The Quality Systems Group

Final Report and Recommendations to the 25th ITTC

1. GENERAL

1.1 Membership and Meetings

Dipl. Ing. Barbara Günther, SVA Potsdam, Germany

Prof. Dr. Ing. Marco Ferrando, University of Genoa, Italy

Dipl. Ing. Akio Ito, IHI Corporation. Japan

Dr. Chun-Ju Lee, MOERI (former KRISO) Korea

Prof. Dr. Ing. Gerhard Strasser, Vienna Model Basin, Austria

The group met three times:
6th – 7th July 2006 Yokohama, Japan
25th – 26th June 2007, Potsdam, Germany
7th – 8th April 2008, Genova, Italy

All members attended all meetings
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1.2 Tasks given by the 24th ITTC to the QS Group.

1. Revise and update the ITTC Recommended Procedures. Modify and re-edit the existing procedures according to the comments of the Conference and the Technical Committees.

2. Update the ITTC Symbols and Terminology List.

3. Cross - check the ITTC Symbols List and the Dictionary with other standards e.g. ISO Standards

4. Stimulate, monitor and support validation work within the Technical Committees.

Additional tasks received by the AC.:

5. Produce a procedure on the review process of the AC Working Groups.

6. Format the Rules for ITTC as a Procedure.

7. Consider ways of publishing data.

2. TASKS PERFORMED

2.1 Procedure on the Review Process of the AC Working Groups.

By the Advisory Council a procedure for the review of the ITTC Recommended Procedures and Guidelines by the AC was developed.

Procedure 4.2-03 was prepared. It deals with work organization within the Advisory Council with regard to tasking and monitoring the Technical Committees and Groups:

1. The Secretary of the Executive Committee should write to the chairmen of all of the technical committees after the Conference to inform them of the tasks for each committee.
2. The Advisory Council should review the progress of the work of each committee.

Each committee should prepare an interim report for consideration at the Council meetings; the reports should include a statement on the progress of the committee's work, attendance at meetings, and any other matters requiring the attention of the Council.

3. Drafts for new or amended procedures should be submitted to the Advisory Council during the autumn the year before the full Conference.
4. The EC and AC secretary should write a note to all TC chairmen giving the formalities and deadline dates, which the committees should follow.
5. The AC should perform the following task
   a) draft recommendations for terms of reference (ToR) for general committees
   b) identify requirements and propose terms of reference for specialist technical committees
   c) review and make recommendations on proposed ITTC procedures
   d) propose topics for group discussions at the full Conference
   e) support the new Committees as regards the start up and interpretation of their tasks

To this effect and acc. to rule 7.4 of the ITTC, several Working Groups can be established within the Advisory Council. The number of working groups, as well as the committees to be monitored by each group have to be decided at the first AC meeting of each conference. For each group a chairman will be nominated to co-ordinate the work of the group. The working load should be evenly distributed among the Working Groups.

Each Working Group has to report to the Advisory Council Meetings.

The following criteria have been established to assist the Advisory Council Working Groups to come to consistent decisions when reviewing proposed ITTC recommended procedures.

1. Accepted without reservation and proposed to the Full Conference.
   The procedure describes current practice in many organizations, and while not all organizations will follow it in all details there is sufficient flexibility in the procedure to enable most organizations who are active in the area to follow it "in principle", and to note the exceptions in their own procedures.

2. Accepted, with minor editorial revisions proposed to the Full Conference.
   The procedure will be acceptable provided minor editorial changes are made. To ensure consistency Quality Systems Group will make the changes, and the procedure will be returned to the technical committee for its acceptance of the changes.

3. Accepted, with areas of concern noted proposed to the Full Conference.
   The procedure, although requiring more work, will be useful to the ITTC members as it is written and should be proposed without delay. The comments of the working group should be published with the procedure. It is impractical for the present technical committee to make the changes required to address the working group's concerns in the time available. The revisions will be done by another committee and included in a later revision.

4. Proposing postponed
   Either the physical basis of the procedure is not in line with current practice or there are other technical problems making the procedure impractical for many organizations to follow. A procedure might also not be accepted because the document is not drafted to a level of detail at which it could be useful or because it is inconsistent with other published ITTC procedures. The revisions required are major and would be proposed as a task for a future committee.

