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Editorial

JEAN-FRANÇOIS MAGAÑA
BIML Director

Mutual Acceptance Arrangement - State of progress

The adoption of the Mutual Acceptance Arrangement at the 38th CIML Meeting in Kyoto was a major event in the life of the OIML and will lead to key new fields of work for all OIML Member States and for the Bureau.

The BIML carried out an inquiry among Issuing Authorities, Member States and Corresponding Members, and the responses received showed that a large number of Issuing Authorities and Responsible Bodies are willing to take part in the future Declarations of Mutual Confidence.

Interest was shown in a wide range of categories, notably *Non Automatic Weighing Instruments* (at least 23 expected participants) and *Fuel Dispensers* (19 participants), but also *Automatic Level Gauges for Fixed Storage Tanks*, *Load Cells*, *Automatic Gravimetric Filling Instruments*, and two new future categories, *Water Meters* and *Electrical Energy Meters*. The number of Issuing Authorities that have already declared their interest in DoMCs for these categories is significant and we can therefore expect that they will be a success.

The Bureau is now starting preparations for setting up the first Declarations of Mutual Confidence, and hopefully we can expect the first ones to be signed early in 2005.

This MAA will also have repercussions on the OIML Certificate System, and the Publication P 1 which governs the System will have to be revised to take account of the implementation of the MAA.

All these subjects are major issues for the work of the Bureau from 2004 onwards, and Members, Issuing Authorities and Instrument Manufacturers will be kept regularly informed of progress. ■

L'Arrangement d'Acceptation Mutuelle - État d'avancement

L'adoption de l'Arrangement d'Acceptation Mutuelle à la 38ème Réunion du CIML à Kyoto est un événement majeur dans la vie de l'OIML et ouvrira des champs nouveaux d'activité pour tous les États Membres de l'OIML et pour le Bureau.

Le BIML a réalisé une enquête auprès des Autorités de Délivrance, des États Membres et des Membres Correspondants, et les réponses reçues montrent qu'un nombre important d'Autorités de Délivrance et d'Organismes Responsables souhaite prendre part aux futures Déclarations de Confiance Mutuelle.

Les sujets d'intérêt mentionnés couvrent un large éventail de catégories, en particulier les *Instruments de Pesage à Fonctionnement Non Automatique* (au moins 23 participants probables) et les *Distributeurs Routiers de Carburants* (19 participants), mais aussi les *Jaugeurs Automatiques*, les *Cellules de Pesée*, les *Doseuses Pondérales Automatiques* et deux futures nouvelles catégories, les *Compteurs d'Eau* et les *Compteurs d'Énergie Électrique*. Le nombre d'Autorités de Délivrance qui ont dès maintenant déclaré leur intérêt pour les Déclarations de Confiance Mutuelle sur ces catégories est significatif et nous pouvons par conséquent nous attendre à ce que ces Déclarations soient des succès.

Le Bureau commence à présent les préparations pour mettre en place les premières Déclarations de Confiance Mutuelle, et nous espérons que les premières pourront être signées début 2005.

Cet Arrangement aura aussi des répercussions sur le Système de Certificats OIML, et la publication P 1 qui régit ce Système devra être révisée pour prendre en compte la mise en application de l'Arrangement.

Tous ces sujets sont des axes majeurs pour l'activité du Bureau en 2004, et les Membres, les Autorités de Délivrance et les Fabricants d'Instruments seront régulièrement tenus au courant du progrès de ces travaux. ■

MOISTURE AND UNCERTAINTY

Uncertainty evaluation of the Romanian reference standard for cereals moisture

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Abstract

Trade and industry is interested in information on dry substance content. Moisture meters used for this purpose need to be verified against proper standards. This paper describes the experience of the National Institute of Metrology of Romania (INM) in the development and use of the reference standard for moisture-based cereals and in the drying method described in OIML Recommendation R 59. An example of how the measurement uncertainty was evaluated using this Recommendation is described and the influence of the main metrological characteristics and sources of uncertainties are presented.

1 Introduction

Most natural products contain moisture. Typical properties of powders such as storability and agglomeration, microbiological stability, flow properties, viscosity, dry substance content, concentration or purity, commercial grade or nutritional value, very much depend on water or moisture content information. Also, the water content that is present is taken into account when a product is priced.

By definition [1] the moisture contained in a material comprises all those substances which vaporize on heating and hence lead to a weight loss of the sample. According to this definition, moisture content includes not only water but also evaporating organic solvents, alcohol, grease, oil or aromatic components, as well as decomposition and combustion products. Legal regulations and product declarations define the difference between natural moisture and moisture added to the product.

Moisture content determinations need to be carried out in real time, thus allowing rapid action to be taken during the production process. Therefore, at present many commercial meters are in use to determine the moisture content of raw materials, intermediate products and finished goods directly on the production line, in a manner described by the internal quality assurance system.

Due to the influence on the sale price of the moisture content of cereals, grains and oilseeds, this kind of measurement performed in Romania is a regulated field and as such is prescribed in the Law of Metrology [2]. Moisture meters used in commercial transactions are therefore subjected to obligatory state metrological control. As a consequence, these instruments are subject to pattern approval tests; these tests, as well as the verification and calibration of moisture meters, are performed in the Physico-Chemical Quantities Laboratory within the National Institute of Metrology (INM) in Bucharest.

In the field of cereals moisture measurement, the method described in OIML R 59 [3] is applied. Parallel moisture content measurements are made on the same grains using both the moisture meter to be tested and the OIML recommended method. Accordingly, several kinds of grains are dried in an oven at established temperature values and periods of time and the weight loss is determined. To apply this method, a secondary standard installation was developed.

In this paper the experience of the INM is described in the development and use of the reference standard for cereals moisture, based on the drying method described in R 59. The main metrological characteristics are also presented. Starting from the sources of uncertainties depicted during the measurement process, an example of how the measurement uncertainty was evaluated is also discussed.

2 Description and main characteristics of the secondary moisture reference standard

The secondary moisture reference standard developed by the INM starting in 1980 consists of a balance, secondary standard weights, an oven and an electric mill.

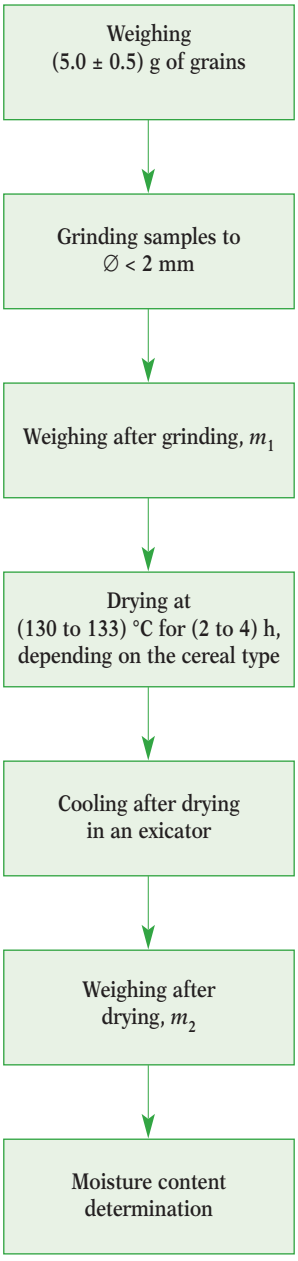
Following the oven drying method, the measurement process is illustrated in Figure 1 (see page 6).

A Class III secondary standard balance with a maximum indication of 100 g, minimum indication of 5 mg and scale interval of 0.1 mg in conjunction with Class E_2 secondary standard weights of 100 g to 1 g and 500 mg to 1 mg are used.

Each sample of cereals is weighed in aluminum boxes with airtight lids of diameter $\varnothing$ equal to (78 ± 1) mm and height h of (25 ± 1) mm.

A thermo-adjustable electric oven ensures the natural circulation of air, and a glass mercury thermometer having a measurement range of (0 to 150) °C and graduations of 1 °C is used.

Figure 1 Moisture content measurement process



After reaching a constant weight, samples are placed on a metallic plate in an exicator, which contains the dehydrated agent phosphorus pentoxide (P_2O_5).

A glass mercury thermometer having a measurement range of (0 to 40) °C and graduations of 1 °C is used for measuring the temperature of the samples.

A thermo-hygrograph having a measurement range of (0 to 100) % and (– 30 to + 40) °C, an error of ± 5 % and, respectively, of ± 2 °C is used to measure the relative humidity and temperature of the air.

An electric mill with a minimum grinding speed of 0.2 g/s is used to grind the samples.

The main species of cereals used to test grain moisture meters are wheat, barley, oats, rye, maize, sunflower and soybeans.

The main metrological characteristics of the INM secondary standard installation to determine the moisture of cereals are as follows:

- measurement range of humidity: (5.0 to 45.0) %;
- repeatability: ≤ 0.1 %;
- expanded uncertainty in the range of (0.10 to 0.15) %, for k = 2 and $P \cong 95$ %.

3 Measurement uncertainty evaluation

The evaluation of measurement uncertainty is accomplished in the INM according to the GUM [4], adopted in Romania as a national standard [5]. The main steps in measurement uncertainty evaluation include:

- definition of the measurand;
- estimation of the equation describing the measurement procedure;
- identification of all possible sources of uncertainty;
- estimation of values for all input quantities;
- evaluation of the standard uncertainty associated with each input quantity;
- calculation of the value of the measurand (using the equation model);
- calculation of the combined standard uncertainty of the result;
- calculation of the expanded uncertainty (with a selected k);
- analysis of the uncertainty budget;
- reporting the measurement result.

To evaluate measurement uncertainty, three measurement points, evenly distributed over the measurement range were selected [6]. Four samples of cereals were used for each point of measurement.

3.1 Modeling the measurement

In accordance with the definition of the moisture content, the measurement equation is:

$$\upsilon = \frac{m_1 - m_2}{m_2} \tag{1}$$

where:

υ is the humidity determined by the absolute method;

m_1 is the initial mass of the moist sample;

m_2 is the mass of the same sample after drying.

Due to the measurement process, 5 correction factors were observed and added to equation (1):

$$\upsilon = \frac{m_1 - m_2}{m_2} \cdot \prod_{i=1}^{5} f_i \tag{2}$$

where:

f_1 is a correction factor due to the time selected for weighing samples of cereals;

f_2 is a correction factor due to the mass of the initial samples depending on the moisture content;

f_3 is a correction factor due to the sample granulation after grinding;

f_4 is a correction factor due to the drying temperature of the samples;

f_5 is a correction factor due to the time selected for drying the samples.

Equation (2) is rather difficult to use as such to combine uncertainties. Therefore, it may be written as the difference between two terms A_1 and A_2:

$$\upsilon = A_1 - A_2 \tag{3}$$

where:

$$A_1 = \frac{m_1}{m_2} \cdot \prod_{i=1}^{5} f_i \tag{4}$$

and:

$$A_2 = \prod_{i=1}^{5} f_i \tag{5}$$

Evaluation of **input estimates** x_i

During in-house experiments, various values of periods of time between weighing samples may lead to different final results of moisture content. Therefore, a correction factor for the time, f_1, was considered. For the considered experiment, a real time of 50 s was taken into account.

The mass of the initial samples may influence the final moisture content result because specific loading of weighing boxes is different. A correction factor for the mass of the initial samples depending on the moisture content, f_2, was considered. For the experiment, a mass of 5.0002 g was taken into account.

Depending on the grinding mill used in the measurement process, several granulations are obtained within the range of ∅ (0.2 to 2) mm. Note that R 59 recommends a maximum ∅ of 2 mm to cover the bottom of the weighing box. Due to the real granulation range, a correction factor due to sample granulation after grinding, f_3, was considered.

During experiments, various values of temperature for drying samples may lead to different final moisture content results. For the experiment, a temperature of 131 °C was taken into account. Therefore, a correction factor for the temperature of drying, f_4, was considered.

The drying time until attainment of a nearly constant mass is specific to each species of cereals. A correction factor for the time of drying, f_5, was considered.

Summarizing, the experimental values are as follows:

m_1 = 5.0002 g

m_2 = 0.3994 g

$$A_1 = \frac{5.0002}{0.3994} \cdot 1 = 12.52$$

A_2 = 1

3.2 Evaluation of standard uncertainties

The combined standard uncertainty of A_1, taking into consideration equation (4), is:

$$u_{A_1} = A_1 \cdot \sqrt{\left(\frac{u_{m_1}}{m_1}\right)^2 + \left(\frac{u_{m_2}}{m_2}\right)^2 + \left(\frac{u_{f_1}}{1}\right)^2 + \left(\frac{u_{f_2}}{1}\right)^2 + \left(\frac{u_{f_3}}{1}\right)^2 + \left(\frac{u_{f_4}}{1}\right)^2 + \left(\frac{u_{f_5}}{1}\right)^2} \tag{6}$$

The uncertainty of the mass measurement, u_m, was evaluated considering the repeatability of the balance component (evaluated as type A standard uncertainty) and the balance linearity indicated on the calibration certificate (evaluated as type B standard uncertainty).
The linearity of the balance as indicated on the calibration certificate was ± 0.1 mg. Thus, considering a rectangular distribution of results, the linearity of the balance contribution was estimated as:

$$\frac{0,1}{\sqrt{3}} = 0,06 \text{ mg}$$

This contribution was considered twice, once for tare and once for weighing of the sample.
The repeatability of mass measurements was determined experimentally and described as being a standard deviation equal to 0.09 mg.

Therefore, the standard uncertainty of the mass measurement was considered as being equal to:

$$u_m = \sqrt{2 \cdot (0,06)^2 + 0,09^2} = 0,124 \text{ mg}$$

The uncertainty of these correction factors was evaluated as being of type B. To determine the influence of the period of time during which the sample is in contact with the air, parallel tests were performed whilst increasing the time of exposure during weighing.

A range of 0.008 % of moisture content determined on parallel samples exposed to air at 15 s, 30 s, 40 s, and 50 s was obtained. Therefore, $u_{(f_1)}$ = 0.008 % was taken for measurement uncertainty evaluation.

The uncertainty $u_{(f_2)}$ due to the influence of the variation of the mass of the initial samples depending on the content of moisture for a rectangular distribution, was considered to be equal to $u_{(f_2)}$ = 0.005 %.

OIML R 59 prescribes a mass of the initial samples of (5.0 ± 0.5) g.

For this correction factor, tests at the maximum and medium recommended masses of the sample were performed and the final result was reported at medium mass.

The results obtained indicated that the mass of the samples should be around the average values.
To determine the influence of the granulation of the samples, tests were performed during the grinding with different granulations.

A range of 0.01 % for moisture content determined on grinding samples at 0.2 mm, 1.0 mm, 1.5 mm and 2.0 mm was obtained. Therefore, considering a rectangular distribution of the results, the uncertainty $u_{(f_3)}$ = 0.006 % was taken as being the measurement uncertainty evaluation.

Several tests were performed to highlight the influence of the drying temperature variation between the recommended limits. In-house studies showed that the uncertainty $u_{(f_4)}$ due to the influence of the drying temperature variation of the samples for a rectangular distribution is $u_{(f_4)}$ = 0.005 %.

The uncertainty $u_{(f_5)}$ owing to the influence of the drying time variation for a rectangular distribution is $u_{(f_5)}$ = 0.005 %.

For this correction factor, tests were performed to establish the influence of the drying time variation to a constant mass. The results indicated that the drying time greatly depends on the type of grain and is correlated with its particle size. Based on previous work, this uncertainty was evaluated.

Replacing the above-mentioned values in equation (6), one may obtain:

$$u_{A_1} = A_1 \cdot \sqrt{\left(\frac{0,124}{5,0002}\right)^2 + (0,017)^2 + (0,011)^2 + (0,011)^2 + (0,011)^2 + (0,006)^2} =$$
$$= 12,52 \cdot 0,013 = 0,162 \text{ %}$$

Accordingly,

$$u_{A_2} = A_2 \cdot \sqrt{(u_{f_1})^2 + (u_{f_2})^2 + (u_{f_3})^2 + (u_{f_4})^2 + (u_{f_5})^2}$$

Considering the evaluated uncertainties for the correction factors:

$$u_{A_2} = A_2 \cdot \sqrt{(0,008)^2 + (0,005)^2 + (0,006)^2 + (0,005)^2 + (0,005)^2} = 0,013 \text{ %}$$

To summarize the results of the evaluation of measurement uncertainty, an uncertainty budget is presented in Table 1 (see opposite).

3.3 Evaluation of expanded uncertainty

The following relation was used to determine the expanded uncertainty

$$U = k u_c(\upsilon) \qquad (7)$$

where the coverage factor k = 2 for a confidence level of $P \cong 95$ %.

Replacing the value of the combined standard uncertainty shown in Table 1, we obtain $U(\upsilon)$ = 0.32 %.

Table 1 The uncertainty budget

Component considered	Source of uncertainty	Value	Standard uncertainty $u(x_i)$, %	Variance $u^2(x_i)$, %
υ	Moisture of the cereal samples	11.52	0.16	0.0257
A_1	According to equation (4)	12.52	0.16	0.0257
A_2	According to equation (5)	1	0.01	0.0001
$u_c^2(\upsilon) = \sum_{i=1}^{2} u_i^2(\upsilon) = 0{,}0258$ $u_c(\upsilon) = 0.16$ %				

4 Conclusions

This paper presented some aspects of moisture content measurement using a reference standard installation developed in the INM.

An expanded uncertainty of $U(\upsilon) = 0.32$ % ($k = 2$), at a confidence level of ≈ 95 % was evaluated using the method developed in the INM. Thus, moisture meters of Class I and Class II accuracy may be verified assuring a ratio of 3 between the mpe of the instrument and the uncertainty of the reference standard installation used to evaluate the performance of the apparatus subject to verification.

To integrate the standard installation developed in the INM in the international circuit of the standard for humidity of cereals in order to confirm the standard equivalence and the estimated values of uncertainty, participation in comparisons relevant to CMC in the field of cereals moisture measurement is needed. ■

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BIRCH STUDY

Economic and Social Benefits of Legal Metrology

Summary Report and Conclusions

JOHN BIRCH
CIML Honorary Member

Abstract

This paper summarises a study conducted for the CIML to review previous studies on the economics of metrology with a particular focus on legal metrology. Some 150 publications were reviewed covering the period from the mid 1960's and including studies on the economics of the national measurement system, programs of metrology authorities and industry case studies. The paper provides a description of the economic and social benefits of trade and regulatory metrology and considers a variety of methodologies that have been used for quantifying these benefits.

1 Introduction

Metrology developed over 5000 years ago with the development of civilizations that required consistency of a wide range of measurements used in everyday life. Consistency allowed the measurements to be aggregated to provide the information needed by the State to organise, plan, defend, and tax with efficiency. State intervention in setting the rules of metrology also provided the trust and confidence necessary to facilitate trade measurement transactions. The fundamental requirement, to ensure consistency, was that all measurements be derived from (royal) standards, what we now define as traceability.

With the development of the modern State, royal decrees and moral precepts were replaced by Weights and Measures legislation which gave legislative force to the rules of the measurement system and established enforcement mechanisms to ensure compliance. This provided the trust in the system, ensured consistency of measurement and established the foundation for what we now describe as legal metrology.

2 The National Measurement System

There was also a massive increase in expenditure on measurement-related activities. Studies conducted by the National Bureau of Standards (NBS) in the USA [9, 11, 12, 14, 17] between 1967 and 1984 indicated that the expenditure on measurement by industry, government and the community was between 3 and 6 % of GNP and sectoral measurement intensity, i.e. the expenditure on measurement-related activities as a percentage of total expenditure, varied between 20 % and less than 1 % of sector expenditure. Major users included Government, trade, electric gas and water utilities.

This expansion created concerns that the lack of centralisation of control of these measurements could be affecting their quality. In 1980 Hunter [14] expressed these problems most clearly when noting:

> "If the direct cost of making measurements is large, the indirect cost of making poor measurements must be huge." And went on "The time appears ripe for a review of the adequacy of our present approach to scientific measurement."

In 1967 a paper by Huntoon [9] put forward the concept of a National Measurement System and the concept was further developed at NBS in the early 1970's and was defined as comprising "All of the activities and mechanisms - intellectual, operational, technical and institutional - used by the country to produce the physical measurement data needed to create the objective, quantitative knowledge required by our society. This knowledge is used to describe, predict, communicate, control and react in many aspects of our personal and social lives, commerce and science and technology.

3 Benefits of Trade Metrology to the Economy

The wide application of measurement after World War II, promoted by the development of electronic technologies, saw the introduction of physical measurements into a wide range of new applications with a proliferation of industry based units for physical quantities. A major advance in bringing coherence to this highly diverse and fragmented system was the adoption in 1960 by the CGPM of the International System of Units that established a single unit for each physical quantity.

In trade based on measurements, Trade Metrology is generally perceived as providing the following benefits:

i) Reduced disputation and transaction costs
ii) Consumer protection
iii) Level playing field for commerce

iv) Effective stock control
v) Control of fraud
vi) Full collection of government excise and taxes based on measurement
vii) Full national benefit for commodity exports
viii) Support of global trade in measuring instruments

4 Benefits of Regulatory Metrology to the Economy

Governments now use measurements in a wide range of government regulations, particularly for the environment, occupational health and safety, traffic control and medicine. The benefits of legal metrology in these applications include:

i) Increased compliance
ii) Sound evidential basis for the measurements
iii) Benefit/cost of metrology regulation can be greater than other policy options
iv) International Recommendations provide a level playing field for the sale of appropriate measuring instruments
v) International Recommendations support global regulatory agreements

5 Benefits of Legal Metrology to Society

Legal Metrology provides considerable benefits to society including:

i) Support of a civil society
ii) Technological education
iii) Reduction of deaths and injuries from accidents
iv) Improvement in the natural environment
v) Improved health from standardisation of measurement and testing

6 Quantifying the Benefits of the National Measurement System

In his 1977 Report "The Economic Analysis of the National Measurement System", [12] Poulson stated:

> "An analysis of the total measurement system, especially in a quantitative benefit-cost mode, is bound to failure: since a modern society could not function without a systematic way of acquiring measurement data, the value of having a measurement system is incalculable."

