Status E-navigation in Sweden

Executive summary

The IMO defines E-navigation as *"the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment."*.

In Sweden the Swedish Maritime Administration has coordinated some major EU-funded projects with many partners from different European countries with initiatives contributing to future e-navigation. Specifically mentioned are the MONALISA, the Sea Traffic Management (STM) Validation Project and the two FAMOS Projects.

FAMOS Freja and FAMOS Odin

The MONALISA project was a project running from 2011 – 2013 where the Sea Traffic Management concept initially was developed. One dimension of STM is that route planning for shipping should be more dynamic and thereby more efficient than today. In order to achieve this the potential areas used for navigation must be hydrographically surveyed by modern methods according to the IHO S-44 standard. In MONALISA hydrographic surveying in Finland and Sweden were included in the project, but when the succeeding MONALISA 2 project was designed it was decided to establish a separate project embracing the hydrographic activities in the Baltic Sea. The FAMOS project was then established and has been running with FAMOS Freja 2014 – 2016 and FAMOS Odin 2016 – 2018.

A major activity in FAMOS is actual hydrographic surveying in the Baltic Sea, but the overall goal is to use these data for new future services for a more efficient shipping in the Baltic Sea and beyond. Given that the so-called squat effect affects the fuel consumption of a ship, bathymetry data can be used to find more cost efficient routes. A study has been made in Kattegat which shows that the fuel consumption theoretically in this area could be decreased with 12 % if the shipping routes would have been optimized due to bathymetry, wind, wave and current. In FAMOS there are several partners involved working with an improved geoid model in the Baltic Sea through gravity measurements at sea. The idea is to achieve a better vertical positioning of the ship. Together with a high resolution bathymetry model, according to the IHO new S-102 standard, a much better determination of the Under Keel Clearance (UKC) can be achieved and also dynamically be surveyed. See more at http://www.famosproject.eu.

Sea Traffic Management

STM is a concept to define a set of systems and procedures to guide and monitor sea traffic in a manner similar to air traffic management. The goal is to provide:

- route plans with regards to weather and geospatial limitations or vessel related requirements can be readily generated.

- planned routes to be automatically monitored, allowing appropriate actions to be executed should the vessel stray off-course.
- collisions to be prevented as sharing of vessel coordinates allow routes to be modified with ease.
- ships can be offered pilot assistance in difficult-to-maneuver areas or whenever requested by captain.
- captains are able to make educated navigation decisions in highly trafficked areas as data of surrounding environment is readily distributed throughout the network.

Route plans can create safe, efficient and environmentally friendly sea voyages. In order to utilize the full potential of STM, it must be developed to take into consideration the operations carried out at ports and beyond. Ports operations and the efficiency of which, are important factors in performance of the transportation system as a whole. STM can contribute greatly in this area as it was conceived with an emphasis on efficient collaboration between operations at sea and on land. See more at http://stmvalidation.eu/.

Cooperation between FAMOS and STM

The FAMOS project has an overall ambition to utilize route optimization and better control of Under Keel Clearance to optimize loading of a ship. STM has developed the concept of route exchange. At the HSSC9 meeting in November 2017 the HSSC agreed that the range of S-421 to S-430 would be assigned to this IEC domain, with S-421 assigned to “Route Plan”.

Using a route plan together with services such as route optimization, UKC management (S-129), bathymetry S-102, water level information (S-104), surface currents (S-111) and navigational warnings (S-124) makes it more relevant to again more closely cooperate and integrate the FAMOS and STM projects. The plan is to establish a new project with the working name STM-FAMOS. At the FAMOS conference, in Malmö 7 – 9 March 2018, the proposed merge of these two projects were presented and the existing FAMOS partners and other stakeholders discussed also new possible items to be included in such a project. The SMA is prepared to coordinate also the STM-FAMOS project and welcomes existing and new partners.