Procedure 4.2-01 "Adoption or Modification of ITTC Recommended Procedures and Guidelines had to be adjusted accordingly.

2.2 Review of the "ITTC Recommended Procedures"

During the 24th ITTC it has been decided that the technical committees in addition to the new procedures review some of the ITTC Recommended Procedures with respect to content and actuality. This in the long run should lead to higher quality of the Procedures.

The following procedures have been produced or updated by the Technical Committees and following the new procedure reviewed by the Advisory Council. After this all the below procedures have been reviewed also by the ITTC QS Group.

The list below shows that there is only one procedure with "Concern noted" and none is postponed. This is, compared to the last period, an improvement.

Additionally the Register 0.0 has been updated.

Furthermore the QS Group has revised existing procedures with respect to symbols, terminology and formatting issues:

7.5-02-01-03
7.5-02-03-03.2
7.5-02-03-03.4
7.5-02-04-01
7.5-02-04-02
7.5-02-04-02.1
7.5-02-04-02.2
7.5-02-04-02.3
7.5-02-04-02.4
7.5-02-04-02.5
7.5-02-05-04
7.5-02-05-04.1
7.5-02-05-05
7.5-02-05-06
7.5-02-05-07
7.5-02-07-03.3
7.5-02-07-04.2
7.5-02-07-04.3
7.5-03-01-04
7.5-03-01-02
7.5-03-01-03
7.5-03-02-01
7.5-03-02-02
7.5-04-01-01.1
7.5-04-01-01.2
7.5-04-03-01

Procedures dealing with uncertainty analysis could not be updated because the Symbols List for uncertainty was not updated by the time when the review was done. The Symbols List has now been supplied by the Specialist Committee of Uncertainty Analysis. The AC has decided that these procedures are going to be updated in the next period.

During the revision it turned out that there was a necessity to approach the advisory council with regard to waterjet propulsion (7.5-02-05-03.1, 7.5-02-05-03.2, 7.5-02-05-03.3), as there are many symbols not included in the symbols list and the group has not the competence to "confirm newly invented symbols". These procedures should be updated during the next period.

Also the template for producing ITTC Recommended Procedures and Guidelines has been updated.

Committee	Submitted procedure	AC decision	Comments
Advisory Council	1.0-01 Rules of the ITTC	Accepted	Rewrite
	4.2-01 Adoption or Modification of ITTC Recommended Procedures and Guidelines	Accepted	Update
	4.2-03 Review of ITTC Recommended Procedures by the Advisory Council	Accepted	New
Resistance	7.5-01-01-01 Ship Models	Minor revision	Review
	7.5-02-02-01 Resistance Tests	Accepted	Review
	7.5-02-02-02 Uncertainty Analysis, Example for Resistance Test	Accepted	Review
	7.5-02-02-03 Uncertainty Analysis, Spreadsheet for Resistance Measurements	Accepted	Review
	7.5-02-02-04 Uncertainty Analysis, Spreadsheet for Speed Measurements	Accepted	Review
	7.5-02-02-05 Uncertainty Analysis, Spreadsheet for Sinkage and Trim Measurements	Accepted	Review
	7.5-02-02-06 Uncertainty Analysis, Spreadsheet for Wave Profile Measurements	Accepted	Review
	7.5-03-01-01 Uncertainty Analysis in CFD, Verification and Validation Methodology and Procedures	Minor revision	Review
Propulsion	7.5-01-02-02 Propeller Model Accuracy	Minor revision	Review
	7.5-02-03-01.1 Propulsion Test	Minor revision	Review
	7.5-02-03-02.1 Propeller Open Water Test	Minor revision	Review
	7.5-02-03-02.3 Guide for use of LDV	Accepted	Review
	7.5-02-05-02	Accepted	Review

