CORPORATION OF LOWER ST. LAWRENCE PILOTS

Maritime Simulation and Resource Centre

A Full Mission
Bridge Simulator for Pilots and Members of the Maritime Community

The acquisition of a Kongsberg **Full Mission Simulator (FMS)** by the Corporation of Lower St. Lawrence Pilots (CLSLP) speaks to the importance Lower St. Lawrence pilots place on maintaining and improving their marine navigation skills.

"Every year, the safe navigation of thousands of vessels in the Lower St. Lawrence pilotage district depends on our expertise. Every year, we sail on a growing array of increasingly sophisticated ships. These new classes of tankers, cargo and cruise ships are faster, larger and rely on more advanced propulsion control systems with integrated, sophisticated electronic navigation technology", said Capt. Simon Pelletier, CLSLP pilot. "This means our pilots must constantly apply their extensive knowledge of local conditions to the varying performance characteristics of a large number of ship classes. Technology is changing what we need to know in order to properly discharge our duties and the FMS gives us an opportunity to offer users an outstanding level of service."

Providing excellent service is exactly what Lower St. Lawrence pilots have been doing since 1860 when they were granted a charter by Parliament to work the dangerous waters downstream from the Port of Quebec. The CLSLP's predecessor thus became the first corporation of professional pilots in Canada. With the inauguration of its state-of-the-art training facility in 2005, the CLSLP became the first pilot corporation in Canada to have an in-house simulator facility.

"Currents, tides, weather, aids to navigation, and physical features are all important factors in the safe navigation of maritime traffic. Managing and sharing such intellectual property can benefit not only members of our corporation but pilots from all over the world", said Capt. Alain Victor, instructor at the facility.
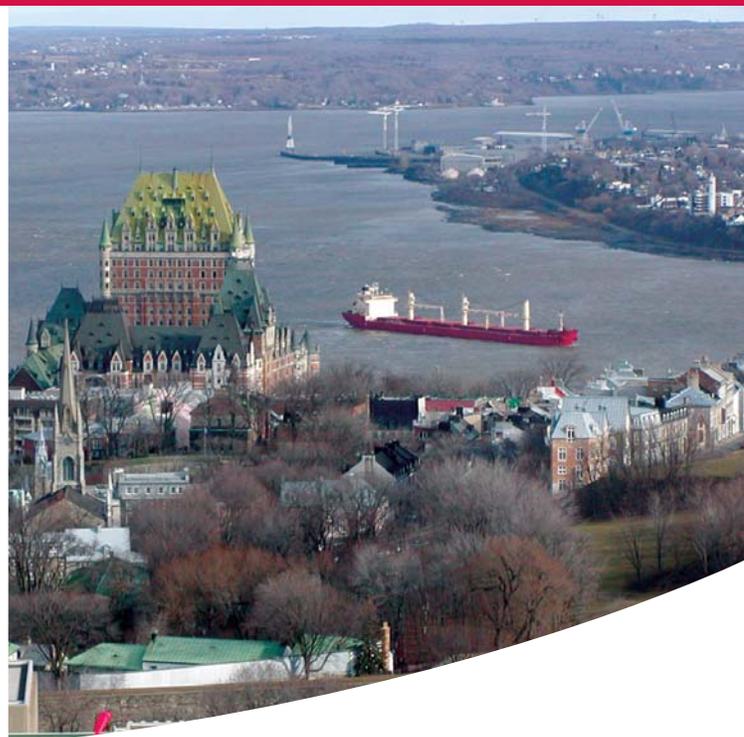
The Maritime Simulation and Resource CENTRE (MSRC)

The **Full Mission Bridge Simulator**, operated by the MSRC, is one of the most advanced simulators of its type in the world and is continually being upgraded. It is equipped with a fully instrumented DNV Class "A" configured bridge with 330° visuals that exceeds the requirements of STCW'95 regulation. The system also includes **three fully equipped bridges** with advanced ship-to-ship tugging functionality. The MSRC has a wide range of visual databases as well as a full database development and editing suite to allow pilots to create and modify their own databases. The Centre also has a wide range of ship models to allow training familiarization ranging from fishing trawlers to liquefied natural gas (LNG) tankers to cruise ships with azimuth controls.

The FMS is a highly effective aid for continuous proficiency training of pilots and other professional navigators. It is also an invaluable asset for research and investigation related to port development, ship manoeuvring and improving ship and port safety and efficiency.

On the left, MSRC instructor with officers of the QM2

Training

At the Maritime Simulation and Resource Centre, everything has been put in place to offer an environment conducive to learning and an exceptional professional development experience. It includes:

> Flexible training schedules

> A wide range of courses (basic, advanced and custom)

> Four ultramodern simulation bridges

> Classrooms and debriefing rooms

Courses Offered by the MSRC

Azimuthing Podded Propulsion
Enable navigators to become acquainted with this "new" mode of propulsion and acquire a good grasp of both the limitations and the advantages of this technology.

