Making Waves in the Marine Industry:
Tugboats in the Great Lakes sail smoothly & safely, powered by eco-friendly solutions from Rittal & Canal Marine

For almost a half a century Canal Marine & Industrial of St Catharines, Ontario has provided electrical design, engineering and services around the clock to the merchant marine, naval and coastguard fleets in Canada and the rest of the World. In recent years, Canal has become a leader in the design and supply of marine hybrid power and propulsion systems. These systems utilize alternative methods for supporting propulsion and the vessel's electrical power plant, so that fuel consumption and emissions are reduced.

Great Lakes Towing of Cleveland, Ohio (popularly called "The Towing Company") operates the largest and most experienced U.S.-flag tugboat fleet. The Towing Company is a significant marine operations link in North America's U.S. Great Lakes-Saint Lawrence Seaway marine transportation network, the fourth seacoast of the United States, an operating area that extends over 8,300 miles of shoreline, encompassing a water surface area of roughly 100,000 square miles.

The Marine Integration Group, comprised of Canal Marine with partners Logan Clutch of Cleveland, Ohio and The Breakwater Group of Prince Edward Island, is providing Great Lakes Towing with state-of-the-art hybrid power and propulsion systems for three new-build tugboats to be operated in the Great Lakes area. These systems will allow the vessels to run with their large main engines shut down for extended periods and will also allow their diesel generators to run less frequently and more efficiently. Emissions will be reduced along with maintenance costs.

Running into some Turbulence

Canal faced some challenges with regards to the hybrid system, which is centered on a common-DC bus arrangement connecting a number of drives, front ends and grid converters.

- Secure Mounting: These air-cooled power converters must be securely mounted within an environment that is subject to significant movement and vibration (as anyone who has experienced tugboat operations will testify).
- Temperature Control: The drives, while very efficient, generate some heat which must be controlled to preserve their rating.
- Easy Accessibility: As well as the drives, automation equipment and other electronics must be mounted in a manner that keeps it accessible, while eliminating the possibility of any electromagnetic interference from drives or motors.
- Space Restrictions: In addition, there are some significant restrictions on the sizing of the entire system, as space is always limited within a tugboat.

Powerful Solutions: Step by Step, Tow by Tow

Canal Marine is always committed to providing the best value to their customers in the equipment and service they deliver. They believe in partnering to develop optimal solutions that address and fulfill the customer's operational goals. In their quest to provide premium service and high quality products for Great Lakes Towing, Canal turned to Rittal, a Company with a track record of providing market-leading innovative solutions to solve specific challenges with standard and custom solutions.

Rittal was selected for the following reasons:

- Golden Track Record: Rittal is a recognized and proven supplier of enclosures for the marine industry. Indeed, Canal personnel have extensive experience working with Rittal products over the past ten years. Rittal's products are considered, within the marine industry, to be sufficiently robust and flexible for use in a range of applications; from small bulkhead-mounted control boxes to full switchboards, MCCs and drive lineups. Canal personnel have installed drives rated above 1MW within Rittal TS8 enclosures in recent years.
- Innovative, Tailor-made Solutions: The hybrid system requires the following features, all of which Rittal was able to supply:

a. A flexible system where modular enclosures could be connected or ‘bayed’ to create a longer enclosure perfectly matching their needs
b. A common bus-bar system complete with clamps, connectors, covers, and other accessories. Not only does this remove the task of designing a solution in-house, it also provides a rated (documented) system suitable for their steady state currents and braced for their peak fault currents.

c. Fans, heaters and thermostats that allow Canal Marine to ensure the environment within the enclosure is regulated. During periods of down-time the enclosure is heated to prevent condensation and, while in use, fans are used to remove heat produced by drives and other components. The Rittal fans move a significant amount of air, as the ambient temperature in the tugboat is already elevated by the presence of large engines.
d. Rittal’s modular system allows Canal Marine to individually purchase infrastructure, such as side panels or additional supports, to tailor the enclosure perfectly to their needs. Rittal even provides cable-management accessories that help maximize the internal space, keeping the cabinet line-up as small as possible. Replacement elements (like doors or side panels) can be purchased individually to accommodate rework needed for future upgrades to the hybrid system.

Rittal is warmed up to environmental protection
https://www.rittal.com/com-en/content/en/unternehmen/presse/pressemeldungen/pressemeldung_detail_68992.jsp
Rittal realizes that high-tech industry and environmental protection are not mutually exclusive, and is particularly focused on environmental sustainability and energy efficiency. Here are some examples:

- Rittal's global 'Green factories' uphold stringent environmental and energy concepts. For instance, the waste heat produced during the painting process is used for degreasing and heating production halls.
- Water consumption at Rittal plants is also extremely energy-efficient. The water used during working operation is cleaned and recirculated.
- Rittal's Blue e+ enclosure cooling units are proven to save up to 75% energy!

Tim Rourke, President, Rittal says: "If state-of-the-art technology in industry can help toward sustainable environmental management and protection, then that is a good thing." Adds Shawn Balding, Director, Canal Marine, "Our goal is to provide our clients like Great Lakes Towing with solutions that are energy efficient and environmentally friendly, and Rittal complies in every way!"

On the Horizon…

Says Shawn Balding, Director, Canal Marine & Industrial, “We were pleased to partner with Rittal in developing an integrated solution that provided security, flexibility and reliability, so that Great Lakes Towing can rest assured that their tugboats can run efficiently and in an eco-friendly manner! This is the first of three Hybrid Systems for The Great Lakes Towing Company to kick off in 2019, and we hope to continue our partnership that works well for all of us!”

Adds Tim Rourke, President, Rittal Systems Ltd., “In the “maritime applications” segment, Rittal is pleased to offer a range of complete system solutions that are sufficiently robust to reliably withstand stringent demands, including systems for particular environmental requirements, resistance to vibrations and seawater, and products with special approvals, which are important for maritime applications. We were so pleased to partner with Canal Marine to offer solutions that incorporate the vast product diversity of Rittal’s standard range, flexibly combined with one another for considerable safety and reliability as well as time and cost savings”.

For more information, please contact marketing@rittal.ca or www.ritttal.ca