Committee	Submitted procedure	AC decision	Comments
	High Speed Marine Vehicles, Propulsion Test		
Manoeuvring	7.5-02-06-01 Free model test	Accepted	Review
	7.5-02-06-02 Captive model test	Accepted	Review
	7.5-02-06-03 Validation of manoeuvring simulation models	Accepted	Review
	7.5-04-02-01 Full scale manoeuvring trials	Minor revision	Rewrite
Seakeeping	7.5-02-07-02.1 Seakeeping experiments	Accepted	Update
	7.5-02-07-02.2 Prediction of Power Increase in irregular waves from model tests in regular waves	Accepted	Rewrite
	7.5-02-07-02.3. Experiments on Rarely Occurring Events	Minor revision	Update
	7.5-02-07- 2.6 Validation of sea keeping computer codes in the time domain	Accepted	New
Ocean Engineering.	7.5-02-07-01.1 Laboratory Modelling of Multidirectional Irregular wave spectra	Minor revision	Review
	7.5-02-07-03.1 Floating offshore platform experiments	Minor revision	Review
	7.5-02-07-03.2 Analysis Procedure for Model Tests in Regular Waves	Minor revision	Review
	7.5-02-07-3.4 Stationary Floating System Hybrid Mooring Simulation, Model Test Experiments	Accepted	Review
	7.5-02-07-03.5 Truncation of Test Models and Integration with Numerical Simulations	Accepted	Review

Committee	Submitted procedure	AC decision	Comments
Stability in Waves	7.5-02-07-04.1 Model Tests on Intact stability	Accepted	Update
Uncertainty Analysis	7.5-01-03-01 Uncertainty Analysis, Instrument Calibration	Accepted	New
	7.5-01-03-02 Uncertainty Analysis, Laser Doppler Velocimetry Calibration	Accepted	New
	7.5-02-03-03 Uncertainty Analysis, Particle Imaging Velocimetry	Accepted	New
	7.5-02-01-01 Uncertainty Analysis in EFD, Uncertainty Assessment Methodology,	Accepted	Review
	7.5-02-01-02 Uncertainty Analysis in EFD, Guideline for Resistance Towing Tank Tests	Accepted	Review
Ice	None		
Cavitation	7.5-02-03-03.7 Prediction of Cavitation Erosion Damage for Unconventional Rudders or Rudders behind Highly Loaded Propellers	Minor revision	New
	7.5-02-03-03.8 Modelling the Behaviour of Cavitation in Waterjets	Accepted	New
Podded propulsion	7.5-02-03-01.3 Podded Propulsor Tests and Extrapolation	Concern noted	Update, had been postponed in last period
Powering performance prediction	7.5-02-03-01.4 1978 ITTC Performance Prediction Method	Bigger revision	Update
	7.5-02-03-01.5 Predicting Powering Margins:	Minor revision	Update

Committee	Submitted procedure	AC decision	Comments
	7.5-02-05-01 High Speed, Resistance Test.	Minor revision	Update
Wake field	7.5-02-03-02.4 Nominal Wake Measurement, LDV Procedure	Minor revision	New
	7.5-02-03-02.5 Nominal Wake Measurement, 5 hole Pitot tube procedure	Minor revision	New
	7.5-02-03-03.1 Model Scale Cavitation Test	Minor revision	Update
	7.5-02-03-03.3 Cavitation Induced Pressure Fluctuations Model Scale Experiments	Minor revision	Update
	7.5-02-03-03.5 Cavitation Induced Erosion on Propellers, Rudders and Appendages, Model Scale Experiment	Minor revision	Update
	7.5-02-03-03.6 Podded Propulsor, Model Scale Cavitation Test.	Minor revision	Update
QS Group	4.2.3-01-01 Guide for the Preparation of ITTC Recommended Procedures and Guidelines		
	4.2.3-01-03 Work Instruction for Formatting ITTC Recommended Procedures and Guidelines		

2.3 Updating of the ITTC Symbols and Terminology List.

The list has been generally updated with the inclusion of a set of symbols on uncertainty analysis which has been supplied by the Specialist Committee on Uncertainty Analysis.

The dictionary also has been cross-checked with the ITTC Symbols List.

The dictionary has been reformatted in the common ITTC style (two columns etc).

2.4 Cross - checking the ITTC Symbols List and the Dictionary with other standards e.g. ISO Standards

The procedure 7.5-01-02-01 "Terminology and Nomenclature for Propeller Geometry" does not comply with the ISO standard ISO 3715-1 Vocabulary for geometry of propellers; however, this ISO standard does not comply with ISO 31 either. So we notified the ISO committee on propellers. They agreed to at least have a look at it.

