

RECOMMENDATIONS CONCERNING THE WORK
OF THE INFORMATION GROUP AND THE TECHNICAL COMMITTEES
ADOPTED BY THE 17TH ITTC

INFORMATION GROUP

(To be adjunct to the Executive Committee)

Recommendations to the 17th Conference

1. The Conference should adopt the guidelines for the preparation of ITTC Proceedings as given in Appendix 9 of the Report of the 17th ITTC Information Committee.

2. The Conference should adopt the new symbols for hydrostatics included in Appendix 4 of the same Report and the Information Group should then include these in the ITTC Standard Symbols.

Recommendations for the future work of the new Information Group

1. The Information Group should continue to monitor and co-ordinate the development of new symbols by the Technical Committees.

2. The Information Group should restructure the ITTC Standard Symbols according to the outline proposal in Appendix 5 of the Report of the 17th ITTC Information Committee and include new symbols agreed by the Technical Committees.

3. The Information Group should continue

co-operation with other organizations to achieve a common agreement on symbols and terminology.

4. The Information Group should continue to revise the Dictionary of Ship Hydrodynamics as required.

5. The Information Group should monitor the development of standard formats for the exchange of data as specific requirements arise.

6. The Information Group should continue to update the ITTC Catalogue of Facilities.

7. The Information Group should plan a group discussion on new hydrodynamic test facilities and new instrumentation systems and techniques for the next Conference. The discussion should be suitably documented by the Organizing Committee.

8. The Information Group should further develop the Index of ITTC Documents, and should update it before each Conference.

9. The ITTC Newsletter should be prepared under the auspices of the Executive Committee according to the outline pro-

posal in Appendix 12 of the Report of the 17th ITTC Information Committee.

Note: The order of presentation of the Recommendations listed above is rearranged compared with that of the Draft Recommendations as adopted at the Conference.

The name "Information Group" is con-

sistently used in place of the original Information Committee, and it addresses any similar formation to be structured by the 18th ITTC Executive Committee. The Group will also prepare programmes for the Executive Committee and Advisory Council Meetings.

RESISTANCE AND FLOW COMMITTEE

Recommendations for the future work of the Committee

1. Report additional data and analyses completed under the Cooperative Experiment Program.
2. Evaluate methods for predicting and scaling model hull boundary layers, nominal wake and viscous resistance.
3. Prepare a critical assessment of the form factor method, considering all hydrodynamic aspects.

4. Investigate the merits of model experimental methods currently used to determine appendage resistance.
5. Prepare a comprehensive description of significant physical processes associated with model hull bow flows, as derived from available data.
6. If sufficient interest exists, initiate a Cooperative Experiment Program on the resistance and flow about hulls in restricted waters.

PROPULSOR COMMITTEE

Recommendations for the future work of the Committee, to be performed in close contact with the Cavitation Committee

1. Review recent propeller work and indicate important developments.
2. Make comparative investigations of the various steps in the prediction of propeller generated pressure fluctuations on the hull (due to blade thickness, load and cavitation) in cooperation with the Cavitation Committee.
3. Investigate the validity of methods used to optimize the hydrodynamic effi-

ciency of propellers. (Problem identification and mathematical treatment.)

4. Investigate different methods to reduce propeller and thruster performance scale effect. (Testing technique, turbulence stimulation, manufacturing problems and roughness.)
5. Survey recent developments of the analytical models of conventional and novel propellers. (Lifting surface models, boundary layer development, effective wake, shed vortex sheet with special attention to tip region flow.)

6. Investigate propeller hydroelastic and strength problems. (Loads, blade deformation, stress prediction, operation in ice, fatigue, singing.)

7. Consider improvement of propeller nomenclature.

CAVITATION COMMITTEE

Recommendations for the future work of the Committee, to be performed in close contact with the Propulsor Committee

1. Work should continue to evaluate cavitation nuclei measuring and seeding techniques.

2. Further work is recommended to investigate criteria for leading edge turbulence stimulators for propeller cavitation testing.

3. Work on noise scaling laws should be pursued and should include comparisons with full scale data.

4. It is recommended to continue work on hull pressure fluctuations, with particular emphasis on cavitation effects,

tunnel wall effects and scaling. This work should be undertaken in cooperation with the Propeller Committee.

5. Work should be continued to improve cavitation erosion prediction methods for comparisons with full scale data.

6. It is recommended to continue studies of interaction effects between ship and cavitating propeller on high-speed craft to establish suitable prediction procedures.

