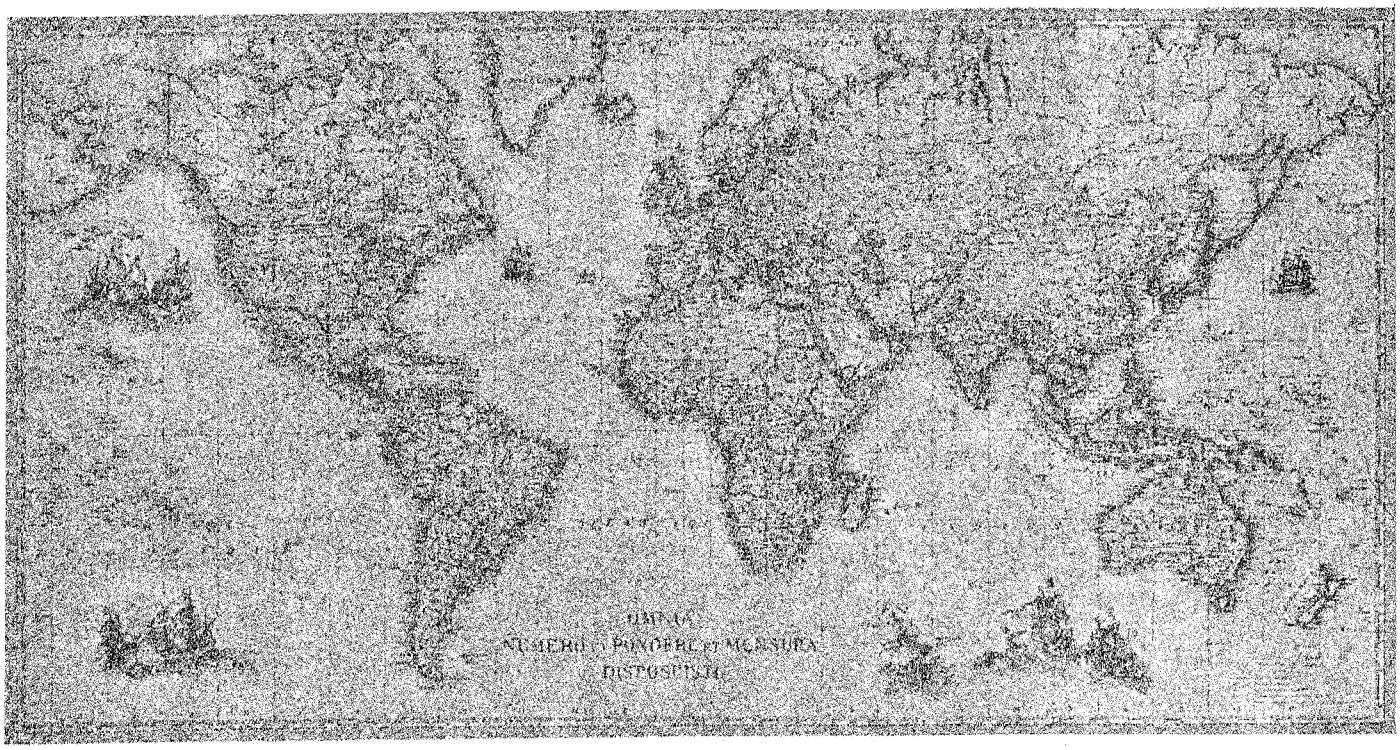
Bulletin OIML n° 87
Juin 1982

BULLETIN

DE

L'ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

Organe de Liaison entre les Etats-membres



BUREAU INTERNATIONAL DE METROLOGIE LEGALE
11, Rue Turgot — 75009 PARIS — France

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BREF COMPTE RENDU de la 18e RÉUNION du COMITÉ INTERNATIONAL de MÉTROLOGIE LÉGALE

Le Comité International de Métrologie Légale a tenu sa 18e session à Paris du 24 au 26 mars 1982. Une soixantaine de personnes représentant 35 Etats-membres y ont participé.

Les débats étaient dirigés par M. BIRKELAND, Norvège, Président du CIML, assisté du premier vice-président, M. ISSAEV, U.R.S.S. Le deuxième vice-président M. McCOUBREY, U.S.A., avait quelques semaines avant la réunion été conduit à abandonner ses fonctions en raison d'une réorganisation du National Bureau of Standards. Le futur second vice-président sera désigné lors de la prochaine session du Comité en mai 1983.

Dans son discours d'ouverture, M. BIRKELAND a tout d'abord salué les nouveaux membres du Comité parmi lesquels il convient de mentionner le représentant du Canada, Etat nouvellement membre de l'Organisation.

M. BIRKELAND a également fait rapport de ses activités en tant que Président du Comité, depuis son élection en juin 1980 ; il a en particulier mentionné sa participation aux conférences ILAC 1980 et 1981 ainsi qu'à deux conférences sur la normalisation et la métrologie, tenues au Mexique et à Cuba à la fin de l'année 1981.

Après avoir réglé un certain nombre de questions administratives et financières, le Comité a examiné en détail le programme et les méthodes de travail des secrétariats pilotes et rapporteurs. Une vingtaine de secrétariats ont été supprimés, soit parce que leurs travaux étaient terminés, soit pour éviter des risques de double emploi avec d'autres secrétariats de l'OIML ou avec des groupes de travail similaires existant dans d'autres institutions internationales. Par contre, deux nouveaux secrétariats ont été créés en ce qui concerne la métrologie des systèmes de mesurage d'une part, les problèmes généraux des dispositifs électroniques d'autre part.

La coordination et la programmation à long terme des travaux des secrétariats de l'OIML ont fait l'objet de longues discussions et ont abouti à certaines décisions qui seront mises en application progressivement.

Le Comité a pris connaissance des conclusions du groupe ad hoc chargé d'étudier l'établissement d'un système de certification OIML. Tout en reconnaissant que le rapport du groupe ad hoc constituait une base adéquate pour le déroulement des travaux futurs, le Comité a estimé que de nombreuses questions fondamentales devraient être étudiées plus en détail et a chargé le Bureau International de Métrologie Légale de convoquer à nouveau le groupe ad hoc pour poursuivre ses études.

Le Comité a ensuite pris connaissance de rapports concernant les relations entre l'OIML et certaines Institutions internationales, en particulier le BIPM, l'ISO et la CEI.

La délégation de Cuba a présenté un compte rendu d'une conférence organisée dans le cadre du Mouvement des Pays non alignés et autres Pays en Développement, sur les problèmes de normalisation, métrologie et contrôle de qualité.

En ce qui concerne les problèmes propres aux pays en voie de développement, le Comité a été informé des conclusions du Conseil de Développement qui s'était réuni les 22 et 23 mars et pour lequel un bref rapport est donné par ailleurs dans ce Bulletin.

Après avoir examiné certaines questions diverses, le Comité a fixé les lieux et dates de ses prochaines réunions comme suit :

19e réunion du CIML, 3-4-5 mai 1983 à Copenhague (Danemark)

20e réunion du CIML, à l'occasion de la 7e Conférence Internationale de Métrologie Légale, en octobre 1984 à Helsinki (Finlande).

La 18e réunion du Comité s'est terminée le vendredi 26 mars en fin de matinée et a été suivie d'une brève réunion du Conseil de la Présidence de l'Organisation, qui comprend outre le Président et le vice-président du Comité, un certain nombre de membres du CIML désignés à cet effet par le Président. Une prochaine réunion du Conseil de la Présidence, destinée en particulier à organiser la 19e réunion du Comité, est prévue pour novembre 1982.

SUMMARY of the 18th MEETING of the INTERNATIONAL COMMITTEE of LEGAL METROLOGY (CIML)

The International Committee of Legal Metrology held its 18th meeting in Paris 24-26 March 1982. About sixty representatives from 35 Members States were present.

The debates were directed by Mr BIRKELAND of Norway, President of CIML, assisted by the first vice-president Mr ISSAEV of the U.S.S.R. The second vice-president Mr McCOUBREY of the USA, had a few weeks before the meeting been obliged to give up his international duties after taking up other responsibilities within the National Bureau of Standards. The future second vice-president will be nominated at the next meeting of the Committee in May 1983.

In his opening speach Mr BIRKELAND first welcomed the new Committee members and in particular the delegate of Canada, a new Member State of the Organisation.

Mr BIRKELAND also reported on his activities as President of the Committee since his election in June 1980 ; he mentioned in particular his participation in the ILAC conferences in 1980 and 1981 and in two conferences on standardization and metrology held in Mexico and Cuba, end of 1981.

After having settled a number of financial and administrative questions, the Committee examined in detail the programme and methods of work of the pilot and reporting secretariats. About twenty secretariats were cancelled either because their work has ended or to avoid duplication with other OIML secretariats or working groups of other international institutions. On the other hand, two new reporting secretariats were created, the first to be concerned with the metrology of measuring systems and the second dealing with general problems of electronic devices.

The coordination and long-term planning of the work of the OIML secretariats were subjects of prolonged discussions and resulted in decisions which will be applied progressively.

The Committee was informed about the conclusions of the ad hoc group responsible for the study of an OIML certification system. It was agreed that the report of the ad hoc group constitutes an adequate base for the development of future work. However, the Committee considered that a number of fundamental questions have to be studied in more detail and charged the International Bureau of Legal Metrology to call the ad hoc group for another meeting to continue its studies.

A report was presented to the Committee about the relations between OIML and some other International Institutions, in particular BIPM, ISO and IEC.

The Cuban delegation presented a report of a conference organised within the framework of the Movement of non-aligned and other Developing Countries on problems of standardization, metrology and quality control.

Concerning the problems particular to developing countries the Committee was informed about the conclusions of the Development Council which met on 22 and 23 March and for which a summary is given elsewhere in this Bulletin.

After having examined various other questions the Committee agreed on the following dates and places for the future meetings :

19th meeting of CIML, 3-4-5 May 1983 at Copenhagen (Denmark)

20th meeting of CIML jointly with the 7th International Conference of Legal Metrology, in October 1984 at Helsinki (Finland).

The 18th meeting of the Committee was closed by midday of Friday 26 March and was followed by a meeting of the Presidential Council of the Organisation which comprises in addition to the President and Vice-president a certain number of CIML members designated by the President. The next meeting of the Presidential Council devoted in particular to the organisation of the 19th CIML meeting is planned to take place in November 1982.

PRÉVISIONS des TRAVAUX des SECRÉTARIATS OIML 1982

Pour répondre à la demande exprimée lors de la 18e réunion du Comité International de Métrologie Légale, nous essayons ci-dessous de résumer les prévisions des travaux des secrétariats de l'OIML pour l'année 1982.

Cette présentation est cependant incomplète car le BIML n'avait, fin avril 1982, pas encore reçu les rapports annuels d'un certain nombre de secrétariats.

SP 1 - Terminologie

Le secrétariat-rapporteur SP 1-Sr 1 étudie actuellement les observations des collaborateurs sur le 3e avant-projet de révision du Vocabulaire de Métrologie Légale (VML) et pense pouvoir présenter un 4e avant-projet définitif au cours de l'année.

Les travaux sur le Vocabulaire International de Métrologie (VIM) vont se poursuivre. Deux autres réunions sont prévues, une à Paris en juin et une autre à Lausanne en septembre.

SP 2 - Généralités sur la métrologie légale

Le premier projet sur des méthodes de contrôles statistiques par échantillonnage, élaboré par SP 2-Sr 5, concerne essentiellement les produits préemballés. Ces travaux vont pour cette raison dorénavant être traités dans le cadre du SP 20-Sr 2.

Le nouveau secrétariat SP 2-Sr 6 créé lors de la 18e réunion du CIML et qui s'occupera des problèmes généraux relatifs à l'électronique prévoit l'élaboration d'un premier avant-projet avant la fin 1982.

SP 4 - Mesurage des longueurs, surfaces, angles

Le Secrétariat-Pilote se réunira à Paris du 12 au 15 octobre 1982 afin d'élaborer un nouveau programme de travail et discuter d'éventuelles modifications à apporter aux deux projets de Documents Internationaux relatifs aux schémas de hiérarchie de mesurage des longueurs et de mesurage d'angles, qui sont actuellement soumis, le premier aux collaborateurs du SP 4 et le deuxième aux membres du CIML pour commentaires et vote par correspondance.

La révision par SP 4-Sr 2 de la RI 35 « Mesures matérialisées de longueur pour usages généraux », actuellement au stade de 2e avant-projet, fera conjointement l'objet d'une réunion. Ceci sera également le cas pour le 3e avant-projet « Appareils de mesurage des longueurs des tissus, câbles et fils » élaboré par SP 4-Sr 3.

SP 5 - Mesurage de volume de liquides

Des réunions des secrétariats-rapporteurs SP 5-Sr 1 « Terminologie », SP 5-Sr 2 « Schémas de hiérarchie » et SP 5-Sr 3 « Mesures de laboratoire » sont prévues pour 1983 au Japon, conjointement avec une réunion du SP 5-Sr 20 « Méthodes et dispositifs de vérification des instruments de mesurage de liquides » dont un 2e avant-projet est en cours d'élaboration. Les secrétariats sont supposés distribuer de nouveaux documents techniques concernant ces sujets avant la fin 1982.

Le secrétariat-rapporteur SP 5-Sr 4 prévoit d'établir un 2e avant-projet sur les « seringues médicales non réutilisables ».

Un nouvel avant-projet sur les bouteilles récipients-mesures a été envoyé aux collaborateurs du SP 5-Sr 5 en avril 1982.

Les réservoirs de stockage et transport d'hydrocarbures feront l'objet de nouveaux avant-projets de la part des SP 5-Sr 8, Sr 9 et Sr 10, pour lesquels des réunions sont prévues en Roumanie en septembre ou octobre 1982.

Le secrétariat-rapporteur SP 5-Sr 11 relatif aux « dispositifs de repérage des niveaux des liquides dans les réservoirs » compte présenter son premier avant-projet vers la fin 1982.

Les dispositions particulières des ensembles de mesurage de liquides feront l'objet d'un 6e avant-projet de la part du secrétariat-rapporteur SP 5-Sr 13 qui pense également pouvoir envoyer aux collaborateurs le premier avant-projet sur les compteurs à turbine.

Le secrétariat-rapporteur SP 5-Sr 15 pense être en mesure d'envoyer fin 1982 un avant-projet concernant les « compteurs et ensembles de mesurage de liquides cryogéniques ».

Le secrétariat-rapporteur SP 5-Sr 16 « compteurs d'eau » projette de se réunir en septembre à Zurich, en liaison avec la Conférence d'IWSA et une réunion de l'ISO/TC 30/SC 7.

Un avant-projet concernant les tables de données des hydrocarbures est en cours d'élaboration par le SP 5-Sr 18. Cet avant-projet comporte en principe la proposition d'adoption pour les besoins de l'OIML de la nouvelle Norme ISO 91-1982.

Le secrétariat-rapporteur SP 5-Sr 19 prévoit d'élaborer, en liaison avec des travaux similaires de la CEE, un avant-projet sur les dispositifs électroniques appliqués au mesurage de liquides.

SP 6 - Mesurage de volume de gaz

L'ensemble des travaux de ce secrétariat sera repris lors d'une réunion du secrétariat-pilote en octobre 1982 à Paris.

Le secrétariat-rapporteur SP 30-Sr 7 « calorimètres à gaz » a été transféré au secrétariat-pilote SP 6 et devient SP 6-Sr 12. Ce secrétariat-rapporteur prévoit pour 1982 l'élaboration d'une nouvelle version de son avant-projet concernant les calorimètres automatiques à gaz dans lequel il sera tenu compte des derniers développements techniques.

SP 7 - Mesurage des masses

Le 2e avant-projet du SP 7-Sr 2 sur les dispositifs électroniques utilisés dans les instruments de pesage a fait l'objet d'une réunion à Paris en mai 1982.

Une réunion du secrétariat-pilote est prévue à Munich, R.F.A. en septembre 1982 et sera précédée par une réunion du SP 7-Sr 4 concernant la révision de la RI n° 3 actuellement au stade de 4e avant-projet.

Une autre réunion du SP 7-Sr 5 aura à statuer sur l'adoption du 2e projet concernant les doseuses pondérales.

Le projet du SP 7-Sr 8 concernant les cellules de pesée fera l'objet de discussions et décisions lors de la réunion du secrétariat-pilote.

SP 9 - Mesurage des masses volumiques

Le secrétariat-rapporteur SP 9-Sr 9 prévoit l'envoi à ses collaborateurs d'un premier avant-projet concernant la terminologie.

SP 10 - Instruments de mesurage pour véhicules

Le secrétariat-rapporteur SP 10-Sr 1 présentera au cours de l'année son 2e avant-projet sur les cinémomètres radar.

SP 11 - Mesurage des pressions

Le secrétariat-rapporteur SP 11-Sr 2 prévoit d'envoyer à ses collaborateurs un 2e avant-projet concernant les schémas de hiérarchie et SP 11-Sr 3 prévoit l'élaboration d'un 4e avant-projet concernant les manomètres à piston.

Un 2e avant-projet concernant les « Méthodes de vérification des manomètres, vacuomètres, manovacuomètres usuels à éléments récepteurs élastiques » sera élaboré par le SP 11-Sr 4 ainsi qu'un premier avant-projet concernant les mêmes instruments enregistreurs. Une réunion du SP 11-Sr 4 est prévue pour 1983.

Le secrétariat-rapporteur SP 11-Sr 5 prévoit d'envoyer à ses collaborateurs un questionnaire concernant une possible révision de la RI n° 16 « Manomètres pour la mesure de la tension artérielle » en tenant compte de l'évolution récente dans ce domaine.

Le 3e avant-projet du SP 11-Sr 7 concernant les baromètres doit être terminé et expédié aux collaborateurs avant l'été 1982.

