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ON 13 DECEMBER 2013 the Canadian marine services company Ocean, based in Quebec, held a ceremony to bless the latest addition to its tug fleet, the *Ocean Tundra*.

The tug, reputed to be the 'most powerful of its type in Canada,' was built at the Ocean Industries shipyard located on Isle-aux-Coudres. The traditional blessing ceremony was held in the presence of Ocean's president Gordon Bain and the first vice president and general manager Jacques Tanguay. Sophie Piette, first female pilot on the St Lawrence Seaway, was given the honour of being appointed 'godmother' to the new vessel.

At the ceremony Jacques Tanguay said: "We are proud to have built such a complex tug and of a scope never before seen in Canada. Again, Ocean has surpassed itself to install larger equipment. There is no longer any doubt about the ingenuity of our team, and our desire is to go even further in the future. The *Ocean Tundra* is the most powerful harbour tug ever built in Canada, for which you will find none or very few equivalents in the world. It could have been built at lower costs abroad. However, with the support of the governments of Canada and Quebec as well as our commitment, we got our people here at home to construct it. Thus, a little more than 160 direct jobs were retained for 14 months."

Ocean Tundra was built to the 'TundRA 100' design by Robert Allan Ltd, naval architects and marine consultants based in Vancouver. Canada has a vast arctic frontier, the east coast is exposed to extreme winter conditions and the Great Lakes area experiences severe ice conditions every winter. Robert Allan Ltd. has for decades worked with clients operating in these cold weather regions and has gained considerable experience in designing ice capable tugs that not only meet the class rules for hull strength but incorporate many of the critical lessons learned to make tugs safe and practical to operate in that extreme climate.

The tug is a powerful Azimuthing Stern Drive (ASD) vessel measuring 36m in length overall, with a moulded breadth of 13m, a depth of 6.85m and draft of 6.5m. Built to operate in extreme conditions, the tug is

Ocean Tundra – Canada's most powerful tug



Ocean Tundra is the most powerful tug of its type in Canada - shown in the icy conditions for which it was designed

constructed to meet the requirements of Lloyds Register +100 A1 LMC UMS Ice class 1A Super FS - Navigation Transport Canada Near coastal voyages Class 2, unrestricted. *Ocean Tundra* is equipped to carry out shiphandling and escort operations, fire-fighting, rescue, salvage and coastal towing.

The hull of the Tundra class tug is not only reinforced to meet the challenging ice class conditions but the hullform is also optimised to carry out shiphandling and escort duties safely and efficiently. Below the waterline the hull is equipped with a central skeg to enhance directional stability and increase steering forces when towing

in the indirect (escort) mode. Bilge keels are also fitted and 'ice fins' are added just aft of the propulsion units.

The hull has a noticeable sheer and incorporates a semi-raised foredeck. The after deck has been kept as free from obstructions as possible and the aft bulwark incorporates a small central roller. Bow fendering is fitted to a standard compatible with 'push-pull' operations with a vessel of this power.

Choosing a suitable hull coating for its latest tug was an important matter for a vessel working in such a harsh environment. Ocean chose Ecospeed, a nontoxic, hard, long-lasting coating with very high abrasion resistance,

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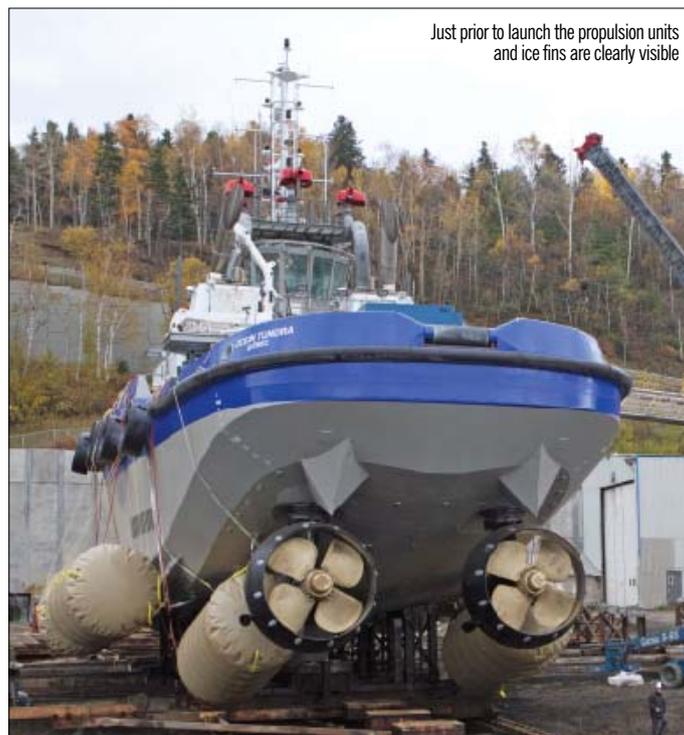
suited to tugs and to ice-going vessels of all types. The coating is claimed to have a long life expectancy and once applied is expected to stay on for the life of the hull with perhaps some touch-ups but no major repair or replacement.

