ENHANCED FAST-TIME-SIMULATION FEATURES TO SUPPORT SHIP-HANDLING SIMULATOR TRAINING

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POTENTIAL OF FAST TIME SIMULATION (FTS) FOR TEACHING AND LEARNING IN THE MARITIME TRAINING ENVIRONMENT

New technologies as Fast Time Simulation (FTS) have great potential for teaching and learning in the maritime training environment and for use on board of ships. New concepts for training application of these innovative technologies were developed at Maritime Simulation Centre Warnemuende MSCW in research projects. The innovation is to simulate the ships motion with complex dynamic models in fast time and to display the ships track immediately for the intended or actual rudder or engine manoeuvre, steered by a smart interface. These simulations allow for new type of manoeuvring design and optimisation at every Manoeuvring Point MP, not only for the next manoeuvring segment ahead but also for the following or even for series of manoeuvring segments. One obvious basic advantage in relation to conventional ship-handling training and navigators' preparation of harbour approaches is the easy creation, visualization and comparability of different manoeuvring strategies.
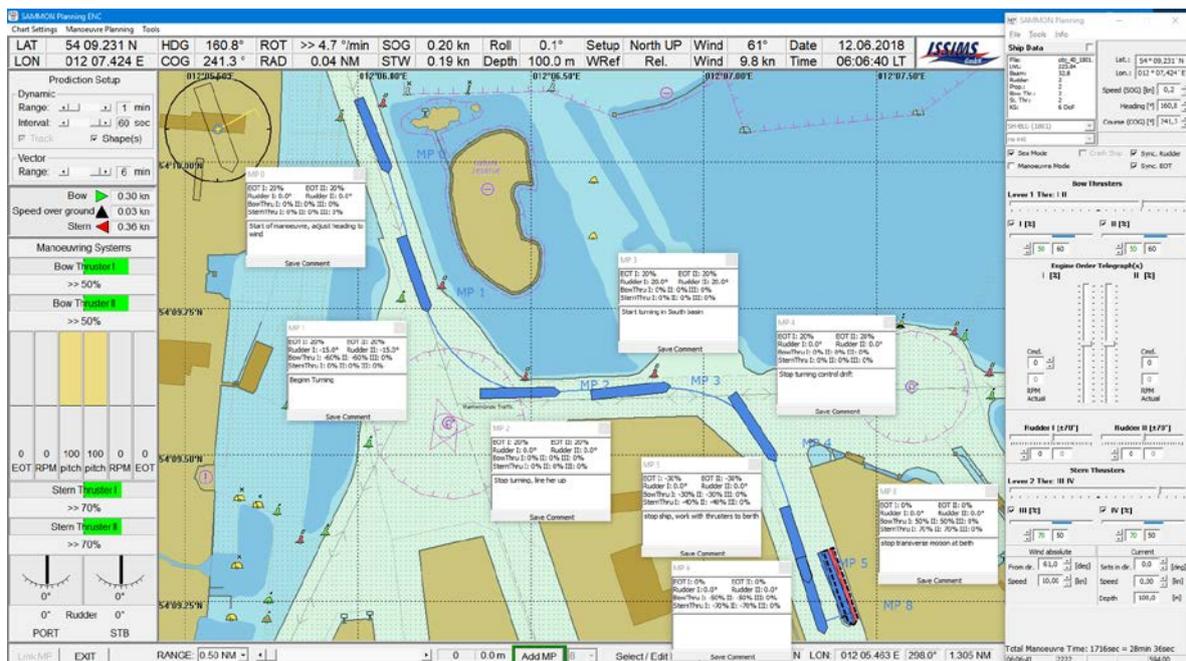

Figure 1: Complete Manoeuvring Plan from FTS Planning Module for Cruise ship for arrival at Rostock Port. The track is indicated by blue lines and Manoeuvring Points MP as ship shapes, additional manoeuvring point information text boxes show the control settingsfor breifing

Technological setup and presentation of results

The FTS software system consists of various modules for (a) Manoeuvring Design & Planning, (b) Monitoring & Conning based on Multiple Dynamic Prediction, (c) Trial & Training and (d) Replay and Assessment. Specifically the Planning module is the missing link in Voyage planning because it allows to develop the concept of specifically the manoeuvres in the unsteady motion segment after entering the moles up to the final berthing manoeuvre – and even to try out alternatives and limits of environmental effects. For practical application the new FTS-features were interfaced to the new Full-Mission and Desktop ship handling simulator systems, configured by benntec / Marinesoft, based on Rheinmetall RME bridge simulator software.

Fig. 1 ANS 6000 brige simulator with Fast Time Simulation System for Simulation-Augmented Manoeuvring Design, Monitoring & Conning - SAMMON is fully integrated to the ANS 6000 by a smart interface using LAN and WLAN. Left: Bridge simulator overview with SAMMON Planning station (right) and instructor station (left) in the foreground, manoeuvring console with displays and visual system in the background. Right: Manoeuvring console with handles and screens with SAMMON Monitoring & Conning Tool display with multiple prediction on the left side

Application of the method and samples of use

It became obvious that the new FTS technology has great potential for teaching and learning in the maritime education, both for lecturing and for simulator training in briefing and debriefing sessions of exercises. Experiences have been made how this new technology can be used to improve the simulator training in the Advanced Ship Handling Training course

- at the World Maritime University, Malmoe / Sweden,
- at the Maritime Simulation Centre of AIDA Cruises at Rostock /Germany and
- at the CSMART Center for Simulator Maritime Training of Carnival corporation at Almere /NL

Samples of application for briefing / debriefing and introduction lectures for simulator exercises specifically for typical cruises ships with Twin-Screw and -Rudder systems will be shown in the paper and at the conference. The potential of this technology for advanced maritime education and training will be discussed.

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