the terminal. The scrapers will be placed inside the line and propelled through the system by the flow of oil.

Although the pump stations will be similar to those presently in operation on other pipelines, the Alyeska stations are specifically designed to meet the challenges of the severe Alaska environment. All of the equipment and virtually all of the station piping is being housed in insulated, windowless buildings connected with covered hallways.

Most of the stations are being built on stable soils in a relatively conventional manner. However, at five stations (1, 2, 3, 5 and 6) some structures are being erected on refrigerated gravel atop permafrost. Coils of pipe to circulate cold brine are being buried in gravel beneath a plastic foam insulation mat under critical structures, to keep the ice rich soils frozen and stable.

Operation

At each station, three pairs of high pressure block valves are being installed on the 48-inch main line. One pair, located at the station entry and exit boundaries, serves to block main line oil flow, providing operators the means to isolate the station in an emergency. The second pair may be used to block the line, while allowing incoming oil access to the relief tanks. The third set allows oil to flow through the main line without passing through the station pumps, and provides the means for scrapers to pass through the line, bypassing the pumps.

At all pump stations downstream of the first station (see illustration) oil will enter through the first remote control block valve and flow to the intake side of the main pumps. From the pumps, oil will flow through valves into the 48-inch main line and out of the station.

Each station will be equipped with an automatic pressure relief system able to detect excessive static and surge pressures in the pipeline. To relieve pressure, relief valves will divert oil out of the line into a 55,000-barrel pressure relief tank. Pressure can be relieved on the suction and discharge sides of the pumps. When normal operating conditions are restored, a booster pump will transfer oil from the relief tank back into the line.

At the Prudhoe Bay origin station, (see illustration) oil received from the producing companies will be measured by eight turbine-type meters. After leaving the meters, the oil will go to storage tanks designed to accommodate the difference in flow between incoming and outgoing oil, before being pumped into the pipeline system.

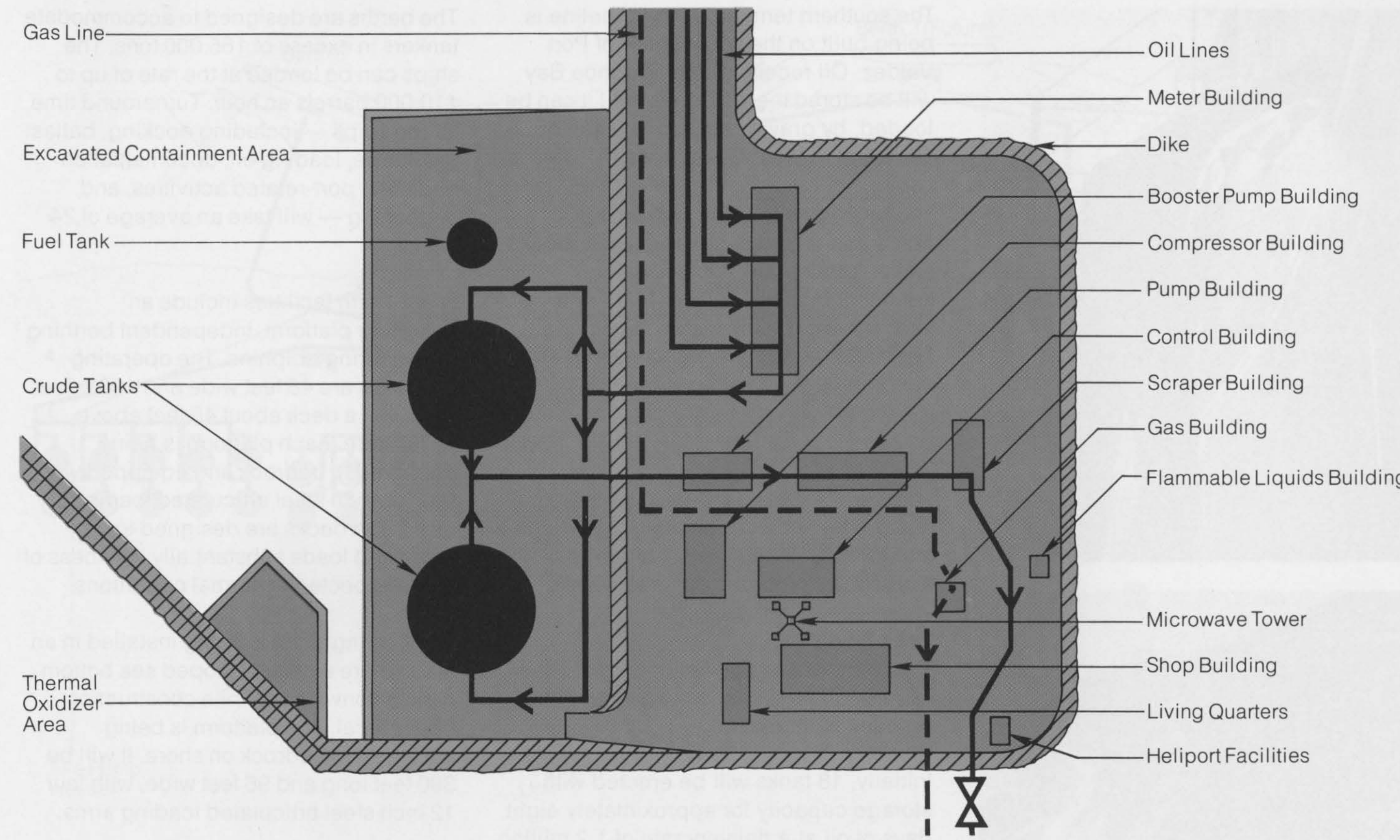
Natural gas, which will power turbines in the first four stations, will be transported in a buried pipeline. This line, for which a separate right of way has been obtained, will run within the construction areas of the State highway or the oil pipeline. Lateral connections will serve each of the four stations. Design pressure of the gas fuel line will be 1,440 pounds per square inch, the operating pressures will range from 600 to 1,200 pounds per square inch. Gas will enter the line at 28 degrees Fahrenheit, remaining below 32 degrees along the route.

