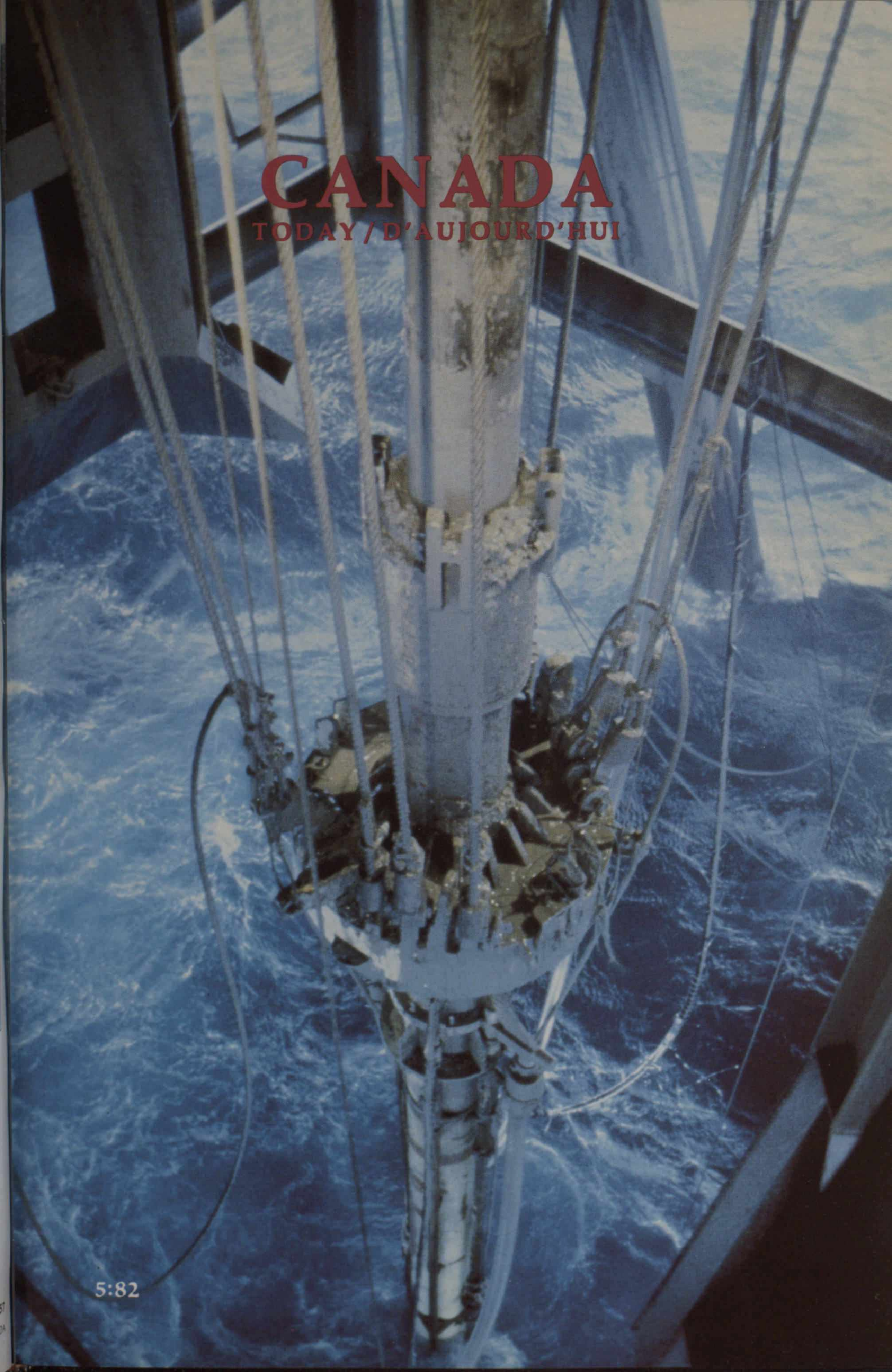
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The Offshore Story

