The Quality Systems Group

Final Report and Recommendations to the 23rd ITTC

1. GENERAL

1.1. Membership and Meetings

Clarke David, University of Newcastle, United Kingdom
Ferrando Marco, University of Genoa, Italy
Guenther Barbara, SVA Potsdam, Germany
Kanar Jan, CTO Gdansk, Poland
Qian Wenhao, MARIC Shanghai, China
Strasser Gerhard, Vienna Model Basin, Austria, Chairman
Toki Naoj, MHI Nagasaki, Japan

The Group met three times:

2000 Ischia
2001 Washington/Vienna
2002 Shanghai

1.1. Recommendations of the 22nd ITTC to the QS Group

Collect procedures for the calibration of instrumentation and measuring equipment.

Adapt the ITTC Quality Manual to the new standard when the ISO 9000 is updated.

Evaluate the implementation of procedures.

Incorporate changes to existing procedures as provided for in procedure: "Adoption or Modification of ITTC Recommended Procedures", ITTC Procedure 4.5-01.

Develop a procedure for updating Symbols & Terminology List.

1.2. Co-operation with other Committees

The 22nd ITTC had approved the ITTC Procedure for Adoption or Modification of Recommended Procedures (4.5-01) which implies that one of the basic tasks of the Quality Systems Group is to review the ITTC Recommended Procedures which are proposed by the technical committees with respect to formal aspects, consistency, completeness etc. prior to their publishing.

Therefore, at the beginning of the period the QS Group wrote to all of the chairmen of the technical committees asking them how many Recommended Procedure they were going to produce in order to be able to schedule the group's meetings. The formal format for the procedure was also sent out to the chairmen. About one third of the Committees answered.

Drafts of ITTC Recommended Procedures were received for reviewing in time from the following Committees:

Resistance Committee

Propulsion Committee

Loads & Responses

Procedures for Resistance, Propulsion and POW Tests

Cavitation Induced Pressures

The rest of the procedures were transmitted to the QS Group by the Advisory Council. The late date of receipt caused some problem for reviewing the procedures with respect to

time. Additionally there was the disadvantage for the technical committees concerned that they themselves were short in time for reacting on the suggested corrections.

The revision of the proposed Procedures was carried out according to the following criteria:

- Compliance with standards
- Compliance with ITTC Terminology and Symbols List
- Comprehensibility
- Completeness
- Consistency and conciseness
- Orthographic, grammar mistakes, punctuation
- Numbering of procedures and references
- Formatting

In some of the revised procedures lengthy parts of discussion of some problem were found, giving no real solution. Normally the QS Group suggested to shorten this and include the rest of these parts in the proceedings as explanations rather than as a part of the procedure. Some of the procedures contained formulations such as “adequate”, “sufficient” etc. without specifying what would be considered adequate. All these terms were picked up by the QS Group and it was asked for more precise formulations.

All of the procedures were reviewed with regard to the above criteria by the QS Group and returned to the Committee Chairmen with the suggested modifications.

2. ISO 9001/2000 CERTIFICATION OF ITTC MEMBERS

2.1. Questionnaire on the Usage of the ITTC Recommended Procedures

A questionnaire was sent to 87 member institutions asking whether they are certified according to ISO 9000 and whether they use ITTC Recommended Procedures.

47 answers were received and the outcome is:

8 of the answering institutions are certified according to ISO 9000 i.e. 17%. This figure is surprisingly low.

39 i.e. 83% of the answering institutions uses one or more ITTC Recommended Procedures.

3. SAMPLE QUALITY SYSTEMS MANUAL

Late in the year 2000 the new version of ISO 9001 has been launched.

Compared to ISO 9001/9002:1994 the structure of ISO 9001:2000 was changed completely, including the name which was changed from Quality Control to Quality Management System. The requirements seem to be more general and provide improved flexibility. ISO 9001:2000 is aimed equally at manufacturing as well as service organizations, with a strong focus on **customer satisfaction**. The major reasons for the year 2000 revisions of the standard include emphasizing the need to measure customer satisfaction, meeting the need for more user-friendly documents, assuring consistency between quality management system requirements and guidelines, and incorporating generic quality management principles into organizations.

The basic elements of new structure of ISO 9001/2000 are shown in Table 3.1.