While his sentiments are understandable, in the ensuing twenty five years many governments have moved to a market economy approach to providing government services with a change in emphasis from output to outcomes. As a result there is a need to provide a measure of the benefits of government programs both to support and justify budgetary allocations and to prioritise expenditure between components of a program.

Some of the earliest studies to attempt to quantify the benefits of the national measurement system were conducted by NBS (USA, now NIST) from 1965 to 1977 and included a number of micro and macro economic studies of the system that identified the labour and equipment costs involved in making measurements in all industry sectors in the US. From these studies it was estimated that the cost to industry of making measurements was 6 % of GNP.

In 1984 Don Vito at NBS [17] further extended these studies of the national measurement system to estimate the cost of measurement and the value added by measurement-related activities. He found that the total cost of measurement to industry amounted to 2 % of sales and the estimated value added from measurement-related activities was 3.5 % of GNP.

For over twenty years the Department of Trade and Industry (DTI) in the UK have conducted a number of studies [52, 53, 55, 56, 58] to provide an economic rationale for their funding of the government measurement infrastructure. The current methodology uses ideas from endogenous growth theory to quantify the economic impact of measurement using the ratio of measurement-related patents (10 %) to total patents to determine the percentage of economic growth generated by measurement.

In 2002 KPMG Consulting conducted a study for the CIPM on the potential economic impact of the CIPM Mutual Recognition Arrangement (MRA) in terms of the efficiency of a multilateral arrangement over multiple bilateral arrangements and the reduction in technical barriers to trade.

The study conducted surveys of twenty-six NMIs who were signatories to the MRA and their cost of maintaining bilateral mutual recognition, and estimated an average annual saving for each member of 2M Euros. The study also estimated an annual economic impact of the MRA in reducing technical barriers to trade of $4 billion.

Throughout 2001 and 2002 the European Measurement Project conducted a number of studies on "The assessment of the economic role of measurement in modern society" [81, 84, 87]. Making an assumption that 1 % of industrial costs are spent on measurement - a figure that is significantly less than found in the NBS

studies - it found that expenditure on measurement in the EU, excluding legal metrology and social expenditure, is 0.96 % of GDP. It estimated that application benefits and knowledge spillovers, but excluding externalities and benefits to society, provided benefits of 2.67 % of GDP with a resulting benefit to cost ratio of 2.73.

EMP also put forward a model for quantifying the economic impact of measurement, using the percentage of EU patents citing measurement activity as a percentage of total patents, to provide a benchmark estimate of measurement innovation providing benefits of 0.77 % of GNP

7 Quantifying the Economic Benefits of Legal Metrology

Whilst there have been a number of studies of the national measurement system there have been few studies of the trade measurement system.

Surveys conducted by Measurement Canada inspectors in 1989-1990 [39, 40] indicated that the total value of goods traded over all classes of trade weighing and measuring instruments was 32 % of GNP. This did not include pre-packaged goods or utility metering. This was consistent with estimates made by NSC, Australia and the Office of Weights & Measures, NIST (USA) [26, 69], i.e. that the annual aggregate value of trade measurement transactions was approximately 50 % of the GNP.

Combining the information from the above study with information gathered on instrument compliance rates, Measurement Canada was able to estimate the cost of verification and reverification activity. They found that for each dollar spent on regular periodic inspection 11.4 dollars of noncompliant measurement was corrected. By targeting inspection activity towards those instruments with higher dollars at risk this "benefit/cost" ratio increased to 28.7. It was also found that on average total trade measurement inequity was comprised of 65 % short measure and 35 % over measure. On average each inspector discovered and corrected about $2 million of total measurement inequity on an annual basis.

However what has not been analysed is the economic (or social) benefit provided by the States' intervention in trade measurement transactions. In particular what Stiefel from NIST [10] has called "economic distortions" resulting from measurement errors would significantly increase if these measurements were left to the market without any intervention by the State, i.e. no legislative requirements, no pattern approval of measuring instruments, no enforcement, etc.

An indication of the magnitude of such economic distortions resulting from the withdrawal of the State, is provided by noting that the annual value of trade measurement transactions in modern industrial societies is about 50 % of GDP and an increase in the average error of measurement of 0.1 %, would create an "economic distortion" of .05 % of GDP. Such an amount is significantly greater than the expenditure by governments in maintaining the national trade measurement systems.

8 Developing Countries

There is little literature on the economics of metrology in developing countries. This despite the challenges to developing countries to develop, modernise and globalise their metrology systems to provide their economies with the social and economic benefits of modern metrology.

Birch [76] noted the importance of an effective trade measurement system for the responsibilities of the government of Papua New Guinea and noted that:

- Mineral products contribute 70 % of PNG export income and 17 % of government revenue;
- PNG has recently changed its taxes on alcohol and tobacco from an ad valorem tax to taxes based on weight and volume;
- There is a proposal to develop the PNG natural gas deposits and export the gas to Australia by a high pressure gas pipeline.

All of these sources of government revenue and national income rely on accurate and consistent measurement.

The UNCTAD specialist workshop on commodity exports of Least Developed Countries held in 2002 [95] recognised in the Chairman's summary report the importance of measurement infrastructure for developing countries and also recognised the importance of national and/or regional testing laboratories to assist developing countries in accessing global markets.

Introducing regulatory metrology for environmental, health and safety control is also a challenge for these metrology authorities. The World Disaster Report [117] has highlighted the importance of road accident control for developing countries. The report estimated that 70 % of road fatalities occur in developing countries and that the current cost of traffic accidents in these countries was roughly the level of all international aid. A major study has forecast that with the rising number of cars, particularly in developing countries, by 2020 road fatalities will be the third highest cause of global death and disability.

The OECD has also noted [118] that an effective road safety program needs a combination of three things: campaigns to raise public awareness of the risks associ-

ated with poor road user behaviour, a stringent enforcement regime and a consistent penalty system. Legal metrology can make a significant contribution to such a program.

9 Conclusion

With the continuing expansion of legal metrology, authorities need to regularly reprioritise their activities to maximise social and economic impact. This will require collection and collation of data on the performance of the measurement system as well as familiarity with national and international economic and social indicators.

The value of trade measurement transactions, the accuracy and consistency with which they are performed, industry expenditure on measurement-related activities and the cost of government programs to maintain and enforce trade measurement systems provide the basic data for quantifying the direct costs and benefits of trade measurement. Regulatory metrology is more difficult to quantify because of its significant social benefits.

Many of the studies conducted by economic consultants were disappointing and a major factor was that they were one-shot studies and they had not been provided with either the information or the understanding of the operation of the measurement system. Studies conducted by in-house economists or by consultants on a continuing basis provided more useful recommendations. ■

Note: All references are from J.A. Birch, *Benefit of Legal Metrology to the Economy and Society*, 2003, available on the OIML web site

SOFTWARE

Integrity check of embedded software in weighing instruments via the Internet

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1 Introduction

It will soon be the general case that nonautomatic weighing instruments (NAWIs) have network connections and that their embedded software is stored on re-writeable media rather than in read-only memory (ROM). These new features offer considerable benefits to manufacturers: for example, if a manufacturer discovers a bug in his products, he will be able to fix the problem via a network. Moreover, he can even add new functions to his products after they have been put into service.

But these new features create a new problem with regard to the integrity of embedded software. In particular, they are incompatible with the idea of type approval in legal metrology, the aim of which is to stipulate those properties that are subject to legal control at the type approval stage. However, the new features do allow manufacturers to change the properties of their products after type approval has taken place. Worse, a malicious attacker may change the embedded software in a NAWI which has been put into service via a network. Conventional solutions to the problem are:

- to seal the media physically;
- to store embedded software in ROM; and
- to block network connections.

The solutions presented in this paper are:

- to confirm software separation;
- to use web-based technologies; and
- to use digital signatures and Public Key Infrastructure (PKI) [1].

The details of the proposed solution are also explained and snapshots of a prototype system based on the solution developed are shown.

2 NAWI up to now and in the future

Figure 1 shows a typical example of conventional nonautomatic weighing instruments. The load cell sends analog signals to the A/D converter, which converts them into digital signals; the latter are processed by the embedded software in the NAWI. For example, the embedded software implements the zero-tracking device, checks stability and calculates weights, which are then displayed or printed. Conventionally the embedded software is stored in ROM. Therefore after the NAWI has been put into service, the embedded software cannot be altered unless somebody exchanges the media on which the embedded software is stored. By physical sealing, a verifier can find evidence of such an exchange.

In the near future a typical example of a nonautomatic weighing instrument will be such as in Figure 2. The differences are that:

- the embedded software is stored on re-writeable media, e.g. EEPROM, Flash memory;
- the NAWI has network connections.

If a NAWI has both these two features, then it can have a software download mechanism.

3 The problem and our solution

As stated in the Introduction, the software download mechanism causes a new problem with regard to type approval in legal metrology. The problem is also discussed in WELMEC Guide 2.3 [2]. The most important idea in [2] is that of *software separation* which makes a distinction in the embedded software between the legally relevant parts and the non-legally relevant parts. The legally relevant parts must be determined at type approval stage, but the non-legally relevant parts may change after the NAWI has been put into service. We also follow the idea of software separation and one of our contributions is a proposal for defining what the legally relevant parts are; the proposal is given in Section 5.

Software separation is necessary in order to reconcile the software download mechanism with type approval. However, software separation itself is not sufficient for the reconciliation. It is necessary to have a method to confirm whether the legally relevant software parts of a NAWI put into service are the same as those stipulated at type approval stage. In [2], it is claimed that the NAWI itself should have the confirmation mechanism, for example, by storing the checksums of the legally relevant software in the NAWI. But if a NAWI has only re-writeable media, the checksums themselves can

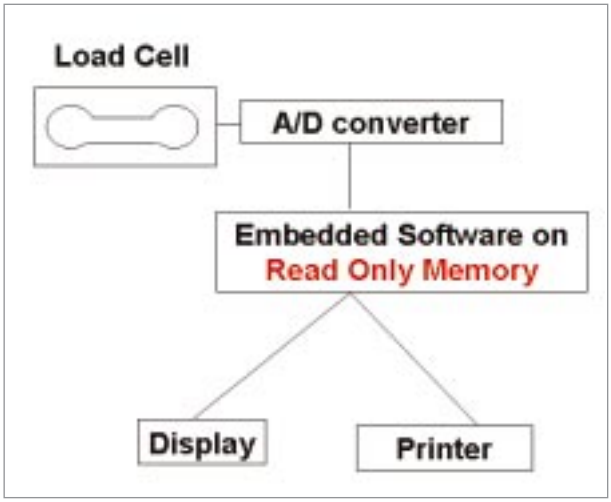

Figure 1

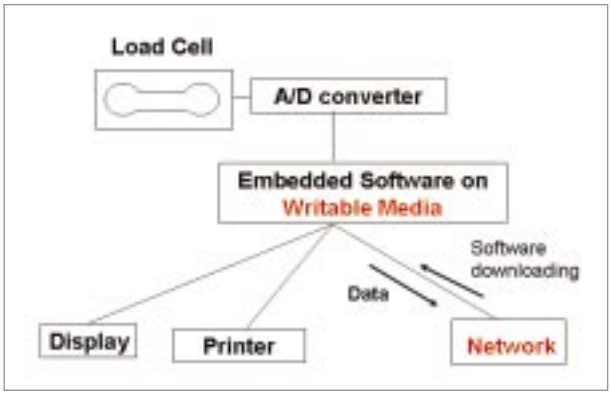

Figure 2

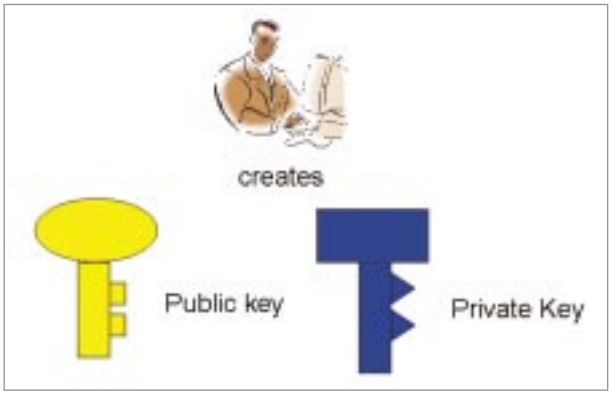

Figure 3

be rewritten. Moreover, if a NAWI has a special ROM for the checksums, the cost of the NAWI increases in line with that. Our proposal is that:

- the checksums or fingerprints of the legally relevant software parts should be saved by a type approval authority at type approval stage;
- periodically, the legally relevant software parts of a NAWI put into service should be verified by comparing their fingerprints with the saved fingerprints at type approval stage.

The advantages of our proposal are as follows:

- there is no need for additional hardware: merely codes of several 10 Kb for generating fingerprints are added to the embedded software; and
- it is secure for legally relevant software, because the saved codes on an authority's server are fingerprints, not real programs and the codes extracted from NAWIs put into service are also fingerprints. It is impossible to recover the real programs from these fingerprints.

In the next section, an implementation of our proposal which uses web-based technologies and PKI [1] is explained.

4 Integrity check using PKI and web-based technologies

The implementation of our proposal employs web-based technologies; Internet browsers such as Internet Explorer are used as far as possible. However, for security reasons, not all should be done by web-based technologies. For example, there is a security risk in using such technologies to extract a fingerprint from legally relevant software, because a third person between the client and the server may be able to intercept the legally relevant software. Therefore, the extraction should be done by local host itself. Since we use web-based technologies, persons using these services may be anonymous. However, in legal metrology, authentication and identification are very important. In order to identify the participants clearly, we use PKI.

The technical background to PKI is public key cryptography. At first, a user of PKI must create a pair consisting of a private key and a public key for himself (see Figure 3). The private key must be kept secret but the public key can be open to anyone. However, there is a problem in that if the public key is distributed publicly, then the public key owner's identification may be "leaked", because a malicious attacker may pose as the owner by using another public key. In order to avoid such an incident, PKI requires certification authority (CA) as an indispensable element. The owner of a public key requests a certificate for the public key to a CA. If the CA confirms the identity of the owner, then the CA issues the certificate (see Figure 4).

The two main usages of public key cryptography are (1) encryption by public key and (2) digital signatures.

Figure 4

We mainly use digital signatures (see Figure 5 for a typical usage). An individual wishing to distribute his data publicly (for example, the legally relevant software parts of a NAWI) but who does not want distorted versions of the data to be distributed, generates the digital signature from the data and his private key (see (1) in Figure 5). Then the data is distributed publicly (see (2) in Figure 5).

After the data has been distributed, one might doubt the integrity of the data which has been obtained: this integrity can be validated using the digital signature and the certificate of the distributor of the data (that includes his public key) (see (3) in Figure 5). It is obvious that the framework of the integrity check applies to the problem which we are faced with.

Next, we explain the implementation of our proposal. As an example, a manufacturer wishes to request type approval of a NAWI type that has a software download mechanism to a type approval authority. Before the request, the manufacturer must:

- create a public key and a private key pair; and
- obtain a certificate for the public key from a CA (the CA can be the type approval authority itself).

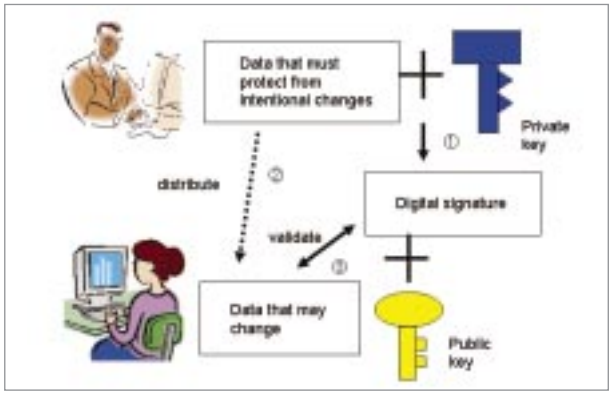

Figure 5

At type approval stage, the following should be done:

- the manufacturer and the type approval authority discuss which are the legally relevant software parts of the NAWI type, then which legally relevant functions should have been defined. In the next section, we discuss this matter. The type approval authority must confirm the software separation of the embedded software of the NAWI type.
- the manufacturer registers the digital signatures of the legally relevant software parts on a server belonging to the type approval authority.

After type approval, NAWIs of the approved NAWI type will be put into service. To these NAWIs the following should be done periodically:

- the verifier should be able to extract the fingerprints of the legally relevant software parts of a NAWI to be verified. Of course, the NAWI must incorporate such a mechanism. But open sources that generate fingerprints (for example, MD5) are readily available. Moreover, the sizes of these programs are relatively small (for example, the size of an executable code for the original MD5 source code is about 18 Kb).
- the verifier should compare the fingerprints generated with the digital signatures stored on the server of the type approval authority. In our implementation this is done by a web-based application. This is secure because the transmitted data via the network only contains fingerprints, not the actual programs themselves.

5 Our proposal for a definition of "legally relevant functions" in NAWI embedded software

In this section we discuss a definition of legally relevant functions in NAWI embedded software. First let us recall the main purpose of a NAWI, which is to measure the weight of an object placed on it. Therefore the software parts which implement the weight calculation using digital signals are important. Without any doubt, the software is under legal control.

Concerning the other parts, the software that calculates the price from a measured weight and a unit price given by an operator of the NAWI shall also be under legal control. For example, see OIML R 76-1 4.15.2 [3].

The user interface parts that receive operators' inputs and store data deal with unit prices and tare values. But the parts are important to manufacturers, because they can demonstrate individual features in their products such as design, functionality, etc. Therefore, it is not advisable to stipulate that such parts

are legally relevant parts at the type approval stage. Moreover, these inputs are indicated on a display. So, if the program parts were modified, it would be easy to detect this fact.

The program parts for displaying and printing deal with weight, price, and tare values and zero indicators which are under legal control (see 4.5.5, 4.6, 4.15.2 of [3]). Many possibilities about software separation of the program parts may be considered. For example, both program parts for displaying and printing might be under legal control, or only those parts for displaying. It seems difficult to put forward a unique concrete solution to such a problem, and it would seem better to propose a standard by which type approval authorities can judge whether a NAWI type should be approved.

A standard that we propose is as below. Legally relevant functions are:

- the functions that are needed to calculate the weight from a digital signal sent from the A/D converter; or
- the functions that are not included in (1) but that are needed for commercial transactions and whose modifications can not be easily detected.

Clause (2) states that a function should be non-legally relevant if any modification of the function can be easily detected, even if the function is needed for a commercial transaction.

The application of the standard to a concrete instance of NAWI types should be determined by discussion between the type approval authority and the manufacturer.

6 Our prototype system

We have implemented a prototype system for the integrity check of embedded software in weighing instruments using standard web-based technologies based on a client-server model. The server-side system uses Microsoft .NET Framework and the server program was written in C#. The client side uses a web browser such as Internet Explorer. But for security reasons described in Section 4, for example, extracting fingerprints should not be done by using web-based technologies. It is also risky to use these technologies in order to generate a digital signature, because a private key must be transmitted to the server-side in order to do this. So we have also developed utility programs for extracting fingerprints and generating digital signatures.

Our prototype system consists of two parts:

- Web pages for manufacturers to register digital signatures. At first a manufacturer registers his certificate for his public key. The registered certificate contains the records of his public key and his e-mail address. Then the server sends a password encrypted by his public key to his e-mail address. The only person who can decode the encrypted password is the manufacturer, because the only person who knows his private key is himself. Using the password the manufacturer can log in. After login, he registers the type of his product that he wants to be type-approved. Finally he registers the digital signatures for the legally relevant software parts of the product type. Legally relevant software parts are dynamic link libraries; we have not considered a solution in the case where an operating system cannot permit dynamic link libraries, i.e., all the modules are combined together in one executable file. But what we must tackle are new technologies such as modern operating systems (e.g. Microsoft Windows and Linux support dynamic link libraries). Figure 6 shows the registration page for digital signatures.

Figure 6

- Web pages for verifiers. By using these web pages, a verifier can confirm that the legally relevant software parts of a NAWI put into service were not modified. But as stated in Section 4, in order to do this, the NAWI must have a mechanism which can extract the

Figure 7

fingerprints (also called hash codes) from these legally relevant software parts. Figure 7 shows the web page which enables the user to verify these software parts. By pushing a button for verification, a verifier can compare a hash code extracted from the NAWI put into service with the digital signature saved in the type approval authority's server.

7 Summary

- Introducing new features of network connections and re-writeable media in weighing instruments challenges the way of thinking of traditional type approval.
- We propose a solution to the problem which uses PKI.
- We also propose a definition of what software parts in weighing instruments are legally relevant.
- We have implemented a prototype system for integrity check based on our proposal.

8 Acknowledgements

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Metrology in a global market

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When talking about what metrology structures might resemble in the year 2020, we must first imagine how long twenty years actually is to gain a perspective of the timescale involved.

I have studied the Dutch situation in the 1920's; this may also be the general European situation, though I do not believe it is a worldwide situation because each country has its own individual (and often completely different) background. At that time, society was so-called "class-based" in the sense that individuals lived in small villages where everything was available locally. There were other villages nearby but people did not visit them, preferring their own local facilities.

