

**Bureau International des Poids et Mesures**

# **Comité International des Poids et Mesures**

96th meeting (November 2007)

#### Note on the use of the English text

To make its work more widely accessible the International Committee for Weights and Measures publishes an English version of its reports.

Readers should note that the official record is always that of the French text. This must be used when an authoritative reference is required or when there is doubt about the interpretation of the text.

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## MEMBER STATES AND ASSOCIATES OF THE GENERAL CONFERENCE

as of 7 November 2007

### Member States

|                        |                                |
|------------------------|--------------------------------|
| Argentina              | Korea (Dem. People's Rep. of)  |
| Australia              | Korea (Rep. of)                |
| Austria                | Malaysia                       |
| Belgium                | Mexico                         |
| Brazil                 | Netherlands                    |
| Bulgaria               | New Zealand                    |
| Cameroon               | Norway                         |
| Canada                 | Pakistan                       |
| Chile                  | Poland                         |
| China                  | Portugal                       |
| Czech Republic         | Romania                        |
| Denmark                | Russian Federation             |
| Dominican Republic     | Serbia                         |
| Egypt                  | Singapore                      |
| Finland                | Slovakia                       |
| France                 | South Africa                   |
| Germany                | Spain                          |
| Greece                 | Sweden                         |
| Hungary                | Switzerland                    |
| India                  | Thailand                       |
| Indonesia              | Turkey                         |
| Iran (Islamic Rep. of) | United Kingdom                 |
| Ireland                | United States                  |
| Israel                 | Uruguay                        |
| Italy                  | Venezuela (Bolivarian Rep. of) |
| Japan                  |                                |

### Associates of the General Conference

|                  |                        |
|------------------|------------------------|
| Albania          | Latvia                 |
| Belarus          | Lithuania              |
| CARICOM          | Macedonia (the FYR of) |
| Chinese Taipei   | Malta                  |
| Costa Rica       | Moldova (Rep. of)      |
| Croatia          | Panama                 |
| Cuba             | Philippines            |
| Ecuador          | Slovenia               |
| Estonia          | Sri Lanka              |
| Hong Kong, China | Tunisia                |
| Jamaica          | Ukraine                |
| Kazakhstan       | Viet Nam               |
| Kenya            |                        |



## THE BIPM

The International Bureau of Weights and Measures (BIPM) was set up by the Metre Convention signed in Paris on 20 May 1875 by seventeen States during the final session of the diplomatic Conference of the Metre. This Convention was amended in 1921.

The BIPM has its headquarters near Paris, in the grounds (43 520 m<sup>2</sup>) of the Pavillon de Breteuil (Parc de Saint-Cloud) placed at its disposal by the French Government; its upkeep is financed jointly by the Member States.

The task of the BIPM is to ensure worldwide unification of measurements; its function is thus to:

- establish fundamental standards and scales for the measurement of the principal physical quantities and maintain the international prototypes;
- carry out comparisons of national and international standards;
- ensure the coordination of corresponding measurement techniques;
- carry out and coordinate measurements of the fundamental physical constants relevant to these activities.

The BIPM operates under the exclusive direction and supervision of the International Committee for Weights and Measures (CIPM) which itself comes under the authority of the General Conference on Weights and Measures (CGPM) and reports to it on the work accomplished by the BIPM.

Delegates from all Member States attend the General Conference which, at present, meets every four years. The function of these meetings is to:

- discuss and initiate the arrangements required to ensure the propagation and improvement of the International System of Units (SI), which is the modern form of the metric system;
- confirm the results of new fundamental metrological determinations and various scientific resolutions of international scope;
- take all major decisions concerning the finance, organization and development of the BIPM.

The CIPM has eighteen members each of a different nationality: at present, it meets every year. The officers of this committee present an annual report on the administrative and financial position of the BIPM to the Governments of the Member States. The principal task of the CIPM is to ensure worldwide uniformity in units of measurement. It does this by direct action or by submitting proposals to the CGPM.

The activities of the BIPM, which in the beginning were limited to measurements of length and mass, and to metrological studies in relation to these quantities, have been extended to standards of measurement of electricity (1927), photometry and radiometry (1937), ionizing radiation (1960), time scales (1988) and to chemistry (2000). To this end the original laboratories, built in 1876-1878, were enlarged in 1929; new buildings were constructed in 1963-1964 for the ionizing radiation laboratories, in 1984 for the laser work and in 1988 for a library and offices. In 2001 a new building for the workshop, offices and meeting rooms was opened.

Some forty-five physicists and technicians work in the BIPM laboratories. They mainly conduct international comparisons of realizations of units, calibrations of standards and metrological research. An annual report, the *Director's Report on the Activity and Management of the International Bureau of Weights and Measures*, gives details of the work in progress.

Following the extension of the work entrusted to the BIPM in 1927, the CIPM has set up bodies, known as Consultative Committees, whose function is to provide it with information on matters that it refers to them for study and advice. These Consultative Committees, which may form temporary or permanent working groups to study special topics, are responsible for coordinating the international work carried out in their respective fields and for proposing recommendations to the CIPM concerning units.

The Consultative Committees have common regulations (*BIPM Proc.-Verb. Com. Int. Poids et Mesures*, 1963, **31**, 97). They meet at irregular intervals. The president of each Consultative Committee is designated by the CIPM and is normally a member of the CIPM. The members of the Consultative Committees are metrology laboratories and specialized institutes, agreed by the CIPM, which send delegates of their choice. In addition, there are individual members appointed by the CIPM, and a representative of the BIPM (Criteria for membership of Consultative Committees, *BIPM Proc.-Verb. Com. Int. Poids et Mesures*, 1996, **64**, 124). At present, there are ten such committees:

1. The Consultative Committee for Electricity and Magnetism (CEEM), new name given in 1997 to the Consultative Committee for Electricity (CCE) set up in 1927.
2. The Consultative Committee for Photometry and Radiometry (CCPR), new name given in 1971 to the Consultative Committee for

Photometry (CCP) set up in 1933 (between 1930 and 1933 the CCE dealt with matters concerning photometry).

3. The Consultative Committee for Thermometry (CCT), set up in 1937.
4. The Consultative Committee for Length (CCL), new name given in 1997 to the Consultative Committee for the Definition of the Metre (CCDM), set up in 1952.
5. The Consultative Committee for Time and Frequency (CCTF), new name given in 1997 to the Consultative Committee for the Definition of the Second (CCDS) set up in 1956.
6. The Consultative Committee for Ionizing Radiation (CCRI), new name given in 1997 to the Consultative Committee for Standards of Ionizing Radiation (CCEMRI) set up in 1958 (in 1969 this committee established four sections: Section I (X- and  $\gamma$ -rays, charged particles), Section II (Measurement of radionuclides), Section III (Neutron measurements), Section IV ( $\alpha$ -energy standards); in 1975 this last section was dissolved and Section II was made responsible for its field of activity).
7. The Consultative Committee for Units (CCU), set up in 1964 (this committee replaced the “Commission for the System of Units” set up by the CIPM in 1954).
8. The Consultative Committee for Mass and Related Quantities (CCM), set up in 1980.
9. The Consultative Committee for Amount of Substance: Metrology in chemistry (CCQM), set up in 1993.
10. The Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV), set up in 1999.

The proceedings of the General Conference and the CIPM are published in the following series:

- *Report of the meeting of the General Conference on Weights and Measures;*
- *Report of the meeting of the International Committee for Weights and Measures.*

The CIPM decided in 2003 that the reports of meetings of the Consultative Committees should no longer be printed, but would be placed on the BIPM website, in their original language.

The BIPM also publishes monographs on special metrological subjects and, under the title *The International System of Units (SI)*, a brochure,

periodically updated, in which are collected all the decisions and recommendations concerning units.

The collection of the *Travaux et Mémoires du Bureau International des Poids et Mesures* (22 volumes published between 1881 and 1966) and the *Recueil de Travaux du Bureau International des Poids et Mesures* (11 volumes published between 1966 and 1988) ceased by a decision of the CIPM.

The scientific work of the BIPM is published in the open scientific literature and an annual list of publications appears in the *Director's Report on the Activity and Management of the International Bureau of Weights and Measures*.

Since 1965 *Metrologia*, an international journal published under the auspices of the CIPM, has printed articles dealing with scientific metrology, improvements in methods of measurement, work on standards and units, as well as reports concerning the activities, decisions and recommendations of the BIPM.

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on 1 January 2008

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**Emeritus directors:** Prof. P. Giacomo, Dr T.J. Quinn

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1 Also Publications.

2 Also site maintenance.

International Committee  
for Weights and Measures

**Proceedings of the sessions  
of the 96th meeting**

(7 – 9 November 2007)

## Agenda

1. Opening of the meeting; quorum; agenda
2. Report of the Secretary and activities of the bureau of the CIPM (October 2006 – November 2007)
3. Membership of the CIPM
4. Membership of the bureau of the CIPM
5. Nomination of the next Director of the BIPM
6. The CIPM Mutual Recognition Arrangement (CIPM MRA)
7. The International System of Units (SI)
8. Consultative Committees
9. BIPM/ILAC Joint Working Group
10. Materials metrology
11. Contacts with other intergovernmental organizations and international bodies
12. Joint Committee for Guides in Metrology
13. Work of the BIPM
14. Preparation for the 23rd meeting of the General Conference
15. *Metrologia*
16. Administrative and financial affairs
17. Other business
18. Election of the bureau of the CIPM
19. Date of next meeting

**1 OPENING OF THE MEETING;  
QUORUM;  
AGENDA**

The International Committee for Weights and Measures (CIPM) held its 96th meeting from Wednesday 7 November to Friday 9 November 2007 at the Pavillon de Breteuil, Sèvres.

Present: S. Bennett, K. Carneiro, Myung Sai Chung, L. Énard, Gao Jie, E.O. Göbel, F. Hengstberger, B. Inglis, L.K. Issaev, R. Kaarls, J.W. McLaren, G. Moscati, A. Sacconi, W. Schwitz, H. Semerjian, M. Tanaka, H. Ugur, J. Valdés, A.J. Wallard (Director of the BIPM).

Also attending: P. Giacomo and T.J. Quinn (Emeritus Directors of the BIPM); J. Kovalevsky (Honorary Member of the CIPM, present for part of the meeting); I.M. Mills (President of the CCU, present for part of the meeting); B. Perent (Administrator of the BIPM); F. Joly and D. Le Coz (secretariat), and J. Williams (Publications). Also in attendance for part of the meeting: R. Cèbe (Legal Advisor of the BIPM) and the following Executive Secretaries and contact persons: P.J. Allisy-Roberts, E.F. Arias, R.S. Davis, P.I. Espina, R. Felder, M. Stock, C. Thomas, R.I. Wielgosz.

Professor Göbel, President of the CIPM, opened the 96th meeting by welcoming all present, particularly Dr Sacconi, who was attending his first meeting. With nearly all members present (H. Semerjian arrived during the first session of the committee), the quorum was satisfied according to Article 12 of the Rules annexed to the Metre Convention.

Professor Göbel noted with sadness the announcement of the deaths of Dr A.P. Mitra, member of the CIPM from 1985 to 1990; Dr Kai Siegbahn, member of the CIPM from 1964 to 1998, Nobel laureate in physics in 1981; and Dr Yoshio Tomonaga, member of the CIPM from 1967 to 1974. The CIPM observed a minute's silence in their memory.

The President noted that the order of various items of the agenda would be changed to ensure sufficient time for discussions on the forthcoming meeting of the General Conference on Weights and Measures (CGPM) and the nomination of the future Director of the BIPM. The agenda for the meeting was adopted and the report of the 95th meeting approved with one minor comment about COOMET, the correct name for which is the Euro-

Asian Cooperation of National Metrological Institutions. The President then invited the Secretary of the CIPM, Dr Kaarls, to present his report.

## **2 REPORT OF THE SECRETARY AND ACTIVITIES OF THE BUREAU OF THE CIPM (October 2006 – November 2007)**

All the important matters arising in the report of the Secretary are taken up later in the meeting. Reference is made in this section to the point in the subsequent discussion at which this occurs.

### **2.1 Meetings of the bureau of the CIPM**

The bureau of the CIPM has met on four occasions since the last CIPM: in March, July, September and November 2007 at the BIPM headquarters in Sèvres. In addition, the Secretary has made several visits to the BIPM and has held a number of discussions with the Director.

The initiative of sending the CIPM members a short summary of the major points discussed by the bureau should help keep CIPM members more closely informed.

The bureau of the CIPM also held its regular liaison meeting with the OIML and with the ILAC in March 2007.

### **2.2 CIPM membership**

Since the last meeting of the CIPM, Dr Attilio Sacconi, Scientific Director of INRIM (Italy) has been elected to fill the vacancy left by the resignation of Professor Sigfrido Leschiutta.

The bureau of the CIPM continues to carefully consider the composition of the CIPM, in particular as regards to the need to maintain long-term membership of the CIPM. It continues to seek suitable candidates by considering the need for a balance between 1) younger members, who would offer greater continuity, and more experienced members, 2) the geographical distribution and 3) by ensuring an appropriate spread of scientific disciplines.

### **2.3 Member States**

The number of Member States remains at 51.

After Montenegro declared itself independent from Serbia on 3 June 2006, the membership of Serbia and Montenegro of the BIPM was being continued by the Republic of Serbia. The BIPM Director will be in touch with the EURAMET contact person for Montenegro so as to establish their formal position in relation to the BIPM.

### **2.4 Associates of the CGPM**

Since the last meeting of the CIPM, Albania, The Former Yugoslav Republic of Macedonia (FYROM), the Republic of Moldova, Sri Lanka, and Tunisia became Associates. The number of Associates of the CGPM is therefore 25, representing 35 States and Economies.

It is expected that the Directors of the NMIs of Moldova, Sri Lanka and Tunisia will sign the CIPM MRA during the meeting of Directors on 14 November 2007. Albania has signed the CIPM MRA by correspondence on 10 October 2007. The arrangements for the signature of the CIPM MRA by FYROM are in progress.

Current contacts with potential Associates include Bangladesh, Bolivia, Cambodia, Colombia, Fiji Islands, Georgia, Guatemala, Iraq, Luxembourg, Morocco, Nepal, Paraguay and Syria. There are also contacts with Saudi Arabia and the United Arab Emirates as potential new Member States.

### **2.5 The next Director of the BIPM**

The post of Director of the BIPM will be vacant in October 2010 at the occasion of the retirement of the current Director, Prof. Wallard.

Twenty-nine applications for the post of Director of the BIPM were received after the vacancy was advertised during the first half of 2007. Nine candidates have been interviewed by the bureau of the CIPM. A short list will be presented to the CIPM for their consideration and decision. After the CIPM has made its decision, the bureau of the CIPM will arrange for the employment conditions with the nominee.

It is intended that the successor of Prof. Wallard will start his/her work at the BIPM as Deputy Director/Director Designate of the BIPM by the end of 2008 or at the beginning of 2009.

**2.6 Situation in relation to payments of the contributions by Member States for 2007**

A number of Member States still have to pay their contributions for 2007. The total outstanding arrears amount to about € 2.8 millions at the end of October 2007, representing 25 % of the 2007 budget. As in earlier years, this level of arrears creates difficulties for financial planning and budgeting.

**2.7 Member States in financial arrears**

There continue to be four States in arrears for more than three years: Cameroon, the Dominican Republic, the Islamic Republic of Iran and the Democratic People's Republic of Korea. Despite the renewed and intensified contacts with the Government of the Islamic Republic of Iran, no final settlement has yet been reached.

**2.8 Assistance to developing countries and potential new Member States or Associates**

The bureau has discussed a proposal to hold a meeting at which National Metrology Institutes (NMIs) and other bodies which offer technical assistance to developing countries in order to explore means of coordinating this activity. The proposal will first be put to the meeting of NMI Directors in order to assess the level of interest.

Developments in the scope of the Joint Committee on coordination of assistance to Developing Countries in Metrology, Accreditation and Standardization (JCDCMAS) are still limited. The situation with regard to the future development of the secretariat of the JCDCMAS, now with UNIDO, is unclear but it is possible that if the BIPM leads the work, it would have greater influence and could develop the programme with a strong metrology element.

**2.9 BIPM matters**

**2.9.1 Presentation of the annual administrative and financial report**

The bureau of the CIPM agreed to change the presentation of the annual report to the Member States on the administrative and financial situation of the BIPM. Since 1939, expenditure has been presented in a table which details the overspending or underspending of the expenditure compared to the budget voted by the CIPM. There had been no similar presentation for

income. The bureau agreed that this will be included in the “*Rapport Annuel aux Gouvernements*” for 2007.

Other aspects of the BIPM's financial situation are presented in section 16.

#### 2.9.2 Staff Regulations and Rules, salary survey and the BIPM pension fund

The BIPM has been preparing a new set of BIPM Staff Regulations and Rules corresponding to modern standards and which would help attract, recruit and retain staff. After submission to the staff representatives for an advisory opinion and a recent first presentation to the bureau of the CIPM, a draft of the new Staff Regulations and Rules has been distributed to CIPM members. There will be a presentation and discussion during the meeting. Approval of the text will, the bureau proposes, be by correspondence after the bureau has again reviewed the contents of the Staff Regulations and Rules in depth and CIPM members have had adequate time to reflect on the document and to comment.

The changes proposed provide an opportunity to update the current Statute. The proposals must be considered as a package since they are interrelated. Some reduced benefits or advantages are balanced by some new, even if limited, benefits and career opportunities. The new Staff Regulations and Rules will apply to all staff whatever their date of appointment.

A major feature of the new terms and conditions of employment apply to provisions for staff disputes in accordance with the Amendment to the Headquarters Agreement to be ratified shortly by the French Parliament, which provides for the recognition of the jurisdiction of an international administrative tribunal for staff disputes. In the case of the BIPM, as with many other intergovernmental organizations, the BIPM will request to recognize the jurisdiction of the Administrative Tribunal of the International Labour Organization (ILO).

