The Manoeuvring Committee

Committee Chairman: Dr. Jakob Buus Petersen
Session Chairman: Dr. Ulderico Bulgarelli

1. DISCUSSIONS

1.1 Discussion to the 24th ITTC Manoeuvring Committee by Kristian Agdrup, FORCE Technology, Denmark

I found both the Report of the Manoeuvring Committee and the presentation by Dr. Buus Petersen very interesting, especially Section 6.6 on the revision of the various shallow-water model tests with the Esso Osaka. During the presentation you showed a figure of the non-dimensional side force during a static drift test at water depth ration h/T = 1.2 as a function of model size. (Please reproduce this figure in your reply) According to that figure there is a large and unambiguous scale effect on the measured side force, meaning that the additional side force in shallow water decreases for increasing model size. If one were to extrapolate the curve towards full-scale, the additional side force/shallow water effect would apparently approach zero, which would be contradictory to normal understanding of this phenomenon including the experience of navigators. Therefore I would like to know the Manoeuvring Committee's conclusion as to the applicability of the mentioned results. I note that other significant forces and moments such as the yaw moment measured in the pure yaw test do not show the same trend.

Additionally, please clarify Table 6.2 of the Report (p.175): are the values given in the bottom line "Max speed loss" as stated or rather "Lowest speed during turn"?

1.2 Discussion to the 24th ITTC Manoeuvring Committee by Ian W. Dand, BMT SeaTech Ltd, United Kingdom

I would like to congratulate the Committee on a fine Report. It is comprehensive and of value to all who work in the field of ship manoeuvring.

The Committee states that there have been no new proposals for shallow water manoeuvring criteria. While this it is true that such proposals are few and far between, there have been some. The Committee might be interested in Dand (2003a) in which this discusser attempted to come to grips with the problems associated with such criteria for low speed in shallow water.

The point was made that a different approach may well be needed to set suitable criteria for ship manoeuvring in such conditions. The traditional criteria based on standard manoeuvres will almost certainly not be suitable. It will be very difficult to find areas of shallow water with constant soundings in which to do such trials and, as the tide will continually rise and fall, the water depth (a key parameter) will not remain constant throughout any lengthy manoeuvre.

It may also be argued that criteria such as tactical diameter and the use of service speed have no place in the locations where low-speed manoeuvring in shallow water takes place. These are usually in port approaches, rivers and channels where course-keeping, controlled loss of speed and the ability to resist cross-winds all at harbour limiting speeds, are of most importance. Significant turning is often assisted by tugs at the lowest of speeds by which time traditional manoeuvring criteria are of little value to the ship handler.

In view of these comments, it might be useful to ask marine pilots for their views as to what manoeuvring criteria they would wish to be satisfied by any ship moving at low speed in shallow water.

It should also be remembered that any well-designed approach channel should take into account the inherent manoeuvrability of ships at low speeds in shallow water, some guidelines being given for designers in Dand (2003b).

These issues are touched upon in Dand (2003a). Suggestions are given for criteria in the form of indices derived from the geometry of the ship as well as various operational indices related to such matters as lateral thruster power, stopping (under control, if possible), breasting and the kick-ahead manoeuvre.

Also suggested by Dand (2003a) is that simulation and some specialised full-scale trials suitable for safe use in approach channels, combined with suitable indices based on past best practice, be used as a way of assessing low speed manoeuvrability in shallow water. This is analogous to the present IMO criteria for open deep water, which themselves are based on past best practice.

References.

Dand, I.W., 2003a, "Low Speed Manoeuvring Criteria: Some Considerations" Keynote Lecture, MARSIM'03, Kanazawa, Japan, August 2003.

Dand, I.W., 2003b, "Approach Channels: a Guide for Design" Final Report of the joint Working Group of PIANC and IAPH, in cooperation with IMPA and IALA. Supplement to PIANC Bulletin 95, June 1997

2. COMMITTEE REPLIES

2.1 Reply of the 24th ITTC Manoeuvring Committee to Kristian Agdrup

The Committee welcomes the discussion by Mr. Agdrup of Force Technology. This discussion is related to shallow water manoeuvring and is about the literature review of "classic" shallow water Esso Osaka model test results. The Committee showed at the Conference Fig. 2.1 depicted below, which is not included in our Report. Figure 2.1 shows the ratio between the non-dimensional side force in deep water and the non-dimensional side force in a water depth ratio T/h=1.2 as function of model scale for a drift angle of 4 degrees. It clearly indicates scale effects as the function shows large, consistent variation as function of scale.

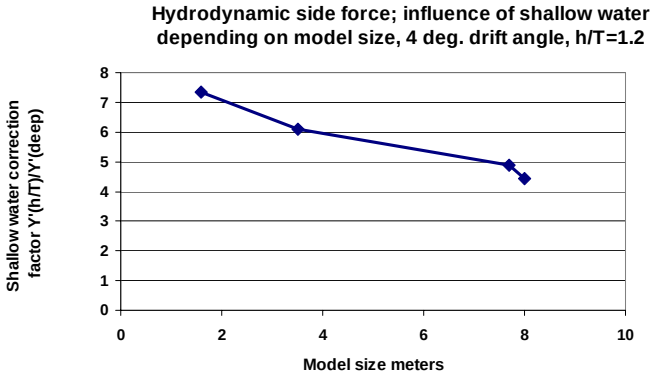

Figure 2.1- Hydrodynamic side force ratio.

Figure 2.1 serves one important purpose; it shows that there are significant scale effects for the side force. The uncertainty inevitably

included in the various experiments makes it impossible to give any guidance as to the absolute values of the shown "scale effect" function. To start speculating in extrapolating the function gives in the opinion of the Committee no meaning at the present stage. The problem could be very relevant to study using CFD, which could be used as a tool to predict the influence of scale or to get an idea of the required scale to obtain converged results for the side force. No scale correlation for the other force and damping contributions was found. This does not imply that scale effects are not present, it could imply that the scatter and uncertainty in the data is much larger than the effect of scale or it could imply that the scale effects on these other hydrodynamic forces or moments do not show a consistent behaviour.

Regarding Table 6.2 of the Report, the Committee would like to thank Mr. Agdrup for pointing out the correct definition.

2.2 Reply from the 24th ITTC Manoeuvring Committee to Ian W. Dand

The Committee is welcoming the references by Dr. Dand regarding criteria for low-speed manoeuvring. Clearly, Dand (2003a) should have been included in our Report. Dand (2003a) lists the main shortcomings of the IMO Standards for service speed and deep water with respect to low-speed manoeuvring and confined water, and mentions several relevant scenarios to consider for defining low-speed confined waters criteria. Further, some geometry and operational indices, which could be taken into account for this purpose, have been proposed. Clearly, this area is a difficult one, as also stated by Dand (2003a) and the development of manoeuvring criteria for slow speed and confined waters is not straight forward, primarily because such criteria must be practical to implement for ship yards, ship owners and authorities. It should perhaps be mentioned that the statement made by the Committee, that there have been no proposals for shallow water manoeuvring criteria, was related to a specific workshop, not a general remark.