Accommodations

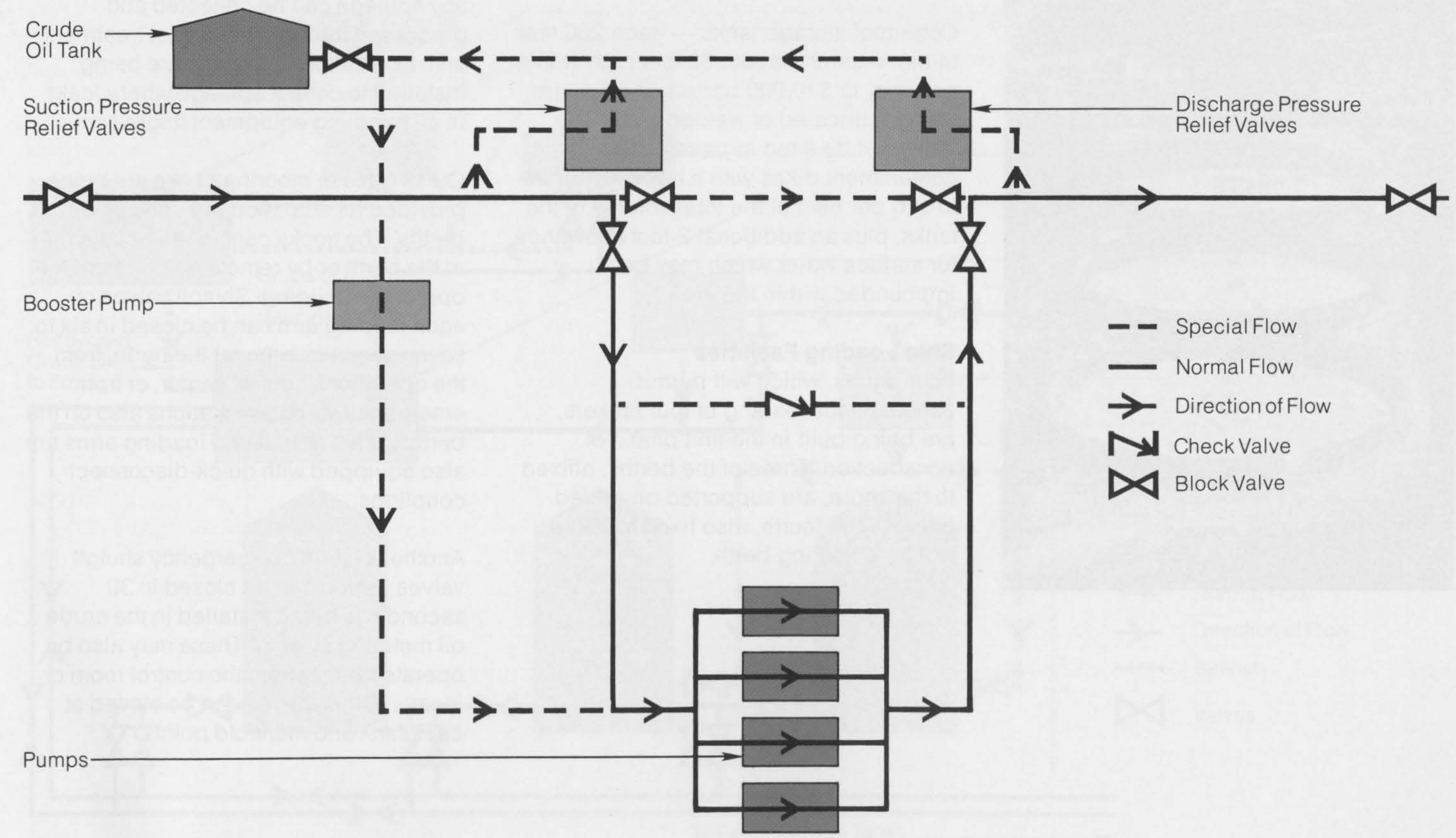
Although the stations will be operated by remote control from the pipeline operational center at Valdez, a small crew of technicians will be assigned to each station to provide needed maintenance and surveillance of equipment. Each station will be equipped to supply all of the requirements of life for the crew. Every station will have a bunkhouse, complete food service, electrical generating facility, central heating plant, water treatment and storage facility, sewage and waste disposal system, station-wide fire detection system and an automatic fire extinguishing facility.

Shops and warehouse buildings are also being built.

Pump Station 1 (Origin Station)



Typical Pump Station Oil Flow



Terminal Facilities

The southern terminal of the pipeline is being built on the south shore of Port Valdez. Oil received from Prudhoe Bay will be stored there in tanks until it can be loaded, by gravity, aboard tankers for shipment to West Coast ports.

The terminal site covers about 1,000 acres and includes storage tanks, docks, tanker loading and ballast water treatment facilities, power plant and vapor control facilities, an office building, fire pump building, warehouse and shop building, and oil spill contingency equipment as well as the pipeline control center.

The site elevation insures that all critical equipment and storage tanks, buildings and other facilities are out of range of statistically probable seismic waves.

Tank Facilities
The terminal storage facilities will be developed in stages as capacity of the pipeline is increased.

Initially, 18 tanks will be erected with storage capacity for approximately eight days of oil at a delivery rate of 1.2 million barrels a day. In the final phase, by the time the line reaches its 2 million barrel daily capacity, there could be up to 32 tanks.

Cone-roof storage tanks — each 250 feet in diameter and about 62 feet high with a capacity of 510,000 barrels of oil — are being fabricated of welded steel. The tanks will be sited in pairs within containment dikes with a capacity equal to 110 per cent of the total volume of the tanks, plus an additional 2-foot allowance for surface water which may be impounded within the area.

Ship Loading Facilities
Four berths, which will permit simultaneous loading of four tankers, are being built in the first phase of construction. Three of the berths, affixed to the shore, are supported on drilled pilings. The fourth, also fixed to shore, will be a floating berth.

The berths are designed to accommodate tankers in excess of 165,000 tons. The ships can be loaded at the rate of up to 110,000 barrels an hour. Turnaround time for the ships — including docking, ballast discharge, loading oil, documentation and other port-related activities, and undocking — will take an average of 24 hours.