If, before mid February 2008, the CIPM approves the new Staff Regulations and Rules, the BIPM would submit its request for recognition of the Administrative Tribunal of the ILO in March 2008. The ILO Governing Body would consider the request at its March 2008 session.

The majority of the terms of employment will also apply to the Director, but as the CIPM is the appointing authority for decisions related to the Director and Deputy Director, it may wish to make specific provisions, such as the

term of office, but which do not need to be incorporated in the Staff Regulations and Rules.

A salary survey was conducted for the BIPM by the Inter-Organizations Study Section on Salaries and Prices of the Coordinated Organizations\* with the aim of comparing the BIPM remuneration packages, *i.e.* basic salary, allowances and pensions paid to staff in comparison with those paid in various employment markets, such as other international organizations and the French public and private sectors. The international organizations covered are the CERN and the ESA, both of which are scientific international organizations, the latter being one of the coordinated organizations. The German and Australian metrology institutes have been taken as the reference NMIs. Further data will be added in relation to the NIST. The study considered salaries at start-of-career and end-of-career, as minimum salaries are pertinent to recruitment and maximum salaries are relevant to retention and motivation of staff. The conclusion of this study is that “on the whole, and except for some specific cases, the BIPM pay is fairly competitive at the end-of-career level but less so at the start for most jobs when compared to ESA, CERN and the French private sector. The comparison with the German and Australian metrology institutes show that, on the whole, salaries at BIPM in scientific, IT and database related fields are on a par with those paid by both these institutes at start-of-career levels. A number of the jobs compared become competitive at the end-of-career level.”

Inasmuch as the bureau of the CIPM has not yet had the opportunity to consider the results of the study, it is too early to come to conclusions. Moreover, there may be further consequences with regard to the pension fund. Also the possibility and desirability for continuing work after the age of 65 years has to be considered.

An external study on the BIPM pension fund was carried out so as to compare the rules of the BIPM pension fund with those of other international bodies and to review the recent evolution of these schemes in terms of benefits and contributions. The consultant also made recommendations with the aim of clarifying and completing the BIPM rules. An actuarial study will be carried out to evaluate the financial consequences of any recommendations for modifications to the pension

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\* NATO, OECD, ESA, Council of Europe, WEU and ECMWF.

scheme. The results of this study will be presented to the CIPM at its next meeting.

As a further consequence, some additional amendments to the Staff Regulations and Rules may be proposed.

### 2.9.3 Headquarters Agreement

The French Foreign Affairs Ministry (FFAM) had proposed to the BIPM certain changes, by exchange of letters, to the Amendment signed in June 2005 by the CIPM to the Headquarters Agreement. The FFAM wanted to include provisions to clarify the exception to immunity from jurisdiction concerning counterclaims and in the case of civil prosecution related to car accidents. The BIPM requested some modifications to the FFAM's proposal and the FFAM accepted the request of the BIPM, which was then approved by the CIPM by correspondence in July 2007. The President of the CIPM then signed the text of the supplement to the Amendment. Now that all the relevant French ministries have also given their approval, the supplement to the Amendment has been sent to the Government and has to be examined by the *Conseil d'État* and then by the French Parliament. At the time of drafting this report, the process of ratification by France is still in progress but the BIPM is in regular contact with the FFAM in an attempt to complete the process as soon as possible.

### 2.9.4 Staff Commissions

An internal BIPM working group on Staff Commissions was set up by the Director to discuss issues related to staff representation and made its recommendations to the Director. As a result, it is proposed that there will be a merger of the Statute Commission, Salaries Commission and Information and Safety Commission. There will be no change to the three remaining commissions (Social Loans, Health Insurance and Social Affairs). The new commission would review all matters concerned with conditions of employment for BIPM staff. As a result, the number of staff members of commissions will drop from 26 to 18.

### 2.9.5 Quality System

The Secretary of the CIPM attended the annual management review of the BIPM's Quality System in August 2007.

In the past year, twelve internal and twelve external audits have taken place. In overall terms, external audits have been very satisfactory. There were especially favourable comments on the success of the transfer of expertise from retiring staff members of the Electricity section to the staff who were previously members of the Radiometry and Photometry section and who were transferred after the closure of this section to the Electricity section.

No complaints were received and no non-conformities observed.

The question of thermometry activities upon which the CIPM was informed last year, had been suspended because of a lack of internal resources, was again mentioned. Staff resources still make it extremely difficult to maintain this activity at the BIPM although the maintenance of know-how would be important. It was agreed to maintain the current arrangements for calibrations of platinum resistance thermometers with the LNE-INM this year but to review the different options at the next meeting of the CIPM.

The KCDB is now included in the BIPM's Quality System and the organic chemistry work will be audited internally and externally before the Chemistry section takes on the task of piloting a comparison next year.

Several external auditors had commented that the BIPM did not appoint deputies to holders of key posts. The management review meeting agreed that this was not feasible in such a small organization as the BIPM. The Director, however, remains the BIPM Quality Manager, even if he delegates this responsibility to a staff member.

The BIPM's top level Quality System documentation is being revised so as to split it up into an "umbrella" document and two additional documents. One will deal with calibration and measurement services, and the other with supporting services. An external audit of the revised documentation is planned for January 2008.

#### 2.9.6 Refurbishment of the old workshop and maintenance of buildings

The refurbishment of the old workshop in the Petit Pavillon has been successfully completed and the new additional meeting rooms are being used. The *Grande Salle* has been carefully refurbished and there have also been refurbishments of a number of laboratories and offices as well as the exterior of the Ionizing Radiation/Chemistry building. Maintenance of the shutters of the Pavillon de Breteuil is also underway.

## **2.10 CIPM MRA matters**

### **2.10.1 The Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB)**

The Joint Committee of the Regional Metrology Organizations and the BIPM (JCRB) has met twice and continues to deal with substantial matters of business. At its meeting in May 2007, the Committee decided to review its rules of procedure. A first text was discussed at the meeting in September 2007 and will be re-drafted for approval at the meeting in May 2008. A particularly important development has been the decision that all NMIs which are signatories of the CIPM MRA will have to provide an annual report on their Quality Systems. This will provide the Regional Metrology Organizations (RMOs) with details of any changes, resolution of any non-compliance observed during audits, etc. and also of any changes that the NMIs had implemented to their Calibration and Measurement Capabilities (CMCs) which might be necessary as a result of participation in comparisons.

The CIPM MRA logo is now authorised for use by 62 NMIs in 36 Member States and in 5 Associates of the CGPM.

The secondment from NIST of Dr Espina as JCRB Executive Secretary of the JCRB will come to an end in May 2008. The BIPM Director has received several applications from NMI staff. Interviews will be held later this year.

### **2.10.2 Signatories of the CIPM MRA**

The CIPM MRA has now been signed by the representatives of 67 NMIs from 45 Member States, 20 Associates of the CGPM and 2 international organizations, and covers a further 118 institutes designated by the signatory bodies.

### **2.10.3 Other signatories: the World Meteorological Organization (WMO)**

The bureau of the CIPM has kept in touch with the developments in relation to the interest of the WMO in signing the CIPM MRA. However, the situation of WMO needs to be carefully considered as WMO does not have laboratories of its own. In particular it is not clear whether the National Oceanic and Atmospheric Administration (NOAA), one of the laboratories which the WMO might nominate, would take part in comparisons for

scientific purposes but not then go on to offer services or to have CMCs, without having a Quality System in place. The bureau is waiting to hear the WMO's latest position.

In general, the linkage of sector specific reference laboratories to the CIPM MRA is an important topic that needs further consideration.

#### 2.10.4 Calibration and Measurement Capability (CMC) and Best Measurement Capability (BMC)

During its last session, CIPM members were informed on the state of the debate over the use of the terms Calibration and Measurement Capability, CMC, and Best Measurement Capability, BMC. The BIPM/ILAC working group on this issue has now finalized its position and is recommending the use of the term CMC for both the NMI and the accredited laboratory community. During the recent meeting of the ILAC General Assembly in October 2007 at Sydney, ILAC passed a resolution in support of the use of the term CMC. The CIPM has an agenda item on the topic.

#### 2.10.5 The CIPM MRA database (KCDB)

Appendix B of the database now covers 593 key comparisons and 163 supplementary comparisons. Among these 593 key comparisons, 274 have their final reports approved and posted in the KCDB, providing a total of about 800 graphs of equivalence displayed in the KCDB. The results of 65 RMO key comparisons are published in the KCDB. Linkage has also been carried out for 11 bilateral key comparisons subsequent to full-scale Consultative Committee key comparisons; their results are added on the appropriate graphs of equivalence.

Some 20 000 CMCs are published in Appendix C of the KCDB.

As a result of the significant changes and upgrades to the KCDB search engine, the number of visits to the CMC area has more than doubled to some 14 000 a month since the last CIPM meeting. Visits to the area which deals with key and supplementary comparisons has also increased from about 3 000 to over 10 000. The KCDB manager will report further on this issue later in the agenda.

#### 2.10.6 Ten years of the CIPM MRA

As 2009 sees the 10th anniversary of the signing of the CIPM MRA, the bureau of the CIPM considers that the event should be celebrated with a major conference or symposium, organized around World Metrology Day in 2009.

#### 2.11 Terminologies

The bureau of the CIPM reviewed the terminologies used when referring to the Metre Convention, the BIPM, the CIPM and the CGPM. The BIPM's legal adviser has produced a note and a "User guide" which have been distributed to the CIPM, but in essence:

- The BIPM is an intergovernmental organization, which comprises only two organs: the CGPM and the CIPM. The BIPM is the name of the intergovernmental organization created by the Metre Convention. It is not a third organ created by the Metre Convention.
- It is the BIPM which enjoys the legal status of an international organization, and implied international personality, privileges and immunities. As a consequence, it is on behalf of the BIPM that agreements with other intergovernmental organizations or States shall be signed.
- Some agreements, such as the Headquarters Agreement and some Memoranda of Understanding, are signed by the President or the Secretary of the CIPM on behalf of the CIPM, as the CIPM is the supervisory organ of the BIPM, or by the Director of the BIPM.

After consideration by the CIPM and final decision by the bureau of the CIPM, these terminologies should be used in all official documents.

#### 2.12 Regional Metrology Organizations

EURAMET applied successfully to the CIPM to be recognized as the RMO which replaced EUROMET.

The initiative to create AFRIMETS, with five sub-regions of which SADC MET will be one, is progressing well and there have been a number of meetings and discussions, in some of which the BIPM has participated, in relation to the sub-regions.

### **2.13 23rd meeting of the General Conference of Weights and Measures**

The bureau of the CIPM has been closely involved in the preparation of the documents for the next meeting of the General Conference on Weights and Measures (CGPM) and, in particular, with the position in relation to the dotation request. This will itself be a major agenda item for the CIPM.

The *Convocation* of the 23rd meeting of the CGPM, the *Programme of work and budget of the BIPM* and the new 2007 report on the “*Evolving Needs for Metrology in Trade, Industry and Society and the Role of the BIPM*”, usually known as the “Kaarls’ Report”, have been forwarded to the Governments of the Member States as well as to the members of the CIPM and to the directors of the NMIs of Member States and Associates of the CGPM.

The bureau of the CIPM also discussed the significant increase in the BIPM’s reserves because of unexpected additional income and temporary savings. This included: royalties resulting from the license agreement with Sartorius; delays in purchasing of receivers as a result of the uncertainty of the launch of the Galileo system; and the late arrival of a report on the investments needed to refurbish the laboratory for the watt balance. These costs are expected to be included in the 2008 budget. In addition, the BIPM has been successful in achieving repayment of financial arrears from Member States. Where these contributions in arrears have not been distributed to Member States, they accrue to the BIPM budget under the headline “Income”. When a Member State has not paid its contributions for three years, the said contribution is distributed among the other Member States. This contribution is reimbursed to Member States when the Member State repays its arrears of contributions and reduce the annual payment requested from Member States. The reserves have increased to some € 2.5 millions above the level of 50 % of the BIPM’s annual budget. As the CIPM will hear later, some of the reserves will be used to balance the budget in 2007 and 2008.

### **2.14 Relations with other bodies**

#### **2.14.1 International Organization of Legal Metrology (OIML)**

The bureau of the CIPM met with members of the CIML Presidential Council during the annual liaison meeting in March 2007. Since last year, the BIPM and the OIML have jointly published a leaflet on the work of the

two organizations and have created a common metrology portal under [www.metrologyinfo.org](http://www.metrologyinfo.org).

#### 2.14.2 International Laboratory Accreditation Cooperation (ILAC)

The bureau of the CIPM has monitored the activities of the Joint BIPM/ILAC Working Group, and draws the attention of the CIPM to the agenda item on the Group's recommendations for the use of the term CMC and the associated definitions and explanatory Notes. As was reported last year, the bureau of the CIPM welcomes the close relationship between the BIPM and the ILAC and the way in which this helps to bring the RMOs and the Regional Accreditation Bodies together. At the meeting held at the BIPM headquarters on 9 March 2007, the results of a survey of National Accreditation Bodies' experiences of the accreditation of NMIs were discussed. The JCRB has launched a similar survey of the experience from the NMIs' perspective and this will be a major agenda item at the next meeting in March 2008.

Further points of discussion will include the proper implementation by the accreditation bodies of credible traceability obtained from NMIs and other Designated Institutes recognized under the CIPM MRA.

#### 2.15 Joint Committee for Guides in Metrology (JCGM): the VIM and the GUM

The Director will report to the CIPM about progress made by the JCGM and its two working groups on the *International Vocabulary for Metrology* (VIM) and on the *Guide on Uncertainty in Measurement* (GUM) under a separate point of the CIPM Agenda. However at the time of drafting this report, the VIM had not finally been published by ISO. Therefore, the BIPM as well as the other partners in the JCGM, had not been in a position to "adopt" it and make it available through their websites.

The bureau of the CIPM reflected on the unsatisfactory situation in relation to the VIM definition of Certified Reference Material which differed from that in ISO REMCO. Unfortunately, information had never reached the appropriate people. In actual fact, there was a relatively small difference between the two definitions and the VIM referred to the REMCO wording. However the latter did not fit into the VIM hierarchy and terminology system.

**2.16 The International Standardization Organization (ISO), the International Electrotechnical Commission (IEC) and the decimal marker**

The situation in regard to the use of the point and the comma by ISO and IEC continues to evolve. Progress has been made with various groups in IEC and ISO which have taken note of the provisions of the Resolution 10 adopted by the General Conference at its 22nd meeting. The ISO Technical Management Board accepted that the decimal marker could be either a point or a comma. The IEC's Standardization Management Board then discussed proposals to align ISO and IEC practice with that of other international bodies but agreed that ISO and IEC would set up a joint group to make a detailed analysis of the benefits, costs, possible solutions and risks of changing decimal marker practice. This group will report back to the ISO and the IEC before the end of 2007. The BIPM Director is in regular touch with the ISO and IEC Secretaries General on this matter and is pressing both organizations to implement the decisions of the CGPM.

**2.17 Joint Committee on Traceability in Laboratory Medicine (JCTLM)**

The cooperation between the BIPM, IFCC and ILAC in the JCTLM is progressing in a very satisfactory way. The cooperation between all the stakeholders in the two JCTLM working groups and sub-groups is very good, although more input from NMIs would be desirable. The JCTLM database, maintained by the BIPM, has been made more accessible and now comprises not only lists of Certified Reference Materials and Reference Methods/Procedures of "higher order", but also a list of available reliable reference measurement services offered by the reference measurement laboratories in the field of clinical chemistry and laboratory medicine. The renewed database has been well received by the clinical community.

The BIPM is liaising with the relevant Directorate General of the European Commission so as to find a way in which the JCTLM database can be seen as a source of the traceability required by the EU *In-Vitro* Diagnostics Directive.

**2.18 Directors' Meeting**

The annual meeting of directors of NMIs will be held on 14 November 2007.

## 2.19 World Metrology Day

On the occasion of World Metrology Day (WMD) on the 20th of May, the Director has again issued his promotional message.

In 2007, the PTB joined the existing collaboration with NMISA to create a poster in support of the 2007 theme of metrology and climate change. This year, the WMD poster was reproduced in 20 languages, through collaborations with a number of other NMIs, and we are delighted with the success of this activity as well as the many letters of appreciation the BIPM has received. Looking ahead to 2008, the BIPM intends to use the Olympic Games as a major world event which could be used to bring the attention of the man in the street to the value of metrology. The NIM has agreed to join the collaboration on this occasion as, of course, China hosts the Games.

## 2.20 Financial report

The table below shows the situation of the assets of the BIPM, in euros, on 1 January of the year noted at the head of each column.

| Accounts  | 2004          | 2005          | 2006          | 2007          |
|---|---------------|---------------|---------------|---------------|
| I. Ordinary funds   | 6 716 177.48  | 6 656 826.81  | 7 405 481.57  | 8 035 603.86  |
| II. Pension fund  | 11 240 366.44 | 11 260 670.61 | 11 872 421.60 | 12 088 858.38 |
| III. Special fund for the improvement of scientific equipment | 0.00          | 0.00          | 0.00          | 0.00          |
| IV. Staff loan fund   | 209 624.60    | 217 347.38    | 229 312.25    | 238 715.51    |
| V. Building reserve fund                                      | 0.00          | 0.00          | 365 499.97    | 114 602.35    |
| VI. <i>Metrologia</i>   | 0.00          | 0.00          | 0.00          | 0.00          |
| VII Medical insurance reserve fund                            | 609 069.49    | 586 449.25    | 581 222.28    | 555 390.57    |
| Totals  | 18 775 238.01 | 18 721 294.05 | 20 453 937.67 | 21 033 170.67 |

Dr Hengstberger asked Dr Kaarls about the use of recovered arrears, and Dr Kaarls reiterated the comments from his report. Dr Schwitz commented about the increasing number of Associates and asked Dr Kaarls if any of the Associates had expressed the intention of becoming Member States.