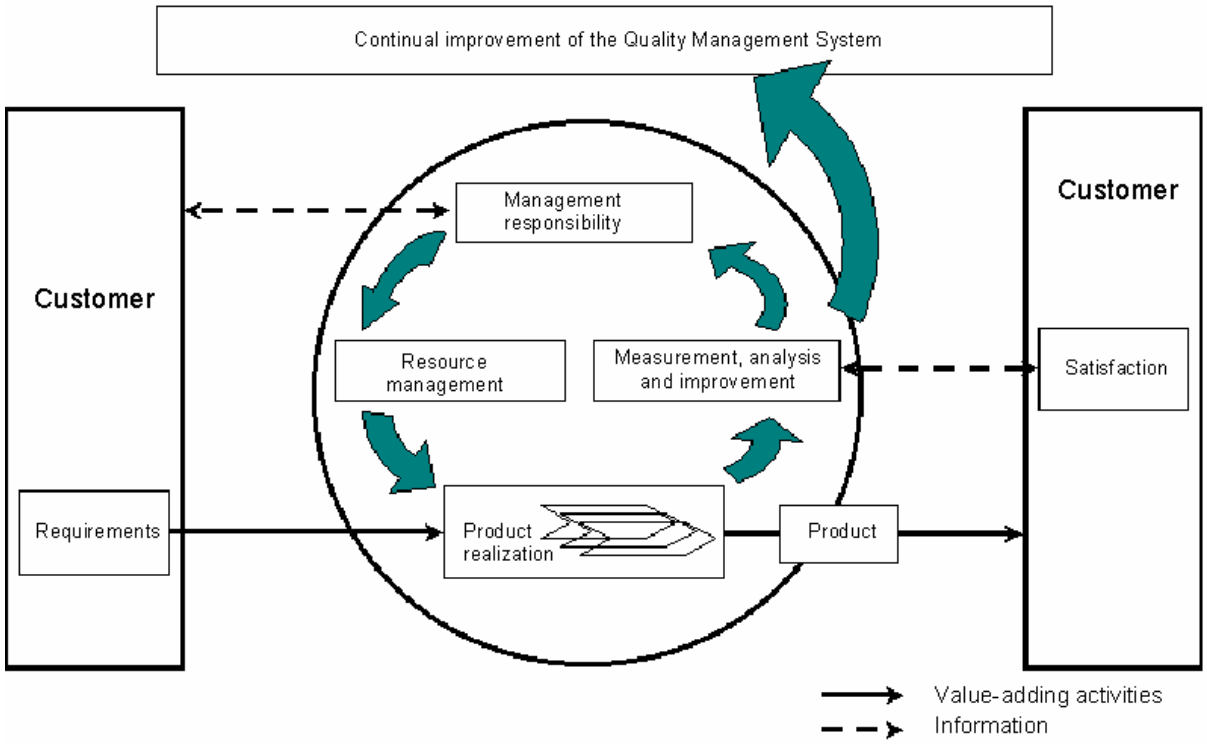

Figure 3.1 Model of a process-based quality management system.

Table 3.1 The 8 sections of the Quality Manual obligatory by the standard ISO 9001:2000.

1	Scope
2	Normative reference
3	Terms and definitions
4	Quality management system
5	Management responsibility
6	Resource management
7	Product realization
8	Measurement, analysis and improvement

The QS Group decided, to be consistent, to re-number all the ITTC recommended procedures according to the now valid structure. Although this may seem confusing to the Conference again, the certified members of the group unanimously agree that during the external audits, life is much easier if one can refer directly to the numbering of the standard and there is no need to explain any internal numbering system.

In order to support the member organisations of the ITTC in introducing a quality control system according to ISO 9001:2000 or in changing from standard ISO 9001:1994 to ISO 9001:2000, the QSG of the 23rd ITTC assembled an updated **Sample Quality Systems Manual** which provides guidance for the quality management and models for quality assurance.

The QSG hopes by submitting this sample manual to simplify and support the implementation of quality control systems or the adaptation to the updated standard ISO 9000:2000 in the community of the ITTC.

4. RECOMMENDED PROCEDURES OF THE QS GROUP

4.1. General

The QS Group proposes two new procedures:

Guidelines for Benchmarking (4.0-01)

Updating of Symbols & Terminology List (4.2-02).

The Procedure on Implementation of Recommended or Interim Recommended ITTC Procedures was reviewed and updated (4.2-01).

4.2. Guidelines for Benchmarking (4.0-01)

According to the tasks assigned to the Group by the 22nd ITTC a procedure for benchmarking tests has been prepared. The procedure has been written in order to illustrate basic understanding of benchmarking activity, explain the processes of benchmarking, and list the common rules to be kept by participating organizations during the benchmarking activity. The following comments are some additions to the procedure itself which is contained as procedure 4.0-01 "Guidelines for Benchmarking" in the ITTC Recommended Procedures. The QS Group found that sometimes the expression "benchmarking" is not quite clear, and therefore we tried in this chapter to give some detailed additional explanations.

