THORDON XL BEARINGS SHOW LITTLE WEAR AFTER 11 YEAR RUN ON *TERRY FOX*

In July 1994, the Canadian Coast Guard vessel, *Terry Fox*, converted its propeller shaft rubber bearings to Thordon XL bearings. Since that time the icebreaker has toiled in such rugged environments as the Gulf of St. Lawrence and Canada's Arctic. Recently, the starboard shaft bearings were removed and analyzed. Measurements of the bearings revealed little wear: 0.79 mm (0.031") for an icebreaker operating for approximately 1200 arduous hours.

Terry Fox was built in Vancouver in 1983. Originally operating in the Beaufort Sea, it was purchased by the Canadian Coast Guard and modified for icebreaking duties in the early 1990s. "She's one of the largest icebreakers in our fleet," says Dan Hornik, Chief Engineer. The ship has an overall length of 88 m (288 ft.), a beam of 17.8 m (58 ft.), a draft of 8.3 m (27 ft.) and propulsion power of 23,200 bhp on four engines. "The gross tonnage is 4,400."

Replacing Rubber Staves

The ship's original stern tube staves - made of rubber - had a history of problems that the Canadian Coast Guard inherited. Rubber bearings did not stand up well to the rigors of icebreaking operations. In fact, the staves had been replaced several times within just a decade, driving up maintenance costs, creating downtime incidents, and adversely affecting performance.

"That's why we approached the Canadian Coast Guard regarding Thordon XL bearings," says Chester McPherson, President of Avalon Marine, a long-time Thordon distributor located in Dartmouth, Nova Scotia. "We knew its track record of long life and trouble-free performance would greatly interest them."

Thordon Bearings has a long history of success in marine applications, with coast guard and naval ships in Canada and the United States, as well as vessels operating in a wide range of capacities around the globe. Thordon XL bearings have also been used on the U.S. Coast Guard icebreakers, *Polar Sea* and *Polar Star* since 1984.

Thordon Installed In 1994

In 1994, the Thordon XL bearings for *Terry Fox* were finish-machined prior to installation, and quickly installed by freeze fitting with liquid nitrogen. "To our knowledge," says McPherson, "these bearing tubes [measuring 792 mm (31.2") ID forward and 831 mm (32.7") ID aft] for the twin screw vessel were the largest ever installed in Eastern Canada at the time."

For more than a decade, the Canadian Coast Guard has enjoyed a range of benefits as a result of replacing the rubber bearings with Thordon XL. For example:

- The starting torque is significantly lower.
- There have been less downtime and maintenance issues, due to the long life of Thordon XL.

(...cont'd. next page)

Thordon XL Bearings

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MAINTENANCE AT INCO GENERATING PLANT NO

Frazzle ice is created when long periods of extremely cold weather, typically in the -35°C range, turn river water into a giant Slushie®. This isn't uncommon on The Spanish River in Northern Ontario, Canada, home of three Inco Hydropower Generating Stations. Frazzle ice is a regular occurrence almost every spring, pounding into the intakes and causing pumps that provide water to the turbines to ice up and shut down.

"When this occurs," says Claude Mailloux, Planner/Supervisor for Inco, "there is a risk that the turbine may run dry." As a result, the main guide bearings may overheat and need to be removed, inspected and reinstalled again.

Easier said than done. Until, that is, Inco began to use Thordon SXL.

Powering A Century Of Growth

The Spanish Riverways has an important dual role in Northern Ontario. It is one of the most breathtaking recreational waterways in the Province, attracting tourists worldwide. It is also the source of hydroelectric power that fuels the region's vast pulp and paper and nickel mining industries. Inco taps this tributary with generating plants located in Big Eddy, High Falls and Nairn Falls.

For most of the operational history of these plants, wood called *lignum vitae* was used as the main guide bearing. But as the rare source of this hard and oily timber - the guayacum tree - became even rarer, Inco was forced to look for alternatives.

"They originally switched over to phenolic bearings," said Lorne Thornton, President of Pioneer Power Industries, a long-time Thordon Bearings distributor, "But these came with maintenance headaches and other concerns."

The problem was, the river water contains a high level of particulates, making it abrasive. As a result, the phenolic bearings would wear rapidly and need to be changed approximately every two to three years. This was not a quick process. In fact, because of the hands-on lead chinking that was involved, the turnaround time to remove and install the bearings was up to four months.

"To make matters worse," says Thornton, "the phenolic bearings would constantly need adjusting to maintain performance, which only added to the workload and expense."

Thordon XL Bearings Show Little Wear... *(cont'd. from page 2)*

But the real benefit to the Canadian Coast Guard, in addition to fuel savings and lower maintenance costs, is the enhanced ability to ensure trouble-free performance of the icebreaker during critical operations in demanding environments.

Great Performance

The predicted wear life of the Thordon XL bearings for *Terry Fox* was 15 years. After 11 years the bearing wear data recorded in September 2004 show a much longer wear life than the predicted life. "We trust Thordon and have always been impressed with the performance of this exceptional product," says Hornik.

Thordon's reputation with the Canadian Coast Guard dates back to the early 1980s, and it is estimated that more than 80% of the fleet has Thordon products installed. *Terry Fox* is just one more Thordon success story that justifies why shipyards and fleet operators around the globe rely on the proven performance and reliability of Thordon bearings.