7. Continuation of comparative tests are recommended with the "Sydney Express" model propeller for cavitation noise measurements and with soft surface coatings for quantitative erosion detection.

POWERING PERFORMANCE COMMITTEE

Recommendations for the future work of the Committee

1. The Committee should continue to monitor the use of the 1978 Method by encouraging the Member Institutions to submit the results and their experience with it so that problems may be identified and possible solutions reached. Further the Committee should continue to investigate the applicability of the Method to unconventional propulsion devices and to twin-screw

ships with emphasis laid on the scaling of appendage resistance and on the pressure of rudders in the resistance tests. In so doing more attention should be paid to ΔC_F and $w_{TM} - w_{TS}$ or $(1 - w_{TM}) / (1 - w_{TS})$ rather than processing C_p , C_N , C_{NP} data only.

2. The Committee should continue to review the progress of work on form factor and hull roughness, and pursue a more rational approach to full scale resistance extrapolation. This work

should be carried out in cooperation with the Resistance and Flow Committee.

3. Latest developments concerning scale effect on propeller characteristics and self-propulsion factors, including the applicability of results from numerical hydrodynamics, should be reviewed. The implications of propeller roughness should also be studied.

4. The Committee should review alternative methods of model testing that will lead to greater cost effectiveness.

5. The Committee should assess rational methods of performance prediction for unconventional hull-propulsor combinations and begin to prepare a standard analysis procedure for practical application.

6. The Committee should be ready to assist the High-Speed Marine Vehicle

Committee in the implementation of an analytical method of performance prediction for high speed craft.

7. An evaluation of the different methods of correcting full scale ship results for the effects of wind and current should be made in order to prepare the way for the adoption of a new standard procedure. The effect of drift and rudder angle should also be investigated.

8. The influence of hull and propeller fouling on service performance should be reviewed as published studies become available.

9. The Committee should continue to review the progress, if any, in predicting the performance of ships in shallow and restricted waters.

HIGH-SPEED MARINE VEHICLE COMMITTEE

Recommendations for the future work of the Committee

1. Undertake a continuing survey of model, full-scale, and correlation data on all aspects of the performance of HSMV's and report these results to the ITTC.

2. Continue to examine and recommend suitable model test procedures and resistance extrapolation techniques, especially as to methods for considering control surfaces, appendages and propulsors and their induced effects on running trim and resistance.

3. Continue to document the extent of linearity in the seakeeping performance of different types of HSMV's.

4. Examine and report on model test procedures for waterjet-driven HSMV's.

5. Provide a survey of available model, full-scale and correlation data on structural loads on HSMV's.

6. Provide a survey of available model, full-scale, and correlation data on manoeuvring characteristics of HSMV's.

7. Continue to identify "tankery"

problems unique to HSMV's.

8. Identify those numerical methods applicable to the hydrodynamic evaluation of HSMV's.

MANOEUVRABILITY COMMITTEE

Recommendations for the future work of the Committee

1. The description of ship steering and manoeuvring behaviour in terms of criteria or indices, as suggested by the Regulatory Bodies, should be kept under constant review. Attempts should be made to develop standard manoeuvres which are relevant to normal operating conditions. The 1975 ITTC Manoeuvring Trial Code should be revised.
2. The development of theoretical and empirical methods for the determination of hydrodynamic and aerodynamic forces acting on ships should be continued. The interaction between hull, propeller and rudder should be taken into account. More effort should be made to collect captive model data for correlation with hull form parameters. Methods for rudder force and torque prediction should be reviewed.
3. A study of system identification methods applied to model and full-scale ships should be carried out, to give insight into ship-model correlation techniques. Attention should be given to the accuracy and requirements of the necessary instrumentation and data recording equipment.
4. Encouragement should be given to ITTC Member Organizations to continue to conduct model tests to compare with the ESSO OSAKA deep and shallow water trials. The comparison of such data will allow improved methods of ship model correlation to be developed.
5. The manoeuvrability of ships in transient and non-uniform conditions should be investigated. The effects of wind, waves and non-uniform current should be studied, as well as the effects of transient and astern running propellers. Stopping, manoeuvring astern, and the behaviour of disabled ships should be given attention.
6. The instrumentation requirements for both model and full-scale testing should be kept under review, especially in cases where non-standard techniques have been developed. Manoeuvring simulator requirements for model tests, and the development of mathematical models should receive attention. A review of automatic steering techniques should be continued. A revision of the standard symbols and plotting parameters used in ship manoeuvrability studies should be carried out.