Fixed-berth facilities include an operating platform, independent berthing and mooring dolphins. The operating platforms are 46 feet wide and 122½ feet long with a deck about 40 feet above lowest tide. Each platform is being anchored to bedrock and equipped with four 16-inch steel articulated loading arms. The decks are designed to withstand loads substantially in excess of those expected in normal operations.

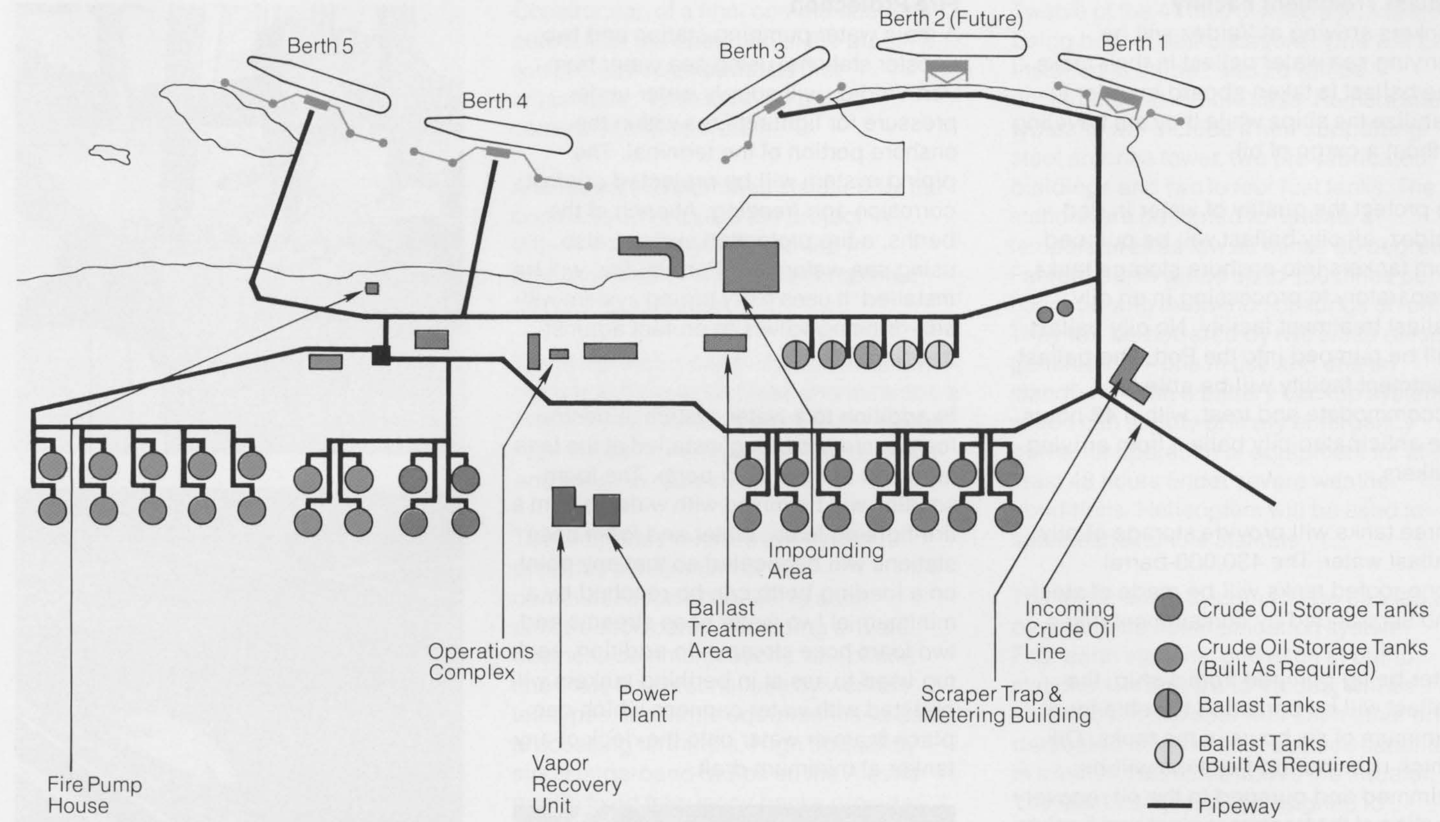
The floating berth is being installed in an area where a steeply sloped sea bottom makes conventional pile construction impractical. The platform is being anchored to bedrock on shore. It will be 390 feet long and 96 feet wide, with four 12 inch steel articulated loading arms.

The steel loading arms and associated work areas on the loading platforms of both fixed and floating berths are being surrounded by an oil-tight curb so that any spillage can be collected and processed through the ballast treatment unit. In addition, drip pans are being installed to collect spillage where leaks in oil handling equipment might occur.