4.2.1. Introduction

Nearly all of the available literature on benchmarking implies that benchmarking is a tool to be used to improve business competitiveness. Actually, this is the ultimate goal since, through a comparison, something is always learnt and this new knowledge can be used to improve competitiveness.

Following this assumption, the literature on benchmarking is mainly concerned in explaining how benchmarking could be applied to every part of every kind of business in order to identify one's weak points or better practices. Common examples of possible fields of application of benchmarking are:

The procurement process of any manufacturer
The assistance/repair network
The accounting system
The comparison of measurement procedures
……..

Nevertheless benchmarking is as old as the mankind, though not so focused on the economic target, since the crudest definition of benchmarking is "*to compare something with something comparable*".

As far as ITTC is concerned over the years several benchmark tests have been performed, aimed to compare processes of relevance to the community. Since the purpose of the benchmark tests is normally restricted to find means to improve our collective knowledge or performance standard, the ITTC guidelines for benchmarking should be focused on the technical/scientific side of benchmarking, disregarding the logistic and economic aspects of our business.

4.2.2. Definitions of Benchmarking

Some definitions of benchmarking found in current literature are:

Benchmarking is the process of identifying, sharing, and using knowledge and best practices. It focuses on how to improve any given business process by exploiting top-notch approaches rather than merely measuring the best performance. Finding, studying and implementing best practices provides the greatest opportunity for gaining a strategic, operational, and financial advantage. (Source: http://www.apqc.org)

Benchmarking is the practice of being humble enough to admit that someone else is better at something, and being wise enough to learn how to match and even surpass them at it. (APQC, 1993)

Benchmarking is "the continuous, systematic process for comparing performances of organizations, functions or processes against the 'best in the world', aiming not only to match those performance levels, but to exceed them." (Mr. Sean O'Reagain, DG Enterprise, European Commission. Source: Recommendations to DG TREN, European Commission, Resulting from BEST Conference 1: 'The State of the Art of Benchmarking in all Sectors', October 2000)

Benchmarking is a process of learning with the aim of changing processes, practices or methods in order to improve performance. It is a powerful tool to improve performance, however it is only a tool. It cannot deliver outstanding results by itself and needs to be part of an integrated management process. (Paul Leonard, Benchmarking expert, Paul Leonard Consultancy Source: Recommendations to DG TREN, European Commission, Resulting from BEST Conference 1:'The State of the Art of Benchmarking in all Sectors', October 2000)

4.2.3. Operational Definitions of Benchmarking

Benchmarking: a systematic process for implementing "improvements"*, based on learning from examples of good practice.

(* "improvements" encompasses incremental change, major steps and innovations; in many cases benchmarking leads to an entirely new way of looking at things.)

Benchmark: An example of a "state of affairs"* that is demonstrably among the best of its type.

(* "state of affairs" may mean a practice, process, output or outcome or any combination of these.)

Best Practice: is the means by which the benchmark level of performance is achieved. It tells us how.

To benchmark: to take part in a benchmarking exercise using the benchmarking process.

4.2.4. Types of Benchmarking

Five types of benchmarking can be defined:

Internal benchmarking is a comparison between processes carried out within one organization.

Competitive benchmarking: the study and measurement of a competitor without their cooperation for the purposes of process or product quality improvement. The latter is called reverse engineering.

Co-operative benchmarking: the measurement of key production functions of inputs, outputs, and outcomes with the aim of improving them. Co-operative Benchmarking is done with the assistance of the entity being studied (the benchmark "partner").

Collaborative Benchmarking: a version of co-operative benchmarking. In the collaborative method, both entities study each other and work together to improve.

Process (or Generic) benchmarking: the comparison of own processes against the best processes around, regardless of industry.

4.2.5. Purpose of Benchmark Tests

Benchmarking is a tool for improving performance by learning from best practices and understanding the processes by which they are achieved.

Benchmarking is not simply a process of data collection and analysis, used to rank different levels of performance (for example of

different organizations, companies or countries etc.), nor is it a process of sharing ideas and practices with others working in the same field. Data collection, comparison and sharing information are elements of the benchmarking process. However, rigorous benchmarking is a much more comprehensive process which is motivated by a desire to improve and which leads to the implementation of changes.