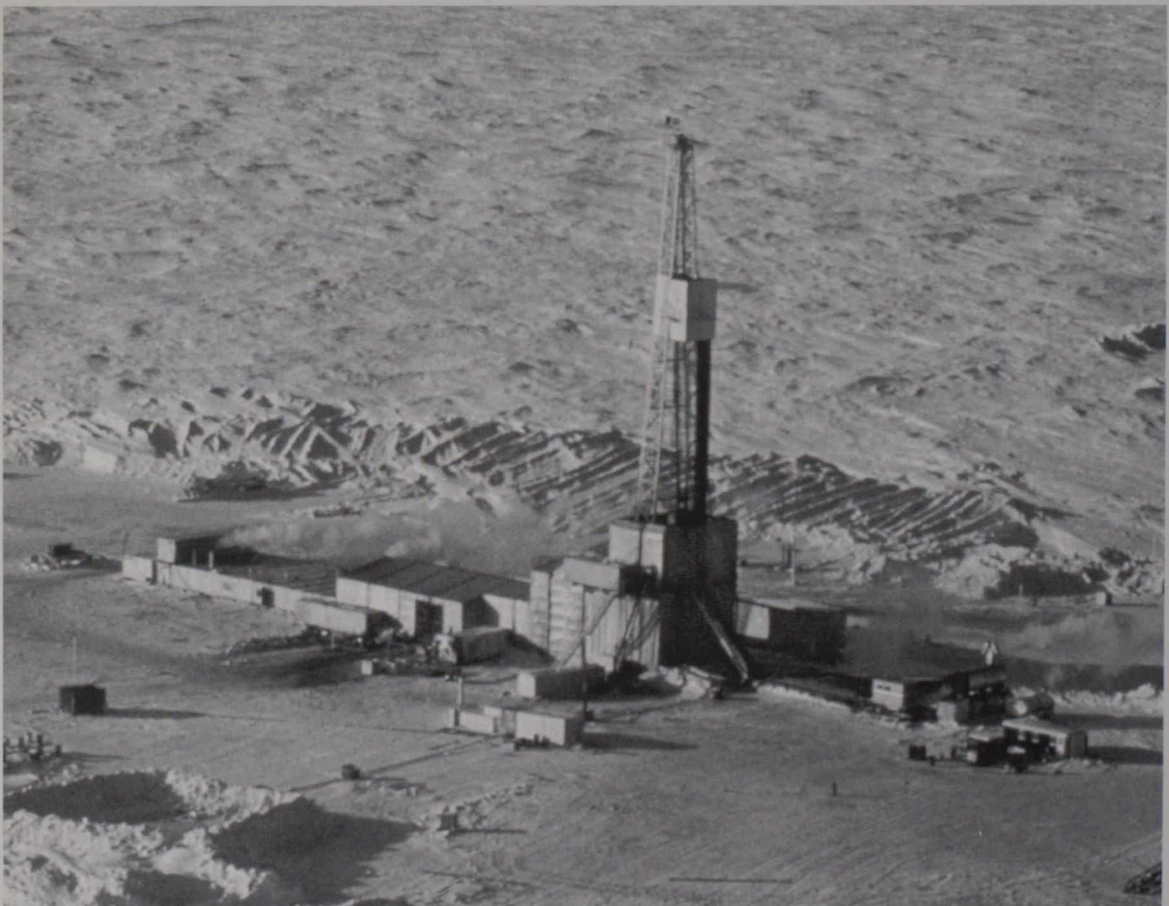
Finding Canada's reserves of elusive oil and gas requires great patience.

Men have been looking in the Arctic and North Atlantic since the mid-1970s, using tools that are ingenious and costly—ships and rigs that are among the largest, most complex and most expensive machines ever made by man.

The work is only now approaching fruition—the first wells should go into production within four to six years.

The work is dangerous and difficult—the men, the drill ships and the rigs are buffeted by hurricane winds and hundred-foot waves and threatened by ice. Last winter eighty-four men died when the rig *Ocean Ranger* tipped, capsized and sank off the Newfoundland coast.

In this issue of CANADA TODAY/D'AUJOURD'HUI we describe the tools, the risks and the results, and tell you how to build an artificial island and what you can do with it when it's done.



Aerial view of Panarctic rig at Whitefish.

Cover Photo: Drilling in Hibernia: view looking down from Mobil's Sedco 709 rig.

PHOTOS: SCOTT FILMS; CANADIAN MARINE DRILLING LTD.

Drill Ships

The first offshore drilling was done from ships, and ships still do much of the initial exploration.

They are very much like other ships, although the crews wear hard hats.

They are held in position by a circle of steel cables attached to 30,000-pound anchors, and they bob and roll but usually not enough to interfere with drilling.

A towering derrick rises from the deck and directly below it is a large, square hole cut through the centre and bottom of the ship, called the "moonpool." The drilling "string" is dropped down through it, to the bottom of the sea.

The Rigs

The first offshore rig was built in 1947—a small drilling platform in twenty feet of water in the Gulf of Mexico.

By the early 1960s rigs were drilling in water 1,000 feet deep. Today, there are huge ones that can drill through 6,000 feet of water and 20,000 feet into the bottom of the icy sea.

All ocean drillers use essentially the same approach. A crane lowers a section of steel pipe through a square hole in the bottom of the ship or rig. Other sections are added until the riser, as it is called, reaches the floor. In northern seas a shallow valley, called the glory hole, is dredged in the sand to protect the wellhead equipment from ice keels that might scour the bottom.

