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