SP 12 - Mesurage des températures

Le secrétariat-rapporteur SP 12-Sr 1 pense pouvoir terminer avant la fin 1982 un premier avant-projet de terminologie relative à la chaleur et au mesurage de la température.

Le secrétariat-rapporteur SP 12-Sr 5 suggère de soumettre vers la fin 1982, pour approbation par l'OIML, un projet d'adoption de la Publication CEI sur les thermocouples après que celle-ci ait été définitivement adoptée par la CEI.

SP 14 - Acoustique et vibrations

Le programme de travail présenté à la réunion des secrétariats-pilote et rapporteurs à Braunschweig, en février 1982, prévoit pour SP 14-Sr 1 l'envoi, avant la fin de l'année, du projet amendé concernant l'adoption pour les besoins de l'OIML de la Publication CEI 651 sur les sonomètres.

Le SP 14-Sr 2 se propose d'élaborer au cours de 1982 un avant-projet de Recommandation sur les audiomètres, basé sur les Normes de la CEI et de l'ISO.

SP 16 - Rayonnements ionisants

Le secrétariat-rapporteur SP 16-Sr 1 « Dosimètres à chambres de ionisation » attend l'évolution des travaux de la CEI avant d'entreprendre l'élaboration d'un 3e avant-projet.

Le secrétariat-rapporteur SP 16-Sr 2 « Laboratoires secondaires d'étalonnage en dosimétrie » prévoit une réunion en novembre 1982 à Budapest.

SP 18 - Mesurage des caractéristiques des produits alimentaires

En plus des études en cours par SP 18-Sr 1 au sujet de la forme finale du 4e avant-projet concernant les humidimètres pour grains, on prévoit l'élaboration d'un premier avant-projet sur les saccharimètres automatiques pour la détermination de la teneur en sucre des betteraves par le SP 18-Sr 4 et un premier avant-projet sur les réfractomètres pour la détermination de la teneur en sucre des moûts de raisin par le SP 18-Sr 6.

SP 19 - Mesurage des caractéristiques des matériaux

Les travaux en cours ont été décrits dans le rapport des travaux pour 1981 (*). Les travaux du SP 19-Sr 1 « Comparaison de force » ont été suspendus en attendant les travaux entrepris par le Comité Consultatif de Masses et Forces (CCM) du BIPM.

(*) Voir Bulletin OIML N° 86, mars 1982.

Une réunion du SP 19-Sr 2 « Machines d'essai des matériaux » a eu lieu à Paris en mai 1982. Une nouvelle rédaction des RI n° 9 à 12 concernant les blocs de référence de dureté sera étudiée par le secrétariat-rapporteur SP 19-Sr 3 lorsque les projets correspondants de l'ISO auront reçu leur forme finale.

Le SP 19-Sr 4 envisage d'entreprendre en 1983 une comparaison de blocs de dureté Rockwell et Vickers et a lancé une enquête à ce sujet.

Le 2e avant-projet du SP 19-Sr 6 sur la terminologie a été envoyé aux collaborateurs en avril 1982.

SP 20 - Produits préemballés

La responsabilité du secrétariat-rapporteur SP 20-Sr 1 « contenu informatif de l'étiquetage » ayant été attribuée lors de la 18e réunion du CIML, il est prévu d'organiser une réunion des secrétariats-pilote et rapporteurs en 1983 en liaison avec un séminaire sur la vérification pratique des produits préemballés.

SP 21 - Normalisation des caractéristiques métrologiques des systèmes de mesurage

L'ensemble des travaux a fait l'objet d'une réunion à Souchoumi, U.R.S.S. en avril 1982.

Un nouveau secrétariat-rapporteur SP 21-Sr 6 relatif aux systèmes de mesurage a été créé lors de la 18e réunion du CIML.

SP 22 - Principes du contrôle métrologique

Un 4e avant-projet sur les « domaines d'utilisation des instruments de mesurage assujettis à la vérification obligatoire » sera élaboré par le SP 22-Sr 1.

Le secrétariat SP 22-Sr 2 prévoit l'élaboration d'un 6e avant-projet sur les « principes du choix des paramètres et caractéristiques à vérifier ».

On compte également que les travaux du SP 22-Sr 5 vont aboutir avant la fin 1982 en un projet de Document International sur les « principes de la surveillance métrologique ».

SP 23 - Méthodes et moyens d'attestation des dispositifs de vérification

Le premier projet de Document International élaboré par le SP 23-Sr 2 et intitulé « Principes de la reconnaissance officielle, d'utilisation et de conservation des étalons » a été envoyé au secrétariat-pilote pour examen.

Les travaux du SP 23-Sr 5 sur les principes d'établissement de schémas de hiérarchie ont été terminés et ce Document International sera imprimé prochainement.

SP 25 - Pays en voie de développement

Comme cela a été demandé par le Conseil de Développement, les travaux du SP 25-Sr 2 seront imprimés en français et en anglais avec la mention « publiés à la demande du Conseil de Développement ».

Le secrétariat-rapporteur SP 25-Sr 3 étudie les commentaires reçus sur le 3e avant-projet concernant les « listes de moyens de vérification destinés à équiper les services nationaux de métrologie » et prévoit l'élaboration d'un 4e avant-projet ainsi qu'une extension de ces listes aux mesurages électriques et de la température.

SP 26 - Instruments de mesurage utilisés dans le domaine de la santé publique

Le premier avant-projet sur les instruments pour la numération des globules sanguins conçu par SP 26-Sr 1 sera envoyé aux collaborateurs pour commentaires.

Le secrétariat-rapporteur SP 26-Sr 5 envisage de commencer ses travaux sur le plan national par un avant-projet concernant les matières de référence utilisées dans le domaine de l'hématologie.

Les différents avant-projets concernant les instruments bio-électriques ont fait l'objet d'une réunion à Rostov, U.R.S.S. en mai 1982.

SP 27 - Matériaux de référence

Les secrétariats-rapporteurs SP 27-Sr 1, 3, 4, 5 et 6 prévoient d'élaborer une série de premiers projets en vue d'une réunion des secrétariat-pilote et rapporteurs en 1983.

Le secrétariat-rapporteur SP 27-Sr 2 a l'intention de proposer l'adoption pour les besoins de l'OIML du système de classification en cours d'élaboration par ISO/REMCO. Une résolution dans le même sens a été prise en ce qui concerne SP 27-Sr 8 pour le sujet « système d'information sur les matières de référence certifiées ».

SP 30 - Mesures physico-chimiques

Le SP 30-Sr 1 prévoit la diffusion à ses collaborateurs des 3èmes avant-projets concernant des matériaux de référence pour la vérification de pH-mètres et de ionomètres.

Le SP 30-Sr 2 poursuit ses travaux de rédaction de la version finale du projet « Méthodes d'étalonnage des cellules de conductivité ».

Le SP 30-Sr 3 prévoit l'élaboration finale du 4e avant-projet relatif à l' « Echelle pratique de l'humidité relative de l'air » ainsi que le 3e avant-projet concernant les « Tables internationales psychrométriques et hygrométriques ».

Le SP 30-Sr 4 prévoit d'élaborer le 1er projet sur les humidimètres pour le bois. Les travaux de ce secrétariat-rapporteur sur les humidimètres à céréales ont été limités à l'examen des travaux de même nature effectués par le SP 18-Sr 1.

Le SP 30-Sr 6 prévoit d'envoyer aux collaborateurs le 3e avant-projet « Schémas de hiérarchie des instruments de mesure de l'humidité des gaz » et envisage de commencer des travaux sur les méthodes de vérification de psychromètres.

Les travaux du SP 30-Sr 7 sur les calorimètres à gaz automatiques seront dorénavant continués sous le sigle SP 6-Sr 12 de façon à mieux cadrer avec l'utilisation pratique.

Les travaux du SP 30-Sr 8 concernant le mesurage de concentrations de mercure dans l'air ont été transférés au secrétariat SP 30-Sr 10 qui dans un cadre plus général s'occupe d'analyses des gaz. Ce dernier secrétariat prévoit l'élaboration en 1982 des deux premiers projets suivants : « Prescriptions pour les gaz purs CO, CO_2, CH_4, H_2, O_2 et N_2 servant à l'analyse des mélanges de gaz » et « Méthodes de vérification des analyseurs usuels des gaz CO, CO_2, CH_4, O_2 et H_2 ».

Le secrétariat-rapporteur SP 30-Sr 9 prévoit d'élaborer une version amendée du premier projet : « Schéma de hiérarchie des instruments de mesurage de la viscosité des liquides » et d'étudier les commentaires de ses collaborateurs sur le 2e avant-projet « Viscosimètres capillaires de verre, méthodes de vérification ».

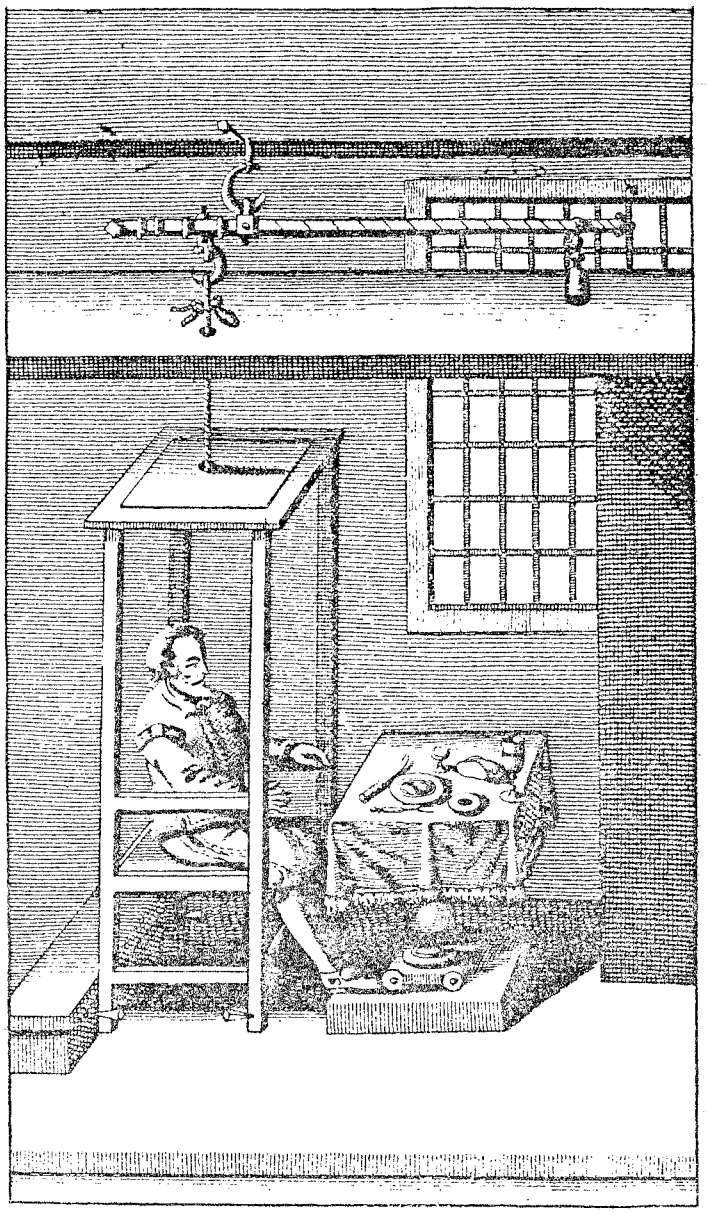
Le SP 30-Sr 12 prévoit l'élaboration, au cours de 1982, du premier avant-projet sur les explosimètres.

SP 31 - Enseignement de la métrologie

Le secrétariat-rapporteur SP 31-Sr 1 prévoit de terminer le premier projet de Document International relatif à la formation d'ingénieurs en métrologie.

Le secrétariat-rapporteur SP 31-Sr 2 vient de diffuser en avril 1982 son premier avant-projet sur la formation des techniciens diplômés en métrologie et des agents de vérification.

La responsabilité du secrétariat-rapporteur SP 31-Sr 3 relatif au perfectionnement de la formation de métrologistes est devenue vacante.



Le pesage de l'être humain à des fins de recherche
Weighing of human beings for research purposes

(Santorio, Santonio, De Statica Mædecina, Venice 1614)

BIML

FORECAST of WORK of the OIML SECRETARIATS 1982

Responding to the request expressed at the 18th meeting of the International Committee of Legal Metrology we are below trying to forecast the work of the OIML secretariats for 1982.

However, this presentation is incomplete due to the fact that BIML had by the end of April 1982, not yet received the annual reports from a number of secretariats.

SP 1 - Terminology

The reporting secretariat SP 1-Sr 1 is at present examining the comments received on its 3rd pre-draft concerning the revision of the Vocabulary of Legal Metrology and expects to present the 4th and definite pre-draft before the end of the year.

The work on the International Vocabulary of Metrology will continue to advance. Two more meetings are foreseen, one in Paris in June and one in Lausanne in September.

SP 2 - Legal metrology principles

The first draft on statistical control by sampling elaborated by SP 2-Sr 5 concerns mainly prepacked products. This work will therefore in future be handled within the framework of SP 20-Sr 2.

The new secretariat SP 2-Sr 6 created during the 18th CIML meeting and dealing with general problems of electronics, foresees the elaboration of a first pre-draft before the end of 1982.

SP 4 - Measurement of lengths, surfaces, angles

The pilot secretariat will meet in Paris, 12-15 October 1982 to set up a new work programme and to discuss possible amendments to the two drafts of International Documents concerning hierarchy schemes for measurement of length and measurement of angles, the first of which is at present being examined by the collaborators of SP 4 and the second has been distributed to CIML members for comments and vote by correspondence.

The revision by SP 4-Sr 2 of RI 35 « Material measures of length for general use », is at the stage of a 2nd pre-draft and will be discussed during the meeting. This is also the case for the 3rd pre-draft « Instruments for measurement of length of textiles, wires and threads » elaborated by SP 4-Sr 3.

SP 5 - Measurement of volumes of liquids

Meetings of the reporting secretariats SP 5-Sr 1 « Terminology », SP 5-Sr 2 « Hierarchy schemes » and SP 5-Sr 3 « Laboratory volume measures » are foreseen for 1983 in Japan jointly with a meeting of SP 5-Sr 20 « Methods and devices for the verification of liquid measuring instruments » for which the 2nd pre-draft is being elaborated. The secretariats are supposed to distribute the pre-drafts concerning these subjects before the end of 1982.

The reporting secretariat SP 5-Sr 4 foresees the elaboration of a 2nd pre-draft concerning non-reusable medical syringes.

A new pre-draft for bottles considered as measuring recipients has been distributed to the collaborators of SP 5-Sr 5 in April 1982.

Tanks for storage and transport of hydrocarbon products will be the subjects of new pre-drafts by SP 5-Sr 8, Sr 9 and Sr 10 for which a meeting is foreseen in Romania in September or October 1982.

The reporting secretariat SP 5-Sr 11 concerned with devices for level gauging in tanks expects to be in a position to distribute its first pre-draft by the end of 1982.

The particular provisions for measuring assemblies equipped with volume meters will be subject to a 6th pre-draft by the reporting secretariat SP 5-Sr 13 which also plans to be in a position to distribute to its collaborators the first draft on turbine meters.

The reporting secretariat SP 5-Sr 15 expects to distribute before the end of 1982 a pre-draft concerning « meters and measuring systems for cryogenic liquids ».

The reporting secretariat SP 5-Sr 16 « water meters » plans a meeting in September in Zürich in connection with the IWSA Conference and an ISO/TC 30/SC 7 meeting.

A pre-draft concerning tables of data of hydrocarbon products is being elaborated by SP 5-Sr 18. This pre-draft will contain basically a proposal to adopt the new standard ISO 91-1982 for the use by OIML.

The reporting secretariat SP 5-Sr 19 plans the elaboration of a pre-draft on electronic devices applied to the measurement of the volume of liquids, in liaison with similar work within the European Community.

SP 6 - Measurement of gas volumes

The whole work of this secretariat will be reactivated at a meeting of the pilot secretariat in October 1982 in Paris.

The reporting secretariat SP 30-Sr 7 « gas calorimetry » has been transferred to the pilot secretariat SP 6 and becomes now SP 6-Sr 12. This reporting secretariat plans to elaborate, during 1982, a new version of its pre-draft concerning automatic gas calorimeters which will take into account recent technical progress in this field.

SP 7 - Measurement of mass

The 2nd pre-draft of SP 7-Sr 2 on electronic weighing devices was the subject of a meeting in Paris in May 1982.

A meeting of the pilot secretariat is planned to take place in Munich, in September 1982 and will be preceeded by a meeting of SP 7-Sr 4 concerning the revision of RI 3 which is presently at the stage of 4th pre-draft.

At the same time, a meeting of SP 7-Sr 5 will have to take a decision on the adoption of the 2nd draft concerning gravimetric filling machines.

The SP 7-Sr 8 draft concerning load cells (weigh cells) will be subject to discussions and decisions at the meeting of the pilot secretariat.

SP 9 - Measurement of density

The reporting secretariat SP 9-Sr 9 foresees the distribution of a first pre-draft on terminology to its collaborators.

SP 10 - Measuring instruments for motor vehicles, ships, etc.

The reporting secretariat SP 10-Sr 1 will complete its 2nd pre-draft on radar speed measuring instruments before the end of 1982.

SP 11 - Measurement of pressure

The reporting secretariat SP 11-Sr 2 plans to send to its collaborators a 2nd pre-draft concerning hierarchy schemes and SP 11-Sr 3 plans to elaborate a 4th pre-draft concerning piston manometers.

The 2nd pre-draft on « Methods of verification of manometers, vacuometers and manovacuometers with elastic sensing devices » will be elaborated by SP 11-Sr 4 as well as a first pre-draft on recording instruments using the same principle. A meeting of SP 11-Sr 4 is planned for 1983.