In the 1950's at the peak of the "comportmentalization" period, meaning that society was organized along political and social lines in which individuals belonged to distinct groups, people lived in their group and even one's sports club or church was in this group. Each group remained separate from all the other groups.

Then in the 1960's, we encountered a new world called the "flower-power period" and idealism was the real force behind it. Formal structures disappeared.

In the 1980's, The Netherlands experienced a "no-nonsense" period based on business: everything had to have a meaning, and that was the start of globalization.

And now in the 2000's, the economy rules the world; it is already a global economy, but this evolution is not finished yet and our world is becoming increasingly money-driven.

Now we must take the next step, first attempting to anticipate what this step will be. I think that the world will become a "village" again, but the whole world will be this village. Networks and network economies will be very important and will be global. And also because of technological developments, communication will become easier and we will become closer. Borders between countries will reduce in importance; global ideas and global values will be developed. So why should we not also develop a global idea about measuring instruments?

Mobility will become huge and I think that the notion of global culture will become dominant, in addition to the individual national cultures, which will remain.

Manufacturers will produce more or less universal products. Of course, requirements for conditions of temperature, etc. will differ but in principle products will be universal, and will be produced at low cost.

Manufacturers will be centralizing their R&D activities - as they are already doing. Product life-cycles will become shorter and shorter and IT and the Internet will be dominant. But more important than that, we will experience a new revolution which will be sensor technology. Such technology is now starting to emerge: the equipment will "see" what is happening, and will inform us accordingly. We will have to deal with these technical developments.

What will manufacturers' demands be? Certainly an efficient certification process, since this is time and money consuming. Manufacturers want global acceptance of type approvals and of self-verification.

So we will shift our focus more to the process than to the end control, as self-verification involves looking at the process. Manufacturers' responsibilities will increase.

Certification bodies will reduce in number, perhaps one or two on each continent depending on where the industry is located and these laboratories will form a network, even a kind of virtual institute. They will connect their operations more intensively and they will operate as consultants providing market access. What they will deliver will be quality, proven confidence and proven improved quality. Efficiency and service levels will have to be high too. Certification bodies will move closer to manufacturers, almost working together. That means that there is something else to do in metrology: there will be a focus on inspection and enforcement, and market surveillance by others than the certification bodies. Also the involvement in regulations, i.e. the harmonization of technical requirements, will be a job that is performed by somebody other than the certification bodies. It will be the same for drawing up criteria to recognize certification bodies.

So what are the rules of the game? Some and even most of these tasks will be part of governmental activities, or at least financed by government.

At the product development level, there will be a training and consultancy instruction relationship with test laboratories in the form of a network. Directly after (or even during) this development phase there will be an approval process with the aim of reaching global acceptance. Then when production is started, everything will run based on the manufacturer's quality sys-

tem. Distribution to the manufacturer's sales agents (including those on other continents) takes place and when the product is sold to the target market, the approval network has already performed its work so the approvals already exist, contrary to what happens now where most approvals still happen between the local manufacturer's agents and local governments.

So one has to start with a definition of the target markets; secondly one performs an investigation about requirements; thirdly one makes an integrated test and type plan for the manufacturer and gives this to the latter; fourthly one has to compile a test report; fifthly one makes the application for all countries, and sixthly one must collect the tools. And that is the job that has to be done for the manufacturer.

So what actions have to be carried out now? We are able to decide more or less what the future will hold and how to envisage where we will be in twenty years because we are all metrologists. If we agree on this then the world will become an easier place for us. Global acceptance is very important and will continue with various kinds of mutual and bilateral agreements. But we have to shift the responsibility more over to the test laboratories themselves. We have to invest in global knowledge so there must be a way to be made aware of how complex all the requirements are. Then we have to work on approval competence and here accreditation would appear to be the most logical way - though there may be others. We should work on the harmonization of regulations and the universal approach on self-verification is fairly important - it is strange that we do not talk about this subject that much. We have to harmonize the use of quality manuals and systems for delegating responsibilities to manufacturers and we have to focus on market surveillance (though that is the job of governments or other bodies).

So my conclusion is that if we make the right decisions now, then we are in a position to choose where we want to be in 2020. Do we want to hold a government regulator function, an inspection body for market surveillance or other kinds of enforcement, or do we want to be a part of the network as a certification body.

With a view to setting up this network in the near future, any ideas or comments are welcome. ■

Changes in consumer protection in legal metrology as a result of new technologies

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This presentation describes the technical development of measuring instruments as far as they have an influence on consumer protection. In this connection also the maximum permissible errors for verification and in service will be discussed. New technologies require new conformity assessment procedures. Here the limits of existing verification procedures and future modifications are pointed out. With initial verification carried out in many countries by the manufacturers, market surveillance becomes more and more important, which is however only a part of metrological surveillance. Finally my proposals will be summarized with an outlook in the future.

In legal metrology it is assumed that the measuring instrument is a complete unit from the sensor up to the display of the measuring result. There is a tendency, for example in utility companies, that peripheral equipment is integrated which is not verified. Therefore the consumer obtains measurement results that determine the price to pay from devices that are not subject to mandatory control. In the future, the Internet will be used for the transmission of measurement results from the measuring instrument to the remote display.

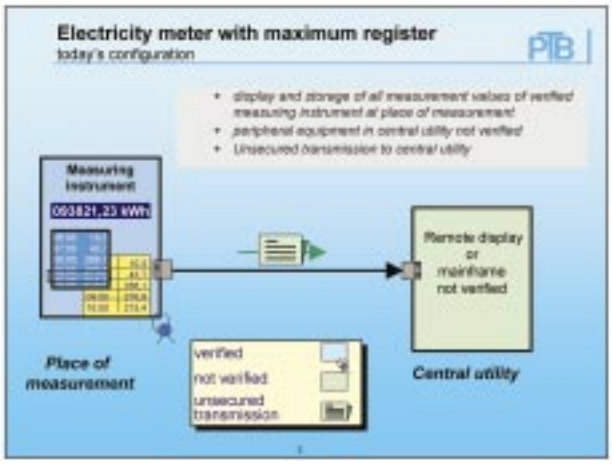


Figure 1

The function of measuring instruments will increasingly be influenced by software. Often this software is not testable because there is no clear separation of the software which is subject to legal control and the other part of the software which is modifiable and changeable by the user. Furthermore, there is a trend that users would like to modify the software by downloading it, so it has to be granted that the modification concerns only the permitted part of the software. Only restricted tests with classic instruments such as type approval, initial verification, re-verification and inspection can be carried out with these electronic modern instruments. Furthermore, in utility companies, the measurement results are connected with prices or tariffs so that the customer is not always in a position to be able to check whether the measurement result, which forms the basis for the price to pay, arises *de facto* from a verified instrument.

Figure 1 shows a typical contemporary configuration of an electricity meter with additional measurement of the load (maximum register). All measurement values are saved and displayed in the measuring instrument at the place of measurement. The transmission to peripheral equipment or central mainframes is carried out unsecured. In case of doubt, the customer can check the results at the measuring instrument and this is our understanding of legal metrology today.

However, it is in the interest of industry to simplify measuring instruments and not to store all the measurement results in the register for a long time. In the future this can lead to a configuration demonstrated in Figure 2.

Figure 2 shows that at the place of the measurement, the customer does not have a complete electricity meter but just a component without storage and display. The measurement results are signed cryptographically via opened networks, for example the Internet, and transmitted to the central utility company. The mainframe and all the software are not subject to legal control.

At the place of the measurement, the customer may use a computer and approved software, and thus has the possibility to access all signed measurement results via the Internet at the place of measurement or even remotely. In this way he can check the invoice of the utility company.

The development of cryptographic codification technologies will lead to the fact that, in the future, distributed measuring systems will be developed with parts which are not subject to legal control but never-

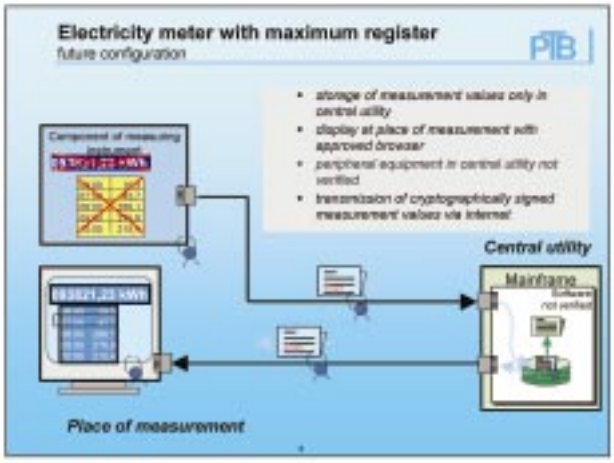


Figure 2

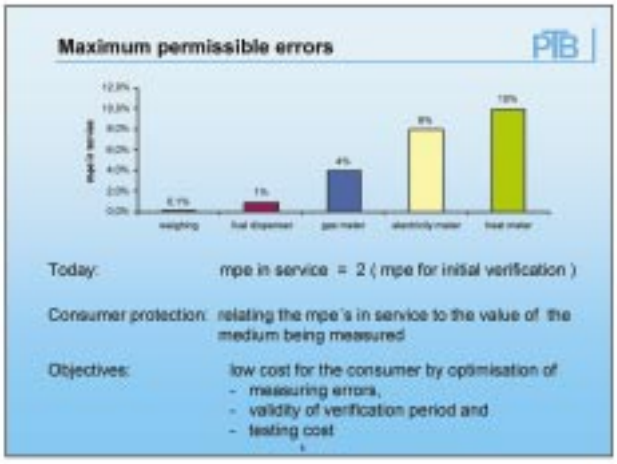


Figure 3

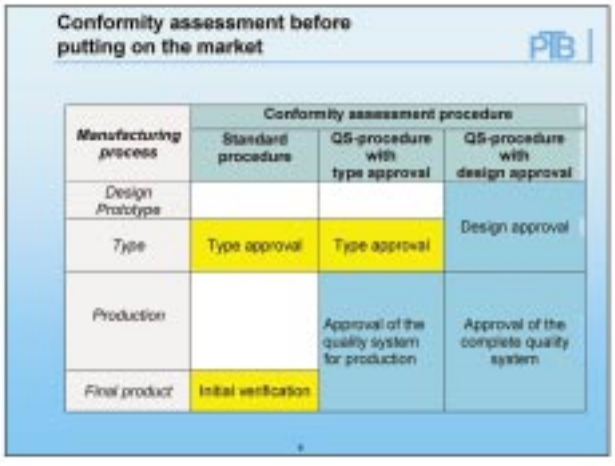


Figure 4

theless with a safe data transfer for the purpose of consumer protection.

To a great extent the maximum permissible errors of measuring instruments depend on the measurand but also on the technology used. As **Figure 3** shows, the mpes in service may vary from 0.1 % for weighing instruments to 10 % for heat meters but in all cases we speak of consumer protection at the same level. Today we differentiate between the mpe for initial verification and the mpe in service, which as a rule is twice the former, so that measuring instruments can be used for a longer period without exceeding the tolerance limited by the mpes in service.

With the introduction of new technologies, the mpes decrease for some kinds of measuring instruments. But improved accuracy does not always mean better consumer protection. We must realize that the price to be paid by the consumer also depends on the cost of the measurement. These costs can be very high for instruments of the utility companies because these instruments have to be re-assembled for re-verification. Since today's electronic devices very often have a shorter lifetime with shorter validity of verification, it may be reasonable to define higher mpes in service for such devices which are very accurate when they are new. An optimization of the cost for the consumer might make it more reasonable to apply a factor higher than 2 between mpes for initial verification and those in service. In particular, this applies to measuring instruments with a small economic impact to the consumer.

In the future the assessment procedure will change.

As depicted in **Figure 4**, with series-produced instruments, it is standard procedure to carry out a type examination and a simplified examination of the final products, called initial verification. However, the manufacturing methods can have considerable influence on the individual measuring instruments, causing the latter to deviate from the type. These deviations cannot be recognized on initial verification. Therefore it may be reasonable to put the responsibility for this examination on the manufacturer on the basis of his quality system. This means that we do not apply the standard procedure but a quality system procedure with type approval. This quality system should be approved and under surveillance by an independent body. Sometimes this kind of examination is called manufacturer-verification or self-verification. However, there is still a limitation concerning the design stage.

It is advisable that software-controlled instruments are not only tested when they have become a complete type or black box, but already at the design stage so that it is easier for the manufacturer to carry out modifications in time so that the instrument meets legal requirements. The quality system of the manufacturer should not cover only the manufacturing and the final product testing, but also the design stage. So one can see that

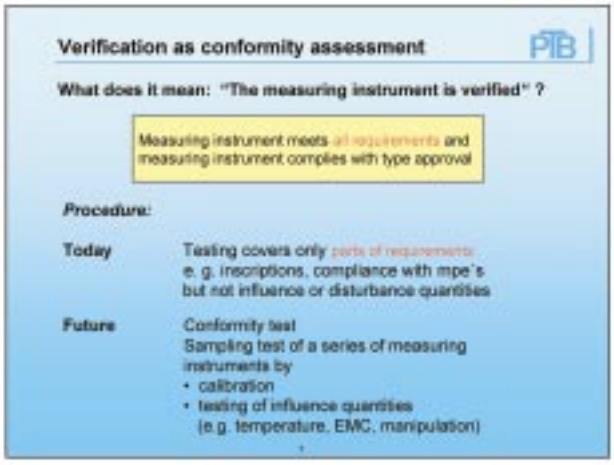


Figure 5

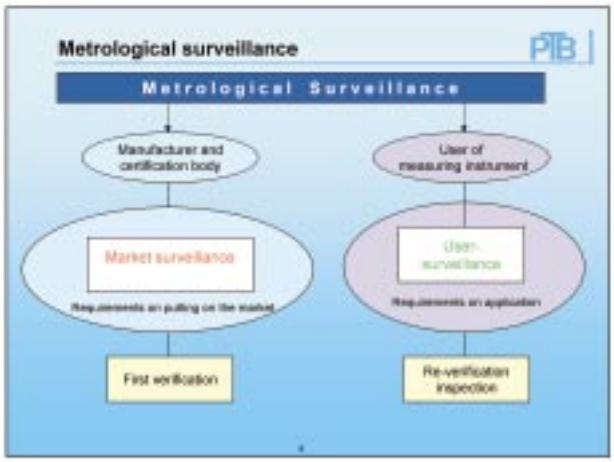


Figure 6

Figure 7

QS-procedure with design approval covers all relevant stages. Due to the experience with type examination, the same bodies should carry out the design examination. The same bodies should also be in charge of the approval and surveillance of the complete quality system of the manufacturer, because there is a very close interchange of this kind of quality system and the design requirements. In the future in Europe, manufacturers will have the possibility to choose between these three different conformity assessment procedures.

As shown in **Figure 5**, the verification should grant that that the measuring instrument meets all legal requirements but, in practice, the verification covers only parts of the instrument, for example inscriptions, installation and the compliance with maximum permissible errors, but not the influence of disturbances such as EMCs. Verification means testing of each measuring instrument so there is an economic limitation for an extension of the verification procedure with the aim of a conformity test.

In order to achieve a testing and certification procedure with measuring instruments meeting all requirements for type approval, series-produced measuring instruments should be tested only by sampling. With a limited number of specimen it is possible to extend the procedure of verification to the significant influence quantities. It would even be possible to apply a simplified EMC-test by using a mobile telephone near the measuring instrument under defined conditions written down in the type examination documents. The results of such simplified examinations at the level of verification are not equivalent to pattern approval but provide more information than no examination at all, as it is the case today.

Figure 6 shows that by introducing 'self-verification' performed by the manufacturer or verification by another private certification body, there is a necessity for metrological surveillance by the government. We should distinguish between the surveillance of the manufacturer and the surveillance of the user of the measuring instrument.

The ability of the manufacturer to put approved measuring instruments on the market has to be checked by market surveillance. The problem is that market surveillance can only apply when the instruments are already on the market. A modified verification is a possible tool for this task. With this 'first verification', the instruments can be checked on the basis of requirements which are valid at the time of the putting on the market. This procedure should guarantee that the manufacturer has met the requirements for all of his instruments.

The surveillance of the user concerns the correct use of the measuring instrument and can be carried out by 're-verification' or 'inspection'. The requirements referring to this aim are not the same as at the time of

putting on the market, but on using the instrument. This procedure should mainly aim at the responsibility of the user.

Figure 7 shows two surveillance methods.

The verification suitable for market surveillance concerns the surveillance of the manufacturer or that of the certification body. The requirements for this verification are those valid at the time of putting on the market. Should this verification be a conformity assessment of the measuring instrument, a modification must be made compared with the today's initial verification which has been already explained. Of particular significance is the statistical test for a series of measuring instruments. This verification could be carried out after a relatively short-time validity of verification period, for instance one year after putting into use. Later re-verifications would be possible after longer time intervals so that the cost for the first short-time validity of verification period would be compensated.

The re-verification or inspection serves the user-surveillance. Therefore the requirements have to be met on using. This concerns the maximum permissible errors in service, the installation and the possibilities of misuse. Furthermore it is reasonable to test the processing of the measurement results relevant to the charging of the customer.

This is important when the measurement results might be influenced by peripheral equipment which is not subject to legal control. Concerning utility companies or petrol stations, this test could be realized if a convenient quality system for this data procession would be required and if checks would be carried out in form of an audit of the relevant part of the quality systems.

Conclusion

In summary, it may be noted that a preferably quantitative definition of consumer protection is necessary and that the maximum permissible errors in service should be reconsidered in this connection. Furthermore, the definition of a measurement result relevant to the price to pay is necessary so that the customer can check his bill on the basis of a correct measurement result. Legal metrology not only means trade with instruments; it also means trade with measuring results.

The manufacturer has to develop the software in such a way that it may be tested. In addition, concerning modern measuring instruments, new conformity assessment procedures are required which make use of the manufacturer's quality system.

The introduction of progressive intervals of validity of the verification period, starting with a short interval which is later extended, might contribute to an improved market surveillance of the manufacturer.

Concerning the surveillance of networked measuring systems, the Internet should be used by the verification authorities in order to check these measuring systems e.g. for download activities.

As the quality of the measuring instruments is assessed by the manufacturer and/or by the certification body, also these bodies have to be monitored. In the future, the increasing privatization of the testing and certification bodies will become more and more a challenge for the legal metrology authorities. ■

The evolution of the metrological control of measuring instruments in France

(The new professions in legal metrology)

GÉRARD LAGAUTERIE
Sous-direction de la Métrologie, France

Introduction

Traditionally and until recent years in France, the control of measuring instruments was performed by state officers. Since 1988 some delegation of controls to private bodies has been possible, and a decree published in 2001 clearly established that:

- where applicable, conformity assessment of measuring instruments is performed in the framework of the quality assurance system (QAS) of the manufacturer, repairer or installer, approved by a designated body;
- where not applicable or in cases where there is no approved QAS, verifications are performed, according to the case, by bodies designated by the Ministry of Industry or by bodies approved by the local authority representing the county in which the body is located;
- the control is performed by state officers only when the above-mentioned modalities are not possible.

This policy is implemented on the one hand in order to offer flexibility to manufacturers, repairers and installers who are capable of demonstrating their competence by implementing a QAS, and on the other hand, both because of the increasing of the number of activities for state officers and in line with government policy to decrease the number of civil servants and to delegate various activities.

The 2001 decree defines four levels of metrological control:

- type examination (approval);
- initial verification (for new or repaired instruments);
- verification of installation (for instruments for which this operation is critical);
- control of in service instruments (periodic verification in particular).

In addition to the national control, procedures in application of European Directives also apply.

When the process of delegation of all these activities (called "first level activities") is achieved, the essential activities of state officers will be:

- surveillance of operators;
- surveillance of instruments in service;
- market surveillance.

These activities are called "second level activities" because state officers are not involved directly in the conformity assessment process.

This paper describes the new modalities of the state officers' action in this context. Those are called the "new professions in legal metrology". Synergies between these activities, factors for success and difficulties will be highlighted.

Definitions

The following definitions apply.

Surveillance of operators

Set of activities implemented in order to check that operators respect their obligations and, in the case of operators having implemented a QAS, their commitments.

These operators are of two main types: firstly designated bodies, agreed bodies, or French notified bodies, and secondly manufacturers, repairers or installers.

"Designated body" means a body designated by the Ministry of Industry for certain activities of measuring

BIML Note:

This English translation by the author is an abridged version of the French original, which is available as a PDF file on the OIML web site (www.oiml.org/2020). Due to space constraints,we regret we are unable to publish the French text. The presentation was given in English in Saint-Jean-de-Luz.

instrument conformity assessment. These bodies have to demonstrate their competence, impartiality and independence from manufacturing and repairing activities in particular.

"Agreed body" means a body agreed by a local authority for certain activities of measuring instrument conformity assessment. These bodies have to demonstrate their competence and impartiality.

"French notified body" means a body notified by the French Government for conformity assessment in application of a new approach Directive. Requirements for designated bodies are similar to those for notified bodies.

Surveillance of instruments in service

Set of activities implemented in order to check on the one hand that instruments in service are correctly maintained and verified and on the other hand, that they are suitable for use and correctly and legally used.

Market surveillance

For instruments intended for regulated usage, a set of activities implemented in order to:

- check that instruments placed on the market and put into service have been subjected to appropriate conformity assessment procedures, conform to statutory requirements and are correctly marked,
- undertake statutory corrective actions.

For instruments not intended for regulated usage, a set of activities implemented in order to check that instruments put on the market are correctly marked.

Audit (definition according to ISO 9000: 2000)

Systematic independent and documented process for obtaining audit evidence (facts, recordings) and evaluating it objectively to determine the extent to which audit criteria (requirements) are fulfilled.