Drillers on Sedco 709 in the Hibernia field.

A CANMAR blow-out preventer for use in the Beaufort Sea.

The riser is reinforced with a cement inner wall, and "the drill string," sections of steel pipe attached to a round steel bit, is dropped inside to the wellhead. The string and the bit—fitted with moving steel teeth—are rotated by an engine. Drilling mud, a precise mixture of clay, water and chemicals, is pumped down the drill pipe to keep the bit cool and the string turning freely. It lifts pieces of rock cut by the bit and sends them up to the platform where geologists can analyse them.

The derrick pulls the string up every twenty-four to thirty hours so the bit can be replaced. It may take a full day to complete this operation.

A blow-out preventer, a complex of valves that can be opened and closed hydraulically from the surface, is fixed at the wellhead to prevent sudden powerful surges of oil or gas from rushing up the pipe.

High Life in the Northern Waters

Canada's great oil and gas reserves are in the North Atlantic and the Arctic.

The men who keep these cold water stations eat well and are well paid. They have frequent vacations.

The ones on the huge semi-submersible rigs in the North Atlantic live orderly, twelve-hour, four-meal days. The work is demanding, fall and winter winds fierce, the weather cold. One shift follows another around the clock. In their off-hours they have films to watch, cards to play and, always, food to eat. Every three weeks they get one off with pay. A helicopter picks them up and takes them to St. John's, Newfoundland, and later carries them back.

Life at the Arctic drilling sites is more varied and less comfortable.

The seismic crews, the men who set off buried explosives so geologists can analyse the resulting sound waves, sometimes sleep in tents but more often in pre-fabricated modules. A basic one—with a centre space and two side rooms—can be used for sleeping, cooking and dining quarters or for offices. In dormitories the central space has wash basins, a shower and a toilet. Each side room holds four crowded bunks. The modules are mobile, some self-propelling, some hauled by tractors. When a survey is finished, the whole camp moves on. When self-propelling units are ready to move, the bunks are collapsed, the walls of the side rooms are folded in and a mechanic takes his place at the controls. They get hot as they move; it may be −30°C outside and 30° above within.

The tractor train modules have larger rooms with panelled walls, a closet, a table and a heater. There may be a game room with darts, card tables and miniature curling.

The crews on the big rigs and artificial islands in the Arctic tend to be older than the seismic crews and their living quarters more elaborate, as well equipped as those in the North Atlantic. There's an abundance of rich foods—four thousand pounds are flown in weekly to a typical rig. There are four main meals, breakfast, lunch, dinner and another dinner at midnight, and sandwiches and soup are served at 4 a.m. Coffee, milk, juices, and cold cuts, bread and freshly baked pastries are available around the clock in the mud room, where the men keep their coats and boots.

The men in the crews may be farmers from the prairies, or city bred. The farmers, used to the loneliness of flat land and prairie winters, complain less. Alcohol is banned and some alcoholic crew members find that the enforced dry periods stabilize their lives. Some crew members are ex-convicts, and their talk often centres on the merits and failings of various judges and penal institutions.

Some crew members are experienced, some are not. Either may have problems—one veteran driller who flew from Egypt to Houston, to Calgary and then by Twin Otter to a camp north of Sachs Harbor in five days, spent several days in a zombie-like daze while his thyroid adjusted. One new recruit arrived at a camp in a poncho, sandals and beads, when the temperature was 40° below. He went back on the same plane.

Seismic surveyor.

The North Atlantic

The Greatest Peril

The greatest drilling danger in the northern seas is from the masses of ice that could collide with the ship, slice through the drill shaft and cause an oil spill.

A Canadian Marine Drilling ship was forced off its bore hole in 1978, and since then drill ships have been required to maintain five protective devices:

1) A quick disconnect system to allow a ship to close its bore hole and leave safely if the ice moves in.
2) A tracking system to monitor ice movement.
3) A water jet thruster to push ice away.
4) A controlled explosion system to break it up.
5) A caisson to protect sea floor drilling equipment from ice keels that might be deep enough to scrape the glory hole, the valley dredged out around the equipment.

For the drillers in the North Atlantic, off Newfoundland and Nova Scotia, the danger takes the shape of icebergs. The glaciers of Baffin Island and Greenland calve thousands of new ones each year. They float south, moving at a rate of ten to seventy miles a day. Only one-eighth of an iceberg shows above the sea surface. The biggest rise 300 feet above the waterline, measure 1,500 feet in diameter and can weigh 3 million tons.