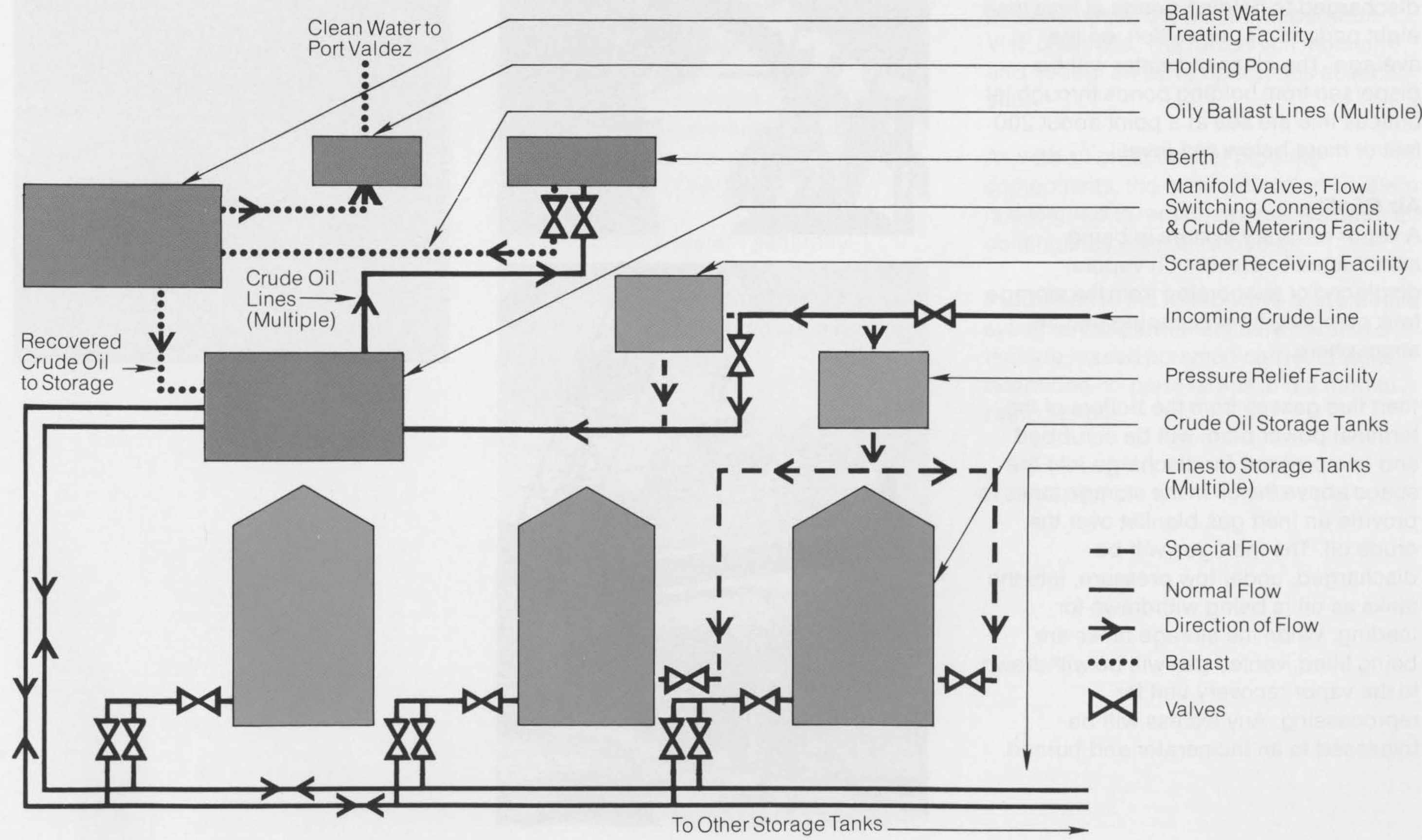
Quick release mooring hooks are being provided for ship mooring lines on all berths. The hooks can be released either at the berth or by remote control from the operator's building. Shutoff valves on each loading arm can be closed in six to seven seconds either at the berth, from the operations control center, or from emergency shutdown stations also on the berths. Steel articulated loading arms are also equipped with quick-disconnect couplings.

Another system of emergency shutoff valves, which can be closed in 30 seconds, is being installed in the crude oil metering system. These may also be operated either from the control room or locally. Other valves can be closed at each tank and manifold point.

Valdez Terminal, Maximum Development



Terminal Oil and Ballast Flow



Ballast Treatment Facility
Tankers arriving at Valdez will be carrying sea water ballast in their tanks. The ballast is taken aboard in order to stabilize the ships while they are traveling without a cargo of oil.

To protect the quality of water in Port Valdez, all oily ballast will be pumped from tankers into onshore storage tanks preparatory to processing in an oily ballast treatment facility. No oily ballast will be pumped into the Port. The ballast treatment facility will be able to accommodate and treat, within 48 hours, the anticipated oily ballast from arriving tankers.

Three tanks will provide storage of oily ballast water. The 430,000-barrel cone-roofed tanks will be made of steel and surrounded by containment dikes.

After being pumped from a ship, the ballast will be permitted to settle for a minimum of six hours in the tanks. Oil which rises during that time will be skimmed and pumped to the oil recovery section of the treatment plant and back to the terminal's crude storage tanks.

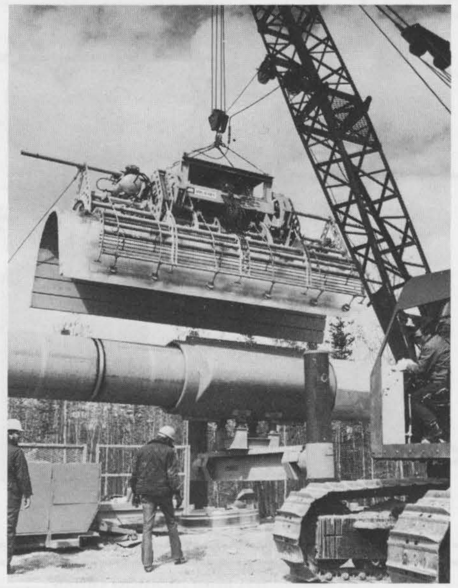
The remaining water will be passed through a chemically aided, dissolved air flotation treatment unit until it can be discharged to holding ponds at less than eight parts of oil per million, on the average. The cleansed water will be dispersed from holding ponds through jet orifices into the sea at a point about 200 feet or more below sea level.

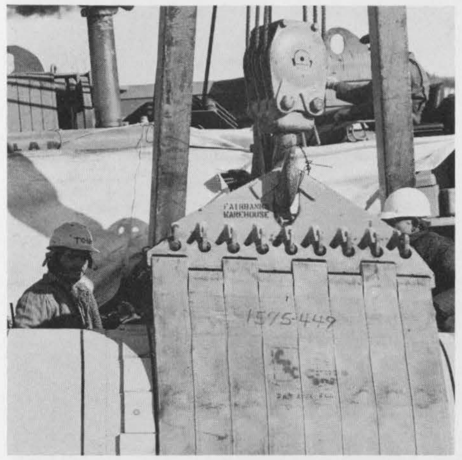
Air Quality
A vapor recovery system is being constructed to prevent oil vapors, displaced or evaporated from the storage tank complex, from escaping into the atmosphere.