In depth visit (of surveillance)

Visit, in general expected, made at the head office or to an agency of an operator, intended to investigate whether the operator fulfils certain of its obligations or commitments, or that the latter are appropriate.

In depth visits may be considered as small intermediate audits.

Unexpected visit (of surveillance)

Unexpected visit of an operator, mainly intended to check the competence of staff in real situations, and to check that the staff fulfils the obligations and commitments of the operator in the presence or in the absence of the state officers as well.

Global description of the situation

The 2001 decree prescribes three categories of operators:

- private bodies in charge of certification (designated or agreed);
- manufacturers, repairers or installers having a QAS approved by a designated body (Laboratoire national d'essais - LNE in particular);
- manufacturers, repairers or installers having no approved QAS but having to request verification to a third party body.

Each type of operator necessitates an appropriate level of surveillance (*see French text for more details*).

Surveillance of agreed bodies in charge of verifications

In addition to the initial audit, the surveillance includes:

- periodic audits;
- in depth visits;
- unexpected surveillance visits;
- instruction of the demand and general follow-up of the activity of the body.

The 2001 decree prescribes that the agreement of a body is issued by the local authority of the department were the body is located and that the agreement is valid for the whole of France. So it was necessary to develop rules for coordination between the DRIREs (local authorities in charge of legal metrology), as far as the instruction of the demand and the follow-up of the activity is concerned.

The pilot-DRIRE (of the region where the local authority issues the agreement) is responsible for this coordination, particularly for the organization of audits and the transfer of information concerning the bodies for which they are responsible.

Each DRIRE performs its minimum program of surveillance that is defined at national level. This pro-

gram takes into consideration the size of the body. The DRIREs reinforce the surveillance of a body according to their own observations, or at the request of the pilot-DRIRE.

Audits

The initial agreement is issued after the conclusion of an audit has been positive. Periodic audits are subsequently performed every two years and the agreement is renewed every four years (complete re-instruction). If necessary, intermediate audits may be performed.

The audit team shall have competence in quality assurance aspects, legal metrology and the specific instrumental technology. In some cases, the team may include only one person, provided that he/she has all these competencies.

Audits are organized taking into consideration the entire national organization of the body. For this it has to declare all its operators, facilities and procedures.

The qualification and the management of operators' competencies are the responsibility of the body, but in the process of the audit the checking of the competence and suitability of procedures may involve any operator, whatever the location at which it is intended to operate.

In depth visits

The head office of the body is subject to an in depth visit each year, during which no audit is to be performed. Each local agency of the body is subject to such visits every two years.

The duration of these visits depends on the size of the body and on whether it is the head office or a local agency.

During an in depth visit it may be checked that the body respects all its obligations and commitments, but in particular those directly connected to statutory aspects, and also those quality aspects having a direct connection with statutory aspects (*see French text for more details*).

The conclusions of each visit are recorded on a specific report.

Unexpected surveillance visits

Familiarity with regulations and the competence of individual operators of bodies are checked in particular during unexpected surveillance visits. This is also the occasion to check whether they respect the obligations and commitments of the body. The unexpected aspect also allows the quality of operations to be appreciated both in the presence or in the absence of the state officers.

During this surveillance, the operator is invited to repeat measurements he or she has already performed in the absence of the state officer. The results obtained both in the presence and in the absence thereof, and the quality of judgments as to the conformity of the instruments, are all analyzed. It is also checked whether he or she is in possession of all the necessary elements and that the standards are calibrated according to the rules.

Each body working in a region is subject to such visits, whose frequency depends on the size of the body.

In order to allow this surveillance, the body has to notify the DRIRE of its verification program. As soon as possible, software will be made available to them in order to automatically notify this program when establishing it for their own purpose.

The conclusions of each visit are recorded in a specific report.

Instruction and follow-up

Instruction means initial or renewed agreement (every four years). At initial agreement the acceptability of the request has to be considered. In any case the instruction includes the organization of the audit and the decision of agreement (or not).

The follow-up consists in particular of organizing periodic alternate audits (alternate to renewal) and to manage available information (reports of visits in particular), in order to judge the quality of the work of the body (reinforcement of surveillance, corrective actions, suspension or withdrawal of agreement). As already stated, this necessitates organizing the transfer of information between the pilot-DRIRE and the other DRIREs involved.

Surveillance of designated bodies in charge of certification (or French notified bodies)

The surveillance of bodies designated by the Ministry of Industry is similar to that of agreed bodies, with the principal difference that the Sous-direction de la Métrologie (SDM), representing the central administration, plays the role of the pilot-DRIRE.

The surveillance of the LNE is adapted taking into consideration the quasi-permanent relationship between the LNE and the SDM.

Surveillance of manufacturers, repairers and installers

The surveillance of manufacturers corresponds to market surveillance (see later). The surveillance of repairers and installers is of the same nature, but in order to avoid ambiguity the expression "market surveillance" has been dedicated to placing on the market and putting into service of new (or considered as new) instruments, according to the meaning given to this concept by the Commission of the European Union. On the other hand, for questions of homogeneity and similarity, the same chapter applies to manufacturers as to repairers and installers.

Moreover, the surveillance of manufacturers, repairers or installers may provide information on the behavior of these operators, but also on any of the bodies to which they delegate certification of instruments.

Whenever they act in the framework of their approved QAS or have to request verification to a third party body, the manufacturers, repairers or installers have to respect a number of obligations that the certification bodies cannot check by themselves: in particular these bodies may not enforce the operators to subject the instruments manufactured, repaired or installed to the statutory certification procedures. This is the role of the state.

The rules implemented for this surveillance involve systematic preventive actions and *a posteriori* actions as well. The number and type of visits depend on the status of the operator.

Manufacturers

A manufacturer has to fulfill two essential obligations:

- Subject manufactured instruments to the appropriate operation of metrological control;
- Ensure conformity to type. This is a key point of metrological control (*see French text for more details*).

Only in depth visits are prescribed, according to the type of necessary investigations. These visits may be unexpected or not.

The conclusions of each visit are recorded in a specific report. If appropriate, the information is passed to the designated body concerned.

Manufacturers having an approved QAS are subject to specific attention in order to determine if the designated body in charge of the approval has taken all appropriate provisions in order to ensure that the manufacturer respects its obligations, in particular concerning conformity to type.

Repairers and installers

Repairers and installers are also subject to an appropriate surveillance in order to check that they respect their obligations (*see French text for more details*).

Surveillance of instruments in service

The surveillance of instruments in service consists essentially in verifying that:

- instruments in service are correctly maintained and controlled;
- instruments are suitable for use and are correctly and legally used.

This therefore includes surveillance of the users; indeed this activity is not really a new one for legal metrology, therefore this subject will not be gone into in depth.

Instruments in use are correctly maintained and subjected to the applicable control

According to the category of measuring instruments, this surveillance is carried out in a systematic or in an occasional manner.

"Systematic" means regularly each year, or from time to time additionally.

"Occasional" means occasionally every year for a category, with or without particular reason, or for a particular instrument after a customer complaint for example.

The choice of the system (systematic or occasional) for a category depends on the importance of or public concern for measuring results.

Instruments are suitable for use and correctly and legally used

This surveillance is performed:

- at the same time as other activities;
- after complaints.

Modalities

The surveillance of instruments in service consists in checking that:

- they have been subjected to the applicable metrological control;
- sealings are present;
- instruments are in an apparent statutory state;
- in a general way, users fulfill their obligations.

It may involve metrological tests, or may be purely administrative.

Market surveillance

Market surveillance is a concept developed by the Commission of the European Union for application of "new approach" Directives. It consists in obligations made to the states. In addition to the requirements in the Directives, the whole concept is developed in a guide on the new approach.

The aim is to guarantee that provisions in the Directives are respected throughout the European Union, and thus to ensure consumer protection, but also fair competition between manufacturers. The state is responsible for this.

For instruments put on the market and put into service for statutory purposes, this consists in ensuring that they are properly marked, have been subjected to the appropriate procedures and fulfill the relevant requirements.

Practically, it consists in checking that the manufacturer or its representative has respected all its obligations concerning the measuring instrument put on the market (proposed for sale) and put into service. This may be done at the manufacturer's factory, at the place of sale or of delivery, but also using information provided by performing other legal metrology activities. Preventive actions can contribute to market surveillance.

In principal, market surveillance stops at the putting into service stage. However, when it is possible to demonstrate responsibility regarding the product in service, the resulting information may be taken into account for market surveillance. For example, actions may be undertaken against the manufacturer if it can be demonstrated that an instrument in service has never received the appropriate marking or, in a general way, that a flaw existed before it was put into service.

A new instrument recently put into service and not respecting metrological requirements can provide an indication that an action of market surveillance would be appropriate. Repressive actions of market surveillance may only be undertaken when the systematic aspect of a flaw is established, the instrument being placed and used in normal operating conditions.

One of the essential obligations of the manufacturer is to ensure conformity to the type.

The notion of market surveillance also corresponds to obligations made at national level.

Systematic action

The systematic action consists in verifying that manufacturers respect their obligations, performing scheduled in depth visits. This systematic action involves mainly preventive actions, information and discussion with manufacturers or importers acting as manufacturers in France.

The DRIREs dedicate a given percentage of their metrological activity to the systematic action of market surveillance.

Occasional activities

In addition to systematic aspects, market surveillance involves occasional activities.

Occasional activities are often the only possible way to perform market surveillance for an instrument that has been subjected to CE (or CEE) control abroad. It consists in visiting locations at which instruments are imported and performing visual examination and tests that are easy to perform on site.

Occasional activities necessitate specific credits in order to buy instruments sent to laboratories for fundamental tests to be performed.

Reinforced surveillance

Reinforced surveillance completes any form of systematic surveillance of:

- operators;
- instruments in service;
- the market.

It is implemented:

- when a DRIRE has noticed a need concerning an operator;
- on declaration of an anomaly declared by a certification body;
- after complaints;
- in an occasional way for non systematic activities;
- on request of the pilot-DRIRE;
- by any DRIRE on its own initiative, with or without particular reason.

Synergies

As already mentioned, each form of surveillance allows highlighting of facts relating to other forms.

Synergies between forms of surveillance

1 The surveillance of operators could allow shortcomings concerning new instruments installed or in use, or on their putting into use, to be detected. According to the case, the responsibility may lie with the operator (see definition) or the custodian or user.

2 The surveillance of instruments in service could provide information for market surveillance, particularly whether new instruments are correctly marked. However, it is recalled that if the surveillance of instruments in service may provide information for market surveillance, it is contrary to its basic principle, the latter stopping at putting into service, except if the responsibility of the manufacturer may be established.

The surveillance of instruments in service could provide indication on certification bodies, for example have they correctly checked seals, proceeded correctly with stamping, filled in the metrological logbook, etc.

3 Market surveillance at the manufacturer's factory could demonstrate in particular that the designated body charged with approval of a QAS did not take appropriate precautions in order to ensure conformity to the type.

In the case of third party certification, it could show in particular that the body did not correctly perform the verification, or that it was carried out on the basis of a certificate that was no longer valid.

Synergies linked to operators

Some operators have several metrological activities, for example:

- verificators for initial or subsequent activities;
- verificator and repairer;
- operator intervening on several categories of instruments.

Information obtained from the surveillance of an activity could provide information for other ones.

Factors for success and difficulties to overcome

New professions and competencies

By no longer performing controls themselves, state officers will necessarily globally lose some competence. However, it is not a fundamental handicap if appropriate precautions are taken to maintain a level of competence sufficient for the new forms of surveillance.

To that aim, as a first step, the new professions must be defined and may be classified as follows:

1 Control of bodies (classification partly applicable to surveillance of manufacturers, repairers or installers)

- officer in charge of instruction and follow-up of files, and corresponding judgments;
- quality assessor;
- technical assessor;
- officer in charge of in depth visits;
- officer in charge of unexpected surveillance visits.

2 Surveillance of instruments in service

- officer in charge of checking the presence of statutory marking and other similar aspects;
- officer in charge of more metrological investigation (tests, suitability for use, legal use of instruments, etc.).

3 Market surveillance

- officer in charge of checking the presence of statutory marking and other similar aspects;
- officer in charge of further metrological investigation (conformity to type, etc.).

As a second step the competencies necessary for each job must be analyzed as far as the following aspects are concerned:

- general metrology and legal metrology;
- instrumental techniques and regulation in the particular fields;
- quality assurance and audits;
- administrative law (European relations in particular) and juridical questions (reports about offences).

This leads to the definition of the basic level of knowledge that everyone must have, and the level of

competencies for specialists, which results in appropriate training programs.

Reflections on rules of qualification for state officers are in progress.

In addition, it is also suggested that one way for maintaining competencies is to have state officers trained by certification bodies, by the LNE in particular.

Sanctions

Confidence in the new metrological control system implemented in France will require that the state implements appropriate surveillance, and that it rigorously applies the intended sanctions against contraveners.

The DRIREs have received instructions in order to correctly perform the new forms of surveillance referred to above, to apply the appropriate administrative and penal sanctions and to make the results of their action known.

For certification bodies, according to the offence committed, the administrative sanctions are:

- recall or observation;
- warning;
- suspension of agreement;
- withdrawal of agreement.

For repairers or installers the withdrawal of their mark replaces the suspension or withdrawal of the agreement.

Users that possess non-legal instruments, in particular those that do not submit their instruments to statutory control, are exposed to the refusing of their instruments or placing under seals.

Penal sanctions are foreseen either specifically in the metrological regulations or generally in the penal code.

Conclusion

The DRIREs have been instructed on how to correctly perform the above operations. However, general instruction may not avoid state officers having to face situations that can not be foreseen.

In order to correctly apply the new implemented system and to face unanticipated situations, state officers must have an appropriate background of competencies. So it is necessary to take appropriate measures to acquire and maintain this competence by organizing suitable initial and ongoing training.

The delegation of certification activities to agreed or designated bodies must be done keeping the same level of metrological quality for measuring instruments. In the same way, the flexibility provided to operators intervening in the framework of their approved QAS shall be seriously controlled, first by bodies designated for this activity, but also by a state surveillance action. This necessitates maintaining an appropriate level of supervision of the system, even if this system relies on confidence in a first approach, and to have a set of efficient administrative and penal sanctions available. Sanctions must be applied rigorously and systematically whenever necessary. ■

OIML Certificate System:
Certificates registered 2003.11–2004.01
Up to date information (including P1): www.oiml.org

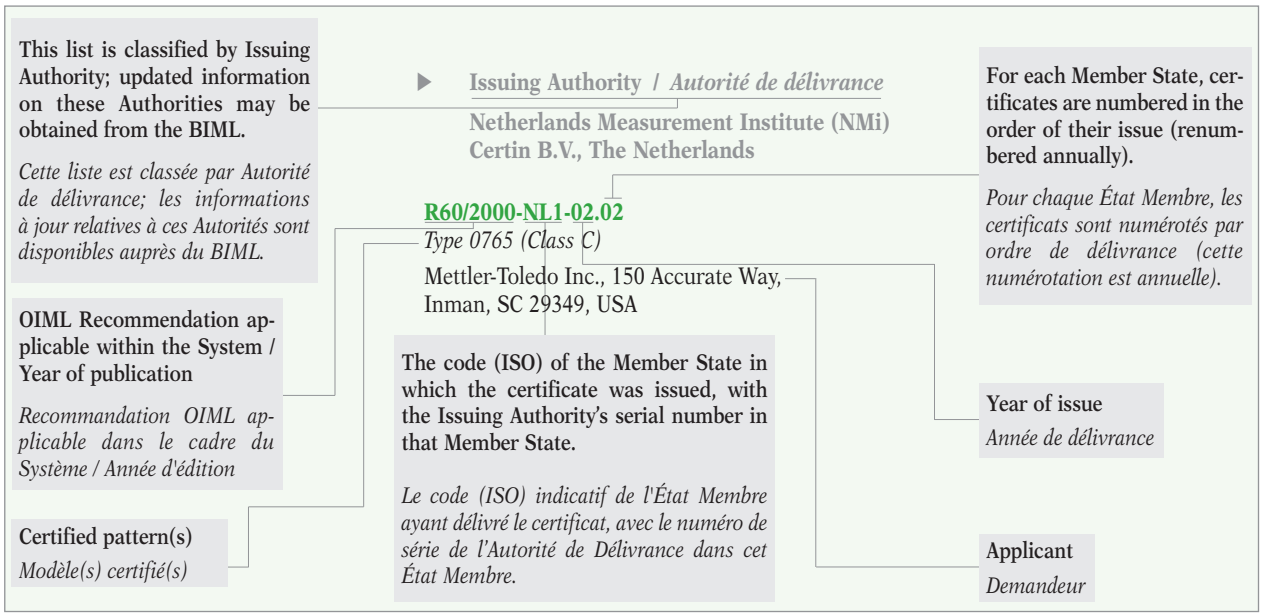
The *OIML Certificate System for Measuring Instruments* was introduced in 1991 to facilitate administrative procedures and lower costs associated with the international trade of measuring instruments subject to legal requirements.

The System provides the possibility for a manufacturer to obtain an OIML Certificate and a test report indicating that a given instrument pattern complies with the requirements of relevant OIML International Recommendations.

Certificates are delivered by OIML Member States that have established one or several Issuing Authorities responsible for processing applications by manufacturers wishing to have their instrument patterns certified.

The rules and conditions for the application, issuing and use of OIML Certificates are included in the 2003 edition of OIML P 1 *OIML Certificate System for Measuring Instruments*.

OIML Certificates are accepted by national metrology services on a voluntary basis, and as the climate for mutual confidence and recognition of test results develops between OIML Members, the OIML Certificate System serves to simplify the pattern approval process for manufacturers and metrology authorities by eliminating costly duplication of application and test procedures. ■



Système de Certificats OIML:
Certificats enregistrés 2003.11–2004.01
Informations à jour (y compris le P1): www.oiml.org

Le *Système de Certificats OIML pour les Instruments de Mesure* a été introduit en 1991 afin de faciliter les procédures administratives et d'abaisser les coûts liés au commerce international des instruments de mesure soumis aux exigences légales.

Le Système permet à un constructeur d'obtenir un certificat OIML et un rapport d'essai indiquant qu'un modèle d'instrument satisfait aux exigences des Recommandations OIML applicables.

Les certificats sont délivrés par les États Membres de l'OIML, qui ont établi une ou plusieurs autorités de délivrance responsables du traitement des demandes présentées par des constructeurs souhaitant voir certifier leurs modèles d'instruments.

Les règles et conditions pour la demande, la délivrance et l'utilisation de Certificats OIML sont définies dans l'édition 2003 de la Publication P 1 *Système de Certificats OIML pour les Instruments de Mesure*.