Dr Kaarls replied that some of the more active Associates were in discussion with the BIPM about becoming Member States and that this was the subject of Draft Resolution E being presented to the CGPM the following week. Dr Schwitz went on to say that the increasing number of Associates represented more work for the BIPM, with relatively small income.

Dr Schwitz went on to ask about the terminology being used to describe the BIPM; for example, “Intergovernmental organization of the Metre Convention”, should this terminology be formally adopted, and asked about the status of the CIPM *vis-à-vis* the BIPM. Professor Wallard replied that Mr Cèbe has drafted a note and produced a Guide on this subject, and that he would be addressing the CIPM later in the week to outline the changes he recommended. Dr Quinn commented that Mr Cèbe's Guide was a useful document, but that it did not go far enough; should the CIPM not now ask the Member States to change the name of the organization? Dr Kaarls replied saying that Mr Cèbe would speak later in the week, and Dr Inglis mentioned that in the said Guide, the Member States are Members of the BIPM and not of the Metre Convention.

Dr Hengstberger returned to the subject of Associates, asking about the type of membership offered. Should we not keep the two classes of membership, Member State and Associate, without regarding the Associate status as a temporary one, particularly since some Associates cannot become a Member State for reasons beyond their control? Professor Göbel said no, some Associates could very well become Member States. Mr Érard commented that some Associate States do not possess an NMI (for example, Tunisia). Professor Wallard replied that the commitment from the Associate was to international metrology, not to a particular institute.

Dr Tanaka asked about the location of the secretariat of the JCDCMAS. Professor Wallard replied that at present it was with UNIDO, but it was something that the BIPM would like to take over: a view seconded by Prof. Göbel.

Dr Tanaka asked Dr Kaarls about his comment in the Report that the BIPM was looking at the possibility of allowing staff members to work beyond the normal retiring age. He thought that given the importance of retaining expertise, this was a good idea. Dr Kaarls replied that given the implications on the staff pension fund, a detailed report on this matter would be made to the next meeting of the CIPM.

### **3 MEMBERSHIP OF THE CIPM**

The President of the CIPM asked the members of the CIPM if anyone wished to announce his intention of retiring from the CIPM. Professor Göbel reminded the CIPM of the rules concerning the election of new members, and said that half of the present CIPM had to be renewed this year by the CGPM. The CIPM then discussed membership issues in a closed session.

### **4 MEMBERSHIP OF THE BUREAU OF THE CIPM**

All the current members of the bureau of the CIPM, excepting Prof. Moscati, wish to go forward for a further term of office.

### **5 NOMINATION OF THE NEXT DIRECTOR OF THE BIPM**

This item was discussed in a closed session of the CIPM on the morning of Friday 9 November. After a discussion, a secret ballot was held and Prof. Dr Michael Kühne, currently a member of the Presidential Board of the PTB, was nominated as Director Designate.

## 6 THE CIPM MUTUAL RECOGNITION ARRANGEMENT (CIPM MRA)

Professor Wallard spoke about the forthcoming tenth anniversary of the signing of the CIPM MRA (2009). He suggested that for the World Metrology Day message for 2009, he would concentrate on the ten years of the CIPM MRA. He asked the CIPM for any thoughts they might have of how best to celebrate this anniversary; for example, a conference; an idea seconded by Dr Semerjian. He also mentioned that during the Directors' Meeting which will be held after the meeting of the CIPM, three Directors of NMIs of new Associates would sign the CIPM MRA, the Republic of Moldova, Sri Lanka and Tunisia. Professor Wallard spoke about the role of the JCRB ("the executive branch of the CIPM MRA") and the Rules of Procedure on the operation of the CIPM MRA. He mentioned that the working pattern of the JCRB was improving, leading to increased efficiency and clarity; however, he commented that there was still some opacity with regard to the link between the CIPM and the JCRB, particularly on policy matters.

Professor Göbel commented that for the efficient running of the JCRB and to facilitate decision-making process, members must have a clear mandate from their RMOs. Mr Énard added that a clear mandate from the appropriate RMO was essential to avoid having to revisit decisions and the re-discussion of issues in the JCRB.

Professor Wallard went on to speak about the decision-making process related to JCRB issues. Any policy recommendations of the JCRB should be circulated to the CIPM for approval. He said that even though some people were in a hurry to take decisions, there were clear procedures about how issues were to be resolved. Dr Semerjian spoke in favour of the present mode of operation of the JCRB. Dr Carneiro suggested that to save time in having to convene the CIPM to take a decision relative to issues being discussed in the more frequent meetings of the JCRB, perhaps the CIPM could mandate others to take decisions on its behalf; in the case of JCRB issues it could be the bureau or an *ad hoc* committee. Dr Kaarls suggested that decisions could be adopted through an electronic vote, by means of email, to speed up the decision-making process.

Professor Wallard commented that the future of the CIPM MRA involves all the stakeholders and there was a need to have better communication.

Dr Quinn suggested that the tenth anniversary would be the ideal moment to look at the successes and failures of the CIPM MRA. However, in any complex structure, one should stick to the established procedures when taking decisions.

Dr Semerjian thought that a special issue of *Metrologia* would be a way of promoting the CIPM MRA and of celebrating the tenth anniversary of the CIPM MRA.

The Executive Secretary of the JCRB, Dr P. Espina, gave a presentation containing an overview of the 18th and 19th meetings of the JCRB and of the recent work of the JCDCMAS. The points covered concerned the mode of operation of the JCRB; the relationship between the CIPM and the JCRB and what the JCRB could or could not decide without contacting or consulting with the CIPM. Dr Espina also spoke about WMD for 2008 – Metrology in Sport. Dr Espina presented to the CIPM, for approval, the “Revised Rules of Procedure for the JCRB” and a document ([CIPM 2007-25](#)) detailing criteria for selection of peer-reviewers for NMIs. Such Rules were approved by the CIPM.

Dr Hengstberger asked about the JCDCMAS, and whether there was sufficient input from developing countries into the work and activities of the committee? He said that the reason for the existence of JCDCMAS came from developing countries, but it was not at all obvious how these very countries could provide their input into the committee. Other members of JCDCMAS thus had to take it upon themselves to speak on their behalf. Dr Espina replied by saying that the terms of reference for the operation of the committee were fixed and that individual countries could only have input through their representatives in the various partner agencies. Dr Espina asked Dr Hengstberger who could be added to the JCDCMAS committee to assist in facilitating this input. Dr Hengstberger replied that the RMOs should be represented. Professor Wallard commented that the BIPM wanted to take over the running of the secretariat of the JCDCMAS, which would certainly provide an opportunity to improve the functioning of the secretariat.

Dr Tanaka asked why the JCDCMAS does not invite representatives of RMOs to their meetings. Professor Wallard replied that this would create logistical problems.

Professor Göbel said that the JCDCMAS was not yet a success and Dr Kaarls commented that before the BIPM took on the secretariat of the JCDCMAS, there should be a more detailed consideration of the

functioning of the JCDCMAS – was it the most appropriate vehicle to achieve the desired goals?

Professor Göbel asked Dr Espina about the status of the source or directory document on the CIPM MRA (a single document containing references to all the documents concerning the functioning and history of the CIPM MRA). Dr Espina commented that there is a first draft but this is in need of considerable editorial work; for example, how best to present the very different types of information and wide range of documents. Dr Espina said that this first draft would be worked on and be presented to the bureau of the CIPM and to the CIPM for approval at its next session.

Dr Quinn asked about a written report to the CIPM on the working of the JCRB, containing details of what has happened over the previous year and which new NMIs have signed the CIPM MRA. He said that while it is true that some of this information can be found in the annual Director's Report of the BIPM, perhaps there should be a separate report on the recent activities of the JCRB, which could be presented to the CIPM at each session.

Dr C. Thomas gave a presentation on the current status of the KCDB.

Dr Hengstberger asked if “Key Comparison Database” was the most appropriate title for the repository of the results of key comparisons; perhaps, MRA Database would be a more appropriate title. KCDB is only about 50 % correct in describing the contents of the database, as it contains CMCs; should the occasion of the tenth anniversary of the CIPM MRA be used to change the name of the KCDB? Dr Inglis agreed with Dr Hengstberger, saying that a change of name is needed to better attract and assist those from outside the metrology community, whom we wish to see using the database, take up the opportunity of accessing the information available. He went on to suggest that it would be good to have more detailed statistics on the type of individuals who access information in the KCDB.

There followed a general discussion about the number of CMCs being published in the KCDB, and the question was raised as to when the influx of CMCs would reach a steady state. Dr Semerjian commented that the graph in Dr Thomas' paper, displaying the number of CMCs being added to the database each year, clearly showed the success of the CIPM MRA.

Dr Schwitz asked if superseded key comparison information and results should be kept in the KCDB. Dr Thomas said that we could label some as archive material, but that they should be available somewhere for reference.

Dr Thomas went on to say that some parts of the KCDB could be viewed by all visitors, but that archived material could be put into another, protected, part of the site.

Professor Wallard made some comments about the World Meteorology Organization (WMO) signing the CIPM MRA. As with the International Atomic Energy Agency (IAEA), there is the need to identify who has the authority to review their Quality System, although, unlike the IAEA, the WMO does not operate its own laboratories. He suggested that the WMO could go ahead and sign the CIPM MRA and, for the moment, only nominate laboratories which meet the CIPM MRA criteria for CMCs and a Quality System. He would be in contact with the WMO on this subject. Professor Göbel commented that the key point was whether or not they intend to have CMCs.

Dr Hengstberger raised a question about the use of the KCDB as a teaching and marketing aid. He said that in his region there was a need to capture the results of RMO comparisons for RMO members, who were not already Member States or Associates of the CGPM. There was also a need to help countries develop their future CMC entries, which could be used to help “developing metrology communities” understand the functioning of MRA. He asked whether a “hidden” (only visible with user name and password) part of the KCDB could not be used as a teaching and marketing aid for these countries. This would also prevent the development of separate RMO databases for these purposes. This suggestion did not meet with the CIPM's immediate support. Professor Göbel thought it would require scarce resources and that Dr Hengstberger should produce a detailed outline of the project he was proposing, which could then be considered at a future meeting. Dr McLaren commented that a great deal of diplomacy went into persuading institutes that they need to participate in international comparisons, and that it was with time that an institute developed the capability to participate – one could not do this quickly. Professor Wallard did not want to see the development of any separate form of RMO comparison database. Dr Semerjian said that what Dr Hengstberger needed to do was to follow what had been done in SIM and create a totally independent internet-based teaching aid, not connected to the KCDB in any way.

Dr Ugur commented that both COOMET and EURAMET have such internet-based facilities which allow people to be trained in preparing and analyzing CMCs. The question was raised that if the KCDB were to be used

for training, then some of the countries being trained and who might be adding their CMCs to a part of the database would not be signatories to the CIPM MRA. Dr Hengstberger pointed out that this was likely to be the case, as there were very few signatories in Africa.

Professor Göbel brought the discussion to an end by asking Dr Hengstberger to write a detailed specification of what he was seeking; whether it was a facility for marketing or for training.

Mr Érard said that in June 2009, there would be a metrology conference organized by the *Collège Français de Métrologie* and the LNE, and perhaps this would be an opportunity for the tenth anniversary of the CIPM MRA to be celebrated.

As a final comment on this agenda item, Prof. Wallard said that he would shortly be interviewing four candidates for the post of Executive Secretary of the JCRB. He thanked Dr Espina for his work and said that Dr Espina's successor would start at the BIPM in April 2008.

## **7 THE INTERNATIONAL SYSTEM OF UNITS (SI)**

Biological units: Professor Wallard presented his paper on Biological Units to the CIPM. Dr Semerjian commented that Dr May of the NIST could make useful contributions to the future work of the BIPM on biological units.

Before the Presidents of Consultative Committee gave their presentations, Dr Sacconi gave a paper, from the Italian Association for Electrical and Electronic Measurements (GMEE), to the CIPM, which gave the support of the GMEE to the CIPM for the suggestions outlined in the paper by Mills *et al.* (*Metrologia*, 2006, **43**(3)) for a redefinition of the kilogram, ampere, kelvin and mole.

## 8 CONSULTATIVE COMMITTEES

### 8.1 Consultative Committee for Electricity and Magnetism

Dr Inglis presented his paper on the recent work of the Consultative Committee for Electricity and Magnetism (CCEM). He commented that it was the decision of the CCEM that a redefinition of the SI be based on fixing the values of  $e$  and  $h$ .

Dr Inglis then presented Recommendation E 1 (2007): Proposed changes to the International System of Units (SI).

Dr Inglis went on to say that the CCEM had set up a working group to look at the strategic planning that would be needed to handle the evolution in electrical metrology over the next ten years. He added that the CCEM was in favour of the BIPM constructing a watt balance, but noted that the resources available for this project were limited. The CCEM supported the use of secondees, such as the visiting scientist from Japan, to supplement the project resources. Dr Inglis spoke about the changes in the Electricity Section, the retirement of Dr Witt and Dr Stock coming in as the new head, and praised the staff of the Section for their hard work, achievements and dedication.

Professor Göbel asked about the status of the ac quantum Hall effect, and was told that the discussions were on-going, but that no decision had been taken. Professor Göbel also asked if the stakeholders in electrical metrology had been consulted about the recommended changes to the SI suggested by the CCEM; he was told by Dr Inglis, that yes the stakeholders had been consulted, and that the Recommendation reflects this discussion.

Professor Wallard commented that the BIPM was conscious of the limited resources currently at the disposal of the team building the watt balance at the BIPM; however, he stressed that good progress had been made even with this limited support.

Dr Inglis made a final comment in support of the watt balance project at the BIPM, which was seconded by Prof. Göbel. Professor Göbel also went on to say that decisions on the redefinition of the SI were still some way away, and that there was no deadline which had to be met.

## 8.2 Consultative Committee for Mass and Related Quantities

Dr Tanaka presented his paper on the recent work of the Consultative Committee for Mass and Related Quantities (CCM). He spoke about the status of the on-going key comparisons and the successful progress of the Avogadro project, which is in its third year. Dr Tanaka mentioned that the enriched Si ingot was transferred to NMIA and cut into parts for various determination and analysis and for two spheres and reported that the spheres polishing were at the successful final stage process on 1 November. He also spoke about the discussions within the CCM meeting in March 2007 specifically arranged for the redefinition of the SI. The meeting approved the special technical steps to be undertaken by two Task Groups in the Working Group for Mass Standards, the one for transferring the mass definition in air to that in vacuum and the other for procedure to evaluate the mass calibration of the BIPM, and the successive discussion in the CCM for the redefinition of the kilogram to be undertaken by a new working group taking over the *Ad hoc* Working Group for SI Kilogram. He stressed that there was a lot of work still to be done before any decision could be taken.

Dr Davis (Head of the Mass section) then spoke about a new formula for air density (CIPM-2007), which is needed to correctly take account of buoyancy corrections in mass metrology. He outlined the history of these corrections and noted that it was the discovery that the air density formulae used previously had not taken proper account of the argon content of the air, which had necessitated a revision. This revision was now over and a number of laboratories had confirmed new figures for the argon content, which agreed. Consequently, he presented a new CIPM air density formula. He asked the CIPM to approve a manuscript for publication in *Metrologia*. The CIPM then gave the necessary approval.

## 8.3 Consultative Committee for Ionizing Radiation

Professor Moscati presented his paper on the recent work of the Consultative Committee for Ionizing Radiation (CCRI). He spoke about the development of a Generic Groupings Table, which will assist laboratories by reducing the number of comparisons needed to support their CMCs, and the need to move to a longer repeat time for some neutron comparisons. Professor Moscati also spoke about the recent publication of a special issue of *Metrologia* on Radionuclide Metrology, which was widely seen and well accepted by the community, and the future special issue on Dosimetry,

which is planned for mid-2008, and that on Neutron Metrology planned for mid-2009. He spoke about forthcoming work at the BIPM on isotopes with very short half lives, and presented two Recommendations to the CIPM:

- Recommendation R-1 (2007): Change of name for the CCRI(I), and
- Recommendation R-2 (2007): Extension of validity of the CCRI(III)-K1 key comparison of neutron fluence measurements at 24.5 keV.

Professor Moscati finished by saying that when he retired from the CIPM, the CCRI would need a new President.

Dr Inglis asked about the justification of extending the validity of comparisons from 10 to 15 years. Dr Tanaka asked to clarify if Prof. Moscati was asking for the CIPM's approval to extend the validity of comparisons, or was he just informing the CIPM. Professor Göbel replied that under the terms of the CIPM MRA, the authority to decide on the period of validity of comparisons rests with the CC – the CIPM must only be informed.

Professor Moscati replied by saying that with some of these comparisons there are serious technical problems, particularly those involving neutron measurements. He said the measurement results are stable, but the difficulty of circulating sources for the measurements is a problem. Dr Inglis and Dr Sacconi did not accept the validity of the argument that these measurements were a lot of work as being justification of extending the validity of the results of comparisons.

Dr Schwitz asked what would be required if someone wished to join such a 'slow moving' comparison after it had started. Professor Moscati replied that they would have to take part in bilateral comparisons, which would integrate them into the key comparison.

Professor Göbel spoke about the two Recommendations from the CCRI, a change of name for Section I of the CCRI (x and  $\gamma$  rays, charged particles) and an extension of the period of validity of comparisons, and both Recommendations were approved by the CIPM. Professor Göbel went on to say that Dr Carneiro had agreed to be the new President of the CCRI, and he thanked Prof. Moscati for all his hard work.