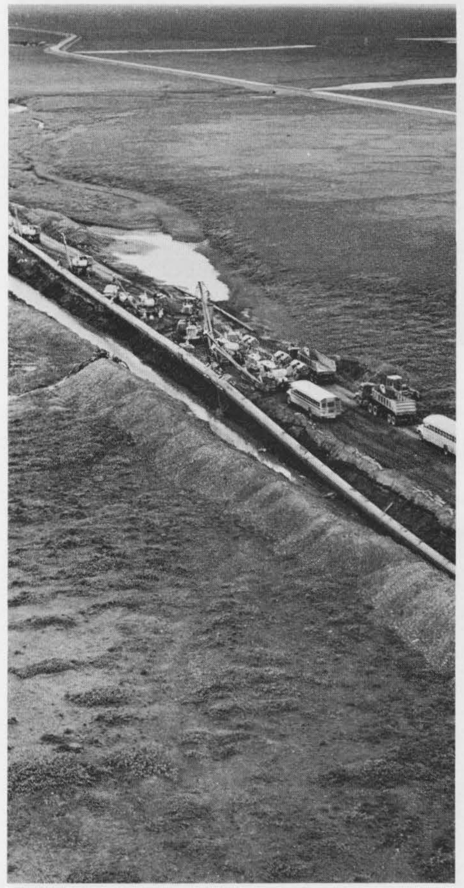
Inert flue gasses from the boilers of the terminal power plant will be scrubbed and compressed for discharge into the space above the oil in the storage tanks to provide an inert gas blanket over the crude oil. The inert gas will be discharged, under low pressure, into the tanks as oil is being withdrawn for loading. When the storage tanks are being filled, vented gas will be withdrawn to the vapor recovery unit for reprocessing. Any excess will be bypassed to an incinerator and burned.

Fire Protection
A main water pumping station and two booster stations, using sea water from Port Valdez, will supply water under pressure for fighting fires within the onshore portion of the terminal. The piping system will be protected against corrosion and freezing. At each of the berths, a fire protection system, also using sea water from Port Valdez, will be installed. It uses a dry piping system with self-draining valves to protect against freezing.

In addition to a water system, a central foam system is being installed at the tank farm and at each ship berth. The foam solution will be mixed with water to form a fire-fighting foam. Water and foam hose stations will be located so that any point on a loading berth can be reached by a minimum of two water hose streams and two foam hose streams. In addition, each tug used to assist in berthing tankers will be fitted with water cannons which can place foam or water onto the deck of any tanker at minimum draft.







Construction of a final communications network for the operation of the pipeline will provide Alaska with its first cross-state, north-to-south public communications system.

A temporary system was installed for the construction phase of the project. A different system will be placed in operation before the line is completed and put into service.

The temporary system links construction camps with other facilities and includes a micro-wave system, mobile radio system, high frequency single side-band radios and aviation radios.

The temporary micro-wave system provides a maximum of 12 communication channels to each construction camp, including private business communications, telephone channels for personal use by workers, teletypes, facsimile equipment and data processing terminals. High frequency single side-band radios on the Alaska public fixed frequency banks provide construction camps and the Fairbanks office with emergency communication facilities.

Leased private line telephone circuits also connect company offices in Anchorage, Fairbanks and Valdez as well as all construction camps.

The final operational communication system is being developed around 41 permanent micro-wave stations between Prudhoe Bay and Valdez.

The micro-wave system generally parallels the pipeline, linking all pump stations, remotely controlled gate valves and pipeline maintenance centers with the Valdez control center.

Twelve of the 41 micro-wave stations are being built at pump stations. One will be installed at Valdez and 28 will be constructed at remote sites. Remote sites typically will include a self-supporting steel antenna tower, two pre-fabricated buildings and two to four fuel tanks. The stations are designed to operate at temperatures as low as minus 80 degrees Fahrenheit, in winds up to 150 miles per hour and with three-inch coatings of ice. They will be powered by two small diesel generators — one in use and one on standby — with a battery backup system which can supply primary emergency power for operation of equipment for at least 48 hours under severe weather conditions. Helicopters will be used to service the remote stations.

The micro-wave system will be backed up by a satellite communication system. Four earth stations, one each at pump stations 1, 4 and 5 and Valdez, will be able to communicate with each other on dedicated channels via a space satellite in orbit 24,000 miles above the equator. The satellite system is designed to handle all pipeline control data in event of any break in communication along the chain of micro-wave stations.

The 62 remote valves on the pipeline will be linked to the main communication network by radio via two independent VHF channels. The radios will monitor and control all valve operations at each site.

As with all other critical pipeline components, the communications system is designed to remain operational after a contingency level earthquake.

In addition to the micro-wave and satellite systems, the permanent network also will include leased common carrier circuits, telephone, in-plant radios and a mobile radio system.

Ship Movement and Routes

Pipeline oil will be moved by tanker from the Port of Valdez to terminals in northern Puget Sound, Los Angeles and San Francisco. On an average, fewer than three tankers a day are expected to sail from Valdez to those ports when the pipeline operation reaches maximum capacity.