Ocean Tundra is powered by two MAK 9M25C main engines each generating 3,000kW at 750 rpm, a total of 8,160 bhp. Each engine is coupled to a Rolls-Royce US 305CP fully steerable propulsion unit incorporating a controllable pitch propeller. On trials in late December the tug achieved a maximum bollard pull of over 114 tonnes and a maximum speed of 15.13 knots. A maximum steering force of 122 tonnes at 10 knots in the escort (indirect) towing mode is predicted.

Three Caterpillar C9 auxiliary generators, each rated at 250kW - 60 Hz, are installed to meet not only domestic shipboard loads but also to power the electrically driven deck machinery.

A good operating endurance is ensured with fuel tanks of 294m³ capacity and dedicated tanks for 18m³ of drinking water and 11m³ of fire-fighting foam.

The FiFi 1 fire-fighting system comprises two water/foam and one 'water only' monitor, located above



Just prior to launch the propulsion units and ice fins are clearly visible

the wheelhouse roof and supplied, along with the self protection dousing system, by two engine driven pumps each of 3,010m³/hr capacity.

An outfit of deck machinery from Markey includes a towing winch fore and aft, two anchor windlasses and a capstan, all electrically powered.

On the fore deck for escort and shiphandling is a Markey DESDF-48-200HP Class III towing winch with a single split drum, accommodating up to 300m of 80mm diameter synthetic towline on each side. The winch has a maximum brake load of 307 tonnes and a maximum line pull of 202 tonnes. Also featured is an extra heavy duty level wind (spooling gear) with rope guides to serve each section of the drum. This winch is particularly well suited to Arctic tugs of this type. The electric motor, water cooled slip brake and controls are all housed within the winch enclosure and warmed with heated air. Markey's constant tension hands free 'render-recover' system is installed, and capable of operating even if the winch is being used at the top end of its line speed and tension.

Also located on the foredeck are the two Markey VEP-16-40 electric vertical capstan windlasses, for 26mm stud



The electrically driven Markey forward winch is a sophisticated piece of equipment

link anchor chain, and controlled from the deck. The windlasses and the aft capstan have drives and motors installed under the deck for protection.

Located aft, in a sheltered alcove below the boat deck, is a Markey TES-40UL-125HP electric single drum towing winch designed for an 800m towline of 64mm steel wire rope. The winch has a maximum brake load of 100 tonnes and a maximum line pull of 66.7 tonnes at 7m/min. Automatic spooling gear is fitted with the mechanism located in an oil bath.

A single set of hydraulically operated tow pins are located adjacent to the stern roller and the Markey CEP 60 - 10 tonnes capacity capstan on the after deck, on the port side of the aft towing winch fairlead. On the starboard side is a Palfinger 15500 M deck crane with a maximum lifting capacity of 6,200kg.

The wheelhouse has good all round vision and is equipped with a navigational and communications outfit appropriate for the roles the vessel will undertake. Included in that

outfit are a gyro compass, ECDIS and radars by Sperry, GPS and AIS by Saab, an echosounder by Elac, GMDSS by Jotron and VHF radios by Sailor.

Fully air conditioned and heated accommodation is provided for a maximum of 10 persons, with single berth cabins for the officers, galley and messroom in the superstructure, and the remaining cabins and sanitary facilities below deck.

Ocean began life as Aqua-Marine, founded by the company's present president, Gordon Bain, in 1972 and specialising in underwater work. In 1987 the company evolved into Ocean Construction Inc. and acquired Québec Tugs, Ltd. Through a series of subsequent acquisitions and expansion moves, including the outright purchase of the Isle-aux-Coudres shipyard in 1997 which was then renamed Ocean Industries Inc, Ocean has become one of the main suppliers of integrated marine services in Canada and a leader in the Canadian marine industry. The acquisitions have included a number of tug companies and Ocean has built up a fleet of eight new tugboats, many of which are ice strengthened and equipped to operate in the severest winter conditions.

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