2.5 Support of work within the Technical Committees.

The QS Group had contact with all Technical Committees apart from the Specialist Committee on Ice.

All submitted procedures have been reviewed.

2.6 Rules for ITTC as a Procedure.

The AC has reviewed, practically rewritten, the ITTC Rules which have been formatted by the QS Group.

2.7 Ways of publishing data, benchmarks

There were frequent requests for publishing data to the ITTC community. The QS Group was asked to consider the problem how to store an publish data. There seems to be confusion on what data to store and how they are to be stored. For this reason some definitions are given:

Data: A collection of natural phenomena descriptors, including the results of experience, observation or experiment, or a set of premises. This may consist of numbers, words, or images, particularly as measurements or observations of a set of variables.

Database: A structured collection of records or data that is stored in a computer system. A database relies upon software to organize the storage of data. In other words, the software models the database structure in what are known as database models (or data models). The model in most common use today is the relational model.

The basic data structure of the relational model can be thought of as a table, where information about a particular entity (say, a ship) is represented in columns and rows (also called tuples). Thus, the "relation" in "relational database" refers to the various tables in the database; a relation is a set of tuples. The columns enumerate the various attributes of the entity (the ship's main data), and a row is an actual instance of the entity (a specific ship) that is represented by the relation. As a result, each tuple of the ship table represents various attributes of a single ship

All relations (and, thus, tables) in a relational database have to adhere to some basic rules to qualify as relations. First, the ordering of columns is immaterial in a table. Second, there can't be identical tuples or rows in a table. And third, each tuple will contain a single value for each of its attributes i.e. each tuple has an atomic value.

A relational database contains multiple tables, each similar to the one in the "flat" database model. One of the strengths of the relational model is that, in principle, any value occurring in two different records (belonging to the same table or to different tables), implies a relationship among those two records.

Benchmark: A standardized problem or test that serves as a basis for evaluation or comparison (as of computer system performance)

Benchmark data: A data collection as base for a benchmarking process (See ITTC Recommended Procedures and Guidelines 4.0-01).

The QS Group cannot foresee a general scheme on data collection. The way data are published depends on the purpose. In any way it has to be data in digital form.

The QS Group recommends using preferably MS Access as data base software because

of its widespread availability (part of MS Office). A collection of data in the form of excel sheets can be transferred into MS Access. Also if commercial databases are used MS Access can usually be transferred to these.

If a committee wants to make data available to the ITTC in future they should supply the set of data in the suggested form. The data then should be published in the official ITTC website.

3. OTHER MATTERS

3.1 Questionnaire

A questionnaire has been sent out to all ITTC member institutions. 18 member institutions answered. The aim was to verify the usage of the ITTC QS Manual and also to find out whether there are requirements for new procedures from member organizations not represented in the Advisory Council.

The suggested topics given by the member organizations as an answer to questions 12 and 13 of the questionnaire were:

- Turbulence stimulator for ship with bulb (position, texture)

- *Re*-Number correction for ship propeller, surface texture (ITTC - 30 micrometers, ISO 484/1-1981 (E) different classes 3 .... 25 micrometers)

- *Re*-Numbers in open water test for determination of propulsion coefficients (low - like in propulsion test or high - and correction for the calculation of test results)

- Submerged bodies SES

- Flow measurement and visualisation (including wake survey), turbulence stimulation on models and appendages and full-scale sea-keeping trials. Uncertainty for propulsion and manoeuvring experiments in ice.

- Extrapolation procedure for pod propulsion

- Inland Ships and Navigation

Almost all of the proposed subjects have been taken into account by the new committee structure decided by the AC.