4.2.6. The Benchmarking Process (Benchmarking Wheel)

Figure 4.1 shows the basic steps which are necessary for any benchmark test. Details are described in the procedures.

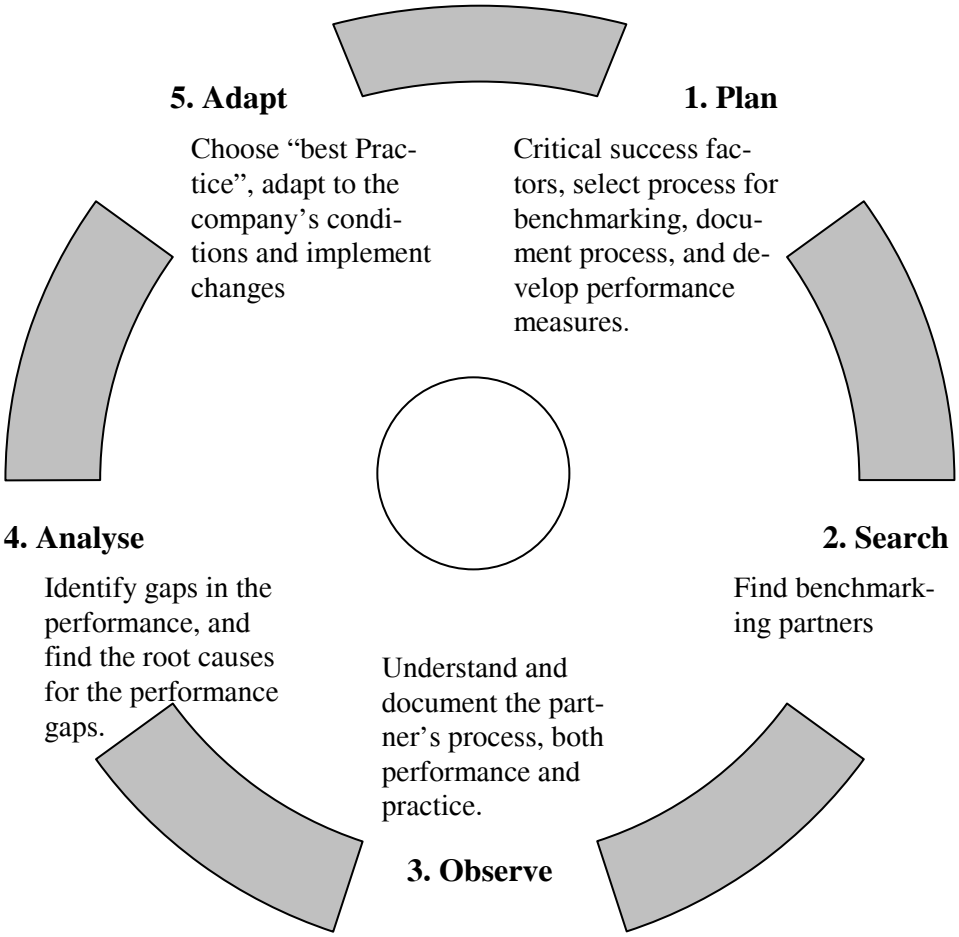

Figure 4.1 Benchmarking Wheel.

4.2.7. The Role of Benchmarking in Total Quality Management

Benchmarking is one of a set of quality management approaches to the improvement of processes and outcomes and it relates well to other Total Quality Management initiatives. Benchmarking is not a one-time project. It is a continuous improvement strategy and a change management process. Once begun, the entity should continue to benchmark against "best practices" in order to continuously improve.

4.2.8. Key Factors

The commitment of all participants in a benchmarking exercise is essential as benchmarking is not an easy or quick process that brings immediate results. Participants must have full understanding of the requirements of the process and a willingness to improve in order to enable the process to work successfully.

It is important for those involved in benchmarking to fully understand the main principles of the process. These principles remain the same regardless of the sector in which benchmarking is applied.

Benchmarking relies on at least four key principles:

- Acknowledgement of the value of learning from others through comparisons and sharing (e.g. collegiality)
- Developing and/or strengthening an outward-looking perspective as a guide to improvement and maintaining an awareness of positioning
- Encouraging the use of evidence (including measures) as a basis for improvement
- A commitment to implementing improvements

Willingness to take part to a benchmark test could be destroyed by one or more of the following reasons:

- The fear of being perceived as substandard comparing to other participants.
- The fear of giving away competitive advantage by sharing information.
- Arrogance; “We are the best anyway, no need for benchmarking!”.