The reporting secretariat SP 11-Sr 5 plans to distribute to its collaborators a questionnary concerning a possible revision of RI 16 « Manometers for blood pressure measurement », taking into account the recent developments in this field.

The 3rd pre-draft of SP 11-Sr 7 on barometers is expected to be finalized and sent to the collaborators before summer 1982.

SP 12 - Measurement of temperature and calorific energy

The reporting secretariat SP 12-Sr 1 plans to finalize its first pre-draft on terminology concerning heat and temperature measurements before the end of 1982.

The reporting secretariat SP 12-Sr 5 proposes to submit for approval by OIML a draft concerning the adoption of the IEC publication on thermocouple data after its definite adoption by IEC possibly before the end of 1982.

SP 14 - Acoustics and vibrations

The work programme presented at the meeting of the pilot and reporting secretariats in Braunschweig in February 1982 foresees, concerning SP 14-Sr 1, the distribution before the end of the year of the first amended draft on the adoption for the use by OIML of the IEC Publication 651 on sound level meters.

The SP 14-Sr 2 has proposed to elaborate, during 1982, a pre-draft on audiometers based on IEC and ISO standards.

SP 16 - Ionizing radiations

The reporting secretariat SP 16-Sr 1 « Dosimeters with ionization chambers » is awaiting the developments of the IEC work before undertaking the elaboration of a 3rd pre-draft.

The reporting secretariat SP 16-Sr 2 « Secondary standard dosimetry laboratories » foresees a meeting in November 1982 in Budapest.

SP 18 - Measurement of characteristics of food products

In addition to the studies under way by SP 18-Sr 1 concerning the final version of the 4th pre-draft on grain moisture meters, SP 18-Sr 4 plans to elaborate a first pre-draft on automatic saccharimeters for the determination of the sugar content in sugar-beets and SP 5-Sr 18 a first pre-draft on refractometers for the determination of the sugar content of natural grape must.

SP 19 - Measurement of characteristics of materials

The work under way has generally been described in the summary of activities for 1981 (*). The activities of SP 19-Sr 1 « Force comparisons » have been suspended pending work undertaken by the Consultative Committee on Mass and Force (CCM) of BIPM.

(*) See Bulletin OIML N° 86, March 1982.

A meeting of SP 19-Sr 2 « Materials Testing Machines » took place in Paris in May 1982. A new edition of RI 9 to 12 concerning hardness reference blocks will be prepared by the reporting secretariat SP 19-Sr 3 when the final version of the corresponding ISO drafts have been received.

The SP 19-Sr 4 plans to undertake in 1983 a comparison of Rockwell and Vickers hardness blocks and has started an enquiry on this subject.

The 2nd pre-draft of SP 19-Sr 6 on terminology has been sent to the collaborators in April 1982.

SP 20 - Prepacked products

The responsibility for the reporting secretariat SP 20-Sr 1 « Information on package labels » having been assigned during the 18th meeting of CIML, it is planned to organise a meeting of the pilot and reporting secretariats in 1983 in connection with a seminar on the practical aspects of verification of prepacked products.

SP 21 - Standardization of metrological characteristics of measuring equipment

The activities of the reporting secretariats Sr 1, Sr 2 and Sr 4 have been the subject of a meeting in April 1982 in Souchoumi, USSR.

A new reporting secretariat SP 21-Sr 6 dealing with measuring systems was created during the 18th CIML meeting.

SP 22 - Principles of metrological control

A 4th pre-draft on the « Fields of use of measuring instruments subject to mandatory verification » will be elaborated by SP 22-Sr 1.

The reporting secretariat SP 22-Sr 2 foresees the elaboration of a 6th pre-draft concerning « Principles of the choice of parameters and characteristics to be verified ».

It is also planned that the work of SP 22-Sr 5 will result, before the end of 1982, in a draft International Document on the principles of metrological supervision.

SP 23 - Methods and means used for certification of verification devices

The first draft International Document elaborated SP 23-Sr 2 with the title « Principles concerning the official recognition, use and conservation of standards » is being examined by the pilot secretariat.

The work of SP 25-Sr 5 on the principles for the establishment of hierarchy schemes is terminated and this International Document will soon be published.

SP 25 - Developing countries

As requested by the Development Council the work of SP 25-Sr 2 will be printed in French and in English with the mention « published at the request of the Development Council ».

The reporting secretariat SP 25-Sr 3 is studying the comments received on its 3rd pre-draft concerning lists of verification equipment for national metrology services and foresees the elaboration of a 4th pre-draft as well as an extension of these lists to the fields of electrical and temperature measurements.

SP 26 - Measuring instruments used in the field of public health

The first pre-draft of SP 26-Sr 1 on blood cell counters will be distributed to the collaborators for comments.

The reporting secretariat SP 26-Sr 5 plans to start its activity at the national level by preparing a pre-draft on reference materials used in hematology.

The various pre-drafts in the field of bio-electrical instruments have been subject to a meeting in Rostov, USSR in May 1982.

SP 27 - Reference materials

The reporting secretariats SP 27-Sr 1, 3, 4, 5 and 6 plan to elaborate a series of first drafts for a meeting of pilot and reporting secretariats to take place in 1983.

The reporting secretariat SP 27-Sr 2 intends to propose the classification system at present being elaborated by ISO/REMCO for adoption by OIML. A similar resolution has been passed as regards SP 27-Sr 8 concerning the information system on certified reference materials.

SP 30 - Physico-chemical measurements

The reporting secretariat SP 30-Sr 1 foresees the distribution to its collaborators of two 3rd pre-drafts on reference materials for the verification of pH-meters and ionometers.

The reporting secretariat SP 30-Sr 2 continues its work on the final version of the draft « Calibration methods of conductivity cells ».

The reporting secretariat SP 30-Sr 3 foresees the elaboration of the final version of its 4th pre-draft on the « Practical scale for relative humidity of air » and of a 3rd pre-draft concerning « International psychrometric and hygrometric tables ».

The reporting secretariat SP 30-Sr 4 plans to elaborate the first draft on wood moisture meters. The work of this secretariat on grain moisture meters has been limited to the study of the work by SP 18-Sr 1 in the same field.

The reporting secretariat SP 30-Sr 6 will distribute to its collaborators the 3rd pre-draft on hierarchy schemes for the measurement of the humidity of gases and plans to start work on methods of verification of psychrometers.

The work of SP 30-Sr 7 on automatic gas calorimeters will be continued under the designation of SP 6-Sr 12.

The activities of SP 30-Sr 8 concerning the measurement of mercury content in air have been transferred to SP 30-Sr 10 which deals with gas analysis in a more general sense. This latter secretariat plans to elaborate, during 1982, the following two drafts : « Prescriptions for pure gases of CO, CO_2, CH_4, H_2, O_2 and N_2 used for analysis of gas mixtures » and « Verification methods of gas analysers for CO, CO_2, CH_4, O_2 and H_2 ».

The reporting secretariat SP 30-Sr 9 plans to elaborate an amended version of the first draft « Hierarchy schemes for instruments measuring the viscosity of liquids » and to study the comments of its collaborators on the 2nd pre-draft « Glass capillary viscosimeters, methods of verification ».

The reporting secretariat SP 30-Sr 12 plans to elaborate its first pre-draft on explosimeters during 1982.

SP 31 - Teaching of metrology

The reporting secretariat SP 31-Sr 1 plans to finalize the first draft International Document concerning the required qualifications for metrology engineers.

The reporting secretariat SP 31-Sr 2 has distributed, in April 1982, its first pre-draft on training of metrology technicians and verification officers.

The responsibility for the reporting secretariat SP 31-Sr 3 concerning advanced training in metrology is now vacant.

RÉUNION
du CONSEIL de DÉVELOPPEMENT de l'OIML

Le Conseil de Développement s'est réuni au BIML les 22 et 23 mars 1982 pour la première fois depuis son institution officielle par la 6e Conférence Internationale de Métrologie Légale.

L'assistance était très nombreuse, ce qui était en partie dû au fait que la plupart des participants étaient venus à Paris pour assister à la 18e réunion du CIML. La participation future de certains pays au Conseil sera confirmée par une enquête en cours.

Les représentants des Institutions Internationales suivantes ont activement contribué aux débats :

Commonwealth Science Council (CSC), IMEKO, ISO, ONUDI, UNESCO.

Après l'élection du président, Mr G. SOUCH (Grande-Bretagne), Mr ATHANE a brièvement rappelé le fonctionnement du Conseil de Développement selon les statuts adoptés par la 6e Conférence de Métrologie Légale en 1980 ainsi que les conditions de financement de son fonctionnement.

Quelques discussions ont suivi sur la délimitation des activités du Conseil. Il a été convenu que le terme « métrologie légale » doit être interprété dans son sens le plus large de façon à correspondre aux besoins des pays en voie de développement, tout comme cela est le cas déjà dans un certain nombre de pays industrialisés.

Mr ATHANE a aussi rappelé que le Conseil n'agit qu'en tant qu'organe consultatif auprès du CIML.

Les travaux récemment effectués par l'OIML en faveur des pays en voie de développement ont ensuite été passés en revue (et principalement les travaux du SP 25 et l'édition de brochures par le BIML).

Le Conseil a recommandé que les travaux du SP 25 ainsi que certaines brochures éditées par le BIML portent à l'avenir la mention « publiés à la demande du Conseil de Développement ».

Les représentants des Institutions Internationales ont ensuite exposé les actions entreprises en faveur des pays en voie de développement dans le domaine de la métrologie : (*)

Mr N.G.A. KHAN, pour le Commonwealth Science Council

Mr N.N. CHOPRA, pour l'ISO

Mr M. FREDERIKSEN, pour l'UNESCO

Mr A.G. EVSTAVIEV, pour l'ONUDI

Mr J. BOZICEVIC, pour l'IMEKO.

Des extraits des exposés ainsi présentés sont reproduits à la fin de ce rapport.

La forme de collaboration de l'OIML avec les autres organisations et institutions a ensuite fait l'objet de discussions.

Les possibilités de financement de projets de caractère régional par l'UNESCO et l'ONUDI doivent être explorées par le BIML en tenant compte de la collaboration possible de la part de l'ISO, du CSC et de l'IMEKO ainsi que des organisations régionales non représentées à la réunion : ARSO, ASMO et SIM.

(*) Des rapports de l'ARSO et de l'ASMO ont été présentés par écrit.

Il a été proposé que le BIML agisse comme un **centre d'information pour des cours et des séminaires** organisés dans différents pays. Ceci s'avère cependant difficile du fait que beaucoup d'informations à ce sujet arrivent souvent trop tard au BIML. Il est donc préférable que cette information, comme par le passé, soit diffusée parallèlement par les organismes concernés et par le BIML quand il en a connaissance.

En ce qui concerne le niveau de technicité des cours et séminaires pour les pays en voie de développement, plusieurs orateurs ont insisté sur le fait qu'il ne convient pas de viser trop haut bien que les besoins varient énormément d'un pays à l'autre.

Le BIML estime que le séminaire technique prévu au sujet des produits préemballés sera probablement, vu son aspect pratique, d'un grand intérêt aussi bien pour les pays en voie de développement que pour les pays industrialisés, le problème étant cependant surtout celui du financement des voyages.

Plusieurs orateurs ont souligné la difficulté d'appliquer directement certaines recommandations de l'OIML et estiment que le BIML devrait **élaborer des guides** pouvant aider les pays en voie de développement à formuler leur propre réglementation technique et à écrire des instructions de vérification.

L'identification des besoins en métrologie constitue un des premiers problèmes d'un pays en voie de développement et selon l'expérience de l'Australie, il appartient même aux pays industrialisés d'aider à formuler ces besoins.

Après une discussion à ce sujet, le Conseil fut d'avis que des études dans les pays concernés étaient susceptibles de donner de meilleurs résultats qu'une enquête par correspondance. Ces besoins pourraient faire l'objet de séminaires régionaux tels que ceux précédemment organisés par le CSC et l'UNESCO. Le Conseil a chargé le BIML d'explorer cette possibilité.

Plusieurs délégués ont exprimé le désir que **l'OIML soit mieux connue** des pays en voie de développement et que l'organisation incite davantage ces pays à devenir membres correspondants de façon à mieux profiter de ses travaux. Il a cependant été souligné que la collaboration dans ce sens peut utilement continuer à s'effectuer par l'intermédiaire des organisations régionales.

Un grand nombre de participants se sont prononcés en faveur de l'organisation de **cours pratiques de métrologie** dans les pays en voie de développement avec l'assistance d'experts des pays industrialisés. Ceci évidemment sous condition de trouver des sources de financement.

Le Conseil de Développement a également voté en faveur de la proposition de son président de demander au BIML d'enquêter et d'informer au sujet **d'équipements de vérification** pouvant être mis à la disposition des pays en voie de développement à prix réduit, à la suite de réorganisations de certains services métrologiques.

Il a été laissé au BIML le soin de proposer la date et le lieu de la prochaine réunion du Conseil de Développement compte tenu de l'impératif de l'organiser conjointement avec une autre manifestation de façon à réduire les frais de voyage des participants.

MEETING
of the OIML DEVELOPMENT COUNCIL

The Development Council met at the BIML on 22 and 23 March 1982 for the first time since its official creation by the 6th International Conference of Legal Metrology.

The participants were in great number partly due to the fact that many delegates had come to Paris for the 18th meeting of CIML. The future participation in the Council of some countries will be confirmed through an enquiry which is under way.

The delegates of the following International Institutions actively contributed to the discussions :

Commonwealth Science Council (CSC), IMEKO, ISO, UNESCO, UNICO.

After the election of the Chairman, Mr G. SOUCH (U.K.), Mr ATHANE summarized the functions of the Development Council in accordance with the statutes adopted by the 6th Conference of Legal Metrology in 1980 as well as the financing of its operation.

Some discussions followed on the limitations of the activities of the Council. It was agreed that the term « legal metrology » should be interpreted in its widest sense to correspond to the needs of developing countries just as it is the case in a certain number of industrialized countries.

Mr ATHANE also reminded the participants that the Council acts only as a consultative body to the CIML.

The recent activities of OIML for the benefit of developing countries were thereafter reviewed (and mainly those of SP 25 and the publication of brochures by BIML).

The Council advised that the work of SP 25 as well as certain brochures published by BIML should in future carry the mention « published at the request of the Development Council ».

The delegates of the International Institutions reported on the range of activities undertaken by them for the developing countries in the field of metrology (*) :

Mr N.G.A. KHAN for the Commonwealth Science Council

Mr N.N. CHOPRA for ISO

Mr M. FREDERIKSEN for UNESCO

Mr A.G. EVSTAVIEV for UNIDO

Mr J. BOZICEVIC for IMEKO.

Parts of these presentations are reproduced at the end of this report.

The form of cooperation of OIML with other organisations and institutions was then discussed.

The possibilities of financing regional projects through UNESCO and UNIDO shall be explored by the BIML taking into account the possible cooperation with ISO, CSC and IMEKO as well as of the regional organisations not present at the meeting ARSO, ASMO and SIM.

(*) The organisations ARSO and ASMO, which could not sent delegates, have sent written reports.

It was suggested that BIML acts as an **information centre for courses and seminars** organised in various countries. This is however difficult since much of the relevant information is frequently received too late by the BIML. It is therefore preferable that like in the past such information be distributed independently by the organisations concerned and by the BIML.

As to the technical level of the courses and seminars for developing countries, several speakers emphasized that it may not be appropriate to aim too high although the needs vary enormously from country to country.

The BIML assumed that in view of its practical aspects, the planned technical seminar on prepacked products will most probably be of great interest to developing as well as to the industrialized countries, the main problem being that of financing the traveling costs.

Some speakers stressed the difficulty of applying the OIML Recommendations directly and suggested that the BIML should elaborate **notes for guidance** which may help the developing countries to write their own technical regulations and verification instructions.

The **identification of the needs in the field of metrology** is one of the first problems for the developing countries and according to the experience of Australia, it is advisable that the industrialized countries assist in the establishment of an inventory of these needs.

After some discussions on this subject the Council came to the conclusion that studies in the developing countries concerned were likely to give better results than an enquiry by correspondence. These needs could be the subject of regional seminars such as those already organized by CSC and UNESCO. The Council requested the BIML to explore this possibility.

Several delegates wished the **OIML to be better known** in the developing countries and that the organisation should stimulate these countries to become corresponding members so that they could benefit better from the work of the organisation. It was pointed out however that cooperation in this direction may with advantage continue through the regional organisations.

A great number of participants were in favour of arranging **practical metrology courses** in developing countries with the assistance of experts from industrialized countries. This is of course once again subject to the availability of funds.

The Development Council also voted in favour of the proposal of its Chairman to ask BIML to enquire and inform about **verification equipment** which may be made available at low cost to developing countries as a result of reorganisation of certain metrology services.

Il was agreed that BIML should suggest the date and place of the next meeting of the Development Council taking into account the necessity of organising this meeting jointly with another event to reduce the travel costs of the participants.

UNESCO

ASSISTANCE to the DEVELOPING COUNTRIES in the FIELD of METROLOGY WITHIN UNESCO's PROGRAMME

L'exposé suivant a été présenté par le délégué de l'UNESCO, Mr M. FREDERIKSEN, lors de la réunion du Conseil de Développement de l'OIML du 22 au 23 mars 1982.

The following speach was presented by the UNESCO delegate, Mr M. FREDERIKSEN, to the OIML Development Council at its meeting on 22-23 March 1982.

The collaboration between OIML and Unesco has been strengthened after the fifth General Conference of OIML in Paris in 1976. OIML's « Pilot Secretariat SP-25 » provided an excellent assistance to the development of Unesco's present programme activities in Metrology.

