ittc-news

INTERNATIONAL TOWING TANK CONFERENCE

June 2004 No. 50

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Message from the Chairman

I am very pleased to announce that following the nominations from Southern Europe, to fill the vacancy in the Ocean Engineering Committee, Professor Nuno Foncesa from the Marine Technology Unit of the Technical University of Lisbon (IST) has been appointed to the Committee.

Arrangements for the 24th ITTC are progressing well and you are invited to follow these on the Conference website: http://www.ittc.ncl.ac.uk

As the time for drafting the Committee reports is approaching, guidelines for the preparation of technical committee reports will be available on the Conference website from 1st July 2004.

Members of the ITTC are invited to send their suggestions for additional information that they would like to see on the Conference website to the Conference Secretariat.

With very best wishes to you all,

Atilla Incecik, Chairman
24th ITTC Executive Committee

News from the Executive Committee

The next meeting of the Executive Committee will be held in St John's Newfoundland, Canada on 10th August 2004, in conjunction with the 27th ATTC and 25th ONR Symposium.

News from the Advisory Council

The Advisory Council will meet on August 9 and 10, in St. John's Newfoundland, Canada, in conjunction with the Office of Naval Research Symposium on Naval Hydrodynamics

The agenda will include

- How to improve the processes for developing the terms of reference of technical committee, the requirements for new specialist committees and for reviewing ITTC recommended procedures.
- Topics for group discussions at the next Conference.
- Nominations of Chairman and Secretary of the Advisory Council after September 2005

ITTC Web site

The co-operation with SNAME, which hosts the ITTC web site works very well. As the final Proceedings from the 23rd Conference have been published, they will be made available on the website in the near future. The Proceedings from the 22nd Conference has now been included on the website.

News from the Technical Committees

Resistance Committee

As it was informed in ITTC News #49, the RC launched the proposal of a series of comparative tests for identifying facility biases as a part of Task 4: "Uncertainty analysis for towing tank measurements". All the ITTC institutional members were invited to participate and 18 of them answered the invitation.

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Two geosyms of DTMB 5415 Combatant, with 5.720 and 3.038 meters length respectively, will be used in the tests. After several problems in the construction of the models, the big one was constructed at CEHIPAR (El Pardo Model Basin) and the small one at CEHINAV (Escuela Técnica Superior de Ingenieros Navales, Madrid). The models and their transportation devices will be ready to start the comparative tests the last week of June 2004.

Due to the different scales of the facilities, 9 ITTC institutional members will test the big model and 9 will test the small one. The document with the technical procedures will be sent soon to all the participants.

All participants will be consulted soon about their facility schedules in order to determine the best travel plans for the models, taking into account the distance between the participant Institutions, the costs of transportation (paid by the Institution sending the model), the total travel periods of the models and the deadline of the series of tests.

The first travel of the big model is planned to the end of June 2004 and the first travel of the small one to the end of July 2004.

As already announced, CFD Workshop Tokyo 2005 (CFDWS05) will be held in March 9-11, 2005 by the National Maritime Research Institute, Japan. The committee works in close collaboration with the secretariat of the workshop, in order to contribute to the workshop, to utilize the result in Task 3: Trends in CFD, to update and improve ITTC recommended Procedure 7.5-03-01-01 "UA in CFD, Uncertainty Assessment Methodology and Procedures", and to prepare ITTC recommended Procedure 7.5-03-02-01 "UA in CFD, Examples for Resistance and Flow".

A total of 8 test cases have been determined. The cases include oblique motions, a diffraction problem, and computations with common grids as new features, in addition to conventional resistance and self-propulsion cases. Approximately 20 parties have already registered. Registration is still possible at the Workshop Web site:
(http://www.nmri.go.jp/cfd/cfdws05/index.html).

The next meeting will be held in Helsinki (Finland), on 16-17 August 2004.

