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World Metrology Day 2011
A resounding success!

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Editorial

Chris Pulham
Editor/WebMaster, BIML

World Metrology Day 2011 – A resounding success!

World Metrology Day, May 20, marks the signing of the Metre Convention in 1875 by 17 nations.

The theme for the 2011 event was *Chemical Measurements For Our Life, Our Future* and was jointly coordinated by the BIPM and the BIML in a concerted effort to create maximum publicity and generate as much interest as possible, worldwide.

This objective was most certainly reached, and the WMD Team is proud to announce that there were over 8 500 visits to the web site www.worldmetrologyday.org (over 26 000 pages were viewed) and almost 3 500 posters were downloaded.

By May 20 we had announced some 27 different World Metrology Day events that were scheduled to take place across the world, and posters in 17 different languages were available for download. Both the BIML and BIPM Directors contributed texts explaining why chemistry is so important to metrology in general. What the WMD Team noticed first and foremost was the excitement and buzz the event generated and the enthusiasm with which metrology professionals across the world participated, by creating and organizing their own events.

Starting on page 38 of this issue of the Bulletin there is a full feature on the 2011 World Metrology Day including all the events, details of the posters, and the introductory texts by the two Directors.

On behalf of all the WMD 2011 Team:

- Andy Henson, BIPM - WMD Project development
- Martin Kaiser, Consultant to the PTB - Poster design
- Chris Pulham and Luis Mussio, BIML - WMD web site design and maintenance
- Jean-Christophe Esmiol (BIML) and Laurent Le Mée (BIPM) - IT support

a warm thank you to all those that participated, and see you next year for WMD 2012! ■

SOFTWARE

Software in weighing instruments – Impacts of the European Directive on Measuring Instruments (MID)

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Foreword

For millennia, weighing was a matter of mass comparison by means of mechanical instruments such as equal arm beam scales. While these instruments gradually grew more and more sophisticated (steelyard balance, decimal balance, Roberval balance, etc.) they were still mechanical instruments without any electronics. Electronics were introduced when, for example, double beam inclination balances were no longer equipped with optical scales having weight figures which were optically enlarged and projected onto a frosted glass pane. Instead, the instruments had ***digitally*** encoded optical scales which used a simple electronic logic to show the weight by means of Nixie tubes.

Still the determination of mass in most instruments was performed without using electronics, especially with those instruments that employed the principle of mass comparison. The situation became different with the invention of new technologies such as electromagnetic (or electro-dynamic) force compensation and strain gauge load cells. These instruments no longer performed a mass comparison. Instead, they measured the force acting on a system that either measured a current necessary to produce the magnetic force to compensate for the force of the load, or determined the change of a voltage from a Wheatstone bridge glued on a metal body, as employed with strain gauge load cells. These instruments needed some kind of analogue to digital converter, that is, electronic circuitry that converts analogue current or analogue voltage signals to digital signals. Moreover, additional electronic circuitries had to process the raw digital data to show it on an electronic display (e.g. seven segments display).

1 Steps towards electronic software controlled instruments

In the beginning, simple electronic or electromechanical weighing instruments were discretely designed, that is, for example, the analogue to digital converter was composed of transistors and operational amplifiers. Further processing of simple digital signals (e.g. the number of clock pulses only) was done by discrete logic circuits formed by simple AND or NAND gates (e.g. the 7400 series by Texas Instruments). Simple microprocessors, though, quickly became available (Intel 4004 in 1971, Intel 8080 in 1974 and the MOS 6502 in 1975) and increasingly found their way into weighing instruments.

In those days most program storage media were a kind of ROM (read only memory) which could be written to electrically (EPROM), yet which could only be erased by optical means (ultraviolet light). Later EEPROMs became progressively more common and contained programs (data) which could be deleted by electrical means. This was done, however, mostly using special devices. Yet EEPROMs as well as electrical buffered RAMs could also be written to without the chip being taken out of the system, e.g. via interfaces available on the instrument. For some years testing authorities did not quite grasp the meaning of this detail, assuming that programs could generally be considered as being unalterable.

Thus, early European Directives on non-automatic weighing instruments (73/360EEC [2] of 1973 and 90/384/EC [3] of 1990) did not consider the problem of software at all. Likewise, neither did OIML R 76:1988 [4] nor the 1992 edition, which were significantly influenced by concepts and technical regulations of the 73/360/EEC. Only in the nineties did European testing and approval bodies increasingly discover the software as being really "soft", that is, alterable, and as such creating a problem concerning the legal metrological requirements. However, initially they did not perceive that problem with standard weighing instruments but with instruments that partly used the hardware of a computer. Of course, adjustment parameters which were intended to be overwritten, e.g. at subsequent verification, were always considered to need a special, physical (electrical interruption of a write line) or logical (switch polled by the program of the weighing instrument) write protection means.

2 First steps towards legal relevant software on open platforms

Early PC systems used for weighing purposes under legal control (subject to verification), for instance,

showed the weight on the monitor. The monitor thus became subject to legal control and therefore the contents of the monitor image had to be kept under surveillance in order that weighing results emanating from the weighing instrument (separate from the PC but using the PC as a display device) could not be overwritten or covered by other programs running on the PC.

Hence, the first concepts used special surveillance controllers to which the normal video controller (EGA standard) also fed its data. The surveillance controller also presented data from the weighing instrument and reserved a certain area of the monitor for the weighing instrument while the rest could be used for standard PC programs. Other concepts used the PC's habit of first checking at start up what executable software there was on cards in the slots of the PC (BIOS functionality). The software that polled the weight values from the weighing instrument connected to a PC interface started as the first program. This software had exclusive access to the interface the weighing instrument was connected to. If terminated, the program blocked access to the interface to which the weighing instrument was connected. In addition to that, an LED on the front of the PC lit up to indicate that the system was not in an operating mode subject to legal control. This principle could only be used on single task operating systems such as IBM-DOS or MS-DOS. Nowadays, multi-task operating systems such as Windows, UNIX, LINUX and MacOS prevent such solutions from being realized.

New ways of treating software subject to legal control had to be found. The first new approach was made by working group 2 (WG 2) of WELMEC (European Cooperation in Legal Metrology) in 1994, based on "software requirements for freely programmable, PC-based modules or peripheral devices which are linked to, or form part of, non-automatic weighing instruments subject to legal control" (introduction to WELMEC Guide 2.3 [5]). A sub-group of WG 2 then drew up a guide (Guide 2.3) named "Guide for examining software (non-automatic weighing instruments)". The guide contained the following essential requirements:

- the legally relevant software shall be protected against intentional changes with common software tools;
- interfaces between the legally relevant software and the software parts not subject to legal control shall be protective;
- there must be a software identification, comprising the legally relevant program parts and parameters, which is capable of being confirmed at verification.

As a matter of fact, the problem of replacing the initially installed "verified" software by a new version was not considered by the first edition of the guide, which primarily aimed at peripheral devices, although software intended for displaying the weighing results was also tested and certified on the basis of the first edition of WELMEC Guide 2.3. The weight display, however, is an essential part of a non-automatic weighing instrument, which, when part of a conventional electronic instrument, must of course not be replaced after verification and securing of the instrument. In order to transfer this philosophy to weighing instruments partly or fully based on open platform hardware, WELMEC Guide 2.3 was supplemented.

3 Loading software onto non-automatic weighing instruments

The second edition (2002) of WELMEC Guide 2.3 was supplemented by an annex dealing with the problem of software downloading (exchanging / replacing) on non-automatic weighing instruments. This annex acknowledged that "new data storage technologies (e.g. EEPROM, Flash Memory) and new concepts of instruments (open platforms, such as PCs) admit an exchange of software via communication interfaces without interfering in hardware". New software, of course, could also lead to different metrological properties because it determines how the instrument works, even if adjustment parameters had not been altered. So the annex required that "suitable conditions have to be established under which a download by the manufacturer could be performed on an instrument in service, as long as the metrological characteristics remain unchanged and the declaration of conformity [i.e. the verification] is still valid". To accomplish that, the following requirements were considered as being essential:

- it shall be guaranteed by appropriate technical means that no software other than that approved for the respective instrument can be loaded;
- it shall be possible for the weighing instrument itself to check the authenticity and integrity of the loaded software by appropriate technical means at every download procedure;
- it shall be guaranteed by appropriate technical means that downloads of software are adequately traceable within the instrument for subsequent controls;
- it shall be guaranteed by technical means that software can only be loaded with the explicit consent of the user of the measuring instrument.

4 Considerations on automatic weighing instruments

The ideas mentioned above were taken up in the requirements of the "Measurements Instruments

Directive" 2004/22/EC – "MID" – (which also deals with automatic weighing instruments) and which contains the following paragraphs in Annex I:

> "8.3. Software that is critical for metrological characteristics shall be identified as such and shall be secured.
>
> Software identification shall be easily provided by the measuring instrument.
>
> Evidence of an intervention shall be available for a reasonable period of time.
>
> 8.4. Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against accidental or intentional corruption".

In order to facilitate consideration of these basic requirements, a software Guide for measuring instruments under the MID was drawn up by WELMEC Working Group 7 (WG 7). Its title is "Software Guide (Measuring Instruments Directive 2004/22/EC)" [6] and it goes into technical details. Most requirements of this Guide have their counterpart in OIML D 31 [12].

The Guide distinguishes "built-for-purpose" devices "type P" from "universal" devices "type U".

With regard to software, type P instruments are characterized as follows:

- the entire application software has been constructed for the measurement purpose. This includes both functions subject to legal control and other functions;
- the user interface is dedicated to the measuring purpose, i.e. it is normally in an operating mode subject to legal control. Switching to an operating mode not subject to legal control is possible;
- if there is an operating system, it has no user shell that is accessible to the user (to load or change programs, send commands to the OS, change the environment of the application, etc.).

The software properties of type U instruments can be described as follows:

- any operating system may be used. In addition to the measuring instrument application, other software applications may also reside on the system at the same time. Parts of the software, e.g. the measuring instrument application, are subject to legal control and may not be inadmissibly modified after approval. Parts not subject to legal control may be modified;
- the user interface may be switched from an operating mode which is not under legal control to one which is, and vice-versa;
- the operating system and low level drivers, e.g. video drivers, printer drivers, disk drivers, etc., are not legally relevant unless they are specially programmed for a specific measuring task.

At the same time WELMEC Guide 7.2 offers different levels of software security. Depending on the kind of measuring instrument and the impact of manipulations, risk classes from A to F have been defined. Automatic weighing instruments have been assigned to risk classes B and C. Class B is for all instruments which are built for (a dedicated) purpose and class C is for all instruments based on a universal hardware device (e.g. a PC). Totalizing weighing instruments are assigned to risk class C regardless of whether they are type P or type U instruments.

The meaning of the risk classes with regard to software is as follows:

- Risk class B requires:
  - a middle level of software protection,
  - a middle level at software examination, and
  - a low level with regard to the degree of conformity.
- Risk class C requires:
  - a middle level of software protection,
  - a middle level at software examination, and
  - a middle level with regard to the degree of conformity.

The middle level of software protection means that "the software is protected against intentional changes made by using readily available and simple common software tools (e.g. text editors)".

The middle level at software examination means that "standard type examination functional testing of the instrument is performed. In addition, the software is examined on the basis of its documentation. The documentation includes the description of the software functions, parameter description, etc. Practical tests of the software-supported functions (spot checks) may be carried out to check the plausibility of documentation and the effectiveness of protection measures".

The low degree of conformity requires that "the functionality of the software implemented for each individual instrument is in conformity with the documentation approved". With the middle degree of conformity, "in addition to the conformity level "low", depending on the technical features, parts of the software shall be defined as fixed at type examination, i.e. alterable only with Notified Body approval. The fixed part shall be identical in every individual instrument".

As so-called "built for purpose" instruments - due to their specific hardware and operating systems - are not as liable to fraud as "universal" instruments based on PC hardware and common operating systems, the requirements are generally less stringent than those for "universal instruments".

5 Special impacts on the different types of automatic weighing instruments under the MID

The MID covers the following categories of automatic weighing instruments:

- belt weighers (continuous totalizing weighing instruments) in accordance with OIML R 50 [7];
- automatic catchweighers as per OIML R 51 [8];
- automatic gravimetric filling instruments according to OIML R 61 [9];
- automatic rail-weighbridges as per OIML R 106 [10]; and
- discontinuous totalizing automatic weighing instruments dealt with under OIML R 107 [11].

Instruments covered by OIML R 51 and R 61 are in most cases intended to check or to produce pre-packages. The user needs the option of setting the nominal load of the pre-package and thus could easily tamper with the quantity of product if he so wished. There is, as a consequence, a high responsibility on the part of the user to correctly fill the pre-packages. In comparison to that, fraud by means of manipulating the software is complicated and therefore rather unlikely. Moreover, most countries have provisions for checking pre-packages that are finally delivered to the stores or that are in stock at the producer's premises. So the challenges associated with the requirements of assigning these instruments to risk class B seem to be sufficiently high. In principle all weighings performed by these instruments can be repeated as long as the packages remain unopened.

The situation is more complicated with train weighing using automatic rail-weighbridges (OIML R 106). These instruments are, for example, used for determining the mass of coal delivered to a power station for the purpose of invoicing but also for carbon dioxide balancing for climate protection reasons. Since every state has been assigned a maximum amount of carbon dioxide it may produce, controlling the mass of fuel generating carbon dioxide when being burned is important. When the coal is stored in bulk or immediately burned, a subsequent check of the amount delivered is difficult or impossible. For other goods and purposes, moreover, using rail-weighbridges, the contents of single wagons may be the target of mass determination, yet normally only within the scope of commercial transactions. Assigning risk class B to these instruments seems to be appropriate because in comparison to totalizers, to which the risk class C has been assigned, smaller portions of mass are determined at one measurement (train weighing) than with totalizers (e.g. when unloading ships).

Continuous and discontinuous totalizers must be considered as being even more critical because the measurement process can hardly be repeated and because huge amounts of mass values are accumulated within the memory of these instruments. If the totalized load value is lost or if it can easily be falsified, then this could lead to significant commercial or even political (carbon dioxide balancing) consequences. Discontinuous totalizers achieve an accuracy that corresponds to that of non-automatic weighing instruments of class III. They may, therefore, normally be used without any restrictions for commercial transactions, e.g. in ports for unloading bulk material (grain) from ships. When the material is dispatched within a short period of time or filled into large silos, a control weighing is impossible. So the weighing must be very reliable and totalized weights may not be lost by, e.g., an interruption of the electrical power supply (see OIML R 107, 4.2.7). Continuous totalizers (belt weighers) are rarely used for commercial purposes since in many countries their accuracy is considered insufficient. For commercial purposes many countries require instruments that have an accuracy corresponding to that of a non-automatic weighing instrument of class III, which means a relative accuracy of at least 0.1 % (non-automatic weighing instrument with a Max corresponding to 500 verification scale intervals "e", verification error limit from zero to Max is 0.5 e). However, as well as rail-weighbridges, belt weighers are used for measuring the fuel (coal) delivered to power plants for purposes of carbon dioxide balancing. Risk class C is generally assigned to totalizers because huge amounts of bulk material are weighed without interruption.

Future prospects and benefits

The essential ideas of the first WELMEC software Guide WELMEC 2.3 have meanwhile found their way into OIML Recommendations such as R 76:2006 and R 51:2006, as well as into R 107:2007. OIML Recommendations R 51 and R 107:1997 are in turn normative documents to the European Measuring Instruments Directive (2004/22/EC - MID) which means that fulfilling the requirements of these Recommendations leads to the presumption that the essential requirements of the MID are fulfilled as well (see Article 13, §(2) of 2004/22/EC).

Recommendations R 50 and R 106 are currently under revision* and will probably adopt the software concepts of R 51 and R 76 (already revised), a fact that means a step towards the uniform treatment of weighing instruments. If weighing instrument manufacturers observe the requirements of the recently revised

R 51, R 76 or R 107, obtaining a European Type Examination Certificate will probably be facilitated. Although WELMEC Guide 7.2 shall also be taken into account, this will not be so much an obstacle because the essentials of this Guide can also be found in the revised OIML Recommendations mentioned above. Vice-versa, European manufacturers are prompted by the MID to follow OIML Recommendations when applying for a Type Examination Certificate and are thus prepared for the worldwide market, at least with regard to OIML Member States. ■

* BIML note (May 2011): R 106-1 has just been approved for publication by the CIML.

References

[1] European Directive on measuring instruments (MID), 2004/22/EC

[2] European Directive on non-automatic weighing instruments, 73/360/EEC (Edition 1973)

[3] European Directive on non-automatic weighing instruments, 90/384/EEC (Edition 1990)

[4] OIML R 76-1, Non-automatic weighing instruments

[5] WELMEC 2.3, Guide for Examining Software (Non-automatic weighing instruments)

[6] WELMEC 7.2, Software Guide (Measuring Instruments Directive 2004/22/EC)

[7] OIML R 50-1, Continuous totalizing automatic weighing instruments (belt weighers)

[8] OIML R 51-1, Automatic catchweighing instruments

[9] OIML R 61-1, Automatic gravimetric filling instruments

[10] OIML R 106-1, Automatic rail-weighbridges

[11] OIML R 107-1, Discontinuous totalizing automatic weighing instruments (Totalizing hopper weighers)

[12] OIML D 31, General requirements for software controlled measuring instruments

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ACCREDITATION

Accréditation et métrologie légale

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1 Objet

L'accréditation est considérée aujourd'hui comme le moyen de référence pour qu'un organisme démontre sa compétence. Ceci dans tous les domaines où elle peut s'appliquer.

Le présent article relate les cas où la métrologie légale peut recourir à l'accréditation, sous toutes ses formes, sur la base de l'expérience française en ce domaine. Il expose les solutions retenues pour y parvenir et les relations induites entre l'administration française responsable de la métrologie légale, aujourd'hui le Bureau de la métrologie, au sein du ministère chargé de l'industrie, et l'organisme français d'accréditation, le Cofrac. Il indique au paragraphe 4.2, l'ensemble des actions que l'Etat doit mener en vue d'imposer l'accréditation aux organismes chargés d'opérations du contrôle métrologique.

Le présent article fait également le point de situation en Europe et au sein de la communauté de l'OIML.

2 Rappel de certains concepts de base et du contexte français sur la métrologie

Pour bien comprendre ce qui suit, il paraît utile de rappeler certains concepts de base de la métrologie et comment elle est organisée en France.