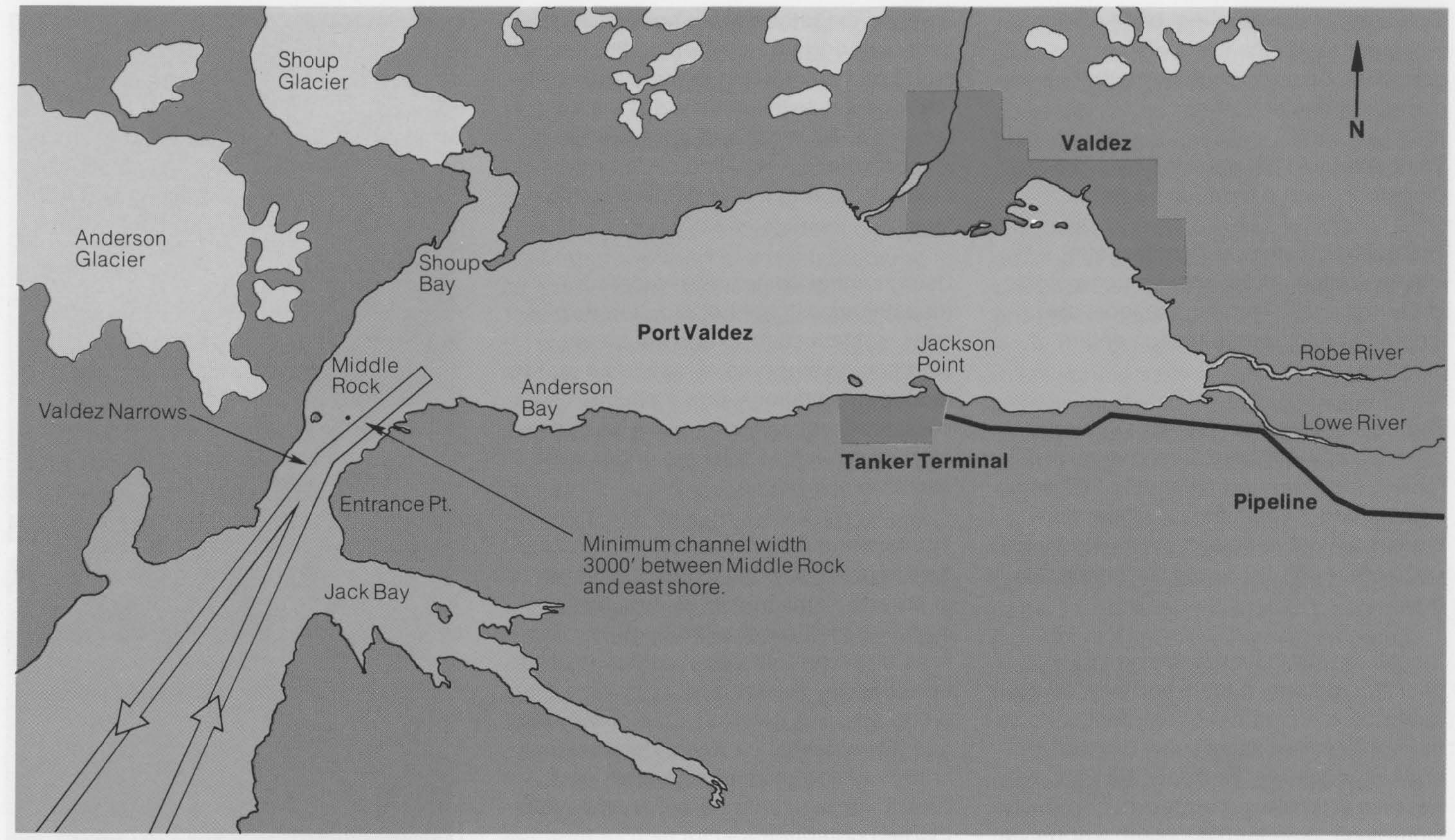
Ship traffic in Alaska's Prince William Sound and the Port of Valdez will be monitored by the U.S. Coast Guard at the Valdez Traffic Control Center. Ship movement within the Valdez Narrows will be restricted to one vessel at a time. The North and South traffic lanes will each be three-quarter mile wide, with a separation zone one mile wide between the lanes.

The Port of Valdez is a protected fjord about 12 miles long, 2½ miles wide and in excess of 750 feet deep. Its size is more than adequate to handle the largest tanker afloat or even contemplated today and easily is adequate for those to be loaded at the terminal there. The narrowest portion of the entrance channel through Valdez Arm is 3,000 feet from Middle Rock to shore, several times wider than ship channels at New York, Philadelphia and Houston, all of which accommodate much greater shipping traffic.

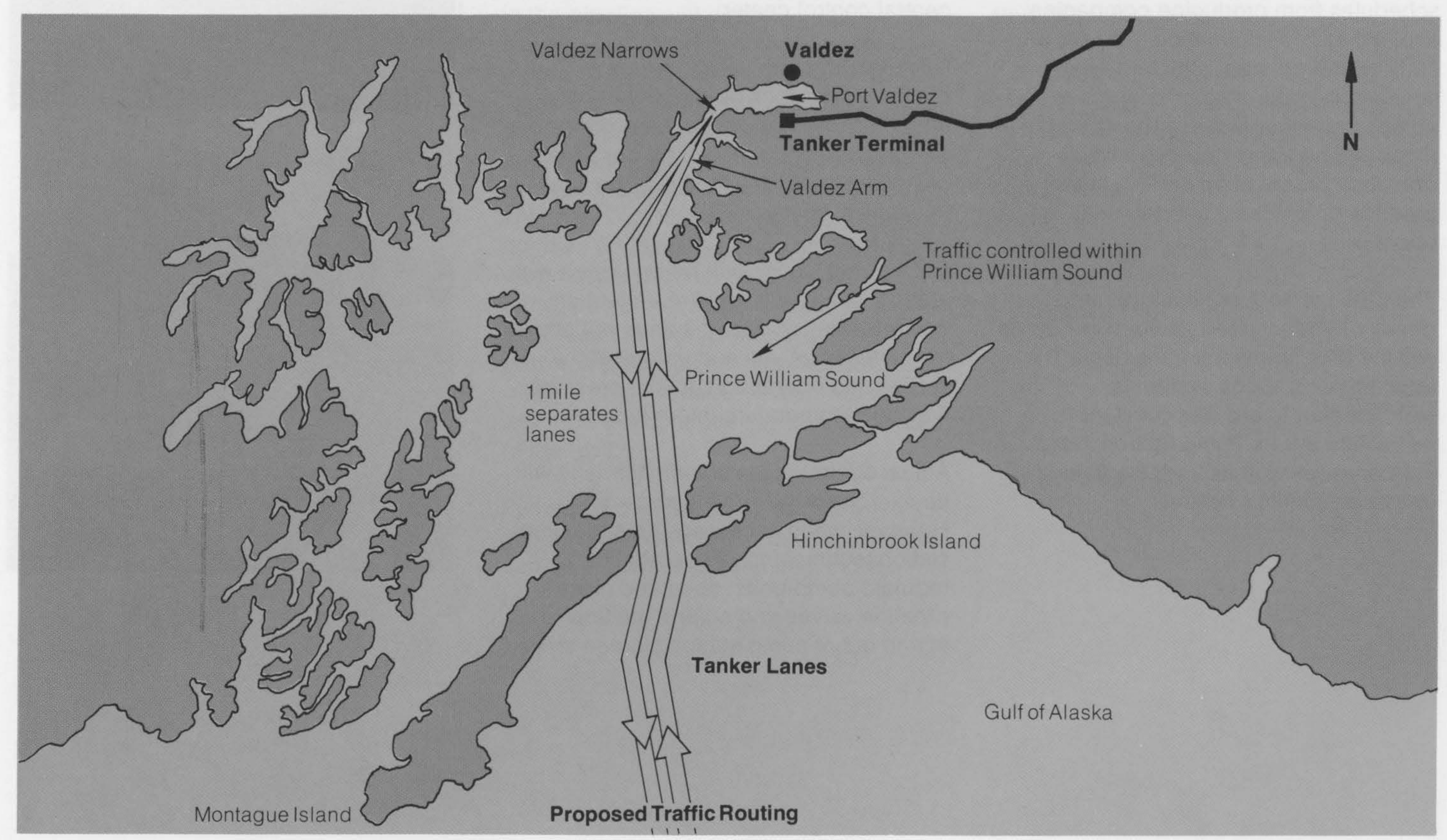
In the Port of Valdez tugs will be used for all tanker docking or undocking. Launches and crews will assist in handling mooring lines during berthing.