A berg could, if undetected, sweep down and rip a drilling rig from its moorings. They are, however, monitored by pilots in reconnaissance aircraft out of St. John's, Newfoundland, who skim 500 feet above the waters and use eyesight and radar to spot and measure them. When the bergs come too close to a rig, one of two steps is taken: they are towed to new courses or the ships or rigs are moved.

Hibernia

Oil was discovered at Hibernia, 168 nautical miles southeast of St. John's, Newfoundland, under the Grand Banks, in the summer of 1979. Tests indicated a total producing capacity of over 20,000 barrels a day.

Production is expected to begin by 1988, and it is estimated that there may be eight billion barrels of oil under the Grand Banks, with about 1.5 billion in the Hibernia field.

North Atlantic Rigs

Sedco 709, a typical late model offshore rig, was designed by Royal Dutch Shell and Sedco, Inc., especially for Canadian waters.

It has worked in the Hibernia field in the past and will return to the Canadian east coastal waters in October.

It is towed to its site and kept in position by electronic devices. Data from navigation satellites above and sonic beacons below are fed by computers to eight, 3,000-horsepower thrusters with variable pitched propellers. These respond to changing winds, waves and currents to keep it precisely in place.

The Sedco 709 is semi-submersible—it has two massive hulls which lie in deep, calm water, giving it great stability.

The 45,000-square-foot deck is 50 to 60 feet above the sea surface, supported by 100-foot columns.

It can continue drilling in winds up to sixty-six knots and when waves rise to fifty-six feet. It rolls and heaves much less than a drill ship—forty-foot waves cause it to rise and fall five feet. It has a crew of ninety-seven and has drilled off Greenland, Ireland and, most recently, off the Newfoundland coast.

If word comes from the Canadian Coast Guard that an iceberg is approaching, the string can be hoisted at a rate of ninety feet in two minutes, the drill hole can be plugged and the riser released in ample time for the rig to get out of the way. After the berg has passed, the rig can return and, using a subsea acoustic system, the wellhead can be found and the riser reconnected in four hours.

The Death of the *Ocean Ranger*

The *Ocean Ranger*, which sank 170 miles east of Newfoundland in February, was the largest semi-submersible in the world. It was built by Mitsubishi in 1976 and leased by Mobil Oil from the Ocean Drilling & Exploration Co. of New Orleans.

On the night of the disaster it radioed the U.S. Coast Guard: "We are *Ocean Ranger* ... we are experiencing a severe list of 10 to 15 degrees and are in the middle of a severe storm."

The Coast Guard alerted Canadian search and rescue teams, and the *Seaforth Highlander*, a standby supply ship which was relatively near, steamed to the position given by the *Ranger* but found an empty sea.

The *Ranger's* eighty-four crewmen, fifty-three of them Newfoundlanders and fourteen Americans, were lost. Twenty bodies were recovered after an intensive five-day search, and divers in two, one-man submarines found the *Ranger* upside down in 265 feet of water, 300 feet east of the well it was drilling.

(The loss of life aboard the *Ranger* was the second greatest in offshore drilling history. The worst disaster occurred in March, 1980, 175 miles off Norway, when hurricane winds overturned a giant floating dormitory, killing 123 crewmen.)

Since the *Ranger* was registered as an American-flag vessel and operating in Canadian waters, both countries are conducting inquiries into the causes of the disaster. Preliminary investigations show that winds buffeting the rig rose from fifty to eighty-five or ninety knots in half an hour, a severe but not an unprecedented stress.

When North Atlantic Oil Is Ready to Flow

Shell will be drilling off Nova Scotia and Newfoundland and Mobil, in cooperation with Petro-Canada, Gulf, Chevron and Columbia, is active in the Hibernia field and adjacent areas.

Commercial production is expected to begin in Canada's North Atlantic around 1988, and when it does, the drilling ships and rigs will be replaced with submerged production systems.

The producing wells would be connected to a manifold on the ocean floor and the oil and gas sent through pipelines and risers to a tanker or terminal on the surface. A maintenance robot, kept on a workboat, could be lowered to the production system when needed. It would run around on a track and be able to make repairs and adjustments spotlighted by TV camera monitors.

Mobil's Sedco 709.

The Arctic

The Explorers - From Mr. Mackenzie to Petro-Can

Alexander Mackenzie, a thrifty man who nevertheless gave his name to Canada's mighty northern river, stopped to examine some slate formations in the river valley one July day in 1789.

He would later note in his diary that "amongst the small stones were ... petroleum like pieces of yellow wax but more friable."

In 1888 Robert G. McConnell, of the Geological Survey of Canada, examined the Mackenzie Valley and came to a more prescient conclusion.

"The possible oil country ... is seen to be almost co-extensive with the Valley itself. Its remoteness from the present centres of population ... will probably delay its development some years to come but it is only a question of time."