Propulsion Committee

The third meeting of the 24th ITTC Propulsion Committee was held during March 31 – April 2, 2004 at the Italian Ship Model Basin (INSEAN) in Rome, hosted by Dr. Francesco Salvatore. All nine members of the Committee were present.
The focus of this meeting was on the review of the progress made by each Committee member on their respective assignment to address the two Recommendations and six Tasks given by the 23rd ITTC. The draft write-up of each member was thoroughly reviewed. Discussions were made and action items were identified that need to be addressed by the next meeting.

Topics arising in the review of recent propulsion developments include tip plate propellers, transcavitating propellers and composite propellers, whilst waterjets and podded propulsors are being dealt with by the relevant specialist committees. New experimental methods include developments in PIV and high-speed camera techniques. The review of propulsion and cavitation procedures is being supported by the use of questionnaires and the Committee is very appreciative of those tanks that have responded. The six tasks are progressing well, entailing a procedure for model propeller accuracy, the numerical design of propellers, secondary thrusters, propulsion issues in shallow water, numerical predictions of effective wake, cavitation and induced hull pressures and issues relating to large propellers for mega container ships. Continued interactions will be maintained with other related Committees including the Powering Performance Committee, Cavitation Erosion Committee, Azimuthing Podded Propulsor Committee, and Waterjet Committee to avoid duplicative efforts.

The next meeting is tentatively scheduled for 3-5 November 2004 at the David Taylor Model Basin, in the U.S. to be hosted by Dr. Ki-Han Kim.

Manoeuvring Committee

Prof. K.P. Rhee hosted the third meeting of the Maneuvering Committee (MC) on 6-7 April 2004 at Seoul National University, Seoul, Korea. Seven of the eight members attended.

Extended outlines and progress on all sections of MC Report and Quality Manual (QM) Procedures (see ittc No. 49) discussed through presentations by Section and QM Procedure leaders. Separate Sections for Scale Effects and Full-Scale Validation, Physics, and Conclusions will not be included in MC Report, but incorporated into other Sections. QM Procedures for uncertainty analysis (UA) for static and dynamic captive model tests will be combined.

New Table of Contents and list of QM Procedures are:

Table of Contents 24th ITTC MC Report:

QM Procedures:

Preliminary Conclusions and Recommendations listed. MC discussed recommendation that 25th ITTC MC organize "Workshop on Verification and Validation of Ship Maneuvering Simulation Methods." MC discussed need for identification of new benchmarks for validation of maneuvering simulation methods for modern hull forms, including effects of stern shape variations. KRISO VLCC and VLCC2 were discussed as good candidates. A formal request made to KRISO for public use of the maneuvering data for these hulls, as was done previously for the resistance and propulsion data, was recently approved. Progress on UA for static and dynamic captive model tests is very good and MC is on track for comparisons of UA results from more than one facility. Progress on UA for free model tests is unfortunately not good. Plans made to initiate this task. Response to MC Questionnaire was less than desirable. Questionnaire will be redistributed with hope of getting at least 30 responses.

The next meeting will be held on 4-5 November 2004, BEC, Val de Reuil, France.

Complete drafts all Sections and QM Procedures distributed by Section and QM Procedure leaders by 1 October 2004. MC Secretary will submit all MC QM Procedures to QSG by 31 October 2004. Plans made for final editorial meeting on 31 March – 1 April 2005 at SVA, Potsdam, Germany

Seakeeping Committee

The 24th ITTC Seakeeping Committee had its 3rd meeting at Shanghai Jiao Tong University, Shanghai, China.

Progress on each task was reported by the assigned member, and there was detailed discussion by all the attending members. Specifically, progress was made in the areas of:

* Seakeeping experimental procedures and benchmark data;
* Techniques of predicting power increase in irregular waves from model experiments in regular waves;
* Frequency domain, seakeeping computer code validation processes;
* Development of time domain, seakeeping computer code validation procedures;
* Experimental and numerical techniques for predicting rarely occurring events (e.g., slamming, deck loads, whipping loads, and parametric rolling);
* Methods to determine impulsive pressure loads on ship structure; and,
* The philosophy, value and availability of operability criteria and uncertainty analysis procedures.