The first action in this direction was the organization of regional seminars in Metrology and Legal Metrology with a view to create an active cooperation in this field within the Member States of Unesco. Three seminars of this kind were held in Asia (Colombo, December 1980), Latin America (Sao Paulo, December 1980), and the Arab States (Amman, February 1981, in collaboration with ASMO). Furthermore a regional workshop on Scientific and Industrial Technology was held in December 1980 in New Delhi. This meeting was organized in collaboration with the National Physical Laboratory, New Delhi and the Commonwealth Science Council (CSC).

In recognition of the need of strengthening metrology infrastructures in the developing countries, the General Conference of Unesco, at its twenty-first session in Belgrade, 1980, included substantial activities in this field within its programme. Paragraph 2174 of document 21 C/5, « Approved Programme and Budget for 1981-1983 » mentions :

« In cooperation with organizations such as the International Organization for Legal Metrology (OIML) and the International Organization for Standardization (ISO), encouragement will be given to the development of metrology and instrumentation through the establishment of programmes of training, co-operative research and exchanges of personnel. To this end a series of regional training courses will be organized in co-operation with appropriate organizations ».

This programme has been « regionalized », i.e. carried out through Unesco's five Regional Offices for Science and Technology. The following activities have been implemented in 1981 :

— Two contracts were issued to the Commonwealth Science Council as financial contribution to a demonstration programme on inter-comparison of time and frequency standards, which was executed under the CSC/Unesco Asia/Pacific Metrology Programme.

— A feasibility study on regional metrological services in South and Central Asia has been carried out.

— A sub-regional seminar in selected fields of Metrology was held at the Central American Institute for Industrial Research and Technology (ICAITI), Guatemala, from 30 November to 11 December 1981 with support from the Italian National Research Council, which provided two professors from its Metrology Institute to give lectures at the course.

The programme will continue to support training courses in Africa, the Arab States, Asia and Latin America. Among planned events in 1982 we can mention :

— A basic training course on Standardization, Quality Control and Metrology, 22 February - 5 March 1982 in Freetown, Sierra Leone. This will be organized by CSC in cooperation with ARSO and Unesco.

— Support to a regional training workshop in selected fields of Metrology in an Arab Member State which will be organized by ASMO.

— Two subregional training courses in Latin America ; one in Montevideo with assistance from the Italian Metrology Institute « G. Colonetti » and another in a Caribbean Member State in cooperation with CSC.

— In the framework of the Asia/Pacific Metrology Programme support will be provided to a regional training workshop in Metrology in Asia to be organized by CSC.

— Within the framework of cooperation with the Union of International Technical Associations (UATI), support will be provided to a regional seminar on instrumentation in production engineering research, to be organized in Asia in collaboration with the International Union of Production Engineering.

— Research (CIRP).

In this connection, it should be mentioned that a close cooperation has been established between Unesco and CSC in the execution of activities in this field in Africa, Asia and the Caribbean region.

Attention may also be drawn to the possibility of obtaining financial assistance from Unesco's Participation Programme (*) for the development of the infrastructure of Metrology Services in the developing countries. Bolivia, Colombia, Nepal and the Democratic Republic of Korea have in the past received such assistance. Another project of this kind provided financial assistance to specialists from non-Commonwealth countries in Asia in order to participate in the CSC's « Asian and Pacific Regional Metrology Conference and Workshop », organized by CSC in Wellington, New Zealand, from 29 October to 9 November 1979.

(*) Requests for projects under Unesco's Participation Programme should be addressed to the Director-General of Unesco and presented (before the end of each year) through the National Commission for Unesco of the Member State concerned. The usual nature of such a request concerns consultant services, fellowships, equipment and support for organization of meetings.

ONUDI **UNIDO**

UNIDO ACTIVITIES in the FIELD of METROLOGY in the DEVELOPING COUNTRIES

by **Mr. A.G. EVSTAVIEV,**
Head Institutional Infrastructure Branch, Division of Industrial Operations

L'exposé suivant a été présenté par le délégué de l'ONUDI lors de la réunion du Conseil de Développement de l'OIML du 22 au 23 mars 1982.

The following speach was presented by the UNIDO delegate to the OIML Development Council at its meeting on 22-23 March 1982.

Mr. President, distinguished delegates, ladies and gentlemen :

I am honoured by the opportunity given to me to address this distinguished International Conference on behalf of the United Nations Industrial Development Organization (UNIDO). Our presence here is an indication of the basic importance we attach to metrology in the industrial development of developing countries and it also testifies the good working relationships between UNIDO and OIML which we would like to further strengthen in the future.

As a matter of fact, we consider that the establishment, organization and operation of a national metrology service including the required laboratories is a necessity for the developing countries. Such a service will provide the required national reference standards, the link with the international reference standards kept by your organization, as well as a national calibration chain and last but certainly not least, metrology services to industry.

As you know, UNIDO's main concern - industry - has become imperative to any consideration of development and international co-operation. As you may recall, this provided the focal point for the Second General Conference of UNIDO which was convened in Lima, Peru in March 1975. At this conference the Lima Declaration and Plan of Action for Development and Co-operation were adopted and were subsequently ratified by the United Nations General Assembly. The Lima Declaration calls for the increase of the developing coutries' share in world industrial production to the maximum level and to at least 25 % by the end of the century. This share was approximately 7 % in 1975 and has not yet reached 10 %.

The New Delhi Declaration and Plan of Action which were adopted by vote at the Third General Conference of UNIDO held in New Delhi in January and February 1980, outlined measures to promote industrial development and to advance the Third World toward the target set by the Lima Declaration in 1975. These measures seek to mobilize the resources of the developing countries and to strengthen international industrial co-operation between developing and developed countries and among developing countries themselves.

The role of metrology as well as standardization and such related activities as quality control and certification in industrial development are well recognized by the developing world. It has enabled developing countries to strengthen their economic base. No scientific and technical advances which affect industry and trade could be

made without a suitable system of measurement provided by the International Standards of Measurement. The developing countries are now aware of the need for good measurement as a fundamental principle not only for the development of science and technology but for turning the wheels of industry. The quality of industrial production depends on better definition and accuracy of measurements. Therefore in many developing countries such as Iran, Iraq, Mauritius, Brazil, Indonesia, etc. new metrological services are being created to meet the requirements of the industry.

The existence of an infrastructure of applied metrology along with full provision for legal metrology is a basic requirement for quality control and for standardization, for without it the preparation and application of standards, leading to better quality, reliability and safety of industrial goods and products, would be impossible. Therefore the task of establishing an infrastructure of applied metrology including an enforcement mechanism must be simultaneously undertaken with the establishment of national standards.

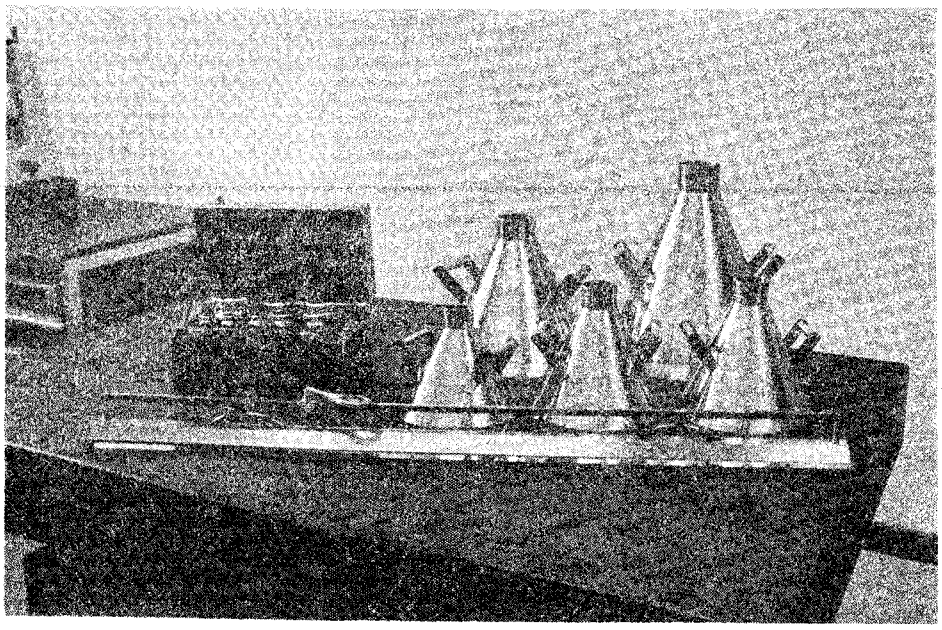
UNIDO's primary aim is to assist the developing countries in these particular fields. UNIDO programmes in the area of metrology are mainly carried out under technical assistance projects financed by the United Nations Development Programme. Training programmes in metrology are organized once a year with the voluntary contribution of the USSR. Since its establishment, UNIDO has increasingly been providing technical assistance to developing countries in metrology and related activities, and also in training of local personnel. UNIDO has also been assisting regional standards and metrology organizations such as the Arab Standards and Metrology Organization (ASMO), Latin American Regional Standards Organization (COPANT), the African Regional Standards Organization (ARSO), and also assists in the reactivation of regional standards activities in the ESCAP region.

Co-ordination and co-operation in these activities with other UN, governmental and non-governmental organizations is also required to ensure the successful development and implementation of international metrology and standardization programmes. UNIDO has been co-operating with UNESCO and ISO which has consultative status with UNIDO.

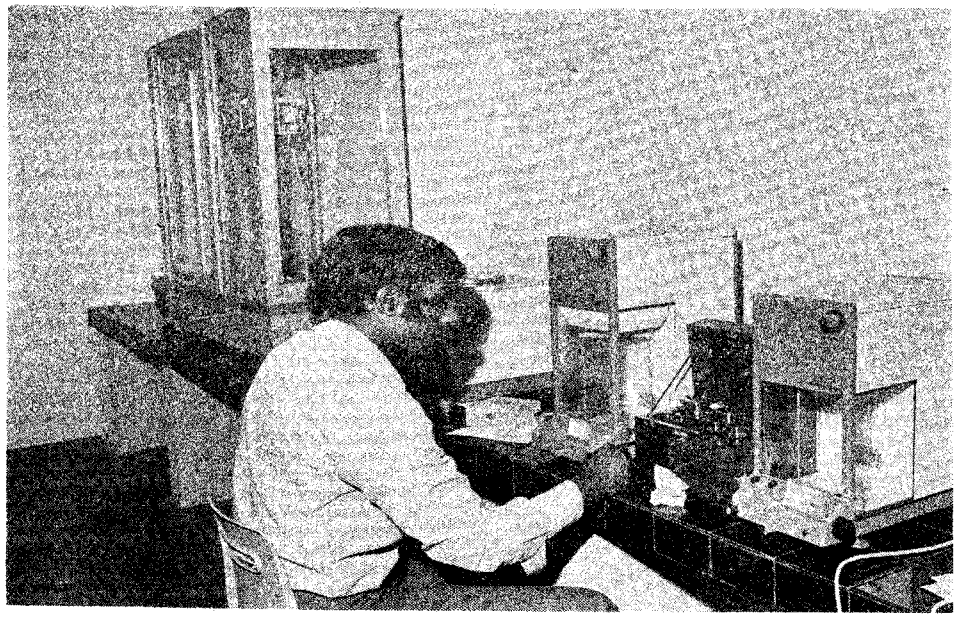
Mr. President, distinguished delegates : It gives me great pleasure to remark that considering the importance of metrology and related disciplines for the industrialization of developing countries, UNIDO and OIML went one step further in their co-operation when the Executive Director of UNIDO, Dr. Abdel Rahman Khane and the former President of OIML, Mr. A.J. van Male decided to formalize relations between our organizations. By signing the memorandum of co-operation, the collaboration of the two organizations has been intensified for the benefit of the developing countries.

Thank you, Mr President.

L'ILE MAURICE - Un pays en développement



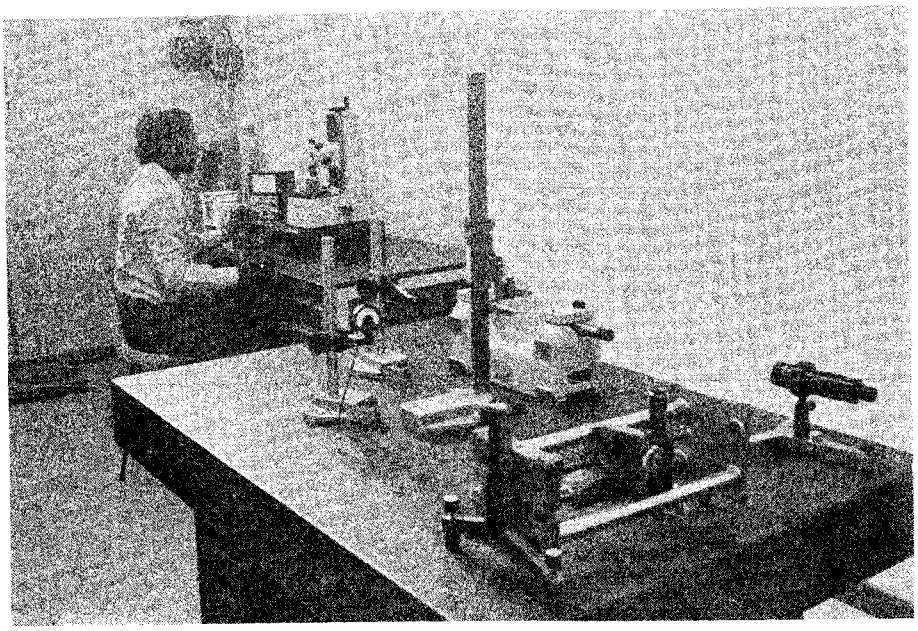
Les étalons principaux de l'Ile Maurice pour masse, longueur et volume.
Basic physical references of Mauritius for mass, length and volume.



Le laboratoire d'étalonnage de masses.
Mass metrology laboratory of Mauritius Standards Bureau.

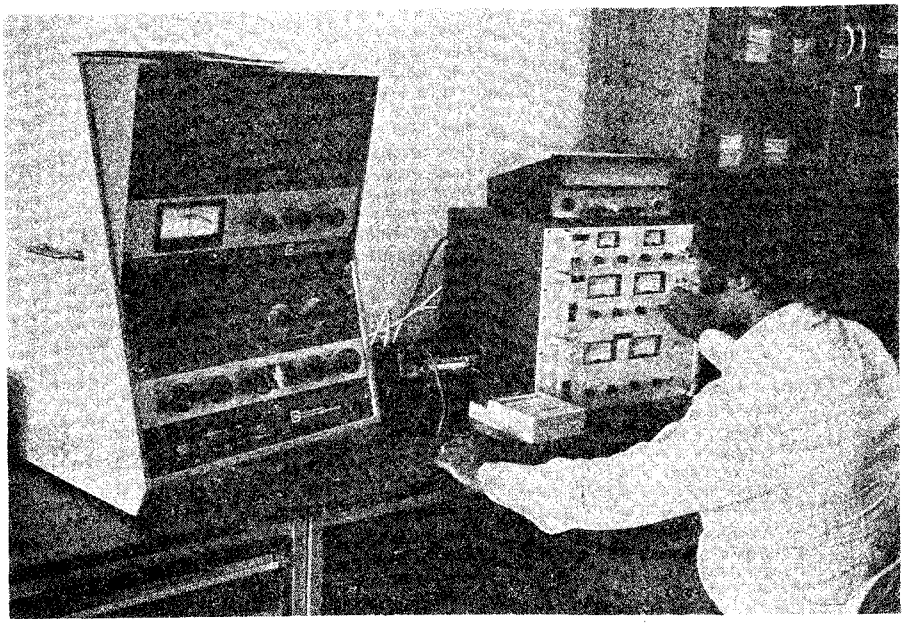
Documentation UNIDO

MAURITIUS - A developing country



Le laboratoire de mesures dimensionnelles.

Length and engineering metrology laboratory of Mauritius Standards Bureau.



Le laboratoire national d'étalonnages électriques.

Electrical calibration laboratory of Mauritius Standards Bureau.

Documentation UNIDO

COMMONWEALTH SCIENCE COUNCIL

METROLOGY for DEVELOPING COUNTRIES : A CSC APPROACH

by **Dr. M.N.G.A. KHAN**
Deputy Secretary, Commonwealth Science Council

L'exposé suivant, qui décrit l'action dans le domaine de la métrologie du Conseil du Commonwealth pour la Science, a été présenté lors de la réunion du Conseil de Développement de l'OIML du 22 au 23 mars 1982.

The following paper which describes the actions undertaken by the Commonwealth Science Council to assist developing countries in the field of metrology, was presented to the OIML Development Council at its meeting 22-23 March 1982.

Summary

The Commonwealth Science Council (CSC), the prime intergovernmental agency to promote science cooperation in the Commonwealth, has been involved in standardization and metrology activities since the late Seventies. Three regional cooperative programmes are in operation - in Asia/Pacific, Africa and Caribbean. Specific projects cover standards formulation, testing methods, calibration, training, metrication, intercomparison, information, legal and industrial metrology and technology transfer. Although originally designed to foster collaboration within the Commonwealth, the scope is now far widened with participation of countries from outside the Commonwealth family of nations.

In operating the programmes, CSC has received and benefitted from the collaboration of UNESCO, ASCA (*), ARSO (**), ADAB (***), OIML, PTB and UNIDO.

This paper summarizes recent progress in the standardization, metrology and related activities of the CSC, and outlines specific CSC initiatives for developing countries.

The approach of the CSC in addressing the question of standardization and metrology cooperation is also explained briefly.

Introduction

A major Commonwealth initiative in the general area of standardization commenced in the mid-Seventies. In reviewing its programme, the Commonwealth Science Council, in 1975, observed that the successful application of science and technology in any country requires the provision, not only of an infrastructure in education,

(*) ASCA = Association of Science Cooperation in Asia.
(**) ARSO = African Regional Standards Organization.
(***) ADAB = Australian Development Assistance Bureau.

training, survey, research and development, but also of a series of activities broadly termed as standards. It was also recognized that in a technological context, the word « standards » is used in two quite separate but related meanings : firstly, in the sense of measurement and secondly, in the sense of specification standards. This realization resulted in programmes which cover both aspects, bearing in mind the scientific and technical content of these activities.