On reconnaît habituellement trois formes de métrologie :

a) La métrologie scientifique (ou fondamentale) lorsqu'il s'agit des applications de la métrologie traçables au plus haut niveau (étalons primaires, recherche…).
b) La métrologie industrielle lorsqu'il s'agit des applications nécessaires ou utiles à l'industrie, notamment des raccordements aux étalons nationaux.
c) La métrologie légale lorsque l'on parle de l'ensemble des règles que l'Etat impose concernant le système d'unités, la production ou l'utilisation d'instruments de mesure, afin d'assurer la qualité et la loyauté des mesurages effectués dans certains domaines (transactions commerciales, sécurité routière, opérations fiscales…) ou au moyen de certains instruments de mesure.

L'Etat français a confié le pilotage de la métrologie française (hors métrologie légale) au Laboratoire national de métrologie et d'essais (LNE) en remplacement de l'ancienne structure, dénommée Bureau national de métrologie (BNM), qu'il convient de ne pas confondre avec le Bureau de la métrologie, dont il sera amplement question dans le présent article. La métrologie fondamentale est donc animée par le LNE et, suivant les grandeurs ou domaines (masse, temps, électricité…), elle est exercée par quatre laboratoires primaires dont l'activité est coordonnée par le LNE, lui même laboratoire primaire pour certains domaines (voir Encadré 1 sur le LNE pour plus de détail).

Le COFRAC, association Loi 1901, est reconnu par décret comme unique organisme national d'accréditation. Son rôle est de permettre aux organismes qu'il accrédite, d'apporter la preuve de leur compétence et de leur impartialité, ceci afin de pouvoir offrir aux entreprises, aux consommateurs et aux pouvoirs publics, une garantie de confiance technique et de fiabilité des résultats pour les prestations effectuées sous accréditation.

Ainsi, concernant les laboratoires d'étalonnages accrédités, un rapport sur les résultats émis sous accréditation assure le raccordement de l'étalon ou de l'équipement de mesure associé au Système international d'unités (SI). Le Cofrac est donc un rouage essentiel de la métrologie industrielle.

La métrologie légale, comme indiqué ci-dessus, relève du Bureau de la métrologie, sous l'autorité du ministre chargé de l'industrie et, bien évidemment, de la hiérarchie intermédiaire. Le Bureau de la métrologie est chargé principalement :

- d'élaborer la réglementation,
- de veiller à sa bonne application,
- de désigner certains organismes de certification en métrologie légale, à caractère national,
- d'animer et de coordonner l'activité des services de L'Etat chargés du contrôle dans les régions et des organismes,
- des relations internationales en métrologie légale.

Chacune de ces trois formes de métrologie ne peut pas s'exercer sans se préoccuper des deux autres :

- les unités de mesure sont définies par la métrologie scientifique, mais sont imposées par des textes de métrologie légale, et de plus, il serait illusoire de penser que la métrologie scientifique existerait si elle

ne débouchait pas sur des applications pratiques de métrologie industrielle ou légale,

- la métrologie industrielle se raccorde par les chaînes d'étalonnage aux étalons primaires développés et entretenus par la métrologie scientifique,
- les vérifications en métrologie légale sont effectuées avec des étalons raccordés au même titre que la métrologie industrielle.

Les entités responsables de chacun des domaines ont toujours entretenu de bonnes relations et des agents de la métrologie légale ont de tout temps participé aux travaux des chaînes d'étalonnage dans les domaines intéressant la métrologie légale. Tout cela a contribué à la cohérence du système métrologique français, malgré la séparation des pouvoirs décrite ci-dessus. De plus, aujourd'hui, le bureau de la métrologie est chargé d'une mission de promotion de la métrologie dans les petites et moyennes entreprises et son responsable représente le ministère de l'industrie au Comité de la métrologie auprès du LNE, chargé de proposer des orientations pour les activités de métrologie scientifique, ce qui ne peut que renforcer la cohérence du système métrologique.

3 Accréditation des laboratoires de métrologie et raccordement aux étalons

Dans de nombreux pays, l'accréditation des laboratoires de métrologie relève du domaine volontaire et n'est donc pas directement imposée par la métrologie légale. Elle ne répond donc pas à l'objet principal de cet article. Néanmoins, pour ne pas risquer que cet article soit considéré incomplet, le sujet sera rapidement abordé.

L'accréditation des laboratoires d'étalonnage sur la base du référentiel constitué par la norme NF EN ISO/CEI 17025 : *Prescriptions générales concernant la compétence des laboratoires d'étalonnages et d'essais*, est devenu incontournable au titre des chaînes d'étalonnage, en France, depuis le début des années 2000. La première accréditation délivrée à un laboratoire d'étalonnage (suivant le guide ISO/CEI 25) date quant à elle de 1973.

Sans remettre en cause la bonne qualité des normes, pour un bon fonctionnement, elles doivent être explicitées par des guides développés de façon horizontale par des instances internationales ou européenne : International Laboratory Accreditation

Encadré 1 - Rôle et situation du LNE en matière de métrologie et d'accréditation

Comme indiqué dans l'article principal, l'Etat a confié au Laboratoire national de métrologie et d'essais (LNE), d'une part, le pilotage de la métrologie (hors aspects réglementaires), et, d'autre part, des activités de certification dans le cadre de la métrologie légale. Le LNE joue ainsi un rôle tout-à-fait particulier en matière de métrologie, le conduisant à intervenir à divers titres. Aussi, lorsque l'on évoque le LNE, il convient de bien savoir de quoi l'on parle.

Tout cela conduit par ailleurs le LNE à avoir un regard particulier sur l'accréditation.

Le LNE assure donc l'animation et la coordination de la métrologie scientifique, donc des laboratoires primaires chargés de la définition et de la mise en oeuvre des unités fondamentales de plus haut niveau au niveau national. A ce titre, en s'appuyant sur les décisions ou avis de commissions appropriées, il gère les crédits mis à disposition de la métrologie scientifique par L'Etat. Il représente la France au niveau international pour ce qui se rapporte à la métrologie scientifique, notamment au sein de la Convention du mètre.

Le LNE est lui-même laboratoire primaire de métrologie pour plusieurs grandeurs. A ce jour, il n'est pas de règle que les laboratoires primaires soient accrédités en tant que tels. Sous le pilotage du LNE, il a été décidé que les laboratoires primaires de métrologie français devaient être accrédités.

Le LNE intervient également dans le cadre de la métrologie industrielle dans de nombreux domaines. A ce titre, il est accrédité par le Cofrac comme tous les laboratoires français intervenant dans le cadre des chaînes étalonnages assurant la traçabilité aux étalons nationaux.

Enfin, l'Etat a décidé de confier au LNE les activités de certification de métrologie légale, d'une part, pour toutes les opérations de contrôle qui se rapportent à la conception des instruments de mesure, et, d'autre part, pour l'approbation des systèmes d'assurance/management de la qualité des fabricants, réparateurs ou installateurs d'instruments de mesure. Le LNE est accrédité pour chacune de ces activités, sur la base du référentiel approprié.

Le LNE a bien entendu de nombreuses autres activités d'études ou de certification (volontaire ou imposée par une réglementation) dans des domaines ayant des liens plus ou moins proches avec la métrologie : certification des dispositifs médicaux, développement de méthodes d'essai et réalisation d'essais en tous genres... Il est accrédité pour bon nombre de ces activités, ce qui fait du LNE un des champions mondiaux pour ce qui concerne le nombre d'accréditations reçues.

Cooperation (ILAC) et European Cooperation for Accreditation (EA). Parfois des guides spécifiques à un domaine sont également nécessaires ou peuvent faciliter grandement la tâche des organismes demandeurs d'une accréditation. Ces guides contribuent également à l'application harmonisée des référentiels dans tous les pays et dans les domaines concernés.

Une bonne métrologie légale se doit d'imposer que les vérifications sont effectuées au moyen d'étalons raccordés aux étalons nationaux ou équivalents étrangers. Indirectement cela nécessite que des laboratoires accrédités existent, sans toutefois conduire à obliger par voie réglementaire l'existence d'un laboratoire accrédité sur le territoire. Dans des domaines où le nombre de laboratoires accrédités est faible, parfois réduit à un dans les cas extrêmes, la cessation d'activité d'un laboratoire peut mettre le système en difficulté. Heureusement, de nos jours, avec les accords de reconnaissance des étalonnages, il reste la possibilité de se faire raccorder à l'étranger. Mais, les industriels préfèrent souvent un service de proximité et la métrologie légale se doit de veiller à ce que ses exigences puissent être relativement aisément respectées.

Une bonne métrologie légale se doit également de veiller à ce que les incertitudes des mesurages effectués à l'occasion des vérifications soient compatibles avec les erreurs maximales tolérées. Cela ne relève pas de l'accréditation des laboratoires de métrologie et donc de cet article, mais il a paru utile de le rappeler au passage.

4 Accréditation des organismes de certification ou de vérification en métrologie légale

Nous abordons ici l'objet essentiel de cet article.

4.1 Contexte et autres considérations générales

4.1.1 Première expérience en France

Depuis plus de vingt ans la France mène une politique de délégation des opérations du contrôle métrologique, l'Etat devant assurer la surveillance du système sous des formes appropriés ; les principes de cette surveillance ont été présentés en 2002 à l'occasion du séminaire sur la métrologie à horizon de 2020, qui s'était tenu en marge de la réunion du CIML (voir l'article « The evolution of the metrological control of measuring instruments in France – (the new professions in legal metrology) », publié dans le Volume XLV – N° 2 d'avril 2004 du Bulletin de l'OIML).

Les premiers cas de délégation n'avaient pas conduit à imposer l'accréditation des organismes de vérification. Il en fut autrement vers le milieu des années 90, lorsqu'il s'est agi de déléguer la vérification des récipients-mesures utilisés pour le mesurage statique des produits stockés ou transportés (bacs pétroliers, cuves de chais, camions-citernes…).

Quatre éléments au moins ont poussé à imposer l'accréditation des organismes chargés des vérifications :

1 Les vérifications nécessitent une haute compétence, notamment pour déterminer les incertitudes d'étalonnage des récipients-mesures.
2 Toujours à propos d'incertitudes, depuis l'origine, les réglementations applicables prévoyaient que les barèmes de jaugeage devaient être déterminés avec des incertitudes maximales tolérées. Dans ce domaine, la notion d'erreurs maximales tolérées n'a pas de sens en soit, puisque l'on fait correspondre les volumes à des hauteurs relevées. En pratique, ces incertitudes maximales tolérées vont, suivant les domaines et les techniques de jaugeage, pour les applications courantes, de l'ordre de 0,2 % à 0,5 %. Hors personne n'avait jamais entrepris de calculer les incertitudes en utilisant les outils offerts par le *Guide pour l'expression de l'incertitude de mesure* (GUM).
3 La nécessité d'harmoniser les pratiques dans ce domaine complexe, les agréments délivrés par les diverses autorités régionales risquant de biaiser la concurrence entre organismes.
4 La volonté de pérenniser et transmettre les compétences des agents qui étaient alors celles des agents de l'Etat, qui ont vocation à diminuer sur le plan purement technique dans un domaine reposant sur la délégation des contrôles.

Pour faciliter l'exercice des organismes, des guides avaient été établis, en concertation avec le Cofrac, notamment pour les calculs d'incertitudes, mais l'expérience a démontré que ceci n'était pas suffisant, confirmant par ailleurs que les motivations du départ étaient fondées. En effet, à l'échéance initiale établie, il s'est avéré que, s'il y avait une homogénéité de niveau des organismes, c'était par le fait qu'aucun n'était susceptible de donner satisfaction au sens réglementaire, principalement pour ce qui concerne les calculs d'incertitudes.

Il a fallu reporter l'échéance, et organiser et assurer les formations nécessaires pour mettre les organismes à niveau.

Grâce à cela, l'objectif a pu être atteint quelques mois plus tard, démontrant par les difficultés rencontrées, que l'exigence d'accréditation apportait une garantie par rapport à la compétence de chacun des organismes et l'harmonisation des compétences. En effet, préalablement les organismes avaient été provisoirement agréés par les autorités régionales, en attendant l'accréditation obligatoire. Ceci montre bien que l'accréditation apporte un complément notable par rapport à l'action que l'Etat peut mener en matière d'évaluation des organismes de contrôle.

4.1.2 Autres applications nationales

La première expérience en matière d'accréditation des organismes de contrôle avait conduit à la conclusion que l'accréditation avait des conséquences positives concernant la compétence des organismes et l'harmonisation des pratiques. Malgré les légères difficultés pour y parvenir, il fut décidé d'exiger l'accréditation des organismes dans les conditions suivantes.

1 Systématiquement pour les organismes appelés à intervenir pour application d'une directive européenne.
2 Systématiquement pour les organismes intervenant dans le cadre d'opérations de contrôle similaires aux opérations prévues par les directives européennes, mais relevant du contrôle national : approbation de modèle, approbation du système-qualité des fabricants ou réparateurs, vérification primitive…
Cette décision est d'autant plus logique qu'un même organisme peut intervenir pour application d'une directive européenne pour une catégorie d'instruments de mesure et pour application d'une réglementation nationale pour une autre.
3 Au cas par cas, jusqu'à présent, pour les autres opérations relatives au contrôle des instruments en service (vérification périodique…).

Concernant cette troisième famille d'opérations, le caractère non systématique du recours à l'accréditation a été motivé, jusqu'ici, par le fait que, si l'accréditation apporte des avantages certains, elle comporte également certains inconvénients :

a) Sauf si l'administration responsable concernée au plan national décide de s'en remettre pleinement aux partenaires concernés, notamment l'instance d'accréditation, imposer l'accréditation exige de la part de cette administration des efforts supérieurs en matière de réflexion à ce qu'ils seraient en absence d'accréditation.

En amont :

- discussions (plus délicates car il est toujours utile de discuter) avec les partenaires, notamment les représentants des organismes concernés et l'instance d'accréditation,
- participation au choix des référentiels d'accréditation, à l'élaboration de guides,
- participation aux critères de choix des évaluateurs techniques qui, à l'origine de la mise en place de la procédure, se trouvent souvent dans l'administration qui est en charge de l'application de la réglementation.

b) Comme notre première expérience l'a montré, imposer l'accréditation conduit à hausser le niveau des organismes. Il faut que les organismes soient susceptibles de franchir suffisamment aisément le pas.

c) Enfin, l'accréditation engendre des surcoûts, même si l'administration et l'instance d'accréditation s'accordent pour les minimiser en mettant en place, notamment, des dispositions adaptées à la structure et à la taille des organismes de vérification.

Avant d'imposer l'accréditation aux organismes chargés du contrôle, l'administration doit peser le pour et le contre et, notamment, considérer ce qu'elle apporte en matière de compétence, au regard de la capacité des organismes à y parvenir sur le plan intellectuel et financier. Pour ce dernier aspect, il faut en particulier prendre en compte le nombre de vérifications effectuées par an par un organisme, le prix des vérifications avant accréditation et le surcoût engendré par cette dernière.

Ces considérations font que, schématiquement et à l'heure actuelle, en France, on peut estimer que l'accréditation a été rendue obligatoire dans la moitié des cas de contrôles d'instruments en service. Le service en charge de la métrologie légale (Bureau de la métrologie) a toutefois prévu de généraliser le recours à l'accréditation obligatoire pour les organismes de vérification.

4.1.3 L'approche européenne

Les directives européennes, tout du moins celles publiées jusqu'en 2008, ne mentionnent pas « l'accréditation » pour les organismes d'évaluation de la conformité.

Elles précisent que les organismes qui sont conformes aux normes qui sont applicables à la gestion de leur activité sont présumés répondre aux exigences qui s'appliquent en vue de leur désignation et notification par l'Etat dont ils ressortissent.

L'accréditation n'était donc pas obligatoire et chaque Etat a pu décider de l'imposer ou non à ses organismes. Comme indiqué ci-dessus, la France avait décidé de l'imposer.

En vue d'améliorer l'efficacité et l'harmonisation de l'application des directives européennes et d'assurer la compétence des organismes chargés de l'évaluation de la conformité des produits, la Commission européenne et les Etats membres de l'Union européenne ont entrepris des réflexions sur la rédaction et l'application de ces directives. Ces réflexions ont abouti à la rédaction de divers textes communautaires dont le Règlement CE n° 765/2008 du Parlement européen et du Conseil du 9 juillet 2008 fixant les prescriptions relatives à l'accréditation et à la surveillance du marché pour la commercialisation des produits et abrogeant le

règlement CEE n° 339/93 du Conseil (JO UE du 13 août 2008), appelé ci-après dans le présent article « le Règlement CE relatif à l'accréditation ».

L'accréditation y est présentée comme le moyen privilégié pour évaluer la compétence des organismes chargés de l'évaluation de la conformité des produits. Le Règlement CE relatif à l'accréditation fixe ou prévoit :

1) Les principes généraux relatifs à l'accréditation, notamment :
   - chaque Etat désigne un organisme national d'accréditation unique ;
   - ou, à défaut et après en avoir informé la Commission européenne et les autres Etats membres, reconnaît les évaluations effectuées par l'organisme national d'un autre Etat membre ;
   - la Commission tient à jour la liste des organismes nationaux d'accréditation et la rend publique ;
   - l'accréditation est une « activité de puissance publique qui doit être reconnue de façon formelle par les Autorités publiques ».
2) Les modalités de fonctionnement de l'accréditation (demande, délivrance, suspension et retrait d'un certificat d'accréditation, recours…).
3) Le principe de non-concurrence, d'une part, entre les activités d'accréditation et de certification, et, d'autre part entre organismes d'accréditation. Toutefois, dans des conditions limitées fixées par le Règlement, un organisme national d'accréditation peut intervenir dans un autre Etat membre.
4) Les exigences applicables aux organismes nationaux d'accréditation, notamment relatives à l'indépendance, l'impartialité, la compétence et la nécessité de se soumettre régulièrement à une évaluation par les pairs.
5) Les mesures à prendre par l'Etat membre vis-à-vis d'un organisme qui ne satisfait plus aux exigences.
6) La création d'une infrastructure d'accréditation européenne, supervisée par la Commission européenne, chargée notamment de gérer les évaluations par les pairs et de coordonner les activités d'accréditation, en particulier conformément aux demandes de la Commission européenne.
7) Les règles de présomption de conformité des organismes d'accréditation aux exigences qui leurs sont applicables.
8) Les obligations d'information faites aux organismes d'accréditation vis-à-vis de l'Etat membre, vis-à-vis des autres organismes nationaux d'accréditation, voire du public, concernant les résultats de leur évaluation par les pairs, ainsi que de l'Etat membre vis-à-vis de la Commission européenne et de l'infrastructure d'accréditation européenne pour ce qui concerne la nature des activités d'accréditation effectuées par son organisme national.