Les services nationaux de métrologie légale peuvent accepter les certificats sur une base volontaire; avec le développement entre Membres OIML d'un climat de confiance mutuelle et de reconnaissance des résultats d'essais, le Système simplifie les processus d'approbation de modèle pour les constructeurs et les autorités métrologiques par l'élimination des répétitions coûteuses dans les procédures de demande et d'essai. ■

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Automatic catchweighing instruments
Instruments de pesage trieurs-étiqueteurs à fonctionnement automatique

R 51 (1996)

▶ **Issuing Authority / *Autorité de délivrance***

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R051/1996-NL1-2003.02
W-9000 for accuracy classes Y(a) and Y(b)

Welvaarts weegsystemen, De Tweeling 4, NL-5215 MC's-Hertogenbosch, The Netherlands

▶ **Issuing Authority / *Autorité de délivrance***

Physikalisch-Technische Bundesanstalt (PTB), Germany

R051/1996-DE1-2002.05 Rev. 2
CWM... with weighing system type WS... (accuracy class X(1) and Y(a))

Bizerba GmbH & Co. KG, Wilhelm-Kraut-Straße 65, D-72336 Balingen, Germany

R051/1996-DE1-2003.12
DISOMAT B plus SWE for accuracy class Y(a) or Y(b)

Schenk Process GmbH, Landwehrstraße 55, D-64293 Darmstadt, Germany

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Metrological regulation for load cells (applicable to analog and/or digital load cells)
Réglementation métrologique des cellules de pesée (applicable aux cellules de pesée à affichage analogique et/ou numérique)

R 60 (2000)

▶ **Issuing Authority / *Autorité de délivrance***

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R060/2000-NL1-2003.26
PWS / PWSM (Class C)

Hottinger Baldwin Measurements, Inc., 19 Bartlett Street, Marlboro, MA 01752, United States

R060/2000-NL1-2003.27
1130 (Class C)

Vishay Tedea Huntleigh International Ltd., 5a Hatzoran Street, New Industrial Zone, Netanya 42506, Israel

R060/2000-NL1-2003.28
BCL-... (Class C)

Minebea Co. Ltd., Measuring Components Div., Kuruizawa Factory Miyota-Machi, Kitasakugun Nagano-Ken, Japan

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Nonautomatic weighing instruments
Instruments de pesage à fonctionnement non automatique

R 76-1 (1992), R 76-2 (1993)

▶ **Issuing Authority / *Autorité de délivrance***

Inspecta Oy, Finland

R076/1992-FI1-2003.01
MCS5 PLUS Crane scale (Class III)

Tamtron Oy, Vehnämyllynkatu 18, FIN-33700, Tampere, Finland

R076/1992-FI1-2003.02
EVOCAR 2000 series (classes III and IIII)

Teknoscale Oy, Kiitoradantie 11, FIN-01530, Vantaa, Finland

▶ **Issuing Authority / *Autorité de délivrance***

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R076/1992-NL1-2003.33
SP-88B / SP89B / EPB-30 (Class III)

Young Thai Scale Co., Ltd., 4 Lane 404, Chung Cheng South Road, Yung Kang City, Tainan Hsien, Taiwan, Chinese Taipei

R076/1992-NL1-2003.39
8270 (Class III or IIII)

Mettler-Toledo Inc., 1150 Dearborn Drive, Worthington, Ohio 43085-6712, United States

R076/1992-NL1-2003.41 Rev. 1
MS-2400 (Class IIII)

Charder Electronic Co., Ltd, 103, Kuo Chung Road, Dah Li City, Taichung Hsien 412, Chinese Taipei

R076/1992-NL1-2003.43
NP-Series (Class III)

Snowrex International Co., Ltd., 2F No. 9, Lane 50, Sec. 3, Nan-Kang Road, Taipei, Chinese Taipei

R076/1992-NL1-2003.45
AJ(H) (Classes I and II)

Shinko Denshi Co., Ltd, 3-9-11 Yushima, Bunkyo-ku, Tokyo 113-0034, Japan

R076/1992-NL1-2003.49
CUB II (RWXX..) (Class III)

Mettler-Toledo (Changzhou) Scale & System Ltd., 111 Changxi Road, Changzhou, Jiangsu 213001, China

R076/1992-NL1-2003.51
SM-710 (Class III)

Teraoka Weigh-System PTE LTD, 4 Leng Kee Road, #06-01 SIS Building, 159088, Singapore

R076/1992-NL1-2003.52
WB-100..MA and WB-110..MA (Class III)

Tanita Corporation, 14-2, 1-Chome, Maeno-cho, Itabashi-ku, Tokyo 147-8630, Japan

R076/1992-NL1-2003.53
WPT 150.0 (Class III)

Radwag Zaklad Mechaniki, 26-600 Radom, ul. Grudniowa 37/39, Poland

R076/1992-NL1-2003.54
MRP 150xA (Class III)

ADAM Equipment Co. Ltd., Bond Avenue, Denbigh East Industrial Estate, Milton Keynes MK1 1SW, United Kingdom

R076/1992-NL1-2003.55
XS... (Class I)

Mettler-Toledo A.G., Im Langacher, CH-8606 Greifensee, Switzerland

R076/1992-NL1-2003.56
DPS-90 (Class III)

Teraoka Weigh-System PTE LTD, 4 Leng Kee Road, #06-01 SIS Building, 159088, Singapore

R076/1992-NL1-2003.57
DJ(H) (Class II)

Shinko Denshi Co., Ltd, 3-9-11 Yushima, Bunkyo-ku, Tokyo 113-0034, Japan

R076/1992-NL1-2003.58
AFP xxxLA (Class II)

ADAM Equipment Co. Ltd., Bond Avenue, Denbigh East Industrial Estate, Milton Keynes MK1 1SW, United Kingdom

R076/1992-NL1-2003.59
WPS xxx/C/2 (Class II)

Radwag Zaklad Mechaniki, 26-600 Radom, ul. Grudniowa 37/39, Poland

R076/1992-NL1-2003.60
SC 900 (Class III)

Shekel Electronics Scales, Kibbutz Beit Keshet, M.P. Lower Galilee 15247, Israel

R076/1992-NL1-2003.61
BI-10000 (Class III)

Mettler-Toledo (Changzhou) Scale & System Ltd., 111 Changxi Road, Changzhou, Jiangsu 213001, China

R076/1992-NL1-2003.62
EW-...i (Classes II and III)

A&D Instruments Ltd., Abingdon Science Park, Abingdon, Oxford OX14 3YS, United Kingdom

▶ Issuing Authority / *Autorité de délivrance*

Physikalisch-Technische Bundesanstalt (PTB), Germany

R076/1992-DE1-2003.07
AL... (Class I)
Mettler-Toledo A.G., Im Langacher, CH-8606 Greifensee, Switzerland

▶ Issuing Authority / *Autorité de délivrance*

The Danish Accreditation and Metrology Fund (DANAK), Denmark

R076/1992-DK1-2003.04
M2200 (Classes III and IIII)
Marel hf, Hofdabakka 9, IS-112 Reykjavik, Iceland

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Multi-dimensional measuring instruments
Instruments de mesure multidimensionnels

R 129 (2000)

▶ Issuing Authority / *Autorité de délivrance*

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R129/2000-NL1-2003.02 Rev. 1
VMS 520
SICK AG., Nimburger Strasse 11, D-79276 Reute, Germany

Updated information on OIML certificates:

www.oiml.org

OIML technical activities

- 2003 Review
- 2004 Forecasts

Activités techniques de l'OIML

- Rapport 2003
- Prévisions 2004

The information given on pages 37–43 is based on 2003 annual reports submitted by OIML secretariats. Work projects are listed for each **active** technical committee and sub-committee that produced and/or circulated a WD or CD during 2003, together with the state of progress at the end of 2003 and projections for 2004, where appropriate.

Les informations données en pages 37–43 sont basées sur les rapports annuels de 2003, fournis par les secrétariats OIML. Les thèmes de travail sont donnés pour chaque comité technique ou sous-comité **actif** qui a produit et/ou distribué un WD ou un CD pendant 2003, avec l'état d'avancement à la fin de 2003 et les prévisions pour 2004, si approprié.

KEY TO ABBREVIATIONS USED

WD	Working draft (Preparatory stage) *Projet de travail (Stade de préparation)*
CD	Committee draft (Committee stage) *Projet de comité (Stade de comité)*
DR/DD/DV	Draft Recommendation/Document/Vocabulary (Approval stage) *Projet de Recommandation/Document/Vocabulaire (Stade d'approbation)*
Vote	CIML postal vote on the draft *Vote postal CIML sur le projet*
Approval	Approval or submission to CIML/Conference for approval *Approbation ou présentation pour approbation par CIML/Conférence*
R/D/V	International Recommendation/Document/Vocabulary (Publication stage) For availability: see list of publications *Recommandation/Document/Vocabulaire International (Stade de publication)* *Pour disponibilité: voir liste des publications*
Postponed	Development of project suspended pending completion of relevant document by other international organization(s) *Développement du projet suspendu en attendant l'achèvement d'un document correspondant par une (d')autre(s) organisation(s) internationale(s)*

OIML TECHNICAL ACTIVITIES	2003	2004
TC 2 Units of measurement		
• Amendment* D 2: Legal units of measurement *harmonized with resolution of 22nd CGPM (Paris, 1999)	Approval	Amendment To be published
TC 3 Metrological control		
• Revision D 1: Law on metrology	3 CD	DD/Vote
TC 3/SC 2 Metrological supervision		
• Revision D 9: Principles of metrological supervision	DD	Vote/Approval
• Revision D 16: Principles of assurance of metrological control	-	WD
TC 3/SC 4 Application of statistical methods		
• Applications of statistical methods for measuring instruments in legal metrology	(3 WD)	1 CD
TC 3/SC 5 Conformity assessment		
• Mutual acceptance arrangement on OIML type evaluations	Approval	To be published
• Expression of uncertainty in measurement in legal metrology applications	2 WD	3 WD/1 CD
• OIML Certificate System for Measuring Instruments	P 1	-
• Checklists for Issuing Authorities and testing laboratories carrying out OIML type evaluations	Approval	To be published
• Interpretation document on application of ISO/IEC 17025 for assessment of laboratories performing type evaluations	(WD)	2 WD/1 CD
• Interpretation document on application of ISO/IEC Guide 65 for assessment of legal metrology certification bodies	(WD)	2 WD/1 CD
TC 4 Measurement standards and calibration and verification devices		
• Principles for the selection and expression of metrological characteristics of standards and devices used for calibration and verification	WD	1 CD
• Revision D 5: Principles for establishment of hierarchy systems for measuring instruments	3 CD	DD/Vote
• Revision D 6 + D 8: Measurement standards. Requirements and documentation	3 CD	DD/Vote
• Revision D 10: Guidelines for the determination of calibration intervals of measuring equipment (Revision developed by ILAC)	DD	Vote/Approval

OIML TECHNICAL ACTIVITIES	2003	2004
TC 5/SC 1 Electronic instruments		
• Revision D 11: General requirements for electronic measuring instruments	DD	Vote/Approval
TC 5/SC 2 Software		
• Software in legal metrology	(WD)	2 WD/1 CD
TC 6 Prepackaged products		
• Revision R 87: Net content in packages	Approval	R To be published
• Establishment of OIML IQ-mark for prepackaged products	Postponed	New CD
TC 7 Measuring instruments for length and associated quantities		
• Revision R 35: Material measures for length for general use	2 CD	3 CD
TC 7/SC 1 Measuring instruments for length		
• Revision R 30: End standards of length (gauge blocks)	Proposal to withdraw	CIML decision
TC 7/SC 3 Measurement of areas		
• Instruments for measuring the areas of leather	6 CD	7 CD/DR
TC 7/SC 4 Measuring instruments for road traffic		
• Electronic taximeters	1 CD	2 CD
TC 8 Measurement of quantities of fluids		
• Vessels for public use (Combined revision of: R 4: Volumetric flasks (one mark) in glass; R 29: Capacity serving measures; R 45: Casks and barrels; and R 96: Measuring container bottles)	2 WD	1 CD

OIML TECHNICAL ACTIVITIES	2003	2004
TC 8/SC 1 Static volume measurement		
• Revision R 71: Fixed storage tanks	WD	1 CD
• Revision R 80: Road and rail tankers	WD	1 CD
• Revision R 85: Automatic level gauges for measuring the level of liquids in fixed storage tanks	WD	1 CD
• Installation for gauging road and rail tankers	WD	1 CD
TC 8/SC 2 Static mass measurement		
• Annex to R 125: Test report format for evaluation of mass measuring systems for liquids in tanks	2 CD	3 CD/DR
TC 8/SC 3 Dynamic volume measurement (liquids other than water)		
• Revision R 86: Drum meters for alcohol and their supplementary devices (Combined with revision R 117 and R 105)	1 CD	2 CD/DR
• Revision R 118: Testing procedures and test report format for pattern evaluation of fuel dispensers for motor vehicles (Based on combined revision of R 117, R 105 and R 86)	Delayed	New 1 CD/ 2 CD
• Revision R 117: Measuring systems for liquids other than water (Combined with revision R 105 and R 86)	1 CD	2 CD/DR
TC 8/SC 4 Dynamic mass measurement (liquids other than water)		
• Revision R 105: Direct mass flow measuring systems for quantities of liquids (Combined with revision R 117 and R 86)	1 CD	2 CD/DR
TC 8/SC 5 Water meters		
• R 49-1: Water meters intended for the metering of cold water (including requirements for electronic devices)	R	
• R 49-2: Test procedures (Amended R 49-2)	Approval	R To be published
• R 49-3: Test report format	Approval	R To be published
• Revision R 72: Hot water meters (revision to be combined with that of R 49)	-	WD
TC 8/SC 6 Measurement of cryogenic liquids		
• Annex D to R 81: Test report format	-	R To be published
TC 8/SC 7 Gas metering		
• Metering systems for gaseous fuel	2 CD/	3 CD/DR
• Compressed gaseous fuel measuring systems for vehicles	3 CD	4 CD/DR

OIML TECHNICAL ACTIVITIES	2003	2004
TC 8/SC 8 Gas meters		
• Combined revision of R 6, R 31 and R 32	WD	1 CD
TC 9 Instruments for measuring mass and density		
• Revision R 74: Electronic weighing instruments	Delayed	2 CD (Depending on revised D 11)
TC 9/SC 1 Nonautomatic weighing instruments		
• Revision R 76: Nonautomatic weighing instruments	WD	1 CD
TC 9/SC 2 Automatic weighing instruments		
• R 134: Automatic instruments for weighing road vehicles in motion Part A - Total vehicle weighing	R	-
• R 134: Part A - Annex C: Test report format	Approval	R To be published
• Automatic instruments for weighing road vehicles in motion. Total load and axle weighing. Part 1: Metrological and technical requirements. Tests	4 CD	5 CD/DR
• Revision R 51: Automatic catchweighing instruments	3 CD	DR/Vote
• Revision R 61: Automatic gravimetric filling instruments	Approval	R To be published
TC 9/SC 3 Weights		
• Revision R 111: Weights of accuracy classes E_1, E_2, F_1, F_2, M_1, M_2, M_3 (including requirements of R 47: Standard weights for testing high capacity weighing machines)	DR	Approval (CIML postal approval)
• Revision R 33: Conventional value of the result of weighing in air (The revised R 33 is proposed to be adopted as a Document)	DD	Approval
• Revision R 52: Hexagonal weights, ordinary accuracy class from 100 g to 50 kg	Approval	R To be published
TC 9/SC 4 Densities		
• Hierarchy scheme for density measuring instruments	2 CD	3 CD/DR
TC 10/SC 1 Pressure balances		
• Pressure transducers with uniform output signal	2 CD	3 CD

OIML TECHNICAL ACTIVITIES	2003	2004
TC 10/SC 2 Pressure gauges with elastic sensing elements		
• Pressure transmitters with elastic sensing elements	1 CD	2 CD
• Combined revision of R 101: Indicating and recording pressure gauges, vacuum gauges and pressure vacuum gauges with elastic sensing elements (ordinary instruments) and R 109: Pressure gauges and vacuum gauges with elastic sensing elements (standard instruments)	1 CD	2 CD
TC 10/SC 5 Hardness standardized blocks and hardness testing machines		
• Revision R 39: Rockwell hardness testing machines	2 CD	3 CD
TC 11 Instruments for measuring temperature and associated quantities		
• R 75-3: Heat meters. Test report format	WD	1 CD
TC 11/SC 1 Resistance thermometers		
• Revision R 84: Resistance-thermometer sensors made of platinum, copper or nickel (for industrial and commercial use)	R	-
TC 11/SC 3 Radiation thermometers		
• Revision R 48: Tungsten ribbon lamps for calibration of optical pyrometers	Approval	R To be published
• Standard black-body radiator for the temperature range from – 50 °C to 3000 °C	WD	1 CD
• Procedures for control of main parameters and characteristics of thermovision instruments	WD	1 CD
TC 12 Instruments for measuring electrical quantities		
• Revision R 46: Active electrical energy meters for direct connection of class 2	WD	1 CD
TC 13 Measuring instruments for acoustics and vibration		
• Revision R 102: Sound calibrators	WD	2 WD/1 CD

OIML TECHNICAL ACTIVITIES	2003	2004
TC 16/SC 1 Air pollution		
• Amendment to ISO 3930/OIML R 99	Approval (by ISO & OIML)	Amendment To be published
• Annex to ISO 3930/OIML R 99: Test report format for the evaluation of instruments for measuring vehicle exhaust emissions	2 CD	Delayed Revision of R 99 proposed
• Continuous measuring instruments for NO_x emissions	WD	1 CD
• Continuous measuring instruments for SO_2 emissions	WD	1 CD
• Continuous measuring instruments for CO emissions	WD	1 CD
TC 16/SC 2 Water pollution		
• Revision R 100: Atomic absorption spectrometers for measuring metal pollutants in water	1 CD	2 CD
• Revision R 83: Gas chromatograph/mass spectrometer/data system for analysis of organic pollutants in water	1 CD	2 CD
• Revision R 116: Inductively coupled plasma atomic emission spectrometers for measurement of metal pollutants in water	1 CD	2 CD
TC 16/SC 3 Pesticides and other pollutant toxic substances		
• Revision R 82: Gas chromatographs for measuring pollution from pesticides and other toxic substances	2 CD	3 CD/DR
TC 17/SC 1 Humidity		
• Revision R 59: Moisture meters for cereal grains and oilseeds	1 CD	2 CD
TC 17/SC 2 Saccharimetry		
• Automatic refractometers. Methods and means of verification	WD	1 CD
TC 17/SC 3 pH-metry		
• Revision R 54: pH scale for aqueous solutions	WD	1 CD
TC 17/SC 4 Conductometry		
• Revision R 56: Standard solutions reproducing the conductivity of electrolytes	1 CD	2 CD
• Revision R 68: Calibration method for conductivity cells	WD	1 CD
• Methods of measurement of the conductivity of electrolytic solutions (Project combined with the revision of R 68)	WD	1 CD

OIML TECHNICAL ACTIVITIES	2003	2004
TC 17/SC 5 Viscometry		
• Reference standard liquids (newtonian viscosity standard for the calibration and verification of viscometers)	1 CD	2 CD
TC 17/SC 6 Gas analysis		
• Procedures for calibration of mine methanometers	WD	1 CD
• Procedures for calibration of alarms of combustible gases and vapors	WD	1 CD
TC 17/SC 7 Breath testers		
• Revision R 126: Evidential breath analyzers	WD	1 CD
TC 17/SC 8 Instruments for quality analysis of agricultural products **(New SC established in 2002)**		
• Measuring instruments used for protein determination in grains	WD	2 WD/1 CD
TC 18 Medical instruments		
• Ophtalmic instruments: Impression and applanation tonometers	-	WD
TC 18/SC 2 Medical thermometers		
• Revision R 7: Clinical thermometers, mercury-in-glass with maximum device (Revision R 7 proposed to be stopped. New project on clinical infrared thermometers will be proposed instead)	1 CD	-
TC 18/SC 4 Bio-electrical measurements		
• Revision R 90: Electrocardiographs (including the Test report format)	WD	1 CD
• Digital electrocardiographs and electrocardioscopes	1 CD	2 CD
• Revision R 89: Electroencephalographs	1 CD	2 CD
TC 18/SC 5 Measuring instruments for medical laboratories		
• Spectrophotometers for medical laboratories	Approval	R To be published

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Meeting of the OIML Development Council

5 November 2003 Kyoto, Japan

The OIML Development Council met on 5 November 2003 at the Kyoto International Conference Hall, Japan and was chaired by Mrs. Ghaïet-El-Mouna Annabi. Also at the presiding table were Mr. G. Faber, Mr. J-F. Magaña and Mr. I. Dunmill.

Delegates were welcomed and the roll-call established that 49 CIML Members (out of 60) were present.

Mr. Magaña explained that the previous February it had been decided to work together with the BIPM, ILAC and other Organizations on the issue of developing countries. It had been decided to set up a Joint Committee on coordination of assistance to Developing Countries in Metrology, Accreditation and Standardization (JCDCMAS) comprising the BIPM, OIML, ILAC, IAF, ISO, IEC, ITU and UNIDO. A presentation had also been made to the WTO TBT Committee, announcing the intention to support developing countries and the WTO had reacted very favorably. The main objective of this Committee was to better coordinate the setting up of metrology, accreditation and standardization infrastructures by pooling expertise, providing information and raising the level of awareness, thus encouraging sustainable economic development through supporting and enhancing the existing activities within these organizations. Information modules would be developed, and web-based information resources would be employed as much as possible. So far the Committee had held three meetings, and a fourth was planned.

OIML Development Council

The actions which had so far been undertaken or considered by this Committee were:

- a survey conducted by the WTO in mid-2002 which indicated that 50 % of WTO member countries had declared that they had metrology infrastructure needs;
- completion of a database started by the WTO on technical assistance needs;
- development of an e-learning package, in association with UNIDO and ISO, and of a series of information modules on different aspects of its work; and
- continuing development of web-based resources, discussion forums, etc.

Future actions in the program or under consideration included:

- activity associated with the UNIDO General Conference to be held in December 2003; and
- an invitation to be sent to the World Bank to attend the next meeting in 2004, to see how their funding and assistance programs could be integrated.

The OIML was also developing a joint presentation on metrology together with the BIPM which could be used by all these partners, and also by Member States. It would combine scientific metrology, legal metrology and other aspects of the subject.

On the subject of regional WTO contact points, Mr. Carstens commented that in South Africa the WTO contact point was within the Bureau of Standards, and Mr. Antuñez Ramirez remarked that the same situation existed in Cuba. Mr. Magaña invited all those present to establish relations with their local WTO contact points, explaining that the WTO was very keen on creating infrastructures for developing countries. Mr. Magaña replied that several information documents existed or were being written which would be of assistance in making such contact, such as a background paper presenting the aims of the JCDCMAS and a module on metrology, drawn up together with the BIPM, which should be ready within a month or two.

Mr. Carstens asked whether comments could be submitted for inclusion in this draft paper, and Mr. Magaña stated that there would be no problem in improving or revising it.

Mr. Šafarik-Pstrosz wished to make two points regarding the WTO and the TBT itself:

- speaking on behalf of the Czech TBT Inquiry Point, he reminded Members that in both developed and developing countries, all technical regulations in the metrology area had to be notified in any case through the TBT Inquiry Point. This applied not only to those for technical equipment, but also to those concerning formal procedural matters; and
- briefly to inform Members that that the Czech Republic had developed cooperation with Albania and was supporting that country in their preparations for harmonization with EU technical requirements and regulations concerning standards, conformity assessment and metrology.

Mr. Magaña closed this item by encouraging delegates to continue working with the other organizations and with the WTO on all these issues. The JCDCMAS draft Terms of Reference had already been approved by the General Conference of Weights and Measures, and should also be approved by the CIML, so that it would have a more official status for the Organization. Naturally the Joint Committee had not awaited this official approval before setting up contacts and progressing with its activities.

Mr. Kochsiek gave a brief summary of the PTB's contribution to legal metrology in developing countries and those in transition to market economies. This included activities announced at the last OIML Development Council Meeting, at the 2000 Conference and also at last year's Task Group meeting, comprising:

- a seminar on *The role of metrology in the conditions of a globalized market* in cooperation with COOMET and the OIML which had been held in Moscow in May 2003;
- a seminar, with the participation of the BIML, held in Tunis in October 2003 for French speaking North African countries; and
- a proposal for verification of commercial weights which had been prepared by Mr. Gupta, from India, and which had been sent to the BIML for publication and distribution to interested developing countries.