Tasking to be completed by the next meeting were confirmed and the table of contents of the final report of the Seakeeping Committee was agreed to.

The next & final meeting is to be held in Washington D.C., U.S.A. in January 2005, where the final report is to be completed.

Ocean Engineering Committee

The OE Committee has welcomed Prof. Nuno Fonseca, Istitutto Superier Tecnico, Lisbon, Portugal as its new member from Southern Europe.

The second committee meeting was held in Trondheim, Norway, during18-19 March 2004. After communication with the Advisory Council, the total number of sub-tasks of the committee have now been slightly reduced (but still following the main structure decided earlier), and the details were settled at the meeting.

The State-of-the-Art Review Review was discussed in detail, and an outline of the content was decided. There are several topics included, and they will not all be commented here, but it can mentioned that a substantial part of it will be devoted to the behaviour of floating structures, which was divided into 5 subtopics:

- New concepts and challenges

- Small floating structures

- Impact loading to to green water and sloshing

- Hybrid (CFD/Potential flow) numerical methods

- Multi-body hydrodynamics

Procedures for verification and validation in the time domain has been removed from the tasks list, one will presently concentrate on the review of procedures for codes in the frequency domain.

The tasks related to VIV has been reduced to monitoring only, while the committee does not intend to propose methods to model systems subject to VIV. This is because that subject will require more work than is possible within the time available for this committee.

A benchmark study on the modelling of extreme nonlinear waves in a 100-year sea state has been initiated. The detailed specification are now being settled, and the study is planned to be carried out during 2004.

The next meeting is to be held in Rio de Janeiro during 4-5 November, 2004, while the final meeting is scheduled to be held in Hiroshima, Japan in February or March, 2005.

Committee on Stability in Waves

The Committee had its most recent meeting in Trieste, Italy on 21-22 February 2004. The meeting started at the University of Trieste and then moved to the (warmer) residence of Professor Francescutto and the hotel because of energy shutdown during the weekend at the university. Progress reports and actions were tabled from the committee members. Progress on the various committee tasks has been as follows.

(1) Prediction of extreme motions and capsizing of intact ships: coordinated by Dr. N. Umeda and Dr. K.J.Spyrou

For numerical modelling technique of intact stability, the benchmark testing study was defined and launched. Although it was initially planned for both a container ship and a purse seiner, hull form data of the purse seiner are available for the participants so far. The participants are requested to calculate turning manoeuvres, roll decay tests, ship motions (steady roll or capsize) in beam waves and in following and quartering waves, as well as the wave-induced forces and moments acting on a hull with their own numerical models and submit them to the Committee by the end of September 2004. The results will be published with experimental data from NRIFE and Osaka University. For updating the recommended procedures of model tests on intact stability, a detailed questionnaire on the existing procedures has been distributed among the experts in this field, who have been requested to reply by the end of May 2004.

(2) Prediction of dynamics of damaged ships: coordinated by Prof. A. Papanikolaou and Mr. T. C. Smith

The benchmark testing study of numerical modelling on damage stability is also ready. Here it will start with the roll motion in calm water and then will be extended to the motions in waves. The subject ships are two ro-ro ships and one tanker. Experimental data will be used from DMI, MARIN and SSRC (NA-ME). This study will be completed by the end of September 2004. A detailed questionnaire on the existing recommended procedures on model tests on damage stability like that for intact stability has been distributed to invite experts' opinions and its deadline is the end of June 2004.

(3) Stability safety assessment: coordinated by Prof. A. Francescutto

A review on stability assessment methodologies covering all IMO instruments was updated. The Committee will develop revision of the existing procedures on model tests from the viewpoint of probabilistic approach or risk-based design.

(4) IMO matters: coordinated by Prof. D. Vassalos

The Chapters 1-3 of the IMO interim guidelines of high-speed craft model tests were examined paragraph by paragraph. A major proposed revision is that the number of required wave and operational conditions be reduced. Because of the limitation of time, the committee agreed that a small group meeting for revision of the remained parts should be held and report its findings by the end of October 2004.