The U.S. Coast Guard and the U.S. Coast and Geodetic Survey have taken steps to improve navigational aids and provide updated charts and maps of the port and its approaches.

Port Valdez



Prince William Sound



Operation and Control Systems

Operation of the pipeline, once oil starts moving through the line, will be controlled by an operations control center at the terminal at Valdez.

The center will be operated by a pipeline dispatcher and a terminal operator.

The control system will consist of a master station complete with computers at Valdez and 12 remote stations, one located at each pump station on the pipeline.

The master station automatically and continuously will scan data from all of the remote stations. Approximately 200 data signals and 1,400 status and alarm signals will be reviewed cyclically by the computer every 10 seconds, 24 hours a day.

Incoming information will be displayed on visual display panels and printed by teleprinter. All critical equipment such as the computer visual display units and control panels will be duplicated and will have an automatic changeover capability. Communication for the system will be via microwave with a satellite backup system (see Communications).

The operations office will receive crude oil production forecasts and tanker arrival schedules from producing companies and, using this information, prepare a daily operation plan reflecting all oil movements, operating conditions of pumps and other factors. The operational plans will be translated into written operation orders to be carried out by pipeline dispatchers and terminal operators.

The pipeline and terminal operators' desks will be manned 24 hours a day, as will the telecommunications desk. The telecommunications system is instrumented to provide constant surveillance from Pump Station 1 and Fairbanks, as well as from the Valdez operations control center.

Pipeline dispatchers will be responsible for monitoring and controlling the flow of crude oil from the first pump station at Prudhoe Bay to the entrance of the Valdez tank farm. Terminal operators will be responsible for receiving oil from the pipeline, storing it and delivering it to tankers.

Using control center data, pipeline dispatchers will control pipeline flow rates, system start-up and shutdown, starting and stopping of individual pumps at all pump stations, pump station pressures, utilization of pump station storage tanks and pipeline and pump station block valves.

The terminal dispatchers will control the flow of pipeline oil to specific storage tanks and from tanks to waiting tankers, directing the flow of oil through loading lines and manifold valves to the desired tanker berth. The terminal operating group also will determine the quality and quantity of tanker cargoes, document all crude oil receipts and deliveries and coordinate with ship personnel the entire loading operation.

The ballast treatment facility will be operated from its own control room located near the unit. Alarm conditions there, however, will be transmitted to the central control center.

Dock loading arm valves will be controlled by dock operators but only after the terminal operator has activated a permissive control. It will be possible to close these valves either from the dock or the control center.

Each pump station will be equipped with station, pump unit and fire protection controls. Station data displays will show the status of valves and pumps at the station and operating suction, pressure, flow and temperature information.

Actual control of the station normally will be exercised by the Valdez center. However, when necessary, on-site pump station technicians will be able to regulate pump units, open and close pipeline valves and control the flow of oil in and out of pump station storage tanks.

Leak Detection

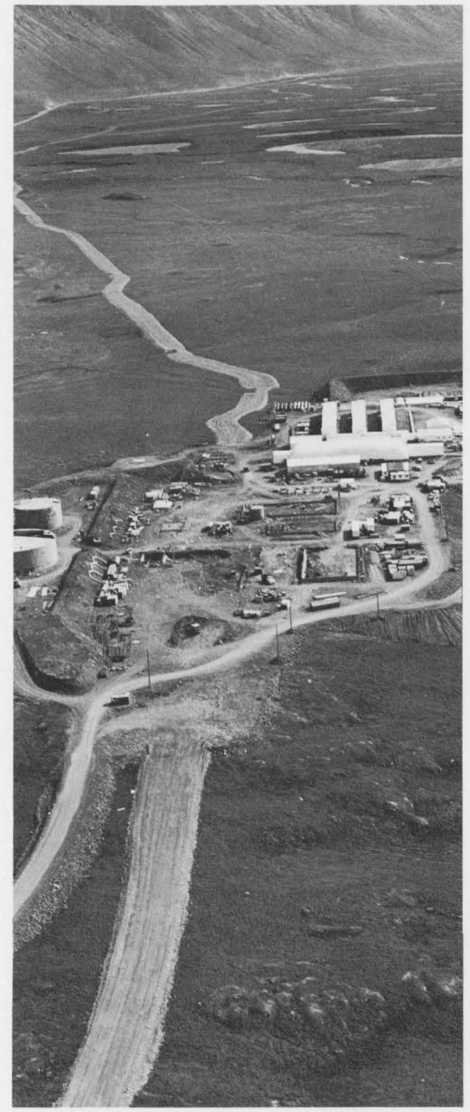
Four separate automatic alarm methods will be provided by the computer to detect leaks in the system. The computer constantly will monitor the system for pressure deviations, flow deviations, flow balance deviations (variance in flow from point to point in the line) and line volume balance (see below).