Other possible obstacles to the effectiveness of benchmarking could come from:

- Benchmarking what is easy to benchmark – but might be of little importance to the participants,
- broadening scope parameters too much, comparing metrics and processes,
- lacking management or team commitment,
- failing to follow up and implement findings,
- skipping the planning phase to get on with the real benchmarking.

To ensure the success of the benchmarking effort, people in charge of the exercise should:

- Insist on a **formal methodology**. Several such methodologies exist. Some companies just adopt one, and others customize one to fit their specialized needs. In this perspective the ITTC procedure for benchmarking is intended as guidance and an aid to those involved in launching benchmark tests.
- Insist on strict adherence to a **code of conduct**. The use of such a code minimizes the risk and establishes the protocol for organizations that share intellectual property. The Benchmarking Code of Conduct developed by American Productivity & Quality Center International Benchmarking Clearinghouse has become a de facto standard utilized by virtually all benchmarks world-wide together with the European Benchmarking Code of Conduct. This code is added as an Appendix to the Guidelines for Benchmarking.
- Insist on utilizing a **systematic process classification framework**. Processes can mean different things to different participants.

4.2.9. Considerations of Relevance to ITTC

In general benchmarking relevant to ITTC is carried out without any regard to competitiveness or commercial matter. Benchmark tests are almost exclusively launched in order to achieve a better technical standard, and they were never intended for ranking ITTC members.

Normally the benchmark tests performed in the ITTC shall be collaborative which together with process benchmarking generally provide the highest value. In the procedure proposed by the QS-Group only benchmark tests which compare processes such as measurements and/or their accuracy, evaluations of tests etc., are taken into account.

As regards ITTC benchmarking, often the benchmark tests are proposed by a committee which has been charged with some task by the conference. Accordingly, the tests are not always perceived as necessary or important by all of the members. This can be particularly true for those institutions that do not share the same sensitivity to the particular problem addressed by the committee. This situation can even lead to the difficulty of finding a sufficient number of partners willing to take part in the exercise.

It is of the utmost importance that the usefulness of benchmarking on the particular subject is widely understood among our community in order to obtain the highest advantages from this tool.

4.3. ITTC Procedure for Updating of Symbols & Terminology List (4.2-02)

A procedure for the updating of the ITTC Symbols and Terminology List was developed. Mainly it is planned to update this list simultaneously with the updating of the ITTC Recommended Procedures.

4.4. ITTC Procedure for Adoption or Modification of ITTC Recommended Procedures (4.2-01)

The procedure for the “Adoption or Modification of ITTC Recommended Procedures” contained one intermediate step that would enable the Committee or the QS Group to implement some modifications in the ITTC Recommended Procedures if suggested by the technical committees during or short after the conference. This proved to be impracticable and therefore this possibility was taken out. The procedures need to be finished completely before the conference and if one of them should not get accepted by the conference it can be taken out completely or marked to be “interim” by an asterisk.

4.5. Working Instructions on Calibration of Standard Measuring Devices

The main issue of collecting working instructions for calibration of simple standard gauges was to make life easier for those who have to write their own Quality Systems Manual. It does not make sense that each of the member institutions “invents the wheel again”, producing working instructions for simple calibration methods. The working instructions are deemed to serve as examples to follow when one is producing ones own analogous documents.

The Chinese member of the QS Group managed to get supported by other Chinese institutions who provided working instructions for calibration methods (Verification Regulations, published by Chinese National Technical Bureau) of basic measurement equipment and translated them into English language.

The following working instructions are available:

Calibration of steel ruler

Calibration of Vernier calliper

Calibration of height calliper

Calibration of micrometer

Calibration of dial gauge

Calibration of chronometer with needle indication

Calibration of chronometer with digital indication

Calibration of weights

Calibration of load cell

Calibration of non-self-indicating weighting instrument

Calibration of liquid-in-glass thermometers

Calibration of Bourdon tube pressure gauge, pressure-vacuum gauge and vacuum gauge

5. ITTC RECOMMENDED PROCEDURES

Following the new standard a complete renumbering of the ITTC Recommended Procedures was carried out to obtain consistency between the procedure numbering and the relevant item of the ISO 9000. In principle all the procedures which were under item 4.9 are now under item 7.5. Calibration procedures are now under item 7.6.

5.1. New Procedures of the Technical Committees

The following new procedures have been proposed by the technical committees to be included in the ITTC Recommended Procedures.

It was decided that Interim ITTC Recommended procedures will be distinguished by an asterisk (*) preceding the procedure's name.