(5) Evacuation in waves: coordinated by Prof. J. Matusiak

The literature review on evacuation in waves was updated..

(6) ITTC Member survey: coordinated by Prof. S. Fan

A general questionnaire on stability in waves was distributed among the ITTC member organisations. Unlike the detailed questionnaires on model tests mentioned above, this questionnaire form is designed to be broad in terms of scope and can be easily filled out. The deadline of this survey is 15 May 2004.

For facilitating the above activities, the web site of this committee is provided with the following web address.

http://www.naoe.eng.osaka-u.ac.jp/ittc-stability/

You may find all necessary data for benchmark testing studies as well as questionnaire forms at this web site. In addition, an initial discussion on the outcome of the benchmark testing studies is planned for the 7th International Ship Stability Workshop hosted by Shanghai Jiao Tong University in China on 1-3 November 2004.

The next committee meeting will be held at MARIC in Shanghai, China in 4-5 November 2004.

Committee on Assessment of Ocean Environmental Issues

The Committee on the Assessment of Ocean Environmental Issues (CAOEI) held its 2nd meeting on January 8 and 9, 2004, which was kindly hosted by Professor Yusaku Kyozuka at Kyushu University in Fukuoka, Japan. Dr C-G Kang chaired the meeting. Five of the Committee's six members attended, including our new member, Dr Kazuo Nishimoto of the University of Sao Paulo.

The committee's scope is focused on reviewing (1) ocean environmental issues arising from pollutants, (2) technology for mitigating the pollutants' impacts on the ocean, (3) experimental and numerical techniques for predicting their distribution, (4) oceanographic equipment and sensors for their detection, and (5) pollution recovery equipment and procedures.

The pollutants of immediate interest are spilled and discharged oil, marine debris and seabed litter, ballast water, CO_2, and nutrients. During the 2nd meeting, committee members presented draft reviews according to our original task allocation and agreed to prepare a first draft report before the 3rd meeting in St. John's in August 2004.

Ice Committee

The 24th ITTC Ice specialist committee had its 2nd meeting in Germany. The meeting was hosted by Dr. J. H. Hellmann of the Hamburg Ship Model Basin (HSVA) on May 21 and 22, 2004. This coincided with the 14th International Conference on Offshore and Polar Engineering (ISOPE-2004, In France).

The members of the committee toured the HSVA laboratories, most members saw these laboratories for the first time. Definitely, the ice tank, the towing tank and other facilities at HSVA were impressive. During the facilities tour, members of the committee talked about the different techniques used to grow ice, testing practices, ship model construction and data acquisition systems used by the HSVA as compared to those used by other tanks in other countries, such as Finland, Canada, Russia and Japan. By any standards, this was a very useful and a very beneficial discussion (it was a real eye opener for most members).

The ice committee has 5 tasks, during the meeting, it was realized that the committee is in control of all tasks. Furthermore, it was agreed that preliminary task reports will be submitted during the next meeting (the next meeting was set to be around October-November, 2004, no host laboratory was selected yet).

It should be noted that at the beginning of the mandate of the 24th ITTC ice committee, Task # 3 (Performance of Propellers in Ice) was not very clear. In this meeting, the leader of that task (Mr. Topi Leiviskä, from Finland) developed test plans, which he will carry out during this summer- early fall in the ice tank of the HUT (Helsinki University of Technology). He is, also, collaborating with the IOT/NRC, Canada, and HSVA, Germany, on the same subject, but the focus will be on podded propellers. In the ship industry market, over the last couple of years, there is a significant demand for podded propellers R&D.

Work on Task # 1 (Experimental Uncertainty Analysis, led by Dr Ahmed Derradji-Aouat) is completed but a draft for the procedure is yet to be written. Similar conclusion was reached for Task # 5 (Review recent developments in the remote sensing of sea ice conditions) led by Dr. Chang-Kyu Rheem, Japan.