An alarm will be sounded whenever there is a change in pressure or flow by more than one per cent. If a leak is indicated, the data display will enable the dispatcher to determine where the leak is located. The operator then can take immediate action to shut down pump stations, isolate sections of the line and initiate repair and recovery operations.

The line volume balance procedure will offer the most sensitive method of leak detection, sensing leaks of much less than one per cent of line flow. In this method the volume of oil entering the system will be compared against the volume of oil being delivered, accounting for all significant variations in net volume of the pipeline, for oil levels in pump station tanks and for use of oil for pump station fuel preparation units.

In addition, regular aerial and ground patrols will survey the line for signs of trouble.

Contingency Planning



A principal concern both of design and construction has been development of a secure and, as nearly as possible, leakproof system for the pipeline, pump stations, terminal and all ship-loading facilities.

However, in case of an accident, detailed contingency plans have been prepared for every portion of the system.
The plans have seven basic objectives:
(1) prevention of oil leaks and spills,
(2) fast, accurate and sensitive detection of any leaks, (3) minimization of spill volume, (4) containment of spills,
(5) recovery of oil, (6) rehabilitation and restoration of affected areas and
(7) public safety and prompt notification.

To implement the plans, specific response procedures have been developed for spills or leaks on every part of the pipeline system. Procedure outlines will be stored in a computer. When a spill or leak is identified, the computer will print out a pre-planned response for the area involved, identifying crews and equipment required as well as immediate response procedures to be followed in meeting the emergency.

Pipeline Contingencies

Nature of action taken if a leak is detected in the pipeline will depend largely upon the size and location of the leak, as indicated by the pipeline data system. Typically, however, if an alarm signals a leak and the location of the leak is apparent from the control center data display, the dispatcher will take steps to shut down all stations north (upstream) of the leak position. Downstream stations then will be shut down. When all necessary pump stations are shut down, the dispatcher will isolate the leak between two adjacent stations sites by closing block valves. He also will close any remotely controlled valves in the area of the leak.

Pump stations can be closed down in six minutes. Other remotely controlled valves can be closed in four minutes more.

Aircraft or ground patrols then will be used to pinpoint the leak. Crews will be dispatched immediately to close locally operated valves, stop the leak, contain the spill in the smallest possible area and begin recovery and repair operations.

One of the first steps taken by crews arriving at a spill will be to create dikes, pits and other containment structures as pre-planned for the particular environmental situation. Where practical in environmentally sensitive sites, permanent structures may be installed during construction to prevent any possible spill from reaching the sensitive site.

In general, spilled oil either will be drained into temporary storage pits or pumped into temporary tanks for later movement by truck to the nearest pump station or other suitable location for return to the line.

Oil which cannot be picked up will be recovered by sorbent materials. Burning of unrecoverable residual oil may be used in some circumstances but only with prior approval of appropriate government authorities.

Soil rehabilitation including aeration, dilution, fertilization and revegetation will start as soon as possible.

If surface water of lakes or rivers is contaminated, spilled oil will be confined by fixed or floating booms and removed by skimming devices, floating sorbents and/or burned.

Terminal Contingencies
Prompt action also is planned in dealing with any spills connected with ship loading activities at Valdez.

The physical characteristics of the Port of Valdez will facilitate containment of oil spills and minimize consequent damage. The harbor is long but narrow. Sheer cliffs and steep rocky beaches account for 56 percent of the shoreline. Mud or shale tidal flats cover about 19 per cent and sand and gravel beaches account for another 13 per cent. Coarse gravel and shale beaches account for the rest. Water depth in the harbor is in excess of 750 feet.

Wind speed is less than 13 miles per hour or 11.2 knots more than 90 per cent of the time.

Current velocity generally is less than 0.5 knots off Jackson Point. In Valdez Narrows and Valdez Arm, currents are reported at less than a knot. Wave action most of the time does not exceed one to two feet in height. Waves of two to three feet have been observed in storms.

Temperatures are mild for the latitude.

The motion of water discharged from about 50 streams, including the Lowe and Robe rivers and Shoup Glacier, may be of some assistance in terms of repelling oil from those areas. For instance, a two to three knot current has been observed near the entrance of the Robe River.

However, in the event of a spill near a tanker, the contingency response would include deployment of floating booms around the vessel and surface oil; deployment of floating skimmers within the contained slick to recover the oil and transfer it to a barge or other facilities, and dispatch of skimming barges to remove slicks and other oil that may escape from the containment booms. In shoreline areas booms could be deployed to protect threatened areas, especially those which are ecologically sensitive.

When work is completed, all contaminated water which had been recovered would be discharged into the terminal ballast treatment system. Surface oil recovery devices and sorbents would be used to remove remaining sheen or irridescence on the water surface.

If necessary to prevent passage of oil from Valdez Narrows into Prince William Sound, Port Valdez could be closed by diversion booms. Sea-going tugs would tow booms into place.

A large amount of special equipment will be kept at the terminal site to meet contingencies. Included will be floating containment booms, sorbents, oil skimmers, bird repelling devices, one large storage barge with pumps and hoses, vacuum trucks, fire trucks with high-pressure pumps, high-pressure water pumping systems which can be operated from shore, truck or boat deck, trucks, bulldozers, a front end loader, tugs and mooring launches and high-intensity lights which will permit oil recovery in darkness.

Alyeska Pipeline Service Company
1835 South Bragaw Street
Anchorage, Alaska 99504

THE WHITE HOUSE

WASHINGTON

November 29, 1975

MEMORANDUM

TO: ALL STAFF

FROM: RED CAVANEY

SUBJECT: EARLY DEPARTURE--
SUNDAY MORNING:

Due to anticipated heavy head winds enroute Asia the scheduled departure from the Anchorage Westward Hotel will be 10 minutes early Sunday morning.

Please board motorcade by 7:20 a.m.