In 1920 the Northwest Co., forerunner of Imperial Oil, Ltd., struck oil at Norman Wells in the Northwest Territories, 900 miles northwest of Edmonton, Alberta. That field has produced 25 million barrels and is still producing.

Exploration moved north, and by 1958 drilling permits were being issued in considerable numbers.

In 1968 British Petroleum Ltd. and Atlantic Richfield found oil at Prudhoe Bay, Alaska, touching off a wave of explorations in that area and in the Mackenzie Delta. The last large public sale of permits in Canada was in January, 1969, and by the end of that year permits had been granted for 400 million acres in the Northwest Territories, offshore and on the Arctic Islands. They required the posting of work bonds against exploration within twelve years.

CANMAR (Canadian Marine Drilling, a subsidiary of Dome Petroleum Ltd. of Calgary) received permission to begin experimental drilling in 1976. By the end of 1979 it had drilled ten wells, the deepest 16,000 feet, in water as deep as 200 feet. Panarctic Oils Ltd. (owned 50 per cent by the federal government and 50 per cent by nineteen private companies) began exploration in the Arctic Islands, focusing on the Sverdrup Basin.

More than forty companies have drilling interests in the Beaufort Sea and Mackenzie River Delta.

Dome Petroleum Ltd., Esso Resources Canada Ltd. and Gulf Canada Resources Ltd. have the greatest interests. Last November Dome, the largest, got promising results from wells at Kopanoar and Koakoak. Experts say the first has a potential of 280 million to 2 billion barrels of oil, the second 300 million to 2 billion. Dome, Gulf Canada and Hunt International Petroleum each have a more than 20 per cent share in the fields.

Late last year Esso drilled the Alerk P-23 exploration well on a sacrificial beach island sixty kilometres north of Tuktoyaktuk. Esso began drilling at West Atkinson L-19 this spring. Panarctic began drilling from four ice platforms during the late winter and will have four rigs in operation in 1983.

For oil drillers the Arctic begins at the Mackenzie Delta and Alaska's North Slope on the edge of the Beaufort Sea. It extends to Canada's Arctic Islands.

Canada's Beaufort Basin has 25 million acres, on and offshore, with an estimated potential of 9.4 billion barrels of oil and 112 trillion cubic feet of natural gas.

There have been major oil discoveries in the Beaufort, mostly by Dome Petroleum, at Koakoak, Kopanoar, Tarsiut, and by Esso Resources at Issungnak.

There is more oil and gas farther northeast in the Islands. The Geological Survey of Canada estimates that they hold 4.3 billion barrels of oil and 87 trillion cubic feet of gas.

Much, but by no means all, can be recovered.

The deciding factor is cost—oil companies and the Canadian government are investing enormous amounts of money and taking great calculated risks. Industry experts believe that with a return of 10 to 15 per cent on investment, 70 to 85 per cent of the oil in the Beaufort Sea can be brought to market.

At the same returns a much smaller part of the "undiscovered, non-associated" gas could be recovered, perhaps no more than 15 per cent. Non-associated gas is found alone, not in oil fields, and it is much harder to make a profit from it.

The exploration for Arctic oil and gas is heavily capital intensive. It can cost $100,000 a day to maintain a drilling rig, even when it's not drilling.

It is also technically challenging—most of the equipment now in use in the Arctic has been invented or at least radically changed in the last few years. The rigs must protect themselves from the wind, the cold and the ice.

Arctic Ice

There are two kinds of Arctic ice—first year and multi-year, which is less salty, tougher and thicker. There are three kinds of Arctic ice formations—shore ice, solidly attached to land; the northern ice pack, which never melts; and the shear ice, which moves around in between them.

Drilling ships and rigs in the Arctic are protected by modern ice-breakers, which have no

Sea ice, fjord and iceberg between Axel Heiberg and Ellesmere Island, Eureka Sound, N.W.T.

difficulty breaking through flat ice up to six feet thick. They do have trouble when they meet multi-year ice ridges which may measure forty feet from top to bottom. They go around them if they can, but some are more than three miles long, and the breaker must then bang into them, back up and bang again, over and over.

Arctic Rigs

One with Wheels

Most rigs, on land or sea, are prefabricated.

Rig 26-E, for example, a $15.2 million prototype, was designed and built in Edmonton, Alberta, by Anglo Energy's Canadian branch, especially for the Canadian North.

Once in place it can be moved from one site to another in hours.