There were also a number of bilateral projects between Germany and other countries/regions including Thailand, Romania, Bulgaria, the SADC Region, ASEAN countries, and West Africa. Additionally, activities had been planned for the following year: in cooperation with the EMLMF, a seminar would be arranged in Malta in 2004 and another in the South East Asia Region.

Mr. Magaña also mentioned that jointly with the IEC and the WTO, the Bureau had organized regional seminars in Lima and in Maputo for developing countries on facilitating developing countries' participation in the work of the OIML and the IEC.

Mr. Birdseye pointed out that it was UK Government policy on international development to concentrate on capacity building by investment within the developing countries concerned, so as to help in building their institutions, such institutions being necessary to ensure stable and prosperous economies. It was also policy to support participation in standards setting, so he agreed that the aims of the Council were consistent with UK policy. Mr. Birdseye also wished to mention that the UK overseas aid budget had approximately doubled under the present Government.

However, like many, the British delegates had the problem of explaining to their Government the value of legal metrology which was, ironically, quite difficult to measure! It may have been a mistake for the NWML to identify their work for developing countries as a separate program item because their funding department, the DTI, had decided that work in this field should be funded by the Department for International Development (DFID). British delegates therefore now had to start again to explain legal metrology to another Government Department. With the support of colleagues in the BIML, they had begun this task and they had been able to assemble a good case for legal metrology being an essential part of capacity building for developing countries.

Meanwhile, the British delegates had continued to run their international course on legal metrology, as well as some other training events, and maintained helpful contacts with developing countries wherever possible. Mr. Birdseye said that for the future, more thought should be given to cooperation with other Member States for this problem of explaining the importance of legal metrology for development, as well as possibly cooperating in practical projects, and perhaps a multilateral approach to funding should be sought.

Mr. Magaña then invited Mr. Wallerus to present the activities of the DAM, and to comment on the final draft revision of Document D 14 *Training of legal metrology personnel*. Mr. Wallerus said that DAM activities for international participants were of two kinds: workshops dealing with specific objectives, and short training courses which were often connected with on-the-job training. The Academy's past, present and future activities and plans were a workshop on the verification of weighing instruments, training courses on pressure measurement, nonautomatic weighing instruments, checking the net content in prepackages, general legal metrology, general testing of measuring instruments, a train the trainer workshop on automatic weighing instruments and an international workshop on automatic weighing instruments. The next workshop would also be a train the trainer session, this time on mass flow meters. It could be seen that there was a move from training the experts to training the trainers, though this type of course was much more expensive, difficult and time consuming than the previous type of course.

Mr. Wallerus confirmed that WG 1 *Training* had nearly finished its work on the revision of D 14 . All proposals which had been supported by the members had been incorporated, and a new draft prepared, the scope of which was to define the outlines for qualification of legal metrology technicians (not engineers or scientists) and to suggest models for training programs.

He explained that this new Document first sets out the scope (general remarks about definitions, fields of tasks and equipping of technicians in the field of legal metrology, recommended qualifications for legal metrology, knowledge and competence required, etc.) and the main part of the document deals with how to qualify people for the work of the future, structure of training, content of training modules, organization of theoretical and practical training, and follow-up training. The proposed modules were as follows:

- Legal and administrative basics - a theoretical module;
- Theory and general metrology basics encompassing standards, feasibility, errors, and measurement in general;
- Theory and practice - how to test and verify various measuring instruments. Some examples were given in four very important annexes to this section of the document; for instance weighing instruments, measuring instruments for vehicles and other uses. Annex A contained a list of measuring instruments, and special ways of testing them;
- A new module dealing with quality management, accreditation and certification according to ISO 9000 and ISO/IEC 17025. Training was provided here for the new schemes and this would become more and more important in the future; and
- Supervision (e.g. of the net content in prepackages).

The four annexes contained a list of measuring instruments, a list of reference documents, some examples of curricula of practical and theoretical training and a list of addresses of institutions which were active in the field of legal metrology. The final version of the Document would be available for downloading from 17 November from the Academy's web site (www.dam-germany.de), and comments and additions, especially for the annexes, would be accepted up to the end of December, by which time it would be finished and the final draft sent to the Council Chairperson for further administrative handling by the BIML. The Document would be available for downloading from the OIML web site, and later a decision would have to be taken as to how it should be published. Mr. Wallerus thanked all those who had contributed comments and proposals, and all the other members of the Working Group.

Mr. Faber said that it would now be necessary to look into how to make the Document into an official OIML Document accepted by the CIML. It had been prepared within the Development Council, which used slightly different procedures from those applied in the *Directives for Technical Work*.

Mr. Ela Essi informed the Council that the Fifteenth Central African Region Conference of African Ministers of Industry had taken place in Yaoundé, Cameroon in March 2003. The principal goal of this Conference had been to identify factors of competitiveness for the industries and economies of the countries in that region. One of the resolutions taken had been the creation of a Regional Legal Metrology Organization grouping all the countries of the region in order to unify their effort and combine their experience and knowledge in the field of legal metrology, accreditation and standardization. The project had to be approved by all Governments concerned. Support and expertise from the OIML Development Council and other RLMOs would be welcomed in due course, in order to assist the region in the matter.

Mr. Faber expressed pleasure at the creation of a new Regional Metrology Organization.

Reporting on the meeting of the Task Group held on 3 November, Mrs. Annabi said that she saw it as being important for the OIML to continue to promote actions directed at developing countries. Mr. Magaña reminded the Council that the previous year the CIML President had appointed this Task Group to reflect on the organization of the OIML's work for developing countries; following its first meeting in 2002, the Task Group had subsequently worked by correspondence, predominantly on two main issues, namely:

- To propose actions of interest to developing countries for inclusion in the OIML Action Plan. A number of proposals had been sent to the BIML and circulated, leading to a draft revision of the Action Plan, and concerned improvements to and acceleration of the technical work of the OIML, and how the participation of developing countries in this work could be facilitated. Suggested methods included developing the use of the Internet and other electronic means, and setting up forums for Technical Committees. Also, importantly, to take account of the WTO TBT Committee's documents and the Triennial Review of this Committee when revising the *Directives for Technical Work*. The revision of the *Directives* had now been completed, but they would continue to be revised and updated. There were a number of initiatives for the promotion and development of legal metrology; these would take the form of organizing seminars and workshops run in conjunction with other organizations, such as the two organized with the IEC. Additionally, information from certain Member States would be circulated to other Member States, the need for interchange of

information being still very important. Furthermore, papers and presentations would be developed which could be used by Member States and Corresponding Members to raise awareness of metrology. The Action Plan also contained some initiatives to facilitate the work of CIML Members in general, using the web not only for Technical Committees but also for the exchange of information. There should be forums in which any country could put questions and receive answers from others. It was also intended that a number of issues should be improved and made more detailed on the Development Council web site. There was a database of experts for technical assistance, which required updating. The training database would also be improved and modified; also the exchange of information about training materials developed in different regions would be coordinated and facilitated so that other countries could benefit.

- Secondly, the Task Group had looked at three Development Council Working Groups and recommended changes. It considered that **WG 2** ***Information*** was obsolete and should be replaced by three actions: to develop more information pages on the OIML web site, to work jointly with the other organizations in the JCDCMAS to develop material of mutual interest, and to improve the database of experts. **WG 3** ***Equipment*** also had difficulties in issuing documents, a problem which had been discussed the previous year. The Task Group had proposed that instead of having a very formal Working Group it would probably be more efficient if the BIML could hire experts to provide papers on the equipment which was needed for specific tasks in legal metrology. Within a matter of six months it would be possible to have a number of such expert reports and although these would not be considered as official OIML Documents, they would be of great help to developing countries. Concerning **WG 1** ***Training***, the situation was slightly different. Mr. Wallerus had spoken of one aspect of training, the revision of D 14 which had in fact been carried out within this WG, but in principle OIML Documents should be drawn up within the network of TCs and SCs and so this kind of work should therefore be transferred to a Subcommittee. Since the revision of D 14 was nearing its end, it might not be necessary to set up a Subcommittee to finish it, though Mr. Wallerus would look into ways to complete and adopt it. Mr. Magaña commented that the work of the OIML should not proceed along separate or parallel lines from that organized by the WTO and other organizations, and so the WG on *Training* was also deemed to be no longer appropriate for future work on developing countries; cooperation with other Organizations should be the preferred method.

The Task Group proposed not to put an end to the work hitherto carried out by the WGs, but to replace them as described above.

The Task Group had also reported to the President of the Committee about what should be set up for the future. As President, he had set up this Task Group one year before, and it had made its final report the day before, thereby bringing it to an end. The report would subsequently be presented to the Committee, since only it could take a decision, and the Committee would then have to present it to the Conference in 2004, because the Conference had set up the structure for the OIML's developing country activities, which only it could change or stop. The process of decision-making was quite complicated, though now well under way. Mr. Faber summarized the main proposals:

- To stop the activities of the Working Groups. As explained, all the work would be maintained, but organized in another way;
- To stop the activities of the Task Group. The Task Group had done a good job, but instead of working with this Development Council, a much more simple structure could be created, which would also be, in his opinion, much more effective than the existing one. This might seem to be criticizing the existing structures, but certainly no blame was attached to any of the persons who had been active in them. In proposing a new structure, the aim was to do more and do it better, and certainly not to reduce any work. There was also some duplication of work - the same people, in the same room, were having the same discussions twice and this situation could be improved. Having read all the papers produced by the Task Group and listened to all the presentations, Mr. Faber was proposing that, from next year on, the activities of this Development Council should be stopped. They would be replaced in two different ways:
  - There was certainly a need for meetings with a number of developing countries and other interested countries, including developed countries. This would be organized in the form of workshops, seminars, round table conferences, etc., where information and all kinds of programs could be fully discussed. The following year, in place of this Council meeting, they would attempt to organize a workshop with the aim of continuing the work for developing countries; and
  - Mr. Faber had proposed to the Task Group and to the Presidential Council the setting up of a permanent *Working Group for developing countries*; such a Group should be very small, because in order for really good strategy and policy to be drafted, it was only possible to work with a small

committee. As previously, it would not be able to take decisions, which was the responsibility of the CIML. The WG would have the same terms of reference as the Presidential Council, which would mean that its members would be appointed for three years. The core of this WG should be two persons who were real experts in the field of activities for developing countries, but not necessarily CIML Members. They would need to be experienced and knowledgeable about metrology, the concerns of developing countries and where to find financial resources. The group should be chaired by one of the Vice-Presidents in order to show that these activities were taken care of at the highest level of the Organization. The group needed of course, a person representing the voice of the developing countries, and the Director or one of the Assistant Directors of the BIML, making a total of five persons.

Mr. Faber said that the exact terms of reference could not yet be given. The above were the main characteristics of the group under discussion. He was, however, in a position to say that the Task Group, where developing countries were represented, had the previous day accepted the proposal unanimously, as also had the Presidential Council. The new structure could therefore be presented to the Development Council with the confidence that it would really be helpful in improving what was being done. It was therefore with some enthusiasm that he presented this new structure in the hope that it would be accepted and that the Committee would adopt it; this would mean that the following year much more precise information could be given concerning terms of reference and other aspects.

Mr. Antuñez Ramirez felt that this was a very important change in the Development Council, whose work was vital. It was very important that there should be developing country participation in this group. He hoped that a high level of participation could be maintained, as metrology in his country was improving because of participation in the work of the OIML.

Mr. Magaña agreed that it was very important for developing countries to participate in the work and be well represented. This issue had been discussed very intensively with the WTO. One of the most important issues that was how to improve and facilitate the participation of developing countries in the work. Regional seminars had been organized in Lima (Peru) and in Maputo (Mozambique) for this purpose, and there were a number of proposals for progress on this front. As Mr. Faber had said, there would be a representative of developing countries within the Group; that was of course essential. There would be experts in technical assistance, who would also contribute experience of developing countries. In the technical work of TCs and SCs, the increased use of the Internet would be promoted, as this was the easiest way for developing countries to participate in discussions, and more efficient than organizing meetings and asking people to travel around the world. Regional Legal Metrology Organizations could also play a very important role in facilitating the participation of developing countries in OIML work.

Mr. Llewellyn's felt that the new structure needed to be driven "bottom up", responding to the needs of countries rather than trying to tell them what their needs were. However, he reiterated that in his opinion this was a very welcome and very correct initiative.

Mr. Faber affirmed that the mission of the small Working Group would be double: on the one hand, to prepare activities and proposals to be discussed in the Presidential Council and, of course, in the Committee. The other mission of this WG would be to prepare workshops and seminars on whatever ideas they might come up with. For Mr. Faber, the main concern was that the voice of developing countries must be heard in the Group, and that when the Group was set up, all countries should know whose was this voice, and to whom they should go when they had something to say. The role of this person was also to be a contact address for developing countries, to whom they would take their ideas, concerns and complaints. However, Mr. Faber had had some experience which suggested that enlarging the Group would result in its becoming more formal and less effective.

Mr. Llewellyn drew the meeting's attention to the fact that developing countries had different types and levels of needs. He appreciated the suggestion that one person should be a conduit for all their needs; he had just wondered whether it was too big a job for one person, and whether thought had been given to the possibility of appointing, for example, one person for the Asia-Pacific Region and others for other parts of the world, thus splitting it geographically.

Mr. Kochsiek said that he had been acting Chair of the Council before Mrs. Annabi took over, and, from his point of view, the main task at that time had been to find out what needs developing countries had. In the least developed countries there was no metrology infrastructure and therefore no contact with whom to discuss what the needs might be. There was therefore a need for a professional expert who had built up experience in metrology infrastructure, especially legal metrology. For this reason his proposal was to have metrology experts from the least developed countries, though this was very difficult.

Mr. Vaucher said that the proposal to keep things as simple as possible should definitely be supported. In his opinion, what developing countries really needed was not paperwork and meetings but help, for instance funding for appropriate facilities and instrumentation, and

necessary training on the job. A small group of competent people would surely be able to help in this case.

Support for developing countries in metrology could not be the responsibility of the OIML alone; legal metrology could not be split off from scientific and industrial metrology. The JCDCMAS was a move in that direction. Mr. Vaucher suggested that in addition to the planned meeting there should also be more actions. The suggestion was that the planned WG should work in close collaboration with the other Organizations.

Mr. Cartaxo Reis agreed with Mr. Vaucher that developing countries needed not only papers but practical action. In Portugal also it was felt necessary to plan practical actions. For example, Portugal had participated in two seminars on legal metrology in July in Angola; following the seminars, they had moved on to practical actions. Plans for 2004 included two more seminars on legal metrology and another training course for verification officers was also envisaged.

Mr. Leitner also supported the program, particularly emphasizing that it was vital to avoid the separation of legal metrology from other aspects of metrology. This must be done from the outset in the drafting of the Group's policies and procedures.

Mr. Krishnamoorthy expressed his appreciation for these actions and added that at a time when developing countries were integrating with the world economy, quick action-oriented recommendations needed to be made by the OIML which were also acceptable to governments, because it was essential that the recommendations be made a part of a government's ongoing transformations. He suggested that the two experts whom it was proposed to appoint might be from developing countries, so that they could reflect the needs of the developing countries to the Working Group, and also that certain procedures needed to be further formulated.

Concluding this item, Mr. Faber thanked delegates for their strong support for changing the structures. The suggestions which had been made about the experts would be taken into account. He agreed that it was important, when appointing people, to look to the regions so as to analyze what was happening in the world and take into account factors such as those mentioned.

Concerning Development Council activities for 2003-2004, Mr. Faber proposed the following four activities regarding the BIML's program for the coming year:

- to seek good subject matter for the 2004 meeting which would take the form of a Round Table Workshop and exchange of ideas, possibly less formal than this year's;
- to continue to work actively with the JCDCMAS, as well as with other organizations, and to develop documents and play an active role in this Committee, which would be a very effective tool for helping developing countries;
- in liaison with the Working Group, to hire experts to develop documents on equipment for developing countries, for several different categories of legal metrology activity. Some of these experts might be able to bring reports of their activities to the following year's meeting; and
- to continue to develop the web site for developing countries.

Mrs. Annabi drew participants' attention to the section of the OIML web site which Tunisia had translated into Arabic for the OIML. If other countries would like to translate OIML web pages into their national language, this could be discussed with the BIML. Naturally the Bureau could not, however, be held responsible for the translations, and any such pages therefore contained a disclaimer to the effect that they were the responsibility of the country which had translated them. This was a good way to promote OIML activities in all countries.

Mr. Magaña informed members that the next meeting would be held jointly with the 39th CIML Meeting and OIML Conference, in Berlin in October 2004.

In closing the meeting, Mr. Faber asked for a clear decision that could be presented to the CIML. He believed that this conclusion was that there was very strong support for the proposals and that, in addition to these, some very important observations had been made. The President should be asked, in appointing the members of this permanent Working Group, to bear these recommendations in mind. With the agreement of the meeting, these conclusions would be recorded in the minutes of the current meeting and he would present them to the CIML. Agreement was given to this, and Mr. Faber pointed out that the Development Council was coming to the end of its existence. There would be a short meeting the following year because there might be some formalities to observe. That would also be an opportunity to look back over its history and to thank all those who had played a role in this Development Council.

The meeting was closed, with final thanks to all contributors, and a fervent hope that soon the discussions of structures could come to an end and the real work and activities could begin. ■

38th Meeting of the International Committee of Legal Metrology

5–8 November 2003 Kyoto, Japan

Introduction and preliminary Agenda Items

Following the opening addresses (see January's edition) the roll of delegates was called: 48 CIML Members out of 60 were present or represented and the statutory quorum of three-quarters (45) was therefore reached. The agenda was then approved (see insert), as were the Minutes of the 37th CIML Meeting.

Members

Mr. Faber welcomed New Zealand and Vietnam, the two newest Member States. The Representatives from each country, both previously Corresponding Members, expressed their pleasure at having acceded to Full Member status and were keen to continue the work already in progress with the full support of the Organization. The Committee also agreed to place Vietnam in the lowest contributory class, as requested previously to the Bureau.

Mr. Magaña stated that the situation of most Members was very good: any due arrears had been paid, though two cases remained for consideration, one being more critical than the other, encompassing many years and a lot of money. But before de-listing the country concerned, Mr. Faber suggested negotiating for three more months in a last attempt to improve the situation.

38th CIML Meeting

Presidential Council

Moving on to the Presidential Council activities, Mr. Faber explained that as usual, all the items discussed in this Council would be dealt with on the CIML agenda. The Council had met on 24 and 25 February in Paris, and had gone through all the items on the agenda. Two items received special attention: progress with the MAA, and the financial situation, more particularly the budget for the years 2005–2008.

The Presidential Council had also had a shorter meeting on 4 November, where one of the most important items had been the structure for work on assistance to developing countries.

CIML Presidency

Item 5 concerned the Presentation of the candidates for the CIML Presidency. Mr. Faber explained that the vote would take place on the Friday afternoon and that the required majority was 80 %. If this majority were not reached, the First Vice-President, Pr. Kochsiek, would have to take over. There was one candidate, Dr. Charles Ehrlich, who gave an oral presentation on his views on the future of OIML.

Financial matters

On the subject of financial matters, Mr. Magaña reminded delegates that the Auditor's Report had to be agreed on and adopted each year. This year the situation was slightly different, and he had sent out a note concerning one or two issues in the Report: firstly, it contained two small errors and secondly the External Accountant had asked to retire. The CIML would therefore be charged with appointing a new Auditor, who would be asked to re-certify the 2002 accounts, together with the 2003 accounts, which would both be presented again in 2004 - at which time it would be necessary to adopt the appointment of the Auditor as well as to approve both sets of accounts.

Mr. Magaña then presented some new graphs for the 2002 budget, which showed the budget voted by the Conference, the estimates made at the beginning of 2002, and the final figures. As compared with the figures voted by the Conference, staff charges were slightly lower, indirect costs were slightly higher, and direct costs were virtually the same. Income, which came principally from Members' contributions, was slightly up. Corresponding Members' fees were slightly higher than planned by the Conference and income from sales of publications had almost doubled, though this was not a very large amount. Another source of income was the reimbursement of taxes by the French Administration, which was again slightly more than planned by the Conference. The overall result conformed to that approved by the Conference.

The picture for 2003 was similar, but staff costs were slightly higher than those voted by the Conference, mainly due to inflation. Indirect costs were comparable to those voted, as were direct costs. All expenses therefore conformed to what had been planned.

Concerning income, Members' contributions had been slightly higher than those planned, but not significantly. Corresponding Members' fees and income from sales had been in conformity with plans, as had the other income.

Looking at income compared with charges, in 2002 what was voted had been realized; there had been a small surplus in 2002, due to a slight increase in income, and charges which had remained constant. But for 2003 estimates and figures showed that expenditure was slightly higher than income, though not to an important extent.

Mr. Magaña said that it was customary to present to the meeting, in the year before Conference, some highlights of the projected 4-year budget (2005–2008), in order for the Committee to discuss it. Their comments would help the Director in his preparation of final proposals for the Conference, in line with the wishes of the Committee.

For 2005–2008 there would be a major event, i.e. the implementation of the MAA, which would be a supplementary task for the Bureau. What was proposed was to present the budget in two parts: a baseline budget corresponding to the usual activities of the Bureau, and an additional budget including charges and income specific to the MAA implementation. An inflation rate of around 2 % was anticipated; salaries would increase in line with inflation, plus a small progression due to increases in length of service. There would also be expenses incurred in organizing seminars, and special funds would be needed for the 50th anniversary of the OIML. Some equipment in the Bureau also needed replacing.

