

## Preface

An event being organized for the fourth time at regular intervals evokes a certain level of continuity. After three successful editions, it seemed worth spending some time to choose an acronym, which would make referring to the Fourth *International Conference on Ship MA*noeuving in *SH*allow and *CON*finned Water much easier. This allows us to welcome you at **MASHCON 2016** !

As for the first three editions, MASHCON 2016 is open for all contributions related to hydrodynamic aspects of ship manoeuvring in navigation areas with restricted dimensions in horizontal and/or vertical direction. For both scientific researchers and nautical experts, ship behaviour in shallow and confined water remains a niche domain. As a matter of fact, seagoing ships are only being confronted with such conditions in harbours and their approach channels, unlike inland vessels, for which shallow and confined waters can be considered as a natural habitat. Nevertheless, each conference so far has put a spotlight on one specific topic within this scope. After ship-bank, ship-ship and ship-lock interaction, this edition will be particularly dedicated to *ship-bottom interaction*.

While the effects due to the close vicinity of the bottom are the core of shallow water ship hydrodynamics, the selection of this main topic has been inspired by the increasing interest in the phenomena occurring in the gap between the keel of a ship and the bottom of a waterway. Different motivations can be identified for this interest. As a result of increasing accuracy of methods for determining a ship's position, also in vertical sense, bottom surveys, maintenance dredging techniques and water level prediction tools, the margins with respect to the required under keel clearance can possibly be reduced, which of course has a beneficial impact on maintenance dredging cost. On the other hand, smaller margins are only appropriate when the overall risk remains within acceptable limits. It should be borne in mind that a minimum UKC is not only required to avoid bottom contact due to squat, response to waves, passing ships. A minimum UKC is also required to guarantee a minimum level of manoeuvrability and controllability. Another issue arising in many navigation areas concerns the problematic definition of the boundary between bottom and water. On the one hand, ship induced flows may cause erosion and sedimentation of the bottom, but on the other hand, a ship's behaviour may be fundamentally changed due to interaction with fluid mud layers covering the solid bottom. Eventually, a considerable share of the contributions to MASHCON 2016 appear to be related to the main topic, which confirms the interest from different viewpoints.

The main purpose of organising a conference is, of course, to provide a meeting opportunity to discuss progress in scientific research and to stimulate mutual contacts between experts in practical and theoretical aspects. The Knowledge Centre *Manoeuvring in Shallow and Confined Water* intends to offer an added value to participants of the conference by making benchmark model test data available for the validation of mathematical and numerical models and tools. On the occasion of the call for papers for MASHCON 2016, a selection was made among model test data which were obtained at Flanders Hydraulics Research with the DTC container carrier at low under keel clearance in the framework of the European SHOPERA project. The data present time series of sinkage and trim, surge and sway forces, and yaw and roll motions, during captive harmonic sway and yaw tests. It is appreciated that the full benchmark data which were released last year have been requested by eleven researchers. This finally led to the submission of three papers, while the other applicants informed us they have not been able to finalise their research yet due to time constraints and/or limited resources. It is also encouraging to notice that some of the benchmark data distributed on the occasion of the former conferences are being used for validation purposes in the contributions to this Conference. Numerical methods are in full development and are quite promising. They are potentially able to provide more insight into the detailed flow in the limited area between keel and bottom, but validation data are required to assess their reliability and applicability. By publishing open model test data, the Knowledge Centre wishes to make a modest contribution to this evolution.

In order to offer some continuity to the target audience we aim to address, a return period of two to three years seems to be optimal. On the other hand, the full organisation of a conference places an important workload to the research groups within the Knowledge Centre partners. For this reason, we try to alternate conference venues in our home cities with locations abroad, relying on partner institutions with common interest. In 2011, MARINTEK and NTNU relieved us of hosting the second conference, and at present, we highly appreciate the efforts of our local host, the Federal Waterways Engineering and Research Institute or Bundesanstalt für Wasserbau (BAW), who was found willing and enthusiastic to

take the organisation of MASHCON 2016 on their shoulders. As a result, Hamburg is the fourth city to host our Conference, after Antwerp (2009), Trondheim (2011) and Ghent (2013).

Contacts between the Knowledge Centre partners, Flanders Hydraulics Research (FHR) and Ghent University, and the Hamburg office of the Bundesanstalt für Wasserbau already go back many years. This is not surprising: FHR and BAW are both governmental institutions, with a core task to provide consultancy to the administrations with respect to issues relating to waterways engineering. Both institutions have been confronted with the need for broadening their activities from purely hydraulic issues to topics related to the behaviour of a ship in confined waterways. It is not a coincidence that both institutions are interested in common topics such as ship's squat, effect of muddy bottoms on navigation, ship-bank interaction, and often rely on model test techniques for acquiring more insight into the physical background of the governing effects. The problems with which the maritime ports and inland waterways have to cope in both countries, are actually very comparable. Antwerp and Hamburg not only meet each other as competitors for silver and bronze on the European container ports winner's podium, but also experience common opportunities and challenges as ports connected to sea by a long channel dredged in a natural river with an important tidal regime. To mention another example, the problems related to sedimentation and fluid mud in German and Flemish ports can be considered as variations on the same theme, although solutions may in practice be quite different.

One change with respect to the former conferences needs to be mentioned: contrary to the three first editions, MASHCON 2016 is no longer co-organised by the Royal Institution of Naval Architects. Nevertheless, the efforts of the Institution in spreading the call for papers and the announcements for the conference is quite substantial. We are grateful to the R.I.N.A. for their support in the starting up of this Conference series, and look forward to further co-operation in the future.

34 contributions by authors from all over the world, an interesting excursion program, a committed local organising staff, a city full of activity exuding a maritime atmosphere.  
Welcome to MASHCON 2016, welcome to Hamburg!

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On behalf of the Knowledge Centre  
*Manoeuvring in shallow and confined water*