As the Manual of the ITTC Recommended Procedures is a loose leaf form collection, the following procedures which have been proposed (state: April 15th 2002) should be added to the manual in case the conference adopts them:

5.1.1. Quality Management System

Guidelines for Benchmarking

4.0-01

5.1.2. Documentation Requirements

Updating the ITTC Symbols & Terminology List

4.2-02

5.1.3. Resistance

Uncertainty Analysis, Spreadsheet for Resistance Measurements

7.5-02-02-03

Uncertainty Analysis, Spreadsheet for Speed Measurements

7.5-02-02-04

Uncertainty Analysis, Spreadsheet for Sinkage and Trim Measurements

7.5-02-02-05

Uncertainty Analysis, Spreadsheet for Wave Profile Measurements

7.5-02-02-06

5.1.4. Propulsion; Performance

Uncertainty Analysis, Example for Propulsion Test

7.5-02-03-01.2

*Podded Propulsor Tests and Extrapolation

7.5-02-03-01.3

5.1.5. Propulsion; Propulsor

Uncertainty Analysis, Example for Open Water Test

7.5-02-03-02.2

5.1.6. Propulsion; Cavitation

Cavitation Induced Pressure Fluctuations, Model Scale Experiments

7.5-02-03-03.3

Cavitation-Induced Pressure Fluctuations, Numerical Prediction Methods

7.5-02-03-03.4

5.1.7. High Speed Marine Vehicles

Manoeuvrability, Evaluation and Documentation of HSMV

7.5-02-05-05

5.1.8. Manoeuvrability

Free-sailing Model Test Procedure

7.5-02-06-01

Validation of Manoeuvring Simulation Models

7.5-02-06-04

5.1.9. Environmental Modelling, Sea Keeping

Validation of Sea keeping Computer Codes in the Frequency Domain

7.5-02-07-02.4

Model Tests on Intact Stability

7.5-02-07-02.5

Model Tests on Damage Stability

7.5-02-07-02.6

5.1.10. Loads & Responses, Ocean Engineering

Floating Offshore Platform Experiments

7.5-02-07-03.1

Stationary Floating Systems Hybrid Mooring Simulation, Model Test Experiments

7.5-02-07-03.4

5.1.11. Control of Inspection, Measuring and Test Equipment
Sample Calibration Working Instructions

Calibration of Steel Ruler

7.6-02-01

Calibration of Vernier Calliper

7.6-02-02

Calibration of Height Calliper

7.6-02-03

Calibration of Micrometer

7.6-02-04

Calibration of Dial Gauge

7.6-02-05

Calibration of Chronometer with Needle Indication

7.6-02-06

Calibration of Chronometer with Digital Indication

7.6-02-07

Calibration of Weights

7.6-02-08

Calibration of Load Cell

7.6-02-09

Calibration of Non-self-indicating Weighing Instrument

7.6-02-10

Calibration of Liquid-in-glass Thermometers

7.6-02-11

Calibration of Bourdon Tube Pressure Gauge, Pressure-vacuum Gauge and Vacuum Gauge

7.6-02-12

5.2. Revised Procedures of the Technical Committees

Several procedures were reviewed and updated by technical committees. In the subsequent list procedure's names are followed by two numbers; the first one showing the number according to the old standard while the second one showing the current number of the procedure.

The following procedures should be exchanged to the following scheme:

REGISTER	
0.0	0.0

5.2.1. Documentation Requirements

ITTC Procedure for Adoption or Modification of Recommended Procedures	
4.5-01	4.2-01

5.2.2. Model Manufacture, Ship Models

Ship Models	
4.9-02-01-01	7.5-01-01-01

5.2.3. Testing and Extrapolation Methods

5.2.3.1. Resistance

Resistance Test
4.9-03-02-01 7.5-02-02-01

Uncertainty Analysis, Example for Resistance Test
4.9-03-02-02-01 7.5-02-02-02

5.2.3.2. Propulsion

Propulsion Test
4.9-03-03-01.1 7.5-02-03-01.1

5.2.3.3. Propulsor

Open Water Test
4.9-03-03-02.1 7.5-02-03-02.1

5.2.4. Cavitation

Model-Scale Cavitation Test
4.9-03-03-03.1 7.5-02-03-03.1

Description of Cavitation Appearances
4.9-03-03-03.2 7.5-02-03-03.2

5.2.5. High Speed Vehicles

Resistance Test for High Speed Marine Vehicles
4.9-03-03-05.1 7.5-02-05-01

5.2.6. Manoeuvrability

Full Scale Manoeuvring Trials Procedure
4.9-03-04-01 7.5-02-06-03

Captive Model Test Procedure
4.9-03-04-03 7.5-02-06-02

5.2.7. Loads & Responses
Sea Keeping

Sea keeping Experiments
4.9-03-05-02.1 7.5-02-07-02.1

Predicting Power Increase In Irregular Waves From Model Experiments In Regular Waves
4.9-03-05-02.2 7.5-02-07-02.2