A survey of standards organizations in the Commonwealth in 1975-76 determined the framework for an integrated approach towards promoting standardization with varying emphases in the different aspects of recognition of the state of development within a geographical grouping of countries concerned. Three regional cooperative programmes were initiated : the Asia/Pacific Metrology Programme (APMP) which was launched in late 1977 ; the African Programme in Standardization and Quality Control (APSQC) which came into existence in mid 1978 ; and the Caribbean Metrology Programme (CMP) which came about in 1979. Technical management is achieved through regional steering committees comprising officially nominated professionals headed by a Regional Programme Coordinator in each case. Australia, Tanzania and Barbados are providing the current coordinators. Funding of the programmes is shared among the participating countries and the collaborating agencies. The Commonwealth Fund for Technical Cooperation (CFTC) has been a major source of external funds. Funding support has also been received from The Commonwealth Foundation (CF), UNESCO, UNIDO and ARSO. ISO has provided technical support particularly in the training activities in Africa and in the Caribbean. Selected OIML publications circulated through these programmes have been found very useful.

Recent Developments

The emphasis of each programme is, of necessity, different in order to reflect the regional needs. The Asia/Pacific programme has concentrated on carrying out a comprehensive intercomparison programme on mass, length, voltage, resistance, time and frequency, to name a few. A comprehensive list is given in Table I. Training, advice and calibration comprise the other activities. It is hoped that the national standards of all countries participating in this programme will have current verification of calibration by 1983. As a prelude to this, two directories of calibration facilities in the region have already been published, the second one in cooperation with ASCA. A basic training course on legal and industrial metrology was held in 1979 at the National Physical Laboratory in New Delhi. In collaboration with UNESCO, a Regional Training Workshop on Scientific and Industrial Metrology was held again at the National Physical Laboratory in India. Training has also been completed or offered in the fields of mass, length, temperature, photometry and radiometry, microwave attenuation, general metrology, pressure, acoustics, engineering metrology, basic electricity, etc. An up-to-date listing is given in Table II.

A survey is planned to assess the instrument maintenance needs of the region. Advice has been given through consultation visits to Indonesia, Republic of Korea, Malaysia, Mauritius, Nepal, Philippines, Singapore, Sri Lanka and Thailand. Two technical meetings are planned for this year :

1. Regional Workshop on Metrology in Quality Assurance, 27-30 April 1982, Kuala Lumpur, Malaysia.
2. Regional Workshop on Metrology for Developing Countries, 30 August - 10 September 1982, Sydney, Australia.

In recognition of the special needs of countries at present without any basic metrology infrastructure, a special subcommittee has been assigned the task of identifying specific projects which will assist in the building up of new oriented infrastructures. Mr H.L.K. Goonetilleke of Sri Lanka together with Mr H. Kartowisastro of Indonesia comprise this important sub-committee.

The African Programme comprises information exchange, training, regional standards and test methods, sharing of testing and calibration facilities, metrology and technology transfer. On information exchange, we are in the process of preparing a document on Guidelines to Establish a National Metrology Service. A draft document has been circulated for comments. Recently, a two week basic training course on Standardization, Metrology and Quality Control was held at Freetown. ARSO, UNESCO and ISO joined with CSC in planning and implementing the programme. The course was jointly funded by the Commonwealth Fund for Technical Cooperation and UNESCO The non-Commonwealth countries which participated were Egypt, Sudan, Liberia and Ethiopia. This was the second basic training course. The first one, covering only standardization and quality control, was held in Nairobi in 1979.

Forthcoming events for this programme include :

1. Regional Specialized Training Workshop in Certification, 1982-83, Mauritius.
2. Second Review Meeting, African Programme on Standardization and Quality Control, September 1983, Tanzania.

The Caribbean Programme covers four areas : industrial metrology, legal metrology, information and training. In October 1980, a two week training course on standardization and metrology was organised in cooperation with ISO and UNIDO. Late last year, a training workshop on alcoholometry was held in Trinidad and Tobago. The object was to familiarise participants with the methodologies associated with the changeover in measuring the alcohol content of liquids from « Sikes proof » method to the percentage volume/volume method, the new system agreed on in 1972 by OIML. In this context, the workshop acted as an instrument in implementing the OIML recommendation No. 22.

Lists of CSC technical meetings and publications are appended to this paper with a view to giving a better appreciation of CSC's activities through these three programmes.

Metrology in Developing Countries

The metrology situation in developing countries suffers from a number of basic inadequacies. Some important ones are :

1. No infrastructure at all.
2. An inadequate organization running basically an office. The Head of the organization has hardly any technical support staff or necessary equipment. Whatever metrology activity there is, is confined to the capital city alone or in some cases extending to some major towns only.
3. More than one organization, with overlapping responsibilites.

The first is a rare case. The other two are more predominant and are real obstacles to development of national metrology systems.

Although the CSC programmes are intended to serve all countries in the different regions, the developing countries with inadequate metrology facilities are unable to benefit to any significant extent. For example, many such countries cannot participate in the intercomparison exercises nor can they take the best advantage of the training offers unless they have on-going activities. They cannot also take advantage of the calibration services that are available. The programme is generally able to offer training and advice but is not in a position to assist in the building up of physical metrology infrastructures. The main responsibility of building up facilities, of course, lies with member governments.

The programmes, if suitably designed, can play useful catalytic roles in this respect as well. The Steering Committee for the Asia/Pacific Programme discussed this issue at the recent meeting in Jakarta and requested the Indian and Indonesian representatives to investigate the matter further.

International initiatives in isolation will simply fail to bring about the desired changes unless these are backed by full participation of professionals in the country and Government support. The CSC programmes are particularly focussed on the above difficulties. Technical advice has been provided to countries facing one or more of the difficulties outlined above. An attempt has been made to highlight specific problems through technical workshops and training courses. It is always a difficult process to undo a historical folly but the problems have solutions given the necessary recognition and willingness to improve the situation.

OIML/CSC Collaboration

In recent years, OIML/CSC collaboration has grown closer. The OIML representatives made very valuable contributions to the CSC meetings, which are gratefully acknowledged.

Technical publications are exchanged regularly between these two organizations. Some OIML publications have been reprinted by the CSC and circulated widely. Favourable comments have been recieved from the recipients of these.

In the development of national metrology infrastructures in developing countries, apart from technical advice and training, provision of equipment remains a critical need. In this context, the proposal of Mr Souch to establish an « Exchange Mart » service would be very helpful. We have proposed to our advanced laboratories that they prepare lists of somewhat out-of-date equipment for donation of such equipment to appropriate developing countries. The CSC has voted some funds to arrange shipment of such equipment. The CSC would be very happy to work closely with any OIML initiative in this regard.

The establishment of the OIML Development Council is a most welcome move and the CSC wishes full success to the Council in meeting its objectives of assisting developing countries in strengthening their metrology activities. Initially, developing countries will find it difficult to embark on a single activity such as legal metrology ; the scope of the Development Council's work may therefore need widening to incorporate other related work in the field of standardization and metrology. This may involve some risk of intruding in the areas of responsibility of other international organizations, but this is worth taking. The other alternative would be to work in conjunction with other relevant international organizations to ensure that developing countries are able to approach the standardization issue on an integrated basis, at least to start with. For any international initiative to be successful, it is necessary that such an initiative be based on

a) full needs of member countries and

b) firm commitments of countries which are to benefit from the initiative.

Special activities have therefore to be designed by international organizations to develop awareness of the need of metrology in national development efforts. In this context, CSC would welcome continuing OIML collaboration in promoting international metrology cooperation and thereby assist development of national metrology infrastructures. OIML cooperation, particularly in information, technical advice, training and provision of equipment, would be most helpful.

The CSC Approach

In promoting metrology collaboration, CSC has adopted a flexible approach. Technical scopes have not been limited to a single specialized area only. They have been designed to meet specific needs of participating countries at different stages of scientific and technological development. For countries at an early stage of development, provisions have been made to offer technical advice, information,

training and calibration. The basic thrust has been to assist in the establishment of new orientated national infrastructures. For countries at higher stages of development, experiments such as international time and frequency intercomparison have been carried out.

The programmes have established cooperative linkages with national establishments dealing with weights and measures, metrication, standardization, testing and calibration and scientific metrology. In many countries, these are separate functions. In such cases, the CSC programmes have provided a framework for national coordination of these as well. In essence, the programmes are promoting an integrated approach to standardization nationally and internationally.

Although the three programmes had a Commonwealth origin, they are no longer solely a Commonwealth activity or responsibility. Participation has been made open to other interested countries in each region. The Asia/Pacific Programme benefitted from the active participation of China, Japan, the Philippines, Republic of Korea, Thailand and Indonesia. Collaboration is being established with Nepal, Pakistan and Burma. Indonesia has been representing these countries on the Programme's Steering Committee. The Asia/Pacific Programme is now a partnership of several international and regional agencies which include UNESCO, ASCA, ADAB and CSC.

Discussion is in progress about providing central coordination from within the region rather than from London. This would undoubtedly strengthen the reach of the programme.

In the African Programme, close collaboration has been established with Africa Regional Standards Organization (ARSO) and UNESCO. ISO has been involved in this programme since its inception.

This programme is also open to non-Commonwealth countries and has benefitted from active participation from some of them. Negociations are already in progress to transfer the responsibility of operating this programme from CSC to ARSO, once again to regionalise the initiative. Collaboration with UNESCO is also close in the Caribbean programme and it is CSC's intention to develop the partnership further and share responsibility more effectively.

In summary, the CSC's approach covers the following :

— develop regional programmes
— promote an integrated approach to standardization
— make participation open to all interested countries in the different regions
— establish meaningful partnership with appropriate regional and international agencies
— regionalise the initiatives and thereby reduce CSC's own involvement.

Conclusion

CSC is very encouraged by the effective catalytic role it has been fortunate to play in pooling several regional and international initiatives together. The initiation of the ADAB programme is regarded as a direct consequence of CSC's efforts in the Asia/Pacific region. The programmes have now achieved considerable maturity. The CSC would therefore like to see new mechanisms for the programmes to attain self sufficiency with CSC's involvement reduced, as had already been mentioned.

In brief, CSC foresees future development on two fronts :

1. the Programmes' ability to respond more effectively to the needs of those developing countries with inadequate metrology infrastructure
2. the Programmes attaining self-sufficiency, thereby minimising the need for CSC's continued involvement.

The achievements of the programmes within a period of four years have been most encouraging. Future prospects of these are also very promising. Their evolutionary and flexible nature, coupled with their achievements to date, make the programmes unique and fine examples of international collaboration in science and technology.

In future, it is intended to widen the scopes of the programmes even further, so that they can offer collaboration to countries at varying stages of development.

The CSC recognises with deep appreciation the collaboration and financial support received from the various governments, participating laboratories, UNESCO, ISO, OIML, UNIDO. The Commonwealth Foundation and CFTC in pursuing these very fruitful regional initiatives. It is hoped that the programmes will continue to grow to provide more meaningful services to the participating institutions. In this regard, even closer collaboration with other regional and international institutions would be most helpful.

TABLE I

Intercomparison Activities in Progress :
Asia/Pacific Metrology Programme

Measurement Field	**Coordinating Countries**
ac voltage and current	Australia
acoustics	Australia
dc resistance	New Zealand
dc voltage	India
	Australia
length	Malaysia
mass	Singapore
photometry	Australia
temperature	Australia (completed)
time and frequency	New Zealand (1st & 2nd completed)

TABLE II

Proposed Specialised Training in Australia

India	photometry and radiometry microwave attenuation
Korea	temperature (completed) photometry and radiometry
Malaysia	engineering metrology (completed) mass length
Pakistan	ac and dc electrical temperature
Philippines	mass ac and dc electrical
Singapore	temperature
Sri Lanka	engineering metrology ac and dc electrical

LIST OF CSC PUBLICATIONS ON STANDARDIZATION & METROLOGY

CSC(77)MS-1	Commonwealth Regional Metrology Programme. Report on the Regional (Asia/Pacific) Project Group Meeting on Collaboration in Measurement Standards, 21 November - 2 December 1977, New Delhi - Proceedings
CSC(77)MS-2	Commonwealth Regional Metrology Programme. Country Reports and Technical Papers presented at the Regional (Asia/Pacific) Project Group Meeting on Collaboration in Measurement Standards, 21 November - 2 December 1977, New Delhi
CSC(78)MS-3	Commonwealth Regional Metrology Programme. Report of the First Meeting of the Steering Committee, 4-6 July 1978, Kuala Lumpur, Malaysia
CSC(79)MS-4	Commonwealth Regional (Asia/Pacific) Metrology Programme. Report of the Second Meeting of the Steering Committee, 28-30 March 1979, Colombo, Sri Lanka
CSC(79)MS-5	Regional (Asia/Pacific) Metrology Programme - Directory of Calibration Facilities
CSC(79)MS-6	Commonwealth Regional Metrology Programme. Report of the First Review Meeting, 29 October - 9 November 1979, Wellington, New Zealand, Volume I
CSC(79)MS-7	Commonwealth Regional Metrology Programme. Report of the First Review Meeting, 29 October - 9 November 1979, Wellington, New Zealand, Volume II
CSC(80)MS-8	Commonwealth Regional Metrology Programme. Glossary of Metrological Terms
CSC(80)MS-9	Commonwealth Regional Metrology Programme. Guidelines for Estimation and Statement of Overall Uncertainty in Measurement Results
CSC(80)MS-10	Guide to Authors
CSC(80)MS-11	Metrology Abstracts - A Bibliography of Laboratory Reports
CSC(80)MS-12	Report of the Meeting of the Third Steering Committee, 1-4 September 1980, Hong Kong
CSC(80)MS-13	Metrology and Metrology Related Organizations
CSC(81)MS-14	Report on the First Time and Frequency Intercomparison
CSC(81)MS-15	Report on the Basic Training Programme in Legal and Industrial Metrology, 27 June - 6 July 1979, New Delhi, India
CSC(81)MS-16	Report on the Fourth Meeting of the Steering Committee 21-23 October 1981, Jakarta, Indonesia
CSC(81)MS-17	Report on the Second Time and Frequency Intercomparison
CSC(78)MT-1	Metrication 1978. Report of Panel Meeting of Commonwealth Senior Metrication Officers, London, 25-27 April 1978 - Proceedings and Recommendations
CSC(79)MT-2	Metrication Manual
CSC(78)SQC-1	Commonwealth Regional Programme on Standardization and Quality Control. Report on the Project Group Meeting on Quality Control and Enforcement of Standards, 10-16 May 1978, Accra, Ghana - Proceedings and Recommendations
CSC(79)SQC-2	Project Group Meeting on Quality Control and Enforcement of Standards, 10-16 May 1978 - Resource Material
CSC(79)SQC-3	Commonwealth Regional Programme on Standardization and Quality Control. Report of the First Meeting of the Steering Committee, 15-19 January 1979, Nairobi, Kenya

CSC(81)SQC-12	African Programme on Standardization and Quality Control, Report of the Third Steering Committee Meeting, 14-16 January 1981, Botswana
CSC(81)SQC13	Draft Guidelines to Establish a National Metrology Service
CSC(79)CMS-1	Caribbean Metrology Project Group Meeting, 23-27 April 1979, Port of Spain, Trinidad & Tobago
CSC(79)CMS-2	Caribbean Metrology Project Group Meeting, 23-27 April 1979, Port of Spain, Trinidad & Tobago - Resource Material
CSC(80)CMS-3	Caribbean Metrology Steering Committee Meeting, 14-15 April 1980, Kingston, Jamaica
CSC(81)CMS-4	Report on an Alcoholometry Training Workshop, 9-30 October 1981, Port of Spain, Trinidad & Tobago
CSC(81)CMS-5	Report on Second Steering Committee Meeting, 10-11 December 1981, Barbados
CSC(79)SQC-4	Commonwealth Regional Programme on Standardization and Quality Control. Report of the Second Meeting of the Steering Committee, 23-27 July 1979, Blantyre, Malawi
CSC(79)SQC-5	Commonwealth Regional Programme on Standardization and Quality Control. Basic Training Course on Standardization and Quality Control, 4-15 June 1979, Nairobi - Resource Material
CSC(80)SQC-6	Commonwealth Regional Programme on Standardization and Quality Control. Information on Certification from National Standards Organizations of Member Countries, April 1980, Nicosia, Cyprus
CSC(80)SQC-7	Report of the First Review Meeting on Standardization and Quality Control, April 1980, Nicosia, Cyprus
CSC(80)SQC-8	Report on Seminars on Food Standards and the Integrated Approach to Standardization, April 1980, Nicosia, Cyprus
CSC(81)SQC-9	Report of a Metrication Workshop, January 1981, Swaziland, Volume 1 - Proceedings
CSC(81)SQC-10	Report of a Metrication Workshop, January 1981, Swaziland, Volume 2 - Resource Material
CSC(81)SQC-11	African Programme on Standardization and Quality Control, Directory of Calibration and Testing Facilities
CSC(81)SQC-12	African Programme on Standardization and Quality Control, Report of the Third Steering Committee Meeting, 14-16 January 1981, Botswana

LIST OF CSC TECHNICAL MEETINGS ON STANDARDIZATION & METROLOGY

23-25 August 1977	Planning Meeting on Metrology, London
14-16 November 1977	Planning Meeting on Quality Control, London
21 November- 2 December 1977	Regional Meeting on Metrology, New Delhi, India
25-27 April 1978	Panel Meeting of Commonwealth Senior Metrication Officers, London
10-16 May 1978	Project Group Meeting on Quality Control and Enforcement of Standards, Accra, Ghana
4-6 July 1978	Regional (Asia/Pacific) Metrology Steering Committee Meeting, Kuala Lumpur, Malaysia
15-19 January 1979	Standardization and Quality Control Steering Committee Meeting, Nairobi, Kenya