#### 8.4 Consultative Committee for Amount of Substance: Metrology in Chemistry

Dr Kaarls presented his paper on the recent work of the Consultative Committee for Amount of Substance: Metrology in Chemistry (CCQM). He spoke about the redefinition of the mole saying that this had been discussed by the CCQM who favoured a redefinition of the mole by fixing the Avogadro constant.

Dr Semerjian asked if there had been any contacts with NIM (China) and WADA with regard to the work of the CCQM given that 2008 will see the Olympic Games in China. Dr Kaarls replied that such contact had been established, and also with the NMIA (Australia). Given the enormous amount of potential work that could be undertaken by the various working groups of the CCQM, Prof. Göbel asked if thought had been given to considering generic grouping of related molecules to limit the investigations of individual molecules. Dr Kaarls replied that this was being actively considered. Professor Göbel asked if redefining the mole by fixing the Avogadro constant would influence uncertainties in chemical measurements, Dr Kaarls replied that it would not cause any problems.

Professor Issaev spoke about the unsuitability of the definition of Certified Reference Material (CRM) in the new VIM3 - there was now an ISO viewpoint and a VIM viewpoint, which was to be regretted. Dr Kaarls agreed saying that there had been a breakdown in communications between the two committees. Dr Quinn commented that perhaps it would be best to leave relations with ISO to the NMIs.

Dr Wielgosz (Head of Chemistry section) gave a presentation on the status of the JCTLM. He commented that the BIPM was in discussions with the European Commission to see if they would be prepared to recognize the JCTLM database as a source of "higher order" information and data able to satisfy the criteria detailed in the EU *In vitro* Directive. Dr Wielgosz commented that the JCTLM now contained 202 CRMs, 139 reference methods and 98 reference measurement services (mostly in Europe); he commented that the database received about 725 visits each month. He also pointed out that for a laboratory to be included in the JCTLM database it had to be accredited, and that at the moment there were many more European laboratories than US laboratories in the database, which might very well tell us something about the accreditation processes of these two regions.

Dr Semerjian said that the JCTLM was a great example of the utility of metrology in health and that all those involved in the JCTLM should be proud of what had been achieved. The JCTLM was a good example of how such international projects, which cut across disciplines, should be undertaken – it was practical and useful; this was a point also made by Prof. Göbel. Dr Semerjian asked if the CCQM had considered biofuels. Dr Kaarls replied that the CCQM was also considering biofuels.

## 8.5 Consultative Committee for Units

Professor Mills presented his paper on the recent work of the Consultative Committee for Units (CCU). Professor Mills mentioned the publication of the new edition of the SI Brochure and outlined the discussion of the CCU on the redefinition of the SI. He presented the background to the discussion, and pointed out that even when the kilogram was redefined there would still need to be kilogram standards to disseminate the unit, but the watt balance would replace the international prototype.

Professor Mills pointed out that the desirable qualities for the definition of a base unit are:

- Reference standards that are believed to be stable under translation in space and time; i.e. that are related to an invariant of nature.
- The definition should be capable of realization within the accuracy required.
- It is desirable to choose simple definitions, both to comprehend and to realise, using apparatus that is neither too expensive nor too complex. However it is the nature of modern science that this may be difficult to achieve, and it is not an essential requirement.
- Definitions should be experimentally realizable by anyone, anywhere, at anytime.

Professor Mills said that the CCU had received representations from the other CCs involved in the debate about the redefinition of the SI, and had considered the views expressed during its recent meeting. He presented a summary of the views of the CCU as:

- The CCU advise that the kilogram, ampere, kelvin and mole should be redefined to fix the values of the Planck constant  $h$ , the elementary charge  $e$ , the Boltzmann constant  $k$ , and the Avogadro constant  $N_A$ , respectively.

- These changes should await resolution of the present discrepancy between watt balance results for  $h$  and the silicon crystal density results for  $N_A$ .
- The changes should be made simultaneously, and should be based on the latest values of the fundamental constants to preserve continuity.
- The words for each new definition should be considered carefully over the next two years, along with the *mises en pratique* to go with each definition.

It was the view of the CCU that the ampere be redefined by fixing the value of  $e$ , not  $\mu_0$ . This was a point discussed by Prof. Kovalevsky.

Dr Valdés asked what was the philosophy behind the wording of the new definitions – how best to describe units? Professor Mills replied that the new definition should be as broad as possible. Professor Göbel commented that we have to live with a practical system, which might please some sections of the metrology community more than others, but we should try and find a consensus what would be acceptable to all. Dr Stock was asked if the CCT was of the opinion that the uncertainty in the Boltzmann constant was good enough to allow it to be fixed to redefine the kelvin; he said that this was the case, but that an independent confirmation of the previous result was desirable.

Professor Göbel spoke about base and derived units; perhaps electric quantities should be defined in terms of the volt. Professor Kovalevsky replied that we do not know if the Josephson relation is exact, so we need to keep the ampere as the base unit.

There was a general discussion about the relative difficulty of communicating to the general population the redefinition of the kilogram in terms of a fixed value of Planck's constant and that of a redefinition in terms of a fixed value of the Avogadro constant. Professor Mills replied that we all had to wait and see what happened with the results of the determination of the Avogadro constant from the single isotope silicon sphere experiment.

Mr Énard and Prof. Göbel asked, respectively, about the redefinition of the candela and a redefinition of the second; Prof. Mills replied that that was a subject for the future.

## 8.6 Consultative Committee for Photometry and Radiometry

Dr Hengstberger presented his paper on the recent work of the Consultative Committee for Photometry and Radiometry (CCPR). He spoke about the candela as an example of a unit, which transcended pure physics and already incorporated needs from other fields (photobiology), which an International System of Units claiming to encompass wider areas of science, like chemistry and biology, needed to demonstrate. He also mentioned the work of the CCPR with the CIE and with other organizations involved in photobiology.

Professor Issaev asked if the relative status of the candela and the lumen has been discussed; Dr Hengstberger replied that this had been done in the past and would be looked at again in the future – no change was currently needed.

## 8.7 Consultative Committee for Length

Dr Chung presented his paper on the recent work of the Consultative Committee for Length (CCL). He presented three Recommendations to the CIPM, and defended the operating procedure of the WGDM with regard to the running of a comparison and of calculating a key comparison reference value (KCRV).

Dr Kaarls commented that the CCL should be careful of the types of comparisons they undertake. Professor Wallard said that the WGDM had started to address the concerns of the CIPM in their manner of operation, and Dr Quinn was pleased to see that there had been some improvement; however, Prof. Issaev stressed that the CIPM should continue to monitor the situation. Professor Göbel commented that the meetings of the WGDM should be held regularly at the BIPM to assist the group in their work.

Professor Wallard mentioned that if the Recommendations were approved by the CIPM, then Draft Resolution I for the CGPM would need to be slightly reworded. The two Recommendations from the CCL (Recommendation CCL 1a (2007) and Recommendation CCL 3 (2007)) were subsequently approved as Recommendations 1 (CI-2007) and 2 (CI-2007), respectively.

Dr Chung announced his intention of retiring from the presidency of the CCL; Prof. Göbel thanked him for his work and suggested that Dr Sacconi should be the new President – a motion which was accepted.

### 8.8 Consultative Committee for Time and Frequency

Mr Énard spoke about a forthcoming conference in Cadiz (Spain) on the algorithms used for calculating TAI. He also spoke about the need to have a coherent vocabulary for use in definitions of base units and the various *mises en pratique* which would be required for the new SI; for example, define the difference between realization and practical realization. Mr Énard commented that he would be working with the Consultative Committee for Time and Frequency (CCTF) to rationalize the types of groups and subgroups within the CCTF.

Dr Arias (Head of the Time, Frequency and Gravimetry section) spoke briefly about the discussions on the possible new definition of UTC without leap seconds and said that decisions would be taken by the International Telecommunication Union in 2009.

### 8.9 Consultative Committee for Thermometry

Dr Ugur commented that all the working groups of the Consultative Committee for Thermometry (CCT) had met over the previous year, but that the CCT had not met. He spoke about the various comparisons that are in progress and the future redefinition of the kelvin by fixing the Boltzmann constant.

### 8.10 Dates for future meetings of Consultative Committees

|       |  |
|-------|--|
| CCAUV | 9-10 October 2008  |
| CCEM  | March 2009   |
| CCL   | June 2009  |
| CCM   | 24-25 April 2008 (preceded by its working groups on 17-23 April 2008)      |
| CCPR  | September 2009   |
| CCQM  | 3-4 April 2008 (preceded by its working groups on 28 March – 2 April 2008) |
| CCRI  | May-June 2009 (not three Sections together)                                |
| CCT   | 20-23 May 2008   |
| CCTF  | May 2009   |
| CCU   | –  |

### 8.11 New Members and Observers of Consultative Committees

The following changes were approved:

|       |   |
|-------|---|
| CCRI  | CIEMAT as Observer CCRI(III)<br>KRISS as Member CCRI(III)<br>BEV as Observer CCRI(II)<br>CNEA as Observer CCRI(II) (Approved in principle pending confirmation of an application) |
| CCM   | MSL as Member   |
| CCL   | BEV as Member<br>SPRING as Member   |
| CCAUV | UME as Member   |
| CCTF  | CENAM as Member   |
| CCPR  | CENAM as Member<br>WMO as Observer<br>CIE as Observer   |
| CCQM  | DG NCM of the Bulgarian Institute of Metrology as Observer  |

## 9 BIPM/ILAC JOINT WORKING GROUP

Professor Wallard gave a presentation on the issue of the definition of CMC and BMC ([CIPM 2007-11](#), see Appendix 1, pages 187-191). He pointed out that the last meeting of the BIPM/ILAC group took place last August during the NCSLI meeting in Minneapolis-St Paul and finalized the paper being presented to the CIPM for approval.

On 29 October 2007, the ILAC General Assembly met and passed the following Resolution:

“ILAC Resolution GA 11.20

The ILAC General Assembly accepts the ILAC/BIPM joint paper on Calibration and Measurement Capabilities (CMC) as a significant step forward in the coordination of this concept between ILAC and BIPM.

ILAC will take this joint paper into account when preparing future documents on measurement uncertainty, in collaboration with the BIPM.”

This result was clearly very satisfactory for the BIPM as it preserved the wish of the NMI community to maintain the term CMC and also achieves harmonization of terminology. The next steps will be to increase awareness in the accreditation community of the importance of traceability and the CIPM MRA.

Two specific actions would be:

- the BIPM will work on a joint statement with ILAC in order to promote the use of the term CMC; and
- various ILAC policy documents will need to be revised and the joint group will be involved in their production.

The BIPM's objectives in this collaboration will include a formalization by ILAC of the need for accredited laboratories to show traceability to the SI through NMIs which are signatories to the CIPM MRA.

Dr Schwitz asked if this meant that CMCs could now be created outside the CIPM MRA by accredited laboratories, which could lead to two classes of CMCs. Dr Kaarls replied that this was not the case. Dr Valdés asked if ILAC would use the CMC definition for testing laboratories. Dr Kaarls replied that they would.

Both Dr Valdés and Dr Carneiro thought that this acceptance by ILAC of the term CMC was a step forward in further strengthening the concept of uncertainty into the work of ILAC.

Professor Göbel asked the members of the CIPM if they accepted Prof. Wallard's paper, which they did unanimously. Professor Wallard said that he would now be working with ILAC on their documentation and in 2008 would be arranging a meeting to look at the mutual problems experienced by RMOs and RABs in accrediting national metrology institutes.

## 10 MATERIALS METROLOGY

Dr Bennett gave a presentation (documents [CIPM 2007-09](#) and [CIPM 2007-09 \(part 2\)](#)) entitled *Evolving Needs for Metrology in Material Property Measurements*, which was a report of the CIPM *ad hoc* Working Group on Materials Metrology. Dr Bennett outlined the Recommendations from the report of the working group – recommendations to the various stakeholders involved in the metrology of materials.

### **To the CIPM:**

1. The Working Group recommends that the CIPM should sign a Cooperation Agreement with VAMAS in order to ensure an ongoing dialogue and actions with a view to identifying key traceability issues affecting the accuracy and repeatability of the measurement of materials properties.
2. The Working Group recommends that the CIPM should instigate a further review in 3 or 4 years' time to evaluate the progress made and determine what further action, if any, is required.

### **To the Consultative Committees:**

3. The Working Group recommends that CC working groups should be established to stimulate comparisons, establish measurement capabilities in NMIs and identify suitable certified reference materials with known uncertainties.
4. The Working Group recommends that the CCEM should establish a working group on electromagnetic properties of materials.
5. The Working Group recommends that the CCAUV should establish a working group on acoustic properties.
6. The Working Group recommends that the CCM and CCL should consider the case for a joint working group on mechanical properties of materials, with VAMAS representation.
7. The Working Group recommends that materials working groups established by CCs should encourage participation of all important stakeholders, including ISO/IEC, ILAC and VAMAS.

**To NMIs:**

8. The Working Group recommends that NMIs should support materials metrology in their work programmes in order to implement and disseminate best practice in the measurement of materials properties.
9. The Working Group recommends that NMIs should encourage their staff to participate actively in the work of materials working groups.

**To VAMAS:**

10. The Working Group recommends that VAMAS Steering Committee should initiate a top-down review, with other stakeholders, to identify priority actions in selected areas and draw these to the attention of CIPM, ILAC and NMIs.
11. The Working Group recommends that VAMAS develop with CIPM appropriate pilot studies.

Professor Issaev asked about the view of VAMAS with regard to the formation of a joint committee. Dr Bennett replied that there was, as yet, no formal view but that representatives of VAMAS had seen the recommendations of the working group. Dr Tanaka spoke about the coordination of activities in areas which fall between the traditional activities of CCs; he said that only the CIPM could organize such coordination and the choices should not be left to individual CCs. He recommended to keep the activity of the *ad hoc* working group running further. Dr Valdés said that some NMI representatives on the CCAUV were already involved in work on acoustical and vibrational properties of materials.

Dr Schwitz asked Dr Bennett about functional properties – where were they in his report, and into which CC would such work go? And Dr Ugur asked about dielectric properties. Professor Göbel asked the CC presidents to give their views about what they could do, and the extent of possible overlap with different working groups to the next CIPM. He asked how best one could monitor this work. Dr Kaarls said that all the stakeholders should now be contacted, not just the CC presidents and he also said that CC presidents should report to the CIPM.

Dr Bennett replied that the introduction of materials metrology should be done through working groups in the existing CCs, not via a new CC. Dr Hengstberger commented that the CCPR was creating a new infrastructure for its working groups and had two key comparisons on

materials, but it might not be the most appropriate for dealing with the recommendations of Dr Bennett's report.

Professor Wallard commented that other organizations, particularly those involved in standards, could be brought into the currently existing CCs. Dr Carneiro commented that we seem always to be adding new working groups to the CCs, and thought it was time that the CIPM consider optimizing the present structure of working groups – perhaps by combining some. Dr Inglis spoke about the importance of nanotechnology, particularly in the CCEM where one cannot distinguish between intrinsic and extrinsic properties of small structures. He said that a working group on general strategy in this area was needed, to provide guidance not just new labels. This point was stressed by Dr Carneiro who asked if the present working group structure was optimal for future challenges.

Professor Wallard asked how comparisons would be organized. Dr Bennett replied that it would be likely that VAMAS would suggest the comparisons that were required. Dr Kaarls asked how NMIs would think about delivering traceability in this area to their customers. Professor Göbel replied that it would be done through CCs. Professor Göbel brought the discussion to close by thanking Dr Bennett for his work; there was general agreement to accept the Recommendations given in the report and strengthen dialogue with VAMAS and to ask the CCs to consider their future role and to report back to the CIPM.

## 11 CONTACTS WITH OTHER INTERGOVERNMENTAL ORGANIZATIONS AND INTERNATIONAL BODIES

Professor Wallard gave an oral update on relations between the BIPM and a number of other organizations.

**WMO:** The relationship with the WMO is working well, a future joint conference is to be organized on the importance of metrology in monitoring climate change. Given the possible size of such a conference, it will probably take place at the WMO's headquarters, in 2009.

**WHO:** The relationship with the WHO could be improved. The working-level relations are good, but there is no contact at the highest level.

Dr Quinn pointed out that the WHO is enormous, with a huge budget and complex structure and they have very different priorities from the BIPM.

**WTO:** There is no change with regard to the BIPM's relationship with the WTO and the BIPM's request for observer status on the committee looking at technical barriers to trade. Apparently, this situation applies to any requests for the status of Observer at the WTO. Dr McLaren pointed out that in Canada, the politicians are now considering bilateral agreements on trade and that the role of the WTO is diminishing.

**ISO/IEC:** The BIPM relationship with ISO/IEC suffers from lack of available resources. There have been problems in communications between ISO REMCO and the VIM working group of the JCGM, which resulted in the unfortunate inclusion of different definitions of reference materials in VIM3 and in ISO REMCO. However, a number of staff members from the BIPM are involved in providing input into the writing of ISO standards, but the involvement with IEC could be improved. Dr Quinn commented on a particular problem with ISO 80000 – the ISQ (ISO Quality Control System); ISO are making unwarranted claims about the origin of the SI, and are mixing SI units with other, not well defined quantities.

**Codex Alimentarius:** Staff members attend each other's meetings, but there is room for strengthening the relationship.

**WADA:** There is a good working relationship.

**US Pharmacopeias:** This group is looking for traceability, and they came to the BIPM seeking to work with the CCQM and to become involved in international comparisons. Dr Semerjian commented that the US Pharmacopeias are seeking better control for continuous rather than batch production of pharmaceutical products.

**UNIDO:** Professor Wallard pointed out that he had met with the Director General of UNIDO, who is sympathetic to the BIPM's goals.

**WCO:** Problems in transporting metrological samples across international frontiers arise from the concerns of customs officials and from security officials. However, we only have two case studies where we have detailed information about how the BIPM's work was upset by problems created by customs officials. We need more examples to present a case to the WCO. Professor Wallard asked the CIPM members to send him information of any such difficulties that they came across.