It is basically a derrick, fourteen stories high, surrounded by pre-fab modules holding tools, housing and stores. It has five sections mounted on wheeled trailer frames, each as tall as a man. Each section has a system of hydraulic jacks. When it is time to move, the sections are jacked up, disconnected and hooked to a large truck or caterpillar tractor. It takes up to five or six days to move a standard oil rig a few hundred yards. The 26-E can be moved to a new site in four or five hours in the summer, in ten to twelve hours in the winter.

It has other attractive features. Crews on earlier rigs worked in the open for weeks, in temperatures as low as 40 below. In this rig waste heat is recirculated through the indoor working quarters and crew members wear jeans and work shirts. An "iron roughneck," an automated pipe-handler, makes the outside pipe connections traditionally made by hand.

Barging In

The 26-E is lightweight, 383 tons. The first move it made was a long one, from Edmonton to Alaska's Prudhoe Bay.

It was built, tested, torn apart and loaded on a seventy-seven-car train which took five days to carry it to Seattle, Washington.

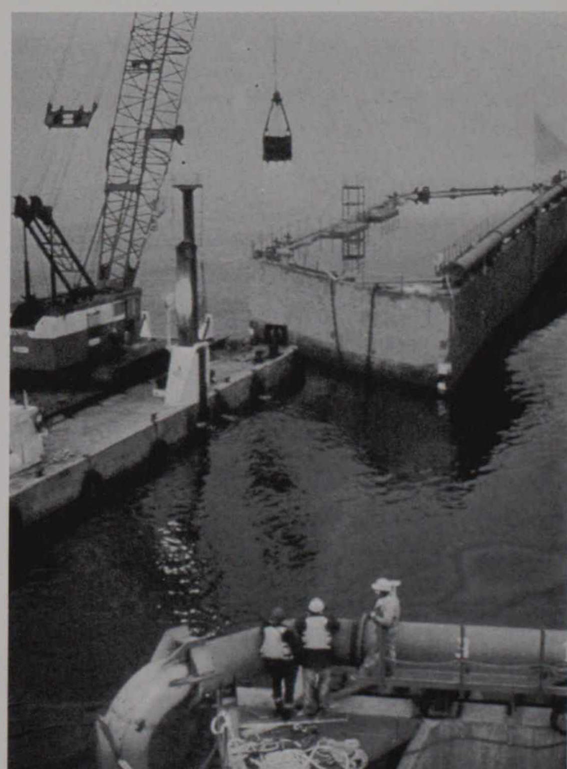
From Seattle a fleet of sea-going barges, each as big as a city block, carried it to Fairbanks in another five days. It was then loaded onto 125 heavy-duty trucks and driven slowly to the Bay. That took twenty-three days. The whole trip cost more than $2.7 million.

How to Build an Artificial Island

There are now more than twenty artificial drilling islands dotting the Arctic seas.

Most, known as sacrificial beach islands, have gently sloping beaches of sand and gravel, often fringed with filter cloth and sandbags. These beaches protect the drilling area from ice and the sea.

The islands are relatively easy to build in water less than sixty-five feet deep where great quantities of sand and gravel are nearby. The sand and gravel are dredged from the sea floor, carried to the island site and dumped, forming a foundation hill called a berm. This procedure becomes



The building of Tarsiut.

Esso's artificial island at Issungnak.

prohibitively expensive, however, when the site is in deep water.

One island, Tarsiut, was built in the summer and fall of 1981 in seventy-two feet of water northwest of Richards Island, between shore ice and ice pack, using a novel technique.

First the berm was laid much smaller than normal, with a crest twenty feet below the waterline. It had a much steeper slope than older examples—a rise of one foot in five rather than one in fifteen—and less than half as much material was needed in its construction.

Four floatable, high-strength, oblong concrete boxes—each 36 feet wide, 49 feet deep and 262 feet long—were then arranged in a square above the crest of the berm. They were hollow with ribbed walls forming many compartments and were joined together by steel doors and anchored to the ocean floor.

Filled with water, they sank to form a wall around the flat top of the berm though their tops were still above the water line. The pool above the berm was pumped dry and the water in the caissons replaced by sand.

Sand and gravel were then added to the berm until the top surface of the island was 25.5 feet above the waterline.

Tarsiut was equipped with over a million dollars worth of monitoring equipment. Diaphragms separating the caisson compartments transfer ice pressures from front to back walls, and gauges measure the strain. Hollow steel plates filled with oil, called Flat Jacks, measure ice pressures on the east wall, and circular plates with shear bars measure loads on the north. The data are recorded on magnetic tape and correlated with ice conditions.

Tarsiut is owned by Gulf Canada Resources, Dome Petroleum Ltd., Mobil Corp's Canadian unit, Canterra Energy Ltd. and Norcen Energy Resources Ltd. Tests of the well designated Tarsiut N 44 this spring showed it capable of an estimated sustained production of 3,500 barrels of oil a day. The oil contains a high percentage of gasoline and diesel. Gulf Canada Resources, the operator, said it will drill two more wells to give a more exact delineation of the reservoir. If the additional wells find sufficient reserves, production could begin as early as 1986.