Concerning the income for the budget, Mr. Magaña continued that the intention was to propose an increase in Members' contributions equal to the estimated inflation rate of 2 %. A small increase in membership could be expected - two new Members had already been welcomed this year and it was hoped that one or two more might join. Regarding Corresponding Members' contributions, following discussions some years ago, it was considered that their subscription should be around 10 % of the base contributory share of Full Members. Summarizing his projections for the period 2005–2008, Mr. Magaña said that in some years there was a small deficit, and in others a small surplus. But there was an overall healthy balance.

It had been considered inappropriate to pay the additional future BIML staff member (for the implementation of the MAA) out of Member State contributions, because these had to be used for the normal operation of the OIML for all countries and not just for those who participated in the MAA. This expense should be balanced by income from the beneficiaries of the MAA (participating Issuing Authorities or manufacturers), a subject to be discussed later.

There were also plans to make all OIML publications freely available on the web site and to stop printing them on paper. In this way the income from sales of publications would be lost but at the same time money would be saved on printing costs. A number of Members considered that it would be good for the promotion of metrology to make all these publications available without payment.

If this budget option were accepted, the situation would exist whereby the income from the MAA would not immediately be sufficient to cover the costs. It was expected that the implementation of the MAA would progress and that after four years the number of participants and manufacturers concerned would be sufficient to balance the cost, but not at the beginning of the implementation. These deficits were the price to pay for the implementation of the MAA but money could be taken out of the Reserve Fund as being an investment for the future.

Mr. Magaña commented that the Reserve Fund was generally considered too high; it represented 15 or 16 months of functioning of the Bureau rather than the half year's budget generally considered to be appropriate. The option of using funds from the Reserve would lower it to an acceptable level but would not compromise the future, since funds would not continue to be taken from the Reserve after four years. After 4 years the Fund would be at a level of approximately 50 % of the annual expenses of the Bureau. Final decisions would not be taken at this point but delegates' remarks would be taken into account with a view to presenting a final proposal in 2004, at which time a more detailed document would be produced, notably concerning the MAA.

Mr. Magaña had calculated that within four or five years perhaps half the present Certificates would be

under the declarations of mutual confidence. He therefore considered his hypothesis to be rather prudent. Today there were 1100 Certificates. If there were 600 certificates under the DoMC, that would balance the cost of one additional engineer. He also considered that after a few years this revenue could also give a small surplus to the Bureau, which could be used to balance the cost of giving the publications free of charge - an additional benefit of the MAA.

Mr. Faber closed discussion on this topic, pointing out that the MAA would be discussed in detail at a later point in the meeting. The main principle to keep in mind was that the MAA should not be financed from Members' contributions. He felt that the budget was very moderate, showing that the OIML was in a good position.

Financial Regulations

In asking Mr. Magaña to introduce the item on the revision of the Financial Regulations, Mr. Faber reminded the meeting that in recent years there had been a strong desire to implement modern principles of accountancy in the financial management of the OIML.

Mr. Magaña explained that the Financial Regulations needed modernizing since the accountancy was not adapted to modern management of an international organization, and was not clear. He therefore planned to use the standard accountancy plan which was in use in France for the accountancy of the Bureau, but harmonized with usage in other countries. Plans could be made in a more transparent way for future expenses and standard software could be used since the present custom-made software was not adapted to the OIML's needs.

A number of issues in the way the Bureau was managed also had to be clarified, to make the system more acceptable to Members. It was difficult to understand some budget issues; the new system would bring more clarity. One example was that the External Accountant should be appointed by the Committee or by the President but not by the Director. And the intention was to finalize the Financial Regulations and to send them to Members in 2004 so that there was time to examine them before they were voted on at the 2004 CIML or the Conference. In principle, the Convention required the CIML to vote on this, but it was possible to decide to present it to the Conference.

Draft Revision of the Staff Regulations

Mr. Faber explained that the BIML Staff Regulations were somewhat outdated and much in need of revision and that work had been in progress on this for some time. There had been discussions between himself, the Director and of course his staff. They now had to be adopted by the Committee. Mr. Magaña pointed out that the new salary scales were similar to the present ones, and were very reasonable when compared with other bodies or other International Organizations. There would not be any increase in staff costs when the move was made from the old grades to the new ones.

BIML Staff

Mr. Faber told the Members that, being in close contact with the Bureau very frequently, he could say that the general situation as far as the BIML Staff were concerned was very good. He could see that every year the efficiency of the Bureau was improving. He mentioned that the current team was working extremely well together as professionals towards a common goal and that the quality of the Staff itself was excellent. Mr. Faber believed that BIML was on the right track. Mr. Magaña explained that every Staff member would from now on have an annual appraisal with definition of objectives for the following year. In fact, they had not waited for the new Staff Regulations to come into force, but had already begun this appraisal system and fixing of objectives in the current year. He considered this to be a good way to motivate people to have clear objectives before them, and the staff of the Bureau in general appreciated this.

After deliberation by the Committee, the President informed Mr. Dunmill that the CIML had unanimously approved the renewal of his contract for a further five years.

BIML activities

Mr. Magaña reiterated the objectives of the Bureau: to support Member States and the Regions in developing legal metrology; to circulate information among Members; to support the OIML Technical Committees; generally to raise awareness of legal metrology; and to help develop mutual confidence among Members.

In addition to its regular work schedule, the Bureau had participated in all the meetings of the APLMF, COOMET, SADCMEL and WELMEC, as well as in other seminars and workshops organized by Members or by Regions and had been present at a number of seminars and meetings concerning developing countries.

As usual, a large number of technical publications and meeting minutes had been published (including P 1), plus the OIML Bulletin. The BIML had continued to play a role in supporting Technical Committees and in monitoring the efficiency and speed of their work, and had attended a number of TC/SC meetings. There had

also been a number of meetings with contacts of the OIML, including ISO-CASCO, ISO-DEVCO, ILAC, the WTO TBT Committee, JCDCMAS, and the BIPM, plus a number of other international or regional meetings. The WTO had also organized two seminars with the OIML and the IEC, and the Bureau had also published a report by John Birch.

Internet and e-mail

New on-line databases had been put on the web site and further modules were under development for OIML Certificates and TCs/SCs. There were also plans to add fora for different issues: for example, OIML TCs would input drafts, and members of the TC would be able to submit comments directly on line, which would facilitate technical work and the dissemination of information to Member States. All the databases were being built from scratch by the BIML so that they could be tailored exactly to specific OIML needs, since off-the-shelf databases had proved unsuitable for OIML requirements.

Commenting on the subject of communication with Members, Mr. Pulham pointed out that e-mailings were sent out to Members about two to three times a week at the most. As far as possible, updates of the web site were grouped together so as not to invade email in-boxes excessively.

On the theme of communication, the Blue Brochure would also be revised and modernized to take account of changes taking place in legal metrology; that project had been slightly delayed due to the current workload.

OIML Action Plan

Mr. Magaña had made a draft revision of the Action Plan, amongst other points taking into account the Task Group's proposals for developing countries and had sent it to Presidential Council Members. It had not therefore been possible to circulate it to Members by June, which would have been necessary in order for it to be reviewed by the latter in time for the current meeting.

Technical activities

Mr. Issaev and Mr. Szilvássy gave information on OIML technical activities, a detailed report on which is published in this edition of the Bulletin. Concerning the work program of TCs/SCs, 10 technical meetings had been held, meaning that a high number of revised and new Recommendations and Documents were already or would soon be ready for approval. It could therefore be stated that over the past 12 months there had been a real increase in both activity and results.

However, a number of projects had also been delayed or had not been forthcoming. On the other hand, good progress had been made with High Priority and Priority Projects and TC 18 had proposed a new project *Opthalmic Instruments - Impression and Applanation Tonometer* which it was proposed that the CIML approve.

Mr. Szilvássy informed members that the Secretariat of TC 8/SC 2 had been vacant for three years, and that nothing had been received from TC 10/SC 3 *Barometers*.

Mr. Lagauterie had proposed the establishment of a new SC (possibly within TC 3) or a new TC on questions of accreditation in legal metrology, but it was concluded that the Secretariat of TC 3 and Mr. Lagauterie would prepare a proposal for the approval of the CIML, which was that the two existing projects be developed by a small working group composed of France and the BIML. Several important Recommendations had been circulated for direct postal approval, notably R 49-2 and R 49-3, but not enough votes had been received for them to be approved. This was also the case for the revisions of R 61-2 and R 134, and the DR of the Amendment to R 99/ISO 3930. Members were urged to vote on drafts circulated as this was a key activity of the organization.

Dr. Sommer reported that work had been started a couple of years ago on uncertainty in legal metrology, including risk analysis. Unfortunately this work had rather lapsed in recent years, but he believed it should be restarted. Dr. Ehrlich confirmed that work on the uncertainty document had been delayed, but he believed that the time was now right for restarting it. Dr. Birdseye pointed out that risk analysis was not only about uncertainty in the traditional sense but could relate to verification periods. He noted that a new project was proposed for the revision of D 19 and D 20 on verification and approval; it was proposed that these two topics should be tackled together so that other possible overall procedures could be taken into account.

Dr. Bennett referred to the work of TC 12 on electricity meters. This had been accepted as a high priority area and concern had been expressed at the postponing of the recent scheduled meeting, and the apparent delays in the program of work. There was awareness of the conflict of interest between manufacturers and regulators, which made this work difficult. She understood that discussions on this matter were taking place between the Bureau and the IEC. Mr. Magaña said that discussions had not yet begun but, clearly, there was a different approach in the case of electricity meters, between legal metrologists and specialists in electrical equipment. This was not a conflict, merely a difference of approach, and a common approach should certainly be found. He agreed that there was no point in having an OIML Recommendation which was not consistent with the IEC standards.

Acceleration of technical activities

The need to speed up projects went back several years. The previous year there had been a Presidential initiative to try to find methods of accelerating OIML technical activities. There were problems with approved and ongoing projects, problems with new reviews of OIML Recommendations and Documents, and problems with new revisions of OIML Recommendations and Documents. In the BIML there had been two short meetings the previous year and a draft document had been prepared. There had been some positive signs of increased activity in the current year and more Documents and Recommendations had been presented for approval.

Another point for concern was that the USA and Russia held almost 50 % of all TCs and SCs, and, together with the work of the UK and Germany, the total came to 70 %. Only 14 countries out of 60 held any TCs or SCs.

Summing up the situation, there were 122 OIML Recommendations and 27 International Documents. Regarding technical work, it was laid down that every 5 years at the outside, the OIML would review every Document and Recommendation. This meant that about 28–30 reviews were due every year, but only a small part of this work was being done. Reasons for this lack of activity had been discussed several times by the Presidential Council and included:

- The tendency to de-regulate in certain countries meant that fewer measuring instruments were subject to control;
- Many fields were controlled by other agencies in the countries and lay outside the scope of existing metrology structures;
- CIML Members either did not have enough authority to influence the other agencies or authorities, or, simply, other agencies did not volunteer for the work; and
- Other agencies in the fields and lack of finances and/or time were also contributory factors.

A list would be drawn up of all the projects, possible reasons for any delay and solutions to the problems. A full list of proposals and due dates would be put on the Members' Page of the web site and each project would have its own page in order that all CIML Members could see the real situation at any given moment. Mr. Szilvássy asked all Member States to immediately begin to review what kind of possibilities there were in their countries for this work and let the Bureau know what they could undertake.

Non-conclusive results of postal ballots

Mr. Magaña said that there had been a number of postal approvals in the course of the year but that for many, it had not been possible to arrive at a conclusion. The Bureau was worried about the situation, since it happened quite frequently that not enough postal ballots were received. As they were trying to accelerate the technical work, they did not wish to wait another year to adopt the documents. He asked the meeting's approval to vote on the five outstanding documents along with the other documents to be voted on at the end of the meeting; this was approved.

Approval of draft Recommendations and Documents

Drafts of five revised or new Recommendations were presented to the CIML for approval:

- DR 1 Revision of R 48 *Tungsten ribbon lamps for calibration of radiation thermometers*;
- DR 2 Revision of R 52 *Hexagonal weights, ordinary accuracy class from 100 g to 50 kg*;
- DR 3 Revision of R 61-1 *Automatic gravimetric filling instruments*, Part 1: *Metrological and technical requirements and tests*;
- DR 4 Revision of R 87 *Quantity of products in prepackages*; and
- DR 5 New Recommendation *Spectrophotometers for medical laboratories* (R 135).

Further drafts presented to the CIML for approval as decided earlier:

- R 49-2 *Water meters... Part 2: Test methods*;
- R 49-3 *Water meters... Part 3: Test Report Format*;
- R 61-2 *Automatic gravimetric filling instruments*;
- R 134 *Automatic instruments for weighing road vehicles in motion*; and
- R 99/ISO3930 Amendment: *Exhaust gas analyzers*.

Mutual Acceptance Arrangement (MAA) and Checklists

Dr. Ehrlich reviewed progress on the MAA since the discussion on the 9 CD in St. Jean de Luz, and gave the results of the two votes that had taken place: 26 yes, 4 no and 2 abstentions. As a result of the comments received, Mr. Magaña and Dr. Ehrlich had prepared a draft that was sent to all Members, and a workshop had been held in June in Paris to review the results of the vote and to address the outstanding issues.

The second Draft Document contained modifications to incorporate the discussion at the meeting in June. In that vote, there were 22 yes votes, 4 no votes and 5 comments, and similarly with the Checklists. So this was approximately a level of 80 % in favor, but, as

could be seen, only about half the CIML Members had voted.

The first issue was costs: administrative costs in operating the program, and costs to Issuing Authorities and testing laboratories for having on-site peer evaluation or accreditation performed. Other comments were:

- The experts on the Accreditation team should come from the same list of experts which would be maintained, that would do peer review audits;
- Interesting suggestions had been made that representatives from the Technical Committees and Subcommittees appropriate to a particular Declaration of Mutual Confidence should be included and take an active role in participation review, to learn about the issues, and understand what was happening on that Committee. This was not something which featured in the earlier versions of the MAA, but was now included;
- There was a fair amount of confusion about having Issuing Authorities evaluated with respect to ISO/IEC 17025;
- There was extensive discussion at the workshop in June about the fact that in different countries Issuing Authorities perform different functions. Sometimes what was called an Issuing Authority in one country might actually do some type of testing or examination;
- One country wished for the reference to ISO/IEC 17040 to be deleted, pertaining to peer assessment of Conformity Assessment bodies, for two reasons: first, it was still in draft stage; secondly, it was not an appropriate document. This was added as an afterthought during the meeting, and, if it was not an appropriate document, then it must certainly be removed. Dr. Ehrlich could see no problem in doing that; and
- Some countries had commented that the Committees on Participation Review could be large and unwieldy; this was a legitimate concern, depending on what the recommendation was for the Declaration of Mutual Confidence (DoMC). The committee for the first Declaration of Mutual Confidence should be kept to a reasonable size.

These were the key issues. One country was totally unconvinced of the practicality of the MAA, but their comments had been based on saying that the Certificate System worked well for their needs in Europe. This had also been discussed at the meeting in June and it had been agreed that for some the Certificate System worked fine at present, but that for others this was not the case. The BIML would undertake a study to get a better understanding of where the Certificate System was and was not working effectively.

Overall, a good majority were in favor of getting started and voting "yes" on the MAA, though there would undoubtedly be some difficulties along the way. There would undoubtedly also be some more discussion of the cost issue.

A number of other detailed comments were made, all of which are published in the full Minutes. Due to space constraints, these can not be published in this abridged version.

Dr. Kildal wanted to question the claim that the OIML Certificate System "did not work". This was quite a serious accusation, because a lot of work had been put into it by the BIML and Members, and, as a priority, they should find out how the System was working. Had this work no value? What was the status of this investigation and when was its completion planned?

Mr. Faber believed that the expression "it does not work" was a little too rigid, because the fact that there were over 1100 OIML Certificates proved that a lot of industries were very much interested, and this proved that the System was at least partly successful, though certainly not as many countries were accepting the Certificates as would be possible - there was definitely room for improvement.

Mr. Magaña said that the Certificate System both worked and did not work. It was successful insofar as manufacturers wanted Certificates, and this gave common bases for type evaluations, and they were often the basis for bilateral mutual recognitions or regional recognitions. The WELMEC type of mutual agreement was based on the OIML Certificate System, which proved that the System had some value. It did not, however, work as well as it might. This was why the MAA had been developed - because the recognition of Certificates was not unanimous worldwide. The MAA was a necessary first step; other issues about conformity and so on might arise at a later stage.

Dr. Llewellyn said that the administration of the MAA should be self-financing, through fees recovered from the beneficiaries. A problem with this was that the additional member of Staff in the Bureau would do other things as well as administer the MAA. It was a difficult and perhaps dangerous precedent for the activities of the Bureau to be funded directly by industry. The OIML was an inter-governmental Organization and it was for governments to fund the activities through the Member States' contributions. He would prefer that Member States' contributions were increased moderately to fund the additional Staff member in the Bureau, but that a single one-off fee were charged to the beneficiaries, i.e. industry, for their Certificates. To sum up, it was wrong to expect industry to fund an OIML activity.

Mr. Vaucher said that the financial problem was the main issue. The Issuing Authorities would have to charge the manufacturers, the manufacturers would charge their customers and the users of the instrument, the consumers.

Mr. Kildal thought it a good principle that the beneficiaries should pay for the cost. He suggested that if OIML Members were worried about cost issues, the IEC schemes should be looked at. Mr. Björkqvist was of the same opinion, that the costs in an enterprise such as this should be borne by the participating bodies rather than the states which financed the OIML. Mr. Valkeapää also shared this view.

Mr. Magaña explained that there would be considerable costs to the Bureau due to the fact that another Staff member would be needed. There could probably be at least 20 Declarations of Mutual Confidence within several years, and even to follow these with the amount of time presently allocated to following up TCs/SCs would require one additional person. There were only two possible solutions: either the Bureau was in charge of following these and ensuring consistency in the work of the different DoMCs, or this was simply left to the Member States. A question of principle was involved: should an organization like the OIML have other income than the contributions of Member States? Was it appropriate for the OIML to undertake commercial activity of this sort? In his opinion, countries which were not interested in the MAA should not be asked to participate in financing it. This was the reason for the intention to have participating countries finance the costs.

Mr. Faber stated that the Reserve Fund had never been used in the past for structural expenses, and would not be in the future either since setting up a new activity was not structural. The Committee could rest assured that they were in control of the Reserve Fund. He felt that the financial policy behind the system should be defined much more precisely, and had already announced that an ad hoc Working Group would be set up to go through all the details over the coming months. But this should on no account hinder the implementation of setting up the first DoMC, once the MAA had been approved.

This Working Group should present a report or at least a first draft before the Presidential Council Meeting in early March 2004, at which the matter would be discussed. After that, perhaps by post, it would be possible to send Members the results, and the final decision should then be made, by postal vote or at the next Committee Meeting. All the observations would be taken into account; the problem had to be solved and Mr. Faber's hope was that the necessary further elaboration would not hinder those Delegations which wished to vote "yes" for the MAA from doing so, because all this only had importance during the setting up of the DoMC and until it was running effectively, which could not happen at all unless the system was accepted.

He hoped that this study would also encourage some countries, which perhaps might have been planning to vote "no", to change their vote. The serious nature of the financial problem was very well understood and much hard work was going into the solving of it. Mr. Faber promised that the implementation of the first DoMC would not be actioned until there was a settlement on finance. And he said that it would be very disappointing for those countries who had asked for implementation to start as soon as possible, if agreement on the financial aspect could not be reached.

The President pointed out that since the Committee had the authority to approve the MAA, it also had the authority to make minor changes in it when the Financial Committee proposals were dealt with. If one or two phrases needed to be changed, this would be included in the Report and it would be up to the Committee to adapt the text where necessary.

Mr. Magaña confirmed that in the budget that would be presented to the 2004 Conference, the normal activity of the Bureau would be clearly separated from the costs and income arising from implementation of the MAA. Each country would be able to see that Member States' contributions were not used for financing the implementation of the MAA.

Summarizing, Mr. Magaña said that there were two separate documents: the MAA, which gave the framework for implementation, which had to be followed very strictly and secondly the Checklists, which were more for guidance. Some groups, in Participation Review, might deviate from the Checklists or adapt them to the specific needs of their DoMCs. The two documents did not have the same level of commitment for the participants and he considered that they should be voted on separately. The results of votes for the two documents in the postal ballots had been seen to be rather similar. But they were two different documents which could be amended differently and which should therefore be the subject of separate votes.

OIML Certificate System for Measuring Instruments

General background information was given on the System, which had been in operation since 1991. There were currently 1145 OIML Certificates; 38 OIML Recommendations were applicable within the System, with some 306 applicants and manufacturers. There were 26 Issuing Authorities from 24 Member States.

With the publication of the revised version of P 1 *OIML Certificate System for Measuring Instruments* (available free of charge), a step was taken towards the second phase of the System. This publication had led to the certification of families of instruments, modules and families of modules of measuring instruments.

A number of developments in the System were important in the light of the discussions on the MAA, notably the free availability of P 1, and the fact that the OIML web site had recently been restructured with a

new searchable database of Certificates. Soon, new (or revised) Recommendations on utility meters would be available and applicable in the System, and the Committee had just practically decided to vote R 49-2 and R 49-3 *Water meters*. The Test Report Format to R 75 *Heat meters* was virtually ready to be sent out by the Secretariat, and a good start had been made on the revision of R 117 on meters for liquids other than water. Also of note was the fact that Slovenia had established its first Issuing Authority, becoming the OIML's 26th Issuing Authority, and that FR1 had transferred its activity to FR2.