**IAEA:** Professor Wallard commented that the IAEA is strongly linked with the work of the BIPM through key comparisons and is a Member of the CCQM and an Observer of the three CCRI Sections.

**CIE:** A Memorandum of Understanding has been signed between the CIE and the CIPM, and the first joint meeting has taken place.

**OIML:** As part of a collaboration with the OIML, Prof. Wallard mentioned the new joint web portal ([www.metrologyinfo.org](http://www.metrologyinfo.org)), and a number of joint publications, which were designed to present a unified face of metrology. Dr Quinn and Dr Inglis both made comments about some of the terms used in the recently published joint leaflet, which they did not like – in particular the use of the word 'scientific' to distinguish legal metrology from metrology. Professor Göbel commented that the next joint meeting with the OIML was scheduled for March 2008.

**ILAC:** The BIPM has been working closely with ILAC. The main achievement of the year was the agreement on the use of the term CMC (see section 9).

## 12 JOINT COMMITTEE FOR GUIDES IN METROLOGY

Professor Wallard gave a presentation on the recent events in the work of the JCGM and its two working groups (the VIM and the GUM).

Professor Wallard commented that ISO had agreed to:

- finalize an electronic file of the current GUM of which a copy will be made available to WG1 to assist them in their maintenance/revision work;
- JCGM/WG2's finalization of VIM3, which will be adopted and published as ISO Guide 99. GUM Supplement 1 would be published by ISO as ISO Guide 98 Supplement 1;
- make electronic files of these future publications available (in WORD or .pdf) to the JCGM members who could, in-turn, use them to 'print' their own copies if they so wish – following the terms of the Charter;
- discuss with JCGM members the preparation and commercial terms of printed copies for further distribution;

- brand the hard copies it prints as ISO Guides (following the terms of the Charter regarding the recognition of the JCGM member organizations);
- develop, host and maintain electronic (html) versions of both the VIM3 and GUM-series, making them accessible and available to JCGM member experts and to the metrology community at large. The 'Metrology Guides portal' would be in a neutral or JCGM design so that it would not appear to the user that they had been hyperlinked to an ISO server. URLs to all member organization homepages would be included, as would be made the possibility of purchasing hard-copies;
- prepare a press release for marketing both the ISO Guide 98 – GUM series and the ISO Guide 99 – VIM, shortly prior to their respective ISO publications.

A new text for the JCGM Charter was accepted by the JCGM, which seeks to clarify the roles of the Committee, its Chairman and Secretariat. As JCGM Chairman, Professor Wallard pointed out to the Committee that secretarial aid to the JCGM and its two working groups is provided by the BIPM.

Professor Wallard and Dr Inglis thanked Dr Williams for his work in the JCGM.

## **13 WORK OF THE BIPM**

### **13.1 Work of the BIPM**

Professor Wallard made a number of presentations. He presented the *Director's Report on the Activity and Management of the BIPM*, which was approved by the CIPM. He explained that a new Health and Safety Committee (HSC) had been created, which gave agreed-upon responsibilities to named individuals, and spoke about the Health and Safety Policy at the BIPM. In addition, the named individuals had received professional training to be able to execute their new duties. He finally spoke about the Quality System of the BIPM.

Rainer Köhler was nominated Health and Safety Manager (HSM). The new committee consists of the HSM, four specialists responsible for electrical, chemical, laser and ionizing radiation safety, the BIPM Administrator, the Head of the Workshop and two members nominated from the Information and Security Commission who provide links with the staff. All specialist staff members have received appropriate training.

The aim of the HSC is to deal effectively and quickly with safety issues, to make sure that appropriately trained staff members review the main danger areas, and to make any recommendations to the Director for improvements. The committee has met three times and has reviewed external audits of the workshop, general safety measures, and the BIPM's safety manual.

Professor Wallard said that under health and safety, there were only some minor incidents to report and that steps had been taken to minimize the risk of any recurrence.

The HSM will also monitor the system of risk assessment and completion of forms for the evaluation of risk and use of substances hazardous to health. This has been in place for nearly 3 years but needs continual revision and audit. In addition to a planned series of internal audits, the Director and the HSM already make an annual personal tour of the laboratory.

The minutes of the HSC are distributed to all staff in order to maintain awareness of the dangers that inevitably exist in a research laboratory. The HSM is following a general safety awareness course to give better guidance to the committee and to the BIPM staff in general. After completion of the training, a new round of safety audits in laboratories and offices of the BIPM will take place. The BIPM safety manual will undergo major revision after completion of the training of the HSM. This manual will also replace one given to all guest workers at the BIPM.

Dr Semerjian offered to send Prof. Wallard a copy of the NIST Safety Manual, and spoke about the procedure used at NIST to organize quarterly health and safety inspections.

Professor Wallard then made a presentation on the BIPM's Quality System and the uncertainties associated with its measurement services. He said that as the BIPM is "under the exclusive direction and supervision of the CIPM", he needed the CIPM's approval for two somewhat sensitive initiatives which he believed would improve the transparency of the BIPM's activities, and which would provide better support for NMIs which take traceability to the SI through the BIPM. These are that:

- the BIPM should present the uncertainties associated with its calibration services in a more coherent and consistent fashion and also link them to the relevant parts of the KCDB; and
- the BIPM should present its Quality System to a special panel of RMO experts.

The bureau of the CIPM has discussed these proposals and they have its support. He said that he had also spoken about them at the JCRB, which welcomes them and which, of course, realizes the need to approach the CIPM before confirming the actions.

Professor Wallard said that the BIPM wished to present its Quality System in its totality, not section by section, and that a clear statement of uncertainties would be helpful. Dr Schwitz thought this a good idea and asked that a short report be made to the CIPM of the outcome of these two initiatives. A number of members asked to see the web section on uncertainties before publication.

The two projects were given the approval of the CIPM.

As a final item under this Agenda point, Prof. Wallard spoke about the BIPM's science strategy. He said that the BIPM had initiated a series of internal science strategy meetings to look the next ten years, attempting to identify the strengths and weaknesses of the BIPM science base and how it should evolve. The BIPM needs to know what it can realistically continue to do and what activities could be more appropriately transferred to NMIs – as was done with laser calibrations. Should there be new activities? Should greater use be made of fixed-term appointments for scientists to initiate new projects and bring into the BIPM new skills which only be needed for a relatively short period? The BIPM would review road maps such as those from RMOs to plan future activities. These plans would be evaluated by experts within the BIPM, and would serve as input into the international road maps to be discussed between the CIPM and the BIPM's heads of scientific sections. Professor Wallard asked the CIPM to participate in a workshop with the BIPM's heads of scientific sections during its routine meeting in 2008.

Dr Semerjian commented that the JCTLM was a good example of what the BIPM should be doing – international coordination, and that the internal discussions that Prof. Wallard had mentioned should be presented to the Directors' meeting.

Dr Inglis thought that the workshop between the CIPM and the BIPM's Heads of scientific sections should also include contributions from

Consultative Committee presidents on the activities of the strategic planning working groups of the CCs. Dr Hengstberger agreed to that proposal. Professor Wallard said that the CCs would be involved. Mr Érard and Professor Göbel thought that this work would take a lot of resources, with Mr Érard saying that the LNE had already taken part to this exercise.

Dr Inglis said that there was a lot of information available, but someone had to take the lead in developing an appropriate road map, but it would be a lot of work.

### 13.2 Depository of the metric prototypes

The visit to the depository of the metric prototypes in the Pavillon de Breteuil took place at 14:00 on 8 November 2007, in the presence of the President of the CIPM, the Director of the BIPM, and the representative of the Curator of the Archives de France.

The three keys necessary to open the depository were assembled: the key entrusted to the care of the Director of the BIPM, the one deposited at the *Archives Nationales* in Paris, brought by Madame Béchu, and finally the one kept by the President of the CIPM.

The doors of the vault and the safe having been opened, the presence in the safe of the international prototype of the kilogram and its official copies was verified.

The following indications were noted on the measuring instruments placed in the safe:

|                      |       |
|----------------------|-------|
| temperature:         | 20 °C |
| maximum temperature: | 22 °C |
| minimum temperature: | 19 °C |
| relative humidity:   | 50 %  |

The safe and the doors of the vault were then locked.

|  |  |   |
|--|--|---|
| The Director<br>of the BIPM,<br>A.J. Wallard | For the Curator<br>of the Archives Nationales,<br>C. Béchu | The President<br>of the CIPM,<br>E.O. Göbel |
|--|--|---|

**14 PREPARATION FOR THE 23rd MEETING OF THE GENERAL CONFERENCE**

Professor Göbel reminded the CIPM that the CGPM was being asked to support an increase of 15 % in the dotation of the BIPM; that is, an increase of 11 % and 4 % for inflation. He went on to outline the timetable for the discussions of the Working Group on the Dotation which would be meeting the following week during the meeting of the CGPM, and said that the Working Group on the Dotation was also going to discuss Draft Resolution H on the financial arrears of Member States.

Professor Göbel suggested that the Working Group on the Dotation be composed of a maximum of two representatives from the following Member States: Australia, Canada, China, France, Germany, Japan, Italy, Rep. of Korea, Netherlands, Russian Federation, United Kingdom and the United States. In addition, a limited number of other States who express a desire could also participate. He also pointed out that the sum being requested was about the largest increase that could be requested given the size of the BIPM's reserves, which had increased recently but which needed to be maintained to deal with substantial fluctuations in the annual income from Member States.

Dr McLaren asked a question about the detailed procedure for the reporting of the deliberations of the Working Group on the Dotation. Dr Kaarls replied that there would be a first meeting on the Tuesday afternoon, then a report to the CGPM on the Thursday morning; if necessary the Working Group on the Dotation would meet again on the Thursday afternoon, with a final report to the CGPM and decision by the CGPM on the Friday morning when the General Conference would vote on the proposed dotation. Dr Kaarls said that there must be no vetoes deposited during the final vote, but that abstentions were allowed. In the case of a veto, the meeting of the CGPM could not be closed and delegates would have to be convened for another date to try to find a solution. If this was after the start of the four year period 2009-2012, the annual dotation of the BIPM would remain at the level of the dotation voted by the CGPM for 2008 until a decision is taken on a revised dotation.

In response to a question from Dr Semerjian about the details of the accountancy system used at the BIPM and whether or not the BIPM had a 'capital fund' with which to fund major items of expenditure, the discussion

moved on to the funding of any shortfalls in the budget by accessing the reserves of the BIPM. Dr Schwitz asked if there were any firm rules about what could and could not be funded from the BIPM's reserves; he said the BIPM must be careful. Dr Inglis said that the reserves had been created to cover operating shortfalls coming from the nonpayment of contributions. Dr Semerjian said that the reserves should only be accessed if it was certain that the sums removed from the reserves could be replaced. He said there should be a detailed decision making process which identifies the appropriate need.

Mrs Perent gave an outline of the history of the reserve funds; its origin to cover fluctuations in payment, and the use to which the reserves had been put; for example, in financing the programme related to the work in TAI in 1985 and in setting up the Chemistry section in 2000. She also said that the reserves had been used to pay for buildings, building work and the refurbishment of buildings, and to make transfers to the BIPM staff Pension Fund. She said that as of the end of 2007, the reserves were predicted to be about 59 % of the annual budget, having in the past reached 70 % of the annual budget. As it was difficult to estimate the fluctuations in the contributions from Member States, it was prudent to have a large reserve available to cover contingencies.

Dr Inglis commented that the CIPM had said in the past that a reserve of 50 % of an annual budget would be appropriate, but the CGPM had opted for a lower figure at its last meeting, and then did not vote to pay for the Programme of Work which had been agreed upon. This was a point also made by Dr Quinn.

In response to a question from Dr Tanaka about the explanation on the nature of the 4 % increase for inflation, Prof. Wallard said that he had studied the inflation index used in many scientific institutions and that this was larger than price inflation.

Professor Wallard recapitulated the proposed Programme of Work of the BIPM, which would be voted upon by the CGPM. He said that this Programme of Work had been reprioritized after the last meeting of the CIPM to emphasize the importance of the watt balance and mass metrology projects.

Dr Semerjian asked about the different scenarios that could be envisaged. If the Member States agree to less than the 15 % requested, would the BIPM be in a position to offer a revised Programme of Work – what would be cut from the Programme to meet the revised dotation. Both Dr Quinn and

Prof. Göbel replied by saying that first the BIPM had to see what the outcome of the dotation discussion will be, and then there would be a process of prioritization with regard to the Programme of Work. The prioritization would be undertaken by the CIPM in the light of the voted dotation for 2009-2012.

Professor Issaev said that there was a real need to present the work of the BIPM to its stakeholders. Professor Wallard replied that this was his firm intention.

Professor Göbel asked the CIPM if there were any comments on the text of the Draft Resolutions. Mr Énard replied that the French Foreign Ministry had said that they were unhappy about the text of Draft Resolution H on financial arrears of Member States.

Dr Semerjian commented that the US would not support the ‘writing off’ of debts from Member States; however, the US would always be prepared to consider rescheduling of debts. He went on to initiate a discussion about the arrears in contributions and how the shortfall is funded by the BIPM and what happens to the contribution when it is eventually paid to the BIPM.

Professor Wallard outlined the voting procedures to be adopted during the meeting of the General Conference, and the manner in which the talks by CC presidents would be given. Finally, Mrs Perent distributed some general information about the housekeeping arrangement for the meeting of the CGPM, particularly about transport and social events.

## 15 **METROLOGIA**

Dr Williams spoke to the CIPM about the present status of *Metrologia*, which has been published by Institute of Physics Publishing (IOPP) on behalf of the BIPM since 2003. The IOPP receives articles on acceptance by the editor at the BIPM, and publishes them both in print and online. IOPP also hosts the online journal. By the terms of the contract between the BIPM and IOPP, IOPP deals with all marketing, distribution and subscription activity for the journal.

Special issues of the *Metrologia* are still organized by an invited specialist editor(s) in cooperation with the editor at the BIPM. Over the last year,

there was one special issue of *Metrologia* published in the period of this report: Radionuclide Metrology, volume 44(4).

2003 was the first year in which the journal was published by the IOPP. Average receipt to publication times for 2006 for regular papers:

|                                     | 2003 | 2004 | 2005 | 2006 |
|-------------------------------------|------|------|------|------|
| Receipt to web publication (days)   | 42   | 57   | 36   | 40   |
| Receipt to print publication (days) | 111  | 106  | 97   | 95   |

Publication times are low and authors can now expect their paper to be published online in just over a month after acceptance which is excellent news. This data demonstrates the efficient working arrangement between the editorial office at the BIPM and the IOPP. IOPP use accelerated publishing on *Metrologia* which means that articles can be published online as soon as they are ready and are then available to be read and downloaded months before a print copy arrives in the library.

As more articles were published, the price per article decreased. This is important as it is one of the measures which librarians use when evaluating journal subscriptions.

The impact factors (IF) are calculated by ISI Thomson Scientific and are available in June of the following year. So the 2006 impact factor will be available by June 2007.

| Year | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  |
|------|-------|-------|-------|-------|-------|-------|
| IF   | 0.945 | 0.842 | 0.983 | 1.314 | 1.479 | 1.657 |

*Metrologia* has the highest impact factor of all related journals which is impressive and important in maintaining quality submissions, and in maintaining and boosting subscription levels.

The total number of subscriptions has gone up which is mainly due to IOPP selling *Metrologia* as part of its journal 'Packs'. This means that rather than sell a single subscription to *Metrologia*, IOPP are able to sell a group of journals together and include *Metrologia* as part of this package. Although more costly overall, this does provide better value for money for an institution and benefits the journal which gains wider visibility than it would otherwise have done. Although most of the institutions who subscribe to *Metrologia* via an IOPP 'Pack' were not aware of *Metrologia* before, a few of them would have been so this may account for the fall of single subscriptions (avoidance of duplicate subscriptions). IOPP are now

selling almost as many subscriptions as part of 'Packs' as they do as single subscriptions.

In conclusion, 2006-2007 has been a good year for *Metrologia*. The journal continues to grow and published about 700 pages of non-special issue pages, which is more than double the number from 2003. Almost 80 000 articles were downloaded from the journal. Circulation has also increased through the availability of *Metrologia* in e-only and other packages, so now 534 institutions have subscriptions of some type, while hundreds more have access through membership of consortia.

The *Technical Supplement to Metrologia* is doing well with 54 abstracts published in 2006 and 30 already published in 2007, with many more in the pipeline.

Professor Göbel thought these to be good developments for the journal. Dr Williams went on to outline the changing origins of the manuscripts and noted that authors come from universities as well as NMIs. This reflected the increasing visibility of the title. He went on to say that in the future it would be important to consider special issue of the journal on more qualitative topics – soft metrology, e.g. colour perception.

There was a short discussion after this presentation about the utility of the impact factor in measuring the 'worth' of a journal. It was generally accepted by the CIPM that the impact factor was not a perfect metric, but was better than no indicator.

Mrs Perent and Dr Williams mentioned that the BIPM was in the final stages of creating a new five year contract with IOPP for the publication of *Metrologia*.

## 16 ADMINISTRATIVE AND FINANCIAL AFFAIRS

Mrs Perent spoke about the *Rapport annuel aux Gouvernements des hautes parties contractantes sur la situation administrative et financière du Bureau International des Poids et Mesures for 2006*, which had been previously circulated to the CIPM. Professor Göbel asked the CIPM members if they were prepared to approve the report and give discharge to

the Director and the Administrator for 2006. The required formal discharge was given to the Director and Administrator of the BIPM.