Experiments on Rarely Occurring Events
4.9-03-05-02.3 7.5-02-07-02.3

5.2.8. Loads & Responses
Ocean Engineering

Analysis Procedure for Model Tests in Regular Waves
4.9-03-05-03.2 7.5-02-07-03.2

5.2.9. Full Scale Measurements
Speed and Power Trials

Preparation
4.9-03-03-01.3 7.5-04-01-01.1

Ship Inspection
4.9-03-03-01.3 7.5-04-01-01.2

Hull and Propulsor Survey
4.9-03-03-01.3 7.5-04-01-01.3

Trial Conditions
4.9-03-03-01.3 7.5-04-01-01.4

Instrumentation Installation and Calibration
4.9-03-03-01.3 7.5-04-01-01.5

Trial Conduct
4.9-03-03-01.3 7.5-04-01-01.6

5.2.10. Full Scale Trials
Manoeuvrability

Full Scale Manoeuvring Trials Procedure
4.9-03-04-01 7.5-04-02-01

5.3. Cancelled Procedures

The following procedures should be removed:

Set of Procedures
0.0-01

Committee Structure of ITTC
1.0-02

Spacing and Numbering of Displacement Stations and Waterlines
4.9-02-01-02

The state of the procedures can be seen in the Register of ITTC Recommended Procedures 0.0.

6. ITTC SYMBOLS AND TERMINOLOGY LIST

The QS Group realized that the whole ITTC Symbols &Terminology List did not comply with ISO 31, "Quantities and Units – Part 0: Basic Principles". In chapter 3 is stated that symbols should be written in Italic style, identifiers should be mainly subscripts and units should be written in Roman style. For these reasons the ITTC Symbols & Terminology (SaT) List was adapted to the ISO 31 standard.

The above problem caused the QS Group to revise also the chapter "Principles of Notation" of the ITTC Symbols & Terminology List.

Moreover it was found that the dimensionless characteristic numbers e.g. Reynolds number (*Re*) or Froude number (*Fr*) did not comply with ISO 31-12 either. Also this was corrected and implemented in all new procedures as well as in the SaT List.

The current subdivision of the SaT List turned out to be impractical from maintenance point of view in addition of being difficult to search for symbols.

For these reasons it is suggested that a new release of the list be prepared containing the symbols in alphabetical order and, like in dictionaries, the field of application is indicated before the definition.

The next QS Group should examine the possibility of implementing the SaT List in the form of a data base.

7. CONCLUSIONS

Some Technical Committees did not understand exactly the function of the ITTC Recommended Procedures. The procedures should not contain articles on the problem to be dealt with. The procedures should rather point out the problems and, if there are any, give **choices** at the state of the art to reasonably solve these problems.

A big percentage of the Member Organisations uses the ITTC Recommended Procedures. This is encouraging for the continuation of the updating of the manual.

Surprisingly few Organisations are certified.

Members and Member Organisations should examine the need for new ITTC Recommended Procedures.

Member Organisations should use the symbols and terms defined in the ITTC Symbols and Terminology List. They should examine the need for updating the list with not included symbols.

8. RECOMMENDATIONS TO THE CONFERENCE

It is recommended that the Quality Manual of the ITTC Recommended Procedures is accepted.

Adopt the revised "ITTC Procedure for Adoption or Modification of Recommended Procedures" 4.2-01.

Adopt the Procedure "Updating the ITTC Symbols & Terminology List" 4.2-02.

9. RECOMMENDATIONS FOR FUTURE WORK

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.

Update the ITTC Symbols and Terminology List.

Put the ITTC Symbols in a relational database in order to be able to search according to ones personal requirements.

Revise and complete the Working Instructions on Standard Measuring Devices.

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

Revise and update the ITTC Dictionary for Ship Hydrodynamics.

The Quality Systems Group

Committee Chair: Prof. Gerhard Strasser (SVW)
Session Chair: Dr. Arne Hasle Nielsen (Force Technology-DMI)

I. DISCUSSIONS

I.1. Discussion on the Report of the 23rd ITTC Quality Systems Group: ISO 2001 Standards

By: Everet L. Woo, NSWC-CD, USA

Has the committee thought about how to adopt and implement the new ISO 2001 standards?

