



**Norwegian Society of
Chartered Engineers**

NORTH SEA FLOW METERING WORKSHOP

Rica Maritim Hotel, Haugesund

October 24-26, 1989

"Presentation of the Norwegian Calibration Service"

Lecturer:

**Hans-Petter Klemmetsen
Norwegian Calibration Service**

North Sea Flow Metering Workshop
October 24-26, 1989, Haugesund

Presentation of the Norwegian Calibration Service

Hans-Petter Klemmetsen
Norwegian Calibration Service

The name, Norwegian Calibration Service, is a little misleading. We do not calibrate, but we are the official Norwegian accreditation body for calibration- and test-laboratories.

Before I go on to give you more specified information as to how Norwegian laboratories can get the necessary accreditation, I would like to give you the status for the work on quality measures for industrial products by the EC-commission up to today.

The commission of the European Communities has made a proposal for a council decision concerning the modules for the various phases of conformity assessment procedures which are intended to be used in the technical harmonisation directives. It is called A Global Approach to Certification and Testing. One key word in this connection, is conformity. The basic structures for the evaluation of conformity are, the bodies responsible for certification and inspection of the testing laboratories, and the manufacturers' quality systems.

At present, these guidelines (drawn from ISO-documents) have been transposed into European standards (EN 29000 and EN 45000).

The commission calls on the member states to promote the implementation of these standards both in their regulations and in private certification systems, and to introduce accreditation systems based on these standards. This implementation has already started in Norway.

To secure the acceptance of Norwegian test results and calibration certificates in Europe, the ministry of industry has instructed the National Measurement Service to create "A national control- and accreditation system for measuring-laboratories". By "measuring laboratories" is among others meant industrial test- and calibration laboratories, which, in their work, are in the need of measuring instrument's with a known traceability and accuracy.

Together with our National Standards Laboratory, the accredited calibration laboratories will form the core in this system. This is the reason why we have started accrediting a series of calibration laboratories before we proceed with accreditation of test laboratories.

The accreditation system for calibration laboratories has been in operation from the spring 1989. Laboratories are accredited according to the international standards which are available for the accrediting of laboratories.

The accreditation system is based on standards and competence in our National Standards Laboratory department, and on our European and international cooperations (BIPM, OIML, ILAC, Euromet, WECC, etc.).

The first calibration laboratories will receive their accreditation by the end of this year, assuming that they satisfy the international standards and other requirements.

We have started the process of building up the accreditation system for testing laboratories.

The time consuming factor in the accreditation process is the time a laboratory need to be able to meet the requirements to technical competence we have specified. Normally it takes from 3 to 18 months to be able to fulfil the requirements. From 1.1. 93 the complete technical harmonisation in EC, and the EFTA countries who want to sell industrial products to EC must be fulfilled.

We hope that the calibration- and testing laboratories in Norway realise this, if not we will have a problem.

The normal norwegian way to do things will be to ring up the calibration service on Christmas eve 1992 and ask for accreditation from 1.1. 93. I am afraid that it would be a difficult situation. Therefore I am very happy to have the possibility to adress you and other audiences in this matter.

International cooperation

Within the field of metrology, international conformity is essential. Hence, active and extensive international cooperation is absolutely necessary. The National Measurement Service in Norway has, ever since the Meter Convention was ratified in 1875, actively participated in international cooperation.

Bureau International des Poids et Mesures (BIPM) and the Meter Convention form the base for all measurement. Our national prototypes and national standards are compared, and traceable, to BIPM's standards. All measuring laboratories in Norway accredited by the Norwegian Calibration Service, must have their standards and instruments traceable to BIPM.

The international organisation for legal metrology (OIML) was established in the early 1950s and the treaty was ratified by Norway in 1957. OIML draws up international recommendations which the member countries are bound to adopt as national regulations. Norway has solely, and consistently, adopted these international recommendations throughout the past 20 - 25 year. The director for The National Measurement Service in Norway, Mr. Knut Birkeland, is OIML's president.

The participation in BIPM and OIML is bound by treaty.

In addition to this, Norway is involved in a number of international organisations such as International Laboratory Accreditation Conference (ILAC), in whose every conference Norway has participated, and the director of The National Measurement Service, appointed by the Ministry of Foreign Affairs, has each time been the leader of the Norwegian delegation.

The Norwegian Calibration Service is a member of the Western European Calibration Cooperation (WECC). WECC has a system of reciprocal acceptance of calibration certificates already in operation. The system consists of a network of bi- and multi-lateral agreements. This system is under further development and completion, and a Memorandum of Understanding (MoU) on reciprocal acceptance has already been signed.

WECC is recognized as the technical organisation for calibration in the EC-commissions' "A global approach to certification and testing" in all fields concerned with calibration.

The experiences from WECC are now used as a basis in the attempt of establishing a similar organisation for accrediting test laboratories in general, EUROLAB.

We participate in the work around the establishment of EUROLAB. Inspiration is drawn from WECC, which has already found its' form during many years of efficient cooperation, and which functions admirably. Norway - and we believe the rest of Europe - will gain from the WECC-model being chosen and that the two organisation, WECC and EUROLAB, cooperate.

The Norwegian Calibration Services' active work within WECC and ILAC especially, gives Norway a good starting position in the meeting of the requirements in the EC-commissions' "A global approach to certification and testing" which so far only exists as a draft, but which is expected to be adopted as it is.

I have now tried to give you an overview of the European picture and how the Norwegian activities fit in.

I will now inform you how you, as a norwegian calibration or test laboratory, can get your accreditation from the Norwegian Calibration Service.

You apply for accreditation as a calibration- or testing-laboratory in writing. You can contact us and ask us to send you the guide stating the requirements for accreditation and the list of the technical fields. Maybe you also would like to have our price-list - may be better not.