	Question	Yes	No
1	Are you following any quality control system?	17	1
2	Is your company certified acc. to ISO 9000?	7+1	8-1
3	If yes: when you are maintaining your ISO 9000 QS do you refer to the ITTC QS Manual?	5	6
4	Has your company used the ITTC Sample QS Manual as one of the documents for establishing a quality control system?	11	5
5	Are you using or referring to the ITTC-Recommended Procedures and Guidelines?	18	
6	Are you using or referring to the Work Instructions contained in the ITTC QS Manual	13	5
7	Is the use of the symbols defined in ITTC Symbols List enforced in your company?	11	7
8	Are you aware of the ISO requirements prescribing the formatting of the symbols?	6	12
9	In case you are using the Symbols List are you using primarily the alphabetic one?	7	6
10	In case you are using the Symbols List are you using primarily the structured one?	7	4
11	Does your company use or take advantage of the ITTC Dictionary?	11	7
12	Does your company wish to have a developed an ITTC Recommended Procedure or Guideline on a special topic?	5	13
	If yes, which _____ _____		
13	Does your company wish some completion or supplement to an existing Recommended Procedure or Guideline?	4	14
	If yes, which _____ _____		
14	Does your company have an educational or training program for establishing and maintaining the use of ITTC-Recommended Procedures and Guidelines?	0	17

3.2 Cancelled Procedures

The Procedure 7.5-02-03-02.3 has been replaced by 7.5-02-03-02.4.

3.3 Observation of the Development or Revision of ISO Standards Regarding Quality Control

There are some minor modifications of the ISO 9000 Standard in preparation, however there no need for action at the moment.

3.4 General Observation Regarding Procedures and Symbols

The experience of the QS Group of the 24th ITTC showed that the procedures of many technical committees do not really comply with the ITTC symbols list and also the formatting given in ITTC Procedure 4.2.3-01-01, Guide for the Preparation of ITTC Recommended Procedures. One main issue is the style of subscripts. Very often it is not understood or ignored that a descriptive subscript should be in Roman letters and a subscript referring to a variable should be in Italic letters.

Again the Group asks the Technical Committees to stick to given formats. Organizations should continue to use the ITTC Recommended Procedures as a reference in their own Quality System.

Member Organizations should apply the ITTC Symbols and Terminology List in all their publications.

Members and Member Organizations are encouraged to state the need for new ITTC Recommended Procedures if it is identified.

Members and Member Organizations are encouraged to identify and state the need for updating the ITTC Symbols and Terminology List including the need for new or missing symbols.

3.5 Distribution and publication of QS Manual

The access to the ITTC website is via http://ittc.sname.org. It contains all the official documentation including ITTC Recommended Procedures, the ITTC Symbols List, Quality Control Sample Manual, and the ITTC Dictionary. Nevertheless it was decided in the AC to produce the whole ITTC QS Manual on CDs and distribute one CD to each member of the ITTC. This should insure a quick and uncomplicated way to have access to the newest version of the ITTC QS Manual.

4. CONCLUSIONS

All ITTC Recommended Procedures have been updated with regard to the ITTC Symbols and Terminology List. Many Procedures have been updated by the technical committees. The update of the ITTC Symbols and Terminology List in the field of uncertainty analysis and water-jet propulsion systems could not be completed satisfactorily.

The ITTC Dictionary has also been revised.

The whole set of documents of ITTC with regard to quality control has been re-edited.

The evaluation of a questionnaire on the usage of the ITTC Recommended Procedures shows that many member organizations accept the “QS Manual” and that the system is alive.

5. RECOMMENDATIONS TO THE CONFERENCE

Adopt the revised Symbols List

Adopt the revised Procedure 4.2-01 “Adoption or Modification of ITTC Recommended Procedures and Guidelines”.

Adopt the revised Procedure 4.2.3-01-01 “Guide for the Preparation of ITTC Recommended Procedures and Guidelines”.

Adopt the revised Procedure 4.2.3-01-03 “Work Instruction for Formatting ITTC Recommended Procedures and Guidelines”.

Adopt the revised ITTC Dictionary

6. RECOMMENDATIONS FOR FUTURE WORK

Revise and update the existing ITTC Recommended Procedures according to the comments of Advisory Council, Technical Committees and the Conference.

Review and edit new ITTC Recommended Procedures with regard to formal Quality System requirements including format and compliance of the symbols with the ITTC Symbols and Terminology List.

Install a system for easy access of member organizations to benchmarks in cooperation with the Advisory Council.

Update the ITTC Symbols and Terminology List especially with regard to symbols for uncertainty analysis and water jet drives.

Stimulate, monitor and support validation work within the Technical Committees.

Observe the development or revision of ISO Standards regarding Quality Control.