14-16 February 1979	Caribbean Metrology Planning Meeting, Trinidad & Tobago
28-30 March 1979	Regional (Asia/Pacific) Metrology Programme Steering Committee Meeting, Colombo, Sri Lanka
23-27 April 1979	Caribbean Metrology Project Group Meeting, Port of Spain, Trinidad & Tobago
4-15 June 1979	Training Course on Standardization and Quality Control for Technical Personnel, Nairobi, Kenya
21-23 June 1979	Planning the Metrology Review Meeting, Wellington, New Zealand
23-27 July 1979	Steering Committee Meeting on Standardization and Quality Control, Blantyre, Malawi
29 October - 9 November 1979	Regional (Asia/Pacific) Metrology Programme Review Meeting, Wellington, New Zealand
14-15 April 1980	Caribbean Metrology Steering Committee Meeting, Kingston, Jamaica
23-30 April 1980	Review Meeting on Standardization and Quality Control Programme, Nicosia, Cyprus
1-4 September 1980	Regional (Asia/Pacific) Metrology Steering Committee Meeting, Hong Kong
20-31 October 1980	Training Course in Standardization, Bridgetown, Barbados
17 November - 19 December 1980	UNESCO/CSC Workshop on Scientific and Industrial Metrology, New Delhi, India
14-16 January 1981	Third Steering Committee Meeting, Standardization and Quality Control Programme, Botswana
19-23 January 1981	Regional Metrication Workshop, Swaziland
21-23 October 1981	Fourth Steering Committee Meeting, Asia/Pacific Metrology Programme, Jakarta, Indonesia
29-30 October 1981	Alcoholometry Training Workshop, Caribbean Metrology Programme, Port of Spain, Trinidad & Tobago
10-11 December 1981	Second Steering Committee Meeting, Caribbean Metrology Programme, Barbados
22-24 February 1982	Fourth Steering Committee Meeting Standardization and Quality Control, Freetown, Sierra Leone
22 February - 5 March 1982	Basic Training Course on Standardization, Quality Control and Metrology, Standardization and Quality Control Programme, Freetown, Sierra Leone
27-30 March 1982	CSC/UNESCO Workshop on Metrology in Quality Assurance, Kuala Lumpur, Malaysia
15-16 June 1982	Intercomparison Training Workshop, Caribbean Metrology Programme, Antigua
30 August - 10 September 1982	Second Review Meeting, Asia/Pacific Metrology Programme, Sydney

IMEKO

The CONTRIBUTION of IMEKO to the APPLICATION of SCIENCE and TECHNOLOGY to DEVELOPMENT

by **Juraj BOZICEVIC**
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L'exposé ci-dessous exprime les points de vue de l'auteur sur les buts du Comité IMEKO pour les pays en voie de développement. C'est une version abrégée d'un document remis au BIML par l'auteur pour la réunion du Conseil de Développement des 22 et 23 mars 1982.

This paper expresses the personal views of the author on the mission of the IMEKO Technical Committee for Developing Countries. It is an abridged version of a document handed over by the author for the meeting of the OIML Development Council 22-23 March 1982.

1. Introduction

The objective of the IMEKO is to promote science and technology of measurement, cooperation among experts from different countries, education and training. These objectives are carried out through meetings, symposia, conferences and other gatherings. The burden of the IMEKO activity is mainly carried out by the fourteen Technical Committees existing within the Confederation. Distinguished and accomplished experts from the IMEKO member organizations take part in the work of these Technical Committees. They are representatives of industry, higher education, the National Offices of Measures and the users of instruments.

IMEKO Technical Committee 11 for Developing Countries has got the role to gather and unify experiences as well as scientific potential and technical know-how of all these Committees.

2. Standpoint and plan of activities

In planning the activity of TC 11 we have paid particular attention to application of systems approach, because it is highly compatible with the way we are thinking in measurement. The methodology underlying a systems approach requires the selection of objectives, clarifying the present status and detailing the various steps on a specific time scale to achieve stated goals. It requires the crossing of discipline boundaries that previously have limited or distorted both the way in which problem was posed and the types of solution derived. Taking systems approach we are stressing the interdisciplinary aspect of life and living as a whole and emphasizing the interconnection between people and artefacts they create. In this context measurement is a priori part of everything what we are doing.

The most important problems we have to face in the developing countries are the lack of competent technical manpower at all levels, low national budgets allocated to education, lack of supporting industry, etc. Taking in account all these circumstances we may not speak in favor of measurement or metrology per se. We must

argue for systems approach to the problems accompanying various programs in different fields of development, and then within the framework of these programs find out the possibilities for our activities. In such manner we shall be able to promote measurement and metrology in the most successful way at a given stage and under given conditions of development.

There are however a few objectives towards which our activity in developing countries could be directed :

1. Arrangement of transfer of knowledge and technology in the field of measurement and metrology through the organization of courses, assistance in planning of educational and training laboratories, assistance in publishing the proper up-to-date textbooks written in native languages, etc. All must be done taking into account the aforementioned circumstances, and not by copying the curricula from the developed countries !

2. Broadening and technical renovation of the knowledge of engineers and technicians, to make a good engineer a better engineer as well as to prevent obsolescence. Increase of technical breadth in contrast with depth is an important prerequisite for managerial responsibility.

3. Assisting industry in the implementation of different cases covering varieties of metrological, measurement and quality assurance problems, particularly assisting in the organization and instruction of the teams which can undertake repair, testing and recalibration of measurement equipment.

4. Assisting the scientific institutions to arrange their own plans and study applications of measurement and metrology.

5. Organizing IMEKO meetings to discuss relevant problems and possible solutions as well as supporting and sponsoring regional activities in both « IMEKO » and « non-IMEKO » countries to organize such meetings. We offer the « IMEKO Summer School » or « IMEKO International Seminar » and the « IMEKO Travelling University » for consideration as a bodies which could make most of the objectives feasible. The plan of action may include many different types of activity, but all must be carefully prepared. The ad hoc committee consisting of practitioners and university faculty members should be organized for each of the tasks and adapted for a particular country or group of countries. After all, the activities must be organized in cooperation with an institute or university in the developing country in question.

Lack of textbooks and teaching literature could be compensated by cheap educational bulletins, written in a simple language and illustrated with many figures. The purpose of the bulletin should be the transfer and promotion of measurement science and technology and its content could cover various questions of measurement, quality assurance and metrology. Beside the English edition, we could subsequently publish the Arabic, the Spanish and other editions.

3. The IMEKO School of Measurement and IMEKO Travelling University

The education and training program of TC 11 is developed taking in consideration two kinds of transfer of knowledges :

— The fundamental and applied knowledges on principles, design, maintenance and use of measurement instruments, which should be tought with the aim of development and improvement of readiness of professionals for apropriate and efficient application of measurement and measurement instruments.

— The up-to-date knowledge on new technologies with the aim of development of the capability and readiness of professionals and decision makers to understand the impact of the new technologies on industrial development as well as to utilize these technologies.

The Summer Schools under the title **Measurement Training for Transfer of Practical Experience** have been conceived as the first step in the realization of this program. Under such a title various subjects of the broad area of measurement, metrology and application can be treated in coordination and cooperation with other IMEKO Technical Committees, but also for participants with different levels of education and from various fields.

The First Seminar of the IMEKO Summer School was on « The Application of Microcomputers in Measurement ». The choice of this subject was motivated by the extraordinary development of microelectronics, particulary of microcomputers and the fascinating impact of microelectronics on industrial development in recent years. We have had particularly in mind the importance of up-dating the knowledge of the experts from developing countries and of developing their ability to understand and judge in circumstances when the new technologies should be applied. It has appeared clear to us that the technological advances in developing countries are beyond capacity of these countries, but their professionals and decision makers should not be helpless spectators. They must be tought about the advances in microelectronics and how utilize them.

We have founded the Summer School in belief that IMEKO and its Technical Committee 11 for Developing Countries must play a strong role in promoting, catalyzing and developing the education and training programs to meet the needs of developing countries, in particular in strengthening the cooperation of the professionals from developed and developing countries.

We do not pretend to promote highly sophisticated science, but the transfer of practical and actual knowledge of measurement, design and application of measurement systems for industrial production monitoring as well as for testing materials and quality control.

The question in minds of the TC 11 people is what is the best course to follow. Using the experiences of the Summer School we plan to organize the IMEKO Travelling University for continuing education and training of engineers and technicians as the next activity. It will work directly in developing countries in cooperation with local porfessional organizations, schools, universities and other responsible institutions. Also we shall need support of developed countries and specialized United Nations agencies as well.

The IMEKO Travelling University will be really a series of well-prepared programs of courses of 1 to 3 weeks durations carried out by ad hoc working groups of 2 to 5 teachers. The field and topics to be tought and the level of instruction should be carefully defined and adapted to the needs of a specific country. It is possible the experts from developing countries should be members of the working group. In combining both teaching and consultation activities we wish to make the Travelling University into as effective an institution as possible.

The emphasis will be upon training, education and upon consultation, upon the development of human resources, but through activities of the IMEKO Travelling University we factually wish to help developing countries in achieving good quality of products, rational use of energy and materials and in amelioration of their economies.

The concrete objectives of education of measurement and metrology in developing countries will be closely related to the level of industrialization, but also to the national objectives. It should be integrated whenever possible into the national development plan in order to respond to actual needs for specialists and the required depth and breath of their knowledge.

We could mention here organization of the Round Table Discussion at 9th IMEKO CONGRESS in Berlin (West) in 1982 under title METROLOGICAL INFRASTRUCTURE - A BASIC MEANS OF INSURING ECONOMIC DEVELOPMENT, PRODUCT QUALITY AND QUALITY OF LIFE.

The topics will make possible to exchange experiences and opinions in :

— Transfer of practical knowledge on measurement and application of measurement instruments and systems

— Consultation for appropriate use and application of measurement equipment and its calibration

— Measurement education and training, particularly : college and university education, the technician's education, organization of laboratory education, continuous education and training for industry, exchange of visiting professors and experts, the fields and topics to be taught ways of use the school system of developing country for measurement education and training.

— Establishment and operation of national centers for metrology, calibration and quality assurance

— Application of measurements in the interest of human health, safety and environmental protection.

The above topics are motivated by a lack of valuable information on the specific needs of developing countries, and we hope that invited professionals from development countries can provide this information at least by responding on the topics as a questionnaire on the state of application of measurement and metrology in their countries. Through these we could better understand their needs and capabilities as well as other related matters, and an analysis of collected information would enable recognition of priorities and decision on further improvement of activities of TC 11.

Through such and similar activities we are gaining valuable experiences, but we are also developing the conditions for better co-operation with colleagues from developing countries and for willingness to solve problems together whilst respecting mutual interests.

The colleagues from developing countries have proposed that the starting action concerning the IMEKO Travelling University should be the IMEKO Friendship or Exploratory Mission of three or four experts, who should for period of 2-3 weeks explore the needs and situation in a group of countries and discuss in situ problems with the responsible authorities. The result of this Mission should be a comprehensive report on the needs with suggestions how to proceed with organization of the IMEKO Summer School and the IMEKO Travelling University.

It is particularly important to promote the exchange of experts, professors and experienced engineers, by establishing a list of professional who would be interested in and willing to serve as visiting professors in developing countries.

4. Concluding remarks

IMEKO - International Measurement Confederation through its Technical Committee 11 for Metrological Requirement in Developing Countries is able to support the UN action for application of science and technology to development. The IMEKO contribution should be in development of human resources, that is training, education and consultation in the field of measurement and metrology, in the application, use, operation and maintenance of measurement instruments and the application of measurement to achieve rational use of energy and materials, good quality of products and to ameliorate their economies.

A principal means of accomplishing these objectives, through operating methods adapted within IMEKO, particularly :

— by creating special working groups,

— by planning the subject of the development on the agenda of future IMEKO meetings,

— by organizing special meetings, seminars and courses,

— by encouraging more interest in industry and academic institutions in various countries,

— by cooperating with the UN agencies and with related international professional organizations,

— by increasing and elaborating the communications with professionals in developing countries,

— by exploring permanently the needs in developing countries regarding measurement and metrology.

The IMEKO Summer School is the inceptive step in the realization of these endeavours, and the First School was organized this year with success. Using the experiences gained through organization of the Schools next step is the organization of the Travelling University as we named the mobile programme of 1-3 weeks seminars directly in developing countries. Beside these activities the IMEKO Friendship or Exploratory Mission in developing countries is planned and the exchange of experts will be promoted.

5. Acknowledgement

The author wishes to express his gratitude to Prof. Gy. Striker, IMEKO Secretary General, for valuable discussions and suggestions. The author is also grateful for the excellent support and co-operation from the members of IMEKO TC 11, particularly to Prof. D. Hofmann and Prof. W Mühe.

Comments of UNIDO officers Messr. M.H.A. Hamdy, A. de Crombrugghe and N. Yamamoto contributed to improvement of the plan of TC 11 activity.

INFORMATIONS

VICE-PRESIDENCE DU COMITE

Le Dr A.O. McCOUBREY, Membre du CIML, Etat-Unis d'Amérique et Vice-Président du Comité International de Métrologie Légale, ayant résigné ses fonctions (voir ci-dessous), le poste de deuxième Vice-Président du Comité International de Métrologie Légale restera vacant jusqu'à la 19e réunion du Comité (Copenhague, mai 1983) à l'occasion de laquelle un nouveau Vice-Président sera élu.

MEMBRE DU COMITE

En raison d'une réorganisation du National Bureau of Standards, le Dr A.O. McCOUBREY a été amené à résigner ses fonctions de représentant des Etats-Unis d'Amérique auprès du Comité International de Métrologie Légale. Il a été remplacé par Mr David EDGERLY, Manager, International Legal Metrology Program, Office of Product Standards Policy, National Bureau of Standards.

Lors de sa 18e réunion en mars dernier, le Comité International de Métrologie Légale a chargé son Président, Mr BIRKELAND, d'adresser au Dr McCOUBREY un témoignage de vive reconnaissance pour l'action qu'il a menée en faveur de notre Institution au cours de ces dernières années.

Nous y associons nos remerciements et par ailleurs nous présentons nos meilleurs souhaits de bienvenue à Mr EDGERLY qui, nous avons plaisir de le souligner, est, depuis dix ans, étroitement associé aux travaux de notre Institution.

NOUVEAUX MEMBRES CORRESPONDANTS

Mr BIRKELAND, Président du Comité International de Métrologie Légale, a récemment prononcé l'admission, en tant que Membre Correspondant de l'OIML, de HONG KONG et du KOWEIT, ce qui porte à ce jour à 68 le nombre d'Etats Membres et Membres Correspondants de notre Institution.

REPUBLIQUE FEDERALE D'ALLEMAGNE

La réglementation technique « Eichordnung » a, en 1981, fait l'objet d'une nouvelle édition comportant tous les amendements et publiée sous forme de fascicules par Deutscher Eichverlag, Braunschweig. Cette réglementation suit en grande partie les Recommandations de l'OIML mais comporte sur bien des points des dispositions d'application supplémentaires nécessitées par l'évolution technique, qui peuvent intéresser d'autres services de métrologie (voir « Documents reçus » dans ce bulletin).

FRANCE

Le Service des Instruments de Mesure a bien voulu nous faire parvenir les derniers cours rédigés par l'Ecole Supérieure de Métrologie. On peut en particulier noter les ouvrages suivants :

— Le mesurage de l'ammoniac liquéfié
par L. Silvert (1979)

— Le mesurage des gaz de pétrole liquéfiés
par L. Silvert (1980)

— Le jaugeage des navires transporteurs de gaz liquéfié (1980)

— Compteurs turbines
par L. Silvert (1980)

— Réception de betteraves sucrières : balances proportionneuses, saccharimétrie
par J. Boesch (1981)

— Humidimètres pour grains de céréales et graines oléagineuses
par J. Boesch (1981)

ROYAUME-UNI

Le BIML vient de se procurer le recueil des conférences présentées à Weightech 81, une manifestation organisée par the Institute of Measurement and Control. Cette publication, en anglais, qui traite surtout du pesage industriel, contient cependant aussi d'autres articles en relation directe avec les travaux de l'OIML. On note en particulier :

— un article par John Elengo sur la réglementation métrologique des cellules de charge
— un article par GF. Hodsman sur l'harmonisation de la réglementation européenne des instruments de pesage
— un article de A.A. Gilli sur l'approbation des instruments de pesage en Grande-Bretagne.

Un article de R.F. Jenkins (NPL) et un autre de H.H. Scheel et M. Kreuzer (Hottinger, RFA) traitent la haute résolution maintenant obtenue dans les comparaisons de force.

Un article de F.E. Wagner (RFA) décrit les balances à étalonnage automatique, un procédé utilisant une masse étalon donc indépendant de l'accélération de la pesanteur et de la dérive due à la température.

La prochaine Conférence Weightech est prévue pour les 13, 14 et 15 septembre 1983 à Wembley Conference Centre.

Les publications peuvent être achetées auprès de
The Institute of Measurement and Control
20 Peel Street
London W8 7PD

IMEKO

Le deuxième séminaire international d'IMEKO traitera la maintenance et l'étalonnage des instruments industriels. Il aura lieu au Centre inter-universitaire de l'Université de Zagreb à Dubrovnik, Yougoslavie, du 12 au 17 septembre 1983.

Le but de ce deuxième séminaire est d'enseigner et d'entraîner les participants dans la maintenance et l'étalonnage des instruments de mesure et ainsi indirectement contribuer à la maintenance préventive dans les usines. Le cadre de ce cours est donné par les sujets suivants :

a) méthodes, principes et procédés d'installation, maintenance, essais et étalonnage des instruments de mesure

b) équipements et facilités de vérification

c) organisation des laboratoires de maintenance et d'étalonnage

d) sélection, enseignement et entraînement du personnel.

