

## Seismic crews again sail Labrador waters

**Stranded natural gas may be unlocked, shipped to Boston**

**By Susan Eaton - For Business Edge**

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A Calgary-based geophysical company with its eye on the future is taking the plunge to explore for oil and gas in the icy waters off Labrador.

After a hiatus of more than 20 years, Geophysical Service Inc. (GSI) has returned to Labrador's continental shelf, investing \$23 million US to purchase and equip a seismic vessel, and to acquire more than 10,000 linear kilometres of seismic data.

Seismic vessels send acoustic (or seismic) waves through the water column and into the rocks below the sea floor. The vessels tow several long streamers (or cables) to record the seismic data, imaging deep geological formations and fault blocks that may contain commercial quantities of oil and gas.

In early October, GSI completed this year's program of 9,000 linear kilometres of seismic data off the Labrador coast. Labrador's continental shelf is about 250 kilometres wide and extends 2,000 kilometres from the northern tip of Newfoundland to Baffin Island. The area is characterized by rough seas and sporadic iceberg traffic.



*Larry MacDougal, Business Edge*

Paul Einarsson says GSI is the tip of the exploration stage as his company returns to the icy waters off Labrador.

"We're the pointy tip of the exploration stage," explains Paul Einarsson, GSI's chief operating officer, chairman and executive vice-president. "We're very little, but very important."

Einarsson adds GSI has been doing this kind of work in Atlantic Canada longer than anyone else, and "we understand the geology, the players and their level of interest in the oil and gas basins."

During the late 1970s and early '80s, the oil and gas industry drilled 27 wells off the Labrador coast, resulting in five significant discoveries totaling 4.2 trillion cubic feet and 123 million barrels of natural gas liquids. Because the industry was looking for oil, the gas discoveries were deemed a technical success but a commercial failure. Labrador's stranded gas reserves have languished for more than 20 years.

Rising natural gas prices – combined with a North American gas market that is becoming increasingly constrained by supply – make Labrador's stranded gas reserves all the more attractive.

Einarsson says recent developments in production technologies have finally caught up to the remote areas of offshore Labrador. Liquefied natural gas, compressed natural gas and Floating Production, Storage and Offloading (FPSO) facilities, such as the one being installed at the White Rose field off Newfoundland, offer possible options for the harsh Labrador environment. "We want to figure out how to get this gas to Boston," adds Einarsson.

Steven Campbell, president of Trans Ocean Gas Inc., is hoping to deliver stranded gas to southern markets from the White Rose oil field by 2008 and from the Labrador Shelf within 10 years.

The St. John's-based company has patented the concept of using ships to transport compressed natural gas (CNG) in fibre reinforced plastic (FRP) pressure vessels. According to Campbell, FRP cylinders are already used as fuel tanks for applications ranging from fighter jets to city buses.

Earlier this year, Trans Ocean Gas Inc. was one of nine companies invited by Husky Energy to submit proposals on how to produce White Rose's 2.7 trillion cubic feet of associated natural gas.

"We know that we're on the verge of creating a multi-billion-dollar-a-year industry," says Campbell, who says he intends to supply markets that don't have existing pipelines or liquefied natural gas facilities. At a cost of \$1 billion US, Trans Ocean Gas Inc.'s proposal contemplates the construction of three ships, each capable of carrying one billion cubic feet of gas to market.

Several large oil and gas companies participated in GSI's Labrador seismic programs in 2003 and 2004, says Einarsson. Corporate participation underwrites a portion of GSI's acquisition costs. After a prescribed period of time elapses – designed to

give the original program underwriters a competitive advantage over industry – GSI is free to market its non-exclusive data to other companies.

With almost 300,000 kilometres of two-dimensional (acquired along transects) and three-dimensional (acquired in a grid pattern) seismic data in its library, GSI bills itself as the largest owner of “non-exclusive” seismic data in Canada’s offshore frontiers (the Beaufort Sea, the Arctic Islands, Hudson’s Bay, Baffin Bay, Labrador, Newfoundland and Nova Scotia).

Founded in 1930 in the United States, the original GSI was widely credited with the development of digital acquisition systems and three-dimensional seismic data acquisition and processing methods, leading to the formation of Texas Instruments in 1950. GSI was subsequently purchased by Halliburton Energy Services.

In 1992, Davey Einarsson, a longtime executive of the original GSI, purchased the proprietary rights to GSI’s speculative data in the Canadian offshore, launching the new GSI in Calgary.

Between 1971 and 1982, GSI acquired 32,000 linear kilometres of data off the Labrador coast. Before embarking on the 2003 and 2004 acquisition programs, GSI reprocessed 20,000 kilometres of its in-house two-dimensional seismic data, using modern processing techniques.

The improvements in imaging deep geological formations were amazing, says Michael Enachescu, an assistant professor of geosciences at the Memorial University of Newfoundland.

Enachescu, who is also the senior Husky research fellow at Memorial University, knows his way around the Grand Banks and the Labrador Shelf – before joining Memorial University last year, he spent 20 years as an exploration geophysicist with Sun Oil (now Suncor Energy) and Husky Energy. He praises GSI’s vision for the future. “They are the heroes,” says Enachescu. “They are risking their own money.”

“They are discovery driven and they have the fire of exploration in their bellies.”

Enachescu says that GSI’s continued presence in Canada shows both “stubbornness and resilience.”

“They confront the ups and downs of the market,” he says. With a legacy that spans 40 years of seismic data acquisition in Canadian waters, he adds, “They know the ropes in Ottawa and they don’t have to deploy a boat from Houston.”

The GSI Admiral is an 89-metre-long, ice-strengthened seismic vessel. Purchased in 2001 by GSI, the Admiral is Canada’s only flagged seismic vessel. The ship carries a crew of 65 to 70, all of whom hail from the Maritimes.

Einarsson says GSI has captured a niche in the seismic acquisition marketplace. “The GSI Admiral is perfect for the North Atlantic,” he says of his vessel, which is smaller than most of its competitors.

Because the GSI Admiral’s home port is Mulgrave Harbour, N.S., Einarsson says he can out-compete foreign companies who charge their clients \$1 to \$2 million US just to mobilize a vessel to Eastern Canada. “We provide our customers with a real savings,” says Einarsson. “We can mobilize and do half of the program for \$1 to \$2 million US.”

Einarsson likens the GSI Admiral’s manoeuvrability to a “small lawn mover versus a large lawn mower.”

The ship trails three to four six-kilometre-long streamers, aligned in parallel, while larger vessels deploy six to eight streamers. In strong seas, however, the streamers can either get tangled up or separated by great distances.

Nonetheless, GSI does have some competition in Labrador waters. In 2002, TGS-NOPEC Geophysical Co., a large international firm, acquired 2,200 linear kilometres of seismic off the Labrador coast.

Between 1999 and 2002, TGS-NOPEC acquired 10 seismic surveys off the west coast of Greenland.

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