Lorsqu'un Etat membre décide de ne pas recourir à l'accréditation, il fournit à la Commission européenne et aux autres Etats membres toutes les preuves documentaires nécessaires à la vérification de la compétence des organismes d'évaluation de la conformité. Dans ce cas, un organisme d'évaluation de la conformité peut néanmoins demander l'accréditation auprès de l'organisme national d'accréditation de l'Etat membre dans lequel il est établi ou, pour des cas particuliers, à l'organisme national d'accréditation d'un autre Etat membre.

Sans rendre l'accréditation des organismes d'évaluation de la conformité strictement obligatoire, ce règlement devrait donc, à terme, rendre l'accréditation difficilement évitable. Ce Règlement européen est applicable depuis le 1er janvier 2010.

La Commission européenne a choisi European Coopération for Accreditation (EA) comme infrastructure d'accréditation européenne (voir Encadré 2).

4.1.4 Le point de vue de WELMEC

WELMEC est l'instance de coordination européenne en métrologie légale. Cette instance produit notamment des guides destinés à faciliter l'harmonisation de l'application des directives de type « nouvelle approche ». WELMEC travaille en collaboration étroite avec la Commission européenne qui publie la référence des guides utiles pour application des directives.

Les guides qui ont été produits à ce jour ont été publiés avant la publication du Règlement CE relatif à l'accréditation mentionné au 4.1.3. Néanmoins, WELMEC à déjà présenté dans certains de ses guides l'accréditation comme le moyen privilégié de démontrer sa compétence pour un organisme, tout en admettant que d'autres règles démontrant une compétence sur la bases de critères équivalents soient acceptables pour application des guides.

Les trois guides de WELMEC les plus utiles dans le cadre de l'évaluation et de l'accréditation des organismes d'évaluation de la conformité sont :

1) Le guide 8.0 Généralités sur l'évaluation et le fonctionnement des organismes notifiés procédant à l'évaluation de conformité,
2) Le guide 8.5 Evaluation des organismes notifiés chargés de l'examen de type Présomption de conformité basée sur EN 45011,
3) Le guide 8.7 Evaluation des organismes notifiés chargés du module F basée sur EN ISO/IEC 17020.

Comme son titre l'indique, le guide 8.0 est un guide horizontal et général pour application de la Directive Européenne sur les Instruments de Mesure (MID). Ce guide est utile pour tous les partenaires concernés : Autorités nationales, organismes d'évaluation de la conformité et fabricants. Il cite notamment les normes génériques permettant une évaluation appropriée des systèmes-qualité des organismes d'évaluation de la conformité et des fabricants.

Les guides 8.5 et 8.7 sont plus spécifiques à l'évaluation des organismes concernés par les Autorités nationales. Il est indiqué en introduction de ces guides qu'il est espéré qu'ils seront également pris en compte par les organismes en charge de l'accréditation. Basés sur les normes indiquées dans leur titre, chacun de ces guides peut être considéré comme le document de référence faisant le lien entre les exigences de la directive et les principes généraux fondamentaux qu'un organisme doit mettre en application pour procéder aux évaluations de la conformité concernées. En d'autres termes, ils constituent une liste des thèmes ou points essentiels sur lesquels un évaluateur ou expert technique doit investiguer, afin d'assurer des évaluations de qualité, de façon harmonisée, en tenant compte des bonnes pratiques habituelles en métrologie légale.

4.1.5 Le point de vue de l'OIML

L'OIML fait également recours à l'accréditation pour démontrer la compétence des organismes de certification (Autorités de délivrance des certificats) et des laboratoires d'essais, pour application du MAA (Arrangement d'Acceptation Mutuelle).

Les Autorités de délivrance des certificats doivent fonctionner conformément au guide ISO Guide 65. L'accréditation est évidemment un des moyens pour le démontrer. Les laboratoires effectuant des essais dans le cadre de l'examen de type doivent fonctionner conformément à la norme ISO/CEI 17025. L'accréditation est un des deux seuls moyens acceptés pour le démontrer, avec pour solution alternative l'évaluation par les pairs.

L'OIML entretient des relations suivies avec les instances internationales d'accréditation en vue de définir des programmes spécifiques d'accréditation pour les opérations effectués en métrologie légale. Un protocole d'accord tripartite (MoU) a été signé avec ILAC pour les essais effectués en métrologie légale et avec IAF (International Accreditation Forum) pour les organismes certificateurs. Un programme de travail commun est défini chaque année dans le cadre de ce MoU.

Conscient de la nécessité d'expliciter les normes pour les applications de la métrologie légale, l'OIML a établi deux guides spécifiques : « Guide for the application of ISO 65 to the assessment of measuring instruments certification bodies in legal metrology » (D 29) et « Guide for the application of ISO/CEI 17025 to the assessment of testing laboratories in legal metrology » (D 30).

Le premier de ces deux guides est établi dans le même esprit que le guide WELMEC 8.5, à la différence près que le guide de WELMEC, s'il est évidemment établi en prenant en compte les principes fondamentaux qui régissent la certification de conception d'instruments de mesure, est destiné à l'application de la directive européenne MID, alors que le guide OIML a été défini pour l'application générale des opérations de certification de conception d'instruments de mesure, tout en y précisant les modalités spécifiques pour application du Système de Certificats OIML et du MAA en particulier.

Encadré 2 - Accréditation et notification

L'accréditation et la notification sont deux activités dissociées, qui sont conduites séparément, selon des processus spécifiques.

Ainsi, un organisme d'accréditation ne se substitue pas à une autorité notifiante.

D'une manière générale, l'accréditation est de plus en plus exigée en tant que préalable à une notification ou pour maintenir une notification, dans le cadre de l'application des directives européennes.

Cette tendance au recours à l'accréditation comme pré-requis à la notification s'est accrue depuis la parution du règlement européen du 9 juillet 2008 relatif à l'accréditation et à la surveillance du marché.

La décision de notification demeure cependant de la responsabilité de l'autorité administrative concernée.

Afin de garantir une harmonisation des exigences applicables aux organismes notifiés européens, EA a publié un guide (EA 2/17) définissant les exigences horizontales générales que doivent respecter les organismes d'évaluation de la conformité qui souhaitent être accrédités en vue d'une notification.

L'évaluation des organismes d'évaluation de la conformité concernés doit ainsi être réalisée sur la base de ce guide en association avec les normes harmonisées pertinentes, les documents EA, ILAC et IAF correspondants, ainsi que les exigences réglementaires associées (directives et textes de transpositions nationaux).

L'application harmonisée des exigences de ce guide est sous la responsabilité du HHC (Comité d'Harmonisation Horizontal) d'EA.

Le respect de la mise en application effective, par les organismes nationaux d'accréditation, de ces exigences relatives à l'accréditation des organismes notifiés, est notamment vérifié à l'occasion des audits réalisés par les pairs, diligentés par EA/ILAC/IAF.

Encadré 3 - La reconnaissance du Cofrac comme unique organisme d'accréditation en France

La publication de la loi française du 4 août 2008, dite de modernisation de l'économie, instaure au travers de l'article 137 la notion d'organisme national d'accréditation unique.

Le décret du 19 décembre 2008, pris en application de l'article pré-cité, désigne le Cofrac comme l'instance nationale d'accréditation seule habilitée à délivrer des certificats d'accréditation aux organismes d'évaluation de la conformité, tant dans le secteur réglementaire que dans le secteur volontaire.

L'instauration d'un monopole de droit pour le Cofrac, via une loi nationale, a été rendu possible par l'adoption du règlement européen du 9 juillet 2008 qui reconnaît, entre autres, à l'accréditation un statut de service public.

C'est pour cela que, jusqu'alors, la reconnaissance officielle du Cofrac comme organisme d'accréditation national et non comme l'unique organisme d'accréditation national n'avait fait l'objet que d'une convention entre le Président du Cofrac et certains ministres.

Cette reconnaissance entérine une situation de monopole de fait qui date d'une quinzaine d'années.

4.2 Mise en œuvre pratique

Le présent chapitre évoque les démarches à entreprendre dans le cadre de la mise en place d'une accréditation obligatoire en métrologie légale et les conséquences potentielles d'une telle décision.

4.2.1 Prérequis

Avant d'imposer toute accréditation, l'Etat doit commencer par définir le cadre général dans lequel les accréditations seront prononcées et désigner un organisme qui en aura la charge : prendre les textes législatifs, réglementaires ou simplement administratifs nécessaires pour instituer le système, choisir le modèle de structure juridique pour l'entité en charge de la procédure, choisir l'organisme ou le créer.

Dans un contexte de mondialisation, il ne serait pas impossible d'imposer l'accréditation pour application d'une réglementation sans avoir d'organisme national d'accréditation, mais cela compliquerait singulièrement la tâche du service responsable de cette réglementation et des organismes de certification.

En France, le Cofrac a été choisi dès le début comme organisme unique d'accréditation (voir Encadré 3 sur le Cofrac pour plus de détail).

4.2.2 Création de l'obligation

Il faut ensuite publier un cadre législatif ou réglementaire rendant l'accréditation obligatoire pour les organismes chargés des activités concernées : exemple pour les organismes chargés de vérification primitive.

Dans ce texte, il est nécessaire ou conseillé d'indiquer, notamment :

- les exigences applicables aux organismes (que l'accréditation soit requise ou non, à part le fait d'imposer l'accréditation, les obligations sont de même nature),
- si l'accréditation est un préalable à la désignation, l'habilitation ou l'agrément (ou toute autre appellation ; on utilise le terme générique « habilitation » par la suite) délivré par l'Etat au bénéfice des organismes pour l'activité concernée, ou si l'accréditation devra intervenir après un certain temps d'activité,
- les référentiels applicables à l'accréditation ou les conditions dans lesquelles ils seront définis et si ces référentiels sont constitués simplement de normes ou sont complétés par des documents d'exigences spécifiques.

4.2.3 Concertation avec l'instance d'accréditation et autres partenaires

Préalablement, il faudra s'être concerté avec l'instance d'accréditation pour définir les buts recherchés, les normes ou référentiels applicables et étudier les besoins en guides spécifiques.

De son côté, l'instance d'accréditation devra définir un règlement d'accréditation opposable aux demandeurs. Il pourra être spécifique à une application, être commun à plusieurs applications ou se rattacher à un règlement générique déjà existant.

Si applicable, l'instance d'accréditation doit également décider de quelle section l'accréditation relève : celle en charge des laboratoires d'étalonnage ou d'essai, celle en charge des organismes d'inspection ou encore celle en charge des évaluations de systèmes de management de la qualité. Si dans certains cas le choix est évident, cela peut ne pas toujours l'être (voir ci-après).

En France, pour les activités relevant de la métrologie légale, le Cofrac a adopté le système suivant :

- Pour les organismes chargés des activités d'évaluation de la conception d'instruments de mesure (un seul organisme concerné en France à ce jour, le LNE), il n'y a pas de référentiel spécifique : la norme EN 45011 s'applique de façon générique, mais un guide spécifique à l'activité d'approbation de modèle a été établi en concertation avec le Bureau de la métrologie.

- Pour les organismes chargés des activités d'évaluation de systèmes d'assurance de la qualité de fabricants ou de réparateurs d'instruments de mesure (un seul organisme concerné en France à ce jour, le LNE), il n'y a pas de référentiel spécifique : la norme EN 45012, remplacée depuis par la norme ISO/CEI 17021, s'applique de façon générique. Il n'a pas été jugé utile de définir un guide spécifique à l'activité d'évaluation de l'organisme, mais il va de soit que le Cofrac doit s'assurer que l'organisme prend en compte tout ce qui a été défini par le pouvoir réglementaire pour évaluer les systèmes-qualité des fabricants ou réparateurs d'instruments de mesure.
- Pour les organismes chargés des activités de vérification primitive ou de vérification périodique, le Cofrac a établi des documents spécifiques à ces activités pour application de la décision ministérielle n° 08.00.110.007.1 du 4 juillet 2008 établissant les exigences spécifiques applicables aux systèmes d'assurance de la qualité des organismes désignés ou agréés pour la vérification des instruments de mesure réglementés. Cette décision, tout comme les documents du Cofrac constituant les exigences d'accréditation (LAB ML Réf 02, LAB ML Réf 05), sont établis sur la base de la norme ISO/CEI 17020. Pour revenir sur ce qui a été évoqué un peu plus haut, bien que cette norme concerne de façon générique les organismes d'inspection, le Cofrac a décidé que cette accréditation relèverait de la section gérant les laboratoires et non celle gérant les organismes d'inspection en général, compte tenu de la préoccupation du Bureau de la métrologie, que les calculs d'incertitudes soient traités avec toute l'attention nécessaire.

Encadré 4 - La gestion des évaluateurs et experts du Cofrac

Afin d'être en phase avec le vocabulaire employé dans la norme NF EN ISO/CEI 17011, référentiel applicable aux organismes d'accréditation, le terme « audit » a été remplacé par « évaluation » dans les documents Cofrac applicables. Cette mise à jour à également conduit à remplacer le terme « auditeur » par « évaluateur ».

Ces modifications sont en vigueur au Cofrac depuis la mise en oeuvre du nouveau processus de gestion des évaluateurs et experts, en 2007.

D'une manière générale, un évaluateur est une personne désignée par un organisme d'accréditation pour procéder, seule ou comme membre d'une équipe d'évaluation, à l'évaluation sur site d'un Organisme d'Evaluation de la conformité (OEC), autrement dit, les organismes de vérification, pour le domaine de la métrologie légale.

Il est important de rappeler quelques définitions se rapportant aux différentes qualifications d'évaluateurs existantes.

- Un évaluateur qualiticien (précédemment dénommé auditeur qualiticien) est une personne qui possède la compétence et la qualification nécessaires pour réaliser l'évaluation d'un système de management de la qualité d'un organisme au regard des référentiels applicables.
- Un évaluateur technique (précédemment dénommé expert technique) est une personne qui possède la compétence et la qualification nécessaires pour conduire l'évaluation de la compétence technique d'un organisme pour des domaines spécifiques du champ d'accréditation demandé au regard des référentiels applicables.

Suite à la mise en œuvre de ce nouveau processus de gestion des évaluateurs et experts, la notion d'expert technique a été complètement modifiée : il s'agit aujourd'hui d'une personne apportant des connaissances ou une expertise spécifiques dans le cadre de l'évaluation d'un organisme. Ainsi, l'expert technique peut intervenir en soutient de l'équipe d'évaluation sur des points spécifiques (ex : méthode mise en œuvre), mais n'agit pas en tant qu'évaluateur.

Ces notions sont complétées par la notion de responsable d'évaluation : il s'agit d'un évaluateur qualiticien ou technique qui possède la compétence et la qualification nécessaires pour assurer l'entière responsabilité des activités d'évaluation spécifiées. Le responsable d'évaluation est amené à diriger une équipe d'évaluation.

Ainsi, la qualification d' « auditeur technique », employée par le passé, a été remplacée par la qualification d' « évaluateur technique - responsable d'évaluation ».

Le processus de recrutement et de gestion des évaluateurs et experts du Cofrac fait l'objet de cinq étapes principales :

- la sélection, après identification du besoin, consistant à valider les capacités personnelles et les compétences techniques attendues du candidat.
- la formation au référentiel et aux techniques d'évaluation, dispensée par la structure permanente du Cofrac.
- la qualification, prononcée à l'issue des étapes ci-dessus, si les conditions requises sont respectées.
- le suivi de la performance et de la compétence tout au long de la période de qualification.
- le renouvellement de qualification, fondé sur l'examen de l'ensemble des éléments de suivi de la performance et de la compétence, complété par l'examen d'un rapport de supervision pour les évaluateurs.

Bien entendu, le Cofrac applique également les guides horizontaux établis par EA ou ILAC.

Pour les raisons indiquées en 4.1.2, il faut également consulter les autres partenaires concernés, sans ignorer leur aptitude à évoluer et sans oublier les aspects financiers.

4.2.4 Choix et gestion des évaluateurs qualiticiens et techniques

Le choix des évaluateurs qualiticiens (autrefois appelés auditeurs qualiticiens ; voir Encadré 4 sur la gestion des évaluateurs et experts du Cofrac), chargés d'examiner les aspects organisationnels, ne nécessite pas de longs développements. Leur qualification est prononcée suivant des dispositions précises.

Le choix des évaluateurs techniques, chargés d'examiner les aspects réglementaires et techniques, mérite par contre quelques informations complémentaires.

Un évaluateur technique est une personne qui possède la compétence et la qualification nécessaire pour conduire l'évaluation de la compétence technique d'un organisme pour des domaines spécifiques du champ d'accréditation demandé au regard des référentiels applicables.

Un évaluateur technique possède donc une très bonne connaissance de la réglementation et de l'opération de contrôle concernées (vérification primitive, par exemple), tout ceci appliqué à la catégorie d'instrument de mesure concernée (compteurs d'eau, par exemple). Il est aussi important qu'il ait de bonnes notions des techniques instrumentales concernées (principe de fonctionnement des instruments). Pour le moins, il doit maitriser ce qu'il convient, dans la mesure où cela peut avoir une influence sur le résultat de l'évaluation des compétences et des procédures de l'organisme.

La MID comporte de telles exigences sur la compétence que doit avoir l'équipe d'évaluation dans le cas de l'évaluation des systèmes-qualité des fabricants et cela doit également prévaloir dans le cas de l'évaluation des organismes chargés d'une opération de contrôle métrologique.

Le « monde de la métrologie légale » est relativement restreint et, par conséquent, le nombre d'évaluateurs techniques compétents peut être parfois limité, notamment lorsqu'il s'agit d'avoir des compétences en matière de vérification primitive et surtout d'approbation de modèle pour application à une catégorie d'instruments de mesure donnée d'autant que parfois certaines catégories donnent lieu à un volume d'activité limité.

Par ailleurs, il est fortement souhaitable qu'un organisme soit évalué par des évaluateurs techniques différents au cours des audits successifs. On comprend bien qu'un système-qualité nouvellement audité ne puisse prétendre à la perfection à l'issue du premier audit et ne tendra vers cette perfection qu'au bout de plusieurs évaluations. L'impossibilité de relever toutes les imperfections d'un système d'assurance de la qualité du premier coup est due à l'impossibilité d'être exhaustif lors d'une évaluation et à la sensibilité ou aux centres d'intérêts favoris des évaluateurs.