Tarsiut could be converted from a drilling to a production island by putting more and bigger caissons around it.

The Caissons Came Rolling Along

The four caissons at Tarsiut were built in Vancouver, British Columbia, and cost $27 million.

They were transported to the Beaufort Sea on submersible barges in July, 1981.

The barges were loaded with water ballast until all but their control towers were below the surface. The caissons were then floated over the barges and the water was pumped out, raising the barges and placing the caissons on deck. They were unloaded by reversing the process in Pauline Cove at Herschel Island.

The Men on Hans Island

Hans Island is rather like a mesa in the sea.

It rises in the Kennedy Channel between Greenland and Ellesmere Island with sheer sides and a flat top, some 3,200 feet in diameter, 650 feet above the water.

Its towering sides are battered by ice in the summer and locked in it in the winter. It is, in this respect, under the same kind of pressures that affect the man-made islands used to drill oil.

In August, 1980, five scientists spent three weeks on Hans monitoring its ice. They used aerial and surface time-lapse photography, accelerometers, theodolites, a distant meter, a bore hole jack and airborne impulse radar to measure the force of multi-year ice crashing into the island. Some floes were several miles in diameter.

Much of what they learned has been put to use in designing oil islands. The project was initiated by Dome Petroleum and funded by Dome Petroleum and several other oil companies.

Super Ships

In 1972 Canada adopted the Canadian Arctic Oil Pollution Prevention Regulations. They were designed to prevent oil spills, and they set design and strength standards for ships sailing in sixteen different arctic zones.

The zones reflect ice conditions. Zone 1 has the most, year round. Ships are classified in terms of their strength in Roman numerals, from I to X.

The higher class vessels have not yet been built. A class X ship may prove too expensive to build. It would be able to break through multi-year ice ten feet thick and could operate in Zone 1 or anywhere else in the Arctic year round. A Class VII ship could reach the southeast tip of Melville

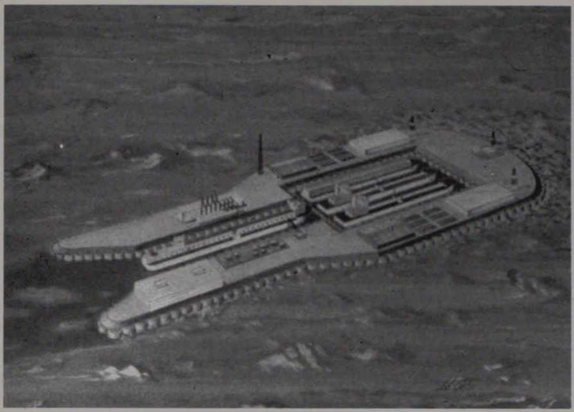


Diagram of Dome Petroleum's planned Arctic Production and Loading Atoll.

Island year round—it would be in the upper reaches of Zone 6.

Since the regulations were adopted, some extraordinary ships have been built and more are on the way.

The Canadian icebreakers *John A. Macdonald* and *Laurier*, approximately Class IV, may operate in Zone 1 from August 15 to September 15.

Dome Petroleum's experimental icebreaker *Kigoriak* has a basically straight-sided hull, with a spoon-shaped bow. The bow has a "reamer" which breaks ice at least six feet wider than the hull. This and beveled sides at the stern make it easier to turn.

The motor vessel *Arctic* was commissioned in June, 1978, and is Class II. It is the world's first ice-breaking (as distinguished from ice-strengthened) cargo ship. It is able to cut through two feet of level, first year ice at a speed of four to five knots. It has a double-skinned bow, three times stronger than the bows on ice-strengthened ships that operate on the St. Lawrence and in the Baltic Sea.

The *Arctic* has an airbubble system, similar to one developed in Finland, which eases it through the ice. The air bubbling along the ship's sides keeps loose ice in motion, acting as a lubricant to reduce friction.

The ship has a controllable pitch propeller enclosed in a duct, which both protects the blades from ice and directs the thrust toward the stern. This is a great advantage when the ship is moving through the ice at slow speeds.

The *Arctic* has a capacity of 28,000 tons and is 688 feet long, about the size of a Great Lakes freighter. It has extended the Arctic shipping season from three months to five. It can move bulk cargo, such as ore concentrates, from the high Arctic to any port in the world. It was built at Port Weller Drydocks in the Niagara Peninsula. Canarctic Shipping Ltd., a federal government agency, owns 51 per cent of it, and three private companies, Canada Steamship Lines, Federal Commerce and Navigation, and Upper Lake Shipping, each own 16½ per cent. It cost $40 million.