Le programme sera composé d'une série de conférences sur les principes des instruments de mesure et leur vérification. Des études-types sur l'organisation des ateliers de maintenance et d'étalonnage dans l'industrie formeront une partie spécialement importante du programme.

L'organisation du programme permettra la conduite simultanée de deux niveaux de cours afin de donner l'occasion aussi bien aux techniciens qu'aux ingénieurs d'y participer.

La langue du cours sera l'anglais mais il est projeté de répéter ces cours dans d'autres langues.

Un livre de cours en anglais sera publié.

INFORMATION

VICE-PRESIDENCY OF THE COMMITTEE

Dr. A.O. McCOUBREY, Member of CIML for USA and Vice-President of the International Committee of Legal Metrology, having resigned from his functions (see below), the post of second Vice-President of the International Committee of Legal Metrology will be left vacant until the 19th Committee meeting (Copenhagen, May 1983), on which occasion a new Vice-President will be elected.

COMMITTEE MEMBER

Due to a reorganisation of the National Bureau of Standards, Dr. A.O. McCOUBREY has resigned from his functions as the representative of the United States of America on the International Committee of Legal Metrology. He has been replaced by Mr David EDGERLY, Manager, International Legal Metrology Program, Office of Product Standards Policy, National Bureau of Standards.

During its 18th meeting last March, the International Committee of Legal Metrology has requested its President, Mr BIRKELAND, to send to Dr. McCOUBREY a testimony of its recognition of his work on behalf of our Institution during the recent years.

We add our sincere thanks. At the same time we are pleased to welcome Mr EDGERLY and to emphasize the fact that for the past ten years he has been closely associated with the work of our Institution.

NEW CORRESPONDING MEMBERS

Mr BIRKELAND, President of the International Committee of Legal Metrology, has recently admitted HONG KONG and KUWAIT as Corresponding Members of OIML ; this increases the number of Member States and Corresponding Members of our Institution to 68.

FEDERAL REPUBLIC OF GERMANY

The technical regulations « Eichordnung » have in 1981 been subject to a new edition comprising all the amendments. It is published in the form of separate leaflets by Deutscher Eichverlag, Braunschweig. The regulations largely follow OIML Recommendations but comprise a number of provisions necessitated by technical developments and which thus may interest also foreign metrology services (for details see « Documents reçus » in this issue).

FRANCE

The « Service des Instruments de Mesure » has kindly sent us the latest courses edited by their metrology school. These courses treat in particular the subjects of measurement of liquified ammonia, measurement of liquified petroleum gas, gauging of vessels transporting liquified gases, turbine meters, measurement of sugar content in sugar-beets, moisture meters for grains (see French version, « Informations » for details).

UNITED KINGDOM

The BIML has procured for its Documentation Centre the collected papers of the Weightech 81 Conference organised by the Institute of Measurement and Control. This publication which is largely devoted to industrial weighing also contains other papers directly related to OIML work. The following may be noted :

— Metrological regulations for load cells
by John Elengo

— Harmonisation of European weighing machine regulations
by G.F. Hodsman

— Pattern examination of weighing equipment (in the U.K.)
by A.A. Gilli

The high resolution now attained in force standard comparisons is also discus-ed in two papers by R.F. Jenkins (NPL) and by H.H. Scheel and M. Kreuzer (Hottinger).

Another interesting paper by F.E. Wagner deals with self calibrating balances, a procedure for automatic calibration using a reference weight and thus independent of the acceleration due to gravity and temperature drift.

The next Weightech Conference is planned to be held at Wembley Conference Centre London on 13-15 September 1983.

The collected papers from Weightech 81 may be purchased from

The Institute of Measurement and Control
20 Peel Street
London W8 7PD

IMEKO

The subject of the Second IMEKO International Seminar is « Maintenance and Calibration of Instruments in Industry ». The seminar will take place in the Inter-University Center of University of Zagreb in Dubrovnik, Yugoslavia from the 12th until 17th September 1983.

The aim of the second seminar is to teach and train participants in maintenance and calibration of measurement instruments and thus indirectly contribute to pre-ventive maintenance of plants as a whole. The framework of the course is specified by the following topics :

a) methods, principles and processes of installation, maintenance, testing and calibration of measuring instruments,

b) calibration equipment and facilities,

c) organization of maintenance and calibration laboratories,

d) selection, education and training of staff.

The programme will be composed of the series of tutorial lectures supported by courses on the principles of measuring instruments and their verification. The Case study on organization of maintenance and calibration workshop in industry will be an especially important part of the programme.

The organization of programme should make possible simultaneous running of two levels of lectures to give opportunity to technicians as well as to engineers to participate.

The language of the School is English, but repetition of the courses is planned in other languages.

The text book with the lectures will be published in English.

REUNIONS

	Groupes de travail	Dates	Lieux
SP 5 - Sr 16	Compteurs d'eau	9 et 10 sept. 1982	ZURICH SUISSE
SP 7 - Sr 4	Instruments de pesage à fonctionnement non automatique	13-15 sept. 1982	MUNICH REP. FED. D'ALLEMAGNE
SP 7 - Sr 5	Instruments de pesage à fonctionnement automatique	16 et 17 sept. 1982	MUNICH REP. FED. D'ALLEMAGNE
SP 7	Mesurage des masses	17 sept. 1982	MUNICH REP. FED. D'ALLEMAGNE
SP 31	Enseignement de la métrologie	20-24 sept. 1982	ODESSA U.R.S.S.
SP 4	Mesurage des longueurs, surfaces, angles	12-15 oct. 1982	BIML
SP 4 - Sr 2	Mesures matérialisées de longueur		
SP 4 - Sr 3	Appareils de mesurage de la longueur des tissus, câbles et fils		
SP 6	Mesurage des volumes de gaz	18-22 oct. 1982 *(provisoire)*	PARIS FRANCE
SP 5 - Sr 8	Réservoirs de stockage à pression atmosphérique ou sous pression	sept.-oct. 1982 *(provisoire)*	ROUMANIE
SP 5 - Sr 9	Camions et wagons citernes à pression atmosphérique ou sous pression		
SP 16 - Sr 2	Laboratoires secondaires d'étalonnage en dosimétrie	nov. 1982 *(provisoire)*	BUDAPEST HONGRIE

SP 5 - Sr 1	Terminologie (volumes de liquides et de gaz)	28 févr.-4 mars 1983	TOKYO JAPON
SP 5 - Sr 2	Schémas de hiérarchie des étalons de volume		
SP 5 - Sr 3	Mesures de volumes de laboratoires		
SP 5 - Sr 20	Méthodes et dispositifs de vérification des instruments de mesurage de liquides		
SP 22 - Sr 6	Principes permettant d'assurer l'efficacité du contrôle métrologique	début 1983	

Groupe de travail mixte ISO-CEI-BIPM-OIML : « Vocabulaire International de Métrologie »	10-12 juin 1982	PARIS FRANCE
»	1-3 septembre 1982	LAUSANNE SUISSE
»	22-24 nov. 1982	LONDRES ROYAUME-UNI
Groupe ad hoc « Système de Certification OIML »	6-8 octobre 1982	BIML
Conseil de la Présidence	16-18 nov. 1982	MOSCOU U.R.S.S.
Dix-neuvième réunion du Comité International de Métrologie Légale	3-5 mai 1983	COPENHAGUE DANEMARK

CENTRE DE DOCUMENTATION

Documents reçus au cours du 2e trimestre 1982

ORGANISATION INTERNATIONALE DE NORMALISATION — ISO

ISO Memento 1982

ISO Catalogue 1982

Recueil de Normes ISO 4 - 1980 : Acoustique, vibrations et chocs (fr.)

Bibliographie 7/Avril 1981 : Normes internationales sur la documentation et la terminologie (fr.)

Bibl. 8/Février 1981 : Vocabulaires internationaux normalisés (fr.)

Bibl. 13/Nov. 1981 : Normes internationales sur l'acoustique, les vibrations et chocs mécaniques (fr.)

Bibl. 16/Déc. 1979 : Normes internationales sur les calculateurs et le traitement de l'information (fr.)

ISO Normes (en fr. et an angl.)

ISO 31/10-1980 : Quantities and units of nuclear reactions and ionizing radiations (nouvelle édition en anglais seulement)

ISO 91/1-1982 : Tables de mesure du pétrole - Partie 1 : Tables basées sur les températures de référence de 15 °C et 60 °F

ISO 6712-1982 : Analyse des gaz - Organes de prélèvement et de transfert des gaz destinés à alimenter une unité analytique

COMMISSION ELECTROTECHNIQUE INTERNATIONALE — CEI

Catalogue des publications, 1982

CONFERENCE INTERNATIONALE SUR L'AGREMENT DES LABORATOIRES D'ESSAIS — ILAC

Répertoire International des Organisations d'Essais et des Systèmes d'Agrément de Laboratoires d'Essais, 1981

INTERNATIONAL ATOMIC ENERGY AGENCY — IAEA

Catalogue 1981-82 - 1st Supplement - Jan. 1982

COMMUNAUTE ECONOMIQUE EUROPEENNE — CEE

Commission des Communautés Européennes
Bulletin N° 38 : Terminologie, 1981

COMMONWEALTH SCIENCE COUNCIL

Commonwealth Secretariat

CSC (81) MS-15 : Asia/Pacific Metrology Programme - Basic Training Programme in Legal and Industrial Metrology, New Dehli, 27 June-6 July 1979

CSC (81) MS-16 : Asia/Pacific Metrology Programme - Report on the Fourth Steering Committee Meeting, Jakarta, 21-23 October 1981

CSC (82) MS-17 : Asia/Pacific Metrology Programme - Report on the Second Time and Frequency Intercomparison, New Zealand, 13 October-18 November 1981

CSC (81) CMS-4 : Caribbean Metrology Programme - Report on the Training Workshop in Alcoholometry, Trinidad and Tobago, 29-30 October 1981

CSC (81) CMS-5 : Caribbean Metrology Programme - Report on the Second Meeting of the Steering Committee, Barbados, 10-11 December 1981

ARAB ORGANIZATION FOR STANDARDIZATION AND METROLOGY — ASMO

Traduction en langue arabe de :

OIML RI 24-1973 : Mètre étalon rigide pour Agents de vérification

OIML RI 40-1977 : Pipettes étalons pour Agents de vérification

OIML RI 41-1977 : Burettes Etalons pour Agents de vérification

OIML RI 43-1977 : Fioles Etalons graduées en verre pour agents de vérification

REPUBLIQUE FEDERALE D'ALLEMAGNE

Physikalisch- Technische Bundesanstalt

EO : Vierte Verordnung zur Anderung der Eichordnung vom 5-6-1981

Allgemeine Vorschriften (EO AV)

Anlage 4 — Messgeräte für die Volumenmessung von Flüssigkeiten in ruhendem Zustand

Anlage 5 — Messgeräte zur Ermittlung des Volumens oder der Masse von Strömenden Flüssigkeiten (ausser Wasser)

Anlage 6 — Messgeräte für die Volumenmessung von strömendem Wasser

Anlage 9 — Nichtselbsttätige Waagen

Anlage 10 — Selbsttätige Waagen

Anlage 12 — Volumenmessgeräte für Laboratoriumszwecke

Anlage 13 — Dichte-, Gehalts- und Konzentrationsmessgeräte

Anlage 14 — Temperaturmessgeräte

Anlage 15 — Messgeräte für die Heilkunde

Anlage 16 — Überdruckmessgeräte

Anlage 18 — Messgeräte im Strassenverkehr

Anlage 20 — Messgeräte für Elektrizität

Anlage 22 — Messgeräte für thermische Energie und thermische Leistung

PTB-Prüfregeln Band 14 : Zustands - Mengenumwerter, 1979

PTB-Prüfregeln Band 15 : Flüssigkeitsmanometer

Technische Richtlinien der PTB :

Messgeräte für Elektrizität :

E Einführung (6-73)

E-0 Inhaltsverzeichnis (4-79)

1 Überprüfung der amtlichen Prüfstellen für Elektrizitäts-Messgeräte (alte Form) (2-11-67)

E 2 Gebührenberechnung für die Prüfung von Normalgeräten, Hilfsmessgeräten und Hilfseinrichtungen (6-81)

E 3 Anträge für die Prüfung von Normalgeräten, Hilfsmessgeräten und Hilfseinrichtungen durch die PTB (4-79)

E 4 Dienststempel der staatlich anerkannten Prüfstellen (1-77)

E 5 Sicherungsstempel an Elektrizitätszählern, in die Tarif-Zusatzeinrichtungen mit Einstellvorrichtung eingebaut sind (4-79)

E 6 Überprüfung der Phasenverschiebung (4-79)

E 7 Netzgleichrichter für Kompensationsmesseinrichtungen (4-79)

E 8 Vergleichswiderstand für Widerstandsmessungen mit dem kleinen Kompensations- Messtich (4-79)

F 9 Behebung von kleineren Störungen an Normal- und Hilfsmessgeräten (10-76)

E 10 Prüfung von Strom-, Spannungs- und Leistungsmessern durch die PTB (4-79)

E 11 Richtlinien für die messtechnische Prüfung von Elektrizitätszählern mit Scheinverbrauchsgetriebe (4-79)

E 12 Zusatzstromwandler für die Messbereichserweiterung von Zählerprüfeinrichtungen (4-79)

E 13 Prüfung von Fernzählgeräten und Tarifschaltuhren als getrennt angeordnete Zusatzeinrichtungen für Elektrizitätszähler (4-79)

E 14 Überprüfung von Präzisions-Digital-Leistungsmessern für Wechselstrom (4-79)

E 15 Überprüfung von statischen Vergleichszählern (4-79)

E 16 Zulassungzeichen (1-79)

E 17 Stichprobenprüfung von Elektrizitätszählern (8-81)

E 18 Wechselspannungs-Konstanthalteeinrichtungen zur Versorgung von Zählerprüfeinrichtungen (12-81)

E 22 Zulassung von Netzgleichrichtern für Kompensationsmesseinrichtungen (6-79)

E 42 Prüfung an gebrauchten Elektrizitätszählern Jahresbericht der staatlich anerkannten Prüfstellen für Messgeräte für Elektrizität (1-78)

Messgeräte für Gas

G Einführung (11-78)

G 3 Technische Anforderungen an Messstrecken für eichfähige Wirkdruck-Gaszähler (7-80)

G 4 Dienststempel der staatlich anerkannten Prüfstellen (11-78)

G 6 Hochfrequente Impulsgeber, die vor der Justierstufe von Volumengaszählern eingebaut sind (1-80)

G 7 Einchung bzw. Geglaubigung von Gaszählern mit Hochdruckgas (7-81)
G 20 Prüfung an gebrauchten Haushalts-Gaszählern (Balgengaszählern) Jahresbericht der staatlich anerkannten Prüfstellen für Messgeräte für Gas (7-79)

Messgeräte für Wasser
W Einführung (11-78)
W 4 Dienststempel der staatlich anerkannten Prüfstellen (11-78)

Messgeräte für Wärme
K Einführung (4-75)
K 2 Raumtemperatur in den Arbeitsraumen der Prüfstellen (4-75)
K 3 Anforderungen der Physikalisch- Technischen Bundesanstalt an die technischen Prüfeinrichtungen von staatlich anerkannten Prüfstellen für Messgeräte für Wärme (1-78)
K 4 Dienststempel der staatlich anerkannten Prüfstellen (11-78)
K 5 Zur Bauartzulassung und Eichung bzw. Beglaubigung von Wämezählern, die aus Teilgeräten bestehen (7-78)
K 6 Verfahren bei der Eichung bzw Beglaubigung von Wärmezählern sowie von Warm- und Heisswasserzählern Übergangslösung (4-80)
K 16 Zulassungszeichen (12-79)

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REPUBLIQUE DEMOCRATIQUE ALLEMANDE

Amt für Standardisierung, Messwesen und Warenprüfung
Gesetzblatt Teil I Nr.37 : Verordnung über das Messwesen vom 26-11-1981

ARGENTINE

Instituto Nacional de Tecnologia Industrial
Vocabulario de Metrologia Legal - Terminos fundamentales (Traduccion del texto oficial frances, edicion 1978) dec. 1981
Departamento de Fisica y Metrologia : Resumen de actividades durante el an 1981

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Amtsblatt für das Eichwesen Nr 5-8/1981 :
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NC 12-04-06 (12-80) : Tendencia a la corrosion intergranular de los aceros inoxidables austeniticos, austenitico ferritico y austenitico martensiticos. Metodos de ensayo

DANEMARK

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NBSIR 80-2141 - January 1981 : Estimated Accuracy of Calibration of Some Membrane - Type LNG Transport Tanks (W.C. Height etc.)
NBS Handbook 44 (1982) : Specifications, tolerances, and other technical requirements for weighing and measuring devices (as adopted by the 66th NCWM, 1981)

NBS Handbook 130 (1982) Model State Laws and Regulations (as adopted by the 66th NCWM, 1981)
NBS Special Publication 629 (Jan. 1982) : Report of the 66th National Conference on Weights and Measures 1981

FRANCE

Réglementation
Décret n° 81-839 du 27-8-1981 relatif au Statut des Ingénieurs des travaux métrologiques
Décret n° 81-883 du 14-9-1981 réglementant la catégorie d'instruments de mesure : Chronotachygraphes
Arrêté du 14-9-1981 relatif à la vérification périodique des chronotachygraphes
Décret n° 81-858 du 15-9-1981 sur l'organisation du ministère de l'industrie
Arrêté du 1-10-1981 relatif à l'homologation, la vérification primitive, et la vérification après installation des chronotachygraphes
Arrêté du 19-10-1981 : Certificats de qualification
Décret n° 82-203 du 26-2-1982 modifiant le décret n° 61-501 du 3-5-1961 modifié, relatif aux unités de mesure et au contrôle des instruments de mesure