De plus, à de rares exceptions près, dans les premiers temps de la mise en œuvre d'un domaine d'accréditation de métrologie légale, toutes les compétences techniques et réglementaires requises ne peuvent être disponibles qu'au sein des agents qui étaient en charge des opérations de contrôle en question, souvent des agents de l'Etat, lorsque la mise en place du domaine d'accréditation se fait conjointement à la délégation des opérations à des organismes. On se heurte alors à plusieurs difficultés :

1) La disponibilité des agents susceptibles d'apporter une contribution aux évaluations : si on a décidé de déléguer les contrôles, c'est souvent parce que l'on avait trop de choses à faire et que l'on souhaite recentrer ses activités sur d'autres domaines. Sur ce plan, la hiérarchie de l'agent peut avoir un effet très important.

2) La volonté des agents de contribuer à l'effort de délégation des contrôles à des organismes : si ce n'est heureusement pas l'avis de tous, certains ressentent comme une frustration qu'on confie leur activité, qu'ils aimaient, à d'autres. Il faut aussi accepter d'acquérir des connaissances en matière d'assurance de la qualité car l'organisme accréditeur ne peut se permettre de recourir à des personnes n'ayant aucune notion dans ce domaine, même pour évaluer les aspects réglementaires et techniques.

3) Le maintien des compétences des agents initialement en charge des activités : si l'Etat doit prendre toutes les dispositions pour assurer une compétence appropriée de ses agents en vue d'effectuer une surveillance efficace des organismes, il est indéniable que le fait de ne plus effectuer les opérations de contrôle métrologique soi-même contribue à une baisse du niveau des compétences techniques antérieures, tout en nécessitant l'acquisition de nouvelles compétences, notamment en matière de gestion et de surveillance des organismes.

Enfin, il faut prendre en compte le fait que les organismes à qui l'on veut déléguer des contrôles doivent faire de gros efforts pour y parvenir : développer des systèmes-qualité, des procédures de vérification, des calculs d'incertitudes... A priori, ils peuvent être réticents à ce que les équipes d'évaluation comprennent des personnes venant de sociétés potentiellement

concurrentes. Cependant, l'accréditation repose sur le principe de l'évaluation par les pairs. Des dispositions sont donc mises en œuvre pour qu'un évaluateur technique issu d'un organisme de vérification puisse intervenir au sein d'un organisme potentiellement concurrent en garantissant toute l'impartialité et la confidentialité nécessaires, que les organismes évalués sont en droit d'attendre.

Il résulte de toutes ces raisons que l'organisme accréditeur, en concertation avec l'administration concernée, doit gérer son « vivier » d'évaluateurs avec une grande attention, voire rigueur, et avec diplomatie.

Compte tenu de tout ceci, en règle générale, lors du développement d'un nouveau domaine d'accréditation par le Cofrac pour les opérations de contrôle et les catégories d'instruments de mesure concernées, les évaluateurs techniques ont été, dans un premier temps, presque exclusivement fournis par l'administration. Il a ensuite fallu faire comprendre aux organismes qu'il faudrait évoluer vers un système où les évaluateurs techniques seraient également issus d'organismes potentiellement concurrents, comme cela se pratique couramment dans d'autres domaines.

Comme évoqué ci-dessus, l'organisme accréditeur doit assurer une sélection, une formation et une qualification appropriées des évaluateurs chargés des évaluations, suivant un processus rigoureux.

4.2.5 Responsabilité de l'Etat et suivi

a) Surveillance et renouvellement des décisions

Le Règlement CE relatif à l'accréditation mentionné au 4.1.3 ne précise pas si les Autorités nationales doivent s'en remettre exclusivement aux conclusions de l'organisme national d'accréditation ou si elles peuvent, voire doivent, mener des actions indépendamment de celles de l'organisme national d'accréditation pour décider de désigner un organisme d'évaluation de la conformité. La logique habituelle voudrait que les Autorités nationales conservent leurs prérogatives. La pratique nous montrera comment les Etats membres de l'Union européenne appliquent cet aspect.

En attendant, jusqu'ici, comme cela a déjà été indiqué, les Autorités françaises chargées de la métrologie ont considéré que le recours à l'accréditation ne les délivre pas de leur responsabilité et de toute action qu'elles jugent utile pour évaluer un organisme. Elles habilitent des organismes pour exercer des activités relevant de la responsabilité de l'Etat, dites régaliennes, et elles estiment qu'il est de leur devoir, parallèlement à l'action menée par l'organisme accréditeur de se forger une conviction personnelle sur la qualité de l'action des organismes.

Ainsi, si les décisions de renouvellement des habilitations sont prononcées sur la base d'évaluations moins approfondies qu'au moyen d'audits classiques, l'administration continue à procéder à des évaluations périodiques systématiques (tous les ans, de façon plus ou moins approfondie d'une année sur l'autre), sous formes de visites dites « approfondies » (appellation retenue pour contraster avec les visites inopinées également pratiquées). L'accréditation est supposée avoir pris en compte tous les aspects, mais, néanmoins, ces visites approfondies donnent lieu à des compléments de vérifications sur des points essentiels relatifs à l'application de la réglementation. Il est par ailleurs toujours utile de garder le contact avec les organismes pour mieux appréhender leurs problèmes particuliers ou les problèmes génériques potentiels.

Chaque fois qu'approprié, l'administration organise également des visites de surveillance inopinées destinées à vérifier comment les opérateurs des organismes travaillent en dehors de la présence des autorités. Cela apparaît comme un complément très utile, voire nécessaire par rapport à l'activité de l'organisme accréditeur, qui conventionnellement travaille uniquement sur la base d'évaluations, donc ne rencontre l'organisme accrédité et ses opérateurs qu'après avoir averti l'organisme de sa visite.

b) Suivi

Par ailleurs, il ne faut pas croire qu'une fois l'accréditation mise en place, l'administration n'a plus rien à faire.

A sa mise en place, il faut gérer les difficultés, notamment gérer les besoins éventuels de report d'échéance d'exigibilité de l'accréditation. L'expérience française est significative à ce sujet : si l'accréditation s'est toujours révélée possible lorsqu'elle a été décidée, jusqu'à un passé récent, ce ne fut pas possible à l'échéance initiale fixée : il fallu alors reporter l'échéance fixée initialement par le texte réglementaire imposant l'accréditation.

En régime de croisière, outre les problèmes habituels d'application de la réglementation, l'administration peut être sollicitée pour donner un avis sur des aspects induits de l'accréditation, liés à l'interprétation d'une exigence réglementaire. Il faut évidemment savoir gérer cela sans porter préjudice aux prérogatives de l'organisme d'accréditation et en se concertant avec lui.

L'administration peut également devoir gérer un dilemme lorsque l'habilitation est conditionnée à l'accréditation, que les opérations de contrôle métrologique sont effectuées par un organisme en situation de monopole ou de quasi-monopole d'activité, et que cet organisme ne répond plus aux critères d'accréditation. L'administration doit alors se préparer à faire face à cette carence susceptible de remettre en cause l'application de la réglementation.

5 Conclusion

L'expérience française a montré que l'accréditation conduisait toujours à améliorer la compétence des organismes chargés des opérations du contrôle métrologique, et à harmoniser le niveau des compétences et la qualité des prestations des différents organismes, dans les domaines ou la concurrence entres organismes est nécessaire.

Si certaines administrations sont certainement capables d'évaluer la capacité d'organismes à effectuer des opérations de contrôle métrologique, l'accréditation ne peut qu'apporter une amélioration concernant cette évaluation et l'harmonisation des pratiques. Cela est dû, au professionnalisme des organismes accréditeurs qui travaillent selon des règles et avec des outils prévus à cet effet : choix des référentiels appropriés, choix des évaluateurs les plus compétents, réitération des évaluations par des évaluateurs techniques différents lors des évaluations successives.

Les opérations du contrôle métrologique sont très spécifiques. Si elles présentent des similitudes avec des évaluations de produits dans divers autres domaines, par exemple dans le domaine de la sécurité industrielle, chaque domaine fait intervenir des compétences et pratiques spécifiques et relève de réglementations spécifiques.

De plus, si les opérations du contrôle métrologique concourent à la même finalité, la qualité des mesurages effectués en service, elles impliquent des règles différentes selon que l'on évalue la conception d'un instrument de mesure, que l'on se place au niveau du contrôle de la production ou encore du contrôle des instruments en service.

Il en résulte qu'une accréditation d'un point de vue universel n'a pas de sens, mais qu'il faut être accrédité pour une opération spécifique. En conséquence, le référentiel d'accréditation, notamment la norme utilisée, pour évaluer les organismes peut être différent d'une opération de contrôle à l'autre. Souvent, la spécificité des métiers liés à la métrologie et la spécificité de chacune des diverses opérations du contrôle conduit à compléter les normes génériques par des guides spécifiques pour mieux préciser les référentiels d'accréditation.

Jusqu'ici, relativement peu d'Autorités nationales ont recouru à l'accréditation pour évaluer la compétence des organismes. L'Union européenne vient de prendre conscience que l'accréditation était pratiquement incontournable pour ce faire. Les auteurs du présent article font le pari que d'ici quelques années, le recours à l'accréditation sera la règle générale.

Cela nécessitera néanmoins quelques réflexions. L'expérience française a notamment démontré qu'il faut se préoccuper de questions philosophiques du style « Qui a fait l'œuf, qui a fait la poule ? ». En termes plus concrets : l'accréditation doit-elle être un préalable à l'habilitation des organismes ou doit-elle intervenir après un certain lapse de temps après une habilitation provisoire ? En toute rigueur, la pleine compétence des organismes ne peut être constatée que lorsqu'ils accomplissent réellement les tâches pour lesquels ils sont habilités. Or, dans le cas d'une réglementation, l'organisme ne peut opérer sans avoir été habilité par l'Etat. On le voit, si l'on conditionne l'habilitation à l'accréditation préalable, en théorie, on se mord la queue. Ceci avait conduit les Autorités françaises en charge de la métrologie et l'organisme d'accréditation à conclure qu'une habilitation provisoire, préalable à toute accréditation, devait constituer la règle. Il semble que l'Europe considère aujourd'hui que l'accréditation doive constituer un préalable à toute intervention des organismes. Cela méritera quelques réflexions sur la manière d'y parvenir.

Indépendamment de la nécessité pour les Autorités d'avoir ou non à évaluer la compétence des organismes préalablement à toute accréditation, le recours à l'accréditation, ne décharge pas les Autorités de leurs responsabilités et ne devrait donc pas les conduire à se reposer exclusivement sur les évaluations réalisées par les organismes d'accréditation. Les Autorités devraient conserver une capacité d'évaluation des organismes, ce qui n'est pas contradictoire avec la prise en compte des conclusions des évaluations organisées par les organismes d'accréditation. Rappelons que les Autorités en charge d'une réglementation ont des prérogatives qu'un organisme d'accréditation ne possède pas, ce qui peut les amener à investiguer sur des aspects complémentaires par rapport à ce que peut faire un organisme d'accréditation.

En conséquence, et pour conclure, une habilitation d'organisme chargé d'opérations du contrôle métrologique devrait être subordonnée à l'obtention d'une accréditation spécifique, permettant d'établir sa compétence et son impartialité. Cette accréditation devrait être considérée comme une condition nécessaire, mais non suffisante pour obtenir l'habilitation. Le recours à l'accréditation ne décharge pas l'Autorité de ses responsabilités et, notamment, de la nécessité de mettre en œuvre les formes appropriées de surveillance des organismes chargs d'opérations du contrôle métrologique. ■

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FR1	Ministère de l'Economie, de l'Industrie et de l'Emploi (MEIE)	*All activities and responsibilities were transferred to FR2 in 2003*																																			
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The *OIML Basic Certificate System for Measuring Instruments* was introduced in 1991 to facilitate administrative procedures and lower the costs associated with the international trade of measuring instruments subject to legal requirements. The System, which was initially called "OIML Certificate System", is now called the "OIML Basic Certificate System". The aim is for "OIML Basic Certificates of Conformity" to be clearly distinguished from "OIML MAA Certificates".

The System provides the possibility for manufacturers to obtain an OIML Basic Certificate and an OIML Basic Evaluation Report (called "Test Report" in the appropriate OIML Recommendations) indicating that a given instrument type complies with the requirements of the relevant OIML International Recommendation.

An OIML Recommendation can automatically be included within the System as soon as all the parts - including the Evaluation Report Format - have been published. Consequently, OIML Issuing Authorities may issue OIML Certificates for the relevant category from the date on which the Evaluation Report Format was published; this date is now given in the column entitled "Uploaded" on the Publications Page.

Other information on the System, particularly concerning the rules and conditions for the application, issue, and use of OIML Certificates, may be found in OIML Publication B 3 *OIML Certificate System for Measuring Instruments* (Edition 2003, ex. P 1) and its *Amendment* (2006) which may be downloaded from the Publications page. ■

The OIML MAA

In addition to the Basic System, the OIML has developed a *Mutual Acceptance Arrangement* (MAA) which is related to OIML Type Evaluations. This Arrangement - and its framework - are defined in OIML B 10-1 (Edition 2004) and its Amendment (2006), and B 10-2 (2004).

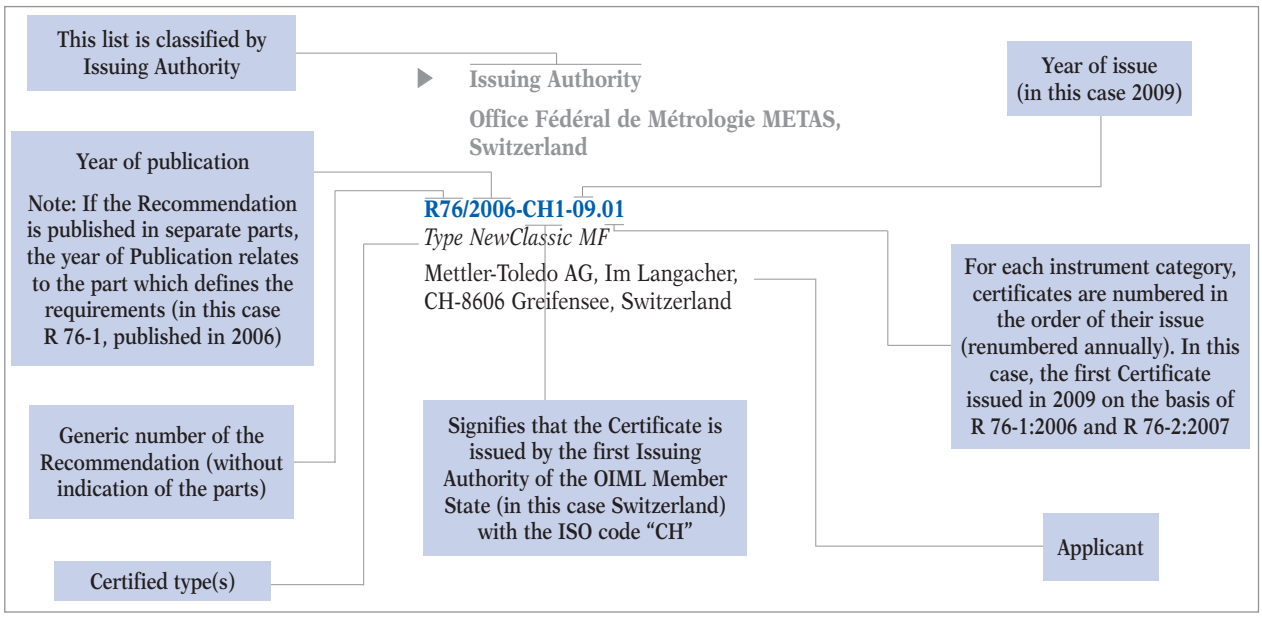
The OIML MAA is an additional tool to the OIML Basic Certificate System in particular to increase the existing mutual confidence through the System. It is still a voluntary system but with the following specific aspects:

- Increase in confidence by setting up an evaluation of the Testing Laboratories involved in type testing;
- Assistance to Member States who do not have their own test facilities;
- Possibility to take into account (in a Declaration of Mutual Confidence, or DoMC) additional national requirements (to those of the relevant OIML Recommendation).

The aim of the MAA is for the participants to accept and utilize MAA Evaluation Reports validated by an OIML MAA Certificate of Conformity. To this end, participants in the MAA are either Issuing Participants or Utilizing Participants.

For manufacturers, it avoids duplication of tests for type approval in different countries.

Participants (Issuing and Utilizing) declare their participation by signing a Declaration of Mutual Confidence (Signed DoMCs). ■



INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Water meters intended for the metering of cold potable water

R 49 (2006)

▶ Issuing Authority / *Autorité de délivrance*

National Measurement Office (NMO), United Kingdom

R049/2006-GB1-2011.01
Family of cold water meters named Aquamaster 3 with main powering, utilising a common, electromagnetic principle - Type: MM/GA & FER2, Mains powered

ABB Ltd., Oldends Lane, Stonehouse, Gloucestershire GL10 3TA, United Kingdom

R049/2006-GB1-2011.02
Family of cold water meters named Aquamaster 3 with battery powering, utilising a common, electromagnetic principle - Type: MM/GA & FER2, battery or renewable powered

ABB Ltd., Oldends Lane, Stonehouse, Gloucestershire GL10 3TA, United Kingdom

R049/2006-GB1-2011.03 (MAA)
Family of cold water meters utilising a common volumetric measuring element, with a nominal capacity of 3.25 revs/litre and having a Q_3 of 10 m^3/h or 16 m^3/h.