The discussion then moved to the situation of Member States in financial arrears and the amounts of arrears involved. Mrs Perent gave a detailed picture of the amounts owed by Member States for up to three years and of those arrears which have been outstanding for more than three years (see Appendix 2, pages 193-196). Mrs Perent detailed the steps which have been taken to recover these outstanding arrears. She also added that the provisions included in the proposed Resolution H on financial arrears, which if adopted by the CGPM next week, would facilitate the recovery of arrears.

Mrs Perent also commented that some fifty thousand euros were owed by a number of Associates.

Dr Ugur asked if a Member State which has arrears outstanding for more than three years could be excluded from attending the meeting of the CGPM; he commented that refusing a national delegation entry to the conference hall could be embarrassing and cautioned against such an action. Mrs Perent replied that in accordance with the terms of the Metre Convention, the advantages and privileges of those States in financial arrears for more than three years were suspended, which also meant that they could not attend the meeting of the CGPM.

Dr Semerjian made a comment that as the dotation consisted of a fixed part and a discretionary part, it was important to distinguish between these two contributions when talking about the arrears owed by a Member State. If a Member State had indicated that it was not prepared to pay the discretionary part of the dotation, the BIPM should take care of the wording used in documents to describe the arrears owed. This point was also made by Dr Tanaka.

Professor Wallard spoke about the progress report on 2007, and after Dr Semerjian and Dr Sacconi had asked a question about the percentage breakdown of the figures into equipment and consumables, the CIPM took note of the progress report on the 2007 exercise.

Professor Wallard then presented the proposed budget for 2008.

Dr Ugur asked a question about the manner in which the BIPM estimated the income to be derived from Associates. Mrs Perent replied by saying that subscriptions of Associates are calculated by applying to the dotation the BIPM coefficients for each Associate. The method used to calculate Associates' subscriptions is essentially the same as that used to calculate the

contributions of Member States but with a minimum of 0.05 % of the dotation instead of 0.49 %. In estimating the budget, there is no assumption that there would be a shortfall in subscriptions from Associates.

Dr Schwitz commented that looking at the budgets for 2007 and 2008, it may be necessary to seek more funds from the Reserves of the BIPM than

## Budget for 2008

### Income

|   | euros             |
|---|-------------------|
| <i>Budgetary income:</i>                    |                   |
| 1. Contributions from the States            | 10 306 195        |
| 2. Interest on capital                      | 290 000           |
| 3. Miscellaneous income                     | 114 700           |
| 4. Subscriptions from the Associates        | 193 587           |
| 5. <i>Metrologia</i>                        | 111 000           |
| 6. Transfer from Account I.– Ordinary funds | 813 418           |
| <b>Total</b>                                | <b>11 828 900</b> |

### Expenditure

|   |           |                   |
|---|-----------|-------------------|
| <i>A. Staff expenses:</i>                               |           |                   |
| 1. Salaries   | 4 583 000 | } 6 230 700       |
| 2. Family and social allowances                         | 1 189 000 |                   |
| 3. Social expenses                                      | 458 700   |                   |
| <i>B. Contribution to the pension fund:</i>             |           | 1 999 300         |
| <i>C. Operating expenses:</i>                           |           |                   |
| 1. Heating, water, electrical energy                    | 196 600   | } 1 284 000       |
| 2. Insurance  | 40 200    |                   |
| 3. Publications   | 63 300    |                   |
| 4. Office expenses                                      | 168 700   |                   |
| 5. Meeting expenses                                     | 188 000   |                   |
| 6. Travel expenses and freight charges                  | 408 700   |                   |
| 7. Library  | 181 000   |                   |
| 8. Bureau of the CIPM                                   | 37 500    |                   |
| <i>D. Laboratories:</i>                                 |           | 1 749 000         |
| <i>E. Buildings (major maintenance and renovation):</i> |           | 483 700           |
| <i>F. Miscellaneous and unforeseen expenses:</i>        |           | 82 200            |
| <b>Total</b>  |           | <b>11 828 900</b> |

had initially been foreseen, and that given the CIPM's earlier discussion about the level of Reserves needed, the depletion of the Reserves might be faster than had previously been thought. Mrs Perent replied that this could be indeed the case (see Appendix 3, pages 197-201).

Dr Semerjian and Mr Énard both questioned the size of the figure used for inflation in the projected budgets. Dr Semerjian asked if this figure was the same as that which was current in the economy of the European Union. Mr Énard also asked if the budget of the library could not be reduced by making greater use of on-line search and electronic subscriptions and savings on annual subscriptions.

Upon request from Prof. Göbel, the budget for 2008 was approved by the CIPM.

## **Staff**

Professor Wallard spoke about the recent changes to the BIPM staff. He commented that a staff member is currently on maternity leave and that another staff member will shortly be going on maternity leave; and that a chemist, Dr E. Flores-Jardines, had joined the Chemistry section, and that a scientist, Dr G. Panfilo, and an assistant, Mr G. Thibaudeau, had joined the Time Frequency and Gravimetry section.

## **BIPM staff promotions**

Professor Wallard asked the CIPM to agree to two promotions; Dr Jiang (Physicist in the Time Frequency and Gravimetry section) to be promoted to *physicien principal* (Principal Physicist) and Dr Davis (Head of Mass section) to be promoted onto the exceptional level 14 of the salary scale on 1 January 2008. Professor Göbel spoke in favour of these promotions, and they were both approved by the CIPM.

## **Staff Statute**

Mr Cèbe (the BIPM's Legal Adviser) joined the CIPM for a presentation on the new proposed Staff Regulations and Rules. Mrs Perent made some opening remarks, saying that the new first draft of the Staff Regulations and Rules had been drawn up by Mr Cèbe; the idea was to create a set of rules which better represented modern standards of management, including human resource management, and to create a more transparent framework

within which staff could challenge decisions which they considered would adversely affect their rights.

In editing the new proposed Staff Regulations and Rules, the BIPM team had made a detailed comparison with the Staff Regulations and Rules of other international organizations, and had discussed the issue with human resource managers and lawyers from other international organizations. The new Staff Regulations and Rules had been presented to the appropriate staff commissions and proposed amendments had been received and many had been included.

Mr Cèbe spoke about the needs which the new Staff Regulations and Rules were intended to fulfill. The current Staff Statute did not respect due process of law, in that there were no procedures for challenging the decisions of the BIPM's Director. There was a need to bring the general terms of the current Staff Statute into line with the social norms of the present day, and to provide greater flexibility for creating a variety of types of appointments which would include fixed-term and indefinite term appointments. There was a need to provide a more comprehensive package of career prospects, and to provide a new channel for settling conflicts with or between staff and in providing opportunities which did not exist under the current Staff Statute – teleworking, paternity leave, family support leave and regular emoluments reviews. In addition, the new Staff Regulations and Rules would be bilingual, whereas the current Statute is only in French.

The new Staff Regulations and Rules would specify the obligations, rights and privileges of international civil servants, and, in consequence, the new Staff Regulations and Rules would also detail the responsibilities and duties to be expected of international civil servants. The new Staff Regulations and Rules would detail the legal protection staff could expect. The new Staff Regulations and Rules would limit certain entitlements, when compared to the current Statute but would create new entitlements.

Mr Cèbe gave a detailed presentation of some of the proposed amendments. He outlined a proposed timetable for the adoption of the new Staff Regulations and Rules by the CIPM. That is, that by early February 2008, the new Staff Regulations and Rules would be approved by the CIPM by using electronic voting and that the new Staff Regulations and Rules would enter into force at the beginning of April 2008. The next CIPM would consider questions concerning staff salaries and pensions, which might require other amendments to the Staff Regulations and Rules.

A general discussion followed in which CIPM members asked if there had been consultation with the staff about the new Staff Regulations and Rules. The CIPM members also put questions related to: the role of the CIPM in any appeal procedure; the first level of appeal after the Director in any disputes with BIPM staff; the level of appeal before the Administrative Tribunal of the International Labour Organization; and the appropriate international body to hear appeals from the BIPM staff.

In response, Mr Cèbe confirmed that there had been consultation with representatives of the staff and they will be further consulted. The CIPM would be informed of complaints which would go before the ILO Administrative Tribunal, and which challenged an individual decision implementing a general decision of the CIPM.

This latter point generated a discussion as to the role of the CIPM in the day-to-day management of the BIPM. Dr Carneiro said that he did not think it appropriate that the CIPM should interfere with the decisions of the Director of the BIPM, in particular with decisions of appointment and terminations of appointment of all staff members whoever they were. Dr Quinn supported Dr Carneiro's position.

Upon request of Dr Göbel, the conclusions of the document CIPM 2007-04 of 7 November 2007 "Presentation of the objectives of the proposed new Staff Rules" (restricted access) were approved by the members of the CIPM.

Dr Göbel also requested that the current draft be reviewed to take into account the comments already made by the members of the CIPM.

Mr Cèbe will revise the current text and re-circulate it to the CIPM for written comments and subsequent approval.

## **17 OTHER BUSINESS**

### **17.1 BIPM Metrology Summer School**

Professor Wallard spoke about the second BIPM Metrology Summer School, which will be held at the BIPM from 29 June to 11 July 2008. The co-Directors of this summer school are Prof. Wallard, Dr Alan Steele from

NRC in Ottawa (Canada) and Dr Mike Sargent from LGC in Teddington (UK), and the Scientific Secretary is Dr Claudine Thomas from the BIPM.

The aim of the school is:

- to present a broad review by world experts of the present state of metrology to a select group of about eighty students drawn wholly from the National Metrology Institutes of Member States and Associates of the CGPM, and
- to provide the occasion for these young people, from among whom the leaders of tomorrow's world metrology system will emerge, to meet and make the essential contacts for the future.

The programme promises to be exciting and well balanced, including a mixture of theory and experiment, chemistry and physics, and views of both the current and possible future versions of the International System of Units. Invited Nobel laureates: Prof. Sir Harry Kroto, Prof. William Phillips, Prof. Klaus von Klitzing, with special guest: Mrs Dava Sobel, author of *Longitude*. In addition, there will be more than forty teachers, chosen among the best metrology world experts. Professor Wallard expressed his thanks to members of the CIPM who had allowed staff to participate in the Summer School.

The timetable of lecture was distributed to the CIPM. Professor Wallard said that the registration fee for participation would be 1 000 euros, and that the PTB had offered to make some financial contribution to support some attendees. Professor Wallard said he would shortly be writing to directors of NMIs with full details, including deadlines for applications.

## 17.2 Terminology

Mr Cèbe presented some legal comments on terminologies to be used when referring to the Metre Convention, the BIPM and its activities and to the CGPM.

Mr Cèbe commented that during the drafting of the *Convocation and Programme of Work and Budget*, the Director of the BIPM had requested some legal comments on terminologies to be used when referring to the Metre Convention, the BIPM and the CGPM. The purpose of this presentation to the CIPM is to address the different terminologies to be used in all official documents and to focus on those expressions which should be avoided.

### The Metre Convention

- The Metre Convention should be referred to as a “treaty” or as a “constituent instrument”, depending on the context.
- “Treaty”: According to the Vienna Convention on the law of treaties (1969), a “treaty” is an “international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation”. In other words, the Metre Convention is a treaty and a treaty is, *per se*, international. Therefore, the Metre Convention should be merely referred to as a “treaty”, and not as a “diplomatic treaty”, an “international treaty” or an “intergovernmental treaty”.
- “Constituent Instrument”: Article 5 of that Vienna Convention reads: “The present Convention applies to any treaty which is the constituent instrument of an international organization and to any treaty adopted within an international organization without prejudice to any relevant rules of the organization”. Therefore, if needs be, the Metre Convention could also be referred to as the “constituent instrument” of the BIPM.

### The BIPM

***The BIPM should be referred to as an international or intergovernmental organization***

- The BIPM is an international organization and should hence be referred to as an “international organization” or as an “intergovernmental organization”.
- “International organization”: an international organization is a “collectivity of States established by treaty, with a constitution and common organs, having a personality distinct from that of its Member States and being a subject of international law with treaty-making capacity”. The BIPM was created by 17 States in 1875. The text of the Metre Convention, as confirmed by the account of its signature by Mr Guillaume in 1902, is focused on the creation of an international organization: the BIPM. The first article of the Metre Convention is thus uniquely concerned with the creation of the BIPM and its Article 6 makes it clear that it is the BIPM which is in charge of fulfilling the mission provided for in the Metre Convention. The signatories of the

Metre Convention did not use the term “international organization”, as this term was not commonly used when the Metre Convention – one of the first constituent treaties – was drafted.

- “Intergovernmental organization”: this term is a synonym for “international organization”. As mentioned in the Vienna Conventions, an ‘international organization’ means an intergovernmental organization. International bodies (e.g. ISO which is a non-governmental organization) should not be referred to as international organizations, as international bodies do not enjoy the same legal status and do not bear the same responsibilities *vis-à-vis* States and the worldwide community as do intergovernmental organizations.

***The BIPM should not be referred to as an “organ” of the Organization***

- “An organ”: the BIPM is an international organization which counts two organs only: the CGPM and the CIPM. The BIPM is not the third organ of an organization whose name would have been overlooked by the signatories of the Metre Convention. In the text of the Metre Convention, the term “BIPM” clearly designates the international organization created. Moreover, under international law, and even if the term “Bureau” may stand for an organ of an international organization, its first accepted meaning is: “... [the] name of some international organizations... of technical and/or administrative nature (Bureau International des Poids et Mesures)...”. In his well-known international law dictionary, the BIPM is thus specifically quoted by J. Salmon as the name of an intergovernmental organization. Besides, it is worth recalling that the name given to an organization cannot form an obstacle to its legal status as an intergovernmental organization.
- It is also worth noting that the BIPM is neither a “bureau” in its minimalist accepted meaning nor a Secretariat. Indeed, the term “Bureau” as an abbreviation for “Bureau International des Poids et Mesures” cannot designate the BIPM’s Direction, scientific and administrative staff. The BIPM’s Direction, scientific and administrative staff constitute the Secretariat of the BIPM. Therefore they could be referred to, if needed, as the “Secretariat” or the “General-Secretariat”, as it is the case in other intergovernmental organizations.

***The “international personality” of the BIPM and the signatories of the agreements committing the BIPM***

- Under international law, only States and intergovernmental organizations can enjoy international personality, privileges and immunities. As evidenced by the Article 3 of the Annexed Rules to the Metre Convention and by the Headquarters Agreement with the French Authorities, it is the BIPM which enjoys the legal status of an international organization, and implied international personality, privileges and immunities. As a consequence, it is on behalf of the BIPM that agreements with other intergovernmental organizations or States shall be signed. Agreements shall be signed by the Director of the BIPM and not by any other bodies, which would not have the legal authority to commit the BIPM (as, *inter alia*, Consultative Committees). For information, some agreements, such as the Headquarters Agreement and some Memoranda of Understanding, were signed by the President of the CIPM or by the Director of the BIPM on behalf of the CIPM, as the CIPM could also commit the BIPM as the supervisory organ of the BIPM. With regard to the Headquarters Agreement, the Metre Convention and the General Conference expressly assigned to the CIPM the duty to liaise with the French Government on issues related to the BIPM and its headquarters in France.

***The “Metre Convention” or “Organisation Intergouvernementale de la Convention du Mètre” as synonyms for “the BIPM”?***

- The Convocations, Reports, Proceedings and other official publications should only bear the “Bureau International des Poids et Mesures” as the official name of the intergovernmental organization created by the Metre Convention (see above). Indeed, it is worth mentioning that, even if some other names are, or have been, in use, they were never endorsed by the CGPM or Member States.
- For instance, the “Metre Convention” is still used as a synonym for “the BIPM” in the *Convocation and Programme of Work and Budget*, as is evidenced by the use of “the Member States of the Metre Convention”. However, legally speaking, a Convention, which is a legal instrument, cannot be considered as an intergovernmental organization. And a State cannot be referred to as a Member State of a Convention or a treaty, but only as a “signatory of”, or a “party to”, that treaty.

- Besides, in 1977, the CIPM considered the creation of another term (“*Organisation Intergouvernementale de la Convention du Mètre*”) with a view to designating “the whole bodies created by the Metre Convention” (see 66th CIPM meeting, 1977, pp. 17-18). As recalled above, such a creation was not needed as the BIPM is not an organ but is the intergovernmental organization created by the Metre Convention. The CIPM signalled then its intention to request the French Government’s opinion and, even if the CGPM created in 1979 a working group on the revision of the Convention, no further proposal was made. Since 1995, “*Organisation Intergouvernementale de la Convention du Mètre*” has been reproduced – under “BIPM” – on the front cover of the Convocations and Proceedings of the CGPM sessions and on other official publications. Such term was not further mentioned in the texts themselves. According to the then Director of the BIPM, this insertion was mostly aimed at recalling the BIPM’s legal status.
- In any event, neither the “Metre Convention”, nor the “*Organisation Intergouvernementale de la Convention du Mètre*” were ever endorsed by the CGPM as synonyms for the BIPM. Legally speaking, such synonyms would need to be endorsed by the CGPM or Member States if they were to be considered as needed.

***The “Organization” as a synonym for the BIPM?***

- Many international organizations simply use the term “the Organization” to refer to themselves in internal and official documents. Accordingly, the text of the BIPM’s Convocations, Reports and Proceedings could refer to “the BIPM” or to “the Organization”, if needs be, without any addition.

**The CGPM**

- The CGPM, the General Conference, is, above all, the governing body of the BIPM. It is not merely a meeting of its Member States. It would therefore be preferable to write “the CGPM decided, at its 23rd meeting, that...”, rather than “the 23rd CGPM decided that...” Indeed, a meeting cannot decide. And the following sentence: “the 23rd CGPM will...”, should as a matter of fact only refer to the meeting of the CGPM, even if there is most often no need to object to this usage. Other intergovernmental organizations share the same

concern, as is shown in the following extract from the International Labour Organization's Declaration: "The General Conference of the International Labour Organization meeting in its twenty-sixth meeting in Philadelphia, hereby adopts this tenth day of May in the year nineteen hundred and forty-four the present Declaration ..."

