



**ROBERT ALLAN LTD.**  
NAVAL ARCHITECTS AND MARINE ENGINEERS

2015-09-18

Revolutionary **RAmora** Brings Tele-Operated Capability to Ship Handling



Imagine the impact of a workboat designed to operate in hazardous environments, but without risk to crew. One that can fight a fire for extended periods and more closely than a conventional fire-fighting vessel, without danger to life or limb. Picture an ultra-manoeuverable high-performance tug in the command of an experienced tug master that can work safely at LNG terminals, within confined channels

or locks, or under the bow of a ship while underway. Yes, drone technologies have opened up a new realm of possibilities for tug ship handling operations.

As a result of research and development over more than a year, Robert Allan Ltd. is pleased to announce its new autonomous tug concept, the **RAMora**. The flagship vessel of Robert Allan Ltd.'s new TOWBoT (Tele-Operated Workboat or Tug) series, the **RAMora 2400** is a versatile towing platform designed primarily for ship assist and berthing operations. A high-performance tug with a bollard pull of 55 tonnes, the **RAMora 2400** features a hybrid propulsion system and substantial battery storage capacity to enable extended operation even in potentially hazardous environments such as LNG terminals or fire-fighting situations.

**RAMora** is designed to leverage - not lose - the capabilities of a traditional tug and operator by working in tandem with a conventional 'command tug'. An experienced tug Master, operating **RAMora** remotely from the command tug, will use the 'immersive telepresence' features built into the **RAMora** console, including live 360 degree video and real-time electronic position-sensing from **RAMora** to capture a continuous on-board perspective for safe and effective ship handling. An advanced real-time control system provides the interface for the operator, as well as on-board manoeuvring/positioning controls, equipment and workspace monitoring and safety management functionality. **This control system design has been developed in partnership with International Submarine Engineering of Port Coquitlam, Canada**, and is derived from proven remotely operated vehicle, autonomous underwater vehicle and surface vessel applications. It gives **RAMora** unparalleled flexibility for operation at various levels of autonomy suited to the situation – from a low level where the operator can pilot **RAMora** directly, to a high level where **RAMora** can be left to undertake work functions semi-autonomously under the operator's supervisory control.



In keeping with Robert Allan Ltd.'s commitment to design top performing workboats, **RAMora** is fitted with Voith Schneider Propeller (VSP) drives arranged in a fore/aft configuration for exceptional omni-

directional manoeuvrability, profiting from experience gained with Robert Allan Ltd.'s new RAVE tug concept. The hull form, designed for high stability and good seakeeping performance in waves, is the product of extensive development work including CFD and towing tank testing. Yet, being a TOWBoT with no need for a conventional wheelhouse, crew accommodations, domestic systems or lifesaving equipment, **RAmora** is simpler and more compact than any conventional tug of comparable performance.

Additionally, the **RAmora 2400** has several resourceful and innovative features. Heavy-duty cylindrical fendering is installed about the entire deck perimeter to allow **RAmora** to push from any point. A stabilized line-handling crane is used to pass the end of the towline to the ship, a feature actually originally introduced by Robert Allan Ltd. to manned tugs in the late 1970's! The hawser winch is installed forward in a well-protected deckhouse. A unique curved and slotted towing staple positioned near midships keeps the towline close to the deck and leading outboard to minimize heeling when towing from the side. The combination of the clear working deck, slotted staple design and fore/aft VSP configuration makes **RAmora** extremely versatile, and more importantly, safer for ship handling operations which pose higher risk to crewed tugs, such as working in close proximity to the bow of a ship that is underway, or within confined channels or locks.



Likewise, **RAmora**'s crucial secondary functions bring emergency capabilities to the harbour environment that are not readily available from crewed tugs. In addition to being equipped with off-ship fire-fighting (fi-fi) capability to "Fi-Fi 1" standard, **RAmora** has two 1200 m<sup>3</sup>/hr fire monitors supplied by electrically-driven fire-fighting pumps, and the crane boom can be optionally fitted with a smaller 600 m<sup>3</sup>/hr fire monitor and camera. Also, since it has no crew **RAmora** can fight a fire more closely and for longer periods than is possible with conventional fire-fighting vessels, while keeping crew out of harm's way.

Robert Allan Ltd. is determined to provide only a high quality, well-researched design product, and has been working with operator clients, a major Classification Society, Voith and other supplier partners to

ensure the **RAmora** TOWBoT system is fully viable, safe, highly reliable and meets the requirements of local authorities.

The possibilities for **RAmora** and other vessels in the TOWBoT series are seemingly endless. With its fundamentally simple arrangement and a control system that is adaptable to future applications which require even higher levels of autonomous operation, the door is now open to tailoring further TOWBoT designs derived from **RAmora** to closely suit any client's specific operational requirements – not only for tug operations, but also for other workboat applications such as rescue/salvage assistance, oil spill response, long-distance line towing or remote intervention tasks. As a first of its type, the **RAmora** is set to become a powerful new player in the modern tug fleet in the years to come.

For more information on **RAmora**, the latest innovation from the design team at Robert Allan Ltd., contact [design@ral.ca](mailto:design@ral.ca).