Elster Metering Ltd., 130 Camford Way, Sundon Park, Luton, Bedfordshire LU3 3AN, United Kingdom

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Metrological regulation for load cells (applicable to analog and/or digital load cells)

R 60 (2000)

▶ Issuing Authority / *Autorité de délivrance*

International Metrology Cooperation Office, National Metrology Institute of Japan (NMIJ) National Institute of Advanced Industrial Science and Technology (AIST), Japan

R060/2000-JP1-2011.03 (MAA)
Beam (bending) load cell - C2B1B-200K, C2B1B-250K, C2B1B-500K, C2B1B-550K, C2B1B-1T, C2B1B-1.1T, C2B1B-2T, C2B1B-2.2T

Minebea Co., Ltd., 1-1-1 Katase Fujisawa-shi, JP-251-8531 Kanagawa, Japan

R060/2000-JP1-2011.14
Beam (bending) load cell - Type: LCB06K300E, LCB06K600E

A&D Company Ltd., 3-23-14 Higashi-Ikebukuro, Toshima-Ku, JP-170-0013 Tokyo, Japan

▶ Issuing Authority / *Autorité de délivrance*

NMi Certin B.V., The Netherlands

R060/2000-NL1-2010.11 Rev. 2
Single point Load Cell - Type: 1022, 1022P and LPS

Vishay Precision or Tedea-Huntleigh, 8A Hazoran Street, IL-42506 Natanya, Israel

R060/2000-NL1-2011.02 (MAA)
Single point Load Cell - Type: F…

Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, JP-146-8580 Tokyo, Japan

R060/2000-NL1-2011.03 (MAA)
Single point Load Cell - Type: K…

Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, JP-146-8580 Tokyo, Japan

R060/2000-NL1-2011.04 (MAA)
Shear beam Load Cell - Type: C2T1

Minebea Co., Ltd, 1-1-1 Katase Fujisawa-shi, JP-251-8531 Kanagawa, Japan

R060/2000-NL1-2011.05 (MAA)
Bending beam Load Cell - Type: CB005

Minebea Co., Ltd, 1-1-1 Katase Fujisawa-shi, JP-251-8531 Kanagawa, Japan

R060/2000-NL1-2011.10 (MAA)
Shear beam Load Cell - Type: SB

Ningbo Sunuo Transducers Technologies Co., Ltd, #296, East Rd of Huandao, Daxie Development Zone, Ningbo, P.R. China

R060/2000-NL1-2011.11 (MAA)
Shear beam Load Cell - Type: QS

Ningbo Sunuo Transducers Technologies Co., Ltd, #296, East Rd of Huandao, Daxie Development Zone, Ningbo, P.R. China

▶ Issuing Authority / *Autorité de délivrance*

National Measurement Office (NMO), United Kingdom

R060/2000-GB1-2010.01 (MAA)
Beam Compression Load Cell Type CZLA4

Shanghai Yongheng Diance Instrument Co. Ltd., Measuring Instruments Co. Ltd., Gangxi Town, Chongming, CN-Shanghai, P.R. China

R060/2000-GB1-2011.01
Stainless steel compression strain gauge load cell

Olçsan Elektronik Sistemleri Iml.San Ve Tic Ltd, Bursa Karayolu 17 km, Eskisehir, Turkey

R060/2000-GB1-2011.02 Rev. 1 (MAA)
MS S-type stainless steel compression and tension load cell
Zhejiang South-Ocean Sensor Manufacturing Co., Ltd., No. 888, Xingyuan Street, CN-313216 Qianyuan Town, Deqing County, Zhejiang Province, P.R. China

▶ Issuing Authority / *Autorité de délivrance*
Physikalisch-Technische Bundesanstalt (PTB), Germany

R060/2000-DE1-2011.02
Strain gauge double bending beam load cell - Type: UDA
Tam tarti Sistemleri San. Tic. Ltd. Sti, Sk. No. 18, TR-56155 Camdibi-Izmir, Turkey

R060/2000-DE1-2011.03
Strain gauge compression load cell - Type: SCL50SA
Shering Weighing Ltd., Pitreavie Business Park, Dunfermline 5, Scotland KY11 UL, United Kingdom

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT
Nonautomatic weighing instruments
R 76-1 (1992), R 76-2 (1993)

▶ Issuing Authority / *Autorité de délivrance*
Dansk Elektronik, Lys & Akustik (DELTA), Denmark

R076/1992-DK3-2011.02
Non-automatic weighing instrument - Type: Load Line-3
Tunaylar Baskül Sanayi ve Ticaret A.S., Akcaburgaz Mah. 88 Sok. No. 7, Esenyurt, Istanbul, Turkey

R076/1992-DK3-2011.03
Non-automatic weighing instrument - Type: Load Line-2
Tunaylar Baskül Sanayi ve Ticaret A.S., Akcaburgaz Mah. 88 Sok. No. 7, Esenyurt, Istanbul, Turkey

R076/1992-DK3-2011.05
Non-automatic weighing instrument - Type: 1900EU : 190DC
Cardinal Scale Manufacturing Co., 203 East Daugherty Street, P.O. Box 151, US-64870 Missouri, Webb City, Missouri, United States

▶ Issuing Authority / *Autorité de délivrance*
NMi Certin B.V., The Netherlands

R076/1992-NL1-2011.04 (MAA)
Non-automatic weighing instrument - Type: BJ165 Series
Snowrex International Co., Ltd., 2F No. 9, Lane 50, Sec. 3, Nan-Kang Road, Taïwan-Taipei, Chinese Taipei

R076/1992-NL1-2011.05
Non-automatic weighing instrument - Type: K-series
Dibal S.A., Astintze Kalea, 24 Pol. Ind. Neinver, ES-48160 Derio (Bilbao-Vizcaya), Spain

R076/1992-NL1-2011.06 (MAA)
Non-automatic weighing instrument - Type: DS-676(H)
Shanghai Teraoka Electronic Co., Ltd., Tinglin Industry Developmental Zone, Jinshan District, CN-201505 Shanghai, P.R. China

R076/1992-NL1-2011.11
Non-automatic weighing-instrument - Type: RGW-400LS
Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, JP-146-8580 Tokyo, Japan

▶ Issuing Authority / *Autorité de délivrance*
National Measurement Office (NMO), United Kingdom

R076/1992-GB1-2011.01 (MAA)
XT Series, Models XT 100, XT 101, XT 200, XT 300 and XT 400 non-automatic weighing instruments
Avery Berkel, Foundry Lane, Smethwick, West Midlands B66 2LP, United Kingdom

R076/1992-GB1-2011.01 Rev. 1 (MAA)
XT Series, Models XT 100, XT 101, XT 200, XT 300 and XT 400 non-automatic weighing instruments
Avery Berkel, Foundry Lane, Smethwick, West Midlands B66 2LP, United Kingdom

▶ Issuing Authority / *Autorité de délivrance*
Physikalisch-Technische Bundesanstalt (PTB), Germany

R076/1992-DE1-2007.07 Rev. 1
Non-automatic electromechanical weighing instrument with or without lever system - Type: DISOMAT Tersus
Schenk Process GmbH, Pallaswiesenstrasse 100, DE-64293 Darmstadt, Germany

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Non-automatic weighing instruments

R 76-1 (2006), R 76-2 (2007)

▶ Issuing Authority / *Autorité de délivrance*

NMi Certin B.V.,
The Netherlands

R076/2006-BL1-2009.11 Rev. 1
Non-automatic weighing instrument - Type: 752KG, 753KG, 599KG, 752KGWA, 753KGWA, 599KGWA or 597KGWA

Pelstar LLC, US-11800 S. Austin, Alsip, IL 60803 United States

R076/2006-NL1-2011.01 (MAA)
Non-automatic weighing instrument - Type: Navigator NV series

Ohaus Corporation, 7, Campus Drive, Suite 310, US-NJ 07054 Parsippany, United States

R076/2006-NL1-2011.03 (MAA)
Indicator - Type: ED640

Elettrondata S.r.l., Via del Canaletto 77/79,
IT-41042 Spezzano di Fiorano (Modena), Italy

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Automatic rail-weighbridges

R 106 (1997)

▶ Issuing Authority / *Autorité de délivrance*

National Measurement Office (NMO),
United Kingdom

R106/1997-GB1-2007.01 Rev. 2
Automatic rail-weighbridge, Railweight TSR4000

Avery Berkel, Foundry Lane, Smethwick, West Midlands B66 2LP, United Kingdom

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Automatic instruments for weighing road vehicles in motion

R 134 (2003)

▶ Issuing Authority / *Autorité de délivrance*

Dansk Elektronik, Lys & Akustik (DELTA), Denmark

R134/2003-DK3-2011.01
Automatic instrument for weighing road vehicles in motion - Type: LL2/AW

Tunaylar Baskül Sanayi ve Ticaret A.S., Akcaburgaz Mah. 88 Sok. No. 7, Esenyurt, Istanbul, Turkey

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Automatic instruments for weighing road vehicles in motion and measuring axle loads

R 134 (2006)

▶ Issuing Authority / *Autorité de délivrance*

Dansk Elektronik, Lys & Akustik (DELTA), Denmark

R134/2006-DK3-2011.02
Automatic instrument for weighing road vehicles in motion - Type: AR-WIM

ESIT Electronik Ltd Sirketi, Nisantepe Mah. Fabrikalar, Sokak No. 8, Cekmekoy, TR-34794 Istanbul, Turkey

OIML Certificates, Issuing Authorities, Categories, Recipients:

www.oiml.org

BIML: Meet the Team

Ian
DUNMILL
Assistant Director

Stephen
PATORAY
Director

Willem
KOOL
Assistant Director

Jean-Christophe
ESMIOL
IT Systems

Philippe
LECLERCQ
Administrator

Florence
MARTINIE
Accountant

Luis
MUSSIO
Engineer

Chris
PULHAM
Editor/WebMaster

Patricia
SAINT-GERMAIN
Office Manager

BIML: Staff Roles and Responsibilities

Stephen Patoray (Director):

As Secretary to the Conference, the Committee, and the President, the Director is:

- Accountable for all work of the Bureau and all services provided to OIML Members;
- Responsible for the preparation of the budget, collection of revenue, and conscientious management of the Organization's funds;
- Responsible for the coordination and management of memoranda of understanding and liaisons with other organizations; and
- Responsible for the coordination and assembly of work related to special studies.

Ian Dunmill (Assistant Director):

- Support to OIML Technical Committees and Subcommittees;
- Developing country activities, liaison with DCMAS network;
- Liaison with WTO, UNIDO, ISO, IAEA, WHO;
- Liaison with AFRIMETS, SADCMEL.

Willem Kool (Assistant Director):

- Support to OIML Technical Committees and Subcommittees;
- OIML Systems – Liaisons with ILAC/IAF and IEC;
- Regulatory cooperation – Liaison with UNECE;
- OIML representation in the JCGM.

Jean-Christophe Esmiol (IT Systems):

- IT Systems (web, mail, mailing lists, databases, CMS, file server, security, etc.);
- IT R&D;
- LAN/WAN, telephone system;
- BIML computer equipment (maintenance, purchase, software).

Philippe Leclercq (Administrator):

- Member State and Corresponding Member contributions;
- OIML relations with the French Administration;
- Operation of the bank accounts. Checking and payment of outgoings;
- National insurance and tax declarations;
- Management and security of the premises.

Florence Martinie (Accountant):

- General accountancy;
- Asset accountancy;
- Liaison with external financial advisers;
- Salary processing.

Luis Mussio (Engineer):

- Support to OIML Technical Committees and Subcommittees;
- Administration of the OIML Mutual Acceptance Arrangement (MAA);
- OIML representation in Seminars and Conferences;
- Liaison with SIM.

Chris Pulham (Editor/WebMaster):

- Web site content management and updating;
- Linguistic editing of OIML Publications and general linguistic support;
- Production of the OIML Bulletin;
- Creation of brochures, leaflets, and promotional material (paper/online).

Patricia Saint-Germain (Office Manager):

- Personal Assistant to the Director;
- Management of the Secretariat;
- Organization of CIML Meetings, Conferences, Presidential Council Meetings, and other events;
- Administrative follow up of TC/SCs;
- Registration of Certificates; OIML database: information management and updates.

Happy retirement, Jacques Bourgeois!

Bonne retraite, Jacques Bourgeois !

Recruited in 1978, after thirty-three years of loyal service to the BIML initially as Archivist and latterly as Office Clerk, Jacques Bourgeois left the BIML at the end of June 2011 to take up the full time occupation of retirement.

Following his role of Archivist in the BIML Documentation Center, his job took on a different direction ten years ago, notably in the wake of the mainstream introduction of computers at the BIML.

Jacques was always able to work as part of a team, and adapted quickly. Very assiduous, he was available to help Colleagues and we all sincerely appreciate his dedication to his job, which he always did in a courteous manner.

So a heartfelt THANK YOU Jacques from all your Colleagues at the BIML, and may we wish you a long, happy retirement during which you can "be your own boss" and do whatever you please. Oh, and please remember not to come in to work!! ☺

Recruté en 1978 et après trente-trois années de bons et loyaux services au BIML d'abord comme Archiviste puis comme "Office Clerk", Jacques Bourgeois a quitté le BIML fin juin 2011 pour être retraité ... à temps complet.

Après avoir effectué un travail d'archiviste au centre de documentation du BIML, son poste a donc connu une orientation différente depuis dix ans liée notamment à la mise en place de l'outil informatique de manière très significative au BIML.

Jacques a toujours fait preuve d'un bon esprit d'équipe et d'adaptation. Très assidu, Jacques était disponible pour aider ses Collègues et nous apprécions tous sincèrement son dévouement à son travail, qu'il a toujours effectué avec courtoisie.

Alors un très grand MERCI, Jacques, de la part de tous vos Collègues du BIML, et nous vous souhaitons une longue et heureuse retraite pendant laquelle vous pourrez "être votre propre patron" et faire ce qu'il vous plaît. Ah oui, s'il vous plaît, n'oubliez pas de ne plus venir au travail !! ☺

MEETING REPORT

OIML TC 9/SC 2 *Automatic weighing instruments*

18–19 April 2011
NMO, United Kingdom

MORAYO AWOSOLA, NMO, United Kingdom

1 Goals of the meeting

The main objectives of the meeting were:

a) to address the TC 9/SC 2 comments on the third Committee Draft (3 CD) of Recommendation R 50-1 *Beltweighers*; and

b) to decide on the appropriate wording for the durability requirements in R 50-1.

2 Welcome agenda, roll call, facilities

Morayo Awosola, John Goulding and Richard Sanders welcomed participants to the National Measurement Office (NMO). A total of 22 Subcommittee members, observers, liaisons, manufacturers, and one BIML representative attended the meeting. Apologies were received from nine other individuals who were unable to attend.

The meeting was chaired by Morayo Awosola with support from John Barton (USA) and George Teunisse (The Netherlands) who took notes.

The Chinese OIML representatives submitted some additional comments on the 3 CD of R 50-1 which will be taken into consideration for the 4 CD.

Australia participated during the whole meeting on both days via a phone conference. The Secretariat expressed TC 9/SC 2 appreciation for the Australian contribution.

3 Confirmation of the minutes of the previous TC 9/SC 2 R 50 meeting

The minutes of the TC 9/SC 2 R 50 meeting held on 4–5 February 2009 were approved without modification; for memory, the decisions of that meeting are listed below, together with notes on progress made since then:

1 Add new accuracy class 0.2 (SC 2 Secretariat). *Done*

2 Reword the terminology and description for 'Empty Belt Profile Correction Device' (Australia). *Done*

3 Amend description of Whole Belt Totalisation Device (SC 2 Secretariat). *Done*

4 Change Belt length (B_L) to complete belt revolutions, where appropriate (SC 2 Secretariat). *Done*

5 Keep 'Dynamic Test Mode' and determine the relevance of 'static test mode' (SC 2 Secretariat). *Done*

6 Replace 'Air cushion conveyor' with 'other devices' (SC 2 Secretariat). *Done*

7 Delete 'Totalisation Hold Back Devices' (SC 2 Secretariat). *Done*

8 Amend 'Minimum value of the totalised load' to remove references to 'Totalisation Hold Back Devices' and 'Empty Belt Profile Correction Device' (SC 2 Secretariat). *Done*

9 Lowest input signal, µV/e - Include in 2 CD with request for further information (SC 2 Secretariat). *Done*

10 Durability testing - Define in time of load, Error limits – initial/in-service? Type of material tests? (SC 2 Secretariat). *Work ongoing*

11 Working group for durability testing – USA, Aus, Sweden. Aus Chair. Produce feasibility study on durability testing by 15 March 2009. *Done*

12 Table 1 – remove subsequent from heading column 3 (SC 2 Secretariat). *Done*

13 Family/modules paper - WG: USA (chair), Netherlands, Denmark by 30 March 2009. *WG (USA, NL, DK) report produced and is not controversial*

14 Check references to standards and severity levels for EMC tests, etc. (SC 2 Secretariat). *Done, and some more work on that*

15 Check terminology for VIM, symbols, index of terms, etc. *Work ongoing*

16 Check D 11 references. Check with Netherlands. *Work ongoing*

17 Check 3.2 and 3.3 and combine for simplicity. (SC 2 Secretariat). *Done*

4 Matters arising

1 The R 50-2 Test Report Format was not dealt with due to the lengthy agenda.

2 Participants had received the comments prior to the meeting by e-mail and they were also distributed at the meeting.

3 Morayo Awosola mentioned that the report "Durability requirements for belt weighers" produced in April 2009 by the working group set up at the 2009 R 50 meeting was available and distributed with the documents for the meeting.

4 There were two presentations from Chinese belt-weigher manufacturers:

- The first presentation, given by Mr. Min Wang from Nanjing Sanai Industrial Automation Pty Ltd., was entitled "Laboratory Beltweigher Tests". A copy of the presentation is available on the TC 9/SC 2 Work-Groups web site:

  http://workgroups.oiml.org/tcsc/tc-9/tc-9-sc-2/r-50-tc9sc2-meeting-april-18-19

  Topics covered in the presentation included:

- Consideration of environmental aspects of belt-weigher installation and testing is important.
- The report "Durability requirements for belt weighers" produced by the working group at the last R 50 meeting indicates in-situ tests are supported by the international beltweigher testing community.
- The China beltweigher test centre had developed a 1 million dollar beltweigher durability testing facility, and work was ongoing to build a more extensive 3 million dollar facility. Nowadays most beltweighers can be easily tested by performing lab tests in which an evaluation of influence factors is first carried out and the EUT is exposed to the amplified factors.
- A comparison is then made between the lab tests and the in-situ tests and a high degree of correlation is shown.

The second presentation by Mr. Ran Li, of Saimo Technology Co., Ltd. was entitled "A durability testing method for beltweighers" and explained a technique called the "Overland standard material technique" which uses a hopper scale installed between two beltweighers to obtain and weigh only a small amount of material to calibrate the beltweigher effectively. Handouts were also distributed during this presentation.