I.2. Discussion on the Report of the 23rd ITTC Quality Systems Group: Policy statement for Experimental Uncertainty Analysis

By: Ahmed Derradji-Aouat, NRC, IMD, Canada

Why there is no policy statement requiring EUA "Experimental Uncertainty Analysis" from all General and Specialist Committees?

Note: The policy is different than a procedure and it is different than the work instructions.

A policy is statement requiring for all Committees to carry out EUA, and hopefully all tanks to conduct EUA; and the ITTC body that enforces this policy is a subgroup of the Quality Systems Group.

I.3. Discussion on the Report of the 23rd ITTC Quality Systems Group: ISO requirements for Froude and Reynolds numbers

By: A.V. Pustoshny, KSRI, St. Petersburg, Russia

As QSG reported they have changed again the symbols for *Fr* and *Re* in order to meet ISO requirement.

At first, when we speak on *Fr* and *Re* it is important that they are not "number", they are parameters, so it is not necessary to consider them as "number" and include "n" into abbreviation. At the second, may be Mr. Froude and Mr. Reynolds were so great, that they may be awarded by the symbols which are long time shipbuilding tradition and which may be kept constant in spite of any charges in standards?

I.4. Discussion on the Report of the 23rd ITTC Quality Systems Group: Use of symbols for residuary resistance and wave resistance

By: A.F. Molland, University of Southampton, United Kingdom

Before I put my question, as secretary of a Committee that submitted eight test and uncertainty procedures to the Quality Systems Group, I should like to say that none of us should underestimate the vast amount of work carried out by the QSG, particularly Professor Strasser, in putting the procedures into the

correct format. I should like to thank the Group most sincerely for all its efforts.

My question, or comment, to the Group lies between the trivial and the profound. Trivial because it simply concerns the use of the symbols C_R (residuary resistance) and C_W (wave resistance), but profound because their use (or misuse) lie at the heart of the 1978 ITTC Performance Prediction method.

On Monday, my Committee on test procedures had to defend the undefensible, in that we had used C_R when we really meant C_W, pointing out that we were making it compatible with the 1978 ITTC Performance Prediction method. In modern terminology, when no form factor is involved, we can use $C_T = C_F + C_R$ (broadly speaking skin friction plus the rest) but, with a form factor, it should be:

$C_T = C_V + C_W = C_F(1+k) + C_W$

(broadly speaking total viscous plus wave).

As a result of this, the use of C_R and a form factor in the 1978 ITTC Performance Prediction method is clearly wrong. I would therefore request that the Quality Systems Group addresses this issue and brings the 1978 ITTC Performance Prediction method up to date.

I.5. Discussion on the Report of the 23rd ITTC Quality Systems Group: Quality Manual on the ITTC web site

By: F. Mewis, HSVA, Germany

I have no questions but two remarks.

First: I would like to thank the Quality Systems Group, Professor Strasser and his team, for the tremendous work they have done. After six years work of this level we do have now a really updated collection of procedures. Thank you very much for this great work.

Second: I tried to find the "Quality Manual" in the Internet before the Conference, unfortunately it was not possible. I have the feeling that the web site of ITTC is not in a good condition. It could be a task for the Quality Systems Group too.

II. GROUP REPLIES

II.1. Reply of the 23rd ITTC Quality Systems Group to E.L. Woo

The Committee has implemented the ISO 2001 Standards already.

II.2. Reply of the 23rd ITTC Quality Systems Group to A. Derradji-Aouat

There is a policy statement of the ITTC Advisory Council stating that uncertainty analysis for the experiments is also required, exactly what you are asking for. The advisory council has now for years consistently followed this policy.

II.3. Reply of the 23rd ITTC Quality Systems Group to A.V. Pustoshny

The symbols for *Fr* and *Re* are defined in the ISO Standards and are used in all other fields in this way.

II.4. Reply of the 23rd ITTC Quality Systems Group to A.F. Molland

It is not the task of the QS group to interfere with the contents of procedures produced by specialist committees. However the group has stimulated the AC to build a specialist group who is dealing with the trial prediction method as well as the evaluation of trial measurements. We consider this as problems which are linked.

II.5. Reply of the 23rd ITTC Quality Systems Group to F. Mewis

Thank you for the remarks. The AC has decided that the operation of the home page of the ITTC is a task of the AC Secretariat.