Together with the application, we would like to have a list showing which field(s) you would like to have accreditation in. We also need to know how you state your uncertainties. In addition to this, we need to have a copy of your quality assurance handbook, and a summary of the qualifications, practical and theoretical, of the members of staff who actually calibrate or do the testing.

Western European Calibration Cooperation (WECC) has made a guide which sets forth the general procedures and necessary administrative conditions for a system of assessment and accreditation of calibration laboratories. All the WECC members use this guide for accreditation of calibration laboratories. The guide is translated into Norwegian, and you have both the English and the Norwegian text in this guide. You have to meet all procedures and conditions set forth in this guide. We therefore recommend you to study the guide carefully before applying for accreditation. We will, however, try to work in an un-bureaucratical way, and therefore recommend that an official from the Norwegian Calibration Service visits you and has an informal look at your laboratory and your quality assurance handbook, and discuss what has to be done before the official accreditation team visits you.

Copies of the guide are available from our office, and I have also brought some with me to this workshop.

In the beginning, we have decided to make use of assessors from the other WECC member countries. This is not because we do not ourselves have enough qualified personell in Norway, but to get the fastest and best possible acceptance of Norwegian laboratories abroad.

There is an overall similarity between the operations of calibration and testing, and the requirements of ISO/IEC-guides 25, 38 and 49 applies equally to calibration, and testing laboratories and accreditation bodies. There are, however, essential differencies which necessitates additional requirements to be applied to calibration laboratories and services. These additional requirements are presented in the WECC-guide.

The fees for accreditation of calibration laboratories, are as follows:

For the first field, the price is NOK 30'000.-
For the next fields, the price is NOK 20'000.- per field.

These amounts cover all the expences besides our direct cost for travel and fees for the assessors from the other WECC-countries. The fees cover the costs for one year, whereafter you pay NOK 18'000.- per field per year. This includes a limited amount of consulting as well as the costs of measurement audits you have to participate in. You will be included in our catalog over accredited calibration laboratories or test laboratories.

The competence of the calibration laboratories is controlled by, among other things, audit- (testing object-) circulation. In the audits, a testing object controlled at the National Standards laboratory, is measured by different users, whereafter the results are compared to the national and international standards.

From our accreditation work so far it is our experience that norwegian calibration and testlaboratories normally do a very good technical job, but that we now and then have a tendency to have incomplete documentation.

I will therefore stress the following points from the accreditation guide.

The laboratory shall operate an internal quality assurance programme appropriate to the type, range and volume of work performed. The quality assurance programme shall be documented in a quality manual which is available for use by the laboratory staff. The quality manual shall be maintained relevant and current by a responsible member of the laboratory staff.

Staff shall have the necessary education, training, technical knowledge and experience for their assigned functions.

There shall be a job description for each technical position category, which includes the necessary education, training, technical knowledge and experience.

The calibration laboratory shall establish and maintain an effective system for the control and calibration of measurement standards, measuring equipment and reference materials used in the fulfilment of specified requirements.

The calibration laboratory shall have adequately documented instructions on the use and operation of all relevant equipment, on the handling of equipment to be calibrated, and on standard calibration and measurement techniques, where the absence of such instructions could jeopardize the efficacy of the calibration and measurement process. All instructions, standards, manuals and reference data relevant to the work of the calibration laboratory shall be maintained up-to-date and be readily available to the staff.

All manual calculations and data transfers shall be subjected to appropriate checks. All computer programs shall be validated.

The laboratory shall maintain records of all measurement standards, measuring equipment and reference materials used to establish conformance to specified requirements. These records shall demonstrate that each measurement standard and item of measuring equipment are found to be outside these limits, the extent of the errors shall be recorded and appropriate action taken.

Results obtained during calibration or measurement shall be recorded and retained. These records shall contain the following data:

- the calibration or measuring method, together with the measuring equipment and reference materials used;
- measurements prior to adjustment when requested;
- a statement of the adjustments made;
- measurement conditions;
- the direct readings taken during the calibrations or measurements;
- the method of calculation of the results, together with any corrections which have been applied;
- measurement uncertainty together with its method of calculation;
- the date of calibration or measurement

All measurement standards, measuring equipment and reference materials shall be labelled, coded or otherwise identified to indicate their calibration status.

Reference standards of measurement shall be calibrated by a competent body that can provide traceability of measurement to a national or international standard of measurement. The intervals between re-calibration of the reference standards shall be prescribed by the national calibration service.

The best measurement capability for each measurement quantity and specified range is the smallest uncertainty of measurement assigned to the laboratory, determined by assessing a budget of contributing uncertainty components, and/or by means of a measurement audit.

The best measurement capability of the laboratory shall be determined over specified ranges for each quantity for which accreditation is granted.

The best measurement capabilities shall be published by the national calibration service as a laboratory accreditation schedule for the quantities and their specified ranges.

All measurement results stated by the laboratory shall have an associated measurement uncertainty. The determination and combination of the uncertainty components shall be in accordance with the documented procedures agreed by the national calibration service. The details of the components of the total uncertainty shall be recorded. Corrections to the measurement results shall be applied when necessary.

Calibration and measurement work carried out by the calibration laboratory shall be recorded on a certificate which accurately, clearly, and unambiguously documents the calibration and measurement results and all other relevant information.

May I end by giving you all interested in accurate measurements my sincere best wishes and to give you my assurance that the Norwegian Calibration Service stands ready to give you all the support we can.

Thank you!

References

[1] Paper presented at the North Sea Flow Measurement Workshop, a workshop arranged by NFOGM & TUV-NEL

Note that this reference was not part of the original paper, but has been added subsequently to make the paper searchable in Google Scholar.