6 Discussion of TC 9/SC 2 comments on the 3 CD of R 50-1

Morayo Awosola mentioned that the comments received on the 3 CD of R 50-1 were highlighted in order of importance. The meeting addressed a large number of 'urgent' comments, with durability forming the main topic of the discussion. The full minutes are available on the TC 9/SC 2 WorkGroups web site:

http://workgroups.oiml.org/tcsc/tc-9/tc-9-sc-2/r-50-tc9sc2-meeting-april-18-19

or on request from the Secretariat: morayo.awosola@nmo.gov.uk.

7 Conclusions

The meeting successfully addressed the majority of the 'urgent' and important comments on the 3 CD of R 50-1. Following a lengthy discussion on durability testing requirements, it was unanimously accepted, for the time being, to implement the Australian proposal (see full minutes) with some modification to be performed by Gregory Glas (NMO) based on the comments of CECIP and concerning the last sentence of the proposal (type approval).

Two working groups were established, both to report to the TC 9/SC 2 Secretariat within two months:

1 A work group was formed consisting of John Barton (USA), Ian Burrell (Aus.), Gregory Glas (UK), Paul Chase (USA) that will develop more clearly defined criteria for the selection of EUTs.

2 In an effort to reduce the time involved in testing beltweighers, Australia proposed that test runs be performed using the worst case circumstances. A working group consisting of Ian Burrell (Aus), Chris Davies (Aus), and Paul Chase (USA) will further develop language for possible inclusion in the 4 CD. Draft language will be provided to Morayo Awosola within 2 months.

The 4 CD of OIML R 50-1 incorporating the decisions of the meeting and addressing all TC 9/SC 2 comments on the 3 CD will be issued for TC 9/SC 2 consultation later in 2011. ■

Particpants attending the TC 9/SC 2 meeting at NMO, Teddington, UK

RLMO NEWS

20 years of COOMET: *We Measure Together for a Better Tomorrow*

PAVEL NEYEZHMAKOV
Head of COOMET Secretariat
National Scientific Centre
"Institute of Metrology", Ukraine

1 Background and areas of COOMET activities

The Regional Metrology Organization COOMET (derived from "Coopération Métrologique") was established on 12 June 1991, when in Warsaw representatives of the metrological organizations of five countries – Bulgaria, Poland, Romania, USSR, and Czechoslovakia – signed a Memorandum of Understanding (MoU).

Since then, the number of COOMET countries has increased on a regular basis:

- Germany and Cuba in 1991;
- Ukraine and Belarus in 1992;
- Slovakia in 1993;
- Lithuania in 1995;
- Moldova in 1997;
- Kazakhstan in 1998;
- Kyrgyzstan in 2000;
- DPR of Korea in 2002;
- Uzbekistan in 2004;
- Georgia in 2006;
- Azerbaijan and Armenia in 2007; and
- Tajikistan in 2009.

Thus, COOMET now comprises 18 member countries.

The supreme body is the COOMET Committee, consisting of the heads of the national metrological institutions of COOMET member countries. The COOMET Committee meets at least once a year and the President is elected by the COOMET Committee from among its members. The President provides the COOMET Secretariat.

Past Presidents of COOMET were:

- S. Referovsky (1991–1994, Poland);
- R. Spurny (1994–1998, Slovakia);
- V. Belotserkovsky (1998–2001, Russia); and
- N. Zhagora (2001–2007, Belarus).

COOMET has been headed by G. Sydorenko (Ukraine) since 2007.

In 2000 the MoU was extended with a regulation on establishing an institution of COOMET Vice-Presidents which now consists of the COOMET President G. Sydorenko (Ukraine), Vice-Presidents N. Zhagora (Belarus), K.-D. Sommer (Germany), V. Krutikov (Russia), and Head of COOMET Secretariat P. Neyezhmakov (Ukraine).

The COOMET President's Council forms the policy of COOMET, cooperates with international and regional metrology organizations, coordinates cooperation in the period between the Committee meetings, and prepares issues to be solved during these meetings.

COOMET activity is based on cooperation in the following areas:

- measurement standards of physical quantities;
- legal metrology;
- Quality Management Systems (QMS);
- information and training.

COOMET adheres to the MoU and *Rules of Procedure* in its activities. Cooperation within COOMET allows its member countries to more successfully solve metrological issues based on established rules and procedures – predominantly issues which concern many countries at the same time.

The objectives of COOMET are:

- assistance in effectively addressing problems relating to the uniformity of measures, uniformity of measurements, and the required accuracy of their results;
- assistance in promoting cooperation of national economies and eliminating technical barriers to international trade; and
- harmonization of the activities of the metrology services of Euro-Asian countries with similar activities in other regions.

COOMET realizes its activities through its five structural bodies:

1) Joint Committee for Measurement Standards (JCMS);
2) Technical Committee for Legal Metrology (TC 2);
3) Technical Committee of Quality Forum;
4) Technical Committee for Information and Training (TC 4); and
5) Technical Committee for Joint Research in Metrology.

There are about 30 permanent structural and working bodies in COOMET and over 514 projects have been proposed over the whole period of cooperation. Now there are 90 active projects.

About 500 experts from the NMIs of COOMET member countries participate in the activities within all areas of cooperation.

2 COOMET activities on legal metrology

Legal metrology is one of the well-developed areas of cooperation in COOMET member countries. Unlike a number of RMOs which have a single objective, COOMET is a multi-purpose organization and, according to its MoU, cooperates not only on measurement standards of physical quantities but also on legal metrology.

At the 20th COOMET Committee meeting (April 2010) a new structure of TC 2 for Legal Metrology was approved. The new structure consists of:

SC 2.1 Harmonization of Regulations and Norms

Tasks: acceptance or adaptation of approved international or regional documents (e.g: VIML, OIML Documents, WELMEC Guides, EC Recommendations).

SC 2.2 Technologies of Measuring Devices and Systems in Legal Metrology

Tasks: development of test procedures for measuring instruments (MI), including software, measuring systems, but also data transfer and other future technologies.

SC 2.3 Competence Assessment of Bodies in Legal Metrology

Tasks: development of criteria for assessment of verification laboratories and other parties.

SC 2.4 Legal Metrological Control (LMC)

Tasks: establishment of projects for the elements of LMC (Surveillance QM, Market Surveillance, Field Surveillance).

The main purpose of the changes in the structure of TC 2 is to improve the efficiency and optimization of the legal metrology activity based on the experience of the OIML and other regional legal metrology organizations. The new structure of TC 2 allows for further expansion of cooperation in the field of legal metrology.

The discussion about the new content of work within TC 2 shows that the country-specific interests should be considered. But all TC 2 member states have the same aim, which is to build and enforce an operational, effective system for legal metrology. The new subcommittee structure is open for different realizations and also for future changes in the methods for legal metrology. One example is the current low interest in market surveillance of several states. But others use this system more than the preventive verification system. So the question for all is how mutual acceptance can be created in the case of free trade of products, i.e. prepackaged goods or measuring instruments. In this context, the growing importance of conformity assessment was noted.

TC 2 plans to hold its next meeting at the beginning of September 2011 in Armenia.

Delegates attending the 21st meeting of the COOMET Committee

Opening panel

3 New areas of COOMET activities

COOMET covers a large geographical zone and its member countries have reached different levels of economical and metrological development. A number of new COOMET members (from the Central Asian and Caucasian region) are now at the stage of creating their own national measurement standard bases, but they are all at different levels of metrological infrastructure development and so they need procedural assistance in elaborating normative documents, training personnel, and making up specifications for the required equipment of metrology institutes.

To expedite the integration of these member countries into COOMET and the global metrological system, a new area of cooperation was established in 2008 within the TC for Information and Training – a Subcommittee for Cooperation in Developing the Basic Metrological Infrastructure of COOMET Member Countries was created. These activities provide an opportunity to bridge the metrological gap between COOMET members.

As a result of many years of discussion of the possibility to realize joint research projects and their sources of finance, a Technical Committee for Joint Research in Metrology was established in 2009. The tasks of this TC for the near future are:

- to identify common research areas;
- to determine priority fields in research and development;
- to determine the efficiency of projects for the economy of COOMET member countries; and
- to identify those interested groups that benefit the most from the implementation of the projects.

The development and implementation of joint projects in COOMET will contribute to science and technology as well as stimulate innovations to solve metrological problems in COOMET member countries.

4 COOMET activity on information and training

The third International Competition "The Best Young Metrologist of COOMET" took place in April 2009 in Minsk, Belarus. The organizers of the competition were BelGIM and the PTB. 28 young metrologists from Belarus, Russia, Germany, Ukraine, Uzbekistan, Cuba, and DPR of Korea participated in the event. Since 2005 the competition is held every other year in different COOMET countries. The first two competitions took place at the NSC "Institute of Metrology", Ukraine, and the fourth International Competition "The Best Young Metrologist of COOMET" was held in Russia on 15–17 June 2011.

In 2009 TC 4 started its activities on updating the COOMET web site, which had been discussed for many years at the meetings of the structural bodies of COOMET.

On 26 October 2010 during the 15th meeting of the COOMET President's Council the new COOMET web portal (www.coomet.net) was launched which will function together with the COOMET website (www.coomet.org).

Unlike the COOMET website, the new portal will be used for answering the needs of COOMET members:

- storage, retrieval, exchange of data communication; and
- coordination, organization of meetings and events, promotion of the RMO and NMIs.

Two training workshops were held in March and December 2010 for online editors of the pages of COOMET member countries and those of COOMET Technical Committees. These pages are now filled in by designated online editors.

Group photo of delegates attending the Committee meeting

5 Strengthening of COOMET relations with international and regional metrology organizations

Nowadays, COOMET is an active participant in international cooperation on metrology; it promotes the uniformity of measurements in the region and contributes to the development of the national metrological infrastructures of its member countries in accordance with international requirements.

In fulfilling its tasks, COOMET collaborates with the OIML, the BIPM, the Joint Committee of Regional Metrology Organizations and BIPM (JCRB), and other regional metrology organizations (WELMEC, APLMF, EURAMET, APMP, etc.).

COOMET representatives participated in the 13th OIML Conference, CIML Meetings, and in the Round Table of regional Legal Metrology Organizations (2008–2010).

Our liaisons with NCSL International moved to a new qualitative level in 2010. Following the resolution of the 20th meeting of the COOMET Committee a Memorandum of Understanding was signed between COOMET and NCSLI in September 2010.

6 21st meeting of the COOMET Committee

The 21st meeting of the COOMET Committee was held on 27–28 April 2011 in Yerevan, Armenia.

The participants of the meeting were COOMET Committee members, Chairpersons of the Technical Committees of COOMET, representatives of National COOMET Secretariats from 14 COOMET member countries (Armenia, Belarus, Cuba, Georgia, Germany, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Romania, Russia, Slovakia, Ukraine, and Uzbekistan), as well as the following representatives of international metrology organizations: CIML President Mr. Alan E. Johnston, BIML Director Mr. Stephen Patoray, BIPM International Liaison Officer Mr. Andrew Henson, and WELMEC Chairperson Mrs. Nataša Mejak Vukovič.

The aims of the meeting were to discuss the strategy and tasks of COOMET development for 2011–2013, the implementation of the Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by national metrology institutes (CIPM MRA), the results of activity on legal metrology, and information and training.

Nineteen agenda items were considered at the meeting, including:

Award presented to Prof. O. Hakimov by COOMET Vice-President V. Krutikov

- main results of COOMET activity in 2010;
- presentation of the Draft COOMET Development Program for 2011–2013;
- comparisons in COOMET and publication of CMC in the KCDB;
- results of QMS peer reviews at the NMIs of COOMET member countries in 2010, and peer reviews in 2011;
- COOMET activity on legal metrology;
- results of the 45th CIML Meeting and the RLMO Round Table;
- COOMET activity on information and training;
- approval of COOMET publications; and
- formation of COOMET structural bodies and appointment of chairpersons of its technical committees and subcommittees.

The COOMET Secretariat gave information on the implementation of the Resolutions of the 20th meeting of the COOMET Committee.

The report of the COOMET President provided an analysis of COOMET activity in 2010 in the areas and subject fields of cooperation stipulated by the MoU and formulated the tasks for 2011–2013:

- Evaluation of the implementation of the COOMET Cooperation and Activity Conception;
- Development of long-term programs for training and raising the professional level of young metrologists;
- Holding workshops on practical preparation for comparisons and CMC submission;
- Completing the pages of the COOMET web portal (www.coomet.net);
- Creation of a database of normative documents on metrology from COOMET member countries;
- Creation of a database of translated international documents on metrology;
- Implementation of the project on the development of a procedure for rating technical devices to measuring instruments;
- Promotion of COOMET at the international level and in member countries.

Participants discussed the results of the RLMO Round Table and the 45th CIML Meeting, as well as the outcomes of the 25th and 26th JCRB meetings.

Delegates were very attentive to discussions on CIPM MRA related issues and comparisons of measurement standards and QMS peer reviews of the NMIs of COOMET member countries. The NMIs of Ukraine (NSC "Institute of Metrology" and DP "Ukrmetrtest-standart") and Belarus (BelGIM) were under the second QMS peer review in the spring of 2011.

The results of the following COOMET-based training workshops were also discussed at the meeting:

- Training Workshop for Online Editors of the New COOMET Web portal (18–23 March 2010, Braunschweig, Germany);
- Workshop on Evaluation of the PTB-COOMET Project and Planning of the Second Phase within SC 4.5 (1 July 2010, Kharkov, Ukraine);
- Training Workshop on Efficient Presentations and Intercultural Awareness within SC 4.5 (28–30 September 2010, Minsk, Belarus);
- Training Workshop on Mass Measurement Uncertainty (5–6 October 2010, Tbilisi, Georgia);
- Training Workshop for Online Editors of COOMET JCMS and TCs (14–16 December 2010, Braunschweig, Germany).

Participants approved the activity of TC 4 on arranging such training workshops.

Information on the activities of the OIML, the BIPM, and WELMEC was also given during the meeting.

The COOMET Vice-President V. Krutikov presented "Honorary Metrologist of COOMET" Medals to Dr. S. Korostin (Russia) and Prof. O. Hakimov (Uzbekistan) for their outstanding contribution to the development of COOMET.

Participants also discussed preparations for further meetings of the COOMET Committee and a decision was made to accept the proposal to hold the 22nd meeting of the COOMET Committee in April 2012 in Bishkek, Kyrgyzstan.

7 Conclusion

COOMET celebrated its 20th anniversary on 12 June. A huge role in the creation of the Euro-Asian Cooperation of National Metrological Institutions was played by its first president Zbignev Referovsky (GUM, Poland). During the years of cooperation COOMET has formed a generation of active participants in COOMET activities. They include both the founders of the organization and relatively young specialists who joined COOMET through participating in the Competition "The Best Young Metrologist of COOMET". During these years COOMET has improved the efficiency of cooperation and gained more authority at both the national level in member countries and at international level.

A workshop devoted to the 20th anniversary of COOMET was held on 15 June in conjunction with the Fourth Competition "The Best Young Metrologist of COOMET".

The official motto of this year's anniversary events is **'We measure together for a better tomorrow'** which reflects the main target of our regional metrology organization. ■

Pavel Neyezhmakov,

Head of COOMET Secretariat
National Scientific Centre "Institute of Metrology",
Ukraine

World Metrology Day 2011:

A resounding success!

Read about the 27 events
notified to the WMD Team and published on
www.worldmetrologyday.org

Feature compiled by Chris Pulham, BIML

Austria

The BEV (Bundesamt für Eich- und Vermessungswesen), Austria, celebrated the opening ceremony of its new laboratory building on 20 May 2011. On that occasion Prof. Michael Kühne, Director of the BIPM, delivered a presentation on World Metrology Day.

Bangladesh

On the occasion of the 8th World Metrology Day in 2011, the Bangladesh Standards and Testing Institution (BSTI) decided to observe the day in a befitting manner in Bangladesh.

A discussion meeting was held in the BSTI auditorium on 20 May, highlighting the theme of the 8th World Metrology Day with Mr. A.K Fazlul Ahad, Director General, BSTI in the chair. H.E. Mr. Dilip Barua, Honorable Minister, Ministry of Industries, Government of the People's Republic of Bangladesh, was present as chief guest. Mr. Asaduzzaman Khan Kamal, Honorable Member of Parliament and Mr. K.H. Masud Siddiqui, Honorable Secretary, Ministry of Industries, Government of the People's Republic of Bangladesh, were present as special guests.

An eminent Professor, Dr. Md. Fakrul Islam, Head of the Glass & Ceramic Engineering Department, Bangladesh University of Engineering and Technology (BUET) and Dr. Franz Hengstberger, CIPM Member, jointly presented the key note speech. There was also an open discussion session. Participants from various sectors such as pharmaceuticals, food and construction materials manufacturers, as well as scholars from Universities and Research Institutions, etc. were invited to attend.

Posters and festoons were also displayed at different key locations in an effort to increase public awareness, all bearing the theme of the day.

BSTI Headquarters, as well as all the BSTI regional offices located in different parts of Bangladesh, observed the day in a similar fashion.

Belgium

The Service of National Standards, Belgium, organized an annual event to celebrate World Metrology Day on 20 May. The celebration consisted of theoretical lectures given by metrologists and scientists with a longstanding experience in the field of metrology. The following lectures were given:

1. The role of metrology in chemistry by Dr. Ph. Taylor, Institute for Reference Materials and Measurements, Geel, Belgium;

2. Application of the First Supplement of the GUM in the field of chemistry by Dr. M. Maeck, FOD Economie, Service National Standards, Belgium;
3. Why the new SI by J. Nicolas, FOD Economie, Service National Standards, Belgium;
4. Propositions of the new definitions of the kilogram by A. Conderys, FOD Economie, Service National Standards, Belgium.

Additionally there was a guided tour of the labs. The event took place on May 20, 2011 from 09:00 at the premises of the FOD Economie, Brussels, Belgium.

Brazil

The Brazilian National Institute of Metrology, Standardization and Industrial Quality (Inmetro) organized the following events to celebrate World Metrology Day 2011:

1. Talks:
   a. Metrology in Chemistry;
   b. The importance of developing food-related reference materials;
   c. Chemical measurements in legal metrology.
2. Short movies on Marie Curie's life and The International Year of Chemistry.
3. Visits to Inmetro's Museum of Metrology.

The event was held at Inmetro's facilities in Rio de Janeiro, Brazil on May 20.

Bulgaria

The Bulgarian Institute of Metrology (BIM), as a major motor in the field of metrology in Bulgaria, organized a World Metrology Day event on 20 May.

