Transas Marine International receives approval for Saint Lawrence Seaway Draft Information System

The St. Lawrence Seaway is one of the most important transportation links in North America. To maximize the efficient use of the seaway, in 2001, the Seaway authorities started a study which would determine the maximum load ships can carry while maintaining a safe Under-Keel Clearance (UKC).

Over the years, the maximum draft of vessels transiting the Seaway in the MLO Montreal to Lake Ontario and the Welland Canal has been gradually increased. At the opening of the Seaway in 1959, the maximum draft for ships was set at 6.85 meters (22 feet 6 inches). This maximum draft is now set at (26 feet 6 inches). However, changes in water levels and a phenomenon called ship sinkage or "squat" made adjusting the maximum draft again more complicated.

Draft is measured prior to departure but a moving ship actually sits much lower in the water, particularly in shallow or constrained channels. How much a ship "squats" depends on factors such as the size and speed of the ship, shape of the channel, depth of the water, currents, wind, and even the presence of other ships.

Undertaken at the request of the St. Lawrence Seaway Management Corporation and industry partners that included the Canadian Ship owners Association and the Shipping Federation of Canada, the mentioned study resulted in standard squat models for the various types of vessels transiting the Seaway.

Over the past year and a half, the St. Lawrence Seaway authorities have developed a functionality description of a Draft Information System that incorporates the Seaway squat models, which was finally approved by all stakeholders in March of this year and was then issued to the public.

In accordance with this specification, TRANSAS has developed a Draft Information System (DIS) based on the NS4000 ECDIS which allows the accurate display of the vessel's position, real-time water levels and data from highly detailed bathymetric charts.

An independent functionality verification and assessment was performed by Lloyds Register in June of this year after which the system was installed on board the M/V ALGOMA SPIRIT for final approval by the St. Lawrence Seaway authorities.

The TRANSAS Draft Information System successfully passed the performance tests without comments or open items. The DIS can run as a stand-alone system or in a network with the Transas NS4000 ECDIS providing a unique combination of precise...
navigation instruments, high definition chart data and real-time navigation information in both the DIS and the ECDIS. The Transas DIS is built on the same hardware platform as the Transas NS4000 ECDIS MFD providing for better redundancy and lower cost of maintenance.

The Draught Information System (DIS) is a program designed to calculate and display the under-keel clearance (UKC) on the basis of the following data:

- High Resolution Bathymetry data provided by the Canadian Hydrographic Service (CHS);
- Water levels; received automatically via Seaway AIS stations of a network of water level gauge stations or set manually by the user;
- Ship forward and after draft set manually by the user;
- Ship Squat based on Seaway Squat Models for the vessel and channel type.

In dangerous navigational situations or under system fault conditions, relevant notifications will be provided for the operator. When the DIS is connected to the Transas NS4000 ECDIS network, any ECDIS can be set up as the DIS for back-up purposes in the same way as the DIS can be used as the ECDIS back-up. The Draught Information System button in the "UKC Data" display is intended for switching between the DIS mode and standard ECDIS mode. When the DIS mode is turned off, the MFD can operate as an additional work station.

The DIS will indicate whether certain areas are safe to pass or require speed adjustments to decrease the squat of the vessel. A required safety margin of 30 cm of UKC has to be maintained. The HD chart contours are then filled in with colors indicating safe passage areas.

The availability of this data on the bridge of the vessel will enable most vessels to maximize their draft up to 26 feet 9 inches from the current Seaway permissible draft of 26 feet 06 inches. This increase of 3 inches would mean that the average Great Lakes vessel can carry an additional 250 to 400 tons of cargo. The investment in this equipment will result in greater operational and environmental efficiencies based on a tonne/mile matrix.

Paul Welling, Regional Sales Director, North America for Transas USA: "The DIS development will not only benefit our customers but is also a huge benefit to safe navigation in the St. Lawrence Seaway. We are proving again that Transas Sets the Standard."

Tom Anderson, Director, Ports & Harbours, Navigation, Algoma Central Corporation: "The use of the Transas DIS will allow for the safe and effective deep loading of our vessels to optimize the full available water column in the Seaway. The use by our vessel personnel of the Transas DIS integrated with shipboard ECDIS/ECS and the supporting Seaway AIS network is an example of an e-Navigation initiative that was developed for a specific area user that has further potential for use in other ports and their connecting waterways."