SEAKEEPING COMMITTEE

Recommendations for the future work of the Committee

1. Seakeeping continues to be an area of vigorous activity on a broad front. The Conference should be kept informed of any significant progress in solving the technical problems which are of importance to Member Organizations.
2. As a further step in the investigation of procedures for irregular wave model tests in tanks and basins, consideration should be given to supplementing the work reported to the 16th and 17th ITTC by comparative ship motion experiments. The S-175 Container Ship used for comparative assessment of ship motion prediction computer programs is proposed for this purpose.
3. In view of the possible benefits associated with the use of the Auto-Regression Method for spectral analysis of short time histories and cross-spectra it is recommended that further developments in this area be monitored and reported to the ITTC. This work should be undertaken in close cooperation with the Ocean Engineering Committee.
4. The Conference should continue to be kept informed of significant developments in seakeeping instrumentation and test techniques, including the generation and analysis of multi-directional waves.
5. The Conference should continue to be kept informed of significant developments in the availability and validity of data about ocean wave characteristics, particularly multi-directionality.
6. Procedures and instrumentation for carrying out experiments to investigate rarely occurring events such as deck wetness, slamming and capsizing should be reviewed. The Conference should be kept informed of new experiments reported in these areas.
7. Progress in the development of ship response computer predictions should continue to be monitored and assessed, with particular emphasis on significant improvements in correlation of model experiments with full-scale data.
8. Significant developments in quantifying the effects of both underwater and above-water hull forms on seakeeping performance should continue to be monitored and reported to the Conference.
9. Details of significant new developments in sea trials, particularly voluntary speed loss and methods for measuring multi-directional wave conditions during sea trials, should be reported to the Conference.
10. The Conference should be kept informed of new developments in considering the viscous effects on ship motion responses.

OCEAN ENGINEERING COMMITTEE

Recommendations for the future work of the Committee

1. The Committee is encouraged to liaise closely with other similar organisations outside the ITTC, in particular with the ISSC and IAHR, and where possible to pool information and resources in comparative studies.
2. Further efforts to understand the nature of the marine environment are necessary. *In particular, attention should be concentrated on multi-directional wave measurements (including wave kinematics), wind structure measurements (especially low frequency and spatial fluctuations), current velocity fluctuations, freak and breaking waves, and the joint probabilities of extreme wave/wind/current conditions.*
3. Comparative studies on data analysis techniques should be started in various key analysis areas. It is recommended that regular wave amplitude and frequency determination, irregular wave spectrum determination and beach reflection analysis might be fruitful areas to start with. It is suggested that data tapes (or where possible simple record generation algorithms) should be circulated, or otherwise made available, to enable every ITTC Member Organization to test and compare their analysis techniques. This work should be undertaken in close cooperation with the Seakeeping Committee.
4. Considerable attention should be directed to the problem of the estimation of the damping in floating systems with low frequency response.
5. Work on improving understanding of the flow around cylinders should be monitored. In particular, new theoretical techniques and the correlation length problem should be studied closely.
6. New developments in theoretical methods should be closely followed but with particular attention and encouragement being given to those methods that seek to deal with non-linear problems with computational economy.
7. The Comparative Semi-Submersible Wave Motions Calculation Study should be continued and extended with the objective of understanding the reasons for the different predictions made by the various computer programs. Consideration should also be given to extending the calculations and model tests to cover second-order forces.
8. Theoretical and experiment-based prediction of the behaviour of ocean structures under extreme environmental conditions is an important continuing problem. Work in this area should be encouraged with the ultimate objective of arriving at analysis techniques that will provide probabilistic measures of vessel or structure safety.

PERFORMANCE IN ICE-COVERED WATERS COMMITTEE

Recommendations for the future work of the Committee

1. Retest the Standard Model at another friction value.
 2. Further investigations on propulsion testing techniques, in particular the propulsion test data for the Standard Model should be reanalyzed and compared to reanalyzed and new full-scale data.
 3. Review the testing techniques for offshore structures in various ice conditions.
 4. Initiate work on establishing standard methods for friction testing on model and full scale hulls as well as a definition for the roughness of the hull.
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