Besides the main theme of the World Metrology Day, namely "Chemical measurements for our life, our future", this year's event coincided with another important date in Bulgarian metrology, the 100th Anniversary since the delivery of the first Bulgarian measurement standards – 1 kilogram and 1 meter.

To celebrate this occasion BIM invited all the interested parties – the Ministry of Economy, Energy and Tourism, the Union of Bulgarian Metrology Experts, the Bulgarian Accreditation Service, the Bulgarian Institute of Standardization, calibration and/or testing laboratories, the Bulgarian Academy of Science, the Technical University of Sofia, the University of Chemical Technology and Metallurgy - Sofia, former colleagues involved in metrology activities, producers of measuring instruments, etc.

There was also an Open Doors Day – all guests were invited to visit the national standards laboratories and calibration or testing laboratories in BIM, where they also found a newly opened special historical collection, where the first Bulgarian measurement standards, as well as some rarities (measurement standards, equipment and legislative documents since the end of 19th and the beginning of the 20th centuries) in the field of Bulgarian metrology were on display.

The Agenda also comprised an official cocktail at 14:00. The cocktail was opened with presentations relating to the development of chemical measurements in Bulgaria, as well as to the theme "100 years – Bulgarian Measurement Standards of Mass and Length".

The "Best Bulgarian Metrology Experts in 2010" were rewarded during the cocktail. Using the opportunity given by www.worldmetrologyday.org BIM would like to congratulate our colleagues all over the world and to wish them an "immeasurable" wellbeing in the future.

Central African Republic

The Central African Republic celebrated World Metrology Day 2011 with the organization of several awareness building activities.

Initiated by the Ministry of Commerce and Industry, WMD posters were placed in many ministries, in the University of Bangui and its laboratories, as well as in all the other laboratories of the capital.

Additionally, a message on the topic of metrology was distributed, and the radio station "Nehemie FM" broadcasted an interview on the occasion of World Metrology Day 2011.

Furthermore, the Department of Industry dedicated two days of the week following the WMD to increasing the awareness of the importance of metrology among its employees.

Chinese Taipei

The Center for Measurement Standards of the Industrial Technology Research Institute (CMS/ITRI) assisted the Bureau of Standards, Metrology and Inspection (BSMI) in organizing a series of activities during the week of May 16-20, 2011 in celebration of World Metrology Day. The activities were a Symposium on International Metrology Development Trend – Measurements in Chemistry (Wednesday May 19, 2011), and a World Metrology Day Forum – Chemical measurements for our life, our future (Friday May 20, 2011).

Croatia

World Metrology Day 2011 was celebrated in Croatia under the organization of the State Office for Metrology.

The celebration took place within the framework of the 2nd International Conference in Legal Metrology in Šibenik from 19-21, May 2011. During the Conference we had the pleasure of welcoming Mr. Stephen Patoray, BIML Director, whom we would like to thank once again for having accepted our invitation.

Denmark

Denmark celebrated World Metrology Day: the event took place on May 18 from 9.30 AM to 1 PM at the premises of the "Confederation of Danish Industry" (DI), as May 20 was a National Holiday in Denmark. For further information: www.daniamet.dk

Germany

The PTB organized an event on the theme "Focussing on Health" on 16-17 May at the Braunschweig Landesmuseum.

Hungary

The Hungarian Trade Licensing Office (MKEH), which is responsible for metrology in Hungary, celebrated World Metrology Day on May 19, 2011 by organizing a symposium at its headquarters. During this one-day event experts from the Office gave presentations on themes that gave an insight into the field of chemical metrology.

India

To celebrate World Metrology Day and National Technology Day, on Friday 20 May at 11:30 am the National Physical Laboratory (India) organized a World Metrology Day event on the theme *Metrology - Chemical Measurements For Our Life, Our Future*. The venue was the CSIR - NPL Auditorium, New Delhi.

- Welcome by Prof. Ramesh Chandra Budhani, Director, NPL;
- Preamble to celebration & introduction of the Chief Guest by Dr. Krishan Lal, Former Director, NPL & President, INSA;
- Address by the Chief Guest, Dr. Srikumar Banerjee, Chairman, AEC & Secretary, DAE,GOI;
- Release of the theme poster on World Metrology Day - 2011, the poster on Intellectual Property, and the MSI News Letter;
- Distribution of Certificate of Appreciation: Technologies Transferred, IPR;
- Vote of thanks by Dr. AX Bandyopadhyay;
- Workshop on Time and Frequency.

Kazakhstan

The Committee of Technical Regulation and Metrology of the Ministry of Industry and New Technology of the Republic of Kazakhstan and RSE "Kazakhstan Institute of Metrology" organized a Conference under the theme "Measurements in Chemistry" to celebrate World Metrology Day on May 20, 2011 in Astana, Kazakhstan.

The Conference was intended for representatives of state administrative bodies, universities, research institutes and metrology services. Together with highlighting the role of measurement in chemical science, the Conference reviewed the current position and prospects of the development of metrology, technical regulations and accreditation in conformity assessment.

Presentations were made by representatives of RSE "Kazakhstan Institute of Metrology", RSE "Kazakhstan Institute of Standardization and Certification", "National Center for Accreditation", Ltd., and experts from metrology services and research institutes.

During the Conference awards were made to the winners of the "The Best Young Metrology Expert of 2011" and "The Best Measuring Instrument". Award certificates were also presented to experts from the metrological services of organizations and enterprises for achievements in their work and contributions to the development of metrology.

The competition "The Best Young Metrology Expert" has been held since 2010, and was established by the Committee for Technical Regulation and Metrology to support and encourage young metrology experts, to develop creative abilities, and to reward the interest of young professionals in their profession, thus promoting the idea of training qualified personnel in the field of metrology.

The Competition "The Best Measuring Instrument" was held in 2011 for the first time, and was established by RSE "Kazakhstan Institute of Metrology" in order to support and encourage local manufacturers of measuring instruments.

All those engaged in the production of measuring instruments were entitled to participate in this competition and the designated winner received the award "The Best Measuring Instrument". Awards were also made for the second and third place runners up. Further information: www.kazinmetr.kz/eng/

Korea (Rep.)

KRISS celebrated World Metrology Day by organizing a symposium on May 20, 2011. It took place at the campus of KRISS, Daejeon, Korea.

The theme of the symposium was "Chemical measurements for our life, our future", and there were presentations and discussions covering such significant issues as climate change, radioactivity, laboratory medicine, etc. Speakers were invited from six organizations in Korea including research institutes, government agencies, academic society, and private business.

The symposium was also connected with the annual workshop of KRISS Measurement Club, a nationwide metrology community which is the place for sharing knowledge and experience of measurement technology among experts from industry, academia, government and research institutes. The annual celebration has been attracting around 200 participants from 150 organizations.

The program included presentations on "Measurement of Climate Change", "Radioactivity in daily life", "Present Status of Standardization of Clinical Chemistry in Laboratory Medicine in Korea", "Development of Instruments for Measurement in Chemistry", "Future Energy and Measurement Technologies", and "Measurement Standards in Chemistry".

Luxembourg

The Public Research Centre Henri Tudor, in collaboration with ILNAS and MLQ, organized an event to celebrate World Metrology Day in Luxembourg. The objective was to create an exchange context to get closer to the practice of metrology in laboratories and companies. Two round tables allowed delegates to discuss the management of measuring instruments, and measurement processes management: normative requirements and best practices.

A plenary session about the future of metrology in Luxembourg closed the event. More information: www.sitec.lu

Mexico

The National Metrology Center, México (CENAM) celebrated World Metrology Day 2011 by an open house on May 20. Visitors had the opportunity to visit many laboratories and attend lectures on the subject of how chemistry affects human beings. Please visit our special event web site www.cenam.mx/pabiertas and also our site from last year www.cenam.mx/pabiertas/reseña2010.

Montenegro

The Bureau of Metrology, Montenegro, celebrated the opening ceremony of its new laboratories (Mass Laboratory, Dimensional Laboratory, Volume Laboratory, Temperature Laboratory, Pressure Laboratory, Laboratory for Electrical Quantities, Laboratory for Time and Frequency) on 20 May 2011. On that occasion Prof Vanja Asanovic, Director of the Bureau of Metrology, delivered a presentation on World Metrology Day.

Peru

To celebrate World Metrology Day the National Metrology Service (NMS) of INDECOPI, Peru organized the following events:

1. May 17 and 18: An International Course entitled *Uncertainly Measurement Estimation using the Monte Carlo Method by Simulation* was held in Lima, Peru. The presenter was Wolfgang Schmidt from the European Association of National Metrology Institutes EURAMET. This course was directed mainly at INM professionals in the SIM-ANDIMET Andean Region.
2. May 19 and 20: The *II Metrology Symposium in Peru* was held in Lima, Peru. International presenters were Petra Spitzer of the PTB, Germany, Wolfgang Schmidt of EURAMET, and Ruben Lazos of CENAM, Mexico. Experts from the National Metrology Service (NMS) also participated.

For more information please visit our website: www.indecopi.gob.pe

Poland

The Central Office of Measures, Poland, organized an annual event to celebrate World Metrology Day on 20 May. The celebrations consisted of theoretical lectures delivered by metrologists - scientists and individuals with a very wide-ranging experience in the field of metrology. The following lectures were given:

Role of JRC-IRMM in the global measurement system; Chemistry in the Central Office of Measures in Poland – Yesterday, nowadays and tomorrow; The mission of chemistry in the beginning of the 21st century; Life and achievements of Maria Sklodowska-Curie; Chemical measurements for our life, our future.

Additionaly, the Central Office of Measures held an exhibition of posters designed by the employess of the Office where the main theme was chemistry and its role in our life.

Russia

The D.I. Mendeleyev Institute of Metrology (VNIIM, St. Petersburg), inaugurated an exhibition dedicated to the participation of the Institute in the events celebrating World Metrology Day on 20 May, 2011. More details: www.vniim.ru/news_180.html

VNIIM also participated from 17 to 19 May, 2011 in the 7th Moscow International Forum "Measurements in Science and Technology - A Bridge to Innovations" (METROEXPO-2011) organized by the ROSSTANDART of Russia in the framework of the celebration of World Metrology Day. More details: www.metrol.expoprom.ru/en/

Serbia

The Directorate of Measures and Precious Metals (DMDM) celebrated World Metrology Day in collaboration with SINGIDUNUM University's Faculty of Industrial Management, by organizing a symposium and a round table.

The event took place on May 17, 2011 from 12:00 at the premises of the University, Belgrade, Serbia.

The Symposium focussed on presenting the current status and development of metrology in Serbia, and also on the main theme of World Metrology Day "Chemical measurements for our life, our future".

The motto of the Symposium and round table discussion was "Where we are now and next steps for the future in metrology". The target audience was students from the Faculty of Industrial Management, together with numerous other interested parties who participated in the event. Introductory presentations included:

1. "Quality infrastructure in the Republic of Serbia" - J. Popovic, Assistant Minister in the Ministry of Economy and Regional Development;
2. "Directions for national quality infrastructure strengthening" - P. Popovic, Associate Professor at "SINGIDUNUM" University;
3. "Metrology in the Republic of Serbia - where we are now and next steps for the future" - L. Dujovic, Assistant Director at DMDM and T.Cincar Vujovic, Head of Department for Electricity;
4. "Metrology in Chemistry" - J. Bebic, Senior Advisor at DMDM.

Tunisia

The National Metrology Agency (ANM) celebrated World Metrology Day (WMD) with the support of the National Institute of Research and physico-chemical analyses (INRAP) and the International Center for Environmental Technology (CITET) in Tunis City.

As part of the celebration, M. Mourad BEN HASSINE, ANM General Director, gave a speech on the strategy for developing metrological activities in the field of chemistry. The program provided many presentations and discussions covering such significant issues as radioactivity, accreditation for medical laboratories, etc. Speakers were invited from relevant organizations which are the main actors for chemical activities in Tunisia, including research institutes, government agencies, academic society, and private sectors.

The seminar was also connected to the annual workshop of ANM, which is the forum for sharing knowledge and experience of measurement technology among experts from industry, academia, government and research institutes. The annual celebration has been attracting around 200 participants from 150 organizations.

Turkey

Tübitak UME (Turkey) celebrated World Metrology Day. The celebrations were held at Tübitak UME, which is located on the Tübitak campus in Gebze.

As part of the celebrations, Prof. Dr. Ayhan Ulubelen gave a talk on "Science and Measurement in Chemistry"; awards were made to the winners in a Photograph Contest among university students on the theme of "Measurement in Our Life"; and a table-tennis tournament along with a marathon in the grounds of Tübitak's Gebze Campus were held in honor of WMD.

Other activities planned for the day included discussions on chemical metrology issues and a standup performance called "Chemical Measurements" by Mr. Muhsin Mazman, a member of Tübitak staff. In addition to these activities, guests from universities were shown around Tübitak UME Chemistry Group Laboratories.

For more details: http://www.ume.tubitak.gov.tr/toplumda_metroloji

United Kingdom

NPL celebrated World Metrology Day online this year using social media, largely through Twitter. We shared interesting measurement facts and stories, posted photographs and videos about the science of measurement, and ran polls and quizzes on measurement. Members of the public were invited to follow @NPL on Twitter, retweet anything they thought would interest followers, and respond to the questions posed throughout the day with their own measurement news, facts and stories, using the hashtag #worldmeasurementday.

We also launched NPL's weekly News Bulletin service at www.npl.co.uk/world-metrology-day. Contact: Fiona Auty, National Physical Laboratory.

United States

NIST sponsored a staff colloquium on World Metrology Day, Friday, May 20, 2011:

Speaker: Dr. Peter Becker, Head, Department of Quantum Optics and Length, PTB Braunschweig

Title of talk: "The Avogadro Project: a 25 Year Quest"

Venue: NIST Green Auditorium, 10:30 am, Gaithersburg MD 20899, USA

NIST sponsored a symposium at the Mid Atlantic Meeting of the American Chemical Society, Monday, May 23, 2011:

Symposium title: "Redefining the Kilogram and Avogadro's Number"
Venue: University of Maryland, College Park MD, USA
Moderator: Dr. Robert Watters, Associate Director for Measurement Services, Material Measurement Laboratory, NIST, USA

Speaker #1: Dr. Richard Steiner, NIST Quantum Metrology Division
Title of talk: "The Electronic Kilogram: Getting There from Here, or How to Measure a Mass Unit after Redefinition"

Speaker #2: Dr. Peter Mohr, NIST Atomic Physics Division
Title of Talk: "The International System of Units and Plans for its Redefinition"

Speaker #3: Dr. Gregory Turk, NIST Analytical Chemistry Division
Title of Talk: "The Molar Mass of Silicon and its Relationship to the Determination of the Avogadro Constant"

Venezuela

The Testing and Measurement Unit ENINSEL, of the Foundation Engineering Institute, Venezuela organized a ceremony to celebrate World Metrology Day on 20 May 2011.

Location: Main building, Auditorium FII, Caracas

Programme: 09:30 Talk - "Metrology and people"
10:00 Talk - "Metrology in the FII"
10:30 Presentation of the Coral FII

Activities began with metrological accuracy at 9.30 AM, with a maximum uncertainty of +/- 5 min (coverage probability 95 %)!

Anyone wishing to adjust their watch and provide traceability could visit the Industrial Metrology Laboratory, equipped with a rubidium clock.

For more information, please visit www.fii.gob.ve

Zambia

The Zambia Bureau of Standards organized an event at the Golf View Hotel, Lusaka, to celebrate World Metrology Day on 20 May 2011. The theme of the event was "Chemical measurements: our life, our future".

Programme

I - Opening ceremony and speeches - Chair: Mr Frederick Hamutunda

National Anthem - D. Kuanda Technical School
Welcome remarks - Mr Mataa M. Mukelabai, Director, ZABS
Entertainment - Twatasha Dance Theatre
Poem - David Kaunda Technical High School
Speech by guest of honour - Hon. Catherine Namugala, MP, Acting Minister of Commerce, Trade and Industry

II - Awards ceremony - Chair: Mrs Margaret L. Lungu

Technical Committee Awards by the Minister

III - Chemical metrology (Industrial and legal perspectives) - Chair: Mr Taxwell J. Chisenga

Chemical measurement traceability - Metrology Department, ZABS
Legal metrology in chemical measurements - ZWMA
Plenary

IV - Chemical measurements in quality management - Chair: Mr Stephen Mazimba

Presentation - Testing Laboratories Department, ZABS
Presentation - Alfred H. Knight Limited
Plenary

V - International Year of Chemistry and Metrology - Chair: Mr Nicodemus Malisa

Presentation - Department of Chemistry, UNZA
Plenary
Poem - David Kaunda Technical High School
Vote of thanks - Mr S. W. Chilembo, Director, ZWMA
National Anthem - D. Kuanda Technical School
For more information on the Zambia Bureau of Standards, please visit www.zabs.org.zm.

2011: International Year of Chemistry

The idea for an international year was first discussed in 2006, during the April meeting of the IUPAC Executive Committee. Following that meeting, an IUPAC task group developed a plan to secure the designation by UNESCO of an International Year of Chemistry. That project (IUPAC project 2007-011-1-050) was successfully completed when in April 2008 the Executive Board of UNESCO endorsed the proposal for proclamation by the United Nations of 2011 as an International Year of Chemistry (IYC).

The International Year of Chemistry 2011 (IYC 2011) is a worldwide celebration of the achievements of chemistry and its contributions to the well-being of humankind. Under the unifying theme "Chemistry - our life, our future", IYC 2011 will offer a range of interactive, entertaining, and educational activities for all ages. The Year of Chemistry is intended to reach across the globe, with opportunities for public participation at the local, regional, and national level.

The goals of IYC 2011 are to increase the public appreciation of chemistry in meeting world needs, to encourage interest in chemistry among young people, and to generate enthusiasm for the creative future of chemistry. The year 2011 will coincide with the 100th anniversary of the Nobel Prize awarded to Madame Marie Curie - an opportunity to celebrate the contributions of women to science. The year will also be the 100th anniversary of the founding of the International Association of Chemical Societies, providing a chance to highlight the benefits of international scientific collaboration.