Error Detection and Use of Advanced Radar Techniques in Restricted Waters
The course is designed to give, all navigation officers and pilots, state of the art guidance in quickly detecting radar errors, assessing radar limitations and correcting radar faulty settings.

Bridge Resource Management For Marine Pilots (BRM-P)
The course is designed to enhance the skills pilots require to work efficiently and effectively with the bridge team during an assignment.
Approved by the American Pilots' Association.

Emergency Procedures for Pilots
Develop the necessary skills to react to any emergency situations that may occur and manage the consequences.

Electronic Chart Display & Information System (ECDIS)
The course is designed to follow all aspects of Transport Canada content on ECDIS (TP 4958) and the purpose to train the mariner in the safe operation of ECDIS. Approved by Transport Canada.

Bridge Resource Management (BRM)
Provide masters and navigating officers' awareness and guidance to good operating practices. Approved by Transport Canada.

A Crew That Can Go the Distance

The **Maritime Simulation and Resource Centre** offers high-level training and actively contributes to the development of maritime projects, thanks to its skilled and dynamic personnel.

The members of the MSRC team of instructors are experts in simulation technology and **highly experienced trainers**. They are backed up by the members of the Corporation of Lower St. Lawrence Pilots, who all hold command certificates and a wealth of navigation experience as **ship-handling experts** and specialized instructors.

The Centre also has **geomatics and database development specialists**, who are able to design and reproduce any port and waterway, navigation situation, structure or ship model needed for customized training programs and project validation.

Operational Research Studies

A ship simulator is not only an excellent resource for training, but also an exceptional tool for performing **operational research studies**. Simulation results, accompanied by informed input by pilots, can provide engineers with reliable analysis.

The four navigation bridges can be used for:

> evaluating tug requirements and optimal usage;

> extending port operational parameters, e.g., night-time operation and environmental windows;

> evaluating proposed new port developments, e.g., optimal positioning of new berths and jetties, extent of channels and turning basins;

> optimal positioning of aids to navigation.

Selected Examples of Operational Research Already Completed or Underway at MSRC

Levis LNG Terminal

Modeled the LNG jetty with an accurate tidal current database for RABASKA LNG Terminal project in Canada and developed extensive berthing and unberthing procedures in both normal and emergency conditions. The manoeuvring procedures were performed with tidal current up to 4 KTS (2.06 M/S). Manoeuvring procedures were performed with Z-drive tug assistance up to 4.

Cacouna LNG Terminal

Modeled the LNG jetty with an accurate tidal current database for CACOUNA ENERGY LNG Terminal project in Canada and developed extensive berthing and unberthing procedures in both normal and emergency conditions. The manoeuvring procedures were performed with tidal current up to 3 KTS (1.54 M/S). Manoeuvring procedures were performed with Z-drive tug assistance up to 4. Ice forces were also modeled to reproduce real-ship behaviour in ice-infested waters.

Special Cargo Project Carrier

Modeled a special cargo project carrier to rehearse pilotage passage plan through the St. Lawrence River and special docking arrangements.

St. Lawrence Seaway Database Development

Modeled the St. Lawrence Seaway from Montreal to Lake Superior to provide emergency procedure training to pilots in these sectors; developed also for several ports on the Great Lakes, including Hamilton, Oswego and Sault-Ste-Marie.

New Passenger Liner Jetty

Modeled a new passenger liner jetty in Saguenay River, evaluating the passage in the waterway and developing berthing and unberthing procedures with operational limits evaluation.

Dredging Project in Cacouna Harbour

Modeled an exhaustive number of departure manoeuvres in various weather and tide conditions in the Cacouna Harbour in order to optimize the area to be dredged in the harbour based on our pilots' recommendations.

Ultramar Refinery Terminal
CANAPORT LNG Terminal, NB, Canada
NuStar Point Tupper Marine Terminal, NS, Canada

Modeled an exhaustive number of manoeuvres with tugs, in various weather and tidal conditions for the Ultramar refinery jetty in order to validate the optimal conditions for safe arrival and departure of product carriers, LNG and VLCC.

New Port Facility, Columbia

The study served as a basis for proof of concept, establishing operational limitations, and potentially accommodating the ongoing training of operators, masters, and pilots for specialized terminal operations. Developed an extended geographic database and conducted simulations to:

> establish and provide limitations to the safe operation of the facility in association with the existing transhipment operation in close proximity;

> establish the minimum number and limitations of the tug's capabilities in providing safe, adequate escort and berthing and unberthing services.