Professor Kovalevsky asked a question about the new category of Corresponding NMI of the BIPM; if this new category of Member were to be created by the General Conference, where would they go in the new organigram of the organization as given in the new Brochure of the BIPM? Professor Wallard replied by saying that if this category were to be created, it would be a very informal category and as such would not need to be included.

Dr Quinn criticised Mr Cèbe's legal opinion on the manner in which the CGPM should be referred to in documents. Mr Cèbe recalled that there is often no need to object to the usage Dr Quinn just mentioned. He commented that the proposed Guide was intended to be a general guide. There are legal justifications for the definitions proposed, however, this guide is part of a process, the main aim of which is to assist all stakeholders in the correct designation of texts and organs in order not to mix them up. He went on to say that the process should remain a constant concern.

## **18 ELECTION OF THE BUREAU OF THE CIPM**

On Friday, 16th November, at the International Conference Centre, Paris, Prof. Göbel opened the last session of the CIPM (W. Schwitz and H. Semerjian absent) by saying that the only remaining item on the Agenda was the election of the members of the bureau.

He said that presently, the bureau is composed of a President (E.O. Göbel), a Secretary (R. Kaarls) and two Vice-Presidents (B. Inglis and G. Moscati). The President went on to say that Dr Inglis had expressed the desire to continue as a Vice-President, but that Prof. Moscati was to retire at the end of 2007, and that all the members of the bureau should be subject to election or re-election.

Professor Göbel left the room and Dr Kaarls spoke strongly in favour of the reelection of Prof. Göbel as President, saying that as the incoming Director of the BIPM was a German, Prof. Göbel would have to retire from his position of President of the CIPM when the new Director assumed his position; but that until that time, Prof. Göbel was prepared to remain as President of the CIPM. Professor Göbel was re-elected unanimously as President of the CIPM. He thanked the members of the CIPM for their support.

Dr Kaarls left the room and Prof. Göbel spoke strongly in favour of his reelection as Secretary of the CIPM, saying that Dr Kaarls was willing to continue as Secretary of the CIPM. Dr Kaarls was re-elected unanimously Secretary of the CIPM. He thanked the members of the CIPM for their support.

Dr Inglis left the meeting room and Prof. Göbel spoke in favour of his reelection as Vice-President of the CIPM, saying that even though he had retired from the NMIA, he wished to continue as a Vice-President of the CIPM. Dr Inglis was re-elected unanimously as Vice-President of the CIPM. He thanked the members of the CIPM for their support.

Professor Göbel paid tribute to Prof. Moscati, who remains a Vice-President until he retires from the CIPM, and was subsequently re-elected unanimously.

Dr McLaren left the room and Prof. Göbel spoke strongly in favour of Dr McLaren's election as Vice-President of the CIPM. Dr McLaren was elected unanimously Vice-President of the CIPM. He thanked the members of the CIPM for their support saying that he was honoured to be elected as a Vice-President.

## **19 DATE OF NEXT MEETING**

The 97th meeting of the CIPM will take place at the Pavillon de Breteuil on 14-17 October 2008. The President closed the 96th meeting by thanking the members of the CIPM again for their contribution to the success of the CGPM.

**RECOMMENDATIONS ADOPTED BY THE  
INTERNATIONAL COMMITTEE FOR WEIGHTS AND MEASURES**

**RECOMMENDATION 1 (CI-2007):**

**Revision of the *Mise en pratique* list of recommended radiations**

The International Committee for Weights and Measures,

**considering** that:

- improved frequency values of molecules in the optical telecommunications region, already documented in the list of standard frequencies, have been determined by femtosecond comb-based frequency measurements;
- frequencies of molecules in the optical telecommunications region have been determined by femtosecond comb-based frequency measurements for the first time;
- frequencies of certain iodine gas-cell absorptions close to the 532 nm optical frequency standard have been determined by femtosecond comb-based frequency measurements for the first time;

**proposes** that the list of standard frequencies be revised to include the following:

- an updated list of frequency values for the  $^{12}\text{C}_2\text{H}_2$  ( $\nu_1 + \nu_3$ ) band at 1.54  $\mu\text{m}$ ;
- the addition of frequency values for the  $^{12}\text{C}_2\text{HD}$  ( $2\nu_1$ ) band at 1.54  $\mu\text{m}$ ;
- the addition of frequency values for the hyperfine components of the P(142) 37-0, R(121) 35-0 and R(85) 33-0 iodine transitions at 532 nm.

**RECOMMENDATION 2 (CI-2007):  
On the value and uncertainty of unstabilised He-Ne lasers**

The International Committee for Weights and Measures,

**considering**

- that most laser interferometers and many other measuring instruments used for length measurement are based on 633 nm He-Ne lasers;
- that these instruments are often used at uncertainty levels that are large compared to the possible variation of the He-Ne laser vacuum wavelength;
- that the vacuum wavelength of the unstabilized 633 nm He-Ne laser is restricted to within a narrow range by fundamental quantum phenomena;

**recognizing**

- that it would be necessary to provide guidance and documentary evidence concerning the value of the vacuum wavelength and its uncertainty that can be expected in the absence of calibration;
- that such evidence could help to avoid unnecessary calibrations of these lasers in such applications;

**recommends**

- that the values  $f = 473.612\,7\text{ THz}$   
 $\lambda = 632.990\,8\text{ nm}$

with a relative standard uncertainty of  $1.5 \times 10^{-6}$ , apply to the radiation in vacuum of a unstabilised helium-neon laser operating solely on the  $3s_2 \rightarrow 2p_4$  transition, independent of the isotopic mixture of the neon;

- that an entry for unstabilized helium-neon lasers, operating on the 633 nm ( $3s_2 \rightarrow 2p_4$ ) neon transition, be included in the second category of the list of standard frequencies, and that an accompanying paper with CCL authority be published in *Metrologia*.

## **APPENDIX 1. CALIBRATION AND MEASUREMENT CAPABILITIES**

A paper by the Joint BIPM/ILAC Working Group  
([document CIPM 2007-11](#))

### **Background**

1. After the “Nashville meeting” of the Regional Metrology Organizations and ILAC in 2006, the BIPM/ILAC working group received a number of comments on its proposals for a common terminology for Best Measurement Capability (BMC) and Calibration and Measurement Capability (CMC). It also received comments on its proposal to harmonise on the term “measurement capability” (MC). Some commentators, primarily from the RMO and National Metrology Institute (NMI<sup>1</sup>) community, wished, however, to retain the term CMC. They argued that it had become widely accepted for use in describing, evaluating, promoting, and publishing the capabilities listed in the Calibration and Measurement Capability part of the Key Comparison Database of the CIPM MRA. Other commentators from both communities considered that the two terms were applied and interpreted differently according either to established practice or to poor or inconsistent interpretation. They considered that this was itself an adequate justification for a harmonized definition. All, however, agreed that there should be further work to follow up the “Nashville statement” (NS).
2. A further proposal was discussed between the BIPM and the ILAC in a bilateral meeting on 8 March 2007 when ILAC representatives volunteered to move away from the term BMC and to harmonise on CMC. The issue was presented to a meeting between the Regional Metrology Organizations (RMO) and the Regional Accreditation Bodies (RAB) on 9 March 2007. The RMO/RAB meeting welcomed the text. Small modifications were made at the Joint Committee of the Regional Metrology Organizations and the BIPM (the JCRB) on 3 May 2007 in Johannesburg. A presentation was then made on 10 May 2007 to the Accreditation Issues Committee of ILAC which accepted the document.

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<sup>1</sup> Where the term NMI is used it is intended to include Designated Institutes (DIs) within the framework of the CIPM MRA.

This text was circulated to the members of the working group on 1 June, in advance of its planned meeting during the NCSLI conference in St Paul, USA, on 1 August 2007 so that there could be further regional consultations. During that period, a small working group developed "Notes 5a and b" aimed at the reference material community.

3. The BIPM/ILAC working group finalised the text during the St Paul meeting and now presents it for approval by the ILAC General Assembly in October 2007 and by the International Committee for Weights and Measures (CIPM) in November 2007. The working group suggested that, after approval, BIPM and ILAC should draft a joint statement on the subject. It also recommended that ILAC should adapt its current draft policy on estimation of uncertainty in calibration so as to take account of the recommendations and the outcome of the working group. The working group will continue to collaborate on other joint documents, which might include additional guidance to laboratories or bodies which produce reference materials. Other documents could include any agreed actions as a result of the ILAC survey of Accreditation Bodies on their experience of accrediting NMIs and a similar survey of the NMIs' experiences. These documents will be discussed in the RMO/RAB meeting in March 2008.

#### 4. The definition

“In the context of the CIPM MRA and ILAC Arrangement, and in relation to the CIPM-ILAC Common Statement, the following shared definition is agreed upon:

a CMC is a calibration and measurement capability available to customers under normal conditions:

- (a) as published in the BIPM key comparison database (KCDB) of the CIPM MRA; or
- (b) as described in the laboratory's scope of accreditation granted by a signatory to the ILAC Arrangement.”

5. The Notes to accompany the definition are of crucial importance, and aim to clarify issues of immediate relevance to the definition. They do not claim to cover every implication, or to address related issues. They may, however, be developed further, either in the current draft ILAC policy document on the estimation of uncertainty in calibration, or in

any guidance subsequently developed by the JCRB, for approval by the CIPM.

## Notes

- N1 The meanings of the terms Calibration and Measurement Capability, CMC, (as used in the CIPM MRA), and Best Measurement Capability, BMC, (as used historically in connection with the uncertainties stated in the scope of an accredited laboratory) are identical. The terms BMC and CMC should be interpreted similarly and consistently in the current areas of application.
- N2 Under a CMC, the measurement or calibration should be:
- performed according to a documented procedure and have an established uncertainty budget under the management system of the NMI or the accredited laboratory;
  - performed on a regular basis (including on demand or scheduled for convenience at specific times in the year); and
  - available to all clients.
- N3 The ability of some NMIs to offer “special” calibrations, with exceptionally low uncertainties which are not “under normal conditions,” and which are usually offered only to a small sub-set of the NMI's clients for research or for reasons of national policy, is acknowledged. These calibrations are, however, not within the CIPM MRA, cannot bear the equivalence statement drawn up by the JCRB, and cannot bear the logo of the CIPM MRA. They should not be offered to clients who then use them to provide a commercial, routinely available service. Those NMIs which can offer services with a smaller uncertainty than stated in the database of Calibration and Measurement Capabilities in the KCDB of the CIPM MRA, are, however, encouraged to submit them for CMC review in order to make them available on a routine basis where practical.
- N4 Normally there are four ways in which a complete statement of uncertainty may be expressed (range, equation, fixed value and a matrix). Uncertainties should always comply with the *Guide to the Expression of Uncertainty in Measurement* (GUM) and should include the components listed in the relevant key comparison protocols of the

CIPM Consultative Committees. These can be found in the reports of comparisons published in the CIPM MRA KCDB as a key or supplementary comparison.

- N5 Contributions to the uncertainty stated on the calibration certificate and which are caused by the client's device before or after its calibration or measurement at a laboratory or NMI, and which would include transport uncertainties, should normally be excluded from the uncertainty statement. Contributions to the uncertainty stated on the calibration certificate include the measured performance of the device under test during its calibration at the NMI or accredited laboratory. CMC uncertainty statements anticipate this situation by incorporating agreed-upon values for the best existing devices. This includes the case in which one NMI provides traceability to the SI for another NMI, often using a device which is not commercially available.
- N5a Where NMIs disseminate their CMCs to customers through services such as calibrations or reference value provision, the uncertainty statement provided by the NMI should generally include factors related to the measurement procedure as it will be carried out on a sample, i.e., typical matrix effects, interferences etc. must be considered. Such uncertainty statements will not generally include contributions arising from the stability or inhomogeneity of the material. However, the NMI may be requested to evaluate these effects, in which case an appropriate uncertainty should be stated on the measurement certificate. As the uncertainty associated with the stated CMC cannot anticipate these effects, the CMC uncertainty should be based on an analysis of the inherent performance of the method for typical stable and homogeneous samples.
- N5b Where NMIs disseminate their CMCs to customers through the provision of certified reference materials (CRMs) the uncertainty statement accompanying the CRM, and as claimed in the CMC, must indicate the influence of the material (notably the effect of instability, inhomogeneity and sample size) on the measurement uncertainty for each certified property value. The CRM certificate should also give guidance on the intended application and limitations of use of the material.

- N6 The NMI CMCs which are published in the KCDB provide a unique, peer reviewed traceability route to the SI or, where this is not possible, to agreed-upon stated references or appropriate higher order standards. Assessors of accredited laboratories are encouraged always to consult the KCDB (<http://kcdb.bipm.org>) when reviewing the uncertainty statement and budget of a laboratory in order to ensure that the claimed uncertainties are consistent with those of the NMI through which the laboratory claims traceability.
- N7 National measurement standards supporting CMCs from an NMI or DI are either themselves primary realizations of the SI or are traceable to primary realizations of the SI (or, where not possible, to agreed-upon stated references or appropriate higher order standards) at other NMIs through the framework of the CIPM MRA. Other laboratories that are covered by the ILAC Arrangement (i.e. accredited by an ILAC Full Member Accreditation Body) also provide a recognized route to traceability to the SI through its realizations at NMIs which are signatories to the CIPM MRA, reflecting the complementary roles of both the CIPM MRA and the ILAC Arrangement.
- N8. Whereas the various parties agree that the use of the definitions and terms specified in this document should be encouraged, there can be no compulsion to do so. We believe that the terms used here are a significant improvement on those used before and provide additional guidance and help so as to ensure consistency in their use, understanding, and application worldwide. We therefore hope that, in due course, they will become commonly accepted and used.



## **APPENDIX 2. DEBTORS – CONTRIBUTIONS AND SUBSCRIPTIONS IN arrears**

### **1 MEMBER STATES**

#### **1.1 Contributions in arrears for 3 years or less**

The contributions in arrears for 3 years or less amount to 2 805 474 euros as at 5 November 2007.

Part of this sum is related to unpaid contributions for 2007 from Bulgaria, the People's Republic of China, the Republic of Korea, Israel, Italy, Pakistan and Serbia and part of this sum is related to contributions in arrears for 2005, 2006 and 2007. This concerns the following States: Argentina, Egypt, United States of America and Uruguay.

- Argentina: Argentina has still contributions in arrears for an amount of 265 782 euros, which are related to 2006 and 2007.
- Egypt: Egypt has financial arrears for an amount of 144 753 euros, which are related to 2005, 2006 and 2007.
- United States of America: The United States of America have financial arrears for an amount of 1302 200 euros (including the discretionary contribution), which are related partly to its contributions for 2006 and partly to its contributions for 2007. 30 % still remain unpaid for 2006 (279 944 euros) as well as the full contribution for 2007 (983 770 euros).

[Note: The USA arrears amount to 1 263 713.96 euros if the additional discretionary contributions is not included in the arrears (38 486 euros for 2005, 2006 and 2007)].

- Uruguay: Uruguay has financial arrears related to 2005, 2006 and 2007 for a total amount of 146 693 euros. So far, Uruguay did not pay any contribution this year but, according to a recent contact with the Embassy in Paris, some payments would be made before the end of this year.

## 1.2 Contributions in arrears for more than 3 years

3.3 millions of euros of contributions are distributed among the other Member States. They mostly concern the 4 following States, which are in arrears for more than 3 years:

- Cameroon;
- Democratic People's Republic of Korea;
- Dominican Republic;
- Islamic Republic of Iran.

The detailed situation is as follows:

| Member States      | Period       | Total amount due | Non distributed contributions | Distributed contributions |
|--------------------|--------------|------------------|-------------------------------|---------------------------|
| Cameroon           | 1997 to 2007 | 474 245.02       | 1 951.00                      | 472 294.02                |
| Korea (D.P.R. of)  | 1989 to 2007 | 714 357.15       | 100 412.03                    | 613 945.12                |
| Dominican Republic | 1962 to 2007 | 941 098.23       | 7 514.14                      | 933 584.09                |
| Iran               | 1976 to 2007 | 1 240 414.07     | 40 528.12                     | 1 199 885.95              |
| Total              |              | 3 370 114.47     | 150 405.29                    | 3 219 709.18              |

Although it consistently and constantly tried to recover these arrears, the BIPM did not manage to have any recent contacts with Cameroon, Dominican Republic, Democratic People's Republic of Korea.

As regards Iran, here is the present situation:

Since the last meeting of the bureau of the Committee in June 2007, the BIPM had a number of contacts with the Iranian Embassy in France. Last June, we had a meeting at the BIPM's premises with the Embassy counsel and some recent telephone conversations with the Embassy scientific counsel.

The arguments submitted by the representatives of the Iranian Government remained the same, *i.e.*:

- Iran withdrew its membership in 1979;

- in any event, it was not a Member of the BIPM any more from 1979, as it did not pay its contributions for 1976, 1977 and 1978;
- it was not provided with any services and the other Member States only paid for the cost of services provided to them,
- the BIPM did not provide it regularly with the amount of the financial arrears.

As a reply, we maintained our arguments, i.e.:

- as from 1975, the Islamic Republic of Iran has never ceased to be a Member of the BIPM;
- the advantages and prerogatives were merely suspended for this State since 1980;
- its contributions were distributed among the other Member States as from this date;
- its debt towards all other Member States needs to be paid if the Islamic Republic of Iran wants to benefit anew from these advantages and prerogatives, even if this debt may be subject to a rescheduling agreement;
- the BIPM provided regularly information to the Islamic Republic of Iran on the amount of financial arrears.

On the request of the Iranian Embassy, the BIPM sent on 25 October 2007 a copy of all the exchange letters between the BIPM and Iran since 1973 (more than a hundred documents).

