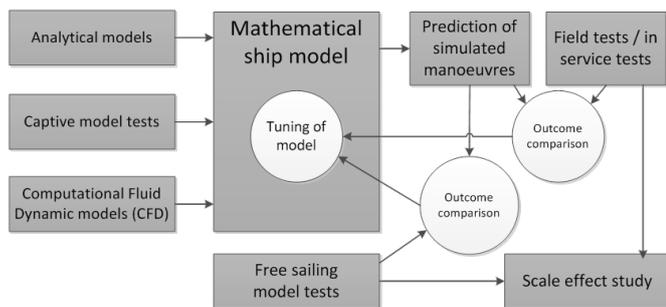


No 3 - April 2014

*This is the third newsletter of the Knowledge-building Project for the Industry "Sea Trials and Model Tests for Validation of Shiphandling Simulation Models" supported by Research Council of Norway. This project aims to improve present validation methodology for shiphandling simulation models. It includes captive and free-sailing model tests as well as sea trials with selected case vessels. The third newsletter describes activities taking place in the period January – March 2014 and a brief description of planned work for the rest of 2014.*

### Brief project description

The project started in April 2013 and will end in December 2016. Total budget is approximately 18 mill NOK (equivalent to 3 mill Euro). Project content is illustrated by the block diagram below.



The project partners have agreed on a set of case vessels including research vessels from two of the participating universities), ferry, offshore vessel, container ship and shuttle tankers. In addition to standard IMO manoeuvring trials the research partners will investigate ship specific low speed test manoeuvres with masters on case vessels and pilots.

As part of the project the research partners will arrange a number of workshops on topics such as documentation of low speed manoeuvring performance, uncertainties in manoeuvring models and validation of simulation models. External specialists will be invited to some of these workshops. The project includes a PhD scholarship at NTNU and a PostDoc position.

### Activities ongoing in January – April 2014

#### Analysis of Gunnerus sea trials

MARINTEK and NTNU are analyzing sea trial results from the calm water and harsh weather tests run in 2013. The first

part has studied the outcomes of the IMO standard turning circles and zig-zag tests. During the calm water tests in Trondheimsfjorden the wind speed was relatively stable in the range of 4 – 7 m/s. A wave and current buoy were moored to the sea bottom in the predefined test area. Wave height was typically 0.1 – 0.3 m that corresponds to sea state 2. The most changing effect was current (both direction and speed). Hourly measurements of current direction during second day of trials (from 8 am to 8 pm) are presented in Figure 1. Current speed was in the range 0 – 0.5 m/s. Both tides and two rivers inflowing to the fjord near the test area influenced currents.

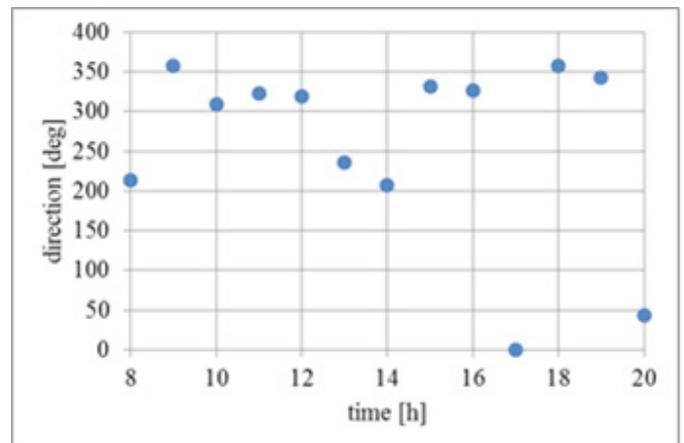


Figure 1. Variation of measured currents speed on the second test day.

As can be seen in Table 1 there were some variations in the measured first and second overshoot angles of the 10°/10° zig-zag test. The variation is partly due to variations in environmental conditions during the tests, resolution of bridge indicators and the accuracy of the control system (rudder angle). A further analysis of the data will be presented in a paper for the MTEC conference in Trondheim (October 2014).

Please turn the page.

Table 1 Results of 10/10 zig-zag tests (5 to port and 7 to starboard)

Direction	1st OA		2nd OA	
	port	starboard	port	starboard
Mean [deg]	7.24	9.89	8.51	7.45
$\sigma$ [%]	11.5	12.9	22.3	12.6

### Free sailing tests with Gunnerus

In March 2014 free sailing tests with R/V Gunnerus were conducted. The tests were done in MARINTEK's Ocean basin. The tests consist of standard IMO manoeuvring tests as zig-zag, turning circles and spiral tests. Further, the effect of varying the tow rope force were investigated due to the fact that there are questioned if manoeuvring model tests shall be conducted on the model self-propulsion point (MSPP) or ship self-propulsion point (SSPP).



Figure 2. Free sailing tests with model of R/V Gunnerus.

### PMM model tests of Island Condor

In January 2014 a meeting between Island Offshore, Rolls-Royce Marine and MARINTEK were held in Island Offshore's office in Ulsteinvik. During the meeting it was decided to use the Island Condor as a case vessel in SimVal. Island Condor is a Rolls-Royce Marine UT 776 CD design, which is under construction with delivery in November 2014.



Figure 3. PMM model tests of Island Condor.

In May 2014 captive PMM model tests with a model of Island Condor were conducted in MARINTEK's large towing tank using a yacht dynamometer mounted on the hexapod system on the seakeeping carriage.

### Analysis of Landegode sea trials and PMM tests

Currently MARINTEK is working on the analysis of both the sea trials and PMM model tests that were conducted with M/F Landegode in 2013. Results from VeSim simulations using manoeuvring coefficients derived from the PMM tests will be compared with the results from the sea trials. A NTNU student has also been working with simulations of M/F Landegode as part of his master thesis.

### Meeting with Singapore Maritime Academy

Kourosh Koushan met Singapore Maritime Academy representatives as part of the RCN – MPA MOU meeting in Singapore on 9th April.

### Planned activities for May – December 2014

Project partners will have separate meetings with shipping companies operating the project's case vessels. It is planned to arrange two workshops, one to finalize the state-of-the-art study of validation methods and one on performing manoeuvring sea trials. The 3rd Steering Committee meeting will be held mid-June at Flanders Hydraulics Research in Antwerp. Announcement of the PostDoc position will take place in June after the Steering Committee meeting.

The first conference paper based on project results has been accepted for presentation at International Maritime-Port Technology and Development Conference (MTEC 2014) in Trondheim 27-29 October 2014.

Sea trials with Island Condor are scheduled for late November 2014.

Representatives from the project plans to participate in the SIMMAN 2014 workshop in Copenhagen in December 2014.

### Contact information

Contact person: Dr. ing. Tor Einar Berg,  
phone +47 9265 9975,  
email: [toreinar.berg@marintek.sintef.no](mailto:toreinar.berg@marintek.sintef.no)

Project website: <http://www.sintef.no/Projectweb/SimVal/>  
Project email: [simval@marintek.sintef.no](mailto:simval@marintek.sintef.no)

*Disclaimer*  
Although this newsletter is written with care neither MARINTEK nor other project partners are responsible for errors in the content.