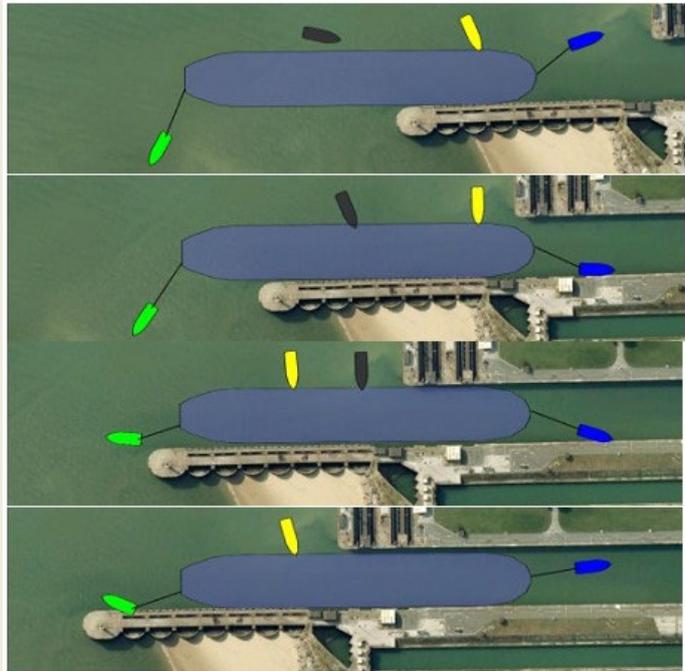


This is the fifteenth [newsletter](#) of the *Knowledge Centre Manoeuvring in Shallow and Confined Water*, which aims to consolidate, extend and disseminate knowledge on the behaviour of ships in shallow and confined water. In this newsletter, we present two of our recent activities involving full-scale ship motion measurements.

On request of the [Port Authority of Dunkirk](#), the motions of the capesize bulk carrier MV Cape Aster (292 m x 45 m x 14.2 m) were measured on a trip departing from the Western [port of Dunkirk](#) at 11:00AM and mooring at the Arcelor Mittal plant in the Eastern [port of Dunkirk](#) at 08:30PM.

The survey was carried out with support of the [Dunkirk Pilotage](#) and the main objective was to study the ship's behaviour during the passing of the Charles de Gaulle Lock in the Eastern [port of Dunkirk](#). The hydrodynamic effects while entering the lock with a ship of maximum dimensions with respect to the actual regulations were studied in detail.



The motions of the vessel were recorded in 6 dimensions (3 translational and 3 rotational) at high frequency. During the survey, the rudder angle, the propeller rate of turn and the forces applied by tugboats were also captured. A survey carried out at full scale is always interesting because it reveals differences which cannot be predicted from model scale. For example, effects from wind and forces exerted by tugs may be quite different in reality.

The data from the [full-scale measurements](#) were used for the validation of an improved mathematical model. Details can be found in the paper entitled "[Hydrodynamics of a ship while entering a lock](#)", which was presented at the [Third International Conference on Ship Manoeuvring in Shallow and Confined Water](#). Details of the ship's behaviour while entering the Charles de Gaulle Lock can be found in the paper entitled "[Lock manoeuvres: practical cases in Europe and Panama](#)".



In order to validate the mathematical manoeuvring model of a CEMT Class IV inland vessel which was derived from comprehensive model experiments, [full-scale measurements](#) of the inland vessel MT Elise (105 m x 9.5 m x 2.6 m) have been carried out on the Lys Diversion Canal. The ship positions were measured with an accuracy of up to 2 cm and the application of rudder and propeller during the passage of the bend of Nevele were registered. In post-processing, the bottom profile and the water level were taken into account, so that the effect of [under keel clearance](#) and the [proximity of banks](#) can be studied in detail.

During the lock passage at Sint-Baafs-Vijve, the water level variation in the lock was logged at six locations in order to analyse the slope of the water level during the filling of the lock. The measured slope of the water level was compared with the trim angle of the MT Elise in order to validate the numerical calculations of lock filling which are in use at [Flanders Hydraulics Research](#). Particular attention was paid to comparing the longitudinal forces on a ship during this procedure.



*Knowledge Centre
Manoeuvring in Shallow and
Confined Water*

Berchemlei 115
2140 Antwerp
Belgium

T +32 (0) 3 224 60 35
E info@shallowwater.be

Although this newsletter is written with care Flanders Hydraulics Research nor Ghent University are responsible for typos or errors in the content. You are receiving this email because you are subscribed to the Knowledge Centre newsletter. We care for your privacy, this newsletter is sent to you without displaying your e-mail details.

You can [unsubscribe](#) to the newsletter, [subscribe](#) or [invite a friend](#).

www.shallowwater.be