Last week, the BIPM also received a request from the Iran Embassy aimed at being provided with a copy of the Convocation of the 23rd meeting of the CGPM. The Iran Embassy also requested to know whether the situation of Iran would be addressed during the meeting of the CGPM. Representatives of the Iranian Government also tried to be provided with the agenda of the 23rd meeting of the CGPM through ISO. A *Note Verbale* was sent on 30 October 2007 to the Iran Ambassador in order to recall that the latter document could not be submitted to Iran as advantages and prerogatives were suspended for Iran until the settlement of all the arrears.

It is now proposed to wait for the decision of the CGPM on Draft Resolution H on financial arrears of the Member States to provide a detailed answer to Iran's arguments on merits. Indeed, if the draft Resolution H is

adopted, it shall strengthen the BIPM's interpretation of the Metre Convention.

## **2 ASSOCIATES**

Seven Associates did not settle their subscriptions for 2007, representing financial arrears for an amount of 50 407 euros. Those Associates are CARICOM, Cuba, Ecuador, Kazakhstan, FYROM, Panama and Philippines. Reminders were already sent and will be soon renewed.

### APPENDIX 3. RESERVES

Note prepared for the CIPM (document CIPM 2007-28, restricted)

As early as 1901<sup>1</sup>, the General Conference on Weights and Measures (CGPM) set up a Pension Fund for the BIPM staff members and a specific Reserve Fund. This Reserve Fund was supported from the payment of financial arrears at the time to cover, on a temporary basis, any difficulties for the BIPM to meet its financial commitments. The latter difficulties mainly originated in the delays in settlement of contributions by Member States.

Moreover, the CGPM decided in 1921<sup>2</sup> that the CIPM could decide on the level of funds to be transferred from the budget to the Reserve Fund and that the interests served would be capitalized. Over the last 40 years, the reserves were, on average, at a level of 79 % of an annual operating budget and were used to support cash flow, in order to:

1. Cope with fluctuations in payments of annual contributions from Member States, which can vary by as much as 40 %.

As mentioned above, these fluctuations have always created difficulties in the financial management of the BIPM since the early years after the creation of the BIPM. More recently, this was the case at the time of the dissolution of the USSR<sup>3</sup>. Indeed, the BIPM did not receive any contribution from this State in 1991 and its arrears were only recovered in full in 1999. At that time, the contributions of the USSR represented nearly 10 % of the dotation. As a result, the increase of arrears in percentage of the annual dotation rose from 19 % to 28 % and a large transfer from reserves, equivalent to 12.6 % of the reserves, was necessary to balance the budget in 1992.

When Italy did not settle its contributions for nearly three years during the period 1998-2000, the BIPM had also to face a shortfall in income of 1.5 million euros, representing nearly 25 % of the reserves.

Finally, this is also the 2007 situation, since the United States of America did not pay part of its contribution for 2006 and its full

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<sup>1</sup> See page 51 of the Proceedings of the 3rd meeting of the CGPM.

<sup>2</sup> See page 53 of the Proceedings of the 6th meeting of the CGPM.

<sup>3</sup> See page 132 of the Proceedings of the 81st meeting of the CIPM.

contribution for 2007. Its arrears amount to 1.3 million euros, *i.e.* 16 % of the reserves.

The fluctuations in payment of annual contributions from Member States since 1981 are illustrated in the attached graph related to contributions in arrears.

2. Provide resources as needs occur, for the BIPM's scientific programme decided by Member States

This was in particular the case when the BIPM took over the responsibility for TAI in 1985 and launched a laboratory programme on metrology in chemistry in 2000. In order to launch the programme related to TAI, transfers from reserves were necessary over the period 1985-1988 for an amount of 1 million of euros, equivalent to nearly 20 % of reserves in 1985<sup>4</sup>. The start-up costs associated with the laboratory programme in metrology in chemistry has also requested transfers, over 2000-2006, of 2 millions euros, equivalent to about 30 % of reserves in 2000<sup>5</sup>.

3. Provide resources for building projects

The long-term building programme decided by the CIPM in the 1980s was fully financed from the reserves. It included the construction of:

- a laboratory building for laser activities in 1981-1983 (about 0.6 million euros, *i.e.* 27 % of the reserves in 1981);
- the *Nouveau Pavillon*, an administration building with library and offices in 1986-1988 (1.6 million euros, *i.e.* 37 % of the reserves in 1986); and of
- the *Pavillon du Mail*, with a new workshop, a large meeting room and offices in 2000-2001 (2.6 millions of euros, *i.e.* 52 % of the reserves)<sup>6</sup>.

In 2006-2007, the conversion of a part of the *Petit Pavillon* in meeting rooms also required a transfer from the reserves for about 0.4 million euros (5 % of the reserves in 2005)<sup>7</sup>.

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<sup>4</sup> See page 21 of the Proceedings of the 74th meeting of the CIPM, page 22 of the Proceedings of the 75th meeting of the CIPM, and *Rapports annuels sur la situation administrative et financière du BIPM pour 1985* (page 7), 1986 (pages 7-8), 1987 (pages 8-9).

<sup>5</sup> See page 8 of the *Rapports annuels sur la situation administrative et financière pour 2001, 2002, 2003, 2004, 2005*.

<sup>6</sup> See page 233 of the Proceedings of the 86th meeting of the CIPM.

4. Make transfers to the Pension Fund, depending on the result of regular actuarial surveys. The last two transfers were made in 1994<sup>8</sup> and 2001. The amounts transferred were respectively of 1.1 million euros, corresponding to 20 % of the reserves, and 1 million euros corresponding to about 16 % of the reserves<sup>9</sup>.

As shown by the attached graph, the reserves reached more than 40 % of an annual operating budget in recent years (in 2005, 70 % and in 2006 74 %), but this high level of reserves was fully justified by the BIPM's financial liabilities and was linked to the following facts:

- Some financial arrears were successfully recovered. Some of the recovered contributions were returned to Member States, since they were related to distributed contributions from Member States which had more than 3 years of arrears. And the recovered contributions from Member States which had less than 3 years of arrears accrued to the BIPM's reserves;
- The staffing level was below the level required to deliver the programme of work approved by the CGPM at its 22nd meeting. This resulted in delays in running cost expenditure;
- Unexpected and "one-off" income.

It should be noted that the level of reserves should drop to 59 % at the end of 2007, as a result, of some catching up on delayed laboratory expenditure and of a reduction in the level of income. Indeed, the level of unpaid contributions has significantly increased in recent years. In 2007, the unpaid annual contributions increased from 14 % to over 20 % of the BIPM's annual dotation. These 20 % represent some 2 millions euros. As it is impossible to foresee arrears and fluctuations in the payment of contributions, the financial management needs to take into account these financial fluctuations and the unavoidable financial commitments mentioned above. These large fluctuations therefore make it necessary to frequently reconsider the appropriate level of reserves.

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<sup>7</sup> See page 227 of the Proceedings of the 94th meeting of the CIPM.

<sup>8</sup> See page 135-136 of the Proceedings of the 83rd meeting of the CIPM

<sup>9</sup> See page 233-234 of the Proceedings of the 86th meeting of the CIPM.

Therefore, at its annual meetings, the CIPM regularly reconsiders the level of reserves necessary to support the cash flow. Therefore, and since 1901, the CIPM repeatedly decided that the level of the reserves should not be less than two thirds of an annual operating budget<sup>10</sup>. At the last meeting of the CGPM in 2003<sup>11</sup>, the Budget Committee “*accepted that for these reasons a level of reserves of about 40 % is prudent*”. However, “*these reasons*”<sup>12</sup> were only related to delays in paying contributions or to arrears and, as mentioned above, there are some other liabilities that can only be fulfilled timely and appropriately if the BIPM can have recourse to reserves set at a rather high level. These wider reasons were not discussed by the Budget Committee.

B. Perent

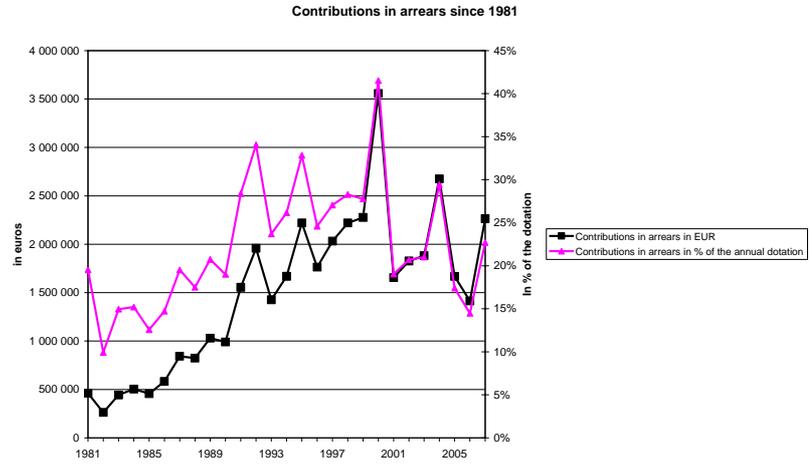
4 November 2007

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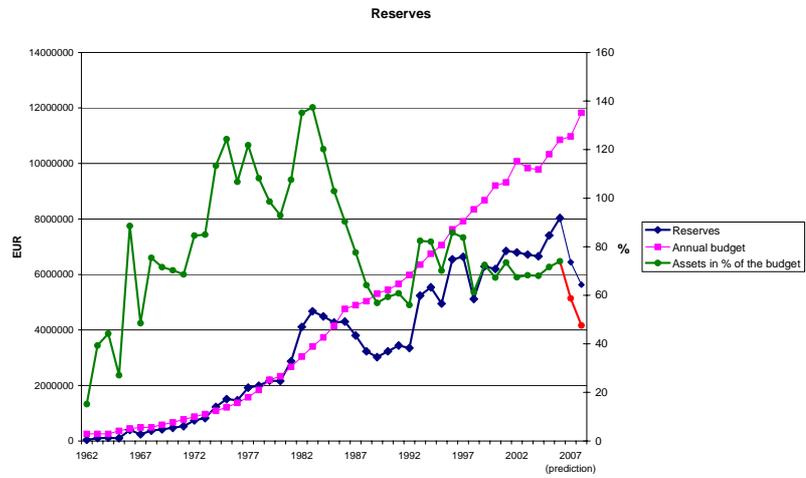
<sup>10</sup> See page 94 of the Proceedings of the 78th meeting of the CIPM and page 126 of the Proceedings of the 82nd meeting of the CIPM.

<sup>11</sup> See page 363 of the Proceedings of the 22nd meeting of the CGPM.

<sup>12</sup> “(a) fluctuations in income from year to year have been more than 20%, and income from Member States comes at all times of the year and reserves are needed to support cash flow; (b) there is a lack of payments in those cases where Member States were in default for up to three years until the redistribution rules are applied” (ibid).



Contributions in arrears since 1981



Level of reserves since 1962



## LIST OF ACRONYMS USED IN THE PRESENT VOLUME

### 1 Acronyms for laboratories, committees and conferences\*

|          |  |
|----------|--|
| AFRIMETS | Inter-Africa Metrology System  |
| BEV      | Bundesamt für Eich- und Vermessungswesen, Vienna (Austria)   |
| BIPM     | International Bureau of Weights and Measures/<br>Bureau International des Poids et Mesures   |
| CC       | Consultative Committee of the CIPM   |
| CCAUV    | Consultative Committee for Acoustics, Ultrasound and Vibration/Comité Consultatif de l'Acoustique, des Ultrasons et des Vibrations           |
| CCEM     | Consultative Committee for Electricity and Magnetism/<br>Comité Consultatif d'Électricité et Magnétisme                                      |
| CCL      | Consultative Committee for Length/Comité Consultatif des Longueurs   |
| CCM      | Consultative Committee for Mass and Related Quantities/<br>Comité Consultatif pour la Masse et les Grandeurs Apparentées                     |
| CCPR     | Consultative Committee for Photometry and Radiometry/<br>Comité Consultatif de Photométrie et Radiométrie                                    |
| CCQM     | Consultative Committee for Amount of Substance: Metrology in Chemistry/Comité Consultatif pour la Quantité de Matière : Métrologie en Chimie |
| CCRI     | Consultative Committee for Ionizing Radiation/<br>Comité Consultatif des Rayonnements Ionisants  |
| CCT      | Consultative Committee for Thermometry/<br>Comité Consultatif de Thermométrie  |
| CCTF     | Consultative Committee for Time and Frequency/<br>Comité Consultatif du Temps et des Fréquences  |
| CCU      | Consultative Committee for Units/Comité Consultatif des Unités   |
| CENAM    | Centro Nacional de Metrología, Querétaro (Mexico)  |

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\* Organizations marked with an asterisk either no longer exist or operate under a different acronym.

|                    |  |
|--------------------|--|
| CERN               | European Organization for Nuclear Research, Geneva (Switzerland)   |
| CGPM               | General Conference on Weights and Measures/<br>Conférence Générale des Poids et Mesures  |
| CIE                | International Commission on Illumination/<br>Commission Internationale de l'Éclairage  |
| CIEMAT             | Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Madrid (Spain)   |
| CIML               | Comité International de Métrologie Légale  |
| CIPM               | International Committee for Weights and Measures/<br>Comité International des Poids et Mesures   |
| CNEA               | Comisión Nacional de Energía Atómica, Buenos Aires (Argentina)   |
| Codex Alimentarius | Commission created by the FAO and the WHO to develop food standards, guidelines and codes of practice  |
| COOMET             | Euro-Asian Cooperation of National Metrological Institutions   |
| EU                 | European Union   |
| DG-NCM             | Directorate General National Center of Metrology, Sofia (Bulgaria)   |
| ESA                | European Space Agency  |
| EURAMET            | European Association of National Metrology Institutes  |
| EUROMET            | European Collaboration in Measurement Standards  |
| FFM                | French Foreign Ministry  |
| GMEE               | Italian Association of Electrical and Electronic Measurements/<br>Associazione Italiana Gruppo Misure Elettriche ed Elettroniche, Milano (Italy) |
| HSC                | Health and Safety Committee  |
| HSM                | Health and Safety Manager  |
| IAEA               | International Atomic Energy Agency   |
| IEC                | International Electrotechnical Commission  |
| IFCC               | International Federation of Clinical Chemistry and Laboratory Medicine   |
| ILAC               | International Laboratory Accreditation Cooperation   |
| ILO                | International Labour Organization  |
| INRIM              | Istituto Nazionale di Ricerca Metrologica, Turin (Italy)   |
| IOPP               | Institute of Physics Publishing, London (United Kingdom)   |
| ISO                | International Organization for Standardization   |
| ISO REMCO          | International Organization for Standardization, Committee  |

|         |   |
|---------|---|
| JCDCMAS | Joint Committee on Coordination of Assistance to Developing Countries in Metrology, Accreditation and Standardization |
| JCGM    | Joint Committee for Guides in Metrology   |
| JCRB    | Joint Committee of the Regional Metrology Organizations and the BIPM  |
| JCTLM   | Joint Committee on Traceability in Laboratory Medicine  |
| KRISS   | Korea Research Institute of Standards and Science, Daejeon (Rep. of Korea)  |
| LGC     | Laboratory of the Government Chemist, Teddington (United Kingdom)   |
| LNE     | Laboratoire National de Métrologie et d'Essais, Paris (France)  |
| LNE-INM | Laboratoire National de Métrologie et d'Essais, Institut National de Métrologie, Paris (France)                       |
| MRA     | Mutual Recognition Arrangement  |
| MSL     | Measurement Standards Laboratory of New Zealand, Lower Hutt (New Zealand)   |
| NCSLI   | National Conference of Standards Laboratories, Boulder CO (United States)   |
| NIM     | National Institute of Metrology, Beijing (China)  |
| NIST    | National Institute of Standards and Technology, Gaithersburg MD (United States)                                       |
| NMI     | National Metrology Institute  |
| NMIA    | National Measurement Institute, Australia, Lindfield (Australia)  |
| NMISA   | National Metrology Institute of South Africa, Pretoria (South Africa)   |
| NOAA    | National Oceanic and Atmospheric Administration, Washington DC (United States)  |
| NRC     | National Research Council of Canada, Ottawa (Canada)  |
| OIML    | International Organization of Legal Metrology/<br>Organisation Internationale de Métrologie Légale                    |
| PTB     | Physikalisch-Technische Bundesanstalt, Braunschweig and Berlin (Germany)  |
| RAB     | Regional Accreditation Body   |
| RMO     | Regional Metrology Organization   |
| SADCMET | Southern African Development Community Cooperation in Measurement Traceability  |

|       |   |
|-------|---|
| SIM   | Sistema Interamericano de Metrología  |
| UME   | Ulusal Metroloji Enstitüsü/National Metrology Institute,<br>Marmara Research Centre, Gebze-Kocaeli (Turkey) |
| UNIDO | United Nations Industrial Development Organization  |
| VAMAS | Versailles project on advanced materials and standards  |
| WADA  | World Anti Doping Agency  |
| WCO   | World Customs Organization  |
| WG    | Working Group   |
| WGDM  | CCL Working Group on Dimensional Metrology  |
| WHO   | World Health Organization   |
| WMO   | World Meteorological Organization   |
| WTO   | World Trade Organization  |

## 2 Acronyms for scientific terms

|      |   |
|------|---|
| BMC  | Best Measurement Capability   |
| CMC  | Calibration and Measurement Capability  |
| CRM  | Certified Reference Material  |
| GUM  | <i>Guide to the Expression of Uncertainty in Measurement</i>                                      |
| IT   | Information Technology  |
| KCDB | BIPM Key Comparison Database  |
| KCRV | Key Comparison Reference Value  |
| SI   | International System of Units/Système International<br>d'Unités                                   |
| TAI  | International Atomic Time   |
| UTC  | Coordinated Universal Time  |
| VIM  | <i>International Vocabulary of Metrology, Basic and<br/>General Concepts and Associated Terms</i> |

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