Task # 2 (Performance of offshore structures in ice-infested waters) led by Dr. Yue Qianjin, China, and Task # 4 (Review the numerical methods applied to ice engineering) led by Dr. Jens-Holger Hellman, Germany, are still underway. However, no major problems are expected. Both leaders will provide draft reports on their respective tasks during our up-coming committee meeting (that will be the third – and last – meeting of the committee).

Committee on Validation of Waterjet Test

The Committee for Validation of Waterjet Test Procedures (Waterjet Committee in short), is now entering its final and possibly most decisive phase. The Committee was given the task to finalize the standardization tests and to develop procedures and nomenclature (where needed) for the performance pre-

diction of waterjet driven vessels. The standardization tests should also be used to feed the uncertainty analysis.

The status of the standardization tests, currently underway, has recently been reviewed at the latest meeting in May at the University College London. Two sets of tests are set out; One being the Self Propulsion Test to determine the overall performance, including jet-hull interaction, the other being the Waterjet System and/or Pump test, to determine the Waterjet System characteristics. The results of both tests are in the end needed to arrive at an overall powering prediction.

The status of the Self Propulsion Tests at that time was that of the 11 institutes that had entered the world wide test circuit, seven institutes had finished the tests. The results of three other institutes are scheduled to be incorporated in the Report, which brings the number of participants that finish in time well above the aspiration level of seven.

Mechanical problems were encountered with the "European Model" at the end of October last year, where the adhesive bond between the impeller and the shaft came off, thereby not only damaging the impeller but the pump housing as well (see photo). Adequate action from El Pardo and our NSWCCD member John Hoyt ensured that a new impeller was shipped to Spain some 6 weeks later and that at the moment of writing, the repaired model is at SVA Potsdam.

An unintended close look into the damaged waterjet for self propulsion tests.

On the waterjet system/ pump tests, some more delays were incurred. Two institutes have finished testing, yielding the results of one waterjet system test and two pump tests. It is expected that in the end, five independent pump test results and two waterjet system test results will be available. Although the aspiration level for the waterjet system tests is not attained, it is expected that sufficient material from both the tests and the already conducted CFD analysis provide sufficient insight to propose sound procedures.

The committee has decided not to pursue any further systematic CFD work. Although originally aspired, this decision needed to be taken because the additional work load could not be managed, because it is not a primary task of the Committee to propose procedures for CFD on waterjet systems and because the currently available CFD results (largely from the ONR Gulf Coast Project) are considered to provide adequate insight.

An outline of the Committee's Report has been defined and three contributions to the Quality Manual are planned, consisting of:

- A procedure for Waterjet Self Propulsion Tests
- A procedure for Waterjet System and Pump Tests
- An example Uncertainty Analysis for a Waterjet Powering Performance Prediction

Committee on Cavitation Erosion on Propellers and Appendages on High Powered/High Speed Ships

The third meeting of the committee was held on the 25th and 26th May 2004 immediately prior to a workshop convened to discuss the latest research in cavitation erosion.

The workshop was hosted by Bassin d'Essais des Carenes, Val de Reuil and coordinated by committee member Laurence Briançon-Marjollet with the assistance of the rest of the committee. The two-day workshop attracted over 40 international researchers from a wide range of disciplines and industries. The topics covered ranged from the latest experimental techniques using high speed video techniques, laser image capture, and vibro-acoustic measurement; alongside numerical predictions based on computational fluid dynamics and embedded phenomenological models; through to recommendations for scaling procedures and guidelines for design. Overall the workshop was very successful in achieving its aim and is of considerable benefit to the progress of the work of the committee.

During the committee meeting itself the committee discussed the work carried out so far on the three tasks assigned. Considerable discussion was made as to suggestions for scaling approaches and also into design guidelines/practical solutions and how best these could be used. Following this the initial

draft of a recommended procedure for carrying out model scale cavitation erosion tests was debated. This was based on the responses received so far to the committee's questionnaire circulated to all members of the IttC in December '03. Although enough responses had been returned the committee would still urge those institutions, especially those engaged in commercial testing, who have still to complete this to email them directly to Juergen Friesch (Friesch@hsva.de) as soon as possible. The final meeting of the committee will be held in Southampton on the 3rd/4th February 2005 when the final report will be edited.