The *Arctic* is the first of a planned line. If ice-breaking oil tankers and liquefied natural gas carriers are found to be environmentally safe, they will probably be at work within eight years.

On the Way

Three more unprecedented ships—an icebreaker, a supply ship and an Arctic dredge—are due in 1983.

They will be guided by REMSCAN—remote sensing communications systems—which will relay information on weather and ice received from satellites, aircraft and shipboard radar.

Dome Petroleum's Arctic dredge will be capable of moving about 11 million cubic metres of fill in a year and of storing 25,000 cubic metres of sand inside its hull. It will meet at least Class IV ice-breaking standards and will dredge year round to depths of 250 feet.

Dome also has a design for an Arctic tanker with a double-skinned hull. Oil would be carried only in the inner section. The hull could be subdivided and would have twin propellers and twin rudders to give it increased maneuverability.

Production Follows

In the Arctic, production systems must be more elaborate than in the North Atlantic—they must be able to resist the inevitable ice.

Artificial drilling islands can be enlarged and permanent facilities set up. Other systems can be anchored in the sea.

In Cook Inlet, for example, there is already a steel jacketed platform, supported by four columns, rising sixty feet above the sea's surface. It is anchored to the floor by steel pilings driven 350 feet below the mud line. There is no cross-bracing since such braces would add to the stresses by impeding ice movement.

A variety of production systems for the future

The Arctic.

are in various stages of development. One, the "monopod," is unique. It has an hourglass shape designed to deflect the ice. It would be easy to transport, easy to submerge. It would be anchored to the sea floor by pilings driven through horizontal pontoons resting on the bottom.

If tanker transportation is approved by the Federal Environmental Assessment and Review Office, Dome Petroleum intends to build an Arctic Production and Loading Atoll (APLA). It would be, essentially, a bisected artificial island with a protected harbour which could support four drilling rigs. Oil would be carried to it by subsea pipelines from other production islands.

The Eastern Arctic

In 1977 the Department of Indian and Northern Affairs consulted with the native people living in the eastern Arctic, with twenty-six oil companies and with other interested groups.

It then established a four-year, multi-million dollar program, the Eastern Arctic Marine Environmental Studies Program, "to determine the environmental constraints" that must be observed in the area of Baffin Island, Davis Strait and Lancaster Sound when drilling begins.

An advisory board with representatives from the ten Inuit communities in the area was formed to monitor the studies.

Taking Care of the Turf

The Arctic has a vulnerable environment and the Canadian government watches it with painstaking care.

The Federal Environmental Assessment Review Office is the agency in primary charge.

It is assisted by a seven-member Environmental Assessment Panel. The panel has been considering oil production options in the Arctic for over a year—atolls or offshore platforms, pipeline or tankers.

The panel conducted a series of public hearings, both in the North and South. In each Beaufort Sea community the panel explained its purpose and representatives of the oil companies explained theirs. There were comments and questions from the floor.

The review considered the environmental, the social and the economic impacts that might occur in the North between now and the year 2000. The panel drafted guidelines for the Industry's Environmental Impact Statement.

The first draft of the statement was submitted in June, 1981, by Dome, Esso and Gulf. The revised draft will be examined by the panel members who will confer with technical consultants and public representatives. They may then require the companies to make further adjustments. The panel's final report will be sent to the Minister of Environment.

A Slick Experiment

The Canadian government and the oil industry conducted an oil spill survey in Balaena Bay beginning in 1977.

First they spilled a lot of oil off the village of Tuktoyaktuk at the edge of the Beaufort Sea.

That summer scientists collected it by booms and found that it could be confined successfully for cleanup.

Further experiments showed that if a spill is near storage facilities it can be skimmed off the surface. If it is in an isolated area it can be burned.

They also found that if the oil spreads under ice it can be monitored by satellite and tracked until it surfaces in the spring. The scientists concluded, cautiously, that it may be easier to handle oil spills in ice-laden waters than in iceless ones.

The Canadian, U.S. and Norwegian governments are cooperating with the oil companies in a $5 million Baffin Island Oil Spill project to study the environmental impact of an oil spill close to shore.

Last summer 3,300 gallons of crude were released into a bay off Cape Hatt, on the northern tip of Baffin Island, and two days later another 3,300 gallons, to which a chemical dispersant had been added, were spilled into another bay nearby. The spills will be monitored over the next several years and the rates of recovery in the two bays compared.

Oil rising to the surface in Balaena Bay: the circular pattern is caused by containment booms under the ice.

PHOTO: SCOTT FILMS

Crewman at dinner at Whitefish in the Arctic.

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