



Form of Written Discussion at the 26th ITTC Conference

Discusser:	
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Affiliation	

Name of Technical Committee or Group to be discussed	Resistance Committee
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Written Discussion (within 1,000 words of length):

I would like to say a few words about the Facility Bias Worldwide Campaign. This initiative grew out of a paragraph on the Committee's term's of reference from the 23rd ITTC in 2002 which to paraphrase briefly, required the Committee to develop benchmark tests for comparative measurements and uncertainty analysis for identifying facility biases and improving the insight on facility operation. The Committee recognized early on that the proposal for a worldwide facility bias campaign was probably more work than anticipated when the terms of reference were approved by the ITTC and that to be successful such an undertaking needed the full support of ITTC member organizations. To wait until the next Conference would have delayed the project by almost three years and Dr. Emilio Campana, then Chairman of the Committee, was granted leave to make a presentation on the proposal to the meeting of the Advisory Council in Busan, Korea in September 2003. The minutes of the Advisory Council record that the Council endorsed the Committee's plan to arrange for a series of comparative tests for identifying facility bias. The Committee immediately went ahead with detailed planning including working out a test program and soliciting participants as described in the Committee's report to the 24th ITTC. The task of maintaining the momentum of such a major undertaking over some 8 years and bringing it to a successful conclusion should not be underestimated. This is especially true in a voluntary organization such as the ITTC and where time in the tank and staff time at participating facilities must compete with the demands of commercial work or funded research. An additional complication was because the work spanned over three ITTC periods there were many changes in the membership of the Resistance Committee. I believe only Dr. Jesus Valle has been involved from the beginning. His contribution is especially appreciated.

The Committee has outlined some of the reasons for the project taking twice as long as first expected, some of which, like the issues regarding the import or export of models from one country to another could never have been anticipated. Another reason, perhaps more significant, is the more than doubling of the number of participating organizations from 20 to 41 as more and more ITTC members realized that this work was something they should participate in. In light of this I am surprised that the number of valid data sets is so much smaller than the number of facilities which tested the model (about 57% and 66% for the large and small models respectively). Without the results an organization's participation is of little



value to the project or the organization. I hope the Committee's presentation and the discussion at this Conference will encourage organizations that have not yet submitted their results to do so.

The Committee has drawn attention to some problems interpreting the requirements for data Submission and I hope the organizations which, for example used values from the example in The spread sheet for uncertainty analysis will be given the opportunity to submit the results of calculations using their own numbers.

Some of the data presented in the report seem to show inconsistencies due to differing interpretations of the requirements for presentation. For example, some of the wave elevation measurements for the large model in Fig. 36 show wave elevations at the bow of about 40mm, which are greater than would be usually observed for such a fine model. This raises the question if the data submitted by the three organizations were all defined with section 0 at the stern or if the data were measured with a wave probe where the wave at the bow is observed at time 0, were correctly transformed to the distance scale? In their Summary of Results the Committee noted that it was necessary to correct phases and signs in the wave elevation data. A detailed description of the corrections made by the Committee would be a useful addition to their report. Other differences may be related to the flexibility allowed to the participants in implementation of the tests. Although the test program and analysis procedure were defined, participants were asked to use their standard techniques for testing the model and for blockage correction (if used). Perhaps some of the standard techniques differed from one another in ways that are important? Did some facilities strip down the model and dismantle the test set-up completely between each of the four days of tests? Did some facilities just remove the model from the tank overnight, leaving the test apparatus in place? How much variation was there among the form factors used and how might this have affected the results? Did the choice of blockage corrector make a significant contribution to the facility bias?

Some of these questions could be answered by making a request for additional information from all participants. In order to advance the analysis I wonder if at some point the Committee may need to relax the measures put in place to prevent those analyzing the data from knowing its origin. Perhaps the biggest improvement over earlier comparative resistance studies, apart from the number of participating organizations, is the emphasis on uncertainty analysis. Uncertainty analysis can show if the differences between results from different facilities are, in the statistical sense, significant and help to explain the reasons for them. The Committee report summarizes the uncertainties for the measured parameters, but stops short of addressing the questions many participants must surely have in mind when they participated in the study. How big are the biases or differences, are they "real", how important are they, what might be the cause and what can be done to improve the situation? I encourage the Committee to address such matters in their continuing analysis of the test results.

Response:

The committee is very grateful for the detailed comments and suggestions many of which will prove invaluable to the 27th resistance committee as it starts its work. We would agree that the submission process significantly hampered the analysis of the data and in particular the ability to resolve queries in the presented data especially as noted with regard to wave elevation, use of example uncertainty analysis and so forth. In order to remove these restrictions we would welcome the participants removing any confidentiality restrictions as regards their interaction with the Resistance Committee. In this way maybe the missing test data and data already presented could be tidied up into a definitive state that can used both for addressing as per its original purpose the influence of facility bias on uncertainty but also maybe to inform the validation of numerical methods for resistance predictions.