Both the OIML and the BIPM are deeply involved in the improvement of chemical measurements, either through the CIPM CCQM (Comité Consultatif pour la Quantité de Matière in French, or Consultative Committee for Amount of Substance) or through many of the OIML Technical Committees. For this reason, the two International Metrology Organizations have decided to join the IYC 2011 and have Chemistry as the theme for this year's World Metrology Day. ■

www.worldmetrologyday.org

World Metrology Day

Message from Stephen Patoray, Director of the BIML

I began my appointment as Director of the International Bureau of Legal Metrology (BIML) on January 1, 2011. With this new role came a number of opportunities to both utilize my experiences and to learn new things. My background is mainly in the area of scales and weighing instruments. So when I first learned of the theme for World Metrology Day (WMD) 2011 *Chemical measurements for our life, our future,* my initial thought was: What can I contribute and what does legal metrology have to do with chemistry? This initial thought lasted for only a few moments as I began to reflect on the many links that exist between the International Organization of Legal Metrology (OIML) and chemistry. Then even more common elements began to appear as I spoke with a number of colleagues; it was now very clear to me that the OIML has a long history as well as current and future work with respect to legal metrology and measurements in chemistry.

The work of the OIML as it relates to chemical measurement goes back a long time. In fact, several of the very first Recommendations, R 4 *One mark flask* and R 8 *Standard method for the verification of instruments for the measurement of humidity in grains* were approved in 1968. But the work did not stop there, and over the years the OIML has developed and approved more than twenty-five Recommendations for a wide range of methods and instruments which apply directly to chemical measurements. From the safety of our water (R 83, R 100 and R 116), safe and healthy food (R 59, R 82, R 108, and R 112), a healthy atmosphere (R 99, R 113, R 123, and R 143), more consistent wine (R 22 and R 124), law enforcement (R 126) and health care (R 135) the OIML has developed Recommendations to meet these important global challenges. May I invite you to take the time to review some of these and to consider how they may be useful to you in your everyday activities.

The role of chemistry in legal metrology became even more clear to me as I began to reflect on my past work relating to grain moisture and constituents in grain. In many transactions related to grain, measurement of both the level of moisture and the levels of the constituents such as protein or starch is required. These measurements are then used to directly affect the price of these commodities. As a result of this, in many countries, the requirements of these measurements as well as the equipment used to measure these values are regulated. An accurate measurement of moisture is also required to ensure the grain can be properly stored. The technology and equipment needed to determine these measurements is very complex. The OIML has developed several Recommendations to address these issues and continues to work in this area to ensure that there are appropriate written standards for these vital areas relating to trade.

Caring for the environment requires not only agreed standards, but also homogeneity of the results produced by the measuring instruments. In many countries the maximum emission values are regulated by law, one common one being that of automobile exhaust emissions. Automobiles that do not comply with the required limits may need adjustments, and their owners may be fined or, in some cases, the vehicles may be taken out of service. The instruments that make these measurements are covered by OIML Recommendation R 99 *Instruments for measuring vehicle exhaust emissions*.

One additional area to discuss is that of the content of alcohol in blood while driving. This condition is regulated in most countries around the world and is sadly one of the most common causes of road accidents. However, the exact level of alcohol content in the blood is not easy to measure and many different types of instruments are used to accomplish this task. OIML R 126 *Evidential breath analyzers* was developed to cover the requirements that these instruments must comply with to ensure that when the test is carried out, the results can be trusted and therefore the right actions are taken.

It would be very easy for me to continue providing additional examples of where chemical measurements directly apply to the world of legal metrology and how the OIML has been contributing to these areas. I hope, however, to have provided you with some basic examples that will enable you to begin thinking of how this very important topic might also apply to the area in which you yourself are involved.

I hope that you will take the opportunity of World Metrology Day 2011, to take a fresh look at how your work may be linked to that of others and how we can strive to all work together to make our life and our future a much better place. ■

World Metrology Day

Message from Michael Kühne, Director of the BIPM

2011 was declared the International Year of Chemistry by the United Nations as a world-wide celebration of the achievements of chemistry and its contributions to the well-being of humankind. The impact on our daily lives of chemical measurements is far-reaching and of enormous benefit although it often goes unnoticed. In general, metrology is an essential but largely hidden aspect of modern society. With a theme of 'Chemical Measurements – for our life, our future', for this year's World Metrology Day, the vital contribution of measurements in this field is being recognized.

The 2011 International Year of Chemistry celebrates the centenary of the award of the Nobel Prize in Chemistry to Marie Sklodowska Curie, recognizing her discovery of the elements radium and polonium. On our website one can find photographs taken at the BIPM in 1904 of Marie Curie, her husband Pierre Curie and daughter IrËne Curie, together with , at that time Deputy Director and later Director of the BIPM. All four were either already Nobel Laureates, or would become Nobel Laureates (twice in the case of Marie Curie). The BIPM was the custodian of the original radium standard prepared by Marie Curie and used for the very first activity comparisons in the field of ionizing radiation. Today, although the original radium standard no longer exists, the BIPM maintains the international reference standards in ionizing radiation for both dosimetry and activity measurements.

The importance of chemical measurements is well established within the International System of Units (SI). A decision was taken in 1971 to include 'amount of substance' and 'mole' as a base quantity and SI base unit respectively, with the support of the International Union of Pure and Applied Chemistry (IUPAC), the International Union of Pure and Applied Physics (IUPAP) and the International Organization for Standardization (ISO).

In today's economy, goods and information are exchanged globally, and international travel and the cross-border transport of livestock and agricultural products are commonplace. This trend is inherent to modern economic prosperity and is set to continue. Our wellbeing also depends on issues that have an impact on our quality of life, such as health care, the environment and food quality. A strong international measurement and standards infrastructure is critical to ensuring that products and services meet their specifications, to assure equity in trade and to underpin a high quality of life. The statement 'if you cannot measure it you cannot control it' is as true today as it ever was. In the field of chemical measurements, certified reference materials (CRMs), measurement standards and reference measurement results provide stated references upon which analytical laboratories can anchor their measurement results. The traceability of measurement results to internationally accepted and stated references, together with their stated measurement uncertainties, as described in ISO/IEC 17025, provides the basis for their comparability and global acceptance.

Meeting the need for reliable and reproducible chemical measurements and certified reference materials is a major activity for the International Metrology Community and National Metrology Institutes. The development of reference materials for chemical properties has been part of the mission of certain National Metrology Institutes since the early 1900s. This role and activity intensified with the formation of the BIPM's Consultative Committee for Amount of Substance: metrology in chemistry (CCQM), with its wide ranging programme of chemical measurement comparisons. These comparisons address wide ranging measurement capabilities related to, for example: cholesterol and glucose; illegal drugs; high risk food contamination; environmental emissions and air quality.

Establishing a better understanding of climate change particularly underlines the need for long term, reliable and reproducible measurements, a need confirmed by the major intergovernmental and international bodies concerned, such as the World Meteorological Organization (WMO), the Intergovernmental Panel on Climate Change (IPCC), and UN Agencies. Indeed in the field of climate change monitoring, the reliability of measurements is a prerequisite for the long-term monitoring of greenhouse gases, their use in radiative and climate change models, and monitoring the effectiveness of mitigation activities. A good example of where international activities have reduced the uncertainty of measurements is for surface ozone. The adverse effects of increased surface ozone concentrations are well reported, notably because of concerns related to premature deaths related to respiratory disease and damage to agricultural crops. Additionally, the best estimate for the net increase in radiative forcing due to

tropospheric ozone from pre-industrialized times until 2005 (IPCC AR4) ranks tropospheric ozone as an important greenhouse gas. Concerns over these effects and the need to control them provide the strongest drivers for accurate long-term measurements.

The role of chemical measurements in ensuring healthy food is emphasized in regulations and supported by international measurement programmes. Reference materials and methods are required to underpin a broad range of food analyses including contaminant analysis, nutritional food additive analysis including vitamins, and the analysis of residues. Residues in foodstuffs can originate from deliberate use of banned substances, from incorrect use of regulated plant protection agents or veterinary drugs or from unintentional contamination during the production process. Regulated measurements of substances in foods require high quality chemical measurements with stated uncertainties to ensure measurement results meet performance criteria.

The safety of water is of global concern, with regulations being implemented to ensure the good quality of surface, ground and coastal waters. Comparison activities which started in Europe and were expanded to the global level by the CCQM, are contributing to the development of a sustainable traceability and dissemination system providing comparable measurement results in water monitoring. Among the priority lists of substances to be assessed as the basis of water quality, the inorganic analytes (nickel, cadmium, lead, mercury) are being studied with the aim of assuring the reliability of measurement results at limit values for these substances.

There is a general move to greater efficiency in the use of fossil fuels with a reduced environmental impact, the latter is also a concern in the disposal of waste products. Accurate chemical measurements are a key component in addressing these issues. In the past, the measurement of sulfur in fuels and combustion systems has received principal attention, but mercury emissions are now attracting regulatory interest because of the potential risk to human health. Measurements of carbon will also become more important as trading systems come into force to combat the radiative forcing effects from the release of carbon dioxide into the atmosphere.

With concerns over the limited supply of non-renewable forms of energy there is growing interest in renewable sources of energy, which brings new challenges. Biofuels, for example, are far more varied in composition than the fossil fuels they displace, requiring the development of a range of new measurement standards and CRMs to support both quality control and trade.

In the field of health, reliable measurements are needed both for therapeutics and diagnostics. Recent regulations for diagnostics have required that 'the traceability of values assigned to calibrators and/or control materials must be assured through available reference measurement procedures and/or available reference materials of a higher order.' This led to the development of a database of higher order reference materials, methods and services under the auspices of the Joint Committee for Traceability in Laboratory Medicine (JCTLM) operated by the BIPM, the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and the International Laboratory Accreditation Cooperation (ILAC). The database provides a unique resource, identifying higher order reference materials, methods and measurement services in laboratory medicine, and thus supporting the *in vitro* diagnostics industry, its regulators and those active in the field of laboratory medicine. By facilitating uniform national and regional implementations of traceability requirements, the database helps avoid potential technical barriers to trade.

In summary, reliable chemical measurements have met, and will continue to be needed to meet the global challenges of clean air, safe water, sustainable energy, healthy food, advanced materials, and dependable medicines.

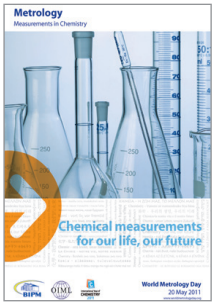
The traceability of such measurements to the SI is, and will remain, a cornerstone for their reliability both now and in the future, and will thus continue to contribute to the prosperity and well being of humankind. ■

Chemical measurements for our life, our future

www.worldmetrologyday.org

The 17 WMD 2011 Posters

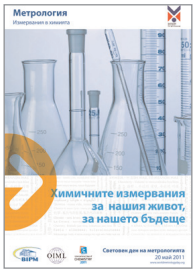
English



French

Albanian

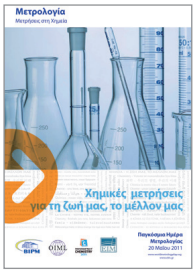
Arabic



Bulgarian

Chinese (Chinese Taipei)

German



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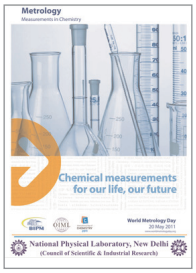
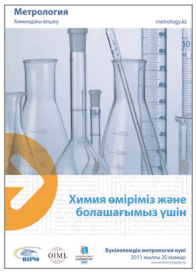
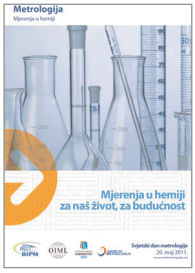


Indian



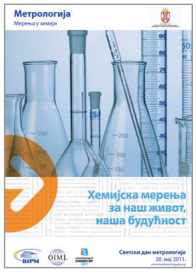
Kazakh

Korean



Montenegrin

Portuguese



Serbian

Slovakian

Spanish

Turkish

MILESTONES MOVING METROLOGY

Milestones in Metrology IV

■ *Call for papers* ■


Delegates attending the 2009 event

Organized by NMi and now with a brand new structure, the three-yearly international conference Milestones in Metrology (to be held from 9–11 May 2012) aims to attract a broader spectrum of visitors. Moving from The Netherlands to the beautiful city of Venice, the event will offer the perfect platform for manufacturers, regulators, end users and metrological institutes in the field of metrology to meet together.

The conference trailer on the NMi website provides an initial overview of the new structure, the tone, and the topics of the conference for the markets of Energy, Oil & Gas, Weighing, and Traffic. Regulators will be able to easily switch between different topics in the four market themes.

The complete program will focus on legal metrology, but this scope will be expanded with the introduction of industrial metrology. During the breaks and the evening events, the focus will shift towards networking and meeting fellow legal metrology professionals.

New networking approach

The Milestones networking aspect has already been launched with the creation of online networks on both LinkedIn and Facebook. "*This gives visitors the opportunity to discuss topics and the option to contact other business-related people before the conference. NMi's experts are available for comments. It is also possible to provide input on the program. With over 180 group members and interesting discussions already ongoing, LinkedIn really is a pre-conference meeting. Moreover, regular updates will be sent out via these networking groups as well as Twitter*", explains Pieter van Breugel, General Manager of NMi.

New structure

For this fourth edition of Milestones in Metrology, the plenary sessions have been reduced to offer a full program for the four markets Energy, Oil & Gas, Weighing, and Traffic, so that the Conference appeals to a wider group in the metrology community.

Legal metrology will continue to be the focus, but lectures about scientific and industrial metrology will be added. According to Pieter van Breugel: "*Of course, we will make sure that testing laboratories, regulators and Notified Bodies will have a complete program covering all four markets. The program for this group picks the legal metrology parts of all four markets, whereas end users and manufacturers can now focus on the broader metrology scope in their specific market.*"

Call for papers

If you wish to apply to present a paper at the Milestones Conference on a topic of interest to you that is of relevance to the fields of legal or industrial metrology, NMi invites you to submit your abstract. Full details of the submission details are available on the website www.milestonesinmetrology.com.

MILESTONES MOVING METROLOGY

15th International Metrology Congress (Paris, 3–6 October 2011)

Economic recovery is on the horizon and new projects are seeing the light in sectors in which there had recently been a slowdown. Headhunters are looking to recruit metrology personnel, which is a sign that the global economy is picking up.

Measurement is an essential element in any quality process and is the basis for decision-making. To reinforce this notion, the 15th Congress is the place for technical exchange between experts, manufacturers and industrial users in the field of metrology. It aims to demonstrate that measurement is a tool for improving industrial processes.

6 round tables for industry are scheduled on the following topics:

- Temperature control in the health field
- Medical biology and accreditation: the keys to success
- Tomorrow's careers in metrology
- R&D, production and metrology: skills to conciliate
- Controlling and saving energy in industry
- Better measurement for lower costs

Some **180 live conferences** are scheduled on various subjects, including:

- Liquid and gas flow measurement
- Nano and micro-technologies
- Extreme electrical measurement
- Energy sources & metrology, and metrology and the environment
- European metrology research programs and their industrial applications
- Metrology in health, radiation protection and dosimetry
- Mechanical quantities, industrial temperature
- Uncertainties and capabilities
- Etc.

A special plenary session entitled **2020 Metrology prospects** is scheduled, and technical field visits are planned to EDF, LNE, SNCF and Synchrotron.

The Congress is the only European event of its kind. It is run jointly by the French Collège de Métrologie in partnership with Euramet, BIPM, OIML, NCSLi and NPL, together with users, professionals and academics: EDF, GSK Biologicals, Hôpitaux de Paris, Renault, Total, Hexagon Metrology, Stork Intermes, Acac, BEA Métrologie, Cetiat, IMQ, LNE, and Université de la Méditerranée. This year's event is sponsored by Hexagon Metrology and Trescal.

For the first time, this Congress will be scheduled concurrently with the **MesurExpovision** show. This partnership is the result of discussions conducted between the CFM and the organizers of the show and the event will offer a high level, full program with broad exposure over the week.

A **Metrology Congress Village** will be set up inside the MesurExpovision show, in which exhibitors will be offered special discounts and the possibility to attend the conferences. The Village will exhibit many technical innovations in about 80 stands.

The full program is available at **www.metrologie2011.com** where conference details may be downloaded and registration carried out online. Attendance may be for one day, two days or for the full event.

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The OIML is pleased to welcome the following new

CIML Members

- **Cuba**
  Eng. Fernando Antonio Arruza Rodriguez
- **Republic of Kazakhstan**
  Mr. Ryskeldy Satbayev Akhmetkaliyevich
- **Russian Federation**
  Dr. Sergey A. Kononogov

OIML Meetings

TC 6 (Prepackaged products)
26–30 September (NIST, Gaithersburg, MD, USA)

46th CIML Meeting and associated events
10–14 October (Prague, Czech Republic)

TC 8/SC 5 (Water meters)
8–10 November (NIST, Gaithersburg, MD, USA)

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Committee Drafts

Received by the BIML, 2011.03 – 2011.05

Blackbody radiators for calibration of radiation thermometers. Calibration and verification procedure	E	3CD	TC 11/SC 3	RU
Instruments for continuous measuring CO, NOx in stationary source emissions	E	1CD	TC 16/SC 1	NL
Revision R 49-1, -2, -3 Water meters intended for the metering of cold potable water and hot water - Part 1: Metrological and technical requirements - Part 2: Test methods - Part 3: Test report format	E	2 CD	TC 8/SC 5	UK

Call for papers

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

World Metrology Day 2011
A resounding success!

Delegates attending the AFRIMETS 2011 Metrology School in Nairobi, Kenya

CIML meets in Orlando, Florida (USA)

Winner of the 2009 OIML Award for Excellent Contribution to Legal Metrology in Developing Countries: Assignment Report

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

The **OIML Bulletin** is a forum for the publication of technical papers and diverse articles addressing metrological advances in trade, health, the environment and safety - fields in which the credibility of measurement remains a challenging priority. The Editors of the Bulletin encourage the submission of articles covering topics such as national, regional and international activities in legal metrology and related fields, evaluation procedures, accreditation and certification, and measuring techniques and instrumentation. Authors are requested to submit:

- a titled, typed manuscript in Word or WordPerfect either on disk or (preferably) by e-mail;
- 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.

Technical articles selected for publication will be remunerated at the rate of 23 € per printed page, provided that they have not already been published in other journals. The Editors reserve the right to edit contributions for style, space and linguistic reasons and author approval is always obtained prior to publication. The Editors decline responsibility for any claims made in articles, which are the sole responsibility of the authors concerned. Please send submissions to:

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