Committe on Azimuthing Podded Propulsion

In its 2nd meeting held in Genoa in last October, the committee decided to actively take part in the forthcoming international conference (T-POD) dedicated to podded propulsion. This would provide opportunity for the dissemination of new information on podded propulsion that can be useful for the committee's activities as well as to be included in the review section of the committee report. In fact one of the objectives of this conference was to contribute in the activities of this committee.

T-POD (Technological Advances in Podded Propulsion) was the 1st International conference dedicated to podded propulsion. It was held in 14th-16th April 2004, in Newcastle upon Tyne (UK) and organised by Newcastle University as part of their ongoing EU-FP5 research project FASTPOD (Fast Ship Applications for Pod Drives). During the conference 37 technical papers were presented under 12 sessions, dedicated to: FASTPOD project; Design technology; Innovative Solutions; Motion Response; Ice Applications; RANS Applications; CRPs; Manoeuvring Loads; Manoeuvring Response; Operational technology; Experimental Technology; and Hydrodynamic Modelling. The conference was well represented by 120 industrial and academic delegates and closed successfully with a joint presentation by the Royal Caribbean and the Celebrity Cruise reflecting their operational experiences. Entire conference papers were edited and collected in a hardcopy T-POD Conference Proceedings that can be obtained by request at http://tpod.ncl.ac.uk/

T-POD conference was chaired by the chairman of this committee and five of the committee members including Dr N. Sasaki, Dr A.V. Pustoshny, Dr A. Sanchez-Caja; Dr P. Liu and Prof M. Atlar (Chairman) all presented papers in the field of powering performance, manoeuvring and RANS applications which are also part of their ITTC activities. The proceedings of the conference have been currently reviewed by all the members to be discussed in the next and 3rd meeting of the Committee.

The next meeting of the Committee has been scheduled in August 13-14, 2004 to be hosted by the National Research Council, Institute for Ocean Technology, in St John's, Canada. This will be in connection with 25th ONR Symposium on Naval Hydrodynamics.

Committee on Powering Performance Prediction

The third meeting of the specialist committee was held from the 1st to 3rd March, 2004 in Shanghai, hosted by CSSRC. Seven members of the Committee attended.

The draft version for the ITTC procedure for conduct of speed and powering trials has been finalised to submit to the QSG. Good progress was also made on the speed and power trials analysis procedure. Replies to the questionnaire on new extrapolation techniques, including use of RANS have been received, and details of such methods are being collected. A procedure for the direct calculation of Grigson's frictional line has been prepared.

A substantial amount of model test and ship trials data were collected to be utilised for the validation analysis of extrapolation techniques. Variations of extrapolation techniques shall be tested using this database. Supplementary model tests are being conducted in the Vienna model basin to be utilised in both validation of extrapolation techniques and uncertainty analysis for the extrapolation methods. Uncertainty analysis for extrapolation has been investigated both by using Monte Carlo simulations and uncertainty propagation through reduction equations.

The next and final meeting of the Committee will be held at Memorial University of Newfoundland in St. Johns on the 1st, 2nd and 3th November, 2004.

Quality Systems Group

The QS Group has prepared a document template fort he writing of ITTC Recommended Procedures. This template has been sent out to all committee chairmen and we kindly ask them to use this template for the production of new procedures. When updating existing procedures the present format of the procedure should be used.

The updating of the symbols list to comply with ISO standard is in progress.

Member Organisations

All member organisations can be found on the ITTC website. In order to maintain a correct and complete lists all members are urged to inform the AC secretary (willem.van.berlekom@sspa.se) of any corrections and/or updates.

Next issue of the ITTC News

The next issue of the ITTC News , No 51, is planned to be published on December 15, 2004. Deadlines for contributions is November 30, 2004.