

This is the eleventh [newsletter](#) of the *Knowledge Centre Manoeuvring in Shallow and Confined Water*, which aims to consolidate, extend and disseminate knowledge on the behaviour of ships in shallow and confined water. In this newsletter, we have an item on the use of real-time simulations in the detailed design of waterways. Two examples for inland and maritime transport show the strength of simulation techniques in the design of existing and new waterways.

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In agreement with our organizing partner, the [R.I.N.A.](#), it has been decided to extend the deadline for submitting abstracts for the [Third International Conference on Ship Manoeuvring in Shallow and Confined Water](#), which will be held in Ghent, Belgium, on 3 – 5 June 2013, to 28 September 2012.

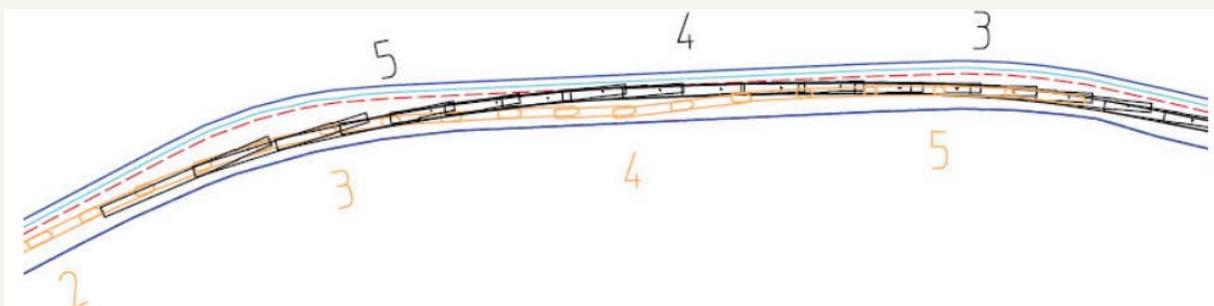


Abstracts of 250 words can be sent to [info@shallowwater.be](mailto:info@shallowwater.be).

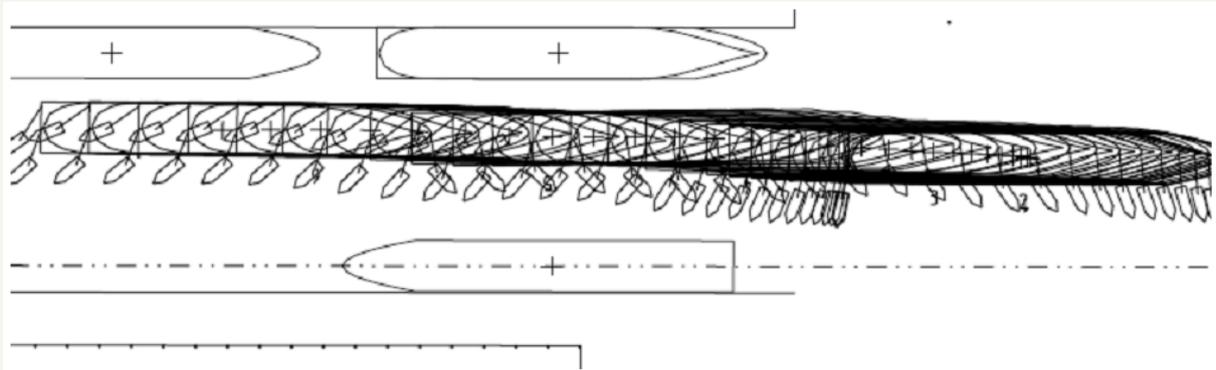
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The design of waterways has been an omnipresent topic in the research done by [Flanders Hydraulics Research \(FHR\)](#) and [Ghent University – Maritime Technology Division \(UGent\)](#) over the last year. Concept design guidelines, such as the [PIANC guidelines from WG 30](#) for maritime transport or the Dutch guidelines for inland transport, are not always in accordance with actual environmental and economic constraints. As a consequence, waterways are not designed according to concept design dimensions. In our experience, several projects have shown that concept design can be too restrictive and that there is scope for improvement in detailed design. This can be done by real-time simulations using full-mission ship manoeuvring simulators while involving all parties in the design process.

For the upgrade of a canal which forms part of the Seine-Scheldt connection between France and Belgium, guidelines were set-up by the responsible government agency for a two-way traffic lane on the canal for a CEMT class Vb push barge convoy (185 m long, 11.4 m wide) and a CEMT class IV motor ship (85 m long, 9.5 m wide). The Dutch design guidelines could not be met, but the proposed design with widened bends and adjusted channel sections was evaluated with real-time manoeuvring simulations on two coupled [simulators \(inland simulator Lara and simulator SIM225 from FHR\)](#). Meetings between the class Vb and class IV vessels were simulated under different wind conditions. Based on the track plots of the individual vessels an optimized design of the canal could be proposed.



For another project that concerned the design of a new access channel to an African port for Ultra Large Container Ships, the design process was split up in different phases. In the first phase, concept design dimensions were obtained using the guidelines from PIANC, the Spanish recommendations for maritime infrastructure and the Japanese guidelines. Based on the results of this concept design, a detailed design was developed in a second phase and evaluated using real-time simulations in a rudimentary 3D environment. The channel dimensions such as the channel width, bend width and radius, lengths of different sections, turning area and dock width can be evaluated based on the real behaviour of the ship in the designed channel with restricted bottom clearance and the presence of banks.



This project again demonstrated that the concept design is a good starting point but needs to be evaluated against the actual constraints. Simulation models which accurately describe the behaviour of the ship and real-time simulations will identify areas which do not match well with concept design dimensions. These findings can then be used to obtain an optimized detailed design.

Concept design guidelines are also being reviewed. PIANC working groups [Marcom WG 49](#) ("Horizontal and vertical dimensions of fairways", chairman Mark McBride of HR Wallingford Ltd. and member Marc Vantorre for UGent) and [Incom WG 141](#) ("Design Guidelines for Inland Waterways", chairman Bernhard Söhngen from BAW and member Katrien Eloot for FHR since June 2012) are going through the same challenge in formulating new design guidelines and processes to come to a well-balanced and safe design. For example, design guidelines for inland waterways vary from country to country. In WG 141, these guidelines are compared with each other and with existing design practices worldwide to come to a document with realistic design criteria and examples.



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