If approved, two of the five Draft Recommendations presented for approval would become applicable within the System:

- DR 1 Revision of R 48 *Tungsten ribbon lamps for calibration of radiation thermometers*; and
- DR 5 (New Recommendation - R 135): *Spectrophotometers for medical laboratories*.

As decided by the CIML at its 37th Meeting, further Recommendations would soon be applicable within the System:

- R 49-2 and R 49-3 *Water meters for cold potable water*; and
- The Test Report Format for R 134 *Automatic instruments for weighing road vehicles in motion. Part A – Total vehicle weighing* was being submitted for CIML postal approval;
- The new revised version of R 111 *Weights…* would be circulated for CIML postal approval as soon as the final DR was available and the postal vote was complete. There had been some delay in this process due to the large number of comments which had been received. It would be available when the postal vote had been completed.

The revised R 61-1 and R 61-2 had been approved by the CIML and it would be necessary for a Supplement on *Certificate transformation requirements* (in analogy with R 60 (2000) Supp.) to be drawn up.

Several actions were already included in the Action Plan concerning the follow-up to the revision of P 1, which now shifted the central role from the CIML Members to the Issuing Authorities. This meant that the Issuing Authorities had to adapt their activity according to the new usage.

When revising or developing new Recommendations, the TCs/SCs concerned had to take into consideration the new rules of P 1, making possible the certification of modules and families of modules including metrological requirements, test methods and test report formats. As mentioned in the *Report on Technical Activities*, to achieve this goal it was very important to have the so-called horizontal document ready, because this was necessary for the application of the revised P 1. The BIML would prepare, with the Co-Secretariat of TC 3/SC 5, an inquiry about the proposals on the individual certification of instruments.

Directives for Technical Work

Mr. Magaña informed the meeting that in the course of the year a draft revision of the *Directives for Technical Work* had been drawn up. Two elements had since come to light which could not have been taken into account during the revision: the possibilities offered by the Internet for technical work, and the fact that the WTO TBT Committee had urged all international standard-setting organizations (including the OIML) to look very carefully at the third Triennial Review of the TBT Agreement, in which a number of countries had expressed concerns about international standardization.

The Directives would therefore have to be reworked, taking into account comments received, Internet developments, and TBT requests; they would not be submitted for approval since there would be another revision the following year. He proposed that the CIML should ask the President and the Bureau to appoint a small Working Group to produce a final draft revision which would be simpler, and would take account of the various new issues; in the meanwhile the present Directives would remain in force.

Translation and distribution of OIML Publications

A number of countries had asked whether they were authorized to make translations of OIML Publications into their own national language and to distribute and sell these. A draft document on this subject had been prepared, *Translation and distribution of OIML publications*.

Draft Guide on the status of OIML Documents and Publications

Mr. Magaña said that this was an information item - there was not yet a document to submit to the meeting. The Bureau had been asked to work on what had been labeled "horizontal documents", though the words "horizontal documents" were not very clear: what was needed was to have a clear description of what kinds of documents and publications the OIML had, and might issue, and the process for adopting them. At the moment there were only Recommendations and Documents, but a distinction could perhaps be made between them and how they were to be adopted, and what kind of commitment these publications placed upon Member States. Some publications constituted a commitment for

Member States, others were more advisory, others informative. Also, some TCs had to follow certain guidelines. The paper being developed would give a description of the different kinds of documents, the way they should be adopted, and the commitment that existed for different structures of the OIML and Member States. This document should be sent for Members' approval, probably after the next Presidential Council, in March or April, and could be voted on at the next CIML Meeting.

Study on *The Economic and Social Benefits of Legal Metrology*

Mr. Birch presented the Study he had begun early the previous year, which now incorporated comments received by a number of Members. The Interim Report presented the previous year had provided a qualitative description of the benefits of trade and regulatory metrology. This second section had been primarily concerned with the qualification of those benefits. Mr. Birch's full conclusions are published in this edition of the Bulletin.

On behalf of the CIML, Mr. Faber thanked Mr. Birch for his hard work.

Development Council
Task Group on Developing Countries
Other developing country activities
JCDCMAS

A detailed report on the Development Council meeting and activities is published in this issue of the Bulletin; the Task group on Developing Countries is also discussed in that report, as is the Joint Committee for the coordination of assistance to Developing Countries in Metrology, Accreditation and Standardization, JCDCMAS.

Mr. Faber reminded those present that a new structure (see the Development Council report) could not be set up immediately but needed Conference approval. He had taken note of the remarks, and the only thing that he was asking for at present was permission to go on doing the preparatory work. A proposal would be made to the Conference the following year and that would be the time for all Delegations to vote.

Liaisons with international and regional institutions

Metre Convention

The last meeting with the Metre Convention and ILAC had been held on 26 February 2003 at the BIML; 14 people had attended. The three Organizations had exchanged information and there had been discussion of a number of possible common actions, notably on the Terms of Reference of the JCDCMAS. A second important item had been discussion of a new seminar concerning the role of metrology in economic and social development, as a follow-up to the seminar organized in 1989 in Braunschweig. This would be organized jointly by the PTB, OIML, BIPM and IMEKO. There was also discussion of progress on D 1 *Law on Metrology*.

Mr. Faber added that cooperation was improving and that it would become increasingly possible to undertake relevant joint actions, and more would be achieved than was at present the case. It was important for Organizations to talk together, avoid duplicating work and do things in cooperation wherever possible.

ILAC

Mr. Magaña pointed out that there was a joint BIPM - ILAC Working Group on the revision of D 1 *Law on Metrology*, in parallel with OIML TC 3, as all of these organizations were interested in the future of D 1.

Dr. Seta gave a brief presentation on ILAC activities. Cooperation between the OIML and ILAC was very important and laboratory accreditation provided the means for determining the competence of laboratories to perform special types of testing measurement and calibrations. It was therefore hoped that accreditation could to be utilized to make Government's job easier. ILAC had been registered as an incorporation in June of this year and their membership now comprised 44 signatories of the ILAC MRA.

Over the past two months ILAC had been focusing on increasing understanding of the benefit of accreditation among the international community, particularly governments and regulators, which included, he believed, the legal metrology authorities.

WTO

There were regular contacts with the WTO TBT Committee, to each of whose meetings the OIML was invited and always tried to attend; relations with the Secretariat were good. The WTO had started a reflection about building infrastructures for developing countries and associating all the observers of the standard-setting organizations to a reflection on the needs of developing countries.

ISO

There were a number of liaisons with ISO, working jointly also with DEVCO and CASCO.

UN-ECE

The UN-ECE is a liaison organization for the OIML, and Mr. Szilvássy mentioned that the OIML was regularly represented in its Working Party 6 meetings.

Draft policy paper on the liaisons with other organizations

Mr. Magaña had drawn up a draft policy paper about OIML liaisons with other bodies which had been discussed in the Presidential Council and in May the final version of the policy paper had been sent out to Members with a view to its approval at this Meeting. It distinguished between, on the one part, relations with inter-governmental bodies and development organizations and on the other, RLMOs and RMOs.

There were also relationships with international standard-setting organizations and international accreditation organizations, such as ISO, IEC, ILAC and IAF. There were regional and national standard-setting organizations, such as CEN, CENELEC and others. And there was also the possibility of liaisons with industrial federations. This paper described how liaisons might be established and what their content should be.

Reports from Regional Legal Metrology Organizations (RLMOs)

APLMF

Dr. Ooiwa reported that the APLMF had worked closely with the Asian Pacific Committee of Standards and Conformance, the OIML, and other RLMOs and had developed structures for international harmonization of trade and legal measurement.

He mentioned two structural changes: at the tenth meeting he himself had been re-elected to remain in office for one more term, and secondly Dr. Matsumoto had succeeded to the post of Executive Secretary. Membership had not changed greatly over the last year.

One of the main APLMF activities had been to arrange training courses. The challenge was a project for training courses in legal metrology, to which support had been offered from the APEC TILF (*Technical Infrastructure for Liberalization and Facilitation*) Fund. This proposal was to promote training courses for measurement instrumentation application techniques and legal metrology for developing economies among the APEC region. Courses were planned on prepackaged goods, weighing instruments and their approval and verification, utility measures, and others were under consideration.

West African Projects

Mr. Yankine said that the PTB had a project entitled "Metrology Encouragement in West Africa". Ten countries were concerned, eight of which belonged to the West African Economic and Monetary Union, and the project had begun in 2000. The PTB had visited all these countries and established an inventory in order to ascertain their needs. There had been regional planning workshops in Burkina Faso, Ivory Coast and Senegal, and training sessions on weight and volume in Burkina Faso, Benin and Guinea. There would be another seminar on ISO 17025. Now there were three Working Groups on Mass, Volume, and on the subject of regulatory and legislative texts. There was an Internet Forum concerning Mass, Volume and Accreditation. Work was now in progress on Equipment.

Euro-Asian Cooperation of National Metrological Institutions / COOMET

Dr. Issaev gave information concerning the activities of the Euro-Asian Cooperation of National Metrological Institutions which had 14 members and in which cooperation had existed since 1990. Now there were four Subcommittees: Liaisons with Regional Organizations and National Metrological Institutions, Software testing, Harmonization on metrology regulations and norms, and Technical competence assessment of verification laboratories.

A 2-year program had been established with three principal objectives: Harmonization of metrological norms and rules, development of agreed criteria and procedures for the assessment of technical competence of verification laboratories, and development of test procedures for evaluating measuring instrument software.

In May an International Seminar had been held in Moscow, organized by COOMET and the PTB and devoted to the Measuring Instruments Directive.

Dr. Issaev hoped that there might be interesting consequences of the implementation of this document in Europe. As he knew, it might be implemented in all the countries of the European Union in 2006, and a decision had been taken to elaborate a Russian version of this document.

EMLMF

Mr. Lagauterie explained that the EMLMF was open to European countries and also to countries having a Mediterranean coast, but that others were welcome to join.

The Forum had 11 members to date and the principal objective was to contribute to the improvement of metrological activities for developing members. As there

were no funds, there had been no real activity in the current year. But nevertheless Mr. Lagauterie noted that with the help of the BIML, to which he was very grateful, it had been possible to arrange a small meeting on Wednesday, and it now seemed that it would probably be possible to organize a meeting in May 2004, in conjunction with a seminar organized by the PTB in Malta.

SADC

Mr. Carstens gave feedback on the activities of SADC. A meeting had been held in Zambia in April 2003, at which three documents had been finalized: Labeling of goods, Beam scales, and Counter scales.

These documents had subsequently been handed to the Standards Body within the SADC region for publication as regional standards, which could then be adopted by Member States as technical regulations. Another training course would also be held on prepacked goods, sponsored by the PTB, and a meeting had been arranged in Mauritius for April 2004.

WELMEC

Dr. Freistetter gave information on the activities of the European Cooperation in Legal Metrology and some information concerning the MID.

WELMEC now comprised 18 members plus 12 Associate Members, who would be full members of the European Union by 1st May 2004. All these countries had to have a common approach to legal metrology, common application, common interpretation, and common sanctions which could be applied for measuring instruments and manufacturers all over Europe if they did not deliver and manufacture measuring instruments in accordance with the requirements. There were regional problems to solve, and there had to be recognized tests in a certain legal framework.

A complete report on decisions taken in 2003 can be read in the October 2003 OIML Bulletin. There had been other important landmarks also, including a strategy document, a new organizational chart, more guidelines, two new Working Groups, two new associate members, and additional technical guidelines.

Among the highlights of the Organization's future work would be the implementation of the MID, market surveillance activities and information exchange, and increased cooperation in technical approaches, training and consultancy.

Draft policy paper on coordination with Regional Legal Metrology Organizations (RLMOs)

The Bureau had developed a draft document, which had been discussed in the OIML Development Council, and then sent to each RLMO for comments. Once all these comments had been received, the BIML would produce a final draft for discussion at the Presidential Council at the beginning of March. This could possibly be proposed for approval at the next Committee Meeting. The principle of this initiative was to set up a permanent group for exchange of information and coordination of the OIML with the RMLOs.

Election of the CIML President

A President now had to be elected for a six-year term, so Mr. Magaña explained the voting procedure, referring to extracts from the Convention. Mr. Faber reminded Members that discussion of this process had begun a couple of years previously, and the deadline for candidacies had been February 2003. Two letters had been received by that date, but one candidate subsequently withdrew so there remained one candidate, Dr. Ehrlich (USA), who had presented himself earlier.

Mr. Faber and Pr. Kochsiek explained the options available in the event that this candidate was not elected. The Director verified the attendance: 50 countries were represented, which was acceptable for a quorum so the vote (in one round) took place. Dr. Tanaka presented the result: not enough votes had been cast in favor of Dr. Ehrlich; this candidate was therefore not elected. Mr. Faber personally regretted the result and expressed his sympathy to Dr. Ehrlich; he know how well he had prepared his candidature, how committed he was to the Organization, and how hard he had worked on the MAA. But the conclusion of the vote was clear and so he handed over control of the meeting to the First Vice-President.

Pr. Kochsiek began by thanking Mr. Faber for his work. His duties as President had now come to an end. Following the convention of the Organization, it was now Pr. Kochsiek's duty to make a proposal. He had not expected this outcome, but had kept in mind the possibility that the present situation might arise and to have an alternative scenario ready.

The two Vice-Presidents had decided, if this contingency arose, to ask Mr. Faber to be President for another two years. However, a vote by secret ballot was needed for this. The roll was called again, ballot papers distributed, votes counted and the result announced. The election of Mr. Faber was not carried because there were too many abstentions.

In the absence of a conclusive election result and in application of Article XV of the Convention, CIML First Vice-President Pr. Kochsiek was charged with assuming the duties of President for one year. He told the meeting that he would continue the policy and strategy set out earlier in the day by Mr. Faber. It had been confirmed in the Presidential Council that the OIML wished to

restructure the cooperation and support given to developing countries. He would also follow up the views expressed by Dr. Ehrlich and the implementation of the MAA (if a "yes" vote were given the next morning), the evaluation of the Birch Report and the St. Jean de Luz Seminar outcome, and, very importantly, he would seek out candidates willing to stand for election as President at the Berlin Meeting in 2004. Pr. Kochsiek hoped that his colleagues would support him.

Mr. Faber wished Pr. Kochsiek success in this difficult job and offered his help and support. The CIML expressed its gratitude to Mr. Faber for his achievements and leadership during his term of office.

Pr. Kochsiek thanked Dr. Ehrlich for offering his candidacy. He was a highly appreciated friend, colleague and expert. He had done a good job, not only as a CIML Member but also in the preparation of the current CIML Meeting.

Pr. Kochsiek then asked Mr. Faber to continue as Chairperson of this CIML Meeting up to the end of the session.

39th CIML Meeting and 12th International Conference on Legal Metrology (Berlin, 2004)

Pr. Kochsiek said that it had already been decided to hold the 12th International Conference and 39th CIML Meeting in Berlin from 25–29 October, 2004. He gave information on travel, accommodation and cultural activities in the city, and the planned official receptions. Time had to be found for the 39th CIML Meeting, the 12th Conference, meetings of the Finance and Technical Commissions, the Development Council, a Round Table and a Workshop. Technical visits to laboratories in Berlin and to the Federal Institute of Materials, Research and Testing would be offered.

40th CIML Meeting and 50th Anniversary of the OIML (France, 2005)

The 40th CIML Meeting in Lyon, France (20–23 June 2005) would be very special, as the 50th Anniversary of the OIML would be celebrated that year.

An International Metrology Congress is organized in France every two years, gathering some 500 people from some 30 countries including a large presence from industry, calibration and testing laboratories. Mr. Magaña's plan was to organize the CIML at the same time and in conjunction with this Congress, especially since the organizers of the Congress were very interested in opening it to legal metrology, and would include a legal metrology session in their program.

Members would be able to vote on this proposal at the end of the meeting.

Further meetings

Mr. Carstens told Members that he wished to make a preliminary proposal that the 2006 CIML Meeting be hosted by South Africa. If everybody agreed, he would go back and try to obtain the necessary finances to make this possible. The venue was still to be decided.

Mr. Faber thanked Mr. Carstens for his offer. It was too early for a final decision, but he suggested to the Committee that a decision should be taken in principle to accept the invitation to hold the 2006 Meeting in South Africa.

OIML Awards

Special OIML Awards were made to four people who had significantly contributed to legal metrology and in particular to the OIML (see photos later in this Bulletin): Knut Birkeland, Gep Engler, Ian Hoerlein and Jim Williamson.

General matters

More details were given concerning the meeting schedule for Berlin, then Pr. Kochsiek announced that that week there had been a mini hearing by the European Parliament about the MID, and his colleague, Dr. Schulz, had been one of the experts present. The MID had not been rejected by this group, so the next stage would take place on 18th November, after the MID had received some other comments from Member States. It was expected that approval would be granted in December, which was good news. There had also been a preliminary decision that harmonized standards of CEN/CENELEC and OIML Recommendations were in line with requirements of the MID.

Dr. Ehrlich also mentioned that R 111 on weights was now complete.

Adoption of Decisions

Before adopting the Decisions (freely available for download on the OIML web site and not published here due to space constraints) Mr. Magaña said there would be three steps: amendments to the MAA documents (on which there was detailed discussion) and to the document on translations; votes on the publications; and votes on the resolutions.

Concerning the document on the translation of OIML publications, several countries had suggested minor modifications, and notably the phrase was added "Member States remain free to incorporate text from rel-

evant OIML publications into national legislation, guidance documents and explanatory notes. Where OIML publications are used as a part of national regulations or guides, then a translation may be made freely available".

The Decisions and Resolutions were adopted after the roll of delegates had been called (49 Member States present; quorum = 45). Notably, all the publications without exception were adopted by the Committee, three of which would be applicable within the Certificate System if the Committee so decided: the revision of R 48 *Tungsten ribbon lamps for calibration of radiation thermometers*; new Recommendation R 135 *Spectrophotometers for medical laboratories*; and R 49 *Water meters intended for metering cold potable water*. R 61 was already applicable within the System, and there was a need for a supplement concerning Certificate transformation requirements.

Closure

Pr. Kochsiek had not prepared a special speech for the closure, since until the preceding afternoon he had not expected this to be necessary. Nevertheless, he commented that a lot of work had been done during the week, and many decisions had been made. The approval of all the draft publications was particularly important. Much still remained to be done. He thanked Dr. Ehrlich for his commitment to the development of the MAA, and was very happy that it had finally been approved.

He also thanked Mr. Faber for his outstanding work for the Organization during his years as President. The positive outcome of the present meeting was also in large part due to his efforts.

Pr. Kochsiek then thanked the Japanese hosts (and especially Dr. Tanaka), who had organized a very successful meeting, and for their hospitality. He also thanked the BIML Staff for their excellent preparation of the meeting and for all their work before and during it.

He finally thanked the CIML Members, Corresponding Members and guests of the meeting, not only for their participation but also for the fruitful discussions. He was convinced that a good contribution had been made to the work of the Organization, and that sound decisions had been made. Finally, he wished everyone a safe homeward journey, and looked forward to meeting them all again the following October in Berlin. ■

Knut Birkeland

Ian Hoerlein

Gep Engler

Jim Williamson

The OIML made awards to four people in recognition of their outstanding contribution to legal metrology

Certificate

OIML

The International Organization
of Legal Metrology

expresses its gratitude to

.....

for his outstanding contribution to the development
of international legal metrology

Gerard Faber — CIML President

4 November 2003

The OIML is pleased to welcome the following new

CIML Member

- **D.P.R. Korea**

Mr. JO Hui Kon

www.oiml.org

- Bulletin
- Calendar
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- Events
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- TCs and SCs

OIML Meetings

April/May 2004 - Sydney, Australia
(Date and venue to be confirmed)

TC 17/SC 8 Instruments for quality analysis of agricultural products

June 2004 - Dubrovnik (*Date and venue to be confirmed)*

TC 18/SC 2 Medical thermometers

25–29 October 2004 - Berlin, Germany

Development Council Meeting
39th CIML Meeting
12th International Conference on Legal Metrology

2-3 December 2004 - Vienna

TC 8/SC 1 Static volume measurement

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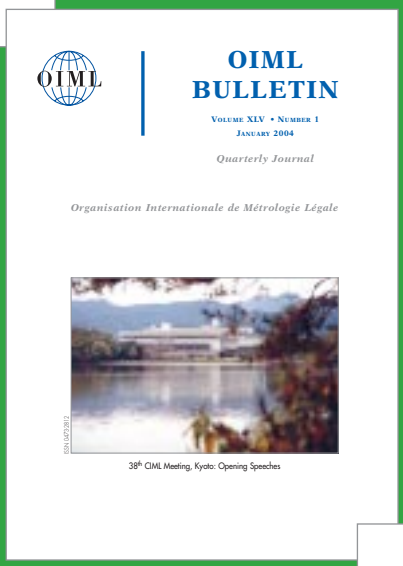
Committee Drafts

Received by the BIML, 2003.11.01 – 2004.01.31

Automatic instruments for weighing road vehicles in motion. Total mass and axle load (Revision R 134)	**E**	**4 CD**	**TC 9/SC 2**	**UK**
Instruments for measuring the area of leathers	**E**	**6 CD**	**TC 7/SC 3**	**UK**

Call for papers

OIML Members
RLMOs
Liaison Institutions
Manufacturers' Associations
Consumers' & Users' Groups, etc.



- Technical articles on legal metrology related subjects
- Features on metrology in your country
- Accounts of Seminars, Meetings, Conferences
- Announcements of forthcoming events, etc.

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- the paper originals of any relevant photos, illustrations, diagrams, etc.;
- a photograph of the author(s) suitable for publication together with full contact details: name, position, institution, address, telephone, fax and e-mail.

Note: Electronic images should be minimum 150 dpi, preferably 300 dpi.

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