Association Française de Normalisation - AFNOR
Catalogue AFNOR 1982

Bureau Interprofessionnel d'Etudes Analytiques
Nouveau périodique : Bulletin mensuel du BIPEA, N° 128 - Déc. 1981

Service des Instruments de Mesure
Derniers cours rédigés de l'Ecole Supérieure de Métrologie :
Informatique (Mai 1981)
Jaugeage des navires transporteurs de GPL et de GNL (Juillet 1980)
Connaissance du navire (Août 1980)
Réception des betteraves, balances proportionneuses, Saccharimétrie (Novembre 1981)
Compteurs turbines (1980)
Le mesurage des gaz de pétrole liquéfiés (G.P.L.) (Juin 1980)
Le mesurage de l'ammoniac liquéfié (1979)
Chimie (Octobre 1981)
Humidimètres pour grains de céréales et graines oléagineuses (Novembre 1981)

ITALIE

Istituto Elettrotecnico Nazionale Galileo Ferraris
N° 1773 — The high speed photometer of Asiago Observatory (P.L. Bernacca, G. Canton, R. Stagni, S. Leschiutta, G. Sedmak)
N° 1778 — Collecting area of a Natural Leaky-Wave antenna (G.C. Rumi)
N° 1779 — Photometry of luminaires at IEN : A new goniophotometer (F. Languasco, M. Pasta, P. Soardo)
N° 1788 — A.C. properties of Nb-Nbx Oy-Pb Josephson tunnel junctions for 2e/h measurements (V. Lacqnaniti, G. Marello, R. Vaglio)
N° 1806 — Distribution of a coded standard time information via broadcasting stations (V. Pettiti, S. Leschiutta)
N° 1808 — Cryogenics in electrical metrology at IEN (D. Andreone, E. Arri, G. Boella, V. Lacqnaniti, G. Marullo)
N° 1814 — Time coded distribution via broadcasting stations (S. Leschiutta, V. Pettiti, E. Detoma)
N° 1815 — The Sirio - 1 timing experiment (E. Detoma, S. Leschiutta)
N° 1823 — La candela ieri e oggi (P. Soardo)
N° 1835 — Tecniche di sincronizzazione tramite satelliti (E. Detoma)
N° 1836 — Codici orari radiodiffusi per sistemi automatici di acquisizione dati (F. Cordara, V. Pettiti)
N° 1840 — Electromagnetic compatibility (EMC) to-day : a review (1979-80) (C. Egidi)
N° 1843 — R.F. Emission from motor vehicles. Review of results (C. Egidi, P.G. Galliano, E. Nano)
N° 1846 — Segnali di tempo e codici orari radiodiffusi (E. Angelotti, S. Leschiutta)
N° 1859 — Procedures for the approval of a calibration centre (E. Arri, R. Perissi)
N° 1861 — Land-to-ship two-way time synchronization via the Sirio-1 satellite (E. Detoma, S. Leschiutta)
N° 1863 — Tito Livio Burattini, metrologo dimenticato del seicento (S. Leschiutta, M. Leschiutta)

JAPON

National Research Laboratory of Metrology
The Measurement Law (Law N° 207, 1951)
(édition actualisée et en langue anglaise)
Outline of « the Measurement Law » in Japan
(en japonais et anglais, 1980)
Japan Machinery and Metals Inspection Institute - JMI
Inspection Services, 1982

PAYS-BAS

Dienst van het IJkwezen
IJkwetgeving I : Aanvulling nr. 29 (Jan. 1982)

POLOGNE

Polski Komitet Normalizacji, Miar i Jakosci
Dziennik Normalizacji i miar : Nr 17-24/1981
Zarzadzenie z dnia 18-9-1981 r. w sprawie ustalenia przepisow :
Nr 132 o sekundomierzach (stoperach) mechanicznych
Nr 133 o przymiarach sztywnych do pomiaru napelnienia zbiornikow
Nr 134 o zbiornikach pomiarowych
Zarzadzenia nr 150 z dnia 23-10-1981 r. w sprawie wprowadzenia obowiazku kwalifikacji jakosci niektorych wyrobow przemyslu drzewnego
Zarzadzenie z dnia 9-11-1981 r. w sprawie ustalenia przepisow :
Nr 154 o silomierzach (dynamometrach) kontrolnych do pomiaru sil statycznych
Nr 155 o wlasciwym uzytkowaniu wglebnikow diamentowych do twardosciomierzy Rockwella i Vickersa
Zarzadzenie z dnia 18-11-1981 r. w sprawie ustalenia przepisow :
Nr 157 o odwaznikach porcelanowych handlowych zwyczajnych
Nr 158 o odwaznikach handlowych zwyczajnych do szalek specjalnych
Zarzadzenie z dnia 23-11-1981 r. w sprawie ustalenia przepisow :
Nr 159 o czestosciomierzach-czasomierzach cyfrowych
Nr 160 o kontrolnych miernikach mocy wielkiej czestotliwosci
Zarzadzenie z dnia 12-12-1981 r. w sprawie ustalenia przepisow :
Nr 168 o przyrzadach do pomiaru dlugosci drutu i kabla oraz materialow tasmowych opatrunkowych i papierowych
Nr 169 o termometrach lekarskich
Instrukcja Nr 8 z dnia 1-10-1981 r. o wzorcowaniu zbiornikow pomiarowych
Instrukcje z dnia 22-10-1981 r. o sprawdzaniu :
Nr 9 sekundomierzy (stoperow) mechanicznych
Nr 10 goniometrow
Instrukcja Nr 11 z dnia 12-12-1981 r. o sprawdzaniu czestosciomierzy-czasomierzy cyfrowych
Katalog Polskich Norm, Tomes 1 et 2 - 1981
Katalog Norm Branzowych, Tomes 1 et 2 - 1981
Polska Norma : PN (titre donné en français) :
81/A-86234 Lait et dérivés du lait. Fromages. Détermination des teneurs en nitrites et nitrates
81/C-04082 Produits pétroliers. Essais des propriétés anticorrosives des huiles minérales
80/E-8200.01 Sécurité des appareils électrodomestiques et analogues. Première partie : Règles générales
8/M-45018 Code de sécurité. Appareils de levage. Désignation de couleurs de sécurité

ROYAUME-UNI DE GRANDE-BRETAGNE ET D'IRLANDE DU NORD

National Physical Laboratory
A code of practice for the detailed statement of accuracy (P.J. Campion, J.E. Burns, A. Williams - 1973)
SI The International System of Units
(C.H. Page, Paul Vigoureux - 3rd edition, 1977)
Changing to the metric System - Conversion factors, symbols and definition (Pamela Anderton, P.H. Bigg - 5th edition, 1979)

Institute of Measurement and Control

Weightech 81, Conference on Weighing and Force Measurement (Harrogate, England 30th Sept.-2nd Oct. 1981)

British Standards Institution

PD 5686 (Jan. 1969) : The use of SI Units

National Weights and Measures Laboratory

Directory of Local Weights and Measures Authorities (Sept. 1978)

Handlist of historical material on legal metrology (March 1978)

Statutory Instruments on Weights and Measures :

1966/780 Local Acts : repeal Order 1966
1967/623 Birkenhead Corporation Acts : repeal Order 1967
1970/1897 Drugs : Metric Equivalents of Imperial Values Regulation 1970
1974/1166 Sugar : Schedule 4 Order 1974
1975/655 Agriculture. The Measurement of Cereals for Import and Export Purposes Regulations 1975
1975/1319 Marking and Abbreviations on Pre-packed Goods Regulations 1975
1975/1873 Gas volume meters. Regulations 1975
1975/2125 Calibration of Tanks of Vessels. Regulations 1975
1976/1664 Equivalents for Dealings with Drugs : Amendment Regulations
1977/932 Bottles as Measuring Containers. Regulations 1977
1977/1271 1976 Act Schedule 4 commencement Order 1977
1977/1332 Cocoa and Chocolate Products Order 1977
1977/1683 Marking of Goods and Abbreviations of Units : Amendment Regulations 1977
1977/1753 Alcoholometers and Alcohol Hydrometers. Regulations 1977
1977/2058 Various Goods (Termination of Imperial Quantities) Order 1977
1977/2059 Bread : metrication Order 1977
1977/2162 Isle of Man - treated as GB Section 11 Order 1977
1978/238 Solid Fuel (signs on coal lorries) Regulations 1978
1978/484 The Units of Measurement. Regulations 1978
1978/741 Potatoes (prescribed Quantities for Prepacks) Order 1978
1978/1080 Termination of Imperial Quantities (Various goods) Order 1978
1978/1081 Coffee Extracts and Chicory Extracts (prescribed quantities) Order 1978
1979/132 The Alcohol Tables. Regulations 1979
1979/729 Egg Grading Machines : Revocation Regulations 1979
1979/955 Solid Fuel : Carriage by Rail Amendment Order 1979
1979/1224 Gas Volume meters : Amendment Regulations 1979
1979/1228 1979 Act Commencement No. 1 Order 1979
1979/1257 Gas Volume meters : Fees Amendment Regulations 1979
1979/1379 Taximeters. Regulations 1979
1979/1752 Milk Order 1979
1979/1753 Solid Fuel Order 1979
1980/8 Marking of Goods and Abbreviations of units : Amendment Regulations 1980
1980/246 Milk and Solid Fuel Machines. Regulations 1980
1980/886 Electricity. Electrical Energy Meters Regulations 1980
1980/1064 Packaged Goods / Amendment Regulations 1980
1980/1878 Liquid Fuel and Lubricants Measuring Instruments : Amendment Regulations 1980
1981/1780 Dried Fruits and Vegetables : Amendment Order 1981
1981/1781 Grain and Farinaceous Products Order 1981
1981/1782 Coffee and Coffee Mixtures Order 1981

SRI LANKA

Minister of Trade and Shipping

National Metric Conversion (Weights and Measures) Regulations (Gazette of the Democratic Socialist Republic of Sri Lanka N° 164/3 - 1981.10.27)

SUISSE

Office Fédéral de Métrologie

Modification du 13-1-1982 à l'Ordonnance sur les taxes de vérification

URSS

Gosudarstvennyi Komitet SSSR po Standartam

Ukazatel Normativno-Tehniceskaja Documentacija v oblasti Metrologii, 1981

State System for ensuring the uniformity of measurements :

Gost 8.037-81 : State special standard and state verification schedule for measuring radio noise power spectral density within frequency range from 0.002 to 37.5 GHz

Gost 8.051-81 : Permissible errors of measurement of linear dimensions to 500 mm

Gost 8.229-81 : Infrared spectrophotometers. Methods and means of verification

Gost 8.435-81 : (ST SEV 1073-78) : Measuring sets ; type artificial line. Methods and means for checking

Gost 8.436-81 (ST SEV 1074-78) : Measuring sets ; type supply bridges. Methods and means for checking

Gost 8.438-81 : Systems of information and measurements. Verification. General statements

Gost 8.440-81 : High-speed six-channel oscillographs. Methods and means of verification

Gost 8.441-81 : Actual high precision generators of frequency and time. Methods and means of verification

Gost 8.442-81 : Moisture meters neutron. Methods and means of verification

Gost 8.444-81 : Standard instruments for dynamic parameter measurements of pulse laser measuring transducers. Methods and means of verification

Gost 8.445-81 : Standard means measuring laser output average power. Methods and means of verification

RECOMMANDATIONS INTERNATIONALES

de la

CONFERENCE INTERNATIONALE DE METROLOGIE LEGALE

R.I. N°		Secrétariats	Année d'édition
—	Vocabulaire de métrologie légale (termes fondamentaux) (édition bilingue français/anglais)	Pologne	1978
1	— Poids cylindriques de 1 gramme à 10 kilogrammes (de la classe de précision moyenne)	Belgique	1973
2	— Poids parallélépipédiques de 5 à 50 kilogrammes (de la classe de précision moyenne)	Belgique	1973
3	— Réglementation métrologique des instruments de pesage à fonctionnement non automatique	R.F. d'Allemagne et France	1978
4	— Fioles jaugées (à un trait) en verre	Royaume-Uni	1970
5	— Compteurs de volume de liquides (autres que l'eau) à chambres mesureuses	R.F. d'Allemagne et France	1981
6	— Prescriptions générales pour les compteurs de volume de gaz	Pays-Bas et R.F. d'Allemagne	1978
7	— Thermomètres médicaux à mercure, en verre, avec dispositif à maximum	R.F. d'Allemagne	1978
8	— Méthode étalon de travail destinée à la vérification des instruments de mesurage du degré d'humidité des grains	R.F. d'Allemagne	1970
9	— Vérification et étalonnage des blocs de référence de dureté Brinell	Autriche	1970
10	— de dureté Vickers	Autriche	1970
11	— de dureté Rockwell B	Autriche	1970
12	— de dureté Rockwell C	Autriche	1970
13	— Symbole de correspondance	B.I.M.L.	1970
14	— Saccharimètres polarimétriques	R.F. d'Allemagne	1978
15	— Instruments de mesure de la masse à l'hectolitre des céréales	R.F. d'Allemagne	1970
16	— Manomètres des instruments de mesure de la tension artérielle	Autriche	1970
17	— Manomètres - vacuomètres - manovacuomètres - indicateurs (instruments usuels)	U.R.S.S.	1981
18	— Pyromètres optiques à filament disparaissant	U.R.S.S.	1970

19 — Manomètres - vacuomètres - manovacuomètres - enregistreurs (instruments usuels)	U.R.S.S.	1981
20 — Poids des classes de précision E_1 E_2 F_1 F_2 M_1 de 50 kg à 1 mg	Belgique	1973
21 — Taximètres	R.F. d'Allemagne	1973
22 — Alcoométrie	France	1973
— Tables alcoométriques	France	1975
23 — Manomètres pour pneumatiques	U.R.S.S.	1973
24 — Mètre étalon rigide pour Agents de vérification	Inde	1973
25 — Poids étalons pour Agents de vérification	Inde	1977
26 — Seringues médicales	Autriche	1973
27 — Compteurs de volume de liquides autres que l'eau — Dispositifs complémentaires	R.F. d'Allemagne et France	1973
28 — Réglementation « technique » des instruments de pesage à fonctionnement non-automatique	R.F. d'Allemagne et France	1981
29 — Mesures de capacité de service	Suisse	1973
30 — Mesures de longueur à bouts plans	U.R.S.S.	1981
31 — Compteurs de volume de gaz à parois déformables	Pays-Bas	1973
32 — Compteurs de volume de gaz à pistons rotatifs et compteurs de volume de gaz à turbine	R.F. d'Allemagne	1973
33 — Valeur conventionnelle du résultat des pesées dans l'air	B.I.M.L.	1973
34 — Classes de précision des instruments de mesurage	U.R.S.S.	1974
35 — Mesures matérialisées de longueur pour usages généraux	Belgique et Hongrie	1977
36 — Vérification des pénétrateurs des machines d'essai de dureté	Autriche	1977
37 — Vérification des machines d'essai de dureté système Brinell	Autriche	1977
38 — Vérification des machines d'essai de dureté système Vickers	Autriche	1977
39 — Vérification des machines d'essai de dureté système Rockwell B,F,T — C,A,N	Autriche	1977
40 — Pipettes étalons pour Agents de vérification	Inde	1977
41 — Burettes étalons pour Agents de vérification	Inde	1977
42 — Poinçons de métal pour Agents de vérification	Inde	1977
43 — Fioles étalons graduées en verre pour Agents de vérification	Inde	1977
44 — Alcoomètres et aréomètres pour alcool	France	1977

45 — Tonneaux et futailles	Autriche	1977
46 — Compteurs d'énergie électrique active à branchement direct	France	1978
47 — Poids étalons pour le contrôle des instruments de pesage de portée élevée	R.F. d'Allemagne et France	1978
48 — Lampes à ruban de tungstène pour l'étalonnage des pyromètres optiques	U.R.S.S.	1978
49 — Compteurs d'eau (destinés au mesurage de l'eau froide)	Royaume-Uni	1977
50 — Instruments de pesage totalisateurs continus à fonctionnement automatique	Royaume-Uni	1980
51 — Trieuses pondérales de contrôle et trieuses pondérales de classement	Royaume-Uni	1980
52 — Poids hexagonaux — Classe de précision ordinaire — de 100 grammes à 50 kilogrammes	Belgique et Royaume-Uni	1980
53 — Caractéristiques métrologiques des éléments récepteurs élastiques utilisés pour le mesurage de la pression. Méthodes de leur détermination	U.R.S.S.	1982
54 — Echelle de pH des solutions aqueuses	U.R.S.S.	1981
55 — Compteurs de vitesse, compteurs mécaniques de distance et chronotachygraphes des véhicules automobiles — Réglementation métrologique	Pologne	1981
56 — Solutions-étalons, reproduisant la conductivité des électrolytes	U.R.S.S.	1981
57 — Ensembles de mesurage de liquides autres que l'eau équipés de compteurs de volumes — Dispositions générales	R.F. d'Allemagne et France	1982

DOCUMENTS INTERNATIONAUX

adoptés par le

Comité International de Métrologie Légale

D.I. N°		
1 — Loi de métrologie	BIML	1975
2 — Unités de mesure légales	BIML	1978
3 — Qualification légale des instruments de mesurage	BIML	1979
4 — Conditions d'installation et de stockage des compteurs d'eau froide	Royaume-Uni	1981
5 — Principes pour l'établissement des schémas de hiérarchie des instruments de mesure	France	*

Note — Recommandations internationales et Documents internationaux peuvent être acquis au Bureau International de Métrologie Légale, 11, rue Turgot, 75009 PARIS.

* En cours de publication.

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